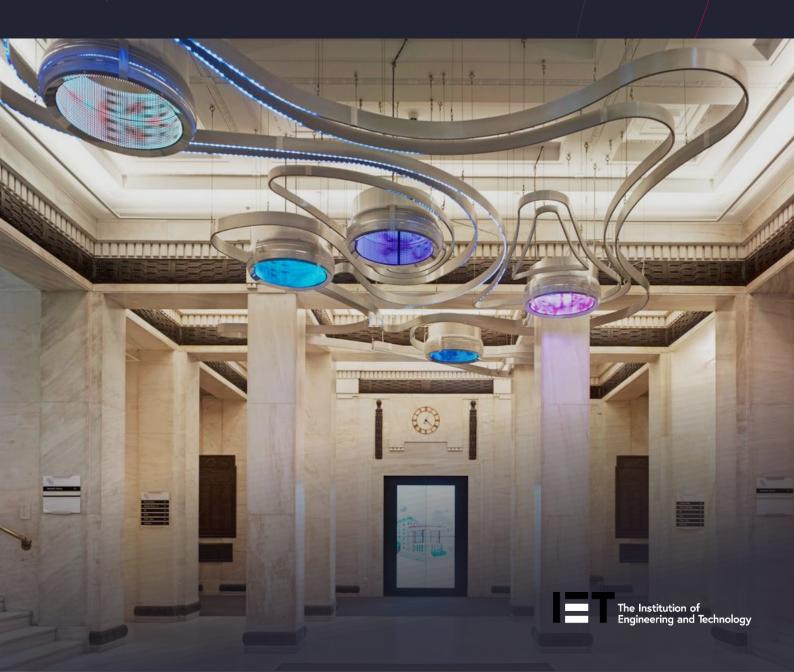


## Case Studies

# The Institution of Engineering and Technology (IET)

IET SAVOY PLACE



## Introduction





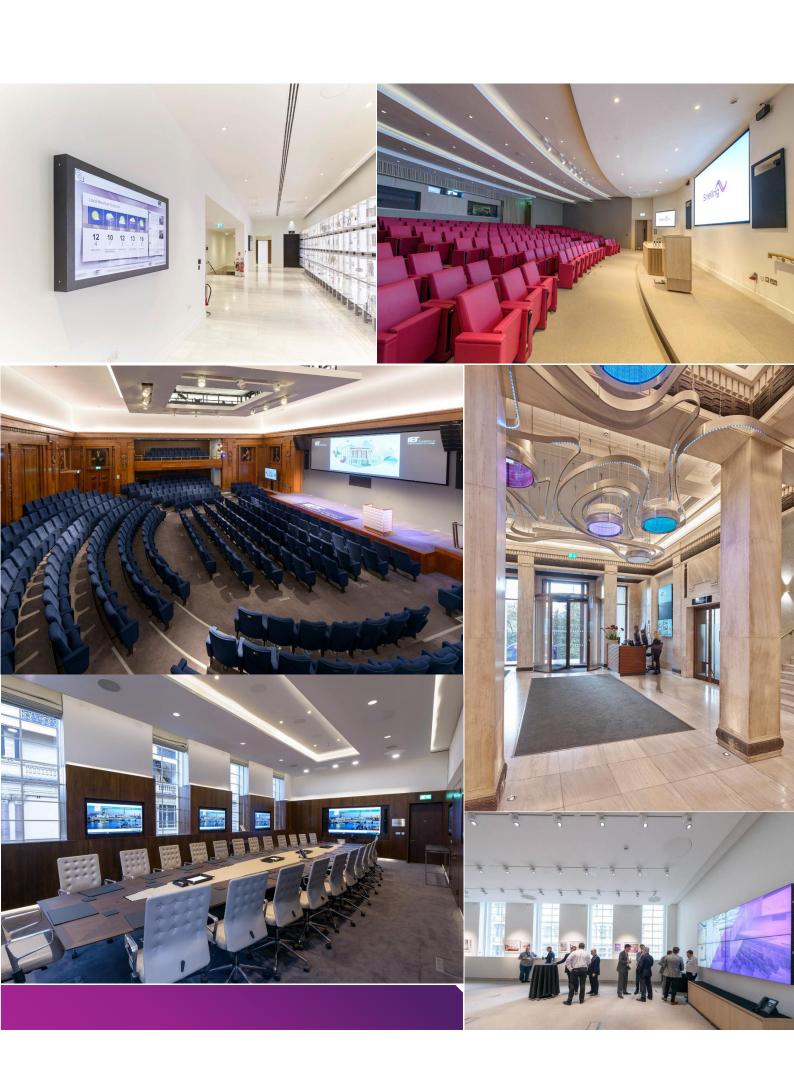
## How can...

AV systems and managed services meet the needs of a Central London landmark, the headquarters of a global professional society and 'Best UK Venue Brand' three years running?

**#SwitchOn**thepossibilities







#### THE BRIEF

The brief stressed on engineering and integration of AV systems to deliver unparalleled business meeting, conferencing and networking experiences for members, who come from global engineering and tech firms.

Very importantly, this implied keeping AV hardware out of the spaces- for example, racks and cables were strictly forbidden and solutions had to be found to minimise clutter of microphones.

Displays and speakers had to neatly blend into the aesthetics of each space, which had unalterable physical characteristics (protected under the listed status of the building).

"While architecture was designed to impress, the AV technology across the building had to deliver a premium white-glove experience".

The brief also stressed upon their revenue and business plans i.e. IET technical and events teams can deliver the best 'white-glove' service for private-hire clients while Savoy Place is marketed as Central London's premiere private hire venue.

