

AVAB **WIKING**

the best... and you can afford it

Only three days are left until the production. Everything is just enough behind schedule to create the tension of a mild panic. Because of delays in constructing the set, the lighting design is not ready. The technical crew and the actors are vying for access to the stage. If that were not enough, the director has called for extra meetings to solve both technical and communication problems.

AVAB designed VIKING to master just such a situation. VIKING is a control board for theatres and TV studios. The overriding conceptual idea was to collect as many control functions as possible and monitor them from a single source. For this reason AVAB equipped VIKING to handle multiple users and tasks.

The lightboard operator can build Presets, while a member of the lighting crew focusses instruments with the remote controller. At the same time the lighting designer revises details of his lighting plot at the computer terminal.

The multi-task capability of VIKING extends the possibilities even further. VIKING can execute fades within fades, run special effects, reposition remote-controlled lighting instruments, shift color changers, steer stage rigging and issue verbal cues to the followspot operators – all simultaneously!

AVAB has solved the critical problem of speed by using the main computer to rele-

VIKING

gate a wide range of different functions to several microprocessors and monitor the results. VIKING is a truly modular system, meaning that you can expand its capacity easily to meet increasing demands.

Even with no "extras", such as remote control of lighting instruments or rigging control, VIKING would be a superior lightboard. Multiple sequences of presets, automatic submaster assignments during playback, programmable special effects and dimmer curves, manual override of timed fades and textual labeling of groups and presets are all part of VIKING's standard software. But that is only the beginning.

VIKING's control philosophy is based upon having a broad palette of design features which you combine to create a homogenous performance, rather than a collection of extemporized events. You set up your program using short, easy-to-learn instructions which immediately appear on the monitor. During the performance you

can unleash any combination of the most complex effects in most cases by pressing a single button. VIKING can even initiate them automatically. This increases the overall coordination of the performance.

Not only can VIKING store crossfade times, but also submaster fade times and assignments. Using the stored elapsed times between crossfades, VIKING issues warning signals when each crossfade is due. Even an relatively inexperienced operator can run a complex performance set up by the lighting designer, should an emergency make this necessary.

VIKING is designed for modern, control-channel-per-dimmer operation. You have up to 1000 channels under your immediate control. Grouping channels together occurs at the software level. The current-sensing circuitry can detect both dimmer and load failures and display diagnostic messages on the monitor. This means that VIKING can automatically replace critical channels, which may fail during playback.



More than a sophisticated control board: A multi-user, multi-task system for theatres and studios

In no case, though, does VIKING "run away" with the show. It is no problem to override all recorded information to correct for variations in the performance. Everything remains under your immediate control.

AVAB's years of experience in theatres and TV studios are evident in the peripheral equipment surrounding VIKING. This equipment accelerates the process of focussing instruments or setting up lighting plots.

AVAB was the first to apply the advantages of wireless infrared remote control to lighting. The small, light-weight transmitter – no larger than a pocket calculator – allows you to call up channels during focussing, record preset information or check through the sequence of presets independently of the control board. You can judge the effect of your lighting from anywhere in the house and make instant corrections via the hand-

held transmitter. AVAB uses infrared light to relay data back to the control board, instead of clumsy cabling, sound waves or radio transmissions, which can interfere with other electronic equipment.

An extensive notebook program makes it possible to code different types of lighting instruments, their positions in the lighting plot or color filters needed for the year's productions. You can use a powerful edit-

ing program during a lighting rehearsal, for example, to address all blue cyclorama instruments in one operation, rather than having to enter separate channel numbers on the Designer Module. This feature is exclusive to VIKING and much more flexible than conventional electronic patching schemes.

With this enormous range of possibilities VIKING can rightfully claim the title of "performance control system". The advantages to you are reliability, repeatability and total coordination of every performance.

Perhaps the most important feature of VIKING, however, is one which you cannot see. To make sure it remains the most advanced control board of the eighties, AVAB has designed obsolescence out of VIKING. Updated program versions – rather than expensive hardware changes – are the answer to your specific requests and new trends in systems control. This protects your investment and insures that today's VIKING is also the VIKING of tomorrow.



VIKING's modular construction: A totally new concept

VIKING's modularity and flexibility are integral parts of the design from the very beginning. All you have to do is choose the Modules and peripheral equipment to suit your individual needs.

The Modules can be placed in any order in the control desk without special mounting tools. This allows you to select the layout most suited to your way of working and even to change this layout quickly to adapt VIKING to a specific production. Each Module has its own integral LED Display duplicating the most important information shown on the Monitors. The Module Displays put this information literally "close at hand". VIKING does not make you a slave of the Monitors.

A portable **DIRECTOR'S CONTROL BOARD** with its own set of modules provides you with all the most important functions of the main board.

VIKING's modularity is evident even within the Modules themselves. To maximize reliability AVAB uses only a limited number of different printed circuit cards which are interchangeable between the Modules. This simplifies troubleshooting. Using the Keyboard you can operate VIKING without any Modules, but it makes sense to have at least four!



The **PROCESSOR MODULE** constitutes the link between the computer and all other Modules. It has no programmable functions. Instead, two keyswitches turn on mains power and unlock the recording safety latch. Two twistknobs adjust the brightness of the Module keys and Wheel

LED's and a third regulates the audible beep signal, which accompanies a number of VIKING procedures.



The **DESIGNER MODULE** is important while setting up the basics of the production design. VIKING has several so-called Fields, where you build up the Presets in your program. Using the Designer Module you can work in any of these Fields. You make numerical entries which you then define by other keys. The Display shows all entries.

All the conventional methods of setting Channel Levels are available. A precision-tooled motorized digital Wheel allows you to vary Levels manually. You can also assign frequently-used Channels or Groups to Mixer Wheels, in effect creating duplicate Designer Wheels. In addition, the programmable STEP LEVEL key gives you quick access to the two Levels which you use most often. The REVERT key returns you to previously set Levels after a change has been made. The ID key flashes any selected Channel or Group on stage or in the studio for quick visual identification. Other keys add information from one Preset to another and assign Channels and Groups to the Mixer Fields.

Using the **COMMAND MODULE** you program more advanced functions. The Module Display is switchable between a digital clock showing the local time and a stopwatch. Here you define all Time functions, such as In- or Out-Fade Times, Delay Times, and Automatic Crossfade Times. You can set separate Delay and Fade Times for up to 32 individual Channels or



Groups within a Crossfade, using the SELECT GROUP function.

Other keys allow you to access all Disk, recording and Sequence functions, to hold Channels at a predefined Level, overriding any other Level information, to start Fades in the Mixer Fields, to assign any of the ten programmable dimmer curves to any Channels, to swap information between any two Channels, to create loops within the Sequences of Presets and to select Monitor and Printer Formats.



