

**HUSSmann<sup>®</sup>**  
**FIBERTRONIC DEFROST CLOCK 1000**  
**Installation/Service Instructions**

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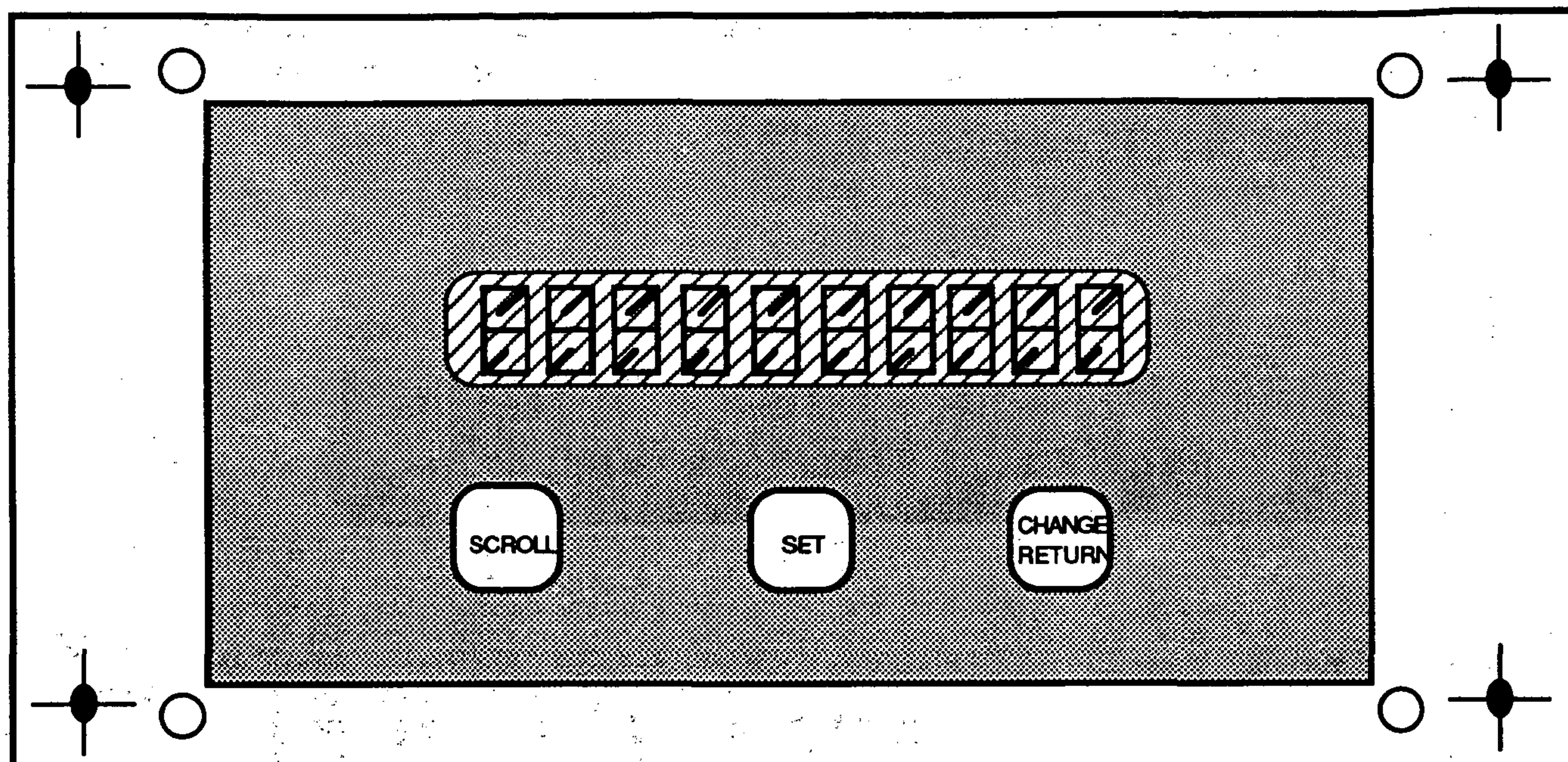


Figure 1-1. Fibertronic Defrost Clock 1000

## PURPOSE

The Fibertronic Defrost Clock 1000 is the most advanced defrost timer in the industry today. This timer has been developed utilizing the most advanced technology available. The Fibertronic Defrost Clock 1000 is designed to control up to 24 refrigeration branches. The clock can only be used in conjunction with the Fibertronic Control Panel for the Super Plus Refrigeration System. This manual will provide the necessary information for installing and programming the Fibertronic Defrost Clock 1000.

## BATTERY BACKUP

The clock's memory chip contains a battery backup. In the event of a power failure, memory is saved for up to 10 years.

## COMPONENTS

### Processor Components:

Front Panel Membrane  
CPU Board

### Connection Components:

Transformer  
24V AC Power Plug  
Fiberoptic Cable  
Branch Defrost Boards

### Processor Components

#### Front Panel Membrane

The front panel membrane consists of a 3-button keypad and a 10-character display. See Figure 1-1. The keypad is a pressure sensitive touchpad which acknowledges each press of any key with a blink of its display.



**CPU Board**

The CPU Board (Central Processing Unit) is located within the enclosure directly behind the front membrane. This board contains the Fibertronic Defrost Clock 1000's internal power source, control chips, memory and optical

transmitters (outputs). There are 24 optical transmitters; 12 are located on top of the clock and 12 are located on the clock's bottom. There is a 24V AC input on the side of the clock.

Optical  
Transmitters  
(Outputs)

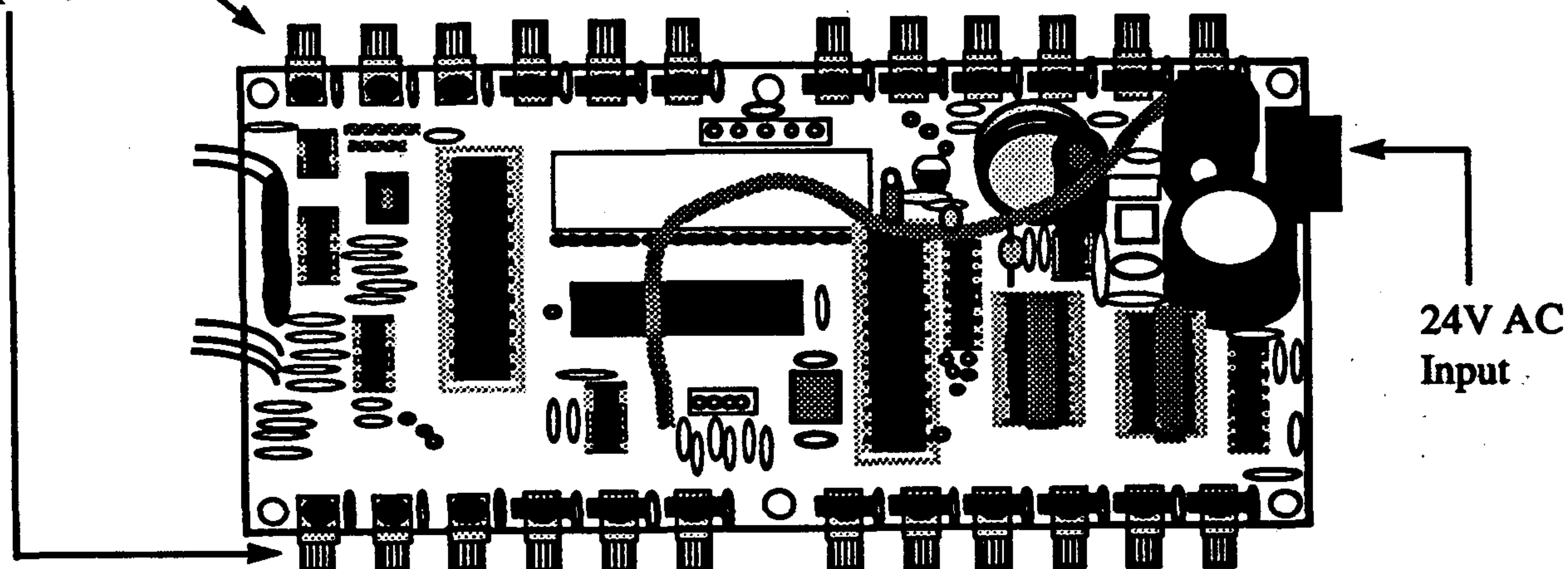


Figure 1-2. CPU Board

**Connection Components****Transformer and 24 V AC Power Plug Assembly**

The control transformer is the power source for the Fibertronic Defrost Clock 1000. This transformer converts from power line voltage

to 24V AC. See Figure 1-3. The transformer is connected to the clock assembly by the power plug assembly, Figure 1-4.

