

IPACO expert report

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<i>Type</i> IFO	<i>Class</i> B	<i>Explanation</i> Advertising banner	<i>Complement</i>
<i>Document</i> Photos	<i>Shoot place</i> Austin Tx, USA	<i>Shoot date</i> September 02 and 03, 2011 between 11:56'58"PM and 00:01'13" Local time (See #1)	



Photo n°CIMG0234



Photo n°CIMG0235



Photo n°CIMG0236

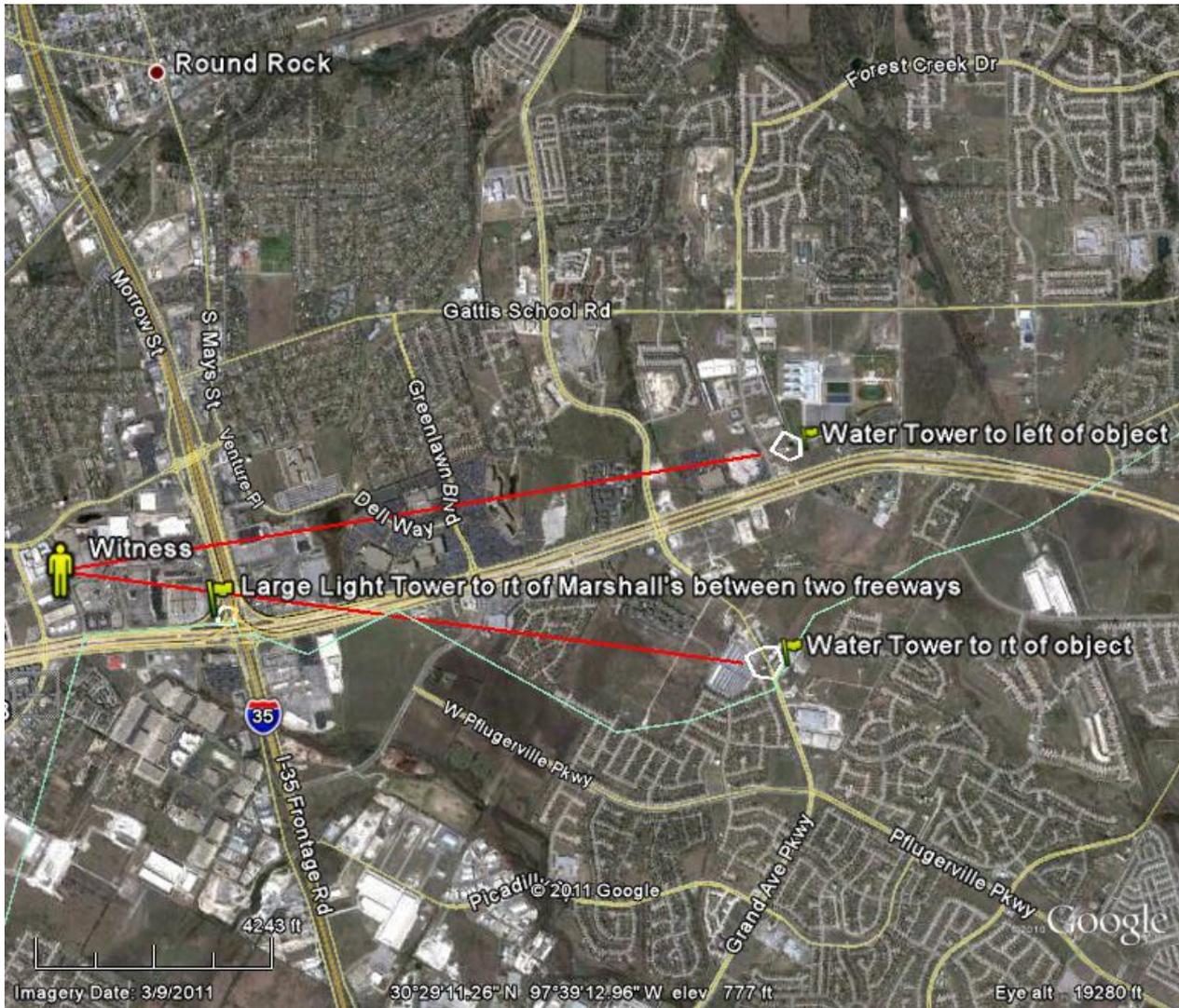


Photo n°CIMG0237

I. Shoot circumstances

The photos were taken in Round Rock, Texas. It is a suburb immediately north of Austin, Texas. They were taken from the witness' apartment through his window.

Situation map:



The object was almost due east of the witness and was traveling south to north. He indicated that its movement was slow and that it had a dull gray color. He at first thought that perhaps a plane was pulling a banner but he saw no plane and none can be seen in the photo.

He viewed the object for about 5 minutes. He believes that the object began moving to the east because he says that its south-north movement stopped and it shrank in size while maintaining its location in the sky.

Unfortunately, there are no other witnesses to this event.

