1. PYROMETER — Meter which provides the temperature readout inside the muffle. It is calibrated in both Fahrenheit and Centigrade.

2. POWER SWITCH — Turns the furnace on and off. The switch has an internal lamp which will light when the power is on.

3. TONE SWITCH — Switches the tone on and off. When the switch is in the ON position, the furnace will emit a soft high-pitched tone when the pyrometer temperature reaches the set temperature on the temperature dial. The tone will continue to sound until the Tone Switch is turned off. The Temperature Dial and the Hold, Limit, and Reset Switch must be set prior to turning the Tone Switch on.

4. HEAT CONTROL — Adjusts the heat rate or rate of temperature rise. A setting of 4 to 5 will give an average heat rate of 90 - 100°F per minute over the firing cycle. Lower settings will result in slower heat rates. Keep in mind that large variations in line voltage and the amount of work in the furnace will affect the heat rate. Adjust the setting to suit your needs.

5. HEAT RATE LIGHT — Light flashes on and off when the muffle is heating. The light turns off when the set temperature is reached.

6. HOLD, LIMIT, RESET SWITCH — This is a function switch which may be set to either the Hold or Reset/Limit mode.
   a. Hold — Simply place the switch in the Hold position. In this mode the furnace will heat to the set temperature and automatically cycle on and off to hold the set temperature.
   b. Reset/Limit — Place switch momentarily to the Reset position. In this position the switch is spring-loaded. Allow the switch to snap back to the Limit position. The furnace will now automatically heat to the set temperature (limit) and then slowly cool down to room temperature.

7. TEMPERATURE DIAL — Dial calibrated in both Fahrenheit and Centigrade, which is used to select the desired temperature.

8. WORK DOOR — Allows convenient loading and unloading of the work.

9. DOOR KNOB — Located on both sides of the muffle for either right or left-handed operation. Provides smooth operation of the Work Door.
INSTALLATION

FURNACE SET-UP

1. Carefully unpack your Jelenko Auto Glazer Furnace and place it in a location which allows at least 2” of ventilation space on the top and on all four sides.

2. Plug the line cord into an alternating current (AC) wall receptacle rated for a minimum of 15 amps.

3. Open the door and install a saggar tray (not supplied with unit) in the heating chamber.

4. Close the door. The furnace is now ready for operation.

INITIAL HEATING & FAMILIARIZATION

1. Turn Temperature Dial to 1200°F.

2. Turn Heat Control to a setting of approximately “5”.

3. Place Hold Limit, Reset switch to reset and then hold.

4. Turn Power Switch to ON. Heat Rate Light will flash on and off.

5. Turn Tone Switch “to ON. If tone alarm sounds, turn Hold, Limit, Reset Switch to Reset and back to Hold. This will stop the tone alarm.

6. Open the door approximately 1 inch.

7. At slightly before 1200°F the tone will sound and the Heat Rate Light will turn completely off. Some smoke may be observed during the-heat up period as moisture is burned off the muffle.

8. Turn the Tone Switch off.

9. Close the door.

10. Turn the Temperature Dial to 1800°F. Heat Rate Light will flash on and off.

11. Place the Hold, Limit, Reset Switch to Reset and then to Limit.

12. Turn Tone Switch to ON.*

13. Furnace will automatically attain approximately 1800°F, tone will sound, Heat Rate Light will turn completely off, and then the furnace will slowly cool down to room temperature. Turn Tone Switch to OFF. Your muffle has now been cured. This procedure should be repeated when the furnace has not been used for a long period of time.

*Turning the Tone Switch to ON is optional. With the Tone Switch in the OFF position the unit will function as described without a tone alarm.

CALIBRATION PROCEDURE

Your new Jelcraft Auto-Glazer has been factory-calibrated and should not need to be recalibrated. However, if you find that it does need to be recalibrated, the procedure given below will restore the Glazer to an accurate condition.

This procedure is necessary for achieving optimum stain and glaze results. You may proceed with this procedure after completion of “INITIAL HEATING & FAMILIARIZATION” in which the muffle was cured.

1) With the glazer unplugged, set the pyrometer to read 0°F (Fahrenheit) by means of the small set screw on the pyrometer face.

2) Remove the silver “plug” covering the calibration hole at the rear of the glazer by prying out with a screwdriver.

3) Locate the small, yellow alignment tool supplied with the glazer and place the slot end in the calibration hole, engaging the tool with the calibration control. Leave the alignment tool in this position for use in later steps.

4) Place a round ceramic tray on the work door and close door.

5) Set the temperature dial to 1300°F.

6) Put the Hold, Limit, Reset Switch into the HOLD position.

7) Set the TONE switch to the ON position.

8) Turn the Power Switch ON.

9) When the TONE sounds, the glazer has reached the LOADING TEMPERATURE, and at this point a pure silver THERM-O-CHECK (not supplied with unit) should be bent into a “V” shape and placed on the ceramic tray.

10) After loading the THERM-O-CHECK, advance the temperature dial to 1900°F.

11) Set the Hold, Limit, Reset switch first to the reset position and then back to the HOLD position. (If this was not done, the tone would continue to sound.)

