SHUNYATA RESEARCH

DIGITAL CABLES

DIGITAL CABLES

High-speed digital transmission is very different from audio frequency signal transmission and requires a different knowledge base and design criteria. Audio cable signal transmission is governed by the principles of inductance, capacitance, and resistance. By contrast, high-speed digital signals are governed by a principle known as 'transmission line theory'. The performance of a transmission line is governed by the characteristic impedance of the cable. Certain types of cable require a specific characteristic impedance to achieve optimal performance — for instance, cable TV coaxial cables are 75 ohms, while test equipment cables require 50 ohm cables. Modern audio and entertainment systems may have multiple digital connections, each with potentially different characteristic impedances.

While the characteristic impedance is a critical factor in the optimal performance of digital cables, our research also indicates that the precision with which a digital cable is constructed has a significant impact on its performance. Shunyata Research digital cables are produced using a *Precision Matched Z* concept. This dictates that tolerances of the conductor surface, dielectric extrusion, and the precision of the braided shield are held to smaller variances. To achieve these tight tolerances, the extrusion and braiding machines must be run at one-quarter speed during the manufacturing process. The result is better performance through a reduction of cable-induced 'signal jitter'.

Superficially, digital cables may look the same as analog cables. For example, a S/PDIF cable can be terminated with RCA connectors, much like analog interconnects. Because the terminations appear the same, analog interconnects could be used as a substitute for a digital cable; but since it has not been designed with the correct characteristic impedance, the performance will suffer.

ArNi™

Precision Matched Z

99.99 PURE
OFE 101

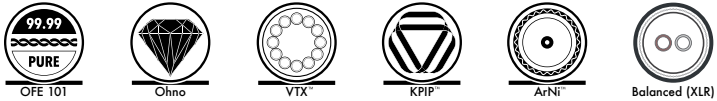
KPIP™

Single-Ended

Balanced (XLR)

DELTA AES/EBU

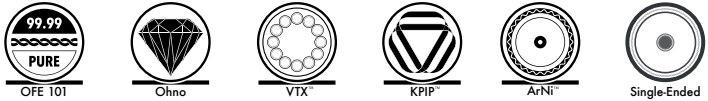
Delta Series AES/EBU features a true balanced, twisted pair design with Ohno continuous cast copper, VTX™ (hollow core) conductors and expensive fluorocarbon dielectrics. Shunyata Research's exclusive KPIP™ process eliminates lengthy burn-in issues.



WIRE	Ohno 110 ohm twisted pair, VTX™ geometry, FEP dielectric, braided shielding
TERMINATION	Shunyata XLR, gold pins.

DELTA S/PDIF

Delta Series S/PDIF uses the finest Ohno continuous cast copper and VTX™ (hollow core) conductors. Silver plated braided shields ensure RFI/EMI immunity. Shunyata Research's exclusive KPIP™ process eliminates lengthy burn-in issues.



WIRE	Ohno 75-ohm coaxial, VTX™ geometry, FEP dielectric, braided shielding
TERMINATION	Shunyata RCA or BNC (75 ohm).

ALPHA AES/EBU

Alpha AES/EBU cables feature Ohno Continuous Cast Copper, VTX™ (hollow core) conductors, expensive fluorocarbon dielectrics and Precision Matched Z for a true reference quality digital cable. KPIP™ eliminates burn-in issues.

WIRE	Ohno 110 ohm twisted pair, FEP dielectric, Precision Matched Z
TERMINATION	Shunyata XLR, tubular gold pins.

ALPHA S/PDIF

Alpha digital cables are constructed using Precision Matched Z to reduce jitter and signal reflections. Expensive fluorocarbon dielectrics and impedance matched RCA connectors ensure reference performance. KPIP™ eliminates burn-in issues.

WIRE	Silver 75 ohm coaxial, FEP dielectric, Precision Matched Z
TERMINATION	Shunyata RCA or BNC (75 ohm).

ALPHA CLOCK-75

Alpha digital cables are constructed using Precision Matched Z to reduce jitter and signal reflections. Expensive fluorocarbon dielectrics and impedance matched RCA and BNC connectors ensure reference performance. KPIP™ eliminates burn-in issues.

WIRE	Silver 75 ohm coaxial, FEP dielectric, Precision Matched Z
TERMINATION	BNC (75 ohm).

ALPHA CLOCK-50

Alpha digital cables are constructed using Precision Matched Z to reduce jitter and signal reflections. Expensive fluorocarbon dielectrics and impedance matched RCA and BNC connectors ensure reference performance. KPIP™ eliminates burn-in issues.

WIRE	Silver 50 ohm coaxial, FEP dielectric, Precision Matched Z
\TERMINATION	BNC (50 ohm).

