

NTL720 LOUDSPEAKER  
OWNER'S MANUAL

**BEAW**





# NTL720 Loudspeaker Owner's Manual

*Congratulations on the purchase of your new EAW loudspeaker. You now own one of the finest professional audio products available - the result of exceptional engineering and meticulous craftsmanship. Please read these instructions to get the maximum performance from your new loudspeaker.*

## 1 SAFETY PRECAUTIONS - READ THIS FIRST

### 1.1 Safety Instructions

Read and heed all warnings and safety instructions in the accompanying "EAW Loudspeaker Owner's Manual" before using this product. Failure to follow this precaution may result in damage, injury, or death.

**WARNING:** The loudspeaker is supplied with an AC mains power cable. Depending on the voltage model ordered, this cable is configured with the most common AC mains connector for that voltage. If the connector is not compatible with the local AC mains receptacle, employ a licensed electrician to re-configure the cable with the proper connector. Ensure that the AC power supply has a properly grounded safety ground. Failure to follow this warning could cause damage, injury, or death.

## 1 CONSIGNES DE SÉCURITÉ - À LIRE EN PREMIER

### 1.1 Instructions Relative à la Sécurité

Lisez et respectez toutes les consignes de sécurité et les mises en garde fournies dans le manuel des enceintes EAW avant d'utiliser ce produit. Le non-respect de ces consignes et mises en garde peut entraîner des dommages aux équipements et des accidents aux personnes pouvant être fatals.

**ATTENTION:** L'enceinte est fournie avec un cordon secteur. Selon la tension du modèle commandé, ce câble est fourni avec la fiche la plus communément utilisée avec cette tension. Si la fiche n'est pas compatible avec les prises secteur de votre région, faites appel à un électricien agréé pour modifier le cordon secteur en fonction du format local. Vérifiez que la fiche secteur dispose d'une mise à la terre. Le non-respect de la mise à la terre peut entraîner des dommages aux équipements et des accidents aux personnes pouvant être fatals.

## 1. PRECAUZIONI DI SICUREZZA - DA LEGGERE PER PRIMO

### 1.1 Norme di Sicurezza

Prima di procedere con l'utilizzo del prodotto, leggere e rispettare ogni avvertenza e norma di sicurezza riportata nel "Manuale EAW Loudspeaker". Il mancato rispetto di ogni precauzione può causare danni all'apparecchiatura, nonché infortuni alle persone o la morte.

**ATTENZIONE:** Il diffusore è completo di cavo d'alimentazione ac fornito in dotazione. In base la voltaggio del modello di diffusore acquistato, il cavo è configurato con il connettore ac più adeguato. Nel caso in cui il connettore non sia compatibile con le prese di corrente adottate nell'area d'impiego, rivolgersi ad un elettricista qualificato per ri-configurare il cavo con il

connettore più appropriato. Assicurarsi che la presa di corrente sia adeguatamente collegata a terra. Il mancato rispetto di tali norme può causare danni all'apparecchiatura, nonché infortuni alle persone o la morte.

## **1. PRECAUCIONES DE SEGURIDAD - LEA ESTO PRIMERO**

### **1.1 Instrucciones de Seguridad**

Lea y observe todos los avisos e instrucciones de seguridad que aparecen en el "Manual de altavoces EAW" adjunto antes de usar este aparato. El no observar esta precaución puede dar lugar a averías en el aparato, daños en las personas o incluso la muerte.

**PRECAUCION:** El altavoz viene de fábrica con un cable de corriente. Dependiendo del voltaje que use el modelo solicitado, este cable estará configurado con el enchufe más habitual para ese tipo de corriente. Si ese enchufe no es compatible con su salida de corriente, contacte con un electricista profesional para que cambie el enchufe del cable por el tipo adecuado. Asegúrese de que la salida de corriente tenga una conexión a tierra adecuada. El no observar esta advertencia puede dar lugar a averías en el aparato, daños en las personas o incluso la muerte.

## **1. SICHERHEITSHINWEISE - LESEN SIE DIESEN ABSCHNITT ZUERST**

### **1.1 Sicherheitsanweisungen**

Lesen und beachten Sie alle Warnungen und Sicherheitsanweisungen der mitgelieferten "EAW Lautsprecher Bedienungsanleitung" vor der Benutzung des Produkts. Nichtbeachtung dieser Hinweise können möglicherweise zu Schäden am Equipment oder zu Verletzungen bzw. zum Tod von Personen führen.

**WARNUNG:** Der Lautsprecher wird mit einem Netzkabel geliefert. Abhängig von der jeweiligen Netzspannung wird das Kabel mit dem für die jeweilige Netzspannung gängigsten Netzstecker ausgeliefert. Sollte der Netzstecker nicht in Ihre Netzsteckdose passen, dann lassen Sie von einem zugelassenen Elektrobetrieb einen passenden Netzstecker montieren. Stellen Sie sicher, dass der Schutzkontakt der Netzsteckdose einen guten Kontakt zur Erde hat. Nichtbeachtung dieser Hinweise können möglicherweise zu Schäden am Equipment oder zu Verletzungen bzw. zum Tod von Personen führen.

## 1.2 EC Declaration of Conformity

Manufacturer: Eastern Acoustic Works — USA

Declares that the following product(s) have been tested and passed all relevant requirements as described below by the appropriate European Directives as they apply to Professional Audio Products.

Product Model: NTL720  
Product Description: Self-powered loudspeaker

Safety Directive(s): EN 60065-2002  
EMC Directive(s): EN 55103-1 (Radiated/Conducted Emissions)  
EN 55103-2 (Radiated/Conducted Immunity)  
2004/108/EEC Directive  
Low Voltage Directive: 72/23/EEC  
Markings Directive: 93/68/EEC

The Technical Report/File is maintained at:

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## 1.3 FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**CAUTION:** Changes or modifications not expressly approved by LOUD Technologies could void the user's authority to operate the equipment.



*Correct disposal of this product.* This symbol indicates that this product should not be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to an authorized collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, or your household waste disposal service.

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## 2 UNPACKING

### 2.1 Contents

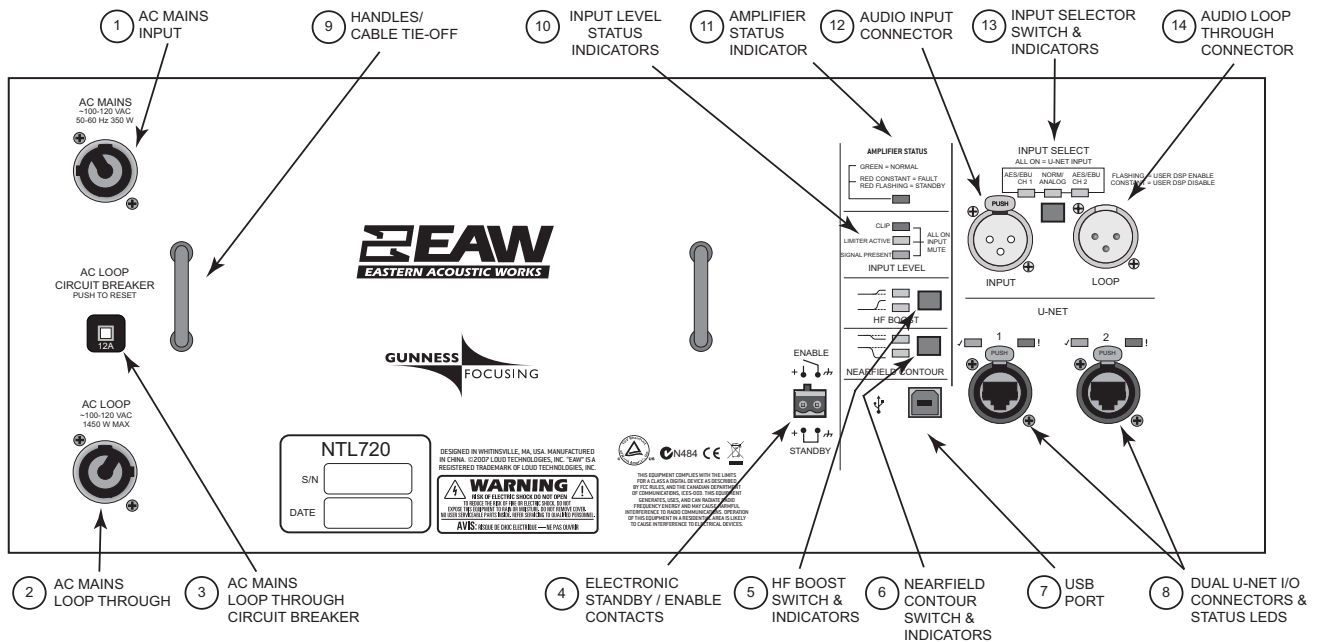
Qty	Item
1	NTL720 loudspeaker
1	Power Cord (dependent on product's AC mains rating)
	115 V - Neutrik® PowerCon® to Nema 15R plug 9.5 ft / 2.9 m
	or
	230 V - Neutrik PowerCon to male Schuko plug 8 ft / 2.5 m
1	Power Cord AC Loop (Neutrik PowerCon to Neutrik PowerCon)
1	USB cable 6 ft / 2 m
1	NTL720 Owner's Manual (this document)
1	EAW Loudspeaker Owner's Manual
1	Warranty card
1	RJ45 Ethernet Cable 2 ft / 0.6 m (Neutrik® EtherCon®)

## 3 QUICK START

If you are in a hurry or are knowledgeable about using powered loudspeakers, these Quick Start instructions provide the details particular to the NTL Series loudspeakers.

### 3.1 Rear Panel Connectors and Controls

- |   |   |
|---|---|
| 1 AC Mains Input:                       | Connect to AC mains supply as labeled                     |
| 2 AC Mains Loop Through                 | Loop AC mains to four (4) additional NTL720s (1450 W max) |
| 3 AC Loop Circuit Breaker               | User resettable, 12 A (115 V), 6 A (230 V)                |
| 4 Enable/Standby contacts               | Closed = Standby, open = Enabled                          |
| 5 HF Boost & Indicators                 | Provides HF boost for air loss over longer distances      |
| 6 Nearfield Contour & Indicators        | Provides “warmth” voicing for nearfield listeners         |
| 7 USB Port                              | Connect to a PC for controlling with EAWPilot             |
| 8 Dual U-Net Connectors                 | Connections for U-Net network                             |
| 9 Handles                               | Can be used to tie-off cables for strain-relief           |
| 10 Input Level Status Indicators        | Indicators for signal present, limiter active, and clip   |
| 11 Amplifier Status Indicator           | Indicator for normal and fault status                     |
| 12 Audio Input Connector                | Connect analog or AES/EBU digital input signals           |
| 13 Input Selector Switch and Indicators | Select type of input signal; analog, AES/EBU, or U-Net    |
| 14 Audio Loop Through Connector         | Loop input signal to additional NTL720 or other device    |



#### 3.1.1 BUTTON PRESS/HOLD FEATURES

*While powered:*

Hold Input Select button for five seconds — user DSP bypass/enable

Hold all three buttons for five seconds — lock/unlock buttons (disables rear panel buttons; software controls are still active)

*On power up:*

Hold Input Select and HF Boost buttons — reset all settings to factory default (all user settings will be overwritten)

Hold HF Boost and Nearfield Contour buttons — put into boot mode (only used for troubleshooting)



## 3.2 Initial Control Settings

Use these nominal settings for the rear panel switches. These are multi-state “soft” switches that control software functions. Repeatedly pressing each switch cycles through its multiple states.

