FEDERAL STAMPS PRINTED BY THE PHOTOGRAVURE PROCESS

Introduction

The intention of this section of the Encyclopaedia is to examine the production of postage stamps by Harrison & Sons, and Thomas de la Rue for the Post Office from the commissioning of designs to the delivery of the stamps for sale. Background knowledge of stamp production will assist in understanding how the many varieties found can be explained, as well as, hopefully, reducing the number of inadequate or incorrect descriptions attributed to variations.

With a number of significant events forecast the Federal post office decided that it would change the printing method from recess printing to photogravure. Before the Kariba Dam issue, all stamps for the Federation were printed by recess. With the printing of the 1955 Livingstone commemorative, the post office would have noted the expense and time it took to design and print just two stamps. The official opening of Lake Kariba was a momentous event for the Federation, which should have been celebrated with more than just two stamps.

The first issue of stamps for the official opening of Kariba Dam were produced by printers Thomas de la Rue and Harrison & Sons, thereafter the remaining five commemorative issues were printed by Harrison & Sons.

Outline history of The De La Rue Co Ltd[2]

The company was founded by Thomas de la Rue, who moved from Guernsey to London in 1821 and set up in business as a 'Leghorn' straw hat maker, then as a stationer and printer. In 1831 he secured his business a Royal Warrant to produce playing cards. In 1855 it started printing postage stamps and in 1860 banknotes. The company's first banknotes were made for Mauritius. In 1896, the family partnership was converted into a private company.

In 1921, the de la Rue family sold their interests. The company was first listed on the London Stock Exchange in 1947. Then called *Thomas De La Rue & Company, Limited*, it changed its name in 1958 to *The De La Rue Company Limited*. In 1960, the company purchased the Waterlow & Sons, who had been printing the Federal definitive stamps.

A takeover bid for De La Rue was made by the Rank Organisation in 1968, but this was rejected by the Monopolies Commission as being against the public interest. In 1991 the company's name was changed again – this time to De La Rue plc.

In 1965 De La Rue established a joint venture with the Italian printer and inventor Gualtiero Giori called De La Rue Giori. Based in Switzerland, the company specialized in building banknote printing equipment. The company printed banknotes for the Central Bank of Iran during the 1960s.

In 1995, the company acquired Portals Limited which had been listed on the London stock market since 1904. For almost 300 years Portals had been regarded as the leading banknote paper manufacturer in the world, having manufactured banknote paper for the Bank of England since 1724.

In 1997, De La Rue acquired Harrison and Sons, the stamp and banknote printers based in High Wycombe. The factory closed permanently in 2003.

Outline history of Harrison & Sons

Harrison and Sons Limited was a major worldwide engraver and printer of postage stamps and banknotes.

The company was established in 1750 by Thomas Harrison; in 1839 Thomas Richard Harrison entered into partnership with John William Parker, creating Harrison and Co**.** It went through

similar names and retained a link with the Harrison family until 1979 when Richard Harrison left the company.[1]

It obtained its first British Post Office contract in 1881. The company won the contract to print the single colour Great Britain Edward VII stamps in 1911 after the Post Office decided not to renew its contract with De La Rue. Initially, using printing machines manufactured by Timsons of Kettering it went on to produce most British stamps over the 60-year period from the 1930s until the 1990s, including the first UK stamp using the photogravure method in 1934 and the first photogravure commemoratives in 1935 for the Silver Jubilee of King George V. The first UK Christmas issue in 1966, on the specially designed Jumelle press, was also printed at Harrison and Sons. They printed their last British commemorative issue, referred to as *'Queen's Beasts'* issue, in 1998. The stamps were actually printed one year before they were issued to the public.

The company (abbreviation H&S) also printed stamps, banknotes, passports and gift vouchers for over 100 other countries from 1881 until 1997 when it was acquired by De La Rue security printers. Some of its most famous publications were *The London Gazette* and *Burke's Peerage*. In addition to union related issues at Harrison, rumours suggested that the sale was also prompted by the steady inroads being made by Harrison into De La Rue's banknote business.[1]

The first stamps printed by Harrison for the Federation were the 3d and 6d values of the Kariba Dam issue in 1960, thereafter the company printed the remaining Federal commemorative issues. All three constituent countries retained the services of Harrison & Sons for a few years after the Federation's breakup.

