

Martyn Fry's Talk

May 2014

Note to self: These scribblings are based on Martyn Fry's talk to the Friends of BPMA on Saturday 17 May 2014. Not for reproduction anywhere in whole or part unless Martyn has approved the wording. GLENN

Processes

Gravure. Mainstay for all UK Defins and some specials. Gravure expensive, hence limited use on specials. Still gravure for PSA specials because of need to die-cut and matrix strip sheets. Gravure is more tonal than litho.

Litho. Mainstay for specials. Used because they get more details in the finished stamp from the artwork. Much "cleaner". Country defins now litho, but switched between litho and gravure in the past on cost grounds. There are enough England and Scotland defins produced, but not enough N. Ireland and Wales defins printed to warrant gravure. Print runs of NI and W last more than a year.

Intaglio. May do another issue in next two years, but very expensive. Everyone loves them. Mainly remains on wish list due to cost.

Modern Stamp Papers

Phosphor coated paper. Major problems with consistency of paper. In Harrison days there were three types of paper, selection based on design. If design was dark, then a brighter paper was chosen. In the 1980s designers favoured bleed-to-edge designs, which lost a lot of the phosphor signal, as the white areas (largely the margins) could not easily read the phosphor. Hence PCP not being used anymore. Not fit for purpose.

Printed phosphor. RM moved in 1980s to printed phosphor. More controllable. OBA paper had been used but when testing the phosphor at print stage it could not easily be seen under UV due to the paper brightness. Non-OBA (or OBA free) meant a dull paper. Fluors were added to the phosphor ink which allowed the bands under UV to be easily seen.

Paper Suppliers. Paper was all Harrison until DLR took them over. It then moved to Tullis Russell at Bollington. Was first RMS (Royal Mail Specification) paper, mainly for gravure. Then TR3 (Tullis Russell 3) became the favoured paper. However, as a paper order can take 8-12 weeks to arrive at the printer an off-the-shelf paper called Chancellor was introduced. This still fulfilled RM specifications.

Question from floor: Is current paper consistent? Answer MF: No. Gravure paper can vary in thickness by 10%, especially on a reel. Not so much variance on sheets. Litho papers are much more consistent. Coating can be a problem, though.

Water Activated gum

Early days. Rowland Hill had introduced a "glutinous wash" on the back of stamps. Martyn hoped that they had moved on somewhat since then.

Gum Arabic. For most of the life of British stamps, the gum was "*derived from the Acacia tree and dried on the sands of the desert*". Yeah, right! Probably not as romantic as it sounds, but basically what we call Gum Arabic. Nothing changed until sourcing proved difficult [GHM: from The Sudan, as he understands it].

PVA. Introduced as the standard adhesive in late 1960s. This was Poly Vinyl Alcohol (some say Acetate). [GHM: Harrison state Alcohol and explain very technically that this is from a range of alcohols that chemists use and has nothing to do with the alcohol that we have done the pub!]

PVA Dextrin. The only PVA variant was when Harrison introduced Dextrin to the mix [GHM: starch]. This was to prevent "stringing" on the Jumelle press. [GHM: ask Bill Dorricott more about what stringing is.]

Calories: Eat one definitive, consume 5 calories. Eat one special, consume 14 calories.

Harming animals. A frequent question posed of Martyn is whether there are any animal bi-products in the gum. He confirmed that as PVA is a derivative of the petroleum industry, no animals are harmed in the making of stamps and that just chemicals and starch are in the mix.

Harming people. Some correspondents in the past expressed concern at licking stamps, wondering what 'nasties' might have migrated to the back from counter tops, etc. RM at time suggested use of sponge to moisten stamps. These concerns helped fuel the move to PSA stamps.

PSA (or self-adhesive) gum

Views. People love or hate them. Collectors were concerned until they saw the quality of the printing and warmed to them. [GHM: I don't totally agree with this statement, as many still hate them.]

