

Appendix 1A – Current Equipment and Facilities

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Chamber facilities and associated control rooms

Ireland is one of several countries that broadcast unfiltered, live proceedings from their legislative chambers. Legislative power is vested in the Oireachtas, which includes the two Houses of the Oireachtas, Dáil Éireann and Seanad Éireann. Oireachtas committees advise the Houses of the Oireachtas on a range of specific areas. There are 4 chambers allocated to the Committees.

These chambers are situated in Leinster House, Dublin 2

- Dáil Éireann
- Seanad Éireann
- Committee Room 1-4 (CR 1-4)

Additionally in Leinster House there is an AV Room that is used for Press briefings and other presentations. The room is equipped with camera facilities and is linked to the new Control Room 5 in Kildare House.

The Oireachtas Broadcasting Unit has responsibility for producing, recording, archiving and broadcasting the proceedings of Dáil Éireann, Seanad Éireann and Oireachtas committees. For this purpose, starting with the Dáil Chamber in 1990, television cameras have been installed in all the legislature chambers of the Oireachtas.

The associated television control rooms/galleries are in Kildare House, Dublin 2. Signals for the Televising Contract are transported between Leinster House and Kildare House.

At the end of 20121/start of 2022 the chambers at Leinster House were fitted out with an upgraded PTZ camera system using the Panasonic AW UE150 4K (1" MOS sensor., 75.1-degree viewing angle and 20x optical zoom) Integrated Cameras. These are powered locally shared with the fibre driver unit.

Panasonic AW UE150 Camera Quantities

- Dail Chamber Qty 7
- Seanad Chamber Qty 4
- Committee Room 1 Qty 4
- Committee Room 2 Qty 4
- Committee Room 3 Qty 4
- Committee Room 4 Qty 4
- AV Room Qty 3

Spotter Cameras: typically wide-angle, fixed position, installed at a high vantage point, provide an overview shot of the entire floor of the chamber, allowing the director or vision mixer to track who is speaking, who is standing, or which microphone is active. This feed is not broadcast publicly but is instead routed to the control room or production gallery.

In the Dáil chamber SDI box cameras are used while in the other chambers dome CCTV are installed. The spotter cameras video signal output follows a signal path, like the broadcast cameras, from chamber to CAR. The spotters are inputted into a sequencer (CAR racks, Kildare St) that was sent to the RF system but currently not operational. The Dail path uses Yellowbrik equipment and other chambers use Bluebell.

Quantities per chamber

- Dail Chamber Qty 5
- Seanad Chamber Qty 4
- Committee Room 1 Qty
- Committee Room 2 Qty
- Committee Room 3 Qty 3
- Committee Room 4 Qty 3

The fibre interfaces for the cameras are also used to transport the audio signals from Leinster House to Kildare House C.A.R. House reference signal is sent in the opposite direction. The Dáil chamber takes a single reference, distributed locally. The cameras in other chambers receive a reference feed per camera.

The camera signals, reference and control use Yellowbrik equipment in the Dáil chamber while all other chambers are equipped with Bluebell 3G/SDI Fibre Optic Transmitter Card and Bidirectional Control Data Interface with Genlock Rx.

The Oireachtas Broadcast Unit delivers video signals to the audio contractor in Leinster House for use on the displays within the chambers. These can be used on special occasions such as visits by foreign dignitaries. The signal is used at the discretion of the audio contractor.

Transport to Control Room

All six chambers and the AV Room are connected to the Central Apparatus Room (C.A.R.) in Kildare St. via fibre optic links.

Several sub-control rooms are used in the signal path such as Leinster House Room 06D and LH2K Room 17 before connecting to CAR, providing carriage of the HD signal across the road (on fibre) to the receivers in CAR and then to the house router for further distribution. A point to note is the age of the installed fibre optic cable, some of which is 25 years old.

Control Room (Gallery) Equipment

The Control Room (Gallery) is a combined vision and audio facility designed to support live production operations. It features a single, linear operations desk that accommodates dedicated operator positions for the following functions:

- Vision Mixer / Director – Video switching and production direction

- Sound and Captions – Audio control and monitoring and graphics live captioning
- Camera and Technical Control / Monitoring – Remote camera operation, shading, and technical oversight

Each position is equipped to support its respective role during live or recorded events

The outputs from the Control Room (Gallery) are routed to signal distribution, routing, and recording systems located in the Central Apparatus Room (C.A.R.) and other relevant locations.

NetOn.Live Software and Hardware

LiveOS is an end-to-end, software-defined platform designed for high-end live and near-live media production. As a private cloud solution, it enables the simultaneous operation of multiple productions across a wide range of use cases, including live production, master control room (MCR), playout, news, sports, and scripted content workflows. Remote production capabilities are also easily deployed.

The Dáil Chamber, the Seanad Chamber, four committee rooms (with provision for a future fifth), two studios, and the AV room are all connected to the centralised LiveOS Private Cloud infrastructure.

The associated control rooms for these spaces are also integrated into the platform and can operate concurrently. The system is scalable, allowing for the addition of further control rooms as required.

The LiveOS platform supports the simultaneous operation of 7 to 8 live productions, enabled by five dedicated Media Servers. For N+1 redundancy, a sixth Media Server has been added to ensure system resilience and continuity.

Camera Control

Camera operations across the parliamentary chambers are managed from dedicated positions within the respective control rooms.

- The Dáil Chamber features two dedicated camera operator positions due to the complexity of its environment, including a prominent glass dome that introduces variable natural lighting conditions.
- The Seanad also experiences natural light through windows, requiring similar lighting compensation.
- Committee Rooms, by contrast, are enclosed spaces with no natural light, and therefore demand less dynamic adjustment during operation.

Camera Control Equipment

- Both the Dáil and Seanad are equipped with Panasonic AK-HRP1010G Remote Operation Panels (ROPs). These ROPs are integrated into the operations desk and

provide precise, real-time control over camera parameters including shading, exposure, and fine-level image adjustments.

- The ROPs are IP-connected via the local Cisco switch infrastructure, enabling fast and responsive communication with the camera systems.

In all control room locations, including committee rooms, camera operators use the Panasonic AW-RP150 PTZ controller. The Dáil is equipped with an additional unit to support its dual-operator configuration. The AW-RP150 offers:

- Joystick and touchscreen control
- Preset recall functionality
- Scene file management
- Tracing memory features

Although presets are occasionally used, the standard operating approach emphasizes manual shot composition. Camera operators typically adjust framing and settings dynamically ("on the fly") in response to editorial direction, before offering a shot for live selection.

Camera Monitoring and Preview

Each camera control position includes a Snell Button-Per-Source (BPS) panel, which allows operators to quickly preview any source on a dedicated monitor. This is primarily used for assessing and fine-tuning camera shots, including checking exposure levels and signal integrity.

In practice, however, the BPS panel is often bypassed. Instead, operators use a CamDrive feature on the RP150 PTZ controller, which triggers GPI (General Purpose Interface) commands to the router, allowing direct camera source selection with a single button—combining preview and engineering functionality in one action.

Captioning and Graphics Workflow

Captioning for Oireachtas TV, the public-facing web TV streams, and the Oireachtas archive is centrally managed via the LiveOS platform. This system handles the creation, storage, retrieval, and display of captions and graphics across all broadcast and archival outputs.

Each programme feed is recorded in two distinct versions to support both live transmission and archival needs:

- Clean Version: A feed without captions or graphics. This is archived and sent to RTÉ for potential inclusion in national news broadcasts.
- Captioned Version ("Dirty"): A feed with embedded subtitles and graphics. This version is recorded into the Avid archive, delivered to broadcast partners, and used for live transmission and internal display systems.

Caption content is sourced from the parliamentary procedural system and integrated into the production workflow via web APIs. The Oireachtas Web ICT team uses Elasticsearch API queries to extract relevant procedural data such as agenda items, speaker names, and session metadata.

