



ONE SYSTEMS®

## PORTABLE OUTDOOR POWERED SYSTEM

### POPSSUBa USER MANUAL



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operation and maintenance instructions.



High voltage

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



**NOTE: The POPS Sub uses an auto-detection circuit that senses and adjusts internal operating voltages to the AC Mains supply. The POPS Sub will operate between 104VAC and 253VAC. However, there are separate AC Mains cable assemblies for 115VAC or 230VAC operation!**

**Although the AC Mains is automatically selected the user must insure that the proper AC Mains cable is supplied (GFCI enabled for 115VAC operation and PRCD enabled for 230VAC operation)**

	<b>CAUTION</b>	
	RISK OF ELECTRIC SHOCK, DO NOT OPEN!	
CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.		

The Portable Outdoor Powered System Sub (**POPSSub**) was designed by One Systems to provide additional bass and sub bass response for the **POPS15** system. The **POPSSub** features an 18 inch (457 mm) diameter woofer that delivers extremely high acoustic output capability at very low frequencies. The **POPSSub** was designed for use in any direct weather outdoor application, such as sporting events, theme park events, civic celebrations and general outdoor presentations. **POPSSub** was designed for ALL weather applications and all components, including all electronics and transducers have been developed for use in rain, snow and other inclement weather applications. The highly portable design is also ideal for portable applications in gymnasiums, indoor and outdoor swimming pools and meeting rooms. **POPSSub** features large diameter pneumatic (air-filled) wheels to allow for easy transportation on soft, wet, grassy surfaces such as football fields, soccer pitches, baseball diamonds etc.

## Specifications

Frequency Response:	40 Hz – 80 Hz
Coverage Pattern:	Essentially omnidirectional
Input:	3-Pin XLR-type (IP 67) (Pin 2 +)
Outputs:	Thru (balanced) High Pass Filtered out (balanced)
Power	
Peak - Total System:	2,000 Watts
Continuous- Total System:	1,000 Watts
AC Mains Power:	104 V AC – 253 V AC (50 Hz – 60 Hz)
Max Acoustic Output (Peak):	128dB*
Weather Performance:	IEC 529 / IP 56
Supplied Accessories:	AC Mains Cable (100Ft / 30.5 m) Input /Output XLR-XLR (6.6 Ft / 2 m) 1.375 inch (35 mm) manual crank-up pole

Dimensions (H X W X D):

344.5 X 790 X 909.8 mm  
21.44 X 31.1 X 35.82 inches

Weight

40 kg (88.2 lbs)

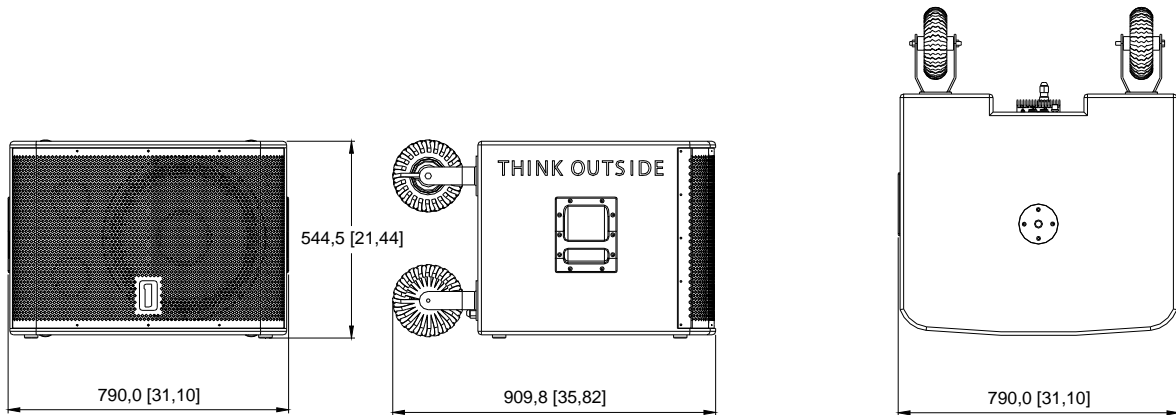
Operating Temperature

0C – 40C (32F – 104F)

