Stamp Identity means a machine identifiable stamp, and possibly readable for class of postage.

Search for Stamp Identity includes
1. Naptha DAG - Graphite Lines Stamp
2. Phosphor + Graphite
3. Phosphor 8mm Band
4. Phosphor 9.5mm Band
5. Phosphor (Triple Band) in commemorative
6. Phosphor (Quard Band) in commemorative
7. Phosphor Coated Paper (PCP)
8. All over Phosphor (AOP)
9. Advance Phosphor Coated Paper (ACP)

Consideration began early to giving a stamp an identity that could be electronically identified.

Graphite

Phosphor Graphite

Phosphor Banded

Methods of stamp identification that were tried & experimented:

- Fluorescence - discarded because of too much 'noise' due to envelope, stamp paper and markings containing fluorescent compounds.
- Magnetic markings - discarded because of metallic objects and stickers on or within an envelope.
- Electrical conductivity - merited further investigation, explained below.

Naptha Dag - "Graphite Line Stamps"

Graphite compounds and, Deflocculated Acheson Graphite (DAG) with Naptha was found as a suitable electric conductor in 1957 trials.

Philatelic Cover from Southampton (9th Nov 1957)

Southampton was chosen as the first centre to experiment with graphite line stamps to check the efficiency of new cancelling machines.

The British Post Office began to consider development of postal automation equipment, following World War II, at three key facilities: Dollis Hill, Postal Headquarters Design & Development in London and, later, at the Research Center at Swindon.

Dollis Hill - London

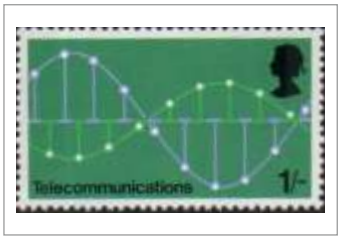
Dollis Hill, located on the north west side of London is where the investigation into luminescent compounds for use in letter facing and mail sorting would begin in the 1940's.

Postal Research Honored

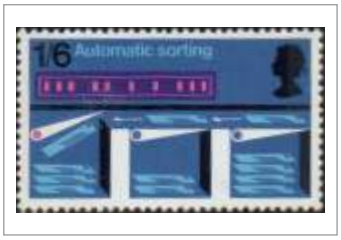
Representing the broad range of research conducted by the Post Office, a set of four stamps were issued in 1969.

Money Transfer

Telecommunications



Telecommunications



Automated Sorting

Automated Sorting Stamp used to USA (on cover) 21/10/1989.

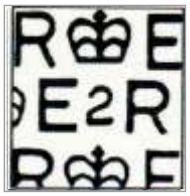
In November of 1957, "Harrisons" released the "Wilding" Graphite Lined definitives.
These stamps were released in the Southampton area only where postal equipment was modified.

Naphtha DAG

Naphtha DAG. Research determined that the graphite lines could be placed on the back of the stamp, under the gum. When electrodes with a 'few hundred volts' were passed over the envelope, the conductivity could be sensed.

All denominations except the 2d were printed with two bands. The 2d stamp whiched paid the "paper" rate had only one band.

The electrical conductivity sensors could differentiate between the paper and letter rates (1 & 2 bands) marking the first effort at automated class 1957 printings Id with misplaced bands.



Watermark: St. Edwards Crown

Graphite bands

Graphite bands

1957 Printing
Id with misplaced bands

FDC Posted at Southampton on 19th Dec 1957, Note 'S' Desk

British definitive stamps began down a pathway of increasing complexity with the addition of the graphite identity bands. Traditional printing varieties were multiplied by watermark and banding variety.

3d Cylinder 7 (No Dot)
with dual Graphite Line

3d Cylinder 7 (Dot)
with dual Graphite Lines

Graphite Stamp used on Cover

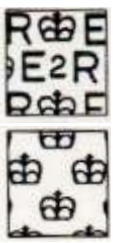
Southampton /A - to London SW15 (20.7.1958)

A cover from Maida Hill (14th March 1962) to Switzerland with Graphite Stamps.

Harrisons were instructed to overprint the remaining graphite-bearing stamps with PHD and released on 18 November 1959. The phosphor bands were applied using Flexo, a form of typography. Stamps are 2-band except the 2d which is 1-band.

