200 PRE-IMAGING PREPARATION

201 INTRODUCTION

Metalphoto, Metalphoto Plus, UltraColor and PolyColor are photographic products that require a film negative or positive. Instacolor is a process that also requires a film negative or positive. This production film, in turn, requires either pre-existing black and white artwork such as newspaper articles, wedding invitations, business cards, etc., or, in the case of panel fronts and nameplates, custom produced camera ready art assembled from type, inked lines and halftone prints.

202 SCOPE OF THIS SECTION

It is the purpose of this section to cover some aspects of generating camera ready art. The material which follows assumes that a blueprint or accurate layout exists and has been given to you to convert to camera ready art either by performing the various steps yourself or by using outside services.

210 ELEMENTS OF CAMERA READY ART - TYPE

211 TYPE STYLES *(Fig. 211.1)*

There are literally thousands of type styles available to the mechanical artist today. How do you select the one style, or face as they are commonly called, that is right for a particular job? The answer lies in a thorough understanding of type as a design and communication element and understanding the purpose it should serve in a project assigned to you. Once you are given an accurate layout or blueprint of a project along with the corresponding copy, it is your job to convert the copy to type. The style or face you select must fulfill the space requirements, its perceived function in the layout, and must conform to production limitations.

Korinna
Korinna Bold
Tiffany Medium
Tiffany Heavy
Avant Garde X-Light
Avant Garde Medium
Chelmsford
Chelmsford Italic
Chelmsford Demi Bold
Times Roman
Times Italic
Times Bold
Times Bold Italic
Univers Medium
Univers Bold
Univers Medium Condensed
Univers Bold Condensed

Eurostile Extended
Eurostile Bold Extended
Souvenir
Souvenir Italic
Souvenir Demi Bold
Souvenir Demi Bold Italic
Colonial
Colonial Italic
Megaron Medium
Megaron Medium Italic
Megaron Bold
Megaron Bold Italic
Megaron Extra Bold
Megaron Bold Condensed
Windsor Light
Windsor Light Condensed
Windsor

Fig. 211.1

FT Barnum
Helena Script
Wedding Text
Cooper Black

Ultra Bodoni
Ultra Bodoni Italic
Braid
Casion Openface

Fig. 212.1

212 TYPE GROUPS

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For our purposes, type styles are divided into two basic groups, serif and sans serif. Other groups which have little application to panel front or nameplate production include script or cursive and decorative faces. *(Fig. 212.1)*
You will note that the outstanding characteristic of a serif face is the crossline, called a serif, at the end of each main stroke. In addition, the various strokes which make up each letter or character are of differing weights. On the other hand, the various strokes which make up each character in a sans serif face are of uniform weight without a crossline. *(Fig. 212.2)*
It is generally accepted that a sans serif face performs better, or reads faster in panel front applications while a serif face may better serve its perceived function in nameplates or signage. *(Fig. 212.3)*
Within each group, the character may be either vertical, called roman, or slanting to the right, called italic. *(Fig. 212.4)*

Fig. 212.2

VOLTAGE METER (sans-serif)
VOLTAGE METER (serif)
Fig. 212.3

Times Roman
Times Italic
Fig. 212.4

Univers Medium
Univers Bold
Univers Medium Condensed
Univers Bold Condensed
Megaron Medium
Megaron Medium Italic
Megaron Bold
Megaron Bold Italic
Megaron Extra Bold
Megaron Bold Condensed
Fig. 213.1

213 TYPE FAMILIES *(Fig. 213.1)*
Most of the type faces available to you today consist of both roman (vertical) and italic (slanted) in a variety of weights and proportions.

Light face	Med condensed
Med face	Bold condensed
Bold face	Extended
Light condensed	Etc.

The larger the family, the more flexibility you have in fitting the type face to the blueprint or layout.

