



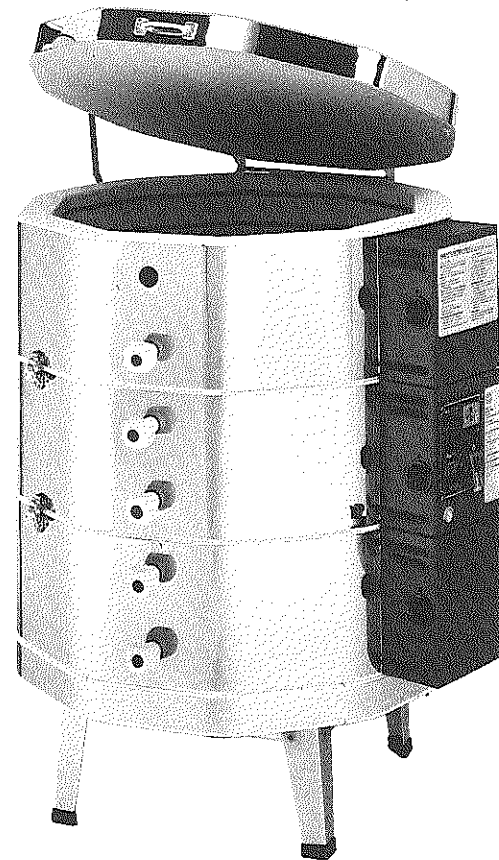
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# SKUTT

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## KILN OPERATING INSTRUCTIONS

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**Warning: Kiln should not be used by unsupervised children. Read and follow all safety labels on the kiln.**

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## Limited Warranty

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SKUTT CERAMIC PRODUCTS, INC. warrants this product to be free from defects in materials and workmanship for two full years from the date of the first retail purchase from an authorized Skutt dealer.

**What Skutt Will Do.** Skutt will repair or replace, at its expense, any defective part upon return, freight prepaid, to any authorized Skutt service center.

**What Is Not Covered.** This Warranty does not cover (1) any defect not reported to an authorized Skutt dealer or distributor within 10 days of discovery; (2) the KILN SITTER®, which is separately warranted by its manufacturer, W. P. Dawson, Inc., 399 Thor Place, Brea, California 92621; (3) any damage caused by overfiring; (4) products subjected to abnormal strain, freight damage, neglect, abuse, improper storage, failure to follow instructions, or products altered from factory standard condition; (5) products whose identification number has been changed; (6) failures of, or failures caused by, parts or accessories not manufactured or supplied by Skutt Ceramic Products; (7) kilns used for purposes other than firing ceramic materials; and (8) kilns used for reduction or salt firing.

**How To Obtain Warranty Service.** Notify your Skutt dealer or distributor within 10 days of discovery of any defect. Deliver any defective part, freight prepaid, to an authorized Skutt service center. A list of Skutt service centers may be obtained from your dealer or from Skutt Ceramic Products, Inc. at the address and telephone number below.

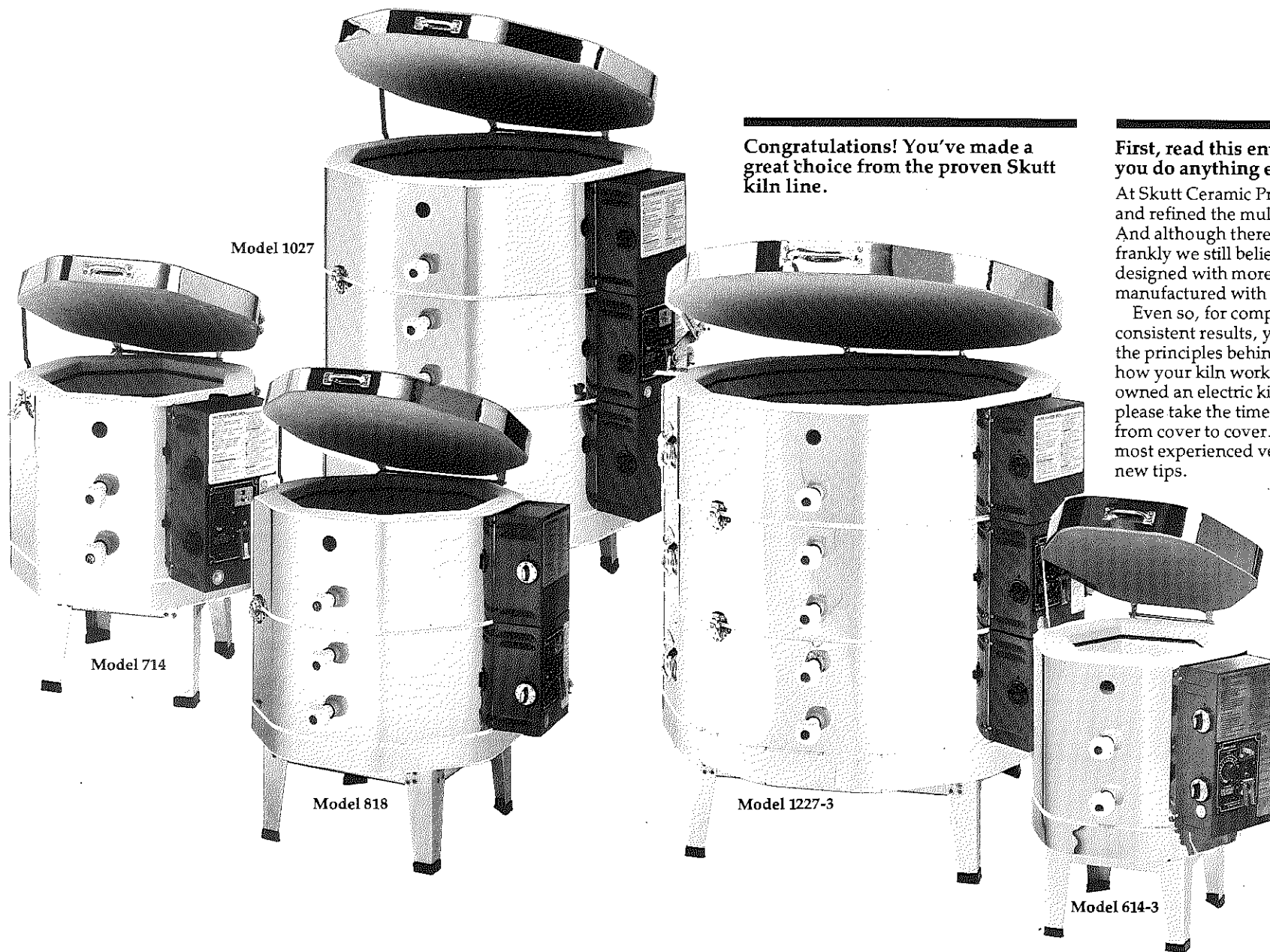
**Other Limitations.** ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING PROPERTY DAMAGE, LOST PROFITS, LOSS OF USE, OR OTHER ECONOMIC LOSS, ARE EXCLUDED TO THE FULL EXTENT PERMITTED BY STATE LAW. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you. ANY IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE DURATION OF THIS LIMITED WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Dealers are not authorized to modify this Warranty or to make any additional commitments. Skutt will not be responsible for promises not contained in this Warranty.

**State Law Rights.** This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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**SKUTT CERAMIC PRODUCTS, INC.**  
2618 SE Steele Street  
Portland, OR 97202  
(503) 231-7726

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**Congratulations! You've made a great choice from the proven Skutt kiln line.**

**First, read this entire manual before you do anything else.**

At Skutt Ceramic Products, we created and refined the multi-sided electric kiln. And although there are many imitators, frankly we still believe that no kiln is designed with more understanding or manufactured with more care.

Even so, for complete safety and consistent results, you must understand the principles behind ceramic firing and how your kiln works. Whether you have owned an electric kiln before or not, please take the time to read this manual from cover to cover. We think even the most experienced veteran will learn a few new tips.

### A word on unpacking and checking.

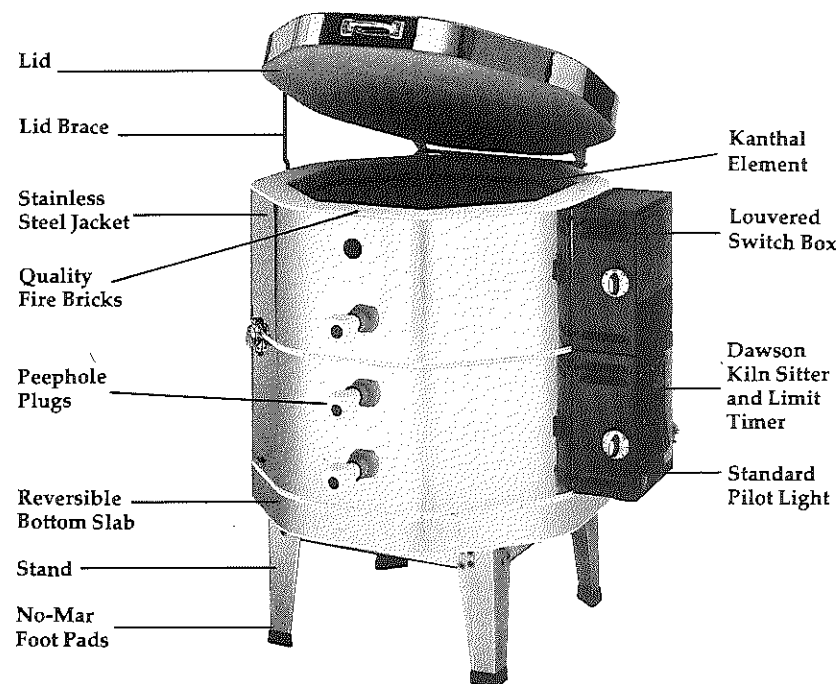
Your kiln has usually traveled a long way by railcar or truck to get to you. Even though it was carefully packed at the Skutt factory, it could have been mis-handled in shipping. If you find any problems as you unpack, do this. 1. Call your freight agent and ask for an inspection. 2. Save all the packing materials. 3. Contact the dealer where you bought your kiln. 4. Don't assemble or fire your kiln until your damage claim has been inspected. Fortunately, few Skutt owners will experience any problems.

### What you'll find in a quality Skutt kiln—and why.

**Brick.** Skutt kilns are constructed of the finest insulating fire brick available today, offering strength, cleanliness and long life. All bricks are precision cut and grooved to assure tight fit, perfect element support and ease of replacement. Because of their porous composition, insulating fire brick are fragile. Always handle your kiln and its brick with care. The brick in your kiln may begin to show some fine cracks after the first few firings, especially after Cone 10 high firings. This is normal and does not harm the structural integrity of the kiln or impair its functioning.

**Elements.** The highest quality iron-aluminum-chromium (Kanthal-type A-1) element wires are used in all Skutt kilns. All multi-sided Skutt kilns are high fire type and are designed to reach Cone 8 or 10 (except 208V 1227 Models). Elements are thoroughly tested both before and

Unpack  
carefully.



after installation for assured performance and even firing.

**Element life** will vary depending on whether the kiln is used primarily for low firing of bisque or greenware, or high firing of stoneware and porcelain. Elements will last for many firings if treated carefully. Remember these points. 1. Keep the element grooves free of debris: bits of bisque, glaze, cones, metal or high fire kiln wash will immediately fuse to an element and proceed to eat through it. Kanthal elements become brittle after repeated firings, so be extremely careful not to break them by scraping. 2. Never attempt to fire above Cone 1 without first removing the blank ring (if you use one).

**Switches.** For long life and dependability, the switches in your Skutt kiln are rated considerably higher than the electrical loads they carry.

**Pilot lights.** All Skutt automatic kilns are equipped with pilot lights to show you when the kiln is on.

**Stainless steel jackets.** Only the finest grade stainless steel is used in Skutt kiln jackets, selected for its expansion qualities so that the bricks are never unduly stressed, yet are fully supported during all stages of heating and cooling. Stainless steel may discolor with repeated heating. Stainless steel cleaner is available.

**Lid brace.** The lid brace holds the lid securely open for loading and unloading the kiln. As you open the lid, allow the lid brace to follow over the anchor pad and screw that is attached to the side of the kiln. Simply allow the notched end of the brace to engage anchor pad and screw, allowing the lid to rest in a full upright position.



## Setting up your new kiln.

**Location.** For safety and convenience follow these basic rules.

Locate your kiln near your present electrical outlet or where a new circuit can be installed with least cost. Position kiln to the left of your electrical outlet so the cord will have an easy run and will not place a strain on the plug or outlet.

Install it in a well ventilated, sheltered area such as a carport, garage, utility or hobby room. It should be convenient to your clay working area, and out of the way of other traffic.

Allow at least 8" of space between your kiln and adjacent walls.

