Prepared by the Operations Work Group of The NAA Color Quality Task Force

DRAFT 11
January 2001

1.Overview

Getting Quality Newspaper reproduction of color or black and white materials is a collaborative effort. It requires attention to detail and maintenance of standards from the moment the ad is conceived until it comes off the press.

This document is designed to provide useful guidelines for advertisers and newspapers as they strive to reach their common goal - better reproduction on a consistent basis. While many industry observers decry the lack of good quality reproduction, a great number of newspapers both in the United States and around the world prove, on a daily basis, that newspaper advertising does not have to mean substandard quality. The NAA Quality Color Task force is committed to helping the industry insure that advertising placed in newspapers meets the same standards as other media and that advertisers can expect consistent quality in every newspaper.

The potential for quality reproduction improves as the technology changes. The NAA and other organizations are constantly evaluating new systems, hardware and software to test their application for the industry. Advances in printing presses, platemaking, chemicals, prepress software are just some of the areas where the NAA is evaluating products to see if they can help in the search for better quality.

This reports attempts to address both the needs of the high-end users who run 4-color ads on a regular basis and the newcomer who is faced with the daunting task of placing an ad for a new demanding client. While we recognize the rapid advance of technology we have tried to put together a document which can also be used by employees at publications who may not have the same financial resources as a major metropolitan daily but still are expected to reproduce the same ad.

We begin with newspaper basics - a primer on how most newspapers are printed and move through every step of the reproduction process including creation, layout and design of the artwork. The committee has attempted to review both digital and traditional workflows, and has tried to look at the most current technologies available from color profiles to pre-flighting.

Throughout the review, there are a number of constants that have become obvious. The most important factor is the willingness of both the advertiser and newspaper to commit the time and effort necessary to insure quality. This means making sure employees are properly trained and that training is updated, and that once standards are established they are followed.

The process begins with the ad creation where agencies and pre press firms must understand the capabilities of the newspaper media. For example, it makes no sense to create an ad using a Pantone© color, which is outside the limits that a newspaper can reproduce. While this may appear obvious, it is a common problem which newspaper production managers face every day.

At the same time newspapers that receive good materials whether they are traditional or digital, cannot simply fall back on the phrase "I printed what I got." Especially if they pay no attention to calibration and standards at the camera or platemaking steps. The number of forms and iterations that an advertisement takes as it moves from concept to print is tremendous. Failure to maintain standards at any junction can ruin in final product and have a cascading affect where a small miscue early in the process becomes a major problem further down the road.

Proofing is a good example. An agency will frequently send materials either digital or traditional and expect that their proof on glossy white stock and a 133-line screen is a good target for their newspapers. Newsprint is not glossy; it absorbs much more ink, and is seldom white. In fact, many times it is seldom consistent from roll to roll at individual newspapers. Lines screens over 85 may look good to an ad agency's client but they will not reproduce the same where reproduced at the line screen the newspaper uses.

The use of calibration, proofing, profiles ink densities and a host of other factors are major components of this report. We believe that the standards outlined here have worked for many of the best examples of quality newspaper reproduction and that if they are followed will result in better reproduction at every newspaper. Our goal is to provide a document that everyone can use and understand and to ultimately encourage more advertisers to use the industry to get their message to the public.

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3. Print Process/ Reproduction

Update terminology

Introduce new terms/technology

Tech News Work Flow diagram

4. NEWSPAPER REPRODUCTION BASICS

To understand the unique specifications which newspapers need it is important to understand how a newspaper is produced. Perhaps the most important facet is the actual method used to apply ink to paper. One can get excellent newspaper reproduction of black-and-white, spot color, and full-color art and photography. Quality reproduction is seen in our newspapers every day--and it starts with your original materials, supplied in a form that meets the unique specifications of the newspaper medium.

Many of the rules for the preparation of artwork for newspapers apply to both black-and-white and color, and those are the rules we will deal with now.

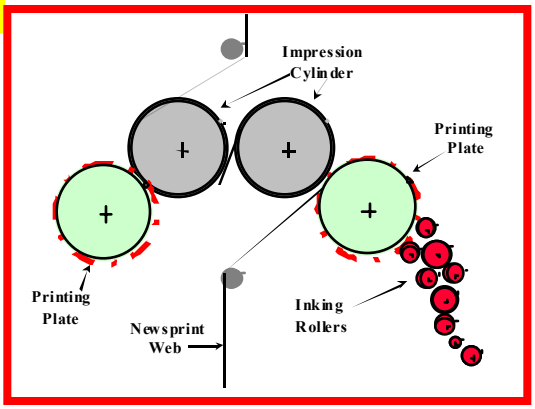
Printing Process Principles

Newspapers are printed by several different methods, which have common characteristics. They are all printed at high speeds (sometimes up to 70,000 copies per hour, the ink is dried by absorption on to the newsprint, and they are all printed on rotary presses from rolls of paper (known as the web). Many newspapers have multiple presses that print on both sides of the web simultaneously applying colored inks (Cyan, Magenta, Yellow, and Black) to produce a limited number of colors.

The printed web, guided by rollers is fed through a folder unit that combines the webs, and folds the paper into the newspaper the average reader sees.

The major printing processes utilized are Lithography, Letterpress, Di-Litho, and Flexography. We will look at each of these processes individually.

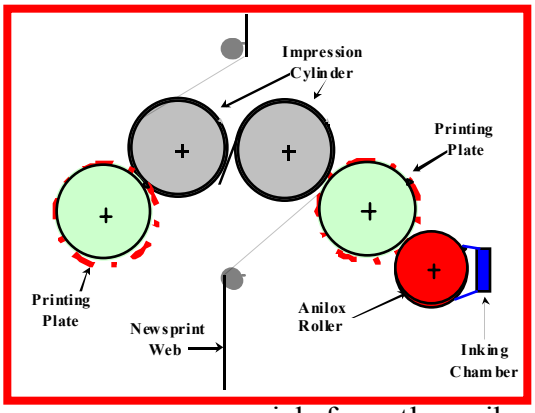
Letterpress



The letterpress printing process utilizes a rotary press with a raised image area printing plate. The printing ink is transferred from a series of inking rollers onto the raised areas of the plate. The image is then transferred to the newsprint. This is an older type of printing technology, which is being phased out as the equipment is replaced. The letterpress printing process depends greatly on high impression setting in order to print smooth and uniformly. The impression cylinder

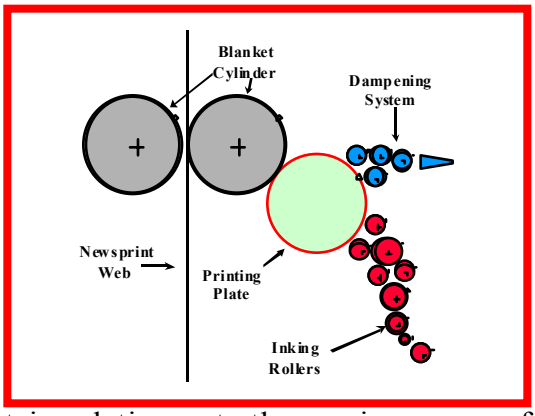
is covered with a hard rubber material that can withstand numerous impressions. The printing of the two sides of the web is done inline at different times.

Flexography



The flexographic printing process is similar to the letterpress process in that it utilizes a raised printing surface plate. The flexographic plate is typically softer than the letterpress plate. This process utilizes a water-based ink, which is metered onto the printing plate by an engraved or anilox cylinder. This anilox cylinder has a uniform engraving pattern, which allows a specific volume of ink to be transferred to the printing plate. The anilox cylinder has a scraper (doctor) blade that removes any excess ink from the anilox cylinder and returns it to the ink fountain. The image is then transferred directly from the printing plate onto the surface of the newsprint. This process requires a "kiss" impression for uniform printing.

Lithography (Offset)



The lithographic printing process is the most commonly used process in producing today's newspaper. The process of lithography uses a planographic (flat) printing plate. This plate has two areas, which are chemically different. The non-printing or non-image area is hydrophilic or water loving. The image area is hydrophobic or not water receptive. In this printing process both an oil based ink and a water based fountain solution are applied to the printing plate. The fountain solution wets the non-image area of the plate while the ink wets the image area.

The ink is applied to the printing plate through a series of rollers. These rollers serve to thin the ink film so the proper amount is applied to the plate. The fountain solution can be applied in several different ways: the solution can be sprayed on, transferred from a high-speed brush or by a molleten or sock roller.

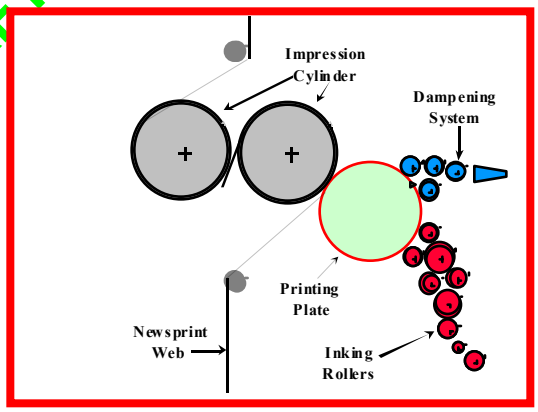
There is an old saying that oil and water do not mix, but as these materials are applied to the plate, the chemistry of the plate is insufficient to separate the materials to their respective

areas. These materials need to interact with each other so that the proper printing characteristics are achieved. The ink needs to emulsify the fountain solution so that it can properly wet the image area. If the ink does not have this capacity, the ink will not transfer uniformly to the plate. The fountain solution needs to have some detergency capacity so that it can wash out any ink that is deposited in the non-image areas. As the proper transfer of materials is complete, the ink is transferred to a blanket cylinder. The blanket cylinder is usually covered with a compressible blanket material. This blanket cylinder then transfers the image to the newsprint. This process is usually blanket to blanket printing, with both sides of the web printed simultaneously.

Di-Litho

"The Di-Litho process or Direct Lithography uses the lithographic printing process, however the image is transferred directly from the planographic printing plate onto the surface of the newsprint as it passes between the blanket and the plate. This type of printing is typically found in newspapers that have converted from letterpress printing to take advantage of the lithographic printing process.

As in offset, ink is applied to the printing plate through a series of rollers. However, since this is a conversion to an existing letterpress, the dampening solution is applied by a spray bar into the nips of the upper ink distribution cylinder and plate cylinder form rollers (diagram will have to change). The ink and fountain solution are emulsified and applied to the plate. The fountain solution wets the non-image area of the plate while the ink wets the image area.

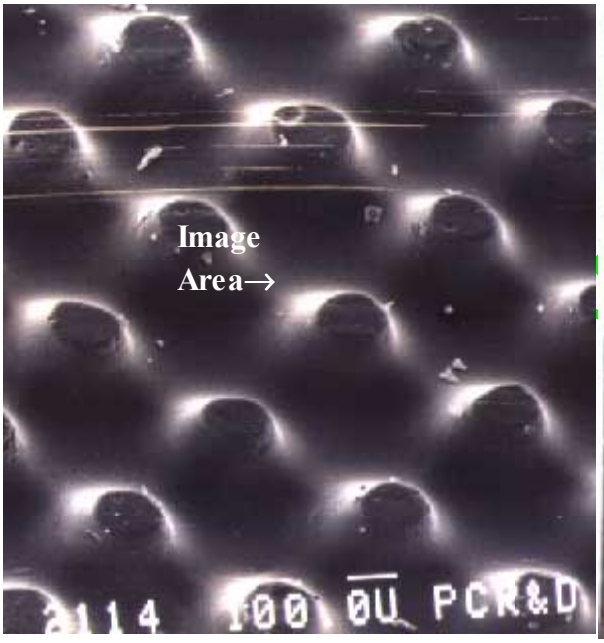


However, unlike offset, the transfer of the emulsified solution is made directly from plate to the newsprint. Di-Litho involves maintaining high impression pressure between the lithographic plate and newsprint backed by the blanket. Because the plate is planographic, ink coverage can be irregular compared to the transfer from relief plates or an offset blanket. To get good ink coverage with Di-Litho, the newsprint must be smoother and have a more even caliper. "The runnability of Di-Litho falls between letterpress and offset while reproduction quality of this process is influenced by an inherent tendency for dot gain in the half tones."

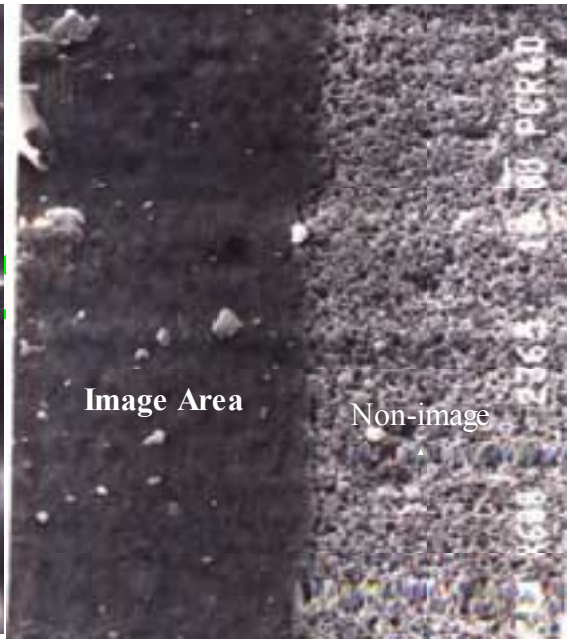
QUALITY NEWSPAPER REPRODUCTION

To better understand the differences in the raised plate type of technologies versus the planographic plates, the following photomicrographs show these plates.