This put the focus of the brief on hardware as well as software programming- a fully branded and custom-designed UI/UX. This applied to equipping Lecture Theatres with the largest display systems and cinema surround sound systems, as well as business spaces with the best-in-class video and audio conferencing facilities.

The brief also stressed on flexibility in the use of systems, such that private clients using any given space can choose from being automated by the user themselves, partial technician-assist, or exclusively technician-driven.

For live events, the brief also emphasised maximising remote access for technicians, in terms of content relay across the building as well as operating AV systems from a remote location.

This includes the integration of control through iPads where possible. Private clients can choose a 'full-technician assist' event, which requires them to simply turn up on the day and leave absolutely everything else to the IET technicians to deliver a live event.

Furthermore, the brief required the integration of technology, such that all spaces are interconnected. The objective was to increase capacity, and allow users of individual spaces to collaborate while utilising the facilities of other spaces, anytime, from any room they may be seated in.

Lastly, but very importantly the brief states the discreet blend of technology with the historic features of the many spaces (much of which is protected under the listed building), which left little scope for remodelling (for example, walls and ceilings). Rather the brief challenged us to innovate solutions which overcome the challenges posed by the physical characteristics of these spaces.

The brief required us to think how AV infrastructure can be designed and built for a building which is:

- Brand Value: A Central London landmark and home of IET since 1909
- 2. Listed: Required HM The Queen's approval letter to commence the refurbishment
- 3. Benchmark: An audience who are at the forefront of engineering and technology matters globally.
- 4. Revenue Source: Awarded 'Best UK Venue Brand' three years running before closing for refurbishment.
- 5. Common venue for BBC broadcasts and the Prime Minister's live press events.

#### **AV SYSTEMS FOR 75+ SPACES**

Name of project: IET Savoy Place

Completion: 08/04/2016

Refurbishment Project Value: £30 million

AV Project Value: £1.6 million

Consultant: Recursive AV

Project Manager: Pat Harris

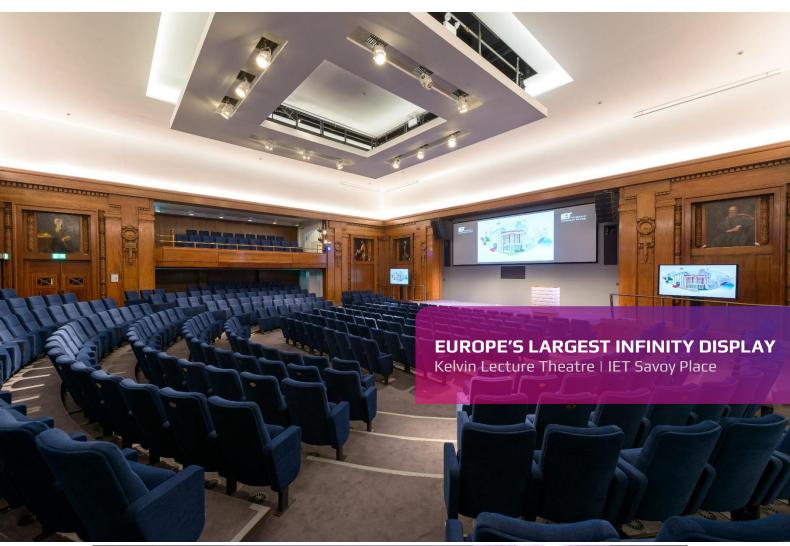
Other Companies:

Gilbert Ash (Main Contractor)

Vaughan Group (M&E Contractor)

Pringle Richards Sharratt (Architect)







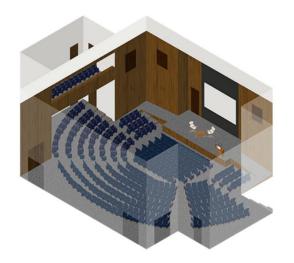
### PROJECT TECHNICAL SPECIFICATIONS

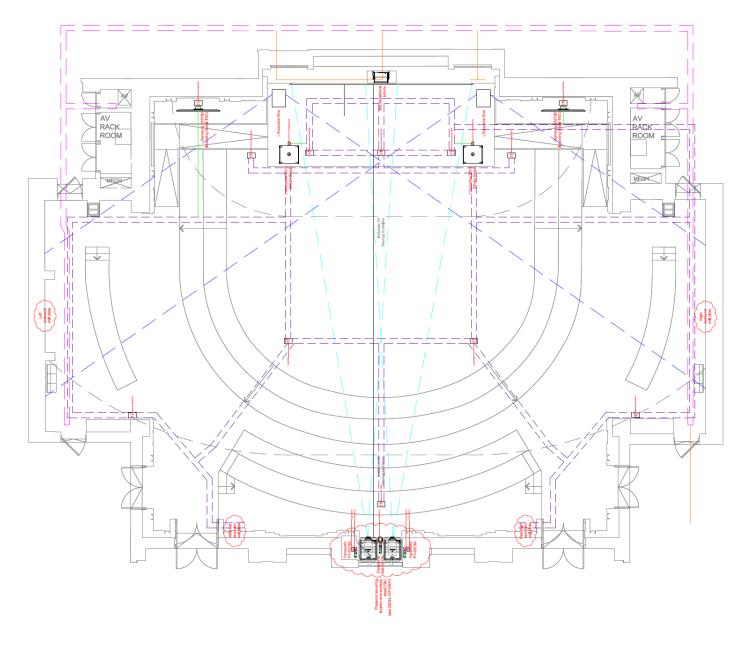
#### **KELVIN LECTURE THEATRE**

Capacity: 475 delegates

Configuration: Cinema-style theatre and Catwalk

The flagship lecture theatre was redeveloped after dropping the ceiling height, which allowed space for the entirely new Turing Lecture Theatre on the floor above. The Kelvin Lecture Theatre (KLT) not being a new build, challenged AV integration to be sympathetic to its myriad of historic features.