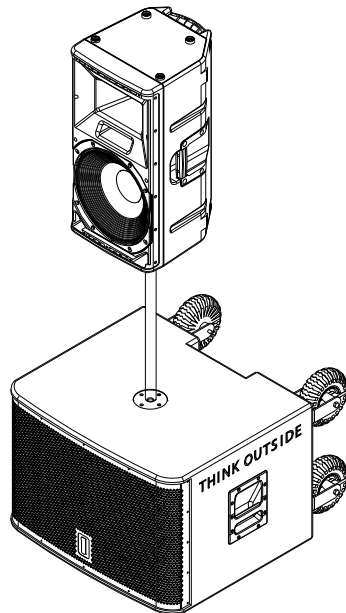
Available Accessories

**POPS 15**

\* NOTE: Max Acoustic Output is based on smoothed overall system response, not peak driver response.



The image below shows **POPS15** mounted on the **POPSSub** using the pole supplied with the **POPSSub**:





## **Read all of the instructions included in this manual**

NOTE: The AC mains supply end of the **POPS** Sub power cable **MUST** be plugged into a supply source that has a GROUND FAULT CIRCUIT INTERRUPTER (GFCI). The 115 VAC version is supplied with an in-line GFCI. The 230 VAC version is supplied with a Portable Residual Current Device (PRCD). In Europe, these devices are also referred to as Residual Current Devices or Residual Current Circuit Breakers.

**NOTE: THE RESET ON THIS DEVICE SHOULD BE TESTED TO VERIFY PROPER OPERATION OF THE SAFETY DEVICE!**

**The POPS** Sub is supplied with an “in line” GFCI device for use in countries that use 115VAC. **DO NOT** bypass this device or disable. The end of the AC Mains cable that is plugged in to the AC Mains supply must be in a dry condition.

**The POPS** Sub is supplied with an “in line” PRCD device for use in countries that use 230VAC. **DO NOT** bypass this device or disable. The end of the AC Mains cable that is plugged in to the AC Mains supply must be in a dry condition.



NOTE: If a hard-wired GFCI or PRCD device is already located at the AC Mains source connection then the “in line” devices may be removed. **THIS MUST BE DONE BY A LICENSED ELECTRICIAN THAT IS FAMILIAR WITH ALL LOCAL AND NATIONAL ELECTRICAL CODES AND PRACTICES.**

**DO NOT BYPASS THE GFCI OR PRCD DEVICE UNLESS YOU ARE FULLY LICENSED AND QUALIFIED TO DO SO!**

Copies of this manual should be retained by both the system installer **AND** end user.

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**POPSSub's** amplifier is a convection-cooled device and requires at least 7 inches (178 mm) of clearance behind the enclosure to allow the heat sink to adequately cool the internal electronics.

SEE SECTION BELOW ON **POPSSub** AND HIGH TEMPERATURE AMBIENT ENVIRONMENTS AND SOLAR GAIN.

DO NOT INSTALL NEAR ANY HEAT SOURCES!

Use **ONLY** the supplied AC Mains connector. **DO NOT SUBSTITUTE!**

Protect the AC Mains power cord from being walked on or otherwise damaged and inspect for damaged connections and damaged insulation.

Use **ONLY** the supplied XLR/XLR cable. **DO NOT SUBSTITUTE!**

There are **NO** user serviceable parts inside the enclosure. **DO NOT REMOVE THE AMPLIFIER MODULE!** (See Service section for details OR contact One Systems)

## WARRANTY

ONE SYSTEMS products are warranted by ONE SYSTEMS, Inc, and ONE SYSTEMS GLOBAL Co. Ltd for a period of 5 years. (3 years for all electronic products) This warranty period begins with the date of purchase by the original end-user of the product. All products are warranted against defects in materials and workmanship.

