

To: Twyla Francois	Contact:	Occ. No.	2010-04119
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From: Blackstone Forensics	Specialist:	Dave McKay
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Nature of Event:

**Forensic Video Analysis and
Authentication of Covert
Surveillance Video**

Case Received

Date

Time

VIDEO ANALYSIS

Apr. 19 2010

	Exhibits	Disposition			
<i>No.</i>	<i>Description</i>	<i>Location</i>	<i>Date Rec.</i>	<i>Date Moved</i>	<i>Init.</i>
1	Portable HP Simple Save Drive	BCIT Lab	10 04 19		

Specifics of Work Done

Details:

Request:

Writer was contacted by T. FRANCOIS with a request to review covert video footage to determine whether or not the footage in question is authentic and was recorded on the date and time indicated by the supplier of said footage. Two incidences of recording were reviewed. One apparently occurring on February 19, 2010 between the approximate hours of 0700hrs and 1737hrs at a facility labeled "Bouvry Exports", and the second apparently occurring February 22, 2010 between the approximate hours of 0600hrs and 1700hrs at a facility labeled "Viande Richelieu Inc.".

The device allegedly used to do the covert recording was a PV-1000 Portable digital video recorder. This device records NTSC video and audio onto an internal hard-drive. The recorded material is saved in an MPEG-4 ASF format which can be played through windows media player once the video files are transferred from the PV-1000 onto another computer.

A portable USB HP drive was received from T. FRANCOIS on April 19, 2010. The hard-drive contained three folders labelled "18022010", "19022010", and "22022010". All three folders were transferred onto a separate laptop computer for analysis purposes.

Forensic Video Analysis:

Analysis was done on the video clips that were contained in the folders "19022010" and "22022010". Folder "19022010" contained 19 individual ASF video clips that were approximately 35 minutes in length. Folder "22022010" contained 19 individual ASF video clips that were approximately 35 minutes in length. Each video clip was approximately 0.99 Gb in size. This approximate size and length was consistent for all the video clips contained in each folder, with the exception of one video clip contained in folder "19022010" named "KAJF0400_19022010173715". This video clip was approximately 23 minutes long and 649 Mb in size.

February 19, 2010 Footage:

The footage that was recorded at the "Bouvry Exports" site was said to have occurred between 0700hrs and 1737hrs. In order to determine whether or not the video was authentic and did occur at the date and time specified the video and audio portions were analyzed independently.

Video:



To determine whether or not the video was in fact authentic and taken on the date specified a number of factors were taken into consideration:

- Do the file properties of the video match the specifications of the recording device?
- Are any inconsistencies in the video observed?

- When was the recorded information created?

The file properties of the individual clips were determined using a combination of software programs. Each video clip had the following similar characteristics:

Duration	: 35mn 18s
Overall bit rate	: 4 030 Kbps
Maximum Overall bit rate	: 3 277 Kbps
Video	
ID	: 2
Format	: MPEG-4 Visual
Codec ID	: M4S2
Codec ID/Hint	: Microsoft
Duration	: 35mn 18s
Bit rate	: 3 734 Kbps
Width	: 1 024 pixels
Height	: 768 pixels
Display aspect ratio	: 4:3
Frame rate	: 25.000 fps
Color space	: YUV
Chroma subsampling	: 4:2:0
Bit depth	: 8 bits
Bits/(Pixel*Frame)	: 0.190
Stream size	: 943 MiB (93%)
Audio	
ID	: 1
Format	: PCM
Codec ID	: 1
Codec ID/Hint	: Microsoft
Duration	: 35mn 18s
Bit rate	: 128 Kbps
Channel(s)	: 2 channels
Sampling rate	: 8 000 Hz
Bit depth	: 8 bits
Stream size	: 32.3 MiB (3%)

Each video clip had properties as listed above. The only variation seen between video clips in some cases was bit-rate characteristics, and duration of the clip. The resolution, frames per second recording, format, codec ID, files size, and maximum overall bit rate were consistent between each video clip. The above information matched that of the digital video recorder specifications.