II. Camera settings

These four photos were taken using a Casio Exilim ex-z33:



This camera was announced in 2009, August and is a cheap 10.1 mega--pixel model with a 3648 x 2736 max resolution in the 4:3 ratio and 3648 x 2432 max resolution in the 3:2 ratio.

Full specifications as well as user's reviews can be seen [here](#).

III. Data examination

1. Camera and EXIF examination

The photos were taken on the 02 and 03 September 2011 between 11:56'58"PM and 00:01'13" Local time [see note #1] (then 4'12" apart) with the following common camera technical specifications:

- 1/400 exposure time
- ISO 64
- Flash fired
- 3648 x 2432 resolution

There are also some differences between these photos like for example:

- Compressed bits per pixel that have a '1.20' value in the non-zoomed photo and between '0.49' and '0.69' in the three others (due to the zoom ratio that varies between them),
- Digital zoom ratio ('1' for the zoomed photo and '4' for the others)

Note #1: The date/time settings were wrong in the camera. Real corrected time is around 6:30PM the day after (then 03 September)

2. Authenticity verifications

a. EXIF data

First step is to searching for original photos taken with the exact same camera model on the net.

There are a lots of photo database that are able to give good results in such research, however, I use to work with Flickr, which is the biggest photo resource all over the net.

You can also find good original samples [here](#).

Then, I've taken 4 (4:3 ratio) +4 (3:2 ratio) original photos and made the following EXIF comparisons with the 4 original "UFO" photos:

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number : 8.51
File Name                : CIMG0234.JPG
Directory                : C:/Users/maison/Desktop/Nouveau
File Size                : 1366 kB
File Modification Date/Time : 2011:09:16 12:21:32+02:00
File Permissions         : rw-rw-rw-
File Type                : JPEG
MIME Type                : image/jpeg
Exif Byte Order          : Big-endian (Motorola, MM)
Make                    : CASIO COMPUTER CO.,LTD.
Camera Model Name       : EX-Z33
Orientation              : Horizontal (normal)
X Resolution             : 72
Y Resolution            : 72
Resolution Unit         : inches
Software                 : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number : 8.51
File Name                : CIMG0235.JPG
Directory                : C:/Users/maison/Desktop/Nouveau
File Size                : 602 kB
File Modification Date/Time : 2011:09:16 12:21:32+02:00
File Permissions         : rw-rw-rw-
File Type                : JPEG
MIME Type                : image/jpeg
Exif Byte Order          : Big-endian (Motorola, MM)
Make                    : CASIO COMPUTER CO.,LTD.
Camera Model Name       : EX-Z33
Orientation              : Horizontal (normal)
X Resolution             : 72
Y Resolution            : 72
Resolution Unit         : inches
Software                 : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number : 8.51
File Name                : CIMG0236.JPG
Directory                : C:/Users/maison/Desktop/Nouveau
File Size                : 702 kB
File Modification Date/Time : 2011:09:16 12:21:32+02:00
File Permissions         : rw-rw-rw-
File Type                : JPEG
MIME Type                : image/jpeg
Exif Byte Order          : Big-endian (Motorola, MM)
Make                    : CASIO COMPUTER CO.,LTD.
Camera Model Name       : EX-Z33
Orientation              : Horizontal (normal)
X Resolution             : 72
Y Resolution            : 72
Resolution Unit         : inches
Software                 : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number : 8.51
File Name                : CIMG0237.JPG
Directory                : C:/Users/maison/Desktop/Nouveau
File Size                : 817 kB
File Modification Date/Time : 2011:09:16 12:21:32+02:00
File Permissions         : rw-rw-rw-
File Type                : JPEG
MIME Type                : image/jpeg
Exif Byte Order          : Big-endian (Motorola, MM)
Make                    : CASIO COMPUTER CO.,LTD.
Camera Model Name       : EX-Z33
Orientation              : Horizontal (normal)
X Resolution             : 72
Y Resolution            : 72
Resolution Unit         : inches
Software                 : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number      : 8.51
File Name                    : CIMG0030.JPG
Directory                   : C:/Users/maison/Desktop/Nouveau d
File Size                    : 4.8 MB
File Modification Date/Time  : 2011:09:18 14:05:08+02:00
File Permissions             : rw-rw-rw-
File Type                    : JPEG
MIME Type                    : image/jpeg
Exif Byte Order              : Big-endian (Motorola, MM)
Make                         : CASIO COMPUTER CO.,LTD.
Camera Model Name           : EX-Z33
Orientation                  : Horizontal (normal)
X Resolution                 : 72
Y Resolution                 : 72
Resolution Unit              : inches
Software                     : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number      : 8.51
File Name                    : CIMG0024.JPG
Directory                   : C:/Users/maison/Desktop/Nouveau d
File Size                    : 5.0 MB
File Modification Date/Time  : 2011:09:18 14:06:47+02:00
File Permissions             : rw-rw-rw-
File Type                    : JPEG
MIME Type                    : image/jpeg
Exif Byte Order              : Big-endian (Motorola, MM)
Make                         : CASIO COMPUTER CO.,LTD.
Camera Model Name           : EX-Z33
Orientation                  : Horizontal (normal)
X Resolution                 : 72
Y Resolution                 : 72
Resolution Unit              : inches
Software                     : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number      : 8.51
File Name                    : CIMG0008.JPG
Directory                   : C:/Users/maison/Desktop/Nouveau d
File Size                    : 6.6 MB
File Modification Date/Time  : 2011:09:18 14:05:31+02:00
File Permissions             : rw-rw-rw-
File Type                    : JPEG
MIME Type                    : image/jpeg
Exif Byte Order              : Big-endian (Motorola, MM)
Make                         : CASIO COMPUTER CO.,LTD.
Camera Model Name           : EX-Z33
Orientation                  : Horizontal (normal)
X Resolution                 : 72
Y Resolution                 : 72
Resolution Unit              : inches
Software                     : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number      : 8.51
File Name                    : CIMG0059.JPG
Directory                   : C:/Users/maison/Desktop/Nouveau d
File Size                    : 5.4 MB
File Modification Date/Time  : 2011:09:18 14:05:44+02:00
File Permissions             : rw-rw-rw-
File Type                    : JPEG
MIME Type                    : image/jpeg
Exif Byte Order              : Big-endian (Motorola, MM)
Make                         : CASIO COMPUTER CO.,LTD.
Camera Model Name           : EX-Z33
Orientation                  : Horizontal (normal)
X Resolution                 : 72
Y Resolution                 : 72
Resolution Unit              : inches
Software                     : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number      : 8.51
File Name                    : 5918659434_92d70e2eb8_o.jpg
Directory                    : C:/Users/maison/Desktop/Nouv
File Size                    : 1050 kB
File Modification Date/Time  : 2011:09:17 15:24:38+02:00
File Permissions             : rw-rw-rw-
File Type                    : JPEG
MIME Type                    : image/jpeg
Exif Byte Order              : Big-endian (Motorola, MM)
Make                         : CASIO COMPUTER CO.,LTD.
Camera Model Name            : EX-Z33
Orientation                  : Horizontal (normal)
X Resolution                 : 72
Y Resolution                 : 72
Resolution Unit              : inches
Software                     : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number      : 8.51
File Name                    : CIMG0047.JPG
Directory                    : C:/Users/maison/Desktop/Nouv
File Size                    : 4.7 MB
File Modification Date/Time  : 2011:09:18 14:08:00+02:00
File Permissions             : rw-rw-rw-
File Type                    : JPEG
MIME Type                    : image/jpeg
Exif Byte Order              : Big-endian (Motorola, MM)
Make                         : CASIO COMPUTER CO.,LTD.
Camera Model Name            : EX-Z33
Orientation                  : Horizontal (normal)
X Resolution                 : 72
Y Resolution                 : 72
Resolution Unit              : inches
Software                     : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number      : 8.51
File Name                    : CIMG0001.JPG
Directory                    : C:/Users/maison/Desktop/Nouv
File Size                    : 5.0 MB
File Modification Date/Time  : 2011:09:18 14:05:09+02:00
File Permissions             : rw-rw-rw-
File Type                    : JPEG
MIME Type                    : image/jpeg
Exif Byte Order              : Big-endian (Motorola, MM)
Make                         : CASIO COMPUTER CO.,LTD.
Camera Model Name            : EX-Z33
Orientation                  : Horizontal (normal)
X Resolution                 : 72
Y Resolution                 : 72
Resolution Unit              : inches
Software                     : 1.00
```

