Radial® engineering

True to the Music™

CATAPULT RACK TX & RX

CAT 5 ANALOG AUDIO SNAKE

User Guide

Radial® Reamp Station User Guide

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Thank you for purchasing the Radial Catapult™ Rack modular snake, a Cat 5 analog audio snake system that is designed to simplify stage setups, take advantage of pre-existing wire infrastructure, and work in combination with other Catapult modules.

We recommend you take a few minutes to read this short manual before you begin using the Catapult Rack TX or RX, as it covers the various features of these devices and tips for setup and use. Should you have any questions about the Catapult Rack or any other Radial Catapult modules, please visit our website at www.radialeng.com for additional resources and frequently asked questions.

OVERVIEW

The Catapult Rack TX and RX both act like typical multi-channel analog audio snakes; they allow you to send balanced mic or line-level signals from one location to another without signal loss, noise, or interference, and without any digital audio conversion needed. However, unlike typical analog snakes that require bulky and expensive multi-channel audio cables, the Catapult system makes use of Cat 5 Ethernet cabling, which is widely available, lightweight, and economical.

Simply connect one shielded Cat 5 cable for every four channels of audio and deliver it to any other Radial Catapult module – it will utilize the analog conductors in the cable to deliver four balanced audio lines to any destination. As many buildings are already pre-wired for Cat 5, you can take advantage of this to transmit audio between distant rooms without the need to install or supply new cable. And since the Catapult system is modular, you can mix and match different transmit and receive boxes to best suit your application.

Each Catapult Rack unit operates like three separate Catapult modules in one chassis. The 12 XLRs on the chassis are split into three banks, each with their own noise-eliminating ground lift switch and RJ45 Ethernet jacks on the rear panel. You can use three Ethernet cables to connect all 12 channels to a single location, or split them off to any of the Radial Catapult stage boxes, providing you with a fully customizable audio snake system that can connect to multiple destinations at once. The Catapult Rack TX features all female XLR connectors, while the Catapult Rack RX has 12 male XLR connectors.
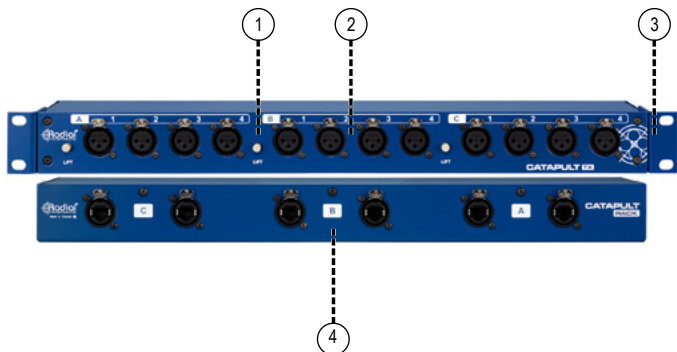
The Catapult Rack TX
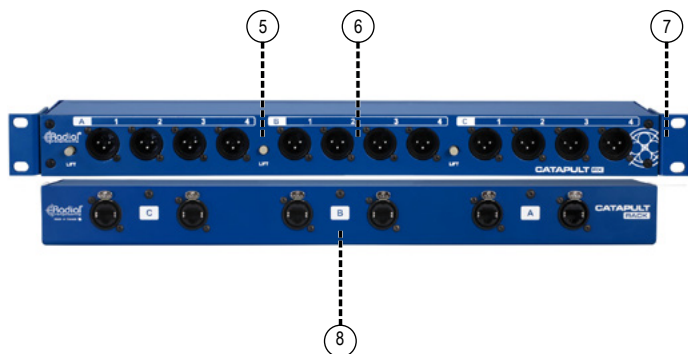

The Catapult Rack RX

FEATURES - CATAPULT RACK TX

1. **GROUND LIFT:** Lifts pin-1 on all four of the corresponding XLR connectors to remove hum and buzz caused by ground loops.

2. **XLR INPUTS:** Locking female XLRs are provided in banks of four, each bank corresponds to a pair of rear panel RJ45 connectors to transmit analog audio over Cat 5 cabling.

3. **REVERSIBLE RACK EARS:** Can be placed on either side of the Catapult Rack, allowing for the XLRs or the RJ45 connectors to face outwards for added flexibility.

4. **RJ45 OUTPUT AND THRU:** Standard Ethernet style connectors for feeding four channels of audio to another Catapult module. Both connectors are wired in parallel with the front panel XLRs. Rugged Neutrik etherCON jacks provide a robust connection for live touring use.

FEATURES - CATAPULT RACK RX

5. **GROUND LIFT:** Lifts pin-1 on all four of the corresponding XLR connectors to remove hum and buzz caused by ground loops.

6. **XLR OUTPUTS:** Locking male XLRs are provided in banks of four, each bank corresponds to a pair of rear panel RJ45 connectors to receive analog audio over Cat 5 cabling.

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8. **RJ45 INPUT AND THRU:** Standard Ethernet style connectors for receiving four channels of audio from another Catapult module. Both connectors are wired in parallel with the front panel XLRs. Rugged Neutrik etherCON jacks provide a robust connection for live touring use.