Using the file information above, the video clips that were created and viewed were consistent within these parameters. Such that what the writer would expect to observe on video was in fact what was observed with respect to resolution, compression, and frame rate. Furthermore, there were no inconsistencies or purposeful editing apparent.

An indication of when the individual video clips were created was then determined by looking at the windows file properties of each video clip. The file property indicating the approximate time the file was last

modified specifies when the file was saved by the system, in this case the PV-1000. Looking at this property for each video clip contained folder "19022010" gave us a creation date of February 19, 2010 at various time intervals based on when the video clip was saved by the system. There was no indication that these properties had been altered in any way. This information was then compared to the time stamp that was contained in the file name. See table below:

Feb 19 2010 Footage:

File	File Time Stamp	Windows Properties (modified)	Time Diff.
KAJF0400_19022010070008	7:00:08	6:35:26	0:24:42
KAJF0400_19022010073527	7:35:27	7:10:48	0:24:39
KAJF0400_19022010081049	8:10:49	7:46:10	0:24:39
KAJF0400_19022010084611	8:46:11	8:21:34	0:24:37
KAJF0400_19022010092136	9:21:36	8:56:54	0:24:42
KAJF0400_19022010095655	9:56:55	9:32:14	0:24:41
KAJF0400_19022010103215	10:32:15	10:07:34	0:24:41
KAJF0400_19022010110734	11:07:34	10:42:52	0:24:42
KAJF0400_19022010114254	11:42:54	11:18:14	0:24:40
KAJF0400_19022010121815	12:18:15	11:53:32	0:24:43
KAJF0400_19022010125334	12:53:34	12:28:52	0:24:42
KAJF0400_19022010132853	13:28:53	13:04:14	0:24:39
KAJF0400_19022010140416	14:04:16	13:39:34	0:24:42
KAJF0400_19022010143935	14:39:35	14:14:52	0:24:43
KAJF0400_19022010151454	15:14:54	14:50:22	0:24:32
KAJF0400_19022010155024	15:50:24	15:25:58	0:24:26
KAJF0400_19022010162600	16:26:00	16:01:22	0:24:38
KAJF0400_19022010170123	17:01:23	16:37:14	0:24:09
KAJF0400_19022010173715	17:37:15	17:00:06	0:37:09

Although there is a time difference between the modified time and the file time stamp, this difference is relatively consistent, indicating that this discrepancy is due to how the video clips are recorded and stored on the original PV-1000 digital video recorder. Additionally, the modified time stamp occurs, in time, before the file time stamp. Had the video clips been tampered with or modified in any way the modified time stamp would occur, in time, after the file time stamp.

Audio

T. FRANCOIS provided writer with a song playlist for February 19, 2010 from a local radio station. The audio was clear enough to compare this playlist with what can be heard on the recorded video. This was used to assist in the time and date verification. After audio analysis, it was determined that what can be heard on the recorded video is consistent with the song playlist provided by the radio station for February 19, 2010 between the times of 0600hrs and 1800hrs. The results and processes of this audio analysis are included with this report (appendix A).

Conclusion: February 19, 2010 Footage

From the above video and audio observations, the date and approximate times appear accurate, such that this particular footage was recorded on February 19, 2010 between the approximate hours of 0700hrs and 1737hrs.

February 22, 2010 Footage:

A process similar to what was done for the February 19, 2010 footage was applied to the footage contained in folder "22022010". However, the technique used to verify the audio portion of the recording was not done.

Video:



As done previously, to determine whether or not the video was in fact authentic and taken on the date specified a number of factors were taken into consideration:

- Do the file properties of the video match the specifications of the recording device?
- Are any inconsistencies in the video observed?
- When was the recorded information created?
- Comparison of time stamp information with wall mounted clock (seen in camera view)

Each video clip had the following similar characteristics:

Duration : 34mn 58s
Overall bit rate : 4 069 Kbps
Maximum Overall bit rate : 3 277 Kbps

Video
ID : 2
Format : MPEG-4 Visual
Codec ID : M4S2
Codec ID/Hint : Microsoft
Duration : 34mn 58s
Bit rate : 3 771 Kbps
Width : 1 024 pixels
Height : 768 pixels
Display aspect ratio : 4:3
Frame rate : 25.000 fps
Color space : YUV
Chroma subsampling : 4:2:0
Bit depth : 8 bits
Bits/(Pixel*Frame) : 0.192
Stream size : 943 MiB (93%)

