UNIT 14  ART PROOFS

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14.0  AIMS

In this unit we shall be familiarizing you with the domain of 'art proofs'. First we shall talk about the various types of proofs and then we shall be telling you about the importance of checking art proofs. This unit discusses the purpose and issues involved in preparing art and checking the proofs for successful printing. While you are expected to know about the various activities that go into preparing a final manuscript for the printer, it is certainly not expected that you would be able to prepare art proofs after you have studied this unit.

This topic is very technical and can only be understood by repeated reading. Whenever possible, consult the professionals who handle the print jobs. You are advised to visit a printing press and get practical lessons from them. There are a number of technical terms in this unit. In order to understand them better, a glossary containing the terms frequently encountered is given at the end of the unit.

At the end of this unit, we expect that you will be able to appreciate the job of preparing proofs, be able to interact with professionals who have the expertise and experience, and indicate your needs and preferences so that the final printed book or publication is attractive, informative or communicative (as the need may be) with the help of the artwork in it.

14.1  INTRODUCTION

By the time you have reached this stage in your course you will already be familiar with the various activities that publishing involves. Even after the text has been finalized, the copyeditor's job is not finished. You have to see the publication through till it is in the hands of a reader. In order then, that the publication is attractive enough to be picked up, we have discussed the importance of illustrations.

So how do you go about arranging for illustrations?

14.2  PREPARING ORIGINALS

The first step of printing an artwork or illustration is preparation of an original. This is commonly known or artwork of simply 'art'.
Not long ago, most of the artwork tasks — such as typesetting, preparing drawings, paintings, and/or photographs and arranging them on a page — were performed exclusively by skilled people working manually with the help of different tools. Now most of the artwork tasks can be accomplished through the computer.

This technology offers more flexibility than traditional tools and equipment like typesetting machines and photographic equipment used for making art. Moreover, the direct control offered by this new technology has blurred the traditional roles of the designer (in creating the art) and the prepress professionals (in making the film for printing). Designers who have the knowledge and the equipment can do prepress tasks as well. They can ensure the quality of their work by checking the proofs at the different levels of the printing cycle as well. The pre-press industry too has changed to incorporate the new equipments of the desktop publishers.

Managing these changing relationships requires knowledge of the printing process and the decisions that must be made to produce output of required quality.

14.3 ARTWORK FOR PRINTING

The first step in making artwork or originals for printing is the integration of words and pictures. Conventionally this is done on a design grid. This is a visual organization of the design and editorial parameters for a particular book, magazine or publication. Each grid is an actual size plan of a double page spread, showing the position and extent of the text and illustration areas, location of headings, page numbers, the trimmed size of the page and so on. In fact, it contains all the positional information that everybody needs, from the editor and designers right through the typesetter and printer needs.

These days grids can be created easily on the computer screen. The design process literally converts the empty grids into layouts that show how the text and illustrations fit together within the grids. The only difference is that it can be done much faster with a computer than by using conventional methods.

14.4 THREE METHODS OF ARTWORK PREPARATION

Art can be broken down into three main methods depending on the requirement of the publications. These are line, half-tone and page planning.

14.4.1 Line Art

Here the original is basically a black-and-white solid image, called camera-ready art. There is a special camera meant for shooting these images in the printing press. It is special because it is big in size, non-portable, and can provide film output of both opaque and transparent (line) and gradations of tones (half-tone) art. Most of the typographic images are line art.

A line art illustration is made by laying out typographic content and drawing the outline of the illustrative area or the graphic shapes. In case the design contains tint areas or flat colours, the art should carry the outlines for these also. The line art should carry trim marks at the four corners of the page. These marks indicate where the page will be cut after printing.