214 TYPE TERMINOLOGY *(Fig. 214.1)*
Type specification has a language all its own and even employs a measurement system unlike any you commonly use. Thus it is vital that you learn the language of type so that your instructions to a typesetter are fully understood.
Face… the name of the specific type style

UNIVERS MEDIUM
UNIVERS BOLD

THIS LINE IS SET IN CAPITAL LETTERS

this line is set in lower case

There is no lead between these lines

There is 1 point of lead added between these lines

There are 2 points of lead added between these lines

Fig. 214.1

and weight.
Character… letters in an alphabet, punctuation marks, symbols.
CAPS… capital letters, also called upper case, abbreviated U/C.
Lower case... small letters, abbreviated L/C.
Point… the increment used to measure type. There are 72 points in one inch.
Pica… the increment used to measure the length of a line of type. There are 6 picas in one inch, 12 points in one pica.
Lead… the space added between lines of type, measured in points.
Set… the proportion of the width to the height of a character in a family of type.

220 TYPESETTING METHODS
No matter which of the following methods of typesetting you employ, the end result is a reproduction proof, referred to as a repro proof or simply repro. This reproduction of the type you ordered is what you use in the assembly of the final camera ready art.
It is important to know these various methods, for each has advantages and limitations.

221 RAISED TYPE
The methods using raised type, that is type in which the letter is raised above the surface upon which it sits, consist of hand set or foundry type and machine set or hot metal. No matter which method is employed, the resultant combination of characters is inked and printed onto a glossy paper.
The advantage of this system is that you can order any number of these repro proofs.
The disadvantages are twofold. One, since the image is achieved by inking, it will smear if rubbed. It is necessary to spray such proofs with a clear fixative such as Krylon Crystal Clear. Two, the repro proof can not be enlarged without loss of quality.

222 PHOTOTYPESETTING

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Phototypesetting or photocomposition is now the most common method of setting type. The type is photographically printed on photographic paper or film. A wide variety of faces and sizes are available.
The advantages of this method are superior quality and the fact that it will not smear.
The disadvantage is that only one proof is produced at a time.

223 TRANSFER TYPE
There are two systems of transfer type available from your graphic arts dealer - rub-off such as Letraset and Micanorma, and cut-out such as Formatt.

224 RUB-OFF TYPE
This system consists of type characters printed on a waxback, thin acetate film. When the film is placed waxed side down onto a surface, burnished and lifted, the character is transferred from the sheet to the surface.

225 DESKTOP PUBLISHING PROGRAMS
Several page composition programs are available that are capable of high quality typesetting output. Popular examples are Xerox Ventura Publisher and Aldus PageMaker.

226 CUT-OUT TYPE
In this system, the type characters are permanently printed on a clear acetate sheet with a pressure sensitive backing. The type is not transferred but simply burnished in place and then cut out.
Rub-off type is much easier to position and properly letterspace than cut-out type. However, cut-out type is more durable than rub-off type which is easily scratched.
The quality of transfer type demands that the type be set “up in size” and then reduced.

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230 ORDERING REPRODUCTION TYPE

231 COPY FITTING

Most of the blueprints you will use for panel fronts specify the size of type required. Thus, your job is to determine that the line length of the copy does not exceed the area specified. Here is where your selection of the set of the characters comes into play.

Each typesetter provides specimen sheets showing each face and size in caps and lower case. By counting the characters in the copy and comparing the count to the same number of characters in the specified point size, the line length can be determined. *(Fig. 231.1)*

You will find excellent books on this subject in your library or graphic arts supply store if you have large blocks of copy or text material to copy fit.

Fig. 231.1

232 WORKING UP IN SIZE

One of the ways to achieve outstanding quality is to prepare the camera ready art in a larger size and then reduce it in the production film. Mechanical artists generally produce "twice up," i.e., 2 times the size of the original. *(Fig. 232.1)*

You can enlarge the blueprint by multiplying all dimensions and type sizes by 2 or by having the blueprint photographically enlarged "twice size." But remember, if the blueprint calls for 12 point type, you now must copy fit and order 24 point type. This holds true for all elements (logos, etc.) in the project.