What is a stamp? Products with Queen's head, perforations (real or die-cut), phosphor and face value = stamp. Horizon or other similar postal items without phosphor = a label. Post and Go are therefore stamps, at least in RMs eyes.

First PSA (1993 booklet). Problems. Stamps could be washed and easily removed from envelopes. The press described them as "the world's first re-usable stamps". Ouch. Also, after 6-8 months following issue the stamps fused to the silicone release layer due to an unfortunate chemical reaction. It's very hard to remove from cover substrate in order to use them on mail today.

Polymers. PSA gum is based on elastomer polymers.

[GHM: Wikipedia definition: "*An elastomer is a polymer with viscoelasticity (having both viscosity and elasticity) and very weak inter-molecular forces, generally having low Young's modulus and high failure strain compared with other materials. The term, which is derived from elastic polymer, is often used interchangeably with the term rubber, although the latter is preferred when referring to vulcanisates. Each of the monomers which link to form the polymer is usually made of carbon, hydrogen, oxygen and/or silicon. Elastomers are amorphous polymers existing above their glass transition temperature, so that considerable segmental motion is possible. At ambient temperatures,*

rubbers are thus relatively soft ($E \sim 3\text{MPa}$) and deformable. Their primary uses are for seals, adhesives and moulded flexible parts."]

Longevity. USPS undertook longevity trials on its own PSA products versus water-activated. The results suggest no difference between them.

Reuse of Stamps

A major problem, with a whole cottage industry existing to defraud Royal Mail of revenue, often via eBay sales.

Frangibility. Trials were undertaken on the frangibility of stamps.

[GHM: Tulliss Russell definition "*With naturally weak internal strength, frangible paper is ultra-destructible, fragmenting into tiny pieces when removal is attempted. The addition of security die cuts will further aid the destruction of the label if required.*"]

The trials involved reducing the weight of the base paper and instead increasing the coatings. The finished stamp remains the same weight as non-frangible stamps. This process weakens the structure of the stamp as it becomes largely chalk. "Never really adopted by RM", said Martyn. [GHM: Implies some were possibly released for sale?] This non-adoption appears to be mainly due to the introduction of slits in the paper.

Gum Weight. USPS stamps have 23 grammes of gum (18-20 grammes used in UK). Stamps stick to envelopes really well in USA, preventing peeling. However, UK market is governed by DDA [Disability Discrimination Act] requirements meaning that the matrix has to be stripped, preventing this higher gum weight, as the printer could not strip the matrix. [GHM: Actually, he could strip the matrix, but stamps would also come off the carrier resulting in customers getting no, or less, stamps than were paid for. This was witnessed at Enschedé on a visit, when metal decorating scrapers had to be used to remove many dozens of stamps that had stuck to the metal feed rollers! It was a total mess that day.]

Bleeding edges. If PSA gummed stamps are left in the wrong environment (too hot or too humid) the gum will bleed beyond the die-cut perfs. Some stock needs to be put in a fridge before die-cutting, much like with raw pastry, to bring its temperature down.

Construction. PSA paper is in five layers.

Until 2008: face, PVA* water soluble layer, PSA, silicone release, carrier.

From 2009: face, clay**, PSA, silicone release, carrier.

* PVA was removed to assist the campaign to prevent re-use.

** The clay layer was added as it causes damage to the substrate, preventing re-use.

Developments

Carriers. The next change will involve printing under the silicone of the release layer paper. (Perhaps a repeat ROYAL MAIL text in a grey colour.) This cannot be counterfeited unless you go back to the laminate manufacturing stage. Due in production by early 2015. All self-adhesive formats will have this security feature.

Solvent soluble ink. Will ruin the face of a stamp if using, say, meth's, MEK [GHM: Methyl Ethyl Ketone] or acetone, as it dissolves the ink. RMs attitude is that if you are using a solvent on a stamp

it has to be for illegal reasons. Water could be used as a way of ruining stamp face, but British climate rules against the idea (it's too wet!).

