

EC-130 ENVIRONMENTAL CONTROL
INSTALLATION AND OPERATIONS MANUAL

Revision 1.0 10/88

EC-130 INSTALLATION GUIDE

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I. INTRODUCTION

The EC-130 is a microprocessor-based environmental control panel, specifically designed to handle the unusual environmental requirements of supermarkets. These requirements include more than simply the comforts of the shopping public, but also involve regulation of the temperature and humidity to ensure the efficient operation of the refrigerated food storage cases.

The EC-130 is available in two (2) configurations. The basic "A" System is used when a single zone HVAC unit is utilized. The optional "B" System is used when two (2) separate central HVAC units are employed. Both systems, A and B, are capable of controlling up to four (4) stages of air conditioning, three (3) stages of heat reclaim, three (3) stages of auxiliary heat, one fan, and one independent humidification stage.

In addition to controlling central systems, the output relay board of the basic EC-130A unit is equipped with four (4) satellite system control outputs; the optional EC-130B configuration can control an additional four (4) satellites, for a potential total of eight (8) such control outputs. These satellite system outputs may be used to control loading dock unit heater, vestibule heaters or small heating and air conditioning units used in office areas. Time of Day Control is also available for each satellite instead of temperature control.

The EC-130 is capable of remote communication via the COM-99 only. The COM-88 will not support communication due to the new templateing being used. The communication to the EC-130 must be done in conjunction with the EILCOM software package.

II. SPECIFICATIONS

ALPHA DISPLAY OF SYSTEM:	A or B.
ALPHANUMERIC DISPLAY OF SYSTEM DESCRIPTION:	Up to 13 characters.
AIR CONDITIONING TEMPERATURE	Day/Night temperature default to 73 degrees F. Outside temperature lockout -10 to 117 degrees F. Interstage time delay 0 to 20 minutes.
HEAT RECLAIM TEMPERATURE NOTE: CAN BE CANCELLED OUT IF NOT REQUIRED.	Day/Night temperature default to 70 degrees F. Flush time 0000 to 2359 hours. Flush Duration 0 to 99 minutes. Outside temperature lockout -10 to 117 degrees F. Interstage time delay 0-20 minutes.
AUXILIARY HEAT TEMPERATURE	Day/Night temperatures default to 65 degrees F. Outside temperature lockout -10 to 117 degrees F. Interstage time delay 0 to 20 minutes.
DEWPOINT CONTROL SETPOINTS:	Dewpoint temperature setpoint defaults to 52 degrees F. Limit number of A.C. stages 1 to 4.
ALPHANUMERIC DISPLAY OF SATELLITE UNIT DESCRIPTION:	Up to 13 characters.
SATELLITE UNIT SETPOINTS:	Load Type cooling, heating and Time of Day. Day/Night temperature default to 65 degrees F. Lockout temperature -10 to 117 degrees F.
EC-130 UNIT SECHEDULE FOR NIGHT SETBACK/SETUP NOTE: IF NOT REQUIRED - (NOT PROGRAMMED) THIS WILL NOT BE AVAILABLE	Occupied time 0000 to 2359 hours. Unoccupied time 0000 to 2359 hours.
ADDRESSING	Can be assigned as a Unit 1 through Unit 8 for remote communications.

Theory of Operation

The EC-128 and EC-130 family of controls operate on a "deviation from setpoint" theory, with discharge sensor anticipation and outdoor lockout capability. This means that the farther away from the desired setpoint the space temperature travels, the more stages of either heating or cooling will be turned on.

The discharge sensor acts as an anticipator in that if there is either heating or cooling on, the control will attempt to limit the additional stages cycled on in order to give the space a chance to react to the capacity currently in the ductwork.

The outdoor lockout feature serves to "lockout" either heating or cooling if the outside temperature is either too warm or too cool. For example, if the cooling lockout setpoint is set for 50 degrees, the cooling will run only if the outside temperature is above 50 degrees. Similarly, if the heating lockout is set for 60 degrees, the heating will only run if the outside temperature is below 60 degrees. The dehumidification cycle is subject to the cooling outdoor lockout setpoint, if air conditioning is being used for the dehumidification of the space.

The deviation from setpoint theory utilized on the EC-130 operate with interstage deadbands -- 1/2 degree on the EC-130. This means that any stage cycles on when the space temperature deviates 1/2 degree from the setpoint, and subsequent stages cycle on as the space temperature continues to deviate in 1/2 degree increments. For example, if the cooling setpoint is 75 degrees, the first stage of air conditioning turns on when the space temperature rises 1/2 degree above the setpoint, or to 75 1/2 degrees. The second stage turns on when the space temperature rises to 76 degrees, and so on. On a fall in space temperature, the second stage of air conditioning would turn off at 75 1/2 degrees and the first stage would turn off at setpoint, or 75 degrees.

The heat reclaim and auxillary heating stages operate in a similar manner on a continued fall in space temperature, below their respective setpoints.

The discharge sensor acts to anticipate either warm or cool air in the ductwork, on its way to the space. It serves to either turn off or inhibit stages from turning on, but does not act to cycle stages on. The authority of the discharge sensor is 1/20th that of the space sensor. The control formula for the discharge sensor is:

$(\text{discharge temperature} - \text{space temperature} / 20) + \text{space temperature}$

This means that the discharge sensor will affect the space sensor 1 degree for each 20 degrees that the discharge sensor is either above or below the space temperature.

There are minimum deadbands of 1 degree between air conditioning setpoint and heat reclaim setpoint, and 2 degrees between heat reclaim setpoint and auxillary heat setpoint. If there is no heat reclaim, and the control is programmed so, the deadbands tighten to 1 degree between the air conditioning and auxillary heating setpoints.

The evaporator fan runs continuously when controlling in the occupied mode. An air flow switch is typically located in the discharge ductwork, and the control allows stages of heating or cooling to cycle provided there is air flow sensed. If air flow is lost the EC-130 turns off all stages of heating and cooling.

The EC-130 control has a night setback feature that may be used, or totally eliminated from the program if not desired. If used, the night setpoints are controlling when in the night mode and the evaporator fan is off except on a call for either heating or cooling.

INSTALLATION GUIDE

This section presents guidelines for the installation of the EIL EC-130 System. Individual system components must be installed in the order in which they were presented. Strict adherence to the outlined procedures and referenced figures must be maintained in order to ensure accurate and efficient performance.

NOTE: ALL INSTALLATION PROCEDURES MUST BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, NFPA 70 AND OTHER APPLICABLE CODES. E.I.L. INSTRUMENTS DOES NOT ACCEPT LIABILITY RESULTING FROM EITHER COMPLIANCE OR NONCOMPLIANCE WITH THE PROVISIONS PRESENTED IN THIS DOCUMENT.

A. SYSTEM OVERVIEW

A typical EC-130 System would be laid out as illustrated in Figure 1.

EIL component symbols with corresponding definitions and abbreviations are presented in Figure 2.

A typical floor plan illustrating sensor and component placement is presented in Figure 3.

A typical wall placement of EIL Energy Control Systems is shown in Figure 4.

EC-130 System mounting and hookup is shown in Figure 5.

EC-130 Control interface is shown in Figure 6.

Mounting and hookup of EC-130 sensors is shown in Figure 7.

Optional Remote Relay Interface hookup is shown in Figure 8.

B. EC-130 SYSTEM INSTALLATION

There are two (2) main cabinets in the EC-130 System. The main unit houses the system (the unit with the keypad and display) and the second unit contains the output relay board. The relay cabinet is normally mounted below the EC-130 main panel. However, with an optional interface, the relay board may be mounted remotely, for instance in an air handler control panel.

1. MOUNTING THE UNIT

A. MAIN UNIT

The main panel should be mounted as outlined in the following steps and as illustrated in Figure 5.

1. Mount the main panel on a permanent wall that can support a weight of 20 pounds and which encompasses dimensions of 20 X 14 X 6 inches. If the relay panel is to be mounted at this location, insure that there is sufficient space below the main unit for the relay cabinet which is the same dimension.
2. Secure the panel to the wall using the four (4) pre-punched holes.
3. Refer to the wall layout (Figure 4) for mounting all of the components of the system.

NOTE: THE AMBIENT TEMPERATURE OF THE LOCATION CHOSEN FOR THE UNITS MUST BE WITHIN THE RANGE OF 40 TO 100 DEGREES F. A NONCONDENSING HUMIDITY LEVEL MUST BE MAINTAINED.

WARNING: EXTREME CARE MUST BE TAKEN TO PREVENT METAL FILINGS AND OTHER DEBRIS FROM FALLING INTO CIRCUIT BOARD SECTIONS. DRILLING SHOULD BE AVOIDED. PUNCHES SHOULD BE USED IF ADDITIONAL HOLES ARE NEEDED.

B. RELAY UNIT

The relay panel should be mounted using the same methods outlined above for the main unit. If the relay unit is to be mounted with main unit, insure that the spacing allows interconnection of the units using the ribbon cables.

2. POWER HOOKUP

Line power must be supplied to both the main and the relay unit. Refer to Figure 5 and as outlined in the following steps.

A. MAIN UNIT

1. Remove the grillage in the main unit by removing the screws, nuts and nylon spacers.
2. Remove the fuse located in the upper right section of the unit. Do not replace until startup and checkout.
3. Connect a 120 volt, 60Hz, 15 ampere dedicated circuit containing a ground wire to the terminals located in upper right section of the unit labeled L, N, and G.

