SUPRA®

Cables

High Fidelity

Home Theatre

Car Audio

Professional

1999/2000

English Edition

SUPRA® Classic

Prior to 1976 loudspeaker cables had no identity. They were simply cables. 2 x 0.5 mm² was the most usual size, while for high specifications, the only alternative was 2 x 0.75 mm². And then there was SUPRA.

It began when we introduced SUPRA 2.5 and shook up the entire market with a whole new concept. All this happened in Sweden 1976. Since then the whole world has followed us. But then the adjustable spanner, the propeller, the safety pin and Dynamite have also come from Sweden, so perhaps it is not so surprising.

Since SUPRA 2.5 was introduced other original ideas have come from SUPRA. The nylon screen, the Swift connector, the stretch-proof multicore cable and the Ply conductor concept are all examples of our forward thinking technology.

Useful to know about..

Tin plating

A Supra concept for cleaner sound.

The tin is of higher resistance than copper and also protects copper from bad sounding corrosion. It also minimises the current jumps from wire to wire over corroded copper surfaces while more of the signal passes through the pure copper *inside* the wires. The tin layer also minimises the skin-effect, by acting as a semi-Litz.

Silver plating

Only when the frequencies are very high, as in digital signals, does it seem wise to go the opposite way, i.e. to silver plate for a lower surface resistance. At such high frequencies it is hard to keep the signal inside the wire, so instead we design for an easier surface current flow.

Digital interlinks

Important properties of digital cables are a high propagation velocity factor and and a correct and stable characteristic impedance (Z).

Analogue interconnects

Low capacitance (C) is important.

Microphone- and line cables

Low microphonic effect, and low capacitance assist quality.

Loudspeaker cables

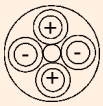
Loudspeaker cables generally need to be of low inductance (L) and prefereably also of low resistance (R).

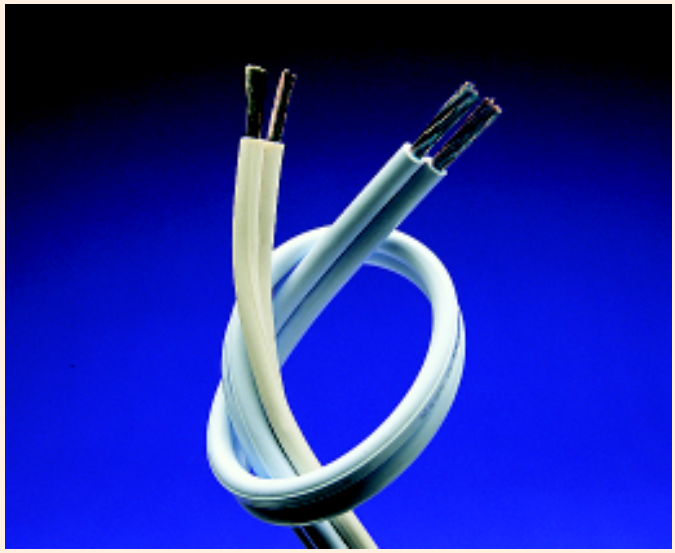
The Classic series comprises highly flexible cables of tin plated multistranded OFC copper of purity degree 5N, which means >99.999% pure, i.e. purer than five nines. The insulation of special ion stable PVC minimises corrosion of the sonically benign tin surface.

This series covers all Hi-Fi applications from low power speakers, such as rear speakers of home theatre systems, to high power systems with long cable lengths.

How to connect Quattro 4x4 for lowest inductance

Connecting Quattro as shown in the figure below will make a lower inductance of 0.37 mH/m, which in turn makes Quattro a top class high-end loudspeaker cable.

Green(+) Blue(-)  Red(+) White(-)



Mini 1.6

2x1.6 mm². An economic version of Classic 1.6 of fewer wires. Application examples: Low power such as rear speakers of home theatres.

 Actual size

Classic 1.6

2x1.6mm². Application exampels: Tweeters in bi-wiring, low power systems or shorter lengths of medium power sysems.

Actual size 

Classic 2.5

2x2.5mm². Application examples: Medium power systems, or shorter lengths in high power systems.

 Actual size

Classic 4.0

2x4.0mm². Application examples: High power systems, or longer lengths in low/medium power systems

Actual size 

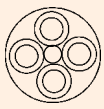
Classic 6.0

2x6mm². Application example: High power systems, even longer lengths.

 Actual size

Quattro 4x4

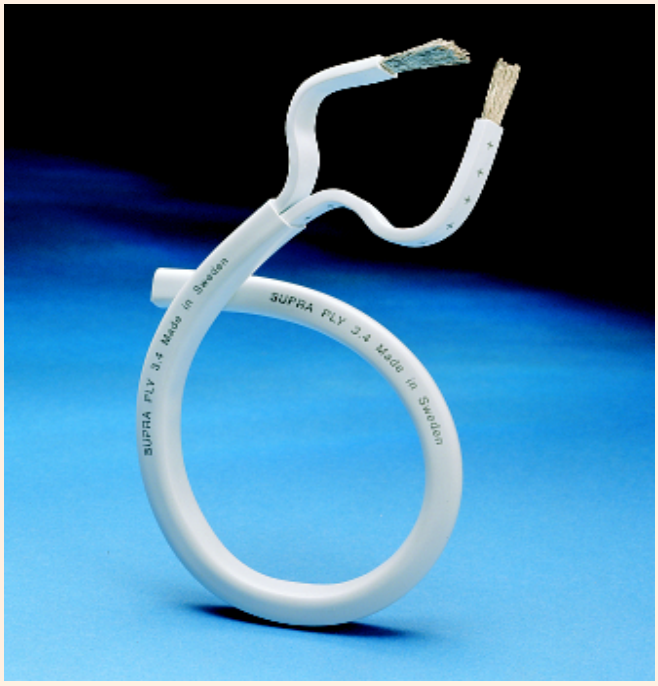
4x4.0mm². Application examples: Bi-wiring, high power systems or longer lengths in low/medium power systems.

Actual size 

Item	Mechanical Specifications								Elec. Specifications	
	Conductor	Cross Sec. Area (mm²/AWG)	Insulation	Jacket	External Size (mm)	Colour	Weight (g/m)	Length/ bobbin (m / ft)	Resistance (Ω/km)	Inductance (µH/m)
Cl. Mini 1.6	2x90x0.15 OFC, Sn	2x1.6 / 15 AWG	PVC	-	2.8x5.7	White	39	300m / 984ft	10.8	0.40
Classic 1.6	2x208x0.10 OFC, Sn	2x1.6 / 15 AWG	Chloride Ion-Stabilized PVC		3.1x6.4	Ice Blue	41	300m / 984ft	10.5	0.40
Classic 2.5	2x322x0.10 OFC, Sn	2x2.5 / 13 AWG			3.6x7.4	Ice Blue/Anth. Grey	66	200m / 656ft	6.8	0.45
Classic 4.0	2x511x0.10 OFC, Sn	2x4.0 / 11 AWG			4.7x9.6	Ice Blue	104	100m / 328ft	4.3	0.55
Classic 6.0	2x756x0.10 OFC, Sn	2x6.0 / 9 AWG			5.5x11.2		146	100m / 328ft	2.9	0.59
Quattro 4x4	4x1020x0.07 OFC	4x4.0 / 11 AWG		PVC	Ø12.5	Ice Blue/Anth. Grey	283	50m / 164ft	4.4	0.37

* Ordinary PVC used in most cables emits corrosion-causing chemicals, as soon as it is made.

