

PHOTOGRAPHIC ANALYSIS

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Date of Review 02/08/22 (updated v2)

Reference [REDACTED]

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SUMMARY

After detailed analysis of the image itself and the physical properties of the print it is my considered opinion that:

- The photograph is a colour print from XP-1 chromogenic Black and White C41 film printed on standard Kodak colour negative paper of the early late 1980s or early 1990s.
- The choice of XP-1 film should be noted as it would suggest someone with a knowledge of, and an interest in photography.
- It is likely that the image was taken on a SLR with a 50mm, 80mm or 110mm prime lens or a mid-range zoom lens OR on a compact 'point and shoot' camera with a 35-70mm or similar zoom lens.
- The image shows no evidence of negative or print based manipulation and all visible signs suggest this is a genuine photograph of the scene before the camera.
- Relative measurements of objects of known size within the photograph allow a calculation of an estimate of the approximate size of the unidentified object of between 30m and 40m with a height of between 8m and 12m.
- The overcast sky visible in the photograph is consistent with that recorded by the UK Met Office for the given location on the day the photograph is claimed to have been taken.
- It is not possible to identify the object in the centre of the frame however the evidence present suggests that this object WAS in front of the camera in the position shown when the photograph was captured.
- It follows that this is either a genuine unidentified flying object in the sky OR that any construction or manipulation used to create this effect occurred IN FRONT of the camera and NOT in the capturing of the scene on film nor in the subsequent processing and printing of the image.
- The results of this analysis are consistent with, and support the claimed heritage of the print.

INTRODUCTION

This analysis is based on a detailed review and analysis of original materials comprising:

- Original Photographic Print
- Card envelope used in which print has been stored
- Photocopies of print contained within envelope

In addition a number of digital copies and enlargements of the original print have been produced by the reviewer to allow more detailed analysis. These include:

- Photographic copies of entire print and envelope (front and back)
- Detailed macro photographs of key areas of the print
- A high resolution flatbed digital scan of the image and envelope

Digital images were produced on a Nikon D610 using a 110mm Micro-Nikkor resulting in NEF raw files at full frame resolution. Images were processed in Adobe Lightroom and exported as 16bit Tiffs with a file size of approximately 138.5 mb.

Digital scans were produced on a A3 Epson Flatbed Scanner using VueScan capture software resulting in 16bit Tiff Raw files. Images were processed in Adobe Lightroom and exported as 16bit Tiffs with a file size of 2.8 – 2.9 GB

ANALYSIS

Image Description



The image is taken looking slightly upwards with the majority of the frame filled with sky and only a small portion of landscape visible along the lower edge of the frame. Variations in the tonality of the sky allow clouds to be distinguished and the scene appears to be lit by diffused light from an overcast sky rather than by direct sunlight.

Along the left hand half of the top edge of the image two groups of branches partially frame the image. The left hand group itself consists of three or four groupings of branches with an increasing density of leaves closer to the upper edge of the image compared with the lower ends of the branches.



The second distinctive group or branches are located to the right of the first just to the left of the central point along the top edge of the image. These branches are darker in tone and more heavily covered with leaves than those to its left. These branches also enter the image at a steeper incline and appear to be different in kind to the leaves to their left.

At the far left of the lower edge of the image there is a darker area which appears to be the branches and leaves of a tree, bush or some kind of plant. The leaves are long, thin and pointed and appear quite different to those seen above the along the upper left hand edge of the image.



Along the lower edge of the image can be seen a fence supported by three posts: two thicker posts (possibly wood) and to the left-hand side a thinner fence support which appears to have a circular hole in the top through which the uppermost wire of the fence passes. This would appear to be a metal post or separator.

Two wires pass from post to post to form the fence. The uppermost of the two fence wires visible appears smoother than the lower.