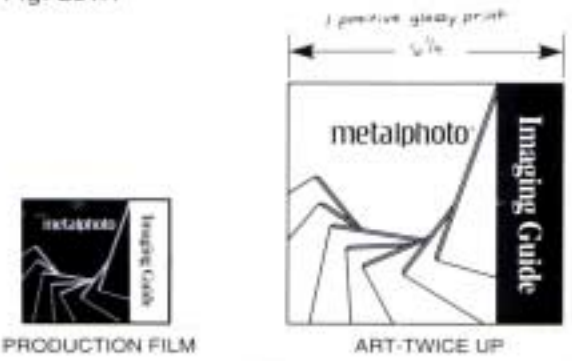

Fig. 232.1

233 HOW TO SPECIFY TYPE

Your instructions to the typesetter must be complete, accurate and in the language of type. Copy must be typewritten as you wish it to be set. For instance, lines of caps should be typed in all caps.

A complete specification must include the

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following: *(Fig. 233.1)*

The name of the face - each typesetting process uses its own name for traditional faces. Thus Helvetica will be called Helios in one process and Megaron in another. Use the name your typesetter shows in his type specimen book.

Weight of the face - light, medium, bold, extra bold.

The set of the face - normal, condensed, extended.

Point size - 8 pt., 9 pt., etc.

Leading - the space between lines of type specified in points.

The shape of text material - flush left, rag right; flush right, rag left; justified, centered.

If copy is submitted to you incorrectly typed, it is often desirable to remark the copy rather than retype it. This prevents transcription errors. Every dictionary contains a set of proofreader's marks usually under the entry, proofread. These marks should be incorporated in the copy and noted in the margin. A dictionary should be your constant companion as you spec copy. Look for errors. There is nothing worse than producing an expensive panel front with a misspelled word.

Fig. 233.1

240 REPRODUCTION METHODS FOR EXISTING LINE ART

Line art is defined as a true black image on a pure white background or a pure white image on a true black background.

You will discover that many elements comprising camera ready art are supplied to you (logos, illustrations, type from a prior setting) but are the wrong size for the current project. Thus it is necessary to change their size. There are various reproduction methods available to you, each having advantages and disadvantages.

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241 PHOTOSTATS

The stat process utilizes an opaque paper negative which is then reshot to produce a reproduction of the original line art. Changes in size may be made in either stage.

Stats are most useful if the layout calls for white type on a black background, since the first shot (negative) produces this directly. Stats are usually cheaper than the products of other methods, but are generally considered low in reproduction quality. Quality can be enhanced by reducing the original.

242 DIFFUSION TRANSFER PROCESS

This system, of which the Kodak PMT process is the prime example, produces a direct positive print of the line art. Innovations in the PMT system have made it possible to produce reverse prints similar to the stat negative.

By varying exposure times, this process can be made color-blind. If you have copy with multiple colors such as yellow, light blue, etc., you will find that other processes reproduce these colors as gray. However, the PMT process will produce solid blacks although you may need several prints which can then be combined in the artwork.

This method is fast and provides extremely high quality. However, multiple prints require individual exposures and processing for each print.

243 LINE SHOTS AND VELOX PRINTS

This method is a two step process similar to the stat method except a photographic film negative is produced in the first step. The negative is then contact printed onto photographic paper called velox paper.

This method produces excellent quality but is usually expensive for single prints as compared to the PMT method. However, for multiple prints of the same subject, the cost may

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be lower than the PMT method.

244 HOW TO ORDER *(Fig. 244.1)*
No matter which process you order, the following information must be clearly indicated.

Type of image - positive (like original) reverse (blacks & whites in reverse of original)

Type of paper - specify glossy for reproduction

Finished size - show dimension line with finished size indicated or if you scaled using a proportion scale, indicate the percentage of reduction or enlargement.