1-band left

Watermark Variation

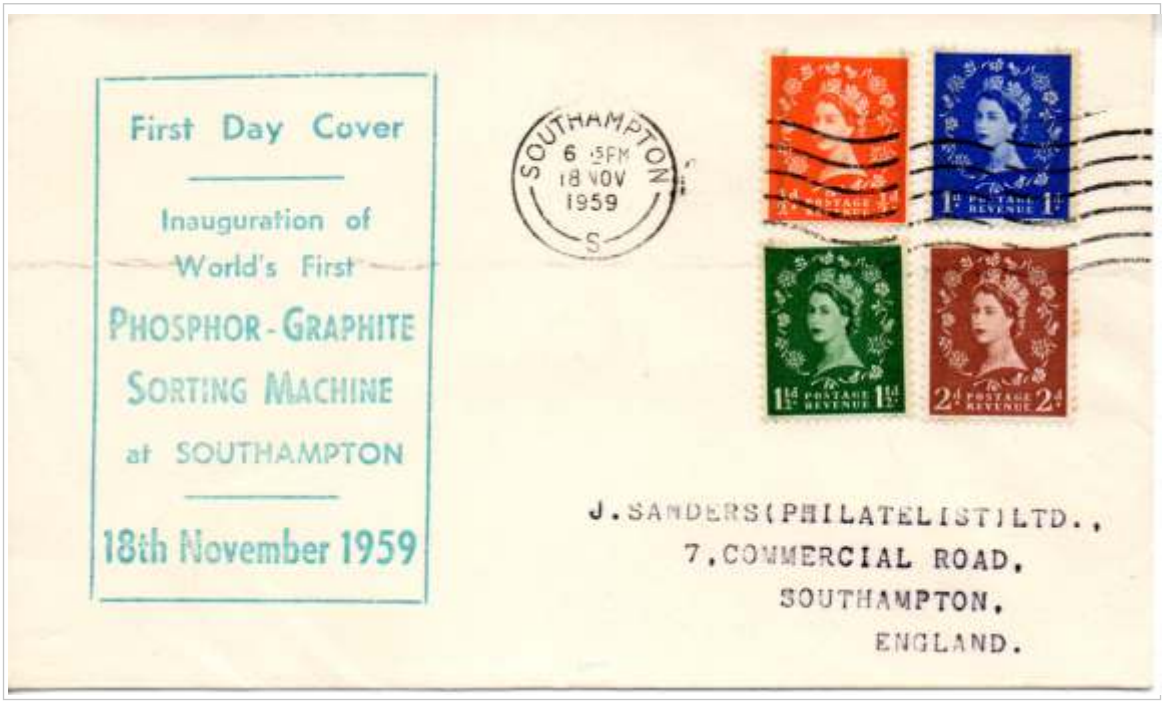


St. Edwards Crown Watermark ½d/, 1d, 1½d

Crowns Watermark 2d, 2½d, 3d, 4d, 4½d

With the phosphorgraphite printings, the definitive stamp became a multi-layer interactive device with a persistent machine-readable identity.

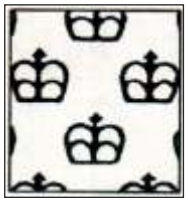
Stamps bearing the first phosphor bands were released on November 18, 1959.
These bands were overprinted by typography on stamps bearing graphite lines on the gum side.
These covers mark the simultaneous commencement of operations of the ALF in Southampton.



First Day Cover : Southampton 'S' Die (Values ½ d, 1½d,2d)

First Day Cover : Southampton 'S' Die (Values 2½, 3d, 4d, 4½d)

With ALS trials progressing, the need was great to re-task CSA to its original intended function as a postcode phosphor. This move necessitated the development of a third compound to be used on stamps for ALF. The chosen compound was: terephthalic acid (TPA) in a cyanuric acid - formaldehyde resin. Printings were released in 1965.



Watermark
Crowns

Phosphor bands

PHD

TPA has a peak emission wavelength of 430nm, edging into the purple-violet range and this wavelength was more favorable for sensing with photo multipliers of the day. TPA would be tradenamed Lettalite **B3** by Harrisons.