You use the facilities on the **CROSSFADE MODULE** to execute and modify your program during playback. Two Crossfade Modules, corresponding to the X and Y Sequences of Presets, allow you even to control two different stages simultaneously! The Module Display shows Presets and Times for each Crossfade.

The Crossfade Module has two digital Wheels to control all Channels which decrease or increase in Level. The SPLIT key gives you independent control of outgoing and incoming Presets. The Wheels produce tactile feedback, creating a genuine interaction between you and VIKING. Built-in servomotors offer a resistance to Wheel movement, signalling any change in programmed Crossfade Times. Two sets of LED's show the direction and rate of the Crossfade.

The TRACK key measures the Time of a manually executed Crossfade or an altered timed Crossfade, which you can then record. The GO key activates the next Crossfade. The STOP/START and INVERT keys allow you to stop or reverse the Crossfade in progress and the BACK key lets you step backward through the Sequence of Presets. You can also use the CUE and PRESET keys to jump to any place in the Sequence.



The **MIXER MODULE** is a versatile tool which facilitates both lighting design and playback. Your VIKING can include up to three such Modules. Each Module has four Wheels. All entries are shown on the Module Display. The four Mixer Fields are independently switchable to three different Modes – the Mixer, the Group and the Master Mode.

In the Mixer Mode you can mix Channels, Groups or complete Presets together to create new Presets. Channels can be assigned to several different Mixer Fields at once without restriction, whereby the highest Level predominates.

In the Group Mode VIKING automatically keeps track of all partial Presets assigned to the Mixer Module, which you use to build the actual Presets in your program. The Wheels on the Mixer Module function like duplicate Designer Module Wheels to set the Levels of selected Channels, Groups or Presets. This means you do not constantly have to call up frequently-used Channels. VIKING automatically assigns them to Mixer Fields, as each Preset appears on stage.

The Master Mode puts an extremely powerful, selectively programmable "Grand Master" at your disposal. You can assign any Channel, Group or Preset to a Master Field. That Wheel then masters the output when the Channels involved are active. Special effects also operate via the Mixer Module, allowing instant correction of their brightness and speed.

The **MIXER POT MODULE** is an economical variant of the Mixer Module, using 100 mm (4") slide potentiometers instead of digital Wheels. It has all of the same basic functions, but lacks the tactile feedback and LED's of the Mixer Wheels.



The **HOUSE LIGHT MODULE** has eight slide potentiometers and a master potentiometer to control house light circuits. This Module operates in parallel with, but independently of, the main system. Each of the eight house light circuits is switchable between independent and master. A rotary potentiometer sets fade times for the master.

A PANIC key gives full output on all circuits in an emergency. WORK LIGHT switches are also provided. You can elect to equip this Module to display mains voltage per phase, amps per phase or total watts consumed. Special measuring equipment is necessary with this feature.

You can equip VIKING with a **COMPUTER BACK-UP** which operates in parallel with, but independently of, the main system. You can use one set of Modules interchangeably in both the Director's Control Board and the Computer Back-up, reducing the overall number of components needed. VIKING offers you three different levels of back-up.

First, you can duplicate the main computer. Second, you can duplicate the computer rack, the digital/analog conversion equipment which produces the control voltage sent to the dimmers. Third, you can add a number of Modules to the Modules in the main system. In the last case, you have a complete duplicate of the main system. You can couple these two systems together and operate them from the main system's GO key for failsafe performance.

The **MANUAL BACK-UP** consists of one control Module located in the control desk and a number of pin-patch modules in the computer rack. The control Module has eight slide-potentiometers with master. There are also eight momentary switches – "bump buttons" – and a twistknob for setting the master Fade Time. You use 10 different color-coded diode pins for assigning Channel Levels in 10% steps from 0% to 100%. Like the computer back-up, the manual back-up operates in parallel with, but independently of, the main system.

You can specify **CUSTOM MODULES** to house your own special equipment, which lies outside the control of VIKING's computer.

Your insight into every operation: The VIKING monitors

A System Monitor and a Channel Monitor are part of every VIKING. You can add a second Channel Monitor in order to view

more than 200 Channels at one time without scrolling. The System Monitor is switchable to display a variety of informa-

tion. The Channel Monitor displays Channel information in formatted or unformatted form. The formatted form displays only the Channels involved in the production, whereas the unformatted form displays all Channels in the system. You can select either black-and-white or color Monitors. VIKING interfaces to any Monitors with RGB inputs. You can connect Monitors in parallel to display information in several locations. You can change the position of the Monitors to suit your particular demands.

FORMAT		X1 002.0																			
01	05	10	14	15	30	31	32	76	77	78	123	124	125	126	127	128	129	130	131		
28	53	49	9	42	32	40	37	71	44	56	37	37	37	37	37	37	37	37	37		
132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151		
37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37		
152	153	154	155	156	251	252	253	254	335	336	337	354	413	414	415	416	417	418	419		
37	37	37	37	37	52	54	12	26	100	16	70	35	44	42	42	42	42	42	42		
420	421	422	423	424	425	426	510	511	512	513	514	515	516	517	518	519	520	521	522		
42	42	42	42	42	42	42	100	100	100	100	100	100	100	100	58	58	58	4	100		
523	557	558	560	561	562	563	564	565	566	633	634	635	636	637	638	639	640	641	642		
100	29	02	30	10	07	14	11	08	01	41	41	41	41	41	41	41	41	41	41		
643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	699	700	701	702		
41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	70	70	70	70		
703	704	705	706	707	708	709	710	711	712	731	732	733	734	735	739	747					
70	70	70	70	70	70	70	70	70	70	34	01	17	15	28	23	56					

CHANNEL MONITOR

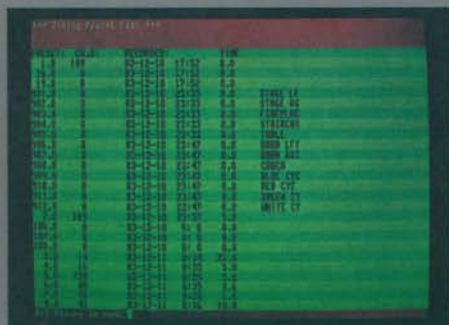
1. Active working Field
2. Channel number
3. Channel Level
4. Channels selected on Designer Module
5. Indication of Dimmer Curve
6. Master Wheel assignment
7. Group Wheel assignment
8. Time Group assignment
9. Dimmer failure
10. Load failure

