

OMX-7011

1:20 Programmable Audio-Video Distributor

Several words on Distribution Amplifiers:

Distribution amplifiers distribute one signal to several users. They vary in the number of inputs, looping capability, number of outputs, operating format, bandwidth and input/output coupling. Distribution amplifiers are used to distribute one video and/or audio source to several video/audio acceptors for simultaneous recording or monitoring one source.

A good quality distribution amplifier amplifies the incoming signal (video and audio), pre-compensates the signal for potential losses (resulting from the use of long cables, for example) and generates several identical buffered and amplified outputs.

Often, a signal processor is inserted between the source and the distribution amplifier for correction and fine-tuning of the source signal before multiplication, thus all copies are corrected in the same way.

There are many factors effecting signal quality when transmitted from a source, to an acceptor:

- ☐ Source and acceptor signal handling capability - as different brands offer different qualities and the final result is limited by the lowest quality part performance. Using a low quality source will always result in low quality duplicates.
- ☐ The connection cables should be of the best quality you can afford. Low quality cables are susceptible to interference, deteriorate signal quality due to poor matching and cause elevated noise levels.
- ☐ Sockets and connectors of the sources and acceptors - so often ignored, should be of best quality, as "Zero Ohm" connection resistance should be assured. Sockets and connectors should match the required impedance (75 ohms in video). Cheap connectors tend to rust, causing breaks in the signal path.
- ☐ Amplifying circuitry quality is extremely important and is needed for high linearity, low distortion and low noise operation.

- ☐ The distance between source and acceptors plays a major role in the final result. If long distances (over 15 meters) exist between sources and acceptors - special means should be taken in order to avoid cable loss, such as using higher quality cables or if necessary - line amplifiers.
- ☐ Interference from neighboring appliances may have an adverse effect on signal quality. Balanced audio lines are less prone to interference, but unbalanced audio and video lines, even though the cables are shielded, should be installed far away from mains carrying cables, electric motors, transmitters etc.

How Do I Get Started?

The fastest way to get started is to take your time and do everything right the first time. Taking 15 minutes to read the manual may save you a few hours later. You don't even have to read the whole manual. At the beginning of each section, you'll find an overview of the section. So if the section doesn't apply to you, you don't have to spend your time reading it.

UNPACKING AND CONTENTS

The items contained in your OCEAN MATRIX Amplifier package are listed below. Please save the original box and packaging materials for possible future transportation and shipment of the Amplifier.

- ☒ Amplifier (rack-mountable)
- ☒ AC power cable
- ☒ User Manual
- ☒ Rubber feet

For additional information regarding optional cables and accessories, contact your dealer.

Getting to Know Your OMX-7011 Amplifier

The **OMX-7011** is a full bandwidth, state-of-the-art, 1:20 Programmable video/audio distribution amplifier designed for studio and other demanding applications. The **OMX-7011** splits a single video and audio input source into twenty identical outputs with no discernible signal degradation. The **OMX-**

7011 has four looping video and audio (stereo) inputs and a user programmable mode of operation. The **OMX-7011** can function as a 1:20, 2x1:10, 4x1:5 or 1:10+2x1:5 DA, and audio operation mode may be separated from video mode. Output signals are DC or AC coupled (user selectable) for highest signal fidelity. Due to the extended bandwidth of the machine it can be also used for video/graphics component distribution. The machine has video gain and EQ. controls for 4 sets of 5 outputs, as well as audio level controls. The audio section may be programmed to function as unbalanced stereo or balanced mono.

INSTALLATION

Rack Mounting

The amplifier may be rackmounted in a standard 19" EIA rack assembly, and includes rack "ears" at the ends of the front panel. The machine does not require any specific spacing above or below the unit for ventilation. To mount the amplifier, simply place the unit rack ears against the rack rails of your rack, and fasten with standard screws through each of the four corner holes in the rack ears. It is recommended to use plastic washers to protect the panel from scratching.

Connecting to Video Devices

Video sources and output devices (such as monitors, projectors or recorders) may be connected to the amplifiers through the BNC type connectors located on the back of the unit. Please keep in mind that the output signal format will match that of the input signal format. All signal connections that use more than one cable interconnecting between devices should be of equal length. Video sources connected to the **OMX-7011** and output devices, may support CV/component video signal types with AC/DC coupling.

Connecting TO Audio Devices

Audio sources and output devices (such as amplifiers or recorders) may be connected to the amplifier through the RCA type connectors located at the back of the unit.

Using the Amplifier

Powering on the Amplifier

NOTES

- 1. Amplifier should only be powered on, after all connections are completed and all source devices have been powered on. Do not attempt to connect or disconnect any video, audio or control signals to the amplifier while it is powered on!*
 - 2. The socket-outlet should be near the equipment and should be easily accessible. To fully disconnect equipment, remove power cord from its socket.*
- 1) Press the toggle switch on the far-left front panel to the up position. In the up position, the toggle switch glows.
 - 2) Operate the acceptors.

Looping

The looping function enables the operator to extend the number of outputs per input. The following example describes looping performed by using 3 amplifiers with one input and 5 outputs each: A video signal reaches input of amplifier No. 1. From looping connector of amplifier No. 1 a cable is connected to input socket of amplifier No. 2. The loop output of amplifier No. 2 is connected to the input socket of amplifier No. 3. In this way the input signal is divided into 15 separate output signals. The operator must always switch to "**Hi-z**" the termination switch of all the amplifiers but the last. The last amplifier's termination switch should always be at "**75ohm**" to maintain well-matched video line (of 75ohm impedance) from first to last amplifier. Note that if looping function is not used, the termination switch should be set to "**75 ohm**".