#### **TECHNICAL SPECIFICATIONS**

- 287" DNP Supernova Panoramic Infinity Screen (UHD Multi-layer canvas)- the largest in Europe.
- Interconnected with Turing Lecture Theatre to serve as a 'spill over' for Kelvin Lecture Theatre.
- 2x edge-blend 16K ANSI Projectors to produce an image 3,200 pixels across (Fully controllable from main AV rack). Analog Way image processor handles multiple inputs (including HDMI and HD-SDI) and Windows.
- 2x 75" video reinforcement LED/LCD displays with permanent DVI Twisted Pair Receiver Unit.
- 3x HD PTZ robotic cameras- ceiling mounted and connected to main control room and IET.TV control room.
- Joystick Camera controller for telemetry control.
- HD Tricaster for live streaming infrastructure.
- Dedicated Video Conferencing facility for remote participants.
- Dedicated audio monitoring system (near field monitors)
- Dual Channel Feedback eliminators
- DDA Compliant

#### **AUDIO**

- 32-channel Yamaha LS9/32 console with Rack mount RIO and Dante card.
- L-Acoustics 5.1 system featuring KIVA line arrays via LA4 amplifiers; L-Acoustics fill speakers, two 18in subwoofers built into the stage.
- Twelve channels of Shure Digital ULX-D wireless microphones along with fixed-wired table microphones.
- Sennheiser IR-based system provides assistive listening.
- Greengo/RTS technician intercom/talkback over the IP network.

#### **REMOTE CONFERENCING**

- Vaddio AV Bridge relays signals from professional-grade cameras and audio systems, along with a microphone mix from the Polycom system to be presented as a USB source for the soft codec.

#### **VIDEO PRODUCTION AND LIVE STREAMING**

- Video Production console for image processing
- Signals routed via upstream and downstream HD-SDI, RGBHV, DVI switchers over building-wide fibre and copper infrastructure.
- HD Tricaster (IET.tv control room) accessible remotely
- Cabletime IPTV.

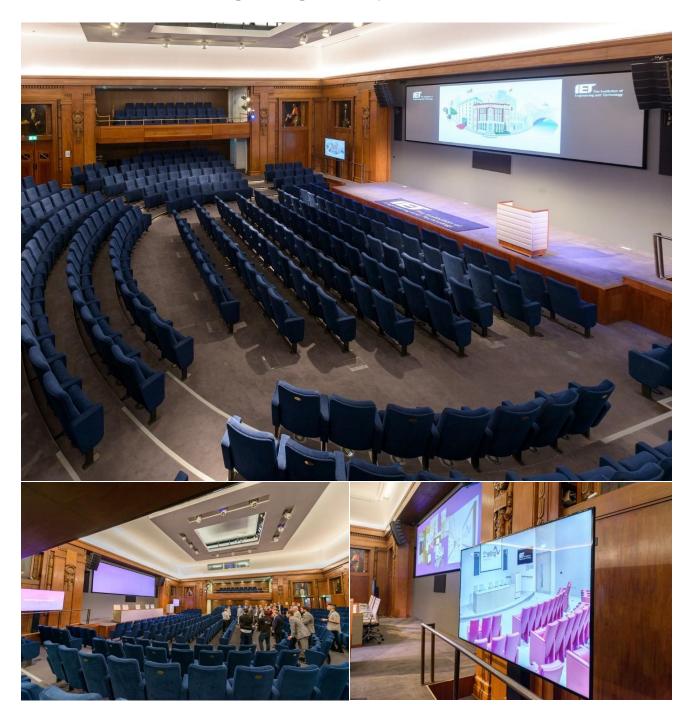
#### **LIVE BROADCAST**

- Outdoor broadcast points and cabling to main control room.
- Each OB location equipped with 4 x HD-SDI, 4x XLR Audio, 4x CAT6A Twisted pair, 4 x MM Fibre Pairs.
- Cables for HD Broadcast Camera Systems also connected to IET.TV control room.
- CAT6A infrastructure.

- Blackmagic Design 12-channel video router, NewTek Tricaster 8-channel multi-camera production system, NewTek TalkShow hardware bridge for bringing Skype calls into broadcast feeds, and Blackmagic 4K SSD recorders.

#### **HOW IT WORKS**

- Four technicians in the 'dedicated master control room': Audio, Video, Lighting and Production.
- Control functions remotely via mixing console/touch panel controllers.
- Technician can also control/adjust setting for projectors through multiple AMX touch panels.
- Further signal relay to IET.tv control room for content creation/broadcast and streaming.
- Adder KVM system to reduce monitor clutter: the IET TV and live event staff have multiple PCs and other visual sources to work with.
- Interconnected with 'Turing Lecture Theatre': video and audio can be sent between the two locations either using Extron FOXBOX fibre transmitters and receivers, or via HDBaseT on Cat6a infrastructure using Extron digital twisted pair transceivers.









