

keyinfo

Summer 2016

Delivering Information from Key Forensic Services Ltd

Toxicology Service – Embedded, Expanding, Enhancing!

Our UKAS ISO/IEC 17025:2005 accredited toxicology service covering all of the common drugs of abuse (21TOX) and 17 specified limits as per Section 5A of the Road Traffic Act 1988, went live on the 4th January 2016 and from this date onwards we have seen a steady growth in submissions from our customers.

Such is the growth in this area, that we are currently undertaking a major expansion programme at our Warrington site, which includes the development of additional laboratory space, procurement of additional state of the art laboratory equipment and the recruitment of more skilled staff.

Commenting on this, Head of Toxicology Marcus Donohue said: 'It's been really pleasing to observe a month-by-month growth in toxicology submission volumes since we became operational with our service. We are all excited about continuing this momentum as

we steer and enhance the scope of our service throughout the remainder of 2016 and into the future.'

'The Section 5A RTA 1988 drug driving legislation came into force on the 2nd March 2015 and since that date the sector as a whole has noticed a significant rise in requests for toxicological examinations. KFS anticipated this legislation and proactively responded by making a significant investment in experienced staff and a fully equipped laboratory to ensure a robust, timely delivery of results to meet the needs of the CJS.



In fact since we went live, we have processed several hundred drugs driving cases, 100% of which have met or exceeded their contractual target date. This is testament to KFS' continual ethos to provide exceptional, customer focused service'.

KFS has excess capacity in Toxicology and is actively seeking further work whether contracted or non-contracted. Please call the team if there is anything we can help with or if you want to know more.



Contact the team:

01925 875636

e-mail: toxicology@keyforensic.co.uk

Secure e-mail:

toxicology.services@keyforensic.co.uk.cjsm.net

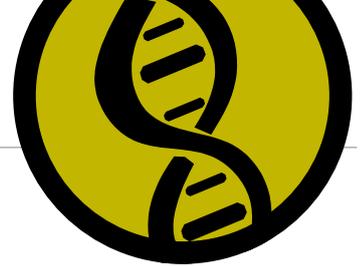
Don't forget.

Our **Coventry Switchboard** number changed last year from 02476 323399 to:

02477 712246

Please make sure that you have noted the new number as the old number will be unobtainable from 01 September 2016.

 **Key Forensic**
Services Limited



New Services Launched

We continue to develop and seek accreditation for new services which we know will assist our customers in the investigation of crime and the prosecution of those committing crime. [Shown below](#) are some of the new services which our customers are now able to take advantage of. We are also working on developing a number of new DNA Specialist Services which will be made available in the coming months.

UKAS accreditation for STRmix™



In June KFS received UKAS accreditation for our STRmix™ (pronounced STARmix) service. Early feedback on the service is very positive, with several customers considering using the technique in a number of ongoing cold case reviews.

STRmix™ is the result of collaboration between the Institute of Environmental Science & Research Limited (ESR) in New Zealand, Forensic Science South Australia, and the Australian National Institute of Forensic Science. It is fully implemented and utilised nationally in Australia and New Zealand, as well as in several US laboratory systems. KFS has successfully validated the software.

The increasing sensitivity of DNA profiling systems has enabled DNA profiles to be obtained from increasingly smaller amounts of template DNA. This increased sensitivity has raised new problems and

intensified existing ones. A DNA profile is now more likely to manifest in the form of a mixture of DNA; whether that be from legitimate mixing during the crime event, background levels of DNA, or as a result of contamination. The increased sensitivity amplifies the stochastic effects inherent with low template DNA such as allelic drop-out and drop-in.

STRmix™ uses sophisticated mathematical modelling to evaluate DNA profiles using peak height information available within a DNA result. The mathematical models have been peer reviewed and published in respected journals. These models now enable KFS to evaluate more complex mixtures than was previously possible, including those mixtures with DNA from up to 3 people. KFS has conducted a technical validation of the STRmix™ software. This means

that we have configured it to operate using our laboratory specific set-up and tested the methods STRmix™ uses to evaluate mixtures.