12) Set the “HEAT RATE” control at approximately 4 ½.

13) When the temperature on the pyrometer reaches 1700°F, open the door slightly to see if the THERM-O-CHECK has melted, and continue to check every 25°F thereafter.

14) When the THERM-O-CHECK just begins to melt (the “V” shape will begin to distort) set the control at the rear of the furnace so the pyrometer reads 1760°F. Rotating this control clockwise increases the pyrometer reading, and, conversely, counterclockwise decreases the reading.

15) If the glazer was off calibration by more than 25°F, repeat this procedure to insure an accurate calibration.
OPERATION

If you have not done so, it is advisable that you read all pages of this manual prior to performing actual work, so that all the benefits of the machine are available to you. An outline of the operatory procedure is as follows:

1. Turn Temperature Dial to the desired temperature setting.
2. Turn the Heat Control to the desired heat rate setting (normally between 4 and 5 will give an average heat rate of 90 to 100 degrees F per minute).
3. Place the Hold, Limit, Reset Switch to the desired mode of operation.
4. Turn the Power Switch on.
5. Turn the Tone Switch on if a tone signal is desired.

TECHNIC FOR FIRING STAINS AND GLAZES IN JELCRAFT AUTO-GLAZER

Before any attempt is made to stain or glaze a porcelain restoration, two important factors must be known:

1. The brand of porcelain used in the construction of the restoration must be determined so that the correct fusing or mating temperature may be used as a guide for re-firing.

2. The thermal history of the restoration should be available. You should know the number of bakes used during its fabrication — whether they were high, average or low temperature — and whether low-fusing porcelains were used for corrective bakes.

The laboratory who made the restoration will gladly supply this data and make recommendations concerning the porcelain fired. This data is important because porcelains are crystalline ceramics, and bake-on porcelains have expansion characteristics which are compatible with their metal substructures only as long as they retain this crystalline state. Firing porcelain too many times, too slowly, or to higher than normal temperatures will cause them to undergo a phase change.

When a porcelain enters its glass phase, its expansion characteristic drops sharply. Severe mismatches in expansion characteristics between the porcelain and its metal substructure will seriously stress the restoration, and weaken it or cause it to fail altogether. This type of failure generally manifests itself in the form of cracks or crazing.

For these reasons ALL FIRING PROCEDURES MUST BE DONE UNDER CAREFUL AND CONSTANT SURVEILLANCE. Normal firing cycles usually have a duration of 6 to 8 minutes. A distraction of only half a minute may be enough to destroy a restoration.

Firing stains or glazes on a porcelain restoration can never be done in a mechanical manner because each restoration has its own glazing characteristics. In all instances, the porcelain must be thoroughly preheated to avoid thermal shock.

TO FIRE

1. Bring furnace to 1200°F (649°C) with the door closed. Use the side knobs to open the door. Place the restoration on a firing tray and center it on the raised portion of the door so that no part of it projects beyond the raised portion.
2. Bring the units closer and closer to the preheated muffle which is holding at a temperature of approximately 1200°F (649°C). This preheating should be accomplished in about 5 minutes.
3. The units are then introduced directly into the muffle, and the furnace door is closed.
4. Set the Temperature Dial to 40°F below the anticipated glazing temperature. Set the Hold, Limit, Reset Switch momentarily to Reset and then to Hold. Set the Tone Switch to ON. Adjust the Heat Control to the desired heat rate. A setting of between 4 and 5 on this dial will give a heat rate of between 90 to 100°F per minute.
5. A tone will sound when the set temperature is reached. Turn the Tone Switch off and check the condition of the glaze under a good source of illumination.
6. If the units are underfired, raise the Temperature Dial setting 20°F and then set the Hold, Limit, Reset Switch momentarily to Reset and back to Hold. Set the Tone Switch on. The tone will sound when the set temperature is reached. Turn the Tone Switch off and check the condition of the glaze. If the units are just beginning to glaze, you may repeat the above step and increase the temperature 20°F or hold the units at their present temperature until the desired degree of glossiness is attained.
7. Turn the furnace off. Remove and bench-cool the units.

IMPORTANT: ALWAYS REMEMBER TO FIRST CAREFULLY CHECK THE GLAZING RECOMMENDATIONS SUGGESTED BY THE MANUFACTURER OF THE PORCELAIN USED TO FABRICATE THE RESTORATION.

LOW TEMPERATURE STAINING AND GLAZING TECHNICS

The danger of possibly over-firing a restoration may be minimized by using a low temperature staining and glazing technic. (If glazing alone is required, it may be accomplished in a single firing.)