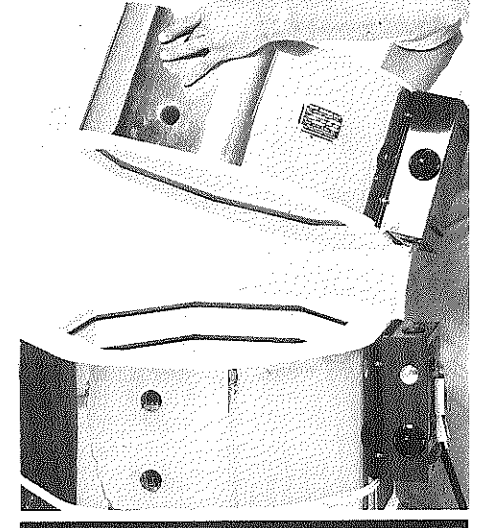
Keep curtains, aprons, plastic or other flammable materials away from your kiln.

Never fire your kiln within a four sided cabinet or closet. The fourth side must always be open to room air to prevent the kiln from overheating surrounding surfaces. It is best to leave at least two sides open for easy access to controls and peep holes.

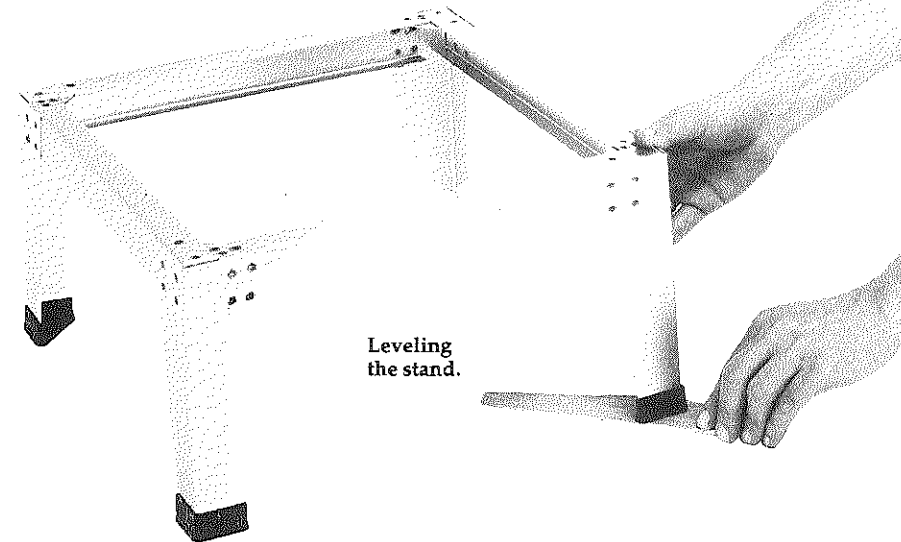
If possible, locate the kiln in a room with a cement floor.

**Assembly.** Having chosen a location, place the kiln on the stand, and make sure it is level and does not teeter. Leveling problems may put unnecessary stress on the kiln during firing. It becomes more difficult to stilt delicate pieces for glaze firing. At worst, a tilted kiln may prevent the falling weight in your kiln sitter from falling correctly, causing an overfire that can damage your ware or kiln. To level the stand, place firm shims **under** the legs (never above them touching the kiln). Center the kiln's bottom slab on the stand and double-check against teetering.

Reassemble the kiln as it was in the carton, remembering to handle rings by their outside surfaces only. Pick up each section so the switch boxes can be aligned by eye before engaging the interbox power blades. Re-hinge the lid to the top ring, and replace cotter pins and the lid brace thumb screw.



Stacking, holding outside surfaces.



Leveling the stand.

### Electrical requirements for your new kiln.

Most important to proper operation of your new kiln is to make sure it has enough of the correct power to operate it. If this is done, your kiln will give you years of satisfying service; if not, your first firing could be disappointing or even disastrous for your kiln.









The chart below shows the recommended electrical specifications for each kiln model. If you are uncertain about your existing outlets, have them checked by an electrician. If you are installing a new receptacle, have the electrician follow this guide.

### Some additional power notes.

**Three-phase operation.** Only special order Models 1027 and 1227 with wall-mounted 3-pole contactors will operate balanced on a three-phase supply. However, any Skutt kiln can be properly powered via unbalanced connection to two of the three hot wires of a three-phase supply (plus the solid neutral wire for Model 714). Of course, the green safety ground connection provided in all Skutt power cords is also used.

**Three-phase installation.** Three-phase Models 1027 and 1227 are shipped with a special gray contactor box, measuring about 6 by 7 by 4½ inches. This box is fed by wires from your breaker box, and must be wall mounted by an electrician precisely following the wiring diagram in the kiln's manual.

### Electrical requirements for Skutt multi-side kilns.

Model No.	Volts	Amps	Watts	Copper Wire Size*	Fuse or Breaker Size	NEMA Receptacle Configuration
614-3	115	20	2300	10	30	5-20 
714	120/240-208	20/10	3600	10	30	14-30 
818P	240	21.7	5200	10	30	6-50
818P	208	24	4990	10	30	6-50
818PWR	240	32.5	7880	6	45	6-50 
818PWR	208	36	7490	6	50	6-50
818	240	26.7	6400	8	40	6-50
818	208	26.7	5550	8	40	6-50
818WR	240	40	9600	6	50	6-50 
818WR	208	40	8320	6	50	6-50
1018	240	38.5	9250	6	50	6-50
1018	208	40	8320	6	50	6-50
1027	240	48	11520	6	60	6-50 
1027	208	48	9984	6	60	6-50
1027 3ph	240 3ph	29.3	11520	8	40	15-50**
1027 3ph	208 3ph	31.3	10580	8	45	15-50** 
1227	240	48	11520	6	60	6-50 
1227	208	48	9984	6	60	6-50
1227 3ph	240 3ph	29.3	11520	8	40	15-50**
1227 3ph	208 3ph	31.3	10580	8	45	15-50** 

\*For runs longer than 50 feet use heavier wire, numerically two numbers lower—for example, instead of #10, use #8. If you anticipate adding a wired ring to Model 818, or installing any larger kiln in the future, use the heavier wire. Blank (non-wired) rings do not change electrical requirements. \*\*See special instructions and wiring diagram.

**208 versus 220-240 supplies.** As you can see from the chart, most Skutt models are available in either 208 or 240 Volt versions. The exception is Model 714 which is universal, and will fire with 120/240-208V power.

The "120/208V" supply is increasingly encountered in schools and newly-built communities, because it's more efficient for heavy 120V loads. This affects Models 818, 818WR, 1018, 1027 and 1227 because their elements receive the full 208 (or 240) applied volts. The 240V versions of these

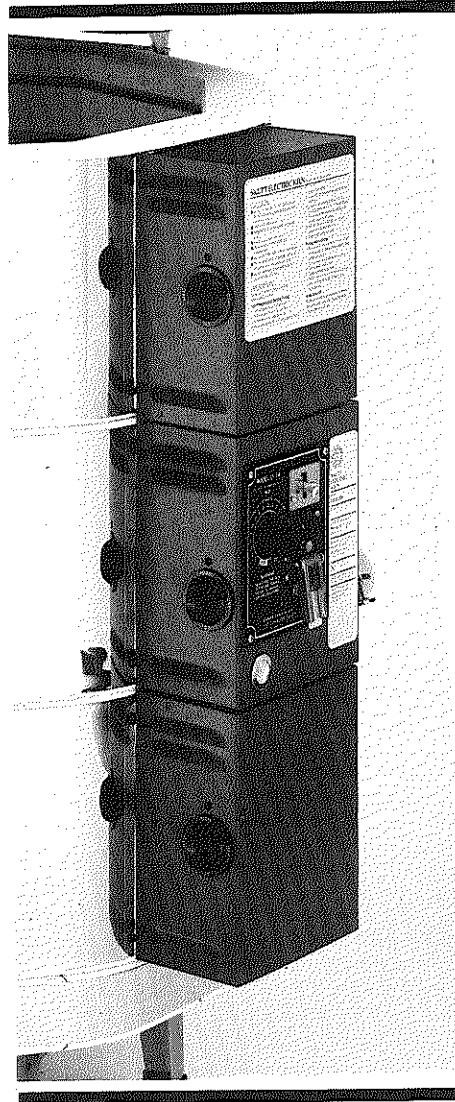
kilns will usually low fire satisfactorily when moved to a 208V area. But the 208V versions should never be fired on a 220-240V supply without first installing a full set of 240V elements. Otherwise all components will be seriously overtaxed.



**Important! Connecting and testing Model 714.** The wall outlets for Model 714 must be powered by 3-wire 120/240-208V solid neutral supply—as for an electric range. Only No. 10 wire is required (or No. 8 for runs over 50 feet). 30 Amp fuses or circuit breakers only—no larger or smaller—are recommended. The U-shaped fourth blade of the 4W30 Amp grounding plug is for pure greenwire grounding of the kiln case. The blade opposite this U-shaped one takes the white solid neutral wire. See the wiring diagram on inside back cover.

You must test Model 714. If your wall outlet should be accidentally mis-wired, 240V could be applied to some of the 120V elements in these kilns. To check, turn the 3-heat switches to Off and plug the cord into the wall outlet. Insert a Junior cone in the automatic shut-off, latch the plunger in (see Kiln Sitter Instructions, page 8) and turn both switches to Medium. The first and third elements from the bottom should heat at the same slow rate with no heating visible for at least 30 seconds. They should glow dull to medium red within 15 minutes. If either element heats up suddenly, turning bright red or orange, turn off the kiln at once. Your wall outlet is improperly wired.

If okay to this point, leave the top switch on Medium and turn the lower to High. If the element on Medium becomes brighter than the lower one on High, your wall outlet is not properly supplied by a white neutral conductor. This must be remedied before using your kiln.

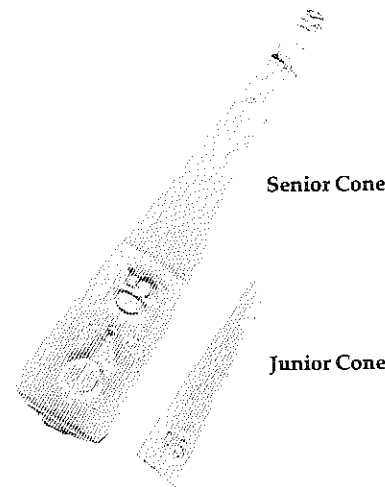


### Automatic kiln sitter controls.

Your Skutt kiln comes factory equipped with the Dawson Kiln Sitter, the standard of quality in the ceramics industry. **However, the Kiln Sitter is intended as an aid to accurate firing—not as a substitute for your attention to each firing.**

As high firing heats build up, many physical changes occur in your kiln. Firebrick and jackets expand. Your ware may expand, crack, or even explode in rare cases. Loads may shift. If any of these interfere with the sensing rod inside the kiln, and should your timer somehow malfunction, an overfire could result. Properly maintained and adjusted, your Kiln Sitter should give you years of trouble-free service.

We recommend you read the Kiln Sitter Operating Manual that comes with your kiln for complete details. Some of that information is repeated here for your convenience.



**Pyrometric cones.** Ceramic firing to the accuracy we know today would be impossible without pyrometric cones. These long tetrahedrons of controlled composition measure "heat work," the combined effects of time and temperature accomplished during a firing.

There are two sizes: the traditional standing Senior cone, 2 9/16" long, and the smaller Kiln Sitter Junior cone, 1 1/8" long. Both are composed of precisely controlled raw clays and frits, and are identified by standard numbers.

Senior cones are designed to be placed standing in angled holders. Commercial cone plaques or self standing Orton Cones are best. You can make your own cone pats from wet clay, but be sure they are thoroughly dry before firing or they will explode in the kiln.

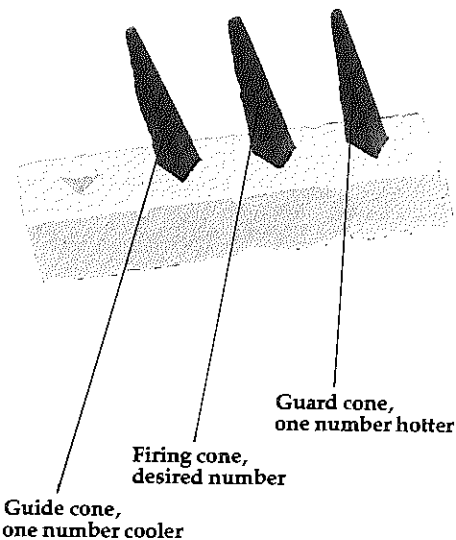
When the cones soften and bend to base, the correct firing time and temperature have been reached. It is important that the cone is standing at the proper angle (as pre-cut at the base) for it to bend at its standard temperature.

Often cones are placed at various levels to tell if the temperature variation has been caused by uneven loading or air circulation. When cones are used to verify the accuracy of your Kiln Sitter, they must be placed at the same level as the Kiln Sitter Junior cone. Obviously, if you wish to monitor firing progress, cones must be visible through a peephole.

