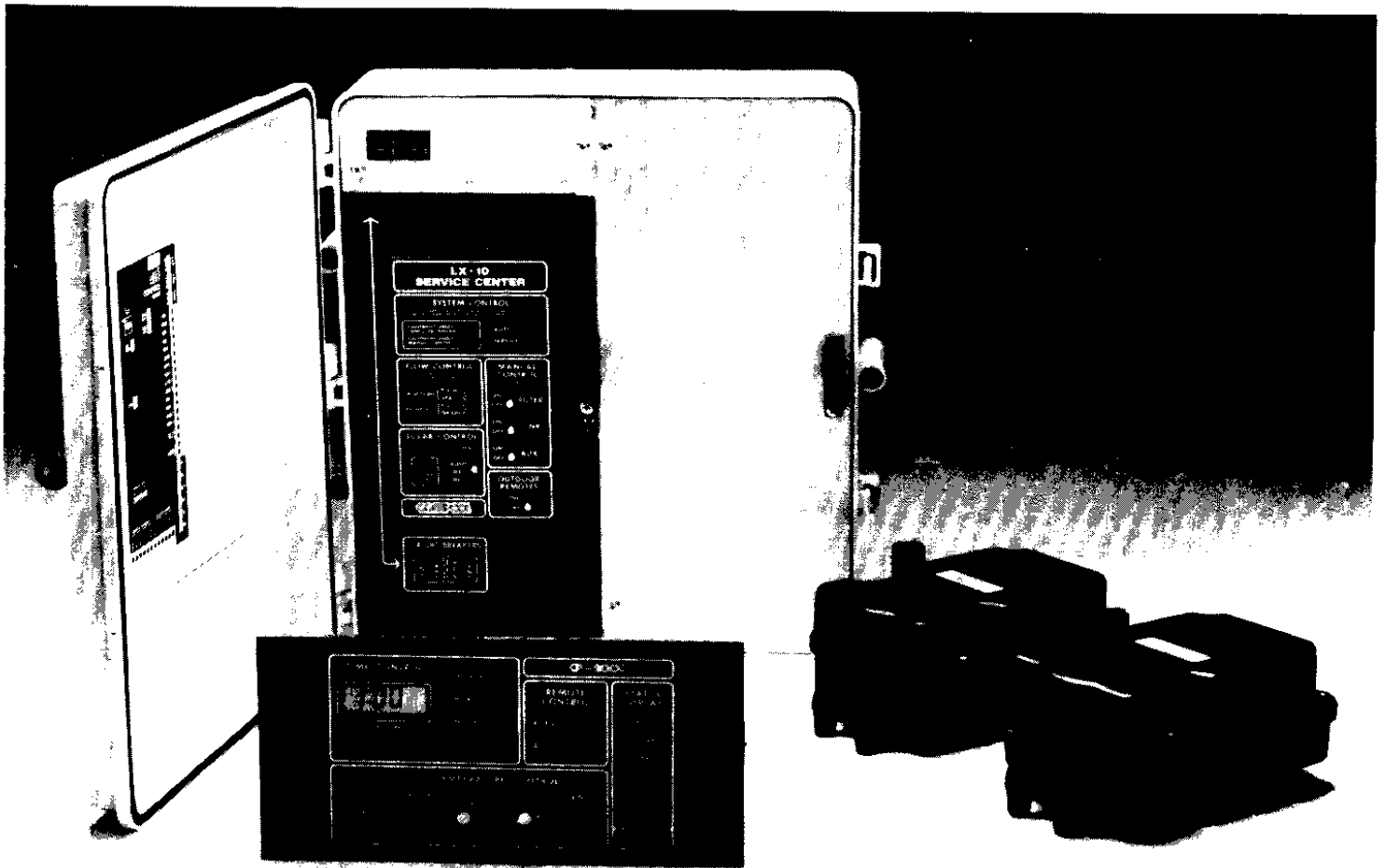


COMPOOL

Computerized Pool Systems

CP-2000 SERVICE MANUAL



599 Fairchild Drive
Mountain View, CA 94043

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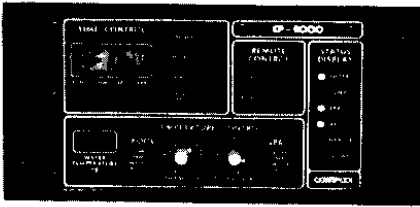
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NOTE:

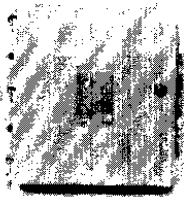
Campco Corporation reserves the right to periodically up-date and modify products. These trouble-shooting principles will, however, remain constant.

INTRODUCTION

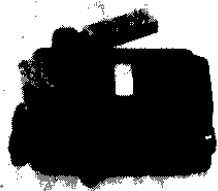
The CP-2000 Control System, is designed to electronically coordinate and operate all of the equipment associated with a swimming pool and spa. Therefore, if a malfunction occurs, it is necessary to determine whether there is a defect at the equipment itself or within one of the following components:



The **CP-2000 Controller**, located in the house, is the Control Center for the system. It houses the Timer Module and a circuit board. (See page 2).



The **LX-10 Service Center**, located at the equipment pad area, is the Power Center for the system. It houses the Transformer Assembly, High Voltage Relays, and a circuit board. (See page 4).



The **VOR-24 Valve Operator**, mounted onto the intake and return valves, switch the circulation from pool to spa. An additional Valve Operator may be utilized to control solar circulation if applicable.



The **Water Temperature Sensor**, mounted in the plumbing system, monitors and transmits the correct water temperature to the CP-2000 Controller.



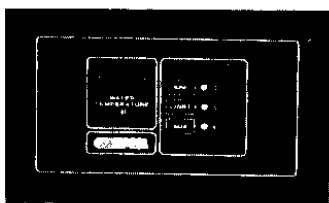
The optional **Solar Temperature Sensor**, mounted at the solar panel array, monitors and transmits the correct solar temperature to the CP-2000 Controller.



The **9pair hook-up cable**, run in conduit, conducts signals between the CP-2000 Controller and the LX-10 Service Center.



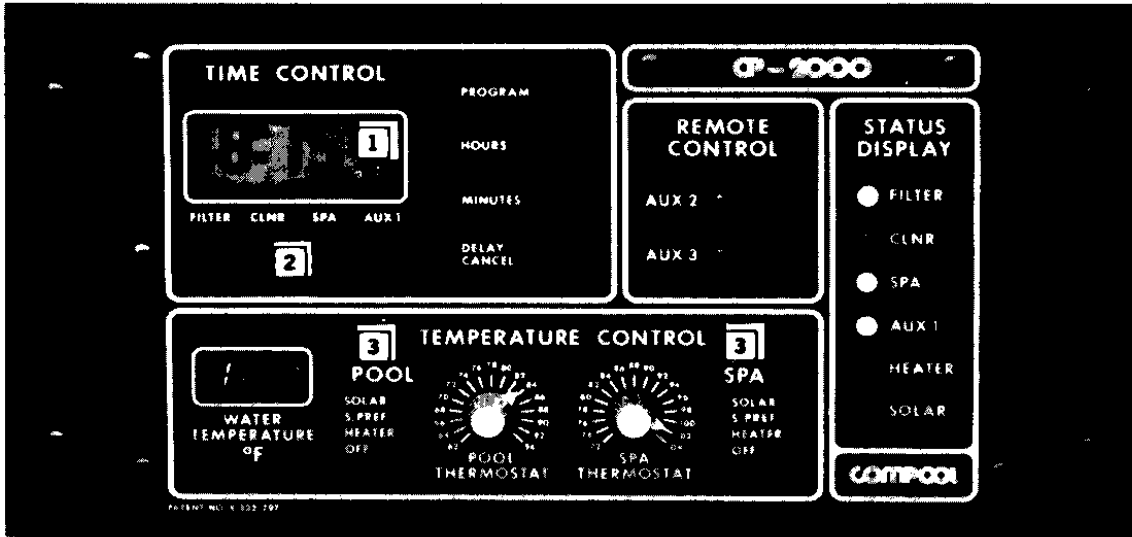
The optional **Superswitch**, located in or near the spa, is a three-function waterproof remote control.



The optional **LVS-3TR**, located in the house or other weather-protected area, is a three-function remote control with a digital temperature readout.

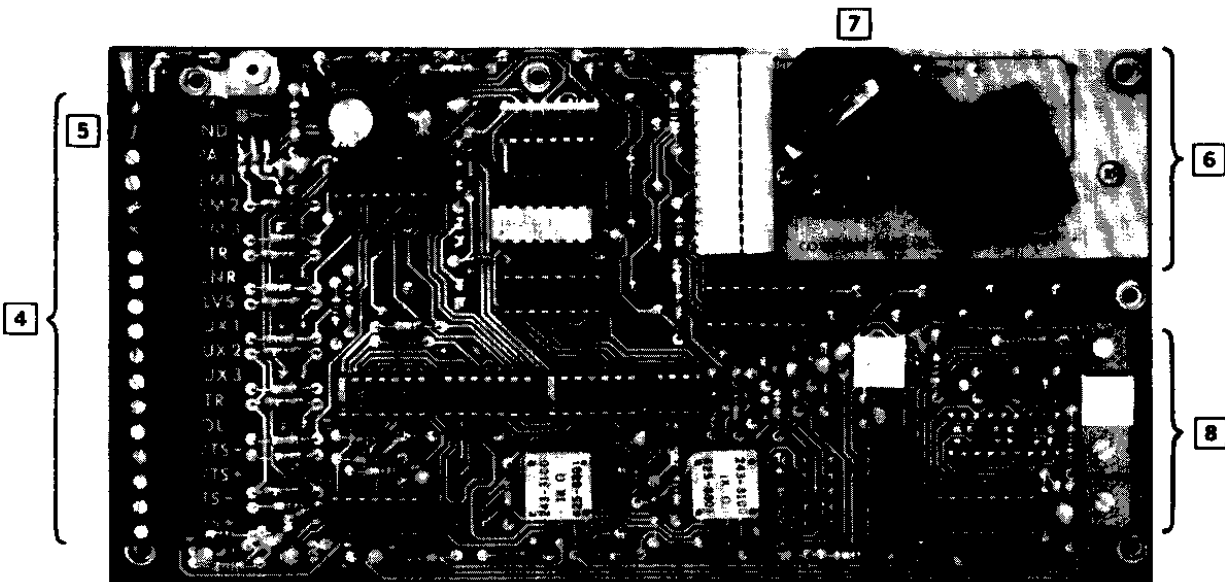
CP-2000 CONTROLLER

The CP-2000 Controller, located inside the house, provides a programmable clock, pushbutton control of all the pool equipment, and separate temperature control for the pool and spa.



- 1 Clock
- 2 Equipment Buttons
- 3 Heat Select Switch

CP-2000 CIRCUIT BOARD



- 4 Terminal Strip (Screw Terminals)
- 5 GND Screw Terminal
- 6 Timer Module
- 7 Timer Module Back-up Battery
- 8 Calibration Adjustment Screws

PROGRAMMING THE CLOCK

Each program at the TIME CONTROL sends a signal to the appropriate equipment, turning it ON or OFF.

IMPORTANT THINGS TO REMEMBER:

Equipment operation can be programmed only when clock is in "program mode".

When Clock is in "time mode", the equipment may be operated at any time by pushing the equipment buttons.

Each program will require you to decide the status (either ON or OFF) of FLTR, CLNR, SPA, and AUX1.

One program cannot turn the same piece of equipment ON and OFF.

For example: You may turn the filter pump ON, and the cleaner OFF in one program. You may not program the filter pump ON and OFF in the same program.

Each program, although independent, affects each following program.

For example: Program 1 (1P) turns the filter pump ON.

Program 2 (2P) turns AUX1 ON, but if the filter pump is not ON in Program 2 (2P), it will turn OFF.

SETTING THE CLOCK:

1. At the CP-2000 Controller, push **PROGRAM** button until no flashing number (*P) appears to the right of the clock. Clock is now in "time mode".

