9-28-1970

Ceramic planters that function as space dividers

Richard Zimmer

CERAMIC PLANTERS THAT FUNCTION AS SPACE DIVIDERS

by
Richard K. Zimmer
Candidate for the Master of Fine Arts, in the
School for American Craftsmen of the
Rochester Institute of Technology

September 28, 1970

Advisor: Professor Hobart Cowles

DEDICATION

This thesis is dedicated to my wife Dorothy and my son Christopher.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

For the past two years I have developed a great interest in plant life. My apartment has become overcrowded with them and a decision as to where to put them produced the idea for my thesis. If I put a series of planters together I could use them as a space divider and also the plants would help alleviate the overcrowding on the window sills. In answering these two needs the planters created a living wall of quiet beauty.

The planters also allowed me to go in two different directions. I wanted to make larger forms that were plant-like themselves and also to make a series of smaller hanging planters that could function together as space dividers.

I chose to work on three types of glaze problems because I lacked a general knowledge of them and I wanted to learn more. I had not the intention of learning everything there was to know about them for that would have been impossible in such a short period of time. I wanted a good basic understanding of them so I could continue experimenting on my own after I had left the School for American Craftsmen.

CHAPTER 1

Glazes

Glazes have always been a challenge for me. At first I was a little mystified and afraid of them. They seemed complicated and difficult to understand. My first year at the School for American Craftsmen unclouded many of my misinterpretations about glazes.

In choosing glaze problems for my thesis I decided to tackle three different areas. These were frit glazes, slip glazes and ceramic decals.

Frits are compounded glaze materials that can be easily calculated because all the elements are known. Slips on the other hand, are clays that one digs up. Their elements are unknown and can only be guessed or deduced from experimentation. Ceramic decals were of interest to me because I wanted to know how much was involved in their production.

When I look back on it now I set quite a task for myself and I have learned a great deal.

FRIT GLAZES

I ran a series of three different tests on frits. Two frits were combined and from that point I added other materials to improve the quality of the glazes.

The first test was with frits P283 and P25, both alkaline frits. The alkaline frits are used primarily

in artware glazes to obtain certain colors and crackle effects. I added kaolin to the frits and found all three worked best as a cone five glaze in equal parts. My basic formula was:

frit P283	33.3
frit P 25	33.3
kaolin	33.3

I ran the following color test on this batch. (Illustration 1)

The results on most tiles turned out well except for the combinations of red iron oxide and manganese dioxide and copper carbonate and manganese dioxide. I further examined the possibilities with red iron oxide, bone ash, amblygonite and rutile. Red iron oxide worked best at 12%. Bone ash differed very slightly from 1% to 15% and made the glaze a darker brown. Amblygonite lightened the glaze at 3% and rutile brought out yellows and tans at 1% and 2%.

Two excellent glazes resulted from these tests. Both glazes are shiny and opaque. Number one is a red brown while number two is a tan.

	One	Two
Frit P283	33.3	33.3
Frit P 25	33.3	33.3
Kaolin	33.3	33.3
Red Iron Oxide	8	8
Bone Ash		8
Amblygonite		2
Rutile		1-3/4

Frits P658 and 3134 were the next combination of basic frit ingredients for glaze testing. I used equal parts of both frits and added kaolin to get the most satisfactory glaze in

a cone five, oxidation firing. Forty-five parts of kaolin worked the best for this series.

In talking over my selection of frits with Mr. Cowles, he suggested I replace frit P658 with frit 3466 because P658 is no longer available. I therefore replaced this frit with 3466 and retested the glaze. The glaze was bright and crazed with equal parts of frit at 50 grams and kaolin at 45. I added flint to help reduce the crazing which it succeeded in doing at 14 grams. I made color tests on this transparent glaze using the same materials as in the previous test. A majority of the colors were interesting and could be used.

Frits 3403 and 3195 were the next two I used together. These are both lead frits and therefore could be fired only in an oxidation atmosphere. I also added kaolin and found 32 grams to 50 grams each of the frits worked the best.

I made another series of color tests (Illustration 1) and from these found that test 3-5 with 1% copper carbonate and 5% rutile was the most interesting.

This test resulted in a semi-brite, yellow tan with patches of blue green. I continued a series with these oxides to see what further effects I could obtain. The result was copper carbonate could be varied from 1½% to 2½% and rutile from 10% to 15%. The following is the recipe.

Frit 3403	38
Frit 3195	38
Kaolin	24
$CuCO_3$	1.5% to 2.5%
Rutile	10% to 15%

CERAMIC DECALS

I approached this challenge two different ways. My first approach was to make use of the facilities at the School of Printing. They permitted me to use their screens. They also reproduced the images I selected in the screen. My second approach was to construct my own silk screens and transfer the pictures on them in the Textile Printing Shop.

The first problem I encountered was with the photograph I wanted to use. The picture had to have a high contrast or it could not be effectively transferred on a silk screen. In addition, the image had to be covered by a "dot system" screen. "This screen reduces the tonal values to a system of large and small dots on the finished film print."[1] The dots are responsible for the half-tone positive which ranges from black to white.

Newspaper pictures go through this dot system, however, and the image if it is a news clipping need not be covered by a "dot system" screen again.

The picture (Illustration 2) was made, first into a negative (Illustration 3) and then a positive. (Illustration 4) These prints are not ordinary ones, but are made on transparent positive film, Ulano film, which is an orthochromatic film. Orthochromatic film is not sensitive to red light in a darkroom. I used the equipment and chemicals in the Graphic

[1] Carol Goldman, "Picture Pots", Ceramics Monthly, January, 1968, p.21.