Two Bands

Phosphor - Watermark (Inverted) Multiple Crowns

One Band
(Left)

One Band
(Centre)

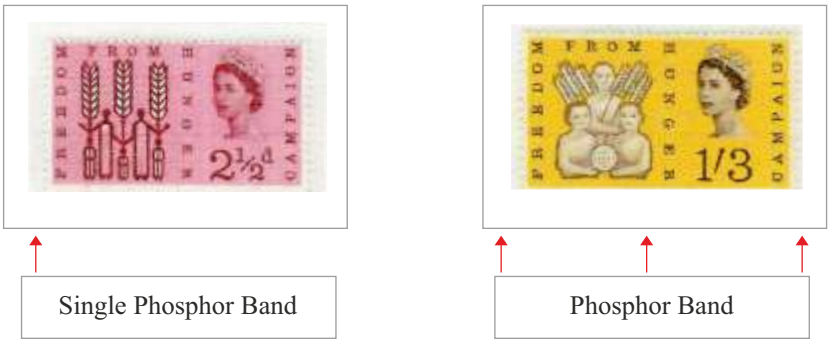
One Band
(Right)

Inverted
Watermark

In November 1962, Lettalite B2 phosphor was released on the ***National Productivity Year*** commemorative set. Paper rate stamps contained one left band and the Letter & Makeup rates contained three bands. Three bands were felt to be needed at that time to be sure that a letter rate stamp would be sensed as such because of the width of commemoratives. Phophor was applied by use of Flexography a form of Typography but using a rubber medium.

Why Three Bands?

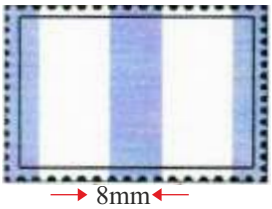
Because the width of a typical commemorative is approximately twice the width of a definitive, placing two bands, one at either edge as with the definitives might have caused the time division sensing method to "time out" before the second band was sensed. This could result in a lack of differentiation between the letter and paper rate. The Printed Material rate bore only one band.



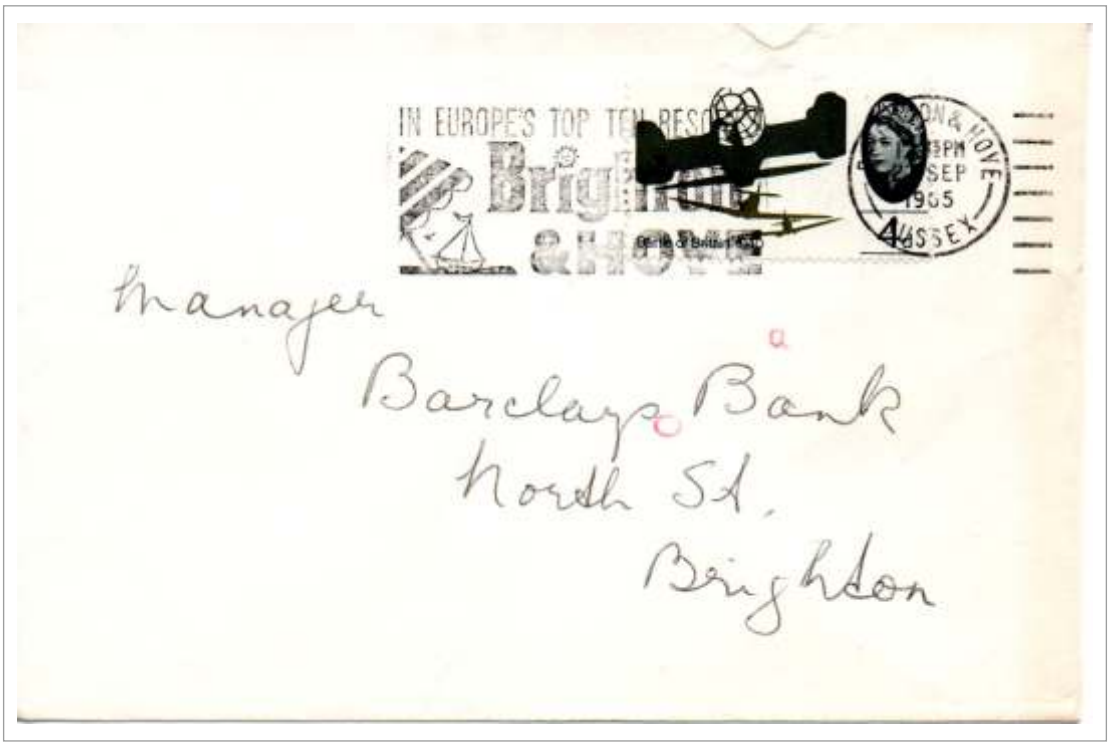
A registered cover from New Milton to USA (1963)