If you are preparing your camera-ready art in a DTP system, take out a proof print and check it thoroughly. Make sure all type is in the right position. Pay special attention to areas where you may have cut between lines or paragraphs, and from one page to the next. Check to see that page numbers, running heads, titles, and captions are accurate.
and placed correctly. Despite being careful, some spelling mistakes may creep into the artwork. Mistakes at the proof stage are relatively inexpensive to correct. Changes on the camera-ready art after it goes to the printer are much more costly. Therefore, go over it carefully, particularly if someone else has done the typesetting.

The line art prepared for computerized film output needs attention equal to that of camera-ready art.

14.4.2 Half-tone Art

This is the process used to produce a half-tone negative or positive from a continuous tone original such as a photograph. A photograph, unlike a line original, does not consist only of areas that are either black or white, but is made up of infinite shades of gray. These cannot be printed as such by the offset process. So breaking the picture up into very small dots simulates the grays. These dots are larger in the dark areas and smaller in the pale areas, giving the effect of grays although only printed in black ink. Colour continuous tone image is also converted into half-tone by separating and screening of four colours — cyan, magenta, yellow and black. Here, dots of varying sizes from the four different colour separations overlap to accurately reproduce the colour original.

Placing a screen in the process camera between the original and the film produces the dots. The screen consists of a fine grid of lines on film, which break the image up into
dots and thus produce a half-tone film. In the digitized output method, computer programming creates these dots.

The screen can be fine or coarse, depending on the eventual printing method and paper being used. Most books and magazines use 133 to 150 screens, whereas newspapers can be as coarse as 65 to 100 screen. The figures used to describe screens relate to the number of lines per inch on the screen (LPI).

Send your originals to the printer for converting into half-tone. Make sure these are cropped proportionately to fit into the space indicated for them on the camera-ready art. Do not forget to mark the necessary instructions like enlargement or reduction size and the page number on which it will appear. Use the reverse of the original for this purpose.

14.4.3 Page Planning

Page planning involves coordinated use of all the elements to achieve an appealing final effect.

Conventional: This is the operation by which all the type and pictorial elements within a page are assembled and placed in their correct position. Usually, the DTP system will have already assembled the type in a page, leaving spaces for any illustration by outlines. A laser printout of the page forms a camera-ready copy. The printer shoots the camera-ready copy by a process camera and then makes a master line negative. Half-tone and line negatives are made separately as per their required size. The master negative is then cut along with the outlines meant for illustration areas, forming hollow windows. The illustrative negatives are then stripped into the master negative to their correct position. Now, this will become a complete film page. One can make the positive film of the page by exposing the negative on another coated film.

Process Camera

Digital: All pictures are scanned with the help of scanning software, which comes along with the scanner. The scanned files will be stored in a format easily understood by digital prepress software, like TIFF. Touch-up of images for dust and scratch removal, color corrections, effects, etc., is done using software like Photoshop. Remember, this task should be done before saving the file in TIFF format. This is because the Photoshop file (PHD) works on layers and can be edited easily layer by layer. The moment it is saved into TIFF, the layers of the image get merged and then no alteration is possible.

Line Art illustrations are created in programs like Illustrator and CorelDraw. Once all the graphic elements are ready to be placed, a page layout program like QuarkXpress or PageMaker is opened, where all the images from Photoshop, CorelDraw and Illustrator, are imported, placed and sized on the page. Text is imported from popular word processing software like Microsoft Word and placed on the page. It can also be keyed directly into any of the software. Once the design and layout is finalized and the
typesetting styles for text and colors for various elements are worked out, you get the final layout when WYSWYG - what you see is what you get.

For the output the final files of all artwork, scanned images, and page layouts, along with the relevant types used bitmap and postscript fonts are stored and forwarded to the output station in printing file format like EPS. These files are opened, trapped and imposed if need be, then made ready and passed on to the RIP. On the ripping station the postscript data will be rasterised and converted into the imagesetter readable format to output on to a film. For a single color layout the imagesetter exposes a single film, a four-colour layout will therefore have four separate films.