Media Center to produce the positive. The next step was to take the positive to the School of Printing.

The School of Printing has the facilities for the screen printing which I thought would be beneficial to potters who wanted to have screens produced in a relatively easy manner. Mr. Robert Webster, who operates the screen printing laboratory, transferred the positive image on to the screen. The process used to produce the image on the screens varied from what I had done in the Textile Shop.

The Printing Shop used a nitex synthetic fabric screen in place of a silk screen. The essential difference between the nitex synthetic fabric screen and the silk screen is the removal of the film after use. The film on nitex can be removed with clorox. Film on a silk screen must be removed with hot water since clorox would destroy the screen.

The fotofilm used was DeCote produced by McGraw. DeCote produces better half-tones and finer detail than the "Hi-Fi" Green I used.

The treated paper support of the DeCote fotofilm is placed face down on a flat surface. The contact surface of the nitex screen is put down on the fotofilm. A Bichromated Colloid, sensitizing solution is squeeged across the back of the screen. The sensitizing solution makes the fotofilm sensitive to light.

When the screen is subsequently dried the treated paper support is removed leaving the sensitized fotofilm ready for contact with the positive. The screen and positive are placed on the Nu Arc Vacuum.

The Nu Arc Vacuum is basically a metal box with a strong light source, a thick piece of glass over this light source and a vacuum that can pull the positive and screen against the glass to insure better contact. The positive is therefore placed on top of the glass of the Nu Arc. The contact surface of the nitex screen is placed on top of the positive. The positive and screen are exposed to the strong light for approximately 2½ minutes.

After the exposure, the screen is washed in 92 degree F. water. The water washes off the film protected by the black areas of the positive. The light penetrated the less dense areas of the positive and chemically hardened these areas to the screen. The darker regions of the positive are therefore essentially the areas that the ceramic ink will reproduce.

After the screen has dried it is ready for use.

In making my own screens and transferring the image myself, I learned more about the difficulty of such an operation. I used the Textile Printing Shop to make my silk screen and also transfer the image.

After constructing the screen I made a contact print by placing the transparent positive on a film called "Hi-Fi" Green produced by J. Ulano & Company, Inc. (Illustrations 5 & 6). This film is a water soluble, presensitized screen process film with a vinyl support backing. The film is barely light sensitive and has to be left exposed under the Nu Arc Rapid Printer for ten minutes.

The film is developed with Ulano "A" and "B" developer for approximately two minutes. Warm water between 110F. and 115F. is used to wash the film until the design is clean. The wash is finished off with cold water.

The wet film is then adhered to the contact surface of the silk screen. The screen and film are blotted with paper until the water is removed from the film. After the film is dry, the plastic backing sheet is peeled off. The adhesive residue from the film side is then washed off with carbon tetrachloride.

The screen is now ready for use. I, of course, found it far easier to allow the School of Printing to handle this part of the operation. There were two advantages to doing this process myself. One, I learned what was involved and could say that I did do all the work myself. Two, I did not have to wait until the School of Printing had time to do the screening.

The two different types of fotofilms used allowed me to use both oil base and water base glazes. The "Hi-Fi" Green

fotofilm is water soluble so it therefore needed an oil base glaze. The DeCote fotofilm is not water soluble and therefore a water base glaze could be used. The thin surface of the decal paper on which the image is printed is however water soluble. I was limited, therefore, to oil base glazes when working on decal paper. I purchased the decal paper from Rueby Process Co., Inc. in Rochester, N. Y.

I used frit glazes, ball milled them dry and then added oil to a thick pasty consistency. These glazes squeegeed through the silk screen onto the decal very well.

After the glaze image dried a thin layer of adhesive material is needed to hold the separate dots of glaze in place as the decal paper is soaked off the back. This adhesive material or cover coat, with the glazed picture on it is then placed on the pot and squeegeed until all air bubbles and water are forced out from between the cover coat and the pot.

I was intent on finding a cover coat or developing one. Krylon, a crystal clear acrylic, was the first material experimented with. It was sprayed on four times to insure good coverage and allowed to dry twenty-four hours. The decal paper was placed in a dish of water and soaked for two minutes. Two minutes was sufficient time for the paper to absorb water and pull away from the cover coat. Krylon, however, did not hold the glaze.

Best Test, a white rubber cement was the next material tested. I again let it dry for twenty-four hours and allowed

the paper to soak in water for two minutes. The rubber cement lifted the image off the paper very nicely but required extreme care in handling. The image was squeegeed on a test pot and allowed to dry before firing to cone five.

After the firing, the image was checked to see if it remained on the pot. The rubber cement burned off and left the image in good condition on the pot.

The next two cover coat tests were made with varnish. Damar Varnish and Decal Varnish were applied with a brush and allowed to dry for twenty-four hours.

The decal paper was soaked in water and removed. The varnishes retained the images very well but were not elastic enough and fell apart after cracking. Varnish, needless to say, did not make a good cover coat.

The white rubber cement worked the best but I feel more experimentation is needed in this area.

I also squeegeed some glaze directly on a test pot. This process worked out well as long as the surface was relatively flat. The nitex screen with the DeCote fotofilm worked since water base glazes could be used for this direct transfer technique. The image was fairly distinguishable. (Slide 7) These tests all were quite successful in the sense that I learned about some of the problems in ceramic silk screen printing. There still are many ideas to be tested. Professor Cowles suggested silk screening directly on damp clay and pushing the image out of shape. This sounds like an exciting

possibility for the potter.