2. Push **HOURS** and **MINUTES** buttons until correct time of day is displayed.

Note: Pay attention to the AM/PM indicator.

Clock is now set.

PROGRAMMING:

It is possible to schedule a maximum of 6 programs for a 24 hr. period. Unused programs should be turned OFF.

1. Push **PROGRAM** button until a flashing 1P (1st program) is displayed on the right-side of the clock. The clock is now in "program mode".

2. Schedule desired time for equipment use by pushing the **HOURS** and **MINUTES** buttons.

Note: Pay attention to the AM/PM indicator.

3. Schedule desired equipment either ON or OFF by pushing the **equipment buttons** (FILTER, CLNR, SPA, AUX1). **Note: If "flag" above equipment button is visible, then equipment is scheduled to turn ON (or stay ON) in that program.**

If "flag" above equipment button is not visible, then equipment is scheduled to turn OFF (or stay OFF) in that program.

4. Push **PROGRAM** button one time. A flashing 2P should be displayed at the right-side of the clock.

Program 1P is now set, and Program 2P is ready to be scheduled.

Note: To return to a previous program, or to check scheduling of programs, push **PROGRAM button until desired program(s) appear.**

5. Repeat the preceding sequence for the remaining programs (2P-6P).

6. Return clock to "time mode" by pushing **PROGRAM** button until no flashing number (*P) appears at the right-side of the clock.

TURNING UNUSED PROGRAMS OFF:

Any unused programs (usually 5P and 6P) should be turned OFF to prevent possible interruption of scheduled programs.

1. Push **PROGRAM** button until desired program is displayed.

2. Push **HOURS** and **MINUTES** buttons at the same time. First release the **HOURS** button, and then the **MINUTES** button. OFF should now be displayed instead of the clock in that program.

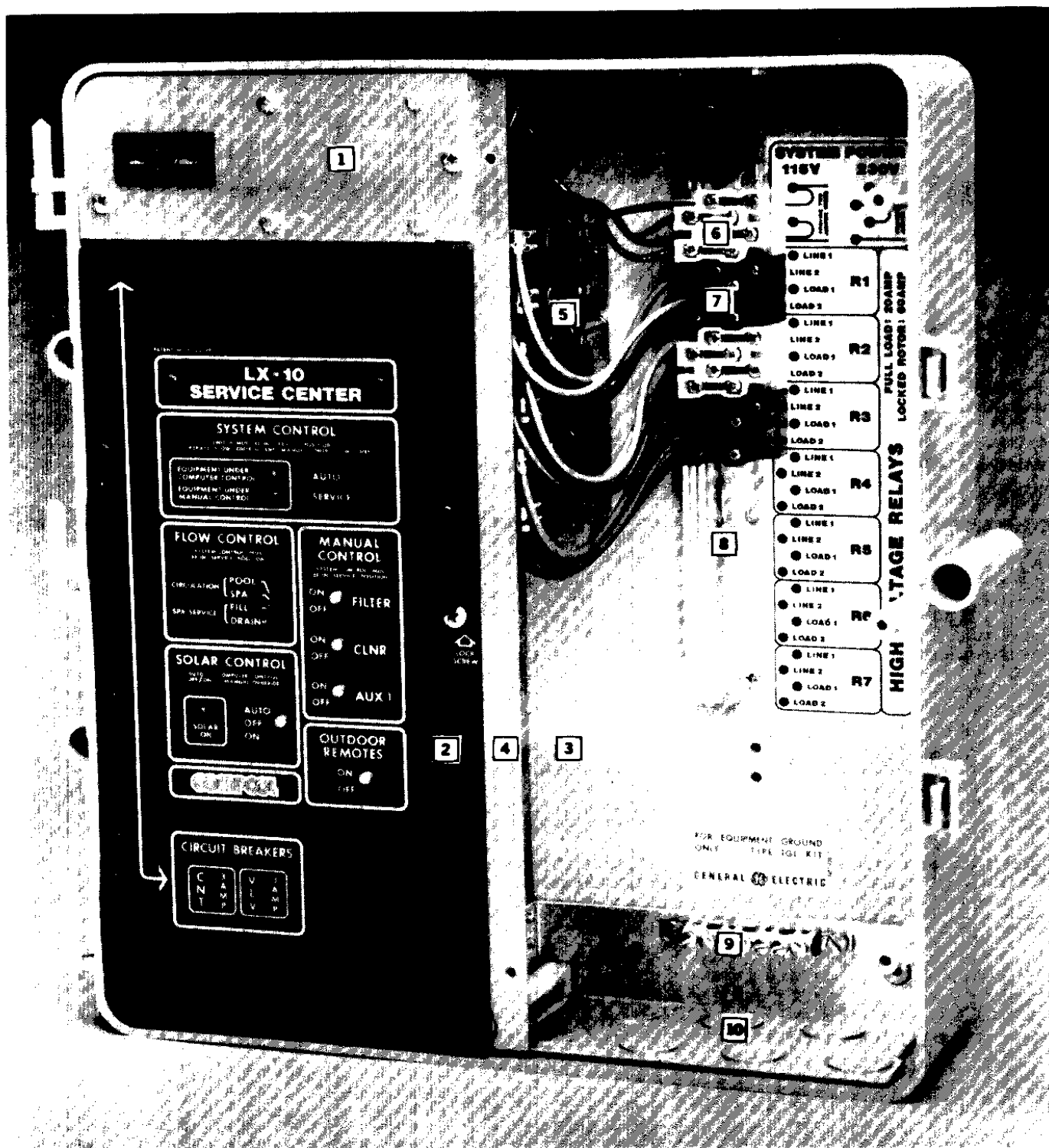
TURNING PROGRAMS BACK ON:

1. Push the **PROGRAM** button until desired OFF program is displayed.

2. Push the **HOURS** button one (1) time. Clock should reappear. Program is now ready to be scheduled.

LX-10 SERVICE CENTER

All high voltage connections are made to Terminal Blocks, located behind service panel in right-side compartment.

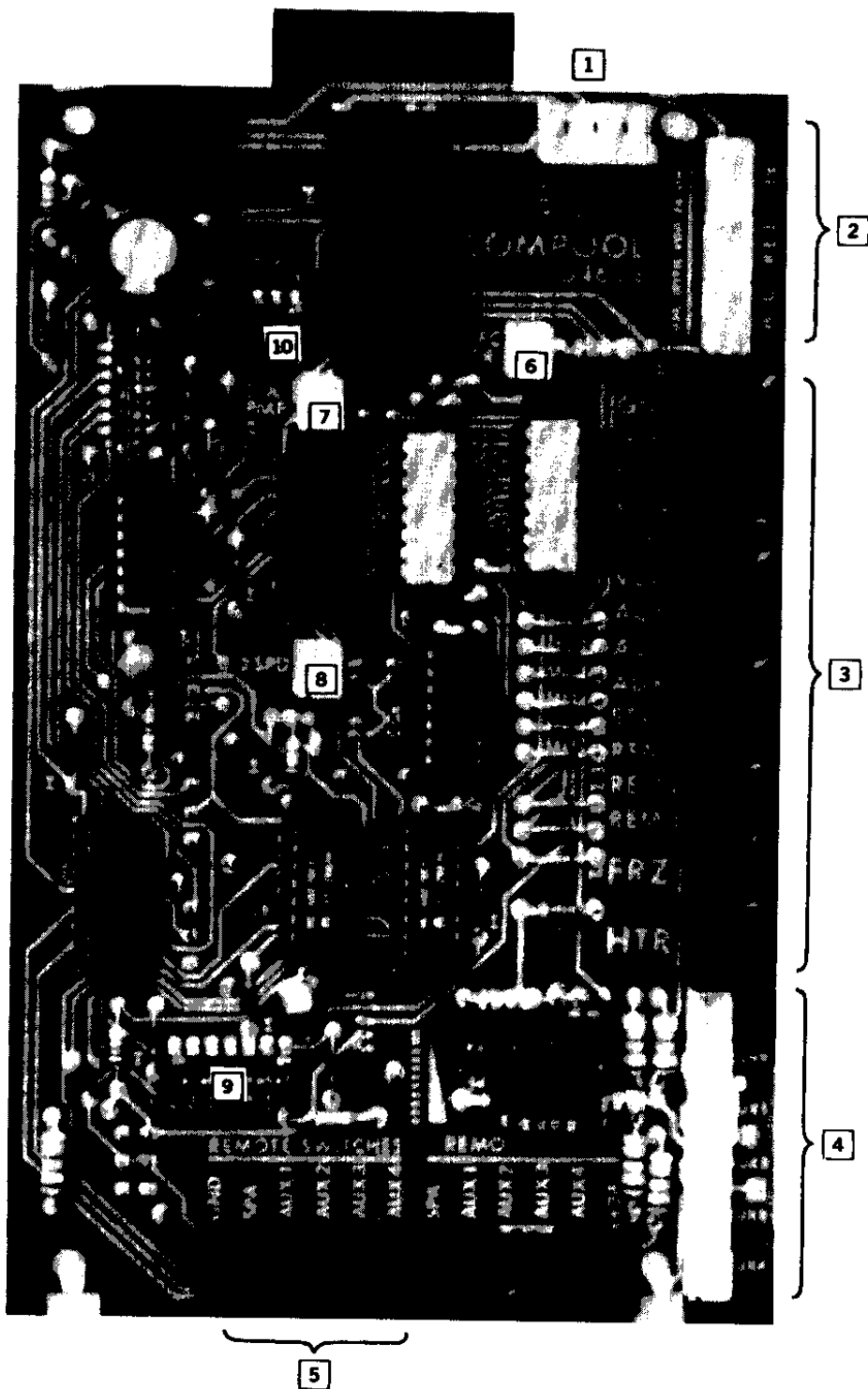


- 1 Transformer Assembly
- 2 Low Voltage Compartment
- 3 High Voltage Compartment
- 4 Voltage Barrier
- 5 Relays (mounted to Voltage Barrier)

- 6 SYSTEM POWER Terminal Block
- 7 Relay Terminal Blocks
- 8 Mounting Rail
- 9 Ground Bar
- 10 Conduit Knock-outs