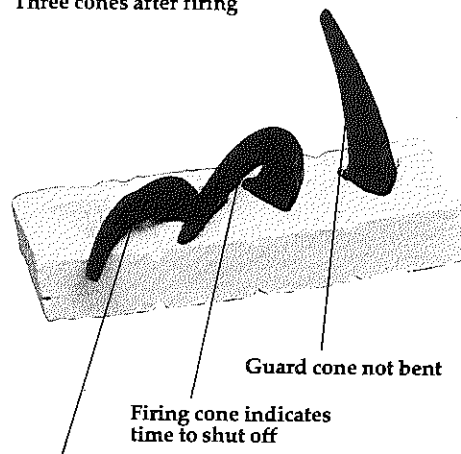
The traditional (and still the most accurate) method of monitoring a firing is to use three Senior cones: the one called the guide cone should be one number cooler than your desired firing; the firing cone should be the desired heat, and the guard cone should be one number hotter. As your firing nears maturity, the guide cone will bend or "drop." This alerts you to watch the firing cone, and Kiln Sitter shut off. If the guard cone is not straight, it is a sign of overfiring.

Fortunately, with today's Kiln Sitters and Junior cones, three-cone firing is rarely necessary. However, always placing a single Senior firing cone at Kiln Sitter level is excellent, inexpensive insurance against inadvertent underfiring.

#### Three cone placement



#### Three cones after firing



#### Guide cone bent early

**Senior cone handling and placement.** Cones are sensitive to moisture when stored and to drafts when firing. Keep them dry or invisible cracks may develop, causing early bending. If you have cone problems, try fresh ones from another source. Place cones at least 3" back from peepholes to avoid a false response to cool air.

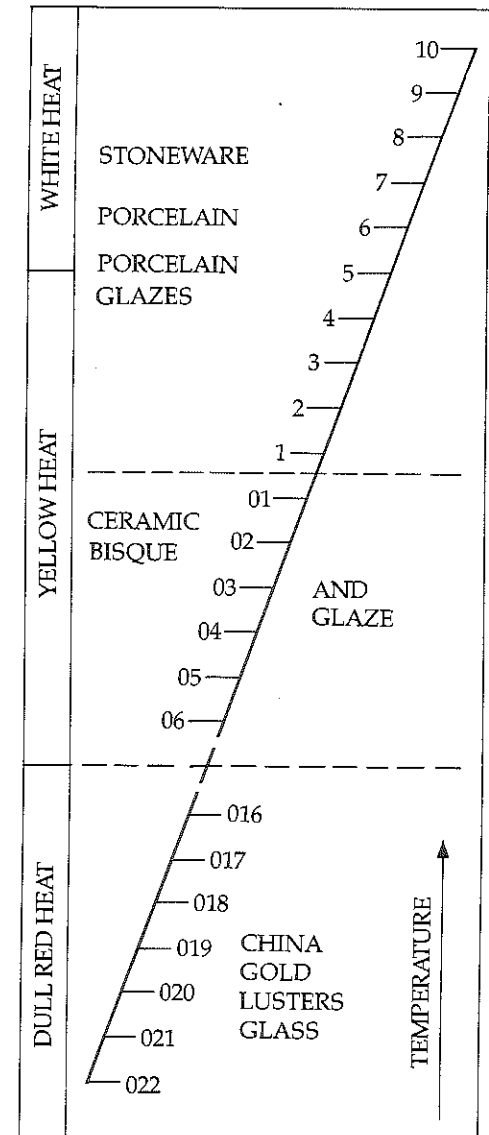
At high temperatures cones can be hard to see. Viewing through dark glasses can help. Try to keep ware back from cones as far as possible.

#### Orton Pyrometric Cones

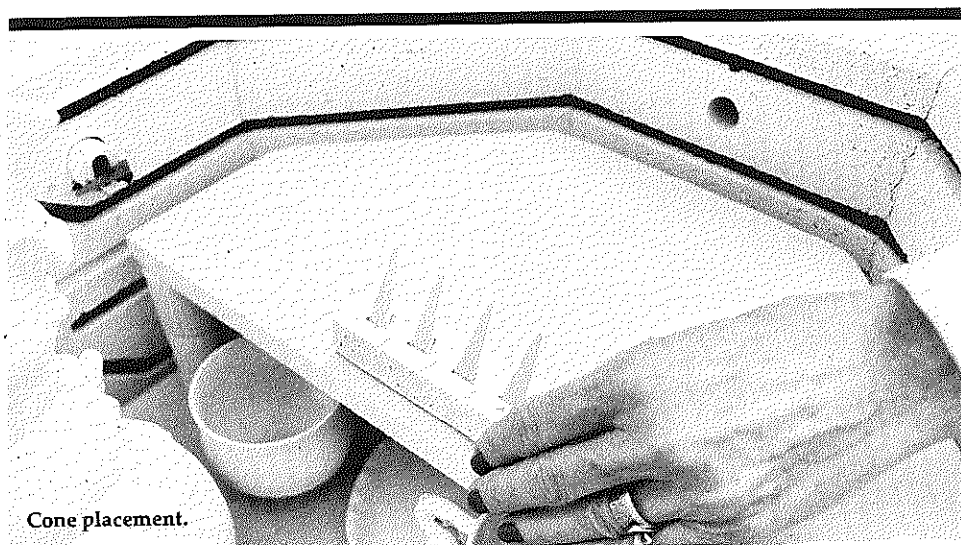
Senior Cone	Temperature	Final temperature required @ 108° F/hr*	@ 270° F/hr*
10		2345° F	2381° F
9		2300	2336
8		2257	2305
7		2219	2264
6		2194	2232
5		2151	2185
4		2134	2167
3		2106	2134
2		2088	2124
1		2077	2109
01		2043	2079
02		2014	2048
03		1987	2014
04		1922	1940
05		1888	1915
06		1816	1830
07		1783	1803
08		1733	1751
09		1679	1693
010		1629	1641
011		1627	1641
012		1591	1623
013		1596	1566
014		1533	1540
015		1454	1479
016		1407	1458
017		1341	1377
018		1285	1323
019		1234	1261
020		1157	1175
021		1116	1137
022		1085	1112

\*Final temperature for cone maturity depends on rate of temperature increase within kiln during final 300-400° of firing. Tables courtesy of the Edward Orton, Jr. Ceramic Foundation.

#### Quick Reference Chart







Cone placement.

### Junior cones and the Kiln Sitter.

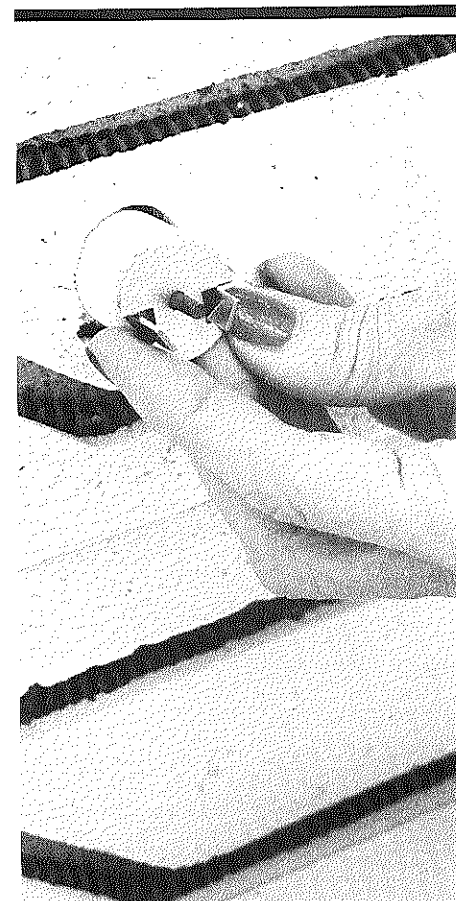
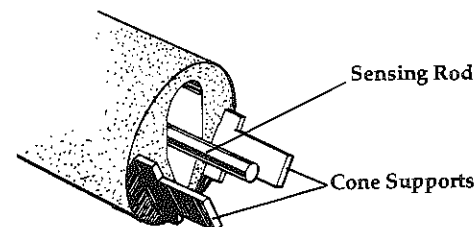
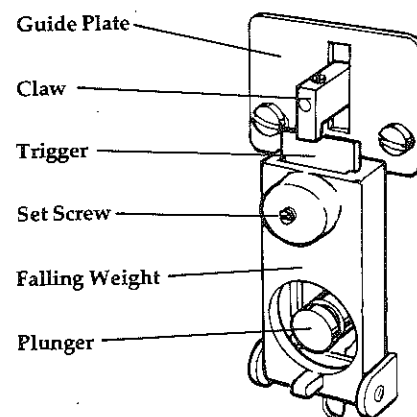
Junior cones are **not** simply miniature Senior cones. They are designed to bend under the weight of the Kiln Sitter sensing rod. Don't expect acceptable results using a Senior cone in the Kiln Sitter. The Junior's shorter length and greater compaction make it stand longer than a Senior if placed on end, but when used horizontally in the Kiln Sitter, the Junior will bend at approximately the same time as a Senior standing.

Because your electrical power and kiln location will vary, you should keep a complete firing record (see back cover) of every firing. You may find, as some Skutt owners do, that you get better results with a Junior cone one step hotter than your Senior cone—that is, a Cone 6 firing may come out better with a Junior 7. If you keep accurate records, you can modify your technique to give the best results.

### What your Kiln Sitter does.

It may look complex, but the Kiln Sitter is designed to be simple and reliable. There are few moving parts, and you can adjust them for perfect operation yourself. A sensing rod rests on a Junior cone inside the kiln. When the cone softens, the weight of the rod bends it down and releases the falling weight. This turns off the kiln.

The limit timer is simply a clock mechanism which you set for a time slightly longer than your anticipated firing. By keeping an accurate record of every firing, you will soon be able to estimate the length of a firing to within a half hour or less. Then, should anything go wrong with your Kiln Sitter, the limit timer will turn off the kiln before overfiring can do damage.



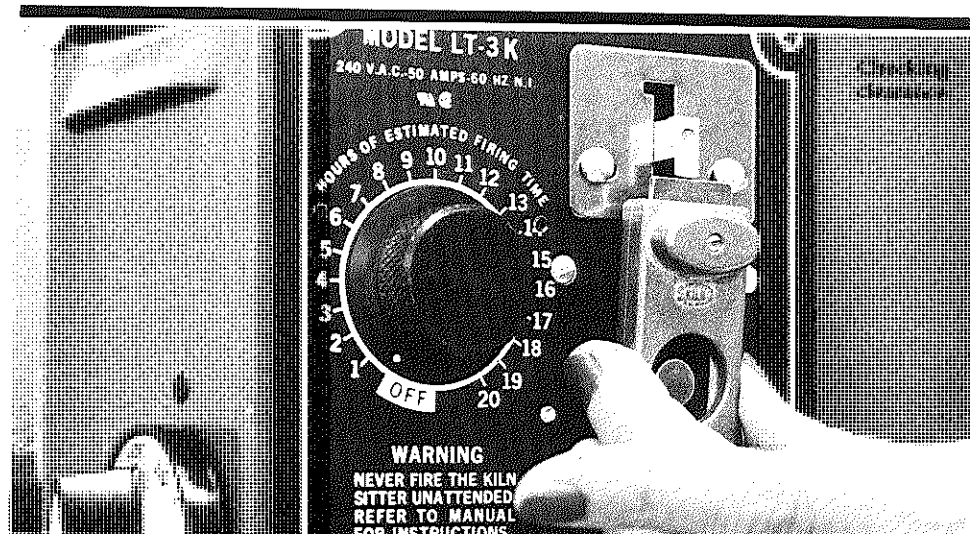
Using the firing gauge to check sensing rod position.

**Important! You must adjust and test your Kiln Sitter on your new or repaired kiln.**

As good as your Kiln Sitter is, you must calibrate and test it before you trust your ware solely to its control. Here's what you should do before the first firing, and periodically to keep the Kiln Sitter in adjustment.

1. **Turn switches off.**
2. **Install the firing gauge.** This metal gauge fits over the sensing rod and cone supports, positioning the rod as it should be when the Kiln Sitter is properly adjusted.
3. **Check the clearance of the trigger and release claw.** The trigger should just clear the release claw. If it strikes the claw, or has more than a few thousandths of an inch clearance, adjust the trigger height by loosening the trigger set screw. Tighten firmly when you are finished, because repeated falling can cause the trigger plate to jar out of adjustment.

There should also be 1/16" of distance between the trigger and the inside of the claw. This can be adjusted with the claw's set screw.



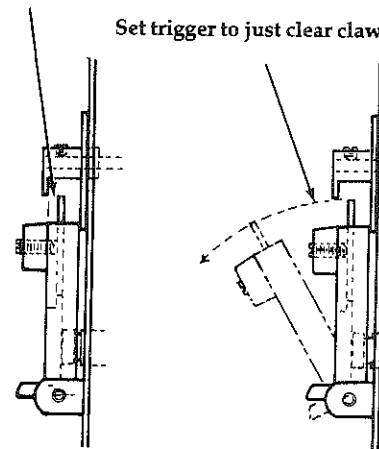
**4. Check the travel of the sensing rod.**

Remove and save your metal firing gauge. Move the sensing rod up and down. It should travel freely, without touching the sides of its tube. On the outside of the kiln, the claw should move freely within the guide plate. If there is interference, loosen the guide plate screws, and center its slot so the rod and claw move freely. Tighten screws.

5. **Make the "2 o'clock" test.** To be sure your falling weight causes the plunger to pop out, press the plunger in, raise the weight to about the 2 o'clock position, and drop it. It should cleanly trip the plunger out.