```
D:\Users\tonio\Documents\utilitaires\exiftool(-k).exe
ExifTool Version Number      : 8.51
File Name                    : CIMG0061.JPG
Directory                    : C:/Users/maison/Desktop/Nouv
File Size                    : 6.1 MB
File Modification Date/Time  : 2011:09:18 14:07:05+02:00
File Permissions             : rw-rw-rw-
File Type                    : JPEG
MIME Type                    : image/jpeg
Exif Byte Order              : Big-endian (Motorola, MM)
Make                         : CASIO COMPUTER CO.,LTD.
Camera Model Name            : EX-Z33
Orientation                  : Horizontal (normal)
X Resolution                 : 72
Y Resolution                 : 72
Resolution Unit              : inches
Software                     : 1.00
```

As it can be noticed in the above extracts of 16 EXIF tags for each photo, the whole photos set have exactly the same EXIF data order and value, except for the usual technical data that varies due to the ambient conditions (flash, ISO, etc....).

b. JPEGSnoop

Since the camera is not in the JPEGSnoop database, I added it in the 3:2 ratio formats using the original photos that I found on the Internet databases.

Then, I checked the four original "UFO" photos class assessment:

```
YCC=[ 688, -166, 81] RGB=[228,214,176] @ MCU[ 75,299]

Finished Decoding SCAN Data
Number of RESTART markers decoded: 0
Next position in scan buffer: Offset 0x00155865.0