This Limited Warranty does not cover product abuse including, but not limited to, mechanical and thermal failures associated with excessive input power applied to ONE SYSTEMS loudspeaker systems. In addition, damage caused by accident, misuse or failure to observe instructions included in the following manuals: "Outdoor installation of loudspeakers" and "Rigging and Suspension of ONE SYSTEMS products" (These manuals may be found on the ONE SYSTEMS web site, [www.ONESYSTEMS.com](http://www.ONESYSTEMS.com)) is not covered. Other acts which are not the fault of ONE SYSTEMS are not covered. Defects or damages resulting from service, testing, product modification or alteration by someone other than ONE SYSTEMS or its authorized agents or service centers are not covered. ONE SYSTEMS is not responsible for misrepresentations by the seller or other parties.

All products covered by this limited warranty must be shipped to an authorized service center (see details below) prepaid. ONE SYSTEMS will pay all material and labor costs associated with repair or replacement of covered products. ONE SYSTEMS will pay all return costs associated with products covered under the terms of this limited warranty.

## Limitation of Implied Warranties

ANY IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL BE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY, OTHERWISE THE REPAIR, REPLACEMENT, OR REFUND AS PROVIDED UNDER THIS EXPRESS LIMITED WARRANTY IS THE EXCLUSIVE REMEDY OF THE END USER (CONSUMER), AND IS PROVIDED IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. IN NO EVENT SHALL ONE SYSTEMS, OR ANY OF ITS OPERATING DIVISIONS, BE LIABLE, WHETHER IN CONTRACT OR TORT (INCLUDING NEGLIGENCE) FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, ACCESSORY OR SOFTWARE, OR FOR ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, OR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, SOFTWARE OR APPLICATIONS OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE ABILITY OR INABILITY TO USE THE PRODUCTS, ACCESSORIES OR SOFTWARE TO THE FULL EXTENT THESE DAMAGES MAY BE DISCLAIMED BY LAW.

**Some states and jurisdictions do not allow the limitation or exclusion of incidental or consequential damages, or limitation on the length of an implied warranty, so the above limitations or exclusions may not apply. This warranty provides specific legal rights, and other rights may exist from state to state or from one jurisdiction to another.**

## REGULATORY AND SAFETY DATA

This product was tested to International Standards for safe operation. The **POPSSub** is compliant with EN60065. Test certification may be obtained from One Systems.

## CONTENTS

The **POPSSub** system is shipped in three cartons. The contents of the cartons are as follows:

### **POPSSub ENCLOSURE**

One Portable Outdoor Powered Systems Sub (**POPSSub**) that includes a class-D digital power amplifier. The complete **POPSSub** is rated to IEC 529 / IP 56.

Also included in this carton is a 1.375 inch (35 mm) standard diameter mounting pole for use with **POPS15**.



**NOTE:** The POPS Sub MUST be located on level ground when the POPS 15 is mounted on top of the supplied pole.



DO NOT USE OTHER SYSTEMS THAN THE **POPS15** WHEN MOUNTING ON THE POLE.

DO NOT SUBSTITUTE OTHER MOUNTING POLES ON **POPS** Sub's ENCLOSURE!

## **AC MAINS CABLE**

100ft (30.5 m) of SJOW-rated AC mains cable with an IP 68-rated cable end connector designed to mate to the input panel of the **POPSSub** enclosure.

## **INPUT/OUTPUT CABLE**

6.6 FT. (2 M) of SJOW-rated two-conductor shielded input/output cable with an IP 67 rating.

## **FEATURES AND APPLICATIONS**

**POPSSub** is a very unique product and may be used in “wet” outdoor environments. Its AC Mains and input/output connectors are designed to provide a high degree of ingress protection. All mechanical connections are rated IP 67 or higher. **POPSSub** may be safely installed in outdoor environments as long as **ONLY** the supplied cables are utilized. **DO NOT SUBSTITUTE CABLES.**

**POPSSub** is a professional product and is designed to be used with a high-quality mixing console. The **POPSSub** does not provide any additional, user-selectable equalization. Equalization functions should be provided by the mixing console or other outboard devices.

One Systems does not feel that adding additional EQ functions are appropriate for truly professional products. The addition of redundant functions such as EQ can cause clipping and distortion.