Rockland Associates have invented a paint on darkroom emulsion called Print-E-Mulsion that can be used to put a photographic image on ceramics. I have not tried these processes but have reached the conclusion that I will in the near future.

SLIP GLAZES

I found the slip glazes the most fun to work with. I obtained slip from two different areas. I looked first for clay deposites on the R.I.T. campus. I found it very close at hand, only a quarter of a mile from where I live in married tenants housing. The clay was part of a stream bank and I dug only a few inches to retrieve it.

The second clay was brought to me by a fellow classmate who had dug it up on his property. He discovered it when he had a pond bulldozed.

I soaked both slips in basins of water and screened then through various mesh screens, the finest being a forty mesh. The clay was then dried out, pulverized and resieved.

I applied the slip on three pots and fired one at cone 08, cone 05, and cone 9 before taking them to Professor Cowles for analysis.

The R.I.T. slip, upon talking with Professor Cowles, appeared to have a high silica content and also some calcium.

The greyish green color of the slip could mean there was some organic matter in it.

The next step was to add the following ingredients to flux the slip.

A 1-2-3 parts Gertsley Borate for CaO and B_2O_3
B 2-4-6-8 parts Spodumene for Li_2O, Al_2O_3 and $4SiO_2$
C 1-2-3 parts frit 3191 for Na_2O, CaO, B_2O_3 and SiO_2

I continued the testing at cone nine and found Gertsley Borate in the A tests worked best at two parts. I then continued the test with the slip at 10, Gertsley Borate at 2½ and made a series of tests adding tin, opax, titanium and rutile.

Opax produced a scaring of the surface while tin, titanium and rutile worked fairly well. Titanium, however, bleached out the slip quite strongly.

The additions of spodumene up to 10 parts produced shivering. After looking over the glaze carefully we decided the utectic point of spodumene was at five for this particular slip. Gertsley Borate was then added at 2 parts, which was all that was needed as an additional flux. I then proceeded to add one part one tin to try and lighten the color of the glaze. It worked and made a fairly nice glaze that responded well to a patterned application.

Frit 3191 was added and worked well at five parts frit to 10 parts slip. I also added opax and bone ash which resulted

in the blistering of the glaze. After this small set back I switched to zircopax which works well at .7 parts. The resulting glaze was:

Slip	10
3191	5
Zircopax	.7

This glaze was a good yellow tan matt.

The slip brought in by a friend when fired by itself at cone 9 had a dark brown pebbly texture. It appeared to need more silica so I added 1 part flint to 10 parts slip. I also added 1-2-3 parts Gertsley Borate for the B_2O_3 to aid as another glass former. The glaze turned darker and more immature from the flint. The Gertsley Borate, however, helped melt the glaze better at 3 parts.

I developed the test further by increasing the Gertsley Borate to 3.5 parts and adding 1 part bone ash and 1.2 parts of Tin Oxide to see if I could get a red brown color. The result was a very nice red brown, matt glaze. The final ingredients are:

Slip	10
Gertsley Borate	3.5
Flint	1
Bone Ash	1
Tin Oxide	1.2

CHAPTER 2

Planters

A large number of people today are living in suburban homes and city apartments. Both types of dwelling afford little space for trees, shrubs or plants. Suburbanites find themselves often living no farther than one hundred or two hundred feet away from their neighbors with little land in front or behind their homes. Apartment dwellers usually have no land to grow greenery on and often very little room in their apartments to place their favorite houseplants. These people have to plan their living space very carefully if they desire an abundance of plants.

This style of living, however, does lend itself to the use of ceramic planters that function as space dividers. The home owner or apartment dweller can create traffic patterns and break up the space in their living quarters while adding a bit of warmth and atmosphere.

The planters in my thesis were designed for the home, apartment or lawn. I set a goal of making at least ten sets of planters. Two larger sets were to be used on the outside of the house or apartment patio. The smaller sets, with usually five planters or more per set, I wanted for use in the home.

After I had finished my ninth set of planters and displayed a majority of them for the Spring Critique, I was made aware of a very important fact. Mr. Gernhardt, who was the guest critique for the pot shop, told me I had a very poor display. It was true and after thinking about it for a few days I decided to put my planters out on loan to other people so they could make them function as space dividers in their own apartments or homes. In doing so, they would use their own imagination in hanging them and deciding what plants they thought suited the planters. I was putting these planters to the test.

Section 1. Standing Planters

Set 1.

My first planters were larger, plant-like in form and constructed by attaching thrown forms together. I designed them for the lawn or patio and they were to be set into the ground. These planters were to create a strange, humorous effect. I made five of them, each different in size.

The base of each is constructed of three deformed cylinders attached together. The top is a large cylinder with a bottom and small balls attached to it. After I made the top cylinder, I placed it on a modeling wheel and proceeded to make the balls to be placed on the outside of the cylinder. I allowed the balls to harden in the beginning but found as I made more that they could be placed directly on the pot. The

balls were deformed a little as the result of immediate placement upon the pot but I felt this added to the plant-like quality of the planter. I pushed a small hole into each of the balls to prevent it from exploding in the kiln.

The planters, when completed, were tall and hard to handle. They made it through the high fire bisque and I glazed only the balls with low fire green, blue, yellow and red glazes. I was pleased with the colors and then proceeded to encase the base of the five planters in cement. I made a form out of bricks found around the shop and used a gravel, sand, ready-mix cement.