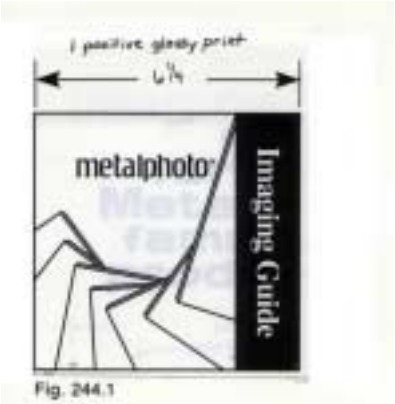


Fig. 244.1

245 PROPORTIONAL SCALING
Proportional scaling simply means that when a shape, usually a rectangle, is reduced or enlarged in one dimension, the other dimension decreases or increases proportionally. Thus, a rectangle measuring 5" x 2", if enlarged twice up, will result in a shape measuring 10" x 4". *(Fig. 245.1)*
It is vital that when you decide to enlarge a piece of line art you verify that the resultant change in the other dimension does not exceed your area requirements.

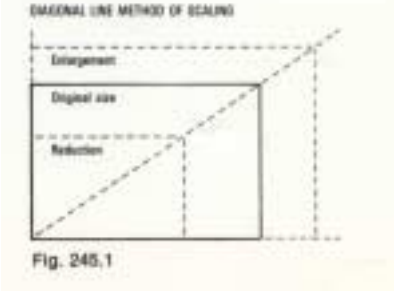


Fig. 245.1

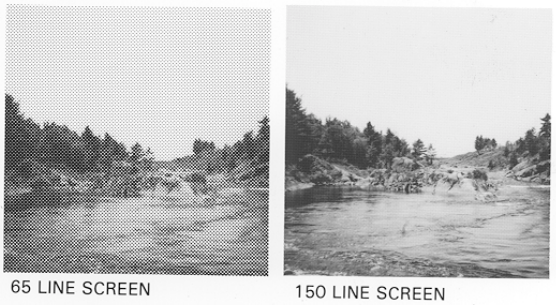
250 REPRODUCTION METHODS FOR EXISTING CONTINUOUS TONE ART

251 THE HALFTONE
Continuous tone art such as photographs or wash drawings contain a broad range of tones or gradations of tones ranging from almost pure white through a range of grays to a dense black. To reproduce all the tones in a photograph would require a printing method which could vary the amount of ink in accordance with the gray value. However, a print-

ing press prints only a solid of a color. Obviously, some other method of reproduction has to be used to achieve the effect of a continuous tone photograph. To accomplish this, the art must be converted to simple black and white. This is called a halftone and is essentially a line shot. This halftone print is made by inserting a ruled screen between the camera lens and the sensitized film. Reflected light passing through the screen openings breaks down the original art into various size dots. Because the dots are so small, the eye blends them into gray values.

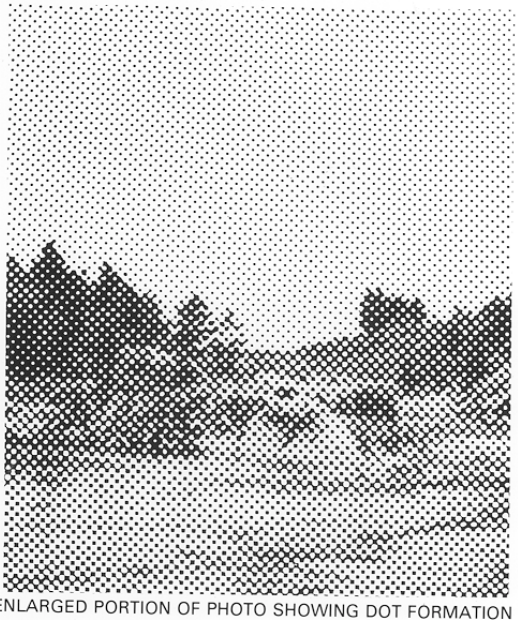
The more dots that are in each square inch of the halftone, the sharper the halftone appears to the eye. *(Fig. 251.1)*

Screens were originally produced by ruling a grid onto glass, the number of lines per inch determining the number of dots produced. Today, contact screens used in PMT halftones use an elliptical opening but the result is the same. Halftone screens are classified by the number of lines per inch and are referred to as 65 line, 100 line, 133 line screens, etc.



