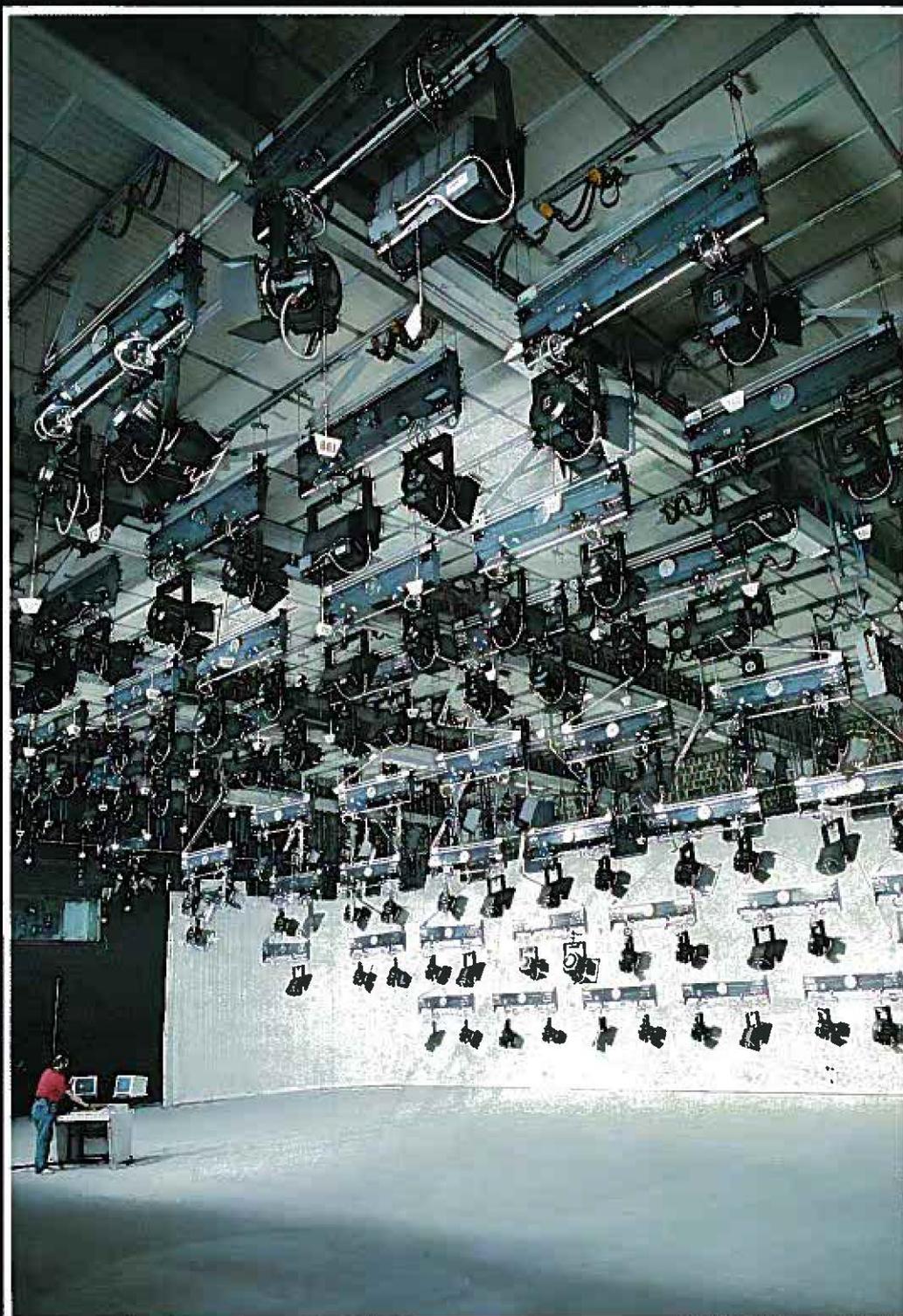


# LIGHTING+**SOUND** *International*



One man control - a first in fully automated studio lighting at VTO in Hannover.  
(see major feature in this issue)

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# A World First: Fully Automatic Studio Lighting System installed in Hannover

**L + SI invited Heinz J. Fritz, managing director of Strand Lighting GmbH Germany, and Derek Gilbert, managing director of Glantre Engineering Limited UK, to describe the fully automated lighting system recently installed at the studios of VTO in Hannover.**

March 31st 1988 saw the handover of what is probably the world's most advanced automated studio lighting facility. It was just over six months earlier that German private sector studio operator VTO (Verlag Teresa Orłowski) placed a DM 2.7 million (£900,000) contract with Strand Lighting GmbH Germany for a major design, supply, installation and commissioning package for two studios encompassing motorised remote controlled luminaires, control and dimmers, self-climbing hoists, structural steelwork, electrical distribution, retractable seating, tracks, drapes and studio accessories.