ElasticSearch, part of the ELK Stack (Elasticsearch, Logstash, Kibana), is a distributed, open-source search and analytics engine used for:

- Full-text search
- Real-time data analytics
- System monitoring and event tracking

Graphics Integration

The LiveOS platform uses the same Web API and Elasticsearch infrastructure to retrieve procedural data in real-time. Key steps include:

1. Field Mapping: Data fields from the procedural system are mapped to corresponding graphic template fields in LiveOS.
2. Template Population: Templates are auto-filled with retrieved data.
3. Human Review: Oireachtas staff review and approve the populated templates within the LiveOS interface.
4. Air-Ready Graphics: Once approved, templates are available in the Gallery for the graphics operator, who can preview and take them to air as required.

Handling Data Updates

If procedural data changes during the day—such as speaker substitutions or agenda updates—these are automatically refreshed in the database and highlighted in LiveOS. The updated data follows the same verification process.

- The on-air graphics do not change automatically—it remains a curated editorial decision whether to push the updated graphic live.
- For urgent updates, the graphics operator can manually enter corrections into the template under guidance from Oireachtas staff.

Resilience and Continuity

In the event of a temporary loss of connectivity to Elasticsearch:

- LiveOS continues to function normally.
- Templates can still be manually populated and used.
- This ensures uninterrupted captioning and graphics support during live broadcasts or recordings.

Metadata

The Sound and Captions operator is responsible for logging and timestamping metadata related to parliamentary proceedings. This metadata is stored within the Avid Recording and Archive system and includes details such as start and end times of Members' and witnesses' verbal contributions, room numbers, committee names, business information, and procedure types. The metadata supports efficient retrieval of requested media by broadcasters and is also used by Members and the Debates Office to review proceedings.

Captioned Feed Distribution

The captioned feed is distributed to multiple destinations, depending on the broadcast requirements and distribution partners:

- TX (Transmission) and third-party broadcasters
- Internal RF system:
 - Analogue distribution (legacy system still required for some receivers)
 - Digital TV (DTV) system (newer, high-quality distribution method)
- Public web streams
- Digital signage system, which receives its source feed from the DTV stream

Video Switching – Managing and Monitoring AV Signals

Under current production protocols and editorial policies (the *Rules of Coverage*), live vision mixing is not a requirement during standard operations. Instead, a simplified "cuts-only" switching approach is employed, using a Preview/Program (PST/PGM) model. Switching is executed via a Button-Per-Source (BPS) control panel located in the Gallery, allowing direct, immediate selection of camera and source feeds without transitions or visual effects.

All video signal routing, source switching, and monitoring are managed by the NetOn LiveOS platform, which serves as the central control layer for the AV infrastructure. Communication between the Gallery control panel and the broader system is routed through a centralised crate located in the Central Apparatus Room (C.A.R.). The panel itself operates over Ethernet, with the production environment running as a software instance on the central crate.

As part of the recent control room upgrade, the legacy vision mixer was replaced with a SKAARHOJ Air Fly Pro Desktop Controller (Blue Pill Inside), now fully integrated with the LiveOS platform. This advanced switching panel provides:

- Up to 12 direct-access source buttons
- A manual T-bar for transitions (used only if required)
- Fully programmable buttons, offering flexible control over any mapped LiveOS function, depending on system configuration

Operators can control the entire system using a mouse and graphical user interface (GUI), either from within the control room, other locations within the building, or remotely. The LiveOS GUI provides access to essential parameters required for switching and monitoring.

Note:

In the current configuration, LiveOS does not have active control over audio mixing or camera operation. However, both systems are networked and GUI-accessible from outside the LiveOS:

- Audio: Behringer audio mixers are fully networked with a control interface available.
- Cameras: Panasonic PTZ cameras are similarly networked and controllable via their own GUI.

With the appropriate licensing, LiveOS can be expanded to include full control over both audio and camera systems, enabling complete remote production capability and business continuity. These licenses are not currently active but can be added in future phases.

Archiving and Avid Workflow

Each control room is equipped with two Avid client workstations, which are used by operators to manage the logging and archiving of recorded content. Logging is performed in real-time or shortly after recording begins, ensuring that metadata and editorial notes are accurately captured and associated with each session.

Recording and Logging Process

- Once the recording is initiated by the director, the Avid system begins capturing both clean (graphics-free) and dirty (captioned) versions of the feed.
- The director is responsible for starting and stopping these recordings. This is done using Avid Capture tools integrated into the Avid MediaCentral | Cloud UX platform, providing a unified interface for ingest, record control, and asset management.
- As the session progresses, the operator opens the chunked low-resolution proxy file—which becomes available almost immediately—and begins logging metadata in real time. This may include:
 - Points of Interest
 - Speaker identification
 - Agenda references
 - Editorial tags
- The logged metadata is then linked to both the low-resolution proxy and the corresponding high-resolution master file within the Avid system. This ensures that all searchable and editorial data remains synchronized across resolutions and throughout the production chain.

Integration with Archive and Post-Production

- The tagged files are stored in the Avid production asset management environment, enabling efficient search, retrieval, and editing for both broadcast and archival purposes.
- The dirty feed is typically routed to the Avid Production environment or equivalent storage system for long-term archive, including downstream workflows such as TX delivery and web publishing.
- The clean feed is also stored and made available for third-party use, such as contribution to RTÉ news or other editorial teams.

Monitoring Multiviewer Configuration

The video monitoring system features two primary multiviewer outputs, each serving a distinct operational purpose:

- Operational Multiviewer: Connected directly to the vision mixer, this layout is used for real-time monitoring of live production feeds.
- System Multiviewer: Generated from the central AV system, this output provides a comprehensive overview of all active signal paths, source statuses, and routing configurations.

The layout and signal assignments for both multiviewers are centrally managed by the technical support team in the Central Apparatus Room (C.A.R.).

Audio

A Behringer X32 Compact Audio Mixing desk is installed and used for audio control in the chamber control rooms and receive feeds of monaural sound from the contractor responsible for the audio system in the chambers. The critical voice feed supplied by the contractor is a switched output from the chamber conference system. One or more of the microphones positioned in front of Members may be contributing to this switched output at any one time. Outside this, individual feeds of ambient sound from a number (typically three) boundary microphones positioned around the chamber are supplied. These alternate sound feeds are presented to the OBU control room and only used in case of emergency.

The audio contractor provides the feeds on an XLR panel in Leinster House. This is the demarcation line between the two systems/contracts. The feeds presented are

- Main Mix
- Backup mix
- Ambience mixed
- Ambience 1
- Ambience 2

- Ambience 3

The audio signal is delivered via fibre driver units (shared with video) to the Central Apparatus Room (C.A.R.) in Kildare Street. There, it is presented on Krone blocks before being connected to the audio jackfields and routed through the analogue audio router, forming a complete analogue signal path from source to distribution.

As part of the ongoing system upgrade, the existing analogue audio infrastructure has been retained, while a parallel Audio over IP (AoIP) path has been introduced to enhance flexibility and operational capability.

A split of the chamber audio feeds is routed to Dante Dark88 AoIP interfaces, located in the technical room at the rear of each chamber. These units provide both main and backup Dante outputs via fibre SFP connections to dedicated Dante switches (Main and Backup) located in the Central Apparatus Room (C.A.R.).

The Dante switches interconnect all Dante-enabled devices across the system, including:

- Behringer audio mixers in each control room, each fitted with a Dante expansion card (two network interface ports per desk)
- The central Dante control PC in the Outside Broadcast Unit (O.B.U.)

The Dante Dark88 units are bidirectional, enabling not only outgoing audio delivery but also return paths, supporting use cases such as live radio interviews from Committee Rooms and offering increased operational versatility.

Audio Monitoring

Audio monitoring within the technical spaces is facilitated by:

- Genelec 1031A two-way active monitor loudspeakers
- TSL AMU2-2MHD+ Audio Monitoring Unit, providing visual and audio confidence monitoring for multiple sources

Translation

In Leinster House (on a different floor), translation booths operated by the audio contractor are provided. These booths are manually operated and staffed by fluent Irish language speakers. The translated audio is routed to the relevant chamber control room, allowing the operational staff to monitor English translations of proceedings conducted in Irish via the room's audio monitoring system.