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Jerry Chow from @IBM explains the huge impact of quantum computing on processing data #IETEngFest







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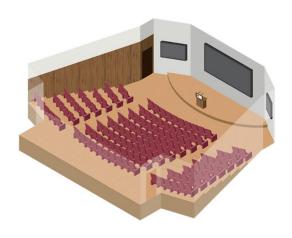
#### **TURING LECTURE THEATRE**

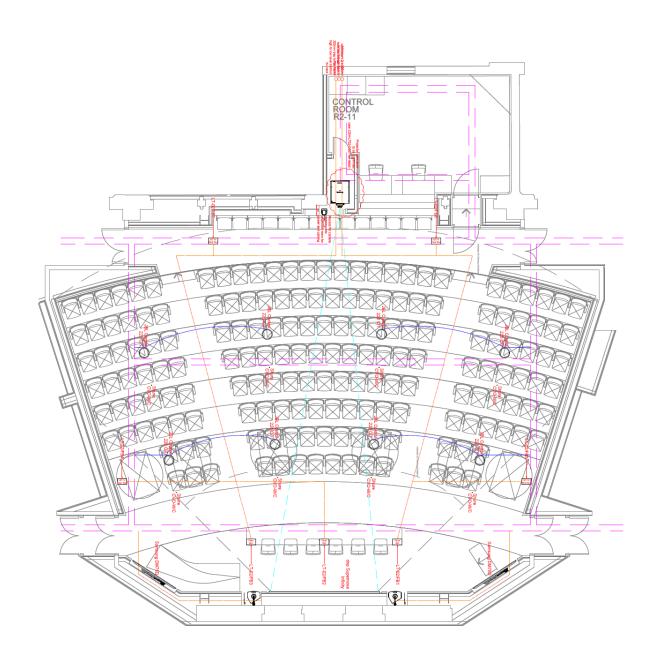
Capacity: 150-175 delegates Configuration: Cinema-style theatre

Keeping the importance of live events in mind, the Turing lecture theatre has a similar specification to the Kelvin Lecture theatre, but sized-down to cater for the requirements of 'smaller audiences'.

In other circumstances, the integration of technology also allows the theatre to act as a 'spill over' to the Kelvin Lecture Theatre when the size of the audience exceeds Kelvin's capacity.

The Turing Lecture theatre is a brand new space built above the Kelvin Lecture Theatre after lowering its ceiling.





#### **TECHNICAL SPECIFICATIONS**

- 164" DNP Supernova Infinity Screen (UHD Multi-layer canvas).
- Interconnected with Kelvin Lecture Theatre to serve as a 'spill over'. Relay live feed of a conference proceedings at Kelvin Lecture Theatre live to viewers at the Turing Lecture Theatre.
- 1x 16K ANSI Projectors to produce an image 1920 x 1080 p (Fully controllable from main AV rack). Analog Way image processor handles multiple inputs (including HDMI and HD-SDI) and windows.
- 2x 75" video reinforcement Full HD LFD with permanent DVI Twisted Pair Receiver Unit.
- 3x HD PTZ robotic cameras- ceiling mounted and connected to Turing control room and IET.TV control room/Main Control Room.
- HD Tricaster for live streaming infrastructure, with flexible I/O and up to 4 live video inputs.
- Joystick Camera controller for telemetry control.
- Dedicated Video Conferencing facility for remote participants.
- Dedicated audio monitoring system (near field monitors)
- Dual Channel Feedback eliminators

#### **AUDIO**

- 32-channel Yamaha LS9/32 with Rack mount RIO and Dante card.
- L-Acoustics stereo program loudspeaker system.
- Eight Shure Overhead Condenser microphones along with a quad-channel digital receiver for Lavalier microphones, and handheld wireless microphones.
- Sennheiser IR-based system provides assistive listening.
- Greengo /RTS technician intercom/talkback over IP Network.

#### **REMOTE CONFERENCING**

 Vaddio AV Bridge relays signals from professional-grade cameras and audio systems, along with a microphone mix from the Polycom system to be presented as a USB source for the soft codec.

#### **VIDEO PRODUCTION AND LIVE STREAMING**

- Video Production console for image processing
- Signals routed via upstream and downstream HD-SDI, RGBHV, DVI switchers over fibre + copper.
- HD Tricaster (IET.tv control room) accessible remotely.
- Cabletime IPTV

#### **HOW IT WORKS**

- Four technicians in the 'dedicated control room': Audio, Video, Lighting and production.
- Control functions remotely via mixing console/touch panel controllers, or on iPad where possible.
- Further signal relay to IET.tv control room for content creation/broadcast and streaming.
- Adder KVM system to reduce monitor clutter.
- Interconnected with 'Turing Lecture Theatre': video and audio can be sent between the two locations either using Extron FOXBOX fibre transmitters and receivers, or via HDBaseT on Cat6a infrastructure using Extron digital twisted pair boxes.









#### WEDMORE BOARDROOM

Capacity: 26 delegates

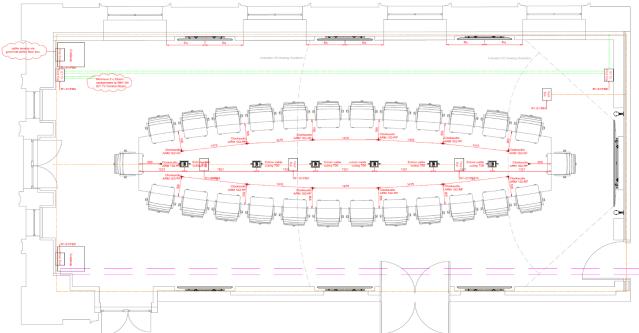
Configuration: Boardroom, Meeting, Classroom, Training

Floor space: 82.73 m<sup>2</sup>

Wedmore Boardroom is the largest boardroom facility among IET's configurable meeting and exhibition spaces.