MAKING CONNECTIONS

As with all audio systems, it is good practice to turn volume levels down or audio systems off before making connections to and from the Catapult Rack. This will help avoid connection or power-up transients from damaging more sensitive components such as tweeters.

You can use any standard Cat 5 or Cat 6 cable to connect Catapult Rack units to each other or to any other Radial Catapult modules. In order to pass 48V phantom power to feed your condenser mics or active direct boxes, *the cable and terminating connections must have a shield.*

If you are transmitting line level signals, the shield is not required due to the twisted pair configuration, but it will still be beneficial as shielded cables are less susceptible to noise. As the twisted pairs in a Cat 5 cable are tightly wound together in a compact jacket, it's a good idea to send similar level signals together over the same wire as this will reduce crosstalk from higher signal levels (such as +4dB line levels) bleeding onto lower output signals (such as -30dB mic levels).

A typical Cat 5 connector and cable showing the four twisted pairs

The Catapult Rack also supports the use of a ruggedized and lockable RJ45 connector type known as an etherCON connector, which features a metal shell that surrounds and protects the RJ45 plug, and prevents against accidental disconnection.

The Catapult Rack RJ45 connectors

A Neutrik etherCON connector

Each Catapult Rack has two RJ45 connectors for each bank of four XLRs. One of these jacks is intended to be used as a passthrough connector which allows you to feed that bank to an additional destination. Since these jacks are wired in parallel with each other, it doesn't matter which one you use for the passthrough - this is why they are unlabeled.

LIFTING THE GROUND

Each bank of four channels on the Catapult Rack is equipped with a ground lift switch. Start with this switch set to the 'out' position.


The ground lift switch

If you hear noise on one of the banks after you have connected to your source and destination devices, try engaging this switch as it can help eliminate ground loop noise such as hum and buzz.

However, note that lifting the ground will disconnect phantom power, which means that condenser mics or active DI boxes will not work on that bank of channels.

USING THE CATAPULT RACK TX AND RX AS A PAIR

To use the Catapult Rack units in their simplest form, connect the TX to the RX using three Cat 5 cables. This creates a 12 channel rackmount audio snake that allows you to send balanced mic or line-level signals from one distant location to another.
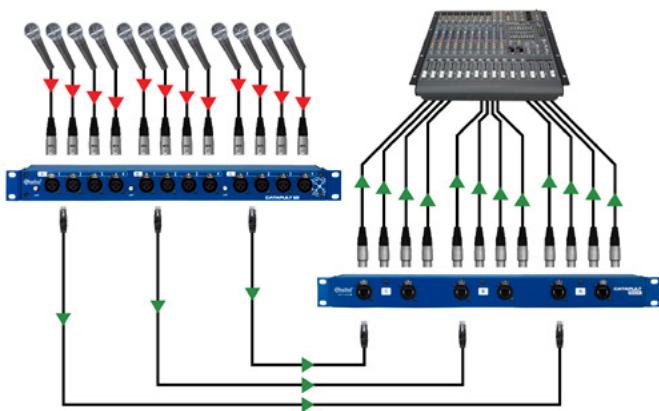
THE RADIAL CATAPULT FAMILY

While the Catapult Rack TX and RX work great as a pair, they are made even more useful by the wide variety of other Radial Catapult modules that already exist. Since all Catapult modules are compatible with one another, you can easily customize your stage or recording studio setup to best suit your needs.

The Catapult Mini modules are extremely compact stage boxes that feature an RJ45 jack on the chassis and a 2ft long fanout of either XLR male, XLR female or TRS connectors. These units are small enough to fit inside the doghouse of a mixing console or tucked behind an equipment rack, but also rugged enough to be placed on a live stage.

The Catapult Mini RX

The Catapult TX4 and RX4 are extremely heavy-duty stage boxes that feature both XLR and RJ45 pass thru connectors on each unit, and certain models also offer transformer isolation on each channel to keep noise to a minimum when used to connect between multiple powered devices.

The Catapult TX4M and RX4M models each feature transformers optimized for use with mic-level signals, while the TX4L and RX4L have line-level transformers on board. The standard TX4 and RX4 models do not feature transformer isolation and as such they can be used with both mic and line-level signals.

The Catapult TX4   *The Catapult RX4*

ADDITIONAL APPLICATIONS

The following examples demonstrate some of the various setups that are possible when using different combinations of Radial Catapult modules.