The system's dynamics processing consists of a compressor/limiter function designed to provide both ultra fast threshold system protection and maximized system dynamics.

## **POPS AND HIGH AMBIENT TEMPERATURES**

**POPSSub** has been designed to work in a wide range of ambient temperatures. When using the **POPSSub** however, consideration must be given to the ambient temperature as well as the heat produced by exposure to direct sunlight.

In a "shaded" environment, the **POPSSub** is rated for normal operation up to 40° C (104° F). In environments where **POPSSub** is subjected to direct sunlight, a portion of that direct solar energy is absorbed by the enclosure and the external heat sink. **POPSSub**'s color and resin formulations have been specifically designed to minimize the thermal/solar gain of the enclosure and the heat sink has been clear-anodized to minimize its solar gain as well.

It is recommended that whenever possible, **POPSSub** should be used in either a shaded area, or in shade provided via an external "umbrella" type of sun shade.

Solar gain precautions should be taken any time the ambient (air) temperature is 90° F (32° C) or higher and if **POPSSub** is intended to be used in direct sunlight.

## **SETUP AND USE OF POPSSub**

### **AC MAINS CONNECTION**

The AC mains are connected to the POPS Sub using the supplied cable ONLY. DO NOT SUBSTITUTE!



**NOTE:** If the POPS Sub is being used with the POPS 15 the best practice is to turn on the POPS 15 PRIOR to turning on the POPS Sub. During the turn off sequence, either the POPS 15 or the POPS Sub may be turned off first!

Prior to connecting the AC mains cable, insure that the AC mains switch on the **POPSSub** is in the OFF position.





On/Off Switch



**NOTE: DO NOT CONNECT THE AC MAINS CABLE TO THE POPSSub IF WATER OR MOISTURE IS PRESENT IN THE CONNECTOR!**

**POPSSub** will operate on any AC mains voltage between 104 volts and 253 volts. The required AC mains frequency is between 50 Hz and 60 Hz.

**POPSSub** uses a waterproof AC mains connector system. To mate the AC mains cable with the AC mains connector on the input plate, align the cable end with the amplifier's panel connector and push with sufficient force until you hear a "click" sound that indicates the cable end and chassis end are properly mated. Support the **POPSSub**'s enclosure with one hand while performing this operation. The AC mains connector is shown below. It is located on the lower portion of **POPSSub**'s input panel.



AC Mains panel connector



INSURE THAT THE AC MAINS CABLE IS SECURLY CONNECTED AND IS “LOCKED” INTO POSTION. DO NOT USE THE **POPSSub** IF THE AC MAINS CONNECTOR IS NOT SECURLY-MATED TO THE AMPLIFIER MODULE!



DO NOT CONNECT THE AC MAINS END OF THE AC MAINS CABLE IN AN AREA THAT IS WET OR SUBJECT TO CONDENSATION OR DAMP CONDITIONS!

The AC Mains end of the cable assembly uses an “in-line” GFCI device (115 V AC) or a PRCD device (230 V AC). DO NOT disconnect this device!

To disconnect the cable end of the AC mains connector, pull back on the collar of the cable’s end connector in the direction shown on the connector. While pulling back on the collar, pull the cable end connector away from the chassis connector.



NOTE: ALWAYS turn off the AC mains power BEFORE attempting to disconnect the AC mains cable from **POPSSub**’s amplifier module!

The AC mains supply end of the cable is shown in the image below.



Cable end  
(connected to POPS Sub)

AC Mains end

Once the AC mains cable is connected to **POPSSub**’s electronics, the other end of the AC mains cable may be connected to the AC mains supply. This end of the AC mains cable is a standard connector and MUST be connected in an area that is DRY. The figure above represents both ends of the AC mains cable. The connector on the left side of this figure is the IP 68-rated cable end that should be

connected to the AC mains input on **POPSSub**'s amplifier module. The connector on the right side of this image is connected to the AC mains supply located in a dry area. (The connector shown on the right side will vary depending on local AC Mains connection requirements!)