STAMP PRODUCTION

The initial stages

The decision to issue stamps was taken by the Ministry of Posts. For the Kariba issue it commissioned both De La Rue and Harrison & Sons to produce designs based on photographic material supplied. For the other five issues Harrison & Sons were commissioned to produce the stamps using its in-house artist Victor Whiteley. All Federation stamps printed by Harrison & Sons were designed by this artist, using photographs and other materials provided by the Ministry. There appears to have been communication between Harrison and the Ministry on the final designs, colour and number of plates to be used for each stamp.

Photogravure printing

Six commemorative issues were printed by the photogravure process. The term "photogravure" comprises two elements, firstly that the image is produced by various photographic processes. "Gravure" is a process whereby the image is etched onto plates, this is the characteristic of all intaglio, or recess printed processes, in the photogravure process the etching is done using photographic means.

On approval of the artwork by the Ministry, the next decision was the number of colours each denomination in the issue was to be printed in. During this period the standard print colours of cyan, magenta, yellow and black (CMYK) were not in common usage. The greater the number of colours used in the printing of the stamp, the greater the cost of production due to the number of printing plates that were needed. For example, all the stamps for the Kariba issue were only in two colours, whilst the Red Cross issue was in a single colour.

Having decided what colours were to be used in the printing, the artwork was then photographed and through the use of negative images and various filters the elements of the artwork were separated.

In addition, it needed to be decided how solid the ink colour needed to be, which dictated the extent of the screening necessary. In the example shown here of the 1963 3d Red Cross stamp the red cross and some text is solid, which required a dense screen. For the Queen's cameo, however, there was a need for a finer screen to enable the facial features to be clearly seen whilst still using one colour ink. The other areas of the stamp printed red also needed a finer screen

The photographing of the artwork to separate the colours may need to be undertaken several times. Once the artwork had been separated, there was the need then to introduce a uniform format for the Queen's portrait and text required for the stamp – country name, value, description and other text. This would probably be been developed separately to the main artwork, and then photographed separately, finally coming together with the photographed artwork for the relevant colour. Whereupon it was re-photographed together as positives or negatives. Once any adjustments were made of the final product it was now necessary to replicate the individual design for each colour by the number of stamps required in the printed sheet. Again, this was undertaken by photographic means. Finally the marginal notations and printers guidelines would need to be added around the sheet of stamps.

Printing plates

The manufacture of the printing plate is a long and involved process. Below is a detailed description of the process of manufacturing the photogravure plates go through several distinct stages:[1]

- First, film positive is made through the process just described.
- The second stage is to sensitize a sheet of pigmented gelatin tissue by immersion into a 3.5% solution of potassium dichromate for 3 minutes. Once dried against a Plexiglas (Perspex) surface, it is ready for the next stage.
- The third stage (usually the next day) is to expose the film positive to the sensitized gravure tissue. The positive is placed on top of the sensitized sheet of pigmented gelatin tissue. The sandwich is then exposed to ultraviolet (UV) light. A separate exposure to a very fine stochastic or hard-dot mezzotint screen is made, or alternatively an aquatint grain of asphaltum or rosin is applied and fused to the copperplate usually before the exposed gelatin tissue is adhered to the plate. The UV light travels through the positive and screen (if used) in succession, each time hardening the gelatin in proportion to the degree of light exposed to it.
- The fourth stage is to adhere the exposed tissue to the copper plate. The gelatin tissue is adhered or "laid down" onto the highly polished copper plate under a layer of cool water. It is squeezed into place and the excess water is wiped clear.
- Once adhered, the fifth stage is to use a hot water bath to remove the paper backing and to wash away the softer, unexposed gelatin. The remaining depth of hardened gelatin is relative to the exposure. This layer of hardened gelatin forms a contoured resist on the copper plate. The resist is dried, and the edges and back of the copper are stopped out (staged).
- The sixth stage is to etch the plate in a series of ferric chloride baths, from the densest to slightly more dilute, in steps. The density of these baths is measured in degrees Baumé. The ferric chloride migrates through the gelatin, etching the shadows and blacks under the