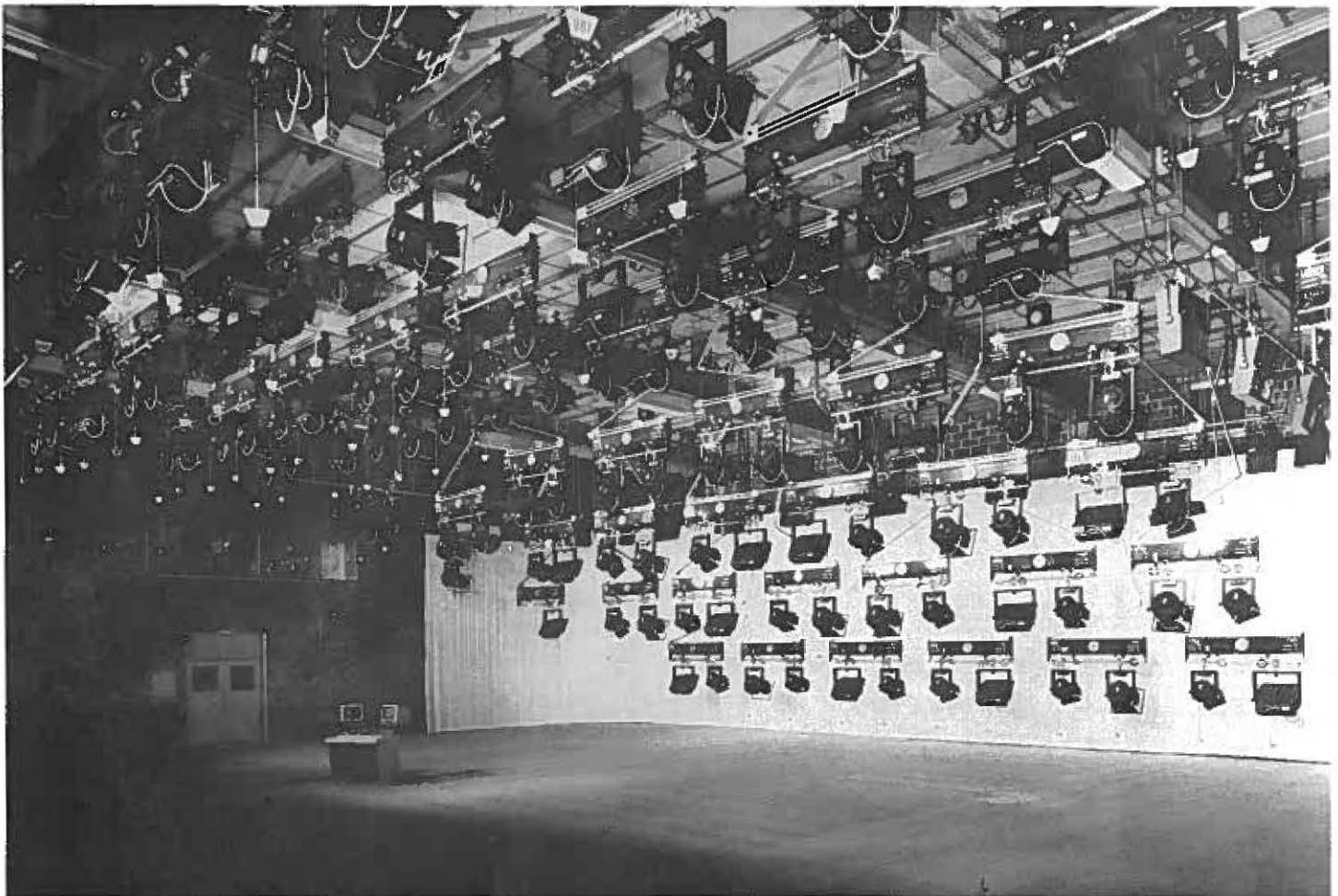
The newly constructed Medienzentrum studio complex in Hannover was originally designed as standard industrial and office accommodation, but during construction, a lease was acquired by VTO and the design amended to incorporate two TV studios Nos 1 and 2 of 680 and 260 square metres respectively, together with ancillary office and production areas.

