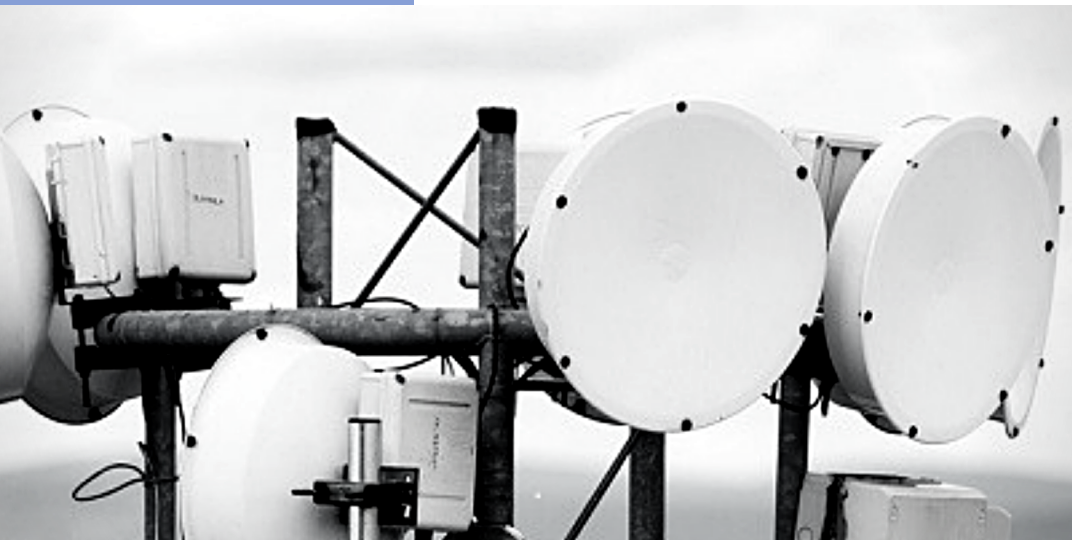


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Keith Borer CONSULTANTS



THIS ISSUE

*Mobile data billing and
interpretation:
pitfalls and dangers*

*Meet the team:
Steven Frost*

*The Handwriting Experts:
website and Facebook*

WHAT IS GPRS?

GPRS stands for "General Packet Radio Service" and was coined in reference to the original 2G network but has remained through 3G, 4G and now 5G networks. It is also called "Mobile Data" but the majority of people working in cell site analysis still use the term GPRS.

DID YOU KNOW?

Since the evolution of the smartphone and the introduction of mobile data, the way call data records should be interpreted continues to change, bringing challenges to how we identify the location of a mobile device. In this time, the user equipment description within the networks has also evolved from MS (Mobile Station) to UE (User Equipment), recognising that it is not only mobile phones connecting to the network but a host of other types of devices including cars and cameras.

GPRS (MOBILE DATA) BILLING AND INTERPRETATION: PITFALLS AND DANGERS

Cell site analysis uses records provided by the network to look at call types, frequencies and the general location of a phone given in terms of which cell was being used. The network creates a record of calls or texts sent or received and the data for these have a start and end time for a voice call and a transmission date stamp for a text message. This can be used to show the general area a phone was in at those times.

Mobile data (GPRS) is different. Most data applications such as web browsing and email, and other applications like WhatsApp, Facebook and TikTok only have data to exchange intermittently. Therefore, the networks needed a more efficient method of utilising the available frequencies. GPRS services provide this. However, in the UK, networks can't record every tiny data transaction in their reports, so they manage data in the form of "sessions", where a data session can last anywhere up to 12 hours. These large data sessions can cause issues when interpreting call data. For GPRS, the time stamp in the call data relates to a session and not the actual time a cell was used. To add further difficulty, the O2 network records its data sessions in a completely different way to other networks.

An important consideration is that, if the network has finalised a session (e.g. if data volume has been exceeded or the session has timed out), the network will allocate a new data session. The network will not contact the handset/user equipment but will rely on the last known location update. This could be hours earlier and in a different location. If an expert relies only on the reported cells, this may imply the handset is in or around an earlier location to the time in question, so it is important to report a "between time" of "at or before" the start time of the recorded cell and after the start time of the last record with a different cell ID. The exception is O2 whose time is "at or before" the end time of the recorded cell and the start time of the last cell with the same cell ID.

"Between times" can produce large periods of time where the mobile device/user equipment could have been anywhere within the area covered by that cell and, in many cases, provides little or no evidential value. If interpreted incorrectly, GPRS records can produce a misleading picture as to where the user was located. We have seen exhibits or statements provided to the Court along the lines of "the phone was in [this area] at this time" when the data has come from GPRS and the "time" was in fact a window of several hours. As mobile data becomes more prevalent, cell site analysis will rely more and more on GPRS data and the pitfalls that go with it. If in doubt, make sure you have a cell site expert review the material.

An opportunity to meet some of our team...

STEVEN FROST

How long have you been a forensic scientist?

Back in 1982 I left school and joined the Army Apprentice College to become a Radio Telegraphist. This entailed learning all about radio frequency, radio waves, Morse code and touch typing. I still find myself listening to old films and deciphering the Morse... After 12 years with the Royal Signals, I joined Durham Constabulary and, in 2014, completed the College of Policing "Radio Frequency Propagation Surveying course". I have since complemented this with training around 4G (LTE) and Wi-Fi modules and in 2020 also attained a City and Guilds qualification provided by Forensic Analytics.

What cases do you find most interesting?

I have been involved in many varied cases throughout my career. What I find interesting are the more minor cases, which may initially appear straightforward, but prove just as difficult as the more complex and serious cases. I enjoy furthering my knowledge around Radio Frequency Surveying and cell site analysis; this has been interesting over the past few years with the introduction of 4G and now as we head to the roll out of 5G networks.

What are your specialisms?

I specialise in Radio Frequency Propagation Surveying (measuring where the actual signal of a phone cell can be found) and Cell Site Analysis.

@KBCforensics

You can follow Keith Borer Consultants on [Twitter](#) for up to date details of CPD training seminars for solicitors and barristers, links to news articles and case excerpts that may be useful to your case.



CrimeLine CPD Podcasts

If you are a CrimeLine subscriber, you can catch up with the experts at KBC in a series of forensic podcasts. Topics include CBD oil, cloud computing, fingerprints, indecent imagery, DNA, fire investigation and handwriting analysis. Look out for new podcasts being added to the series. You'll find them under CPD.



The Handwriting Experts at Keith Borer Consultants are now online at www.thehandwritingexperts.co.uk and also on [Facebook](#). You'll be able to find out more about the team and the type of work they do, as well as read interesting articles on handwriting analysis and signature comparison.

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