I buried the base of the planters in the ground close to each other. This made quite a difference in their appearance. They did look like large, humorous, plant-like creatures growing from the ground. I was very pleased with the effect.

Set 2. (Slides 12-15)

I conferred with Professor Wildenhain about these planters and he told me of one he had seen constructed of two cylinders that wrapped around each other. This gave me an idea for another set of planters. I decided this set would be made up of three tall cylindrical planters, one of them consisting of two cylinders that wrapped around each other.

By constructing all three planters at the same time I was able to complete the three more quickly. I allowed the

bottom portion of the planters to dry and set up before I added the next section. After throwing the cylinders, I took them directly from the wheel and attached them by scoring and applying slip to the top of the previous section. I then distorted the new section and drapped plastic over it to allow even drying. I was, however, too hasty in adding a section at one point and one of my cylinders tore apart. The bottom was too damp and I had pushed the clay too far off balance. I let both broken sections dry to a leather hard state and scored the edges and attached them. In doing this, I was able to achieve a very pleasing effect.

I finished the piece by inserting a cylinder with a bottom inside the top cylinder. I cut away sections of the outer cylinder to give it a more plant-like shape. These pieces were also very fragile but made it through a high-fire bisque. I used a low-fire blue glaze on the top inner portion of the piece and a low-fire black glaze applied very thinly on the rest of the piece.

My next step was to set them in cement. I did this using bricks as in the first set of planters. My first unfortunate accident occurred a week later. When I tried to move the planters one of them snapped and broke near the cement base. They were too thin to be moved without taking a great deal of care.

I made the cylinders thin because it allowed me to twist them out of shape with greater ease. The thinness allowed me

to achieve a more interesting form. I should have either filled the form with cement or made the wall thicker.

The planters were also set outside in the ground.

These planters, like the ones in Set 1, were designed to be humorous if not somewhat grotesque. They are, however, different from Set 1 in that they need plants in them to work aesthetically. The planters in Set 1 can work without the plants.

Section 2. Hanging Planters

Set 3. (Slides 16-18)

My next attempt with forms from nature was with a set of two large hanging planters. These were very interesting in shape and I was quite pleased with them.

They are completely handmade and I enjoyed working on them. The basic shape was made by using a deep bowl as a mold. I rolled out six coils of clay and placed them in the bowl, an equal distance apart, running from the lip to the bottom center of the bowl. I covered them and the inside of the bowl with plastic and pressed clay into this form. The end result was six long grooves in a basic bowl shape. I made four of these shapes and put two together lip to lip. I then cut out a three inch diameter hole at one end and rolled a slab of clay together in a tube shape and attached it to the rim of this hole. I then joined the three inch diameter top to the top of the tube shape.

I allowed the forms to stiffen up and then cut out the long vertical openings in the slab tube. I also made a hole in the top to allow a rope to fit through. I glazed only the top with a low-fire black glaze.

These planters hang in a friend's apartment and separate the music area from the rest of the living room. He hung them with a hemp rope and was delighted in the way they worked as a space divider.

Set 4. (Slides 19-21)

My next set of hanging planters were designed using a similar form and construction technique as that of Set 3. I rolled out three coils and placed them inside a larger bowl. I made eight of these shapes and then paddled two layers of coils around the top edge to form a smoother and thicker rim. Under the rim of the planters I made three holes equally distant for hanging. These planters were glazed with a brown glaze applied very thinly to help retain the rough quality of the clay.

These planters I loaned to another friend. He and his wife hung them with venetian-blind cord that they dyed dark brown. This group of planters separates the dining room and the living room. They used springerii, ferns, spider plants and donkey's tail as the plants. These different plants all worked well together and make an interesting wall.

The next four sets of planters are similar either in design or the technique in which they were made. They are all slabs. Three of them I used wooden fabric stamps from India to create a design in the slabs. I purchased these stamps from a store called "Dockside" in Alexandria, Virginia. (Slide 22)

Set 5. (Slides 23&24)

The first set of ten planters were made from slabs that I stamped. I folded the slab around a wad of paper and pressed the sides together leaving the press marks in the planter. Holes were poked in the top and bottom of each side for hanging the planters. With this set I also made flat stamped slabs to hang in between the planter to break up the space further.

This set was hung in my apartment to create an entrance way into the living area. It directed the flow of traffic from the front door to the center of the living room. The planters also provide for an interesting conversation piece as well as containers for my increasing collection of plants.

I hung these using heavy duty rug yarn. As long as the pots are small and the yarn does not get wet it will last for approximately one year. I would not recommend using it as the main support for the pot.

These planters like the other three sets in this section do not work well individually as planters. They are excellent in a group and do not overpower the plants.

Set 6. (Slides 25-27)

The next set of planters were stamped slabs pressed into a bowl. The slabs were draped over the edge of the bowl and cut off unevenly to form a flat irregular lip. I made the holes under the lip so that leather or a small chain could be attached. Flat slabs and coils were constructed to hang in between the planters. This set hangs above a kitchen counter and breaks up the space between the kitchen and an informal dining area.

The planters contain a variety of plants and are hung with ten pound fish line. The people who I loaned them to are quite pleased and said the plants need only to be watered once a week. I also felt the planters worked well in the area.

Set 7. (Slides 28-30)

I made another set similar to the last but larger and without a stamped design. I glazed it with an iron red-brown color. These planters were not exciting individually but did look well together.

The people who hung these constructed a wooden frame to hang the planters from. Braided strands of rope were used to hang these planters. They divide a study area from the rest of the living room.