A number of leading studio lighting com-

panies were invited by VTO to submit turn-key design and build proposals, but the majority were overawed by the short timescale available and by the demanding brief that ranged from precision remote control of luminaires to design and implementation of structural steelwork. Strand Lighting Germany were the only company prepared to respond to the challenge imposed by the project. From the earliest stage, they involved as their design, project engineering and co-ordination partner, Glantre Engineering Limited of Reading, England. The two companies pooled their resources to provide a comprehensive design proposal with full presentation drawings within two weeks of the initial site survey. The contract award followed shortly afterwards, with the basic building already structurally completed.

The first difficulties arose from the building's change of use. Roof and walls had been built to normal industrial standards and the close proximity to Hannover airport's flight path meant that major provisions were necessary in order to achieve an acceptable

standard of acoustic isolation for the studios. The acoustic consultant's requirements for a 300mm layer of dense insulating material, together with allowance for 'worst case' winter snow loadings on the roof, all but accounted for the full load bearing capacity of the 26m span reinforced concrete roof beams of the main studio. As a result, a totally separate steel structure was needed to accommodate the normal studio lighting and scenery loads. Additional design constraints were caused by the restricted working height of 7.6 metres between the studio floor and underside of the existing roof beams. It was decided to install the supporting structure for the hoists between the roof beams thereby gaining an additional 90cm. Glantre's design team carried out detailed load calculations and jointly with a German structural engineering consultant appointed by Strand, designed the necessary additional primary supporting steel structure together with all secondary steel support beams, galleries and catwalks. Approvals of the design were obtained from the Hannover



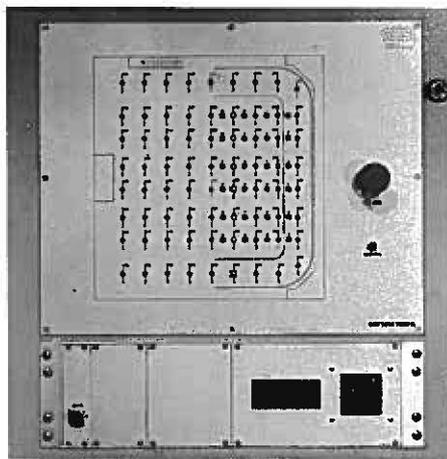
The lighting rig in Studio 1 at VTO, Hannover.

City Authority and the steelwork installations carried out in November 1987 by Strand's sub-contractors Gueldner Stahlbau.

The studio lighting installation was to be based on extensive use of motorised remote controlled luminaires in a basic fixed rig configuration along with a semi-saturated layout of motorised self-climbing hoists. Although involving an above average capital cost, this would permit VTO's entire studio lighting installation to be handled on straightforward productions by a single person who would be lighting director, console operator and electrician all in one. For the major light entertainment productions that are envisaged, the lighting complement can be increased to two or three - in fact the latter figure becomes the minimum personnel level when two followspots are required.

Use of the Quartzcolor Giano double-ended dual source luminaires was considered initially but rejected on the grounds of cost. Instead, it was decided to adopt a basic lighting rig for Studio 1 consisting of 36 5kW Pollux fresnel spotlights, 64 2kW Castor fresnel spotlights and 36 2.5/5kW Arturo softlights. The fresnel spotlights are fitted with motorised pan, tilt and focus while softlights have controllable pan, tilt and 2.5/5kW switching. Motorisation of barn-door shutter movement and rotation was considered desirable but not mandatory; barn-door adjustment by pole operation was chosen as a compromise. The luminaire motorisation system selected was the Precision Automated Lighting System, PALS, developed for Strand Lighting by Light Works Limited under a contract granting Strand exclusive world-wide rights.