THE NUTCRACKER		283-12-11		SEQUENCE		1:48		P1351	
CUE	PRESET	S	AUTO	OUT>	DELAY<	IN	CHE	TEXT	12-SCOPY TO JUMP
1	1				1'00			HOUSELIGHT DOWN	
2	2	A	1.5	7	7.3			CURTAIN LIGHT DOWN	
3	3				5.0			PRES 559 > CONST FIELD	
4	4				25.0			DARK PRESET	
5	5				5.0			FOLLOWSPOT DROSSELMEY	
6	6				5.0			011 PRESET	
7	7			3.6	0.3	< 3.3		FILTERCH. STAGE LEFT	
8	8				1.6			SHORT PRESET	
9	9				15.0			CURTAINS DOWN	
10	10				5.0			LIGHT BEHIND CURTAIN	
11	11			7.5	>15.0	7.5		LIGHT IN FR OF CURTAIN	
12	12				5.0			FOCUSING FOR ACT 2	
13	13				1'35			SPOT CENTER	
14	14				45.0			RED CHASE	
G 1	G 2	G 3	G 4	G 5	G 6	G 7	G 8		
20.0	50.0	50.0	50.0	59.0	50.0	50.0	49.0		
STAGE LFT	STAGE RGT	FIREPLACE	STAIRCASE	TABLE	DOOR LFT	DOOR RGT	COUCH		
M 3	M 0	M 1	M 2						
45.0	35.0	45.0	50.0						
DOOR RGT	RED CYC	GREEN CYC	COUCH						
SEQ.:	FIXED								
TRACK	3.0	8.5							
TO DISK?									
0:12->	603	THE_MU0012	128J	TK					

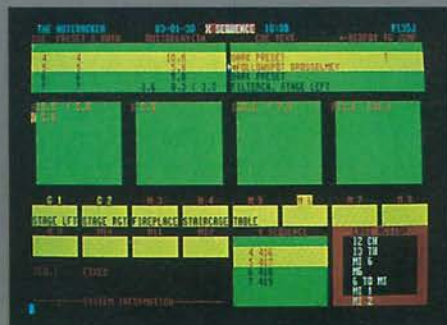
SYSTEM MONITOR

1. Play Text
2. Date
3. Sequence being programmed
4. Time elapsed since last Crossfade
5. VIKING program version
6. Split fade
7. Automatic crossfade with Wait-and-Start Time
8. Outgoing and incoming Presets
9. Sequence Text
10. More Text stored in memory
11. Spoken Sequence Text
12. Incoming or outgoing multiple Preset Automatic initiation of Y Sequence Indication of Special Effects Indication of Time Groups
13. Indication of Cue Jump
14. Mixer Field information
15. Indication of Mixer Field Mode
16. Mixer Wheel position in percent
17. Preset Text
18. Sequence in reserve
19. Seven last actions
20. System status
21. Information from System and Keyboard entries

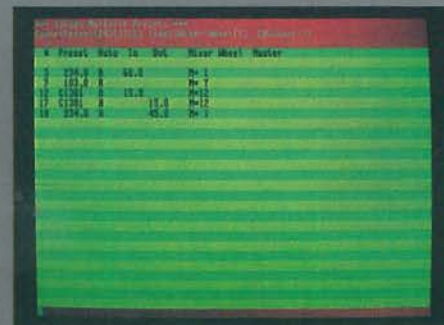
Exactly the information you need, just when you need it



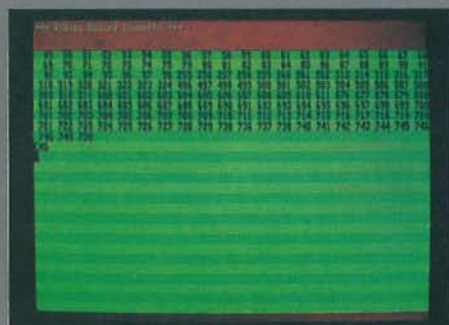
Preset List, accessible via MONITOR FORMAT key. Display shows recording times and dates from each Preset along with total number of Channels present.



Group Times remaining are updated instantly during Crossfade. Channel Monitor displays Channels in Time Group with Group letter designator. System Monitor changes format automatically to show Time Groups when present.



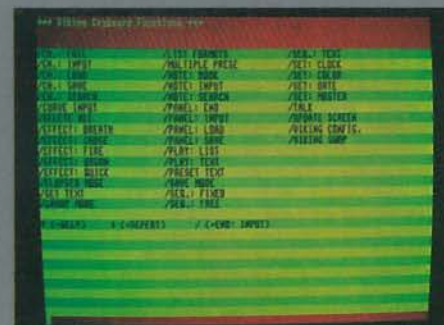
Multiple Preset Display, accessible via Keyboard. VIKING assigns Multiple Presets automatically to Mixer Module as they appear in Crossfade Fields. Sequence accepts any Preset – even a Special Effect Preset.



Unused Channels Feature, accessible via MONITOR FORMAT key. Display shows all Presets with no recorded information.



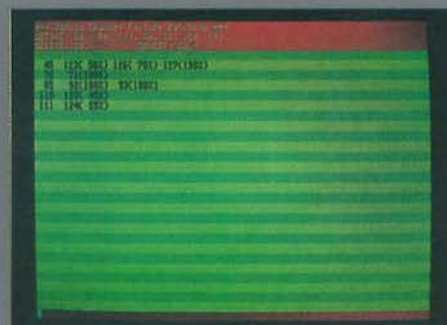
Channel Input Display, accessible via Keyboard. Program renumbers Dimmers in any order.



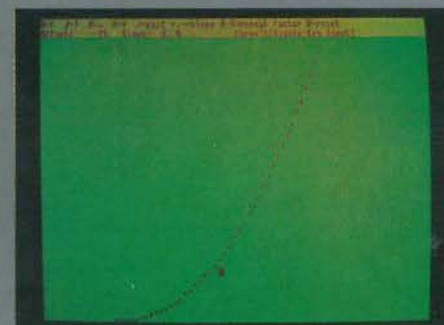
Help List, accessible via Keyboard. First two letters of each command word call up desired "subroutine".



Typical **Special Effect Display**, accessible via Keyboard. In addition to Display for Chase Light Effect, there are Displays for Breathing Cues with fixed and random times, Fire Effect, Light Organ, Quick Chase and Soft Chase.



Channel Failure Patching Display, accessible via Keyboard. Program accepts maximum of three replacements for each of up to 20 critical Channels. Correction factor is based upon percentage of original Channel Levels. Current-sensing circuitry detects failures and can activate automatic replacement.



