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Guide to radio controls

For technical managers



Why radio controls?

- Provide information to commentators so they can tell the unfolding story of the races
- Informed spectators cheer on leading athletes, and make an exciting atmosphere
- Can also be used in relays as warning of incoming runners (e.g. Harvester)
- Potential safety feature



Commentary equipment

- Public Address (PA)
 - Standard outdoor PA requirements
 - 100V designed for voice & outdoors
 - Switched microphones
- Van or tent?
 - Logistical & financial decision
 - Needs to be large enough for ~3 people and up to 5 laptops/screens
 - Needs several sturdy tables and chairs
- Power 120W to 240W, ~2kw (generator or mains)



Results service interface

- Cable run between commentary and download must be < 120m
 - We use a physical 100Mbps Ethernet connection between commentary and the main database server. Ethernet is specified to 100m though we successfully run up to 120m. More than that we see performance issues.
http://en.wikipedia.org/wiki/Fast_Ethernet#100BASE-TX
 - We could increase the range by putting a powered switch in the middle to allow another 100m cable. But this needs to be externally powered.
 - We never use wireless solutions. They are prone to interference and performance issues that immediately become problematic for commentators. Although wireless links may quote high bandwidth, this is often simplex and once overhead and latency is taken into account it becomes unusable.
- Main database server must have sufficient processing power
 - Commentary views in standard results software do a database look up every 3-10 sec
 - Results server separate from download recommended

Technical considerations

- Results software choice
 - Your results software needs to support commentary & radio controls
 - Your commentators have to be happy with the software choice
 - In the UK we regularly use 3 systems
 - Sport Software (OE, OS)
 - SportIdent (AutoDownload)
 - Michael Napier (MERCs)
- Punching starts
 - OK for helpers, but otherwise very difficult for us to manage
 - When implemented for all competitors, radio control equipment will be required for all start boxes
 - Will increase your costs considerably

Radio Controls



- Radio Controls
 - Both SPORTident and EMIT have online controls, with RS232 outputs
 - GPProjects equipment can take up to three RS232 inputs to get punch data back to the commentators
 - GPProjects equipment can be daisy chained if more inputs, or duplicate data transmission, required
- “Touch free” technologies
 - GPProjects products include two SPORTident Short Range Radio (SRR) receiving channels. These can receive data from SIAC cards or up to two SRR-enabled control units.
 - EMIT fly-by technology cannot be used with GPProjects equipment – contact EMIT UK for advice