CONTROL	SETTING	LED INDICATION
HF Boost	Normal	Both LEDs off
Nearfield Contour	Normal	Both LEDs off
Input Select	Normal	Center LED on (Norm/Analog)

**WARNING:** Before connecting an NTL loudspeaker to the AC mains supply, completely turn down the input signal to the loudspeaker using the signal source's output level (master volume control or other output level control). If not, there could be excessive and possibly damaging sound levels from the loudspeaker when energized.

## 3.3 Audio Connection

Connect the output from your line-level signal source to the XLR-3F Input connector on the rear panel. This is an electronically balanced input. Use the loop through connector to daisy-chain the signal to additional NTL720s.

## 3.4 AC Mains Connection

Connect the supplied AC mains cord to the Neutrik PowerCon receptacle on the rear of the loudspeaker. Use the appropriate cord for the AC mains voltage as labeled on the loudspeaker: nominal 115 V or 230 V. Connect the other end to the AC mains supply receptacle. If necessary, have a qualified electrician change the AC mains cord plug as required for compatibility with the local AC mains receptacle.

**CAUTION:** There is no power switch on the loudspeaker. When connected to the AC mains, the loudspeaker will be fully operational, with the output level controlled by the signal source feeding the loudspeaker.

## 3.5 Adjusting the Output Level

With a source program playing, gradually turn up the level of your signal source until the desired volume is reached but below the point where the CLIP and/or LIMITER lights illuminate.

**CAUTION:** If there is no sound, turn down the signal source's output level before investigating the problem. Do this to avoid excessive and possibly damaging sound levels from the loudspeaker.

## 4 OVERVIEW

### 4.1 Introduction

The NTL720 loudspeaker is intended for professional use. The construction, components, and hardware have been designed to provide robust, reliable performance for its intended application. Please ensure that you fully understand proper installation and operation before use.

### 4.2 Description

The NTL720 is a compact format line array system that represents true breakthrough technology for arrayable loudspeakers. NTL720 arrays are intended for listener distances up to about 150 ft / 46 m and where vertical pattern control is a primary concern. NTL720 arrays can be configured for a wide range of vertical patterns by varying the quantity of loudspeakers in and curvature of the array. The NTL720 Array Wizard automatically produces an array design to fit the particular, user-entered audience dimensions. The lightweight and revolutionary rigging design facilitates assembling and deploying arrays.

A major design innovation is the use of EAW's new DSP (digital signal processing) technology *Gunness Focusing™*, named after its inventor David Gunness. *Gunness Focusing* corrects physical anomalies inherent to compression driver phase plugs, horns and LF driver cone behaviors, as well as other sources of phase non-linearities within and between elements of the array. The result is sound being projected to listeners literally in sharp focus throughout the nominal horizontal and vertical patterns. *Gunness Focusing* improves consistency across the vertical pattern and provides the uniform horizontal performance from a line array that is normally associated only with single loudspeakers. *Gunness Focusing*, along with the highest quality amplification, affords sonic performance comparable to the highest quality, direct radiating, studio monitors but at much higher output levels and with a well-defined projection pattern.

NTL720 loudspeakers are designed to meet the requirements and demands of portable applications. While physically configured for temporary installation, arrays can be permanently installed. The integral electronics are based on proven, high-efficiency amplifier technology, with field-replaceable amplifier modules. The loudspeakers need to be connected to an AC mains supply and a line-level audio signal. The internal *Gunness Focusing* DSP is factory preset to provide correct and consistent performance in terms of array directionality, phase linearity, subsystem operating ranges, and maximum output limiting.

The NTL720s are computer-controlled using the EAWPilot software that provides the user with standard DSP filter and delay functions for adjusting the overall array for the particular venue, program content, or personal taste in the voicing.

NTL720s are normally connected to the computer as a complete array. This is done by connecting the computer to one NTL720 via its USB port, or via the U-Net connection on an EAW UX8800 processor. The other NTL720s are connected to this one and each other using EAW's U-Net network. The NTL720 connected to the computer (or UX8800) functions as a gateway to the U-Net network allowing EAWPilot to control individual elements within the array and the entire array as a whole.

While a single NTL720 may be a functional loudspeaker, it is properly characterized as an array module. As such it is engineered to be used in arrays of at least four NTL720s in order to achieve the designed performance for most applications.

NTL720s are designed so they can be easily replaced even when suspended in an array. The rigging hardware consists of two assemblies, each fastened to one side of the NTL720 enclosure with four panel screws. The screws can be released from each side, completely detaching the loudspeaker enclosure from the rigging. In this way, an NTL720 enclosure can be removed from the front of an array and replaced with another NTL720 without lowering the array or altering its structural integrity.

## 4.3 Amplification

As is true of all professional loudspeaker systems, the performance of the NTL720 Series loudspeakers depends on amplifiers delivering an adequate supply of clean power. To maximize performance, the loudspeakers have powerful, built-in, high-efficiency amplifiers. NTL720s are tri-amplified, meaning their LF, MF, and HF subsystems each have their own amplification and internal DSP. Even though extremely lightweight, these amplifiers provide the exceptionally high output capabilities required for professional applications.

## 4.4 Using the Loudspeaker

You will need to perform the following general tasks to properly put the loudspeaker into service. The details for each task are provided in this manual.

1. Design the array using the NTL720 Array Wizard.
2. Design and install a rigging or mounting system to support the array in its intended location and aimed in the desired direction.
3. Connect a line-level audio signal to the loudspeakers in the array.
4. Connect the loudspeakers to an AC mains supply as specified on the loudspeakers.
5. Connect the computer control to the loudspeaker's USB port.
6. Set-up and adjust overall system gain and signal processing, as needed to maximize the array's performance for the application.
7. Provide training to operate the loudspeakers within their limits.
8. Provide regular inspection and maintenance to maintain the integrity of the installation and the performance of the loudspeakers.

# 5 ARRAY DESIGN

## 5.1 Software Programs

### 5.1.1 EAWPILOT

EAWPilot is software for controlling the digital signal processing (DSP) for multiple EAW products. Use the EAWPilot to apply user-adjustable signal processing to the overall array. The interface provides standard DSP functions, including parametric equalization, high/low shelving, low- and high-pass filtering, level, and signal delay.

### 5.1.2 NTL720 ARRAY WIZARD

The NTL720 Array Wizard's primary function is to determine the configuration that will provide the best vertical performance for a given application. Various venue dimensions are user-entered that allow calculating the optimum array configuration. Given the venue dimensions, the program can work in either of two basic ways, with both displaying the resulting coverage.

**Note:** EAWPilot and the NTL720 Array Wizard can be found in the Downloads/Software section of the EAW website ([www.eaw.com](http://www.eaw.com)). It's a good idea to check the website periodically for updates to these software applications.

**Automatic Mode:** The interface will calculate the optimum number of enclosures, enclosure splays, array aiming angle, fly-bar pick point and user-control settings. This can also be done for a given inventory of NTL720s. Additional, user-variable criteria are provided for application-specific output levels and for level consistency for near-to-far listeners.

**Manual Mode:** This provides complete control over the array's configuration. The number of enclosures, enclosure splays, array aiming angle, and fly-bar pick point are entered manually.

Complete instructions for operating the NTL720 Array Wizard interface are in the Help file.

### 5.1.3 COMPUTER REQUIREMENTS

EAWPilot and NTL720 Array Wizard require an IBM compatible PC with the Windows® 98, Windows® 98SE, Windows® 2000, Windows® ME, Windows® XP, Windows NT® or Vista® operating systems. It is not designed to work with Windows® 3.x, Windows® 95, or Macintosh® operating systems.

## 5.2 Fill Coverage

### 5.2.1 UP-FILL

Some applications, such as theaters and small arenas, can require up-fill coverage from the array. In this case, the array is designed to tilt back for up-firing coverage from the topmost enclosures.

### 5.2.2 DOWN-FILL

Many applications require extreme down-fill coverage. In this case, the array is designed to have enough curvature for the bottom NTL720 to provide coverage almost directly beneath the array.

### 5.2.3 HORIZONTAL COVERAGE AND SIDE-FILL ARRAYS

Regardless of the length of the array, a NTL720 array has a horizontal beamwidth (-6 dB points) of approximately 110°, with pattern control maintained to a very low frequency.

The horizontal pattern also features “soft shoulders” that provide consistent frequency response to well beyond the nominal -6 dB points. These soft shoulders can provide up to 150° of “usable” horizontal coverage, albeit at somewhat reduced level. This off-axis performance also provides good acoustic integration with side-fill arrays. In some cases, these shoulders may be sufficient for side-fill purposes.

### 5.2.4 NTL720 SERIES AS SIDE-FILL ARRAYS

NTL720 side fill arrays can be hung adjacent to the mains, extending the coverage to over 180° for wrap-around audience coverage. For best results in most cases, align the bottoms of the the NTL720 array with the bottom of the main array.

## 5.3 Ground Stacking

NTL720s may be ground-stacked. Normally, a ground-stacked NTL720 main array is used where suspension is not possible, too difficult, or too time consuming. Additional uses are as stage side fills and audience front fill. The recommended minimum number of stacked NTL720s is two (2) and the maximum is six (6).

**WARNING:** Ground-stacked arrays, especially the maximum recommended arrays, requires assembly by personnel qualified to ensure adequate stability from tip over for the particular application. Mechanical assistance will normally be required to lift and position enclosures for arrays taller than approximately 5 feet. For more information on ground stacking, see Section 8.2.

## 5.4 Subwoofers

### 5.4.1 GENERAL CONSIDERATIONS

Although the impressive low frequency performance of NTL720 Series arrays allows them to be used without subwoofers for some events, subwoofers will normally be used for live musical performances.

**NOTE:** Bass performance is often highly program or venue-dependent, as well as subjective as to quantity and quality. For this reason the type, quantity, and disposition of subwoofers may vary considerably with the application. The type and quantity recommendations below are for general purposes, providing a balanced system for most music applications. Quantities may need to be adjusted up or down for specific situations.

### 5.4.2 RECOMMENDED SUBWOOFERS

Several of EAW's SB Series of subwoofers are recommended as complements to NTL720 line arrays in addition to the NTS22. These include: SBX220, SB250z, SB600z, SB850z, SB1000z, SB1002, or BH760. Please contact the Application Support Group (ASG) for current subwoofer recommendations.

Model Subwoofer	Qty	Qty NTL720
NTS22	1	2
SBX220	1	2
SB250z/SB600z	1	2.5
SB850z	1	3
SB1000z/SB1002	1	3
BH760	1	4

## 6 ELECTRICAL INSTALLATION

### 6.1 AC Mains

There are two NTL720 models, differing only in the AC mains supply:

NTL720 (115 V)	Nominal AC mains: 100 V to 120 V, 50 Hz to 60 Hz
NTL720 (230 V)	Nominal AC mains: 220 V to 240 V, 50 Hz to 60 Hz

### 6.2 AC Mains Connection

This section details the requirements for the AC mains connection required by each NTL720 loudspeaker.

#### 6.2.1 AC MAINS SUPPLY

**WARNING:** Read all instruction and cautionary notes concerning electrical power in the “EAW Loudspeaker Owner’s Manual”.