65 LINE SCREEN 150 LINE SCREEN

Fig. 251.1



ENLARGED PORTION OF PHOTO SHOWING DOT FORMATION

252 COPY DOT

A layout or blueprint often calls for a halftone
to be reproduced along with the line copy in the finished product.

Two methods are available to achieve this result.

1. STRIPPING
   In this method, a line negative of the line art and a separate screened negative (halftone) of the continuous tone are combined (stripped together) to produce the final production film.
2. SCREENED PRINTS
   In this method, a paper print of the halftone referred to as a screened velox, is assembled in position with the line art and the result is shot in one step to pro-

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duce the production film.
This process is called copy dot because in effect we are copying the small dots of the halftone. It is essentially a line negative process with more controls.

Screened prints for copy dot should not use greater than 110-120 line screens.
The advantages to the copy dot method are control of the finished camera ready art and lower cost than the stripping method.

253 DIFFUSION TRANSFER PROCESS
This method, of which the Kodak PMT process is a prime example, produces a screened halftone positive print in one step in a manner similar to line prints discussed in Section 242.
The quality is excellent and is totally acceptable for the Metalphoto application.

254 SCREENED NEGATIVE/VELOX PRINT
This method is a two step process similar to the line shot process described in Section 243. The basic difference is that the halftone screen is introduced between the lens and the film, so that a halftone negative is produced. This screened negative is contact printed onto velox paper producing a paper positive halftone print. This method is of high quality but is more expensive and time consuming. However, if multiple prints are required, this method may result in a lower total cost than the PMT method.

255 TYPES OF HALFTONES
SQUARE HALFTONE - A square halftone, commonly called a square cut, is a screened negative or print, rectangular in shape, with its entire surface carrying a dot formation. This is true even if the original has a pure white background. *(Fig. 255.1)*
OUTLINE HALFTONES - If you wish to eliminate the dot structure in the background,

Fig. 255.1

Fig. 255.2

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it is necessary to mask or cover the area you wish to retain. *(Fig. 255.2)*
Although other methods are used, the quickest and easiest way to mask is to use a ruby or amber colored film. Both have a rubberline coating on polyester film that can be cut and peeled away, exposing the clear film.

256 HOW TO ORDER DIRECT SCREENED PRINTS OR SCREENED VELOX PRINTS

The following must appear on each photograph or piece of continuous tone art. *(Fig. 256.1)*

Finished size - show dimension line with finished size indicated or if you scaled using a proportion scale, indicate the percentage of reduction or enlargement. See Section 245.

Screen count - the number of dots per inch, specified as 100 line, 110 line, etc. For copy dot, 100 line or 110 line is recommended.

Contrast ratio - Since copy dotting increases the contrast ratio in the finished product, the screened print should be slightly flat. Ask for a contrast ratio suitable for "COPY DOT".

Fig. 256.1

257 HOW TO SCALE

Refer to Section 245.

260 ASSEMBLY OF CAMERA READY ART

In this section, we will not attempt to detail how to execute paste-up, mechanical, keyline or finished artwork (all terms which mean camera ready art), but rather we will highlight the advantages and limitations of materials and tools available to you.
These recommendations are made to enhance accuracy and the production of error-free work. Condition yourself to check and double check every dimension, copy, and in-

struction before committing your finished work to production film.

261 BASIC TOOLS

Since accuracy is so vital, you must use a drawing board, T square and triangle that produce accurate parallel lines and right angles. The edge of the board must be straight and true. The head of the T square must be tight and the triangle must be checked to make sure it forms a 90 degree line to the T square.

