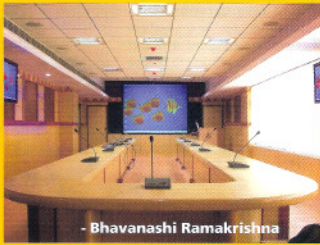


Scripting A Security Encryption



- Bhavanashi Ramakrishna

The Research Centre Imarat (RCI) at Hyderabad - the nerve centre of India's defence strength - is one of the most strictly guarded security spaces in the country, by virtue of its very nature. Providing an A/V solution for conferencing facilities at such a place is an equally sensitive proposition which has been deftly handled, amidst several challenges. OS, this time, presents a riddle from the RCI.

The Research Centre Imarat (RCI) - part of the Defence Research Development Laboratory (DRDL) campus at Kannchanbagh on the periphery of Hyderabad - constitutes one of the most stringently guarded places in the country, owing to its role, together with its more noted parent establishment, in the defence expertise mechanism.

A brainchild of India's celebrated missile scientist Dr. APJ Abdul Kalam, and said to be an Arabic equivalent of 'emirate,' in nomenclature, the Imarat occupies the innermost recess of the DRDL, a place which actually signifies its importance.

Designing a boardroom for the director of such an establishment, obviously, comes with a high degree of sensitivity about the security of the whole proposition. This being the backdrop, the job, taken after stringent procedural protocols, wasn't that easy though the project spec does look a little simpler.

"The brief was to set up an audio / visual system with conferencing facility in the director's boardroom," informs Jaleel H Sabir, chief of The Sound Room, a noted Hyderabad-based A/V system integration firm entrusted with the task. "It was taken as a turnkey project that included supply, install, integration and commissioning of the system."

According to him, the work involved custom designing the conference table, a controlled-

wireless conferencing system with RF digital encryption but with open frame design for future expansion. A rough outline of the system design required a minimum of six channels with routable outputs, including PC control software, projector with 3000 ANSI lumen wide XGA with motorized zoom and focus control, XGA distribution amplifiers, plasma displays, A/V routing matrix processors, document camera, and of course, microphones powered by encrypted software.

There were apparently many challenges. The room is located in the second floor of the building, measuring 60.0' x 21', and already provided with central air-conditioning system false roofing. Originally designed by RCI's in-house Military Engineering Services (MES), the basic purpose of the space was to conduct technical meetings aided by a front projection system for high profile officers, with a seating capacity for 25.

"The first challenge came from the very shape and size of the room and the way its interiors contrasted with the given specs," says The Sound Room chief. In order to create the desired ambience and ease of maintenance, the architects chose veneer covered walls, wood flooring and POP ceiling. Huge windows meant to let in natural light were covered by vertical blinds. The wall was covered with fabric panels to

The A / V Script

- 130-inch DNP Supernova screen
- Encrypted & self-powered Audio
- Concealed speakers
- Concealed cabling
- Portable configuration

• INSTALLS •

reduce reverberation. This, according to the system integrator, dictated a major rework of infrastructure before they ventured on A/V set up.

The main points culled out of the situation included:

- An over sized screen in a 3:4 ratio to suit the long room and seating layout
- Additional screens for all the seats to enable a good view of the projected content
- Very specific ceiling speaker locations and zoning

Since much of the interior work was completed before the system integrator stepped in, they had to remove the wood flooring, install under floor cable ducts, run conduits for cables in the two long side walls for the plasma screens. Then erect the screen wall for a rear projection system, and install the speakers in the false ceiling - instead of mounting them on the walls - and then provide routing to adjacent rooms for remote I/O.

"We had design the conference table to ease out routing of various cables and power to all the seating locations," informs Sabir, "this was a departure from conventional, but allowed us to have control over the table surface finishes etc which was vital to reduce surface reflections of the main screen and enhance the viewing experience."