Audio
ID : 1
Format : PCM
Codec ID : 1
Codec ID/Hint : Microsoft
Duration : 34mn 58s
Bit rate : 128 Kbps
Channel(s) : 2 channels
Sampling rate : 8 000 Hz
Bit depth : 8 bits
Stream size : 32.0 MiB (3%)

Each video clip had properties as listed above. The only variation seen between video clips in some cases was bit-rate characteristics, and duration of the clip. The resolution, frames per second recording, format, codec ID, files size, and maximum overall bit rate were consistent between each video clip. The above information matched that of the digital video recorder specifications.

Using the file information above, the video clips that were created and viewed were consistent within these parameters. Such that what the writer would expect to observe on video was in fact what was observed with respect to resolution, compression, and frame rate. Furthermore, there were no inconsistencies or purposeful editing apparent.

An indication of when the individual video clips were created was then determined by looking at the windows file properties of each video clip. The file property indicating the approximate time the file was last

modified specifies when the file was saved by the system, in this case the PV-1000. Looking at this property for each video clip contained folder “22022010” gave us a creation date of February 19, 2010 at various time intervals based on when the video clip was saved by the system. There was no indication that these properties had been altered in any way. This information was then compared to the time stamp that was contained in the file name. In this case there was a wall clock that could be seen within the camera view. This was also used to assist in time determination. See table below:

Feb 22 2010 Footage:

File	Wall Clock (Approx.)	File Time Stamp	Windows Properties (modified)	Time Diff.
KAJF0577_22022010060008	06:00 to 06:35	6:00:08	5:36:06	0:24:02
KAJF0577_22022010063507	06:35 to 07:10	6:35:07	6:09:46	0:25:21
KAJF0577_22022010070946	07:10 to 07:45	7:09:46	6:44:24	0:25:22
KAJF0577_22022010074426	07:45 to 08:20	7:44:26	7:19:08	0:25:18
KAJF0577_22022010081909	08:20 to U/K	8:19:09	7:53:46	0:25:23
KAJF0577_22022010085347	U/K	8:53:47	8:28:18	0:25:29
KAJF0577_22022010092819	U/K to 10:05	9:28:19	9:02:52	0:25:27
KAJF0577_22022010100253	10:05 to 10:40	10:02:53	9:37:26	0:25:27
KAJF0577_22022010103728	U/K to 11:10	10:37:28	10:12:06	0:25:22
KAJF0577_22022010111207	11:10 to U/K	11:12:07	10:46:38	0:25:29
KAJF0577_22022010114639	U/K	11:46:39	11:21:10	0:25:29
KAJF0577_22022010122111	12:20 to 12:55	12:21:11	11:55:48	0:25:23
KAJF0577_22022010125549	12:55 to 13:30	12:55:49	12:30:34	0:25:15
KAJF0577_22022010133036	13:30 to 14:05	13:30:36	13:05:34	0:25:02
KAJF0577_22022010140534	14:05 to 14:40	14:05:34	13:40:24	0:25:10
KAJF0577_22022010144025	14:40 to 15:15	14:40:25	14:15:20	0:25:05
KAJF0577_22022010151520	15:15 to 15:50	15:15:20	14:50:20	0:25:00
KAJF0577_22022010155020	15:50 to 16:25	15:50:20	15:25:16	0:25:04
KAJF0577_22022010162517	16:25 to 17:00	16:25:17	16:00:06	0:25:11

Although there is a time difference between the modified time and the file time stamp, this difference is relatively consistent, indicating that this discrepancy is due to how the video clips are recorded and stored on the original PV-1000 digital video recorder. Additionally, the modified time stamp occurs, in time, before the file time stamp. Had the video clips been tampered with or modified in any way the modified time stamp would occur, in time, after the file time stamp.

Conclusion: February 22, 2010 Footage

From the above video observations, the date and approximate times appear accurate, such that this particular footage was recorded on February 22, 2010 between the approximate hours of 0600hrs and 1700hrs.

