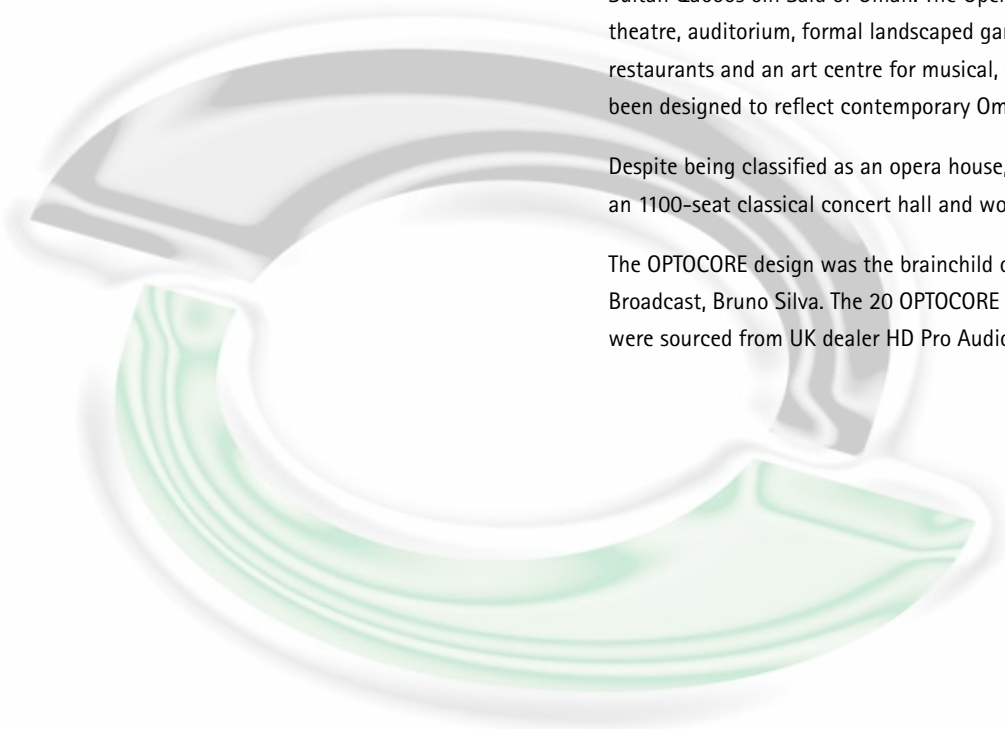# OPTOCORE

Installed Sound

Royal Opera House
Muscat, Oman

Occupying an eight-hectare site, the magnificent new Royal Opera House Muscat (ROHM), which officially opened this Autumn, was built on the royal orders of Sultan Qaboos bin Said of Oman. The Opera House complex, consisting of a concert theatre, auditorium, formal landscaped gardens, cultural market with retail, luxury restaurants and an art centre for musical, theatrical and operatic productions, has been designed to reflect contemporary Omani architecture.

Despite being classified as an opera house, the main space actually transforms into an 1100-seat classical concert hall and world-class organ recital hall.