Dimmer Curve Display, accessible via Keyboard. Up to ten individually programmable Dimmer Curves can be stored in memory. VIKING can reassign Curves from Preset to Preset with maximum of three different Curves per Preset. Special non-dim Curve imparts on-off function to any Channel.

You don't need all these peripherals to run VIKING, but they certainly make production design even more exciting

The **KEYBOARD** is a versatile addition to any VIKING. You normally enter your pro-



gram using the Modules. However, you can also enter all programming commands via the Keyboard. This means that you not only can use the Keyboard as a back-up for any Module, but you can also control VIKING with no modules in place at all! The Keyboard is a simple and efficient way of writing complex "subroutines", like chase light, light organ, fire effect, breathing cues and quick chase effects. You enter all text information on the Keyboard. A powerful editing feature allows you to make global changes throughout your program. Using the Keyboard, the computer and a Monitor you have an extremely powerful computer terminal at your fingertips!



You can connect any high-speed **PRINTER** with serial input to VIKING and produce a variety of printouts ranging from play and special effects lists to inventory sheets for each production. These lists are a perfect complement to your archive of production programs stored on Disk.

You can equip your VIKING with a **TOPOGRAPHICAL CHANNEL-SELECT PANEL**. The panel has a layout which corresponds to the actual physical positions of the power outlets in the theatre or studio. Each Channel has its own pushbutton with two LED's to show when you have selected it for Level setting or when it is part of the chosen Preset.

Your VIKING can accept a 0dB **AUDIO INPUT** for use with the light organ function. The signal is converted into four 8-bit data words, representing the bass, low mid-range, high mid-range and high frequency portions of the program source. You use these data words to program light organ effects which you can incorporate into your production.



The **WIRELESS INFRARED REMOTE CONTROL** is a unique feature which was pioneered by AVAB more than ten years ago. Indeed, today it is a "must" for any advanced control system. With this mode of information transmission, there is no risk for interference with radio controlled equipment. You can call up Channels, set Levels, record Presets and run through your Program from anywhere in the house. The hand-held transmitter has a keypad and a Display showing your entries.

The **SPEAKER MODULE** gives your VIKING a personality of its own. VIKING informs you in clear, easy-to-understand English when you are about to make a radical change in recorded information or when an important function – such as a

Crossfade – has been completed. Like the Module Displays, the speech program sorts out vital information for your immediate attention – a welcome feature during busy rehearsals or complex performances. More importantly still, you can include spoken messages as part of your program. During the performance you can route these messages to the follow spot operator, for instance, to inform him of an upcoming cue. This means there is no danger of forgetting to give important verbal instructions.



The **MODEM** allows you to connect your VIKING with AVAB's test computer in Gothenburg via the international telephone network. You use the Keyboard to run test routines and communicate directly with AVAB technicians.



You can connect a **COMPUTER TERMINAL** to VIKING and use it to create programs just as if you were working at VIKING's Keyboard. Virtually all of VIKING's features are available to you. Information can be entered on VIKING's control desk and the terminal simultaneously.

VIKING will always be complete, because the development never stops

AVAB has long realized the advantages which remote-controlled instruments offer to theatre and studio lighting. With VIKING, however, this concept takes on an exciting new dimension.

Until now remote control systems were more often than not completely separate from the lightboard. They were crudely constructed and produced inaccurate positioning, which could hardly be termed repeatable. Repositioning during a performance was more a gag than a viable artistic contribution. VIKING dramatically changes all of that.

VIKING can control any motorized lighting instrument. With NIETHAMMER VARIMOT® instruments or AVAB's own pan-and-tilt systems, though, VIKING can achieve an unprecedented level of perfection: a 350° pan with a guaranteed positional accuracy of ± 5 cm at a distance of 25 meters. NIETHAMMER'S VARIMOT® system offers pan, tilt, focus, zoom and iris functions, plus an electromagnetic color changer, which will accept up to eight gels.



NIETHAMMER 5-motor, 2 kW zoom profile

The standard remote-controlled "yoke" can accept a wide range of different types of instruments.

AVAB's own remote control system is modularly constructed. It consists of up to eight amplifiers which steer DC-motors for pan, tilt, focus, zoom and iris, plus 16 connectors to, for example, an electromagnetic color-changer.

When connected to VIKING, remote-controlled instruments function as terminals. They accept positional instructions and inform VIKING via feedback circuitry when the assigned tasks have been carried out. You can program information for these instruments as part of VIKING's sequence of Presets. As each Preset is called up in preparation for the next Crossfade, instruments change position, refocus and receive new color assignments.

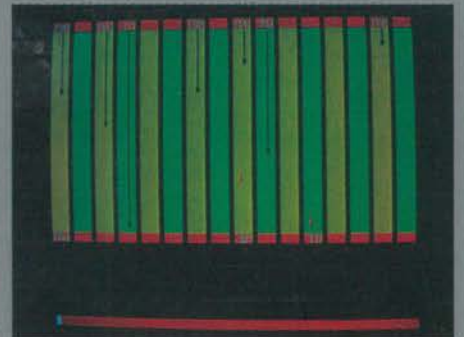
Remote-controlled instruments save you money, because you can make one do the job of several. They save you time, because you can refocus much more quickly and accurately. Perhaps most importantly, however, they can add new dramatic impact to your productions by offering controllable patterns of movement. They can track events on stage or in the studio contributing a unique flow and excitement to the action.

VIKING can also support the remote control of stage rigging. Via a special Module and corresponding Monitor Display you can electronically position hanging sets with an accuracy of ± 5 mm. You can synchronize different elements of the rigging to move together as groups or to move at different rates, reaching their respective end positions simultaneously. AVAB's wireless infrared remote control serves as an alternate input device when controlling rigging. This makes it possible for you to enter instructions from the stage or studio – rather than from the control booth – thus maintaining surveillance over all movement.



Rigging motors

Preprogrammed set changes can become stimulating additions to the production, rather than necessary but annoying interruptions. You can integrate them into the action in a way which was impossible until now.



Display showing rigging positions

For AVAB the possibilities which remote control offer the lighting and set designers are far from exhausted. AVAB is refining these and other applications, which, like VIKING itself, constitute a long-term development project.



Control board, rigging equipment

For consultants and architects: All the facts and figures

A. GENERAL DESCRIPTION

The computer-controlled system shall utilize a 16-bit computer as the main computer with microprocessors serving as ancillary process controllers. The system shall provide multi-user, multi-task capability.

The memory shall be of CMOS-type with battery back-up. The total memory capacity shall be expandable using additional plug-in printed circuit memory cards. To facilitate loading the operational program without effecting the user's production program, the two programs shall be stored in separate memory banks.