**DANGER:** Ensure that the AC mains voltage matches the voltage rating listed on the loudspeaker next to the AC Mains connector. DO NOT APPLY 230 V MAINS POWER IF THE VOLTAGE RATING ON THE LOUDSPEAKER IS 115 V. IMMEDIATE AND CATASTROPHIC DAMAGE TO THE LOUDSPEAKER WILL RESULT AND MAY CAUSE A FIRE HAZARD, SERIOUS PERSONAL INJURY, OR DEATH.

#### 6.2.1 ALIMENTATION SECTEUR

**ATTENTION:** Lisez toutes les instructions et notes de sécurité sur l'alimentation secteur, dans le mode d'emploi de l'enceinte EAW.

**DANGER:** Vérifiez la tension secteur de l'enceinte, sérigraphiée à côté de l'embase secteur de l'enceinte. NE PAS APPLIQUER UNE TENSION SECTEUR DE 230 V SI L'ENCEINTE EST DE 115 V. LES DOMMAGES À L'ENCEINTE SERAIENT IMMÉDIATS ET IRRÉVERSIBLES - DE PLUS, CES DOMMAGES PEUVENT ÊTRE SOURCE D'INCENDIE, DE BLESSURES GRAVES VOIRE FATALES.

#### 6.2.1 ALIMENTAZIONE AC

**ATTENZIONE:** Leggere tutte le istruzioni e le avvertene riguardanti l'alimentazione elettrica, incluse nel Manuale EAW Loudspeaker.

**PERICOLO:** Assicurarsi che il voltaggio dell'alimentazione utilizzata nell'area in cui si intende utilizzare il diffusore, corrisponda al voltaggio riportato nel pannello posteriore del diffusore, vicino alla connessione di alimentazione AC. NON UTILIZZARE UN VOLTAGGIO DI 230 V SE NEL DIFFUSORE VIENE INDICATO UN VOLTAGGIO DI 115 V. IL DANNO PER IL DIFFUSORE SAREBBE IMMEDIATO E MOLTO SERIO, E POTREBBE CAUSARE INCENDI, DANNI FISICIALE PERSONE E LA MORTE.

#### 6.2.1 FUENTE DE ALIMENTACIÓN

**PRECAUCION:** Lea todas las instrucciones y advertencias relativas a la corriente eléctrica que aparecen en el manual de altavoces EAW.

**PELIGRO:** Asegúrese que el voltaje de la salida de corriente coincida co el que aparece indicado en el propio altavoz al lado del conector de entrada de corriente. NO APLIQUE UN VOLTAJE DE 230 V SI SU ALTAVOZ FUNCIONA CON UN VOLTAJE DE ENTRADA DE 115 V. EL NO CUMPLIR ESTO PUEDE DAR LUGAR A DAÑOS INMEDIATOS Y CATASTROFICOS EN E ALTAVOZ, ASI COMO AL RIESGO DE INCENDIOS, DAÑOS SERIOS O INCLUSO LA MUERTE.

## 6.2.1 NETZSTROMVERSORGUNG

**WARNUNG:** Lesen Sie alle Anweisungen und Sicherheitshinweise bezüglich der Netzspannung in der EAW Lautsprecher Bedienungsanleitung.

**GEFAHR:** Versichern Sie sich, dass die zur Verfügung stehende Netzspannung mit der auf der Rückseite des Lautsprechers angegebenen Spannung übereinstimmt. SCHLIESSEN SIE KEINE 230 V NETZSPANNUNG AN, WENN DER LAUTSPRECHER FÜR 115 V KONFIGURIERT IST. SOFORTIGE, KATASTROPHALE SCHÄDENSIND DIE FOLGE. ES BESTEHT DIE GEFAHR VON FEUER, VERLETZUNG ODER TOD.

Each NTL720 model is manufactured for a particular nominal AC mains voltage, either 115 V or 230 V. Provide the loudspeaker with AC mains circuit capable of:

Model	115 V	230 V
Range	100 V to 120V	220 V to 240 V
Frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
Maximum Current	3 A / 350 W	1.5 A / 350 W

## 6.3 AC Mains Cable

The supplied AC mains cables mate with the Neutrik PowerCon NAC3MPA AC MAINS jack on the loudspeaker.

**WARNING:** Ensure that AC power supply has a properly grounded safety ground. Failure to follow this warning could cause equipment damage, injury, or death.

**CAUTION:** The supplied AC mains plug may not be appropriate for local AC mains receptacles. If not, have a qualified electrician remove the existing AC mains plug and install a plug appropriate for the AC mains supply receptacle and following all local codes.

**CAUTION:** If an extension cord is used for the AC mains, use only a cord rated for at least 1800 VA.

## 6.3 Cordon secteur

Le cordon secteur fourni est équipé d'une fiche Neutrik PowerCon NAC3FCA adaptée à l'embase secteur Neutrik PowerCon NAC3MPA de l'enceinte.

**ATTENTION :** Il se peut que le format de la fiche secteur ne corresponde pas à celui de votre situation géographique. Dans ce cas, faites appel à un électricien agréé pour qu'il remplace la fiche par une autre du bon format. Respectez les normes électriques de câblage locales.

**ATTENTION:** Assurez-vous que la ligne secteur dispose d'une terre. Le non-respect de cette précaution peut entraîner des dommages aux équipements et des accidents aux personnes pouvant être fatals.

## 6.3 Cavo d'alimentazione AC

Il cavo Neutrik PowerCon NAC3FCA fornito in dotazione è collegabile al connettore Neutrik PowerCon NAC3MPA AC MAINS presente nel diffusore.

**CAUTELE:** Il connettore del cavo d'alimentazione AC fornito in dotazione potrebbe non essere adeguato per le prese di corrente impiegate nell'area in cui il diffusore viene utilizzato. In questo caso, contattare un elettricista qualificato per sostituire la presa di corrente con una dotata di connessione adeguata. Per il cablaggio, occorre seguire la codifica corretta utilizzata nell'area d'utilizzo.

**ATTENZIONE:** Assicurarsi che la presa d'alimentazione sia correttamente collegata a terra. Il mancato rispetto di tali avvertenze potrebbe causare danni all'apparechiatura, nonché infortuni alle persone o la morte.

### 6.3 Cable de alimentación

El enchufe Neutrik PowerCon NAC3FCA incluido en el cable encaja en la toma de entrada Neutrik PowerCon NAC3MPAAC MAINS del altavoz.

**PRECAUCION:** El enchufe que viene en el cable de alimentación incluido puede que no encaje en las salidas de corriente de su zona. Si ocurre esto, contacte con un electricista profesional para que sustituya el enchufe problemático y lo cambie por uno adecuado para la salida de corriente. Compruebe que se sigan todas las normativas de seguridad aplicables.

**PRECAUCION:** Asegúrese que la fuente de alimentación tenga una conexión a tierra correcta. El no cumplir con esta advertencia puede dar lugar a daños en el equipo, en las personas que lo manejen o incluso la muerte.

### 6.3 Netzkabel

Das mitgelieferte Kabel kann an der Seite mit dem Neutrik PowerCon NAC3FCA in die PowerCon NAC3MPA Buchse auf der Rückseite des Lautsprechers gesteckt werden.

**VORSICHT:** Das mitgelieferte Netzkabel besitzt möglicherweise einen Netzstecker, der nicht in Ihre Steckdose passt. In diesem Fall können Sie sich von einem zugelassenen Elektrobetrieb einen passenden Netzstecker unter Berücksichtigung der jeweils gültigen Vorschriften montieren lassen.

**WARNUNG:** Stellen Sie sicher, dass der Schutzleiter der Netzsteckdose eine gute Verbindung zur Erde hat. Nichtbeachtung dieses Hinweises kann zu Schäden am Equipment, zu Verletzungen oder zum Tod führen.

### 6.4 Power On / Off

**CAUTION:** There is no power switch on the loudspeaker. When connected to the AC mains, the loudspeaker will be energized and fully operational with the output level controlled by the signal source feeding the loudspeaker.

#### 6.4.1 POWER ON SEQUENCE:

When energized, the loudspeaker's electronics will initialize. The initialization sequence will last between 1.5 and 2 seconds. The indications for normal initialization are:

1. All LEDs will illuminate steadily, starting from right to left: INPUT SELECT, U-NET, AMPLIFIER STATUS, INPUT LEVEL, HF BOOST, NEARFIELD CONTOUR.
2. The LEDs will then illuminate according to the current status of the functions they indicate.

If it is desired to completely power off (de-energize) the loudspeaker, a conveniently located AC mains disconnect must be supplied or the power cable must be unplugged from the AC mains supply.

### 6.5 AC MAINS VOLTAGE

**CAUTION:** There is no power switch on the loudspeaker. When connected to the AC mains the loudspeaker will be fully operational, with the output level controlled by the signal source feeding the loudspeaker.

The NTL720 is compatible with these nominal AC mains: 100 V, 110 V, 115 V, 120 V, 220 V, 230 V, and 240 V at 50 Hz to 60 Hz.

Connect the supplied AC mains cord to the Neutrik PowerCon socket on the rear of the loudspeaker. Use the cord with the Nema 15P for nominal 115 V AC mains. Use the cord with the Schuko plug for nominal 230 V AC mains. Connect the other end to an AC mains supply receptacle, nominal 115 V or 230 V as labeled on the loudspeaker. If necessary, have a qualified electrician change the cable plug as required for compatibility with the local AC mains receptacle.



**CAUTION:** To maintain all compliance ratings, keep AC input voltage between 100 V to 120 V or 220 V to 240 V.

Replacement 115 V AC mains cord part number: 0021435  
 Replacement 230 V AC mains cord part number: 0015224

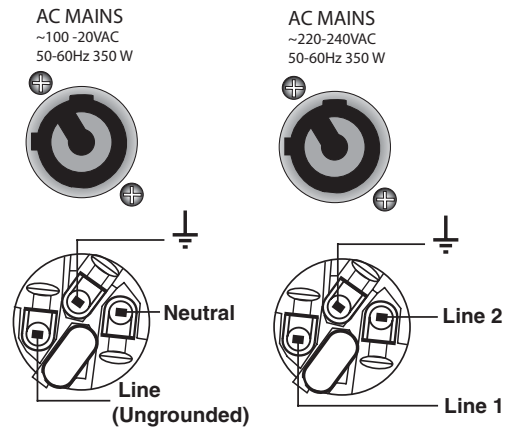
## 6.6 POWER CORD RECEPTACLE

The Neutrik PowerCon AC mains inlet on the rear panel accepts the detachable power cords supplied with the unit.

**120 V AC mains:** Use the 3-wire grounded AC cord with the NEMA 5-15 plug.

**230 V AC mains:** Use the 3-wire grounded AC cord with the Schuko plug.

**CAUTION:** It is the user's responsibility to provide a proper AC mains plug for any AC mains outlet configuration that differs from those supplied with the product.



**NAC3FCA CONNECTIONS**

Conductors 115 V Model		Conductors 230 V Model	
Line or Ungrounded	Black	Line 1	Brown
Neutral or Grounded	White	Line 2	Blue
Safety Ground	Green	Safety Ground	Green / Yellow Striping

**AC MAINS WIRE COLOR CODE**

## 6.7 GROUNDING

The chassis of this product is grounded through the grounding conductor of the power cord. To avoid electric shock, plug the power cord into a properly wired and grounded receptacle before making any connections to or operating the product.