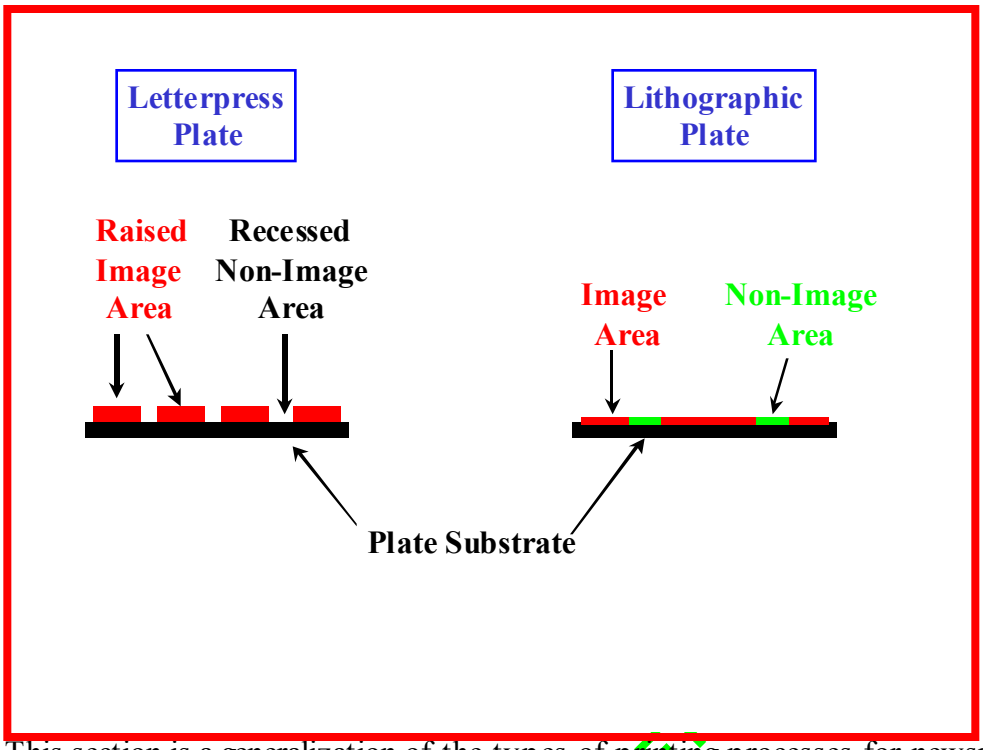
Letter Press Plate



Lithographic Plate



The following schematic drawings show a cross sectional view of the printing plates.



This section is a generalization of the types of printing processes for newspapers. Various manufacturers of printing presses utilize different designs for their presses. The intention of this paper is to give an overview of the processes so that one can contrast the differences.

QUALITY NEWSPAPER REPRODUCTION

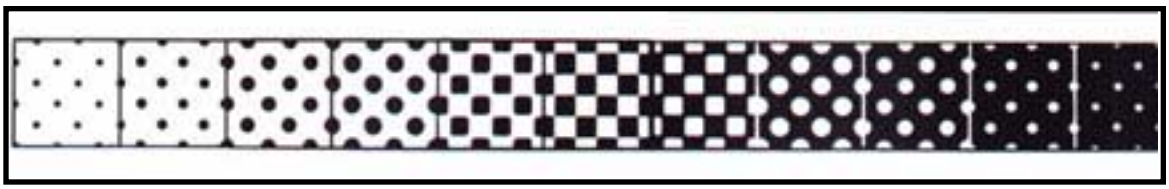
How is a Photograph reproduced in a Newspaper?

To reproduce a color photograph in newspaper printing the newspaper uses a four-color printing process. This process separates the color photograph into four primary colors, Black, Cyan, Magenta, and Yellow with dots of varying sizes. These dots are then overprinted to achieve the variety of colors we see in the finished product. We will look at these steps in greater detail.

In traditional print production, a halftone is produced by placing a halftone screen between a piece of film and the image and then exposing the film. The film would be exposed through large industrial cameras. To produce color photographs, the halftone needs to be exposed through different color filters and different halftone screens to achieve the four-color separation.

In today's world, the original artwork or photograph is analyzed on an electronic scanner. This scanner transforms the image into a digital format. Software is used to modify and enhance the image. The digital image now can be separated into its primary colors. Each of the four colors now can be converted into a series of dots. The dot size depends of the intensity of the color in each portion of the original image. The tonal range is shown below. The size of the dot increases from 0 to 50%, when the tonal scale reaches this point, the dot reverses and the non-image area becomes smaller as the tonal curves reaches 100%. The dots are small enough so that the eye sees the reproduction as a continuous tone. In a typical newspaper production, an 85-line screen is used. What this means is that there are 85 rows of dots in both the horizontal and vertical per square inch of screen.

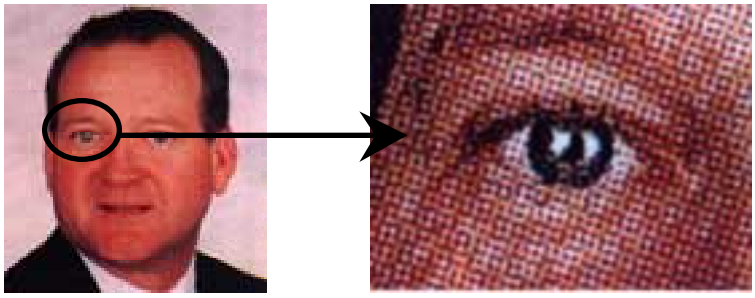
Enlargement of tonal scale



HIGHLIGHTS MIDTONES SHADOWS

QUALITY NEWSPAPER REPRODUCTION

The following shows a halftone and photomicrograph showing the use of different tonal size dots



The following shows the four-color separations and their final result

Cyan Printer

Magenta Printer

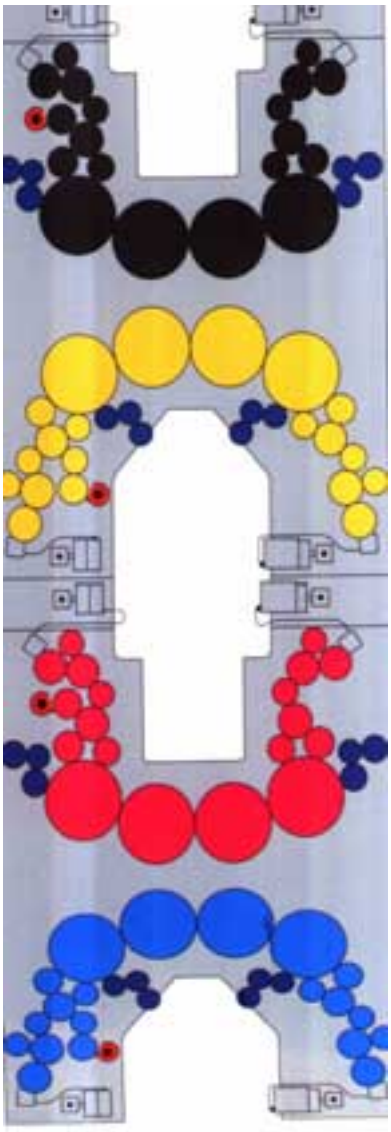
Yellow Printer

BlackPrinter

Cyan & Magenta Printers

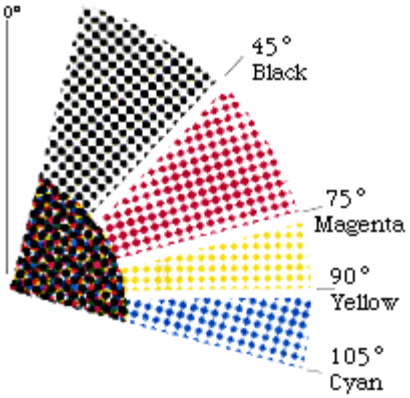
Cyan, Magenta, & Yellow Printers

Four Color Reproduction



QUALITY NEWSPAPER REPRODUCTION

Each of the four colors needs to be produced at different angles to each other. This is done so that the resulting print does not cause a pattern called moiré. A moiré pattern is the effect of superimposing two color separations and creating a pattern different from the original. Cyan, magenta, and black screens must be separated by 30 degrees, with yellow at an angle 15 degrees from the other three colors. In all cases, black must not be placed at the 90-degree angle (SNAP recommendation).



The final step in the four-color printing process is the proper registration of the four colors. Careful steps are taken to align the four colors so that they print exactly in the correct positions. The following illustrations show the differences between a reproduction with proper registration and one misaligned. The misaligned reproduction looks fuzzy and out of focus, while the properly registered reproduction looks clean and sharp.

Misregistered Reproduction

Properly Registered Reproduction

Throughout the reproduction process a phenomenon occurs called dot gain/TVI or tone value increase. The reproduced dot undergoes a growth from its original size.

This is a generalization of the four-color printing process for newspapers. The intention of this paper is to give an overview of the process so that one can see the complexity and limitations of the process.

Systems Calibration

Monitors, proofers, imagesetters, and other output devices performance capabilities change over time. In monitors, phosphors degrade and become unstable. In proofers, the dyes or colorants can change with age, heat, humidity, and other factors. Each device used in the color reproduction process has a calibration routine to assure that the equipment is image colors at correct levels.

5. Layout stages

Layout

The design of a newspaper advertisement is critical to its ability to communicate effectively. Your advertisement must be able to arrest the attention and interest of people scanning the newspaper's pages at a rate of seconds per page.

The basic elements of any advertisement are space, copy and art. The illustrations you select should serve to both attract attention and inform the reader. The copy further explains the message, and the space provides the environment in which that message is presented.

Within the space, the layout must take into account the average reader's tendency to start reading at the top of an advertisement or page, and then scan diagonally downwards from left to right. The elements of an advertisement are best placed so as to take advantage of this tendency. Too many breaks in the expected flow of reading may be enough to distract readers and move them away from the advertisement.

DESIGN CONSIDERATIONS

Newspapers provide an excellent medium for reaching a variety of markets. While different advertising formats appeal to different markets, there are some general concepts for newspaper advertising which help positively impact readers with quality reproduction.

Simple design and layout considerations can improve print quality perception. Effective use of white space (non-image) and strategic placement can increase cleanliness and desirability of an ad.

WHITE SPACE (NON-IMAGE)

White space is probably the most underestimated and under used element in newspaper advertising. Regardless of the ad size, format and whether it is color or black/white, white space effectively captures the reader's attention and interest. Not only does open space focus the reader" attention on the copy and art, it also helps to increase the perception of overall contrast, cleanliness and image quality.

QUALITY NEWSPAPER REPRODUCTION

DOUBLE TRUCK

One of the main advantages of a double page ad versus two single pages, is the capability to bleed through the center margin. However, mechanical press paper controls (nips and trolleys) which are necessary to hold and guide the paper through the press, can result in undesirable markings through the center margin. It is not possible to completely eliminate these markings.

Therefore, we recommend avoiding the placement of important images (i.e. logos) in the center fold, especially if they require a large amount of ink. The mechanical devices will not only track through the image, but cause it to set-off on the facing page.

For broadsheet double page ads, the standard image size is 26¾" across the page. Limiting the image area to 26½" will allow for the mechanical trolleys to run in the non-image area, thus eliminating unwanted markings on the left and right edges of the page. For tabloid double page ads, it is recommended that the regular height of 13" be reduced to 12¾" to eliminate these mechanical markings.

Positioning is a critical factor when working with color images. It is not recommended to have a heavily inked image on one page, with a light image mirroring it on the facing page. This may cause ink set-off or smearing from one page to the next.

GATEWAY

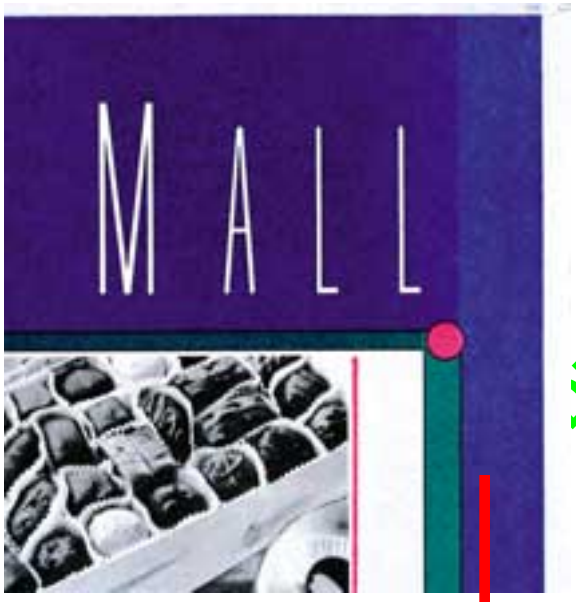
Some newspapers provide the option to run a gateway format that offer the advertiser a unique way to deliver their message.

A gateway is an advertising product that is two or three columns wider than a single six column page. The excess width is folded from the gutter toward the outside edge of the page, creating a flap with its hinge at the gutter fold.

One of the most important aspects of a gateway ad, which determines its success or failure, is that it built to the proper layout dimensions. This is especially important if an image is to bleed off the

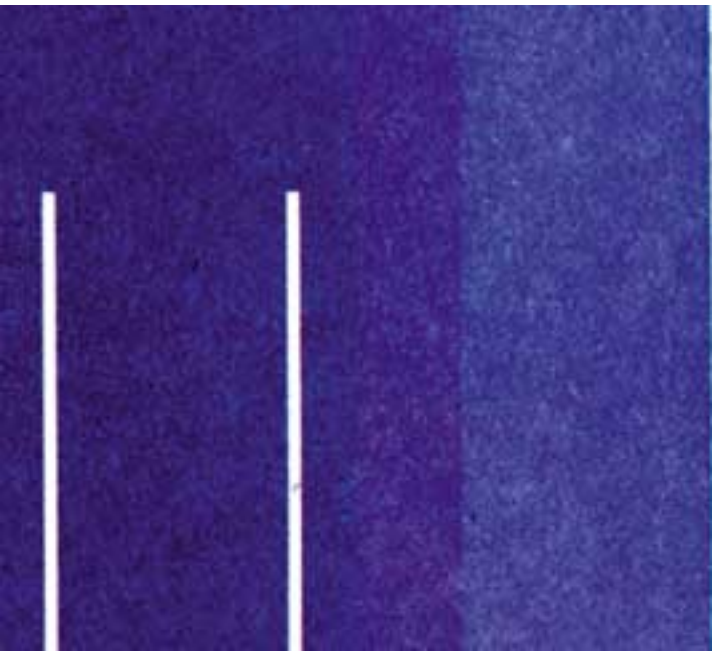
front page. To minimize ink set-off and mechanical markings, the same considerations for double page ads apply.

INK STARVATION



Certain layout formats contribute to non-uniform ink distribution, commonly referred to as ink starvation. When a solid, tint, or halftone is followed by or adjacent to a heavily inked bimage in the same inking zone, there is potential for a noticeable appearance of uneven ink laydown.

Borders, in particular, are especially prone to ink starvation. It would be best not to use continuous solid, borders around the perimeter of an ad. However, if a border is desired, lighter screen values are recommended.



Preliminary sketch

A small, simple sketch of the original concept is the best way to start designing an ad. Sometimes a series of these quickly prepared thumbnail drawings are used to compare various ideas.

Rough

The rough layout is a full-size drawing that presents a reasonably accurate guide to the size and position of all the elements of the finished advertisement. The layout can often be okayed in rough. Many ads go to the newspaper composing room at this stage, with specifications for typefaces and sizes of elements indicated on the rough, and copy and illustrations attached.