Power-fail circuitry shall insure that no information is lost due to power outages. Following such an outage the system shall reset automatically to the exact status of the production program which existed before the outage took place.

The external memory shall consist of a standard 8-inch floppy disk drive. The system shall be fully operational using one such drive. The system shall be capable of reading from or to disk during playback.

The system shall have a true control-channel-per-dimmer configuration. Up to 1000 control channels shall be available for immediate access without the need for any type of hard-wired or electronic patching. The system shall control both solid-state analog and digital dimmers.

The system shall operate on 240 (120) VAC, 50 (60) Hz, two-wire-plus-ground mains service.

All of the following features shall constitute the minimum performance standard:

B. SOFTWARE CONFIGURATION

The operational program shall incorporate all functions and shall be written in a real-time, high-level language, such as C or PASCAL, and shall be stored in CMOS memory. No external devices shall be required for special effects, for monitoring dimmers and their loads and for the control of peripheral devices. Program updating shall occur via floppy disk and shall not require hardware modifications of any type. Once updated, all system operations shall be functional without need for peripheral devices, such as floppy disk or cassette.

The operational program shall include real-time test programs for troubleshooting which can be executed while the system is performing its normal functions. Tests shall be transmittable via modem and the international telephone network to the manufacturer's central computer for analysis and diagnosis.

C. HARDWARE CONFIGURATION

1. The system shall consist of a modular control desk where production programs are entered and played back and a computer rack where digital/analog conversion takes place, dimmers and their loads are monitored and video displays are generated.
2. Communication between control desk and computer rack shall occur in digital form.
3. The system shall provide for a wireless infrared remote control device.
4. The system shall be fully operational without any modules in place.
5. All functions shall also be accessible from an alphanumeric keyboard.
6. The modules shall be interconnected via a ribbon cable data bus and shall be freely positionable within the control desk without need for tools or special equipment.
7. The modules shall have their own integral displays, which complement information shown on the video monitors.
8. The fader wheels used as level-setting devices, as submasters and as cross-faders shall be precision-machined and shall incorporate servomotors to provide tactile feedback to the user.
9. Integral LED displays shall indicate fader wheel levels and direction of fades.

D. SETTING LEVELS

1. Channel levels shall be set or altered individually, in randomly selected or prerecorded groups or as complete presets.
2. Level setting shall take place either in active or blind modes.
3. Levels shall be entered using a digital fader wheel or keystroke entries interchangeably.
4. The system shall provide for a user-programmable level key to enter two often-used levels.

5. Functions to limit minimum or maximum levels, to alter globally recorded levels with a correction factor and to hold channels at predetermined levels shall be provided.
6. A programmable preheat function shall be provided.
7. The submaster wheels shall be used as auxiliary level-setting devices for single channels, groups or presets.
8. The contents of any or all submasters shall be combinable and transferable to another preset for recording.

E. RECORDING

1. Any number between 0.1 and 999.9 shall constitute a valid preset number.
2. Presets may be recorded in any order and at any time.
3. The amount of memory remaining shall be displayed continuously on the video monitor in percent.
4. A direct-to-disk facility shall be provided to store each preset on disk automatically, if the user so desires.
5. The system shall provide a facility for recording component presets on the submasters which are combined to create new presets and for assigning those component presets automatically to the submasters during playback.
6. Special effect presets may be assigned to both the playback sequence and independent fader wheels.
7. Any or all of the following shall be assignable to every preset:
 - a. An in or out fade time plus a delay time in tenths of seconds, seconds, or minutes and seconds up to one hour.
 - b. User-programmable dim-curves.
 - c. An 80-character message, of which 22 are displayed automatically and the rest recallable from memory.
 - d. Up to 16 color changer assignments.
 - e. Position assignments for up to 256 remote-controlled lighting instruments.
 - f. Movements for 256 motors controlling stage rigging.
8. Any or all of the following shall be assignable to each crossfade:
 - a. Up to 32 simultaneous in or out fade times plus delay times in tenths of seconds, seconds, or

minutes and seconds up to one hour.

- b. User-programmable fade-curves.
 - c. An automatic wait-and-start time between crossfades in tenths of seconds, seconds, or minutes and seconds up to 1 hour.
 - d. A spoken message of up to 80 characters in computer-synthesized speech.
9. The system shall allow the operator to choose between two distinct types of sequences:
 - a. A computer-generated sequence, whereby presets are played back in strict numerical order.
 - b. A user-programmable sequence, whereby presets may be played back in any order.
 10. The system shall provide a facility for recording loops from any preset to any other preset in the sequence and for specifying the number of times, between 1 and 99, that such a loop be executed.
 11. The system shall provide a means for interrupting all automatic functions by pressing a single key.

F. SUBMASTER FUNCTIONS

The system shall include up to 12 submasters which shall be switchable to provide the following functions:

1. Single channels, groups or presets shall be assignable to submasters without regard for conflicts and can then be combined to create new presets.
2. Single channels, groups or presets shall be assignable to submasters for level correction.
3. Single channels, groups or presets shall be assignable to submasters which act as selective grand masters for the channels involved.
4. Contents of the submasters shall be recordable for each preset and shall be reassigned automatically as a function of each crossfade.
5. Fade times shall be assignable to submasters.
6. A 9-character describer shall be assignable to each submaster preset.
7. Special effects shall be assignable automatically to submasters during playback.

G. PLAYBACK FUNCTIONS

1. The system shall be capable of supporting two independent sequences of presets, each with its own crossfade wheels.
2. The crossfade wheels shall provide control for manual, timed or recorded time fades. Timed fades can be converted to a manual fade at any time.
3. A facility shall be provided for coupling submaster fades, special effects and the second crossfader to the main crossfader so as to activate all functions simultaneously by pressing a single key.
4. All time fades may be manually overridden, that is, accelerated, slowed down, stopped, resumed, reversed, faded to full or faded to black.
5. A facility shall be provided for timing a manually executed or altered time fade and entering this time into memory.
6. A facility shall be provided for clocking the elapsed time between two crossfades and entering this time into memory.

H. DISPLAYS

Lighting program and system information shall be displayed in three forms: alphanumeric LED's integrated into each module, fader-wheel LED's and at least two video monitors. The video monitor displays shall be so designed that there is no loss of information if color monitors are not used. The video displays shall have user-selectable "pages" to show a variety of information and shall be updated at a speed faster than 1/16 second per page.