In order to get an approval before the final printing is done, these films are sent for proofing to assess the colors in case of discrepancies, corrections are made and the cycle is repeated again. The final approved films are then sent to the offset press for final printing of the large volume printing.

To Recapitulate:

Artwork or art is the term used for any original needed to print a job. The artwork task involves typesetting, making ready of a drawing, painting or photograph and arranging it on a page. A skilled person can do it on a design grid manually. Now all these jobs are done on a computer as well.

There are three methods of artwork preparation — line, half-tone and page planning. Line art is basically black and white solid images. This is used for making film by a process camera, hence called camera-ready copy. It can be a DTP printout or a hand drawn image. Line art can also be created on a computer. Here the image will go to the imagesetter instead of camera for the film output.

Half-tone images are created from continuous tone paintings and photographs. Here, the tones of these images are broken into very small dots simulating various levels of tones of the originals. The film of the half-tone images can be obtained either by a process camera or computer programming.

14.5 PRINTING PROCESSES

There are several printing processes available in the market. Each one has its own characteristics, advantages and disadvantages. The method of printing you choose depends on your budget, the printer’s capability and the printed results you want. Because Offset is the most popular printing process, we are discussing here only the basics of this process. Since most of the pre-printing jobs these days are done in a desktop environment, this is also discussed in brief.

14.5.1 Offset Printing

Unlike other types of printing, offset involves printing from a flat surface. An offset press is generally rotary. It works on the principle that oil and water do not mix. The system has a damping unit which applies water to the plate. There are three cylinders — a plate carrier, a rubber blanket and an impression cylinder. A thin metal sheet with a plano graphic image is wrapped around the plate cylinder. The damping rollers coat the plate with water then the ink rollers ink the image area of the plate. The ink image is then transferred to the rubber-blanketed cylinder. The image on the rubber blanket is in reverse. This is turned the right way round when it is transferred to paper. The paper comes between the rubber blanket and the impression cylinder. The rubber blanket is water repellent and protects the paper from distortion.
Whatever is to be printed by the offset process should be converted into a film negative or positive, which is the main theme of this lesson. The next step of this printing is preparation of plate. The most commonly used offset plate is a thin aluminum metal sheet. It is mechanically treated to hold the necessary moisture at the time of printing. The plate is coated with a light sensitive emulsion and then dried. The negative/positive film is positioned over the plate and exposed under high intensity light. The exposed image area of the plate is coated with a chemical that attracts oil-based ink but repels water. The non-image area coated so that it attracts water and repels ink.

The offset press is the most important modern method of printing because of its ability to print near natural quality by fine screen half-tones. The use of the rubber blanket facilitates printing on less expensive paper. The printing plate for offset is inexpensive and can be easily curved to fit around the cylinder. Some kinds of plates (deep-etch) give a long print run. The preparation of art of the offset process is mainly photographic or image-assembly by computer, which goes well with modern reproduction methods.

14.5.2 Desktop Publishing

DTP can do almost anything a dedicated publishing system does.

Firstly, it allows you to compose text in a manner that comes close to the requirement of typesetting, that is, well-designed, proportionately spaced characters along with the ability to produce justified lines, if desired, including automatic and customized hyphenation. The process of composition also generally implies other typographical considerations including the use of more than one type font and size, and a character set more varied than that available on a typewriter or with hot metal composing methods.

An in-built dictionary helps in checking spellings. It also embraces the setting of tabular matter, indents of all kinds, and also aesthetic character kerning. The system accepts processed words from disk, tape or direct entry of keyboard. It also draws attention to grammatical mistakes by means of green and red underlines.

Secondly, the art and design can be created in accordance with the commands of the operator. Business graphics can be generated by programs that use figures from the data and convert them into required charts or graphics.