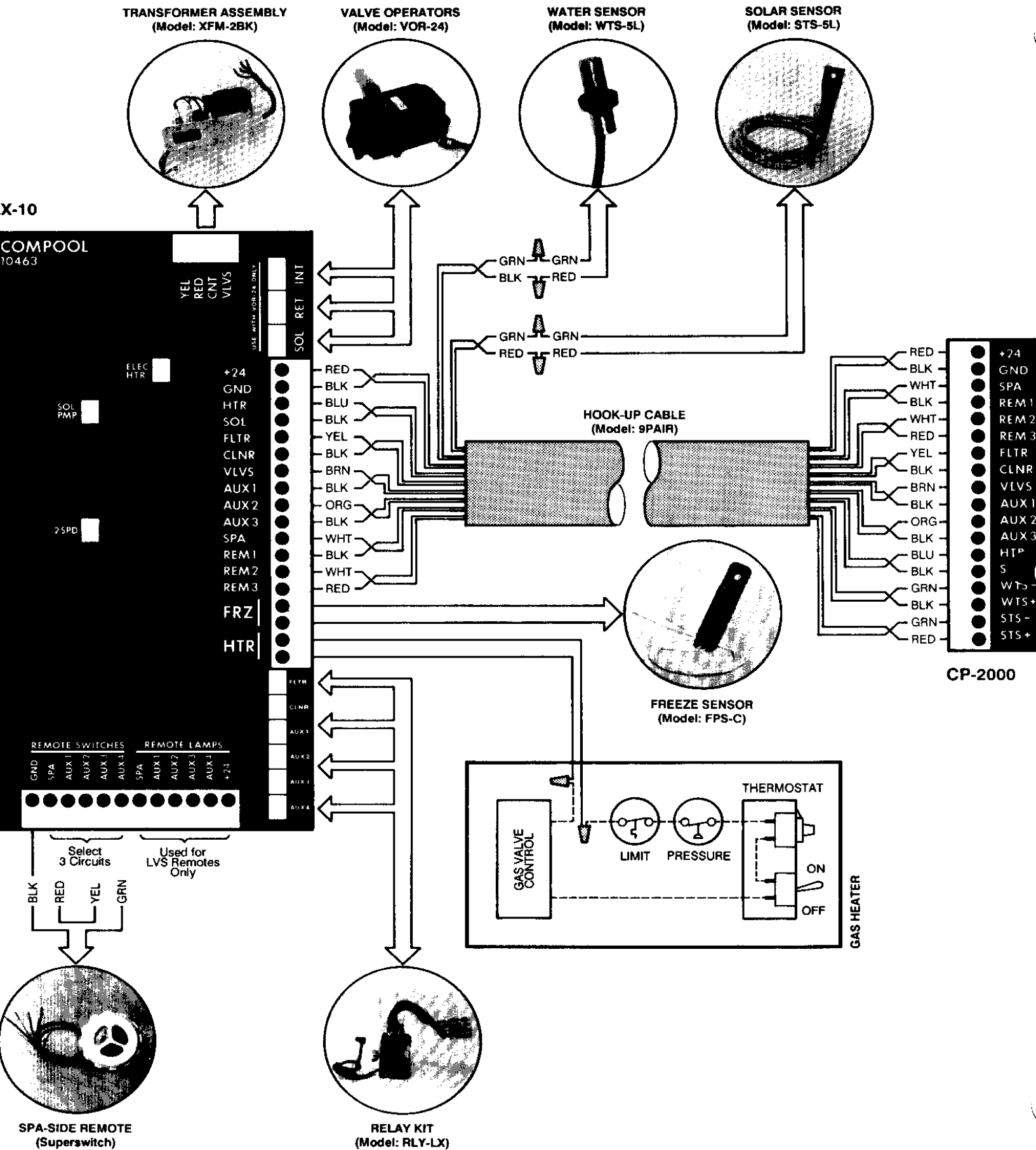
LX-10 CIRCUIT BOARD

All low voltage connections are made to circuit board, located behind hinged faceplate in left-side compartment.



- | | |
|---|---------------------------------------|
| 1 Transformer Socket | 6 Electric Heater Relay Socket |
| 2 Valve Operator Sockets | 7 Solar Pump Relay Socket |
| 3 Terminal Strip (Screw Terminals) | 8 2 Speed Pump Relay Socket |
| 4 Filter, Cleaner, and Auxiliary Relay Sockets | 9 U10 Program Switch |
| 5 REMOTE SWITCHES Screw Terminals | 10 U11 Program Switch |

LOW VOLTAGE WIRING

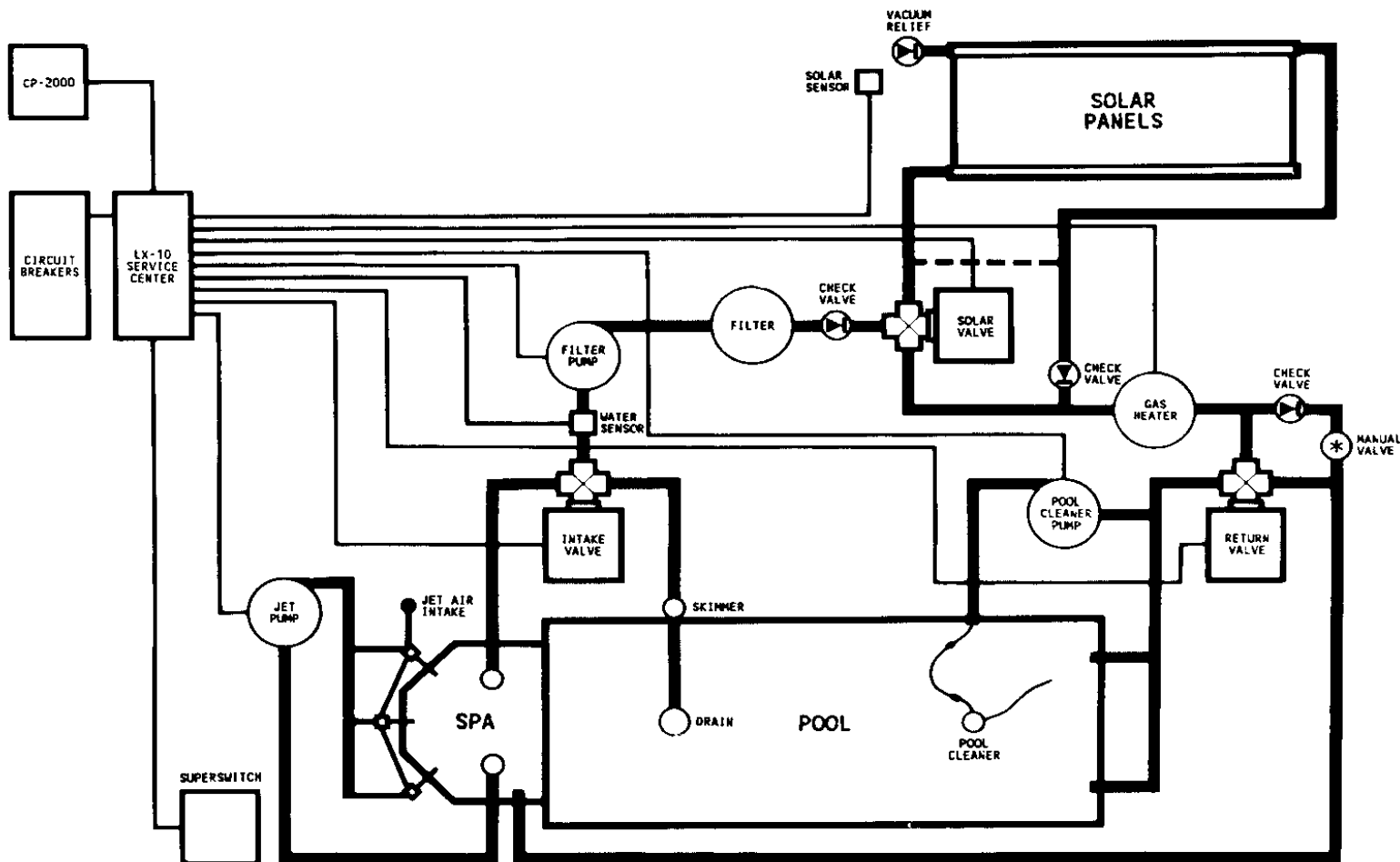


X-10

COMPPOOL
10463

CP-2000

TYPICAL PLUMBING SCHEMATIC



PRELIMINARY CHECK-LIST

Before commencing the trouble-shooting of any specific symptom, it is advisable to familiarize oneself with the preceding SYSTEM INTRODUCTION, and check the following:

1. All circuit breakers at the electrical supply panel.
2. The 3 amp circuit breakers located above faceplate in low voltage compartment of LX-10.
3. At the LX-10, ensure that **SYSTEM CONTROL Switch** is in the "AUTO" position, all **MANUAL CONTROL Switches** are in "OFF" position, **FLOW CONTROL Switch** is in "POOL" position, **SOLAR CONTROL Switch** is in "AUTO" position, and **OUTDOOR REMOTES Switch** is in the "ON" position.
4. At the CP-2000 Controller, ensure that the clock has been programmed correctly.
Pay particular attention to the AM/PM indicator.
5. Check for loose connections or miswiring at both ends of the Hook-up Cable.
Pay particular attention to the color-coded pairs of wires.
6. At the Valve Operators, check that handles have not been inadvertently pushed down into "manual override" position. *You should not be able to turn the handle.*

JUMPER TEST

During many of the trouble-shooting sequences, it will be necessary to provide a **Jumper Test**. To conduct this test, you will need a short length (6" to 10") of wire, with the insulation stripped back $\frac{1}{4}$ " at each end. At the LX-10 Circuit Board, touch one end of the jumper wire to **GND screw terminal** (circuit ground). Momentarily touch other end of the jumper wire to screw terminal which corresponds to the circuit being tested. If the circuit is functioning correctly, a very audible "click" should be heard as the appropriate relay is activated.

NOTHING OPERATES:

Step 1: Check circuit breakers at electrical supply panel.

Step 2: At the LX-10, temporarily put **SYSTEM CONTROL Switch** in the "SERVICE" position, and the **MANUAL CONTROL Switches** in the "ON" position.

- If the equipment will still not operate, *go to Step 4.*
- If the equipment operates, there is a malfunction at either the CP-2000 Controller or the Hook-up Cable. *Go to Step 3.*

Step 3: *Go to TROUBLE-SHOOTING THE CABLE (page 22), paying particular attention to the Red/Black pair (+24 and GND).*

- If there is no malfunction within the cable, *repair/replace CP-2000 Circuit Board (model PCB-2000); go to Removing Components (page 29).*

Step 4: At the LX-10, check the 3 amp circuit breakers which are located directly above faceplate in left-side compartment. Tripped circuit breaker is indicated by a white tab.

- If breaker has tripped, *push to reset.*
- If breaker continues to trip, *go to Step 6.*
- If breaker has not tripped, there is a malfunction at the Transformer Assembly. *Go to Step 5.*

Step 5: At the LX-10 high voltage section (behind service panel in right-side compartment), check that SYSTEM POWER has been connected to the correct line voltage. (One jumper wire for 230V, and two jumper wires for 115V).

- If the connections are correct, *replace the Transformer Assembly (model XFM-2BK); go to Removing Components (page 29).*

Step 6: If the circuit breaker continues to trip, unplug transformer from top-side of LX-10 Circuit Board.

- If the breaker will now reset, *go to Step 7.*
- If the breaker continues to trip, *replace the 3 amp circuit breaker (model CB-3); go to Removing Components (page 29).*
- If the new breaker continues to trip, *replace the Transformer Assembly (model XFM-2BK); go to Removing Components (page 29).*

Step 7: At the LX-10, unplug 18-pin terminal strip from right-side of circuit board, and reconnect transformer to socket at top-side of circuit board.

- If the 3 amp circuit breaker trips, *repair/replace LX-10 Circuit Board (model PCB-LX10); go to Removing Components (page 29).*
- If the 3 amp circuit breaker does not trip, *go to Step 8.*

Step 8: At the CP-2000 Controller, unplug terminal strip from circuit board, and, at the LX-10, reconnect 18-pin terminal strip to right-side of circuit board.

- If the 3 amp circuit breaker does not trip, there is a malfunction at the CP-2000 Controller. *Repair/replace CP-2000 Circuit Board (model PCB-2000); go to Removing Components (page 29).*
- If the 3 amp circuit breaker trips, the malfunction is within the Hook-up Cable. *Go to TROUBLE-SHOOTING THE CABLE (page 22), paying particular attention to the Red/Black pair (+24 and GND).*

FILTER PUMP DOES NOT OPERATE:

Step 1: Check filter pump circuit breaker at electrical supply panel.

Step 2: At the CP-2000 Controller, ensure that clock is in "time mode", and push **FILTER equipment button**.

- If **FILTER Light** at the **STATUS DISPLAY** does not come on, there is a malfunction at either the CP-2000 Controller or the Spa-Side Remote Control (if applicable). *Go to Step 3.*
- If **FILTER Light** at the **STATUS DISPLAY** does come on, the CP-2000 Controller is functioning correctly. *Go to Step 4.*

Step 3: At the LX-10, temporarily put **OUTDOOR REMOTES Switch** in the "OFF" position.

- If the filter pump now turns on, there is a malfunction at the Spa-side Remote Control. *Replace the Spa-side Remote Control (Superswitch); go to Removing Components (page 29).*
- If filter pump does not turn on, there is a malfunction at either the CP-2000 Circuit Board or the Timer Module. *Go to Step 5.*

Step 4: At the LX-10, temporarily put **SYSTEM CONTROL Switch** in the "SERVICE" position, and **FILTER Switch** at the **MANUAL CONTROL** in the "ON" position.