**NOTE:** The AC Mains cable is an extension cable. It is a high-quality cable with low line loss. Connecting the AC Mains cable to another extension cable will produce additional line loss and can result in low ac mains voltage at the POPS amplifier module. It is not recommended that additional extension cables be used with this AC Mains connector.

Once the AC mains cable is securely connected to both the amplifier and AC mains supply end, **POPSSub** may be powered up. A good practice is to make sure the audio levels on the mixer's output (or other source output) are reduced or muted prior to applying power to **POPSSub**.

**NOTE:** When power is applied to the **POPSSub** and the unit is turned on, there is a short delay before the pilot light illuminates.



Pilot Light



**NOTE:** If the pilot light does not illuminate within 30 seconds the unit may be in a **FAULT CONDITION**. The unit should be returned to One Systems for evaluation.

**THERE ARE NO USER-SERVICABLE PARTS INSIDE. DO NOT REMOVE THE AMPLIFIER MODULE!**

## **AUDIO CONNECTIONS**

**POPSSub** includes two male XLR connectors. This configuration differs from the standard male input and female out/thru due to the water and moisture requirements of this product. Both the input and output/thru XLR connectors on the POPS Sub are male Neutrik plugs and require Neutrik cable end connectors

NC3FXX-HD-D. The supplied XLR to XLR audio cable has two of the NC3FXX-HD-D connectors.

The POPS Sub also features a High Pass Filters output. This output is a 4<sup>th</sup> order (24dB/Octave) high pass output designed to provide a drive signal to the POPS 15 enclosure. This is a balanced output with pin 2 positive.

The image below illustrates the top portion of **POPSSub**'s input plate. Both the audio input and audio thru connectors as well as the HP filtered output are shown. In this image all connectors are shown with their water covers in place.

NOTE: **POPSSub** also features an audio "signal present" indicator LED that is next to the Pilot Light. This indicator will illuminate when there is an audio signal present at the XLR input. The threshold for this indicator is approximately -25dBV.



When the audio connectors are not in use, the water covers should be inserted in the XLR connector. (Example: If the audio input is being used but the audio thru connector is not being used, the water cover should be inserted in the audio thru XLR to prevent moisture intrusion).



Audio Input, Thru and HP Filtered Weather Covers

The image above shows both the input and thru connectors with water covers in place.



NOTE: Care must be exercised to insure that each end of the XLR connector is securely seated in the mating panel connector and locked into place. Insert the connector into the panel connector until a soft "click" is heard. This indicates the

cable end is properly mated to the panel connector. To remove the XLR connector simply squeeze the rubber “boot” of the connector on the top and bottom as near to the panel end of the boot as possible.

Failure to properly seat and secure the connector will reduce the water protection features designed into the connector assembly.



Audio Input

The POPS Sub also features an audio “thru” output. This connection **MUST** also use a Neutrik NC3FXX-HD-D cable end connector.