Many mechanical artists use drafting arms or drafting machines, not only to insure accuracy but to increase speed.

Another area where accuracy suffers is in the selection of rulers. Always use metal, machine divided rulers in which the zero mark is some distance from the edge of the ruler. Choose rulers with the greatest number of increments per inch, 1/64th or 1/100th for example.

Use a magnification device and fine pointed instruments when using these finely divided rulers.

262 SELECTION OF ILLUSTRATION BOARD

You should use a smooth surface illustration board, called hot press, in a medium or heavy weight for most of your work. This surface is ideal for inking lines and is necessary for the proper adhesion of one-coat rubber cement or wax described in the next section.

263 ADHESIVES

There are three common materials available to you to affix type, stats and veloxes to your artwork.

Two coat rubber cement - With this material system you coat both the art and the illustration board. It provides excellent adhesion but requires that the excess cement on the illustration board

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material system you coat both the art and the illustration board. It provides excellent adhesion but requires that the excess cement on the illustration board be removed. However, it does permit easy positioning of large units by the *slip-sheet method.*

One coat rubber cement - With this material you merely coat the art and position it on your illustration board. After lightly burnishing, the adhesion is quite good.

Waxing machine -This device coats the back of the art with a thin layer of wax. The art is then applied to the illustration board in the same manner as art coated with one-coat rubber cement.

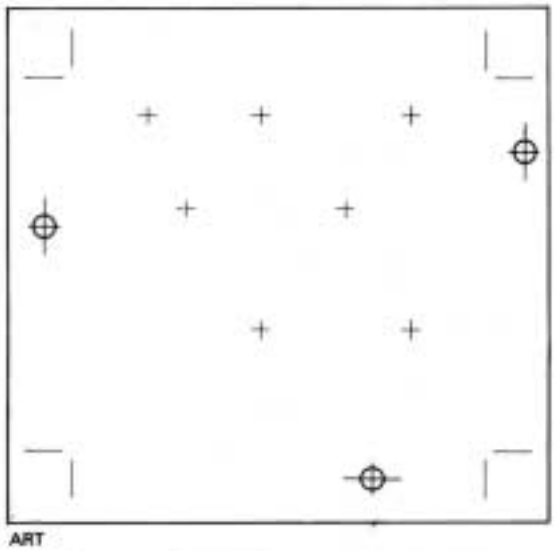
A WORD OF CAUTION - if your camera ready art is out of your control for a long period of time, such as in the case of submission for approval, or if it might be subjected to high temperature conditions, the elements may curl up and pop loose.

264 RULING

The old fashioned ruling pen has been replaced with inking devices which have constant width points. These ruling sets produce the same width line each time they are used. If you are working "up size" in which rules in excess of two points are required, you should consider using ruling tape which is produced in a wide variety of widths.

265 CROP MARKS, REGISTER MARKS AND FABRICATION MARKS

It is vital that all of these marks be outside the trimmed area of the finished product. For example, never draw the outside perimeter of a hole to be fabricated. Instead use a center mark, or cross hair which will be eliminated by the cut itself *(Fig. 265.1)*



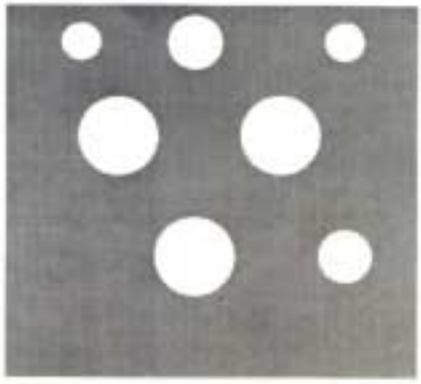


Fig. 265.1

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266 XEROX DUMMIES

You can satisfy yourself that all the elements you have specified for your project will fit by copying them on a copy machine and then taping them onto your layout before proceeding to the finished artwork.