Set claw 1/16" from trigger.

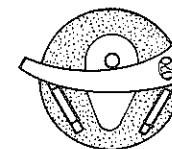
Set trigger to just clear claw.



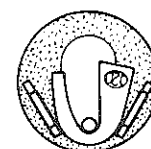
**Additional Kiln Sitter notes.**

Your Kiln Sitter is now calibrated and working properly. For trouble-free operation, just remember these points.

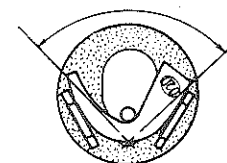
1. **Never lubricate your Kiln Sitter.** Oils will gum up the works.
2. **Keep foreign objects out of the Kiln Sitter tubes.** Bits of ware or debris can stop the sensing rod from dropping. Check frequently.
3. **Keep a light coat of kiln wash on the cone support and sensing rod surfaces.** This will be explained under the First Firing section.
4. **Replace bent cone supports or sensing rods.** After repeated firings, these may bend. For best firing accuracy, replace them when they look distorted.
5. **Use only dry Junior cones, properly positioned as shown in the First Firing section.** Tips from Senior cones will not work. After a firing, the cone should show about a 90° bend. Much more or less bend is a sign of incorrect adjustment, and will cause over or underfiring.



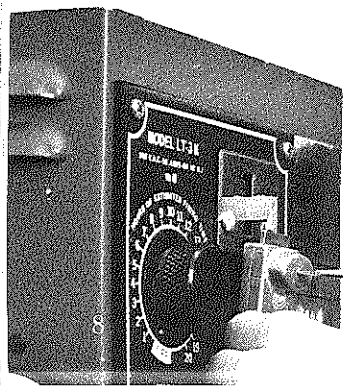
Underfired  
Incorrect adjustment



Overfired  
Incorrect adjustment



Correct adjustment  
Approximately 90° angle



Adjusting  
the trigger.





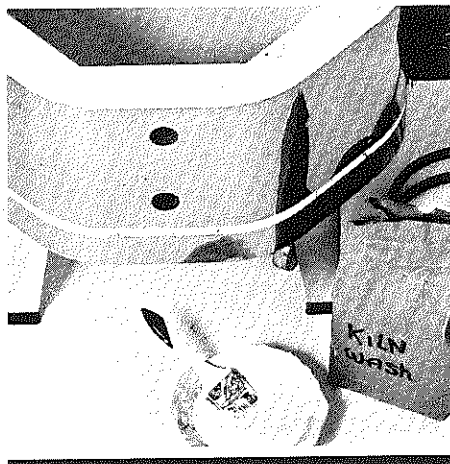
### Preparation before firing.

Remove any brick chips or other foreign matter from around the elements. Bits of bisque and glaze will eat through elements and our warranty cannot cover such accidents. We recommend that you vacuum the inside of the kiln to remove any dust that accumulates during shipment.

Wipe all your new shelves clean, and brush coat one side of each to 1/16" thickness with high fire kiln wash, available from your dealer. Except for porcelain glaze fires, full new coats are seldom needed—just spot-patch and sand off the surface evenly with coarse sandpaper wrapped around a wooden block.

Kiln wash the floor of the kiln, being careful to leave a one inch margin unpainted all the way around. Never kiln wash the walls or lid of your kiln!

Now you're ready to fire. Be sure to review the preceding sections, double checking for safety and correct electrical connections.



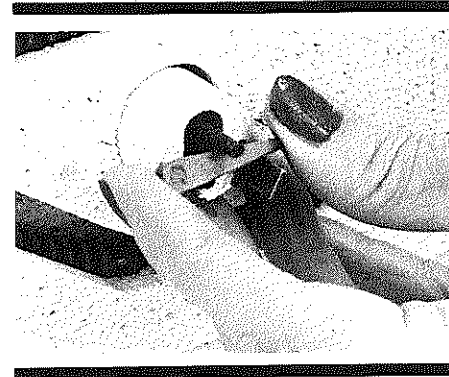
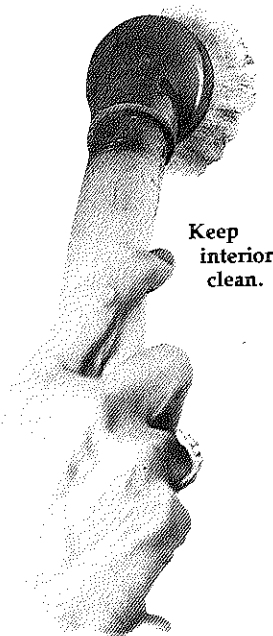
Kiln wash floor.

### Firing your new kiln.

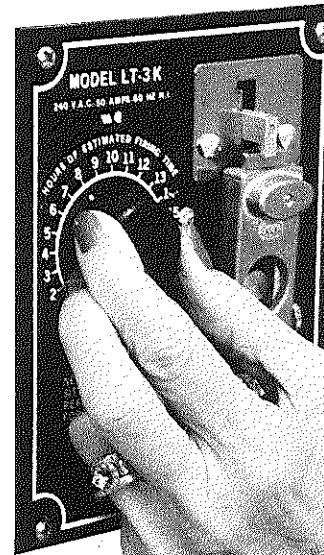
It is important to the life of your kiln that your first firing be done properly. Before you start, read this entire manual carefully, including the preceding sections and the loading and firing instructions.

New elements and foreign matter like dust give off vapors that tend to discolor glazes. Therefore, your first firing should be a bisque or a Cone 05 empty test fire with only your shelves in the kiln, posted as though ware were on them.

1. Apply a thin coat of high fire kiln wash to the surfaces of the Kiln Sitter sensing rod and cone supports. Allow wash to dry thoroughly. It will keep cones from sticking.
2. Lift the falling weight.
3. Press the claw down until it holds the weight trigger in place.



Junior cone placement.



Setting the limit timer.

4. Insert a Junior cone, under the sensing rod, with a flat side down, and the number facing the inside of the kiln.

5. Place a Senior visual cone in line with the peephole on the same level as the Kiln Sitter to make sure the automatic shut off is working properly. Use cones with the same number—for example, a 05 Junior cone in the Kiln Sitter and a 05 Senior visual cone.

6. Turn all switches off.

7. Because it's not needed for the test, set your limit timer to 10 so it won't interfere.

8. Press in the Kiln Sitter plunger so it locks.

9. Follow the general firing instructions and switching schedules printed on the switch box of your kiln, and printed on page 12 or 13.

10. View your Senior cone by removing a peephole plug periodically. It should bend to the base (6 o'clock position) and the Kiln Sitter should turn the kiln off at about the same time. Watch your kiln throughout the firing. Don't rush through the first firing. Make notes of things that you want to remember and make visual observations of the kiln while it is firing.

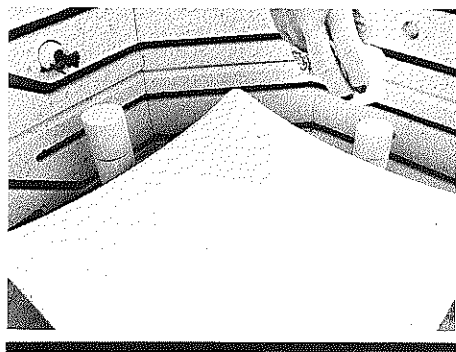
Likely, everything will work as it should, and you're ready to go on to production firings. If things go wrong, re-read this manual and contact your Skutt dealer.

### Loading: the key to consistent results.

Careful loading will always be repaid with satisfaction. Rushed, careless loading can bring disaster to pieces you've worked on for hours.

First, never load damp ware into your kiln! Make sure it's all bone dry first. Keep a piece of old greenware on your drying shelves. New ware should feel no cooler on your cheek or forearm than an old piece. If it does, water is still evaporating from it.

Plan your load carefully. Set out all your pieces before you start loading, and pre-arrange them as you wish to load them. Always load slowly—dropped ware or shelves may damage the inside of your kiln.



Allow clearance around posts

Balance out your load by density. If half your load consists of small, heavy pieces and half of large thin-walled pieces, don't group the small heavy pieces in one section, but mix them so there is a balance of each type throughout the kiln. See the accompanying illustrations. Don't set pieces of ware directly on the floor of the kiln. It's better to tilt them (except as noted under Porcelain) to allow circulation of heat under them, or place your bottom shelf 1" above the floor.

Ware should not be placed within 1" of the elements for best results. Large flat pieces like plates that demand the full width of the kiln should have their rims positioned between two elements.

"Nursing through" ill-designed or roughly-handled plates may require tilting them up from the slow heating shelves during all firings. Plate or wash-bowl pins serve well, placed every 2" to 3" around the foot.

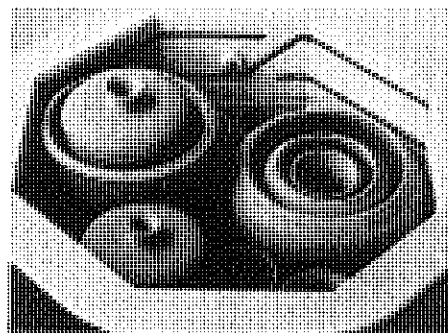
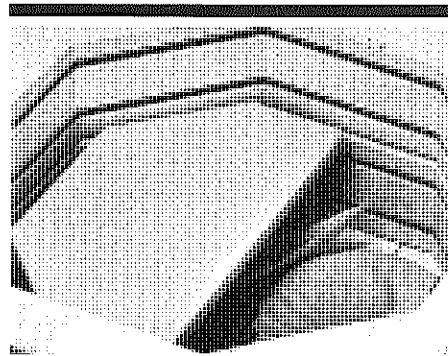
Always have at least one element groove between shelves, and two grooves between the bottom of the kiln and the first shelf. Include at least 2 element grooves in the heating of your 4 1/2" blank ring—or 4 grooves if possible with the Model 714 Blank Ring.

Remember that your blank ring must be entirely removed whenever firing hotter than Cone 1—or Cone 01 with Model 1227.

Don't crowd the Kiln Sitter. Keep shelves at least 1/4" from sensing rod, and ware 1/2" away. If your load should shift during firing, there will be less danger of jamming the Kiln Sitter.

Whenever you do test firings—as on your first firing, remember to leave room for a Senior cone that's visible through the peephole on the same level as the Kiln Sitter. Place the cone back at least 3" from the peephole so draft won't affect it.

We recommend always placing a Senior visual cone with every firing. Although you normally won't watch it go down, its condition when you unload the kiln will prove your firing was correct—or alert you to possible problems if the ware displays faults.



Shelves should go between element grooves, with two grooves below the first shelf

Nest heavy and light pieces in bisque fires.

### Loading greenware for bisque firing.

Greenware is easier to handle and load than other ware. Greenware should be placed in the kiln in its natural position, but any large flat piece—such as a wall plaque—can go on its flat side to prevent warping. Cannisters and boxes should be bisque fired with lids in place for assurance of good fit. For more efficient production, you may wish to experiment with nesting bisque. Just remember never to strain the rims.



Stacking bisque.



### Loading for glaze firing.

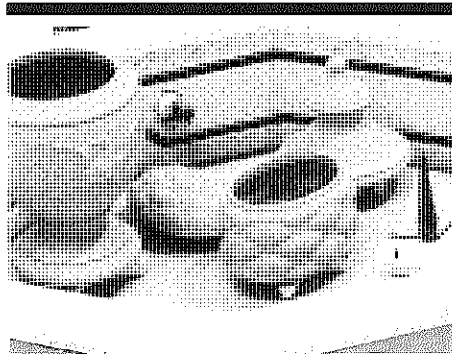
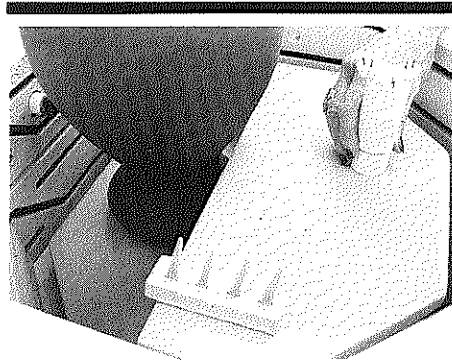
Glaze firings require that you have kiln washed the bottom of the kiln and one side of each shelf. Glaze will stick permanently if you fail to keep a good coating of kiln wash on these surfaces.

Don't let any of your pieces touch one another or the sides of your kiln.

Stilts are devices used in glaze firing to elevate the fired pieces from the shelves. There are many styles. Use those that provide the widest bearing capacity for stability. If a piece wobbles on its stilts, it may tumble during firing. Make sure you have a good solid load.

To avoid stiltling by "dry footing," you may carefully avoid glazing the base of your piece, or you can first apply a wax resist to the base which will reject any glaze. You can also wipe unfired glaze from the foot of your ware with a damp sponge, if you've not applied your glaze too thickly.

Leave all possible "breathing room" between pieces for best firing uniformity. It should not be less than 3/4" or bubbles and fumes may contaminate adjoining ware.