Comp

The comprehensive or comp is a fine-tuned version of the rough. Its purpose is to give a very precise idea of the finished ad, but without actually setting type or producing other elements. Comps may be prepared for clients or others who have to okay an ad layout. Often no comp is needed.

Once the layout and copy have been okayed, art and type are prepared.

Paste-up

Advertising materials may be delivered to the newspaper ready to go directly to the process camera—a camera-ready mechanical or final paste-up. More commonly, advertising materials are delivered together with instructions the newspaper production staff is to follow in making the materials camera-ready.

General guidelines for the mechanical

The mechanical must be meticulously clean, since any stray bits of paste-up wax or rubber cement will show up on the negative. Try not to write instructions in the image area. If it's unavoidable, use a very soft, light-blue non-reproducing pen or pencil—a blue that is invisible to the process camera.

Mechanicals should be prepared on a substantial base such as illustration board or a heavy grade of grid paper that will not bend easily. If elements are pasted down on flexible paper, they will have a tendency to pop off during handling.

All typeset copy should be of equal density. The recommended density range is from 1.4 to 1.8.

Elements should be carefully positioned, using gridlines or T-squares to guide alignment. The widely used hot-wax system of affixing elements makes repositioning easy. Cellophane tape should never be used to secure type or art copy.

Waxed elements should be rolled down after they have been positioned to fix them firmly in place. Use minimal amounts of wax or glue and keep the roller clean, so that there is no excess adhesive on the surface of the paste-up.

Indicate all instructions for reverses, tint blocks or art on the base or on a tissue overlay. Any instructions written on the base material should be put in the borders, using a non-reproducing pen or pencil. When a tissue overlay is used, areas to be in reverse should be shaded in red, and areas to be tinted should be shaded in blue, with the proper percentage screen indicated.

Prepare individual acetate overlays for each color to be used. Include all special instructions for that color—screens, tints, rules, photos—on the overlay. Place at least three register marks on the base art and on each overlay.

Camera-ready mechanical

A camera-ready mechanical or paste-up is ready to be photographed as part of the negative for the newspaper page on which the ad will appear.

It is a representation of a complete newspaper advertisement on which all typeset copy and illustrations have been fixed into exact position. The photographs have already been screened, and the mechanical may include a pre-screened positive print of a photograph. Any tint blocks and reverses have been positioned.

Mechanical

The more common practice is to have the actual reproduction copy for type and other line elements pasted down, but the space for continuous-tone illustrations indicated with a photostat marked "for position only".

At the newspaper, halftones of the photographs are shot separately and stripped into the mechanical or the finished negative.

Ad sizes

Advertisement size: Standard Advertising Units

T. Croteau to write this section.

Artwork

QUALITY NEWSPAPER REPRODUCTION

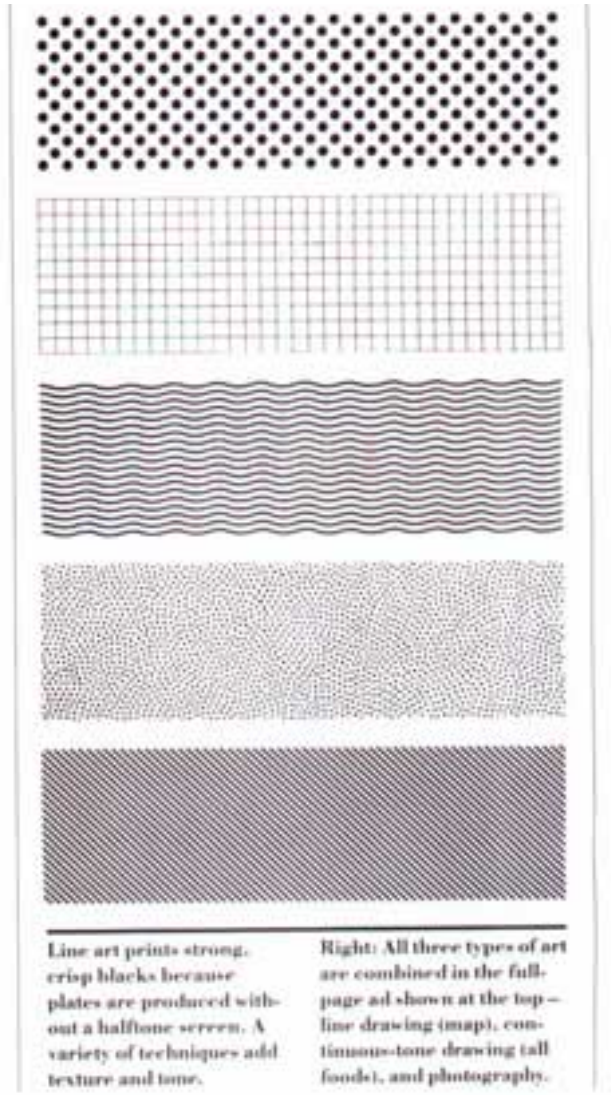
Artwork can be divided into three general categories: line drawings, continuous-tone drawings and photography.

The choice of the type of art to be used for a particular ad is largely an aesthetic one, but be aware of the limitations of the different art media. For example, a black or dark-colored product may not hold detail in a small photograph, and might be better illustrated with line art or a continuous-tone illustration.

Line art

The simplest artwork to reproduce in a newspaper is line art. A piece of line art is either black, where the artist has produced lines or dots, or white, where no ink has been put down.

Line art has a limited range of tonal variations, simulated through the use of various techniques:
Patterns pre-printed on transparent sheets.
Dot information produced by the artist with a fine point pen or pencil.
Textured board used with a pen, pencil or dry brush. Textured boards have the advantage of precise tonal control in adjacent areas.



Line art prints strong, crisp blacks because plates are produced without a halftone screen. A variety of techniques add texture and tone.

Right: All three types of art are combined in the full-page ad shown at the top – line drawing (map), continuous-tone drawing (all foods), and photography.

The line drawing simulates tonal variation by using solid black lines spaced close together for darker tones, and farther apart to give the appearance of lighter tones.

Give the artist the exact reproduction size of the drawing--its final size in the printed advertisement. For the best reproduction, the original drawing should be made to the final size or as near to it as is practicable. Reducing a drawing too much causes unacceptable loss of detail, as fine lines fade and narrow spaces fill in; and enlarging a

drawing too much exaggerates imperfections.

Make sure line art is dark enough. Areas where the ink is not sufficiently black and dense will tend to drop out.

Continuous-tone art

Continuous-tone artwork contains a wide range of tonal values, from white through the increasingly dark gray of black-and-white art or through the many hues in color, to black. It is similar in range to the photograph or color transparency.

Wash drawings must have good contrast between adjacent areas—about a 15% to 20% difference in tone values. The gray scale reproduced here illustrates a good choice of tones: 0, 20%, 40%, 60%, 80%, 100%.

Very light backgrounds often print poorly. Vignettes especially are troublesome. The soft edges harden and blacken during the process of newspaper printing and lose the fade-out effect. It is much better to eliminate them altogether.

Typography

The right typeface will help create the mood and atmosphere you want in your advertising message. A soft, delicate typeface that's a good choice for copy selling lingerie or flowers tends to be a bad choice for copy describing heavy machinery. The bold, heavy typeface that suits the machinery is probably wrong for the lingerie.

Typefaces in newspaper ads should also be chosen for their ability to reproduce well in the newspaper printing process. Sans serif faces and faces with uniform thickness throughout the letter

Traditional/Classic faces have serifs

Bodoni

Bodoni Italic

Bodoni Bold

Century Expanded

Century Expanded Italic

Century Oldstyle

Garamond Light

Garamond Book Italic

Garamond Bold

Gothic/Sans Serif faces have no serifs

Avant Garde Gothic X-Lig

Avant Garde Gothic Boo

Avant Garde Gothic Me

Helvetica

Helvetica Medium

Helvetica Expanded

Franklin Gothic

FranklinGothicMedItalic

Franklin Gothic Heavy

reproduce better than type with delicate lines or serifs.

Choose typefaces that are easy to read; the reader shouldn't have to make an effort to understand your message. Ornate faces should be used sparingly. A good rule is to limit them to headlines.

Avoid setting body copy or long headlines in all capitals; lower case words are easier to read. Condensed typefaces can also be troublesome for a reader.

Limit copy to three different typefaces in your ad. Too many faces can result in a jumbled look and confuse or distract the reader. An alternative to changing typefaces is to change the point size, style or weight of the face you are using. The Helvetica typefaces available, for example, may include sizes from 6 to 24 points; in light, medium or bold; in roman, italic, condensed, or expanded.

As a rule of thumb, choose the largest typeface you can use without creating a crowded feeling in the ad. Overcrowding cuts down the readability of the ad.

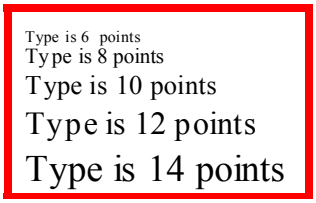
Too small a typeface can fill in during the printing process. Type smaller than 6-point should be avoided. Display ads should rarely go below 8-point.

Check the type repros carefully for broken letters and any spacing problems.

A word about proofing type: The graphics or production person should always make sure that a person with copy responsibility checks the typeproof for errors that may creep into copy. Nothing looks quite as bad as a typo or a misspelled word in an advertisement. It diminishes the credibility of the advertiser.

TYPE FACES

Sans serif type faces are the best choice for newsprint reproduction. They easily reproduce with desired clarity and readability. Type faces with thin or delicate serifs and strokes, and non-uniform character thickness, should be avoided. Extremely fine strokes can drop out in the conversion process, while thick strokes can fill-in on press.



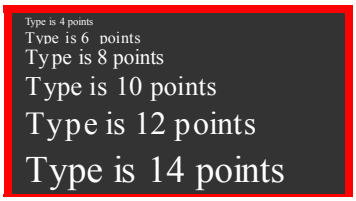
For clarity and readability, we recommend using type sized at 7 points or above into our advertising design. Because of the ink and newsprint relationship, small type tends to lose definition on press.

SURPRINTED TYPE

For optimum results, it is suggested that type not overprint a background screen (tint or ghosted images) greater than 25%. This allows for dot gain and provides necessary contrast between text matter and the background image.

T. Bader to provide examples

REVERSE TYPE



When utilizing reverse type, be aware that some type styles with delicate serifs and fine strokes tend not to reproduce well. Thin strokes usually fill with ink when reversed. Incorporating reverse type which is less than 10 points is not recommended. Text reversed out of a 4-color image area should be 12 points or greater in size. This allows for slight variances in register, while maximizing legibility.

For contrast and readability, reverse type should not be positioned within screened areas containing less than a 70% screen, nor in a yellow or other light colored background.

SCREENED TEXT

Reproducing text matter as a screen percentage of a solid can be successfully achieved on newsprint. For best results, avoid screening type styles with a fine to medium weight and those with serifs. As a general rule, text screened at 80% or more will reproduce as solid. For legibility reasons, consideration should be given when attempting to reproduce type as a light screen tint.

COLOR/CONTRAST IMPORTANCE

For best results, black original linework is recommended. This provides optimum clarity and contrast in reproduction. Linework produced using colors other than black often reproduces with low contrast. Many colors are difficult to convert into a dense black, which is necessary for optimum linework reproduction.

Red type on a black background is considered to be poor copy for linework. Many scanner and camera optics used for line art reproduction see red as black. Therefore, the total distinctions between images are greatly minimized.

Light original material (i.e. charcoal and pencil drawings) is also not recommended for linework reproduction. Assuming the intent is to maintain a pure white background, the lighter tonal values are difficult to reproduce. Images that lack contrast and sharpness, or are not dense enough, tend to disappear in the reproduction process.

SIZE

Material submitted in its final size dimensions will reproduce best. Enlarging and/or reducing images too much causes a loss in detail. Enlarging material to a great extent exaggerates imperfections. Reducing causes small spaces or openings to fill-in and fine lines may fade. It is especially important that pre-screened material be submitted in final size dimensions.

Gray bars

Gray bars should be used by printers to make sure they have their ink levels and gray balance is set correctly. Traditionally press operators have relied on their own estimation of correct color and since color can be very subjected it has resulted in many inconsistencies. If gray bars are used and the colors of Cyan, Magenta, and Yellow are set to the correct specifications the images on the printed page should reflect the intention of the advertiser if they were created correctly.

The use of a gray bar establishes dual accountability in the reproduction process. The press room is responsible for maintaining even gray bar densities across the page and the advertisement material supplier is accountable to follow the specifications contained in this document.

When the three process colors are printed in the proper ratio, a shade of gray is produced. A gray bar is the proper screening of the three process colors to obtain the desired level of grayness. Cyan is always the highest screen in a gray bar because of the inherent impurities in the pigments that are used in the process inks. Some examples of typical gray screening combinations are indicated in the table below.

SHADE OF GRAY	PERCENT SCREEN AREA		
	CYAN	MAGENTA	YELLOW

Midtone	40	30	30
Quartertone	25	18	18

What Percent Screen Area Should My Newspaper Use?

The use of a gray bar in the newspaper must be transparent to the reader and advertiser. It should not detract from the reproduction on the page where it is used. A test form (such as SNAP, GATF, or NAA) should be run on the press that includes two gray bars so that the editorial department will have samples to look at and can make a decision on which gray bar screening is acceptable to them. Many newspapers have gone to the quartertone gray bars. It is felt that the quartertone gray bar is more sensitive to variation by the eye, yet still yields high enough density readings to be considered accurate (by the densitometer.) During this test run the solid ink densities are set to industry specifications such as SNAP, GATF, NAA.

Dot gain is determined from this run so that proper compensation can be made in the prepress area. The dot gain is very critical to the proper use of the gray bar. (See Section on Dot Gain for greater detail on this topic) If dot gain increases, color saturation decreases at the same density specifications. What this means is if the dot gain increases, a higher density would be apparent in the gray bar if the solid ink density was set correctly. If the density of the gray bar is reduced to standard levels, in actuality the solid ink density levels will be reduced. Uniform gray balance is often times more critical then the solid ink density.

Once the gray bar is selected from the test form, the reflection densitometer density specifications for the selected gray bar can be determined by reading the gray bar in the same column where the solid ink densities are in specification. Some examples of density specifications for various gray bar screenings are listed in the table below:

Offset 3-C Gray Balance				Black Tint Equivalent	Aim Density of Three-Color Patch
C	M	Y	K	K	
25%	18%	18%	0%	25% (Quartertone)	0.52 +/- 0.05
40%	30%	30%	0%	50% (Midtone)	0.65 +/- 0.05

Note: The densities of all three colors should be within +/- .02. If low all should be low, if high all high.