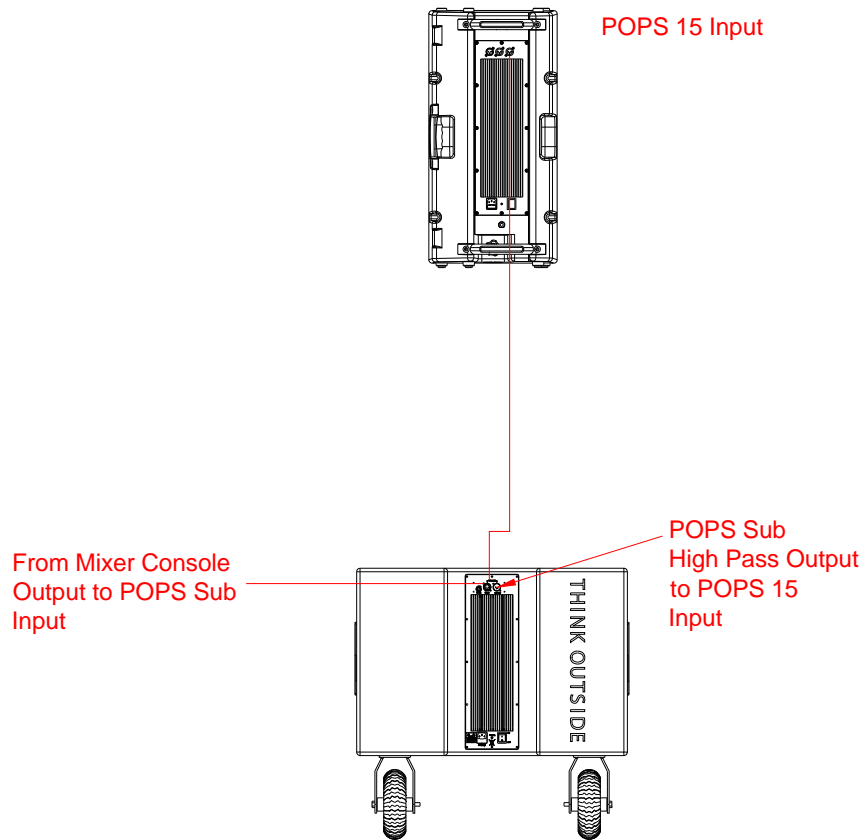


Audio Input

Audio “Thru” Output

Connect the audio output from the console/mixer using the supplied XLR to XLR cable using the Audio Input XLR as shown below.

The wiring is also shown below for the **POPSSub** and **POPS15**.



As noted above, the mixing console's output is wired to the **POPS** Sub's input. The **POPS** Sub's High-Pass Output is wired to the input of the **POPS** 15. The XLR connectors supplied with **POPS15** and **POPSSub** must be used for these connections. **DO NOT SUBSTITUTE!**



**DO NOT USE THE CONNECTOR IF MOISTURE IS PRESENT IN THE PANEL PORTION OF THE XLR CONNECTOR. THE PANEL'S CONNECTOR MUST BE DRIED PRIOR TO CONNECTION!**



**WARNING: DO NOT SUBSTITUTE XLR CABLE END CONNECTORS. FAILURE TO USE NEUTRIK NC3FXX-HD-D CABLE END CONNECTORS WILL COMPROMISE THE WATER / MOISTURE RATING OF THE **POPSSUB** AND MAY RESULT IN UNSAFE CONDITIONS. NEUTRIK NC3FXX-HD-D CONNECTORS MUST BE USED FOR ALL CONNECTIONS ON THE **POPSSUB**.**

## USING THE POPSSub (Application and Trouble-Shooting Tips)

**POPSSub** is a high-quality professional sound reinforcement system designed for use in both direct weather outdoor applications as well as high ambient noise indoor applications. The **POPSSub** is designed to be used with the **POPS15**. Some basic precautions will insure long-term reliability.



INSURE THAT THE **POPSSub** IS PLACED ON LEVEL GROUND THAT IS CAPABLE OF SUPPORTING THE WEIGHT OF BOTH THE **POPSSub** AND THE TOP POLE-MOUNTED ENCLOSURE .

FAILURE TO INSURE A FLAT SURFACE THAT IS CAPABLE OF SUPPORTING THE ENTIRE WEIGHT OF THE **POPSSub** AND **POPS15** MAY RESULT IN INJURY AND PROPERTY DAMAGE!

### GAIN

**POPSSub** has an external gain control designed to match the subwoofer's acoustic output with the **POPS15**. Care should be exercised when setting this gain level to insure that the overall system gain structure is below the system's electronic overload (below clipping levels).

The optimal "starting" point of the **POPSSub**'s gain function is at the 50% rotation position. (half-way between the rotation extremes of the gain function control)

In this position, adding the **POPSSub**'s output to the output of the **POPS15** will increase the low-frequency output at 50 Hz by 6 dB and over 8 dB at 40 Hz. Increasing the gain control to max will produce approximately another 4 dB of output from the 50% position.

Rotating the gain in the counter clockwise direction from the 50% position will rapidly reduce the gain of the **POPSSub**.

The output gain of the mixing console should be set at a low level and then the gain of the **POPSSub** should be set to the desired level to achieve the required overall system acoustic response.