Other than text, graphics may be either free-hand graphics or drawings using CAD (computer-aided design) programs. They may also be scanned in from a peripheral device such as a scanner or drawn with the help of a digitizer. The pictures need not be derived from photographs and screened to become half-tone for the purpose of reproduction. The system performs a variety of manipulative tasks, such as sizing, cropping and image rotation. Enhancement can also be created, using several visual effects — strokes, washes and textures that simulate conventional art techniques.
Thirdly, the display ability of the system allows you to see your created visual documents on the computer monitor/VDU. Thanks to the editing ability of the system, shifting i.e. changing of composed matter is done. The illustrative area may also be edited by cutting, cropping, deleting, superimposing, colouring etc. Whatever the system’s capabilities are, DTP clearly demands an effective and experienced editor and an imaginative designer as critical components of the package.

Finally, the system must be able to produce output on at least one of the devices available. Today’s publishing standard requires the output of a DTP system to be at least 600 dpi or more for the master to be camera ready or on the film in positive form.

For many users, a laser printer is sufficient for their job; for others, this laser output is too low a quality to be used for publishing. In such cases, the master for printing is created through image setters, which help get higher resolution output, where 600 dpi or less printouts serve as proofing copies optionally.

Since the DTP system requires a small area to install and less of running around, one person can easily take control of the entire process and keep track of both the creative and production aspects. For bulk publishing and printing, of course, one needs to use a regular printing press and publishing house.

To recapitulate, knowledge of printing is essential in handling art and checking proofs. There are different processes of printing available in the market. The offset press is the most popular one. The factors that determine the popularity are: inexpensive make-ready, easy plate making, ability to print fine-screen half-tone on less expensive paper and series of computer and photographic techniques in coordination.

These days most of the pre-printing jobs are done in a desktop environment. Its capability of typesetting, editing and designing on computer screen has provided an entirely new way to create a print document in less time, with less cost and less running around.

### 14.6 CHECKING PROOFS

Always preview your publication throughout its development by creating proofs. Proofing allows you to check the layout, verify the accuracy of text and graphics, and anticipate and solve potential printing problems before the files are imaged. If you are creating a four-colour process publication, proofing can show that colours will print on the correct separations.

Problems identified in an early preview or desktop proof can be corrected easily. The same problems identified on film separations are more time-consuming and expensive to fix. Also, many prepress service providers require PostScript laser printer separations when you deliver electronic files for imaging.

Intersperse preview and proofing cycles into your workflow as you develop your publication. When you find a mistake in your publication, correct the problem and verify the changes by proofing on the desktop before imaging film.

#### 14.6.1 Desktop Proof

In the process of designing the publication you can always preview the page on-screen and evaluate it from time to time. This is also called soft proof. You will not get a reliable colour display onscreen if your monitor is not calibrated with a colour management. Check to see that appropriate colours have been assigned to each object of the design. Don’t rely on the onscreen appearance of colours to proof your colours. The colours on the screen do not exactly match their final printed appearance.
The desktop inkjet printout as proof is one of the cost effective ways to identify the problems with layout and design. Use it to see the appearance of the text and to check the overall layout. The PostScript laser printer’s outputs are good for proofing purposes, if the design involves colour separation. Besides, it will let you preview overall page design, show colour relationships, and verify bitmap image resolutions. Many printers these days provide direct digital colour proofs — proofs that indicate the colour that you expect in the final document.

14.6.2 Film Separation

Colour originals have to be separated by four basic colours of pigment — cyan, yellow, magenta and black. A colour scanner is used for this purpose. It produces the four films for the respective colours. These are stripped on transparent sheets with registration marks on each sheet. Certain tasks are necessary for checking film quality:

- Look for streaking, scratches, or other damage to the film.
- Work with your prepress service provider to determine the screen angle and ruling for each separation.
- Make sure bleed objects extend beyond the boundary indicated by the crop mark and areas you expect to trap.
- Use a light box to view films placing them one on another. It is best way to check the separation’s alignment correctly.
- If a single separation for a page is wrong, ask the printer to produce all the separations for that page to ensure that the separations don’t mis-register.