Set 8. (Slides 31-33

The last of these four similar sets was the most time consuming to finish. I made this set for a specific type of

plant. The Spider Plant. The Spider plant requires a lot of water and doesn't need direct sunlight. These plants are also root bound and do not need much soil to grow in. I, therefore, needed a small planter with only a small opening that would prevent a rapid evaporation of water.

I decided to make a planter with a circular shape. I cut circular slabs, all the same size and stamped them. Between two of these circular slabs I attached a low four to five inch diameter, bottomless cylinder. After the cylinder had become leather hard I cut a rectangular hole in one side.

I rubbed a yellow glaze into the design made by the stamp after they were bisqued and fired it to cone five.

I again was disappointed by the individual planter but I feel it works well as a group.

After I finished the last of these four sets of planters I felt the urge to get back on the wheel. The next two sets were thrown on the wheel.

Set 9. (Slides 34-36)

Set 9 Consists of small bowls of varying sizes that have a small rim to them. They were good planters and could work individually as well as in a group. I glazed them a grass green.

The couple who I loaned these planters to have used them to create a reading area in their living room. They

feel plants produce a quiet atmosphere that is essential for reading.

Set 10. (Slides 37-39)

The planters in set 10 were the result of my passion for more form in the planters. I threw a basic cylinder leaving the finger ridges in them. The shape was wider at the top than at the bottom of them merely for decorative purposes. I then applied handles on the top rim. I felt the design was very effective.

I glazed these pots with one of the slip glazes I had developed. These are hung in the entrance way of an apartment and separates the hallway from the owner's bar. He has used a chain to hang them and attached the chain to screw eyes in the ceiling.

Section 3. Standing and Hanging Planters

Set 11. (Slides 40-42)

The last set of planters I made is a conbination of hanging and free standing planters. I used a simple box shape. I found and constructed cardboard boxes to use as forms for my planters. My first attempt at making the planters was unsuccessful. I had trouble with an even drying. I solved this problem by placing the boxes on sticks to allow the air to get under the bottom and insure a more even drying.

My first handles were also unsuccessful. They were too small and would not hold the weight of the dirt and plants.

Therefore, I made another set of boxes with larger handles. I attached them to the side of the box instead of to the rim.

I used rope to hang this set of planters. There are nice clay qualities to the boxes and they are quite successful as planters. I glazed only the inside of the boxes with a slip glaze.

CONCLUSION

It is very difficult to make a concluding statement on my work. I feel that I have just begun working. I have been working at ceramics for approximately four years and I know it will take at least another four years before I can say I am a good potter.

My experience with planters has brought me a long way in learning about clay as a material. I felt I solved some problems in construction of my planters. I still have much to learn about design. I worked in two separate directions. My large planters were complicated while my smaller ones were extremely simple. There was a steady progression of similar ideas in the stamped slab planters but I also tended to jump around from one design idea to another. The box planters, for instance, were a totally different design from the smaller stamped planters.

These planters were designed to work in a group and not as individual pieces. In most cases, they do not function as single pieces. The group of planters must also be visualized with plants in them. This is important to the concept of the planters. I have built an interdependence between the plant and the planters. While the plants depend upon the planters for a home, the planters also depend on the plants to help make an attractive space divider.

I have always felt that I could not limit myself while in school to any one way of making pottery. The need to delve into and experiment with a wide range of areas in pottery is a basic part of my human makeup. The ideas I have jotted down in my notebooks are enough to keep me busy for the next twenty years.

Perhaps this basic need for experimentation in a number of areas led me to choose three glaze problems for my thesis. Ceramic decals and slip glazes I found to be the most rewarding. Ceramic decals were rewarding because they are complicated and slip glazes because of their simplicity. I have learned enough to go on with further experimentation in these areas on my own.

The School for American Craftsmen has given me the knowledge to cope with any problems I may encounter in ceramics. I feel this has made my two years here a valuable experience.

BIBLIOGRAPHY

Garren, Robert. "Ceramic Planters". Unpublished M.F.A. thesis, School for American Craftsmen, Rochester Institute of Technology at Rochester, New York, 1969.

Goldman, Carol. "Picture Pots". Ceramics Monthly, January 1968.

Kosloff, Albert. Ceramic Screen Printing. Cincinnati: The Signs of the Times Publishing Company, 1962.

Markman, Roberta H., and Marie L. Waddell. Ten Steps in Writing the Research Paper. Woodbury: Barron's Educational Series, Inc., 1965.

McDonald, Elvin. Garden Ideas A to Z. Garden City: Doubleday & Co., Inc., 1970.

Nelson, Glen C. Ceramics. New York: Holt, Rinehart and Winston, Inc., 1960.

Palusky, Robert. "Covered Containers and Serving Pieces". Unpublished M.F.A. thesis, School for American Craftsmen, Rochester Institute of Technology at Rochester, New York, 1969.

Rhodes, Damiel. Clay and Glazes for the Potter. Chilton Book Company, 1957.

Smolenski, John C. "Serving Pieces and Local Clay Glazes". Unpublished M.F.A. thesis, School for American Craftsmen, Rochester Institute of Technology at Rochester, New York, 1969.

Yu, Charles. "Methods for Applying Photographic Images or Designs to Ceramic Objects". United States Patent 3,171,742., March 2, 1965.