Then the gain of the mixing console should be increased to achieve the desired output levels. If any distortion or clipping is detected, the gain of either the mixing console output or the gain of the **POPS Sub** should be reduced.

The **POPSSub**'s gain control location is shown in the picture below:



POPS Sub Gain

## EQUALIZATION

The **POPSSub** has all the required equalization functions included in its amplifier's circuitry. The equalization functions have been optimized for flat frequency response and maximized system dynamics. **POPSSub** does not have user-adjustable external EQ.

The mixing console should be capable of providing sufficient output signal levels to supply the necessary voltage levels to drive the **POPS15** and **POPSSub** to full power and still insure adequate headroom. The mixing console should be capable of driving 100 feet (30.5 m) of balanced cable as well as the **POPS15**.

If additional equalization is required, care should be taken to avoid excessive EQ in any band, but particularly at low frequencies. Excessive equalization can produce "band selective" clipping and distortion. All EQ boost levels should be monitored if system distortion is present.

## DISTORTED SOUND

When input levels to the **POPSSub** exceed the amplifier's gain capability, internal dynamics processing functions will engage and provide system protection. However, it is still possible to "overdrive" the input section of the enclosure. If distorted sound is present the following steps should be taken:

1. Verify that the mixer's output is not clipping or overloaded. If the output metering section of the mixing console is continuously in the "red" then the output level should be reduced. (occasional "red" indications are usually fine and are dependent on the mixing console output capability).

2. Verify that excessive equalization is not present anywhere in the signal chain.



3. Verify that AC mains levels are within the required range.



Voltage measurements on the AC Mains should be performed by a licensed electrician or individual trained in making high voltage measurements.

## NO SOUND

1. Verify that signal is present on the input of **POPSSub**.
2. Verify that there is AC Mains voltage on the AC Mains input to the **POPSSub**
3. If AC Mains voltage is present, verify that **POPSSub**'s fuse is not blown.



NOTE: IF THE FUSE IS BLOWN, REPLACE ONLY WITH THE SAME TYPE OF FUSE. THIS FUSE TYPE IS NOTED ON THE INPUT PANEL NEAR THE FUSE HOLDER. THE LOCATION OF THE FUSE HOLDER IS SHOWN BELOW.



FUSE HOLDER



The fuse holder is a waterproof design. Insure that the gasket is properly seated when replacing the fuse. Insure that the fuse holder cover is securely tightened. DO NOT OVER-TIGHTEN THE FUSE HOLDER'S COVER.

## PRODUCT SERVICE



There are NO user-serviceable parts inside the **POPSSub**. NOTE: See section below titled "Replacement of Components" for woofer servicing.

The **POPSSub's** amplifier module **MUST** be serviced by an individual authorized by One Systems.

**POPSSub's** amplifier is attached to **POPSSub's** enclosure using 12 x M4 stainless steel machine screws with self-sealing washers. The unique self-sealing feature of these washers forms a waterproof seal between the amplifier module and the enclosure.

The washers are supplied by Gaynor Industries and are Gaynor Industries part number LTN37164

**DO NOT SUBSTITUTE WASHER TYPES.**

### **Replacement of Components**



**REPLACEMENT OF COMPONENTS MUST BE PERFORMED BY A QUALIFIED TECHNICIAN OR ONE KNOWLEDGABLE IN THE REPLACEMENT OF TRANSDUCER COMPONENTS!**

**DO NOT ATTEMPT ANY REPAIRS UNLESS **POPSSUB'S** AMPLIFIER HAS BEEN DISCONNECTED FROM THE AC MAINS SOURCE!**

In the event of woofer failure, the woofer may be accessed by removing the front grill and then removing the woofer. This should be done by a qualified technician or contractor. There is no need to remove the amplifier panel in the event of a woofer failure.



**USE EXTREME CARE WHEN HANDLING **POPSSUB'S** AMPLIFIER MODULE. THE COMPONENTS ON IT ARE FRAGILE. THE MODULE MUST NOT BE SET ON ITS COMPONENT SIDE OR DAMAGE WILL OCCUR!**