The PALS installation includes a controller in the main lighting control room and a portable studio floor unit. Most luminaire operation is expected to be carried out from the

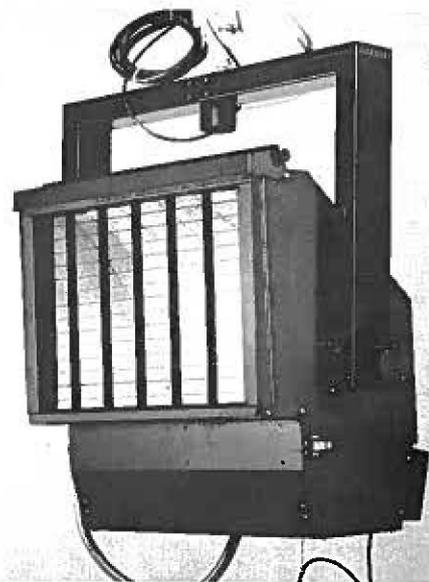


The Hoist mimic and control.

latter. The PALS studio floor panel is installed in an integrated lightweight mobile trolley together with hoist and main lighting control remote units. A trailing cable system was selected in preference to infra-red or radio remote control and a number of alternative socket outlet boxes are provided.

The PALS controller, also developed for Strand by Light Works, is based on an IBM Personal Computer with dedicated keyboard and serial line driver board. All the electronics are installed in a rack mounted version in the main lighting control room. Command and cue information are displayed on a high resolution colour monitor. Control software has been customised to suit the Medienzentrum installation with screen layout specially developed to mimic the studio plan, making the complete system very simple to operate.

While the main usage of the PALS system will be for rapid setting and focusing of studio luminaires, the controller permits

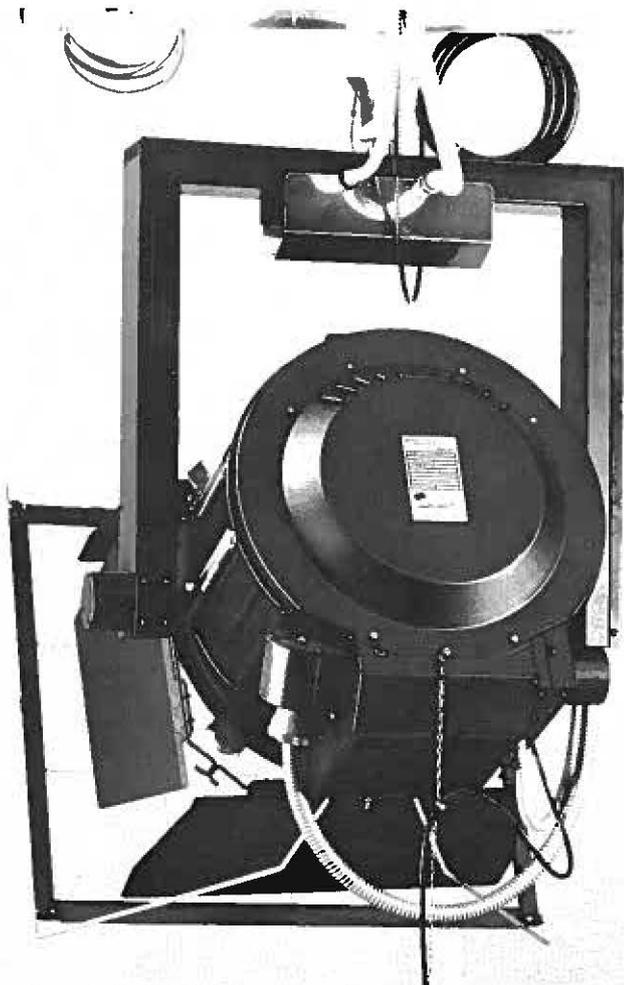


A remote-controlled Arturo 5kW.