- STRmix employs standard statistical methods in use across a number of fields of data analysis.
- STRmix has been validated by KFS to the standards set by SWGDAM.
- No UK validation standard currently exists; however, it is in development. When this standard is published we will verify STRmix to the UK standard.

The STRmix service is particularly suitable for:

- Major crime cases
- Cases where there is limited evidence.
- Sexual offence cases where there is no suspect

Calibration of Chronoscopes

Another new service offering launched this year, is our calibration of chronoscopes.

The chronoscope is a vital piece of equipment for testing whether air weapons are legal and performing correctly. It is important therefore that chronoscopes are correctly calibrated.

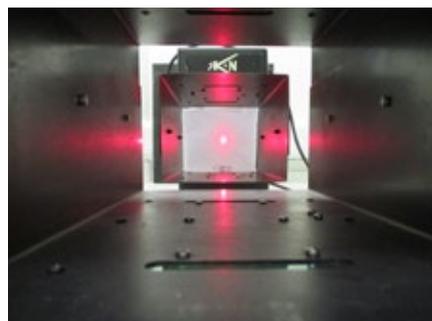
Skani Chronoscope Calibration

We are able to provide a service for the measurement of muzzle kinetic energy using a Mk9 Skani chronoscope S/N 030705 (referred to here as KFS chronograph).

The KFS chronograph has been specially adapted by the manufacturer allowing KFS to calibrate the measurement of

time by this chronograph. Additionally, a purpose-built gauge designed by KFS has allowed calibration of the pellet travel distance measurement by the KFS chronoscope. From these calibrations and uncertainty analysis, an uncertainty of measurement for velocity has been calculated for the instrument.

The performance of the customer chronograph is then directly compared against the KFS instrument, using .177 and .22 air rifles, with pellet weights



chosen to give relevant velocities for the 12 foot-pound limit and above. For each shot, simultaneous velocity readings are obtained for the chronograph pair in series. The positions of the two chronographs are then swapped and the tests are repeated.

The results are analysed and a calibration certificate is provided, recording the performance of the customer chronograph compared with the KFS chronograph. The uncertainty of measurement previously determined for the KFS chronograph will be given, illustrating the lowest possible 'true velocity' for each test result. This will allow the customer to decide an appropriate deduction to be made from their chronograph velocity reading in future casework.

KFS is able to provide an annual calibration check for each customer chronograph.

Please call Paul Olden in our Firearms team if you require any more information or if you would like to requisition the service. 02476 323387.

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Proficiency Trials

KFS can set up and monitor quality assurance tests in the form of Proficiency Testing (PT) to support the activities undertaken within force evidence recovery facilities. These trials consist of seeded items being submitted to the force for the force to carry out an examination, the result of which is subsequently submitted back to KFS for analysis.

The analysis should show that as much as possible of the evidence submitted has been recovered and that any anti-contamination steps required for the particular evidence type have been taken. The trials are designed to test all aspects of a force's scope of accreditation. Scenarios will be designed in accordance with the type of work carried out in the laboratory at the force.

Range of Proficiency Trials

- DNA Cellular – swabbing.
- DNA Cellular – minitaping. To seed a small fabric item with DNA to be recovered with minitapes.
- DNA Cellular – minitaping. To seed an item of footwear with DNA to be recovered with minitapes.
- DNA Saliva – swabbing.
- DNA Cellular/Saliva – cutting.
- DNA Blood – visual search.
- DNA Blood - microscopic search.
- Blood Search – visual search.
- Blood Search – microscopic search.
- DNA Semen – swabs
- DNA Semen – items
- DNA Mixed stains –Semen
- DNA Mixed stains –Non Semen
- Bespoke (non-standard) trials – available upon application

All samples are processed using techniques with the same level of sensitivity and integrity as those used for casework stains processed as part of KFS' routine services.