Two dark marks appear along this upper wire just to the left of both of the two thicker posts (see above). It is not possible to clearly determine what these marks are with any certainty however they are likely to be grass or animal fur, wool, or some similar material which has become attached to the fence wire. The lower of the two fence wires has a regular marking along its length (see below) whereby the wire appears slightly thicker at regular intervals. This would seem to indicate that the wire is probably barbed or possibly that this wire forms the uppermost edge of gridded wire fencing with the marks indicating where slightly thinner vertical wires are attached which have not registered on the film.



The barbed wire typically used in agriculture and forestry has a standard space of 10cm between the barbs (Ref 1 & 2) and in a photograph taken by the author of a barbed wire fence with 10cm spaced barbs on moorland in the Peak District the wire appears similar to that in the photograph (see below).

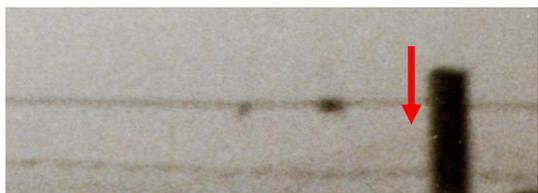


Section of Original Photograph show wire (assumed to be barbed) with approximately 16 'barbs' visible

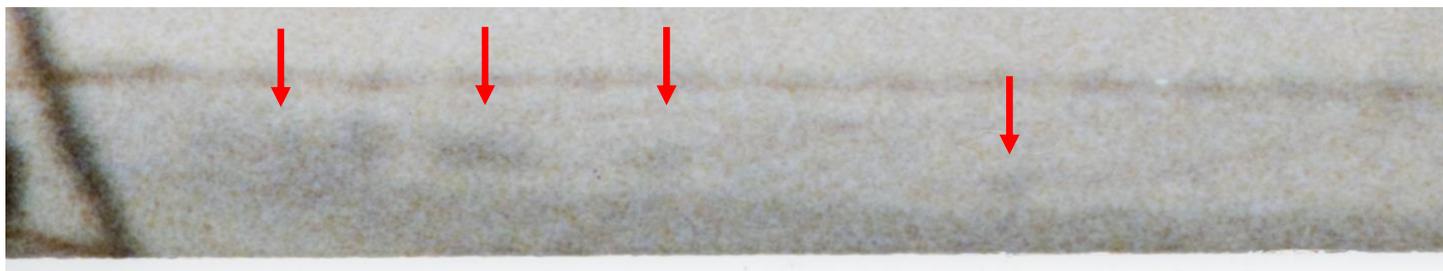


Authors recent photograph shot on 70mm lens focused on near foreground (5 feet distant) showing 16 barbs of a barbed wire fence at a 15 feet distant appearing slightly out of focus. As the barbs fall out of focus their points disappear and they appear as a slightly thickening of the wire at regular intervals similar to that seen in the original photograph.

Behind the fence along the lower edge of the print, a range of hills appear in the far background of the image. About two thirds of the way along the bottom of the photograph and behind the third fence post there is a distinctive angular peak on the horizon which is the highest point visible in the background (see below)



Just to the right of the left hand thinner fence post and in front of the range of hills on the horizon, there is a slightly lower hill or ridge with what appears to be three groupings of trees, a large grouping closest to the fence post followed by a small group of 3-4 trees and finally what appears to be a single tree or possibly a pair of trees (see below). A little further along the ridge, approximately midway between the first and second fence post there appears to be a further lone tree on this hill.



Some way closer to the camera, just visible to the right of the third fence post and to the right of the distinctive hill on the horizon is an irregular dark area at the very lower edge of the print. This would appear to be the tops of trees in a forest or wooded area in the middle distance.



Given that, other than the distant horizon described above, the land behind the fence remains out of view it would appear that the ground behind the fence falls away. Even given the fact that the image is framed looking slightly upwards to the sky, were the ground to rise behind the fence, it would be visible in the image.

In the Centre of the image appears an unidentifiable object with a squashed diamond shape. This object has some slight variation in its tonality along with length with a dividing line along its length with the upper surface lighter in tone than its lower surface. The lighting of this object is consistent with the diffused overcast lighting of the overall scene.