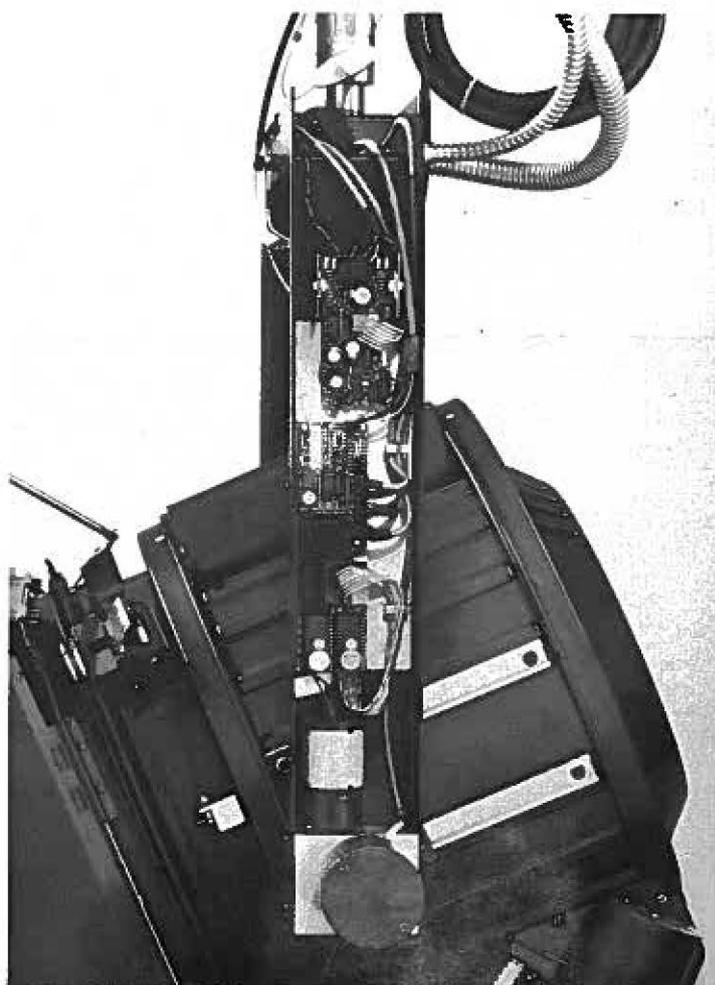
cues to be stored and replayed to enable luminaire resetting or special effects sequences to be carried out during a production. A further benefit is that for repeat productions that recur on say a weekly basis, the usual luminaire settings can be instantly recalled.

The absolute position of each function of each luminaire is recorded for every cue which is then recorded directly on to hard disk. Groups of cues may be copied on to floppy diskette for back-up and library storage. A single 20 megabyte hard disk will store over 5000 cues, a quantity far in excess of any conceivable user requirement!

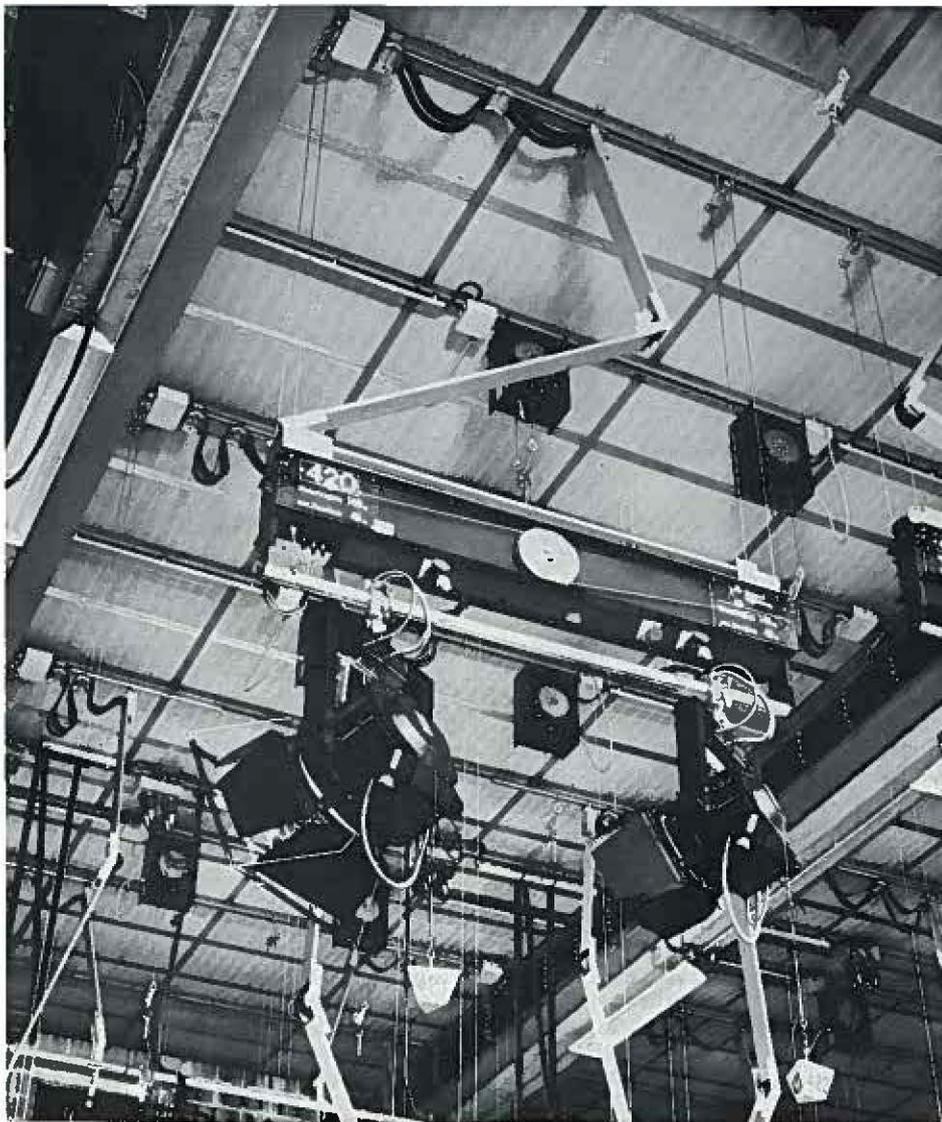
The dedicated keyboard has cursor keys for positioning the lights, numeric keys for selecting addresses and groups and a range