CREATE STAGE ZONES WITH MULTIPLE MODULES

Set the Catapult Rack RX at your PA console and place three compact Catapult Mini TX units at different zones on stage. This cuts down on cable clutter and streamlines your setups and teardowns.
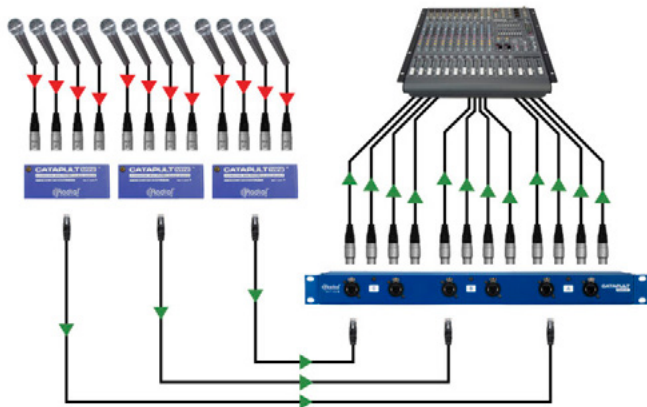
TAKE ADVANTAGE OF PRE-EXISTING CAT 5 WIRING

Use the Cat 5 cables already wired throughout a building to send audio from one room to the other without additional installation or messy cables. Keep in mind that it is common for cable infrastructure to be unshielded, so it may not pass phantom power. *Note that the signals between two Catapult modules cannot pass through a network switch, as it will block the analog audio signal.*


Cat 5 Wall Plate
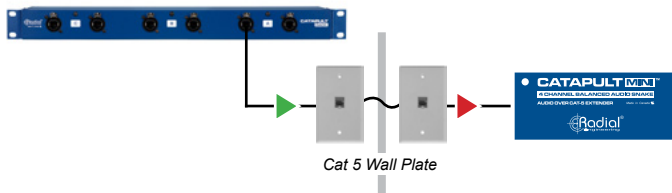
ADD FLEXIBILITY WITH THE CATAPULT TX4

Combining the Catapult Rack RX with Catapult TX4 stage boxes adds flexibility to match the needs of any setup. The TX4 features both male and female XLR connectors so they can be used for both sends and returns, or the XLR thru connectors can feed channels to a monitor console while the Cat 5 cable feeds the main PA system.
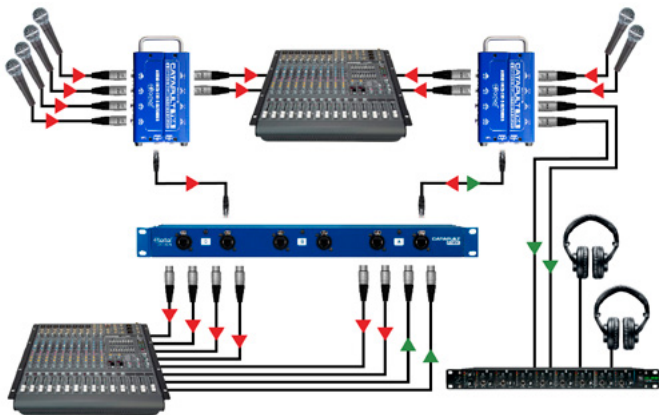
USE THE CATAPULT RACK WITH ISOLATED STAGE BOXES

Send audio to three separate zones by using the Catapult Rack TX and the transformer-isolated Catapult RX4L modules together as a return snake. The isolated outputs allow you to send audio to multiple power amps or other powered devices without the need to worry about ground loop noise.
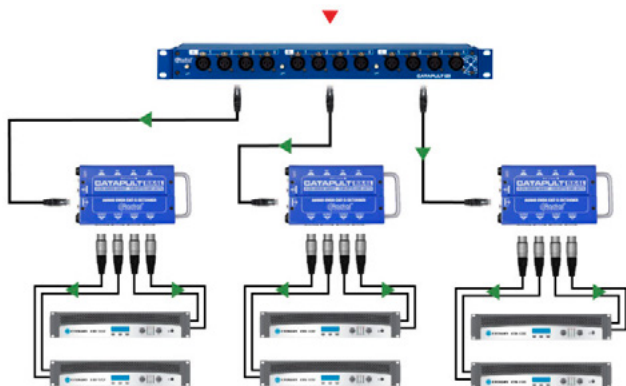
SPECIFICATIONS*

TX - RX

Audio Circuit Type: ....Passive RJ45 to XLR

Frequency Response: ....10Hz - 100kHz, ±0.05dB

Total Harmonic Distortion: ....<0.0003% @ +4dBu, 20Hz - 20kHz

Signal to Noise Ratio: ....>114dB

Dynamic Range:...136dB

Maximum Input:...+20dBu

Crosstalk Between Channels: ....-130dB @ 1kHz, +4dBu

Crosstalk Between Banks:................................-140dB @ 1kHz, +4dBu

Features

Input / Output Connectors ....12 XLR, 6 RJ45 etherCON

Reversible Rack Ears:......................................Rackmount with either side facing out

Ground Lift Switch: ....Disconnects Pin-1 on bank of XLR connectors

General

Construction: ....18-gauge Steel Chassis, 12-gauge Steel Faceplate

Size:...L: 19" x H: 1.75" x D: 3.25"

Weight: 3.06lbs (1.39kg)

Finish:...Durable Powder Coat

Warranty: ....Radial 3-year, transferable

* Subject to change without notice.

THREE YEAR TRANSFERABLE LIMITED WARRANTY

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