The OPTOCORE design was the brainchild of ROHM's Deputy Head of Sound & Broadcast, Bruno Silva. The 20 OPTOCORE components that make up the network were sourced from UK dealer HD Pro Audio and installed by UK-based NMR.
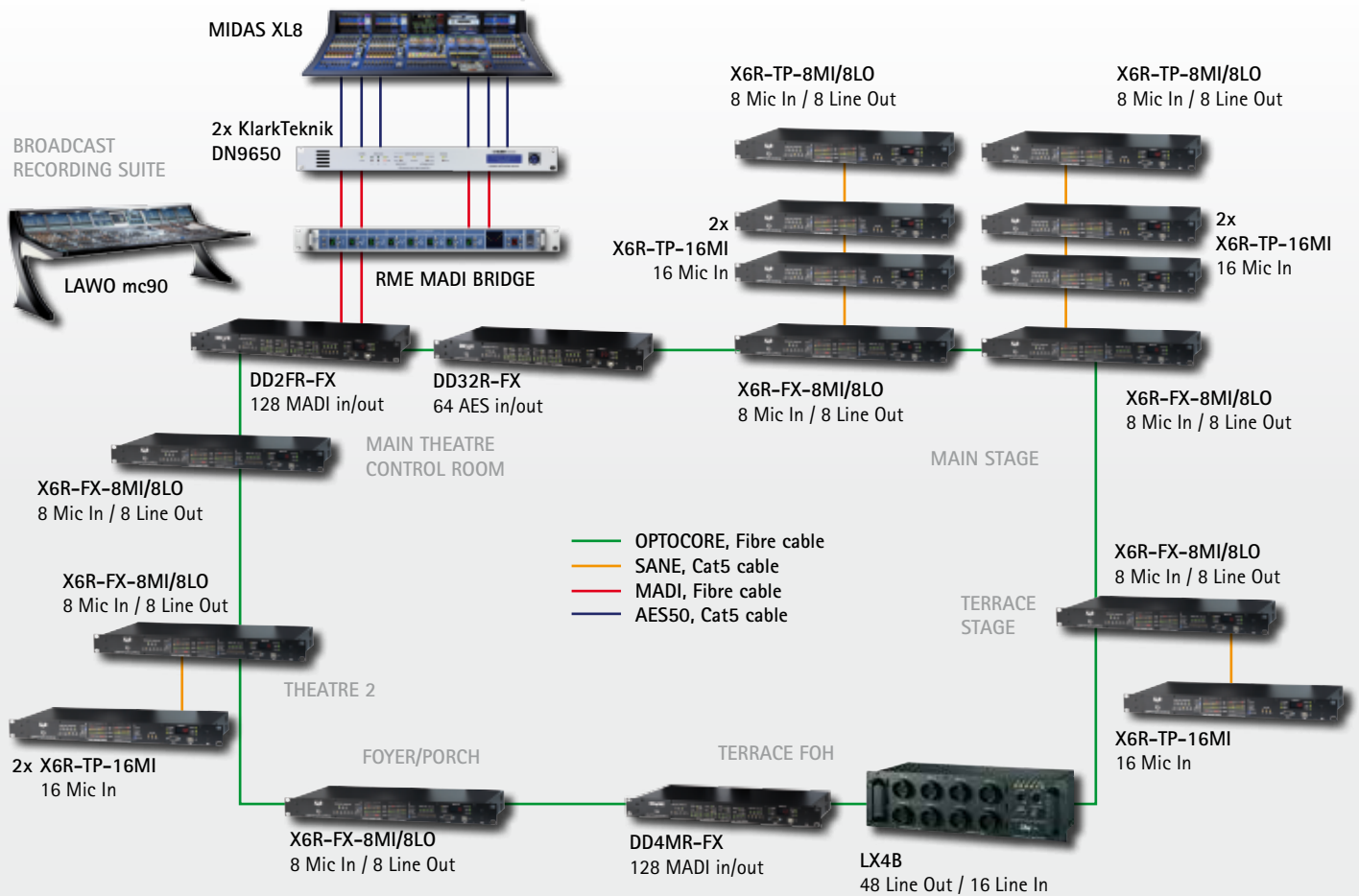
OPTOCORE – the only solution

Bruno Silva was already familiar with the OPTOCORE functionality, flexibility and reliability from his time spent in London, where as Head of Sound he helped design the Kings Place Music Foundation in 2008 around OPTOCORE devices. Prior to that he had first been exposed to this leading optical digital network system while working at Casino Estoril, in his native Portugal.

He, and the remainder of the experienced resident sound team — comprising Collin Chivers from the Royal Opera House Covent Garden, and Mike Compton, from the Royal Shakespeare Company — joined the project at the end of 2010, and immediately made some modifications to the original project spec.

System designer has chosen the OPTOCORE R-Series analog and digital devices, but also took advantage of OPTOCORE backwards compatibility using LX4B as analog feed. Now the Royal Opera House uses the latest 2.14 OPTOCORE Control Software will all the latest features available.