In 1965, commemorative phosphor was switched to TPA in generally the same time frame as the definitives. Bands continued to be 8mm wide and the same 1-Band : 3-Band configuration was used.

The Battle of Britain printings are typical of violet phosphor stamps.



Violet
Phosphor Configurations



Transforma
Local (2 Ident)

Ident "a"

Ident "O"

Enlarge View

Cover with 4d usage with banded stamps.

A local delivery cover posted at Brighton on Sep'1965, both inward & outward idents, which were still sorted using the 'TRANSORMA' sorting machine and modern face chancellors.

From the British Paintings in 1967, onward, only phosphor-bearing stamps would be issued. A 9.5mm band width would be adopted as standard and commemoratives at the letter rate (soon to be 1st class) would have only two bands.

Phosphor Configurations

The commemoration of the 900th anniversary of the Battle of Hastings produced the only **4-Banded stamp** ever issued by Royal Mail.

Phosphor Configurations

Phosphor Configurations

The Europeon Free Trade Association (EFTA) printing was the first commemorative to use 9.5mm bands

9.5mm
Violet
Phosphor Configurations

From the first phosphor-bearing commemoratives, the *National Productivity Year,* to this 1967 *British Wild Flowers*, all commemoratives were issued both with and without phosphor. The *Wild Flowers* issues was the last for this practice. Hereafter, all commemoratives would only be issued with phosphor. The 9.5mm band width would become the standard.

The final two commemorative series to bear TPA bands were printed in September and October of 1972.

British Broadcasting

A field post office cover from FPO 79 (29th Oct 1972).

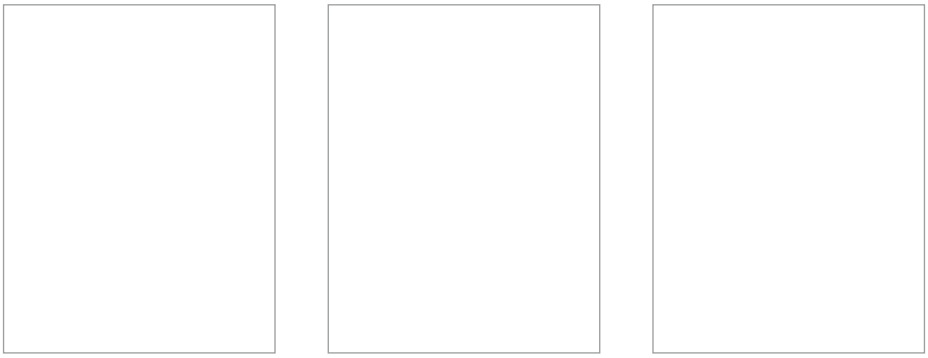
FPO DS - 1972
Forces Postoffice

Christmas 1972

Royal Mail applied Phosphor Coated Paper to commemoratives beginning with the 1972 Royal Silver Wedding. This timing of this initiative is surprising, since the official trials from 1969 had all been considered failures. No records appear to be available which tabulate the error-of-identity performance of the commeratives. PCP would continue in use until 1993 when a return to phosphor bands occurred.

Phosphor Configuration

Royal Silver Wedding 1972



British Explorers

While specific records have not come to light on the performance of PCP on commemoratives, an interesting experiment was tried in 1973. This involved the two stamps issued in commemoration of the *Nineteenth Commonwealth Parliamentary Conference.*

Parliamentary Conference

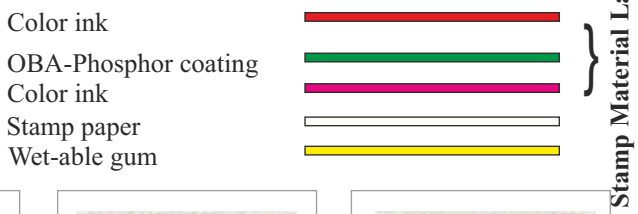
PCP Stamp Material Layers

Tests from Dollis Hill had shown that not only were organic phosphors susceptible to moisture but that dark colors could also obscure the phosphor's emission signal. With the PCP process, the phosphor is undermeath the color ink, in the OBA coating. This means that the only clear emission signal would come from the white margins. The *Parliamentary* printing is unique in all of the commemoratives due to the very wide margins incorporated in the artwork. Clearly, this was a trial light and dark ink plus a wide, unobstructed edge.