**DANGER:** This equipment must be operated with the power cord grounding conductor connected to a properly grounded AC outlet. Do not disconnect, “lift,” or otherwise remove this ground connection. Without this connection, accessible parts, including knobs and controls that may appear to be insulated, can render an electric shock that can cause injury or death to operating personnel.

Connect the supplied AC mains cord to the PowerCon jack on the rear of the loudspeaker. The PowerCon system uses a locking connector. To lock, twist 1/4 turn clockwise after fully inserting it into the receptacle. Then, connect the other end of the cable to the AC mains supply receptacle. This will energize the loudspeaker.

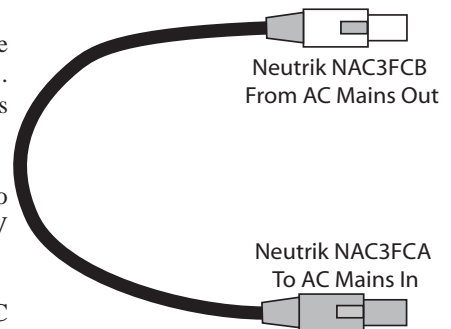
## 6.8 AC LOOP connector

The Neutrik PowerCon AC mains and AC loop connectors are wired in parallel to provide an AC mains inlet and outlet on each NTL720.

The blue AC mains inlet mates with a Neutrik PowerCon NACFC3A (supplied). The white AC mains outlet mates with a Neutrik PowerCon NACFC3B (also supplied). Therefore, to loop the AC mains from enclosure to enclosure, connect the AC mains jumper cable as shown. Up to four NTL720s can be looped in this fashion.

Use the AC loop connector to daisy-chain AC mains power from one enclosure to another. The maximum, continuous load must not exceed 12 A for the 115 V version and 6 A for the 230 V version.

**NOTE:** The circuit breaker only protects the AC Loop outlet, not the AC Mains connector. If the continuous load connected to the AC Loop outlet exceeds the rated load, the circuit breaker will trip. For this situation, reduce the connected load and then manually reset the circuit breaker.



Recommended cable length for connecting vertically adjacent enclosures = 12 in to 18 in / 300 mm to 450 mm

## 6.9 Operating Temperature

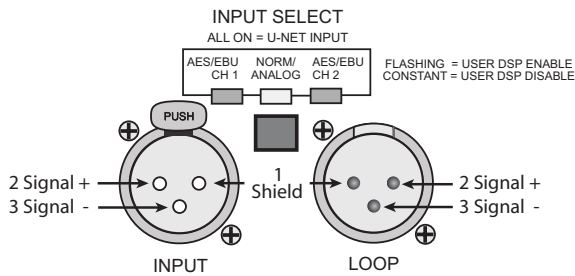
The operating temperature range is 32° F to 131° F / 0°C to 55° C.

## 6.10 Input Connections

### 6.10.1 ANALOG SIGNAL INPUT CONNECTION

The two XLR-type connectors on the rear of each NTL720, one female and one male, are designed for professional audio signal levels, nominally 0 dBu (= 0.775 V). Normally, use the female XLR as the signal input. Use the male XLR as a loop-thru output to connect the same signal input to additional NTL720s.

To use these connectors for analog audio input signals, repeatedly press the associated momentary INPUT SELECT switch, cycling through the LED indications until only the NORM/ANALOG LED is illuminated.



Cable: 2 conductor plus shield  
Mating Connector: XLR-3 male

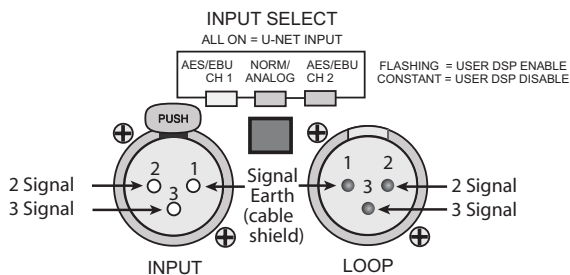
PIN 1 Shield  
PIN 2 Plus / Hot  
PIN 3 Minus / Cold

### 6.10.2 DIGITAL SIGNAL INPUT CONNECTION

The two XLR-type connectors used for analog audio signals are also used for digital audio signals. These are designed for the AES/EBU digital signal (AES3 Standard). Use the female XLR as the signal input. Use the male XLR as a loop-thru output to connect the same signal input to additional NTL720s.

To use these connectors for digital audio input signals, repeatedly press the associated momentary INPUT SELECT switch, cycling through the LED indications until either the AES/EBU Ch 1 or the AES/EBU Ch 2 LED is illuminated.

Channel 1 and Channel 2 are also referred to as Subframe 1 and Subframe 2.



Cable: 2 conductor plus shield  
Mating Connector: XLR-3 male

PIN 1 Signal earth (shield)  
PIN 2 Signal  
PIN 3 Signal

**IMPORTANT:** Looping an AES/EBU signal to another NTL720 or other audio device's analog input will result in audible digital noise at potentially high levels. Make sure the downstream device's input accepts an AES/EBU (AES3) digital input signal.

### 6.10.3 USB CONNECTION

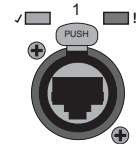
The standard USB connection on the rear of the NTL720 is designed to connect a computer with the EAWPilot control program installed. Subsequent NTL720s are connected using the U-Net ports. EAWPilot provides user-adjustable control over individual elements in the array and over the array as a whole.

- Port Type: USB 1.1
- Cable: Standard USB 2.0 Cable Type A to B supplied (Maximum 15 ft / 3 m without active repeaters. A 6 ft / 2 m USB cable is supplied.)
- Mating Connector: USB type "B" connector



### 6.10.4 U-NET NETWORK CONNECTION

The two, identical, locking Neutrik EtherCon connectors on the rear of each NTL720 combine an RJ45 connector with a locking shell. They are designed for connecting EAW's audio and control signals between additional NTL720s and other U-Net enabled devices. Either connector may be used as the ports are bi-directional. In addition, they auto-sense the cable wiring configuration (standard or crossover).



- Cable: Ethernet CAT-5 or better (300 feet/91 meters maximum)
- Mating Connector: RJ45 with or without Neutrik NE8MC cable carrier
- Wiring Configuration: Standard or crossover cable (ports autosense cable configuration)
- Green Status LED: Indicates communication is established between two devices
- Red Status LED: Indicates a network error. A solid red LED indicates there is an error somewhere on the network. A blinking red LED indicates the device that is causing the error.

To use the U-Net input signal, repeatedly press the associated momentary INPUT SELECT switch, cycling through the LED indications until all three LEDs are illuminated.

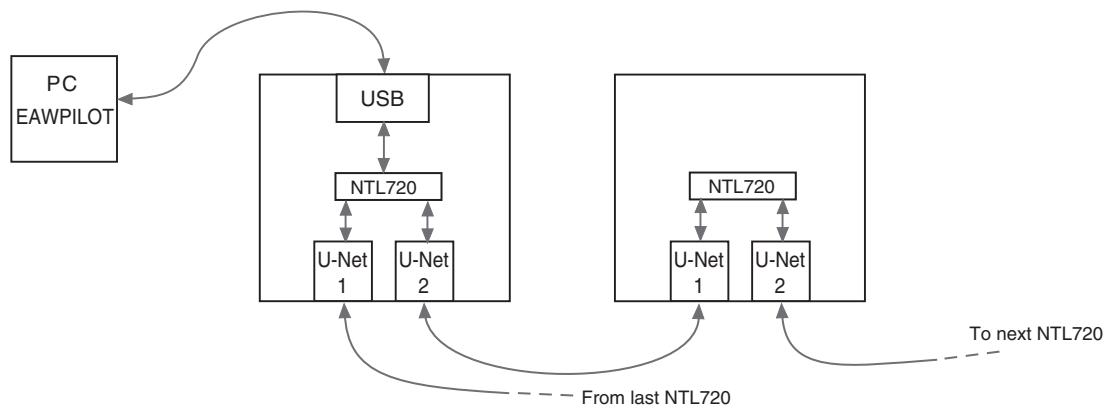
**Note:** EAWPilot must be used to select the U-Net audio channel and configure the U-Net audio routing.

## 6.11 U-Net Configurations

NTL720s are equipped for networking both control signals and audio signals through the U-Net connections. Audio can be routed in to, out of, and through each device over U-Net and devices can be controlled individually or as an array. EAWPilot is required to configure the U-Net networking of the NTL720 and its operation is described in the EAWPilot Help file (Help > EAWPilot Help).

### 6.11.1 CONNECTING MULTIPLE NTL720s IN A U-NET CHAIN

Connect the USB port on the rear panel of the first NTL720 to a computer with the EAWPilot control program installed. Connect one of the U-Net ports on the rear panel of the first NTL720 to a U-Net port on the next NTL720. Continue daisy-chaining the remaining NTL720 U-Net ports until they are all connected. An analog or digital input signal to the first NTL720 can then be routed over U-Net to all subsequent units. This is done using EAWPilot control software.

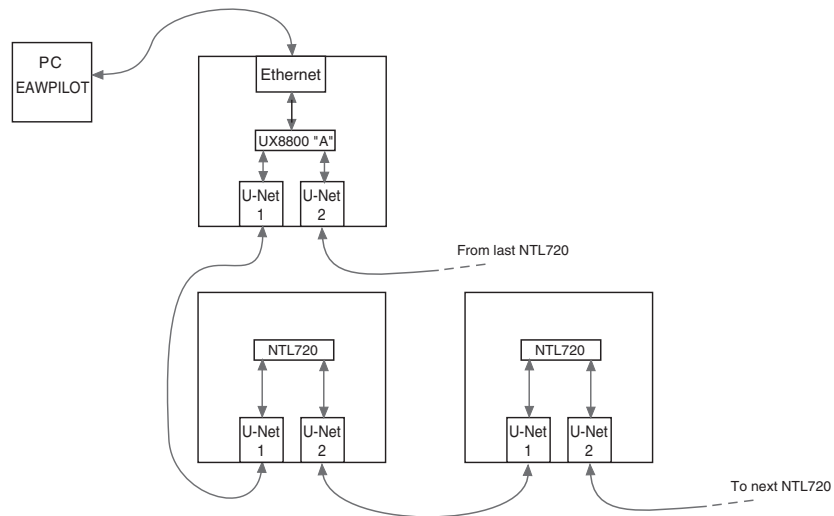


## 6.11.2 CONNECTING ONE OR MORE NTL720s TO A COMPUTER USING A UX8800

Use the UX8800's front panel Ethernet port and the supplied Ethernet crossover cable to connect directly to a computer's 10, 10/100, or 100 Mbps Ethernet port. A user-supplied, shorter or longer cable may be substituted. The UX8800's Ethernet port is auto-negotiating, meaning it will automatically exchange information over a link about speed and duplex capabilities and negotiate these to the highest common denominator.

**CAUTION:** An Ethernet crossover cable is required when connecting two Ethernet ports in the same layer of the OSI model (Open Systems Interconnection Reference Model). A computer's Ethernet port, meaning its NIC (network interface card), and the UX8800 are both OSI layer 3 ports. Therefore, an Ethernet crossover cable is **REQUIRED** when directly connecting the UX8800 to a computer's NIC. An Ethernet crossover cable reverses transmit and receive pin connections between the connectors at each end of the cable.