The AV systems have been designed for use by internal and external clients seeking a fully kitted boardroom, with built-in HD video and audio conferencing, and which can also be used as a training room and for dinners.



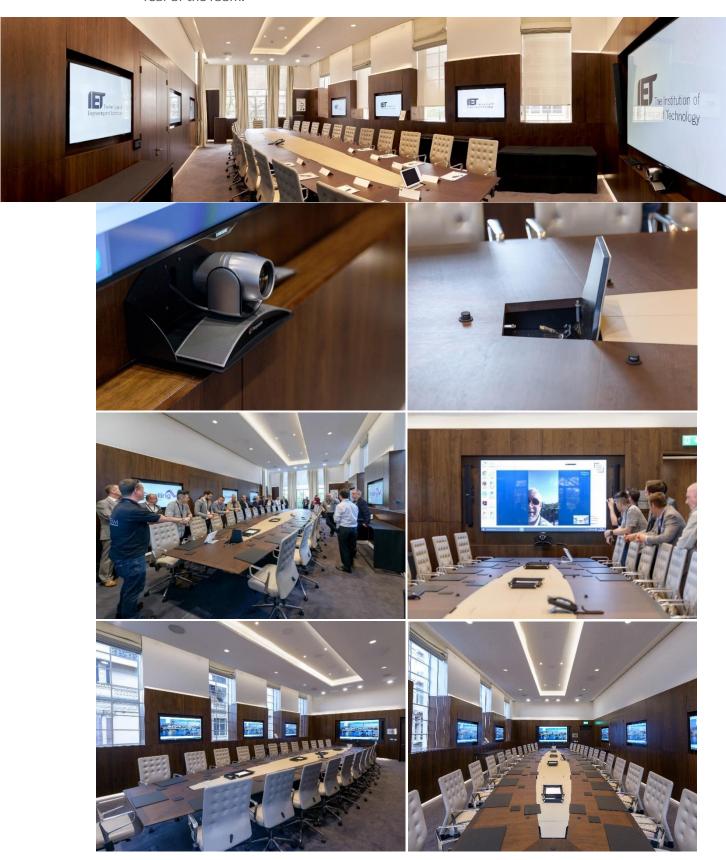


#### **TECHNICAL SPECIFICATIONS**

- 1x 95" Samsung Full HD LFD serves as the primary video conferencing and presentation module.
- 6x 55" Samsung Full HD LFDs serve as relay monitors capable of mirroring the primary LFD as well as independent content. This is particularly useful during presentations to display supplementary information (such as charts and diagrams) to content on the primary display.
- Signals are routed by an Extron matrix, while sources are selected and controlled via an AMX touchscreen – which can also be mirrored by an iPad.
- Polycom video conferencing system with multiple SoundStructure DSPs.
- Clockaudio motorised microphones with auto rise and fall (retract under the desk when not in use).
- Bose Engineered sound system.
- Provision for both hard and soft video conferencing codes via Vaddio AV Bridge.
- Ability to display IPTV with produced IET.tv channels.



- Bespoke inputs for laptops and other digital and analogue devices at the front, middle and rear of the room.

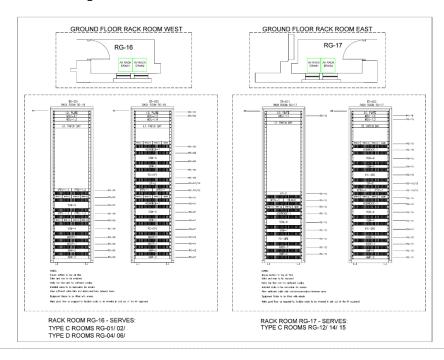




#### **OTHER SIMILAR SPACES**

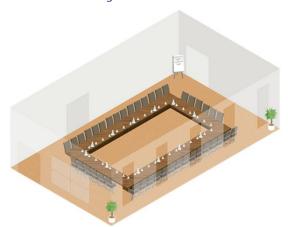
Ideally, the client desired a 'table-and-phone' setup. Keeping the audience in mind, the brief specified keeping the smaller spaces clear of any AV racks and equipment. To meet the requirement, dedicated AV rack spaces were distributed on each floor for remote access.

The following spaces are equipped with AMX touch panels for a network-centric system, which makes access and content distribution available anytime, anywhere. In addition, Extron DTP and XTP systems relay signals over the CAT 6A twister pair infrastructure for feeds such as video conferencing.



#### MOUNTBATTEN EXHIBITION ROOM

Large exhibition space adjoining the Turing Lecture Theatre complete with 4x 55" Video Wall with live streaming and IPTV.









#### **FARADAY WALL**

Bare walls at the Faraday Knowledge Centre, which is a private networking and meeting space, were transformed with a bespoke projection system to disseminate IET branded content of interest to members. These include engineering statistics, news, technology updates and IET events.



The setup involves 2x Panasonic 16K projectors (housed in custom-built Audipack Silencer units) to produce a 270" edge blended image (23% of the overall image) at 3400 x 1080p. Content is relayed from Dataton Watchout, which includes IET-produced content (including IET.tv) and live content from Lecture Theatres. The facility is fully manageable from the master control room or from an iPad remotely, if desired.