Talkback and Communications

Room talkback is handled by a GlenSound Galaxy 114 rack-mounted commentary and intercom unit, offering integrated microphone, headphone, and talkback capabilities to:

- Transmission (TX)
- Central Apparatus Room (C.A.R.)
- Individual chamber control rooms

In addition, an RTS DKP-4016 16-key digital intercom panel is available to provide multi-channel talk and listen functionality across TX, studio, and C.A.R. environments.

High-Demand Scenarios

During high-pressure broadcast scenarios—such as Budget Day—the need for increased inter-room operation (e.g. for live keying and layered productions) leads to significantly higher talkback traffic. The adoption of LiveOS will streamline and enhance workflows going forward, potentially reducing the talkback requirement.

Resilience and Fallback Systems

To ensure continuity of service during equipment failures or unexpected disruptions, each chamber control room is equipped with a dedicated resilience and fallback pathway.

Emergency Switching Mode ("Red Button")

Each room includes a "Red Button" emergency function. When activated, this function:

- Transfers control from the primary production system to a backup mode.
- Enables a Button-Per-Source (BPS) router control panel, allowing manual crosspoint switching of camera and source signals directly via the house video router.
- Provides immediate access to predefined sources, including a dedicated backup vision mixer.

This ensures that essential production outputs can continue without reliance on the primary LiveOS control interface.

Each Gallery is equipped with a Blackmagic Design ATEM Mini vision mixer, receiving live feeds from the chamber's installed cameras and the possible use of an internal media player. This unit is operated through a SKAARHOJ Mini Fly control panel, permanently installed on the operations desk for quick access in fallback scenarios.

The audio input of the Blackmagic mixer is connected as follows:

- The main audio mix is connected to the Left input.

- The backup audio mix is connected to the Right input.
- Audio channel selection is achieved via hard panning to either the Left or Right channel, ensuring clear and immediate control over which mix is broadcast.

This configuration enables a fully functional secondary path for both video and audio, ensuring that chamber proceedings can continue to be captured, monitored, and transmitted even in the event of a primary system failure.

This mechanism is also used during system testing or scheduled maintenance, enabling rooms to be safely taken offline without disrupting the wider AV workflow.

Private Mode Operation in Committee Rooms (Parliamentary Chambers)

When a committee wishes to conduct proceedings in *Private Mode*, the process is initiated by the clerk via a dedicated control button. Activating this button triggers the following sequence:

1. Privacy Indicator Activated: A "P" indicator light illuminates within the control room, clearly signalling that the meeting has entered private mode.
2. Audio Muted at Source: All audio feeds from the room are muted at the source, ensuring that no sound is transmitted beyond the chamber.
3. Acknowledgement Required: A *Privacy Acknowledge* button appears on the control interface. This must be pressed by chamber control room staff to confirm that they are aware of the private mode status. This creates a secure two-way confirmation process.
4. Visual Notification and Camera Block: Once acknowledged, a privacy notification is displayed on in-room screens. Simultaneously, any active camera feeds are blocked, and a "Private Session in Progress" caption or graphic overlay replaces the live video.

This procedure ensures both technical and procedural assurance of privacy, safeguarding the confidentiality of sensitive discussions.

Studios & Control Rooms

TV / Radio Studio Control Room

The TV Studio Control Room is situated next to the TV studio.

The layout of the studio control room was revised and refurnished in 2019 including the addition of an IAC manufactured isolation Sound Booth

The room was designed for a busy working environment, particularly for production days such as Budget Day and special events, with specific positions for each operator, a separate booth for the sound engineer, a new monitor stack and technical furniture.

The main operations desk provides seating for a Producer, Production Assistant, Vision Mixer/Director, Camera Control and Autocue.

The secondary desk is used by the CapGen operator and, at times, an EVS operator.

All positions have routable connectivity for network connectivity that provides services such as talkback and phone.

For Vision Control a 2ME Ross Carbonite Ultra is used; each ME has 4 powerful keyers with luma, linear, chroma and DVE key types - as well as an additional 5th hidden keyer for animated MediaWipe and DVE transitions. Each ME also provides a clean feed output, along with 2 advanced pattern generators for wipes, pattern masks and colour washes. The control surface is installed in the operations desk while the signal/processing crate is in C.A.R.

The studio cameras were replaced in 2021 after the installation of new cameras in the chambers.

Four Panasonic AW UE150 4K replaced the existing Telemetrics cameras with three of them installed on the existing Miller pedestals while the fourth camera, with autocue, is installed on a Vinten pedestal. The camera operators use the Panasonic AW-RP150 PTZ controller

A Ross Xpression Character Generator is installed as per the other Galleries.

NEC flat screens display the Carbonite Multiviewer outputs as well as an independent Apantac multiviewer.

Within the installed IAC Isolation Booth, a Calrec Brio is used as the studio sound desk. The interface chassis installed in the rack room and the Control surface installed in the booth. Brio has comprehensive broadcast features - delay resource, dynamics, integrated talkback, and multiple monitor outputs.

Genelec audio monitoring is installed in the room and the booth.

To provide an isolated space where the Sound Operator can monitor audio without affecting other operators, a standalone IAC Isolation Booth was installed. The Sound booth gives at least 40dB isolation with a sound reverberation time, at average speech frequencies, of less than 0.25 secs. The construction gives the operation a facility to monitor audio during live production as well as a space for Audio post-production.

Studio 2 and Sign Language

In 2019, a second small studio facility—Studio 2—was established in the Basement Area. This studio is primarily used for Irish Sign Language (ISL) interpretation, utilizing an installed green screen to support the integration of signed content into programming.

The control setup mirrors that of Studio 1, employing the original Telemetrics camera system and the RCCP-1 control surface for unified management of camera robotics and shading. A second Telemetrics camera has been added to support signing requirements for online platforms such as Zoom.

Additional equipment includes a Mackie audio mixing desk, an audio delay unit, and Genelec audio monitoring speakers.

Recording & Archive System

The Oireachtas Broadcast Unit (OBU) is responsible for the recording, storage, and archiving of all parliamentary proceedings. The Recording and Archiving system is the core function of the OBU, ensuring the preservation and accessibility of official broadcast records.

The current Avid-based system, originally installed in 2018 and upgraded in 2023, provides a fully integrated recording, storage, and archiving solution.

Recording & Storage Infrastructure

- Live recording from all chambers and galleries is handled by the Avid FastServe system.
- Online storage is maintained on Avid Nexis, providing immediate access to recent recordings.
- Long-term archiving is performed using LTO-8 tape storage, ensuring data preservation and compliance with archival standards.

Archival Migration & Standardization

Since 2018, an ongoing migration process has been in place to transfer legacy recordings from:

- Broadcast tape archives (Betacam SP, Digital Betacam, DVCAM).
- Early digital archives (DTF-2, LTO-4).

The goal is to consolidate all historical and current recordings into a single standard format stored on LTO-8 for consistency, accessibility, and futureproofing.

Metadata & Logging System

Metadata management is a critical component of the OBU Recording & Archive system. Metadata logging is carried out manually by operators in each gallery. The process is being developed to access information from the Oireachtas Procedural Information System, linking the recording archive with official parliamentary records.

The OBU's Recording and Archive system is a highly resilient, secure, and scalable solution, ensuring that all parliamentary proceedings are accurately recorded, stored, and archived in a structured and searchable manner.

2018 Avid-based system install

In 2018, the Recording and Archive system in the Oireachtas Broadcasting Unit (O.B.U.) underwent a complete transformation following a tender process. A new Avid-based system was installed, providing a highly resilient and industry-standard solution for recording, and archiving parliamentary proceedings.

The system comprises:

- Avid FastServe Ingest Servers – for high-performance recording and ingest.
- Avid NEXIS – a software-defined storage platform.
- Avid MediaCentral – a suite of media management and content creation tools.
- Avid MediaCentral MAM – for search, retrieval, and workflow automation.
- Avid AirSpeed Playout Server – for content playout.
- SGL Middleware & Spectra Logic LTO-8 Tape Archive – for long-term content storage.