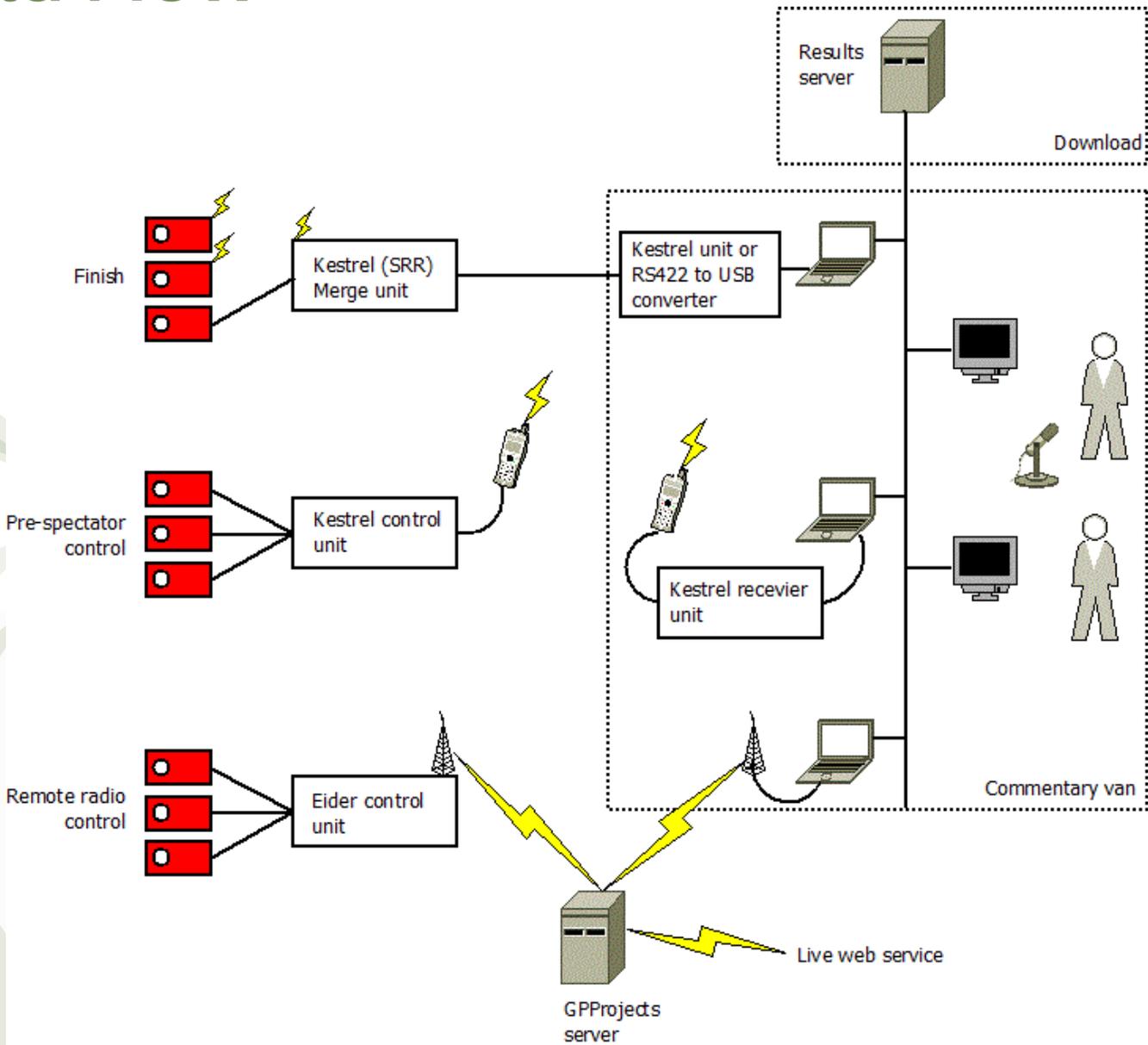
Radio Network

- GPProjects equipment is based on three types of telemetry – wired, radio and mobile. The choice of telemetry used depends on the location of the radio control

Product	Telemetry	Capacity	Latency	Range
Merge	Cable (RS232, RS422)	250 / min	< 10 sec	< 500m
Kestrel	Radio (TA200)	30 / min	< 20 sec	< 1Km
Eider	Mobile phone network	40 / min	< 30 sec	GSM



Data Flow



How to check mobile coverage

- Does your mobile phone have signal at the control and at the arena?
 - Even a weak signal will work
- If not, are other networks available:
 - Find 'select operator' function on your phone (usually in the 'phone settings' menu)
 - Change from 'automatic' to 'manual'
 - You'll generate a list of available networks
- Alternatively, GPProjects can supply a piece of equipment that can test mobile phone coverage at key sites. Please arrange several months in advance.

Controls and stakes

- SPORTIdent radio controls use BSM v7 master stations, and stakes/cradles need to accommodate these
 - BSM7 master stations don't fit in BSF8 to BSM7 adaptor cradles.
 - We can provide suitable stakes if necessary
- EMIT radio controls are provided attached to stakes, and are supplied through EMIT UK
- Radio controls are often programmed separately
 - Use Rugby / internet / radio time throughout



Live Results

- Make sure your results software will generate live results html
- In field wifi de-rigueur
- Security / partitioning
 - Users must not affect download / commentary
- Could also provide radio control info

Backup timing

- Required for some events, but lots of effort
- Consensus has been to use video / web cam, with on-screen time synchronised.
- But... woe betide having to use it:
 - Post World Cup 2005 test proved impossible to recreate results accurately
- Best option is to have a final control not very far away, and then the run in could be voided