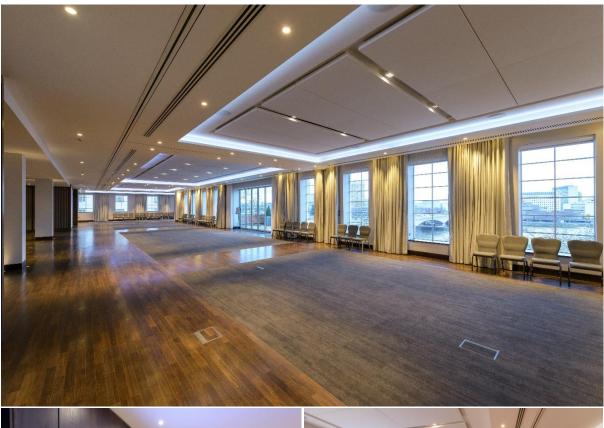




#### **RIVERSIDE SUITE**

The Riverside Suite is Savoy Place's dedicated reception space ideal for large and small events i.e. the space can be used as one large venue or acoustic partitions allow the room to be divided into as many as five sections.

3x Samsung 75" Full HD LFDs allow branding the space, along with 4x Tannoy full bandwidth in-wall speaker systems powered by the most powerful eight-channel amplifier in the Lab Gruppen C-Series family.

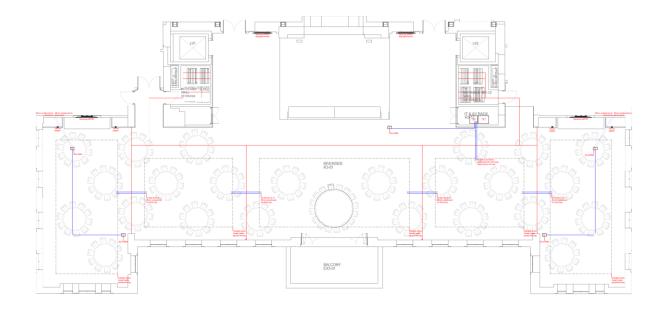






**Acoustic partitions** are possible to cater for smaller events, with BSS Soundweb Audio DSPs to sub-divide relevant audio output to each respective partitioned zone. Technicians can manage the audio output for each partitioned space on an iPad, which displays a graphic render of the floor space. In addition, Shure RF Microphones and radio receivers are also equipped for the 5-zone system. The infrastructure also allows audio relays to the Johnson Terrace where required.

One large Induction loop array was not possible due to wooden panels on the floor with carpeted islands. In consultation with Ampetronic, we installed conduits before the wooden panels on the floors were put in place, and a complex multi section induction loop was put in place (See next page).



Schematic: Multi-section induction loop



Image: HRM The Princess Royal at the IET Savoy Place Relaunch at the Riverside Suite (2016)

#### **JOHNSON TERRACE**







The Johnson Terrace is an extention to the Riverside Suite with a Bose Engineered Sound System with an integrated Drawmer sound limiter to comply with outdoor noise regulations. One of the building's 'outdoor' broadcast patch points is also located on the terrace to allow broadcasters to connect with the building's live broadcast infrastructure and OB vans on the street level.

#### **MAIN LOBBY AND FOYER**

The main lobby features the primary videowall with 4x 46" Samsung Full HD LFD, to relay content from Dataton Watchout. This videowall can display created content from IET.tv as well as live feeds from the lecture theatres. The left flank of the lobby features a 3x 55" Full HD LFD videowall for welcome/greetings at the main reception. On the right flank of the lobby, 1x 75" Full HD LFD serves the purpose of digital signage.



#### **DIGITAL CHANDELIER**

This sculptural piece represents the convergence of the various sectors of engineering the IET represents by presenting them as a dynamic 'field of energy'.

The various facets are depicted as animated particles of energy that interconnect to become greater than the sum of their parts.

As visitors move underneath the sculpture various elements subtly animate and come to life creating a dynamic and changing image of the IET.



#### **TOUCHPANELS**

A single UX was applied across all touch panels, adapted to landscape/portrait installation. Designed with the IET brand identity, users can choose from Freeview TV, signage channels and live content from around the building. Additionally, the panels also offer video/audio conferencing control where appropriate.







#### **IPTV SYSTEM**

All installed displays across the building are retro-fitted with CableTime Mediastar receivers for Live TV and encoded media. This allows many internal, external and live channels across the building. It is the driver for both the digital signage system and room booking displays for greatest flexibility over any public facing screen, allowing the centralised switching of content from room signage, corporate branding, live feeds and digital signage information amongst others.

The system also has inbuilt flexibility to display HTML, JPEGs and other internally generated information, for example, welcome messages to videowalls at the front of house, and throughout the rest of the building's common areas.



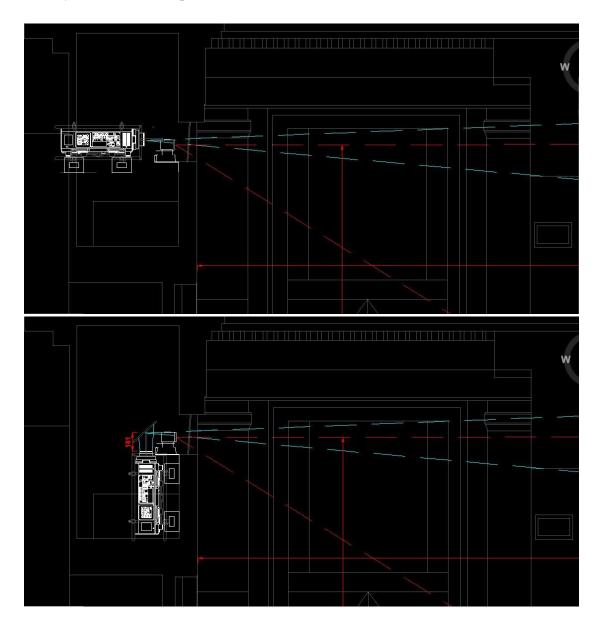
"The system is highly effective at effortlessly distributing a wide range of content - from playlist of videos and images to camera feeds - around our building. Perhaps the most impactful element has been the ability to schedule content through the building, allowing each box to output its own individual content at a chosen time. The flexibility of the system is very impressive."