Ecology. PSA gum not very good for environment. A water-activated stamp will degrade in the soil, a PSA stamp will not due to the silicone. In an attempt to balance this, all papers are now FSC [Forest Stewardship Council] accredited. RM was the first administration to go this route. RM knows that all materials are from sustainable sources. Well, only the face paper, as the carrier cannot be guaranteed to be OK.

Inks

OVI ink. The Questa £10 stamp show-cased security features, including OVI [Optically Variable Ink]. Colour shifts from, in RMs case, green to gold and back again. Nightmare in production. Every cylinder gets allocated a number and the OVI ink (printed via the Queen's head cylinder) on the Castles stamps was so abrasive that the printer went through the alphabet twice with new tooling. [GHM: and to think that cylinders are chromed for longevity in use!] Wastage at one point was running at a whopping 70%, i.e. only 30 sheets out of every 100 printed were fit for purpose. Use did not last long and was replaced by a gravure gold (GHM: and later no gold, using instead the intaglio ink colour to produce a single colour stamp).

Thermochromic ink. Inked area changes from solid to clear on application of the heat of a finger. Reverts to solid again upon cooling. Can also go clear to solid, but not used by RM thus far.

Glow in dark ink. Was suggested for Terror stamps, but there were too many health and safety issues surrounding the idea of potentially licking the 'nasties' in the ink.

Fluorescent ink. Mostly used in the phosphor ink mix. Originally yellow, later blue, as yellow was in the same colour spectrum as PHILTEC equipment (mail sorting marks on envelopes). RM stamps cannot now be higher than 37mm due to the PHILTEC kit being affected by taller stamps.

Fluors were used as substitute for glow in dark ink on aforementioned Terror stamps.

Scented inks. Ether was originally planned by designers for use on the Nobel Prize stamps!!! Eucalyptus used instead, as it is a harmless oil. However, some folk are chemically sensitive and a woman created a hate campaign against the stamp. RM will never use scents again. They work by having micro-bubbles of non-animal gelatine loaded with the scent and by scratching the inked surface it releases the smell by bursting the bubbles.

Iridescent ink. Difficult to apply. Three types currently in use. Will eventually only be one type. Which one is used is dependent on the colour that it is going on. Iridescent inks are not readily seen by scanners, hence deterrent when copying. Also provides production traceability by use of coding (year when printed and in what format). Difficult to read in litho printings as it is a rotary (gravure) ink. Cartor could use litho for the stamp and flexo for the iridescence. Enschedé cannot, hence poor PSBs by them of late.

Phosphorescent ink. UK is the only administration worldwide that uses organic phosphor. Everyone else uses inorganic. Blue phosphor now standard. Harrison had manufactured the phosphor for RM until DLR took them over. Huge experience lost upon closure. Sourcing new supplier difficult. Current formulation far from perfect. Good batches, followed by bad. Bad batch at time of writing. Gravure can lay down a far heavier amount of phosphor, but litho currently requiring four times the

norm to get a good signal. One ton of phosphor ink used by RM each year, so small order for supplier. Keen to solve this problem! There is a strict specification when reading phosphor, which is subject to the vagaries of the British climate due to humidity swings. A much wider range of acceptable readings therefore required.

Automatic Colour Recognition (ACR). ACR looks at image and colours on stamp when mail is flying through the Mail Centre readers and states what the stamp is. It has a massive database of [British] stamp designs within it. No need to use phosphor to stream mail any longer. Could solely use ACR BUT only 50% of Mail Centres possess the ACR kit. However, these 50% process 85% of all mail. So, either close down all the non ACR centres, or upgrade to include the kit. Latter option has been chosen. Phosphor would then be a security feature and not a mail streaming (1st v 2nd class) feature.