14.6.3 Machine Proofs

To ensure the quality of colour printing, a ‘machine proof’ should be obtained from the film separations. This may be done by making an offset plate and printing from these on a proofing press. It is a slower hand-fed version of an offset printing machine. This method is a bit expensive, but is one way of obtaining several copies of a proof.

Since the prints of individual colours are built up one at a time, it shows the progression to the eventual four-colour result. These prints are called ‘progressive proofs’. These proofs show the result of four individual colours and also the combination of two, three and four colours. The printer uses these as a guide to set the ink on the printing machine to the correct strength.
When checking the colour proofs, it is best to tell the printer what result you want to achieve, rather than instructing them as to how it should be achieved. For example, if a darker green is required, it is better to say darker green rather than increase blue, because it may be the best way to achieve a darker green is reducing the yellow rather than increasing blue. **If in doubt, consult the technicians of the printing press.**

Remember that some of the spot colours and metallic inks cannot be represented by four colour proofs. Additional films and additional impressions from these are required to get proofs for these colours. Here also work with your printer to find the best way to solve them.

Insist that your printer supplies the machine proofs on the paper it will finally be printed on. Proofs on art paper look quite impressive. But if the job is to be printed on other than art paper, proof on paper that soaks ink will definitely look different finally.

### 14.6.4 Press Proofs

After approval of the film separation/machine proofs, plates are made from the output films and mounted on the cylinder of an offset press. The press is prepared with correct inks and paper and several trial runs are carried out to ensure correct ink coverage and register.

When an action is complete, a sheet is available for final checking. This is called press proof. A single colour printing machine can show only one colour proof at a time, which often difficult to evaluate. It is better to wait for the full colour printing proofs.

Press proofs should be checked at the printing press only and also according to their schedule. The machine is stopped temporarily for this purpose. The press’s time is precious. If you are responsible for checking your printed piece, you have to go there when you are called. This is your final chance to see your piece before it is printed.

At this point, concentrate on changes that can be made by adjusting the machine, paper and ink. If you demand more than these such as change of a name, replacement of a photograph, etc. this will involve repetition of all the steps of printing i.e. from artwork to fixing plate to the cylinder. If there is a mistake from printer’s end such as page sequence, folding marks, it should not be charged to you.

While going through press proofs, check whether changes marked on the earlier proofs have been carried out. Make sure that the job is being printed on the paper you have supplied or suggested. Press proofs mean final printed sheets. Therefore, see the neatness of the sheet. Compare the press proofs to the machine proofs. The press operator will adjust the ink density in case of non-matching of colours.

Printings of wide solid areas always create a big problem along with half-tone because the required ink flow for the solid area is more than the half-tone area. If the proofs show non-consistency of solid colour, ask the printer to give a separate impression for the solid area. Check the alignment of both sides of a sheet by folding it. This will help you to check the page sequence also. Finally, glance all over the page and see that the colours and their registration are to your satisfaction.

**Write OK on the Proof and Sign**

**Looking Back**

Always, proofs of the print documents should be checked at the different stages of the print cycle. The first step is desktop proofs. Low-resolution desktop proofs are inexpensive and can be checked for the overall look of the design. The PostScript laser printer’s output and digital colour proofs are closer to the final printed image.
The second step is the film separation. Check the colour-separated films on its quality, screen angle, bleed, trap and alignment. Since this is rather technical an area press staff help may be taken to check the proofs.

Machine proof is the third step. It is obtained from film separations on a hand operated offset machine and called ‘progressive proof.’ These proofs also must be checked by expert eyes and should be passed to the machine operator of the press. The operator uses these as guide to set the ink on the printing machine to the correct strength.

The final chance to check the proof before printing is press proofs. These are checked at the press, stopping the machine temporarily. Changes at this stage can be made only by adjusting the machine, paper and ink. Make sure that the instructions given on the earlier proofs have been carried out. You may also see the neatness of the proof, consistency of flat colours, alignment, folding marks and page sequences.