Ply 2.0 Actual size



Ply 3.4 Actual size

Item	Mechanical Specifications								Elec. Specifications	
	Conductor	Cross Sec. Area (mm²/AWG)	Insulation	Jacket	External Size (mm)	Colour	Weight (g/m)	Length/ bobbin (m / ft)	Resistance (Ω/km)	Inductance (µH/m)
Ply 2.0	2x120x0.15 OFC, Sn	2x2.0 / 14 AWG	Chloride Ion-Stab. PVC	PVC	6.1x4.9	Ice Blue	73	100m / 328ft	8.1	0.30
Ply 3.4	2x192x0.15 OFC, Sn	2x3.4 / 12 AWG			7.0x7.0		104	100m / 328ft	5.1	0.20

Supra Ply, a Logical and Scientific Design

Before considering more special 'esoteric' 2nd and 3rd-order effects, such as conductor metallurgy, the performance of audio cables is principally determined by their series loop resistance (R), their series loop inductance (L) and their shunt capacitance (C). Both the absolute and the relative values of R, L & C matter. For speaker cables connecting high performance amplifiers to every day electrodynamic (moving coil or ribbon) speaker drive-units that are desired to operate with fidelity across the audio band, the R & L (cable resistance & inductance) must both be low, while the value of C (capacitance) does not matter much [1,2]. This is so because current flow into conventional speaker drive-units is relatively so much larger than in line-level connections, and also absolutely large, ranging to over 100 Amperes in some instances. This is especially true of auto (12 volt) installations. But simply using a fat wire gauge makes R low at the expense of increasing L. This is musically unacceptable for high sonic quality.

'Squaring the circle' techniques to make this loop inductance, L, low, simultaneous with low resistance, include tapes, either stacked in parallel pairs, or several arranged side-by-side in ribbons, where the ends are X-connected. But of course, these types are (i) impractical to fit to nearly every known speaker connector (at least without introducing discontinuities), (ii) are stressed and may be unsightly when right angle surface bends are required in domestic installation, and (iii) are unsuited to for mobile use by professionals. Litz techniques, i.e. multiple, parallel, insulated conductors are more practical in use and laying out, but when properly executed, they are expensive.

They are also awkward to terminate and must be soldered. Other types are grossly large, like industrial pneumatic pipes, making them unsuited to smaller domestic dwellings.

Conventionally, fat conductors' high loop inductance (which raises impedance at +6dB/octave) is further raised due to internal eddy currents causing 'Skin effect'. This acts like 'the square root of an inductor', i.e. progressively adds a +3dB/octave component to the cable's series inductance. With typical speaker cable runs of a few metres, the combined inductive effect is that performance in moderately heavy, plain conductors is measurably affected with steady signals at or a little above 1kHz. Whereas for music transients, even low bass qualities are affected.

Conventional stranded cables with copper, silver or related conductors suffer from complex oxidation. The surface becomes a semiconductor. The diodes so formed between the strands are not seen by steady-state signals, but look like the plates of a high value capacitor to transient signals. This causes low-level energy storage and release after transients, that is invisible to steady state testing yet nonetheless perfectly audible with many music recordings. This 'transversal distortion' may also be described in terms of the TEM (Transverse Electro-Magnetic) Wave, which takes a direct route, whereas electron flow is 'trapped' inside individual, particular strands that are commonly twisted away from the most direct route, at each of the inevitable bends in a stranded cable, when laid-out.

Supra Ply is able to be a large-section, low resistance cable, while also overcoming skin effect and transversal distortion, by using a proprietary, pure tin plating. This has the double benefit that tin and copper meld without forming a diodic barrier (as with many silver-plated copper 'audiograde' conductors) and that tin strongly resists most common causes of metal corrosion, and hermetically protects the copper, making Supra Ply ideal for outdoor use.

By contrast, most audiograde cables claiming highly pure copper or silver conductors are either wholly unprotected from contamination, initially by the out-gassing of the plastic covering (even if PTFE/Teflon), and eventually from the impure atmosphere - and even from accidental immersion in liquids! Some very expensive cables are protected only by a very thin, initially good lacquer, that must

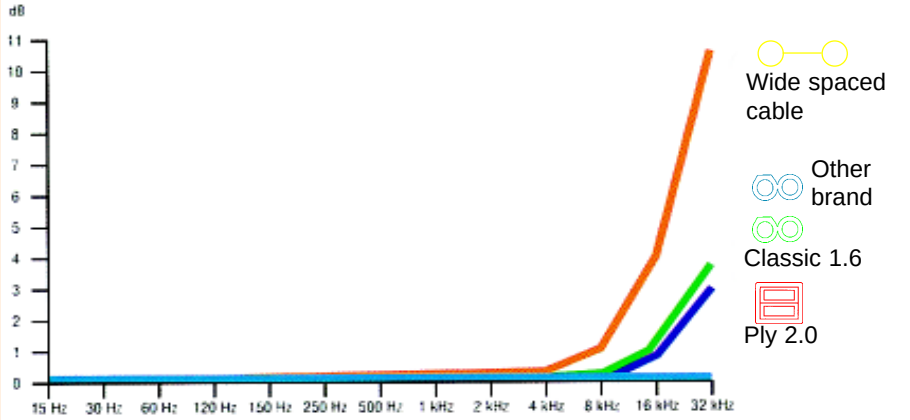


Fig.1 Steady-state cable losses

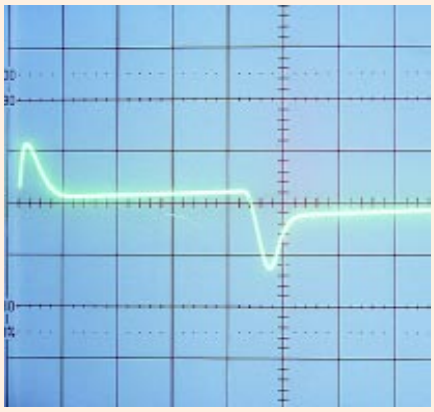


Fig.2 Oscilloscope graph of losses for Ply 2.0

Fig.3 Typical wide-spaced type of cable

eventually crack, invisibly, with handling and age.

Even if oxidation should form on the outside of Supra Ply, it will be sonically benign, as in audiograde 'metal oxide' resistors - which are really tin oxide.

Other Advantages

For wiring-up, Supra Ply is easily formed. Unlike ribbons, tapes and Litzes, the rectangular conductor section is instantly made circular, for insertion into the circular-shaped receptacles of binding posts, 4mm ('banana'), Speakon, XLR and most other speaker connectors.

Supra Ply's overall square X-section allows it to readily enter most connector housings, too.

Supra Ply is also readily coiled up, like ordinary, inferior-sounding 'mains power type' speaker cables. It is therefore easy for professionals to use. Sound producers can easily take Supra Ply to the mixing venue along with their favourite mini-monitor speakers.

Demonstrating the Difference

Unlike some audiograde products, the benefits of Supra Ply (and other cables employing similarly logically progressive philosophies) are readily shown by comparative and repeatable measurements. These differences may be portrayed in a number of realms.

Fig.1, in the swept frequency domain shows progressively increasing losses above 1kHz for all cables, caused by inductance + skin effect - ranging up to 10dB at 20kHz or so, where ultrasonic sound from vinyl discs in particular, can simulate pleasure centres in the brain [3]. Here, Supra Ply's healthy, low-loss behaviour at the higher audio frequencies (and, by implication, the transient parts of lower frequency music fundamentals) is made evident with a basic 'steady-state' sine-wave sweep.