- If the filter pump does not turn on, there is a malfunction at either the Filter Pump Relay or the filter pump itself. Return **FILTER Switch** at the **MANUAL CONTROL** to "OFF" position, and **SYSTEM CONTROL Switch** to "AUTO" position. *Go to TROUBLE-SHOOTING THE RELAYS (page 21).*
- If the filter pump does turn on, *go to TROUBLE-SHOOTING THE LX-10 (page 20).*

Step 5: Plug a new Timer Module (*model TIMERMOD*) into the CP-2000 Controller (see page 29), and recheck the **FILTER equipment button**.

Step 6: If **FILTER Light** at the **STATUS DISPLAY** still does not come on, there is a malfunction at the CP-2000 Circuit Board. *Repair/replace CP-2000 Circuit Board (model PCB-2000); go to Removing Components (page 29).*

POOL CLEANER DOES NOT OPERATE:

Step 1: Check cleaner pump circuit breaker at electrical supply panel.

Step 2: At the CP-2000 Controller, ensure that clock is in "time mode", and push **CLNR equipment button** and **DELAY CANCEL button**.

- If **CLNR Light** at the **STATUS DISPLAY** does not come on, there is a malfunction at the CP-2000 Controller. *Go to Step 4.*
- If **CLNR Light** at the **STATUS DISPLAY** does come on, the CP-2000 Controller is functioning correctly. *Go to Step 3.*

Step 3: At the LX-10, temporarily put **SYSTEM CONTROL Switch** in "SERVICE" position, and **CLNR Switch** at the **MANUAL CONTROL** in the "ON" position.

- If the cleaner does not turn on, there is a malfunction at either the Cleaner Relay or the pool cleaner itself. Return **CLNR Switch** at the **MANUAL CONTROL** to "OFF" position, and **SYSTEM CONTROL Switch** to "AUTO" position. *Go to TROUBLE-SHOOTING THE RELAYS (page 21).*
- If the pool cleaner does turn on, *go to TROUBLE-SHOOTING THE LX-10 (page 20).*

Step 4: Plug a new Timer Module (*model TIMERMOD*) into the CP-2000 Controller (see page 29), and recheck the **CLNR equipment button**. Don't forget to cancel the 4 minute delay.

Step 5: If **CLNR Light** at the **STATUS DISPLAY** still does not come on, there is a malfunction at the CP-2000 Circuit Board. *Repair/replace CP-2000 Circuit Board (model PCB-2000); go to Removing Components (page 29).*

AUX 1 DOES NOT OPERATE:

Step 1: Check appropriate circuit breaker at electrical supply panel.

Step 2: At the CP-2000 Controller, ensure that clock is in "time mode" and push **AUX 1 equipment button**.

- If **AUX 1 Light** at the **STATUS DISPLAY** does not come on, there is a malfunction at either the CP-2000 Controller or the Spa-side Remote Control (if applicable). Go to Step 3.
- If **AUX 1 Light** at the **STATUS DISPLAY** does come on, the CP-2000 Controller is functioning correctly. Go to Step 4.

Step 3: At the LX-10, temporarily put **OUTDOOR REMOTES Switch** in "OFF" position.

- If auxiliary 1 now turns on, there is a malfunction at the Spa-side Remote Control. *Replace Spa-side Remote Control (Superswitch); go to Removing Components (page 29).*
- If auxiliary 1 does not turn on, there is a malfunction at either the CP-2000 Circuit Board or the Timer Module. Go to Step 5.

Step 4: At the LX-10, temporarily put **SYSTEM CONTROL Switch** in "SERVICE" position, and **AUX 1 Switch** at the **MANUAL CONTROL** in the "ON" position.

- If auxiliary 1 does not turn on, there is a malfunction at either the AUX 1 Relay or the auxiliary equipment itself. Return **AUX 1 Switch** at the **MANUAL CONTROL** to "OFF" position, and **SYSTEM CONTROL Switch** to "AUTO" position. Go to *TROUBLE-SHOOTING THE RELAYS (page 21)*.
- If auxiliary 1 does turn on, go to *TROUBLE-SHOOTING THE LX-10 (page 20)*.

Step 5: Plug a new Timer Module (*model TIMERM0D*) into the CP-2000 Controller (see page 29), and recheck the **AUX 1 equipment button**.

Step 6: If **AUX 1 Light** at the **STATUS DISPLAY** still does not come on, there is a malfunction at the CP-2000 Circuit Board. *Repair/replace CP-2000 Circuit Board (model PCB-2000); go to Removing Components (page 29).*

AUX 2 OR AUX 3 DOES NOT OPERATE:

Step 1: Check appropriate circuit breaker at electrical supply panel.

Step 2: At the CP-2000 Controller, push the appropriate **REMOTE CONTROL equipment button (AUX2 or AUX3)**.

- If the appropriate **Status Light** does not come on, there is a malfunction at either:
 1. The LX-10, 2. The Hook-up Cable to the CP-2000 Controller, 3. The Spa-side Remote Control (where applicable), or 4. The auxiliary equipment itself. *Go to Step 3.*
- If the appropriate **Status Light** comes on, the malfunction is at either the Auxiliary Relay or the LX-10. *Go to TROUBLE-SHOOTING THE RELAYS (page 21).*
- If the wrong **Status Light** comes on, there is a malfunction at the Hook-up Cable. *Go to TROUBLE-SHOOTING THE CABLE (page 22)*, paying particular attention to the White/Red pair (AUX2 and AUX3 remote switches), and Orange/Black pair (AUX2 and AUX3 status lights).

Step 3: At the LX-10, temporarily put **OUTDOOR REMOTES Switch** in the "OFF" position.

- If auxiliary equipment now turns on, there is a malfunction at the Spa-side Remote Control. *Replace the Spa-side Remote Control (Superswitch); go to Removing Components (page 29).*
- If auxiliary equipment does not turn on, *go to Step 4.*

Step 4: At the LX-10, provide a **Jumper Test** at the terminal strip located on right-side of circuit board. Temporarily connect the jumper wire between **GND screw terminal** (circuit ground) and either **REM 2 screw terminal** (Auxiliary 2 remote switch circuit) or **REM 3 screw terminal** (Auxiliary 3 remote switch circuit). A very audible "click" should be heard as the appropriate high voltage relay is activated.

- If there is no "click", *go to TROUBLE-SHOOTING THE RELAYS (page 21).*
- If there is a "click", but the auxiliary equipment still does not come on, there is a malfunction at the equipment itself. *Refer to Equipment Manufacturer's instructions.*
- If there is a "click", and the auxiliary equipment now comes on, there is a malfunction at the Hook-up Cable to the CP-2000 Controller. *Go to TROUBLE-SHOOTING THE CABLE (page 22)*, paying particular attention to the White/Red pair (AUX2 and AUX3 remote switch circuits).

AUX 4 DOES NOT OPERATE:

Step 1: Check appropriate circuit breaker at electrical supply panel.

Step 2: At the LX-10, provide a **Jumper Test** at the **REMOTE SWITCHES screw terminals** located on the bottom of the circuit board. Temporarily connect the jumper wire between **GND screw terminal** (circuit ground) and **AUX 4 screw terminal** (Auxiliary 4 remote switch circuit). A very audible "click" should be heard as the AUX 4 high voltage relay is activated.

- If there is no "click", go to *TROUBLE-SHOOTING THE RELAYS* (page 21).
- If there is a "click", but the auxiliary equipment does not come on, there is a malfunction at the equipment itself. Refer to *Equipment Manufacturer's instructions*.
- If there is a "click", and the auxiliary equipment now comes on, there is a malfunction at the Spa-side Remote Control. Replace the *Spa-side Remote Control (Superswitch)*; go to *Removing Components* (page 29).

HEATER DOES NOT OPERATE:

- Step 1:** At the equipment pad, check that filter pump is running.
- Step 2:** Check the filter pressure.
- If filter is clogged, the heater may not be getting sufficient water flow. *Backwash filter if necessary, in accordance with Manufacturer's instructions.*
- Step 3:** At the heater, check the pilot light and heater controls. Heater must be turned on, and its own thermostat must be turned all the way up.
- Step 4:** At the CP-2000 Controller, make sure that **POOL** and **SPA Heat Select Switches** are in the "HEATER" or "S. PREF" position, and that **POOL THERMOSTAT** and **SPA THERMOSTAT** are set correctly.
- If **HEATER Light** at the **STATUS DISPLAY** does not come on, or the **WATER TEMPERATURE Display** indicates either an unreasonably high temperature or three dashes, *go to TROUBLE-SHOOTING THE WATER SENSOR (page 26).*
 - If **HEATER Light** at the **STATUS DISPLAY** comes on, and the **WATER TEMPERATURE Display** indicates the approximate water temperature, the CP-2000 Controller and Water Sensor are functioning correctly. *Go to Step 5.*
 - If **HEATER Light** at the **STATUS DISPLAY** turns off before spa attains the maximum temperature of 104° F., or if the spa overheats, the CP-2000 Controller may need a calibration adjustment. *Go to CALIBRATION (page 28).*
 - If spa will not heat up to 104° F. and **HEATER Light** at the **STATUS DISPLAY** stays on, the high limit control inside the heater may need adjusting. *Refer to Heater Manufacturer's instructions.*
- Step 5:** At the LX-10, temporarily put **SYSTEM CONTROL Switch** in "SERVICE" position, and **FILTER Switch** at the **MANUAL CONTROL** in the "ON" Position.
Disconnect 2-conductor cable from **HTR screw terminals** at the bottom end of terminal strip, located on right-side of LX-10 circuit board. Temporarily splice the two wires together.
- If heater does not work, there is a malfunction either within the 2-conductor cable or at the heater itself. Reconnect 2-conductor cable, and *go to Step 6.*
 - If heater works, the malfunction is either at the LX-10 or within the Hook-up Cable to the CP-2000 Controller. Reconnect 2-conductor cable, and *go to Step 7.*
- Step 6:** Inside the heater, remove other end of 2-conductor cable which is connected to the gas valve control and the thermostat. Temporarily splice the gas valve and thermostat together.
- If heater does not work, there is a malfunction within the heater. *Refer to Heater Manufacturer's instructions.*
 - If heater works, there is a malfunction within the 2-conductor cable. *Replace the 2-conductor cable (model 2COND).*
- Step 7:** At the LX-10, remember to return **SYSTEM CONTROL Switch** to "AUTO" position, and **FILTER Switch** at the **MANUAL CONTROL** to "OFF" position.
Provide a **Jumper Test** at the terminal strip located on the right-side of LX-10 Circuit Board. Temporarily connect the jumper wire between **GND** and **HTR screw terminals** at the top end of terminal strip.
- If the Heater Relay on the circuit board does not "click" on, the malfunction is within the circuit board. *Repair/replace LX-10 Circuit Board (model PCB-LX10); go to Removing Components (page 29).*
 - If the Heater Relay on the circuit board "clicks" on, the malfunction is within the Hook-up Cable to the CP-2000 Controller. *Go to TROUBLE-SHOOTING THE CABLE (page 22), paying particular attention to the blue wire (HTR) of the Blue/Black pair.*

SOLAR DOES NOT OPERATE:

Note: Ambient air temperature must be approximately 5 degrees warmer than the pool water before solar will operate.

Step 1: At the equipment pad, check that the filter pump is running.

Step 2: At the LX-10, check the 3 amp circuit breakers which are located directly above faceplate in left-side compartment. Tripped circuit breaker is indicated by a white tab.

- If breaker has tripped, *push to reset*.
- If circuit breaker continues to trip, there is a malfunction at the Solar Valve Operator. *Go to TROUBLE-SHOOTING THE VALVE OPERATORS (page 23).*

Step 3: At the CP-2000 Controller, make sure that **POOL** and **SPA Heat Select Switches** are in either "SOLAR" or "S.PREF" positions, and that **POOL THERMOSTAT** and **SPA THERMOSTAT** are set correctly.