### 14.7 SUMMING UP

In this unit, we have introduced you to the concept of illustrations, the various types of illustrations you can go for, the importance of checking proofs of illustrations and given you some technical information about the field of art proofs. We have not anticipated that you know anything in advance about the whole domain and so have gone into some detail more for the sake of familiarizing you rather than expecting that you would yourself be able to produce such artwork.

The glossary that follows will help you to understand some of the terms we have used and also to use as a ready reckoner in case you encounter them in the course of your everyday functioning.

### 14.8 GLOSSARY

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tbody>
<tr>
<td>Alignment</td>
<td>Positioning letters and art on a common baseline</td>
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<tr>
<td>Art paper</td>
<td>Coated paper either gloss or matt finish which can carry a good reproduction of half-tone</td>
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<tr>
<td>Artwork</td>
<td>Line drawing, a photograph combined for the purpose of reproduction and called artwork. Abbreviation of artwork is art.</td>
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<tr>
<td>Bleed</td>
<td>Running an art to the edge of a page. Printing a bit an inch if an image goes beyond the desired dimensions and then trimming the sheet produces the effect.</td>
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<tr>
<td>Bitmap</td>
<td>The images that are formed by rectangular grid of small squares, known as pixels. Each pixel contains data that describes whether it is black, white, or a level of colour.</td>
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<tr>
<td>Calibration</td>
<td>The act of adjusting equipment so that it performs in accordance with an established standard. Calibration is necessary when equipment is installed and continues to be a necessary part of on-going use and maintenance.</td>
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<tr>
<td>Colour Management</td>
<td>A CMS is a set of software designed to increase the accuracy and consistency of colour between a scanner, display and printer. Mapping colours from</td>
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the colour gamut of one device into a device-independent colour model and then mapping those colours to the gamut of another device accomplishes this consistency.

**DPI**

Abbreviation for dots per inch. A method for measuring the resolution of pixels on a monitor screen or laser charges on paper.

**PostScript**

A page-description language developed by Adobe Systems. It has become a de-facto standard for high-resolution imaging.

**EPS (Encapsulated PostScript)**

A postscript file format used for saving both bitmap and vector images that contains information like screen ruling and colour separation for the prepress.

**Kerning**

Adjusting space between two adjacent letters so that part of one is positioned within the space of part two.

**Process Camera**

A large camera used for graphic art photography, such as shooting negatives and positives as a prelude to plate making, making colour separation, or screening continuous-tone images into half-tones.

**Process Colours**

Three pigment primaries and black. These colours are capable of printing full colour illustrations.

**Progressive Proof**

A set of proofs of all colour plates used for an operation separately or in combination.

**Screen Angle**

The angles used to align colour half-tone screens. Typical screen angles in degrees are 45, 75, 90 and 105 for black, magenta, cyan and yellow.

**Screen Ruling**

Number of dots per line or inch produce half-tone screen or screen tint.

**Stripping**

Cutting out and placing in position, particularly with reference to arranging a photographic negative, in masking paper for a plate.

**Register**

Placement of printing formes, plates or negatives in such a way so that they will print in a correct position over another forme or plate, as in colour printing.

**Resolution**

Clarity of the graphic image, as determined by the number of pixels per inch.

**RIP (Raster Image Processor)**

Converts PostScript and raster data to machine bitmaps that an output device like imagesetter can process.

**Screen**

A device used to produce a half-tone that breaks the continuous tone in dots. Also a dot pattern on a printed page produced by such a device.

**Stripping**

Cutting out and placing in position, particularly with reference to arranging a photographic negative, in masking paper for a plate.
Layout and Design

TIFF (Tagged Image File Format): Standard file format commonly used to save bitmap images. It contains all the details of the image for printing but is not good for compression.

Trapping: In colour printing, when inks print out of register, gaps of colour shifts appear between the objects. Trapping compensates for this mis-registration by slightly expanding one adjacent colour into another.