Connect one of the U-Net ports on the UX8800's rear panel to a U-Net port on the NTL720. If there are more than one NTL720, connect the other U-Net port on the NTL720 to the next NTL720, and so on. This configuration is used to route any number of UX8800 outputs to the NTL720s on the U-Net chain. Again, EAWPilot is used for U-Net configuration.



It is recommended that you connect the last free U-Net port to the first NTL720. A ring is created so the audio and control signals have two paths around the network, and the integrity of the network is maintained in the event that one NTL720 should go offline.

There is no requirement to connect Port 1 to Port 2 or vice versa. Signals are sent out both U-Net ports bidirectionally so any port can be connected to any other port. It is recommended, however, that the NTL720s be connected sequentially, top down or bottom up in an array.

## 7 ARRAY OPERATION

### 7.1 Overview

The operation of an NTL720 Series system involves:

1. Understanding the principles on which it operates.
2. How to electronically configure it for a specific task.

### 7.2 Engineering Design

#### 7.2.1 DIVERGENCE SHADING

In almost any venue, there are significant differences in distance from the loudspeaker array to the nearest and farthest audience members. The idea is to turn up the output level of the array aimed towards the farthest audience members and then progressively turn it down for audience members closer to the array. These differences in distance are accompanied by changes in the array's vertical aiming angle.

To create the NTL720, divergence shading was originally modeled as a single, continuous, curved line source. The average curvature at any point could be varied, as explained, to vary the output, providing more output for longer distances and less for shorter distances. The engineering task was to design a series of small elements that, when arrayed, would closely approximate the performance and the range of vertical pattern control of the line source model.

Rather than using different amplifier levels to set the desired output variations along the array's length, a combination of the amount of curvature and the quantity of NTL720s determines the output variations. A shallow curve means more loudspeakers are facing a given direction, putting out more energy within a given vertical angle. A more radical curvature for the same number of loudspeakers spreads the energy over a wider vertical angle, reducing the energy at any particular point. Simply put, less curvature in a portion of the array turns the output volume up in that portion and more curvature in a portion of array the turns the output volume down in that portion.

If you understand the above, you basically understand how a NTL720 array works. More specifically:

1. More splay at the rear of the enclosures turns the volume up (adds less curvature to the array).
2. Less splay at the rear of the enclosures turns the volume down (adds more curvature to the array).
3. More enclosures provide a greater vertical coverage angle.
4. Fewer enclosures provide less vertical coverage angle.

The NTL720 Array Wizard uses the above variables to determine the quantity of enclosures and the variation in curvature along the length of the array that will optimize coverage for the audience distances and angles the array must address. It actually works "backwards" by modeling the ideal curved source for the user-entered parameters, then creating an array of NTL720 elements that most closely approximates the performance of the ideal source.

#### 7.2.2 GUNNESS FOCUSING™

Developed by the EAW engineering team (and named after its inventor, David Guinness), Guinness Focusing uses DSP technology to eliminate the traditional characteristics of "honk" and "splashiness" that can plague horn-loaded loudspeaker designs. The honk of a horn is normally heard in the lower frequencies of its band pass, while splashiness (an attribute of compression drivers) is usually heard in the highest frequencies and obscures the fine detail in instruments, such as cymbals.

Likewise, cone drivers have inherent resonances in their upper frequency range that result in "muddiness" in the middle of the vocal range. These HF and LF behaviors combine to produce a sonic signature commonly referred to as "coloration."

The DSP algorithms specifically developed for the NTL720 correct these anomalies and resonance problems, resulting in a sonic performance comparable to the highest quality, direct radiating studio monitors but at a much higher output level.

### 7.3 Operating Controls

The operating controls on the NTL720 rear panel are momentary contact, “soft” switches. This means that they control software that does the actual switching with status lights indicating the switch “position.” Pressing a switch repeatedly will cycle through its available options.

#### 7.3.1 INPUT SELECT

Repeatedly press the switch between the XLR input connectors to cycle through and select the desired input signal type. Press and hold the switch for five seconds to bypass the user-adjustable DSP (accessible from EAWPilot). Repeat to enable the user DSP.

LED flashing = DSP enabled  
LED constant = DSP disabled

**Note:** U-Net can be selected with the Input Select switch, but the U-Net audio channel and routing must be configured using the EAWPilot software application.

INPUT SELECT ALL ON = U-NET INPUT AES/EBU CH 1    NORM/ ANALOG    AES/EBU CH 2	LED Status		
Norm/Analog	off	on	off
AES/EBU Ch 1	on	off	off
AES/EBU Ch 2	off	off	on
U-Net	on	on	on

#### 7.3.2 HF BOOST

Repeatedly press the HF BOOST switch to cycle through and select the desired HF Boost option. This can be used to compensate for high-frequency attenuation due to airloss.

**Note:** The EAWPilot program allows you to enter temperature and humidity values for the system, and listening distance values for each loudspeaker in the array. Airloss is dependant on distance, temperature, and humidity, and the airloss pre-emphasis is automatically calculated and applied by EAWPilot. The factory tuning for an NTL720 is configured for a listening distance of approximately 50 ft (15 m). In instances where EAWPilot will not be used, the HF Boost and Nearfield Contour switches can be used to approximate the Airloss preemphasis function. The approximate listening distance associated with each switch position is indicated in the tables.

**Note:** HF Boost and Nearfield Contour cannot be used together, however they can be used in conjunction with the Airloss preemphasis function to further tailor high-frequency response.

HF BOOST	LED Status	
	Upper	Lower
None	off	off
Moderate: >75 ft/23 m	on	off
Max: >100 ft/30 m	off	on

#### 7.3.3 NEARFIELD CONTOUR

Repeatedly press the NEARFIELD CONTOUR switch to cycle through and select the desired nearfield contour option.

NEARFIELD CONTOUR	LED STATUS	
	Upper	Lower
None	off	off
Moderate: <35 ft/11 m	on	off
Max: <20 ft/6 m	off	on

#### 7.3.4 STANDBY JUMPER

Use these dry contacts to remotely control the operational status of the loudspeaker’s electronics. Short the contacts to place the amplifiers in standby mode. This disables the high-voltage rails powering the amplifiers, muting the system and reducing power consumption when the system is not being used. Open the contacts for full function. The Amplifier Status LED flashes red when the amplifiers are in standby mode.



Contacts	Electronic Status
Open	Fully functional
Closed	Standby

**Note:** The NTL720 ships with the mating connector for these contacts installed. If this feature will not be used, the connector may be removed.

### 7.3.5 AC LOOP CIRCUIT BREAKER

This is a resettable circuit breaker that protects the NTL720 from passing excessive current through the AC Loop connector. Connect no more than four NTL720s to the AC Loop connector of a single NTL720. If the circuit breaker should trip, the first NTL720 will continue to operate, but all the NTL720s connected via the AC Loop connector will stop working. Determine what caused the circuit breaker to trip and remedy the situation before resetting the circuit breaker.

## 7.4 Signal Processing

### 7.4.1 FACTORY SIGNAL PROCESSING SETTINGS

NTL720 array performance, in terms of frequency response, beamwidth consistency, output level capability, and wavefront coherency is dependent on the crossover and other processing settings fixed within the built-in digital processing. These settings are determined from extensive measurements in typical venues as well as the theory of curved sources from the acoustical work of physicists Harry Olsen and Leo Beranek. As such, they are required in order for the array to perform correctly and should normally provide excellent results in a variety of venues.

## 7.5 User Adjustable DSP

### 7.5.1 EQUALIZATION

The EAWPilot software application provides access to standard, user-adjustable DSP functions to modify the overall performance of the array to accommodate a particular program content, venue characteristics, or personal taste in voicing. These include low-pass filter, high-pass filter, shelving and parametric EQ, gain, delay, and polarity. It also provides access to signal routing (Input Select and U-Net Send), as well as HF Boost (Air Loss) and Nearfield Contour settings for each individual loudspeaker.

### 7.5.2 ARRAY MEASUREMENTS

**Smaart** - The EAW Smaart program is an ideal tool to use to measure and optimize a NTL720 array for a particular venue. This is a fast, yet sophisticated, process that will indicate problem areas due to particular venue characteristics. Usually it is a matter of applying small amounts of 1/3 octave or parametric equalization to adjust significant anomalies. A demo version of Smaart is available at [www.eaw.com](http://www.eaw.com).

### 7.5.3 OPERATING LIMITS

While the NTL720 processing includes robust driver and amplifier protection algorithms and circuits, it is ultimately the responsibility of the audio system operator to operate the loudspeakers within their capabilities. This is the only way to ensure that loudspeakers are not stressed beyond their limits to the point of damage or failure.

Operation beyond their capabilities usually includes, but is not limited to, one or more of the following conditions:

- Severe amplifier clipping
- Noticeable distortion
- Mechanical noise (such as cones bottoming out)

The NTL720s have both Limiter Active and Clip indicators. A suitable means for determining if these indicators are active is highly recommended. At a minimum, the operator should have a meter display calibrated to indicate the level where the NTL720s limiting and clipping points are to avoid exceeding their capabilities.

As an alternative to a mixing console or other meter display, the EAWPilot software provides real-time meter display of the NTL720 levels.



## 8 PHYSICAL INSTALLATION

NTL720 Series arrays are intended to be suspended or ground-stacked. This chapter details how to physically configure NTL720 Series arrays. The following are the recommended methods for most situations. Specific situations may require other methods. It is the user's responsibility to determine the viability and safety for alternate methods and implement them accordingly.

### 8.1 Rigging Warnings

**WARNING:** Suspending anything, especially overhead of people, should be done with extreme caution. Always engage the services of a certified professional who is qualified to determine the requirements for and to implement overhead rigging. Only persons with the knowledge of proper hardware and safe rigging techniques should attempt to suspend NTL720 Series arrays overhead. Failure to follow these precautions may result in damage, injury, or death.

**DANGER:** When suspending or stacking NTL720s, avoid placing any parts of the body between the enclosures or between an enclosure and the Fly Bar. Always use the integral handles to lift or position enclosures. Failure to follow this precaution may result in damage, injury, or death.

**CAUTION:** An NTL720 weighs approximately 47 lb / 21 kg. This, along with the physical size, means that one person may be able to lift and carry it. However, always use proper lifting techniques to avoid injury. Use good judgment to determine if you need lifting assistance such as another person, a back support belt, or mechanical assistance.

**IMPORTANT RIGGING WARNING:** Each captive Quick Release Pin, used to attach enclosures together, can be inserted into one of several holes in the rigging end caps integral to the enclosures. The particular hole is used set the splay angle between the enclosures and thus their aiming. Use the correct holes as determined by the NTL720 Array Wizard. Always insert the pins from the inside of end caps. The pins will not properly engage if inserted from the outside of the end caps.

### 8.2 Ground Stacking

Up to six NTL720 loudspeakers may be stacked using the FB172 Fly Bar as a base. You can purchase the FB172 Fly Bar w/ Ground Stack Kit (LOUD P/N 0025596) or the FB172 Ground Stack Kit (LOUD P/N 0020646), which is used to convert the FB172 Fly Bar into a stable, adjustable base for stacking the NTL720 loudspeakers. Installation instructions are included with the kit.

### 8.3 Flying

Up to 16 NTL720 loudspeakers may be suspended from an FB172 Fly Bar (LOUD P/N 0023890), depending on whether the array is a straight or curved column. Installation instructions are included with the Fly Bar.