System Diagram and Components

OPTOCORE

MIDAS XL8

2x KlarkTeknik DN9650

BROADCAST RECORDING SUITE

LAWO mc90

RME MADI BRIDGE

DD2FR–FX
128 MADI in/out

DD32R–FX
64 AES in/out

MAIN THEATRE CONTROL ROOM

X6R–FX–8MI/8LO
8 Mic In / 8 Line Out

X6R–FX–8MI/8LO
8 Mic In / 8 Line Out

THEATRE 2

2x X6R–TP–16MI
16 Mic In

FOYER/PORCH

X6R–FX–8MI/8LO
8 Mic In / 8 Line Out

TERRACE FOH

DD4MR–FX
128 MADI in/out

LX4B
48 Line Out / 16 Line In

X6R–TP–8MI/8LO
8 Mic In / 8 Line Out

X6R–TP–8MI/8LO
8 Mic In / 8 Line Out

2x X6R–TP–16MI
16 Mic In

2x X6R–TP–16MI
16 Mic In

X6R–FX–8MI/8LO
8 Mic In / 8 Line Out

X6R–FX–8MI/8LO
8 Mic In / 8 Line Out

MAIN STAGE

X6R–FX–8MI/8LO
8 Mic In / 8 Line Out

TERRACE STAGE

X6R–TP–16MI
16 Mic In

- —— OPTOCORE, Fibre cable
- —— SANE, Cat5 cable
- —— MADI, Fibre cable
- —— AES50, Cat5 cable

1 x DD2FR–FX
256 channels on optical MADI for OPTOCORE and SANE with Ethernet, RS485 and Video I/O.

1 x DD4MR–FX
256 channels on optical MADI for OPTOCORE and SANE with Ethernet, RS485 and Video I/O.

1 x DD32R–FX
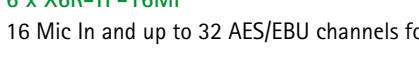64 AES/EBU channels for OPTOCORE and SANE with Ethernet, RS485 and Video I/O.

6 x X6R–FX–8MI/8LO
8 Mic In and 8 Line Out for OPTOCORE and SANE with Ethernet and RS485.

2 x X6R–TP–8MI/8LO
8 Mic In, 8 Line Out and up to 32 AES/EBU channels for SANE with Ethernet.

6 x X6R–TP–16MI
16 Mic In and up to 32 AES/EBU channels for SANE with Ethernet.

1 x LX4B
16 Line In and 48 Line Out for OPTOCORE.

Detailed OPTOCORE setup

OPTOCORE Device	ID Number	Location	Function
DD2FR–FX	1	Main Theatre Control Room	MADI ports connected to the RME MADI Bridge. Integration of Midas console via two KlarkTeknik DN9650 AES50 to MADI bridges.
X6R–FX–8MI/8LO	2	Main Theatre Control Room	FOH analog I/O
DD32R–FX	5	Main Theatre Control Room	FOH AES/EBU I/O
X6R–FX–8MI/8LO	3	Main Stage	Stagebox 48/16
X6R–TP–16MI	3.2		
X6R–TP–16MI	3.3		
X6R–TP–8MI/8LO	3.4		
X6R–FX–8MI/8LO	4	Main Stage	Stagebox 48/16
X6R–TP–16MI	4.2		
X6R–TP–16MI	4.3		
X6R–TP–8MI/8LO	4.4		
X6R–FX–8MI/8LO	7	Terrace Stage	Stagebox 24/8
X6R–TP–16MI	7.2		
DD4MR–FX	9	Terrace FOH	MADI connection for terrace FOH console
LX4B	10	Terrace FOH	16/48 analog connection for terrace FOH console
X6R–FX–8MI/8LO	8	Foyer/Porch	Foyer analog I/O
X6R–FX–8MI/8LO	6	Theatre 2	Stagebox 40/8
X6R–TP–16MI	6.2		
X6R–TP–16MI	6.3		

OPTOCORE system enables the connection of both control FOH rooms with all available I/Os around the building. All analog connections are made with the combination of X6R-FX and X6R-TP devices equipped with different analog input and output cards (mainly Mic In and Line Out cards). On the main stage there are two stageboxes – 48 Mic Inputs and 16 Line Outputs each. Smaller Terrace Stage is equipped with 24 Mic In, 8 Line Out stagebox, Theatre 2 stagebox provides 40 Mic Inputs and 8 Line Outputs and one X6R-FX-8MI/8LO device adds one more I/O connection point with 8 Mic Inputs and 8 Line Outputs at Foyer. Main Theatre Control Room enables the connection of consoles or any external devices by popular MADI or AES/EBU standard, but also adds 8 Microphone Inputs and 8 Line Outputs to the system. Terrace FOH is equipped with well-established LX4B FOH device, providing 48 analog outputs and 16 returns for any analog console, but there is also digital format available – BNC MADI through DD4MR-FX interface.

The result is an elegant and efficient solution with a versatile OPTOCORE fibre transmission network that will sustain ROHM well into the future.

OPTOCORE