B. RELAY UNIT

Using the same procedure outlined above for the main unit, however, there are no grillage and screws to remove. The same 120 volt source can be used for both the relay and main units.

3. INTERCONNECTING THE UNITS

MAIN AND RELAY UNIT INTERCONNECTION

If the relay unit is to be mounted with the main unit, a ribbon cable is used to interconnect the units. Refer to Figure 5 for the hookup.

If the relay unit is mounted in a remote location, interconnect the main and relay units using a multi-conductor, 18-gauge, shielded control cable as shown in Figure 8.

Note: An optional remote relay option module (Part # ECRR) must be used.

4. OPTIONAL COM-99 AND MASTER UNIT INTERCONNECTION

Connect a two (2) pair 22-gauge, shielded cable from EC-130 Main unit to the COM-99 unit as shown in Figure 5.

5. TEMPERATURE SENSOR INSTALLATION

A. LOCATION

The EC-130 System has the capability of monitoring Space Temperature, Discharge Air Temperature and Dewpoint Temperature for each of two (2) main air conditioning systems. Additionally, the unit monitors outside air temperature and the space temperature for each of eight (8) satellite systems. The location of these sensors is critical for proper operation of the EC-130 System. Therefore, the sensors should be installed in accordance with Figure 7 and the following guidelines.

B. MOUNTING

Sensors must be mounted in accordance with the following points in order to ensure durability, accuracy and efficiency.

1. Use a sunshield when mounting the outside sensor.
2. Use a ventilated enclosure for mounting the inside temperature sensor.
3. Mount the sensors where they will be free from outside influences, such as drafts, cold walls, etc..
4. Mount the discharge air sensor at least six (6) feet downstream from the nearest heating or cooling coil and locate the probe so that it sees an average temperature value of the discharge air. Do not let this sensor swing freely as time will break the wires. Secure sensor to a conduit extension or the like.
5. Always mount the dewpoint sensor in a horizontal position. Keep open from debris to ensure good airflow across sensor.

C. CONNECTIONS

Sensors must be connected in accordance with the following points in order to ensure durability, accuracy and efficiency.

1. Always use a soldering process or its equivalent to secure the connection.
2. Always insulate connections after completion of soldering.
3. Connect the red lead to the appropriate sensor terminal (SP, DISCH, DP, S#), on the input/output board on the EC-130 unit. Refer to Figure 7.

CAUTION: NEVER RUN SENSOR WIRING IN THE SAME CONDUIT AS POWER WIRING AND AVOID FLUORESCENT LIGHT BALLAST, MOTORS, ETC.

CAUTION: NEVER RUN SENSOR WIRING ACROSS THE ELECTRONICS IN THE CABINET.

CAUTION: SENSORS MUST BE WIRED WITH 18 GAUGE SHIELDED CABLE.

CAUTION: GROUND THE SHIELD AT THE MASTER UNIT END ONLY.

D. CONNECTION TO RELAY BOARDS.

To control an Air Conditioning, Heat Reclaim or Auxiliary Heat loads, it is necessary to interconnect the EC-130 relay boards with the device control circuitry. This usually entails breaking in series with existing thermost controls in the case of a retrofit, or in a new installation, simply connecting the EC-130 relay to the device control relays. The control relays contained on the EC-130 relay board are "normally" open relays. Therefore, after connection to the relay board, this device will not operate until the EC-130 System is operating (this can be circumvented by installing a temporary jumper across the relay terminals). Use the following procedure and Figure 6 for hookup.

1. Mount the Air Flow Switch in the discharge air duct. Specific mounting and installation instructions can be found in the air flow switch package.
2. The Air Flow Switch should provide a contact closure when the fan for the HVAC system is "ON".

3. Use #18-2 AWG shielded wire for running to EC-130 panel.

IMPORTANT: DO NOT RUN AIR FLOW SWITCH CABLE ON OR WITHIN FOUR (4) FEET OF ANY LINE VOLTAGE CONDUIT OR EQUIPMENT (FANS, MOTORS, ETC.)

4. Connect normally open air flow sensors from each system to their respective relay boards. This terminal is at the upper left hand corner of the board. If an air flow sensor is not employed, jumper the connection terminals AFS to GND. Refer to Figure 6. The air flow switch contact should close when air flow is present.
5. Connect the Fan, Air Conditioning, Heat Reclaim and Auxiliary Heat stages for each system to their respective terminals.
6. Connect satellite system controls to their respective terminals.
7. Leave the 120 volt power fuse disconnected until system is ready for startup.

(A) 1 SUNDAY	(B) 2 MONDAY	(C) 3 TUESDAY	(D) SYSTEM ELAPSED TIMES	(E) SATELLITE UNIT NUMBER DESCR.	(F) A/C SETPOINT	(G) SPACE TEMP.	(H) MAIN SYSTEM NUMBER DESCR.
(I) 4 WEDNESDAY	(J) 5 THURSDAY	(K) 6 FRIDAY	(L) SET-BACK SCHEDULE	(M) SATELLITE UNIT SETPOINT	(N) HEAT RECLAIM SETPOINT	(O) OUTDOOR TEMP.	(P) MAIN SYSTEM STATUS
(Q) 7 SATURDAY	(R) 8 HOLIDAY	(S) 9 WEEK	(T)	(U) SATELLITE UNIT TEMP.	(V) AUX HEAT SETPOINT	(W) DISCHG. TEMP.	(X) EXIT
(Y) 0	(Z) DAY / DATE TIME DAYLIGHT	(+) / (-) + / - YES / NO	(*) HOLIDAY	(#) SATELLITE STATUS	(SP) DEW POINT SETPOINT	(BS) DEW POINT TEMP.	ENTER

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IV. INTRODUCTION TO THE KEYPAD

The touch-sensitive keypad, consisting of thirty-two (32) "keys", and the sixteen (16) character display, comprise the communication system required between the user and the EC-130.

Notice that the keys are multi-functional. The primary function of each is printed in the center of the key. With the exception of the ENTER key, there is a small superscript letter, or other character, in the upper right hand corner of each key. These include the entire alphabet, a period, an apostrophe, a number sign (#) and the ability to space forward (SP) and space backward (BS). These superscript letters are used for programming certain specific functions (i.e., the descriptions of the main system or satellite units) and will be discussed further below.

The days of the week, which appear under the number keys are not spelled out on the display. When DAY 1 appears on the display, it is interpreted as SUNDAY, DAY 2 as MONDAY, etc. The numerals are the primary operating and programming function intended for these keys.

Other MultiFunctional Keys:

A. +/- (PLUS/MINUS) AND YES/NO

Plus/Minus is used primarily in conjunction with numbers and values during programming, especially for temperature settings.

The YES/NO operates as a toggle switch, i.e. programming of the satellite unit setpoint function requires a toggle response in order to assign a "cool", "heat" or "Time of Day" control.

B. GENERAL PROGRAMMING INFORMATION - PROGRAM SWITCH

On the display, flashing values are those that the user may alter for his individual needs. These will be discussed in greater detail below. However, it is important to note that the EC-130 will not accept entries which exceed its Default Values. The display will continue to flash in this case, indicating another entry must be made.

When programming single digit numbers for any function, the user should preface the number with a zero (0). The unit is designed to display single digit numbers with a preliminary zero (0), 01 through 09.

Two (2) spring switches, located on the printed circuit board, on the back side of the unit front door panel, control the user's ability to program the EC-130.

The switch located in the lower left hand corner of the printed circuit board controls access to the Programming Mode. Depress this switch; the display will change from the continual display of time (in 24 hour military time) and PROG will appear. The EC-130 is now ready to receive program commands. Once the user has finished programming, depress the programming switch. The time display will reappear.

NOTE: THE UNIT ASSUMES THAT ONCE THE PROGRAMMING SWITCH HAS BEEN DEPRESSED, A PROGRAM ORDER WILL FOLLOW. AT LEAST ONE (1) PROGRAM ENTRY MUST BE MADE BEFORE SWITCHING OUT OF THE PROGRAM MODE.

NOTE: THE UNIT WILL RETURN TO RUN MODE (TIME IN DISPLAY) AFTER 15 MINUTES IF NO ENTRY HAS BEEN MADE.

CLEAR SWITCH

The switch located in the upper right hand corner of the printed circuit board should be approached with CAUTION. This is the "Memory Clear" switch. Depressing it while the unit is in the Programming Mode will erase all previously programmed values (except day, date and time.) The user may wish to clear the entire memory of the unit if, for example, the unit is moved to another facility or if the need of the parameters of the facility change.

NOTE: THE DEFAULT VALUES PROGRAMMED BY THE MANUFACTURER ARE NOT ERASABLE BY ANY MEANS.

The EC-130 unit should be "cleared" as soon as installation is complete and the unit is powered for the first time.