#### 8.3.1 SUSPENSION LOAD RATING — WORKING LOAD LIMIT (WLL)

The WLL (Working Load Limit) for the Fly Bar is determined by the NTL720 Array Wizard, depending on the array configuration.

The WLL (Working Load Limit) for the rigging on each NTL720 is 752 lb / 341 kg.

The design factor for these ratings is 10:1.

**WARNING:** It is the responsibility of the user to ensure the attachment to the Fly Bar, the rigging method, and attachment to structure are inspected by a certified professional who is qualified to determine the requirements for and implement overhead rigging.



## 9 SERVICE, INSPECTION, and MAINTENANCE

### 9.1 General Service

For any faults that cannot be field-repaired as noted below, contact the EAW Service Department listed in Section 9.6.2 to determine the appropriate action. This applies to both warranty and non-warranty faults.

### 9.2 Rigging Service

Because of the potential serious consequences and liabilities due to faulty rigging, contact EAW to determine the appropriate service solution for any rigging hardware problems.

### 9.3 Basic Field Troubleshooting and Repair

Each NTL720 loudspeaker has an input panel, internal components and wiring, transducers, and an enclosure. Troubleshooting for various performance problems usually involves isolating the problem to one of these areas:

1. Transducers
2. Internal electronics and wiring
3. Enclosure and integral hardware

If no problems can be traced to any of these items, look for problems with external electronics or cabling. Troubleshooting these items is beyond the scope of this manual.

#### 9.3.1 LOUDSPEAKER REPLACEMENT

An NTL720 can be replaced independent of the rigging hardware. This means an NTL720 can be replaced while flown in an array and without disturbing the array rigging. The rigging hardware for each NTL720 is bolted to the sides of the loudspeaker so that the loudspeaker enclosure may be completely detached from its rigging hardware without affecting the structural integrity of the hardware or the structural integrity of an NTL720 array.

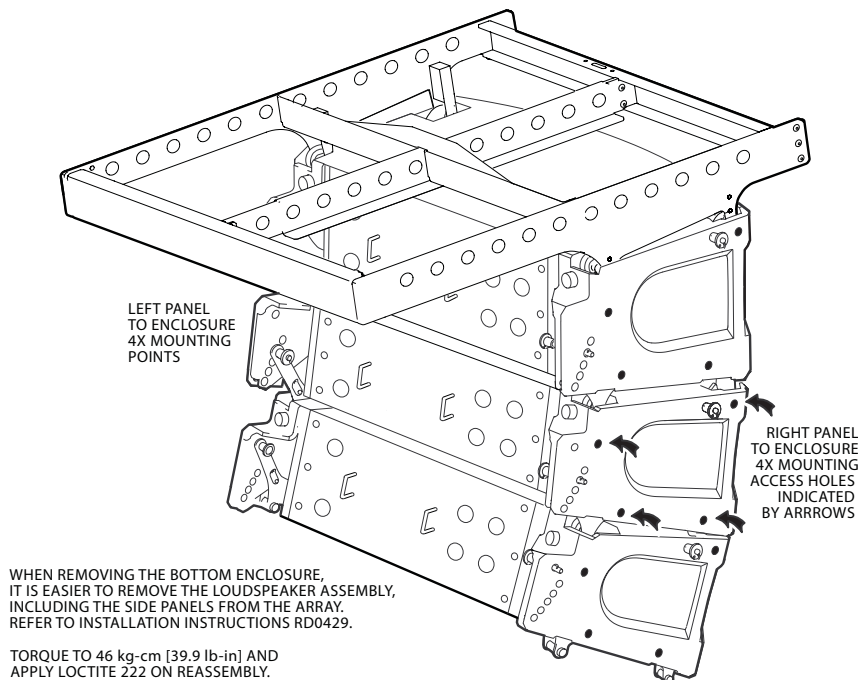
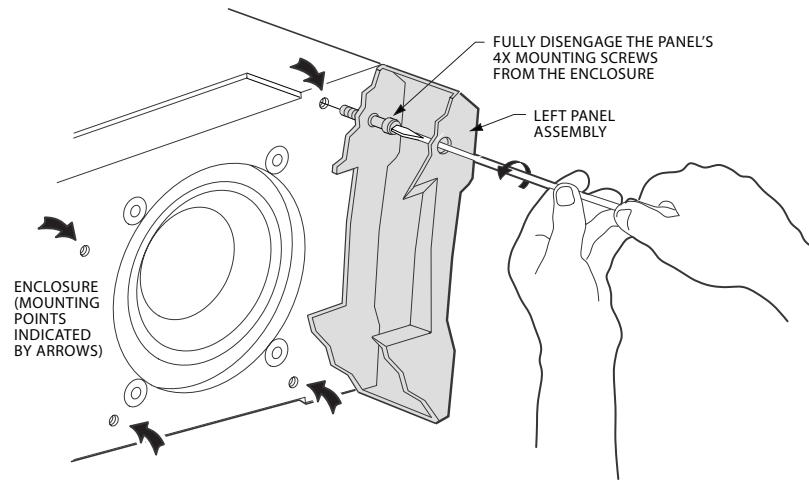


Figure 1 Remove and Replace Enclosure From the NTL720 Hanging Array

1. On each side of the loudspeaker, release the four panel screws that attach the enclosure to the rigging assembly.



THE ENCLOSURE IS HELD IN THE ARRAY BY 8 SPRING LOADED SCREWS, 4 FROM THE LEFT PANEL AND 4 FROM THE RIGHT PANEL. THESE SCREWS REMAIN IN THE THE SIDE PANELS AFTER DISASSEMBLY.

**DANGER:** WHEN THE ENCLOSURE TO BE REMOVED FROM THE ARRAY IS FACING DOWNWARD IT WILL FALL FREE WHEN THE 8 MOUNTING SCREWS ARE DISENGAGED. TO PREVENT THIS, HOLD THE ENCLOSURE'S FRONT INTO THE ARRAY WHEN DISENGAGING THE 8 MOUNTING SCREWS.

Figure 2 Remove and Replace Enclosure From the NTL720 Hanging Array

2. Slide the enclosure out from between its two rigging assemblies to the front of the array.

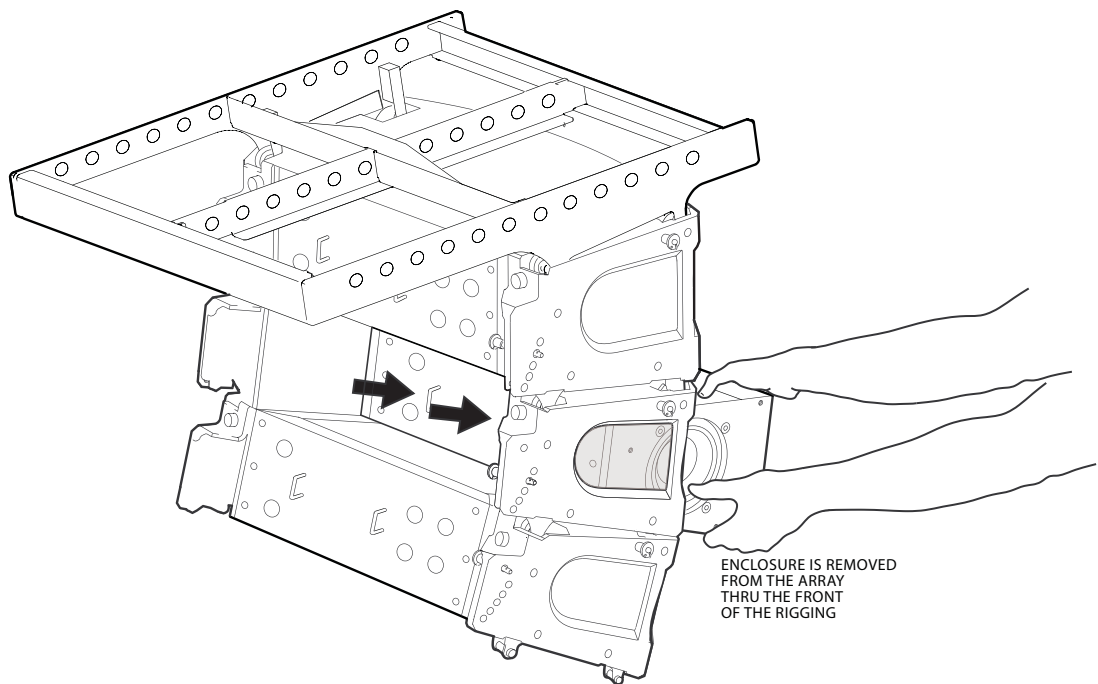


Figure 3 Remove and Replace Enclosure From the NTL720 Hanging Array

3. For each side of the enclosure, apply a few drops of Loctite 222 on the threads of each of the four threaded inserts in the enclosure that mate with the panel screws in the rigging assemblies.
4. From the front of the array, slide the replacement enclosure in between its two rigging assemblies.
5. Engage the panel screws released in step 1 and tighten them securely (torque to 46 kg-cm/39.9 lb-in).

### 9.3.2 TRANSDUCERS

A faulty transducer will usually cause readily audible distortions or other unwanted noises. In other cases, they may stop functioning. Use your ears and test signals or other sound source to determine which one is at fault.

**Field Repair:** Transducers are field replaceable with factory-supplied replacement parts.

### 9.3.3 INTERNAL ELECTRONICS AND WIRING

Faults with these items will usually cause transducers to stop working, have significant amounts of distortion or possibly be intermittent. If the fault is isolated to the internal electronics or wiring, repair of such faults must be done by the EAW factory service or by an authorized EAW distributor.

**Field Repair:** The entire electronics assembly is replaceable with a factory-supplied assembly.

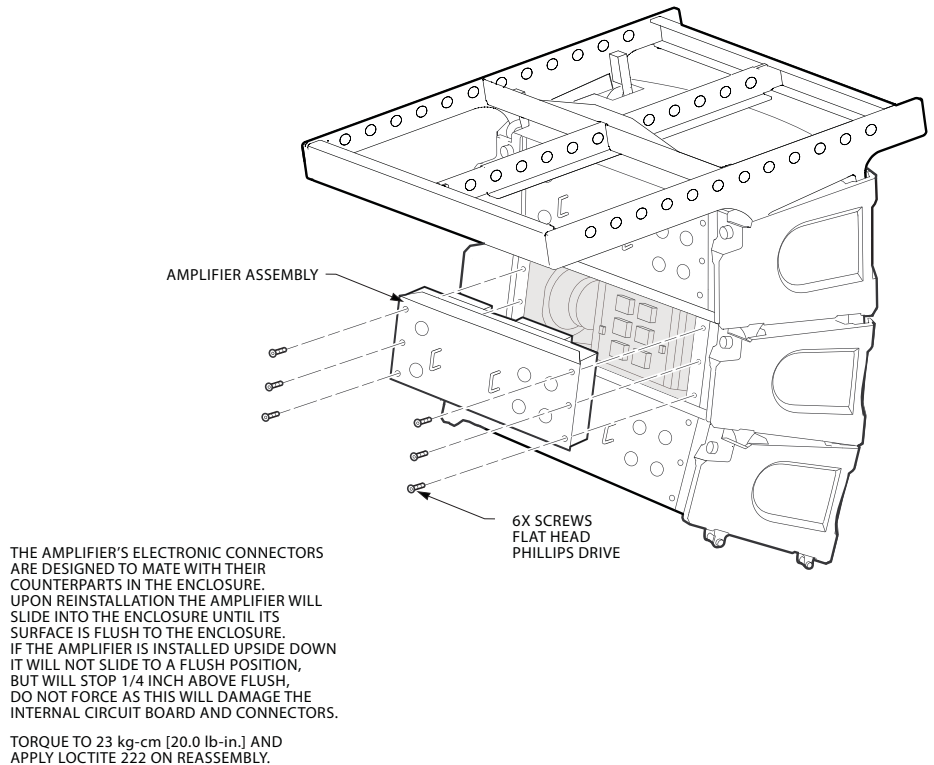


Figure 4 Remove and Replace Amplifier From the NTL720 Enclosure

### 9.3.4 REPLACEMENT FUSE

115V: LOUD P/N 0018783

Slow blow 6.3 A 5 mm x 20 mm 250 VAC (Wickmann P/N 1811630.000; also Littelfuse P/N 21506.3P)

230V: LOUD P/N 0021289

Slow blow 3.15 A 5 mm x 20 mm 250 VAC (Wickmann P/N 1811315.000; also Littelfuse P/N 2153.15P)

### 9.3.5 ENCLOSURES

Enclosure problems, such as loose hardware, faulty joints, or other structural problems, will usually be heard as distinct buzzes, rattles, or other unwanted noises. To test for enclosure problems, use a sine wave signal manually swept on the LF sub-system. The input level should be no more than 6 dB below rated power (equals no more than 1/2 rated voltage). It may be possible to field-repair some enclosure problems.