Central to the A / V integration is its portable configuration. It enables the system to be shifted to other areas as and when required. The only controls on the system are video source selection and volume for the presentation speakers and a power switch!

The entire system solution was designed to be controlled by three main units:

- A Kramer presentation switcher with FSR concealed conference table top AV input that takes care of the VGA source selection, including routing signals to the main projection screen as well as the plasmas, and the monitors installed outside the room
- A Beyerdynamic MCW-D 200 Editor conference control unit for controlling the wireless conferencing between the chairman and the delegates
- An Ashly Protea 24.24 audio matrix processor for routing 12 balanced audio inputs and 8 balanced audio outputs, that include those from the two other main components in the network

Unique Audio

Choosing Beyerdynamic MCW-D 200 was significant in that it fit into the client's specific requirement for secured wireless conferencing solution. The system is characterized by a PC control that authorizes each mic with a 1024-bit encryption. This encryption provides the choice of which of the supplied units are allowed participate in the conference, and once the chosen ones are specified, the rest get locked out and cannot receive the audio from the conference.



The RCI Director's Boardroom. Equipped with one of the largest DNP Supernova screens and special echo-cancellation and encrypted audio mechanism, the A / V set up is one of its kind.



The rear-projection mechanism with a double-mirror rig (left), and the A/V system rack (right)

"However, this is still an open-ended system which allows addition of more number of microphones," Sabir explains, adding, "this was done keeping in view the future prospects of expansion to larger conferences. The user doesn't need to re-work on the system then."

Besides the encryption of wireless conferencing, the audio is also unique in one more aspect. Incorporation of Custom self-powered presentation speakers that are designed with ribbon HF element for tight control on vertical dispersion.

This effectively reduces ceiling and floor reflections. The moment a delegate switches his/her microphone button (before speaking into the microphone), the ceiling-mounted speaker overhead automatically reduces its output-only the rest will perform optimally.

"This effectively means that the delegates will hear the speaker much better than the speaker himself," says Feroz Ahmed Khan, who handled the entire installation. "This way, neither the speaker nor the delegates would experience any echo," he says. According to him, it is a remarkable aspect in that

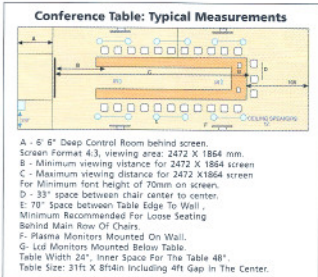
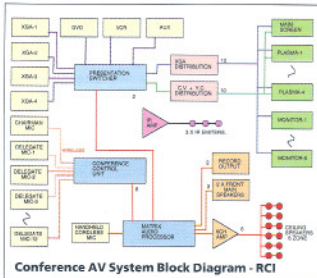
'this speech intelligibility was achieved without any structured acoustic treatment to the space.'

"There were no pre-configured or installed acoustics in the room, except the veneer and the fabric covers," explains Feroz, "we evolved the design to do away with the predicament."

The audio is powered by Ohm CL3T ceiling speakers and Crown CP660 six-channel amps. Shure cordless lapel microphones are also included in the configuration, but are used only when presentations are made from the podium.

Rear Projection

Another important aspect is the use of rear projection system. The Sound Room incorporated a 130-inch DNP Supernova screen - said to be one of the largest screens from the Danish manufacturer - at the rear end. The screen is powered by a 5000 ANSI lumen Sony projector fixed in a double mirror rig behind the screen. A separate cabin had been created for housing the rig and the projector.