In this technic, stains are applied to the porcelain units to achieve the desired effect. Then:

1. The units are held in a pair of tweezers close to the muffle to dry them quickly. The muffle should be holding at a temperature of approximately 1200°F (649°C).
2. After units have been transferred to a saggar tray, they are carefully preheated and fired to approximately between 1650°F and 1700°F at a heat rate of approximately 100°F per minute. At this temperature, the stains will fuse onto the surface of the porcelain which has not been made hot enough to become molten. However, this will cause the porcelain to have a slightly roughened surface.
3. To overcome this, a thin coating of glaze slurry, which is made by mixing glaze powder with staining or glazing medium, is applied carefully, dried and preheated as above, and the units are fired to approximately between 1650°F and 1700°F at a heat rate of approximately 100°F per minute. This temperature is then held until the porcelain attains the desired degree of glossiness. (A minute or two may be required.) If milky areas are seen in the glaze, the temperature should be held until they disappear. Any desired temperature may be maintained by the Jelenko Auto-Glazer.
### Symptom of Cause Troubleshooting Guide

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<tr>
<th>Symptom</th>
<th>Cause 1</th>
<th>Cause 2</th>
<th>Cause 3</th>
<th>Cause 4</th>
<th>Cause 5</th>
<th>Cause 6</th>
<th>Cause 7</th>
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<tr>
<td>No heat/tem, set dial above zero-pyrometer at zero-heat rate light will not flash-power switch illuminated.</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
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<tr>
<td>Pyrometer needle goes full scale (2200°F)</td>
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<td>1</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
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<tr>
<td>Heat rate light stays &quot;on&quot; continuously</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Power switch &quot;on&quot; but not illuminated — no heat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Erratic pyrometer reading</td>
<td>2</td>
<td>4</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
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</tr>
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</table>

Numbers listed in the boxes indicate causes in most probable order.

*During periods of dry weather, or depending upon the user's clothing, a static charge may develop on any pyrometer causing erratic readings or "sticking." This static charge may be removed by applying an ANTI-STATIC FLUID (obtainable at most any phonograph record store) directly to the face of the pyrometer.*
MAINTENANCE AND REPAIR

(Disconnect Line Cord Plug from wall socket prior to attempting any repair.)

The MUFFLE and THERMOCOUPLE have a limited life and will have to be replaced from time to time. Therefore, it is a good suggestion to have a spare of each on hand for such a replacement.

MUFFLE

The GLAZER MUFFLE is constructed of high-grade heating element wire supported by lightweight insulation. This combination permits rapid heating rates along with very low power consumption.

After some use, the MUFFLE may show several superficial hairline cracks on the interior. This is a result of expansion and contraction of the insulation at high temperatures and subsequent cooling. It in no way affects the life or performance of the MUFFLE.

DO NOT USE DENTAL GLAZES TO REPAIR THESE CRACKS.

Remember to always place work on a saggar tray. Keep muffle unit clean to avoid premature burnout problems. Failure of the MUFFLE to heat generally indicates that it has burned out.

MUFFLE AND THERMOCOUPLE REPLACEMENT

1. Remove the orange skirt by pulling the bottom forward until the spring catches release.

2. Remove the back and bottom cover as a unit by taking off the two back fasteners, then removing the screws from the edge of the cover.

3. Disconnect the THERMOCOUPLE from the two center screws of the terminal strip at the back. Remove it by pulling back and up to slide it from the MUFFLE. Note that one leg has a + marking on the bead of the THERMOCOUPLE which connects to the plus terminal.

4. Disconnect the MUFFLE from the two outside screws of the terminal strip.

5. Remove the four screws holding the MUFFLE. Two of the screws are at the top behind the orange skirt. The other two are near the ends of the terminal strip at the rear. Close the door to support the MUFFLE during this step.

6. Next, open the door and lift out the MUFFLE over the top of the door shaft.

7. Insert a new MUFFLE. Guide the pigtails through the insulated holes in the rear. Be certain that the ceramic insulators are placed over these pigtail leads.

8. Complete the operation by reversing the procedure required to take out the MUFFLE. Note that the rear of the MUFFLE can be adjusted to effect a close relationship between the door and the MUFFLE.

PRINTED CIRCUIT BOARD REPLACEMENT

1. Place the unit on its front, controls facing down.

2. Remove the ten screws along the edges of the back and rear which hold this “L” shaped panel on the glazer. Also remove the two rear rubber feet.

3. Lift the rear/bottom “L” shaped panel away so that the internal components of the glazer are exposed.

4. Disconnect at the printed circuit board both the red and the black thermocouple wires coming from the upper section of the glazer.

5. Disconnect the two wires that connect to the printed circuit board in the upper right hand corner.

6. Remove the phillips head type screw at the top center of the printed circuit board.

7. Lift the printed board straight up and out of the connector at the bottom of the board.

8. Reverse this procedure to install the new circuit board.

PYROMETER REPLACEMENT

1. Remove printed circuit board (refer to printed circuit board replacement).

2. Remove the two Phillips head type screws which are located in the approximate center of the aluminum chassis. The chassis is the portion of the glazer on which the transformer and other components are mounted.

3. Being careful not to damage any of the wiring, gently place the chassis to the left side of the glazer so access is gained to the rear of the pyrometer.

4. Remove the wires on the two terminals at the rear of the pyrometer, noting that the groups of three wires of one color are on the terminal marked —.

5. Remove the four mounting nuts located at each corner of the pyrometer. The pyrometer now should lift off the front panel.

6. Reinstall the new pyrometer by following this procedure in reverse, making sure you put the pyrometer leads back on their proper terminals (group of three wires of one color on — terminal, single wire of other color on + terminal).
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