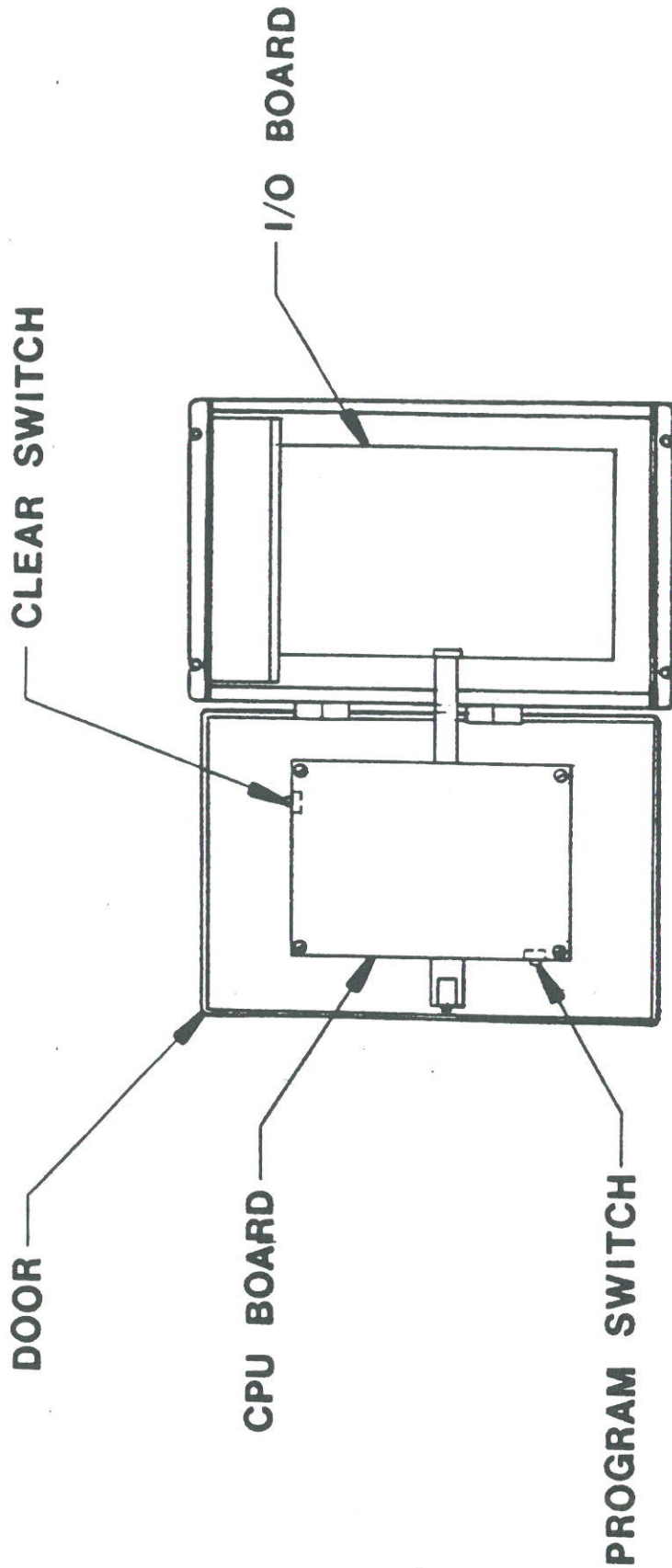
C. MASTER CLEAR BACKGROUND

Before programming the unit for the first time, the unit's memory should be cleared.

The EC-130 can be totally cleared with the Master Clear Procedure.

Typically, Master Clear is performed when:

1. EC-130 is initially powered up.
2. After replacement of a major component.
3. If the processors becomes "locked-up" a power down and power up will not work.



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JOB NAME			
SYSTEM LAYOUT		SYSTEM LAYOUT	
SCALE	DRAWN BY	CHECKED	APPROVED
	NAME	NAME	NAME
	DATE	DATE	DATE
DRAWING NO.		SHEET	
		OF	
		REV	

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EC-130 PROGRAMMING GUIDE

I. GENERAL

A. MASTER CLEAR

Once installation is complete and an initial power up done, the EC-130 System should be cleared.

Clearing The System:

1. Remove the AC power fuse (disconnect power) located on the top of the unit and leave depowered for (2) two minutes.
2. Simultaneously, push the CLEAR SWITCH located on the top right side of the CPU board and hold while powering the unit back up (replacing fuse).
3. Push down the PROGRAM SWITCH on the left side of the CPU board and keep depressed while still holding the CLEAR SWITCH.
4. Release the CLEAR SWITCH.
5. Release the PROGRAM SWITCH.

The EC-130 is now ready for programming.

B. RUN MODE - PROGRAM MODE

The normal operating mode for the EC-130 control is the run mode. The correct time of day, in military time, is displayed. The EC-130 will revert to the run mode automatically after 15 minutes if the operator fails to switch the unit from the program to the run mode.

Placing the unit in program mode:

To place the unit in the program mode, slide the spring switch downward. The spring switch is found on the inside of the door, on the lower left portion of the CPU board. (At least one entry must be made before the unit may be returned to the run mode).

The EC-130 display will show "PROG" or "PROGRAM" as soon as the unit is placed in the program mode.

C. PROGRAM LOOPS

The EC-130 system has a series of program "loops". Whenever a function key is pressed, there will be more than one selection under each key to program.

EXAMPLE:

If A/C SETPOINT key is pressed, the following will appear:

```
A   DAY   SETPT   073
      press enter
A   NITE  SETPT   073
      press enter
A   L.O.  SETPT   010
      press enter
A   DELAY 01
```

When a selection is made and the "loop" is entered, the user must step through each part of the loop before another function or "loop" can be started.

Stepping through the loop can be accomplished in normal programming by entering values where needed, or by continually pressing either the ENTER or EXIT key until the "loop" is complete and the display reads PROG in the program mode or the correct time of day in the run mode.

II. PROGRAMMING

A. PROGRAMMING MAIN SYSTEM / SYSTEM DESCRIPTION / NIGHT SETBACK MODE

Once in the program mode, a system must be selected. The main system will be either A or B. In the single system unit, the EC-130A, all programming will be done in the A system only. In the dual or EC-130B, (2) two systems are available to be programmed. It is important that the user program each of the systems, A & B, individually. The whole functional programming sequence for each main system must be completed before beginning on the second system.

Programming System A:

1. Begin by pressing MAIN SYSTEM NUMBER / DESCRIPTION key.
2. Select proper system by pressing A - then enter.

The letter of the system selected will appear in the left side of the display and dashes will be flashing just to the right. A description may now be typed on the display using the alphabet keys on keypad. Thirteen (13) letters or number in the descriptions may be used. Numbers may be typed by pressing # key and then pressing the appropriate number, spaces and backspaces by using SP and BS keys (SP = space and BS = backspace). When desired description is complete, press ENTER key.

The description of system A is now entered in memory. Whenever the system is interrogated, the description will appear in display. In the program mode, when the system is selected, the description will flash. Modifications to the description can be made if necessary, or simply press the ENTER key to retain in memory.

We are now locked into System A and have completed the description. The "A" will remain on the left side of the display throughout the programming sequence.

PRESS ENTER

SET BACK (WITH YES FLASHING) APPEARS

NIGHT SETBACK

If a night set back schedule is required for the main system A, press ENTER. If night set back is not required, press the + - key and NO will appear, press ENTER. The option of night set back has now been locked in and the display will no longer be flashing.

The setback schedule affects only the main systems heating and cooling. If setback is chosen, each of the systems (heating and cooling) will display a night setpoint. If no setback is used, the nite setpoints will not appear. The setback schedule will be programmed at a later time using the specified setback key.

We have now gone through a "program loop", which will be covered shortly.

We are now ready to program the setpoints, time delays, etc.

Prior to programming any setpoints, the following deadbands and default values should be noted:

B. DEFAULT VALUES & DEADBANDS

Preprogrammed by the manufacturer, these are reasonable base-line temperatures and other values for all the programmable functions. If the EC-130 was not programmed by the user, or if the programmed memory was cleared, these are the temperatures, etc. at which the unit will automatically maintain the facility.

1. Air Conditioning - 1 degree deadband with Heat Reclaim

- a. Day/Night = 73 degrees F
- b. Lock-Out = -10 degrees F (No Lock-Out)

2. Heat Reclaim - 2 degree deadband with Auxiliary Heat

- a. Day/Night = 70 degrees F
- b. Lock-Out = 117 degrees F (No Lock-Out)