We offer different pricing options for individual trials or trials on a quarterly or annual basis. Quarterly and annual arrangements attract good discounts, please contact your Account Manager for the various pricing options.

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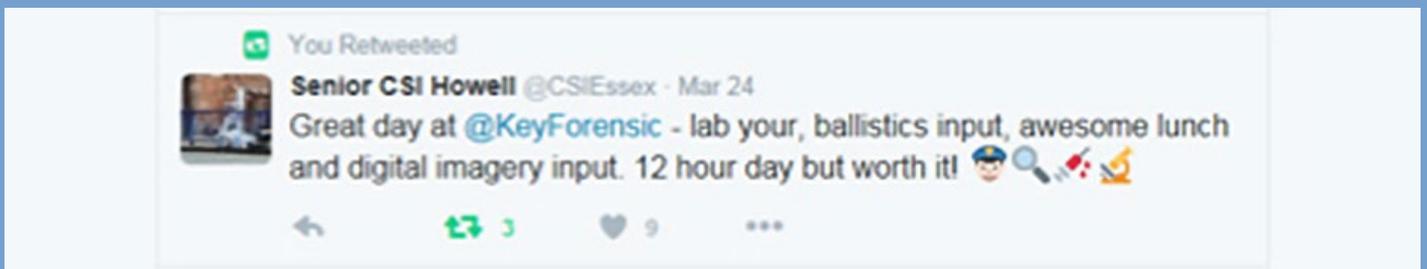
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Force Training days are a Great Success

From our Coventry HQ, KFS recently delivered a series of one-day training programs to some of our Police customers, covering the specialisms of Firearms, Forensic Image and Video Analysis and Blood Pattern Analysis. The training days, designed to increase awareness, were extremely well-received and some customers even **'Tweeted'** favourable comments about their particular program.



KFS scientists deliver tailored forensic training in the very latest techniques and best practice to law enforcement staff at all levels. We offer a comprehensive range of training services, covering a wide range of disciplines, with packages designed to deliver the right skills to the right people. We encourage customers to undertake a detailed Training Needs Analysis with us, ahead of training delivery. This allows us to structure our training programmes to fully meet the requirements of the trainees.

Training will be instructor-led, with a combination of theory and practical sessions. Programmes will include demonstrations and practical exercises. Programme notes and copies of presentations will be provided in electronic and hardcopy format.

Examples of previous training courses delivered:

- Digital Forensics – Forensic Image & Video Analysis
- DNA and Biology
- Questioned Documents and Handwriting Examination
- Drugs
- Fire Investigation
- Firearms and Ballistics
- Forensic Photography
- Marks and Traces
- Toxicology
- Laboratory Accreditation

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Scene Attendance Service

We have Scene Attendance Teams located at all of our sites. These teams are on call 24-7 and are able to respond very quickly to the urgent and complex requirements of major incidents.

The teams can be mobilised almost immediately via our on call Duty Manager system and can be at a crime scene very shortly afterwards. Typically, our Scene Attendance Teams are able to provide support to the investigation of homicides including shootings, serious sexual assaults, fatal fires, kidnapping and offences involving firearms.

The teams will provide valuable input into the forensic strategy and attend case conferences, as well as supporting the investigation through all stages with advice, consultation and milestone updates. We strongly believe in providing the investigative team with a single point of contact – a senior KFS scientist with experience of all types of serious crime, who, as well as being hands-on, is the liaison point for all other KFS scientists and manages

the progress of the case at all stages, providing frequent updates and reports.

Our teams use the very latest DNA techniques to maximise the chances of getting results.

Within the teams we are able to offer a cache of hugely experienced, scene-going scientists, many of whom have attended hundreds of crime scenes, of varying types and complexity. Most of

these scientists are leaders in their field and all are accustomed to the requirements and workings of a major investigation and especially the need for prompt and accurate information in order to quickly associate or eliminate a suspect or suspects. They are accustomed to giving evidence in court and undergoing rigorous cross-examination.