It should be noted that density values above should be used only as a guide because they are dependent on the dot gains for each color on the press. The aim densities for your press should be established through the use of test forms.

Gray bars and color bar targets should be large enough to permit measurement. A target height/width or diameter of 3/8" is recommended so that proper measurements can be made. Gray bar targets do not need to be continuous and can be creatively designed across the width of the page.

Screen Ruling

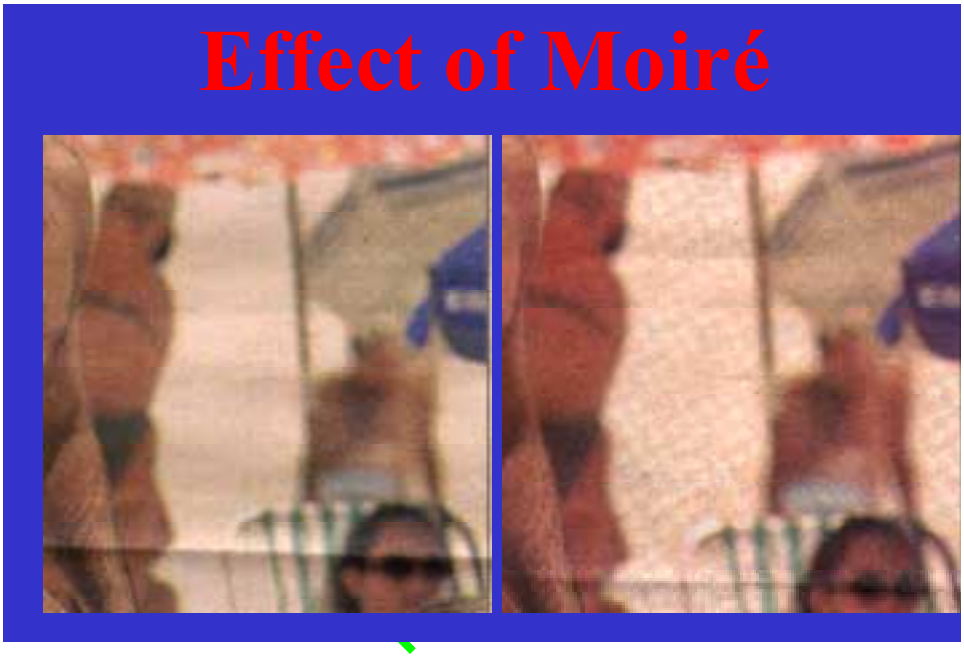
The industry standard for halftone reproduction is 85 lines per inch (lpi). However, a finer screen ruling, up to 120 lpi for web offset, may be considered if it could improve image quality. A finer screen ruling minimizes the appearance of halftone dots and could provide greater detail, print smoothness, and overall perception of a continuous tone image. Because a higher screen ruling can lead to plugging in the shadow areas, it is important that the midtones and three-quarter tones be opened an additional 5-15% to allow for dot gain.

Don't ask the newspaper to use art material at its final size that already contains a too-fine screen, such as a 120- or 133-screen made for use on magazine stock. When a finer screen than the one a paper specifies is used, there is a tendency for the ink to connect adjoining dots. This results in muddy or plugged-up printing, with loss of detail in shadow areas.

You should consult with the newspaper and find out what line screen they use before submitting final materials. In most cases, they will only be able to use a single line screen

value. In addition, for proofing purposes you should view you finished documents at the same line screen that the newspaper will use.

In the digital world, many files sent to newspapers contain no line screen information. For example, PDF files contain only enough digital data to permit reproduction up to about 133-line screen. Data that is not needed when the file is output is simply discarded. Re-screening pre-screened material with the newspaper screen is a bad idea, too: much detail is lost and a moiré pattern is often created.



Space

An effective advertisement must have enough space to communicate its message. "Extra" white space that eliminates crowding can go a long way toward capturing interest and promoting effective communication.

It is best to try to feature a few items rather than include everything. If many items must be mentioned, select one for major emphasis. This dominant element will attract the reader and lead to more complete reading of the entire message.

An ad that surrounds a body of copy with white space attracts more viewers than one that has copy running from border to border. Blank space focuses the reader's attention on the copy and/or art.

Copy

This section deals with copy as an element in the layout. See also the separate section on typography.

In the copy block of an ad, the lines of type are usually set flush left—that is, with each line beginning directly under the preceding line—so as to take advantage of the natural left-to-right reading pattern of our culture. The right margin can be left ragged or set flush, depending on the image the advertiser is seeking to promote. The flush-right style is the more formal looking.

Runaround or wraparound is a popular technique in which the typeset copy is fitted around the shape of the art. Be alert for the point at which runaround type may impair readability.

Think twice before using a reverse (white type or artwork dropped out of a solid black or toned background) and before using overprinting type on a gray tone background. If you do choose one of these methods, use a limited amount of copy. Choose a strong sans serif typeface of 12 points or larger, adequately spaced, and preferably, all caps. Small type in a reverse tends to fill in with ink when printed.

Overprinting on a screen tone such as benday will attract reader attention, provided that the screen background is not too coarse and the type is bold enough to be easily read. Keep the screened background light—no more than a 25 to 30% tone screen. Here, too, use a strong type of 12-point size or larger. Don't use a reverse illustration or type with a light screen.

Every advertiser should have a distinctive logo, incorporating such standard information as the business's name, location and telephone number. The logo tells the reader where the advertised goods or services can be bought, and at the same time, it builds recognition for future advertising.

Art

Illustrations guide the reader to the copy. Ideally, lines within the artwork lead the reader's eyes to the message. These major lines, called lines of force, are important guides and can make or break an advertisement.

Make use of the fact that the reader tends to look in the direction in which the model, car or other subject is looking or moving. A model looking toward the copy block takes the reader to it. A model looking out of the ad space may move the reader's eyes away from the ad.

Color Selection (NAA Color Book)

NAA specifies ink sets for the various newspaper printing processes. These inks conform to strength and shade standards established by NAA. Currently Volume 8 edition of the NAA color book is available. The recommendations are as follows:

Offset	Flexography	Letterpress
AD-LITHO®	NAA AD/FLEX™	AdPro®

Inks conforming to NAA specifications are made using the following pigments:

Cyan	Phthalocyanine blue (green shade)
Magenta	Rubine red
Yellow	Diarylide yellow
Black	Furnace black (blue shade)

6. Photography

Digital

Digital photography has become an integral part of many ad preparation work flows. Digital cameras are now available in studio models for high resolution product and fashion work, in 35 models for deadlines news and sports photography, and as consumer models designed for at home use. All three when used in the proper setting can produce useable results.

The key element in the digital camera is the CCD (charged coupled device display) which translates directly into input resolution and image quality. For studio work when lighting can be controlled and image scaling is a primary concern the studio cameras can provide results that identical with traditional methods. The 35mm units manufactured by several vendors and sold by resellers the CCD display produces a lower resolution and necessitates some compromises in the use of lenses and lighting conditions.

But for most general news and sports use the ability to create a photograph and within minutes transmit it back to a desk editor is more than worth any minor limitations. We are now seeing photographs of major news events on the front pages of newspapers virtually minutes after they take place. For newspaper use where 85 line screens are the norm the reproduction can be excellent Consumer models of most digital cameras are designed for web use and at home viewing on computer screens. To date most of these models are not adequate for general newspaper uses in news or advertising situations. The exception is where images are to be used very small (2 inches by 2 inches and no photo retouching is needed. Examples would be real estate or car ads where small images are needed to illustrate an ad. They can generally be handled by a non-professional with acceptable results and can be manipulated to an extent. The advantage is that no additional scanning is needed and they can be simply downloaded from a desk. In many models the photographer can actually see what he or she has taken and make another picture before even returning to the office.

Digital photography will no doubt continue to improve, particularly at the low end, where cameras will need to be less expensive to be a general purpose item, but they are a significant part of the digital environment and when used properly can produce excellent results in many newspaper settings.

Conventional Photography

The quality of the original photograph will determine the quality of the halftone that is reproduced in the newspaper. Bracket exposures to be sure of getting a good original. Especially when working with color transparencies, supply alternate exposures to the newspaper.

Some defects in an original photo can be corrected at the newspaper—accentuating highlights, for example, or enhancing the density of middle tones and shadow tones—but the surest way to get good reproduction of a photograph is to supply a good-quality original.

Characteristics of a good black-and-white image

An ideal photograph for newspaper reproduction is one where details are clearly visible in both highlight and shadow areas, there is good contrast within the mid-tone range, and shadow is held to an absolute minimum. Avoid prints that are either very contrasty or very flat and light.

The print of a black-and-white photograph should have a black image on clean, smooth-surfaced white paper with a matte finish. Avoid textured and color-tinted originals.

Photographs taken with black-and-white film are best. Prints made from color transparencies tend to have too much contrast, and they are rarely as sharp as original black-and-white prints.

Selecting original images is a critical step in the coldset print reproduction process because coldset printing is able to image a density range of approximately 1.20. A high quality image cannot be reproduced on press unless a high quality image has been selected from the start. This is important for black-and-white as well as color photography.

Color reproduction can be enhanced by selecting a bracketed exposure that is 1/2 stop lighter than an optimal meter reading, do not over expose.

Clarity and Sharpness

The sharpness of the original photograph, and especially in the areas of interest within the photograph, has a greatest impact on the clarity of the reproduction. When selecting a photograph, art directors, artists, and others should scrutinize the original picture or transparency using a glass loupe or projection to determine the level of image sharpness. An important step in producing a sharp photograph, especially in outdoor settings, is the use of fill flash in tandem with a smaller camera lens aperture setting. This combination provides improved focus and depth of field.

Photo using available light only Fill flash photography

QUALITY NEWSPAPER REPRODUCTION

Use of non-original copies of a photograph (often called duplicates), faster speed films, and enlarging grainy photographs all contribute to a reduction in the sharpness achievable in the printed reproduction. These photographs also have a detrimental impact on scanning since sensitive scanner optics cannot reliably sense the "pixelized" grain effect.

Self-Developing Photographs

Photographic media that are self-developing are not recommended for use as originals.

The film format

The 35mm format can produce excellent results for newspaper reproduction; newspaper editorial photographers use 35mm almost exclusively. Larger format cameras--2¼" x 2¼" or larger—are recommended if the photograph's size in the advertisement will be large. In general, the larger the film format, the sharper the final photograph will be.

Print size

The size of the photographic print should be as close as possible to the size of the image to be printed in the advertisement. In the case of a full-page or double-truck format, the material supplied should be no smaller than 4 x 5. If the original is too small, the photograph may become grainy and blurry when enlarged. A large print is easier to retouch.

Flare and Haze

Flare and haze are the main causes of color saturation loss in original photos. Flare desaturates and washes out colors in the form of non-image light that strikes the camera lens

Photo with no flare or haze Haze results in flat appearance

during the exposure. Backgrounds, strobe lighting, and camera angles can all contribute to an increase of image flare. To prevent non-image light from striking the camera lens, filters, lens hoods, lens angles, and a Gobo or flag can be used.

Haze is a normal atmospheric condition associated with hazy and overcast weather. Like flare, haze often reduces color brilliance. The degree of which depends on the camera angle and abundance of haze.

The photographer

Look for a photographer whose portfolio includes a wide range of published newspaper advertisements that demonstrate precise focus and exposure, and good contrast, color saturation and depth of field.

Some subject matter is so difficult to photograph that it is worth your while to pay higher fees to a photographer who is a specialist in the particular area. You save money in the long run by avoiding costly reshooting. Photographers who specialize in food, for example, may have complete professional kitchens in their studios. They can ensure the low temperature range that may be needed to keep perishable food at its visual peak; they know the special lighting techniques that make photographed food appealing.

Products and other subject matter

If the subject is a product, it must be in perfect condition. The slightest blemish will stand out in the photograph, either requiring costly retouching or making the photograph unusable.

If there's to be a person in the photo, a professional model will help you get better results in a shorter time. You can select the look that will best convey your message, and, almost as important, you will have a person experienced in following the photographer's directions and in making up and dressing for photography.

Any person whose photograph is in your advertisement should be required to sign a model release, whether they are the main subject or just appear in the back-ground. In the case of a

child, a guardian's signature is needed. Using a model release protects the advertiser from the legal problems that unauthorized use could cause.

Planning the shoot

Detailed advance planning will help in many ways to produce a quality photograph and to save the photographer's expensive time.

Get any necessary permissions in advance. On an outdoor shoot, if you don't want parked cars in your photo, you'll need to get permission to rope off the area. You'll need releases from the owners of property that might appear in the background.

Lighting should be relatively even. Light for detail in shadow areas; dark shadows do not print well. For outdoor photography, choose midday hours. Balance any backlighting with fill-in flash or reflectors.

Lighting

Lighting for good newspaper reproduction should be relatively even, without extreme highlights or extreme shadows. Dark shadows do not print well on newsprint, and tend to distort shapes. Arrange lighting so as to enhance subject texture and allow detail to show in shade areas. Light reflected onto a subject increases the sense of shape and texture. Extra care is needed with subjects that are either very light or very dark.

Avoid harsh lighting and backlighting. Avoid direct lighting from a source on or near the camera as the only light source; it makes the subject appear flat and shapeless.

The outdoor photograph that will reproduce best in a newspaper is one taken in the evenly lit hours around noon—unlike photography intended for magazine reproduction or

exhibition, which is usually planned for the early morning or late afternoon hours specifically to get shadows.

Use fill-in flash or reflectors to eliminate shadows and increase detail in outdoor photos. This is especially important for color photography, where the amount of correcting that can be done in the lab is more limited than with black-and-white.

ILLUMINATION

Front Lighting

The most essential element is achieving high quality images is proper illumination. Proper front lighting on subject matter will increase printed detail and maintain color fidelity. From a technical standpoint, it positions the subject matter towards the lighter, more distinguishable detailed region of the print range. With color, ample illumination on the subject provides a truer rendition. Conversely, avoid back lighting, it results in dark and dirty color reproduction.

Back light image

Front Light Image

Uniform/Non-Uniform Lighting

Uniform lighting on all subject matter within the photo results in optimum reproduction. Detail is maximized throughout the full tonal range of the image.

Non uniform or uneven lighting of elements in the same photo can pose technical problems for optimum scanning. Extreme differences in lighting should be avoided. Scanners are unable to maximize the reproduction of detail in both the illuminated subject area and that which is cast in shadows. However, lighting which falls behind the subject is not a technical problem. With a contrasting background, it is acceptable and encouraged. When the background is not lit it will go black, adding a sense of depth.