Ingest & Recording Process

The ingest and recording system is based on four Avid FastServe servers installed in Central Apparatus Room (CAR). Each FastServe can capture eight simultaneous HD sources, providing a total of 32 ingest channels. The server's feature:

- Hot-swappable dual power supplies.
- Dual-port network connections for redundancy.
- RAID-protected hard disks for reliability.
- A secure Linux-based operating system.

MediaCentral | Capture enables automated recordings through a graphical interface, allowing for scheduling, monitoring, and metadata management. Recordings are initiated in the Gallery/Control Room with Directors controlling their own recordings using Capture Manager. However, in CAR, recordings can be started for multiple Galleries simultaneously.

Each Gallery records two feeds:

- Clean Feed (no captions).
- Dirty Feed (captioned).

Recordings begin at staggered intervals and use a segmentation process for long-duration content. If a segment exceeds a single channel's capacity, an additional channel within the same pool is assigned.

Channel Pool Management & Routing

The system dynamically allocates recording channels through Channel Pools, managed by Capture Manager and interfaced with the Snell Router.

The 32 ingest channels are distributed as follows:

- Galleries (6 x 3 feeds each) = 18 channels.
- Studios (2 x Clean & Dirty feeds) = 4 channels.
- Loop Recordings (Dáil x2, Seanad x2) = 4 channels.
- Control Room Loop Recordings = 4 channels.
- Spare channels for redundancy = 2 channels.

Monitoring & Backup

- Two Apantac 16 P.I.P. Multiviewers in CAR display all 32 recording channels, each labelled for easy identification.
- Loop Recordings serve as backup in case of a FastServe failure.
- Additional Backup System: A separate system using Blackmagic Design recorders and Samsung SSDs provides further redundancy.

Recording Format & Naming Convention

- Main recordings are segmented:
 - Dáil & Seanad: 5-hour segments.
 - Committee Rooms: 3-hour segments.
- Naming convention:
 - *Chamber/Date/Time/Clean or Dirty/Segment Number.mxf*
 - Example: Dail_20200225_1000_CLEAN_01.mxf
- Codec: XDCAM HD50 422

Storage System Overview

The Avid Nexis system serves as the central storage platform for all online media, while archived media is exported to LTO-8 tapes for long-term preservation.

FastServe, under the control of Avid | Capture, automatically transfers recorded material to Avid NEXIS, where it is checked into the Avid | MediaCentral database for access and management.

The Nexis central storage is spread across three chassis, providing a raw storage capacity of 600TB. This storage is physically distributed across:

- Ground Floor Central Apparatus Room (CAR)
- PetaSite Server Room in the Basement

Storage Resilience & Capacity

- The system is configured with RAID 16, reducing usable storage to 480TB while ensuring redundancy.
- Each 200TB chassis loses approximately 40TB for resilience, allowing the system to withstand:
 - The failure of two disks in any chassis.
 - The complete failure of one chassis without data loss.

Storage Allocation

The Nexis storage environment is structured as follows:

- Clean Material: 188TB, stored in a RAID 1 fully mirrored environment (378TB total usable).
 - Equivalent to one year of clean content (prioritised for editors).
- Captioned (Dirty) Material: 75TB (approximately one year of material).
- Loop Recordings: 10TB (approximately one month of recordings).
- Edit Storage: 10TB (used for temporary editing workspace).
- Restored Media: 3TB (temporary storage for restored archive material).
- Database Backups: 0.1TB, fully mirrored.

Each hour of recorded content in XDCAM HD50 422 format occupies 22.5GB of storage.

Redundancy & Backup

- FastServe Storage Redundancy:
 - FastServe devices contain their own internal storage, allowing for temporary local storage in case of disconnection from central systems.
 - Once the connection is restored, material is automatically checked into Avid | MediaCentral.
- Archival Workflow:
 - Media is archived to LTO-8 after completion of QC, keyframe identification, and proxy generation.
 - The Nexis system was designed to store more than a year of clean material before archiving.
- Proxy File Generation:
 - Material stored in Nexis is high resolution only.
 - When accessed from local PCs, a proxy file is generated on demand, allowing standard desktop users to create sequences or send media for transmission (TX) via Telestream Vantage.
 - E2 Nexis storage holds proxies for the archive. While less reliable, proxies can be regenerated as needed.
- Editing of Archived Media:
 - To edit archived media, it must first be restored to the Nexis environment.
 - Once restored, content can be trimmed, edited, and re-exported as needed.

- For HD-SDI playout, media is transferred to Avid | Airspeed, a 4-channel playout device.
- Edited content must be consolidated before playout or export.

Databases Overview

The storage and management of media assets are handled through Avid Nexis for near-term storage and LTO-8 tapes for long-term archiving. The system utilises two interconnected database solutions to manage and track media throughout its lifecycle:

- Avid MediaCentral | Production Management (P.A.M.) – for active media workflows.
- Avid MediaCentral | Media Asset Management (M.A.M.) – for archive and metadata tracking.

Avid MediaCentral | Production Management (P.A.M.)

Formerly known as Interplay P.A.M., this digital asset management system is designed to organise and track media assets in a collaborative editing environment.

- All newly recorded media is ingested and managed in the P.A.M. environment.
- Media is accessible through Avid | MediaCentral or directly via Avid Media Composer systems.
- P.A.M. integrates asset tracking with workflow management to streamline content editing and distribution.
- Operators can log, edit, and send video sequences to a playout server directly from P.A.M.

Avid MediaCentral | Media Asset Management (M.A.M.)

MediaCentral M.A.M. is a Microsoft SQL-based database that works alongside P.A.M., focusing on long-term asset management and archiving.

- M.A.M. tracks media stored in the LTO-8 archive system.
- It allows for detailed metadata tagging, enabling multi-layered classification of media assets.
- The system provides a structured approach to searching, retrieving, and managing archived content.

Avid MediaCentral User Access

Avid MediaCentral is a web-based application that allows users to interact with both P.A.M. and M.A.M. databases from standard desktop workstations, laptops, or mobile devices.

- Two MediaCentral servers serve data to users.
- The interface supports logging, annotation, search, access, modification, transcoding, and media retrieval.
- Users can perform searches in:
 - P.A.M. only (for active media).
 - M.A.M. only (for archived content).
 - A federated search that queries both databases simultaneously.

Database Interaction & Search Capabilities

- MediaCentral | P.A.M. and M.A.M. are fully integrated, ensuring seamless media tracking from production to archive.
- Users can search across both databases, enabling fast retrieval of active and archived media.
- Metadata layers in M.A.M. provide detailed classification and retrieval options for archived content.

This integrated system ensures efficient management of all media assets, allowing seamless access to both recently recorded and archived material.

Applications

The Avid environment includes a hybrid virtualised and physical server infrastructure, optimised for performance and resilience.

Virtualisation & Server Architecture

- VMware nodes run most main applications, including Capture Manager.
- MediaCentral and SGL middleware are not virtualised, as they require high-performance processing.
- The system includes two dedicated physical MediaCentral nodes to handle intensive application demands.

Hybrid VM Environment

- Ingest (CAP01 & CAP02) → Virtualised.
- M.A.M. (Media Asset Management) → Virtualised
- Storage → Physical
- Indexers → Virtualised
- Retrieval → Handled by MediaCentral on two physical nodes.

The primary interfaces within this environment include:

- Avid MediaCentral
- Avid Capture
- MediaCentral UX

Editing Capabilities

- The system includes five Avid Media Composer edit stations for post-production and content preparation.

These were upgraded as part of the Record and Archive project and are in the Basement area and one in C.A.R.

Typically, these edit suites are used in O.B.U. production creation. The design of each of the edit suites is similar based around Avid media Composer software with suitable workstation hardware and peripheral equipment attached. The Edit Suites have connection to the Online storage which keeps over one year of clean media available.