How it works

The police customer calls the KFS Duty Manager (07792 268294) to discuss the incident and to determine the expertise required. The Duty Manager then arranges for the appropriate KFS scientist to contact the customer to arrange a meeting point and time at the incident/scene.

The scientist will then obtain a briefing either from the initial discussions or at the scene from the Crime Scene Investigator (CSI) / Senior Investigating Officer (SIO), in order to understand the examinations required, assess the viability of the request, and to establish any lines of communication.

Before entering the scene, the KFS scientist will conduct and record a risk assessment to identify and manage any risks and hazards associated with the scene examinations. The scientist will then conduct the scene examination, based on the agreed strategy in consultation with the investigative

team. The scene examination will be documented with appropriate plans, notes, sketches and photographs. The scientist may provide an initial interpretation of their findings to the CSI/SIO prior to leaving the locations. As soon as possible after returning to the laboratory, the scene-attending

scientist will arrange the scene debrief with another competent scientist. Details of this debrief will be recorded in the case-file. The scientist will then prepare a scene report/statement for the customer according to the customer requirements and in compliance with the relevant Force Protocol.

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Some of our Scene-going Scientists

Judith Cunnison, Team Leader Biology, Norwich

Judith has a long and distinguished career as a highly respected senior forensic scientist with over 30 years' experience. Judith has worked on some complex high profile cases in her career and continues to lead a team of forensic scientists in our Norwich laboratory. She is an expert witness and an experienced scene-going scientist.

Helen Myhill, Team Leader Biology, Coventry

Helen joined KFS in 2013 as an experienced Reporting Manager and Team Leader.

Helen's career spans over 25 years having worked within the Metropolitan Police and the FSS. Helen specialises in homicide cases and has considerable experience of scene and court attendance.

Jackie French, Reporting Manager, Biology, Warrington

Jackie's background is with the Metropolitan Police Service, The Forensic Science Service and latterly, Greater Manchester Police, where she worked in Submissions at Bradford Park. She reports all body fluid types, Blood Pattern Analysis and Damage. She is a scene-going scientist.

Maggie Boyce Reporting Manager, Biology, Warrington

Maggie has over 25 years' experience as an expert reporting cases, including cold cases, involving the interpretation of current DNA techniques, including mixtures and low template DNA (Low Copy Number, LCN); identification of all body fluids, Blood Pattern Analysis (BPA), identification of and comparison of textile fibres, interpretation of damage; identification of and comparison of hairs.

Steve Harrington, Head of Biology Coventry

Steve is an expert in Human Contact Traces (Blood, Body Fluids, Hairs and Blood Pattern Analysis) and Forensic Fibre Examination Analysis with 15 years' experience. He has attended over 100 crime scenes and has worked on a significant number of major incidents and earned many commendations as a result of his important contributions.

Steve is experienced in the examination of biological material such as blood, semen, saliva and hair and the interpretation of blood patterns at crime scenes and on items at the laboratory. He has given testimony in cases of murder, sexual assault and other cases involving body fluid transfer, fibre transfer and the interpretation of DNA profiling results.

Martin Beale, Team Leader, Biology, Warrington

Martin has been with KFS since 2008. Martin has over 10 years' experience in reporting sexual offences cases. He is the lead for Blood enhancement techniques and is a regular scene-goer.

Anna Sheikh, Reporting Manager, Biology, Warrington

Anna joined KFS in 2013. She has over 19 years' experience having worked in DNA as well as operational Biology. She specialises in biological evidence types, especially BPA and Crime Scene examination/interpretation. Anna has led on the examination and interpretation of numerous complex and high profile cases, reporting over 120 scenes. She has worked on complex cases in the UK and UAE.