SIGMA AES/EBU

Sigma interconnects feature Shunyata Research's exclusive patent-pending TAP Polarizer technology. TAP reduces electromagnetic polarization distortion. Ohno Continuous Cast Copper and VTX™ (hollow core) conductors with expensive fluorocarbon dielectrics make for a true reference quality interconnect.

99.99 PURE OFE 101 · Ohno · VTX™ · KPIP™ · ArNi™ · Precision Matched Z · TAP Polarizer

WIRE	Ohno 110 ohm twisted pair, FEP dielectric, Precision Matched Z
TERMINATION	Shunyata XLR, gold pins.

SIGMA S/PDIF

Sigma digital cables are constructed using Precision Matched Z to reduce jitter and signal reflections. Expensive fluorocarbon dielectrics and impedance matched connectors ensure reference performance. TAP reduces electromagnetic polarization distortion.

99.99 PURE OFE 101 · KPIP™ · TAP Polarizer · Precision Matched Z

WIRE	Silver 75 ohm coaxial, FEP dielectric, Precision Matched Z
TERMINATION	Shunyata RCA or BNC (75 ohm).

SIGMA CLOCK-75

Sigma digital cables are constructed using Precision Matched Z to reduce jitter and signal reflections. Expensive fluorocarbon dielectrics and impedance matched connectors ensure reference performance. TAP reduces electromagnetic polarization distortion.

WIRE	Silver 75 ohm coaxial, FEP dielectric, Precision Matched Z
TERMINATION	BNC (75 ohm).

SIGMA CLOCK-50

Sigma digital cables are constructed using Precision Matched Z to reduce jitter and signal reflections. Expensive fluorocarbon dielectrics and impedance matched connectors ensure reference performance. TAP reduces electromagnetic polarization distortion.

WIRE	Silver 50 ohm coaxial, FEP dielectric, Precision Matched Z
TERMINATION	BNC (50 ohm).


SHUNYATA RESE

Shunyata Research uses only the highest purity of copper available for the production of its wire products. **OFE Alloy 101** or C10100 is the highest grade of copper with a minimum 99.99% purity and a conductivity rating of 101% IACS. OFE stands for oxygen-free electrolytic and supersedes the term OFHC (oxygen-free high conductivity). C10100 is the only grade of copper that comes with a written certification of purity. Certified by ASTM F68 C10100.

Ohno wire, also called PCOCC was invented in 1986 by professor Atsumi Ohno of the Chiba Institute of Technology in Japan. Copper wire is created by an extrusion process that pulls a rod of cold copper through a small orifice which creates multiple crystalline boundaries. By contrast, Ohno wire is made by a process using heated molds that cast a wire to form a single crystalline structure. Ohno wire is well known for its exceptionally pure, grain-free sonic qualities.

Shunyata Research's exclusive **VTX**™ conductors are made in the shape of hollow tubes. Since current can only travel through the outer rim on the wire, there are no skin effects or random eddy currents. VTX™ conductors are made from pure OFE C10100 or Ohno (single crystal) copper.

KPIP™ (Kinetic Phase Inversion Process) was developed by Caelin Gabriel after years of research into the underlying causes of various effects such as burn-in, wire directionality and the effects of cryogenic treatment. He discovered that there was an underlying core principle that burn-in and cryogenics only "partially" addressed. Once the governing principle was understood it became possible to create a processing technique and machine that could virtually eliminate the need for burn-in and cryogenic treatment.

ArNi® is a type of wire created by Shunyata Research designed to be the finest quality wire available for audio purposes. It begins with the highest purity of copper available – OFE C10100 or Ohno (single crystal). Then it is formed in virtual hollow tubes eliminating skin effects and eddy current distortions. In addition, the wire undergoes our proprietary KPIP™ process.

TAP (Transverse Axial Polarizer) is a device that interacts with the electromagnetic field generated by the signal traveling along the signal cable. TAP improves the sonic performance of the cable by modifying the behavior of the electromagnetic wave that surrounds the signal cable. In effect, the TAP blocks longitudinal-oriented waves while passing transverse-oriented waves. The effect in sonic terms is like using polarized sunglasses to reduce reflected sunlight. Correcting polarization micro-distortion reduces what some call sonic glare. ~ Patent Pending ~

Shunyata Research digital cables are produced using a **Precision Matched Z** (PMZ) concept. This means that tolerances of the conductor surface, dielectric extrusion, and the precision of the braided shield are held to minute variances. To achieve these tight tolerances, the extrusion and braiding machines must be run at one-quarter speed during the manufacturing process. The result is better performance through a reduction of cable-induced 'signal jitter'. (Note: Z means impedance)

SHUNYATA RESEARCH®

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