A remote-controlled 5kW Pollux with outrigger colour frame.



Inside a PALS yoke, showing motor, gearbox and electronics.



The self-climber and scenery point hoists. The installation electrics are concealed in the supporting steelwork.



View from the lighting control room through to the studio.

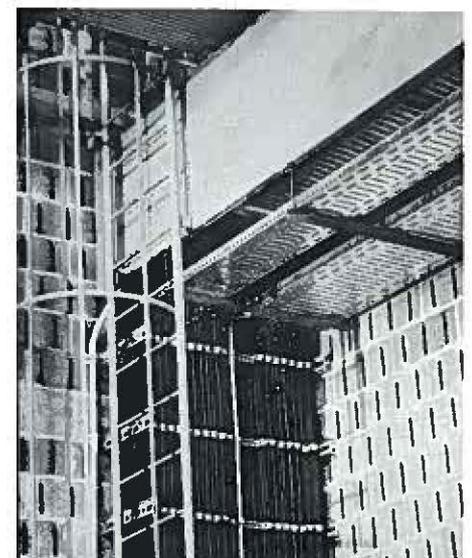
of command keys to record, edit and control the playback of cues. Consecutive cues may be linked for automatic follow-on, or chased in a continual cycle. Lights may be stopped mid-cue, returned to their last position, or stepped between any two cues in discrete intervals.

The PALS sets fitted to the Quartzcolor luminaires each comprise a rectangular section steel yoke with heat shield, housing the motor drive assemblies and processor board with drive electronics. Good protection is provided against accidental damage. Movement of pan, tilt and other functions if provided by a DC servo motor coupled to a precision reduction gearbox. The gear ratio is varied to suit different luminaires. The output shaft incorporates an adjustable clutch to protect the luminaire from damage. The absolute position of the output shaft is measured by a potentiometer. Each head contains a powerful 16-bit micro-controller which decodes its own addresses, stores cue data, and controls the motors. The potentiometers are continuously monitored and the speed is adjusted with changes in load and distance. The luminaires stop with a resolution of 1 part in 1000.

In addition to the PALS luminaires, in Studio 1 conventional Iris 4 main cyclorama lighting is provided with a quantity of Iris 2 units for the corners. For light entertainment, 60 Punchlite parcans mounted in five specially designed trusses have been supplied. The truss system is equipped with multicore cable connection to meet the requirements of fast and easy rigging and derigging. Additional luminaires of various types for portable application are provided along with two CID followspots.

The self-climbing hoists for Studio 1 are four-wire type to comply with German safety regulations and incorporate 'flip-flop' folding cable trays. A three way PALS controller is fitted to each hoist. Also incorporated within each hoist are dimmed feeds for three luminaires together with hoist power and control cabling. A separate data cable handles the PALS control signals. The German manufactured hoists are nominally of 150kg load capacity; each incorporates a 2m length of lighting barrel to which two PALS luminaires are permanently fitted. The third space on each barrel is available for an additional PALS luminaire or for special effects luminaires and may be varied according to the needs of particular productions.

While British studio practice has generally been to incorporate the motor control and contactors within the hoist, for Medienzen-



Cable trays below the gallery.

trum it was decided that these should be mounted in a separate hoist power rack installed in the dimmer room. This rack also incorporates all control printed circuit boards and relays.