Dan Matthews, Senior Chemistry and Biology Reporting Manager, Coventry

Dan is a senior forensic scientist and is an expert in fire investigation and the examination of items for glass, paint and particulates as well as DNA and human contact traces (including laboratory based blood pattern analysis). He has over 13 years' experience and has a breadth of skills, both in forensic biology and forensic chemistry.

Dan has been involved in the investigation of many fire scenes and reported many hundreds of cases in across all his areas of expertise. He has provided expert opinion on his findings to the courts on numerous occasions.

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Phil Seaman, Senior Firearms and Homicide Examiner, Warrington

Phil has over 25 years' experience in the examination of biological material such as blood, semen, saliva, and hairs together with the interpretation of blood patterns at crime scenes and items in the laboratory. As a Senior Firearms and Homicide Examiner, other areas of expertise gained in this period include the examination, analysis and interpretation of cases involving the transfer of fibres, glass and footwear marks, including interpretation of damage features on clothing.

Since 2003, Phil has gained considerable experience in the examination of firearms and attending a variety of homicide scenes (approx. 400+), with numerous examples of high profile cases and multiple fatalities. He has also had high security clearance to work on NCA and anti-terrorist type cases.

Neil Simpson Reporting Manager, Biology, Norwich

Neil holds the degrees of Bachelor of Science in Biological Sciences and is a Doctor of Philosophy in the field of Molecular Genetics.

Neil is experienced in the examination of biological material such as blood, semen, saliva and hair and the interpretation of blood patterns. He is also experienced in the interpretation of DNA profiles including complex mixtures and low template DNA profiling results.

Khaldoun Kabbani Firearms Reporting Manager, Warrington

Khal is a member of the Association of Firearm and Tool Mark Examiners with over 19 years hands-on experience with the use, functioning, dismantling, assembly, and characteristics of a variety of weapons. As a firearms expert, he has attended numerous post mortems of casualties from firearms and improvised explosive devices.

Khal has assisted Key Forensic Services' digital team undertaking and analysing of images purported to show numerous executions by Sri-Lankan forces post cease fire and also assisted the team in relation to identification of numerous weapons within the video footage.

Khal is fluent in English, French and Arabic.

Paul Olden Head of Firearms, Warrington

Paul has over 25 years' experience as a forensic scientist, including a wide range of physical evidence types before specialising in firearms. He has worked on numerous major investigations involving all aspects of firearm evidence including scene and wound interpretation.

Paul designed and presented the CSI firearms course at the national training centre for many years, and is currently an examiner for the Chartered Society of Forensic Sciences.



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Major Incident – Op Bednar

A teenager who groomed 14-year-old Breck Bednar over the internet before slashing his throat in a sexual and sadistic attack was sentenced to a minimum of 25 years in prison.

Computer engineer Lewis Daynes, 19, admitted murdering Breck Bednar after luring him to his flat in Grays, Essex, on 17 February 2014.

Breck told his parents he was sleeping at a friend's house near their home in Caterham, Surrey, but secretly travelled to see Daynes after 12 months of interacting via an online gaming forum.

It was there that Daynes knifed him in the throat, causing him to die within seconds. Afterwards, Daynes sent pictures of Breck's bloodied body to two of his online friends.

Key Forensic's scene-going scientists attended Dayne's flat where a significant amount of evidence-bearing material was found. The material was recovered and examined at the KFS lab in Norwich where our scientists were able to determine that sexual activity had taken place between Daynes and Breck

Bednar and that during the course of their meeting Daynes carried out the vicious attack on Breck, restraining him with duct tape, slashing his clothing and stabbing him repeatedly with a very sharp Swiss Army-type knife.

Our lead scientist's input into this challenging and sensitive enquiry added valuable strength to the prosecution case and earned him a commendation from Essex Police for his expertise and dedication, in this very distressing case.

Sentencing Daynes at Chelmsford crown court, the judge, Mrs Justice Cox, ordered him to serve life with a minimum of 25 years in prison, meaning he will be at least 44 by the time he is released.