COLOR TEST CHART

1. base glaze
2. 4% red iron oxide
3. 2% copper carbonate
4. 1% cobalt carbonate
5. 6% rutile
6. 10% manganese dioxide

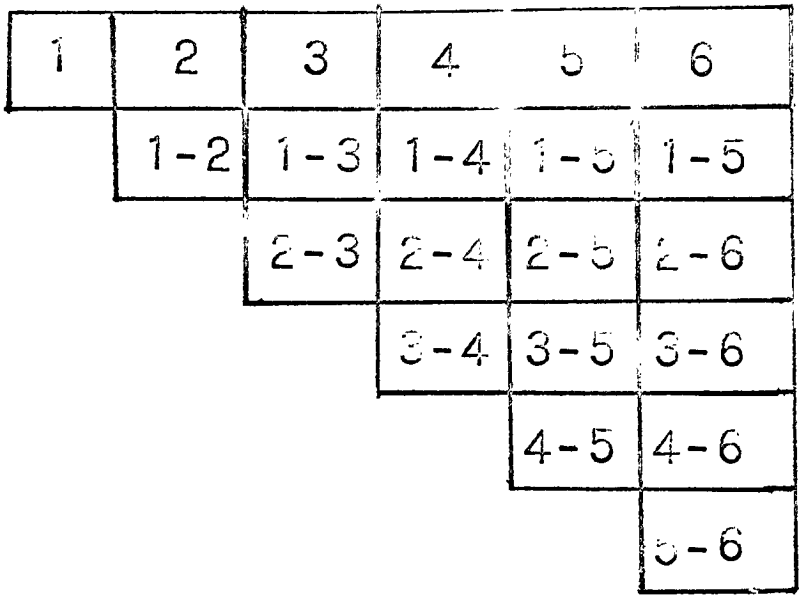


ILLUSTRATION 1

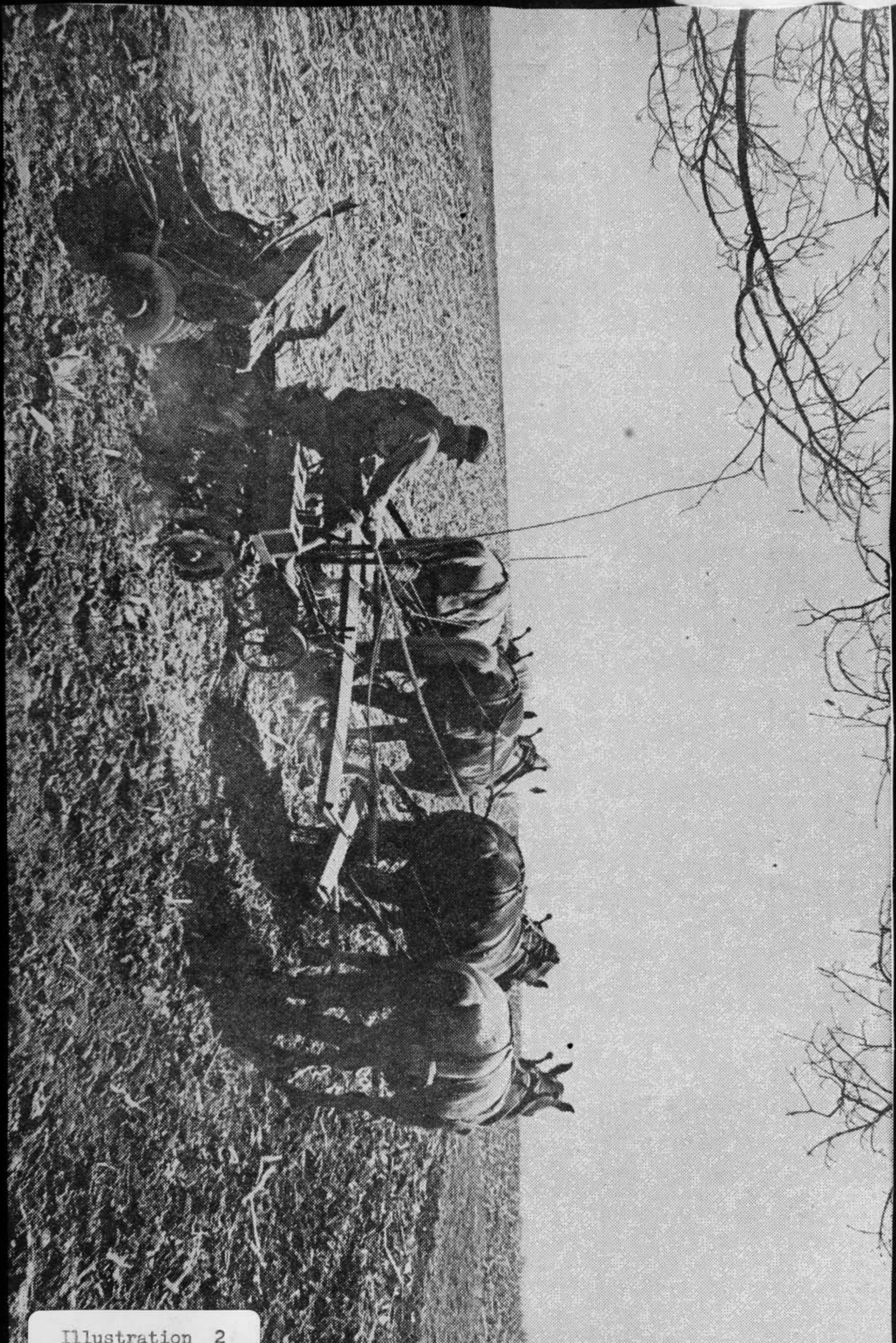


Illustration 2

Illustration 3

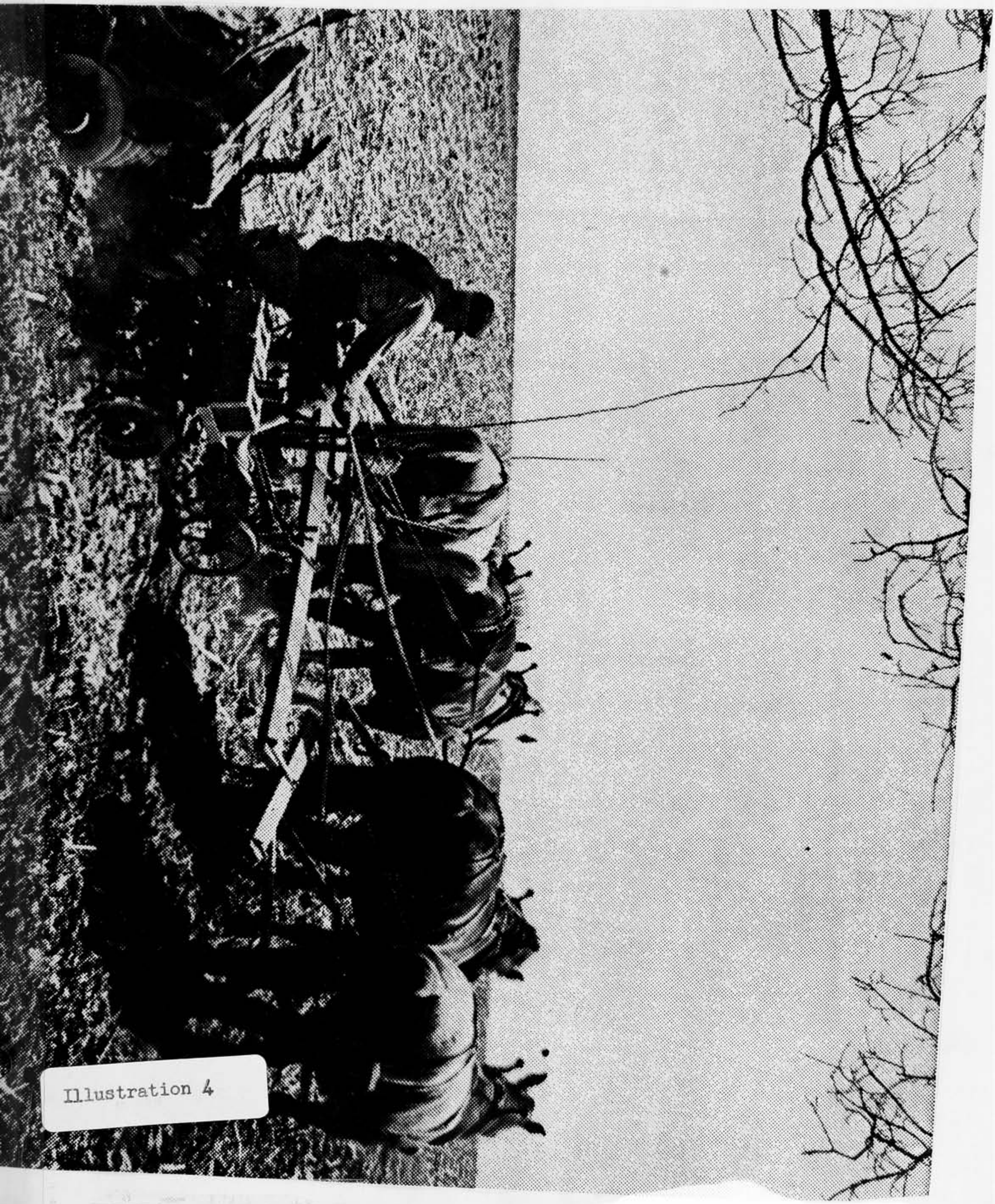


Illustration 4

SPECIAL TREATMENT FOR CLOSE REGISTER WORK

To make the film more flexible and to improve register . . . mix 2 ounces of Glycerine to one quart of water and use as follows:

After you have used at least two sheets of newsprint to blot up most of the water *while adhering* . . . apply a *soaking-wet coat* of this solution *to the inside of the screen* and allow it to remain on for about 5 minutes . . . then proceed to blot the screen in the conventional way. If 2 ounces of Glycerine to a quart is not enough . . . increase it . . . if it is too much decrease it.

REMOVAL OF FILM

Use hot water! If any haze is left, a small amount of Enzymes will take it out. Be sure to wash with vinegar after using Enzymes to kill the action of the Enzymes.

STORAGE OF "HI-FI" GREEN

"HI-FI" GREEN is presensitized and should be stored in the tube with the cap on. Keep it away from heat as it will "dry-out" the film and also may buckle the vinyl plastic backing sheet.

DARK ROOM

"HI-FI" GREEN does not require a dark room . . . however keep film away from sunlight and bright fluorescent lights. Yellow fluorescent tubes and incandescent lights will not affect the film.

IMPORTANT INFORMATION

Plants that are very warm and dry may have trauble because the film will lase maisture ta the dry air if expased far any length af time. When the film becames dry enaugh it will curl, crack ar even de-laminate when subjected ta raugh handling.

If yau are experiencing any difficulty alang these lines, stare the film in a humidified ar damp area.

Same users place the film in a cantainer with a maistened sponge. This replaces maisture in the film just like a humidar supplies maisture ta cigars that may dry-aut.

In the summer, during high temperature and relative humidity canditians, the film may became tacky and saft. At this time it shauld be stared in a caal, dry place.