- If **WATER TEMPERATURE Display** indicates either an unreasonably high temperature or three dashes, *go to TROUBLE-SHOOTING THE WATER SENSOR (page 26).*
- If **SOLAR Light** at the **STATUS DISPLAY** does not come on, *go to TROUBLE-SHOOTING THE SOLAR SENSOR (page 27).*
- If **SOLAR Light** at the **STATUS DISPLAY** will not come on at a reasonably low temperature, or turns off before optimum solar energy is utilized, the CP-2000 Controller may need a calibration adjustment. *Go to CALIBRATION (page 28).*
- If **SOLAR Light** at the **STATUS DISPLAY** comes on, and the **WATER TEMPERATURE Display** indicates the approximate water temperature, the CP-2000 Controller and Sensors are functioning correctly. *Go to Step 4.*

Step 4: At the LX-10, temporarily put **SOLAR CONTROL Switch** in the "ON" position.

- If the solar does not turn on, there is a malfunction at the Solar Valve Operator. *Go to TROUBLE-SHOOTING THE VALVE OPERATORS (page 23).*
- If the solar turns on, the malfunction is either at the LX-10 or within the Hook-up Cable to the CP-2000 Controller. *Go to Step 5.*

Step 5: At the LX-10, return **SOLAR CONTROL Switch** to "AUTO" position, and provide a **Jumper Test** at the terminal strip located on right-side of circuit board. Temporarily connect the jumper wire between **GND** and **SOL screw terminals** located at the top end of terminal strip.

- If the solar does not come on, the malfunction is at the LX-10 Circuit Board. *Repair/replace LX-10 Circuit Board (model PCB-LX10); go to Removing Components (page 29).*
- If the solar comes on, the malfunction is within the Hook-up Cable to the CP-2000 Controller, *Go to TROUBLE-SHOOTING THE CABLE (page 22),* paying particular attention to the black wire (SOL) of the Blue/Black pair.

VALVES DO NOT ROTATE TO SPA CIRCULATION:

- Step 1:** At the LX-10, check the 3 amp circuit breakers which are located directly above faceplate in left-side compartment. Tripped circuit breaker is indicated by a white tab.
- If breaker has tripped, *push to reset*.
 - If circuit breaker continues to trip, there is a malfunction at either the Intake or Return Valve Operator. Go to *TROUBLE-SHOOTING THE VALVE OPERATORS (page 23)*.
- Step 2:** At the CP-2000 Controller, ensure that clock is in "time mode", and push **SPA equipment button**.
- If **SPA Light** at the **STATUS DISPLAY** does not come on, there is a malfunction at either the CP-2000 Controller or the Spa-side Remote Control (if applicable). Go to *Step 5*.
 - If **SPA Light** at the **STATUS DISPLAY** does come on, the CP-2000 Controller is functioning correctly. Go to *Step 3*.
- Step 3:** At the LX-10, temporarily put **SYSTEM CONTROL Switch** in the "AUTO" position, and **FLOW CONTROL Switch** in "SPA" position.
- If the valves do not rotate to spa circulation, there is a malfunction at either the Intake or Return Valve Operator. Go to *TROUBLE-SHOOTING THE VALVE OPERATORS (page 23)*.
 - If valves rotate to spa circulation, the malfunction is at either the LX-10 or within the Hook-up Cable to the CP-2000 Controller. Go to *Step 4*.
- Step 4:** At the LX-10, remember to return **FLOW CONTROL Switch** to "POOL" position, and **SYSTEM CONTROL Switch** to "AUTO" position. Provide a **Jumper Test** at the terminal strip located on right-side of LX-10 Circuit Board. Temporarily connect the jumper wire between **GND** and **VLVS screw terminals**.
- If valves do not rotate to spa circulation, the malfunction is within the LX-10. *Repair/replace LX-10 Circuit Board (model PCB-LX10)*; go to *Removing Components (page 29)*.
 - If valves rotate to spa circulation, the malfunction is within the Hook-up Cable to the CP-2000 Controller. Go to *TROUBLE-SHOOTING THE CABLE (page 22)*, paying particular attention to the brown wire (VLVS) of the Brown/Black pair.
- Step 5:** At the LX-10, temporarily put **OUTDOOR REMOTES Switch** in the "OFF" position.
- If valves now rotate to spa circulation, there is a malfunction at the Spa-side Remote Control. *Replace the Spa-side Remote Control (Superswitch)*; go to *Removing Components (page 29)*.
 - If valves do not rotate to spa circulation, there is a malfunction at either the CP-2000 Circuit Board or the Timer Module. Go to *Step 6*.
- Step 6:** Plug a new Timer Module (*model TIMERM0D*) into the CP-2000 Controller (see page 29), and recheck the **SPA equipment button**.
- Step 7:** If **SPA Light** at the **STATUS DISPLAY** still does not come on, the malfunction is within the CP-2000 Circuit Board. *Repair/replace the CP-2000 Circuit Board (model PCB-2000)*; go to *Removing Components (page 29)*.

SPA DRAINS OR OVERFLOWS:

- Step 1:** At the LX-10, check the 3 amp circuit breakers which are located directly above faceplate in left-side compartment. Tripped circuit breaker is indicated by a white tab.
- If breaker has tripped, *push to reset*.
 - If circuit breaker continues to trip, there is a malfunction at either the Intake or Return Valve Operator. Go to *TROUBLE-SHOOTING THE VALVE OPERATORS (page 23)*.
- Step 2:** At the LX-10, temporarily put **SYSTEM CONTROL Switch** in the "SERVICE" position, and manually activate Valve Operators from the **FLOW CONTROL Switch**.
- If Valve Operators do not rotate to the appropriate position, go to *TROUBLE-SHOOTING THE VALVE OPERATORS (page 23)*.
 - If Valve Operators rotate to the appropriate position, go to *Step 3*.
- Step 3:** At the Valve Operators, check position of valve handles. Handle should indicate that the appropriate valve port is fully closed. **Note: If spa is not elevated above the pool, the return valve may have been offset to provide an overflow.**
- If valve handles do not indicate a fully-closed valve port, a cam-adjustment is necessary inside the Valve Operator. Go to *VALVE OPERATOR CAM-ADJUSTMENT (page 24)*.
 - If valve handles indicate that the ports are fully closed, valves need servicing. Go to *SERVICING THE VALVES (page 25)*.

EQUIPMENT OPERATES ERRATICALLY:

Step 1: Check appropriate circuit breakers at electrical supply panel.

Step 2: At the LX-10, temporarily put **OUTDOOR REMOTES Switch** in the "OFF" position, and observe the equipment over a 48 hour period.

- If the equipment does not malfunction during this period of time, the malfunction is at the Spa-side Remote Control. *Replace Spa-side Remote Control (Superswitch); go to Removing Components (page 29).*
- If the equipment continues to malfunction during this period of time, go to Step 3.

Step 3: Plug a new Timer Module (*model TIMERMOD*) into the CP-2000 Controller (see page 29), and recheck the equipment operation.

Step 4: If the equipment continues to operate erratically, there is a malfunction in the Hook-up Cable to the CP-2000 Controller. *Go to TROUBLE-SHOOTING THE CABLE (page 22).*

SPA-SIDE REMOTE DOES NOT OPERATE:

Step 1: Check appropriate circuit breakers at electrical supply panel.

Step 2: At the LX-10, check that **OUTDOOR REMOTES Switch** is in the "ON" position.

Step 3: At the Spa-side Remote Control, determine which pushbutton is not working, and identify the corresponding "suspect" wire :

Red Pushbutton = red wire.

Yellow Pushbutton = yellow wire.

Blue Pushbutton = green wire.

Switch Common = black wire (connected to the circuit ground).

Step 4: At the LX-10, provide a **Jumper Test** at the **REMOTE SWITCHES screw terminals** located on the bottom of the circuit board. Momentarily touch the jumper wire between the **GND screw terminal** and the **screw terminal** to which the "suspect" wire is connected. A very audible "click" should be heard as the appropriate relay is activated.

- If there is no "click", *go to Step 5.*

- If there is a "click", but the equipment does not come on, there is a malfunction at the equipment itself. *Refer to Equipment Manufacturer's instructions.*

- If there is a "click", and the equipment now comes on, there is a malfunction at the Spa-side Remote Control. *Replace the Spa-side Remote Control (Superswitch); go to Removing Components (page 29).*

Step 5:

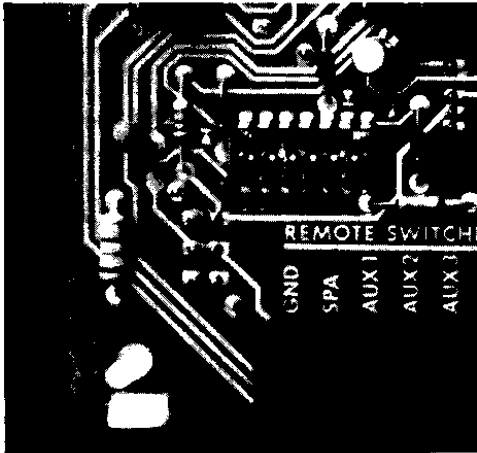
- If the "suspect" wire is connected to **SPA** or **AUX 1**, and the equipment cannot be operated from the Jumper Test, but works from the CP-2000 Controller, there is a malfunction within the Hook-up Cable to the CP-2000 Controller. *Go to TROUBLE-SHOOTING THE CABLE (page 22), paying particular attention to the White/Black pair (white - SPA, black - AUX 1).*

- If the "suspect" wire is connected to **AUX 2**, **AUX 3**, or **AUX 4**, and the equipment cannot be operated from the Jumper Test, *go to TROUBLE-SHOOTING THE RELAYS (page 21).*

TROUBLE-SHOOTING THE LX-10

The LX-10 Service Center, installed at the equipment pad area, is connected to the CP-2000 Controller with a 9-pair (18 wire) Hook-up Cable. Signals are transmitted from the CP-2000 Controller to the LX-10, which in turn activates the appropriate pool equipment. The LX-10 houses a Transformer Assembly, a Circuit Board, High Voltage Relays, and Service Switches, so that the Pool Serviceman can manually control the equipment from the equipment pad.

- Step 1:** At the LX-10 circuit board, check that **U10 Program Switch** (refer to photograph below) has been programmed correctly. Unless the system has been modified to provide custom controls (see *SYSTEM OPTIONS* below), Switch #3 and Switch #6 should be the only switches in the "ON" position.
- Step 2:** At the LX-10, temporarily put **SYSTEM CONTROL Switch** in the "SERVICE" position, and appropriate **MANUAL CONTROL Switch** (FILTER, CLNR, or AUX 1) in the "ON" position. A very audible "click" should be heard as the appropriate high voltage relay is activated.
- If there is no "click", go to *TROUBLE-SHOOTING THE RELAYS* (page 21).
 - If there is a "click" and the equipment is activated, the relay is functioning correctly. Go to Step 3.
- Step 3:** Return appropriate **MANUAL CONTROL Switch** to "OFF" position, and **SYSTEM CONTROL Switch** to "AUTO" position. Provide a **Jumper Test** at the terminal strip on right-side of LX-10 circuit board. Temporarily connect the jumper wire between **GND** and the appropriate equipment **screw terminal**: either **FLTR** (filter pump), **CLNR** (pool cleaner), or **REM 1** (auxiliary 1). A very audible "click" should be heard as the appropriate high voltage relay is activated.
- If there is no "click", there is a malfunction within the LX-10. *Repair/replace the LX-10 Circuit Board (model PCB-LX10); go to Removing Components (page 29).*
 - If there is a "click", but the equipment does not come on, there is a malfunction at the equipment itself. *Refer to Equipment Manufacturer's instructions.*
 - If there is a "click" and the equipment is activated, there is a malfunction within the Hook-up Cable to the CP-2000 Controller. Go to *TROUBLE-SHOOTING THE CABLE* (page 22), paying particular attention to the Yellow/Black pair (yellow - FLTR, black - CLNR), and the black wire of the White/Black pair (Auxiliary 1 remote switch circuit).



SYSTEM OPTIONS:

Programmable 2 speed filter pump control:

U10 Program Switch setting: #1, #3, #6 ON; #2, #4, #5, #7 OFF.

Additional remote control in lieu of cleaner:

U10 Program Switch setting: #4, #5, #6, ON; #1, #2, #3, #7 OFF.

