TECHNICAL DESCRIPTION

1. AUDIO SYSTEM
2. SYSTEM FOR THE TECHNICAL COMMUNICATION
3. THE FOYER AUDIO SYSTEM

AUDIO SYSTEM

1. SOUND SYSTEM OF THE LARGE STAGE

The sound system of the large stage consists of the audio control booth, system for the transfer of the microphone signals, system for the reproduction of the music materials, system for the sound support of the performers, system for the synchronisation of the performers on the stage and the system for the reproduction of the sound effects.

In the audio control studio there is an analogue audio mixer which can accept 24 microphone-line signals, and to transfer them into 2 main L, C, R OUTS, 8 group, 12 support and 6 matrix OUTS. Four CD players and one MD recorder are installed as the main sound sources. For the sound support of the performers, 12 systems of wireless (around the neck) microphones ("bugs") are being used. Effect processors for voice and other sounds are also being used for those purposes. All audio signals are connected with three patch panels, half-normal configurations, which gives a lot of possibilities in adapting the system to different needs. For the monitoring in the audio control booth high quality monitor speakers and headphones are being used.

System for the transfer of the microphone signals allows 24 microphone splitters, each with 4 independent OUTS, with the possibility of adjusting the amplification, and the possibility of sending the voltage of 48v necessary for the use of condensed microphones. Every channel of the splitter has the possibility of pre-listening. As a part of the microphone system there are also 4 fixed PZM microphones, controlled by the automated console, which are used for the live coverage of the performance. In the system there are also 24 microphones of various sensitivity and angle characteristics which can allow different usages, from live performances to recordings of the theatre performances or some other programme content.

Main sound system of the large stage is installed in "L, C, R" configuration with the addition of the effect speakers in the auditorium ("surround"). All the sound systems used include amplifiers, amplitude and phase correctors and compression limiters.

Multifunctional digital processors and digital amplitude correctors are used for the synchronisation of the work of the speaker systems, amplitude and phase correction, to get as a result the sound as close as it can be to the recorded material or the performer. Left and right clusters of speakers include 2 wide range and 1 low frequency speaker systems each, while the central cluster has 2 wide range speakers above the portal opening, and 4 additional units on the proscenium level for the first rows of the auditorium.

For the reproduction of the effects there are 6 speakers installed with the possibility of installing 2 additional units, as well as 4 stage monitors for the synchronisation of the performers on the stage.
As a part of the audio system there is also an audio production control studio which can be used for the rehearsal and recording purposes of the programme material for the needs of the theatre. It consists of the digital audio mixer, 8-channel digital recorder, a digital work station for recording and post production, CD recorders for the preparation of the programme material for the needs of the performances, MD recorder, DAT recorder, CD players and analogue cassette tape players. Audio mixer has an option of the preparation of the signal for recording in the 5.1 surround technology, which could then be reproduced in the main audio system of the theatre.

Audio system of the small stage, according to the expected modern and transformable programme contents, has a very flexible audio system. In its basis it is one easy transportable case which has inside an audio mixer, sound sources, analysis of the signal, with the possibility of the connection on two positions in the auditorium. Along with this, there are also four movable speaker systems and fixed surround speakers for the reproduction of the effects.

2. SYSTEM FOR THE TECHNICAL COMMUNICATION

This system allows the functions needed for the organisation of any programme content in the theatre. A digital programmable intercom matrix is used for those purposes, which allows a wide spectre of types of communication, from party-line to isolated types of connections. Besides that it provides the communication between all the technical spaces involved in the organisation of the performance, as well as the technical staff on and around the stage. One of the most important functions is the possibility of calling the performers and staff in the dressing rooms, make up rooms, etc. as well as the calling the audience for the beginning of the show. The function of live coverage of the sound of the performance throughout the building is made. The main intercom control is located on the stage managers control desk, while others are located on the directors control desk, sound operators booth, light operators booth, video control room, audio control studio, etc.

In the frame of the system for the technical communication there is also a sub system with the large number of intercom connections for the communication with the staff responsible for the mechanical systems, light technicians, camera operators. These connections are used with the light portable intercom stations, so called "belt pack" - with the combination of headphones and microphone. The use of the intercom matrix allows also the function of the sound feeds for the needs of the performance rehearsals.

3. THE FOYER AUDIO SYSTEM

This system is meant for the reproduction of the music material before the performance and also for the calling of the audience for the beginning of the performance. System consists of the amplifier of 100V, with 4 independent INS and OUTS, with the possibility of the programming of the priority signals. The amplifier is used for the activation of 4 speaker systems. Speaker system consists of one low frequency and 4 middle-to-high frequency speakers, which can cover the space of the main entrance of the foyer, wardrobe for the audience, balcony of the foyer and the toilettes.

INSTALLATIONS OF THE AUDIO SYSTEM

All of the cable installations connected to the audio system and the technical communication system, as well as the energetic parts of these systems, are done with the high quality, isolated, halogen free cables. All the lines of the cable installation are done through metal pipes and closed structures.

The energy feeding of these systems is done with the independent energy feed, with earth and is centralised for all the parts of the system through the GRO which is located in the amplifying room. All the measures of precaution are made to secure the entrance against all non professional staff, as well as the accidental contacts with the parts under the voltage. All the connections and fuses are made according with the system, trying to maximally lower the possibility of any electric energy or voltage drop outs.