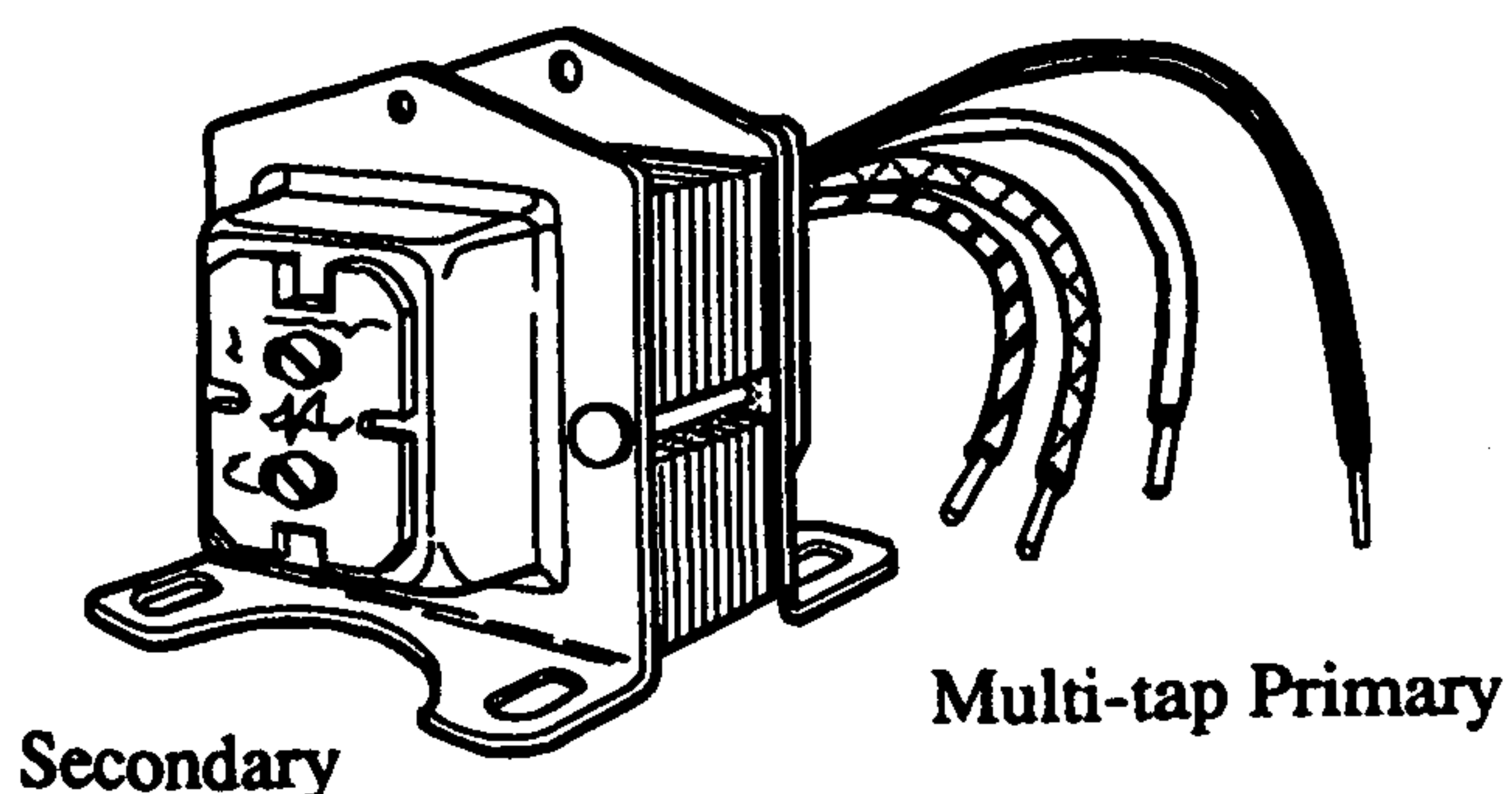


Figure 1-3. Control Transformer

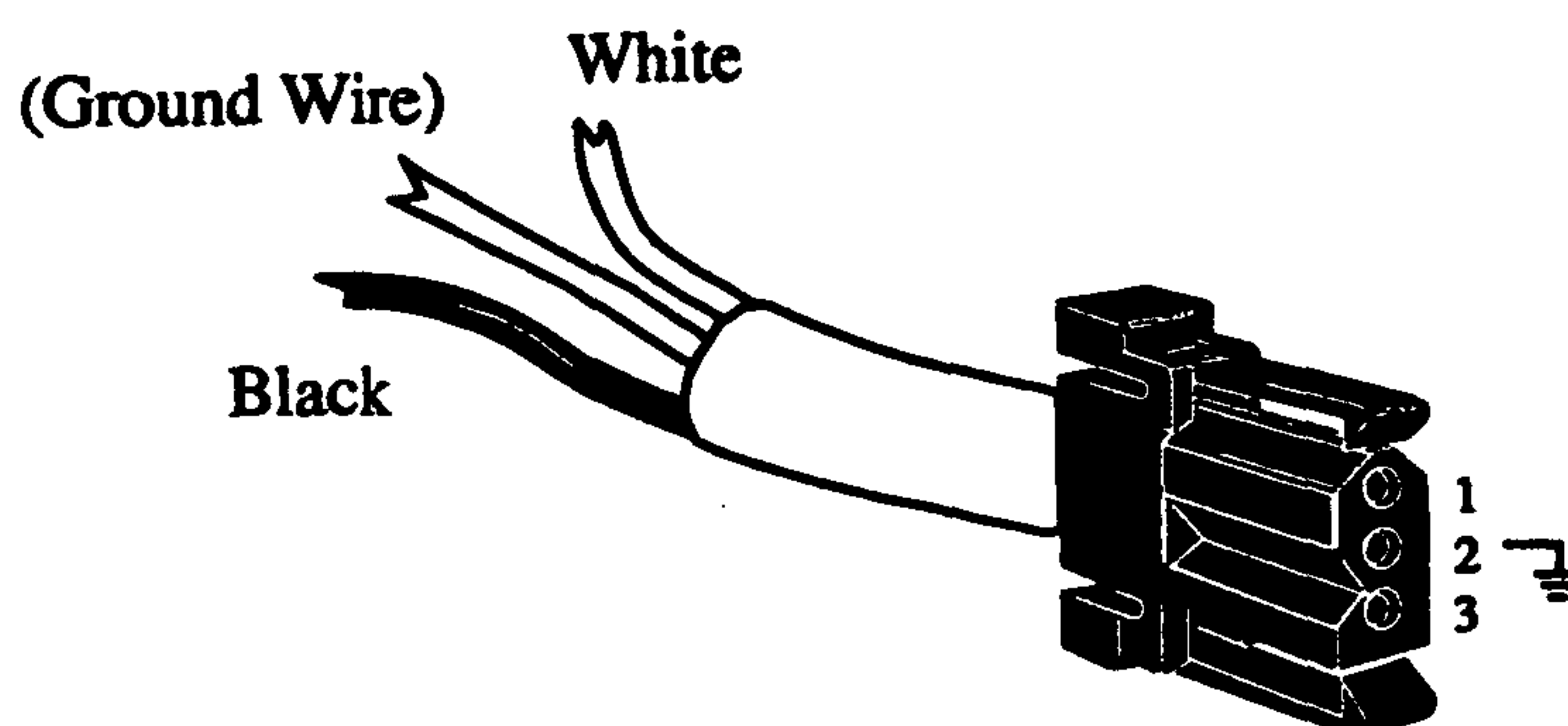


Figure 1-4. 24V AC Power Plug Assembly



### Fiberoptic Cable and Branch Defrost Boards

Fiberoptic cable connects the Fibertronic Defrost Clock 1000 to the branch defrost boards. The fiberoptic cable used to send the light signal is an MITSUBISHI SHV-4001.

The 24 outputs of the clock are special LED optical transmitters. The Fiberoptic cable is inserted in the outputs and run to the respective defrost branch boards installed across the top of

the Fibertronic Control Panel. The cable allows a light signal from the optical transmitters on the clock to travel to the branch defrost boards.

There is a branch defrost board for each of the possible 24 systems. The branch defrost boards on the Fibertronic Control Panel are Printed Circuit Boards equipped with a light sensor.

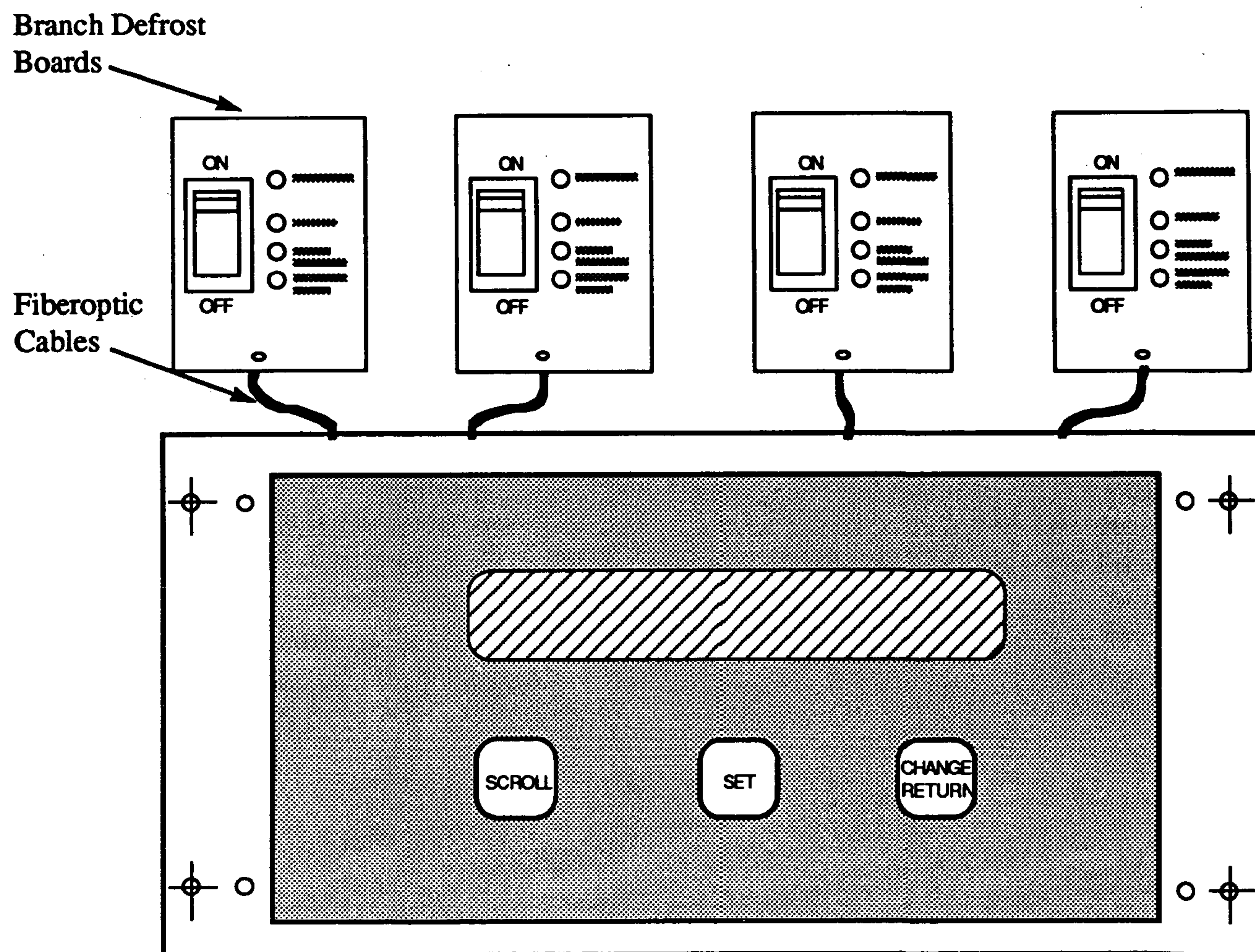


Figure 1-5. Fiberoptic Cables and Branch Defrost Boards



**SECTION 2 — INSTALLATION**

**GENERAL**

The Fibertronic Defrost Clock 1000 is designed to be factory or field installed on Super Plus Fibertronic Systems.

**NOTE:** In order to minimize unit downtime, read these instructions carefully, understand the procedures and have all the necessary materials available.

**FACTORY INSTALLED**

The clock is mounted on the left-hand door of the Fibertronic Super Plus System. The transformer is mounted inside the panel directly behind the clock. All wiring and cable integral to the Fibertronic Control Panel is completed at the factory. This includes the 24V AC transformer and branch boards.

The transformer is a multitap transformer. The 120V AC primary connections are connected to terminal XIC (through fuse F1) and X21 in the control panel. The usual 208 and 240V AC primary wires have been insulated. The 24V AC is connected to the clock via the 24V AC power plug assembly. The bare ground wire is connected to the panel liner.

The branch defrost board are an integral part of the Fibertronic Control Panel for Super Plus Systems. The Fiberoptic Cable is connected from optical transmitters (outputs) on the clock to the sensors on the branch boards.

**FIELD INSTALLED**

This section provides instructions for field installations on existing Fibertronic Super Plus Systems. The following parts are required:

<b>Required Parts</b>		
<b>Item</b>	<b>Description</b>	<b>Quantity</b>
1.	Fibertronic Defrost Clock 1000 .....	1
2.	24V AC Power Plug Assembly .....	1
3.	24V AC Transformer .....	1
4.	Fiberoptic Cable (MITSUBISHI SHV-4001) ....	15 ft/System
5.	#6-32 Screws .....	4
6.	Tie Raps and Mounts .....	5
7.	Fuse Holder and Fuse .....	1
8.	Ring Stake-ons .....	3
9.	Bezel with EPC P/N 0340200 .....	1
	or Bezel without EPC P/N 0340202 .....	1
10.	Jumper Plug Assembly .....	1/System

There are two parts that make up the field installation process—Clock Wiring and Branch Board Configuration.

## Clock Wiring

1. Mount the defrost clock to the left-hand door under the refrigeration controller. The clock assembly is to be screwed to the back side of the door using the four (4) available screw holes. The clock should be centered in the middle of the bezel opening.
2. Mount the 24V AC transformer (provided) to the panel liner near the defrost clock.
3. Connect the 24V AC power plug (provided) to the secondary of the transformer. The bare ground wire should be connected to the panel liner near the transformer.
4. Connect the primary leads to the 120V AC control circuit of the panel. Place a 1/2 amp MDL slow blow fuse in series with the hot (X1) lead from the transformer to control circuit for protection of the clock.
5. Connect the Fibertronic Defrost Clock, as shown below in Figure 2-1, to each defrost branch board using the supplied fiberoptic cable. Note that the cable jacket must be stripped 1/8" back to expose the clear plastic core. The end of the plastic core should have a clean-cut look. It should not be crushed or squeezed at the end.
6. The plastic screw collar should be tight to hold the cable firmly in the optical transmitter (output).
7. After all branch boards are connected to the clock as described above, plug the 24V AC power plug into the right-hand receptacle as shown below in Figure 2-1.

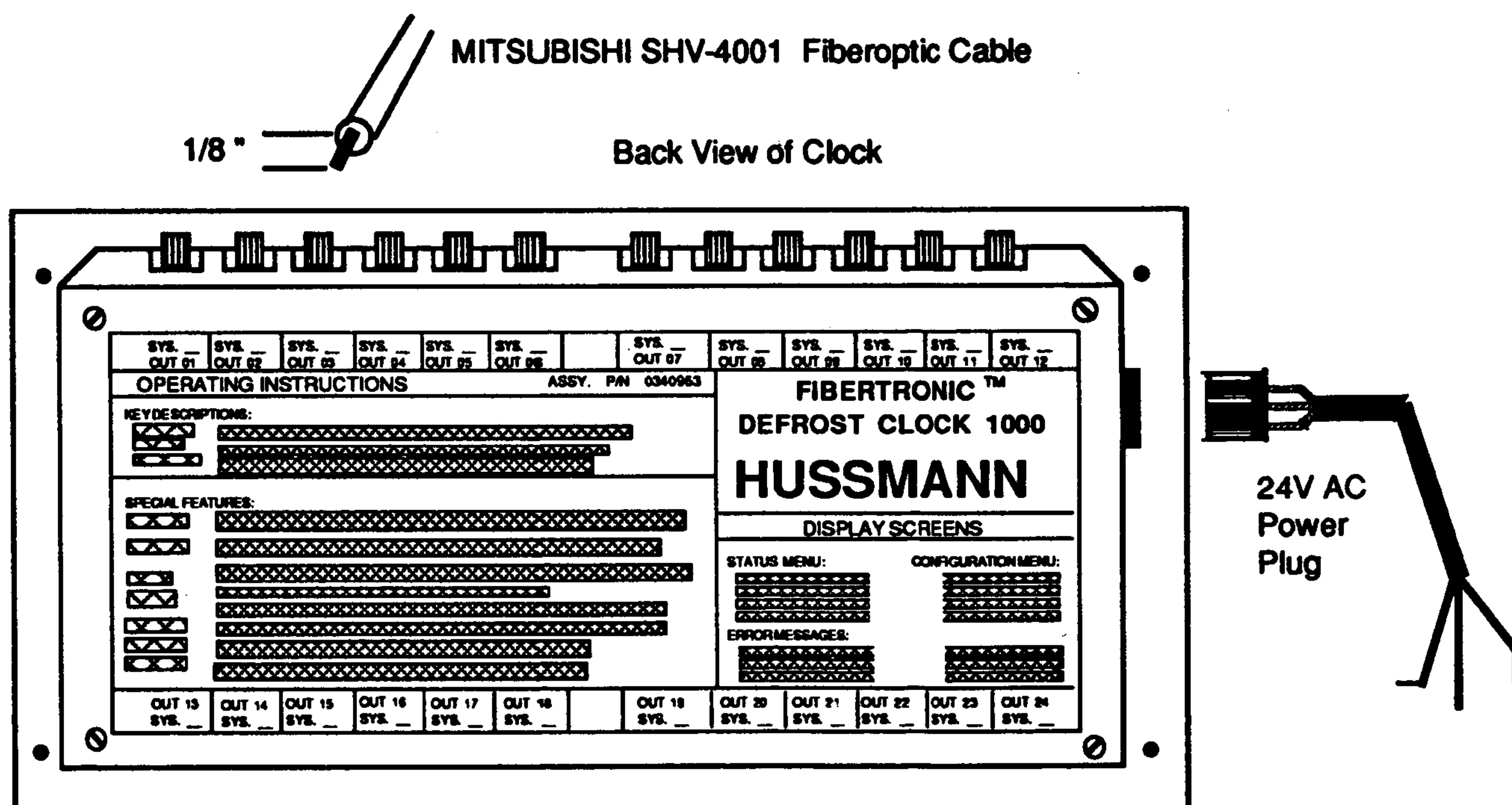


Figure 2-1. Connections to Fibertronic Defrost Clock 1000



### Branch Board Configuration

The standard defrost branch boards have jumper selected options for types of defrost and for the type of clock (mechanical or Fibertronic Defrost) used to input the defrost signals.