Cox said: "Having lured the young victim to your flat, you murdered him. You had befriended Breck and a number of other adolescent friends through an online community.

"Your contact with Breck increased in a sinister way. The precise details of what happened in your flat are unclear and may never be known. I'm sure that this murder was driven by sadistic or sexual motivation."

24-7 DUTY MANAGER NUMBER 07792 268294

For further information on any of our services, please contact the Account Manager for your force:

- Eastern Region forces
- South East Region forces

Craig Bennett

T 02477 712246

M 07772 294609

E craig.bennett@keyforensic.co.uk

E craig.bennett@keyforensic.cjsm.net

- East Midlands Region forces
- National Crime Agency
- IPCC

Katie Laird

T 02476 323382 ext. 6042.

M 07814 217745

E katie.laird@keyforensic.co.uk

E katie.laird@keyforensic.cjsm.net

- West Coast Consortium forces

Richard Bishop

T 02477 712246 Ext. 4013

M 07792 265785

E richard.bishop@keyforensic.co.uk

E richard.bishop@keyforensic.cjsm.net

All Other enquires please contact:

Paul Whitehouse, Marketing Manager

T 02477 712241

E paul.whitehouse@keyforensic.co.uk

T 07792 268525

E paul.whitehouse@keyforensic.cjsm.net

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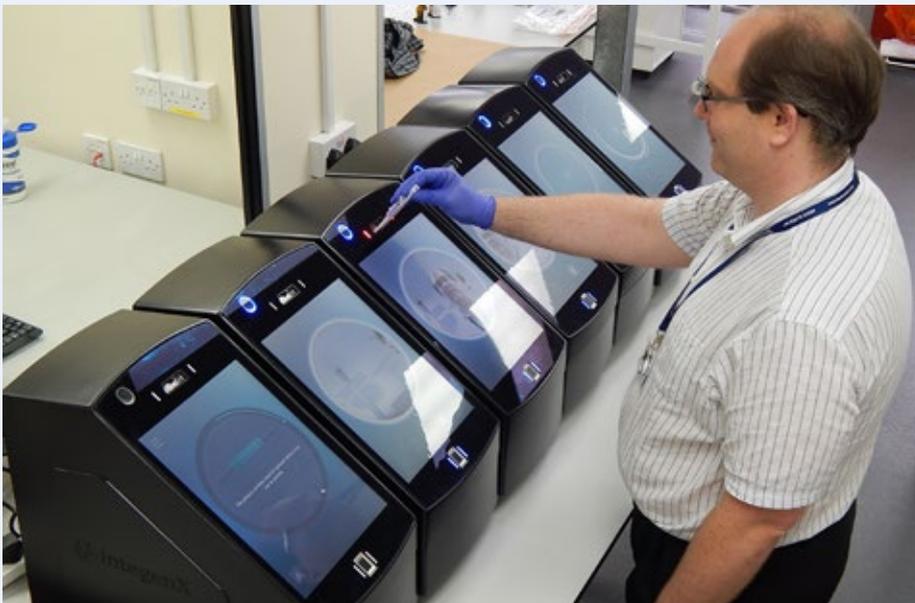
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RapidHIT®ID Update

RapidHIT®ID ...the story so far

The RapidHIT®ID is designed for ease of use, and with a footprint approximately 25% of the size of the RapidHIT® 200 System, the RapidHIT®ID system can be utilised in any location. RapidHIT®ID uses leading industry-standard chemistries and generates DNA profiles from mouth swabs that are compatible with UK National DNA Database®.

The RapidHIT®ID was unveiled by IntegenX® at the ISFG conference in Poland in September 2015. After this initial release a phase of instrument β -testing was begun with both Key Forensic Services and with the University of North Texas in order to streamline the instrument, its analysis parameters and remote access software.