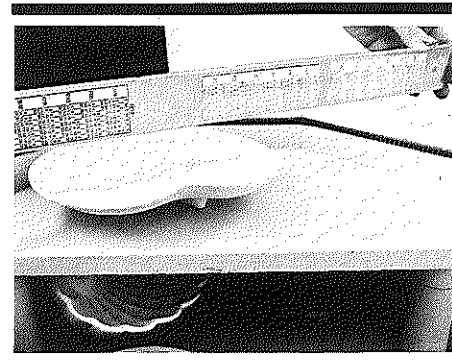
Glaze firing requires stiltling and careful placement of ware to avoid discoloration from fumes.

### Loading for porcelain and stoneware firings.

These materials differ only in purity of clays, although they appear different in color and texture. By definition, both must be fired hot enough to render the bodies waterproof (be vitrified) at which temperatures they tend to wilt.

Because the bodies become soft, they must be bisque and glaze fired resting flat on a freshly kiln washed surface, or one sprinkled with silica flour (flint). Flint must be kept out of the element grooves.

To avoid distortion, pieces must either be carefully designed or the overhangs specially supported. Figurine arms are generally supported by hollow greenware pillars, made of the same clay



Check clearance with a ruler so pieces don't stick to your lid.

material. These will shrink along with the piece, which in high firings can be as much as 12%.

Simpler shapes such as wide plate rims are generally supported by reusable rings (setters) made of even higher firing material specifically shaped for that one article.

Both porcelain and stoneware glaze firings are invariably dry-footed to prevent fusion to the shelves.

### Overglazes.

Stilting may be helpful, especially when overglazing unsound ware, because it allows heat to penetrate between the ware and the slower-heating shelves. Large double-pointed stilts can be used to hold plates apart when fired on edge. This may actually be the safest of overglaze loading methods.

### Glass sagging.

Because of the very close temperature control necessary with glass work, it is rare to fire on more than two shelves. The lower one is usually posted well off the kiln floor and the upper one is placed at least 3" above the first mold. The center of the load should fall a bit above the center of the kiln.

### Firing instructions.

Today's prepared clays and glazes, when used as directed, are very tolerant of different firing schedules, as evidenced by the fact that many studios begin all firings of slip-cast ware by immediately turning off all switches to High and closing the lid after 45 minutes! If it ever seems necessary to slow down the recommended schedules given below to get satisfactory results, you should check the health of your ware first.

When firing a new kiln or one that has undergone repairs or disturbance, place and watch a Senior visual cone at Kiln Sitter level for at least the first ten firings to double-check the automatic shut-off. Make it a habit to always place a Senior visual cone at Kiln Sitter level, as mentioned in our loading instructions.

If you are ever in doubt about a firing, simply **turn the kiln off**. Never chance ruining an entire load of ware if something has toppled off its stilts, if you hear odd noises, or if the kiln has been jarred. You won't harm your ware by shutting the kiln off before maturity. Simply set fresh cones and start over.

Because you will keep the top peephole unplugged during the entire firing, **never** unplug any of the lower peepholes for more than a few seconds. This causes a strong convection "jet-draft" which can easily fracture ware and chill the cones in the kiln, particularly visible cones placed behind that particular peephole.

Most workers prefer to take 5-7 hours for ceramic bisque and glaze fires (Cones 06-04), 7-10 hours for porcelain and stoneware (Cones 3-6). The simple switching schedules below are suitable for

all full load firings of ceramics, porcelain and stoneware.

### Kiln preparation before firing.

1. Turn all switches to Off position.
2. Raise lid and lock in Up position.
3. Check Kiln Sitter adjustments.
4. Raise falling weight and set proper Junior cone in Kiln Sitter.
5. Load kiln. Set Senior visual cone(s) while loading.
6. Lower lid and insert lid prop; 2 1/2" for overglaze and lace fires, 1" for all others.
7. Plug peepholes except for the top one, which is always left open. This will allow fumes to escape, and avoid fumes traveling through the Kiln Sitter tube and gumming up the mechanism.
8. Set limit timer for 1/2 hour beyond expected firing time. You may always change the limit timer setting simply by turning the dial.
9. Push in Kiln Sitter plunger until it locks in.

### Firing schedule for the Skutt 614-3 with infinite switches.

1. Turn all switches to Low for 1 hour, longer for hand built or wheel thrown ware. Overnight on Low can ensure against explosion of thicker wheel thrown or hand formed ware.
2. Turn all switches to 4 for 2 hours.
3. Turn both switches to 6 setting for up to Cone 04 firings. Use the High setting for Cones 03 and hotter.
4. If kiln atmosphere is already free of haze and little odor is coming from the kiln, or if you've fired on Low overnight, close the lid. If the kiln atmosphere is hazy, check regularly until the kiln is vapor free, and then close the lid.
5. Watch Senior visual cone set at Kiln Sitter level for first 10 firings of new or just repaired kiln.

### General comments on infinite switches.

When instructions refer to "Medium" switch settings, such as the Ceramic Glaze Firing section on page 13, set your 614-3's infinite switches to 4.

If your Skutt 614-3 consistently fires too hot or too cool at the top or bottom, follow the guidelines suggested for the 818 on page 17, and adjust your numbered settings for Medium or High to compensate accordingly.

### Firing schedule for Skutt kilns with infinite switches. Models 818 only.

1. Turn all switches to Low for 1 hour, longer for hand built or wheel thrown ware. Overnight on Low can ensure against explosion of thicker wheel thrown or hand formed ware.
2. Turn all switches to 4 1/2 for 1 hour. On Models 818WR and 818WRBR you may retard the heat setting of the center section by 1/2 of 1 number for more even heating.
  - 3a. For Model 818, turn both switches to 6 for up to Cone 04 firings. Use the High setting for Cones 03 and hotter.
  - 3b. For Model 818WR turn the top and bottom switches to High, center switch to 4 1/2 for up to Cone 04 firings. For Cones 03 and above turn top and bottom switches to High and center to 4 1/2.
4. If the kiln atmosphere is already free of haze and little odor is coming from the kiln, or if you've fired on Low over night, close the lid. If the kiln atmosphere is hazy, check regularly until the kiln is vapor free, and then close the lid.
5. Watch Senior visual cone set at Kiln Sitter level for first 10 firings of new or just repaired kiln.





### Firing schedule for Skutt kilns with 3-heat switches. Includes Models 714, 1018, 1027 and 1227.

1. Turn all switches to Low for 1 hour, longer for hand built or wheel thrown ware. Over night on Low can ensure against explosion of thicker wheel thrown or hand formed ware.
2. Turn all switches to Medium for 1 hour.
3. Turn all switches to High.
4. If the kiln atmosphere is already free of haze and little odor is coming from the kiln, or if you've fired on Low overnight, close the lid. If the kiln atmosphere is hazy, check regularly until the kiln is vapor free, and then close the lid.
5. Watch Senior visual cone set at Kiln Sitter level for first 10 firings of new or just repaired kiln.

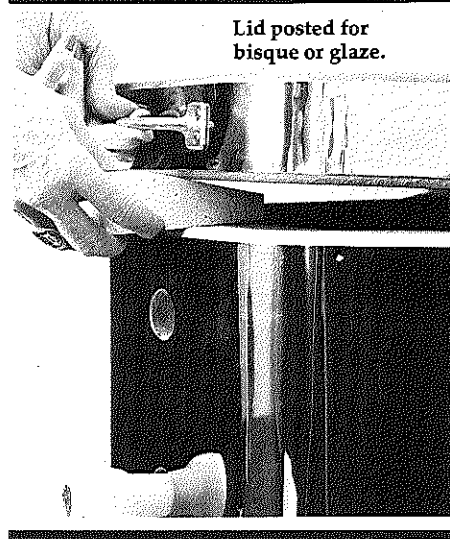
### After each firing.

1. Allow the kiln to cool naturally. Never unplug other peepholes or post the lid until the ware is cool enough for bare-handed unloading.
2. When unloading, be sure to examine the Senior cone and the Junior Kiln Sitter cone carefully. If they disagree, find out why.
3. There should still be 15-45 minutes left on your limit timer's dial (it stops when the Kiln Sitter trips). If not, revise your setting next time.

If the falling weight is found upright, you know the timer shut the kiln off. Find out why immediately.



Lid posted for face, china, gold, or luster.



Lid posted for bisque or glaze.

### The underglaze fire.

Greater detail can be preserved in conventional and one-stroke underglaze decoration if it is first "set" by a Cone 019-04 firing before glazing and a glaze firing. If the decoration was applied directly to greenware, the underglaze fire acts as the bisque fire, and therefore should be a full Cone 05-04 fire.

### Ceramic glaze firing.

**Warning:** Use only lead-free or lead-safe glazes on any surface which may come in contact with food or drink.

If your ware has been bisque fired to Cone 05 or 04 and properly glazed, dried

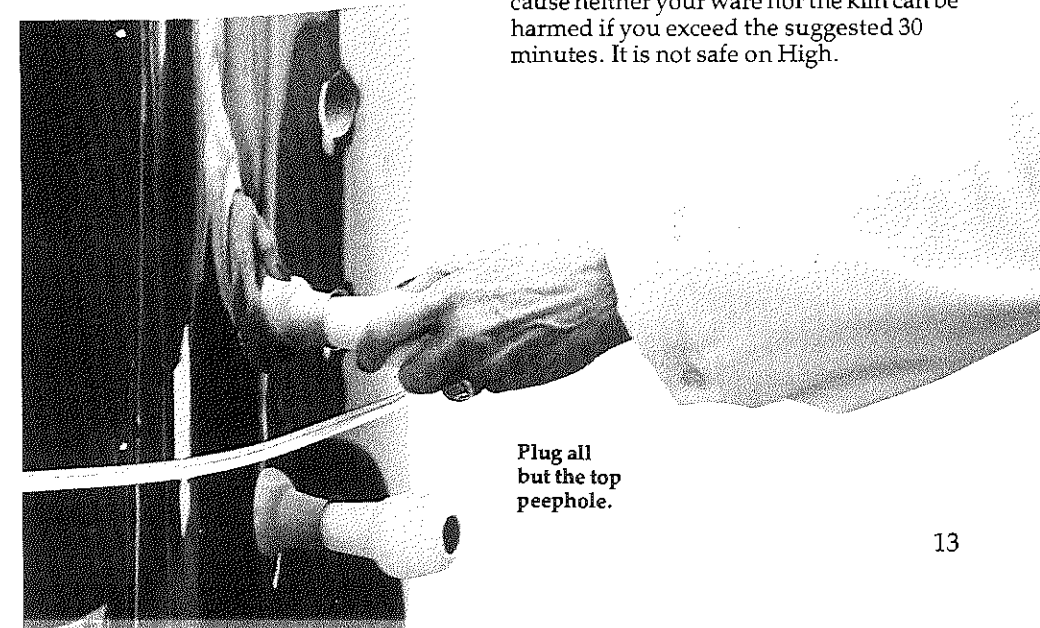
and loaded, an 06 or 05 glaze fire will normally produce a flawless surface. If not, consult the ware imperfections section, on page 16.

Crystalline glazes often require Cone 04 firing to develop fully—or may need a "soaking" period at slightly reduced heat after maturity is reached.

Soaking is accomplished immediately after automatic shutoff, typically by an 05 Junior cone.

1. Turn all switches to Medium.
2. Lift the Kiln Sitter falling weight half way.
3. Push the Kiln Sitter plunger in firmly, making sure it is well latched.
4. Gently lower the falling weight so as not to unlatch plunger.
5. Leave in this position for 20 to 30 minutes.
6. Push falling weight down to unlatch plunger in Kiln Sitter, turn all switches to Off.

On Medium this is a safe procedure because neither your ware nor the kiln can be harmed if you exceed the suggested 30 minutes. It is not safe on High.



Plug all but the top peephole.

### "Greenglaze" one-fire ceramics.

With the talc clay bodies and prepared glazes available to the ceramist today, some prefer to "one-fire" their ceramics. In some instances you can satisfactorily glaze a piece of greenware and complete it in a single firing, maturing the clay body and the glaze at the same time. However, because there may always be residual moisture in the clay body, persistent cratering and pinholing may occur, as well as off-color spots from impurities burning out of the clay. Fire to at least Cone 05, or preferably to Cone 04.

Except with reds, the best one-fire results are usually obtained by soaking for 20 to 30 minutes, as explained above.

### Overglaze fires.

**China paints.** If fired too hot, fine detail will be blurred. If fired too cool, china paint pigments will not be absorbed into the glaze and will quickly wear off. Fire until the paints acquire a sheen similar to the surrounding glaze. With practice, this can be judged through the peephole. By setting a group of guide cones, you can note which cone is down when sheen matches, so you can fire exactly to this cone with the Kiln Sitter.

This temperature will vary over several cones if widely different colors are used. High quality will be achieved only by applying and firing the higher temperature colors first, followed by lower temperature ones. The required temperature also varies with the softening temperature of the parent surface.

For ceramic and porcelain articles other than tableware, a single Cone 019 firing will often be a good compromise.

**Metallics** (gold, platinum, copper, and others). These will fire dull if applied too sparingly, or if underfired. Overfiring, particularly of larger areas, results in reticulation or "crocking"—shrinkage of the metal, leaving a network of glaze lines exposed. Greater overfiring results first in spotty, then total disappearance of metal through vaporization. On ceramics and porcelain start with Cone 019. Metallics and greens are usually incompatible.