**Pascal Akaraonye** Digital Content Executive IET Savoy Place

#### **EVIDENCE OF INNOVATION**

Savoy Place not being a new build posed its own set of challenges, which we overcame successfully with engineering creativity, and customisation. For example:

1. **Inadequate projector housing space**: the specified projector for Kelvin Lecture Theatre was a tight fit for the housing space (encapsulated by Marble walls). We found a solution in installing the projectors vertically, each with a bespoke mirror, working on the same principle as a periscope. Not only did this arrangement solve the problem, it now also provides ample space for maintenance technicians to reach the projector. The optical system was designed and built in-house for 3 axes of mechanical adjustment and the projection mount was developed based on a Lang frame.

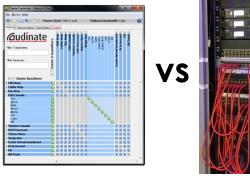


2. **160mm Vs 234 mm**: The client specification for the cable retractor system required vertical installation to the wall. The housing space, however, was inadequate given the depth of the wall. The retractor was redesigned and rebuilt, in-house, with fully reengineered mechanisms to fit the standard cable length of the retractor into a much smaller space.

Since then, the manufacturer has approached us with interest in learning how we achieved this, for their internal research purposes, and to meet a growing demand in the market.



- 3. **Transformed bare walls**: The large wall separating the Turing Lecture theatre and the main reception was transformed with an edge-blend projection system to display IET-branded content. This content can be programmed and operated from an iPad if required, and is also capable of relaying live content from anywhere in the building.
- 4. **Greater capacity**: It is now possible to host larger events than the capacity of the Kelvin Lecture Theatre by seating delegates in the Turing Lecture Theatre. Live video along with insets of other content including but not limited to camera footage from other parts of the building, external content, branding and live remote conferencing.
- 5. Blending the proven with the new: Given the client's focus on revenues from live events, we blended the new (for example, routing audio through DANTE networks) with the proven (for example, analogue cables and physical mixers with motorised faders). In effect, technicians before the event can setup the audio digitally (or an iPad remotely) but for the unpredictable during an event (for example, speaker picks up wrong microphone), they also have access to the physical cables and mixers (technician can simply switch the cables on the router, doing which on a digital interface would require a few moments to reset).





6. **Broadcast-ready**: Tie lines for broadcast signals run from the height of the building, with outside broadcast points at street level and on the roof. When OB trucks arrive on site, they plug in their fibre, send personnel to the roof, plug in the other end, and they're ready to go.



7. **Efficient infrastructure for IET.TV:** the team within the IET responsible for capturing, creating and distributing media for IET members and external subscribers.

#### **USER TESTIMONIAL**

"Snelling Business Systems have proven to be very capable AV integrators not only for meeting the specifications of the brief, but also for their sound advice and technical know-how throughout the course of the project. We had set extremely high expectations to meet the needs of the Savoy Place, which we intend to promote as one of London's most premium venues.

I'm delighted to say this has been achieved as evident from our sales and revenue figures. The process they followed to assess and understand the needs of all audiences that would use the spaces has worked to our benefit.

Events and conferences being our primary revenue driver, the Lecture Theatres Snelling delivered assimilated their collective transferable experience in AV systems for large spaces with historic features. We have received very positive feedback for the infinity displays, including Europe's largest at the Kelvin Lecture Theatre.

I was equally impressed by the mirror-rig projection system they developed in-house for the Kelvin Lecture Theatre- not only did it solve the problem of inadequate space but also allowed space for maintenance access. More so, when faced with this challenge, they were unwilling to settle for any quick solution, which just about works.

Making the spaces interconnected to one another and to a master control room is the ideal arrangement keeping in mind the premium white-glove service we wish to continue marketing.

With little effort, events can be delivered with technician assist or full technician control. The vast capabilities of the system are perfect for the range of uses we have from engineering showcases, awards ceremonies, panel discussions, to public debates. With the new infrastructure, our in-house digital content unit, IET.tv can create digital content for distribution/live streaming. We now have a vast gallery of content for members as well as subscription for external users.

Another great aspect of the system is its scalability, which was previously a challenge given the restricted capacity of the theatres. For larger events, we can use multiple spaces for the same event at the same time and content can be relayed live to anywhere in the building.

Moreover, broadcasters/film crews can pick broadcast-quality feeds from the site itself. Many BBC shows are broadcast live from the Johnson Terrace (another source of revenue for us).

Personally, the key indicator for success was to identify whether we are able to do better than before in the use of the space, and therefore in driving revenues. Looking at the figures (next page), I can confidently say the systems delivered have far exceeded our high expectations.

I have worked on a vast range of AV and IT projects with many integrators in my career spanning over 15 years; working with Snelling Business Systems was truly refreshing and very rewarding".

#### Richard Best

Head of IT and Digital Services The Institution of Engineering and technology

#### **STATISTICS OF SUCCESS**

"Following the closure of IET savoy place we anticipated it would take six months following our soft launch in December 2015 for business to return to 50% of pre-closure volumes, and a further six months to return to 100%.