Network Infrastructure

The Recording and Archive system operates on a high-performance network topology, utilizing a mix of 1 Gbit/s, 10 Gbit/s, and 16 Gbit/s switches.

- Primary connectivity is Ethernet, except for SGL middleware, which uses Fibre Channel.
- VMware nodes are connected to a dedicated SAN for high-speed data access.
- SGL archive nodes (A & B) utilise a separate Archive SAN (AR SAN).

Security & External Connectivity

- All external connections are routed through a pair of Fortigate firewalls, ensuring secure data access and transmission.

Resilience & Scalability

- The network is built on Cisco technology, designed for high availability and redundancy.
- Dual core switches provide a fully resilient infrastructure, allowing seamless failover and ensuring uninterrupted operations.
- The system is expandable, with the capability to add additional Fabric Extenders (FEX) for client connections.
- All critical equipment—including servers, VMs, Nexis storage, and FastServe ingest servers—is integrated into a redundant architecture for reliability.

Refresh of Core Elements of the Avid Recording and Archiving System (2023)

In 2023, the **Recording and Archiving system** underwent an upgrade to address the end-of-life status of core broadcast hardware and to enhance overall performance. This initiative focused on updating hardware, software, licenses, and maintaining bespoke processes within the system.

- **Health Check & Decision:** A thorough system health assessment led to the decision for an upgrade, targeting hardware components that had reached their 5-year lifecycle end.
- **Virtualized Core Infrastructure:** The system operates on a virtualized core comprising:
 - 21 Virtual Machines (VMs): Distributed across 3 server nodes.
 - Associated Storage Solutions: Ensuring efficient data management and retrieval.

The hardware upgrade encompassed several critical components:

- SQL Server Cluster: Enhanced database performance and reliability.
- Virtual Machine Stack: Upgraded to support advanced virtualization needs.
- vSphere Licenses: Updated to the latest versions for improved VM management.
- FlashNet SQL Server Cluster: Improved media asset management capabilities.
- FlashNet Storage: Expanded capacity to accommodate growing archival requirements.
- Editing Workstations: Five new Avid Media Composer edit stations were installed, offering editors the latest tools for content creation.
- MediaCentral Cloud UX Servers: Upgraded to support the latest software enhancements and user demands.

Software and Licensing Enhancements

- Alignment with Avid's "Most Recent Qualified Version" Principle: Ensured that all software components are up to date, guaranteeing continued support under the Service Level Agreement (SLA).
- MediaCentral Software Suite: As the primary user interface for operators, a significant update was implemented to enhance functionality and user experience.

Logging and Metadata

The media asset management process begins with data input in each gallery, where operators log metadata entries that become part of the MediaCentral P.A.M. environment.

Logging Process

- The Sound Operator is responsible for logging, as their primary audio tasks involve minimal adjustments to ambient sound levels.
- Logging occurs 15–20 seconds after the event, due to the delay in media being checked in from FastServes to MediaCentral P.A.M.
- In each gallery, a single operator manages graphics, sound, and logging simultaneously.

Metadata Entry & Structure

- Logged metadata enables searchability by speaker, date, and points of interest (P.O.I.).
- House metadata schema is followed within Capture Manager.
- Metadata logged includes:
 - Speaker name & political party
 - Business item under discussion
 - Timecode in/out (TC in/out)
 - Start & end time of the speaker's contribution.
 - Duration
 - File name
- Some metadata fields are automatically stored, while others require manual input by the operator.

Metadata Synchronization & Quality Control

- Logging is performed against the Dirty (captioned) feed, as on-screen speaker names assist in accuracy.
- Since editors require the Clean feed, a MediaCentral MAM script runs overnight, automatically copying metadata from the Dirty feed to the Clean feed. C.A.R. staff verify metadata transfer, ensuring completeness. If needed, metadata can be manually copied at any time via a simple user interaction.

Archive & Retrieval System

- Avid M.A.M. interacts with SGL middleware, enabling media archiving and retrieval from the LTO-8 library.
- SGL FlashNet is a content archive and storage management system, independent of Avid but fully integrated with M.A.M.
- M.A.M. relies on SGL to track material stored on each LTO-8 tape, using only the tape ID.
- When a user requests media via MediaCentral M.A.M., the system queries SGL, which:
 - Loads the appropriate tape.
 - Selects the correct segment for retrieval.

Archive Storage – Spectra Stack LTO-8 Tape Library

The Spectra Stack LTO-8 tape library, located in the basement rack room, is the central core of the archive.

Capacity & Scalability

- 160 tape slots, expandable to 480 slots.
- 4 LTO-8 drives, supporting 4 simultaneous operations.

- Each LTO-8 tape holds 12TB of data.
- One year of Clean material fits on approximately 13 LTO-8 tapes.

Management & Middleware

- SGL Middleware connects to the Spectra Stack library, tracking all stored media.
- SGL maintains an MS SQL database to manage tape information.
- A pair of SGL servers (SGL A & SGL B) operates in a cluster with a shared SAN.

Migration of Legacy Media

- The SGL middleware also manages the migration of older material.
- It connects to Sony Petasite to facilitate migration from LTO-4 to LTO-8.
- Currently, only LTO-4 material has been migrated.
- Future migration plans include legacy digital and analogue tapes.

Archive

The Oireachtas AV archive consists of approximately 71,000 hours of recorded content accumulated through past and current broadcasting contracts. The archive is stored in various formats, with ongoing migration efforts to consolidate all material onto LTO-8 storage.

Archive Breakdown

- 1990–2000: Broadcast Tape Archive
 - 17,500 hours stored off-site on approximately 20,000 videotapes (Betacam SP, Digital Betacam, and DVCAM).
- 1999–2009: Legacy Sony Petasite
 - 16,000 hours stored on DTF-2 data tapes.
- 2010–2019: Digital Archive on LTO-4
 - 37,500 hours stored on LTO-4 tapes in D10 format (MXF OP1A).
- 2018–Present: Current Digital Archive
 - 7,000 hours (or 12,000 hours including backups) stored in an LTO-8 StorageTek library.
 - Format: XDCAM HD422 1080i50 50Mbit/s (MXF OP1A).
 - Both clean and captioned versions are archived.

Archiving and Migration Strategy

- Since 2018, approximately 5,000 hours per year of both clean and captioned material are archived (rising to 8,000 hours per year with backups).
- 2010–2018 SD material (D10 format) was originally stored on LTO-4 but is now migrated to LTO-8.
- 2018–Present HD material is stored directly on LTO-8.
- Migration and digitisation of analogue tapes and Sony DTF-2 tapes began on July 1, 2020, and is nearing completion.

The ongoing migration project ensures long-term preservation and accessibility of the Oireachtas AV archive, consolidating all legacy formats into the LTO-8 standard.

Transcoding & Media Delivery

- Telestream Vantage, operating within the virtualised environment, handles all media transcoding workflows.
- Content designated for transmission is transcoded into the required format before delivery.
- External media delivery (e.g., to RTÉ or Virgin Media) is typically:
 - Transcoded using Telestream Vantage.
 - Transferred through the Fortigate firewall.
- Avid AirSpeed (4-channel) is used for baseband/video playback.
- Web & FTP transfers are also handled via Telestream Vantage.

Support & Monitoring

The Recording and Archive system is monitored entirely through Avid and SGL tools, with no separate third-party monitoring system. The Avid ecosystem provides built-in real-time monitoring across all components, including:

- FastServes
- Nexis storage
- MediaCentral
- VMware environment
- SGL middleware
- StorageTek LTO archive

The Avid Health Monitor application aggregates system data, allowing technical staff to oversee system performance and diagnose issues proactively.

Technical Support Structure

Level 1 Support – OBU Technical Staff

Oireachtas Broadcasting Unit (OBU) technical staff are trained to provide Level 1 support, handling:

- Basic troubleshooting & diagnostics
- Technical & user support for operational staff
- Status monitoring & reporting
- Routine procedures, including backups & verification.
- Planned system shutdowns & reboots.
- System resets & invoking standby systems.