**Lusters.** Lusters may flake off if applied thickly and will "frost" if overfired. To start over, fire to 06-05. Keep ware well away from kiln elements. Fire to 019 for durability, drop to 020 if frost is encountered. Lusters are extremely sensitive to contamination by kiln vapors, particularly those from greens, and lid ventilating must sometimes be continued at 1/2" or 1" throughout the firing.

**Overglaze.** Breakage of ware during overglaze firings can usually be traced to roughly-handled, unevenly-dried or unevenly-sponged greenware. In general, there is less trouble with art porcelain than with ceramic pieces, and least with high quality, pre-glazed, dry-footed imported china blanks.

Firing schedules for overglazes can usually be accelerated because the ware is entirely free of moisture. Sound ware can be started on Medium for one hour, switched to High and the lid closed whenever lack of odor shows the oils have been completely driven off. Under-ventilation is the biggest cause of problems.

### Firing porcelain.

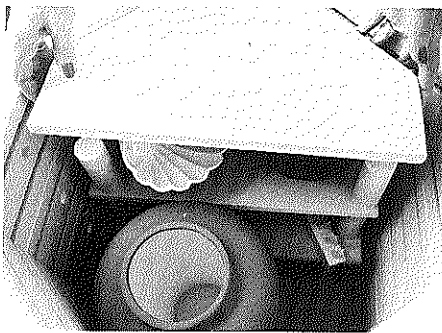
Art porcelain should be bisque fired to Cone 5 or 6 (not 05-06) in your Skutt kiln, with the 4 1/2" blank ring removed of course. Ware should be loaded and supported as noted on page 11. Begin glaze fires with the lid posted open 2 1/2". Optimum translucency can be achieved several ways.

1. By loading the kiln very heavily with ware or extra shelves.
2. By bisque firing twice to the same temperature, often wet-sanding with a fine grit silicon carbide paper between firings for maximum smoothness.
3. "Soaking" for 30-45 minutes immediately following automatic shutoff, as discussed under ceramic glaze firing.

Porcelain glaze is usually fired at Cone 3, at which temperature auxiliary supports for arms are no longer required. But dry-footing is still essential.

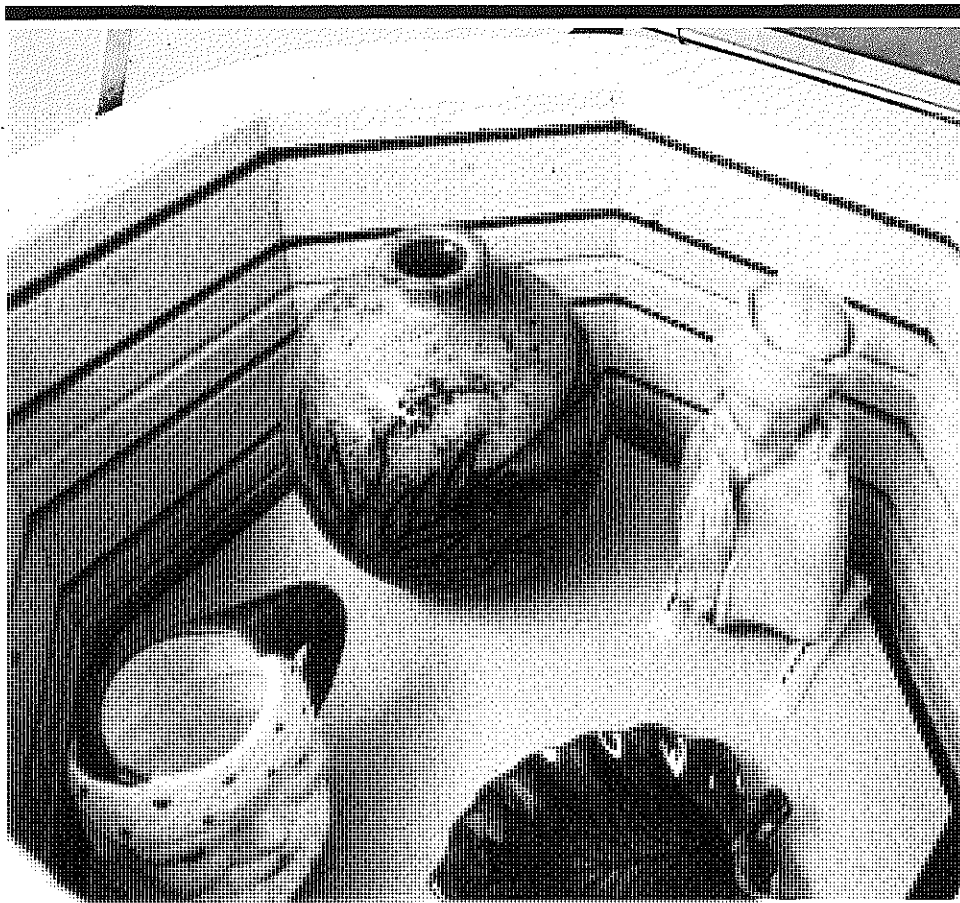
Overglaze decoration is fired exactly as with ceramics, but usually 2 to 4 cones hotter (017-015) to produce penetration, gloss and durability on the higher-softening glaze. Overglazes are also frequently applied directly to porcelain bisque that is to remain unglazed. Fire to the above cones.

Removing  
stilts.



Fire together only glazes with similar heat  
recommendations.





Allow ample room for air circulation around ware and shelves during glaze firings.

### Firing stoneware.

All Skutt kilns (except Model 1227-208) can attain Cone 8 or Cone 10 (with any blank rings removed, of course.) Trying to high fire with blank rings in place will seriously overwork the elements.

Because stoneware shapes are designed for self-support during firing, the glaze can be matured at the same time as the body, particularly because the pinholes, sunbursts, and scumming which tend to accompany one-firing are often highly prized in stoneware. Pieces are dry-footed, of course, and loaded per page 11.

The procedure for stoneware differs from that for one-fire ceramics in that the plain or decorated greenware is usually first given a low bisque firing at Cone 016-04 before glazing. Due to the ware's thickness, the Low period is extended in all firings.

While the typical overglaze decorations are rarely considered suitable on stoneware, Cone 06-04 reds, oranges and crackles are sometimes added by after-firing to provide effects unobtainable at the higher temperatures. Warm the vitrified ware to facilitate application of such glazes.

### Firing glass.

**Sagging** of sheet glass and bottles is carried out in terra cotta molds dusted with whiting (calcium carbonate) or one of several similar tradename separators.

Fire on Low for one hour with the lid posted 1", then close the lid and switch directly to High until kiln is shut off by an 016-014 cone. This varies with the brand of glass. For best results, immediately flush the kiln by posting the lid open 1" for one to ten minutes; then close the lid and allow the kiln to cool naturally.

Glass softens very quickly and many workers prefer to use a pyrometer (thermocouple type thermometer) rather than pyrometric cones. Using one, remain on Low until about 700 degrees F., then switch directly to High, closing the lid as soon as odors cease. Fire rapidly to preserve the colors. Shut off the kiln and post the lid immediately when the pyrometer reaches the desired temperature, usually in the 1450-1525 degree F range for most glass.

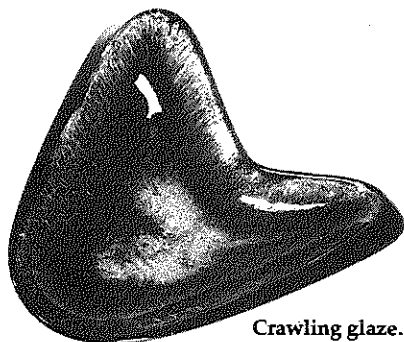
**Glass decoration** can often be carried out with conventional china paints, metallics and lusters when the glass is being fired to sagging temperatures. Freestanding tumblers and other vessels can rarely be taken above Cone 022 without wilting, so at such low temperatures the special glass stains, golds and lusters produce more dependable results.

## Troubleshooting ware imperfections.

### Common glaze faults.

**Crawled glaze.** In "crawling", blank or bald spots appear in the glaze surface after firing. Crawling may be caused by having a dusty or dirty bisque surface, or applying the glaze heavily. Skin oils from excessive handling of greenware may clog clay pores, causing the glaze to be repelled. Hard spots in the clay surface created by excessive sponging or polishing of the greenware is also a cause.

To attempt to salvage such a piece, apply additional glaze to the bare spot and refire, or cover the entire piece with a textured glaze and refire.



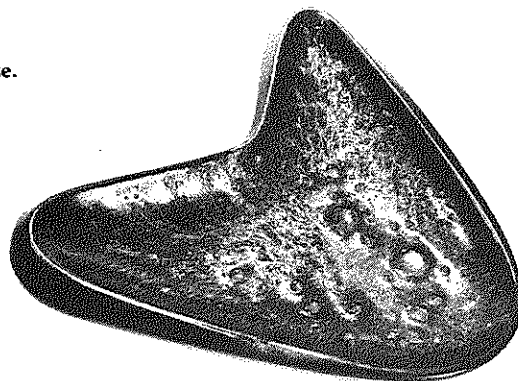
Crawling glaze.

**Cratered or bubbled glaze.** In this glaze error, the craters develop as a result of body gases erupting through the glaze and "freezing" as the kiln cools. This condition is caused by underfiring. To salvage such a piece, grind down the high spots, apply a thin coating of glaze and refire to a higher temperature.

**Pinholes.** Pinholes are tiny indentations in the glaze surface which are generally no larger than the point of a pin. This fault may occur in almost any type of glaze, and is caused by underfiring. To salvage a piece, refire at a higher temperature.

**Sagging glaze on a vertical surface.** Sagging or running glaze is generally caused by too heavy an application of glaze. It is a warning sign that too much glaze is being applied. Take extra care with similar pieces.

**Excessive application of glaze.** The example shown demonstrates the type of surface which can result from too heavy an application of glaze. This error is difficult to salvage, so remember to apply less glaze in the future.



Excess glaze.



Excess glaze.

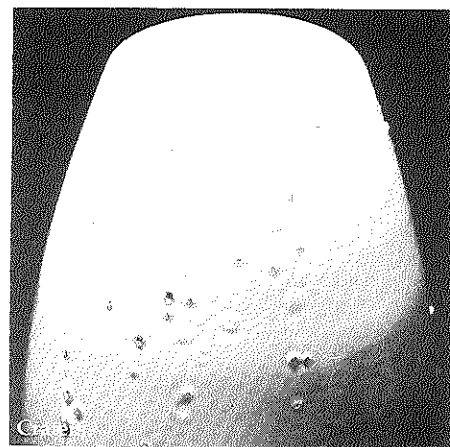
**Discolored overglazes.** Underfiring occasionally leaves small pin holes or pores in the glaze that can't be seen without a magnifying glass. If there is poor ventilation in the kiln, china paint oils may seep into these pores and burn to charcoal, seriously affecting the color of the finished piece. You can sometimes repair the damage by soaking the piece for several hours at a low red heat, cooling and inspecting to be certain that all the carbon has been oxidized, and then giving the piece a true glaze firing.

### Additional glaze errors.

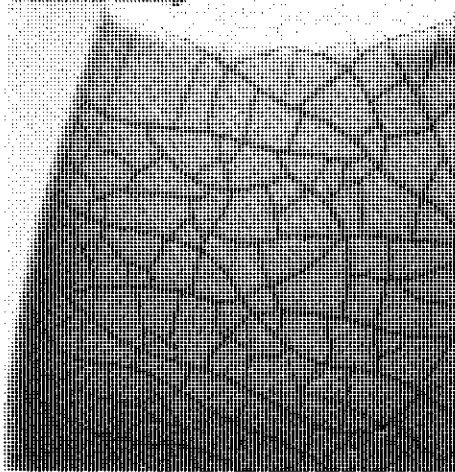
**Cracks in the body.** When a crack occurs in the body, examine the glaze at the edge of the crack. If the glaze is inside the crack or rounded over the corners, the break occurred early in the glaze firing, and was probably present in the clay body before the piece was glaze fired.

In some instances a sound appearing piece of ware will crack during a glaze or overglaze firing. This can be caused by an excess of water used in the original clean-up of the greenware. Too much moisture applied to an area of greenware causes that area to expand while the dry or slightly damp areas have already gone through normal shrinkage. Even if a piece of dry, cleaned greenware shows no visible cracks, it is possible an internal stress is there. This crack can open up during later firings.

If the glaze at the edge of the crack is sharp, the break developed after the glaze was fired. This type of crack is usually due to opening the kiln door or peepholes while the ware is still hot.



Finished crazing



**Crazing.** Crazing is characterized by a network of fine cracks in the glaze surface. It may be caused by underfiring bisque, clay or glaze, incompatible clay and glaze, or by opening the kiln door before the ware is completely cooled. Crazing may be eliminated by refiring the piece to a temperature one cone higher than the original firing.

**Delayed or aftercrazing.** Crazing may also occur days or months after the piece has been fired. Although the finish may look perfect when it is first removed from the kiln, crazing may occur. While underfiring may not be the direct cause of immediate crazing, it is the major cause of delayed crazing. To correct it, refire the piece.