I. SUPPLEMENTARY FUNCTIONS

1. A clock and calendar display shall be provided.
2. A stopwatch display shall be provided.
3. The system shall provide for the archiving of all production programs using an 8-inch floppy disk drive.
4. It shall be possible to label each program using both a number and a title for identification purposes.
5. It shall be possible to store several versions of the same program.
6. The system shall be capable of supporting a computer terminal, from which all functions are accessible.

7. The system shall be capable of supporting a remote second control desk.
8. The system shall be capable of supporting a high-speed printer.
9. The system shall be capable of supporting a panel for channel selection with one pushbutton per channel.
10. The system shall be capable of communicating with the manufacturer's test computer via telephone modem.
11. The system shall be capable of triggering control devices for stage rigging.
12. The system shall be capable of supporting external triggering devices to start fades or special effects.
13. The system shall provide for independent control of houselights, worklights and emergency lighting.
14. It shall be possible to monitor input phase voltages, amps per phase and total watts consumed.

J. BACK-UP SYSTEM

The system shall be so constructed so as to allow the user to choose between a manual or a computer-controlled back-up, both with their own separate power supplies.

The manual back-up shall consist of a pinpatch system to assign each of the system's channels to any or all of 8 submasters using color-coded diode pins in level steps of 10%. A grand master with time function shall be provided.

The computer back-up system shall use a computer which is identical to and capable of executing all the playback functions of the main computer. Both systems shall be capable of operating in parallel and have equal playback status. A facility shall be provided for activating playback functions in both the main and back-up systems via entries on the main system.

VIKING CONFIGURATION

CONTROL DESK (standard or custom-designed)

Alphanumeric Keyboard
2-3 Video Monitors (color OR b/w, specify type and size)

Modules

- 1 Processor Module
- 1 Command Module
- 1 Designer Module
- 0-2 Crossfade Modules
- 0-3 Mixer Modules with Wheels OR
- 0-3 Mixer Modules with Potentiometers
- 0-1 Houselight Module
- 0-3 Back-up Modules (Computer) OR
- 0-1 Back-up Module (Manual)

TOGETHER WITH

- 0-# Pin-patch Modules with 8 x 96 channels (specify number)
- 0-# Custom Modules (specify number)
- 0-1 Remote Instrument Control Module
- 0-1 Remote Rigging Control Module

COMPUTER RACK (19-inch, standard or custom-designed)

Main Computer

- 1-2 Floppy Disk Drives
- 2-3 128 kbyte CMOS Memory Cards
- Interface: Remote Instrument Control
- Interface: Remote Rigging Control

Main Output Computer

- 2-3 Video Control Cards
- # Control Channels (specify number)
- # Relay Channels (specify number)
- Dimmer surveillance (yes OR no)
- Analog OR Digital Dimmer Control

Back-up Computer (configured as Main Computer)

Back-up Output Computer (configured as Main Output Computer)

UTILITIES

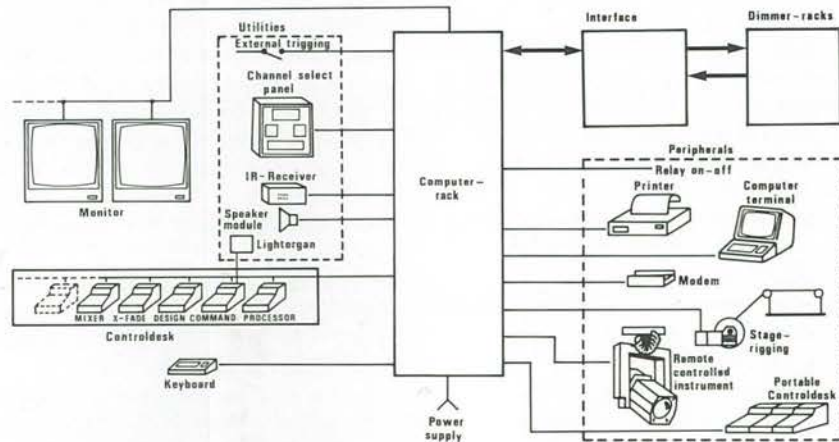
- Topographical channel-select panel
- IR Control Card
- # IR Transmitters (specify number)
- # IR Receivers (specify number)
- Speaker Module
- Light Organ Card (software-controlled)
- External Triggng

PERIPHERALS

- Computer Terminal (specify type)
- Printer (specify type)
- Portable Control Desk
- Stage Rigging
- Modem
- Remote Controlled Instrument
- Relay on/off

DIMMERS

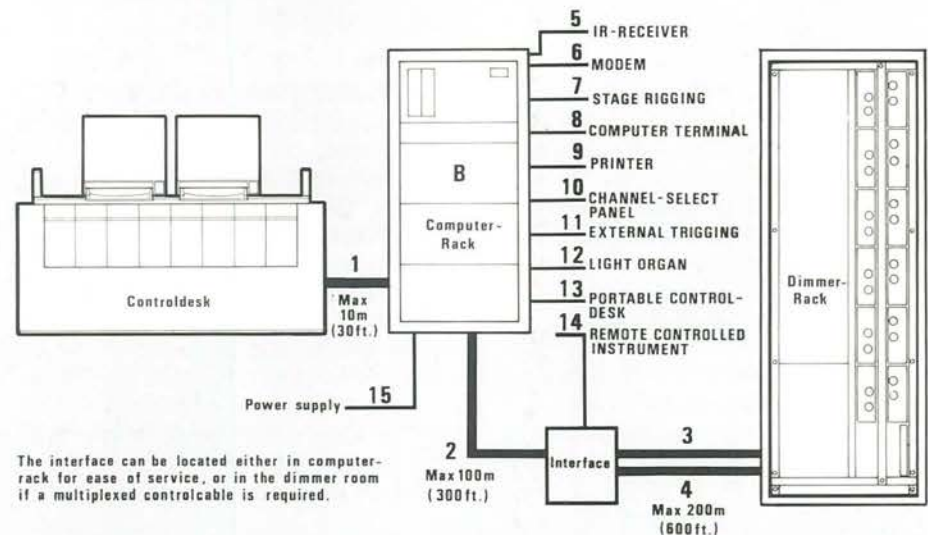
- (specify number and power ratings)
- (specify analog or digital)
- (specify if surveillance option required)



CABLE LIST

(cross-section of each wire 0,20 mm² if nothing else is mentioned)

1. 20 twisted pairs + foil shield, 10-wire + foil shield, 2 x 10 mm² + 3 x 4 mm² flexible, 3 x 1,5 mm², 4 x 75 ohm coax for each color monitor, 1 x 75 ohm coax for each b/w monitor
2. 20 twisted pairs + foil shield 3x1,5 mm + shield.
3. Analog control: 40-wire + foil shield for each group of 32 dimmers
Digital control + sense: 2 twisted pairs + foil shield for each group of 250 dimmers
4. Analog sense: 40-wire + foil shield for each group of 32 dimmers
5. 4-wire + foil shield
6. 5-wire
7. 20 twisted pairs + foil shield
8. 3-wire (for long distance 3-wire + foil shield)
9. 3-wire (for long distance 3-wire + foil shield)
10. 10 twisted pairs + foil shield
11. 5-wire + foil shield
12. 2-wire + foil shield
13. 20 twisted pairs + foil shield, 4 x 75 ohm coax for each color monitor, 1 x 75 ohm coax for each b/w monitor
14. 2 twisted pairs + foil shield
15. Power supply



The interface can be located either in computer-rack for ease of service, or in the dimmer room if a multiplexed controlcable is required.