Fig.2 & 3 are 'scope pictures, in the steady-state time domain. They show typical damping (dynamic) differences, using a classic square wave. After a transient event, Supra Ply both restrains the peaking and accelerates the return of the signal voltage to zero volts, at the speaker end of the line. The peaking of the wide-spaced cable demonstrates both bad damping, and hf loss. These effects occur because spaced cable has high inductance and low capacitance - the diametric opposite of what is required to drive ordinary loudspeakers.

Worldwide Reviews/Reports

Absolute Hi-Fi	Hong Kong, #22 '95
Audio Art	Taiwan, Oct '94
Audio	Norway, #2 '96
Audio	Norway, '97 'Product of the year '96'
Audio Technique	Hong Kong, May '95
Hi-Fi NewsRR	UK, Dec '96
Hi-Fi Review	Hong Kong, July '95
Hi-Fi Vide-Elektro'	Finland, Jun/Jul '96
Hi-Fi Video Test	Holland, Mar '95
HiFi & Musik	Sweden, Oct '96
High Fidelity	Sweden, #1, '97
Hi-Fi News	UK, Feb '97
Lyd & Bilde	Denmark #8, '97
High Fidelity	Sweden, Jan '97
Hi-Fi Review	Hong Kong, Sep '98
Alta Fidelidad	Spain, #87, '98
Stereofonia	Spain, Nov '98

Research References

Ben Duncan, Loudspeaker Cables, Case Proven, Proc. The Institute of Acoustics, UK, Nov '95.
Also published in Studio Sound & Broadcast Engineering (UK); and Stereophile (USA) - both Dec '95.
Ben Duncan, Modelling Cable, Electronics World (UK), Feb '96.
Ben Duncan, Measuring Speaker Cable Differences, Electronics World (UK), June/July '96.
Ben Duncan, Black Box (column), Hi-Fi News & Record Review (UK), June & July '96.

Other References

[1] Malcolm Omar, Mawksford, The Essex Echo, Hi-Fi News, Aug '85; Aug & Oct '86 & Feb '87.

[2] Fred E. Davis, Effects of Cable, Loudspeakers & Amplifier Interactions, J. AES, June '91.

[3] T. Ohasi, E. Nishina, N. Kawai, Y. Fuwamoto & H. Imai, High Frequency Sound Above the Audio Range Affects Brain Electric Activity & Sound Perception, '91

Bi-wire Ply in nylon braid.

See page 7 for bi-wiring accessories!

SUPRA screened loudspeaker cables radiate less interference to low level circuits, inputs and interconnects. With the dense multitude of inputs and outputs now found on the back panels of audio/video receivers, the minimising of these effects becomes very important.

LINC stands for Low INteraction Concept.

The shield also protects the opposite way as it minimizes the aerial effect, rejecting high frequency interference into the system.

Minimising of interference fields is also important in other fixed installations. Computers are an important part of everything technical nowadays. Sensitive networks of low level information controls all kinds of operations audio, video, production processes and the like.

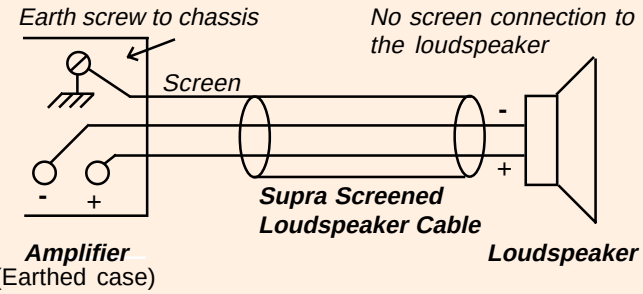
These systems are getting more compact and more complex with more cables closer and closer which means that the sensitivity to disturbances increases correspondingly.

The radiation from unshielded loudspeaker cables is often stronger than that from ordinary mains cable applications.

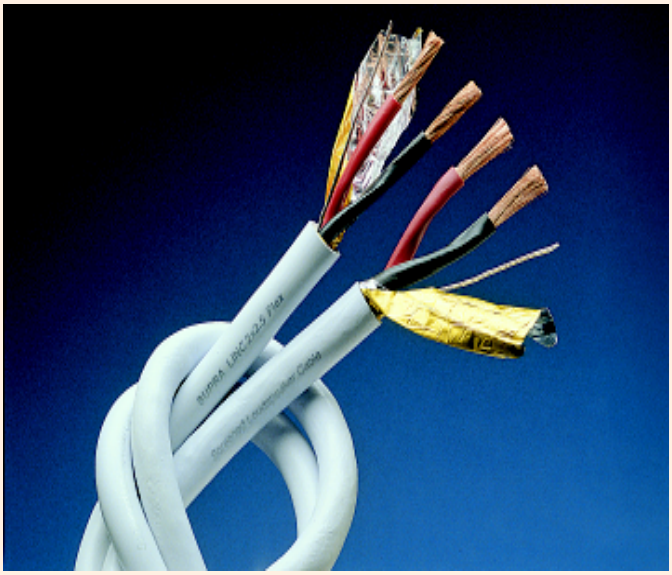
Multi room installations often require audio, video, data and loudspeaker lines to run through ceilings and walls in very close proximity.

The possible biological effect of electric and magnetic alternating fields should also be considered.

Wiring diagram:



The screen is to be connected to the amplifier chassis or any other ground point of the amplifier. No connection is needed at the loudspeaker end.



Flexible cables for Hi-Fi

Linc 2.5 Flex

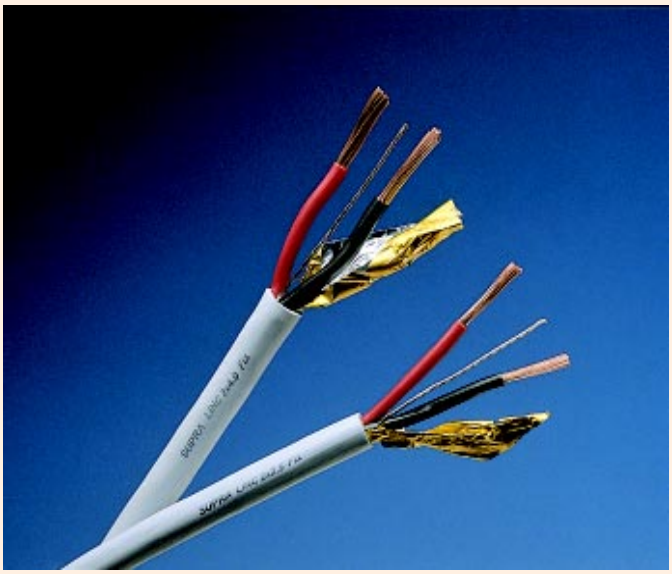
2x2.5mm². Application examples: Medium power systems or shorter lengths in high power systems.

Actual size

Linc 4.0 Flex

2x4.0mm². Application examples: High power systems or longer lengths in low/medium power systems.

Actual size



Cables for fixed installation

Linc 2.5 Fix

2x2.5mm². Application examples: Medium power systems or shorter lengths in high power systems.