At either end of the object, approximately a fifth of the distance along its length, a lighter area of tone is present with the left hand area being both larger and lighter than area visible at right hand end. Just to the right of the centre of the object a darker circular area of tone is present.

The far right hand extremity of the object, where the upper and lower surfaces join, extends to circular 'nose' like form. In contrast, at the left hand extremity of the object the upper and lower surfaces join at a point. A slight darkening is present just to the right of the top peak of the object. No smoke or fumes are to be seen around the object.

The plane flying below and behind the unidentified object is traveling from right to left and, from it's position in relation to the landscape behind, it appears to be flying at a relatively low height. A slight blur suggests that the plane is moving at speed.

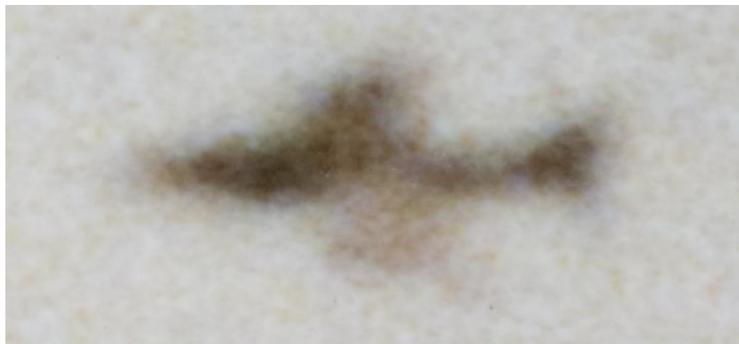


Image Source – Warbird News [HERE](#)

Although it is not possible to clearly identify the plane due to it's distance from the camera; the slight blur in the image; and the film grain, the plane's silhouette is consistent with that of a Harrier Jet.

Climatic Conditions

The image reveals an overcast sky with diffused light and no visible blue sky or direct sunlight.

The date given for the creation of the photograph is Saturday 4 August 1990 at 2100 GMT approx. The weather recorded by the UK Met Office for that day includes the following summary of the weather in Scotland:

“Scotland and Northern Ireland had a rather cloudy day, but some eastern parts of Scotland were quite sunny. There was some rain in the north and west of Scotland with a few showers in Northern Ireland and southern Scotland by the evening. Temperatures were a little above average.” (3)

Central Scotland had between 2 and 4 hours of sunshine from dawn to dusk with temperature of between 18 and 22 degrees centigrade (3). Sunset on the 4th August 1990 was at 09:20:53 PM (4) which would place the origin of the photograph around 20 mins before sunset.

Conclusion - The weather and sun data for the day in question are thus consistent with the claimed heritage of the photograph and the visual evidence contained within.

Lens and Camera.

Assuming the image has been printed full frame - aside from the small amount of image cropped of each side to allow the image to fit on the 10x8” print - the field of view suggests that lens used is likely to have been a standard or short telephoto lens, with an approximate focal length of between 50mm and 110mm.

The sharpest point in the image is the unidentified object in the sky with both foreground and background details appearing out of focus in comparison. Due to the sharpness of the central object, the blurring of other areas of the image would seem to be a result of focus and the depth of field used rather than due to camera movement during the capturing of the image. Depth of field is the depth of the scene that is rendered in focus either side (in front or behind) of the point of focus and is a function of the aperture (F Stop) used along with the focal length of the lens. Wider apertures and longer focal length lenses result in a shallower depth of field.