Jumper J4, if cut, will select a mechanical clock to input the signal. Jumper J5, if cut, will select the Fibertronic Defrost Clock to input the signal. Refer to Figure 2-2 for jumper locations.

If a mechanical clock is being replaced with the Fibertronic Defrost Clock, one of two things must be done to allow the board to operate properly.

1. Re-solder jumper J4 and cut jumper J5.
2. Or unplug cable assembly P2 and insert a shorting plug assembly into the P2 plug. When this is done, cut jumper J5 and install the fiberoptic cable to the branch board as described on the previous page.

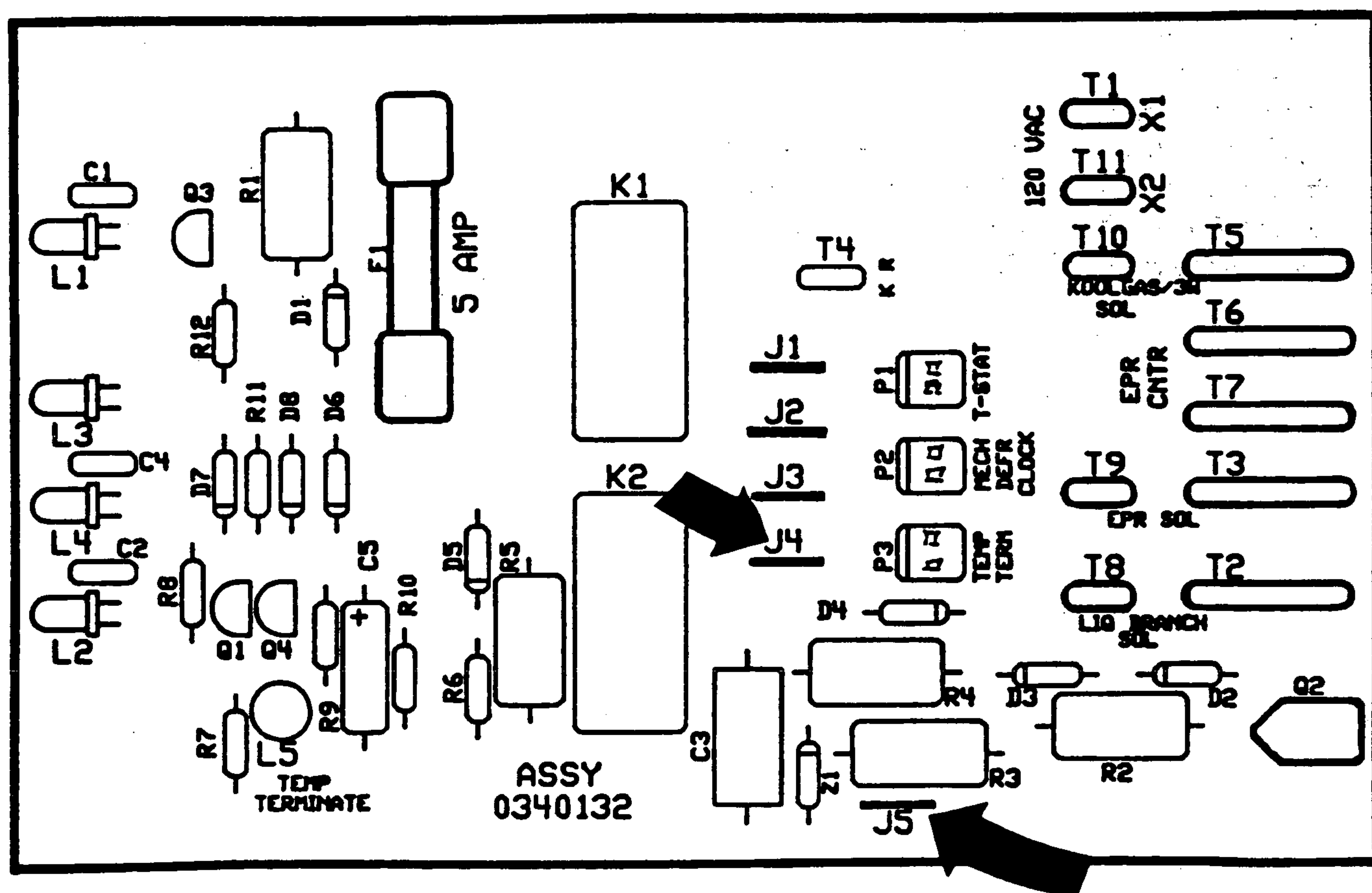


Figure 2-2. Defrost Branch Board Jumper Identification

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## START-UP

Complete the following sequence to start the Fibertronic Defrost Clock 1000.

1. Carefully check all wiring before start-up.
2. Check the fiberoptic cable to ensure proper seating into the branch boards and clock.
3. Unplug the 24V AC power plug assembly from the side of the Fibertronic Defrost Clock 1000.
4. Using a digital voltmeter, verify 24V AC secondary supply across terminals 1 and 3 of the power plug assembly (see Figure 1-4). If the power supply is 21-30V AC, connect plug assembly into the side of the clock. When the Fibertronic Defrost Clock 1000 is first powered up, the initial display will read HUSSMANN.

## CHECKOUT PROCEDURE

Now that the Fibertronic Defrost Clock 1000 has been completely installed and started-up a quick checkout should be conducted. Each system has a manual forcing screen for testing and manual defrosting (see Page 3-15). Using the manual forcing feature, force each of the connected systems into and out of a defrost (one system at a time) to verify that the defrost clock fiberoptic cables and branch defrost boards are operating correctly. If any system does not respond, refer to Service Page 4-1.



## SECTION 3 — OPERATION

### GENERAL

The Fibertronic Defrost Clock 1000 display screens are designed to allow easy programming of one or all of the 24 systems. This section is intended to provide the user with the necessary instructions for programming the desired defrost schedule.

Below are the main programming options for each of the 24 system outputs (optical transmitters) of the defrost clock. All programming screens are located in the Configuration menu of the selected system. See Page 3-5 Display Screens.

### PROGRAMMING OPTIONS

#### System Numbering

The user has the option of changing the system numbers to match the numbers actually in use. For example, outputs not being used should be numbered 00 or, if there is more than one rack in the store, the systems for the second rack may be numbered 25-48. See Page 3-17 System Numbering.

#### Type of Defrost

The user may select from O.T. (Off Time), GAS. (Koolgas) or ELE. (Electric).

#### Start Time

The clock operates on a 24-hour period starting at 00:00 hours (midnight) and ending at 23:59 (11:59 p.m.). For this reason the first defrost should be scheduled to start at or after midnight. The start time of the first defrost will be used, along with the number of defrosts for that day, to determine the start times for that system's subsequent defrosts. Defrosts are scheduled on the quarter hour.

#### Defrost Cycle Duration

This is the total duration of the defrost cycle in minutes. The length can range from 1-127 minutes. All defrosts for that system will have this chosen duration.

### Number of Defrost Cycles

This is the number of defrost cycles that the system will complete in a 24-hour period (midnight-midnight). You may select from 1-12 defrost cycles. This number is limited, however, to a certain maximum based on the time selected for the first defrost cycle.

### NOTES:

- Defrosts are scheduled on the quarter hour.
- The clock operates on military time. The 1st available defrost time is 00:00 (midnight) and the last is 23:45 (11:45 p.m.)
- The clock will not continue a schedule into the next calendar day.

### AUTOMATIC SCHEDULING ROUTINE

The number of defrost cycles is limited because the clock has an automatic scheduling routine that looks at the start time of the first defrost of the day and then breaks the day up into equal parts. If the start time is too late in the day to get 12 equal parts then the clock will limit the number of defrosts to the number of equal parts that can be obtained. This is how the "Number of Defrosts Possible" is determined in Figure 3-1 below.

Latest Start Time	Number of Defrosts Possible	Time Interval Between Defrosts
1:00 a.m.	12	2:00
1:15 a.m.	11	2:15
1:30 a.m.	10	2:30
1:45 a.m.	9	2:45
2:45 a.m.	8	3:00
2:45 a.m.	7	3:30
3:45 a.m.	6	4:00
4:45 a.m.	5	4:45
5:45 a.m.	4	6:00
7:45 a.m.	3	8:00
11:45 a.m.	2	12:00
23:45 (11:45 p.m.)	1	24:00

Figure 3-1. Automatic Scheduling Intervals  
Set by Clock

Figure 3-2 is an example of an automatic schedule for System #01. The defrost times selected by the computer have been penciled in on a programming chart. In this example System #01 has the following:

Type of defrost—Koolgas  
Start Time—1 a.m.  
Length of cycle—10 minutes  
Number of defrost cycles—4

Note that the clock has set the schedule for 1:00, 7:00, 13:00 and 19:00.

As seen in Figure 3-3, if the user had entered 6 for the number of defrost cycles the resulting schedule would have been 1:00, 5:00, 9:00 13:00 17:00 and 21:00.

The automatic scheduling routine simplifies the programming process by providing a basic defrost schedule. Each of the individual start times, except the first, may be tailored to meet individual customer needs. (See Page 3-14 Subsequent Defrost Times.)

**NOTE:** Each of the 24 systems is factory configured as follows:

Type of defrost—Off Time (O.T.)  
Length of cycle—10 minutes  
Number of defrost cycles—4

System #01 is scheduled to start its first defrost at 00:00 (midnight), System #02's starts 15 minutes later at 00:15, System #03's starts at 00:30, etc

## COMPLETING PROGRAMMING CHART

A full size programming chart is attached to the back of this publication. The chart shows a 24-hour day divided into 96 parts, one each 15 minutes. Thus, defrosts can only be programmed to start in 15-minute increments.

When filling in the schedule the user should place a mark in one (1) of the four (4) blocks for the hour in which the defrost is to start. If the duration of the defrost is more than 15 minutes the next block should also be marked. See Figure 3-4.

Completing the chart before the initial programming of the Fibertronic Clock will prevent the possibility of scheduling errors and simplify the selection of start times.



Hussmann Corporation  
Fibertronic™ Defrost Clock 1000 Programming Chart

Date: \_\_\_\_\_

Store Name & Number: \_\_\_\_\_

Unit Serial Number: \_\_\_\_\_

Rack Letter: A / B / C / D / E      Number of Systems: \_\_\_\_\_

		User Defined Information				Systems Defrosting Schedule (15 Minute Increments)																							
		Type	1st Defrost	Dur. (Min.)	No.Def.	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Sys. 1	Out. 01	KG	1:00	10	4																								
Sys. —	Out. 02																												
Sys. —	Out. 03																												
Sys. —	Out. 04																												

Figure 3-2. Example of Automatic Scheduling

Hussmann Corporation  
Fibertronic™ Defrost Clock 1000 Programming Chart

Date: \_\_\_\_\_

Store Name & Number: \_\_\_\_\_

Unit Serial Number: \_\_\_\_\_

Rack Letter: A / B / C / D / E      Number of Systems: \_\_\_\_\_

		User Defined Information				Systems Defrosting Schedule (15 Minute Increments)																							
		Type	1st Defrost	Dur. (Min.)	No.Def.	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Sys. <u>1</u>	Out. 01	KG	1:00	10	6	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
Sys. <u>  </u>	Out. 02					<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	
Sys. <u>  </u>	Out. 03					<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	
Sys. <u>  </u>	Out. 04					<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	

Figure 3-3. Alternate Schedule Based on NO. DEF. XX

Hussmann Corporation  
Fibertronic™ Defrost Clock 1000 Programming Chart

Date: \_\_\_\_\_

Store Name & Number: \_\_\_\_\_

Unit Serial Number: \_\_\_\_\_

Rack Letter: A / B / C / D / E      Number of Systems: \_\_\_\_\_

		User Defined Information				Systems Defrosting Schedule (15 Minute Increments)																							
		Type	1st Defrost	Dur. (Min.)	No.Def.	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Sys. 1	Out. 01	KG	1:00	20	4																								
Sys. 2	Out. 02	OT	00:00	60	2																								
Sys. 3	Out. 03	OT	2:30	30	3																								
Sys. —	Out. 04																												