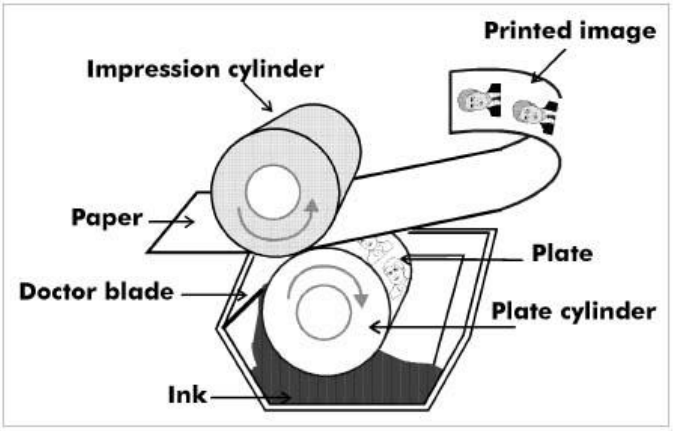
thinnest areas first. The etching progresses through the tonal scale from dark to light as the plate is moved to successively more dilute baths of ferric chloride. The image is etched onto the copperplate by the ferric chloride, creating a gravure plate with tiny "wells" of varying depth to hold ink. The pattern formed by the aquatint grain or the screen exposure creates minute "lands" around which the etching occurs, giving the copperplate the *tooth* to hold ink. The "wells" which hold the ink vary in depth, a unique aspect of photogravure.

- The final stage is to print the cleaned plate.

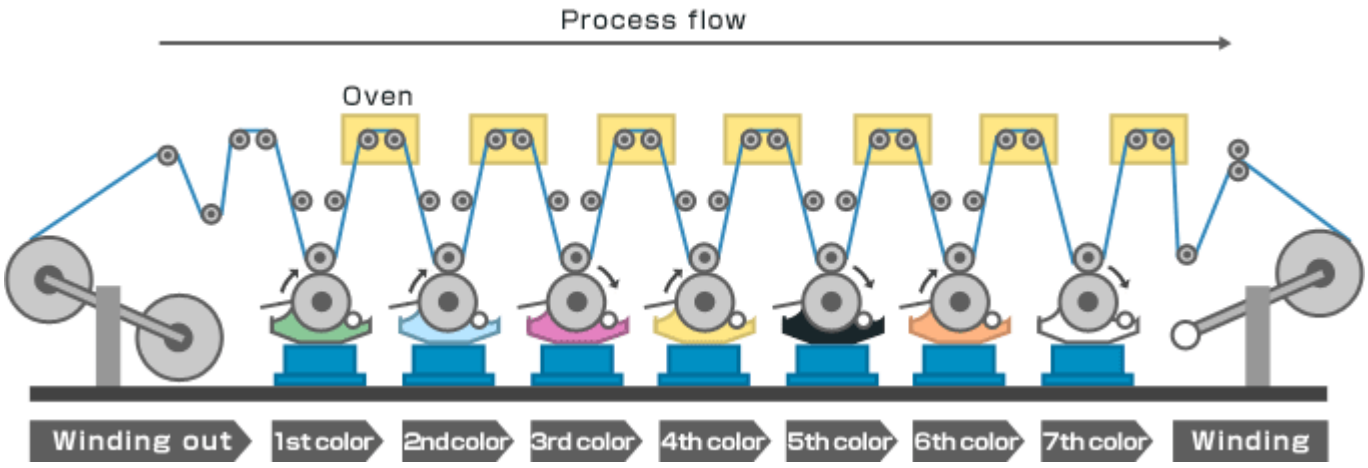
Printing press

The actual printing press comprises a series of individual units, each of which prints a different colour as the paper is fed through the press.