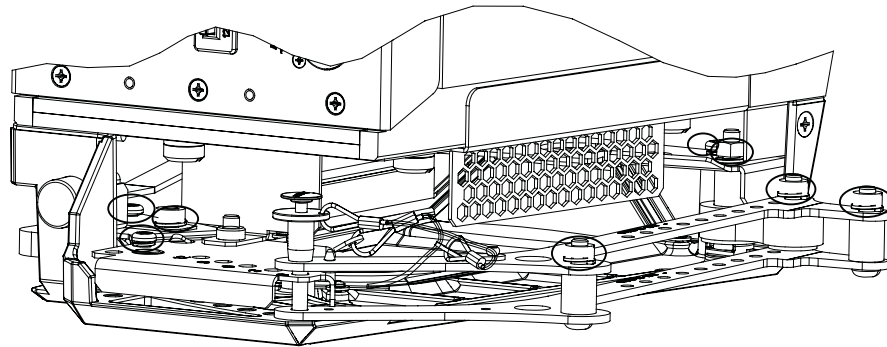
## 9.4 Inspection and Maintenance

Refer to Section 11 in the EAW Loudspeaker Owner's Manual (included) for complete information on inspecting and maintaining EAW loudspeakers and rigging systems.

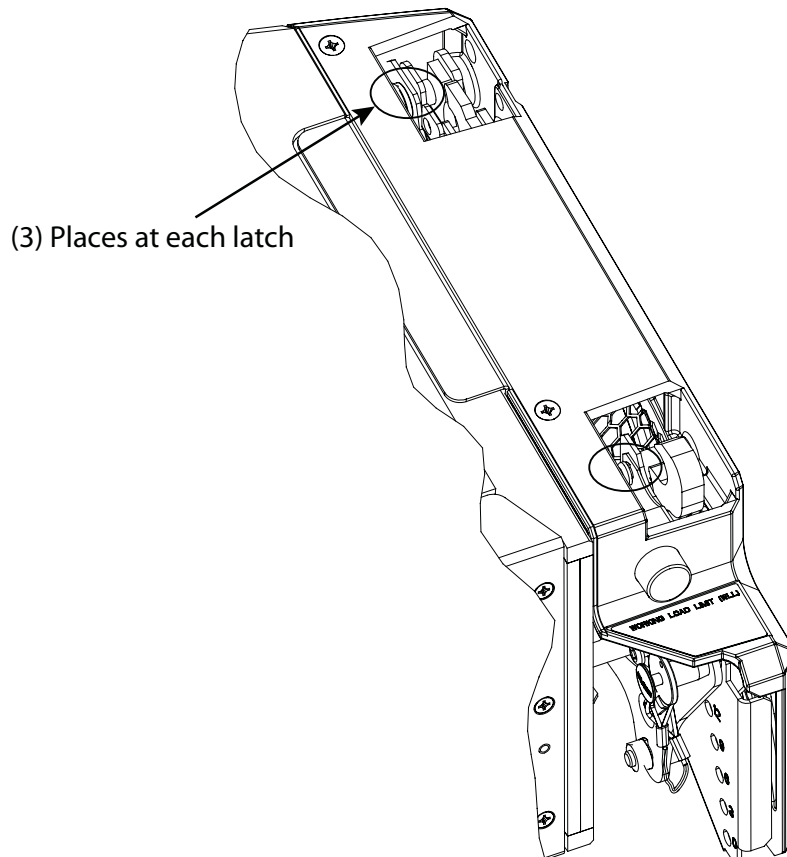
Before suspending in an array, the rigging right and left panel assembly of each loudspeaker should be inspected to ensure that all lock washers in the assemblies are fully collapsed and that all fasteners are secure.

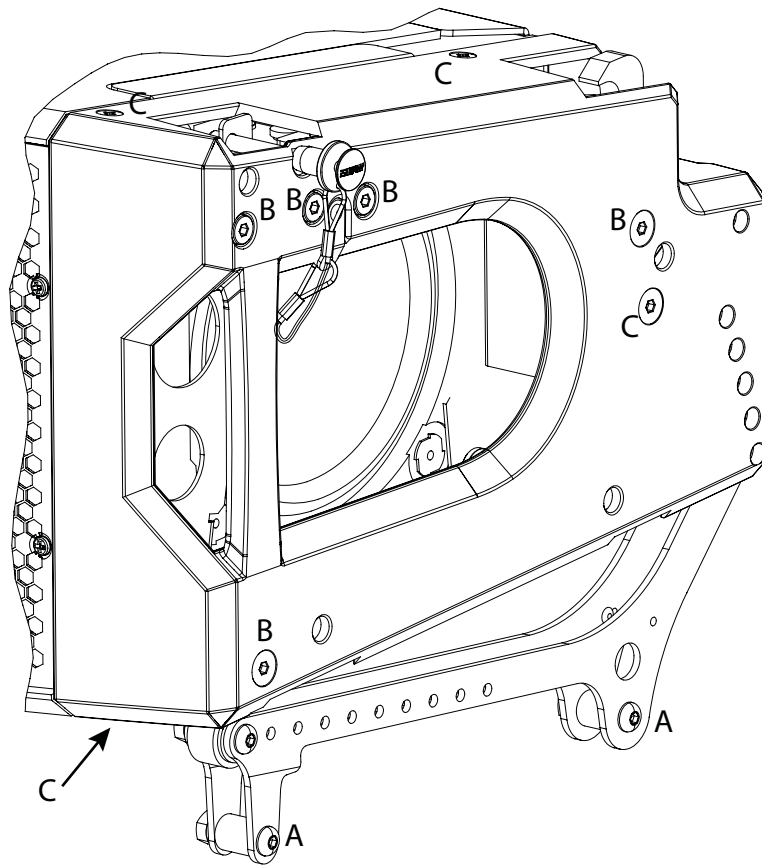
If any are found loose, they should be tightened to the appropriate torque setting as shown in Table 1. **Note:** Four (4) screws on each end in position "C" also require Loctite® 222.

The four (4) quick-release pins in each loudspeaker must be inspected before adding the loudspeaker to an array. All of these pins must work freely and properly to ensure that they engage correctly in the rigging process.



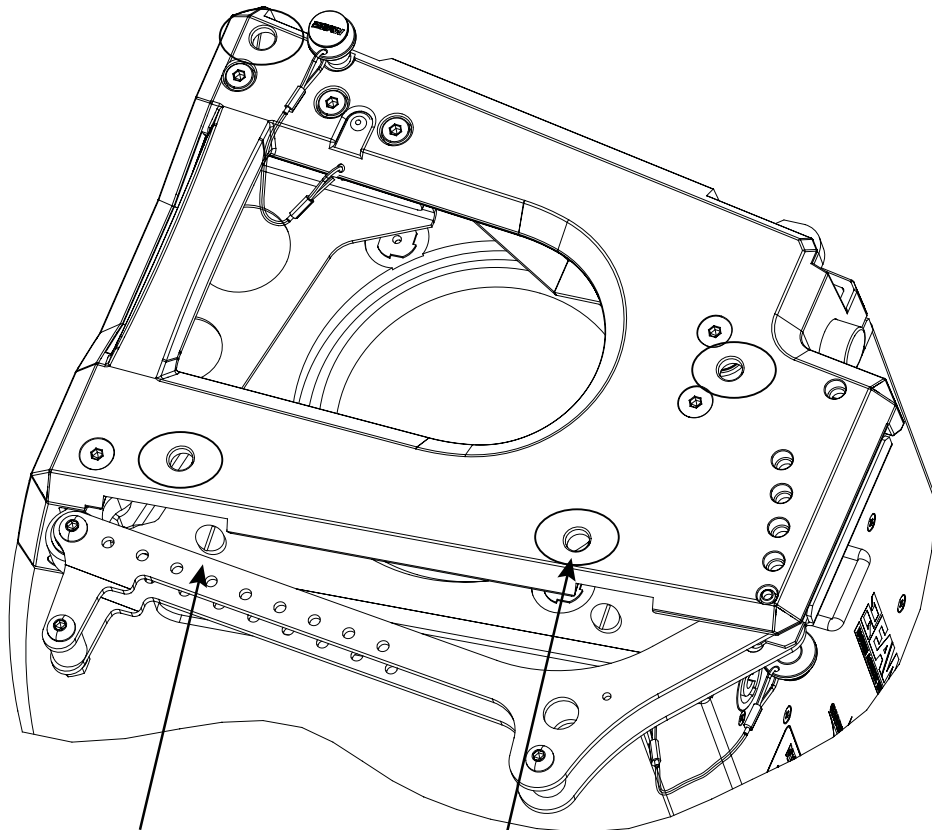
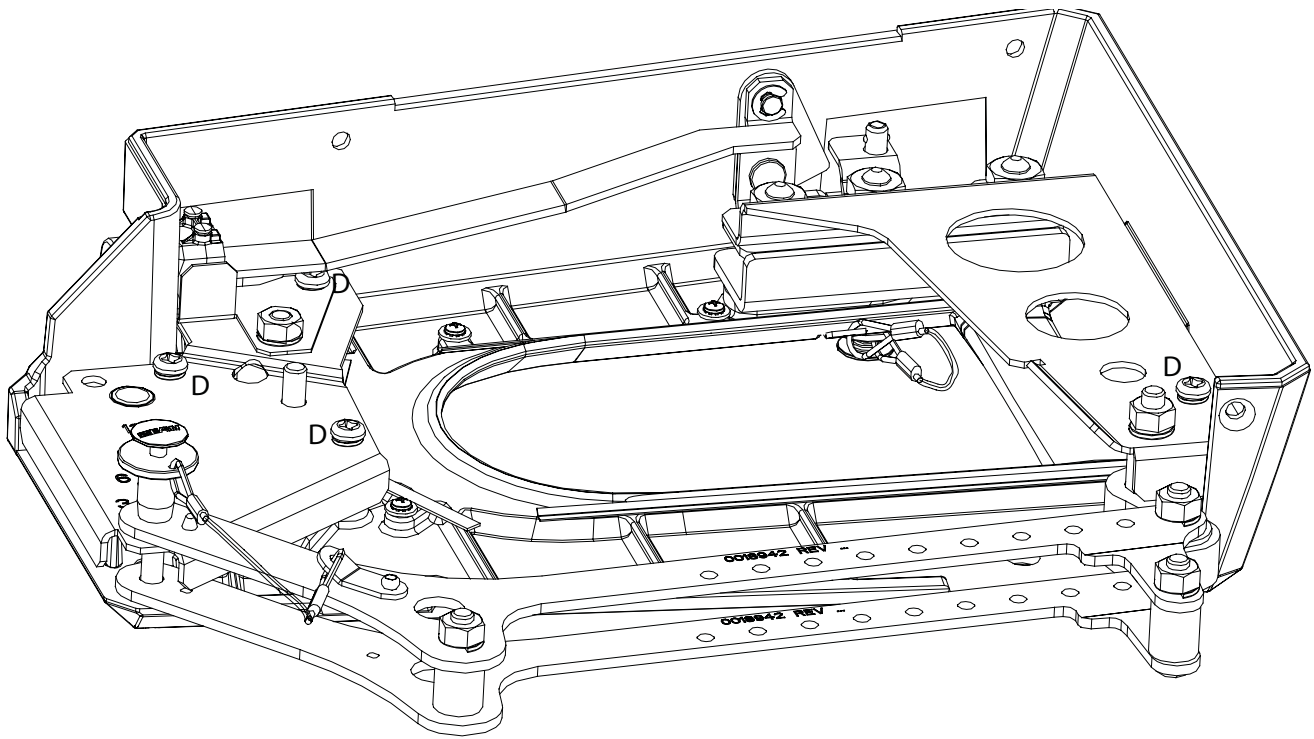
Inspection points circled





