# Steve Caldwell

## RF Engineer, Spectrum Manager

Sydney, Australia

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Technical Air Gap
Professional RF and Audio Systems Service and Support

## PROFILE

RF engineer and spectrum manager working in professional audio, broadcast and live events since 1998. Specialises in the design, installation and operation of radio microphone, in-ear monitor (IEM) and FM broadcast systems, and in spectrum surveying, coordination and monitoring for large-scale events, locally and internationally. Has delivered RF and spectrum management for the Opening and Closing Ceremonies of multiple Olympic, Paralympic, Commonwealth and Asian Games, including liaison with local spectrum authorities such as Industry Canada (Vancouver), IDA (Singapore) and Q-Tel (Doha).

## EMPLOYMENT

**Technical Manager / RF Engineer** · **NW Group (Norwest Productions)** — Feb 2004 – Present
Management of the Service department, Technical Manager, RF and audio engineering. Rydalmere, Sydney.

**RF Engineer, Frequency Coordination and Spectrum Management** · **Touring and Broadcast events** — Nov 1999 – Present
RF engineering and spectrum management for local and international touring productions and broadcast shows (see page 2).

**Head Technician, Audio / RF** · **Jands Pty Ltd** — Feb 1998 – Feb 2008
Servicing of all RF and audio equipment; design and build of custom RF and audio equipment.

## MAJOR EVENT EXPERIENCE

### Olympic & Paralympic Games

- **Paris 2024** – RF Engineer / Spectrum Monitoring. Design, engineering, installation and operation of RF mass-cast monitoring systems for the Opening Ceremonies.
- **Tokyo 2020** – RF Consultant / spectrum coordination, Ceremonies. Design, implementation and monitoring of radio microphone and IEM systems.
- **Rio 2016** – RF Consultant / spectrum coordination, Ceremonies. Radio spectrum management; two-way radio system design; radio microphone and IEM systems.
- **London 2012** – RF Engineer / Spectrum Manager, Opening and Closing Ceremonies. Calculation of all Ceremonies spectrum; design, install and operation of radio microphone, IEM and BTR systems.
- **Vancouver 2010 Winter Olympics** – RF Engineer / Spectrum Management for Opening, Closing and Victory Ceremonies; custom RF equipment; spectrum management with Industry Canada.
- **Singapore 2010 Youth Olympic Games** – RF engineering and operation of radio mic and IEM for Opening and Closing Ceremonies; spectrum management with IDA.
- **Sydney 2000** (Assistant to Audio Technical Director) and **Athens 2004** (Assistant to Audio Project Manager; service technician) Olympic Ceremonies.

### Commonwealth, Asian & multi-sport Games – Ceremonies

- **Aichi-Nagoya 2026 Asian & Para Games** – RF Engineer / Spectrum Manager: spectrum management, monitoring and RF engineering.
- **Gold Coast 2018 Commonwealth Games**, **Jakarta 2018 Asian Games** and **Invictus Games Sydney 2018**.
- **Ashgabat 2017**, **Baku 2017 Islamic Solidarity Games**, **SEA Games 2017** (Kuala Lumpur).
- **Glasgow 2014 Commonwealth Games**, **Veracruz 2014**, **Baku 2015 European Games**, **Pacific Games 2015** (Port Moresby), **Invictus Games Orlando 2016**.
- **Melbourne 2006 Commonwealth Games**, **Doha 2006 Asian Games**, **Delhi 2010 Commonwealth Games**, **Pan Arab Games 2011** (Doha).

### Other major events

- **FIFA World Cup 2026 Half Time Show** (New Jersey) and **NFL Super Bowl LX** (2026, SF Bay Area) – spectrum monitoring / RF engineering for professional wireless systems. Also **Super Bowl LIX** (New Orleans, 2025).
- **Papua New Guinea 50th Anniversary of Independence** (2025) – RF engineering, spectrum management and monitoring of all ceremonies and festivals, Port Moresby.
- **Expo 2020 Dubai** (2020–22) – RF Consultant / spectrum management, Ceremonies.

## OTHER MAJOR EVENTS (CONTINUED)

- **Film shoots (2022):** *Furiosa: A Mad Max Saga* (RF engineering and spectrum management for Main Unit production sound, with custom-built RF equipment) and *The Fall Guy* (DIT video assist / RF).
- **Rugby World Cup 2011** (Auckland), **CHOGM 2011** (Perth), **AFC Asian Cup 2015**, **International Fleet Review 2013**, **Sydney Opera House** digital-dividend interference mitigation (2014).
- **Singapore National Day Parade** (2007–2010), **World Youth Day 2008** (Sydney, city-wide radio mic / IEM spectrum management), **NSW Schools Spectacular** (2007–2018).