Actual size

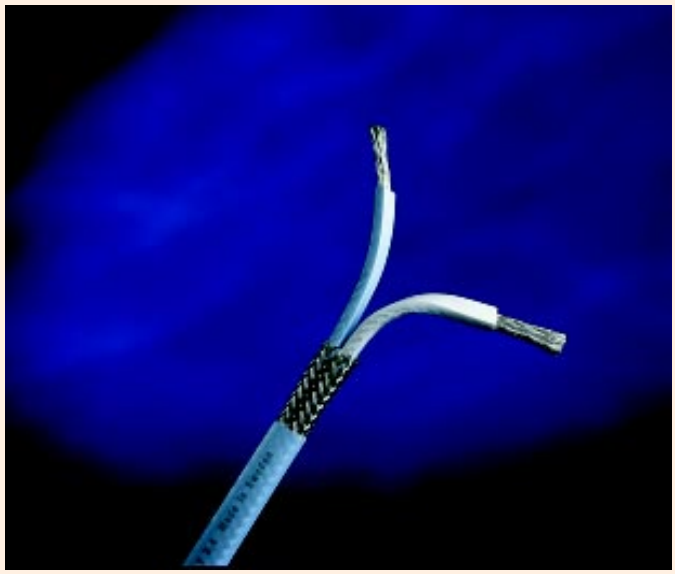
Linc 4.0 Fix

2x4.0mm². Application examples: High power systems or longer lengths in low/medium power systems

Actual size

The screened Ply 3.4/S combines low inductance and tin plating with the screen concept, making it our top high-end loudspeaker cable.

Read more about the Ply on page 4-5!



Test Reviews

Supra Linc

Alta Fidelidad Spain, #95 '98

Supra Ply 3.4/S

TNT Audio non-commercial internet magazine

http://www.tnt-audio.com/accessories/ply34s_e.html

Alta Fidelidad Spain , #100 '99

Also, an interview with Tommy Jenving:

http://www.tnt-audio.com/intervis/suprae.html

Ply 3.4/S

Applications: High power systems, or longer lengths in low to medium power systems or where RF levels warrant it.

Actual size 

Item	Mechanical Specifications										Elec. Specifications	
	Conductor	Cross Sec. Area (mm²/AWG)	Insulation	Shield	Shield Coverage	Jacket	External Size (mm)	Colour	Weight (g/m)	Length/ bobbin (m / ft)	Resistance (Ω/km)	Inductance (µH/m)
Linc 2.5 Fix	2x45x0.25 OFC, Sn	2x2.5 / 13 AWG	Chloride Ion-Stabilized PVC	Al./Poly. foil 0,2µm, drain wire 7x0.54 OFC Sn	100%	PVC	Ø7.8	Ice Blue	105	100m / 328ft	7.8	0.42
Linc 4.0 Fix	2x49x0.32 OFC, Sn	2x4.0 / 11 AWG					Ø8.1		120		4.9	0.44
Linc 2.5 Flex	2x322x0.10 OFC, Sn	2x2.5 / 13 AWG					Ø7.8		105		6.8	0.42
Linc 4.0 Flex	2x511x0.10 OFC, Sn	2x4.0 / 11 AWG					Ø8.1		120		4.3	0,44
Ply 3.4/S	2x192x0.15 OFC, Sn	2x3.4 / 12 AWG		Braid 156x0.15 Sn	> 90%		7.5x7.5		129		5.1	0.20

Accessories for bi-wiring

Bi-wiring is a separation of the music signal current into two cables; one for the higher and one for the lower frequency range, e.g. one for bass and one for the midrange/tweeter.

Bi-wiring makes an audible enhancement. The best combination is a pair of Ply 3.4 or 3.4/S.

In order to make it work the loudspeakers should preferera-bly be equipped with separate inputs to the crossover networks. If not, then you could move out the crossover network from the loudspeaker boxes and put it close to the amplifier. It should then be easy to make a bi-wired connection from the crossover to the loudspeaker components.

Nylon braid 'hose' is available for sleeving over the cables to gather them into a single bi-wire cable pair.

You do it like this:

The braid sleeve widens when it is pushed together longitudinally, which makes it very easy to push the cable pair into it. The braid sleeeve is supposed to be somewhat shorter than the cable pair to leave a margin to be stretched afterwards in order to tighten against the cable pair.

A heat shrink at each end fixes the stretched braid sleeve and completes the work.

Please be aware: A very tense stretching makes a neat result, but also a less flexible cable.

The termination trousers in the picture are for twin interconnects. They are applied with Supra Twin and Supra CarLink.

Heat shrink hose
Termination trousers Nylon braid

Item	Mechanical Specifications					
	Fit. Dim. (mm)	Inner Sixe (mm)	External Size (mm)	Temp. Range (°C)	Colour	Q'ty/ Pack
Heat Shrink Hose 12.7	Ø6.4-Ø12.5	Ø12.7(Ø6.4)	Ø14	-55 to +135	Black	20cm
Heat Shrink Hose 19.1	Ø9.5-Ø19.0	Ø19.1(Ø9.5)	Ø20.5			20cm
Nylon Braid 10	Ø7-Ø15	Ø10	Ø11	-70 to +125		10m
Nylon Braid 15	Ø10-Ø21	Ø15	Ø12			

Item	Mechanical Specifications					
	Fit. Dim. (mm)	Inner Sixe (mm)	External Size (mm)	Temp. Range (°C)	Colour	Q'ty/ Pack
Termination Trousers	Ø7.5-Ø9.0	Ø8.5 (Legs Ø3.3)	Ø9.5x80(Legs 40)	-30 to +120	Black	2pcs
Rubber Sleeve 7.5	Ø7.5-Ø13	Ø7.5	Ø9.2x30	-30 to +130		
Rubber Sleeve 10	Ø10-Ø16	Ø10	Ø12x35			
Shield Coil Rohrflex 12	Ø5-Ø12	Ø12	Ø15.8	-40 to +115		5m

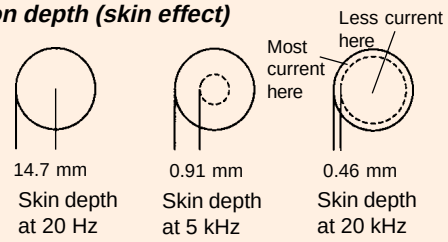
EFF-I Interconnect Cable Analogue/Digital 75 Ohm

The dynamic influence of the skin effect is of great sonic influence as the music/video signals are nothing but variations. By means of the Equalized Frequency Flow technique (EFF) Supra takes skin effect into account. The EFF-I cable consists of two tube-shaped conductors with a wall thickness of 0.20 mm which is well below the smallest skin depth within the audio range. This makes all frequencies operate under the same conditions.

Effective penetration depth (skin effect)

$d = 1/\sqrt{\pi \mu_r \mu_0 \sigma f}$

σ = conductivity



EFF-I Interconnect Cable Construction

Silver plated OFC copper 0.5 mm²/conductor. Tube-shaped flexible conductors with a center core of PE. Two conductors, individually screened, for balanced or semibalanced connection.

EFF-I Interconnect Cable

Application examples: Analogue interconnect or digital audio with 75 Ohm RCA interface or video interconnect.