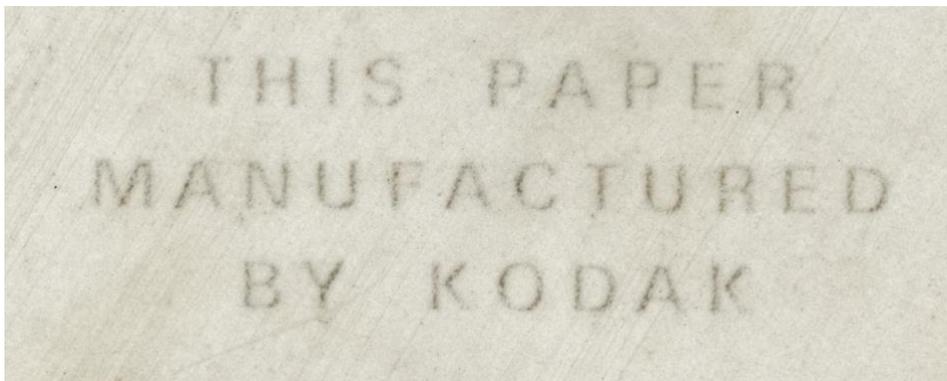
The depth of field visible in the image is fairly shallow suggesting either a wider aperture (e.g F2.8 – F5.6) or a longer lens (eg 80mm or above) or possibly both.

The above information would suggest the use of a traditional SLR (single lens reflex) camera fitted with either a fixed focal length lens (a prime lens) with a focal length of between 50mm and 110mm OR a zoom lens with a variable focal length of perhaps 35-110mm or 70-210mm. This would be fairly common equipment for an interested amateur photographer in the late 1980s and early 90s.

The second possibility is that the image was taken on a simpler and cheaper 'point and shoot' compact camera. Compact cameras of the late 1980s and early 1990s were fairly advanced with auto exposure and accurate auto focus available at a reasonable price. At this time point and shoot film cameras were the most popular camera for amateur family, travel and holiday photography. Many compact cameras had short range zoom lenses such as 35-70mm or 35-110mm and it is quite possible that such a camera might have been used to produce this photograph.

Paper Type

The backstamp identifies the paper as a Kodak paper.



Prior to 1961 Kodak paper was produced with a backstamp or water mark printed across its rear surface comprising of EKC encircled by a double-lined circle. This was replaced in 1961 by a single line of text reading: 'A KODAK® PAPER'. From 1972 up until the early 1990s this changed to the watermark shown on this print which comprised of three lines of text:

THIS PAPER
MANUFACTURED
BY KODAK

From 1989 onwards Kodak started to brand each of their individual product lines with a unique back print or watermark so this would suggest the paper was produced sometime between 1972 and the early 1990s.

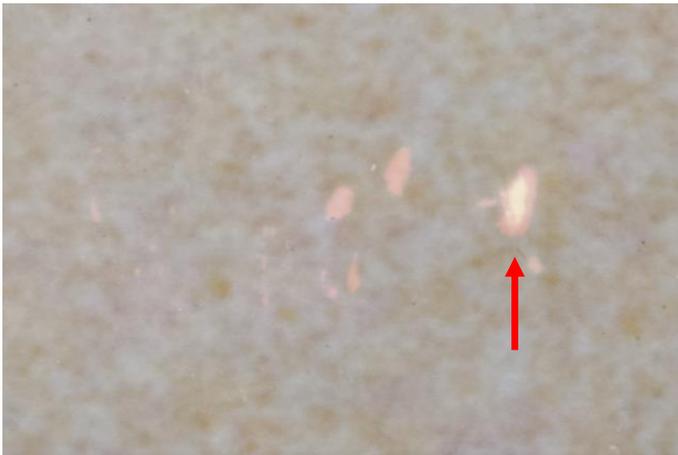
The weight, texture, surface, finish and thickness of the paper identify it as a resin coated paper.