Figure 3-4. Durations Over 15 Minutes Long



# Hussmann Corporation

## Fibertronic™ Defrost Clock 1000 Programming Chart

**Number of Systems:** \_\_\_\_\_

[illegible]



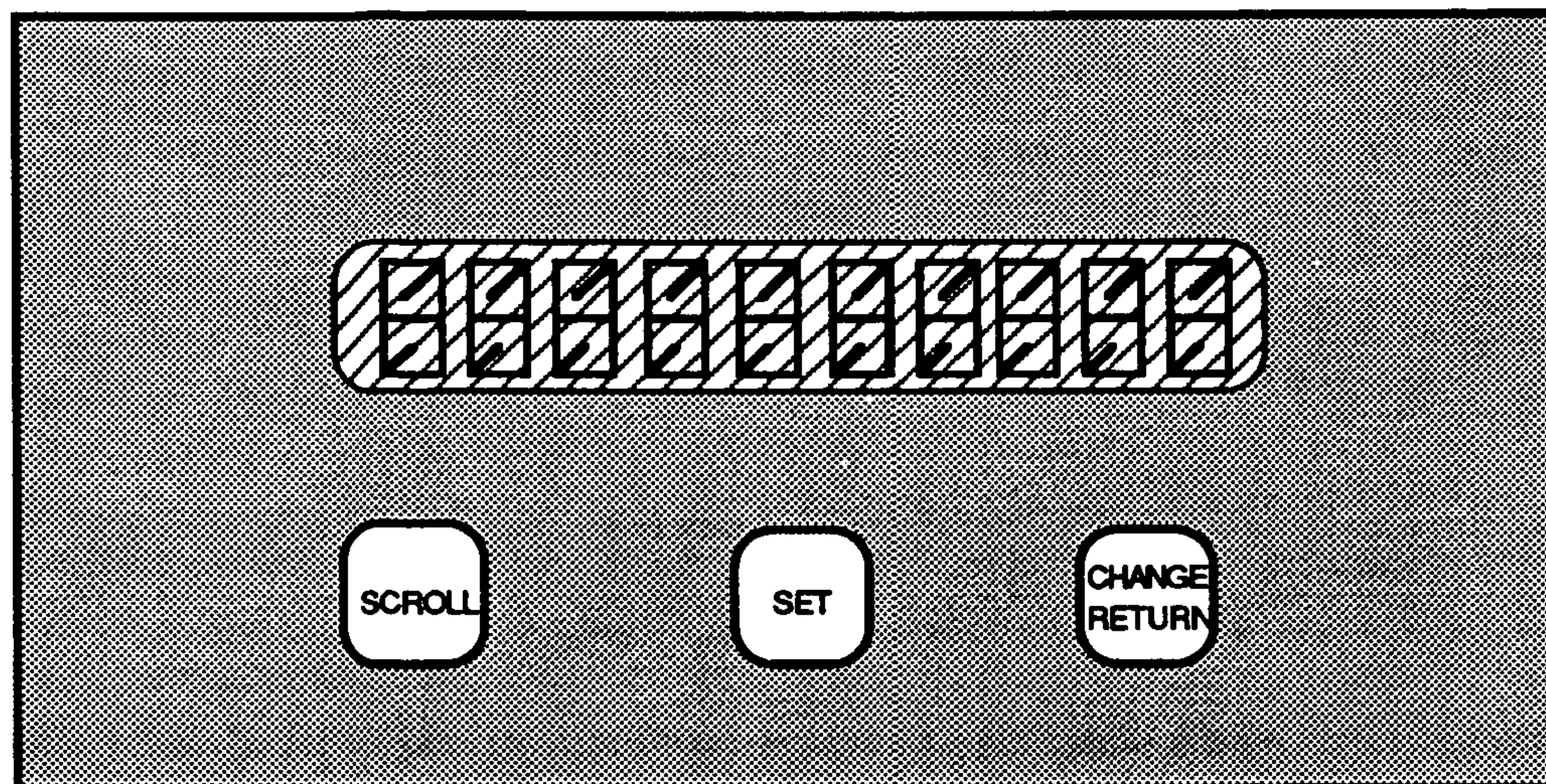


Figure 3-5. Fibertronic Defrost Clock 1000

**KEYPAD FUNCTIONAL DESCRIPTION****"SCROLL" Key**

Press this key to move to the next screen. The clock will not automatically advance you to the next screen in the menu.

**"SET" Key**

Press this key to enter a submenu or to initiate and complete changes to the parameters shown.

**NOTE:** The only parameter that can be set without first correctly entering the pass code is the MAN ON/OFF, which manually forces defrost on or off for testing or maintenance. The system does not have to be de-activated (ACT OFF) in order to do this. See Page 3-15, Manual Forcing.

**"CHANGE/RETURN" Key**

Press this key to change the values shown for the displayed menu items or to return to the beginning of the menu.

**CAUTION:** THE "SCROLL" AND "CHANGE/RETURN" KEYS ADVANCE IN ONLY ONE DIRECTION. IF YOU PASS UP A VALUE YOU MUST CONTINUE UNTIL YOU COME TO THAT VALUE AGAIN.

**DISPLAY SCREENS**

The Fibertronic Defrost Clock 1000 has a 10-character display which shows three sets of menus.

The main menu is the System Status menu (Page 3-10) which displays time, date and status (defrost or refrigeration) for all 24 possible systems. Each of the 24 possible systems has a submenu called the Configuration Menu.

The Configuration menus (Page 3-11) allow the user to change the defrost schedules of individual systems. These menus have error screens that alert the user to defrost scheduling problems.

Finally, there is the System Numbering menu (Page 3-17). This menu, which allows the user to assign and/or change system numbers, appears only if the correct pass code has been entered.

**NOTE:** The screens shown on the following pages are simulations. The actual display's lettering is more digitized in appearance. For example the letter "S" and the number "5" look exactly alike. Also, "##," "HH/MM," "MM/DD," etc. are indicators. The actual display will show a value where the indicator is positioned.



A rectangular screen with rounded corners and a double-line border, displaying the word "HUSSMANN" in all caps.**Power Up Display**

This display appears for 3–4 seconds when the system is first powered up.

**Default Screens**

One or more of the three screens shown on the left will appear after the power up display. The default screen(s) will also appear after programming the clock and if no key is touched in 3 1/2 minutes.

A rectangular screen with rounded corners and a double-line border, displaying "ACT. ##" in all caps.

**NOTE:** "##." is an indicator, the screen will show the actual system number(s).

This default screen alerts the user to the fact that the system has been de-activated. (If more than three ((3)) systems are off a flashing ">" will appear; press scroll to view the remaining system numbers.) A system that is de-activated (ACT OFF) will not operate as called for by the defrost schedule. See Page 3-11 for more information. **NOTE:** To activate a system you must enter its Configuration menu.

A rectangular screen with rounded corners and a double-line border, displaying "MAN. ##" in all caps.

This default screen indicates which systems have been manually forced on or off. To manually force a system on or off you must enter its Configuration menu. See Page 3-20 for a description of manual forcing.

A rectangular screen with rounded corners and a double-line border, displaying "TIME HH:MM" in all caps.**Time Display**

This is the first screen of the System Status Menu. If no systems are de-activated or in a forced condition this screen serves as the default screen.

The ":" between the 2nd and 3rd digits blinks when showing the actual time of day.

**NOTE:** The ACT ## and MAN ## default screens remind the user of changes made. The time screen is the real time of day. It is the only screen shown after Husmann, if, on power up, no systems are ACT OFF.



SET	TIME --: MM
CHANGE	TIME #: #: MM
SET	TIME HH: --
CHANGE	TIME HH: # #
SET	TIME HH: MM
SCROLL	DATE MM/DD
SET	DATE --/DD
CHANGE	DATE # #/DD
SET	DATE MM/--
CHANGE	DATE MM/# #
SET	DATE MM/DD
SCROLL	P. CODE _ _ _ _

**Set Time—Requires Pass Code**

Press "Set" to start the HH blinking.

Press "Change" to alter the hour.

Press "Set" again to start the MM blinking.

Press "Change" to alter the minutes.

Press "Set" to end the set routine.

Press "Scroll" to advance to the next screen.

**Date Display**

The day's calendar date (The clock corrects itself for Leap Year.)

**Set Date—Requires Pass Code**

Press "Set" to start the MM blinking

Press "Change" to alter the month.

Press "Set" to start the DD blinking.

Press "Change" to alter the day.

Press "Set" to end the set routine.

Press "Scroll" to advance to the next screen.

SCROLL	P. CODE - _ _ _
SET	P. CODE - _ _ _
CHANGE	P. CODE # _ _ _
SET	P. CODE 8 - _ _
CHANGE	P. CODE 8 # _ _
SET	P. CODE 8 8 - _
CHANGE	P. CODE 8 8 # _
SET	P. CODE 8 8 8 -
CHANGE	P. CODE 8 8 8 #
SET	P. CODE 8 8 8 8
INCORRECT	
CORRECT	

**Pass Code**

For view only, press "Scroll" to advance to the next screen. In order to change parameters, however, the user must enter either the factory or the user configuration pass code.

**Enter Pass Code**

Press "Set" to start the first "\_" blinking.

Press "Change" to enter 0–9 for each number of the pass code.

Press set to start the next space blinking.

—Repeat for each space.—

**NOTE:** If no key is touched for 3 1/2 minutes the pass code is disabled and the display returns to the default screen.

**CAUTION:**  
**THE FACTORY CONFIGURATION PASS CODE IS 8888, SINCE THIS CODE CAN NOT BE CHANGED IT SHOULD BE CAREFULLY GUARDED.**

Press "Set" a fifth time to enter the code and to end the set routine.

**Incorrect Entry**—Displays 3–4 seconds then returns to pass code screen; incorrect entry is erased. Try again.

**Correct Entry**—Displays 3–4 seconds then returns to pass code screen; correct entry is displayed. Press "Scroll" to advance to the next screen.



P. CODE 1 2 3 4

### Changing User Configuration Pass Code

The user configuration pass code is "1234". This is the code that should be given to employees. For the security of your defrost schedule, it is recommended that the code be changed periodically. ONLY AFTER THE CORRECT PASS CODE IS ENTERED CAN A CHANGE TO THE CODE BE MADE.

SET

CHANGE

P. CODE - 2 3 4

Press "Set" and "Change" simultaneously to start the first number in the current code blinking.

CHANGE

P. CODE # 2 3 4

Press "Change" to enter 0-9 for each number of the pass code.

SET

P. CODE # -3 4

Press set to start the next space blinking.

CHANGE

P. CODE ## 3 4

—Repeat for each space.—

SET

P. CODE # # - 4

**NOTE:** Either the factory (8888) or the user configuration pass code will allow the clock's parameters to be changed. Thus if the user pass code is forgotten the parameters can be changed using the factory configuration pass code.

CHANGE

P. CODE # # # 4

SET

P. CODE # # # -

CHANGE

P. CODE # # # #

SET

P. CODE # # # #

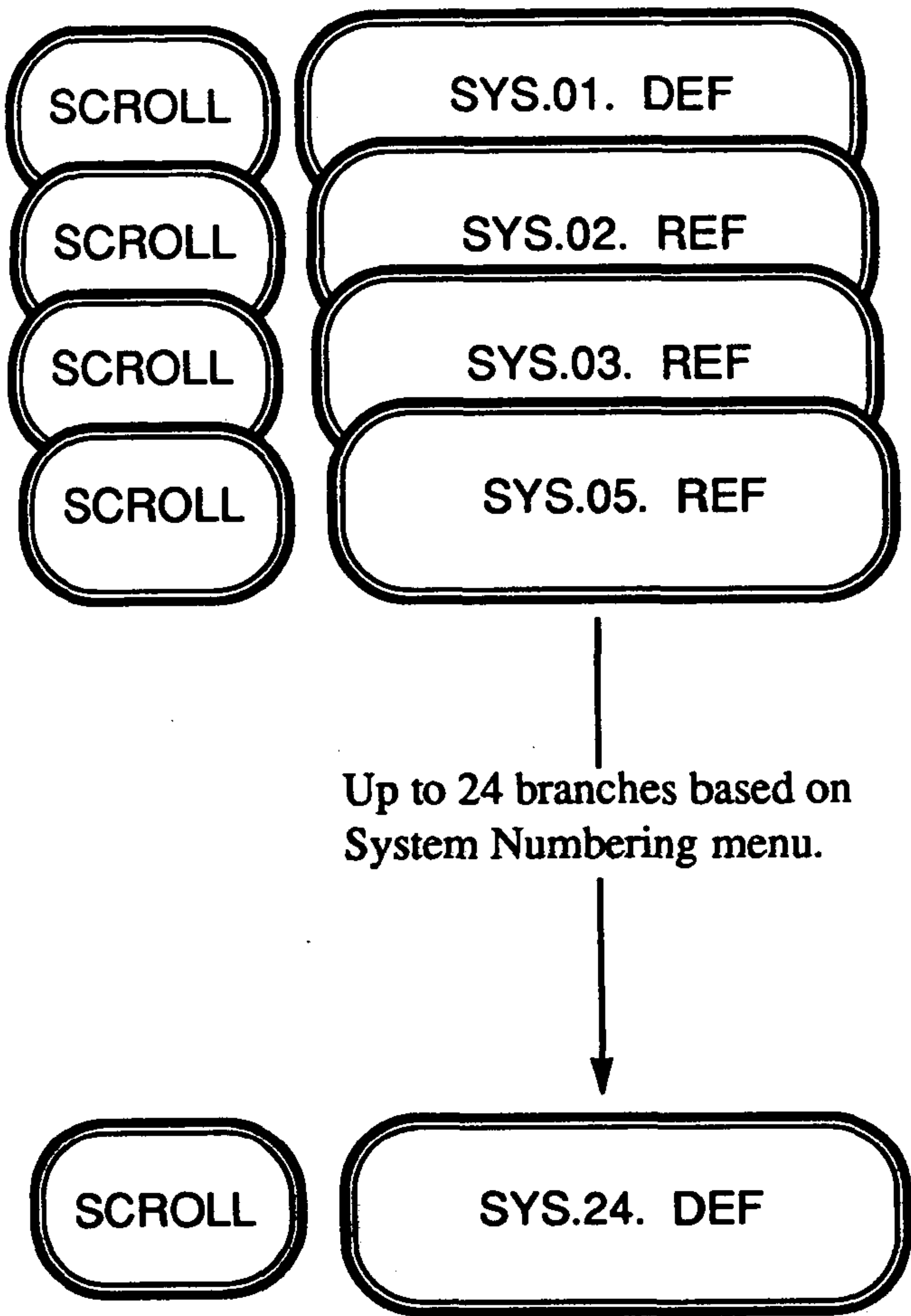
Press "Set" a fifth time to enter the new code and to end the set routine.