Other commemoratives were used as a platform for experiments with All-over Phosphor and PCP.

1969 - The Prince of Wales issue was produced with all-over phosphor applied by flexo in-between color ink cylinder steps producing a 'sandwich' structure.

Investiture of the Prince of Wales



Dickens & Wordsworth (1970) with twin banded Stamps.

Philatelic FDC used on 3.7.1970 from Chipping Campden (Glos).

1976 - The Roses issue represented a one-time trial of blue phosphorescing *Diphenylene oxide*. Results of the trial are not known although the compound was not subsequently used.

Roses (Diphenylene Oxide)

The Machin Series Arrives

The Wilding series of definitives was replaced in 1967 by the Machin series. The series name derives from the artist and sculptor, Arnold Machin. These stamps inherited the phosphor type (TPA) and configurations **(1-Band = Printed Paper rate, 2-Bands = Letter & Makeup & higher rates).**
After 16 September 1968, the Printed Paper rate would become 2ND class and the Letter rate would become 1ST class.

Makeup Rates

Printed Paper Rate 8/67 - 3/68 Makeup Rate

Printed Paper Rate 9/68 - 9/68 Letter Rate 6/67 - 8/68

Printed Paper Rate 9/68 - 1/711

Letter Rate 7/68 - 1/71

Makeup or Other Rates → On

12/69 - 5/70

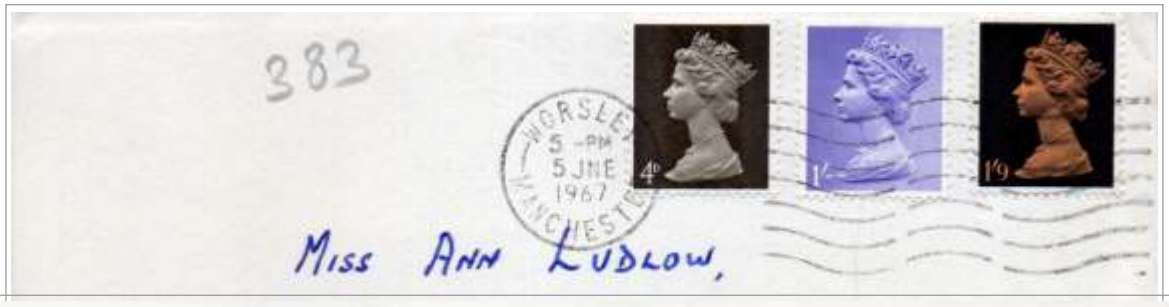
The Machin design was continued after decimalization in February 1971.
This series would become the definitive workhorse for the U.K. to the present. Banding conventions continued as before with:

Machine Values (1971-1996)

1. All issues were printed on either
2. Ordinary Coated Paper (OCP)
3. Florescent Coated Paper (FCP)
4. Phosphor Coated Paper (PCP) or
5. Advance Coated Paper (ACP)