RC paper comprises of a thin layer of paper sealed between two layers of polyethylene (plastic) with the photographic emulsion and a top coating on the top surface. RC papers are thinner and lighter than fibre based (FB) paper at around 190gms compared to 250gms or more for FB paper. The introduction of RC speeded up processing times as the plastic coating prevents the absorption of processing chemicals which dramatically reduced the required washing and drying time. RC paper was produced with the following surfaces: F (glossy), N (matte), Y (silk), E (lustre) with glossy by far the most popular. The image quality of RC prints was less than Fibre Based paper due to the thinness of the emulsion present and the lower silver content which also resulted in a more limited response to toning in Black and White photography. RC paper was extensively used in the printing of colour negative photography where the speed of processing and drying was important.

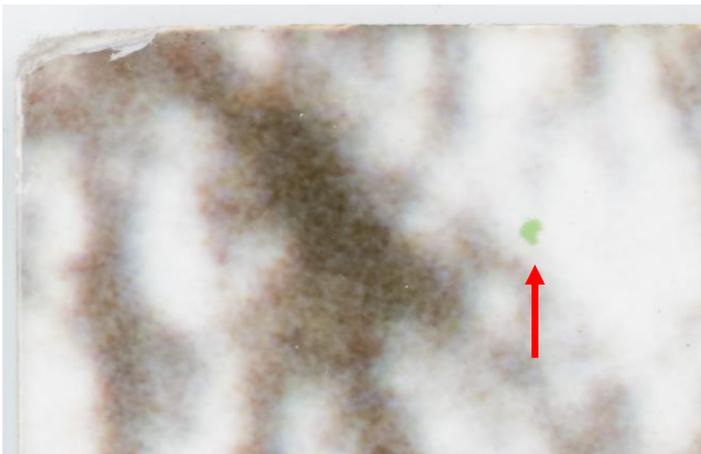
Kodak Resin Coated (RC) supports, were introduced to their colour paper range in 1968. RC papers were most popular in situations where the speed of printing was important and were typically used in consumer high street printing, press and publicity photography, police, healthcare and other applied or commercial areas of practice. Fibre Based paper

continued to be used for exhibition and archive prints within art photography and other areas where image quality and permanence were a priority although RC paper would typically be used for contacts and proof prints.

An small area of abrasion in the lower right section of the photograph (see image detail) reveals an orange/red layer beneath the image layer which is consistent with COLOUR paper.



A small turquoise/green 'spot' in the upper left section of the print (see image detail) appears to be an small unprocessed area of the paper – unprocessed colour negative paper has a turquoise/green colour – possibly resulting from a small piece of dirt or adhesive being attached to the print surface during processing. This would again suggest that the paper type is colour rather than a toned Black and White print.



Conclusion – The image is print on Resin Coated Colour Photographic Paper manufactured by Kodak, produced between 1972 and the early 1990s. The paper type is consistent with the claimed heritage of the print.

Print Size - 10x8"

The 10x8" (20.5 x 25.5cm) paper size was introduced alongside the introduction of 10x8" large format film in the early years of the C20th and progressively replaced the previous 'plate' sizes of film and paper. 10x8" paper allowed direct 'contact' printing of images made on 10x8" film (or four contact prints of 5x4" negatives) and became the most popular paper size within professional photography for much of the second half of the C20th being used for press and publicity prints, proof prints, police and health situations. Since the advent of digital photography paper sizes have largely moved to the 'A' series of paper sizes although photographic (analogue) paper is still produced in imperial sizes.

35mm film has a ratio of 3:2 while 10x8" paper has a ratio of 5:4 thus in order to print a 35mm image on a sheet of 10x8" photo paper without borders a proportion of the sides of the image would have to be cropped. It should be assumed that this image has been cropped in this manner when printed. The common paper sizes for typical consumer 'en-prints' 6x4" (ratio 3:2) and 7x5" (ratio 3.5x2.5) are a better fit for 35mm film requiring little or no cropping.

Conclusion – The print size is consistent with the claimed heritage of the print.

Film Type

Areas of the image which would exhibit colour in a colour print (the sky, the trees in the near foreground and distance, the grass in the foreground) are all rendered in tones of sepia or 'toned' black and white and do not exhibit any 'true' colour tones. The image is however not pure monochrome/black and white having a slight sepia tone. Sepia tone can be achieved by toning a black and white print however given that it has been established above that the image is printed on colour paper this would suggest that image was printed from a black and white negative.