Coupling

The coupling function enables the operator to determine whether the incoming video signal is DC or AC coupled. When DC coupling is selected and proper standard video signal is applied to the amplifier's input, the output signal is equal to the input signal. When AC coupling is selected, DC components of the incoming signal are removed. DC coupling is always preferable since AC coupling might cause some linearity distortions in low and high frequencies (due to non-ideal behavior of capacitors). A problem

may arise when the incoming signal is riding on a DC offset especially when the acceptors are highly effected by deviation of DC offsets (A to D converters for example), which in turn results in a distorted picture.

Level Control

Level Control function enables the operator to control video signal level or compensate for distortions such as those caused by cables that are too long. Using a non-standard, or an uncalibrated video source also affects the incoming signal. Picture darkness is usually caused by low video signal and on the other hand, excessive video level "burns" the picture. The sync signal (should be around -0.3v) may be used to check conformity of the whole video signal: If sync level is too low or too high, the incoming video signal is not within the standard level. To correct the incoming video signal, an oscilloscope should be connected to amplifier's output and the LEVEL trimmer adjusted until satisfactory sync level and hence proper picture are achieved.

WARNING!

1. *Be aware that the amplifier was pre-calibrated for transparent operation at the factory and re-tuning it will upset signal transparency.*
2. *Do not attempt to adjust the LEVEL trimmers without using accompanying standard calibrated oscilloscope or waveform monitor!*

Equalization Control

Equalization Control function enables the operator to compensate for degradation of the video signal due to too long or non-standard cables. Popular cables such as the RG-59, RG-11 or the RG-179 signal cause degradation/attenuation of the following values:

CABLE TYPE	LENGTH	FREQUENCY	ATTENUATION
RG-59	100 meter	10MHz	3.6dB
	100 meter	100MHz	11dB
RG-11	100 meter	10MHz	2.2dB
	100 meter	100MHz	7.5dB
RG-179	100 meter	10MHz	8dB
	100 meter	100MHz	30dB

Degradation and loss of video signal are mainly caused due to stray capacitance which occur in long cables. As longer cables or higher frequency are used, the problem becomes worse, resulting in fine detail loss as well as color degradation. When RGB signals are involved (200-300MHz), degradation is even greater, leading to a total loss of sharpness at high resolution. It is necessary to compensate for the problem by using the amplifier's EQ. Control trimmer. Equalization is performed as follows: A Color Bar Generator is connected to amplifier's input and a Waveform Monitor (or an Oscilloscope with 75ohm termination) is connected to the long cable output. A known color bar signal is applied to the amplifier's input and compared to the signal monitored at the far side. The operator adjusts the EQ. trimmer until the measured output chrominance signal matches that of the input signal.

WARNING!

3. *Be aware that the amplifier was pre-calibrated for transparent operation at the factory and re-tuning it will upset signal transparency.*
4. *Do not attempt to adjust the LEVEL trimmers without using accompanying standard calibrated oscilloscope or waveform monitor!*

Programming the OMX-7011

The **OMX-7011** mode of operation is selected by pressing one of the operating mode control switches (one set for audio and one set for video) as described below:

- ⊗ Pressing the **1:20** switch, splits input "1" to all 20 outputs.
- ⊗ Pressing the **2x1:10** switch, splits input "1" to outputs "1-10" and input "3" to outputs "11-20".
- ⊗ Pressing the **4x1:5** switch, splits four inputs to four consecutive sets of five outputs each.
- ⊗ Pressing the **1:10+2x1:5** switch - Splits input "1" to outputs "1-10", input "3" to outputs "11-15" and input "4" to outputs "16-20".

Technical Specifications:

INPUTS:	4 video looping, 1Vpp/75 Ω on BNCs with termination switches. 4 stereo audio (or balanced mono) +4dBm / 50 k Ω , on RCAs.
OUTPUTS:	20 (1:20, 2x1:10, 4x1:5, 1:10+2x1:5) Video 1 Vpp/75 Ω on BNCs. 20 (1:20, 2x1:10, 4x1:5, 1:10+2x1:5) Audio-stereo (or Balanced mono) +4dBm / 50 Ω , 27 Vpp max. on RCAs.
VIDEO BANDWIDTH:	430 MHz -3dB.
AUDIO BANDWIDTH:	110 kHz -1dB.
DIFF. GAIN:	0.06 %.
AUDIO THD+NOISE:	< 0.02%.
DIFF. PHASE:	0.08 Deg.
2nd HARMONIC:	< 0.002%.
VIDEO S/N RATIO:	> 76 dB.
AUDIO S/N RATIO:	> 80 dB.
VIDEO COUPLING:	DC / AC user selectable.
AUDIO COUPLING:	AC.
VIDEO CONTROLS:	-1.2/+1.7 dB LEVEL, 0/+2.4 dB EQ.
AUDIO CONTROLS:	+0.3/+6.2dB.
POWER SOURCE:	115VAC 50/60 Hz, 18.5 VA.
DIMENSIONS:	19 inch (W), 7 inch (D) 2U (H) rack mountable.
WEIGHT:	3.6 Kg. (8 Lbs.) Approx.
ACCESSORIES:	Power cord.

Please note that if the output signal is disturbed or interrupted by very strong external electromagnetic interference, it should return and stabilize when such interference ends. If not, turn the power switch off and on again to reset the machine. The socket-outlet shall be installed near the equipment and shall be easily accessible. To fully disconnect equipment, remove power cord from its socket.

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