*** Marker: EOI (End of Image) (xFFD9) ***
OFFSET: 0x00155865

*** Searching Compression Signatures ***

Signature: 01A7D6495501D68564C2F984DAD02C20
Signature (Rotated): 0108ADBADC3DCC151D4E882DFBE7B7DC
File Offset: 0 bytes
Chroma subsampling: 2x1
EXIF Make/Model: OK [CASIO COMPUTER CO.,LTD.] [EX-Z33]
EXIF Makernotes: OK
EXIF Software: OK [ 1.00]

Searching Compression Signatures: (3327 built-in, 4 user(*) )

EXIF.Make / Software      EXIF.Model      Quality      Subsamp Match?
-----
+CAM:[CASIO COMPUTER CO.,LTD. ] [EX-Z33 ] [3:2 ratio ] Yes

Based on the analysis of compression characteristics and EXIF metadata:

ASSESSMENT: Class 3 - Image has high probability of being original
Note that EXIF Software field is set (typically contains Firmware version)
```

Image (RGB, DC) @ 12.5% (1/8)

ORIGINAL "UFO" PHOTO

6971d7f21c87a3ab1d0ea7e9d18e37fc - JPEGsnoop

File Edit View Tools Options Help

YCC=[1016, 0, 0] RGB=[255,255,255] @ MCU[0, 0]

Finished Decoding SCAN Data
 Number of RESTART markers decoded: 0
 Next position in scan buffer: Offset 0x002F8561.0

*** Marker: EOI (End of Image) (xFFD9) ***
 OFFSET: 0x002F8561

*** Searching Compression Signatures ***

Signature: 01A7D6495501D68564C2F984DAD02C20
 Signature (Rotated): 0108ADBADC3DCC151D4E882DFBE7B7DC **1**
 File Offset: 0 bytes
 Chroma subsampling: 2x1
 EXIF Make/Model: OK [CASIO COMPUTER CO.,LTD.] [EX-Z33]
 EXIF Makernotes: OK
 EXIF Software: OK [1.00]

Searching Compression Signatures: (3327 built-in, 4 user(*))

EXIF.Make / Software	EXIF.Model	Quality	Subsamp Match?
*CAM:[CASIO COMPUTER CO.,LTD.]	[EX-Z33] [3:2 ratio] Yes 2

Based on the analysis of compression characteristics and EXIF metadata:

ASSESSMENT: Class 3 - Image has high probability of being original
 Note that EXIF Software field is set (typically contains Firmware version)

Image (RGB, DC) @ 12.5% (1/8)

ORIGINAL 3:2 RATIO PHOTO TEST

Ready

Both have exactly the same JPEG compression signature (**1**) thus the “class 3” assessment (**2**) which is the higher in probability for the photos to be genuine.

c. Weather conditions

The photos were taken in Round Rock (Texas) approximately at 6:30PM on the 03 September 2011. [A quick check](#) on the weather conditions at this date/time is showing cool wind (6.2m/s) from NNE:

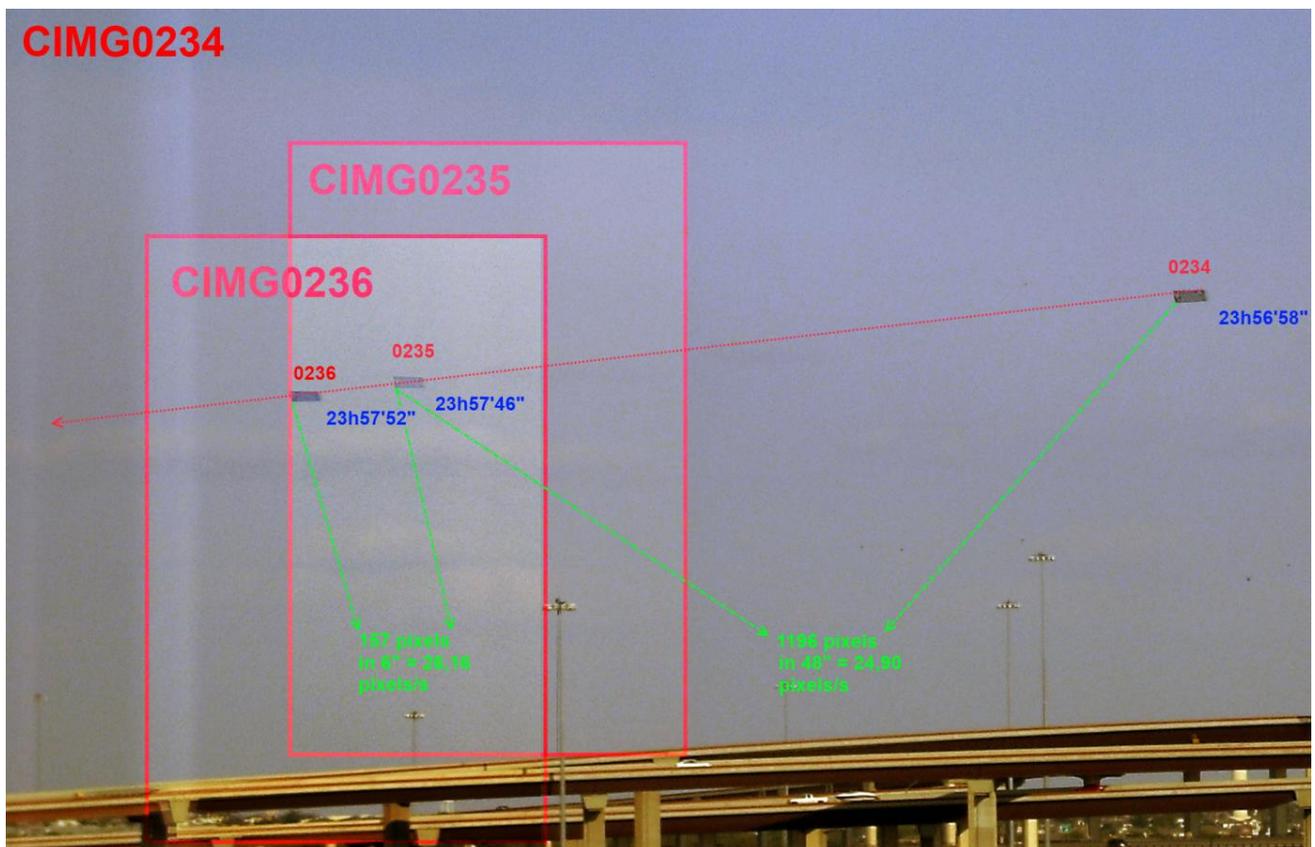
5:55 PM	37.0 °C	35.8 °C	12.0 °C	22%	1004.6 hPa	16.1 km	NNE	22.2 km/h / 6.2 m/s	38.9 km/h / 10.8 m/s	N/A
6:35 PM	36.0 °C	34.7 °C	12.0 °C	23%	1004.3 hPa	16.1 km	NNE	22.2 km/h / 6.2 m/s	33.3 km/h / 9.3 m/s	N/A
6:55 PM	36.0 °C	34.7 °C	12.0 °C	23%	1004.3 hPa	16.1 km	NNE	25.9 km/h / 7.2 m/s	38.9 km/h / 10.8 m/s	N/A

The witness said that this object was travelling from south to north, which is **not compatible to the possibility of this object move to have been caused by the wind.**

d. Composition

Using pictures n°234, 235 and 236, I've done a composition (n°237 is out of frame), trying to keep both the ratio picture format and relative position of the landscape marks. Fortunately, it seems that the photographer didn't move at all between the shoots, however, the bad thing is that it does not allow me to do a photogrammetry analysis, which could help us to determine both the real object size and distance....

Real size of this composition can be seen [here](#)



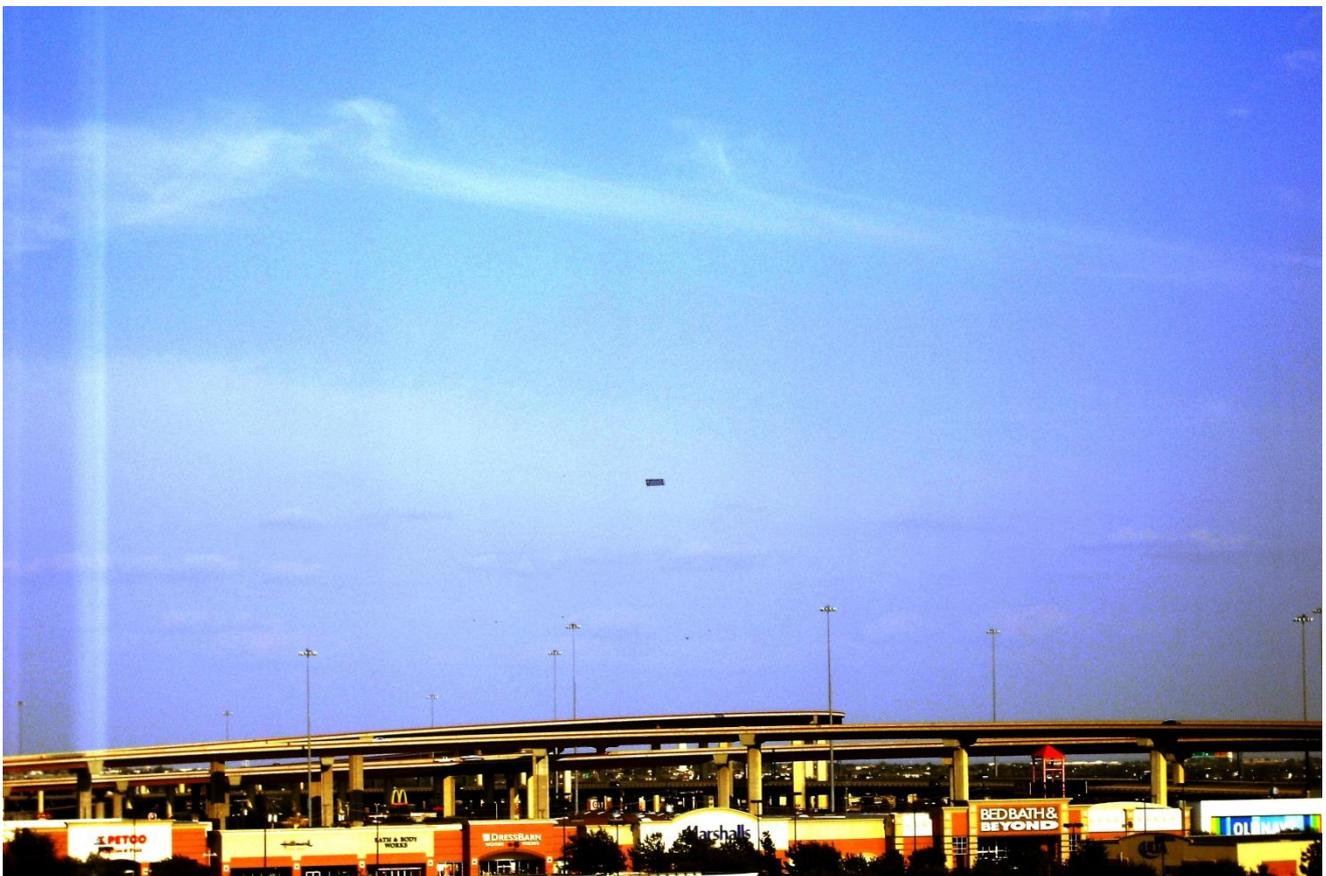
What we learn from this?

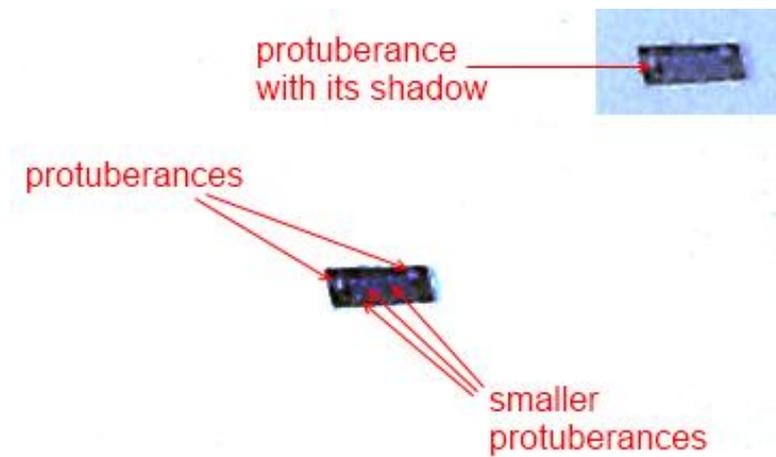
- **The object moves in a straight line**, there is only a very slight rotation in its position in the n°0235 picture.
- **It also moves in a regular speed**, there's only a slight variation in the estimated speed that could be due to a margin error (+/-1 pixel/s) in my zoomed pictures reduction and/or in my pixels count.
- Accurate measurement of the length of the object on each photo, in pixels, all things being equal, shows that **the object is slowly moving away from the observer**, reducing its apparent size, to pass from a length of 184 pixels in the photo n°0234 to about 170 pixels in the photos n°0235 and 0236, then about 100 pixels on the photo n°0237.

e. Improvements

Although the photos quality is not optimal, is it still possible to try some improvements.

Tries on the photo n°CIMG0234:





f. Hypothesis of the advertising banner trailed by a small plane or a helicopter

In the context of this hypothesis, some measures have been carried out with IPACO.