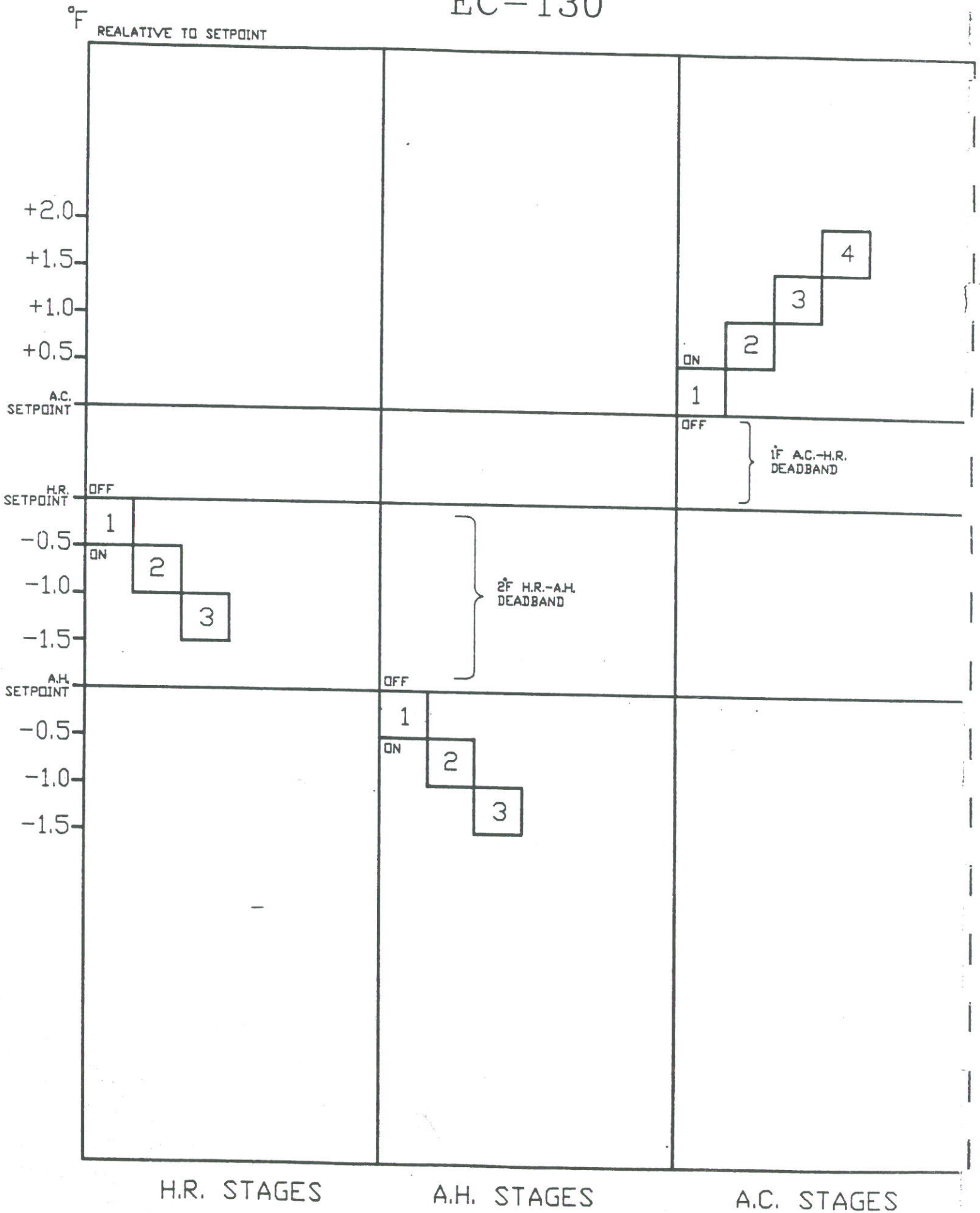
3. Auxiliary Heat

- a. Day/Night = 65 degrees F
- b. Lock-Out = 117 degrees F (No Lock-Out)

Refer to the following chart to see deadbands and staging in block form.

NOTE: Heat Reclaim can be eliminated as will be seen in the programming of the "Heat Reclaim Setpoint". If this is desired the deadband will now become 1 degree between Air Conditioning and Auxiliary Heat.

EC-130



C. PROGRAMMING SETPOINTS

A/C SETPOINT:

We will assume the following setpoints to program A/C:

Day Setpoint	-	74 degrees
Nite Setpoint	-	76 degrees
L.O. Setpoint	-	50 degrees
Delay	-	3 minutes

Press A/C setpoint key - display will indicate:

A DAY SETPT 073 (flashing)

PRESS "074"

PRESS ENTER

A NITE SETPT 073 (flashing) appears

PRESS "076"

PRESS ENTER

A L.O. SETPT -10 (flashing) appears

PRESS + - KEY* "50"

PRESS ENTER

*You must use the + - key to change from a negative to a positive figure.

A DELAY 01 (flashing) appears

PRESS "03" ENTER

The "loop" has been completed and "PROG" is again displayed.

HEAT RECLAIM

We will assume the following setpoints to program heat reclaim:

Day Setpoint	-	72 degrees
Nite Setpoint	-	72 degrees
L.O. Setpoint	-	100 degrees
Delay	-	3 minutes
Flush DUR	-	10 minutes
Flush Time	-	0300

Remember the 1 degree deadband for A.C. and 2 degrees for A.H.

Press Heat Reclaim Setpoint key - display will indicate:

A HEAT REC - YES (flashing)

NOTE: If no is chosen, none of the heat reclaim parameters will appear and "PROG" will return in the display. We will choose "YES" to go through the "loop" and how to program the setpoints.

PRESS ENTER TO CHOOSE "YES"

A DAY SETPT 070 (flashing) appears

PRESS "072" - PRESS ENTER

A NITE SETPT 070 (flashing)

PRESS "072" - PRESS ENTER

A L.O. SETPT 117 (flashing)

PRESS "100" - PRESS ENTER

A DELAY 01 (flashing)

PRESS "03" - PRESS ENTER

A FLUSH DUR 10 (flashing)

PRESS "10" - PRESS ENTER

A FLSH TIME "0000" (flashing)

PRESS "0300" - PRESS ENTER

"PROG" IS DISPLAYED

AUXILLIARY HEAT

We will assume the following setpoints to program Auxilliary Heat:

Day Setpoint	-	68 degrees
Nite Setpoint	-	66 degrees
L.O. Setpoint	-	65 degrees
Delay	-	10 minutes

Press AUX HEAT setpoint key - display will indicate:

A DAY SETPT 065 (flashing)
PRESS "068" - PRESS ENTER

A NITE SETPT 065 (flashing)
PRESS "066" - PRESS ENTER

A L.O. SETPT 117 (flashing)
PRESS "065" - PRESS ENTER

A DELAY 05 (flashing)
PRESS "10" - PRESS ENTER

"PROG" IS DISPLAYED

DEWPOINT SETPOINT

We will assume the following setpoints to program dewpoint:

Setpoint - 54 degrees
Maximum Stages - 3

Press dewpoint setpoint key - display will indicate:

A SETPT 052 (flashing)

PRESS "054" - PRESS ENTER

A MAX STAGES 01 (flashing)

PRESS "03" - PRESS ENTER

"PROG" IS DISPLAYED

SETBACK SCHEDULE

We will assume the following store hours and days to program the setback schedule:

- 1. Sunday - 8:00 a.m. - 5:00 p.m.
- 2. Monday - 7:00 a.m. - 10:00 p.m.
- 3. Tuesday - 7:00 a.m. - 10:00 p.m.
- 4. Wednesday - 7:00 a.m. - 10:00 p.m.
- 5. Thursday - 7:00 a.m. - 10:00 p.m.
- 6. Friday - 7:00 a.m. - 10:00 p.m.
- 7. Saturday - 7:00 a.m. - 10:00 p.m.
- 8. Holiday - 9:00 a.m. - 4:00 p.m.

NOTE: Numbers 1 through 8 on the keypad designate the days of the week as listed above.

Press setback schedule key - display will indicate:

A DAY 0 (flashing)

PRESS "1" (designates Sunday)

PRESS ENTER

A OCCUPIED 0000 (flashing)

PRESS "0700"

NOTE: By setting the time an hour before the store actually opens, you are enabling it to reach the day setpoint temperature by 0800 hours.

PRESS ENTER

A UNOCCUPIED 0000 (flashing)

PRESS "1700"

PRESS ENTER

If enter is pressed again the display will revert back to the occupied time. It will be necessary to press EXIT to return to:

A DAY 1 (flashing)

Continue to program as done for day one for the entire week schedule.

SATELLITES

There are 4 satellites available for A, single system or 8 satellites available for B, dual system.

PROGRAM SATELLITE 1 DESCRIPTION

Press satellite unit setpoint key - Display will read:

SATELLITE NO. 1 (with "1" flashing)

PRESS ENTER

ENTER DESCRIPTION OF SATELLITE
(using alphabet in upper right of each key)

PRESS ENTER TO LOCK IN DESCRIPTION

PROGRAM SATELLITE 2 DESCRIPTION

Follow above directions to program remaining satellites. Where the number is flashing in the display you will have to change from #1 to #2, etc.

SATELLITE 1 SETPOINT

We will assume the following setpoints to program satellite 1:

Type Load	-	Heat
Day Setpoint	-	70 degrees
Nite Setpoint	-	68 degrees
Lock Out	-	65 degrees
Occupied	-	0700
Unoccupied	-	2000

Press Satellite Setpoint key - display will indicate:

SATELLITE 1 WITH "1" (flashing)

PRESS ENTER

1 TYPE LOAD HEAT (flashing)

PRESS ENTER

1 DAY SETPOINT 65 (flashing)

PRESS "70"

PRESS ENTER

1 NIGHT SETPOINT 65 (flashing)

PRESS "068"

PRESS ENTER

L.O. SETPOINT 117 (flashing)

PRESS "065"

PRESS ENTER

1 DAY 0 (flashing)

PRESS 1 (SUNDAY)

PRESS ENTER

1 OCCUPIED 0000 (flashing)

PRESS "0700"

PRESS ENTER

1 UNOCCUPIED 0000 (flashing)

PRESS "2000"

PRESS ENTER

The unit will now toggle between the occupied and unoccupied setpoints until EXIT is pressed. Display will indicate:

1 DAY 1 (flashing)

PRESS "2"

PRESS ENTER

Continue to program entire week as done with Day 1. Press EXIT twice to return to PROG in display.