Actual size 

DAC Digital & Analogue Interconnect Cable, AES/EBU Harmonised

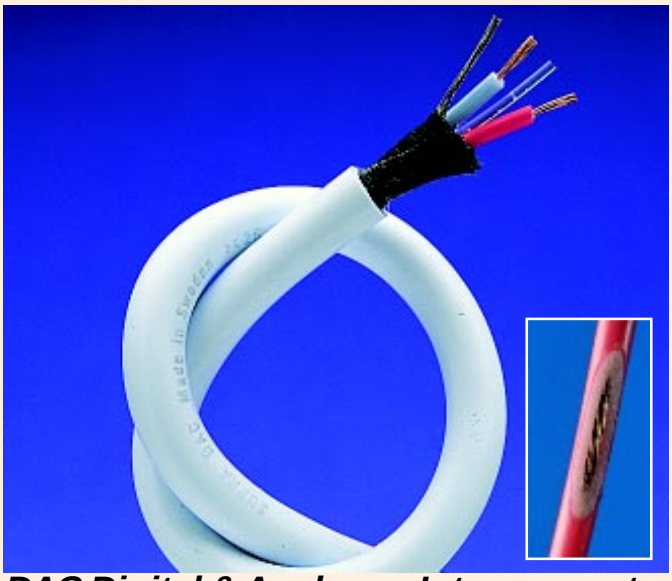
A fast interconnect of extremely low capacitance. In accordance with our design concepts the inductance is to be low for a loudspeaker cable whereas for an interconnect the capacitance is to be low. Supra DAC is insulated with PE foam skin which exhibits only 45 pF/m. It is screened with our very efficient and strong semiconductive nylon ribbon. Supra DAC is also designed for digital audio and is harmonised with the AES/EBU standard. (Square wave 60 MHz, impedance 110 Ohms, balanced.)

The very high frequency properties of Supra DAC are outstandingly good, owing to its high velocity factor. More clean transients and thus improved space dimension comes with the high velocity.

The velocity factor of Supra DAC is as high as 78% of the speed of light, owing to the low dielectricity of the gas blown foam skin insulation. With PTFE/Teflon it would have been only 71%.

The velocity factor can be calculated with the simplified formula: $n = 1/\sqrt{K}$

where K is the dielectricity factor of the insulation material. (See page 19.)



DAC Digital & Analogue Interconnect

Application examples: Digital audio with XLR-interface 110 Ohm AES/EBU or as a common analogue interconnect with RCA or XLR plugs.

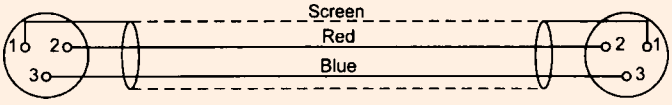
Actual size 

Item	Mechanical Specifications									Electrical Specifications			
	No. Of Channels	Conductor	Insulation	Shield	Jacket	External Size (mm)	Colour	Weight (g/m)	Length/ bobbin (m / ft)	Resistance (Ω/km)	Capacitance (pF/m)	Char. Impedance 1 MHz (Ω)	Propagation Velocity
EFF-I	1	2x16x0.15 OFC, Ag	PE	Al/Poly. Foil	PVC	Ø7.2	Ice Blue	73	50m / 164ft	38	77	75	0.66c
DAC		2x19x0.19 OFC	PE Foam	Semi-Cond. Nylon		Ø6.5	Ice Blue/Anth. Grey	35		80	45	110	0.78c

Semi-balanced connection with RCA plugs

Signal source >> Text reading this way >> Receiving device

Balanced connection with XLR connectors



Signal source >> Text reading this way >> Receiving device

Note: For analogue applications the impedance, 75 Ohm or 110 Ohm, is negligable at audio frequencies.

All Supra connectors have shielding housings and the cables are provided with Supra´s efficient screens which helps ensure noise rejective interlinking.

The cables are developed with the focus on low capacitance, high velocity factor and correct and stable characteristic impedance.

The results are improved definition and dynamics.

Test Reviews and articles

EFF-I

Lyd & Bilde	Denmark, #8, ’97
Hi-Fi Review	Hong Kong, Sep, ’98
Alta Fidelidad	Spain, Dec, ’98
Hifi & Musik	Sweden, #1, ’99
Hi-Fi Choice	England, March, ’99 (EFF-ISL Best buy)

TNT-Audio, non-commercial internet magazine
http://www.tnt-audio.com/clinica/eff1e.html

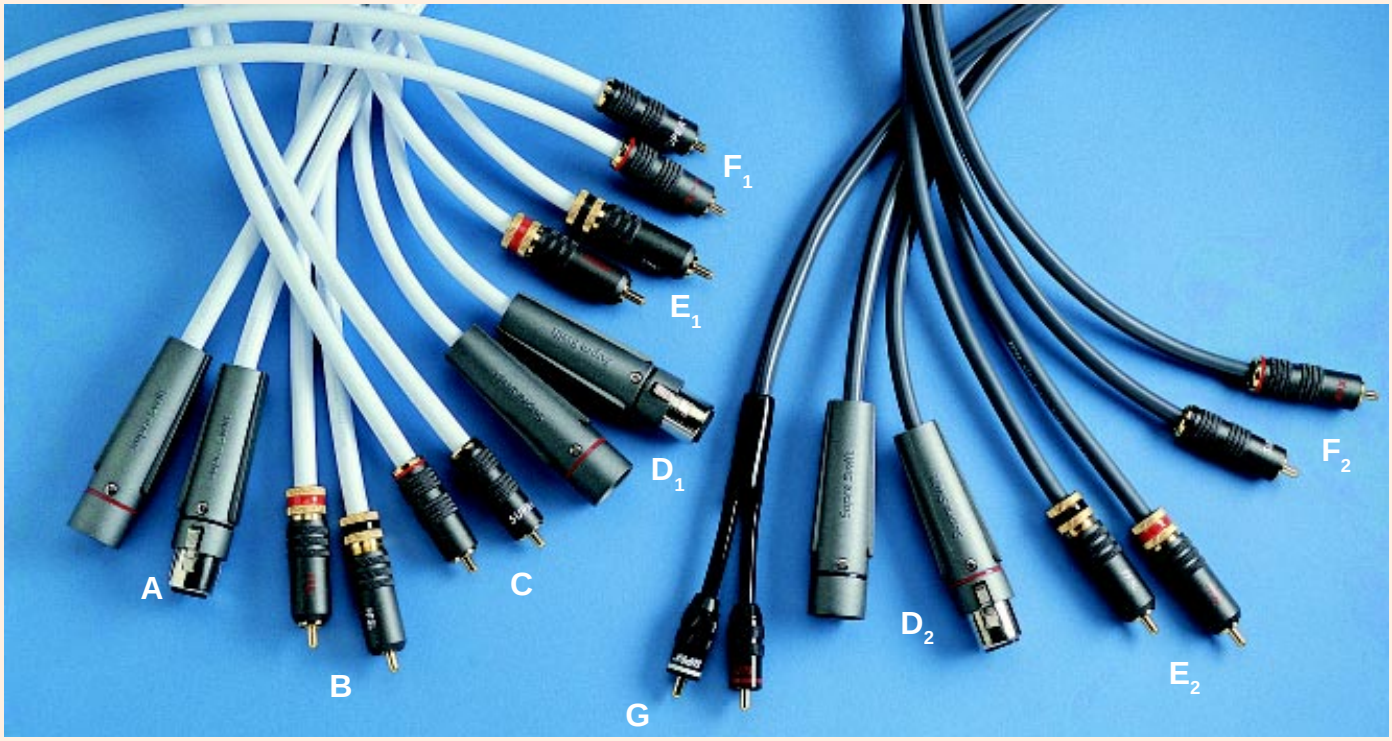
Articles about applying EFF-I

Ben Duncan, Pure Transfer, Hi-Fi News & Record Review (UK), Nov ’97
Ben Duncan, Black Box (technical column), Hi-Fi News & Record Review (UK), Dec ’96 and Nov ’97

DAC

High Fidelity	Sweden, #1, ’97

Also, an interview with Tommy Jenving:
http://www.tnt-audio.com/intervis/suprae.html



Analogue Interconnect Cables

Item	Mechanical Specifications							
	Pict. Ref.	Connector	Cable	Screen Connection	Solder Tin	Connector Fixing	Standard Length (cm/ft)	Colour
EFF-IXLR	A	SWIFT XLR LIGHT AU	EFF-I	Balanced	Lead-Free, Sn 96.3%, Ag 3.7%, Flux 3.5% Corrosion Resistance	Quick Lock	2x75 / 2.5ft	Ice Blue
EFF-ISL	B	PPSL RCA		Semi-Balanced		Squeeze Lock		
EFF-IX	C	PPX RCA				-		
DAC-XLR	D	SWIFT XLR LIGHT AU	DAC	Balanced		Quick Lock		IceBlue/ Anth. Grey
DAC-SL	E	PPSL RCA		Semi-Balanced		Squeeze Lock		
DAC-X	F	PPX RCA				-		
TWIN	G	RCA-6	MS02-JP	Semi-Bal.			1x75 / 2.5ft	Anth. Grey

ZAC Fibre Optic Interconnect

ZAC stands for Zero Attenuation Concept.