MECHANICAL DATA

Control desk (8 Modules)

Length=1506 mm (60")
Depth=680 mm (27")
Height (adjustable)=750-1165 mm (30-46")
Weight=85 kg (188 lbs.)

Computer rack (Main Computer only)

Width=600 mm (24")
Depth=600 mm (24")
Height=1200 mm (48")
Weight=77 kg (170 lbs.)

Computer rack (with Computer Back-up)

Width=600 mm (24")
Depth=600 mm (24")
Height=1800 mm (71")
Weight=140 kg (309 lbs.)

Construction Materials

Control Desk: Modules=2 mm (5/64") steel plate, black lacquered finish
Desktop=Mahogany or optional custom design
Stand=Welded steel, black lacquered finish

Computer rack: 19-inch rack, convection cooled

Operating environment

0-30°C (32-86°F) air temperature
20%-80% relative humidity

Control cabling

Analog: 50-pole Champ multiconnector with securing clamp, one connector per 32 channels, cable ELAKY 20x2x0,6

Digital: One twisted pair per 250 channels, shielded, XL3-3 female connector

ELECTRONIC DATA

Control signals:

Analog: Adjustable between -12 V and +12 V, normally adjusted to 0 V=off, +10 V=full on OR

Digital: In modules of 250 channels, serial output rate=153.6 kbaud, RS422 (IE 1488)

Current sense (feedback from dimmers):

With current through dimmers
=+10 V, otherwise=0 V

Accuracy:

Recording=8 bits (0.4%),
crossfades=10 bits (0.01%)

Resolution:

Monitors and displays=1%

Computer:

Main computer=16-bit, Programming language=real-time PASCAL,
1 main port, 4 serial ports
Peripheral computers=2 x 6809 and 1 x 6809 per 256 channels

Primary memory:

256 kbyte CMOS, expandable by plug-in modules with 128 kbytes

External memory:

8-inch floppy disk, 1 system-obligatory, 1 additional as option

Powerfail restart:

Instantaneous (0.3 second), from CMOS-memory and from next instruction

ELECTRICAL DATA

Mains power:

220 V (±10 V), 50 Hz, 500 VA or
240 V (±10 V), 50 Hz, 500 VA or
117 V (±5 V), 60 Hz, 500 VA

Power supply:

Primary switching=20 kHz, filter = CISPR N

Video signal:

B/W BNC 2 x 75 Ω, 14 MHz, 625 lines, 32 x 80 characters or
COLOR BNC 4 x 75 Ω, 14 MHz, 625 lines,
32 x 80 characters

Monitor type and size:

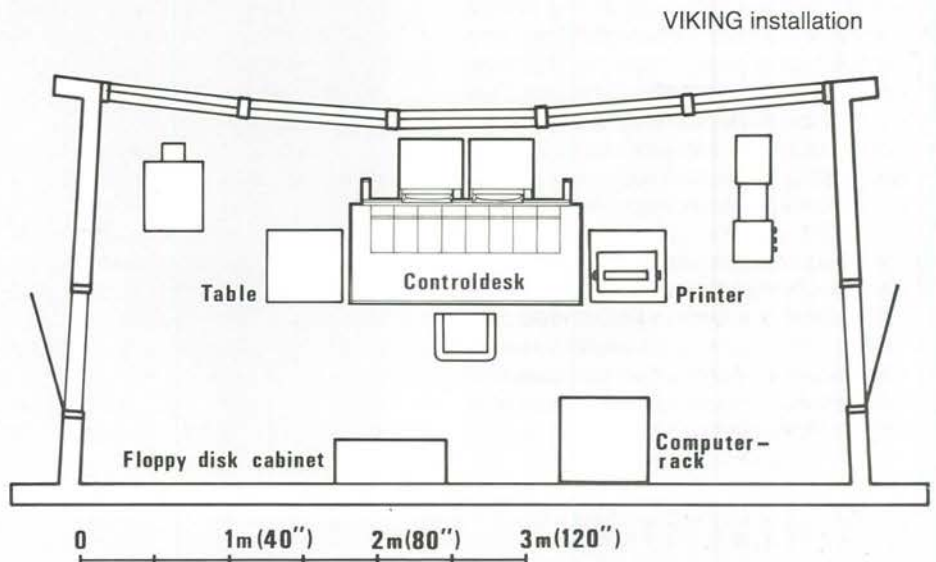
Optional

Battery back-up:

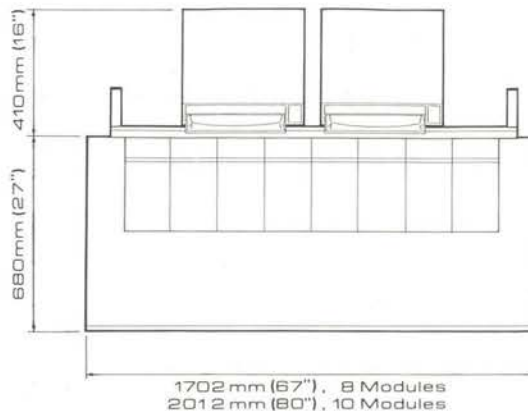
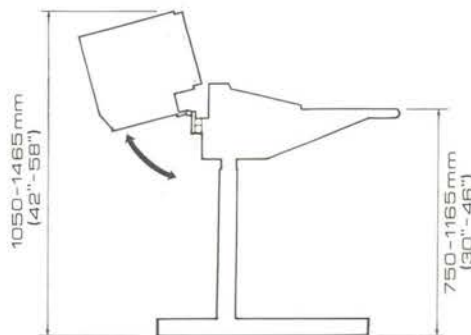
CMOS with NiCad-back-up

Memory retention:

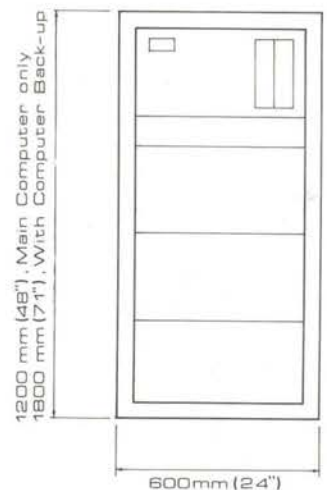
1 month without mains power



CONTROL DESK (8 Modules)



COMPUTER RACK
(Main Computer only)



To offer complete control systems we acquired the means to produce lighting instruments... The very best!