Engineers,
Predrag V. Marković
Vladimir I. Matutinović

SPECIFICATION

3.1.1. SPEAKER SYSTEM FOR THE MAIN AUDIO SYSTEM

Pos.	Pcs.	Description
01.	3	CQ-2 Full range, max. SPL 139dB,1240W (620W/per channel)/L/C/R
02.	3	CQ-1 Full range, max. SPL 133dB,1240W (620W/per channel)/L/C/R
03.	2	650-P Subwoofer,max.SPL 136dB,1240W (620W/per channel)/L/C/R
04.	4	UPM-1P Full Range, max.SPL 123dB, 350W (2 channels: 225 + 125W) / proscenium
05.	1	LS-1A Line Driver 230V, 50Hz
06.	1	DSP Processor-Digital delay, and Parametric EQ Klark Teknik DN-9849
07.	1	19^2 Rack for the installation of the equipment with the mechanic tools, wired

3.1.2. SPEAKER SYSTEM FOR STAGE MONITORING SYSTEM AND EFFECTS

Pos.	Pcs.	Description
01.	2	UPA-1P Full range, Stage Monitor system SPL 133dB, 700W (350W/per channel)
02.	2	UPA-2P Full range, Effects System SPL 133dB, 700W (350W/per channel)
03.	2	USW-1P Subwoofer, effect speakers, SPL 133dB, 700W (350W/per channel)
04.	1	UM 1P Monitor speaker
05.	1	UM 1P Monitor speaker
06.	12	MM-5 Ultra compact-Wide range, Surround system, SPL 100dB, 25W
07.	1	MM-4 Controler
08.	1	LD-1A Line driver
09.	2	Power amplifier Electro Voice Q66
10.	4	UPA-Mounting yoke, installation equipment, for the full setting of the angle 360°

3.1.3. EQUIPMENT FOR THE SOUND CONTROL OF THE SPEAKER SYSTEM

Pos.	Pcs.	Description
01	1	Sound console MIDAS/LEGEND 3000
02	3	Audio processor Klark Technik DN 9340 + 9344
03	3	CD Player Tascam CD-450
04	1	Mini Disc recorder Tascam MD-350
		1
06	1	Digital reverberation effect
07	2	Voice processor
08	2	Monitor headphones
09	2	Monitor speaker Meyer Sound UPM-1P
10	1	Power amplifier 2x350W / built in the speakers
11	1	Set of technical furniture

3.2. AUDIO PRODUCTION CONTROL STUDIO

Pos.	Pcs.	Description
01	1	Digital Audio Console YAMAHA 02R with additional equipment
02	1	8 channel DAT Tascam DA-98HR
03	1	Audio work station
04	1	DAT recorder Tascam 20MkII
05	2	CD recorder TASCAM CD-RW402, CD-RW 2002
06	1	Mini disc recorder Tascam MD-350
07	1	Analogue cassette player Tascam 122MKIII

3.3 MICROPHONES AND THE DISTRIBUTION OF MICROPHONE SIGNAL

Pos.	Pcs.	Description
01	24	Dynamic and cardioids microphones
02	4	Fixed microphones of-stage que
03	4	UHF wireless microphones Senhaiser
04	2	Microphone pre-amplifiers Klark Teknik DN-1248+ (12 channels)
05	1	Auto. mixer IVIE 802A
06	1	Case 19"
07	12	Wireless microphones ("bugs") Senheiser EW-112

3.5 FOYER AUDIO SYSTEM

Pos.	Pcs.	Description
1	30	BOSE Free Space 3 Module + Subwoofer
2	1	Audio console - zoner
3	1	Power amplifier Bose 100V/400W

3.6 SYSTEM FOR THE TECHNICAL COMMUNICATION

3.6.1. General communication system of the building

Pos.	Pcs.	Description
1	4	Speaker with the tube for the sound for the sound on the stage 15/25W/100V, RCF HD 3421/T
2	1	Zeus Matrix - zoner module
3	1	Zeus Matrix - module for the distribution of the signal
4	1	Power amplifier Bose 100V/400W
5	1	Digital recorder of alarm messages RCF RD 2010RM

3.6.3. TECHNICAL INTERCOM SYSTEM WITH THE STAGE MANAGER'S CONTROL DESK

Pos.	Pcs.	Description
1	1	Stage manager's control desk, 19"/9U/6U, with installed control panel for the sound zones and additional commands, with serial communication, gong generator for the audio system and calling of the audience, with 2 colour video monitors 10", 2 CATV tuners, digital watch/stop watch, telephone, space for the installation of the master intercom KP-12, working light Litlite 18", work desk 485x350mm, professional-MIL A/V/RF connection, with the special connection cable 5m, according to the project, whole set.
2	1	Master intercom station, 4 channel, for the stage mngr. desk, TELEX
3	5	Intercom station 2-channel 19"/1U, TELEX, MKP-4
4	10	Intercom station - "beltpack" with headphones MTK, TELEX
5	3	Portable intercom station with speaker TELEX BKP-4
6	1	Digital 24-channel programmable matrix of intercom system
7	2	Regulation for the feed of the intercom system MS-4001
8	1	Active monitor speaker for the light control Klein Hummel O110
9	1	Console for the director's intercom station