**Shiny matt surface.** A matt glaze which becomes glossy in the glaze firing is generally caused by overfiring. It is extremely difficult to correct.

**Textured glazes, smoothed.** A textured glaze is formulated to develop an irregular surface when fired. If it fails to do so, it is generally due to too light an application of glaze. It is extremely difficult to correct this condition. Reglazing and refiring rarely will help.

**Cloudy or discolored glazes.** This condition is characterized by a muddy or discolored appearance in the fired glaze. It may be caused by using dirty or contaminated brushes, by not leaving enough space between the glazed pieces during firing so chemical fumes jump from one glaze to another, or by placing the piece too close to the kiln elements. It is extremely difficult to correct.

**Grainy glaze.** Uneven or irregular color in the glaze surface is generally caused by too thin an application of glaze. To correct, apply a coat of glaze, then refire.

**Greyed or discolored red glazes.** Grey wash out, or black areas in the red glaze may be caused by too thin an application of glaze, the red glaze being fired with colors which it is incompatible, (generally yellows and greens) or firing too hot. Cone 07 to 06 is usually the best range for red glazes. To salvage, apply a heavy coat of glaze and refire.

**Underglaze peeling.** Underglaze may pull away from the clay body. This may be caused by too heavy an application, or not firing the underglaze before applying glaze. It is extremely difficult to correct this error.

*This section on glaze faults prepared in collaboration with Martin L. LaVoor who assisted with information and illustrations.*

### Electrical and kiln trouble shooting.

Your Skutt kiln is put under heavy load as it heats and cools. Like any electro-mechanical device, it may show signs of wear. For most home hobbyists, electrical work can be both confusing and dangerous. If this listing points to internal electrical trouble, we recommend you contact your Skutt dealer.

### Automatic shutoff.

Kiln Sitter consistently over or underfiring compared to a Senior check cone at Kiln Sitter level.

1. Check Kiln Sitter adjustments, page 8.
2. Bent Junior cones from Kiln Sitter deeply cracked across lower faces, indicating moisture problems. Buy new cones.

Kiln equipped with infinite switches (Model 818) consistently firing too hot or too cool in one section.

1. Adjust infinite switch higher or lower on Medium and High settings to compensate.

### Occasional overfiring.

1. Sensing rod not accurately centered between cone rests.
2. Falling weight mounting bracket bent so weight rubs against it. Adjust per page 8.
3. Overglaze oils or organic matter from native clays accumulated on inner face of guide plate. Remove plate, clean with lacquer thinner. Never plug top peephole. Vent lid longer if necessary.

Senior check cone overfired, but Junior Kiln Sitter cone only normally bent.

1. Use magnifying glass to doublecheck numbers of both fired cones.
2. Cones may erratically "freeze" if, near end of firing, the temperature rises less than 50°F per hour or, in Skutt kilns, when more than 10-11 hours is required on High after lid is closed. Always remove 4 1/2" blank ring when firing hotter than Cone 1 (Cone 01 in Model 1227-208).
3. If problem persists, see your Skutt dealer.

Kiln found with weight fallen but pilot light and all elements still on. Cones overfired.

1. Turn switches off. Protect hands with gloves. While kiln is still hot, perform 2 o'clock drop test, page 8, fifty times. Repeat when cooled. If plunger is released every time, you either forgot to latch the weight up when setting the cone, or the fall was impeded by the power cord or another obstruction.
2. If any cleanly-made 2 o'clock drop fails to release the plunger, contact your Skutt dealer.

### Electrical problems.

Only half of the kiln's elements light up on Medium.

Normal. The Medium element always occupies the lower half of the section controlled by three-heat switches.

Irregular clicking noises from models equipped with infinite switches (Model 818).

Normal. These switches constantly cycle on and off at all settings other than High.

Elements hum at first, later do not.

Normal. Kanthal-type elements are magnetic only up to red heat. Humming then ceases.

Fuse blows or breaker trips more than one minute after switching to High.

1. Fuse/breaker and wire sizes improper for the kiln. See page 4.
2. Other loads on same circuit.
3. Poor quality fuses loosely screwed in sockets.
4. Tarnished or loose connections at a breaker or fuse socket. This can increase the temperature of either device, causing unwarranted interruptions. With main switch Off, make sure all connections are bright and tight. Replace panel parts if necessary.
5. Note: Your kiln will not draw more power as it ages. Aging elements can only draw less power.

Fuse blows or breaker trips almost immediately after switching to High.

1. On Model 714, unit is plugged into incorrect socket. See testing, page 5.
2. Check circuit and switch box as suggested above.
3. Examine cord and plug for breaks.
4. Check with Skutt dealer regarding interiors of switch boxes.

Power interrupted during firing, kiln is still hot.

1. If still in venting stages, refire as though a fresh load, using original cones.
2. If venting is completed and you know the load was never within one hour of shutoff, resume firing with the same cones. If chamber glows visibly red with power off, switch directly to High. Otherwise, first fire one hour on Medium.
3. If you suspect the load was within one hour of shutoff, cool kiln, set fresh cones, and refire as usual, except that the lid can be left closed throughout.

Abrupt increase in firing time.

1. Check your Senior cone, and shut off kiln manually if it is down. Check Kiln Sitter thoroughly as outlined above.
2. If your Senior visual cone is still standing and you have confidence that it bears the correct number, check fuses or breakers. If temperature then begins to rise, complete firing as usual.
3. With Model 714, turn to High. If half of kiln is unlighted, one side of a two pole breaker may have tripped. Reset breakers.

4. On Models 818, 1018, 1027 and 1227, one section's not heating may mean an element is dead. Unplug kiln and gently lift straight runs with a pick to find the break. See your Skutt dealer for element replacement.
5. If elements are not broken, contact your Skutt dealer about switch box connections.
6. If problems persist, ask your power company to perform a voltage test at your wall outlet with all elements on High.

Gradually increasing firing times, often accompanied by increasingly uneven temperatures within the kiln.

1. Wall receptacle defective. With main switch off, check connections, or call an electrician.
2. Circuit feeding wall receptacle defective. Brighten, tighten or replace screws, fuse sockets or terminals.
3. Kiln switch box connections need tightening. Contact your Skutt dealer.
4. Power supply problems. Have your power company connect recording volt meter to studio wiring and also make spot check of voltage drop from main panel to kiln's wall outlet with kiln drawing full power. Start a firing at your usual time and volt meter will record voltage variations during the critical hours when your kiln should be approaching shutoff.
5. Elements need replacement. Contact your Skutt dealer.

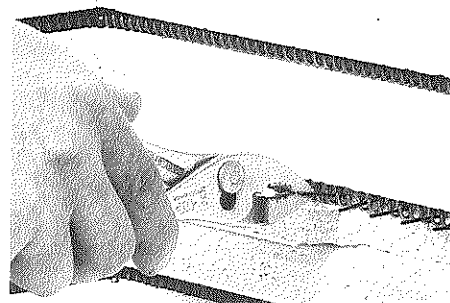
### Some simple repairs you can make.

Happily, your Skutt kiln will give you few occasions to refer to this section. The careful handyman can keep a Skutt kiln operating with no difficulty. But if you are not mechanically inclined, it is best to call an authorized Skutt service person, or competent small appliance repairman or other electrician. Take this owner's manual along with you. To transport your kiln, handle sections by their outer edges, and place them on a flat surface, cushioned by folded blankets.

### Wall repairs.

The premium brick used in Skutt walls will withstand thousands of firings without crumbling. Broken element grooves are usually the result of carelessness in handling the kiln sections or in loading ware.

It's almost impossible to cement a broken groove lip back into place without contaminating the heating element. If the element starts to sag out of position, hang it on 1 1/2" element pins only, inclined toward the back of the groove as shown.

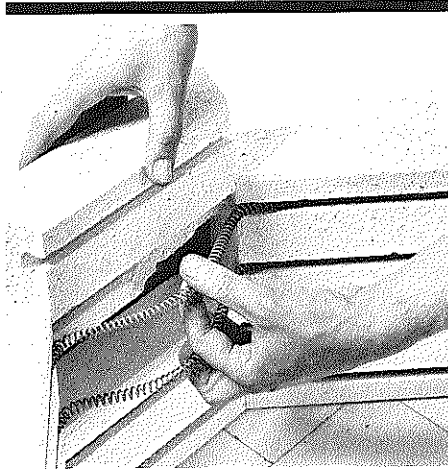




**Caution:** elements become very brittle after a few firings, so if straightening is necessary, heat that element electrically to visible redness, unplug the kiln from the wall and immediately push the element back into position with a metal implement, reheating whenever stiffening is detected. Place your hanging pins in a straight row and the element will serve the rest of its normal life.

In general, don't be concerned about the loss of a little wall or floor thickness. The element grooves reduce nearly nine square inches of each wall brick to 1 7/8" thickness, so a few more square inches make little difference.

Replacement of wall bricks is simple in Skutt kilns. 1. Order needed bricks from the parts list available from your Skutt dealer. Replacement of terminal bricks involves cutting and renewing element connectors and should normally be postponed until it's necessary to replace that element. 2. If repairing a top ring, disconnect the lid and remove all fittings from the jacket except the switch box. 3. Place the ring, damaged side up, on a perfectly flat surface such as the kiln lid. 4. Pull out the straight element pins at the ends of the damaged brick. 5. Loosen the worm-type jacket tighteners equally, 1/2" to 3/4". 6. Gently lift elements from troughs with a pick or long-nose pliers and gently bow them out into firing chamber just far enough to allow damaged brick to be slipped out and its replacement inserted. Make sure element troughs are proper side up. This is easiest if a helper holds the adjoining bricks away. Remember that the elements are brittle. 7. Hold the tightener housings with pliers and tighten them evenly until the worms seize. Slip ele-



ments into new grooves and pin down. 8. Use sandpaper over a woodblock to sand the edges of new brick down nearly flush with its neighbors. 9. Replace hinges and hardware, and position the kiln so you can finish tightening the jacket during a firing, just before the kiln shuts off on your next Cone 06 or hotter firing. 10. Finish sanding the new brick down flush with its neighbors.

#### Floor repairs.

Unless a glaze is overfired, drips of it can normally be knocked off a well-maintained 1/16" layer of kiln wash without damage to the surface below. Remember to remove all ceramic glaze drips before taking the kiln to porcelain/stoneware temperatures, where they will be overfired and soak through the kiln wash.

The floor can be patched level again even though several square inches have been damaged to a depth of 5/8". Simply

undercut or dovetail the edges of the area to retain a patch made by mixing dry high fire kiln wash with just enough water to form a very stiff putty. Tamp the putty into place, and scrape flush with the rest of the floor. Allow to dry well before firing.

Don't forget that your kiln floor has two lives—just turn it over.

#### Lid repairs.

Because your Skutt lid is so strongly cemented and well reinforced by its stainless steel band, you'll have to work hard to get it to develop a crack which will sift particles on your ware. Use only the contoured venting prop to "post" your lid up to save the dustproof coating.

If a tall glazed piece expands enough to fuse to the lid, do not attempt to fill the resulting hole, but simply smooth its interior with sandpaper and blow clean. Your lid too, has a flip side if ever needed. Just remove the screws holding the hinge leaves, turn the lid over, and reattach the leaves to new 3/32" holes drilled in the lid's band.

#### Replacing elements.

While Skutt kiln elements are not difficult to replace, they require electrical connector tools. We recommend you ask your Skutt dealer about the procedure. He can also help you with the rare switch box problem.

#### Glossary

**Aftercrazing.** Glaze crazing after firing—days, weeks or months later.

**Bisque.** Ware which has passed through its first firing without benefit of glaze.

**Ceramic.** In general, any man-made solid product resulting from the fusion of mineral substances. Also used to identify a type of high-talc body which fuses at moderate temperatures—cones 05-03.

**Clean-up.** The process of cleaning, scraping, sanding and sponging greenware to make it ready for firing and decoration.

**Cone plaque.** A stand or rest for holding cones during firing.

**Crackle glaze.** A type of glaze which when fired is intentionally "crazed". Stains or other colorants are often rubbed into the cracks to heighten the effect.

**Crazing.** Small hairline cracks in glazed surfaces that appear after firing. Usually caused by underfiring the body.

**Dipping.** Application of glaze to bisque or greenware by simply immersing it in a container of the glaze.

**Dry footing.** Leaving the base of a piece of ware free of glaze, or removing applied glaze from the underside of the foot by wiping. Avoids the need for stilts.

**Element.** A coil of resistance wire through which current passes, creating the necessary heat for firing.

**Element groove.** The recess in the kiln brick into which the element is placed.

**Firing.** The act of maturing clays and glazes by the application of heat.

**Firebrick.** The insulating blocks which form the chamber of your kiln.

**Foot.** The supporting rim at the base of a piece of ware.

**Glaze.** A special finely ground glass suspended in water with the aid of gums or emulsifiers. Glaze may be clear or colored; glossy, eggshell or matt; applied to bisque or greenware by brushing, spraying, pouring or dipping.