In this instance, the low voltage wiring should also be modified as follows:

Disconnect black wire of Black/Yellow pair from CLNR screw terminal on LX-10 circuit board, and substitute with yellow wire from Spa-side Remote (Superswitch).

TROUBLE-SHOOTING THE RELAYS

High Voltage Relays, capable of switching either a 115V or 230V piece of equipment, are located behind the service panel in the right-side compartment of the LX-10. Each relay is plugged into a relay socket on the LX-10 Circuit Board. The relay is activated by a 24V DC signal from the LX-10 Circuit Board.

EQUIPMENT DOES NOT TURN ON:

If the equipment will not turn on, there is a malfunction either within the LX-10 Circuit Board or at the High Voltage Relay.

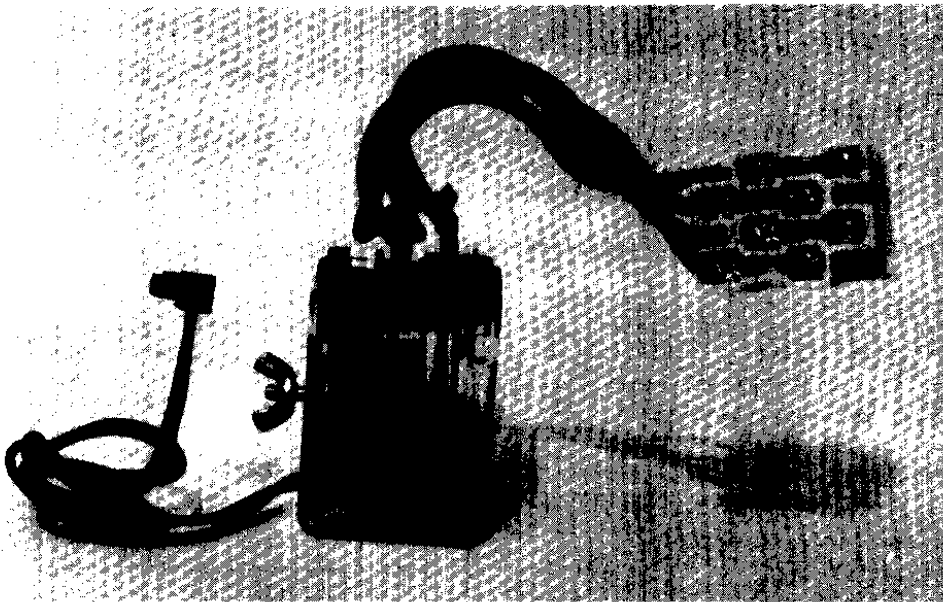
Step 1: At the LX-10, unplug "suspect" Relay from relay socket at right-side of circuit board, and temporarily transfer to the socket of a relay which is known to be functioning correctly (either **FLTR**, **CLNR**, or **AUX 1**). Temporarily put **SYSTEM CONTROL Switch** in "SERVICE" position, and the appropriate **MANUAL CONTROL Switch** (either **FLTR**, **CLNR**, or **AUX 1**) in the "ON" position. A very audible "click" should be heard as the "suspect" relay is activated.

- If there is no "click", the relay is defective. *Replace High Voltage Relay (model RLY-LX); go to Removing Components (page 29).*
- If there is a "click", the relay is functioning correctly. *Repair/replace the LX-10 Circuit Board (model PCB-LX10); go to Removing Components (page 29).*

EQUIPMENT DOES NOT SHUT OFF:

A miswired or defective pump motor can cause the switch contacts of the High Voltage Relay to become welded shut. In this instance, the pump will never shut off, even when the relay is unplugged from the LX-10 Circuit Board.

Step 1: Rewire or replace the pump motor in accordance with Manufacturer's instructions, and *replace the High Voltage Relay (model RLY-LX); go to Removing Components (page 29).*



TROUBLE-SHOOTING THE CABLE

A 9-pair (18 wire) Hook-Up Cable interconnects the CP-2000 Controller with the LX-10 Service Center. Each pair of wires is twisted throughout the length of the cable. A malfunction within the cable can occur under any of the following conditions:

- 1. Miswiring:** This situation is created if the jacket of the cable is stripped-back insufficiently, so that the appropriate pairs cannot be easily identified.
- 2. Short Circuit:** This situation is created if the insulation of each wire is stripped-back too far, so that exposed (uninsulated) wires are touching outside of the terminal strip.
- 3. Open Circuit:** This situation is created by a bad connection at the terminal strip, or a broken wire within the cable.

Step 1: At the CP-2000 Controller, check that wires have been connected to the correct screw terminals, in accordance with Wiring Diagram located inside the enclosure. Check for loose connections, and ensure that there are no exposed (uninsulated) wires outside of the terminal strip.

Step 2: At the LX-10, check that wires have been connected to the correct screw terminals on right-side of circuit board. Refer to Wiring Diagram located inside the LX-10 cover. Check for loose connections and ensure that there are no exposed (uninsulated) wires outside of the terminal strip.

Step 3: Identify a wire which is known to be functioning correctly, and temporarily disconnect from screw terminals at both ends of the cable (the CP-2000 Controller and the LX-10). Temporarily transfer this "good" wire to the appropriate screw terminals of the "suspect" wire at both the CP-2000 Controller and the LX-10. Retest the equipment.

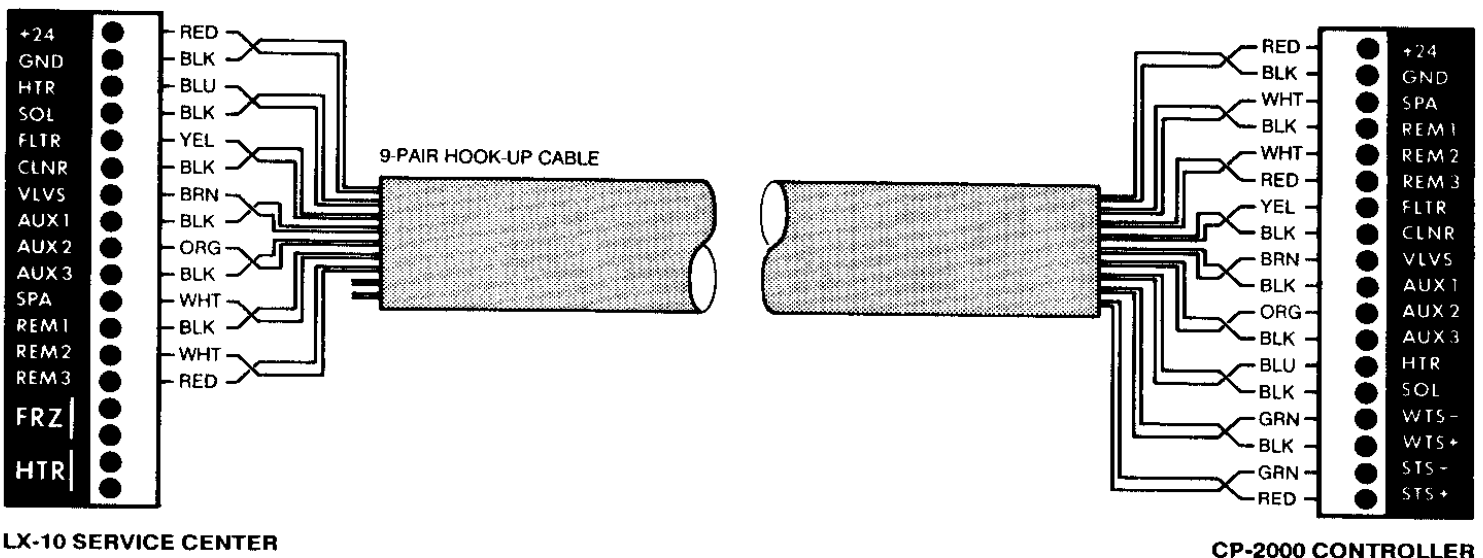
- If the equipment functions correctly, the "suspect" wire is defective. *Go to Step 4.*

Step 4: Occasionally, only one wire within the Hook-up Cable is defective.

- If the Control System does not utilize solar, the following three wires will not be used: The Green/Red pair, and the black wire of the Blue/Black pair.

In this instance, the defective wire can be permanently exchanged with one of these "spare" wires.

- If the Control System utilizes solar, there will be no "spare" wire within the Hook-up Cable. *In this instance, it will be necessary to replace the Cable (model 9PAIR).*



TROUBLE-SHOOTING THE VALVE OPERATORS

Valve Operators are located at the Intake (suction) and Return Valves. A plug-in cable connects each Valve Operator with the LX-10.

The LX-10 receives signals from the CP-2000 Controller, and automatically rotates the Valve Operators between pool and spa circulation.

If the system includes solar, a third Valve Operator will automatically divert the flow of water through the solar panels whenever solar energy is available.

Step 1: At the LX-10, check the 3 amp circuit breakers which are located directly above faceplate in left-side compartment. Tripped circuit breaker is indicated by a white tab.

- If breaker has tripped, *push to reset*.
- If circuit breaker continues to trip, *go to Step 5*.

Step 2: At the LX-10, check that **SYSTEM CONTROL Switch** is in the "AUTO" position.

Step 3: At the Valve Operator, check that the valve handle has not been inadvertently pushed down into "manual override" position. You should not be able to turn the handle.

Step 4: Check that cable has not been unplugged from the side of Valve Operator.

Note: If the valve is staged incorrectly, its position can be reversed by unplugging the cable from the Valve Operator, rotating the plug 180 degrees and reinserting into socket on side of Valve Operator.

Step 5: At the LX-10, unplug cable of "suspect" Valve Operator from appropriate **valve operator socket** at right-side of circuit board: either INT (intake valve), RET (return valve), or SOL (solar valve). Transfer cable to the socket of a Valve Operator which is known to be functioning correctly.

Temporarily put **SYSTEM CONTROL Switch** in "SERVICE" position, and manually activate the "suspect" Valve Operator from either **FLOW CONTROL** or **SOLAR CONTROL Switch**.

- If the "suspect" Valve Operator rotates, there is a malfunction at the LX-10. *Repair/replace LX-10 Circuit Board (model PCB-LX10); go to Removing Components (page 29)*.
- If the "suspect" Valve Operator will not rotate, *go to Step 6*.

Step 6: Replace cable from "suspect" Valve Operator with one from a valve operator which is known to be functioning correctly.

- If the "suspect" Valve Operator rotates, its original cable is defective. *Replace Cable (model CORD-VOR); go to Removing Components (page 29)*.
- If the "suspect" Valve Operator will not rotate, there is a malfunction within the Valve Operator. *Replace Valve Operator (model VOR-24); go to Removing Components (page 29)*.



VALVE OPERATOR CAM-ADJUSTMENT

The internal stops inside the Valve Operator have been preset at the Factory for either the Compool Pro Valve (120 degree rotation) or the Ortega/Jandy Valve (180 degree rotation). However, fine adjustment of these internal stops (cams) can be accomplished to correct any misalignment, or to provide an overflow to the spa.

Step 1: At the LX-10, temporarily put **SYSTEM CONTROL Switch** in "SERVICE" position, and **FLOW CONTROL Switch** in either "POOL" or "SPA" position.

Step 2: At the Valve Operator, remove Knob, Handle and Cover.

Step 3: Reposition Handle onto shaft of Valve Operator, and check position of Handle in relationship to valve port (refer to photo #1). See below for "closed port" positions of Compool, Jandy and Ortega valves.

Step 4: Make note of the imprint (POOL or SPA) where cable plugs into side of Valve Operator (refer to photo #2). Orientation of cable plug will determine valve position.

Step 5: Activate the Valve Operator by removing cable, rotating 180° and reinserting into Valve Operator. Allow Valve Operator to rotate until Handle indicates desired position, and then immediately unplug cable. This will disengage Valve Operator.

Note: To reverse rotation of the Valve Operator, rotate cable 180° and reinsert.

Step 6: Loosen lock nut, and gently adjust upper cam (clockwise rotation) and/or lower cam (counterclockwise rotation) so that corresponding micro-switch is engaged (refer to photo #3).