J. Ulano & Company, Inc.
610 DEAN STREET • BROOKLYN, NEW YORK 11238 • MAIN 2-5200

Technical Data Sheet

ULANO "HI-FI" GREEN

(PRESENSITIZED SCREEN PROCESS FILM ON .005 VINYL SUPPORT)

ULANO "HI-FI" GREEN is a presensitized ready to use film for general all purpose screen printing.

1 – **COLOR:** GREEN
2 – Packaged 6 rolls per carton
3 – Size of rolls: 40" x 150" 44" x 150"
40" x 300" 44" x 300"
4 – Supplied in sheets: 20" x 30" (6 sheets per tube) (6 tubes per carton)

CHARACTERISTICS

- EASY TO USE!
- REQUIRES NO DARK ROOM!
- REMOVES FROM GAUZE WITH HOT WATER!
- DIMENSIONALLY STABLE!
- TOUGH EMULSION!
- STICKS TIGHT TO SILK, WIRE, NYLON AND DACRON!

Illustration 5

EXPOSURE

Always expose through the vinyl support. The best light source is a carbon arc. The resistance of the film will depend on a good light source.

It is impossible to give accurate exposure time as all lamps will vary. As an example – a 35 AMP arc at 30 inches should make a good film in 3 minutes

The longer the exposure, the thicker the film. The shorter the exposure, the thinner the film. To find the exposure you like, make a set of test exposures from thin to thick.

DEVELOPING

Mix one ounce (28 grams) of "A" to 35 grams of "B" in one pint (16 fluid ounces) of water . . . shake until completely dissolved! Pour in tray . . . *immerse film side up* . . . develop for 1½ minutes minimum.

WASH-OUT

Wash film with warm water between 110° F and 115° F (40 to 45C) until design is clean . . . finish off with cold water.

ADHERING

Provide the usual build-up or contact board – place the wet film on this board *film side up* . . . next place the clean screen in position and press lightly . . . now take newsprint (not newspaper) and blot . . . do not press too hard while blotting . . . use enough changes of newsprint to remove the water from the film. Allow film to dry! While film is drying, block-out all remaining open areas . . . this will improve register.

BACKING SHEET REMOVAL

After the film is dry, peel off the plastic backing sheet. If the plastic looks milky, the film should be completely dry and the plastic will strip off easily. If there is too much resistance, allow more time for drying. After the plastic backing has been removed, wash off the adhesive residue from the film side with naphtha, benzine, toluol or carbon tetrachloride.

IMPORTANT POINTS AND SUGGESTIONS

ULANO "A" AND "B" DEVELOPER

After developing the first piece of film protect the developer from strong light by covering the tray . . . *if you don't the developer will be spoiled!* If the film crinkles and floats off the plastic while washing it may be due to spoiled developer.

A tray of developer will last all day . . . for many pieces of film. *Never bottle and save used developer because it forms a strong gas . . . discard it every day!*

The "B" powder is very important . . . it controls the thickness of the film . . . and the durability. Less than 35 grams of "B" to a pint of water will produce softer and thicker films . . . more than 35 grams will make the film harder and thinner . . *not enough "B" may cause the film to crinkle and float-off the plastic.*

For your convenience we now supply "A" & "B" developer powders in accurately weighed packets. Each carton contains 8 packets of "A" 28 grams and 8 packets of "B" 35 grams. This makes a total of 8 pints of developer. We also supply a 20 pound kit . . . (10 lbs. "A" and 10 lbs. "B" in bulk.) The pre-weighed packets insure the proper strength developer at all times.

CLEAN SCREENS

All screens, new or used – silk, wire, nylon or dacron must be cleaned properly to insure tight adhesion and prevent "break-down". The cleaning should incorporate a mechanical as well as a chemical action.

The best method we have found to date is as follows . . . first wet the screen . . next sprinkle "Ajax" on . . then with a rag *(not a brush)* rub lightly in a circular motion over every square *inch of the screen* . . . Finally flush with water --- while flushing rub your hand over the screen to remove all particals of "Ajax". On wire, nylon and dacron it is advisable to clean new screens two or three times in the above manner to be sure of doing a thorough job.

If you neglect to do a satisfactory cleaning job on your screen you may get premature "break-down". If you desire to try other cleoning methods make two test screens one with the above method and the other as a check against it . then choose the best procedure.

REGISTER

To obtain the best register first use an adequate frame . . preferably metal – then stretch the fabric as tight as possible.

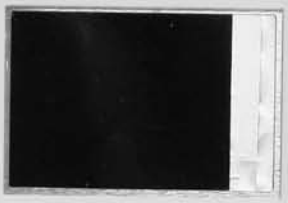
Before adhering film *"pre-block-out"* all border areas to within an inch of the film . . then after the film has been adhered *and while the backing plastic is still on* complete the "block-out" . . . finally after the film is dry remove the backing plastic.

Illustration 6


SLIDE 7
Slide 8
Slide 9
SLIDE 10
Slide 11
Slide 12
SLIDE 13
Slide 14
Slide 15
SLIDE 16
SLIDE 17
SLIDE 18
SLIDE 19
SLIDE 20
Slide 21


SLIDE 22
Slide 23
Slide 24
SLIDE 25
Slide 26
Slide 27
SLIDE 28
Slide 29
Slide 30
SLIDE 31
SLIDE 32
SLIDE 33
SLIDE 34
SLIDE 35
Slide 36

Slide 37



Slide 38

Slide 39

Slide 42