NOTE: Cooling loads are programmed identical to heating loads. When load type heat is in display use the + / - key to toggle to cooling load and then continue as done with Satellite 1.

SATELLITE 2 SETPOINTS

We will assume the following setpoints to program Satellite 2:

Type Load	-	T.O.D. (Time of Day)
Time ON	-	0730
Time OFF	-	2230

Press Satellite setpoint key - Display will read:

SATELLITE 1 WITH "1" (flashing)

PRESS "2"

PRESS ENTER

2 TYPE LOAD HEAT (flashing)

PRESS +/- KEY 2 TIMES (T.O.D. IN DISPLAY)

PRESS ENTER

2 TIME ON 0000 (flashing)

PRESS "0730"

PRESS ENTER

2 TIME OFF 0000 (flashing)

PRESS "2230"

PRESS ENTER

The unit will now toggle between TIME ON and TIME OFF until the EXIT key is pressed, display will indicate:

2 DAY 1 (flashing)

PRESS "2"

PRESS ENTER

Continue to program the entire week as done with Day 1.

Press EXIT twice to return to "PROG" in display.

GENERAL OPERATION OF THE EC-130

III. GENERAL OPERATION OF EC-130

Each main system of the EC-130 has 4 temperatures which play a role in the overall operation of that system.

SPACE TEMPERATURE

Each of the loads (A.C., H.R., A.H.) will turn on in 1/2 degree increments, beginning with load 1 followed by 2, 3, etc. The loads will turn off also in 1/2 degree increments in reverse order.

DISCHARGE TEMPERATURE

This temperature is known as an anticipater with a 20:1 ratio. This means that as the discharge temperature drops to 20 degrees below the A.C. actual setpoint the setpoint will actually float up 1 degree. The operation will be the opposite for heat loads.

OUTSIDE TEMPERATURE

To ensure unnecessary loads of heating or cooling from being turned on regardless of space temperature the outside temperature is monitored. This is done by the lockout setpoints. One important parameter will be A.C. lockout. This must be taken into account for the dehumidification needs required by the dewpoint.

DEWPOINT

This temperature is a combination of the drybulb and wetbulb temperature. Stages of A.C. will turn on in 1/2 degree increments allowing as many stages to turn on as are programmed by the max. stages. The dewpoint must be above the setpoint to turn on stages and they will turn back off in 1/2 degree increments in reverse order.

There is a load designated only for the purpose of dehumidifying. It will turn on when the dewpoint has gone 1/2 degree above the setpoint. This load is not related to the maximum stages and is available for loads such as a desiccant wheel.

STATUS AND OVERRIDE OF EACH LOAD ON AN INDIVIDUAL SCALE

If trouble shooting or "start up" testing is required this is best accomplished by the use of the "9" key status and the "0" key override. These 2 keys must be used in conjunction with each other to ensure that the unit is returned to it's normal run condition. The relay boards are marked as AC1, AC2, HR1, etc. and below each description they are also marked with a load # such as AC1 - LD.10, AC2 - LD.11, etc.

To put a load in override:

1. Determine load number by viewing the relay boards or by looking at load chart on the following page.
2. Press "0" key.
Display will indicate:
LOAD 00 (WITH 00 FLASHING)
Enter load desired to turn on
Press ENTER
Display will indicate:
LOAD XX (# DESIRED) OVR ON

To remove a load from override:

1. Duplicate the process used to put a load into override.
Display will indicate:
LOAD XX (# DESIRED) OVR OFF

When the status of a load is desired:

1. Determine the load number by viewing the relay board or by looking at the load chart on the following page.
2. Press "9" key.
Display will indicate:
LOAD 00 (WITH 00 FLASHING)
Enter load desired
Press ENTER
Display will indicate:
LOAD XX (# DESIRED) (SEE DESIGNATION CHART BELOW)

- LOAD STATUS DESIGNATIONS

DISPLAY SHOWS:

LOAD STATUS WILL BE:

LOAD #	ON	" ON "
LOAD #	OFF	" OFF "
LOAD #	OFF D	" OFF " because there is no air flow in Main Air Handler
LOAD #	ON 0	" ON " in override
LOAD #	OFF OL	" OFF " because of outside temperature Lockout

I/O BOARD
LOAD CHART

ZONE A				ZONE B			
LOAD		LOAD		LOAD		LOAD	
10	AC1	15	HR2	22	AC1	27	HR2
11	AC2	16	HR3	23	AC2	28	HR3
12	AC3	17	AH1	24	AC3	29	AH1
13	AC4	18	AH2	25	AC4	30	AH2
14	HR1	19	AH3	26	HR1	31	AH3
20	FAN	09	DEH	32	FAN	21	DEH
-	AFS	-	NSB	-	AFS	-	NSB
-	DH	-	NSB0	-	DH	-	NSB0
1	SAT1	3	SAT3	5	SAT1	7	SAT3
2	SAT2	4	SAT4	6	SAT2	8	SAT4

STATUS KEY DESCRIPTION

The status key is only usable in the run mode. When the status key is pressed the display will indicate:

NIGHT SETBACK

SYSTEM IS PROGRAMMED TO BE IN SETBACK MODE

"OR"

EX NIGHT SETBACK

SYSTEM IS TRIGGERED INTO SETBACK BY NITE SETBACK TERMINAL

"OR"

SETBACK OVERRIDE

SYSTEM IS TRIGGERED OUT OF SETBACK BY NIGHT SETBACK OVERRIDE TERMINAL

AC

X'S OR O'S X - (OFF) O - (ON)

NO FLOW - (NOT SENSING AIR FLOW IN THE MAIN AIR HANDLER)

ALL OFF - (SYSTEM SATISFIED)

LOCKOUT - TEMPERATURE HAS EXCEEDED THE OUTSIDE LOCKOUT SETPOINT

PRESS ENTER

HEAT RECLAIM

X'S OR O'S X - (OFF) O - (ON)

NO FLOW

ALL OFF

LOCKOUT

PRESS ENTER

AUXILIARY HEAT

X'S OR O'S X - (OFF) O - (ON)

NO FLOW

ALL OFF

LOCKOUT

SATELLITE TEMPERATURE AND STATUS KEYS

PRESS SATELLITE TEMPERATURE KEY

ENTER SATELLITE NUMBER DESIRED TO BE VIEWED.

PRESS ENTER TO VIEW TEMPERATURE.

Duplicate the above by using the status key to view whether the load is ON or OFF.

RUN TIMES OF EACH LOAD

WHILE IN RUN MODE:

PRESS SYSTEM AND SATELLITE RUN TIME KEY

DISPLAY WILL INDICATE:

AC 1 -(RUN TIME IN HOURS & MINUTES), AC 2 - (RUN TIME), ETC. THROUGH H.R., A.H., FAN, AND DEHUMIDIFICATION.

Next the 4 satellites will be viewed.

If only satellite run times are desired:

PRESS SYSTEM AND SATELLITE RUN TIME KEY.

DISPLAY WILL INDICATE:

AC 1

PRESS EXIT TO JUMP FORWARD TO THE SATELLITE RUN TIMES.

TO CLEAR RUN TIMES OF EACH LOAD:

PUT UNIT IN PROGRAM MODE

PRESS SYSTEM AND SATELLITE RUN TIME KEY

DISPLAY WILL INDICATE:

AC1 (RUN TIME IN HOURS AND MINUTES)

PRESS + / - KEY

DISPLAY WILL INDICATE:

AC1 WITH 0 HOURS AND 0 MINUTES

NIGHT SETBACK (NSB)

Each Main System can be put into the night setback mode by the use of a signal on the NSB (night setback) terminal. A ground signal from the "RG" terminal to the "NSB" terminal will indicate to the EC-130 to revert to the night setpoints. This feature could work in conjunction with the COM-99 demand shedding available.

Verification of this being active "ON" would be the green LED being on and the status key displaying "EX NIGHT SETBACK".

NIGHT SETBACK OVERRIDE (NSB0)

Each Main System can be removed from the night setback mode by use of the NSB0 (night setback override) terminal. A ground signal from the "RG" terminal to the NSB0 terminal will indicate to the EC-130 to revert back to normal operation or the day setpoints. This feature could work using a switch at the managers office to bring the space temperature back to the occupied temperature at a time which conflicts with the program setback schedule so no reprogramming would be required. This will have priority over all nite setback operations.

Verification of this being active "ON" would be the green LED being on and the status key displaying "SETBACK OVERRIDE".

USE OF THE ADDRESS / PASSWORD KEY

The EC-130 has a blind key which serves two (2) purposes.

1. To select the unit number of the EC-130. This is required when more than 1 EC-130 is being used to communicate through a single COM-99.
2. To select the use of a password in order to make any program changes. This would mean that when the EC-130 is put into the program mode via the program switch the display will ask for a password in order to continue.

How to set up the parameters of the password function.

1. Place unit in the program mode. Before using any other key, press the letter "T". At this point the display will change from saying PROG to PASSWORD 0000. The four zeros will be flashing.
2. Enter the numbers 1357 and press the ENTER key. The display will change to read:

PROG PASSWORD NO (FLASHING)

If you wish to use the program password feature press the "+ / -, yes / no" key. The display will change to:

PROG PASSWORD YES (FLASHING)

If you enter with the word YES in the display anyone who wishes to change any program setpoints on site will be required to enter a password which will allow the user entrance into the program mode.