Step 7: Finger-tighten lock nut and check adjustment by reinserting cable into the Valve Operator. Repeat Steps 6, and 7 until desired adjustment is achieved.

Step 8: Replace Cover, Handle and Knob. Make sure that cable is inserted in its original position.

Step 9: At the LX-10, return **SYSTEM CONTROL Switch** to "AUTO" position.

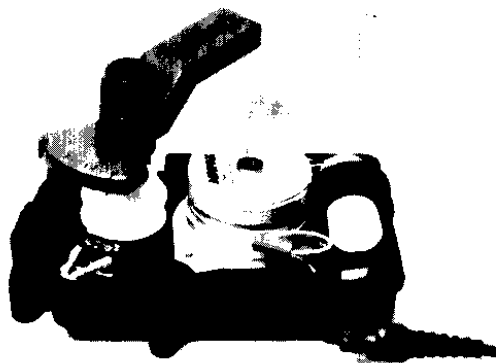


photo #1

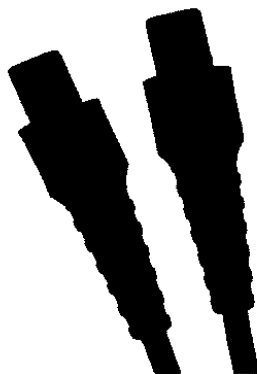


photo #2

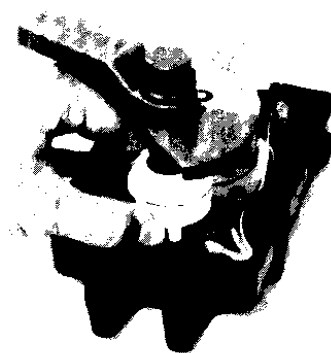


photo #3

To completely close a port:

Compool Valve: Handle position should stop approximately 1/4" before dead-center of port.

Jandy/Ortega: Handle position should stop at dead-center of port.

SERVICING THE VALVES

The 3-port valves should be lubricated every four months, or sooner if the pool is exposed to an extraordinarily high amount of sand or dirt. Failure to lubricate valves will result in premature wear of seals and permanent damage inside the valve, which will eventually cause the valves to leak.

CAUTION: Use only approved silicone grease. Petroleum-based lubricants will damage valves.

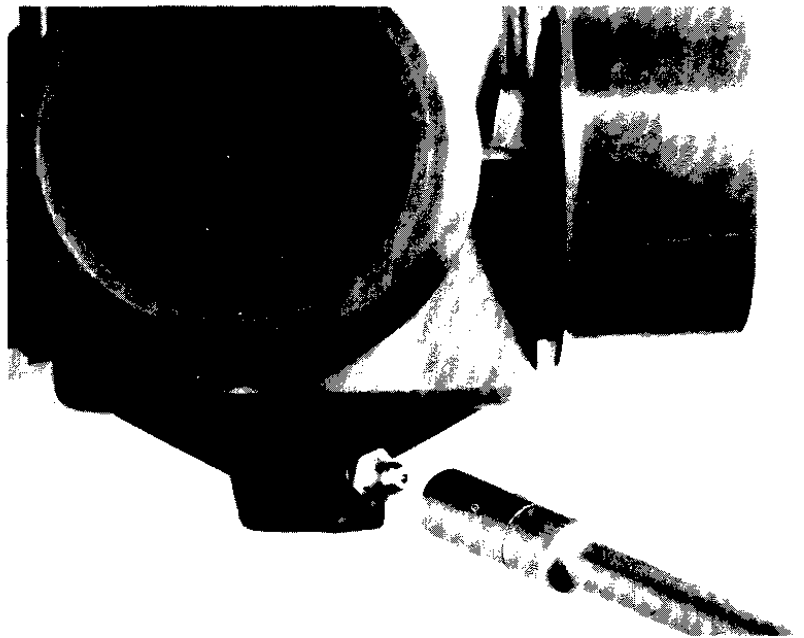
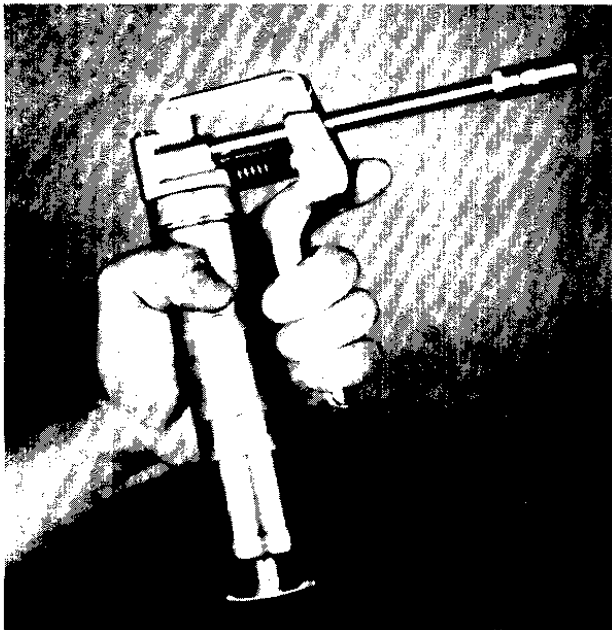
COMPOOL VALVE: If the system is plumbed with the Compool Pro Valve, maintenance is a very simple operation, which can be performed by either the Pool Owner or the Pool Serviceman:

Step 1: Ensure that valve is in the "closed port" position, and use Compool Grease Gun (*model GUN-3*) to inject silicone grease into grease fitting at bottom of valve. Use approximately eight squeezes on grease gun trigger after grease begins to flow.

For best results, squeeze slowly, and wait a few seconds between squeezes.

Step 2: Wait approximately 15 minutes before attempting to rotate valve.

Step 3: If valves have not been serviced on a regular basis, it may be necessary to replace the Diverter Assembly inside the valve. In this instance, also inspect the valve housing for scratches from abnormal wear, and replace valve if necessary.

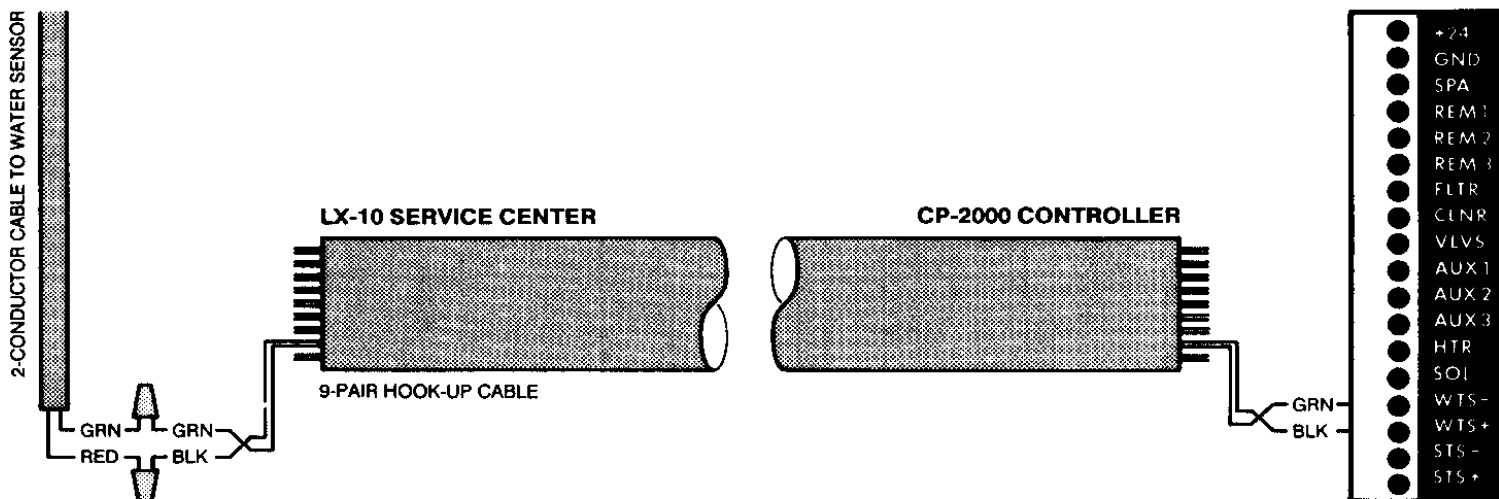


ORTEGA/JANDY VALVE: If the system is not plumbed with the Compool Pro Valve, check with the manufacturer's service instructions. It may be necessary to remove the Valve Operator, and disassemble the valve in order to lubricate the diverter and O-ring seals. Compool Silicone Grease is available in a 1 oz. tube (*model GRE-1*) for this application.

TROUBLE-SHOOTING THE WATER SENSOR

The Water Temperature Sensor is located within the plumbing system at the filter pump. A 2-conductor cable interconnects the Sensor with the 9-pair Hook-up Cable inside the LX-10. The Sensor will measure either pool or spa temperature, depending upon whether the valves have been rotated to pool or spa circulation.

- Step 1:** Check location of Water Sensor. It should be installed between the intake (suction) valve and the filter.
- Step 2:** At the CP-2000 Controller, check for loose connections or miswiring between Green/Black pair of the 9-pair Hook-up Cable and the **WTS-** and **WTS+** screw terminals. Refer to Diagram below.
- Step 3:** At the LX-10, check for loose connections or miswiring between the 2-conductor cable from the Water Sensor and the Green/Black pair of the 9-pair Hook-up Cable. Refer to Diagram below.
- Step 4:** At the LX-10, disconnect 2-conductor cable from the Green/Black pair of the 9-pair Hook-up Cable. Temporarily put **SYSTEM CONTROL Switch** in "SERVICE" position, and **FILTER Switch** at the **MANUAL CONTROL** in the "OFF" position.
At the Water Sensor location, disconnect hose clamp and remove Water Sensor.
At the CP-2000 Controller, temporarily connect Water Sensor to the **WTS-** and **WTS+** screw terminals (green wire to WTS- and red wire to WTS+).
 - If the **WATER TEMPERATURE Display** indicates the approximate temperature, the Water Sensor is functioning correctly. Go to **TROUBLE-SHOOTING THE CABLE** (page 22), paying particular attention to the Green/Black pair (WTS- and WTS+).
 - If the **WATER TEMPERATURE Display** indicates either an unreasonably high temperature or three dashes, there is a malfunction at the Water Sensor. Replace Water Temperature Sensor (model WTS-5L), go to **Removing Components** (page 29). Before reinstalling at the filter pump, test the new Sensor at the CP-2000 Controller.
- Step 5:** If the **WATER TEMPERATURE Display** continues to malfunction after replacing the Sensor, there is a malfunction within the CP-2000 Controller. Repair/replace CP-2000 Circuit Board (model PCB-2000); go to **Removing Components** (page 29).



TROUBLE-SHOOTING THE SOLAR SENSOR

The Solar Temperature Sensor is located at the solar panel array. A 2-conductor cable interconnects the Sensor with the 9-pair Hook-up Cable inside the LX-10. The Sensor measures the ambient air temperature, which must be approximately 5 degrees warmer than the water temperature before the solar will operate.

Step 1: At the CP-2000 Controller, make sure that **POOL** and **SPA Heat Select Switches** are in either "SOLAR" or "S.PREF" positions.

Step 2: At the CP-2000 Controller, check for loose connections or miswiring between the Green/Red pair of the 9-pair Hook-up Cable, and the **STS-** and **STS+** screw terminals. Refer to Diagram below.

Step 3: At the LX-10, check that **SOLAR CONTROL Switch** is in the "AUTO" position.

Step 4: At the LX-10, check for loose connections or miswiring between the 2-conductor cable from the Solar Sensor, and the Green/Red pair of the 9-pair Hook-up Cable. Refer to Diagram below.

Step 5: At the CP-2000 Controller, temporarily disconnect the Green/Black pair of the 9-pair Hook-up Cable from the **WTS-** and **WTS+** screw terminals, and substitute with the Green/Red pair. (Connect green wire to WTS-, and red wire to WTS+).