Uniform lighting

Non-Uniform Lighting

Background

For black-and-white photography, light and medium-colored subjects are best shot against a dark background. Dark subjects are best photographed against a background that is only moderately light; too light a background may merge into the page it is printed on.

When there are light and dark subjects in the same photograph, compromise on an intermediate tone background that will provide a fairly good contrast with both.

Photograph the subject against a contrasting background. Avoid a very light background, as at right. The halftone edge would not show against newsprint.

Color photography has the advantage of providing color contrast, even when subject and background are of the same tone. Make sure that if subject and background are the same general color, the hues are not so close that they blend into one another.

Background contrast

Background contrast in studio photography plays an important role in successful newspaper reproduction. White or highly reflective backgrounds impact the critical exposure time (**fraction of seconds**) that the camera/film needs to record the light absorbing subject detail. This reflectance, if not carefully directed, can also introduce unwanted flare that furthers the loss of detail and color saturation. For example, do not assume a white background is required for a dark brown or black product.

Backgrounds that still provide contrast, but are not highly white reflective, serve both the technical and aesthetic requirements of optimum print reproduction.

High contrast background

Medium contrast background

FULL TONAL RANGE ORIGINALS

Whenever possible, use a full tonal range image. This is defined as a photo that has all the representative tonal values from light to dark, including specular lights (**reflection from shiny surface**) or non-detail whites.

With a full tonal range original, print contrast is significantly increased since image dots are not required in the non-detail whites during the screen separation process. This optimizes the full effect of the entire print range from the paper brightness to the ma

Originals with excessive contrast (
Nevertheless, extreme contrast is u
loses detail in prepress conversio
originals generally have excessive co

ORIGINAL COPY –QUALITY S

- Proper front uniform
- Sharpness/focus (espe
- Size of original vs. rep
- Background which accentuates subject matter
- Full tonal range
- No apparent grain
- Absence of flare/haze
- Instant prints are not recommended

Original with proper contrast

Density range

Professional layout artists and others who work with photos learn to tell at a glance whether a print will reproduce well. Newspaper original material should appear slightly flatter in density range, or contrast, because of the inherently higher dot gain in the printing process that causing all tone ranges to darker in the final print. Contrast is a familiar quality they

judge; density range is a related but less familiar one. Printing technicians use an instrument called the densitometer to measure density precisely.

Density range is the difference between the density of the lightest highlight in a photo and the darkest shadow. For optimum newspaper reproduction, the recommended densitometer reading is 1.4—1.8 for a black-and-white photograph, and 2.5—2.8 for a transparency. (Note: Densitometer must be zeroed on a calibration plaque—not on newsprint).

7. Image Prep

You've selected art that will reproduce well. Now you must supply the information that the process camera operator digital image technician at the newspaper needs in order to make a negative of the right image area at the right size. A number of characteristics need to be carefully considered such as indicating image area and final size, along with indicating cropping marks. See Image Preparation Checklist for additional details.

Handling photographs

In handling photographic prints, follow these guidelines:

Don't draw cropping or sizing lines on the surface of the print. Make any crop marks on the white border of the print or on an overlay. Or make a photocopy of the print and mark cropping on this.

Don't write on the back of the print. Don't write on an overlay or other piece of paper while it is on top of the print. Any pressure can mar the surface and show up in the reproduction.

Avoid paper clips. They will damage the print. Put notes or copy on a separate piece of paper, and attach it to the back of the print with tape.

Don't bend, fold or roll the print. This can cause cracking of the surface that may show up in the reproduction.

Scaling art

You scale or size art to find out, for example, what the measurements of your reproduction art will be, given the measurements to which you have cropped your original art. Or you might need to work backwards from the already set measurements of the reproduction art on a layout, to find out what the cropped measurements of the original art must be.

In a typical case, you first crop your original, say, to 5" wide by 7" deep. You know the image must come down to 3" wide on the layout, and you want to find out how deep the layout image(reproduction image) will then be.

There are two basic scaling methods:

Proportional scale method

A proportional scale will make this kind of calculation for you, and give you your percentage of original figure at the same time.

Diagonal line method

Many artists prefer to use the diagonal line method. It produces the actual reproduction size and shape, and the needed dimension can be measured directly.

Determining percent of original figure

Using the percentage of original figure is the preferred way of instructing the process camera operator digital image technician as to the reproduction size of artwork.

To calculate percent of original, you need to know the length of the controlling dimension of the reproduction image and the length of that dimension of the original image.

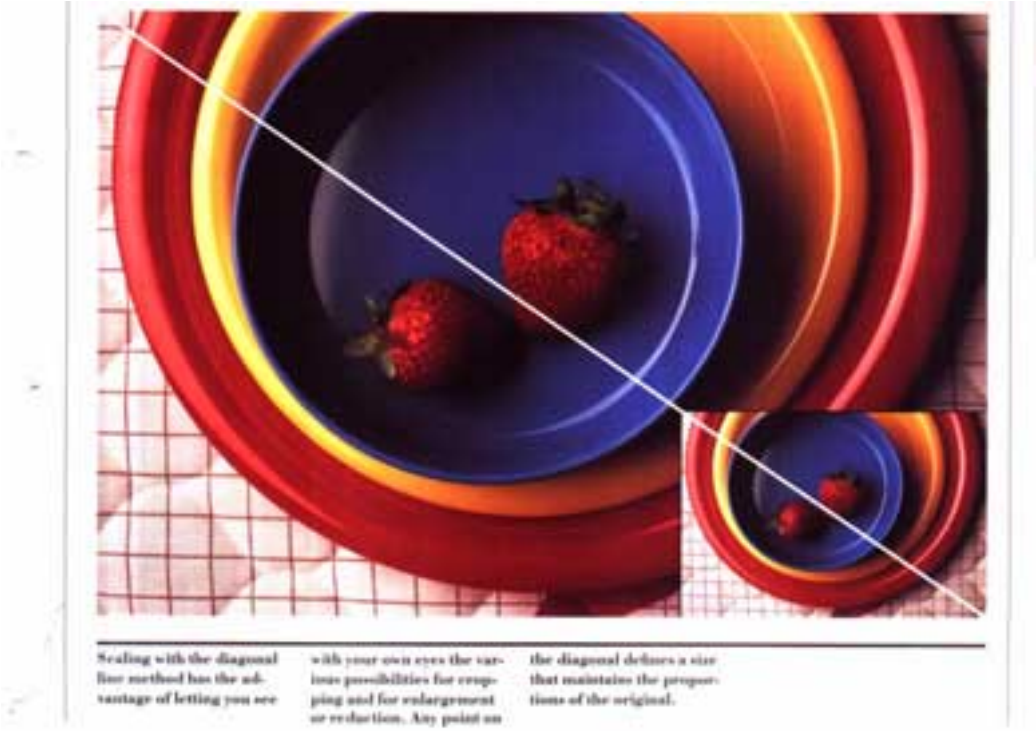
An inexpensive proportional scale offers a quick and accurate method of finding this ratio between the reproduction size and the original size, expressed as a percentage. At the same time, the artist can check the new size of the copy's other dimension, to make certain both dimensions will be correct in the reproduction.

You could also work out the figure with a calculator or by hand, using this formula: divide reproduction measurement by original measurement and multiply the result by 100. That's the percentage of original.

Example: Your controlling dimension is 5", to be reduced to 3", 3/5 = .6, and .6 x 100 = 60. The percentage of original is 60%.

Example: Your controlling dimension is 3", to be enlarged to 5", 5/3 = 1.6667 x 100 is 166.67 or 1662/3%.

Percent of original is a crystal-clear instruction to the image technician, because the focusing



Scaling with the diagonal line method has the advantage of letting you see with your own eyes the various possibilities for cropping and for enlargement or reduction. Any point on the diagonal delivers a size that maintains the proportions of the original.

scales on the process camera are calibrated in percentages. And since a single percentage figure applies to all dimensions, there are no mix-ups as to which is the controlling dimension.

Scanning Line Art and Pre-Screened Copy

For optimal results, it is recommended to use the same resolution as plotting resolution of the output device. Line art images should have a minimum input resolution of 800 pixels per inch (ppi) at the final image size. Line art should be scanned at close to the final reproduction size to avoid scaling problems that can compromise quality. If resizing is called for after the art is scanned, then the input/output scanning ratios reported previously should be applied.

Scanned Art	Recommended Input Resolution	Minimum Input Resolution	Considerations
Type	Same resolution as output resolution	1200 ppi if the output resolution is not known at time of input	Higher resolution leads to larger file sizes
Line art	Same resolution as output resolution	800 ppi if the output resolution is not known at time of input	Thinner/finer lines may demand higher input resolution
Line drawing/ cartoons	Same resolution as output resolution	800 ppi if the output resolution is not known at time of input	Thinner/finer lines may demand higher input resolution

Camera Ready

Copy	Usage	Considerations	Examples???
Imagesetter Paper Film	Final Copy	See SNAP guidelines for range and screening	
Fax Laser printer Inkjet	Proofing only	If used as original copy, reproduction will not meet quality expectations	

Electronic	See page #		
Magazine Directory	Not recommended	If used as original copy, reproduction will not meet quality expectations	
Pre-screened			

What is Gray Balance?

The reproduction of a visually neutral scale comprised of cyan, magenta, and yellow tints is referred to as gray balance. A neutral three-color gray is produced using unequal halftone dot sizes of these three colors, with cyan halftone value always being larger than the yellow or magenta tint values when printing to SNAP densities. Cyan, magenta, and yellow tint values that produce proper gray balance in SNAP proofs and printing are shown in Table N. Dot gain/tone value increase must be controlled throughout the scanning, proofing, film creation, and printing process in order to maintain the relative halftone dot values required for gray balance to be achieved.

Why is Gray Balance Important?

Gray balance is essential to quality four-color printing since reproducing images, including shadow areas and blacks that do not have a cast, or tone, requires that the undercolors of cyan, magenta, and yellow be imaged or printed in a manner that appears neutral. This type of reproduction is referred to as printing in proper gray balance.

Correct gray balance | Blue cast in neutrals | Green cast in neutrals | Yellow cast in neutrals

How Is Gray Balance Measured?

Gray balance is visually assessed by comparing an overprint of the cyan, magenta, and yellow tints with a black tint having an equivalent visual density or "weight." Gray balance must be assessed under standard viewing conditions. Gray balance can also be measured with a densitometer by using the three-filter mode and measuring the gray balance patch.

Total ink Coverage

Under Color Removal (UCR), Under Color Addition (UCA) and Gray Component Replacement (GCR) are the three most effective methods that are very critical in correcting for total ink coverage during color separation process.

UCR is a function of color separation that replaces specified amounts of cyan, magenta and yellow inks with black ink in neutral shadow areas. Inversely it is also possible to increase the three-color component in a variation of the UCR technique called UCA.

GCR is similar concept applied to saturated color areas. The concept of GCR is to remove the gray caused by the three colors of ink and replace it with black.

Achieving the proper amount of ink coverage for process color reproduction has many advantages that include improvement of printability and quicker drying of ink, ink cost reduction, shadow colorcast correction and stability of gray neutrality.

In order to print good shadows the maximum dot area of all four inks for process color material should not be more than 220% - 240%. This helps to compensate for dot value increase/decrease and allow maximum shadow detail with minimum shadow area ink set-off. Dot area exceeding 240% may result in darker shadows on newsprint.

Dot Gain/Tone Value Increase/Decrease

Tone Value Increase/Decrease is an important aspect, which must be compensated for in reproduction in order to achieve excellent quality. Physical dot increase is the natural spread of dot as the image is transferred from one production step to the other. Because of the highly porous nature of newsprint, newspaper reproduction incurs a significant amount of dot increase.

For example, a 50% dot could increase to approximately 80% dot after printing. Dot increase is also slightly higher as the line screen increases. To compensate for dot value increase/decrease and avoid poor reproduction quality, the following specifications for dot value adjustments are recommended:

Revise

Dot Gain/TVI @ 25%	Offset (85-100 lpi)	Flexography (85 lpi)	Letterpress (65-72 lpi)
Cyan	25%	20%	15%
Magenta	25%	20%	15%

Yellow	25%	20%	15%
Black	25%	20%	15%
Tolerances	+/- 3%	+/- 3%	+/- 3%

Dot Gain/TVI @ 50%	**Offset (85-100 lpi)**	**Flexography (85 lpi)**	**Letterpress (65-72 lpi)**
Cyan	30%	30%	18%
Magenta	30%	30%	18%
Yellow	30%	30%	18%
Black	30%	30%	18%
Tolerances	+/- 4%	+/- 4%	+/- 4%

Color Balance Considerations

In order to help obtain proper color balance, included in this specification is the restriction that dot gain/TVI values of the three process colors (Y, M, C) should not differ from each other by more than 4% from the aim value. That is: if either cyan or magenta is +2% (32%) in dot gain/TVI, yellow deviation should not be greater than -2% (28%).

Dot Gain/TVI	**Offset @ 75%**	**Flexography @ 75%**	**Letterpress @ 65%**
Cyan	20%	18%	16%
Magenta	20%	18%	16%
Yellow	20%	18%	16%
Black	20%	18%	16%

Resolution

Resolution – both for input devices and for output devices – is an important consideration in the printing process. Several measurements are used to describe image characteristics in the process:

ppi, or pixels per inch, is a measure of the amount of information scanned in from an image or captured using a digital camera. The higher the resolution capability of the input device, the higher the possible scan resolution. Scan resolution is critical to image quality.

dpi, or dots per inch, sometimes referred to as spi (spots per inch) is a measure of the resolution of the printer, imagesetter, platesetter, or other output device. SNAP recommends use of dpi to refer to output resolution.

lpi, or lines per inch, is a measure of the frequency of the halftone screen used to print an image. The specific lpi chosen is a function of both the printing process and substrate on which the job is being printed.

When Digital Media Are Supplied

Unless previously agreed upon, all digital files will be accompanied by proofs that represent how these files will reproduce on the final printed piece. With each set of files and accompanying proofs, the organization sending these files and proofs should provide the information shown below. This information is needed by the printer/newsprinter and should be communicated by the originator of the digital file(s)/proof(s). A sample form is supplied in the back of this document for use in recording this information.

HALFTONE REPRODUCTION

After selecting the most suitable image, the next challenge is successfully preparing it for press reproduction. At this critical prepress stage, the major factors of tone compression, dot gain and tone reproduction must be managed. As with photography, these issues apply to both black/white and color images.