If you do not wish to use the program password feature - Press the ENTER key. The display will change to "UNIT NUMBER" (FLASHING) - You can now enable remote communication for up to eight (8) EC-130 panels by pressing the appropriate number.

CAUTION: Please ensure that no two unit numbers are the same. Press the enter key when the proper unit number is in the display. The display will go back to the PROG mode and normal programming can be resumed.

NOTE: 4.6 and later terminal software is required to communicate to EC-130's with unit numbers higher than 2.

EC-130 ENVIRONMENTAL CONTROL

DATE _____

UNIT # _____

SYSTEM A

DESCRIPTION _____

SETPOINTS

COOLING

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____

RECLAIM

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____
 FLUSH DURATION _____
 FLUSH TIME _____

AUXILIARY HEAT

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____

DEWPOINT

DP SETPOINT _____
 MAX STAGES _____

SETBACK SCHEDULE

DAY	OCC	UNOCC
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____

SYSTEM B

DESCRIPTION _____

SETPOINTS

COOLING

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____

RECLAIM

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____
 FLUSH DURATION _____
 FLUSH TIME _____

AUXILIARY HEAT

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____

DEWPOINT

DP SETPOINT _____
 MAX STAGES _____

SETBACK SCHEDULE

DAY	OCC	UNOCC
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____

EC-130 ENVIRONMENTAL CONTROL

DATE _____

UNIT # _____

SYSTEM A

DESCRIPTION _____

SETPOINTS

COOLING

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____

RECLAIM

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____
 FLUSH DURATION _____
 FLUSH TIME _____

AUXILIARY HEAT

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____

DEWPOINT

DP SETPOINT _____
 MAX STAGES _____

SETBACK SCHEDULE

DAY	OCC	UNOCC
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____

SYSTEM B

SETPOINTS

COOLING

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____

RECLAIM

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____
 FLUSH DURATION _____
 FLUSH TIME _____

AUXILIARY HEAT

DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____
 DELAY _____

DEWPOINT

DP SETPOINT _____
 MAX STAGES _____

SETBACK SCHEDULE

DAY	OCC	UNOCC
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____

EIL EC-130 SATELLITE PROGRAM SHEET

EC-130 SATELLITE UNITS

UNIT # _____

DESCRIPTION _____

SENSOR # _____

LOAD TYPE: HEAT / COOL / TOD

- A. DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____

B. SETBACK / SETUP SCHEDULE

TIME OF DAY SCHEDULE

	<u>DAY</u>	<u>OCCUPIED</u>	<u>UNOCCUPIED</u>	<u>TIME ON</u>	<u>TIME OFF</u>
SUN	1	_____	_____	_____	_____
MON	2	_____	_____	_____	_____
TUE	3	_____	_____	_____	_____
WED	4	_____	_____	_____	_____
THUR	5	_____	_____	_____	_____
FRI	6	_____	_____	_____	_____
SAT	7	_____	_____	_____	_____
HOL	8	_____	_____	_____	_____

UNIT # _____

DESCRIPTION _____

SENSOR # _____

LOAD TYPE: HEAT / COOL / TOD

- A. DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____

B. SETBACK / SETUP SCHEDULE

TIME OF DAY SCHEDULE

	<u>DAY</u>	<u>OCCUPIED</u>	<u>UNOCCUPIED</u>	<u>TIME ON</u>	<u>TIME OFF</u>
SUN	1	_____	_____	_____	_____
MON	2	_____	_____	_____	_____
TUE	3	_____	_____	_____	_____
WED	4	_____	_____	_____	_____
THUR	5	_____	_____	_____	_____
FRI	6	_____	_____	_____	_____
SAT	7	_____	_____	_____	_____
HOL	8	_____	_____	_____	_____

EIL EC-130 SATELLITE PROGRAM SHEET

EC-130 SATELLITE UNITS

UNIT # _____ DESCRIPTION _____
 SENSOR # _____
 LOAD TYPE: HEAT / COOL / TOD

A. DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____

B. SETBACK / SETUP SCHEDULE TIME OF DAY SCHEDULE

	<u>DAY</u>	<u>OCCUPIED</u>	<u>UNOCCUPIED</u>	<u>TIME ON</u>	<u>TIME OFF</u>
SUN	1	_____	_____	_____	_____
MON	2	_____	_____	_____	_____
TUE	3	_____	_____	_____	_____
WED	4	_____	_____	_____	_____
THUR	5	_____	_____	_____	_____
FRI	6	_____	_____	_____	_____
SAT	7	_____	_____	_____	_____
HOL	8	_____	_____	_____	_____

UNIT # _____ DESCRIPTION _____
 SENSOR # _____
 LOAD TYPE: HEAT / COOL / TOD

A. DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____

B. SETBACK / SETUP SCHEDULE TIME OF DAY SCHEDULE

	<u>DAY</u>	<u>OCCUPIED</u>	<u>UNOCCUPIED</u>	<u>TIME ON</u>	<u>TIME OFF</u>
SUN	1	_____	_____	_____	_____
MON	2	_____	_____	_____	_____
TUE	3	_____	_____	_____	_____
WED	4	_____	_____	_____	_____
THUR	5	_____	_____	_____	_____
FRI	6	_____	_____	_____	_____
SAT	7	_____	_____	_____	_____
HOL	8	_____	_____	_____	_____

EIL EC-130 SATELLITE PROGRAM SHEET

EC-130 SATELLITE UNITS

UNIT # _____ DESCRIPTION _____
 SENSOR # _____
 LOAD TYPE: HEAT / COOL / TOD

A. DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____

B. SETBACK / SETUP SCHEDULE TIME OF DAY SCHEDULE

	<u>DAY</u>	<u>OCCUPIED</u>	<u>UNOCCUPIED</u>	<u>TIME ON</u>	<u>TIME OFF</u>
SUN	1	_____	_____	_____	_____
MON	2	_____	_____	_____	_____
TUE	3	_____	_____	_____	_____
WED	4	_____	_____	_____	_____
THUR	5	_____	_____	_____	_____
FRI	6	_____	_____	_____	_____
SAT	7	_____	_____	_____	_____
HOL	8	_____	_____	_____	_____

UNIT # _____ DESCRIPTION _____
 SENSOR # _____
 LOAD TYPE: HEAT / COOL / TOD

A. DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____

B. SETBACK / SETUP SCHEDULE TIME OF DAY SCHEDULE

	<u>DAY</u>	<u>OCCUPIED</u>	<u>UNOCCUPIED</u>	<u>TIME ON</u>	<u>TIME OFF</u>
SUN	1	_____	_____	_____	_____
MON	2	_____	_____	_____	_____
TUE	3	_____	_____	_____	_____
WED	4	_____	_____	_____	_____
THUR	5	_____	_____	_____	_____
FRI	6	_____	_____	_____	_____
SAT	7	_____	_____	_____	_____
HOL	8	_____	_____	_____	_____

EIL EC-130 SATELLITE PROGRAM SHEET

EC-130 SATELLITE UNITS

UNIT # _____ DESCRIPTION _____
 SENSOR # _____
 LOAD TYPE: HEAT / COOL / TOD

A. DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____

B. SETBACK / SETUP SCHEDULE TIME OF DAY SCHEDULE

	<u>DAY</u>	<u>OCCUPIED</u>	<u>UNOCCUPIED</u>	<u>TIME ON</u>	<u>TIME OFF</u>
SUN	1	_____	_____	_____	_____
MON	2	_____	_____	_____	_____
TUE	3	_____	_____	_____	_____
WED	4	_____	_____	_____	_____
THUR	5	_____	_____	_____	_____
FRI	6	_____	_____	_____	_____
SAT	7	_____	_____	_____	_____
HOL	8	_____	_____	_____	_____

UNIT # _____ DESCRIPTION _____
 SENSOR # _____
 LOAD TYPE: HEAT / COOL / TOD

A. DAY SETPOINT _____
 NIGHT SETPOINT _____
 LOCKOUT SETPOINT _____

B. SETBACK / SETUP SCHEDULE TIME OF DAY SCHEDULE

	<u>DAY</u>	<u>OCCUPIED</u>	<u>UNOCCUPIED</u>	<u>TIME ON</u>	<u>TIME OFF</u>
SUN	1	_____	_____	_____	_____
MON	2	_____	_____	_____	_____
TUE	3	_____	_____	_____	_____
WED	4	_____	_____	_____	_____
THUR	5	_____	_____	_____	_____
FRI	6	_____	_____	_____	_____
SAT	7	_____	_____	_____	_____
HOL	8	_____	_____	_____	_____