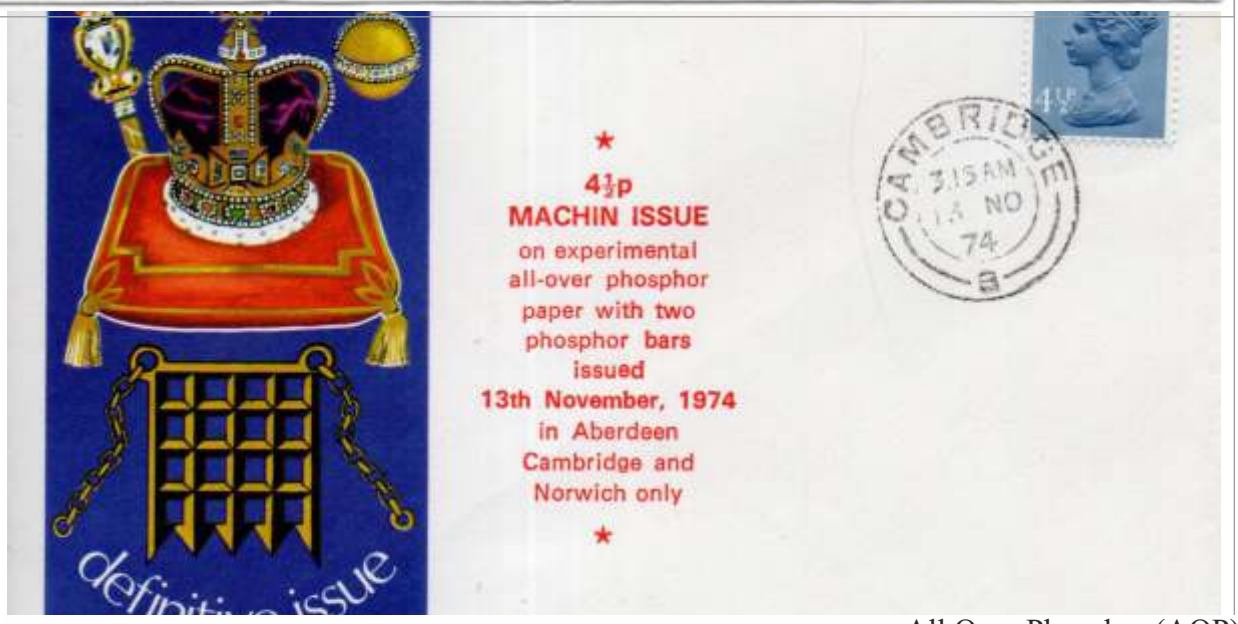
From the philatelic point of view, the "Machins" are far more complex than the simple design might at first suggest, with well over five thousand varieties of colour, value, gum, phosphor banding, iridescent overprints, perforations and printing methods.

After 1967, a number of development led to updation in Phosphor compounds & bonding to facilitate the development of the ALF Machine.



<1967> Banded Stamps

<1966> Special Phosphor Paper

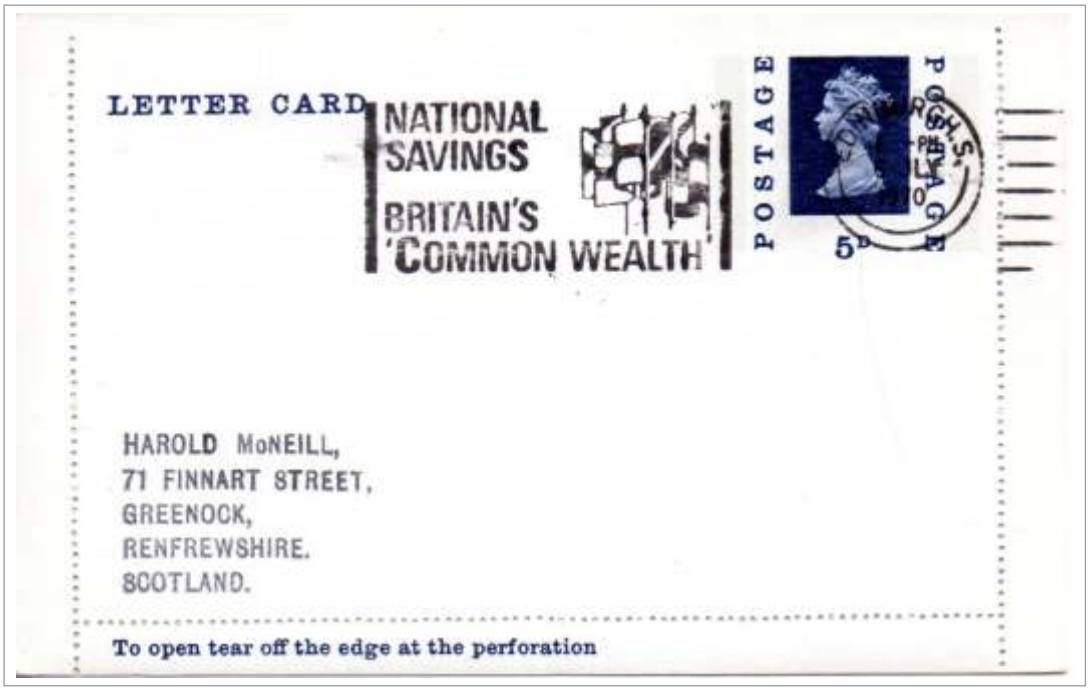


<1974> All over Phosphor

All Over Phosphor (AOP)