- Installing basic applications & patches
- Assisting Level 2 support as required

End-of-Day Procedures:

At the close of business each day, technical staff must ensure:

- All recordings are complete.
- Proxy files are generated.
- LTO archive processes are finalised.
- Quality control (QC) checks are completed.
- All storage segments are present and accessible.

Level 2 & 3 Support – SLA Agreement

Advanced support is provided under a Service Level Agreement (SLA) with Tyrell and Avid.

- Remote access is available through:
 - vSphere Client (for virtualised machines)
 - LogMeIn (for secure remote troubleshooting)
- All external data interactions are routed through Fortigate Firewall systems to ensure security and compliance.

This multi-tiered support structure ensures continuous system monitoring, rapid troubleshooting, and secure remote assistance, maintaining the stability and reliability of the Recording and Archive system.

Broadcast Infrastructure and Playout Solution

The Oireachtas TV channel provides public access to the work of the Dáil, Seanad and Committees. Oireachtas TV, launched in 2014, is available nationwide on multiple platforms:

- Saorview – Channel 22
- Virgin Media – Channel 207
- Sky – Channel 517
- eir Vision – Channel 504
- Vodafone – Channels 201 (Oireachtas TV), 207 (Dáil Éireann), and 208 (Seanad Éireann)

The project was implemented to provide a 24/7 automation channel to the Houses of the Oireachtas. The SiMedia playout system deployed in Oireachtas TV, provides a comprehensive, client-server-based broadcast automation solution. Central to the system architecture are Dell servers housed in the basement racks (R110/111), with operator workstations located in Transmission Control, CAR, and the basement. The platform supports ingest, scheduling, media asset management, and automated playout with full redundancy, leveraging a robust suite of tools including MediaPlayer, MediaDevice, MediaList, and MediaCG for graphics and subtitling. Eight ingest channels feed into a resilient architecture of main and backup playout servers, with seamless switching facilitated through remote failover controls. Operator access is managed via a Guntermann & Drunke KVM matrix, enabling real-time interaction with recording systems, MAM databases, and control interfaces. This system underpinned Oireachtas TV's reliable delivery of scheduled programming and live broadcasts with integrated graphics and automated workflows

In 2021 the system underwent a significant upgrade to address some deficiencies in the earlier system namely: Standard Definition (SD) playout only, use of Microsoft Windows 7, IT hardware and playout devices at end of useful life, functional deficiencies related to subtitling and on-air graphics and insufficient resilience.

At the core of the 2021 solution is a central repository built on an industry-standard SQL database, providing comprehensive Media Asset Management (MAM) functionality. The system enables the creation of playlists that form the schedule of events and includes hardware capable of recording media directly into the platform. Crucially, it supports frame-accurate access to content while it is still being recorded—essential for fast turnaround scenarios such as a 12-hour Dáil sitting, where immediate availability of content is required for marking and playout scheduling.

The solution also features an integrated subtitling system, allowing subtitle files to be linked to media assets within the database for automatic playout and preview. Subtitles can

be generated in multiple ways, including via .mp4 exports sent to external transcription agencies.

Enhanced channel presentation was a key improvement in the 2021 system, with more effective use of graphics and animated loops to deliver smoother transitions between events.

Oireachtas Broadcasting Unit (OBU) operates a dedicated Recording and Archive System (RAS) based on Avid technology. This system is used for recording all sources, with metadata applied in the galleries and content archived to digital linear tape (LTO-8). The playout system interfaces with the RAS and supports the creation of low-resolution transcodes of the day's live feeds for web distribution. The proxy generation will be performed simultaneously with the high resolution for the base band recording and from a dedicated proxy server for the file ingest. With the proposed hardware, the transcoding performance of hi-res to low-res for the required purposed can be carried out between three to four times real time.

The system ensures continuous operation with:

- Main and Backup Playout Servers, connected via changeover switches.
- Remote failover control, enabling seamless backup activation.

On-Air Graphics & Subtitling

Graphics System

The MediaCG Software manages:

- Logos, Crawls, Images, Videos, and Animated Graphics.
- MediaCG Editor for real-time graphic project creation.
- MediaCG Player, which airs graphics manually or automatically.
- Integrated scheduling, ensuring accurate playout of graphic elements.

Subtitle System

The live channel supports the late binding subtitle insertion with:

- Offline Subtitle Preparation Workstations.
- Main and Backup Subtitle Inserters. The inserters are not tied to a defined playout device and may be wired using the router to allow either inserter to work with either playout server and/or in Preview Mode.
- Seamless automation integration for real-time subtitle playout. □The new Subtitling portion of the Playout system provides the functionality to create, preview and automatically play closed caption subtitles.

Screen Subtitling Polistream system includes

- Polistream Host Platform supporting all Polistream software modules. The dual power supplies avoid down-time during UPS battery swap out to keep subtitles on-air 24/7
- HD/SD-SDI INSERTER/KEYER CARD VBI and VANC inserter card. Inserts onto one channel of digital video. Inserts data into VBI lines for SD video and VANC data packets for HD video.
- CHANNEL PLAYOUT SOFTWARE - supports any form of subtitle playout from file.
- Subtitles are inserted from standard STL file into HD-SDI as VANC data packets associated by VITC timecode (from the incoming HDSDI).

Network Infrastructure

All server/workstations are fitted with dual NICs and the Network is equipped with 2 off 1Gb/s capable 48 Port switches.

- 1Gb network backbone for high-speed data transfer.
- Additional interface units for the KVM Matrix, ensuring ease of operation across workstations.

The Automation System Network is created on a .150 sub net.

The network will facilitate data connection between the various elements that make up the automation system as well as communication and data transfer to external connections as follows

Avid to SiMedia; Copper connection from SiMedia Aruba Switches in Basement to Avid Core Network Switches in Rack 2 C.A.R. Transfer from Avid to SiMedia; Use FTP for file transfer from Avid to Simedia. File transfer from Simedia to Avid Single IP connection between Simedia system and Snell router; Copper connection from SiMedia Aruba Switches in Basement to Sirius Router in Rack 6 (via NW T.P.s in Rack 110 Basement and Rack 11 C.A.R. Dual IP connection between Simedia systems and NTP; With connection implemented to Avid

Core NW, these links can be used to carry the traffic between the Simedia systems and the NTP servers on the SPG machines in CAR.

Remote access for operators; OBU will implement VPN through the firewall (Fortigate) for remote access for operators. This will require a connection between the Firewalls in CAR and Basement Racks. Copper connection from SiMedia Aruba Switches in Basement FortiNet Servers in Rack 34 (via NW T.P.s in Rack 110 Basement and Rack 11 C.A.R.

Remote access for Simedia engineers; Simedia will run the Supremo server (like Teamviewer) on the MAM SQL server for remote access to the new system.

PC access from TX suite to Simedia servers; Copper connection from SiMedia Aruba Switches in Basement to Network Term Panel in TX Control (via NW T.P.s in Rack 110 Basement)

PC access from CAR to Simedia servers; Copper connection from SiMedia Aruba Switches in Basement to Network Term Panel Rack 11 C.A.R

Broadcast Presentation Switcher & Resilience

Main and back-up engines are employed for the critical applications including, Graphics, Transcoding, Databasing, Subtitling and Payout.

To enhance operational reliability:

- A Broadcast Presentation Switcher mitigates single points of failure and reduces reliance on the house router. The system has a 16-channel vision desk (Playout Presentation switcher) which is controlled by the automation and support keying facilities. The desk supports various transitions which will be scheduled from the Automation System.
- External character generators (Main and backup), are used with fill and key, sending the output of the video board to the Presentation Vision mixer.
- Two broadcast paths:
 - Main Path: Uses the Broadcast Presentation Switcher. The Playout engines feed separate paths. The Main Path enters as a source to a 16 input Presentation Switcher with keying facilities (Fed with all main TX sources including live sources, outputs of the playout/ recording machines and router outputs)
 - Backup Path: A House Router Selection Panel acts as a source selector for the Reserve Path
- Each path includes failover mechanisms, down-res conversion, and OP-47/OP-42 subtitle encoding for SD transmission. Main and Reserve feed mirrored Distribution Amplifiers and Format Converters (Ross Xconverter), that send the Channel output via separate Encoders (SD) to Platform Distribution on diverse Fibre Paths. The changeover will happen automatically or be directly controlled by a dedicated tool in SI Media automation system. Inside the UI, there will be a button to control the switch between SDI1 and SDI2 of the embedded changeover card (Ross Xconverter), to force the switch between main and backup.