TONE COMPRESSION

Normal

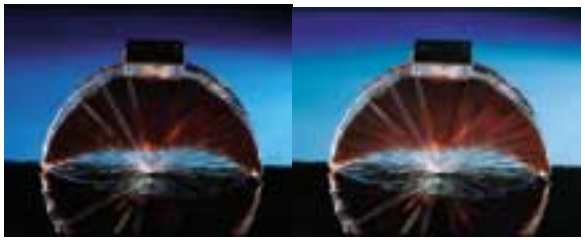
To reproduce an image on newsprint, an important alteration known as tone compression must take place. It allows for the reproduction of an original photo with a wide range (0 to 3.0 density) of tones from light to dark, into the limited reproducible range (0.1 to 1.1 density) of ink on newsprint.

Extreme

Extreme contrast photos lack detail and often have the appearance of being too dark and/or too bright. When tone compression occurs, tonal areas lose contrast. Therefore, it is critical to capture and select images with a normal contrast range. Originals with extreme contrast will lose detail when scanning compression is applied.

If an original with high contrast or non-uniform subject lighting is chosen, avoid employing significantly more compression in an attempt to capture both light and dark detail. Over-compressing simply results in the loss of detail and the appearance of a flat reproduction.

Generally, standard compression of a normal photograph will produce acceptable results. A normal photograph for optimum newspaper reproduction contains a full range of contrast from light to dark, with noticeable detail throughout. This separation of tonal values will produce excellent print contrast.



Normal Compression Optimized Tonal Compression

TONE REPRODUCTION

The theory behind tone reproduction is to successfully manage the placement of halftone dots (highlight, midtone and shadow) to maximize contrast and detail for the interest area of an image. To optimize reproduction, every image should be handled on an individual basis for proper tonal distribution.

The following examples illustrate why tone manipulations must vary according to original copy, and that standard dot aimpoint specifications serve simply as a guide for normal contrast images. Non-detail white drop-outs, midtone placement, and shadow/range restoration are major strategic factors which must be addressed for quality halftone reproduction of each image. See

OPTIMIZING TONE REPRODUCTION

BLACK & WHITE HALFTONES
Material dot percentage aimpoints for normal full tonal range originals.

Halftones intended for offset printing can have dropout highlights. It is advisable to carry a minimum highlight dot in halftones used in direct letterpress printing.

NON-DETAIL WHITE DROP-OUT

Remove all printing dots from non-detail whites to maximize the entire available print range between paper brightness and total ink saturation. A common example of a non-detail white is the reflection from a shiny surface (i.e. chrome on vehicle, jewelry and electronics).

Dots held on shiny surface of car

Dots dropped out on shiny surface of car

ADJUSTING MIDTONE PLACEMENT

Adjusting the midtone is crucial to optimizing the area of interest in an original. Lighting conditions and subject content dictate the need for modified midtone placement.

Many quality failures occur when subject midtones are not properly adjusted in the scanning process. This can result in images printing too dark, even though specifications are adhered to. Midtone placement is dependent on each unique image and subject content. Midtones should be lightened (less printing weight) for dark images.

QUALITY NEWSPAPER REPRODUCTION

Improper midtone adjustment Properly adjusted midtone

It is important to note that commercial proofs seldom reflect the 28% - 32% midtone dot gain incurred on newsprint. Often, the proof will represent a match of the original, however, the printed reproduction will appear too dark.

SHADOW/RANGE RESTORATION

A common error made in tone reproduction is to make necessary midtone adjustments without restoring the shadow range (darkest setting). Because the shadow is pulled open by powerful midtone manipulations (opening up for detail) it is important to restore the shadow to its maximum density.

With high-key originals, slightly more weight than specified can be given to non-detail shadows to enhance print contrast.

Properly adjusted midtone which results in open shadows Shadow range restored

Enhancing Sharpness

Aside from tone reproduction, a final strategy for producing quality halftones is electronic digital sharpness. The original image sharpness is extremely important factor in optimum newsprint reproduction. In most originals, it may be beneficial to apply additional electronic digital sharpness. This works to improve the perception of detail and clarity in the image. The amount of sharpness employed depends on the smoothness of photo emulsion and enlargement size. Noticeable white or black image outlines can result if an excessive amount of digital sharpness is applied.

Conservative amount of unsharp masking Optimum Unsharp masking

Color management

Because equipment used in the color printing process – scanners, monitors, output devices, printers, printing presses, etc. – interpret colors differently, it is difficult to maintain original colors accurately throughout the process. In the past, expensive specialized computer systems were used in an effort to preserve accurate color reproduction. The components of such systems were designed to work together exclusively, and were tuned to interpret colors consistently from one step in the process to the next. Generally, these systems were considered "closed loop" systems because all the pieces worked only with one another.

The introduction of personal computer technology and desktop publishing software made the color printing process considerably less expensive. However, it also introduced the problem of varying components having to work together. Color production components are now available from many different sources, but they are far more difficult to "tune" to work together to produce consistent results.

To solve this problem, two major developments have taken place. First, a standard method of describing colors was agreed upon. The International Color Consortium (ICC) has agreed upon a numbering scheme to describe all the colors in the spectrum. Second, software tools have been developed to translate colors into these standard "codes" for each device in the process. Thus, if the scanner sees red, it records the standard numbers for red. The monitor then reads the standard numbers for red and shows the proper red when it reproduces the image on the screen. The same holds true for all the devices in the process, including – theoretically – the printing press. If properly set and the combination of the given printing inks allow, the press should be able to reproduce the same red whenever those particular numbers are called for.

The hardware and software tools that allow for this translation and interpretation of colors comprise color management technology. The goal of the technology is to reproduce accurate colors consistently, regardless of the source of input or destination of output. The ability to reproduce colors consistently from one newspaper to the next is extremely important to advertisers. Technologies that can achieve such consistency are of obvious interest to the publishing industry.

1. **Color management alone won't help.** Color management is a total process, not simply a piece of software. Quality color reproduction is dependent on process controls, standards,

and software working together. It is essential to identify process variables and stabilize them. Color management can work, but problems arise when something new is introduced, which is a frequent occurrence. If process control is not in place, color management will not help. For example, the press must be properly calibrated and able to reproduce SNAP standards (standard printing specifications developed for coldset printing) and the advertiser must provide ads based on those standards. The industry must agree to the SNAP standard and follow it in order to assure advertisers of consistent high-quality printing.

2. **Implementation is complex and requires adequate knowledge.** Color management implementation is complicated and requires time, commitment, energy, and dedication. It remains difficult for newspapers because of required resources, including press time, training, labor, hardware, and software. Lack of training remains a critical problem in providing consistent color quality. Employees must be provided with the opportunity to learn the process and gain requisite technical skills.

3. **Color space transformations could cause problems.** While it is possible for color management software to accurately transform colors from one color space to another, it is not certain if it is possible to change them back again. Based on where the conversion takes place in the production process, this could cause problems for archiving material, re-use of materials for different printing processes, and Internet publishing.

4. **Consistency of results among color management systems has not yet been demonstrated.** While color profiles may be exchanged among different color management programs, it is not proven that the different programs will produce the same results. In other words, it is not yet known if different programs will yield identical results from the same profile.

5. **Color management has potential benefits for newspapers.** Color management has the potential to allow people "upstream" from the presses to see what the product will look like before, rather than after, it comes off the press. More people will have more information about the finished product in advance. Advertisers might know earlier what to expect from the finished product, and could have more control over the results. The rigorous calibration required for color management can also help determine when individual components begin to drift.

Color profiles

In essence, the color-sync software is a switchboard that relays information about color devices to your software. This information is stored in a small file called a profile. By

coordinating the profiles for your scanner, monitor, and printer. Color-sync helps to ensure that the color on your monitor matches the color that comes out of your printer.

For example, let's track an image from the scanner to the printer, focusing on one color in the image. For the sake of this example we'll call the color ruby red, although colors are represented by a much more complex naming system.

1. The scanners profile contains information about how the scanner defines its color space or gamut.

2. Before the image is displayed on the monitor color-sync will check the monitor profile and compared with the scanner profile, it may find that the monitor and the scanner display ruby red differently in their gamuts.

   After comparing the profiling and adjusting the image, the monitor will display the color that both profiles agree is closest to the true ruby red.

3. Before the image is printed, color-sync will consult the printer's profile to see how it portrays ruby red in its gamut. It will then adjust the color so that the printed image will resemble as closely as possible the image on the monitor.

Software types names? i.e. PhotoShop

R. Leseburg/ T. Croteau

8. Preflighting

Prepress Planning and Preflight Worksheet

As the digital file is completed, it needs to be checked for completeness. A sample check list for this process is in the Technical Worksheet Section.

Virus Check

9. Output

Proofing

The Function of Proofs

Different types of proofs have different functions in the workflow process. These include position and press proofs.

Position Proofs are copies of ads given to sales reps and/or accounts when requested. The purpose of a proof is to correct any typos and make minor style corrections. Do not use proofs to aesthetically revise the layout or copy. Preferred type faces, sizes and client ad styles must be communicated to artist or Mac operator in advance.

Overview of Technologies and Types of Proofs

If a proof is made from an electronic file, it is Digital and if it is made from film, it is called Analog. Note: Some digital proofs have dots and some continuous tone. Both technologies can be used to produce a proof at various points along the production process.

A layout only shows the elements and their relative position.

A contract proof shows a final version of the job.

Types of Color Proofs:

The two types of color proofs are press proofs and photomechanical proofs.

1. Press Proofs

Proofs should be pulled on newsprint similar to that used by newspapers, so that the press proof will approximate the finished reproduction as closely as possible.

2. Photomechanical Proofs

A fundamental difference between color overlay proofing systems and color press proofs is that a color overlay proofing system can be expected to simulate the dot percentages in the film negatives, while a color press proof should approximate the finished reproduction.

Most newspapers use photomechanical proofs, since the press-proof method is both expensive and time-consuming.

There are two kinds of photomechanical proofs - one-piece color proofs and color overlay proofs.

One-piece Photomechanical Proofs: A one-piece color proof is made by producing a separate transparent sheet carrying a color dye image, for each color ink to be used. The transparent dye images are placed in register with each other and then laminated onto a white board or sheet of paper.
With the improvements in digital proofing most newspapers are trending toward digital proofing systems. The most effective proofing systems are digital proofs made directly onto newsprint substrates. Such proofing systems allow for accurate calibrations between proofs and press reproduction.

PDF Workflow

The Portable Document File (PDF) was developed by the Adobe Corporation in the early 1990's. As an alternative to HTML the company envisioned it as a way to create World Wide Web documents that could be displayed and downloaded in the exact format of the authoring program. The format, which is a shorthand kind of postscript, was quickly adopted for a number of uses and thanks to the efforts of several major corporations, AT&T, The United States Government, and The Associated press among others, it has quickly become a standard for a variety of uses.

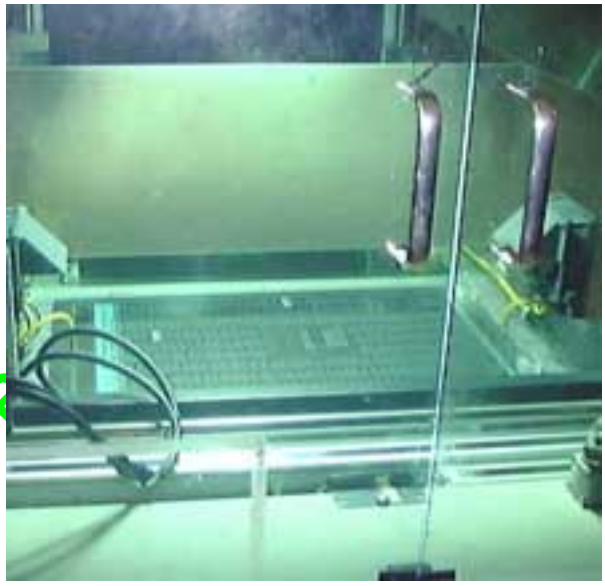
Included is the transmission of documents from one site to another where it can be printed without sending the high resolution graphic files or the fonts along with the documents. The portable files contain all the necessary printing data, including fonts, and lose none of the original quality. The PDF format has already gone through a number of changes and will continue to evolve as Adobe opens the code and creates new forms. Therefore, the workflow for PDF will be changing as the technology changes. Currently a Black and white file sent to a publication can either be printed directly to film or velox, or can be exported to a standard EPS format for placement in a page layout program.

For color files, the standard method of output is the export to EPS where the layout program converts the composite color information into CMYK or spot color separations. One disadvantage of the PDF format is the lack of edibility of the files. Depending on how the file is created it maybe impossible to make any changes to the document without

sophisticated equipment. As the format changes this edibility is expected to change with the use of plug-ins to allow re-toning of images as well as font changes.

In addition newer page layout programs and some rips are being developed that will allow direct import of the PDF file and with PostScript level 3 direct output of color files for in-RIP separations.

Platemaking Processes



Printing plate issues are among the most crucial affecting reproduction quality. Accurate image transfer from film to plate is essential for good print reproduction. Improper exposure can cause excessive dot growth on negative working plates. Plates must be accurately exposed and processed, hold image details well and register correctly.

Quality assurance tools such as the NAA Digital Color Test Form, IFRA PostScript Color Test forms, GATF Star Targets, UGRA/FOGRA Control Strips, digital test targets, etc., should be used with plate image measurement.

The UGRA/FOGRA plate control wedge is used to control platemaking and detailed evaluation of print reproduction curves. The wedge consists of continuos tone wedge, microline targets, halftone wedge, doubling and slur patches and highlight and shadow tints. Image resolution and exposure latitude, tonal value transport and range, film quality and plate reproduction curve should also be checked for quality and consistencies.

Newspapers using digital plates need to be capable of precisely and consistently imaging them. Digital plates will not provide excellent reproduction quality if the process is not properly calibrated. Image data has to be accurately processed, manipulated and maintained and results must be predictable for correct reproduction on the press.

Newspapers should also be aware that the type of plate screening can affect densitometer measurements. As the line screen ruling increases, the corresponding measured dot will also likely increase. Care should also be taken when attempting to measure images on digital plates to avoid measurement bias and inconsistency. Instrument aperture, calibration measurement techniques, plate and image contrast, plate gaining characteristics and plate processing conditions are some of the factors that can affect plate measurement consistency.

Although densitometer use does not constitute a perfect plate measurement process, their use, when combined with consistent plate measurement procedures, will enable newspapers to better control their printing processes.

Printing plates must be accurately bent to press specifications. Plate squareness must be checked and verified prior to using them for production.

10. Presswork

Gray bar

Listed below are some critical points that must be adhered to when using the gray bar.