The innovative curving of the fibre core tip to get a zero divergence loss enables plastic fibre optic to be used, and achieve the same transmission quality as that of a glass fibre core. Thus, we combine the strength and flexibitlity of the plastic fibre with a high-end Hi-Fi transmission.

Properies and advantages of the fibre optic cable are:

- Mechanically strong
- Low weight
- Wide band width
- Interference immune.
- No radiation
- Non-conductive; Independent of voltage potentials.

Basic principals:

At the transmitting side a light source is used, either a LED or a laser. The light is passed into the optic fibre and at the receiving end the light is detected by a photo-diode.

By means of turning the light on and off, a digital communication is created.

ZAC is availble in lengths of 1m(3ft), 2m(6ft), 5m(16ft) and 10m(33ft).

ZAC Toslink Fibre Optic Cable

Test reviews ZAC

Hifi & Musik	Sweden, #1, '99
Alta Fidelidad	Spain, # 100, '99

Digital Interconnects

General:

Always, in digital applications, the choice of a cable of correct characteristic impedance is very important. There are two standard impedances:

- 75 Ohm S/PDIF interface which uses RCA connectors. This is most common in Hi-Fi applications from CD transport to DAC, as well as home recording.
- 110 Ohm AES/EBU interface which is balanced and has XLR connectors. This is mostly used in professional applications.

75 Ohm Interconnects: Trico-ID and EFF-ID

The 75 Ohm digital interconnects are desinged for RCA (Phono connectors) interfaced transmission between CD transport and digital to analogue converter. They have the capability to transfer the full digital spectrum and can be used with a number of 75 Ohm applications.

110 Ohm AES/EBU Interconnect: DAC-XLR

DAC-XLR is a balanced interconnect for digital transfer, mostly in professional equipment. DAC stands for Digital & Analogue Cable, not to be mixed up with DAC converters.

DAC-XLR Trico-ID EFF-ID DAC-XLR

Item	Mechanical Specifications							
	Connector	Cable	Screen Connection	Solder Tin	Connector Fixing	Application	Standard Length (m/ft)	Colour
ZAC-1M	TosLink	ZAC Fibre Optic Cable	-	-	Quick Lock	Fibre Optic	1m / 3.3ft	Ice Blue
ZAC-2M							2m / 6.6ft	
ZAC-5M							5m / 16.4ft	
ZAC-10M							10m / 32.8ft	
EFF-ID	PPSL RCA	EFF-I	Semi-Balanced	Lead-Free, Sn 96.3%, Ag 3.7%, Flux 3.5% Corr. Resist.	Squeeze Lock	Digital 75 Ω	1m / 3.3ft	
EFF-ID	BNC				Twist Lock			
Trico-ID	PPX RCA	Trico			-			
Trico-ID	BNC				Twist Lock			
DAC-XLR	PPX RCA	DAC	Balanced		Quick Lock	Digit. AES/EBU 110 Ω		Ice Bl./Ant. Gr.

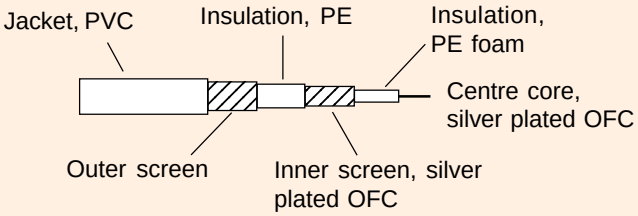
Trico Digital Video/Composite Cable 75 Ohms

Trico is an interconnect cable of very low capacitance, insulated with PE foam which makes only 58 pF/m and makes the propagation velocity to 78% of the speed of light.

Trico is double shielded with a braided inner screen of silver plated OFC copper and an outer of bare OFC copper. The screens provide efficient noise protection. The centre wires are made of silver plated OFC copper. The silver plating of the conductor/screen enhances the high frequency properties of the cable.

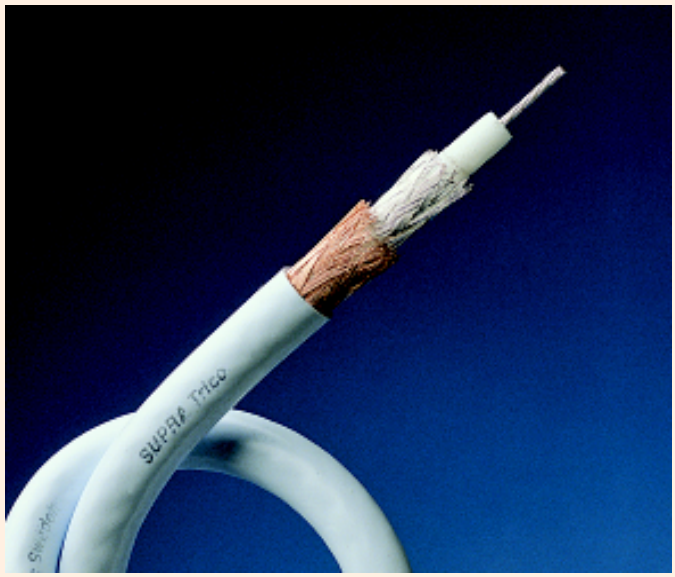
The high technology design of Trico makes an extremely low attenuation: 0.6dB/100m at 1MHz and 7.1dB/100m at 100MHz.

True 75 Ohms: The characteristic impedance is very stable: +/- 1.5 Ohms up to 100MHz.



Test review Trico

Alta Fidelidad Spain, #100, '99



Trico Digital/Composite Cable

Actual size

AV-6 Audio/Video Cable, 6-core Coax

AV-6 is a multi-core coax of 6 individual 75 Ohm rated coax cables, commonly screened with an external aluminium/ polyester shield.

Each core has a braided screen of tin plated OFC.

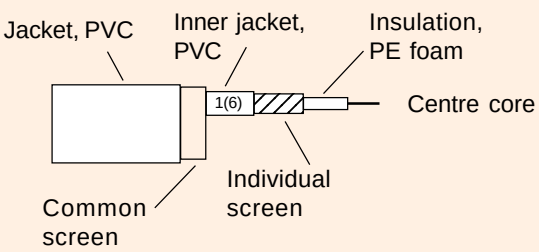
AV-6 is of very low capacitance owing to the PE foam insulation.