- Size and distance estimations of the object

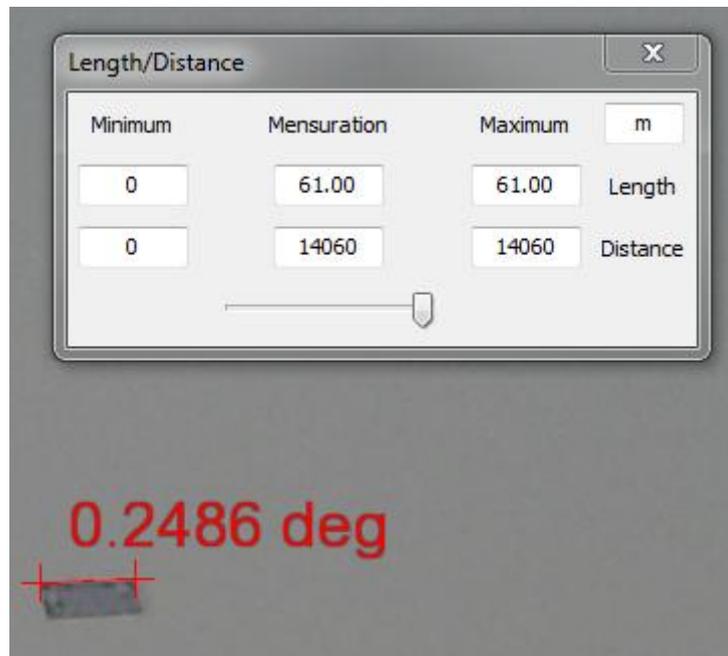
We know by examining the EXIF metadata that the camera "Casio EX-Z33" has an 18.90mm focal length for a 35 mm equivalent of 107.

This gives us by using the angle measurement tool of the software on the photo n°0234 (wide shot), an angular size for the object in its largest dimension of **0.2486 °**.

We therefore have the following options for the distance at which it could find itself away from the camera, depending of its size, for three models of banners of different length:

Image 034	length (ft)	length (m)	distance (m)
1	200	61	14060
2	150	45,7	10534
3	100	30,47	7023

Fig. 2



Then, in the hypothesis of a 200ft long banner, that gives us a distance between the camera and the object of 14kms (8.7 miles)!

- Speed estimations of the object.

If we took again the data graphically obtained in *Fig. 1*, we find that the object (which, measured on the photo n°0234 in its greatest length 46 pixels) moves linearly of 1196 pixels in 48 seconds between the photo n°0234 and n°0235.

By using the table in *Fig. 2*, we obtain by elementary calculations a range of speeds comprised between 59.4 and 118.8km/h (37 and 73.8mph).

Image 034	length (ft)	length (m)	distance(m)	1 pixel = (m)	46 pixels = (m)	1196 pixels = (m)	speed (m/s)	speed (km/h)
1	200	61	14060	1,326	61	1586	33	118,8
2	150	45,7	10534	0,99	45,7	1184	24,66	88,78
3	100	30,47	7023	0,66	30,47	792	16,5	59,4

Fig. 3

These speeds, especially the higher, are quite consistent with that of a helicopter (the average speed ranges for common patterns between 28 and 386km/h [80 to 240mph]), especially as speed must be reduced compared

to normal (i.e. without banner towed) for this banner to be properly trailed without risk of causing any damage.

- Could the object that trailed that banner be seen and / or heard by the witness photographer?
- Regarding the perception of noise, in the first chapter "shoot circumstance", the witness said he took photographs through the window of his apartment, which greatly reduces the chances of being able to hear any possible noise coming from any aircraft engine or helicopter, especially at the distances that were estimated in the previous chapter.