EC-130 SATELLITES

DATE _____

UNIT NO. _____

SENSOR 1

SENSOR 5

SAT. DESCRIPTION _____

SAT. DESCRIPTION _____

SETPOINTS

SETPOINTS

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

SENSOR 2

SENSOR 6

SAT. DESCRIPTION _____

SAT. DESCRIPTION _____

SETPOINTS

SETPOINTS

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

SENSOR 3

SENSOR 7

SAT. DESCRIPTION _____

SAT. DESCRIPTION _____

SETPOINTS

SETPOINTS

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

SENSOR 4

SENSOR 8

SAT. DESCRIPTION _____

SAT. DESCRIPTION _____

SETPOINTS

SETPOINTS

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

EC-130 SATELLITES

DATE _____

UNIT NO. _____

SENSOR 1

SENSOR 5

SAT. DESCRIPTION _____

SAT. DESCRIPTION _____

SETPOINTS

SETPOINTS

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

SENSOR 2

SENSOR 6

SAT. DESCRIPTION _____

SAT. DESCRIPTION _____

SETPOINTS

SETPOINTS

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

SENSOR 3

SENSOR 7

SAT. DESCRIPTION _____

SAT. DESCRIPTION _____

SETPOINTS

SETPOINTS

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

SENSOR 4

SENSOR 8

SAT. DESCRIPTION _____

SAT. DESCRIPTION _____

SETPOINTS

SETPOINTS

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

DAY SP _____
NITE SP _____
LO SP _____
HTG/CLG/TOD _____

SUPERMARKET SYSTEMS

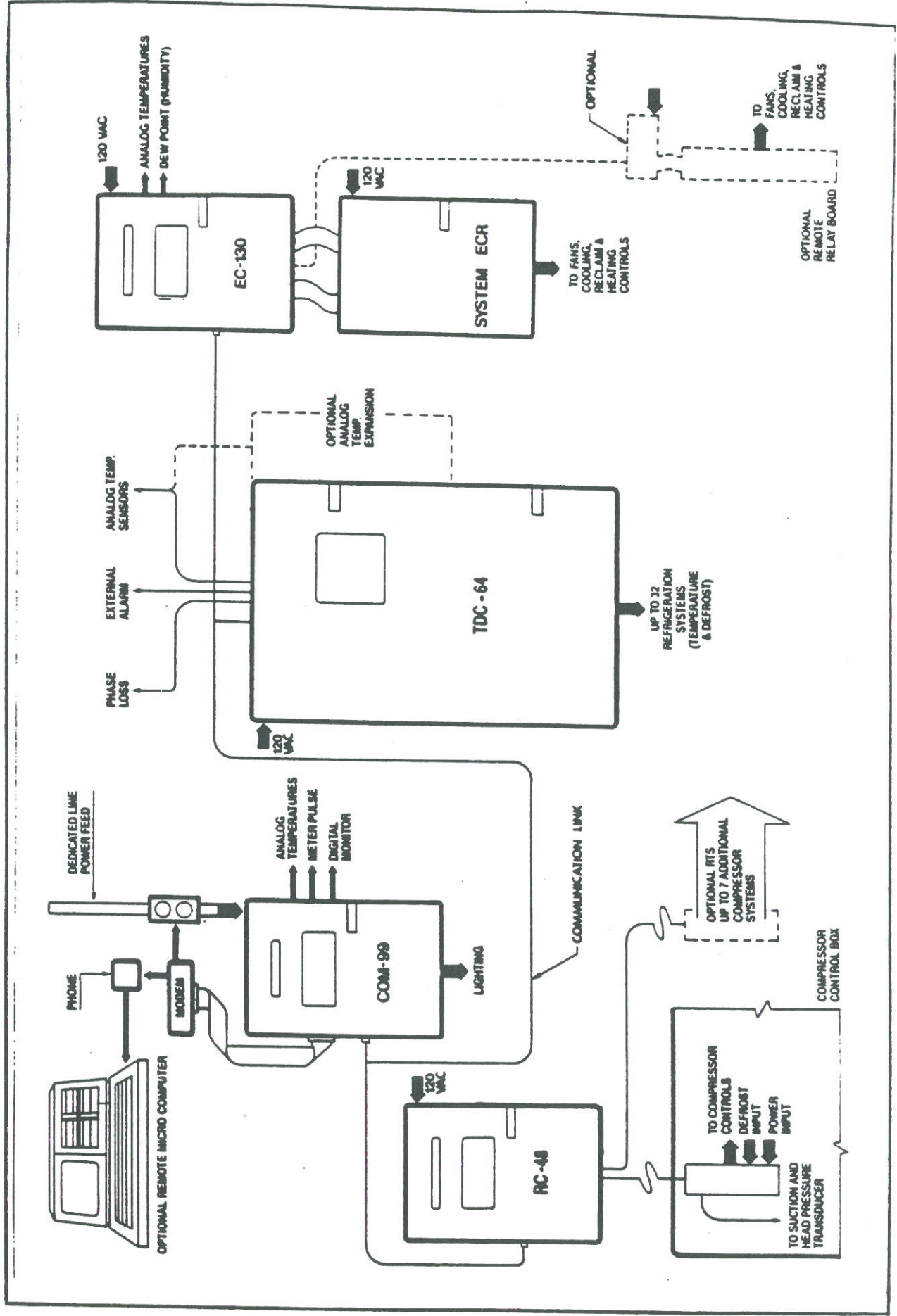
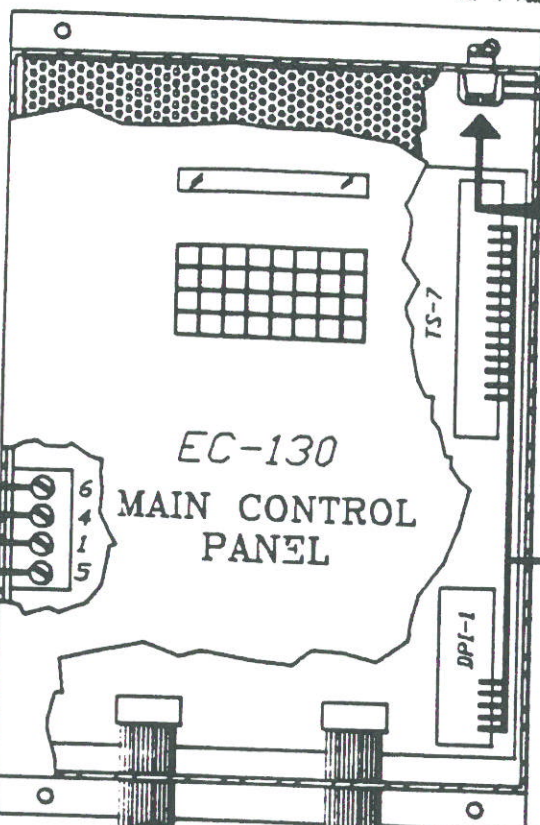
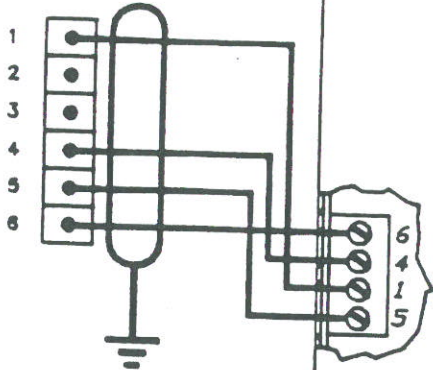


FIGURE 3

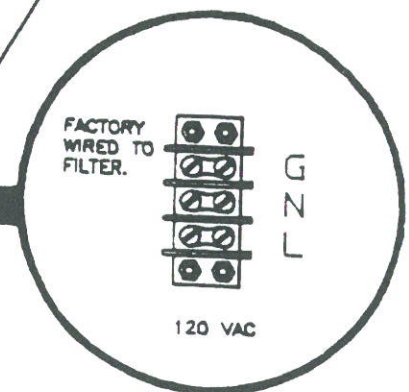
COMMUNICATION LINK

COM-99



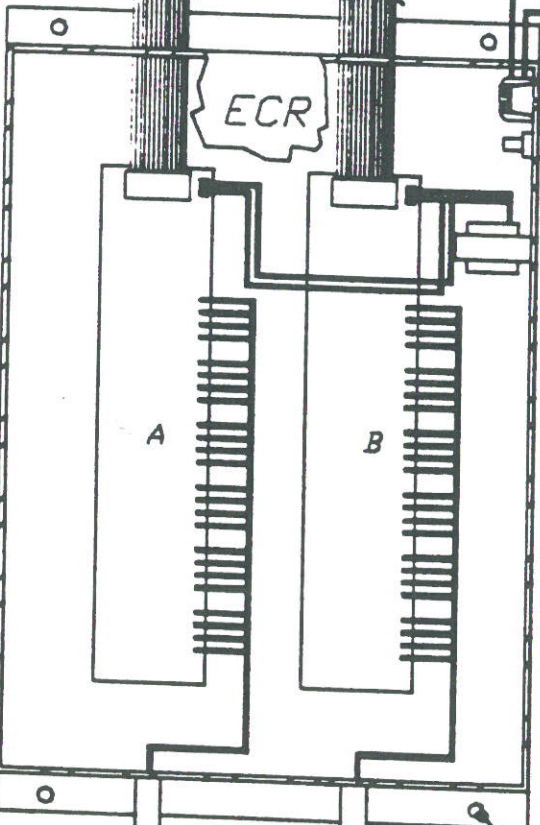
FUSED AT 1 AMP

DEDICATED LINE FOR POWER FEED REQUIRED

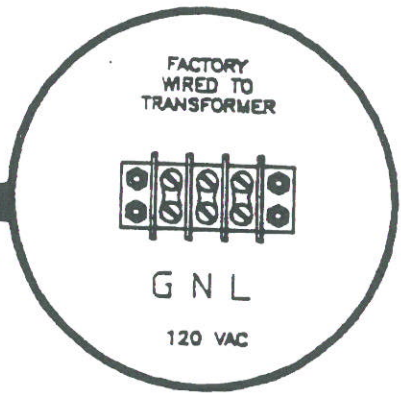


REMOVE GRILL COVER FOR ACCESS TO POWER WIRING. BE SURE TO PUT PLASTIC WASHERS BACK IN PLACE WHEN GRILL IS REINSTALLED.