Technology, Standards and Performance

- The solution is fully broadcast quality High-Definition HD-SDI sampled at 1080i/25 and conforms to the SMPTE 292M standard.
- Legacy SD material (pre-2018) in the archive is recorded at 50Mbits/s MPEG 2 (IMX 50) conforming to the SMPTE 356M standard. The system plays this content in its native format
- All audio is embedded in the SDI
- There are two independent network paths from the OBU to RTÉ.
- The Main Playout signal can be fed to either and both encoders and the Backup Playout signal can be fed to either and both encoders
- The legacy material residing in the old playout system was encoded at 10Mbit/s MPEG2 SD; Resolution (720x576). Audio: MPEG Layer 2, stereo, 256Kbit/s. This is supported.
- Material recorded in the Avid system is high definition compressed at 50Mbit/s XDCAM HD 4:2:2 Long GOP in an MXF wrapper. Audio is uncompressed. This is supported.
- The browse proxy standard is set at 1 or 2Mbit/s H264 for video, MPEG1 Layer 2 @192Kbit/s for audio in MP4 wrapper.

Transmission Control Room – Oireachtas TV

The Transmission Control Room (TX Control) is the central operator interface for managing live broadcasts on Oireachtas TV. It serves as the control hub for all on-air operations, scheduling, and monitoring, interfacing with the core hardware housed in the Central Apparatus Room (C.A.R.).

Operator Workstations & Responsibilities

The control room is designed to support four operator positions, each responsible for different aspects of live transmission and content management:

1. Long-Term Scheduling
 - Programme planning.
 - Content ingestion and media asset management.
2. Short-Term Scheduling & On-Air Operations
 - On-Air Presentation – Real-time playout control.
 - Schedule Updates – Adjustments to live and pre-scheduled content.
 - On-Air Graphics – Management of overlays and branding.
 - Channel Output Monitoring & Control – Ensuring smooth, uninterrupted broadcast.

Each operator workstation is connected via an Ethernet-based KVM matrix (Guntermann & Drunke) providing secure and flexible access to the following critical systems:

- Players & Recorders – For media playback and content capture.
- Preview Systems – Real-time preview of scheduled and live content.
- Media Asset Management (MAM) – Access to stored media and metadata.
- Logger – Live logging of events for compliance and archiving.
- Remote Access Units – Secure external control of transmission hardware.

Monitoring & Multiviewer Display System

The main monitoring display wall consists of four NEC P552 screens configured in a 2 x 2 layout, showing real-time video feeds via the house router's multiviewer system. The display setup provides a comprehensive visual overview of:

- Live feeds from all chambers.
- Main & Reserve Playout and Preview channels.
- SiMedia ingest servers (for content capture and replay).
- Main DA feeds and Off-Air return feeds.

In addition to the central monitoring wall, the TX Control desk includes:

- PC workstations running SiMedia applications, with local video monitoring for real-time playout control.
- On-desk video previews for precise operator control over scheduled content.

Audio Monitoring System

The room features a high-quality audio monitoring system, ensuring accurate transmission audio control. Key components include:

- Genelec Studio Monitors:
 - One stereo pair dedicated to transmission audio monitoring.
 - One stereo pair fed directly from the router for master control.
- Operator Desk Audio Monitoring:
 - Switchable headphone amplifier for individual monitoring.
 - Small local loudspeaker for nearfield audio previewing.
 - Selectable audio sources, allowing operators to monitor multiple feeds.

The Transmission Control Room serves as the nerve centre of Oireachtas TV, enabling seamless control, real-time scheduling, and high-fidelity monitoring. With a fully integrated KVM system, advanced multiviewer displays, and dedicated audio monitoring, operators maintain complete oversight of live and scheduled broadcasts, ensuring uninterrupted and high-quality public service transmission.

Distribution

1. Live Channel, distribution to RTE, distribution to service providers
2. Houses of the Oireachtas Web Distribution
3. Houses of the Oireachtas Internal IPTV, delivery to Digital Signage
4. Outside Broadcast Points
5. Circuit and Distribution interface points

Live Channel, distribution to RTE, distribution to service providers

The Live Channel has built in redundancy/resilience throughout its system. The playout path follows a Main/Back-Up architecture with the encoded output signals (Main & Back-Up) leaving the building on separate/diverse routes for distribution within RTE Donnybrook. (Other platforms facilitate their own distribution paths). Encoder A is transported via HEANet to MMR1 (Meet Me Room) in the Administration Building, RTE Donnybrook and Encoder B is transported by Virgin Media to MMR2 in the Radio Building, RTE Donnybrook. In both locations, in R.T.E., the received signals are cross distributed across campus to both MMRs to present resilient feeds to the distribution platforms. In addition, the signals are distributed to the Pres.Rack Room in the TV building to service other providers distribution endpoints and monitoring in RTE External Department. Confidence monitoring feeds, from both MMRs, are returned to Kildare House and displayed in C.A.R., using low cost H264 Encoders, in R.T.E, matched to decoders in Kildare House.

The Live Channel output is delivered from C.A.R., using SD encoders and sent by diverse paths to RTÉ (TV and Radio Buildings) before diverse presentation to the Saorview/eir inject points in RTÉ Donnybrook. The connectivity for the two paths is provided by HEANet and VIRIGN MEDIA. Each path has its own encoder and decoder.

To meet the needs of HD delivery to the Sky platform, a HD encoder decoder solution was installed.

Oireachtas TV, along with individual chamber outputs in some cases, is distributed to multiple broadcast platforms through a combination of baseband and IP paths. The key distribution methods are outlined below:

- Sky: Receives the HD playout signal directly from the Oireachtas through a 20Mbps connection to both Meet Me Rooms in RTE. The locally HD-encoded signal is HD-decoded at RTÉ and routed into the local Sky headend for transmission.
- Saorview: Receives the SD playout from the Oireachtas Broadcast Unit. Local SD encoding is performed at the Oireachtas site, followed by SD decoding at RTÉ for integration into the national Saorview platform. The diverse receive paths are distributed to provide availability for other platforms.

- Eir Vision: Uses a dual-feed approach. One feed is received at RTÉ for local SD distribution, while a second is delivered directly from the Oireachtas Broadcast Unit as an IP feed.
- Vodafone: Operates its own encoding infrastructure on-site at the Oireachtas, ingesting the Oireachtas TV channel as well as HD feeds from both the Dáil and Seanad chambers.
- Ulster Television: Maintains a dedicated on-site network connection interfaced to a network switch/Live U.....
- Virgin Media: Connected through their own on-site encoders.

Confidence Monitoring

- H.264 encoders at the MMRs in RTÉ send monitoring feeds back to Kildare House.
- Decoders display these feeds in the Central Apparatus Room (C.A.R.) for real-time quality control.

The channel has extensive redundancy features and comprehensive emergency switching. A Soft Panel Interface can be accessed remotely. This may be used “out of hours”. A limited access TeamViewer session allows remote access to approved operators and Technical Support, both to the Live Channel equipment in OBU. All remote access is dual authenticated.

The incoming provider will implement a monitoring and fault reporting regime for the linear Oireachtas broadcast channel on the platforms of SKY, VIRIGN MEDIA , eir Vision and Vodafone IPTV. Domestic receivers are in the C.A.R. area and their output is displayed on a multiviewer for this purpose. The monitoring will endeavour to capture any errors on Video, Audio and ancillary services. Video monitoring will include the following. Video freeze frames, black flashing, picture pixilation and the absence of compression artefacts. Audio monitoring will include absence of clicks, chirps and excessive compression artefacts.