Forensic Video Analysis Conclusion:

After analysis of the of the individual video clips with respect to file properties, the time stamps associated to each, the video recorders specifications, corresponding audio information, and the writers' own experience in viewing surveillance video, it is the writers' opinion that from the information provided the "Bouvry Exports" footage was recorded on February 19, 2010 between the approximate hours of 0700hrs and 1737hrs and The "Viande Richelieu Inc." was recorded on February 22, 2010 between the approximate hours of 0600hrs and 1700hrs. Furthermore, it is the writers' opinion that the footage recorded at both facilities is authentic.

Signed,

Dave McKay

Appendix A – Forensic Audio Analysis

Forensic Audio Services: Occurrence Report

From: Blackstone Forensics Specialist: Jason Mauza

Case File: Alberta Horse Case	For: Canadian Horse Defense Coalition	Contact: Twyla Francois
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Nature of Event: Audio Forensic Analysis

Audio Analysis			
	Exhibits	Disposition	
No.	Description	Location	Date Rec.
1	1 HP Simple Save Hard Drive	Elephant Ears Lab	04/28/10
2	Playlist from radio station 107.7 fm 'The River' in Lethbridge, Alberta for Feb.19 2010	Elephant Ears Lab	04/28/10
3	Detailed transcript of Video footage from Twyla Francois	Elephant Ears Lab	04/28/10

Specifics of Work Done

Forensic Audio Analysis - Authentication of date of recording:

J.MAUZA received 1 HP Simple Save hard drive containing a copy of the original video footage from D.MCKAY on 04/28/10. The hard drive was received in a sealed envelope.

Mr. MCKAY requested that the nineteen video files be reviewed by the writer with the following request:

- Clarification and enhancement of the audio portion of the recordings on Feb.19 2010 for the purpose of determining the actual date of the recording.

Process:

A copy of the nineteen video files contained on the hard drive was transferred uncompressed to a secure forensic workstation. The files were in an .ASF Windows format. Because the workstation cannot process this file type directly, the video files were then converted into 'mpeg' format.

Once all the relevant video files were converted, waveform and spectrograph analyzers were used to view the audio portion of the files in a visual context.

Writer then proceeded to examine and analyze portions of the files that contained a loud radio playing in the background.

Since the recordings had a fair amount of distortion, writer applied a de-clipping algorithm to reduce the amount of distortion.

A detailed playlist from 'The River' 107.7 fm radio station in Lethbridge, Alberta for Feb.19 2010 was also provided.

This was determined by the client to be the radio station being played on the radio the day of the recordings.

Writer then concentrated on two of the files that contained loud radio portions:

- KAJF0400-19022010081049
- KAJF0400-19022010103215

Analysis:

After carefully analyzing the recorded audio portions stated above, it is the opinion of the writer that the video/audio recordings were from the date Feb. 19 2010.

This conclusion was reached through the following:

1. On video file KAJF0400-19022010103215 from 0:00:00 - 13:40.00 three songs were congruent with the radio playlist. These included; "Africa" - Toto, "The Time of my Life" - David Cook, "Ironic" - Alanis Morissette. Also at 24:00.00 - 30:00.00 congruent songs include; "Semi-charmed kind of Life" - Third eye Blind, "Son of a Preacher Man" - Jann Arden.
2. On video file KAJF0400-19022010081049 from 06:30.00 - 16:10.00 two songs were congruent with the radio playlist. These included; "Goodbye Stranger" - Supertramp, "Need you Now" - Lady Antebellum. Also at 23:45.00 - 29:00.00 congruent songs include; "Iris" - Goo Goo Dolls, "Fifteen" - Taylor Swift.
3. Comparing the identified songs with the provided radio playlist for that same date of Feb.19 2010.
4. However there is an approximate 35 minute discrepancy between the transcript provided by Twyla Francois and the radio station 107.7 "The River", this still does not affect the date in question.

It is through these observations and comparisons with the radio playlist that the writer concludes these recordings were made on the stated date of Feb. 19 2010.

Signed,

Jason Mauza