In late March 2016, the KFS Norwich DNA team, began working on the advanced protocol optimisation on the RHID platform for the NDNAD-compatible NGMSelect Express chemistry. Two of our team spent extended periods of time at the IntegenX manufacturing site in California, working with the IntegenX technical team on the development.

The development is progressing well with the final optimisations completed. KFS aims for ISO17025 accreditation by UKAS by the end of 2016. The RapidHIT®ID is ideally suited to use in a custody suite environment, where its small footprint and ease of use (no specially-trained staff required to operate it) will make it an invaluable tool in the processing of persons arrested.

The RapidHIT Command Centre

The remote access Command Centre software allows multiple instruments to be connected –either in the same location or remotely. Therefore, a number of instruments in custody suites across a particular city, force or region can all be connected and seamlessly share data generated by the RapidHIT®ID system



RapidHIT®200

RapidHIT®ID

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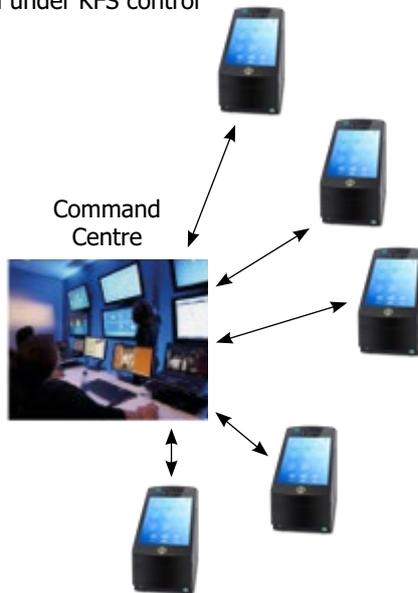
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Command Centre features

Securely linking all Rapid DNA instruments in the field to a central location under KFS control

- Monitor RH ID status
- Data transfer
- Remote help
- Ordering
- User management
- Consumables management
- User Compliance
- System QC



RH-ID Map Screen



Live help screen

Casefile Corner

Murders of James Attfield and Nahid Almanea

Over a two-year period KFS examined a very large number of exhibits (which included bikes, fishing rods and a park bench) and supported Essex Police with examinations of murder scenes and the homes of possible suspects.

James Fairweather, 17, described as having a fascination with the Yorkshire Ripper, was recently convicted of the 2014 murders of two strangers in Essex, following a two-week trial.

He admitted the manslaughter of James Attfield and Nahid Almanea in Colchester, but denied murder on grounds of diminished responsibility.

He said he was suffering from psychosis, but the court heard a psychiatrist cast doubt on the claims.

Guildford Crown Court heard Fairweather, of Colchester, had material at his home on Peter Sutcliffe, the Yorkshire Ripper, as well as on Ipswich serial killer Steve Wright and US murderer Ted Bundy.

Saudi Arabian student Nahid Almanea and James Attfield were stabbed to death within a few months of each other in 2014

Mr Attfield, 33, was stabbed more than 100 times. His body was found on the Riverside Path in Castle Park on 29 March.

Ms Almanea, a 31-year-old student at the University of Essex, was stabbed on the Salary Brook Trail footpath on 17 June as she walked to the Wivenhoe campus from her accommodation in Woodrow Way.

The court heard Fairweather, a pupil at Colchester Academy, had been bullied at school since he was 11 and his defence argued a combination of autism, paranoia and voices in his head made him kill.

When he was arrested in May 2015, he was found hiding in bushes near the same spot he had attacked his second victim.

He was wearing latex gloves and carrying a knife.

The court heard he told police he was "going to get my third victim, but there was no-one about".

During the course of the investigation, teams from KFS's Norwich and Coventry sites examined over 70 submissions, many of which were treated as urgent. Most of the work was biology based, but there were also requests for damage interpretation, footwear comparisons, documents and toxicology. In addition, a large number of possible weapons were examined. Our 'one-stop shop' approach stood us in good stead in this particular investigation, as we were able to provide the full range of forensic services required by the Essex investigative team.

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