Position	Torque Requirement
A	81 kg-cm (70.3 lb-in)
B	75 kg-cm (65.1 lb-in)
C	36 kg-cm (31.3 lb-in) + Loctite 222
D	10 kg-cm (8.7 lb-in)

Table 1



(4) Panel screws on each side, accessible through holes in side panels, are to be fully engaged and secure.

If loose, they should be fully released, apply Loctite® 222 to the threads, then re-assembled and set to 46 kg-cm (39.9 lb-in).

## 9.5 Contacting EAW

We have tried to answer any questions you may have about the NTL720 in this manual and in the EAWPilot/NTL720 Array Wizard help files. Should you need further assistance, please do not hesitate to contact us. You can contact us in several different ways.

### 9.6.1 OPERATING QUESTIONS

For questions about configuring or operating the loudspeakers, contact:

EAW Applications Support Group	
Tel	508-234-6158
Tel	800-992-5013 (USA only)
Fax	508-234-6479
e-mail	asg@eaw.com

### 9.6.2 SERVICE INFORMATION

For questions about troubleshooting or servicing an NTL720, contact:

EAW Service Department	
Shipping	One Main Street Building 11 Whitinsville, MA 01588 USA
Tel	508-234-6001
Tel	800-992-6001 (USA only)
Fax	508-234-3776
e-mail	service@eaw.com

### 9.6.3 GENERAL

For all other information:

Mail	Eastern Acoustic Works One Main Street Whitinsville, MA 01588 USA
Tel	508-234-6158
Tel	800-992-5013 (USA only)
Fax	508-234-6479
Web Site	<a href="http://www.eaw.com">http://www.eaw.com</a>
e-mail	info@eaw.com

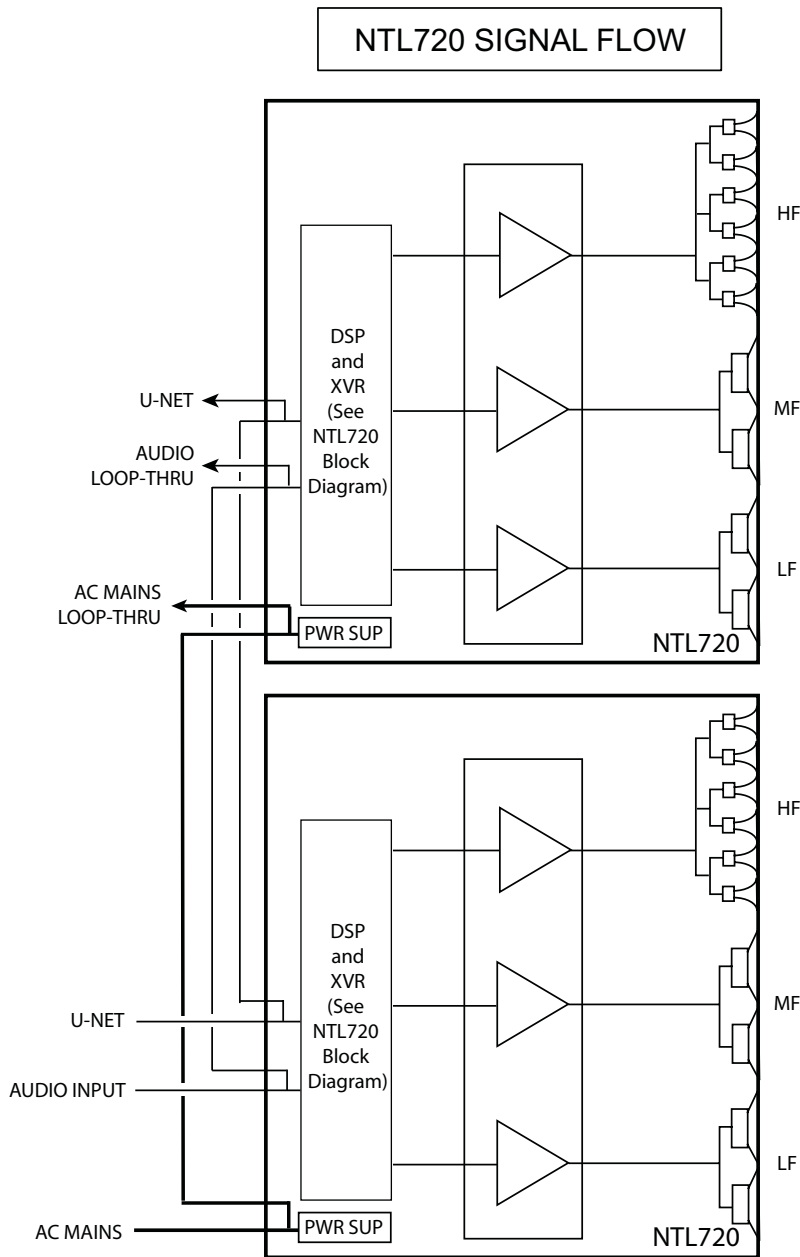
# 10 SIGNAL FLOW AND BLOCK DIAGRAM

## 10.1 Signal Flow Diagram

The signal flow diagram shows the signal flow for two NTL720s.

As can be seen, the audio input signal, AC mains, and the U-Net signal can be looped from one NTL720 to additional NTL720s.

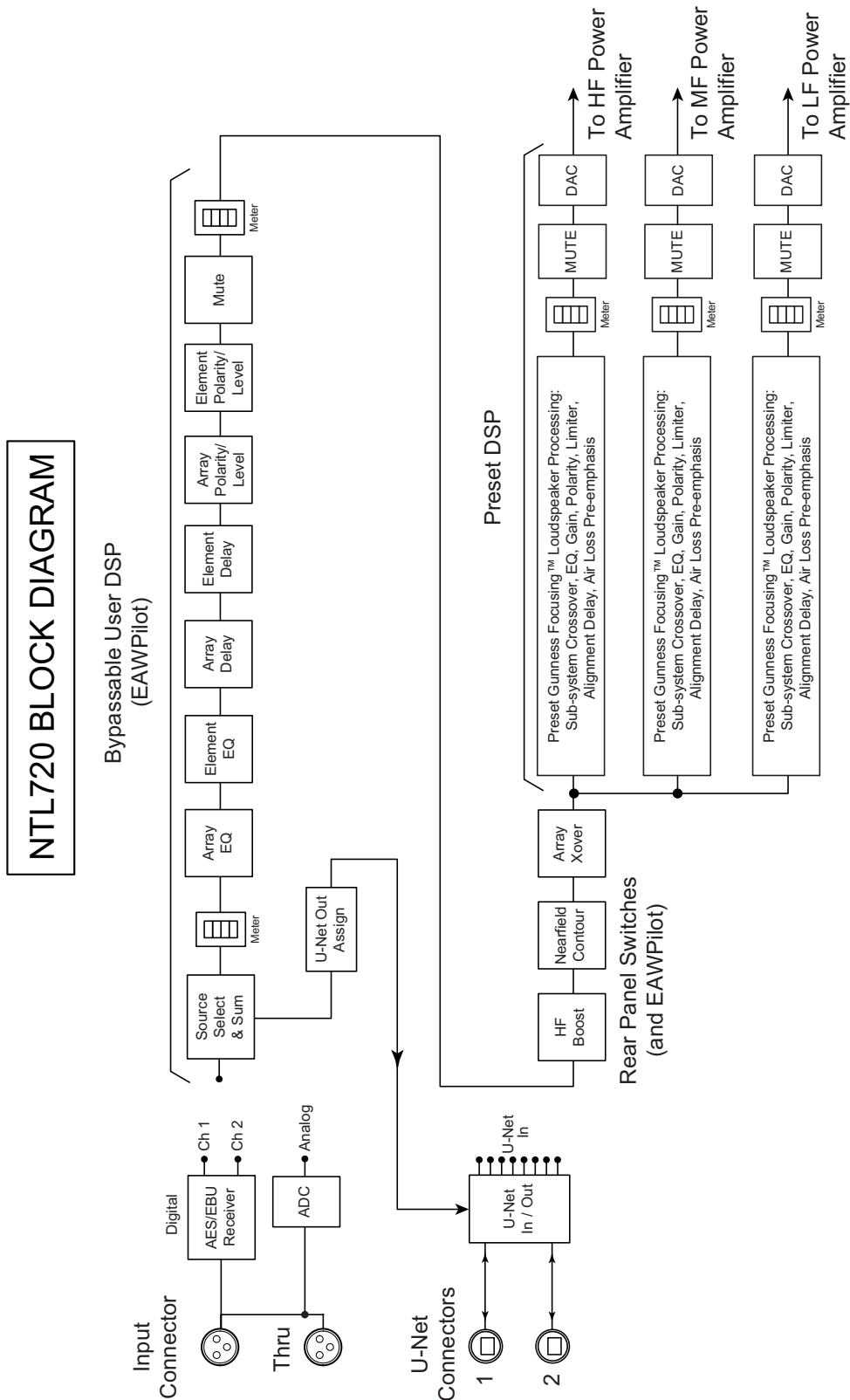
While the audio and U-Net cables can be looped to any number of additional NTL720s, the maximum for the AC mains looping is four additional NTL720s. This is limited by the resettable circuit breaker in-line with the AC mains loop jack.





## 10.2 Block Diagram

The block diagram shows the DSP blocks for the NTL720. The user DSP is configurable using the EAWPilot software application. The preset DSP is not user-configurable and is designed to optimize the performance of the NTL720s.









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