A unit of the printing press comprises two cylinders, the first being the plate cylinder onto which the printing plate is attached. This cylinder is placed within a trough of ink, which becomes embedded in the etched areas of the plate. As the cylinder spins round in a clockwise direction it picks up the ink, any excess is then scrapped off by the doctor blade, before it reaches the paper being fed through the present. The second cylinder is known as the impression cylinder, which acts as a support for the paper to take the ink from the plate to give the printed image.



The single unit of the printing press is one of several units linked together to give a continuous print run. Below is a diagram of a seven unit press, which is more common today than it may have been in the 1960's. By having several colours in a print run, the quality of the printing can be improved considerably.



Number of printing plates

All issues would have had a separate printing plate or cylinder for each of the colours used. The printing of the 1960 Kariba and 1962 Airmail issues the stamps were printed in two panes. The panes can only, in the case of the Kariba issue be distinguished by the printer's marking in the sheet margins. The 1962 Airmail issue introduced annotating the printing plate in the sheet margin. In the case if this issue each pane was annotated by either 1A or 1B for each of the colours in the

margin. The three subsequent issues only had single panes of stamps, all of which were annotated 1A.

Papers and Gums

The paper and gums are listed as either "white paper with yellowish gum" (Kariba only) or "*white unwatermarked paper. Colourless gum*" (other issues) by the Mashonaland Guide.

Marginal Notations

All sheets have

- the printer's imprint, although not included in the 1960 Kariba issue, can be found in all the other issues in different locations. The colour of the imprint being one of the printing colours.
- The cylinder number was not included in the 1960 Kariba issue, nor the 1961 Mining issue. The remaining four issues all having cylinder numbers in different margin locations. The 1962 issue have cylinder number 1A and 1B for the different panes, the remaining issues all being 1A..
- The sheet values for all issues are printed in £.s.d. in different margin locations The sheet value is printed in one of the printing colours.
- Colour registers: there was no colour registers – "traffic lights" – for these issues.
- Sheet number: These are printed separately and are located in different margin locations
- Printer's guidelines: Guide marks are only noted in the Mashonaland Guide for the 1960 Kariba issue to distinguish the two panes.[4]

PRINTING VARIATIONS

Missing colours

As the stamps are printed in a continuous flow through the printing presses it is unlikely that a sheet of stamps would be missing a colour in its entirety. However, there are the varieties known to have occurred by what is referred to as a "dry print". "*This can be caused by two events on the printing press. The ink trough runs out of ink, and streaks first to appear, as there is not enough ink to fill the recesses/cells. Or the Press has been stopped for a time. The solvent dries out in the recesses/cells, clogging them up. When the press starts again, it may take time for the solvent in the trough to clear/dissolve the ink in the cells. Most of these start up sheets are destroyed, but some slip through the checkers"*[5]

Below is a strip of stamps from sheet of 3d stamps of the 1960 Kariba, where part or the whole of the are missing the vermillion colour. This missing colour is likely to have been caused by a dry run in their printing.

Plate movements

One of the most common errors found in photogravure printed stamps are plate movements. There are two probable causes to this type of error, firstly that one the printing plates moved during the printing process. This is unlikely as the plates are fixed in to the printing cylinder. The second reason, and more likely cause, is that there has been some movement of the paper as it progresses through the printing press. Below are examples of some of the more extreme movements found.

Printing Plate Varieties or Flaws

Many more specialised catalogues list flaws found in the stamps, these are varieties that occur on individual stamps within the printed sheets. The listings of these flaws in catalogues such as the Rhodesia Stamp Catalogue under many issues are faults that occur on all sheets of that stamp in a specific location. These flaws are generally visible to the naked eye and as a consequence are easy to identify. They are known as constant varieties or flaws.