AVAB Elektronik AB, one of the world's leading manufacturers of professional products for stage and studio, has its headquarters in Gothenburg, Sweden. Electronic research and development, product design, together with production facilities for lighting, audio and process control equipment are concentrated here.

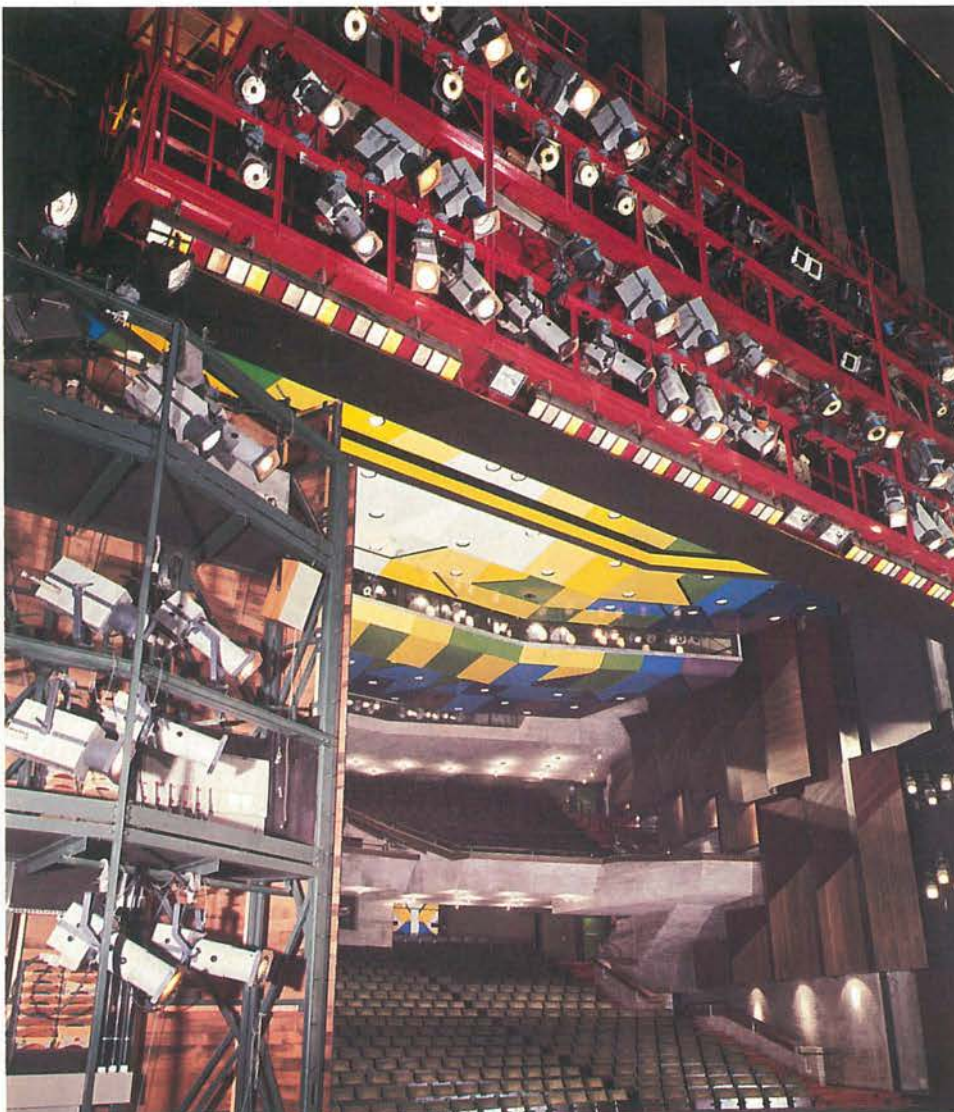
AVAB has increased its sphere of activities dramatically with the purchase of EMIL NIETHAMMER GmbH, a 60-year-old company located in Stuttgart, West Germany, with an enviable reputation for the optical excellence and solid craftsmanship of its lighting instruments.

AVAB has also opened AVAB America in San Francisco, California, which specializes in products for the American market.

Enthusiasts with several years of practical experience in the theatre founded AVAB more than 12 years ago. Other common factors in their backgrounds – higher education in computer technology, systems design and mechanical construction – are evident today in the practical conception and execution of AVAB products. All of the original founders of AVAB are still active. A few years ago the Board of Directors was complemented by an American lighting designer, adding still more practical know-how to the company.



Production at AVAB



NIETHAMMER, Badisches Staatstheater, Karlsruhe, West-Germany

Today AVAB has sales and service offices in most European countries, America and Australia. It also offers an extremely varied array of equipment in other areas outside lighting control for stage and studio, including architectural lighting, audio mixing and communications systems, and industrial process control.



The NIETHAMMER Plant

The company has grown considerably since its founding and is still expanding. In spite of this, however, AVAB has remained a very personable organization, which endeavors to maintain a good working relationship with customers. In fact, many practical suggestions for product improvement come directly from end users. AVAB considers this kind of close contact the key to continued success.

**Many claim to know about theatre and studio technology:
We put knowledge into practice**



VIKING installation, Swedish Television, "Cirkus"-studio, Stockholm.
VIKING's console can be customized finished to accommodate special requirements.

AVAB's modular concept leaves plenty of room for that individual touch in design which integrates VIKING perfectly into any environment, and adapts it to your esthetic and ergonomic requirements.

Whereas the hardware is more or less permanent, the software is anything but rigidly fixed. Any computer-controlled device is only as good as its program. AVAB has already paved the way for new innovations by making VIKING's program expandable, which eliminates the need for expensive hardware changes. Through this brochure you have been introduced to the newest, but certainly not the last, in top-of-the-line control systems.

Acquiring a VIKING is securing the future at a price you can afford.



VIKING installation, 750 channels, Théâtre de la Ville, Paris

AVAB

ELEKTRONIK AB

AVAB ELEKTRONIK AB

Västra Hamngatan 1
411 17 Gothenburg
SWEDEN

Phone +46 031 17 92 40
Telex: 27531 AVABGOT S

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