ACCEPTED

### Acknowledgement

Displays 3-4 seconds then returns to pass code screen; new pass code is displayed.

Press "Scroll" to advance to the next screen.



**System Status (1-24 possible) Menu**

This is the current condition of the system displayed. A "DEF" will be shown if the system is in defrost, a "REF" will be shown if it is in refrigeration.

Press the "Scroll" key to see the status of all 24 possible branches.

**Manually Forced Systems**

If a system is manually forced into a defrost or out of one, the status will flash to indicate the forced condition.

**NOTE:** The system numbers can be changed to better meet the actual needs of the customer. Also if a system is not in use, and has been assigned the number 00, that system will not be displayed on the System Status menu. See System Numbering Page 3-17 for more information.



## Configuration Menus

The following screens are found in the Configuration menu for the specific system that was last selected using the "Scroll" button. There is a configuration menu for each system (1-24).

**To View**—Press "Set" to enter the system's Configuration menu.

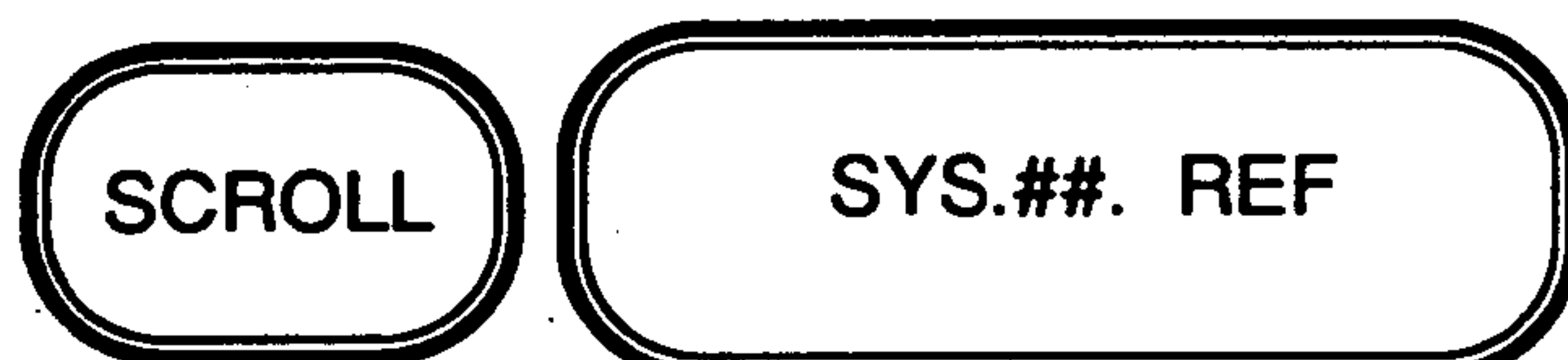
Press "Scroll" to advance to the next screen in the Configuration menu.

**To Change**—The correct pass code must have been entered as described above.

Press "Set" to enter the system's Configuration menu. **The system must then be de-activated (ACT OFF) as described below.**

**To Return to the System Status Menu**—Press "Change". If the system is ACT OFF (de-activated) when the "Change" button is pressed the ACT OFF screen will display. This is to prompt the user to reactivate (ACT ON) the system. Press "Change" once more to exit the menu without reactivating. Or scroll to that system, activate it as described below and then press "Change".

**CAUTION: IF A SYSTEM IS LEFT WITH ITS ACT OFF THE OUTPUT WILL NOT OPERATE AS CALLED FOR BY THE DEFROST SCHEDULE.**



### Select the System

Scroll to the system number to be entered. "##" is an indicator, the screen will show the actual system number.

Press set to enter the system's Configuration menu.

### Activate

Activates or de-activates the system to respond to the programmed defrost schedule. (To select a different system, press "Change" to return to the System Status menu.)

### Set ACT—

Press "Set" to start the current status blinking.

Press "Change" to toggle the status from OFF to ON and back.

Press "Set" to end the set routine.

Press "Scroll" to advance to the next screen.

**NOTE:** The system **MUST** be set to **ACT OFF** to change the configuration. If a system is left with its ACT OFF, however, the output will not operate as called for by the schedule.

SCROLL	##. TYP. O.T.
SET	##. TYP. - -
CHANGE	##. TYP. - -
SET	##. TYP. GAS.
SCROLL	##. 1ST.HH:MM

**NOTE:** To change these screens you must enter the correct pass code and de-activate (ACT OFF) the system.

Type of Defrost

Defrost procedure required for the connected case

Set Type of Defrost—

Press "Set" to start blinking the "O.T." value.

Press "Change" to select one (1) of three (3) possible types: O.T. (Off Time), GAS. (Koolgas) or ELE. (Electric).

Press "Set" to end the set routine.

Press "Scroll" to advance to the next screen.

1st Defrost Time

First defrost of the day.

**NOTE:**

- Defrosts are scheduled on the quarter hour.
- The clock operates on military time. The 1st available defrost time is 00:00 (midnight) and the last is 23:45 (11:45 p.m.)
- The clock will not continue a schedule into the next calendar day.

See Page 3-1 for more information.

Set 1st Defrost—

Press "Set" to start the HH blinking.

Press "Change" to alter the hour's value. (Hours change in 1-hour steps while minutes change in 15-minute steps.)

Press "Set" to start the MM blinking.

Press "Change" to alter the minute's value.

Press "Set" to end the set routine.

Press "Scroll" to advance to the next screen.

SET	##. 1ST.- -:MM
CHANGE	##. 1ST.- -:MM
SET	##. 1ST.HH:- -
CHANGE	##. 1ST.HH:- -
SET	##. 1ST.HH:MM



SCROLL      ##. DUR.MMM

Defrost Duration

Duration of the defrost cycle from start to finish. This is also the duration of a manual force. This screen is shown for all types of defrost.

SET      ##. DUR.MMM

Set Defrost Duration—

Press "Set" to start the MMM blinking.

CHANGE      ##. DUR.MMM

Press "Change" to alter the minute's value by one (1). The range is 1–127 minutes.

SET      ##. DUR.MMM

Press "Set" to end the set routine.

Press "Scroll" to advance to the next screen.

SCROLL      ##. NO.DEF.04

Number of Defrosts Per Day (1–12)

Number of defrosts to be completed for that system in a 24-hour period. The maximum number of defrosts that can be programmed for a system is determined by the start time of the first defrost. The clock automatically limits this number. See Page 3-1.

SET      ##. NO.DEF.- -

Set Number of Defrosts—

Press "Set" to start blinking the "04" value.

CHANGE      ##. NO.DEF.- -

Press "Change" to alter from 1 to maximum number of defrosts per day (see Page 3-1).

SET      ##. NO.DEF. 06

Press "Set" to end the set routine.

Press "Scroll" to advance to the next screen.

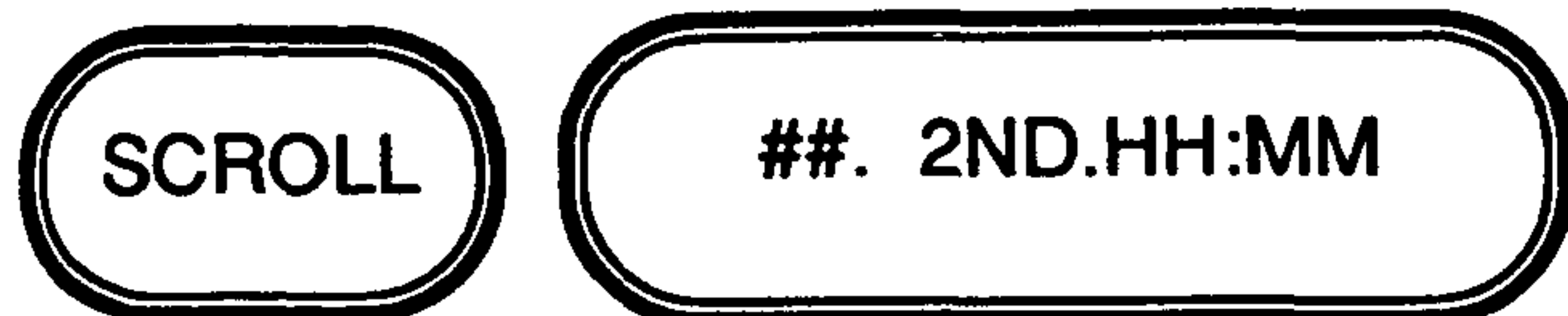
**NOTE:** Each of the 24 systems was factory configured as follows:

Type of defrost—Off Time (O.T.)

Length of cycle—10 minutes

Number of defrost cycles—4

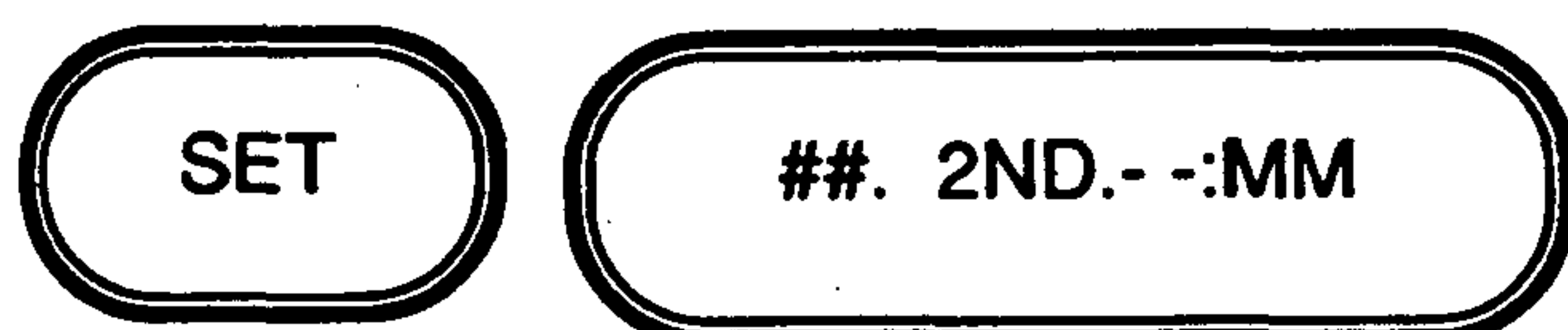
System #01 is scheduled to start its first defrost at 00:00 (midnight), System #02's starts 15 minutes later at 00:15, System #03's starts at 00:30, etc.



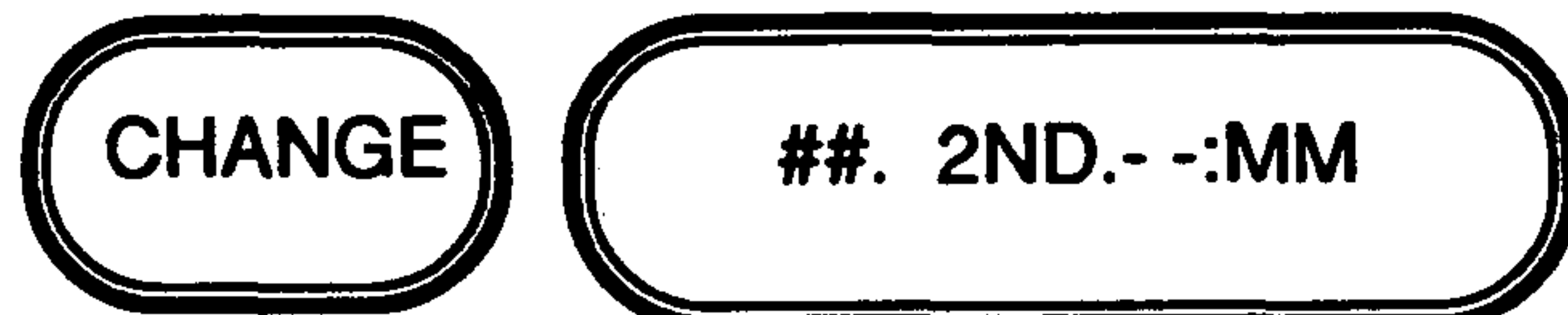
### Subsequent Defrost Start Times

If a system has more than one defrost per day a screen will show for each subsequent defrost time. The times of subsequent defrosts are automatically determined by the clock based on the number of defrosts per day and the starting time of the first defrost. These subsequent defrost settings may be changed to suit the customer's individual needs.