Two types of black white films may have produced this print:

- a standard black and white photographic film processed using standard black and white processing chemicals (eg Ilford FP4 or HP5; Kodak Pan-X, Tri-X or T-max; Fuji Neopan 400)
- a chromogenic colour film designed to be processed using standard C41 colour negative processing chemistry to produce a monochromatic image when printed on colour paper (eg Ilford XP1 or XP2).

Whilst a standard Black and White negative could be used to produce a black and white image on colour negative paper this would require difficult colour adjustment during printing due to the fact that black and white film is missing the yellow and magenta colour masks which are used in controlling the colour reproduction of colour negative images and result in the orange colour typical of colour negatives.

Ilford XP-2 (launched in spring 1991) and the earlier XP-1 (introduced in 1980) is a high-speed, fine-grained chromogenic film available in 35mm and 120 sizes which was adapted from standard colour negative stock to produce black and white prints when processed using the standard colour processing (C41) and printed on colour negative paper. It has a particularly wide exposure latitude and delivers good results unpredictable lighting or where there can be wide-ranging subject brightness.

Ilford promoted the film on the basis of its wide exposure latitude which allowed film speeds from ISO 50 to 800 to be used on the same roll of film still resulting in correctly exposed images however XP-2 became popular amongst amateur photographers who wished to produce black and white images but wanted the convenience of high street (C41) processing and printing at a time when the processing of traditional silver gelatine black and white films was either becoming expensive or no longer provided by many high street labs and chemists. It should be noted however that few people would process the XP films at home due to the requirement for it to be processed using C41 colour chemistry which only few hobbyists would be equipped to do.

This would seem to suggest that the photographer was both interested and knowledgeable about photography as at this time the use of XP films was not common amongst popular and family photography, and loading a camera with such a film would be a proactive choice, especially as it was more expensive than standard colour negative film. During the late C20th black and white practice was closely linked to traditional documentary practice and was also a popular choice for landscape photography.

Conclusion – It is my considered opinion that the film used was **Ilford XP-1** processed using C41 chemistry. This is consistent with the claimed heritage of the print. The choice of this fairly specialist film by the photographer should also be considered as it suggests an interest in, and knowledge of photography.

Film Grain

The film grain within the image is noticeable however not extreme. Film grain is largely determined by the film stock however is also a result of the processing chemistry. Higher speed film has coarse and more noticeable grain while speed increasing or edge sharpening developers may also produce coarser grain. Grain size is also determined by the amount of enlargement.

A full frame image printed to 10x8" will exhibit finer grain than a portion of the same image enlarged to 200% and printed on 10x8" paper. Assuming the print is full frame (with a slight crop to the edges due to proportions of the paper size) the grain size present in the appears to be fairly fine grain and most consistent with a film with an ISO of 100 or 125 or perhaps a fast film (eg HP5) processed in a fine grain developer.

The grain is also consistent with that of Ilford's XP films which were well known for their fine grain properties. The grain is not sufficiently sharp enough due to the quality (sharpness) of the printing to allow more detailed analysis of grain shape which might help confirm the film type.



The grain in the area of the unidentified object in the centre of the image shows no break, distortion or unevenness and is continuous across the object. There is no evidence from the grain distribution around the object that the image has been collaged or constructed. The grain is continuous, in size, texture and density across the whole image suggesting that the image itself (both negative and print) has not been manipulated. The grain present in the photograph and around the unidentified object is consistent with this being a genuine recording of a scene in front of the camera.

A possible approach to disguising the collaging and construction of an image, either on the negative or print would be to rephotograph a manipulated image on a coarser grain film so that a convincing and genuine grain distribution disguises joins and artefacts of the manipulation. Whilst it is impossible to fully rule this out this would be unlikely due to the fineness and consistency of the grain in this image.