The main hoist remote control position is a wall panel at studio floor level. This incorporates a mimic layout of the studio together with all controls including a keypad for hoist selection and command. Control facilities are available for group operation of hoists and for the memorisation of groups. A second control keypad is fitted to the studio mobile remote control trolley.

For scenery suspension, 24 200kg capacity point hoists are installed. These may be operated singly or in groups and are controlled from the same wall panel and studio floor keypad as the lighting hoists.

Lighting control for Studio 1 employs a 240 channel Galaxy II console with memory back-up, two playbacks, pre-set masters, programmable effects and geographical mimic. The console is installed in the studio vision control room together with the in-

tegrated PALS control and electronics. A Galaxy studio remote control unit is mounted in the mobile studio trolley. The racks for the thyristor dimmers are of Strand Lighting Germany's own manufacture and in accordance with German electrical regulations. In total 12 racks have been installed, each housing 24 5kW plug-in thyristor dimmers, 240 of which supply Studio 1 with 48 for Studio 2. The dimmers used are PIP CS closed loop square law type with filtering to full broadcast specification.

Clearly, the next development step for automated studios will be the Strand Galaxy III generation of control systems with the capability to control and memorise all PALS functions as well as dimmer selections and levels. While it is technically feasible to incorporate hoist control as well, this appears undesirable from an operational and safety point of view.

The complete studio electrical installation has been designed by Glantre Engineering in co-operation with Strand Lighting's project management and carried out by a local sub

contractor. A main studio distribution switchboard receives a 1,000 amp 220/380V TPN supply from the studio substation and feeds dimmer racks, hoist power racks and all other ancillary services for both Studio 1 and Studio 2. Power distribution incorporates multicore cables laid on cable tray in accordance with usual continental practice. Studio primary steelwork and galleries were purpose designed to accommodate the extensive network of cable tray - an example of the hidden benefits that can arise from a package contract.

Additional studio equipment supplied to Strand Lighting GmbH through Glantre Engineering includes a triple track cyclorama system with white and chromakey blue cloths, black velour drapes together with fixed and mobile retractable seating tiers providing a total of 198 audience seats.

The smaller Studio 2 has only been partially equipped at present. A 48 channel Strand M24 memory system and dimmers are installed together with complete steelwork and power wiring infrastructure. A total of 15



PIP dimmer racks.



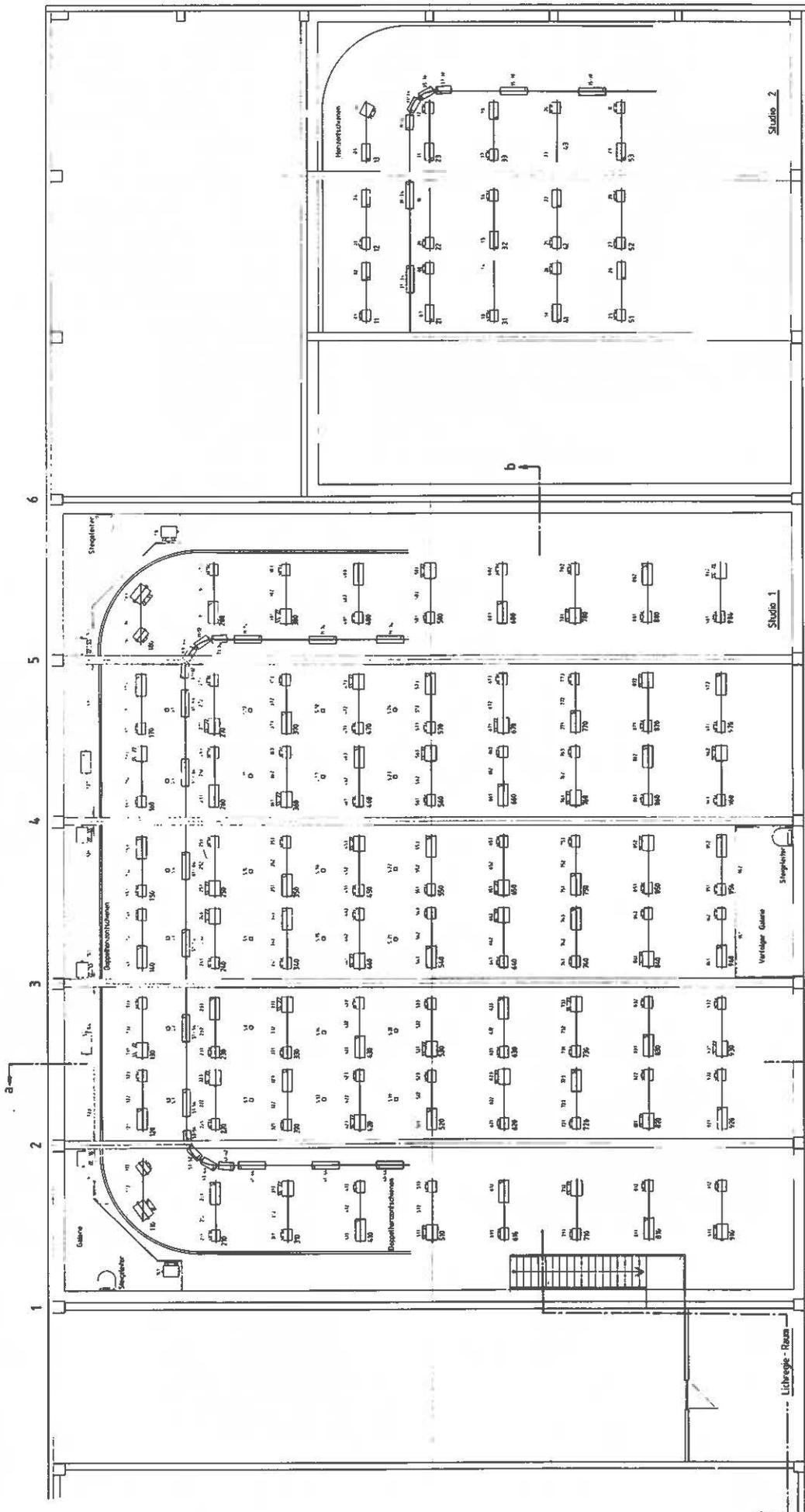
Operation of hoists and luminaires from the studio floor control.