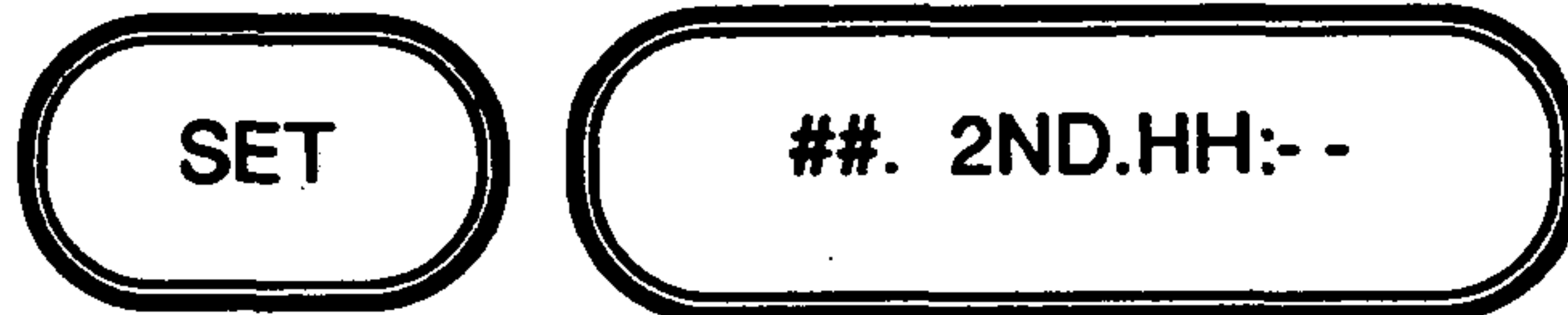
Change Subsequent Defrost Start Times—The starting time of subsequent defrosts can be changed by the user when desired. (The current pass code must have been entered earlier in order to make this change.)



Press "Set" to start the HH blinking.



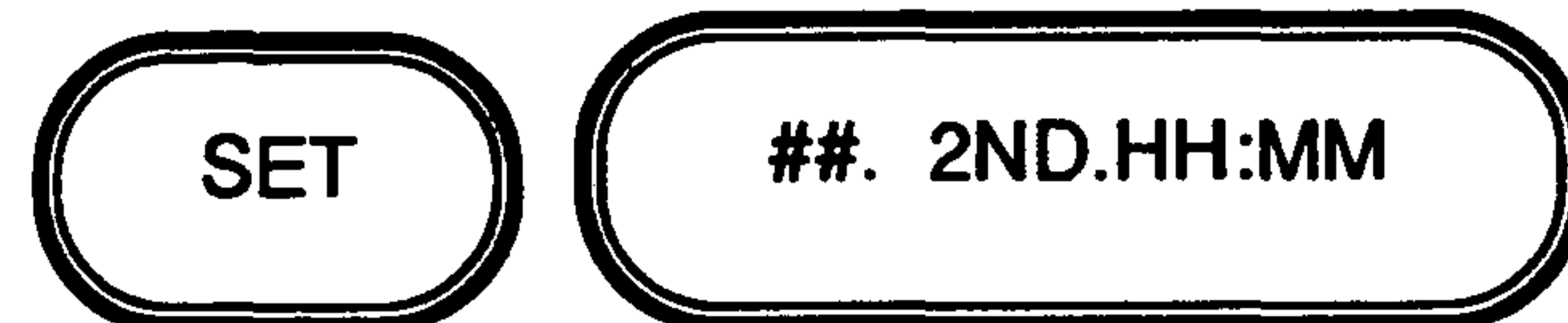
Press "Change" to alter the value.



Press "Set" to start the MM blinking.



Press "Change" to alter the value.



Press "Set" to end the set routine.  
Press "Scroll" to advance to the next screen.

Repeat for each of the subsequent defrost time to be changed.



SCROLL	##. MAN. ON
--------	-------------

SET	##. MAN. --
-----	-------------

CHANGE	##. MAN. --
--------	-------------

SET	##. MAN. OFF
-----	--------------

SET	##. ACT OFF
-----	-------------

CHANGE	##. ACT. --
--------	-------------

SET	##. ACT. ON
-----	-------------

CHANGE	SYS. ##. REF/DEF
--------	------------------

### Manual Forcing

Forces defrost ON or OFF for testing or maintenance. (For a description of manual forcing see page 3-20) The maximum duration of the forcing will be the programmed duration (DUR) of a defrost for any type of system. The System Status screen will be flashing "DEF" or "REF" to indicate the manual force condition.

Set Manual Forcing—The current status will be dependent on the output status as set by the defrost schedule. For example, if the system is in defrost already then the current status will be ON.

Press "Set" to start the current status blinking.

Press "Change" to toggle the status between ON and OFF.

Press "Set" to end the set routine.  
Press "Scroll" to advance to the next screen.

### Reactivate the Clock

Press "Set" to start the current status blinking.

Press "Change" to toggle the status from OFF to ON.

Press "Set" to end the set routine.

**CAUTION:** IF A SYSTEM IS LEFT WITH ITS ACT OFF THE OUTPUT WILL NOT OPERATE AS CALLED FOR BY THE SCHEDULE.

Press "Change" to return to the System Status menu. **NOTE:** An error screen may appear.

## Error Messages

When attempting to ACT ON a system after making a scheduling change, the clock first completes an ERROR check. The system automatically searches for four common error situations that could be harmful to the product. The error message will remain in the display until the "Scroll" key is pressed. The ##. ACT OFF screen will reappear. The Configuration menu for that system can be exited with ACT OFF, if desired, by pressing the "Change/Return" key.

**NOTE:** A system that has an error in its schedule can not be ACT ON (activated). The error must be corrected before a defrost cycle is required.

ERR. ##

### Koolgas Defrost Overlap Error

This is an error message to indicate that a gas defrost system schedule conflicts or overlaps with another. At no time can two gas defrosts be programmed to start at the same time, nor may they overlap. An ERR. ## will result. The "##" indicates the system number with which the system being configured is in conflict.

ERR.##.##.##.

### More Than Three (3) Systems Overlap Error

If more than three (3) systems are scheduled with the same start time, or if they overlap, an ERR.##.##.##. message will result. The screen will provide the numbers of the systems that coincide with the system currently being programmed. No more than three (3) may overlap.

SQ.ERR. ##.

### Sequential Error

This is an error for just the system currently being programmed. This message indicates that the defrost times being input are not in sequential order. For example, if the 2nd defrost is scheduled to start after the 3rd, you would receive this error screen.

ERR. 15 MIN

### Less Than 15 Minutes Error

If an attempt is made to schedule the same system to start a new defrost less than 15 minutes after the previous defrost will terminate, this error screen appears.

**NOTE:** Press "Scroll" to return to the Configuration Menu from an error screen.

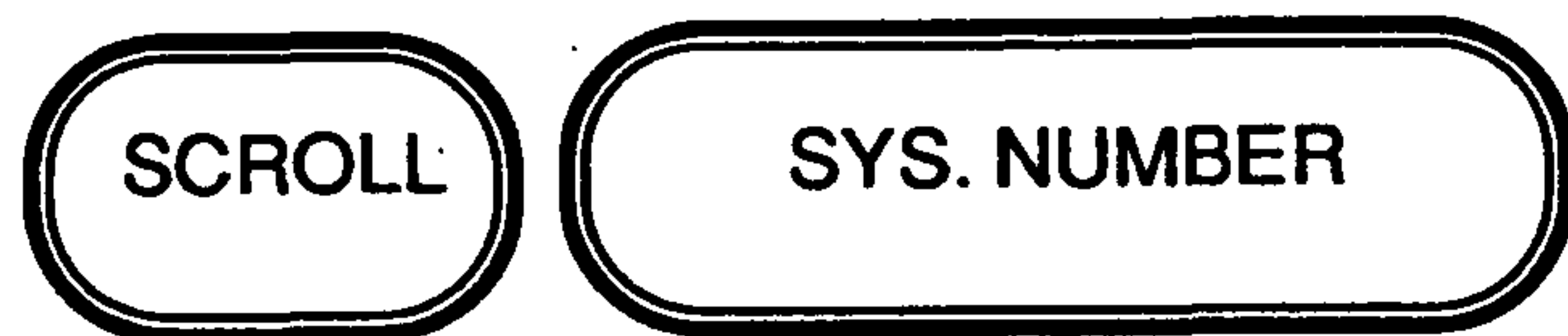


### System Numbering Menu

This menu appears **ONLY** if the correct pass code has been entered. This menu allows the user to assign system numbers to the 24 possible outputs (optical transmitters) of the clock. For example, output 01 is factory set as SYS. 01, but the user can renumber it anything from 01-99. Each system must have a different number, but not all of the 24 outputs must be used.

**NOTE:** Each output that is **not** in use should be assigned the number 00. The 00 (unused output) assignment may not be placed before assigned outputs, only after the last assigned output. The 00 assignment tells the clock not to show screens for these outputs on the System Status menu.

The "Scroll" button will move the user down through the 24 separate assignment screens. This menu can not be exited until all outputs are properly assigned and the clock is reactivated.



#### System Number

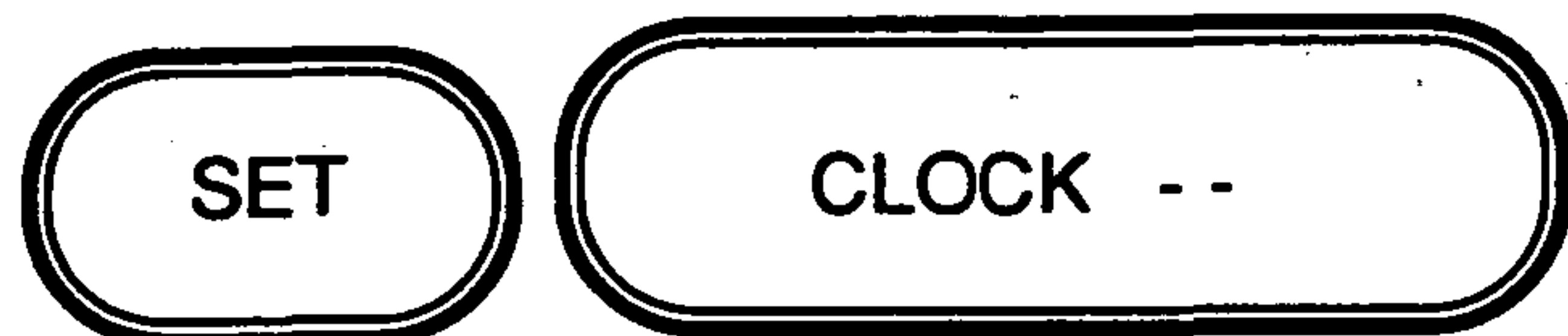
This screen appears in the System Status menu, after the System 24 screen, only if the user has correctly entered the pass code as described earlier.

Press "Set" to enter the System Numbering menu.



#### Clock ON/OFF

Allows all outputs to turn off regardless of the schedule so that system numbers for an output can be set or changed.



#### Set Clock OFF—

Press "Set" to start ON blinking.



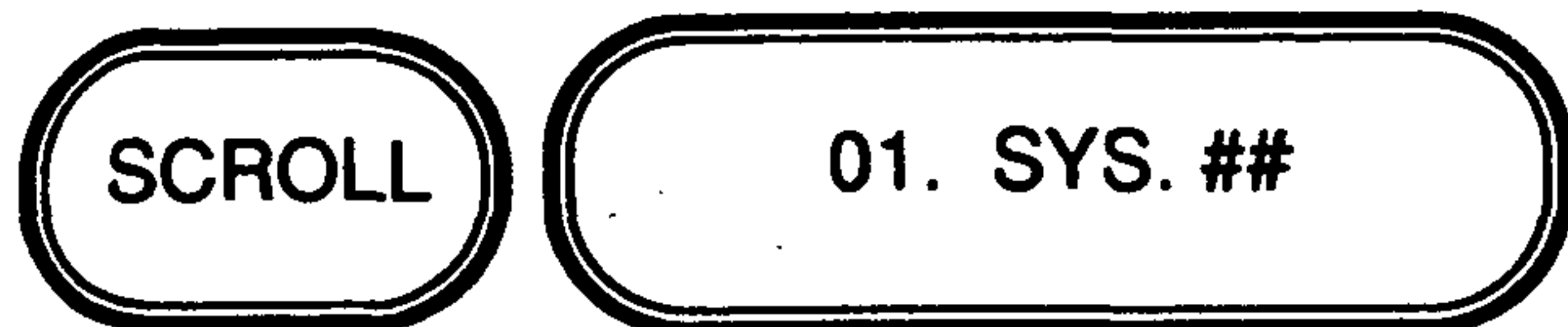
Press "Change" to switch to OFF.



Press "Set" to end set routine.