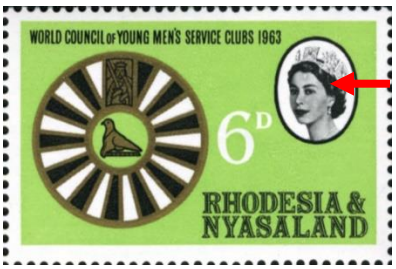
The Mashonaland Guide on the other hand also lists many minor spots, specks, blemishes and lines that are not quite so easy to see with the naked eye. Whilst spots, specks, blemishes and lines are relevant to someone collecting in such detail, they do not add significant value, if any, to the stamp.

Gorge Flaw

Dam Retouch

Serif Flaw

Extra Landing Light



Forehead Retouch

As each issue is examined these flaws will be looked at in more depth.

Non-Plate flaws

Varieties or flaws that occur in some issues which do not appear on the printing plates are known as “batch” flaws, as these occur in one or a few of the sheets of stamps. As these flaws only occur in batches they are rarely catalogued, but do constitute additional interest for many specialised collectors. There are a number of batch flaws that could be termed “standard” as they occur with some frequency in some issues, some are however rarer. The following is a description of some of those varieties that frequently occur.

Doctor Blade flaws

This batch variety is particular to the printing of stamps by the photogravure process. When a piece of foreign material gets caught by the doctor blade in a single unit of the printing press, or if the doctor blade is damaged, the ink gets under the doctor blade and leaves lines of ink on the surface of the plate cylinder. This then gets passed through to the paper, and is usually seen as a white line with thick lines of the ink on either side. The doctor blade flaws are seen either perfectly horizontal or perpendicular to the bottom of the stamp, the direction being dependent on the format of the printing plate to the direction of travel of the paper. So, stamps printed “the right way up” will have the doctor blade flaw horizontally, whilst stamps printed on their side will have vertical doctor blade flaws. No individual stamp will have the doctor blade flaw in both directions.

Examples of doctor blade flaws

Other batch flaws

Numerous other batch flaws are found on stamps printed by the photogravure process, these include ink blobs, smudges, additional line (not doctor blade), dots etc. These will be dealt with in more detail, if relevant, when each issue is examined.

Printing Offsets

Offset of gold on back of 1s3d YMSC issue

The last printing variations or flaws relates to printing on the gum side of the stamp where all or some of the printing inks can be seen. The probable cause of this is that ink has not dried sufficiently before the next printed sheet is placed on top. The offset is a mirror image of the face of the stamp, more often than not this is usually one of the printing colours. In photogravure printing this is relatively rare.

PERFORATIONS

All stamps produced for the period in question were perforated using the comb perforation method. (For more detail on comb perforation see the section on the recess printing of Federal stamps).

The perforation gauges however for the two printers are slightly different as are the stamp sizes. Different catalogues show differences in the perforation gauges. Stanley Gibbons measure the perforations to the nearest half unit, whilst the Rhodesia Stamp Catalogue measures to the nearest quarter.

	Stamp size[4]	SG perf	RSC perf[3]	
De La Rue	41 x 26.5 mm	13	13 x 12¾	
Harrison & Sons	40.5 x 27 mm	14½ x 14	14¾ x 14	Landscape stamps
	27 x 40.5 mm	14 x 14½	14 x 14¾	Portrait stamps

Generally speaking, the De La Rue stamps have one margin imperforate with all other margins fully perforated. Harrison & Sons, on the other hand, have one of the longer margin's imperforate with the opposite margin fully perforated, and the shorter sides with one extension hole. The direction of travel of the perforator is from the imperforate sheet margin towards the opposite fully perforated margin.

FIRST DAY COVERS

The Federal Post Office did not issue first day covers, all first day covers produced were produced privately, many by the philatelic societies in the Federation.

References:

1. Wikipedia, free encyclopaedia, on the subject of "Harrison & Sons Ltd".
2. Wikipedia, free encyclopaedia, on the subject of "De La Rue & Co Ltd"
3. The Rhodesia Stamp Catalogue, 1983/4, published by the Salisbury Stamp Company (last edition)
4. "A Guide to the Postage Stamps of Rhodesia, 1st January, 1964 – 31st July, 1966" published by the Mashonaland Philatelic Study Group, supplement No 2.
5. Extracted from Frank@stamphelp.com on printing faults found in gravure.