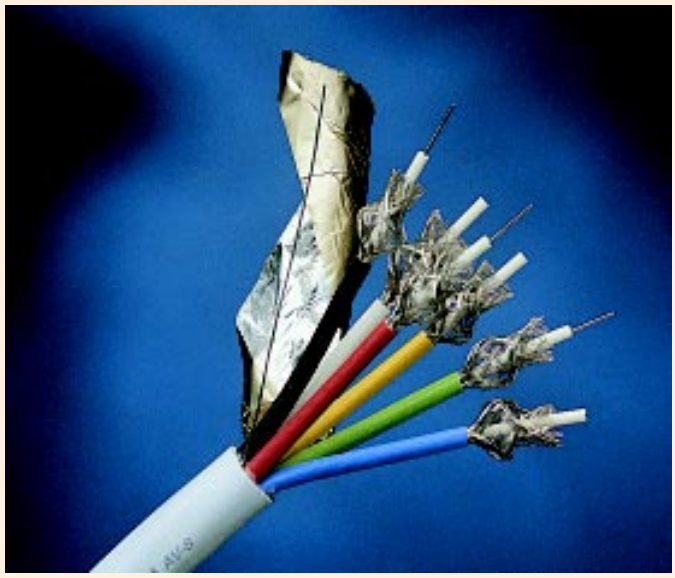
The construction is especially developed for Home Theatre use and allowes several applications with DB25, Scart, RCA, S-VHS and BNC connectors.

The timing error is less than 2.2 nS which enbles accurate RGB transmission.

Applications:

- Component analogue video
- Video walls
- High resolution video projection
- CG workstations
- Studio tie lines





AV-6 Video Cable, 6-core Coax

Actual size

Item	Mechanical Specifications											Electrical Specifications				
	No. of Channels	Conductor	Insulation	1st Shield, Coverage	Insulation	2nd Shield, Coverage	Jacket	External Size (mm)	Colour	Weight (g/m)	Length/ bobbin (m / ft)	R (Ω/km)	C (pF/m)	Char. Imp. 1 MHz (Ω)	Attenuation 1MHz (dB)	Prop. Velocity
Trico	1	1x7x0.36 OFC, Ag	PE Foam	0.15 OFC Ag, >90%	PE	0.15 OFC, >85%	PVC	Ø8.3	Ice Blue	37	50m / 164ft	22.3	58	75	0.6/100m	0.78c
AV-6	6	6x1x0.5 OFC, Sn		0.10 OFC Sn, >85%	PVC	Al/Poly. Foil, 100%		Ø11.0		147		87,8	45	75	1,4/100m	0.78c

Trico Video Interlinks

The Trico interlinks are semi-balanced for efficient noise rejection. Trico is double screened and the outer screen is connected to earth at only one end of the cable, so there is no signal through that screen, but it serves only as a screen.

Trico is applicable for video signal transference in almost all video equipment, as today's projectors, DVD players, video processors, etc are all equipped with composite inputs/outputs. It suits both analogue and digital video transmission.

Trico-IV BNC and Trico-IV RCA

AV-6 Interlink for AC-3/DTS Surround

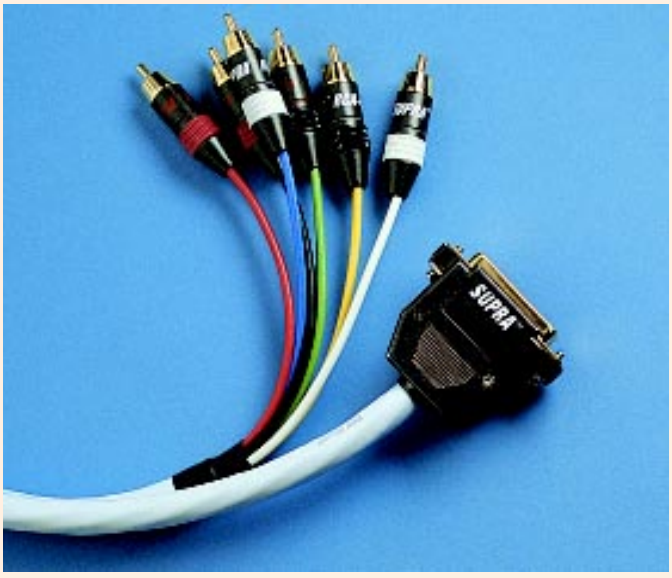
AV-6 is a high performance multi-coax construction of low capacitance 75 Ohm cores, especially developed for 5.1 channel home theatre sound (Dolby digital/DTS). All connector housings are fully shielding.

The cores are used for:

- **Right front**
- **Left front**
- **Center**
- **Sub woofer**
- **Right surround**
- **Left surround**

All cores are marked for easy installation.

The DB25 is a rather new connector in Hi-Fi and is rapidly getting more common. For ex. Rotel is using it as a standard in all their home theatre products.