Galaxy II lighting console with memory back-up (left) and PALS control (right).



The Galaxy studio remote control with integrated PALS control.



Symbole	Studio 1		Studio 2	
	Grundausstattung (mehrfachwert)	Zusatzausstattung (mehrfachwert)	Grundausstattung (mehrfachwert)	Zusatzausstattung (mehrfachwert)
Stufenmischschleifer Pellic 5M	36	6	-	-
Stufenmischschleifer Celar 2M	66	6	17	2
Mischtrahler Arlun 2,5FSM	36	2	-	-
Mischtrahler Arlun 1,2/1,5SM	-	6	10	2
Zoom-Profilschleifer Calista 2722	12*	-	3	-
Herzschleife Iris 1	8*	-	4*	-
Herzschleife Iris 2	-	-	4*	-
Parcels	-	12	-	-
Beleuchtungs-Grän 4 = 075M	-	12	-	-
Beleuchtungs-Grän 4 = 025M	-	6	-	-
Verträge	-	2	-	-
Dezentralkonsole 15kg	21	-	-	-

Nicht mehrwert



## Strand Lighting Germany Celebrates 20th Anniversary

Strand Lighting Germany celebrates its 20th Anniversary on May 6 this year. It was founded in 1968 as Strand Electric Hessenbruch GmbH at Giessen, and was moved to its present location in the same year. With the takeover of Strand by Rank, the company was renamed Rank Strand GmbH and more recently to Strand Lighting GmbH. The company is responsible for operations in Germany, Austria and Switzerland and has 36 employees.

Managing director since 1977 is Heinz J. Fritz, 49, who joined the operation in 1963 when it was represented by agents Diedrich Buschmann of Braunschweig. He was promoted to sales manager in 1970 before taking over as managing director.

self-climbing hoists and 30 or more PALS luminaires will be supplied at a future date.

For the main installation programme during March 1988, the site team was made up of more than 20 personnel of Strand Lighting GmbH and their specialist subcontractors including staff of both Light Works and Glan-

tre. The latter's team of four headed by their project manager Vic Dobbs, provided Strand with an important general purpose capability ranging from seating and track assembly to control terminations and overall commissioning.

This important installation in Hannover is

already generating widespread interest within the broadcasting industry, and could well be a pointer to the future for clients who wish to adopt capital intensive rather than labour intensive studio lighting installations in order to achieve significant medium and long term cost savings.

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