Houses of the Oireachtas Web Distribution

The Houses of the Oireachtas online distribution system is maintained under arrangements outside the scope of the Televising Contract and is managed by the Web Team within the Communications Unit. The Bluebell encoders which handover signals are installed outside the OBU in Kildare House.

The Televising Contract Service Provider is responsible for making available content feeds to the Web Team who then handle all aspects of live streaming on Oireachtas.ie and the Oireachtas app.

Houses of the Oireachtas internal TV distribution system

The internal TV distribution system is maintained by Office of Public Works (OPW), separate from the Televising Contract. The head-end for this system is installed in C.A.R.

The Televising Contract Service Provider is responsible for making available 16 AV content feeds to the TV distribution system head-end. These feeds comprise:

- Dáil chamber (captioned output)
- Dáil chamber (sequenced spotter cameras output - Whips)
- Seanad chamber (captioned output)
- Seanad chamber (sequenced spotter cameras output - Whips)
- Committee room 1 (captioned output)
- Committee room 1 (sequenced spotter cameras output - Whips)
- Committee room 2 (captioned output)
- Committee room 2 (sequenced spotter cameras output - Whips)
- Committee room 3 (captioned output)
- Committee room 3 (sequenced spotter cameras output - Whips)
- Committee room 4 (captioned output)
- Committee room 4 (sequenced spotter cameras output - Whips)
- On request (video replay facility)
- Six-way split screen output (Dáil, Seanad, Committee rooms 1 – 4)
- Four-way split screen output (Committee rooms 1 – 4)
- Oireachtas TV

The RF Systems are managed by the OPW.

A parallel update to the distribution system was carried out with the installation of a digital signal distribution. Due to the presence of many older TV sets without digital tuners the legacy analogue distribution system could not be decommissioned. Both systems now work in parallel.

The digital delivery system is used to connect various screens throughout the complex that act as Digital Signage outlets.

OB points

Several Dark Fibre Outside Broadcast (OB) points exist in and around the area of the Leinster House / Kildare House complex, Kildare Street, Dublin 2. There is dark multi-mode fibre at each point; there is no active equipment at each point. The points have not been used to any great degree except for the plinth connection due to the increased use of wireless connectivity over devices like LiveU. The fibre to the plinth was replaced in recent years.

OB Points are as follows:

- Two points located at Molesworth Street (Leinster House in background)
- Two points located at the Plinth (inside gates of Leinster House)

- Two points located at Siopa (covered area with Leinster House in Background)
- Two points located at Government Buildings
- One point located in Government Press Room
- One point located in Taoiseach's ante room
- One point located in AV Room Ground Floor
- One point located in AV Room Basement
- Two points located at Portico
- Two points located at LH2000 Reception

Connectivity between the OBU Central Apparatus Room (C.A.R.) and these OB Points was upgraded in 2008. Portable 'kits' exist within OBU, containing electrical to optical fibre transmitters and receivers, for use with these points.

All technical equipment must be EU certified and be appropriate for its planned use.

Video, Audio and Timing Standards

Video Standards

SMPTE ST 2110 (IP-based)

A suite of standards for transporting video, audio, and ancillary data over IP networks in real-time.

- ST 2110-10: System timing and synchronization
- ST 2110-20: Uncompressed video over IP
- ST 2110-21: Traffic shaping and delivery timing
- ST 2110-30: Audio over IP (see audio section)
- ST 2110-40: Ancillary data (e.g., captions, timecode)

Resolution Support: SD, HD, 3G-HD, UHD

Compression: Uncompressed

SMPTE ST 259 / 292 / 424 / 425 (SDI-based)

- ST 259: SD-SDI (Standard Definition)
- ST 292: HD-SDI (up to 1.5 Gbps)
- ST 424: 3G-SDI (up to 1080p)
- ST 425: 3G-SDI Level A and B mapping for 1080p video

Still widely used for SD and HD baseband video in traditional or hybrid SDI-IP facilities.

Audio Standards

SMPTE ST 2110-30 (Audio over IP)

- Based on AES67, this standard enables uncompressed linear PCM audio streams over IP.
- Supports multichannel formats including stereo, 5.1, and 7.1.
- Synchronized using PTP (Precision Time Protocol).

AES67 (AoIP Interoperability)

- An interoperability standard for professional Audio over IP systems.
- Ensures seamless integration between vendors such as Dante, Ravenna, Livewire+, and others.
- Used in both broadcast and live sound environments.

Dante (by Audinate)

- A widely adopted proprietary AoIP protocol.
- Uses standard IP networks for high-quality, low-latency audio.
- Natively compatible with AES67 for interoperability.
- Commonly used in both broadcast and corporate AV settings.

AES3 (AES/EBU)

- A digital audio transmission standard using XLR (balanced) or BNC (unbalanced) connectors.
- Frequently used for inter-device digital audio connections in baseband workflows.

Analogue Audio Standards

- Standard professional analogue audio is typically line-level at:
 - +4 dBu balanced (professional standard)
 - -10 dBV unbalanced (consumer level)
- Balanced connections are typically made using XLR or TRS connectors.
- Still used in some baseband environments or as failover paths in critical systems.

Synchronization and Timing Standards

SMPTE ST 2059

- Defines use of PTP (IEEE 1588-2008) to synchronize IP-based media devices.
- Provides frame-accurate sync for video, audio, and ancillary streams.
- Replaces traditional sync sources like blackburst in IP environments.

Other Timing Protocols and References

- PTP (Precision Time Protocol): Primary IP-based synchronization protocol for SMPTE ST 2110 systems.
- NTP (Network Time Protocol): Used for non-time-critical synchronization (e.g., clocks, logs).
- Black & Burst: Analog video sync signal used in SD environments and as reference for SDI-based systems.
- Tri-Level Sync: High-precision sync reference used in HD and 3G-SDI environments, offering better timing accuracy than blackburst.

An Evertz master / slave SPG system is installed with changeover and a master clock / timecode reference system.

Miscellaneous signal processing equipment installed includes video aspect ratio converters (used for legacy video content that was originally recorded in 4:3 aspect); ISDN and POTS telephone hybrid units, audio delay synchronisation equipment.

Miscellaneous signal processing equipment installed includes video aspect ratio converters (used for legacy video content that was originally recorded in 4:3 aspect); ISDN and POTS telephone hybrid units, audio delay synchronisation and dynamics equipment.

Central Apparatus Room (C.A.R.)

The C.A.R. for the Houses of the Oireachtas televising operation is located on the ground floor of Kildare House.

C.A.R. acts as the engineering and operational hub for signal handling and monitoring (including quality control – QC) of televising operations. C.A.R. houses all infrastructure for the Live Channel.

Technical Monitoring Position

C.A.R. is the endpoint of termination signal circuits to and from Leinster House, used principally for cameras and audio respectively, and for circuits to OB points, broadcasters and other distributions, such as RF ring main and web-streaming.

A monitoring and control position exists within C.A.R. The latest facility upgrade included a new furniture layout to assist comprehensive monitoring.

The position contains several video and computer data monitors, designed to give 'at a glance' state of health monitoring of outputs from the chambers and committee rooms; key processes associated with the current Digital Archive; and general roving monitoring of OBU / C.A.R. operations.

Video and audio monitoring are installed to allow continuous assessment of the chamber and committee room main outputs. These, via a display in the monitoring area, inform the operator in C.A.R. as to potential anomalies with the outputs such as video at black, or frozen, and audio silence events, such that any issues may be identified and resolved at an early stage.

Other duties carried out at the technical monitoring position include routine content QC spot checks and follow up QC checks because of potential anomalies identified.

General Digital Archive administration is also performed at the monitoring position.

C.A.R. acts as the engineering and operational hub for signal handling and monitoring of televising operations, both the Recording and Archive section as well as the live channel Oireachtas TV.