267 ASSEMBLY

This is the actual paste-up of the various elements on your illustration board. It is important to remember that Metalphoto, UltraColor and Metalphoto Plus use photographic processes and will look no better than the artwork used to produce the production film. Neatness and cleanliness are the keynote here. If a ruled line is ragged or type is smeared or uneven in density, reject it and start over. It is true that some people producing production film can "save" the job by stripping and opaquing, but there is always the chance that it will "slip by."

268 OVERLAYS

The use of overlays for color separation, "windows" for halftone drop-ins, or surprinting type over halftones is necessary for other than simple one color art. However, the various techniques are beyond the scope of this manual. The use of ruby or amber film as outlined in Section 255 can be used here.

269 PROTECTION OF CAMERA READY ART

Before you let your finished artwork out of your control, protect it with a hinged flap taped along one edge. You may use layout bond or tracing vellum. Not only does this provide protection for the artwork but it provides a handy surface for instructions.

270 PRODUCTION FILM

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271 INTRODUCTION

The Metalphoto family of photosensitive, anodized aluminum products and associated reproduction processes require a high contrast film negative or positive to produce an image.

The intent of this section of the guide is to acquaint you with basic film processing tips to achieve proper production film. However, since films from different manufacturers vary in sensitivity and processing instructions, we strongly advise that you maintain a good working relationship with your local graphic supply dealer and rely on him for specifics relative to the film you are using.

272 FILM SYSTEMS AVAILABLE

Two systems for producing production film are available to you, rapid access or standard litho.

273 RAPID ACCESS FILM

This method utilizes a stabilized emulsion in which the development time is built into the film itself. Thus it is impossible to overdevelop this type of film.

In addition, the development bath has an exceedingly long life (several days) and does not have to be replaced twice a day as with the litho system. It also operates within a wider temperature range than litho film developer.

The density produced by this film is normally adequate for all the Metalphoto family of products.

However, this method requires good quality, black & white artwork as no variation in exposure or development time can be used to increase the density of weak areas of the artwork.

273.1 SPECIALIZED RAPID ACCESS FILM

Kodak Ultratec will consistently deliver 4.5

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density readings. Halftone dots are extremely hard and line work is very sharp, permitting a wide latitude in contact exposure work. The chemistry consists of a single solution developer. Only one replenishment rate is required, regardless of exposure, and no control strips are required.

Kodak Versalite contact and duplicating films can be processed in a white light darkroom. All that is required is fluorescent lighting, covered with an inexpensive UV-blocking sleeve, and a 600-watt quartz lamp for exposure. Versalite films can be processed in almost all rapid access chemicals including Ultratec described above.

274 STANDARD LITHO FILM

This type of film utilizes the classic time and temperature method of developing.

It offers the advantage of being able to increase the density of weak areas of the artwork. This is necessary for copy dot halftones where the dot structure of a PMT print is less than jet black.

However, development control with litho film is much more critical than with rapid access film and the development bath must be replaced quite frequently. It is advisable to use a Stouffer 21 Step Wedge with this method.

Since films from different manufacturers vary in processing instructions, follow the instructions that accompany the specific film you are using.

275 SELECTION OF FILM SYSTEM

Since the rapid access system normally produces a negative of sufficient density for Metalphoto products, we suggest that this be your basic choice for all line shots and copy dotting when the artwork is of good quality. Use the standard Iitho film process where the artwork has weak areas or the screened velox prints have a gray dot structure.

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276 PRODUCTION FILM REQUIREMENTS

Production film for Metalphoto, Metalphoto Plus, UltraColor, PolyColor and Instacolor processing must fulfill the following requirements to achieve quality results.

Image and Emulsion Side

Image on film negatives or positives must be right reading with the emulsion side down (RRED). This means that when the emulsion side of the film is facing away from you, the copy should appear the same as in the artwork. ***Failure to process all film RRED will result in ragged and fuzzy reproduction.***

The emulsion side of raw, unprocessed film appears lighter in color than the base side. This emulsion side must face the copy board of your camera to produce RRED production film.