It is also worth noting the presence between the witness and the subject of a busy road, "Interstate 35" (denoted "I35" on the map) and a highway interchange.

Thus, the noise caused by vehicles traveling on these routes is able to hide that produced by the vehicle, airplane or helicopter, towing the banner.

- For the problem of visual perception of the object pulling the banner, this one moving from right to left of the observer, the object in question should logically be found to the left of the banner. Thus, by carefully examining the photos n°0234 and n°0236, one note the presence of two "dark spots" that seemed to be at the same place to the left of the banner:



Close-up of photo n°0234



Close-up of photo n°0236

Could it be possible that this dark spot was the plane or helicopter that trailed the banner?

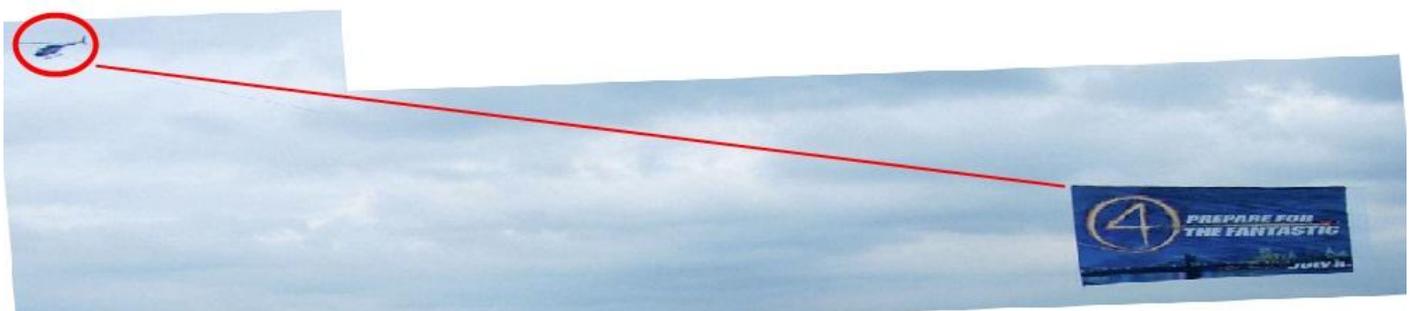
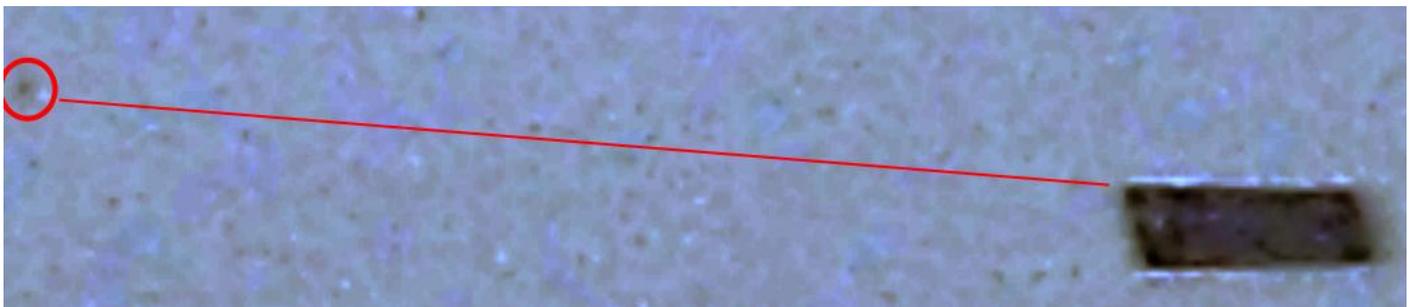
A "classic" banner 200 feet (61 meters) long in a configuration similar to that we can see in the photos is as follows:



(1)

The ratio cable length/banner length here is 3.83.

Using this ratio and reducing the proportions of the banner in our example above in the same way as those of our photographs purpose of the study, we find that distances as well as angles measures of "object tractor/banner "are very similar:



Small differences can easily be explained by several concomitant or not factors (exact size of the banner, cable length connecting the airplane or helicopter to the banner, etc.).

It is also possible to give a good estimate of the actual length of the cable towing the banner with IPACO.

Thus, for a banner 61m (200 feet) long, the angle between the banner and its "tractor" is measured with the software at 1.191 °. Using the maximum distance between the object and the observer estimated earlier, 14.060m (8.74 miles), we obtain a cable length of 292.30m. (0.18 miles) (*Fig. 4*)

The greater the distance is, the length shortened is. Thus, for a 7km (4.35 miles) away banner, we find a cable length of 145.50m. (477 feet)

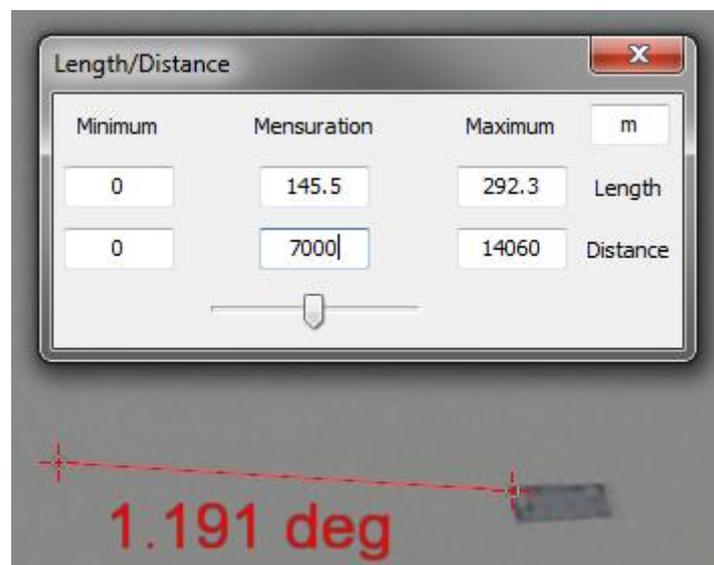