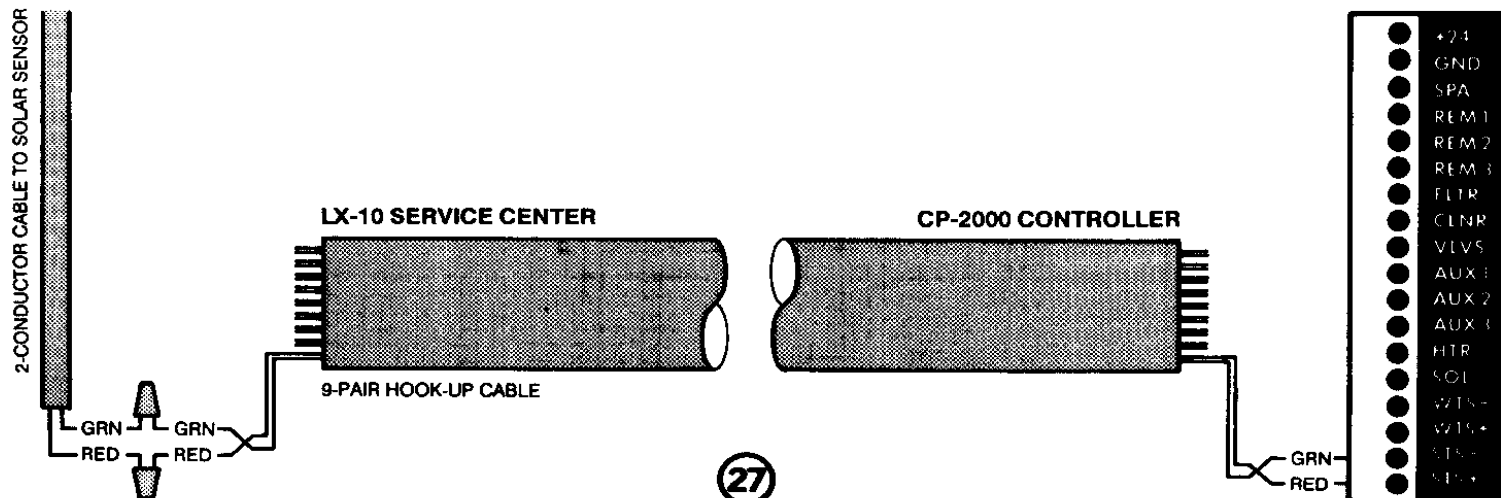
- If the **WATER TEMPERATURE Display** indicates either an unreasonably high temperature or three dashes, go to Step 7.
- If the **WATER TEMPERATURE Display** indicates the approximate ambient temperature, the Solar Sensor is functioning correctly. Reconnect Green/Black and Green/Red pairs to their original locations, and go to Step 6.

Step 6: At the CP-2000 Controller, use a small flat-blade screwdriver to rotate the **S.DIFF Adjustment Screw** located on the bottom right corner of the circuit board.

- If it is possible to turn off the **SOLAR Light** at the **STATUS DISPLAY** by rotating this Adjustment Screw, the CP-2000 Controller may need a calibration adjustment. Go to **CALIBRATION** (page 28).
- If **Solar Light** at the **STATUS DISPLAY** will not turn off, there is a malfunction at the CP-2000 Controller. Repair/replace CP-2000 Circuit Board (model PCB-2000); go to **Removing Components** (page 29).

Step 7: At the solar panel array, disconnect Solar Sensor from 2-conductor cable, and remove Solar Sensor. At the CP-2000 Controller, temporarily connect the Solar Sensor directly to the **WTS-** and **WTS+** screw terminals (green wire to WTS- and red wire to WTS+).

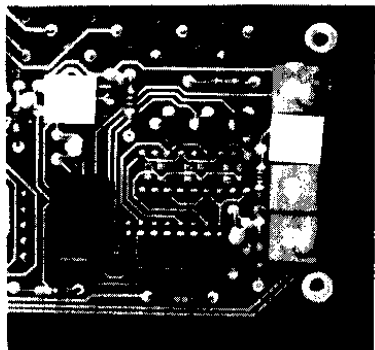
- If the **WATER TEMPERATURE Display** continues to indicate either an unreasonably high temperature or three dashes, there is a malfunction at the Solar Sensor. Replace **Solar Temperature Sensor** (model STS-5L); go to **Removing Components** (page 29). Before reinstalling at the solar panel array, test the new Sensor at the CP-2000 Controller.
- If the **WATER TEMPERATURE Display** indicates the approximate temperature, the malfunction is either within the 9-pair Hook-up Cable or the 2-conductor cable between the Solar Sensor and the LX-10. Go to **TROUBLE-SHOOTING THE CABLE** (page 22), paying particular attention to the Green/Red pair (STS- and STS+).



CALIBRATION

Calibration of the CP-2000 Controller is preset at the Factory. However, fine adjustment of the WATER TEMPERATURE Display, the electronic Thermostats, and the solar differential (if applicable) can be accomplished at the DSPLY, DIALS, and S.DIFF Calibration Adjustment Screws located on the right-side of the CP-2000 circuit board. A small flat-blade screwdriver should be used to rotate the Calibration Adjustment Screws.

NOTE: The ZERO Adjustment Screw should not be adjusted by anyone outside of the Factory.



WATER TEMPERATURE DISPLAY:

Step 1: Turn the spa on, and heat up to approximately 90° Fahrenheit. Use a thermometer to verify the temperature.

Step 2: At the CP-2000, rotate **DSPLY Adjustment Screw** until the **WATER TEMPERATURE Display** matches the temperature indicated at the thermometer.

SPA THERMOSTAT:

Step 1: Turn the spa on, and heat up to 90-96° Fahrenheit.

Step 2: At the CP-2000, set the **SPA THERMOSTAT Dial** to the temperature indicated at the **WATER TEMPERATURE Display**. Rotate **DIALS Adjustment Screw** completely to the left, and then rotate slowly back to the right until **HEATER Light** at the **STATUS DISPLAY** just comes on.

Step 3: Check adjustment by rotating the **SPA THERMOSTAT Dial** to verify that **HEATER Light** will come on at the correct temperature.

SOLAR DIFFERENTIAL:

Step 1: At the CP-2000 Controller, put the **SPA Heat Select Switch** in "SOLAR" position, and turn the **SPA THERMOSTAT Dial** completely to the right. Ensure that clock is in "time mode", and push the **SPA equipment button**.

Step 2: Check the **WATER TEMPERATURE Display**, and place the Solar Sensor into a glass of water which is 5 degrees warmer than the water in the spa.

Step 3: At the CP-2000, rotate the **S.DIFF Adjustment Screw** completely to the left, and then rotate slowly to the right until **SOLAR Light** at the **STATUS DISPLAY** just turns off.

PROPER REMOVAL OF COMPONENTS:

1. TRANSFORMER ASSEMBLY (model XFM-2BK):

- A. Turn off all power to system.
- B. At the LX-10 high voltage section, disconnect 4 black transformer wires from left-side of first Terminal Block (SYSTEM POWER).
- C. At the LX-10 low voltage section, unplug Transformer Assembly from socket at top of Circuit Board.
- D. Remove the 4 large mounting screws, and lift Transformer Assembly out of LX-10.

2. CIRCUIT BREAKER (model CB-3):

Remove Transformer Assembly (as above).

- E. Disconnect lug connections, and push Circuit Breaker out of Transformer Assembly.

3. HIGH VOLTAGE RELAY (model RLY-LX):

- A. Turn off all power to system.
- B. At the LX-10 high voltage section, remove high voltage wires from appropriate Terminal Block.
- C. Pry Terminal Block off of Mounting Rail.
- D. At the LX-10 low voltage section, remove wingnut to release appropriate Relay from Voltage Barrier.
- E. Unplug Relay from appropriate socket on LX-10 Circuit Board, and thread plug through hole in Voltage Barrier.

4. LX-10 CIRCUIT BOARD (model PCB-LX10):

- A. Unplug Transformer Assembly, High Voltage Relays, and Valve Operators from sockets on LX-10 Circuit Board.
- B. Unplug 18 pin and 12 pin terminal strips from LX-10 Circuit Board. **NOTE: Do not disconnect wires from terminal strips.**
- C. Remove LX-10 Circuit Board by releasing 4 mounting clips on outer edges of Circuit Board.

5. CP-2000 CIRCUIT BOARD (model PCB-2000):

- A. At the CP-2000 Controller, remove gray cap from POOL and SPA THERMOSTAT knobs to expose mounting screws. Loosen mounting screws, and remove knobs from faceplate.
- B. Remove 4 mounting screws from outer edges of faceplate, and pull Controller out of wall-mount enclosure.
- C. Unplug 18 pin terminal strip from Circuit Board. **NOTE: Do not disconnect wires from terminal strip.**
- D. Remove remaining mounting screws from faceplate, and release CP-2000 Circuit Board.

6. TIMER MODULE (model TIMERMOD):

- A. At the CP-2000 Controller, remove 4 mounting screws from outer edges of faceplate, and pull faceplate out of wall-mount enclosure.
- B. Remove mounting screw from upper left-side of faceplate.
- C. Turn faceplate over so that Circuit Board is exposed, and carefully disconnect Timer Module by sliding to the right.

7. VALVE OPERATOR CABLE (model CORD-VOR):

- A. Disconnect Cable from side of Valve Operator.
- B. At the LX-10 low voltage section, unplug other end of cable from appropriate valve operator socket on Circuit Board.

8. VALVE OPERATOR (model VOR-24):

- A. At the Valve Operator, unplug cable, and remove Knob and Handle.
- B. Remove 4 large mounting screws, and lift Valve Operator off of valve.
- C. Temporarily mount Handle and Knob onto valve.

9. WATER TEMPERATURE SENSOR (model WTS-5L):

NOTE: Do not remove Water Temperature Sensor until replacement is on site.

- A. Turn filter pump OFF.
- B. Use a screwdriver to disconnect pipe clamp which is retaining Water Temperature Sensor.
- C. Cut-back cable approximately 6" from sensor, and pull-out Water Temperature Sensor.

10. SOLAR TEMPERATURE SENSOR (model STS-5L):

- A. At the solar panel array, cut-off splice connections to sensor cable, and disconnect Solar Temperature Sensor.

11. SPA-SIDE REMOTE (Superswitch)

- A. At the LX-10 low voltage section, disconnect cable from REMOTE SWITCHES screw terminals.
- B. At the spa, carefully unscrew the Superswitch, and thread cable out through conduit.

NOTE: All replacement components will arrive with proper installation procedures.

WARRANTY AND REPAIR POLICIES

WHAT IS COMPOOL'S WARRANTY?

This is a Summary - please see Owner's Manual for complete details.

Components: 1 year.

Field service: 90 days. Labor charges paid to Authorized Warranty Stations only.

Please call Compool for Authorized Warranty Station(s) in your area.

Not covered: Freeze sensors, batteries, water-damaged circuit boards, labor for calibration, or any component damaged by improper installation.

FACTORY REPAIR PROCEDURE:

1. Send defective equipment via prepaid UPS, Federal Express or certified mail, directly to:
Compool Corporation, 599 Fairchild Drive, Mountain View, CA 94043.
2. On your company letterhead, please include the following:
 - a. A brief description of the problem.
This will assist our repair technician in diagnosing the problem and speed up return.
 - b. Write "PLEASE REPAIR PART(S) AS NEEDED" (or other specific service instructions).
Our technician will not begin repair on your item unless you specify service instructions.
3. If return destination is outside of California, shipping will be "UPS SECOND DAY" unless otherwise specified.
Applicable shipping charges plus labor will be included on repair invoice.
Warranty repairs completed by Compool will be shipped at "No Charge".

TECHNICAL SUPPORT:

Technical questions regarding trouble-shooting and warranty evaluation will be answered by phone Monday through Friday from 9:00 am to 5:00 pm Pacific Standard Time at (415) 964-2201 or by FAX at (415) 964-5429. Collect calls will be accepted from job site only.



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