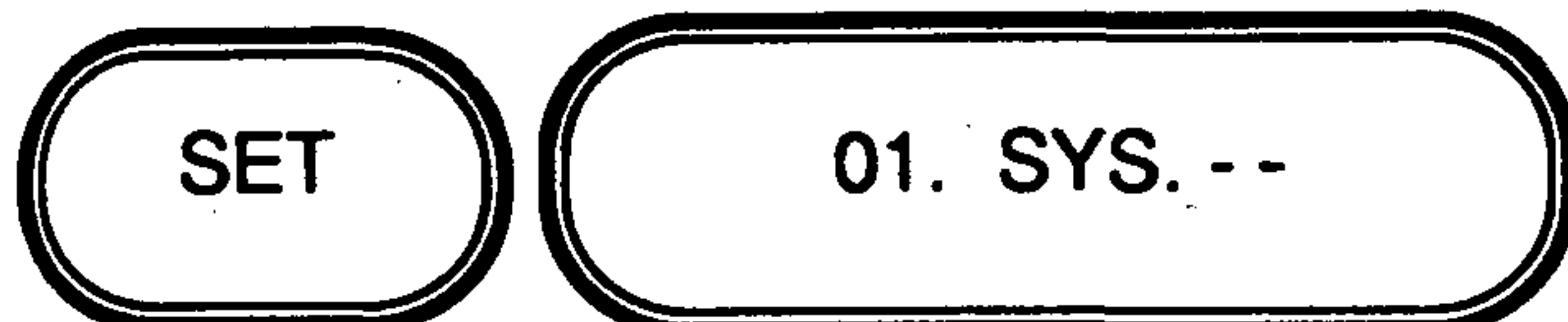
**NOTE:** The "Set" button must be pressed to end the set routine or the clock is not set OFF.

Press "Scroll" to advance to the next screen.



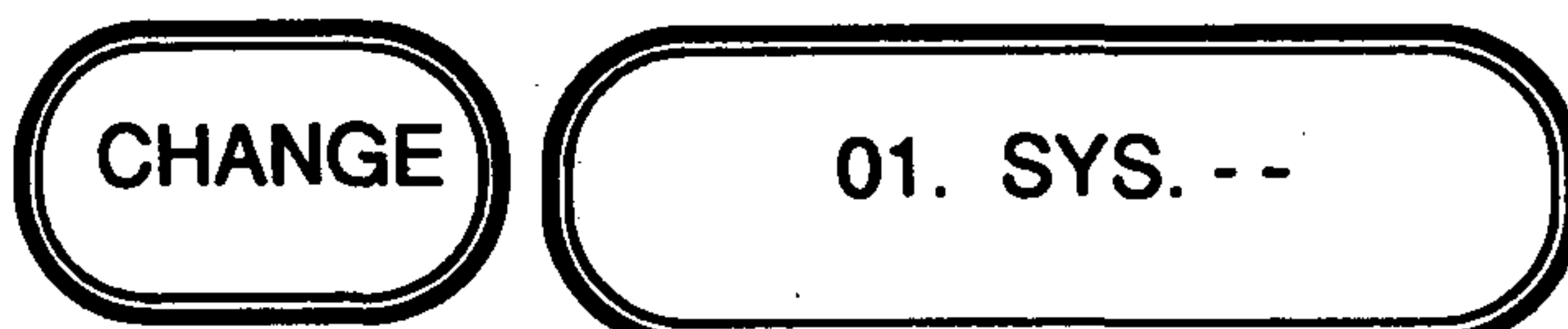
#### Assignment Screens (1-24)

An assignment screen will appear for each of the 24 outputs(optical transmitters). **NOTE:** Each output **MUST** be assigned a number. Outputs that will not be used should be assigned the number 00. (These outputs will not appear in the System Status Menu.) The 00 (unused output) assignment may not be placed before assigned outputs, only after the last assigned output.

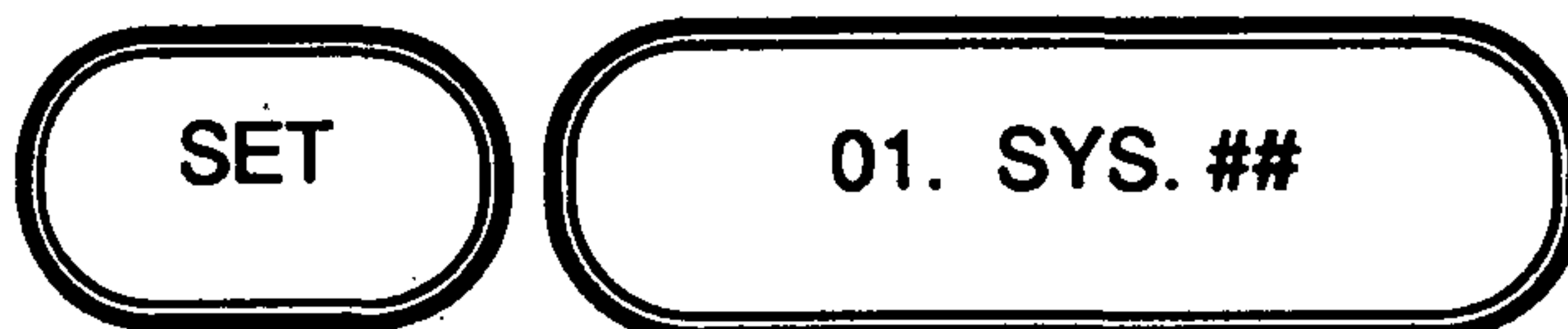


#### Set Assignments—

Press "Set" to start the ## blinking.



Press "Change" to alter the value.



Press "Set" to end the set routine.

Press "Scroll" to advance to the next screen.

**—Repeat for each system.—**

**NOTE: —Repeat for each system.—**



#### Set Clock ON

**CAUTION: DEFROSTS CAN NOT BE INITIATED IF THE CLOCK IS SET OFF.**

Press "Set" to start OFF blinking.



Press "Change" to change to ON.



Press "Set" to end set routine.

**NOTE:** The "Set" button must be pressed to end the set routine or the clock is not set ON.



Press "Change" to return to the System Status menu.

**NOTE:** An error screen may appear.



A large, horizontally-oriented button with rounded ends and a double-line border. The text "ERR. CHECK" is centered within the button.

ERR. CHECK

#### Error Check

This screen is displayed if the user attempts to change to CLOCK ON with duplicate system numbers or misplaced unused outputs.

**NOTE:** Press "Scroll" to return to the System Numbering Assignment screens from an error screen. Find the duplicate system number or misplaced unused (00) output and correct it. The clock cannot be set on until all outputs are properly assigned.

A small, horizontally-oriented button with rounded ends and a double-line border. The text "SCROLL" is centered within the button.

SCROLL

A horizontally-oriented button with rounded ends and a double-line border. The text "STATION ##" is centered within the button.

STATION ##

A small, horizontally-oriented button with rounded ends and a double-line border. The text "SCROLL" is centered within the button.

SCROLL

A horizontally-oriented button with rounded ends and a double-line border. The text "BAUD ####" is centered within the button.

BAUD ####

#### Remote Communications Option

These two screens only appear after the System Number screen if the correct pass code was entered. The screens are used by an optional remote communications system to communicate with the clock.

The station number can be set from 1-99. The Baud Rate can be set for speeds of 1200, 2400, 4800 or 9600.



---

## DESCRIPTION OF MANUAL FORCING

Manual forcing is a service tool designed to assist the user in trouble shooting the system branch wiring and valving. Because the manual forcing function is self correcting, the pass code need not be entered prior to attempting to use this feature. This is the only parameter that can be set without first correctly entering the pass code.

The "MAN. ON/OFF" screen of the Configuration menu will show ON or OFF based on the defrost schedule (see Page 3-15). The status will be OFF if the system is in refrigeration and ON if the system is in defrost.

Manual forcing toggles the status between OFF (refrigeration) and ON (defrost). Therefore, if initially toggled from OFF to ON, a defrost cycle is manually started. If initially toggled from ON to OFF, the scheduled defrost is manually terminated.

**NOTE:** The user should review the schedule of a system before using the manual feature to be aware of any up coming defrosts.

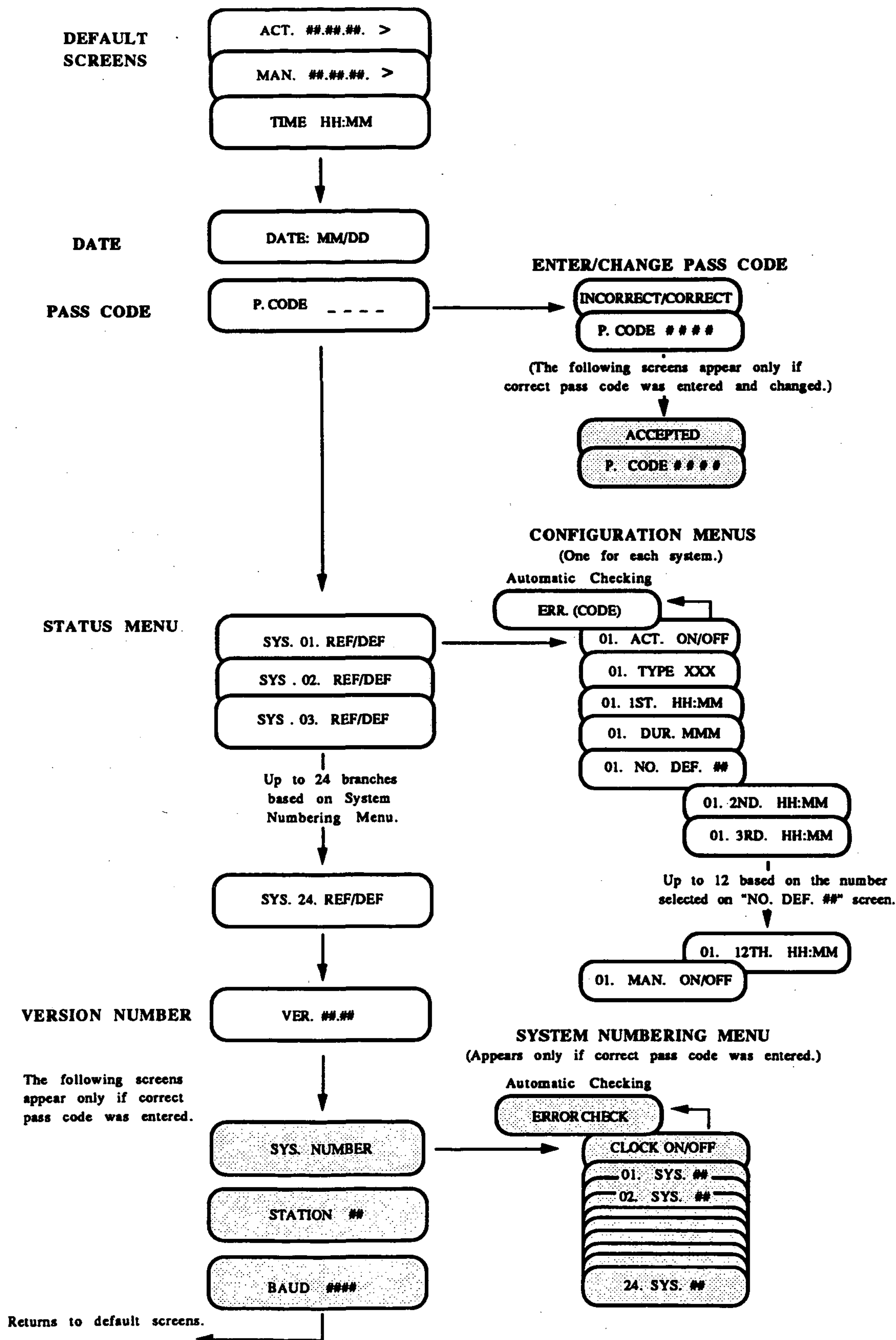
If a system is manually forced into defrost, that system will return to its scheduled state at the end of the programmed defrost duration.

Unlike "ACT OFF", if a system is left in a manually forced condition, the clock will automatically correct itself. The clock continues to check the system's schedule at all times during the manual condition. Therefore, no scheduled defrost start or termination is missed.

If power is removed and returned, all manual forcing conditions are immediately removed and all systems respond to their normal defrost schedule.



## DISPLAY SCREEN SUMMARY





## SECTION 4—SERVICE

### GENERAL

This section is designed to assist servicemen in troubleshooting the Fibertronic Defrost Clock 1000. A step-by-step checkout procedure is included to isolate the cause of the malfunction.

### RECORDING INFORMATION

Upon arrival at the refrigeration rack, make a record of the following information for future reference.

- A. Rack model and serial number
- B. Fibertronic Defrost Clock 1000 model and serial number
- C. EPC controller model and serial number (if installed).

Record the following applicable settings and present readings as shown on the rack controllers.

#### Suction Pressure Controller:

Suction Pressure	_____ psi
Suction Set Point	_____ psi
Low Alarm Set Point	_____ psi
High Alarm Set Point	_____ psi
Koolgas Defrost	_____ ON/OFF

#### Fibertronic Defrost Clock 1000 Control Status:

Default Screen(s) Display	_____
System(s) Status	_____
REF:	_____
DEF:	_____
Number of Systems Installed	_____

### APPARENT MALFUNCTIONS

Based on the your observations, proceed to the Troubleshooting Checkout Procedures Table, Page 4-5, to determine the most likely cause. Proceed in order through the checkout procedures listed for the observation until the fault is isolated.