(NB – comparative examples of grain from 35mm B/W films can be provided in subsequent versions of this report)

Conclusion – The film grain is consistent with the film identified (XP-1) and suggests that no negative or print based manipulation of the image has taken place and that the image is a genuine representation of a scene in front of the camera.

Chromatic Aberration

Peripheral areas of the print, especially the branches of the trees at the top left and the fence and bushes at the lower left and right seem to exhibit lateral chromatic aberration. Chromatic aberration, also known as colour fringing, is a colour distortion resulting from the camera or enlarger lens which creates an outline of colour along metallic surfaces or high contrast edges resulting in a blur of blue-yellow, red-green or magenta-purple fringing around the edge of objects in the photograph. Lateral chromatic aberration only occurs at the edge of images while longitudinal chromatic aberration occurs across the whole frame.



In the detail above green-red fringing can be seen around the fence post with a red/yellow fringe to the left and a weaker green/blue fringe to the right of the post. This is not seen on the fence post at the centre of the lower edge nor on the unidentified object at the centre of the image. Given the image has been taken on black and white film which couldn't record the any chromatic aberration present in the cameras lens this must be chromatic aberration produced by the enlarging lens during the printing of the image.

Calculating the Approximate Size of the Unidentified Object

The relative sizes of objects in the photograph, as measured from a print, are dependent upon their actual size AND their distance from the camera. This relationship is an inverse linear relationship, i.e. size is $1 / \text{distance}$ - if you double the distance the size halves.

The length of a Harrier Jet is known and the length of a section of the barbed wire in the foreground can be calculated based on the standard spacing of barbs on the typical type of barbed wire in universal use across farming and forestry applications where the barbs are spaced in 10cm intervals (see ref 1 & 2). Thus if we are able to determine at what point between the fence in the foreground and the jet in the background the UFO is flying, we are able to calculate an approximate value for the size for the unidentified object.

Background - Harrier Jet



Length of Harrier GR3/AV-8A = 14.4 m / Length on Print = 0.80 cm

Middle Distance - Unidentified Object



UFO - Length on print = 3.33 cm / Height on print = 0.97 cm

Foreground: Wire Fence



To Scale from Original Image

Length of Fence (18 barbs) = 170 cm / Length on Print = 6.11 cm

- **Harrier** - True Length = 1440 cm / Image Length = 0.80cm
- **UFO** - True Length = Unknown / Image Length = 3.33cm
- **Fence** - True Length = 170cm / Image Length = 6.11cm

Calculations of the approximate size of the Unidentified Object have been made based on three different placements of the object between the fence in the foreground and the harrier jet in the background:

Option 1 - Assuming UFO is 50% of distance between fence and jet - UFO Length = 30.43 m / UFO Height = 8.86 m

Option 2 - Assuming UFO is 33% of distance between fence and jet - UFO Length = 20.60 m / UFO Height = 6.00 m

Option 3 - Assuming UFO is 66% of distance between fence and jet - UFO Length = 40.27 m / UFO Height = 11.73 m

Conclusion - Assuming the position of the unidentified object is (as it appears to be) closer to the Jet in the background than the fence in the foreground, an approximate length of between 30 m and 40 m and a height of between 8 m and 12 metres can be calculated for the object. NB – It should be noted that the measurements calculated here are approximate and are based on the stated assumptions and will have a margin of error of approximately +/- 10%.

References:

- 1 - <https://www.jacksons-fencing.co.uk/fencing/agricultural-fencing/wire-fencing-barbed-wire>
- 2 - <https://www.crestalafencing.co.uk/product/barbed-wire/>
- 3 - https://digital.nmla.metoffice.gov.uk/SO_80a8b686-2482-478c-bba6-02828d9a5d10/
- 4 - https://sunrise.maplogs.com/blair_atholl_pitlochry_ph18_uk.105340.html?year=1990