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Model No.	Description	Qty
Beyerdynamic MCW-D 200	MCW Digital Central control unit: D555- Direct Sequence Spread Spectrum, 2.4 GHz, 5 transmitting and 4 receiving channels (expandable); operating mode: voicecontrol/manual/request to talk; voting and interpreter. 19"-housing, 2 HU, optional antenna. Only for MCW-D units of the 2000 series	1
Beyerdynamic MCW-D 2023	Chairman microphone unit with integrated transceiver (2.4 GHz, D555), antenna, battery and loudspeaker. For MCW-D 200 control unit	1
Beyerdynamic MCW-D 2021	Delegate microphone unit with integrated transceiver (2.4 GHz, D555), antenna, battery and loudspeaker. For MCW-D 200 control unit	12
Beyerdynamic CA 2450	Optional pcb for 1 transmitting/1 receiving channel 2.4 GHz D555	2
Beyerdynamic CA 2411	Angled rod antenna 2.4 GHz, N(HF) plug	3
Beyerdynamic MCW-D 200 Editor	Windows editor software (freeware) for digital wireless conference system (supplied with control unit). Only for MCW-D 200 control unit	1
Beyerdynamic MCW-D 200 Editor	Optional pcb for individual Audio In/Out, for MCW-D 200 central control unit	1
Beyerdynamic LE-D 10	Charging unit for up to 10 microphone units MCW-D 200	1
Beyerdynamic MCW-D 200 Controller	Windows application software for digital wireless conference system. Only for MCW-D 200 control unit	1
DNP130* NWA	130" New wide angle screen back projection screen	1
DNP130* TMR	130" twin mirror rig assembly	1
Sony	5000 ANSI Lumens XGA LCD Projector with 1.2-1.8:1 Zoom	1
Kramer VP 23XL	AV presentation switcher with minimum 4 each of S.Video inputs, XGA inputs, composite video inputs and audio. Minimum video bandwidth of 250MHz, PC controllable	1
Kramer VP 12XL	XGA distribution amplifier with 12 outputs, minimum bandwidth of 300MHz. PC controllable	1
Kramer VM 10YCxL	YC. CV. Audio switcher, distribution amplifier. 1 input 10 outputs	1
OHM CL 3T	Ceiling speakers 12 numbers. Bohm load. 20w.	12
Ashly Protea	Audio routing matrix processor with 12 balanced audio inputs and 8 balanced audio outputs. With levelling, AGC, Dynamic eq, noise gate and matrix output	1
Crown CP660	Six channel amplifier. Minimum 60 watts average power per channel into 4 ohms load Custom Built Presentation Speakers AV presentation speakers, full range. Active Monitors	2
Samsung UF80DX	Digital presenter	1
Shure EUC24/58	Wireless Uni - Directional Dynamic Microphone System	1
Custom Designed Conference Table	Custom designed conference table for seating of 25 with lan, with three VGA/audio input points, and power points built in	1
IR Extender System	Infrared Emitters and receivers	2
Equipment Rack	Equipment rack to house all the equipments	3
Podium	Custom Designed Lectern	1
Cable top boxes	Hideaway Surface Access Enclosure	3
Interconnects	Interconnects, connectors etc.	1
Back Projection Room	Back Projection room with a control room and a store room with masking and frame work and POP finish with provision for Active Monitors	1

In addition to the DNP screen, four additional plasma monitors have also been mounted on the walls - two each on each side to enable better view of the video content to the delegates.

The video also includes a Samsung digital presenter for meeting the requirements of projection of paper presentations. The system is also enabled to project 3D images of objects- meaning objects, however minute they are, can be seen in finer details in magnified images on the Supernova screen, as well as the plasmas.

Portable System Integration

Central to this entire, unique system integration, according to The Sound Room, is its portable configuration. The audio and video systems are installed in their respective racks to enable the system to be shifted for use in other areas as required by the client. The only controls on the system are video source selection and volume for the presentation speakers and a power switch. Rest of the functions is all automated, enabling very easy day to day operation.

"Most installs of this type are not designed to be portable" says Jaleel. "In many cases, we concentrate only on the AV part," he explains, "here, the client wanted a portable configuration so that it can be used on other locations as and when required."

Overall, the AV system integration is one of the very different installs that had the elements of security, encryption, portable nature et al.