## OPERA, FESTIVALS & RECURRING ENGAGEMENTS

- **Opera Australia – HANDA Opera on Sydney Harbour** (2012–2017, 2019, 2021–2025): radio microphone and IEM design and installation and spectrum management. Also **Carmen on Cockatoo Island** (2022) and **IFAC Handa Presents Sydney Opera House – The Opera** (2016, including FM distribution for patrons).
- **The Royal Edinburgh Military Tattoo** – Sydney 2006 and 2019, Melbourne 2016: spectrum coordination, management and RF engineering.
- **Sydney WorldPride 2023** (opening and closing ceremonies, Mardi Gras parties) and **Tropfest 2026**. Also **Live Earth** (2007), **FIFA World Conference** (Sydney Opera House, 2008) and **ABC** in-house spectrum coordination (2015).

## TOURING PRODUCTIONS

Coldplay, Take That, One Direction, Spice Girls, George Michael, Brian May, Pet Shop Boys, P!nk, Pussycat Dolls, Fall Out Boy, Spandau Ballet, Tears For Fears, Kool & the Gang, Cold Chisel, Goldfrapp, Alan Jackson, David Copperfield, The Wiggles, Hi-5, Rocky Horror Show, Burn the Floor; Parklife, V Festival, Laneway Festival; corporate and conference work for Microsoft, Facebook, Toyota, Telstra, Optus and Commonwealth Bank.

## BROADCAST & TELEVISION

Top Gear, So You Think You Can Dance, X Factor, Australian Idol, Dancing with the Stars, MasterChef, The Biggest Loser, Next Top Model, MTV Video Music Awards, Nickelodeon Kids' Choice Awards, ARIA Awards, APRA Awards, Logie Awards, Carols in the Domain, Carols by Candlelight, Red Bull Air Race, Australia Day celebrations, School Spectacular.

## PUBLICATIONS & MEDIA

- **RF Tips According to Steve Caldwell** – Shure Insights, Sep 2019
- **RF Coordination at Rio 2016** – Shure UK Blog, Nov 2016
- **Interview: RF Engineer at Norwest Group** – Shure Insights, Mar 2016
- **Spectrum Management London 2012** – RadioUser (UK), Sep 2013
- **Wireless Spectrum Management Pt 1 & 2** – AV magazine, Issues 29 and 30
- **RF Faraday Cage Match** – Practical Show Tech #021, May 2020
- **Postcards from Tokyo** – interview with Jands on Tokyo 2020 Ceremonies systems
- **IMDb** – *Furiosa: A Mad Max Saga* (2024), *The Fall Guy* (2024)

## PANELS & SPEAKING

- **AFTRS** – "The Digital Spectrum Selloff" panel (2013)
- **AES Conference, San Francisco** – "Wireless Frequency Wrangling at Large Events" (2012)
- **INTEGRATE Trade Show** – technical panel (2009)

## MEMBERSHIPS

- AARG (Australian Audio Repairers Guild) – Founding Member
- AES – Full Member
- IEEE – Member · SES – Member
- Brotherhood of Audio Service Technicians and Engineering Resource Database (BASTERDs) – Member

## SKILLS

RF design and engineering · Spectrum management · Antennas · Filter design · Transmission lines · Transmitters · Electromagnetics · Software defined radio · Cognitive radio · Network analysers · Audio amplifier design and engineering · Audio engineering · Professional audio · Live sound · Broadcast · Live events

## CERTIFICATIONS

- ROCP – Maritime Radio Certificate of Proficiency
- Advanced Rigger
- Ship's Skipper – Master 5
- Marine Engine Driver – MED III
- SCUBA – Open Water

## WHAT COLLEAGUES SAY

> "Steve's understanding of RF spectrum management and engineering is second to none. His ability to provide solid RF performance in the harshest and most demanding environments is remarkable."
>
> Tuomo George-Tolonen, Sr. Director, Strategic Global Market Development (2012)

> "One of the most capable RF engineers I have ever worked with... his preparation and organization is mind blowing."
>
> Peter Erskine, Communications and RF planning, coordination and operation (2012)

> "Steve was a fantastic contribution to the team that made London 2012 Ceremonies happen... he was the eyes and ears on our spectrum."
>
> James "Brew" Breward, Audio, Intercom & AV Systems Engineer (2012)