### WARNING

Several parts of this checkout procedure have to be performed with the power applied to the control circuit and the defrost branch boards.

Use caution when panel doors are open.

#### Clock Output Test

The output test is designed to verify the defrost clock's ability to send an optical signal to the required system output. Proceed with the following steps to check for Red LED activity in the fiberoptic cable. NOTE: The branch defrost board must have its power on to perform this test.

Using the defrost clock keypad move to the System Status screen of the system to be checked. Observe the current status (REF or DEF) and then press "SET" to enter the system's Configuration menu.

Observe that the ACT screen is ON. Remember ACT must be ON or the clock output (optical transmitter) will not respond to the programmed schedule for normal operation.

Scroll down through the menu screens noting the programming of the system.

Stop scrolling when the MAN. ON/OFF screen is reached. Observe the status, if OFF the branch defrost board Yellow LED should be off also.

Remove the fiberoptic cable from the specific system output you are testing. Look into the empty output and observe the Red LED. The LED should match the status shown in the MAN ON/OFF screen. Thus, if the Red light shows, the screen should read MAN ON. If the light is off, the screen should read MAN OFF.



Change the manual status to read MAN. ON as described in Operations Page 3-15 and observe the Red LED. If the LED fails to respond the clock is the cause of the output failure. Proceed to Handling Clock Failures Page 4-3.

Also note that if the Red LED was always on, even when the manual screen reads MAN OFF, the clock output has failed. Proceed to Handling Clock Failures.

A properly operating Red LED, in normal room light, is bright Red and will shine on an object placed 1/4–3/4" over the output. If the LED is dim, proceed to Fiberoptic Cable Test and verify proper cable operation. Then, if required, proceed to Handling Clock Failures.

Before exiting a system's Configuration menu, be sure that the system is ACT ON, otherwise it will not operate according to its defrost schedule.

#### **Fiberoptic Cable Test**

This test is designed to verify that the optic cable (light conductor) is working well and that it is not losing light from the clocks bright red output LED.

After verifying that the suspect output is operating well, reinsert the cable into the output. Check the end of the cable and verify it is cut and stripped as described on Page 2-2.

Using the manual screen force ON the output. Observe that the defrost branch board Yellow LED light turns ON. **NOTE: Be sure the power is on to the branch defrost board.**

If a different defrost board turns on, an optical cable wiring problem exists. Proceed to Identify Assigned Outputs Test. If the proper defrost branch responds there are no problems. Verify and, if necessary, reprogram the schedule. Be sure to ACT ON before exiting the menu. If the proper board didn't respond complete the remaining checks in this test.

#### **WARNING**

Parts of the branch defrost board have line voltage 120V AC and neutral terminals. Line: T2, T3, T7, T6, T5, T1, T4, P1, P2 and P3. Neutral: T8, T9, T10 and T11. Exercise caution or open control circuit when handling the branch defrost boards.

**NOTE:** Systems manually forced "ON" will be reset to "OFF" when power is removed from the clock. Systems have to be manually turned on again after power is restored.

Remove the fiberoptic cable from the defrost board being checked.

Observe that a bright red light is emitted from the cable. When the systems is manually "ON." If the board is still not responding correctly or the valving is not operating refer to the Fibertronic Installations Instruction Service section for trouble shooting of the branch board.

If the light exiting is now dim or not observed the cable is not operating correctly. Replace the cable and reset.

#### **Identify Assigned Outputs**

On the back of the defrost clock is a sticker which indicates the position of each output — 1–24. An associated SYS\_\_\_ is also shown for each of the 24 outputs. This section is intended to assist in identifying which output will operate which system on the Super Plus rack.



**NOTE:** The Super Plus Systems are factory wired to the defrost clock starting from left to right with output 01 and up to output 24.

Using the manual forcing screen MAN ON/OFF for each system programmed into the clock verify the properly identified defrost branch board responds. The first system status screen shown by the clock is always output 01. The second status screen is output 02 and so on.

Repeat the manual ON/OFF for all status screens shown in the clock menu. The number of screens should never be fewer than the number of systems on the Super Plus rack.

**NOTE:** Do not have more than 10 systems manually on at one time, control may reset because of demand on power supply.

If discrepancies are found the system numbers can be reassigned for convenience. The optical cable can also be moved if there is enough length to do so.

### **Power Supply Test**

The Fibertronic Defrost Clock 1000 is supplied with power by a multitap primary transformer. The primary taps are: 120/208/240V AC with a secondary output of 24V AC at full load. Acceptable secondary voltage limit is 21–30V AC.

Using an AC voltmeter, verify the power transformer primary and secondary voltages. Replace the transformer if voltages measured are outside the specified range. If no voltage is measured, check panel transformer fuse. If blown, replace with similar type and rating.

Unplug the 24V AC power plug from the clock and verify the secondary voltages across Pins 1 and 3. If voltage is less than 21V AC replace the power plug assembly. If the voltage is within the specified range but the clock still fails to operate when the 24V AC power plug is connected,

replace the clock assembly. Good continuity from pin 2 to ground (panel or box assembly liner) must exist.

## **HANDLING CLOCK FAILURES**

Two courses of action exist to provide defrosting of cases in the unlikely event of a partial or complete clock failure. The options are—Output Reassignment and Manual Defrosting.

### **Output Reassignment**

Unused outputs may be used as spares. Thus if a few outputs have failed and no longer signal true defrosts move them to the currently unused outputs by following the instructions below. (See the System Numbering Menu section on Page 3-17 for details.)

### **Example**

Clock A has a failed #3 output (Out 03); however this clock has available Outs 20, 21, 22, 23 and 24.

### **Solution**

1. Remove the optical cable from Out 3 and place in Out 20.
2. Enter the System Number menu and scroll to screen "03. SYS. 03." Change 03 to a number larger than the total systems in the store, such as 99..
3. Scroll to screen "20. SYS 00." 00 represents an output that was not needed and can be used as a spare if necessary.
4. Set Out 20 to be the new System 03 ("20. SYS. 03").
5. Exit the menu as described in the operations section.
6. Using the new Configuration menu of SYS. 03, found after SYS. 19 in the Status menu, program the desired schedule and activate (ACT ON) the system.

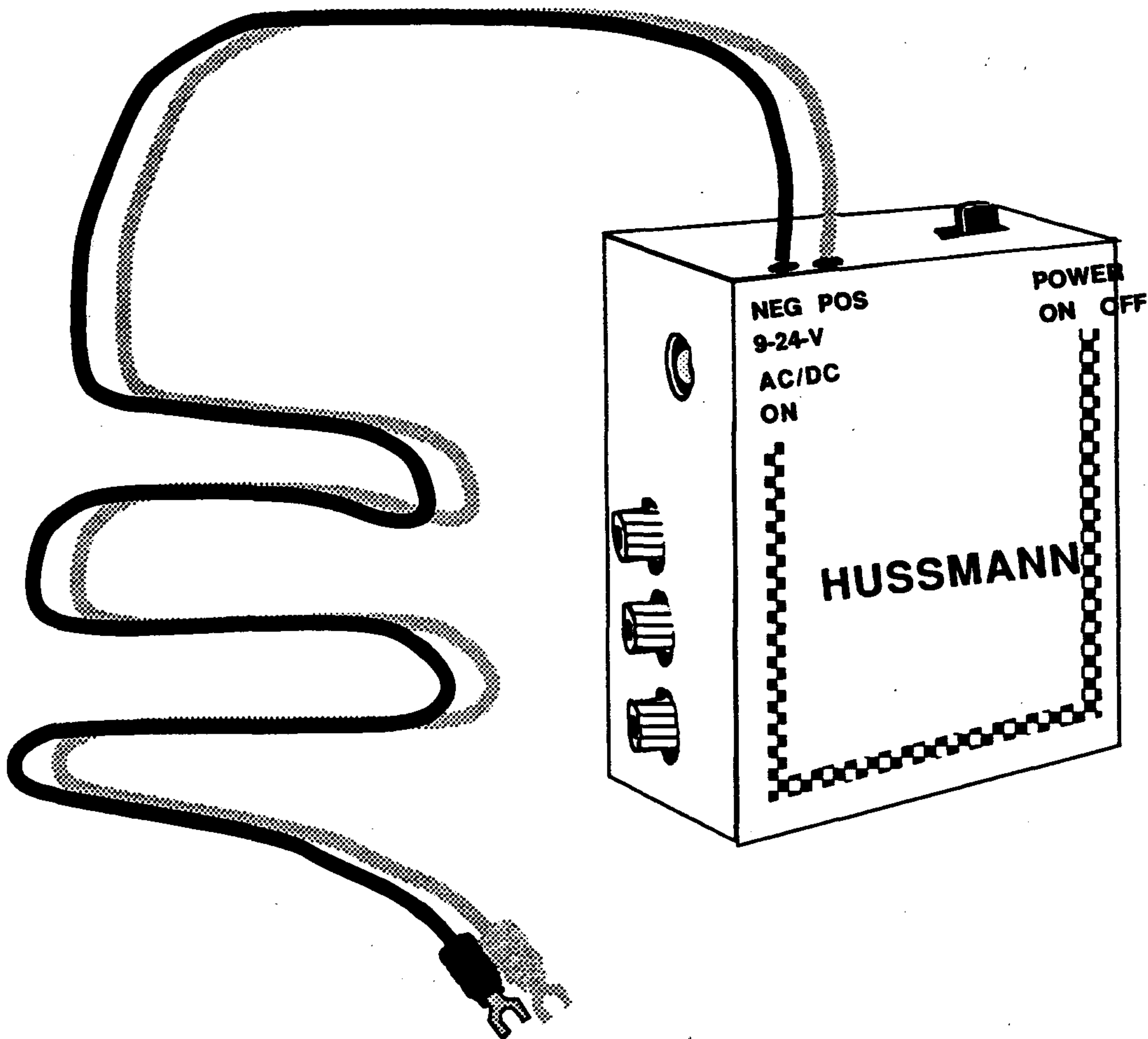
This procedure can be completed to reassign as many failed outputs as there are spares available.

### Manual Defrosting

In the event of a large or complete clock output failure an isolated fiberoptic output module is provided to facilitate manual defrosting of cases until the replacement clock arrives. This is made available in every Fibertronic panel to prevent icing of critical cases due to the lack of a normal defrosting schedule.

#### Manual Defrosting Procedure

1. Remove the optical cable from the clock output that has to be defrosted.
2. Insert the cable into one of the three available outputs on the manual defrost module.
3. Place the module switch in the ON position. The connected system should start the defrost cycle.
4. Leave the switch on as long as desired for a defrost period.
5. Several manual defrosts can be conducted at one time if desired using the two additional module outputs.
6. Repeat this procedure selecting new systems until those requiring defrost have been taken care of.



Isolated Fiberoptic Output Module



# **TROUBLESHOOTING CHECKOUT PROCEDURES TABLE**

OBSERVATION	PROBABLE CAUSE	CHECKOUT PROCEDURE	PAGE 4-
Display Blank	<ul style="list-style-type: none"> <li>-Power Failure</li> <li>-Fuse Failure</li> <li>-Transformer Failure</li> <li>-24V AC Power Cable Failure</li> <li>-Processor Failure</li> </ul>	-Power Supply Test	3
Defrost Branch Board "Defrost" LED status does NOT match Fibertronic Clock system status.	<ul style="list-style-type: none"> <li>-Panel Defrost Branch Board Problem</li> <li>-Fiberoptic Cable Failure</li> <li>-Wrong Optical Fiber in Output</li> <li>-Defrost Clock Output Failure(s)*</li> </ul>	<ul style="list-style-type: none"> <li>-Refer to Fibertronic Panel Installation Instruction Service Section</li> <li>-Fiberoptic Cable Test</li> <li>-Identify Assigned Outputs</li> <li>-Clock Output Test</li> </ul>	<div>2</div> <div>2</div> <div>1</div>
Defrost Branch Board "Defrost" LED matches clock status screen, but system valving does not.	<ul style="list-style-type: none"> <li>-Panel Wiring/Component Problem</li> <li>-Defrost Branch Board Failure</li> </ul>	-Refer to Fibertronic Panel Installation Instruction Service Section	
System missed or misses scheduled defrosts.	<ul style="list-style-type: none"> <li>-Configuration Menu for System was Activated OFF</li> <li>-Total Rack Power Outage</li> </ul>	<ul style="list-style-type: none"> <li>-Clock Output Test</li> <li>-Check Power Source</li> </ul>	1

\*Branch Boards can be connected to extra outputs if available. The operator will have to assign a new output and program the old schedule into the new system. The optical cable is then placed in the new output for branch board control.

## A

ACT ON/OFF—3-11, 3-15  
Advancing Screen—See Scroll Key.  
Apparent Malfunctions—4-1  
Automatic Checking—See Error Messages.  
Automatic Scheduling—3-1

## B

Battery Backup—1-1  
Baud Number—3-19  
Bezel—2-1  
Branch Board Configuration—2-3  
Branch Defrost Board—1-3

## C

Changing User Configuration Pass Code—3-9  
Checkout Procedure—2-4  
Circuit Boards—1-3  
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