Postally paid? If stamped mail is accepted or rejected by systems in place is determined by these checks and outcomes:

ARC pass & phosphor pass = mail piece treated as postally paid

ARC fail & phosphor pass = mail piece treated as postally paid

ARC pass & phosphor fail = mail piece treated as postally paid

ARC fail & phosphor fail = rejection of mail item, requiring human intervention

Reading. When reading the phosphor, the bands need to be 12mm apart on a stamp to tell its class. So, a 1mm slit in the mail processor reader opens and 'sees' the first band as the envelope speeds through. If 50 milli-seconds later when the 1mm slit re-opens it sees a second band, then it is treated as a first class mail item. If phosphor is only seen on first opening of slit, then it is treated as a second class mail item.

Horizon System

Label design due to change. No more gold but a light image of Machin head. The head will be made-up of morphed text. Not a single line used. Created using De La Rue security software package. Trials with large central head done, but rejected as PO counter printers (Epson) cannot print the intended 9mm 2D barcode required for developments in packet service. The smallest they can print is 22mm. So, Queen's head to be relegated to top right corner in much smaller format than intended to provide room for barcode without a potentially conflicting head behind it. Overprints will include date of purchase (only valid that day) and postcode prefix. So, if label states M20 (Manchester 20) postcode, but address states RM2 (Romford 2) postcode, the item will incur fine and be treated as unpaid.

Martyn wants to eliminate even this new design in time in favour of Post and Go label stock behind counters [GHM: As Irish SOAR (Stamps On A Roll, but going even further).] The old Epson printers are to be replaced, so why not reel-fed instead of two-up sheet fed.

Lenticular

A question from the floor discussed the lenticular Thunderbirds stamps in MS format. Not good end product, stated Martyn. Trials suggested OK. Could tear by hand but not easily. Could saw wood with the perforated edges as they were so sharp! Fell off some envelopes. 36 images per stamp, giving much movement but needed a thicker plastic lens as a result. Won't do such an issue again.

Post and Go

Label plans. There is an intention to move away from thermal paper and to use stamp paper instead, due to the benefits of being able to incorporate all the security features of a modern stamp. Would instead print a thermal ink area to stamp surface.

Labels question from floor: Any work done on how long thermally printed stamps would last? Martyn responded that longevity is dependent on the substrate used. The better quality the substrate the longer it will last. Be assured that any thermal stamp WILL fade over time. The 2008 stamps show no sign of degradation... yet. Receipts are printed on cheap paper, so expect fading within the year.

Machine developments. More of the BPMA-type new machines will appear in coming year on a permanent basis at new sites. [GHM: No mention of the Stanley Gibbons shop machine discussed in some magazine recently.]

Where could it all end? There is no limit on these terminals. They could have more printers selling more stamp types, let you book holidays or print out football or theatre tickets.... limitless. Plans are being developed to display philatelic products in a glass case, letting customers order there-and-then and have them posted directly to their home. [GHM: I think he said from Swindon.] 700 NCR machines planned for installation by March next year, latest. RM could put machines in collection offices, hotels, museums, etc. Again, limitless locations BUT they could not compete with any Post Office environment, so no machines will appear any time soon in Sainsbury's or Starbucks, or anywhere else on the high street. [GHM: I think from memory that this agreement of non-competition is in place for an agreed number of years.]

Question from the floor: Why were there originally five designs and now six in a strip of P&G labels? Answer: The printing cylinder now used can accommodate 18 labels in one revolution, hence 6 labels x 3 = 18.

Timeframe to produce a stamp

Finally, a question from the floor asked how long it takes to prepare a stamp. Martyn stated that they are currently working on 2016 issues, the programme for which will require Board sign-off this June. Most time is spent on design and approvals stages, especially when IP (Intellectual Property) is involved, such as Dr Who and James Bond. These involve much legal debate.

Typically, artwork received by RM 40 weeks prior to issue date.

Stamps on-press 20 weeks prior to issue date.

Stamps delivered to RM 7 weeks prior to issue date.

Lecture ended with Richard West expressing his thanks to Martyn on behalf of all present.