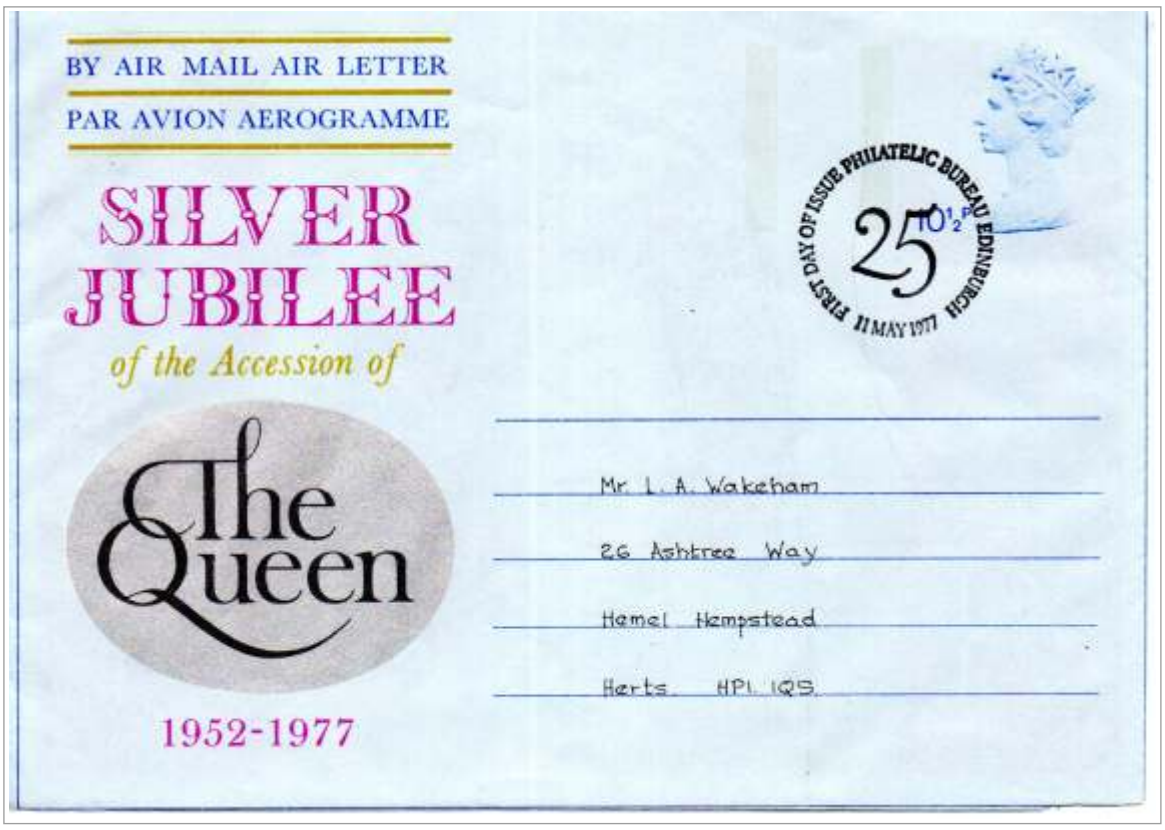
During the co=development of the ALF Machines and the phosphor compounds that would enable their operations, it was realised that the phosphor could be placed onto /into the stamp paper during production (Then the additional step of placing bands on the surface during printing could be avoided . Also an expensive cylinder would not have to be manufactured and maintained).

Letter Card (with Two band on either side)



5d Postage Paid for Letter Card from to Scotland (5th July 1970).

Aerogramme (with two band on LHS of the Machin Motif.)



10½p Postage Paid to Herts, Philatelic Cover 11th May1977.