FROM SPACE, DISCHARGE, DEWPOINT SENSORS ETC.



FUSED AT 1 1/2 AMP



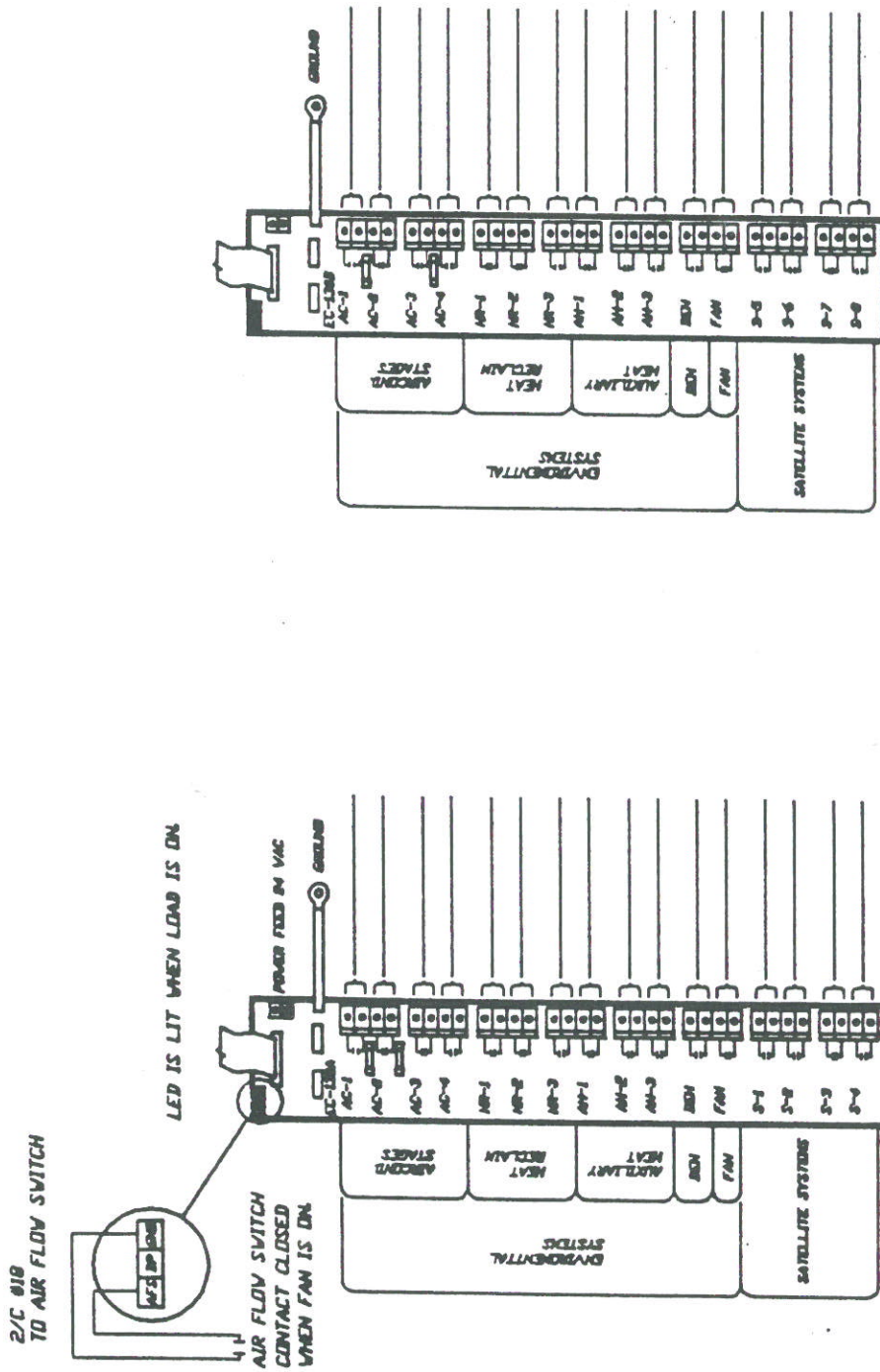
LOCAL RELAY ENCLOSURE

TO FAN, COOLING, HEATING AND SATELLITES.

1/4" MOUNTING HOLES (4).

EC130 MOUNTING AND POWER CONNECTION DIAGRAM

FIGURE 6



NOTES:

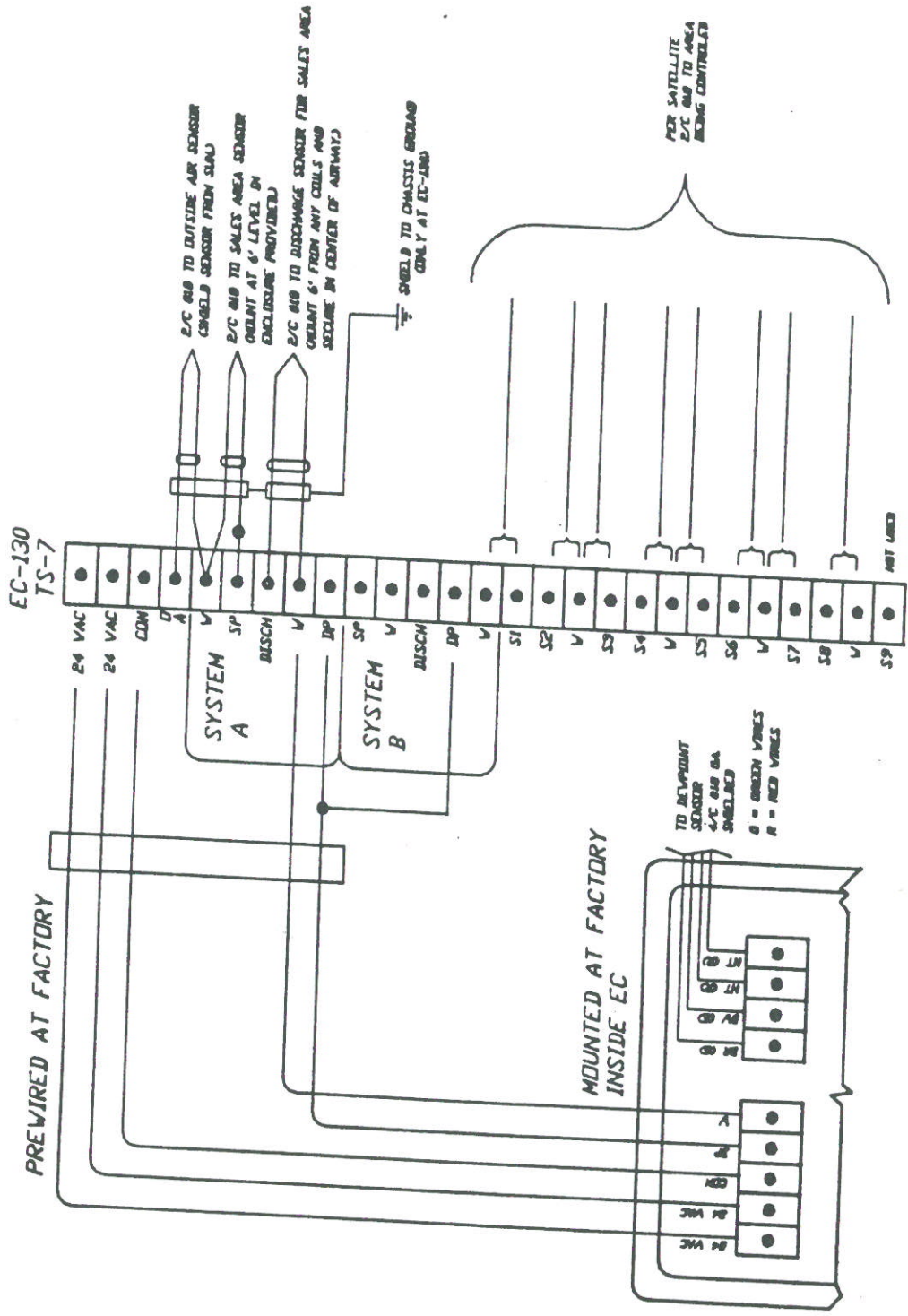
1. WIRE AC, HR ETC. TO VALVES OR CONTACTORS AS NEEDED. ALL RELAYS ARE FUSED AT 3 AMPS.
2. ALL LOADS ARE NORMALLY OPEN.
3. IF A CONTACT CLOSURE DEWPOINT DEVICE IS USED, WIRE AT DP AND GND ON RELAY BOARD.

EC-130 RELAY BOARD B

EC-130 RELAY BOARD A

ECR-CONTROL INTERFACE

FIGURE 7



EC-130B INSTALLATION OF SENSORS

DPI-1