- The imagesetter/film processors must be checked regularly to insure that they are outputting the proper film screening for the gray bar. This can be checked with a transmission densitometer.
- The width of the gray bar should be as wide as the target window for both the transmission and reflection densitometers to insure proper readings.
- Densitometers should be checked for proper calibration daily.
- The print density specification range for the gray bar has to be within the density variation capability of your press.
- Always make gray bar density corrections on press from dark color to light. This should be done because the cyan and magenta pigments contain components that effect the yellow component of the gray bars. If the yellow is adjusted first, it would have to be reset after the other colors are brought into adjustment.
- Always take readings on the same position of the gray bar and same plate position (high side or low side) to minimize density variations due to impression on the press.

USE OF THE GRAY BAR IN THE PRESSROOM

When starting up the press the following steps should be taken when using the gray bar:

- **Get page in register**
- **Get gray bar balance across the page by eye**
- **Check the gray bar with the reflection densitometer**
- **Adjust the density if necessary, darkest color first**
- **Recheck density after a few minutes in the same position and adjust as necessary**

The gray bar can be a powerful tool that allows you to have good color reproduction and consistency if it is used properly.

Solid Ink Density (SID)

The following solid ink densities (dry SID values measured using Status T densities and as absolute, meaning that paper density is included) should result in optimum reproduction quality:

Dry Solid Ink Density, SID	Offset Newspapers	Flexography	Letterpress
Cyan	.90	.95	.90
Magenta	.90	.97	.90
Yellow	.85	.79	.85
Black	1.05	1.05	1.00
SNAP Aim Point Tolerances	+/- 0.05	+/- 0.04	+/- 0.05

11. Technical Supplement

References

Web sites

New technology future
Resources list

Profiling software Vendors

Windows and Macintosh

Agfa Color Tune
978-658-5600
www.agfahome.com

Color Solutions *Color Blind Professional ICC*
(760)436-6593
www.color.com

Kodak *Color Flow*
800 235-6325
www.kodak.com

Macintosh only

Candela Color Synergy
612 894-8890
www.candelacolor.com

Color Savvy *Profile Savvy*
513 748-9160
www.colorsavvy.com

Delta-E *Profiler*
510 237-5913
www.delta-e.com

Gretag Macbeth *Profile Maker*
800 622-2384
www.gretagmacbeth.com

Heidelberg *Scan Open, Print Open, View Open*
888-546-0265
www.linocolor.com

Imation *Spectral Profiler*
800 328-1303
www.imation.com

Monaco Systems *Monaco Profiler*
978-749-9944
www.monacosys.com

Scitex *Profile Wizard*
905 206-9800
www.scitex.com

Sonnetch *Colorific*
415 957-9940
www.colorific.com

Spectrophotometer/Colorimeter vendors

Gretag MacBeth
617 Little Britain Road
New Windsor, NY 12553
(914)565-7660

X-Rite

3100 – 44th Street South West
Grandville, MI 49418

QUALITY NEWSPAPER REPRODUCTION

(616)534-8960

Quick Start Guide URL

SNAP

Quality Tools

NAA Quality Toolbox

Tools for Pre-press

1. Reflection Densitometer with current calibration plaque.
2. Transmission densitometer with Step Tablet for film.
3. 30x Lighted Magnifier.
4. Linearization software for imaging.
5. Screen Angle indicator.
6. Screen Rule determiner.
7. New Digital Color Test Form
8. Plate exposure scale / Contacting scale.
9. Color booth 5000 Kelvin and Verifier Strips.

Tools for the Press

1. Shore Hardness Gauge.
2. Copper Measurement Gauge.
3. Blanket Gauge.
4. Conductivity / pH Gauge.
5. Roller Stripe Tested.
6. NAA Color Ink Book.
7. Monitor Calibration Software and Occluder.

NAA Production Process SOP Manual

12. Glossary

ABSORPTION (1) Optical term for the partial suppression of light in passage through a transparent or translucent medium or material. (2) The property of a porous material, such as paper, which causes it to take up liquids with which it is in contact.

AD/FLEX™ Standard Flexo color inks tested and approved by the Newspaper Association of America (NAA) for process and spot color reproduction.

AD-LITHO Standard Lithographic color inks tested and approved by the Newspaper Association of America (NAA) for process and spot color reproduction.

AdPro® Standard Letterpress color inks tested and approved by the Newspaper Association of America (NAA) for process and spot color reproduction.

Agate Line Unit used to compute advertising space column depth. Fourteen agate lines to the column inch was used as an industry standard before introduction of the Standard Advertising Unit (SAU).

APERTURE A small opening. In cameras, the aperture is usually variable in the form of an iris diaphragm and regulates the amount of light which passes through the lens.

AUTOMATIC PASTER

BENDAY A mechanical tint on a transparent base that creates shading and texture for graphic reproduction without screening.

BLANKET A sheet of rubber that is reinforced with fabric which is used on an offset press to transfer the image from the plate to the paper.

BLEND Sometimes called a vignette or degradee, a blend is a halftone image tint in which the background or a portion of the illustration gradually shades off until the lightest tones or extreme edges appear to merge with either a second blend printed using a different color or the paper on which the one-color is printed.

CHARACTERIZATION TARGET A target that is scanned or imaged and then measured in order to characterize (also referred to as to map or to describe) the range or gamut of colors that that scanner or camera can perceive, an imagesetter or platesetter can image, or a proofer or printing press can depict.

CIE The Commission Internationale de l'Eclairage (in English: International Commission on Illumination. It is a technical, scientific, and cultural non-profit organization whose objectives are to provide an international forum for discussion of all matters relating to the science, technology and art in the fields of light and lighting, and for the interchange of information in these fields between countries, and to develop basic standards and procedures of metrology in the fields of light and lighting.

CMS Color Management System (CMS) refers to a software program that compensates for the different color characteristics of input devices such as scanners and digital cameras and output devices such as imagesetters, digital proofers, and printing presses.

COLDSET PRINTING Printing process sometimes referred to as non-heatset and open web that prints only on uncoated papers, and typically uncoated groundwood sheets such as newsprint, using ink systems that rely primarily on absorption and to a lesser degree oxidation to first set and then dry.

COLOR BARS Printed tonal scales of the process colors used to monitor ink density, dot gain/tone value increase, and other print characteristics on proofs and printed sheets.

COLOR MANAGEMENT: A process that draws on characterization targets and Color Management System (CMS) software as tools to translate and map the gamut of colors achievable using each component of the reproduction system – including digital and conventional cameras, scanners, imagesetters and platesetters, and proofing systems and printing press -- with each other component of the system. The goal of CMS is to provide predictable, consistent, and efficient tone compression as an image moves through the graphic arts process.

CONTRAST The difference of tonal graduation between the light and dark areas within an image.

CONTINUOUS TONE (CT): According to the GATF Encyclopaedia of Graphic Communications, continuous tone, sometimes referred to as contone, is essentially a photographic image that is not composed of halftone dots. Examples include photographs, transparencies, and digital proofs that do not employ halftones, such as xerographic, dye transfer and ink jet proofing systems. The term continuous tone also refers to a digital image that has been scanned prior to being screened into halftone dots. Continuos tone also refers to a bitmap file of a scanned image.

D_{MAX} The area of maximum density (darkest area) of a reflection or transmission photographic material.

D_{MIN} The area of minimum density (lightest area) of a reflection or transmission photographic material.

DENSITOMETERY A method of measuring density, dot gain/tone value increase, and other characteristics. Densitometers are the name of the device used to measure the transmission or reflectance of specific

colored light through or from transparent or reflective copy samples.

DENSITY The light absorbing property of a material, expressed as the logarithm of the reciprocal of the reflectance or transmittance factor; higher density indicates more light is absorbed.

DENSITY, ABSOLUTE A measurement of light reflected from a target or other patch that includes the density of the substrate on which the ink, colorant or material being imaged appears.

DENSITY, REFLECTION A measurement of light reflected from a target or other patch imaged on a substrate such as paper, boxboard, or some other opaque surface.

DENSITY, TRANSMISSION A measurement of light transmitted through a target or other patch imaged on a substrate such as clear polyester film, glass, or some other translucent surface.

DENSITY, RELATIVE A measurement of light reflected from a target or other patch that excludes the density of the substrate on which the ink, colorant or material being imaged appears

DOT GAIN/TONE VALUE INCREASE (TVI) An attribute of printing wherein the halftone dot size increases through successive stages of the reproductive process. Total Dot Gain, sometimes called Apparent Dot Gain, describes the combined effects of both the mechanical and optical increases in tonal rendition. It represents the difference between the halftone dot on the film or specified in the file and the appearance of that halftone dot on the piece being measured. As the industry embraces digital workflows and digital imaging methods that do not employ halftones, the term *tone value increase* is being recognized as the more inclusive term to describe this phenomenon.

DOT AREA (APPARENT)/TONE VALUE When measured objectively using a reflection densitometer or similar device, the size of the halftone dot, including mechanical plus optical components, that is imaged or reproduced on opaque materials. The Apparent Dot Area/Tone Value minus the halftone dot on the film or specified in the file equals Dot Gain/Tone Value Increase.

DOT AREA, FILM: When measured objectively using a transmission densitometer or similar device, the size of the halftone dot, including mechanical plus optical components, that is imaged or reproduced on translucent materials.

DOT GAIN CURVE: The name for a graph illustrating dot gain values reproduced from highlight and quartertones values through midtones and three-quartertone values and including solids by an imaging device, including a digital or analog proofing system or a printing press.

DPI Dots Per Inch (DPI), sometimes referred to as Spots Per Inch (SPI) is a measure of the resolution of the printer, imagesetter, platesetter, or other output device.

DRY BACK The change in the print density from the time of printing as the ink is absorbed into the sheet of paper. Densities typically decrease in values as dryback occurs.

EPS Encapsulated PostScript (EPS) is a file format developed by Adobe Systems Inc. According to the GATF Encyclopedia of Graphic Communications, the EPS format provides an output device-independent PostScript representation of page, graphic element, or other object. In addition to including a low-resolution bitmap file of the page or image to permit quick on-screen viewing, EPS files are able to image smooth lines and curves at the output resolution called for using the output device.

FAN OUT

FONTS

FOR POSITION ONLY For Position Only (FPO) refers to physical or electronic images which are included on a hard copy or electronic mechanical to indicate only the position of the final artwork or scan and are not intended to print. When employed they are placeholders in the page or on the file for high-resolution images or alternate text, graphics, or pictures.

GAMUT According to the GATF Encyclopedia of Graphic Communications, gamut, sometimes referred to as the color gamut, is the range of colors that can be reproduced with a specified set of inks or other colorants on a specified paper or substrate while using a designated printing press or other imaging device.

GATF

GRAY BALANCE The relationship of cyan, magenta, and yellow inks required to reproduce a neutral gray scale within a given printing system.

GRACoL General Requirements for Applications in Commercial Offset Lithography

GRAY COMPONENT REPLACEMENT (GCR) An electronic color scanning capability in which the least dominant process color is replaced with an appropriate value of black in process work.

GRAY SCALE A strip of standard gray tones, ranging from white to black. In the case of color-separation negatives for determining color balance or uniformity of the separation negatives.

HALFTONE An image, typically on a piece of graphic arts film, having a tone pattern composed of round, square, elliptical, or a combination of dots of uniform density but varying in size.

HIGHLIGHT The lightest tonal areas in a halftone or color separation film and reproduction. Highlights encompass halftone values ranging from 1% to 15% dots.

HUE ERROR Hue error indicates a deviation from a theoretically perfect process hue.

HUE One of the three attributes of color, the others being saturation and brightness. Hue is determined by the color's dominant wavelength in the visible color spectrum.

IFRA

INPUT RESOLUTION

L.A.B.

LINE DRAWING

LPI Lines Per Inch, is a measure of the frequency of the halftone screen used to print an image.

MIDTONE The middle tonal areas in a halftone or color separation film and reproduction. Midtones encompass halftone values ranging from 40% to 60% dots.

MOIRE Undesirable patterns occurring when reproductions are made from halftone proofs or steel engravings, caused by conflict between the ruling of the halftone screen and the dots or lines of the original. This is usually due either to incorrect screen angles or misregister of the color impressions during printing.

MURRAY-DAVIES EQUATION The equation specified by SNAP to calculate dot gain/tone value increase.

NAA

OPACITY The measure of the amount of light which will not pass through a substrate or ink.

PDF Adobe Systems Incorporated, the software company that created PostScript™, has published an updated page description software called Portable Document Format, or PDF.

PIXEL ARTIFACTS

PPI Pixels per inch, in a digital file. Each pixel represents the smallest tonal element in a digital imaging system.

PRINT CONTRAST A method of evaluating and optimizing the *density* of the ink deposited on the *substrate* during printing. The ink strength--or print contrast--is determined to take into account the solid ink density, the density of the ink in *shadow* areas of the image, and the *dot gain*. Print contrast is calculated by measuring the ink density of a solid area and the ink density in a 75% tint.

PRINT DENSITY The light absorbing ability of the printed image or base material.

PROOFS

QUARKXPRESS Software that provides a full range of word processing, typographic, and page layout features that enables users to combine text and graphics into a complete page.

QUARTERTONE In imaging and photography, the portions of an image (such as a photograph) with tonal values between those of highlights and middletones, containing halftone dot sizes of approximately 25% dot area.

RASTER IMAGE PROCESSOR (RIP) A device which converts an image into a bit-map suitable for *Digital printing* (Computer-to-print). The electronic bit-map indicates every spot position on a page in preparation for an actual printout.

REGISTER Exact correspondence in the position of pages in color printing.

REGISTER MARKS Small crosses, guides or patterns placed on the originals before reproduction to facilitate registration of plates and their respective printing.

RESOLUTION The capability of making distinguishable the individual parts of an alphanumeric or other image.

RGB

Scanner A device that can separate color and multiple shades of gray to create digital halftones. The light energy of each pixel is converted into a digital signal and the number of lines and their dimensions determines the details of the image.

SCREEN ANGLE Any of the particular angles at which a halftone screen or the original itself is placed for each of the color separation negatives, in order to prevent formation of interference patterns (moiré') in the completed color reproduction. Angles of 30° between colors produce minimum patterns.

SCREEN RULING In halftone photography, the number of lines of *dots per inch (dpi)* on a halftone screen. Each line (or row) and each column contain a certain number of dots at a particular density.

SEPARATION (Color)(1) In color photography, the isolation or division of the colors of an original into their primary hues, each record or negative used for the production of a color plate. (2) The act of manually separating or introducing colors in printing plates. In lithography, direct separations are made with the use of the halftone screen; indirect separations involve continuous-tone separation negatives and screened positives made from these.