Fig. 4

An important point for the visual perception of a remote object is the notion of "[resolving power](#)".

The resolving power of the human eye is approximately one minute of arc, or 0.017 °.

However, in this case, the object towing the banner is visible on photographs by a very small angle, estimated by IPACO around 0.03 °.

It is quite conceivable that the witness, in good faith and depending on many parameters, (such as its own vision, the presence of a window between the lens and the scene being photographed, the distance to the helicopter or plane and thus the action of atmospheric scattering on appearance, etc.) wasn't able, at the time, to see the airplane or helicopter.

IV. Conclusion

The photos are very likely genuine. No tampering traces have been detected. The object present in the photos seems to move in an “intelligent” way and have a very uncommon shape; at first glance, it cannot be compared to any known object.

However, the first intuition of the witness was probably good, because we were able to show that the object photographed was probably a banner towed by a small plane or helicopter.

It is also worth noting that, despite our efforts, we were unable to find for this day neither clues nor evidence (photos, records, articles ...) about the flight that took place over the city of Austin, which was at the origin of this observation and these photographs.

Special thanks for their help in this investigation to:

- **Robert Powell**, *Director of Research for the Mutual UFO Network*
- **Fletcher Gray**, *MUFON (Mutual UFO Network), Star Team Manager, Chief Investigator of Texas*
- **Angelia Joiner**, *former staff writer of the Stephenville Empire-Tribune, Texas.*

Big thanks as well is due to the team of the French UFO Skepticism site (in French: "[UFO SCEPTICISME](#)"), and in particular "Nablator", "Sebastian" and "Gilles F. ", for their insight and their participation to the preparation of this report.

V. Sources – Photo credits

The photos were directly submitted to the expert by the witness, through Robert Powell.

- (1) This photo of a helicopter towing an advertising banner comes from [this Internet site.](#)