**We have beaten our own forecasts** with the sales team having taken 860 event bookings between December 2015 and May 2016 alone, and exceeding our revised targets to reach 2,788 bookings confirmed as of September 2016. We have received 3,815 enquiries (Jan – Sep 2016) with 1,708 enquiries between Jan–Apr 2016 (following the soft launch) alone. This equates to a 163% increase in enquiry value figures, up from £5,029,588 (Jan – Sep 2013) to £29,247,928 (Jan – Sep 2016).

For STEM related events (including internal and external events) we registered a 104% increase in bookings over the pre-closure figures by April 2016. Staff at Savoy Place have held 1,780 show rounds (Jan – Sept 2016) and a total 76,448 delegates were hosted (Jan – Sept 2016). Total Building footfall registered a 186% increase over pre-closure figures in the same period. Usage of facilities including meeting rooms, boardrooms, lecture theatres etc. also registered a 107% increase in the same period.

Net Promoter Score for Audio Visual facilities has been recorded at 94% as on Sep 2016. It also gives me immense pride to announce that we have won the 'Best New or Refurbished Venue' of the Year at the London Venue Awards 2016, the highest awards accolade in our industry.

These figures combined with the additional facilities we can now offer, including central London's largest full service conference venue, client branding throughout via our digital signage platform and restaurant covers combined with a breath-taking roof terrace and the latest audio visual systems has evidently driven our commercial success (as per client feedback).

Take for example, just over 60% of our top 20 clients have returned to the venue since re-opening and have confirmed events in 2016 and 2017.

We have exceeded our own predictions and I can confidently say that our decision to invest in IT & AV systems with our partners, Snelling Business Systems, was a critical part of the success we can claim today".

#### **Clare Davies**

Sales & Development Manager IET Venues

Michelin Guide Great Britain & Ireland 2017

**Best New or Refurbished Venue:** London Venue Awards 2017

InAVation Awards 2017: Best Corporate Project of the Year

Install Awards 2017: Best Project (across all categories) and Best Corporate Project of the Year





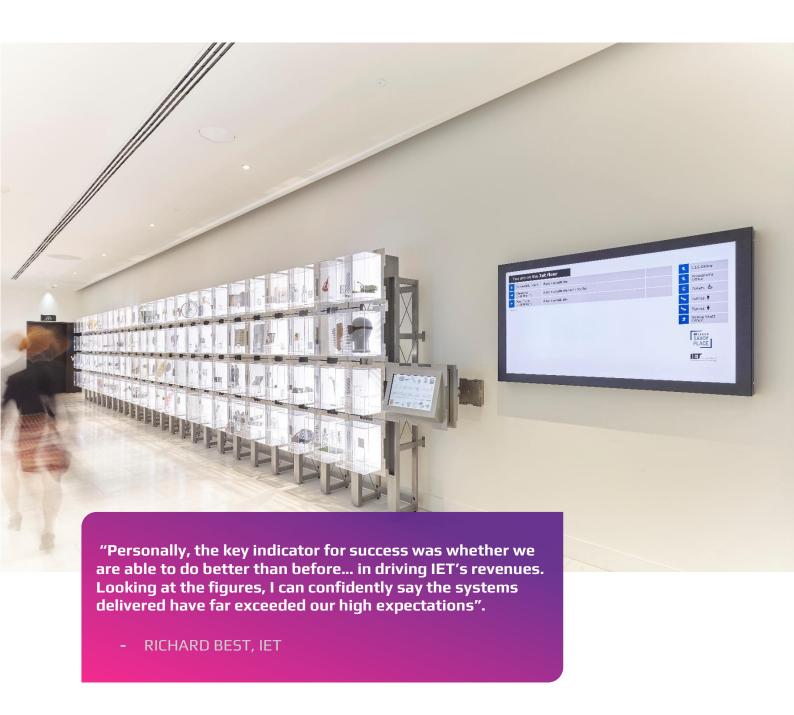
IET Venues @IETvenues · Oct 11

Great review by @LuxuryColumnist of the very first live launch of the @MichelinGuideUK at #IETLondon

Read here - bit.ly/2d4vqVz



**1**→ 2



### ABOUT US

In plain speak, we are an international supplier of integrated audio-visual systems, environments, and communications technology. We design, integrate, install and maintain robust AV systems and environments.

But 'how' we do it isn't so plain.

Our roots go back to 1954 when Roy Snelling started his business selling and servicing Television and Radio sets in the early days of commercial broadcasts.

As more and more Television and Radio sets found a place in living rooms, Roy witnessed a major transformation – a new medium for people to interact, engage and consume information; the same purpose for which we continue to design and build Audio Visual systems and environments.

We have come a long way.

"Snellings" quickly grew into a household name with Roy's steadfast commitment to "customer first" – delivering an unmatched retail experience from the moment they walk in the door to a lifelong relationship.

We have carefully nurtured this belief in our internal culture – "customer first", as well as our design and engineering philosophy – "Audio Visual Excellence. Operational Simplicity".

Spot an opportunity. Respond to Change.

Technology will evolve. New platforms will emerge, and your needs will transform. Our culture allows us the flexibility to adapt and respond – to keep pace with change in our industry; to ensure our advice always keeps you ahead of the curve, and your competition.

We deliver all aspects of audio visual integration from design to the supply, installation and on-going maintenance - all backed by a service ethic, which continues to carry the Snelling signature of quality.

Based in London and Norwich, we have maintained our portfolio of major clients and diverse projects across corporate, higher education, public sector, defence and aerospace, retail, medical and healthcare, leisure and hospitality, museums and attractions, and niche specifications.



## **SNELLING BUSINESS SYSTEMS**

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