SNAP Specifications for Non-Heat Advertising Printing. SNAP outlines prepress and printing specifications for coldset offset, letterpress, and flexographic printing on uncoated groundwood sheets.

SOLID INK DENSITY (SID) In imaging and *color*, the perceived darkness of a substance, material, or image caused by the absorption or reflection of light impinging on the material.

STATUS T A standard wide-band densitometric response specified in ISO 5/3 and ANSI PH2.18 to be used for color measurements in the graphic arts.

STOCHASTIC A type of digital halftone screening that varies the pattern of dots while keeping the size of the dots constant.

TAGGED IMAGE FILE FORMAT (TIFF) In computer graphics, TIFF is the most commonly used *file format* for saving and transporting bitmap images. Essentially, TIFF saves an image with little information beyond the values of the pixels contained in the image, and a header (or tag) describing the output size and the resolution of the image.

TERTIARY COLORS

TEST FORM

THREE-QUARTERTONE In imaging and photography, the portions of an image (such as a photograph) with tonal values between those of *middletones* and *shadows*, containing *halftone* dot sizes of approximately 75% *dot area*.

TONAL RANGE Alternate term for density range, or the gamut of tones in an original or reproduced image. Density range: expressed as the difference between the area of maximum density (the darkest portions of an image) and the minimum density (the lightest tones).

TONE VALUE The percentage of an area on a film or print or in a digital file to be covered by colorant. Also known as apparent dot area.

TONE VALUE INCREASE (TVI)/DOT GAIN Difference between the tone value on a print and the corresponding value on a halftone film or in a digital file. Also known as dot gain.

TONE VALUE SUM The sum of the tone values on all the color separations in the darkest area of an image. Also know as TAC, total area coverage.

TOTAL AREA COVERAGE (TAC) The sum of the tone values on all the color separations in the darkest area of an image.

TRAP (Apparent) The ability of a printed ink film to accept the next ink printed on top of the first.

TRAP (IMAGE) In multicolor printing, an allowance of overlap for two colors printed adjacent or overlapping to each other as a means of compensating for misregister and to avoid gaps between colors.

TRAP (INK) The action of printing an ink film on top of another ink film.

TRUE TYPE

UGRA PLATE CONTROL WEDGE: A test target used to control the plate making process. The five elements of this target measure exposure level, resolution, minimum dot sizes, tone reproduction, and directional effects of imaging.

UNDERCOLOR REMOVAL (UCR) A form of process color reduction that decreases the dot sizes of the cyan, magenta, and yellow inks in the neutral shadow areas and compensates by increasing the dot size of the black printer. See GCR.

UNSHARP MASKING A scanning technique that will sharpen or exaggerate image edges.

VELOX A paper positive image reproduction produced on a camera, exposure frame, or imagesetter.

VIGNETTE (Also known as Fade Away) (1)A small decorative design or illustration of any kind on or just before the title page, or at the beginning or end of a chapter of a manuscript or book. (2) An original piece of copy. (3) Halftone printing plate of impression in which the background or a portion of the illustration gradually shades off until the lightest tones or extreme edges appear to merge with the paper on which they are printed.

Virus

13. Technical Worksheets

Customer Feedback form

Thank you for your recent procurement of advertising space in **The Daily Planet**

The materials supplied for this project have been evaluated to determine adherence to industry and company specific standards. The following information is provided to you as a service of our organization to facilitate continuous improvement in reproduction quality.

Size	Resolution	Density	Type	Screening	Proof
Large	Low	Low	Large	Too Fine	Not Supplied
Good	Good	Good	Good	Good	Good
Small		High	Small	Too Coarse	Can't Match
Reverses	Trapping	Sharpening	Highlight	Midtone	Shadow
	Too Much	Over Sharp	Large	High	Closed
	Good	Good	Good	Good	Good
	Too Low	Too Soft	Small	Low	Open

Negative Film

Emulsion Orientation	Incorrect	Correct	
D Min	Low	Good	High
D Max	Low	Good	High
Proof supplied	No	Good	Not Acceptable

QUALITY NEWSPAPER REPRODUCTION

Please contact us regarding electronic submission of future materials

Electronic

Format ?
Receive Method ?

Fonts	Embedded	Included	Not Included
Graphics Resolution	Too High	Good	Too Low
Proof supplied	No	Good	Not Acceptable

QUALITY NEWSPAPER REPRODUCTION

Advertiser Materials Check List

Ad Number_____
Advertiser name_____
Contact name and phone number_____
Contact Email_____
Sales Rep _____
Headline/slug_____

Hard copy proof
Electronic Ad File
Fonts included (only send ones is Ad), both printer and screen
Convert embedded fonts in EPS files to paths
Scanned Elements
Min. photo resolution 200
Min vector (Line art) resolution 800
Min Scanned type resolution 1016
High resolution files
Convert RGB to CMYK or spot colors
Exclude crop/register marks and tag lines not intended to print

PDF
Down sample image to 200dpi
J PEG no more than medium.
Composite color
Embed all fonts

Supplied Film
Screen ruling
Registration marks
Emulsion orientation
Screen angle
Dot Shape
Proof (hard Copy)
Dmax above 4.0
Dmin below .08
Total ink density
C__M__ Y__K__
Total____
Image Size

Speck Free (dirt)
Crop marks
Color Indicator(s)

Velox
Screen ruling
Crop marks
Screen angle
Dot Shape
Proof (hard Copy)
Dmax above 1.6
Dmin below .08
Image Size

Image Preparation Checklist:

To accurately communicate desired information to a process camera operator, desired needs must be communicated accurately using universally understood criteria.

First is indicating image area and final size. Basically, the process camera operator digital image technician asks three questions:
What is the image area?
That is, what gets cropped out?
You indicate the image area with one or more sets of crop marks—on the border of the art, on an overlay, or on a photocopy of the original.
What is the controlling dimension?
Is it the width—the horizontal dimension? Or is it the height—the vertical dimension?
Show the controlling dimension clearly.
Avoid confusion by showing only the crop marks for the controlling dimension, when possible.
What is the final or reproduction size?
That is, how much is the image area to be enlarged or reduced?
Or is it the same size?

Secondly, newspapers readily accept either of two ways to express the final or reproduction size:
Final Measurement:
The measurement in inches of the final image's controlling dimension.
Write this measurement between the crop marks of the controlling dimension.
Example: 3". Avoid confusion by showing *only* this measurement—the laws of physics will take care of all the other reproduction size measurements. If the image area is to be reproduced same size, write "S/S" or "Same size."
Percentage of Original:
Ways to find this ratio between reproduction size and original size are given on Show this figure clearly.
Example: "60% of original." Avoid confusion by showing only this figure.
Specifically, do *not* include the reproduction size measurement of the controlling dimension. If the image area is to be reproduced same size, write "S/S" or "Same size."

Thirdly, crop marks must be clearly indicated.
A soft red grease pencil is a good choice for making crop marks, and also for noting the reproduction size and any other instructions.

Do not mark image area.

Often only one set of crop marks are needed—at the bottom, for example, if your main concern is to get the reproduction image a certain width.

But if it takes crop marks on more than one side to indicate the image area, be sure that the controlling dimension is clearly indicated.

Prepress Planning and Preflight Worksheet

Customer Name

Day Entered Delivery Date

P.O. # Job #

Contact Phone

Fax E-mail

Job Description

Quantity Size

Hardware Used

❑ Macintosh ❑ IBM-compatible ❑ UNIX

Data Storage

❑ Floppy disk
❑ Compressed
Method
❑ Photo CD
❑ Self-extracting
❑ Removable Hard Disk Cartridge MB
❑ Optical MB
❑ Magnetic Tape MB
❑ Cassette Tape MB
❑ Dat Tape 8 mm MB
❑ Other MB

File Delivery

❑ Sneaker Net/Courier
❑ LAN Line/Fiberoptics
❑ Satellite
❑ Modem
Software Version
Speed/Baud Rate Mfg.
File Transfer Protocol
Parity: ❑ even ❑ odd ❑ none
Data Bits: ❑ 7 ❑ 8 Stop Bits: ❑ 1 ❑ 2

NO mention of PDF

❑ Faxed Hard Copy

Artwork

Graphics Supplied Quantity
Transparencies: 35 mm
4x5
6x7
8x10

Reflective Photos
Drawings & Illustrations
Line Art
Mechanicals

Image Capture Information

Scanning: Color RGB
Color CMYK
Grayscale
Line Art
❑ Digital Camera

Save Graphic As: ❑ Macintosh
❑IBM-Compatible
❑ TIFF ❑TIFF RGB
❑TIFF CMYK ❑ PhotoShop
❑ EPS ❑ EPS DCS ❑ PICT ❑

❑ OCR Scanning
Text Only
Reformat Page as Original

Save Text As: ❑ Macintosh ❑ IBM-Compatible
❑ Text File ❑ Other
❑ MS Word

Page Layout Programs Selected

❑ QuarkXpress V. ❑ Pagemaker V.
❑ Framemakeer V. ❑ Other

Fonts Used

1.
2.
3.
4.
5.
6.

Screen Fonts Included ❑ Yes ❑ No
Printer Fonts Included ❑ Yes ❑ No

QUALITY NEWSPAPER REPRODUCTION

Advertising Agency Production Module

The purpose of this section is to describe the production requirements of the various newspaper printing processes for the Advertising Agency Production Person in order to better match the customer's expectations with the newspaper's capabilities.

It is important that the advertiser understand the differences from commercial heat-set printing to printing on newsprint. The major differences are:

1. Range the lightest to darkest range is smaller on newsprint.
2. Dot Gain on newsprint is higher than in commercial printing. Typically 25 to 35 percent in the midtones for offset and 18 to 25 for letterpress.
3. Total Ink Density is lower on newsprint, typically 220 to 260
4. Screen Ruling is lower because of the above issues, use lower screen ruling such as 85 to 100 line for offset, 65 to 85 for letterpress.
5. **Detail** is lower because of ink absorption into the newsprint. To compensate use higher levels of unsharp masking
6. Measurement targets Use of a Color/Gray Bar is recommended to control the above points. Some Commercial Printing can trim off measurement targets, which can not be done in Newspaper printing.

For optimum reproduction quality, Final ad material should be submitted in the following format(s):

1. Electronic See the Digital Advertising Guide for more detailed information on electronic files.
2. Velox (B&W)
3. Film (color)

The following will not reproduce well (not recommended):

Laser printer output
Low resolution images (I.E. Internet).
Color copier/printer
Faxed copy
Pre-printed images (re-screens)
Velox color separations

Q uality Do's and Don'ts
Do fill out checklist.
Do handle electronic media with care.

NAA Operations Work Group

For more information

Place business card here for local Technical Contact:

QUALITY NEWSPAPER REPRODUCTION

Do ensure all materials are on time.
Do supply proof or lay out with supplied material.
Don't fold or crease customer supplied materials.
Don't staple customer supplied materials.

QUALITY NEWSPAPER REPRODUCTION

Specification Sheet.

Tone reproduction separation aim points for film intended to reproduce as black-and-white or single-color images are:

Black-and-white or single-color images

Tonal Area	Offset (85 lpi)	Offset (100 lpi)	Flexo-Graphy (85 lpi)	Letter-Press (65-72 lpi)	Letter-Press (85 lpi)
Specular/ non-detail	0%	0%	0%	0%	0%
Highlight	3%	3%	5%	8%	5%
Quartertone	18%	16%	15%	20%	15%
Midtone	35%	32%	35%	38%	35%
Shadow	85%	85%	80%	85%	75%

Tone reproduction separation gray balance aim points for film prior to the application of UCR

Cyan	Magenta	Yellow	Black	Tonal area
Offset 85 lpi				
3	1	1	0	Highlight
20	14	14	0	Quartertone
38	30	30	10	Midtone
60	50	50	80	Shadow
Offset ´00 lpi				
5	2	2	0	Highlight
20	14	14	0	Quartertone
38	30	30	10	Midtone
60	50	50	80	Shadow
Flexography 85 lpi				
8	5	5	0	Highlight
20	14	14	0	Quartertone
38	30	30	10	Midtone
60	50	50	80	Shadow
Letterpress 65 - 72 lpi				
9	5	5	0	Highlight
20	14	14	0	Quartertone
42	33	33	0	Midtone
61	52	52	75	Shadow
Letterpress 85 lpi				
8	5	5	0	Highlight
20	14	14	0	Quartertone
38	30	30	10	Midtone
60	50	50	80	Shadow

Gray bar. Recommended amounts for cyan, magenta and yellow in gray bars varies by newspaper. (1/8 in or 2mm minimum in size across the whole ad) Two commonly used values at newspapers are:

Offset 3-C Gray Balance				**Black Tint Equivalent**
C	**M**	**Y**	**K**	**K**
25%	18%	18%	0%	25% (Quartertone)
40%	30%	30%	0%	50% (Midtone)
Flexography 3-C Gray Balance				**Black Tint Equivalent**
C	**M**	**Y**	**K**	**K**
20%	14%	14%	0%	25% (Quartertone)
38%	30%	30%	0%	50% (Midtone)
Letterpress 3-C Gray Balance				**Black Tint Equivalent**
C	**M**	**Y**	**K**	**K**
40%	30%	30%	0%	50% (Midtone)

Move or condense this section.

It is important to appreciate that there are three key issues impacting the successful preparation of newspaper ad material. They are as follows:

1) Advertisers, specifically agency production personnel must utilize newspaper ad material specifications in order to optimize ad reproduction quality.

2) Due to the unique specification set-ups and required program changes, advertising production personnel may fail to properly apply the specifications. Failure to adjust basic programs will result in equipment and software applications (PhotoShop) overriding critical quality settings. As an example, PhotoShop menu select parameters are often set to commercial default settings. If not properly adjusted, the default settings will override attempts to apply newspaper specifications. Similarly, most high-end scanner imaging is commercially programmed to produce a full range black printer resulting in a muddy reproduction.

3) Most commercial proofing systems are not linked to newspaper press reproductions. In many cases, a linkage can be set up by obtaining proper press reproduction data. However, many commercial proofing systems are not easily calibrated to newspaper reproduction resulting in a false expectation of how the reproduction will appear in print. These widely used commercial systems prevent newsprint quality optimization by not allowing accurate quality interpretation and desirable adjustments. Too avoid a disconnect between the proof and the expected reproduction, a proofing system must be capable of calibrating to the newspaper press. This requires further communication between the newspaper and the ad production personnel to ensure that the proofing system of choice has the ability to reflect newspaper print reproduction tonal ranges and color renditions.

14. Contributors and Acknowledgements

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