After the film is developed and fixed, you can

identify the emulsion side by scratching both sides of the film in a black image area with a needle. The side that produces a clear line is the emulsion side.

Proper Density

We require a density of from 3.8 to 4.0 as measured by a transmitting densitometer.

If you do not have a densitometer at your disposal, use the following method to check for proper density.

Hold the black area of a developed and fixed film negative close to your eye. The film should be close enough to touch your nose. Face toward an overhead light and count slowly to 10. If at the end of the count, you cannot see the light source through the film, then the film is of proper density.

When using standard litho film you can maintain a check on proper density by placing a

Kodak gray scale next to your copy. Use the visual check, outlined in the previous para-

graph, and note the solid steps on the gray scale. If all processing conditions are perfect, you will find 4 solid steps. However, temperature variations and age of baths may require as high a step as step 6 to achieve proper density.

A weak density or thin film will result in fogging of the plate.

Relationship of Film Size to Image and Plate Size.

NON-IMAGE INTENSIFIED METALPHOTO PLATES, METALPHOTO PLUS PLATES, PRE-DYED AND CLEAR ULTRACQLOR PLATES

Production film size should be oversize to the part being produced and the same size or slightly smaller than the plate size used. All crop marks and register marks should be contained in the film, outside the image area but inside the plate area. *(Fig. 276.1)*

IMAGE INTENSIFIED METALPHOTO PLATES AND INSTACOLOR PROCESSING

Production film should be oversize to part being produced and smaller by at least 1/2" in one dimension than the plate size being used to accommodate the inclusion of a Stouffer 21 Step Wedge in the exposure step. *(Fig. 276.2)*

Opaque

Use an alcohol solvent opaque only. Apply opaque to the base side of the film. *DO NOT USE A WATER SOLUBLE OPAQUE.*

Film Positive

To produce a right reading, emulsion side down film positive, use a contact printer with a sandwich consisting of the raw film, emulsion side up and the film negative, emulsion side up. Expose to a point light source to prevent spreading of the image.

277 PRODUCTION FILM WITH MULTIPLE IMAGES

Often, great economies in production costs can be achieved by repeating the same image several times on one piece of production film, or by combining several different, small jobs. When the same job is repeated several times it is referred to as a step and repeat. When several different jobs are combined it is called a combination sheet.

However, since both types of multiple image sheets require exact fabricating procedures to process them back to a single image, the specifications and tolerances needed in the production film must come from the fabrication department.

DO NOT ATTEMPT TO CREATE MULTIPLE IMAGE SHEETS WITHOUT FIRST CHECKING EACH SPECIFICATION AND ALL TOLERANCES WITH THE FABRICATING DEPARTMENT.

Fig. 276.1

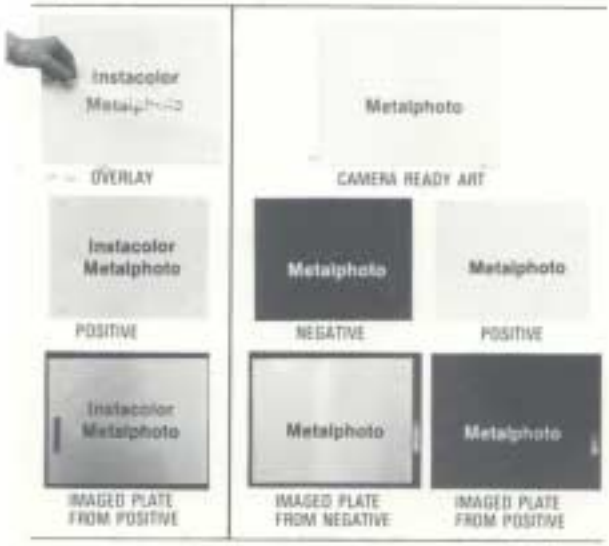

Fig. 276.2