**Greenware.** Unfired, fragile clay forms, wet or dried.

**Impurities.** Minute quantities of foreign matter in clays which often cause spots in glaze.

**Incising.** Cutting through moist greenware in a desired pattern.

**Kiln sitter.** A patented device which uses pyrometric cones to automatically and accurately shut off the kiln.

**Kiln wash.** A high heat-fusing powder to which you add water and brush onto kiln shelves and kiln floor. It allows removal of accidental glaze drips. Also used on high-temperature parts of the kiln sitter.

**Limit timer.** A device which operates by time alone, back-stopping the kiln sitter in case it is defeated.

**Lusters.** Irridescent overglazes, applied thinly.

**Mature.** A completely fired piece of ware or glaze.

**Nesting.** Placing one piece of greenware within another for bisque firing.

**Ohm meter.** An instrument for measuring resistance in elements.

**One-fire.** The practice of applying glaze to greenware and firing one time.

**Overglaze.** Decorative liquids applied over the glazed surface, such as china paints, lusters, gold and other metallics. Fired at lower temperatures.

**Peephole.** An opening in the kiln wall which allows visual inspection of the chamber during firing.

**Peephole plug.** A piece of refractory used to plug the peephole.

**Pinholes.** Small holes in the glazed surface of ware.

**Porcelain.** A clay body which when fired to approximately cone 6 becomes vitreous and translucent.

**Posts.** Ceramic shapes that support kiln shelves during firing. Three per shelf are recommended.

**Pouring.** The act of filling a mold with slip.

**Pyrometer.** A high temperature thermocoupled device or thermometer. Most useful in glass firing. Cannot be accurately substituted for cones in firing other materials.

**Pyrometric cone.** Slender, unfired clay pyramids which soften and bend when the kiln load has matured to the desired degree. Two sizes are available. Junior cones are for use in the kiln sitter, Senior cones are for visual use.

**Refractory.** Any high temperature clay material.

**Sgraffito.** The decorative technique of removing some areas of underglaze from ware with a sgraffito tool, thus allowing the color of the body to show through.

**Shelf.** A slab on which ware is placed in kiln. Allows utilization of the full kiln height.

**Slip.** Liquid clay slurry which is poured into molds.

**Soaking.** Holding a kiln at or near a given temperature.

**Stilts.** Various single- and multi-pointed supports used to hold ware up off the shelves during the glaze fire, thus preventing adhesion.

**Stoneware.** A high fired ceramic body which is vitreous, not translucent, and usually made of native clays.

**Talc.** A white powder used in ceramic clay bodies.

**Terminal brick.** The kiln brick through which the element pigtails pass into the switch box.

**Terra cotta.** A natural, low firing red clay.

**Thermocouple.** A pair of wires which are inserted into the firing chamber to serve as the temperature-sensing element of pyrometer.

**Underglaze.** Liquid coloring which is applied directly to bisque or greenware.

**Venting.** The practice of propping up the kiln lid ("posting" it) to allow the escape of vapors during initial stages of firing.

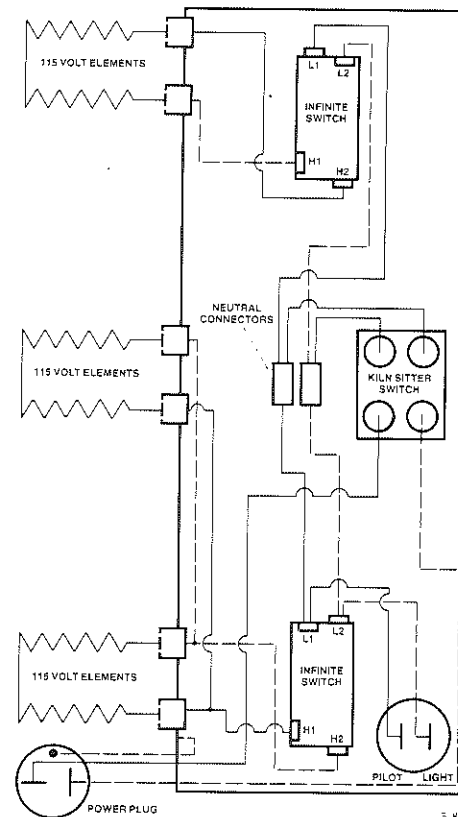
**Vitreous.** Fully fused, waterproof ware which need not be glazed.

**Volt meter.** An instrument for measuring voltage at the kiln.

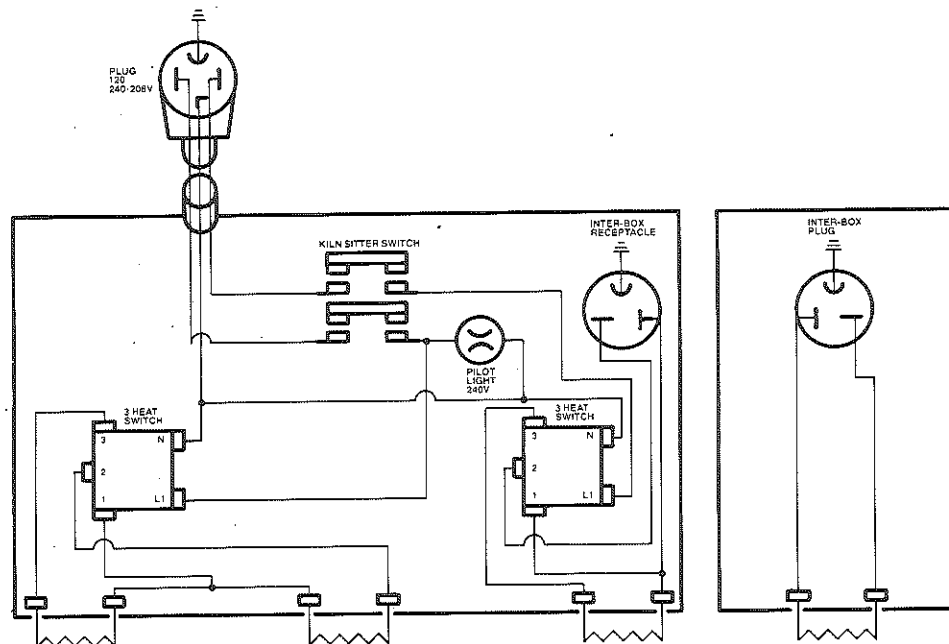
**Warpage.** The loss of ware shape during firing, usually caused by overfiring or improper placement in the kiln.

**Ware.** Any shaped piece of pottery, stoneware, or porcelain, in any state of completion.

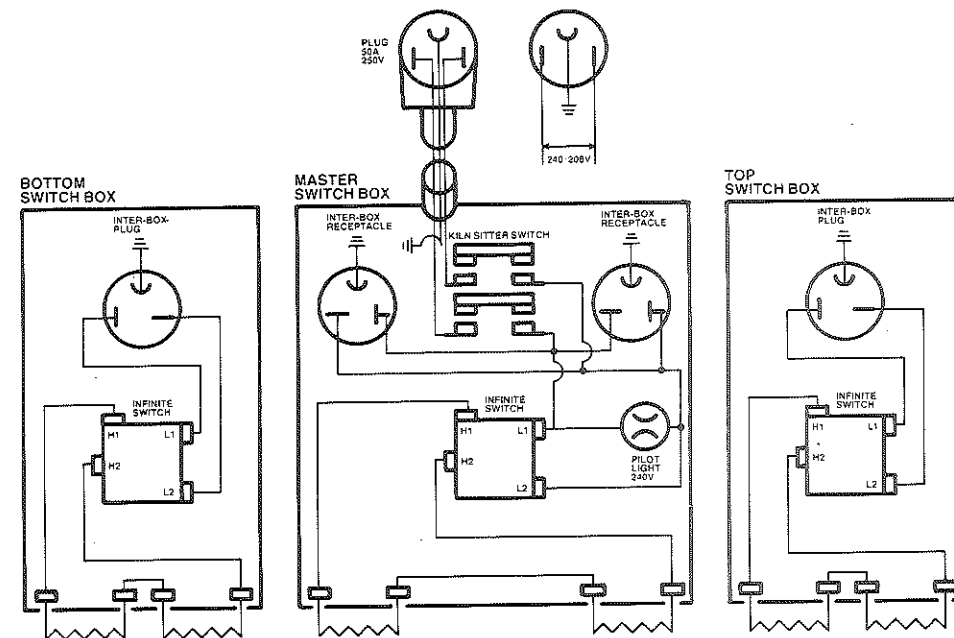
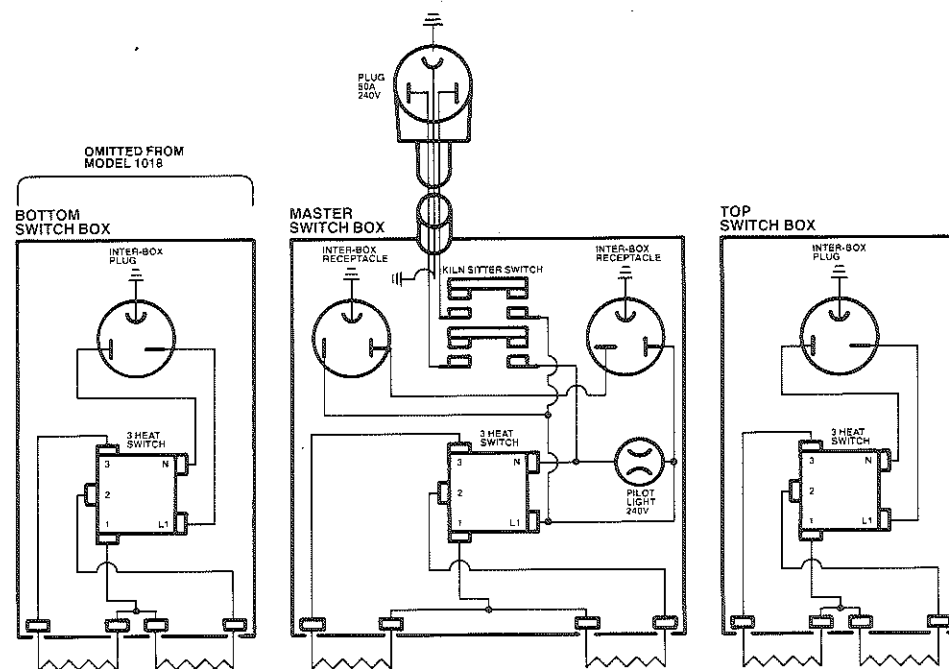
Model 614-3 Wiring Diagram



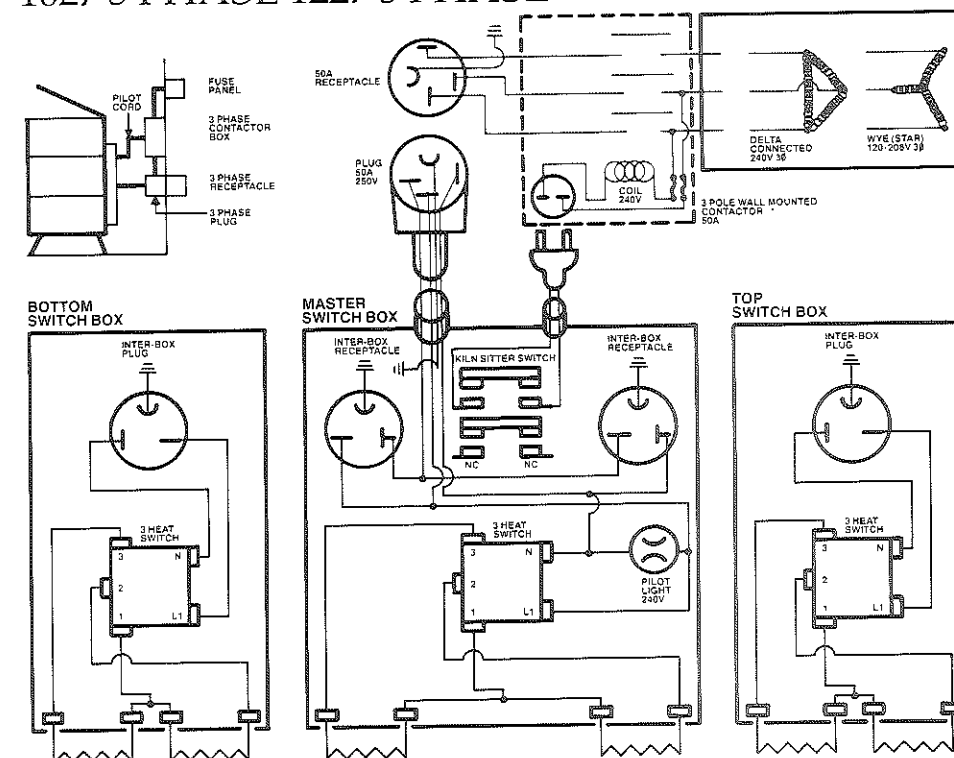
Wall receptacle is 115 Volts, 20 Amps. Breaker size must be 30 Amps. #10 copper wire is recommended from breaker to wall receptacle.

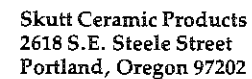


1018, 1027, 1227



1027 3 PHASE 1227 3 PHASE



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