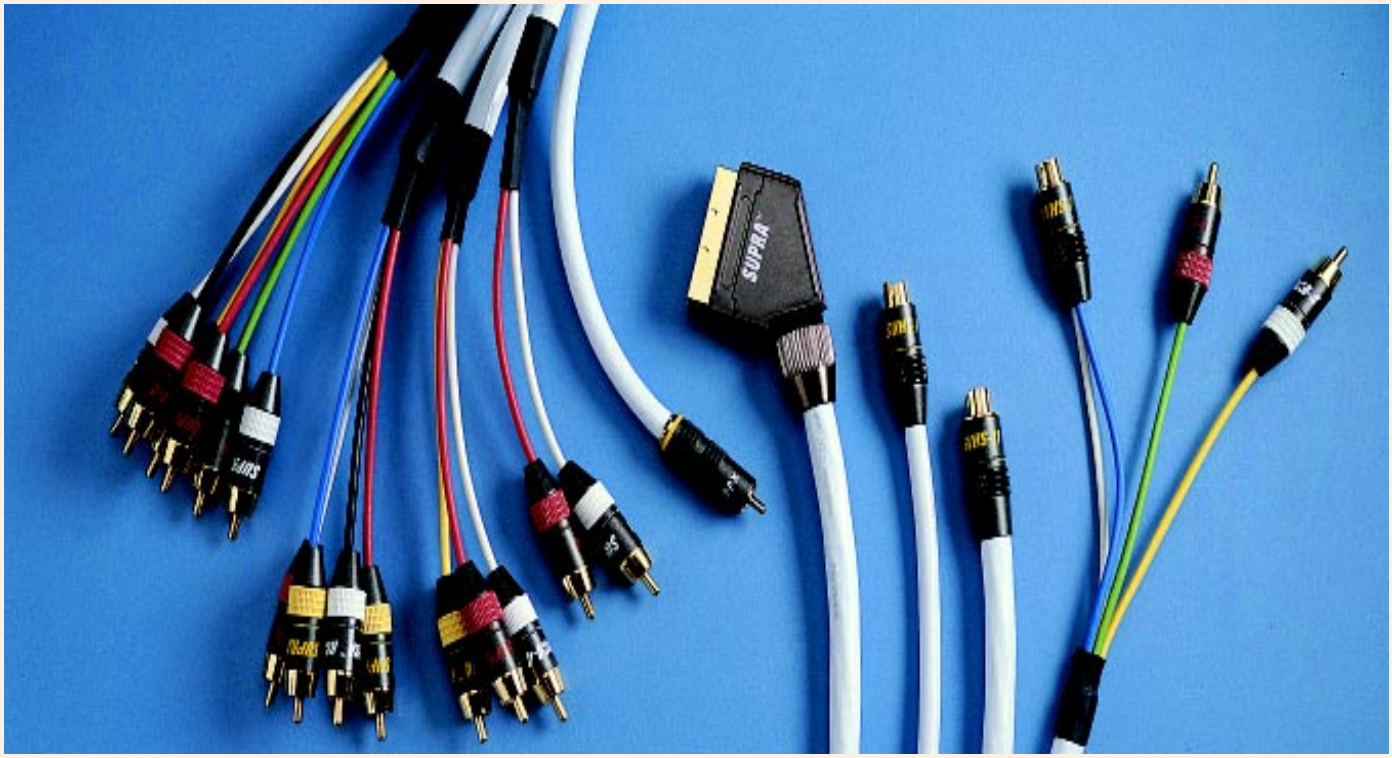
AV-6 DB25M-RCA

Item	Mechanical Specifications							
	Connector	Cable	Screen Connection	Solder Tin	Connector Fixing	Application	Standard Length (m/ft)	Colour
Trico-IV RCA	PPX RCA	Trico	Semi-Balanced	Lead-Free, Sn 96.3%, Ag 3.7%, Flux 3.5% Corrosion Resistance	-	Video 75 Ω	1x1m / 3.3ft	Ice Blue
Trico-IV BNC	BNC (75Ω)	Trico			Twist Lock			
AV-6 DB25M-DB25F	DB-25M / DB-25F	AV-6			Screw Lock	AC-3/DTS, 75 Ω		
AV-6 DB25M-RCA	DB-25M / RCA-4	AV-6			Screw			

Supra has quite a comprehensive portfolio of audio/video interlinks for home theatre. All are equipped with fully shielded connector housings.

The interlinks are suitable for composite audio/video, S-VHS, Dolby digital/DTS and RGB transmissions.

The table below will guide you to the correct choice of interlink.



A Choice of the Available Audio/Video Interlinks

Item	Mechanical Specifications					Recommended Use											Function				
Only standard items are listed. Non-standard connectors or cables with changed signal direction are made on request.	Cable	Connector	Screen Connection	Solder Tin	Standard Length (m)	Amplifier	AV Amplifier	CD	DAC	DVD	Laser disc	Processor	Satellite	TV	Video	Computer	Composite	RGB	S-VHS	Audio	Video
Trico-IV	Trico	PPX RCA	Semi-Bal.	Lead-Free, Sn 96.3%, Ag 3.7%, Flux 3.5% Corrosion Resistance	1	X	X	X	X	X	X	X			X	X	X			X	X
Scart to 1 RCA-4		Scart /PPX RCA										X		X	X	X	X				X
Scart to 2 RCA-4	AV-6	Scart/RCA-4					X							X	X					X	
Scart to 3 RCA-4							X					X			X		X			X	X
Scart to 4 RCA-4							X							X	X		X	X		X	X
Scart to 6 RCA-4							X					X			X		X	X		X	X
Scart to Scart Comp./S-VHS		Scart	Balanced									X	X	X	X		X		X	X	X
Scart to Scart RGB		Scart										X	X	X	X		X	X		X	X
S-VHS to S-VHS		S-VHS-11					X			X		X		X	X	X			X	X	X
S-VHS/2 RCA to Scart		SVHS-7 / RCA-4 / Scart					X			X		X		X	X	X			X	X	X
Scart to S-VHS/2 RCA							X					X	X	X	X				X	X	X
3 RCA to 3 RCA		RCA-4	Semi-Bal.			X	X					X			X		X			X	X
4 RCA to 4 RCA						X	X					X	X		X	X	X	X		X	X
6 RCA to 6 RCA						X	X					X	X	X	X		X	X		X	X
DB-25M to DB-25F		DB25 M/F	Balanced				X			X		X								X	
DB-25M to 6 RCA		DB25M/RCA-4	Semi-Bal.				X			X	X	X								X	

Boxcon

Gold plated box connector for cables up to 10 mm² or Banana/Fork. For wall thickness up to 29 mm.

1 pair/pack.

Also avalable in bulk of 50 pairs.

Fork

Gold plated spade. The size of the fork width is 5.5 mm. The cable can be connected either on axis or on a 90° angle. Fits up to 10 mm² cables. Adapter screw for banana plug is included. Fork is the most copied Supra connector worldwide.

2 pairs/pack.

Also available in bulk of 200 pcs.

Banana

Gold plated 4 mm banana plug for up to 10 mm² cables. Can be connected either on axis or on a 90° angle. Red and black housings.

2 pairs/pack.

Also available in bulk of 50 pairs.

Fork XL

A larger variation of the Fork. The size of the fork width is 6.5 mm. The adapter screws for banana plug are not included in this product.

2 pairs/pack.

Also available in bulk of 200 pcs.

BFA Connectors

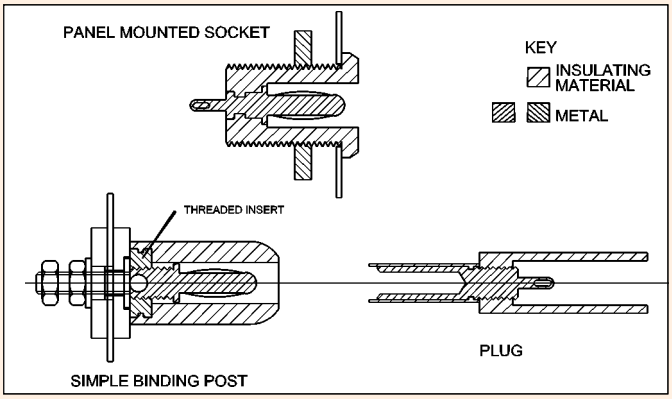
In accordance with EU regulations, a loudspeaker connector is to comply principally with the same safety standards as a mains plug, to allow CE marking.

Supra's BFA connectors harmonise with these standards. This type of connectors is developed by British Federation of Audio Manufacturers and is expected to become internatio-nal standard for loudspeaker connectors.

Briefly the connector can be described as an insulated Banana connector. (See drawing.)

BFA-M Cord Connector

BFA-F Cabinet/Panel Mounting



Design principle of the BFA connector (Drawing by BFA)

Item	Mechanical Specifications								
	Quantity/ Pack	Quantity/ Bulk Pack	Connector	Material	Contact Locking	Wire Connection	Max Cable Area (mm²/AWG)	External Size WxHxL (mm)	Colour
Fork	4 Pcs	200 Pcs	Spade Cord, 5.5mm	24 Ct Gold Plated Cu	-	Screw/Solder	10 mm² / 7 AWG	8x20x21	-
Fork XL		200 Pcs	Spade Cord, 6.5mm					10x12.5x26	
Banana	2 Pairs	50 Pairs	Banana Cord		Expansion Pin			10x18x42	Red/ Black
Boxcon	1 Pair	50 Pairs	Banana/Spade Chassis		Screw Lock			Ø19x35-64	
BFA-F	2 Pairs	50 Pairs	BFA Cord		-			Ø10x40	
BFA-M	1 Pair	50 Pairs	BFA Chassis		Expansion Pin			Ø20x35	

Swift XLR Au Set

Patented

XLR connector with gold plated pins. Fully shielded for noise rejection. Easy assembly. No losable screws. Nothing to slip on the cable before soldering.

A set of male/female per pack.

Bulk pack: 10 pcs male or female. (No set.)

PPSL

Gold plated RCA plug with squeeze locking of both contact part and cable clamping. Lathe turned in one piece. Front mounted shielding housing. Maximum cable dia. 7.7 mm.

1 pair/pack.

Also available in bulk of 50 pairs.

RCA 6

Gold plated RCA plug with squeeze clamping, only for cable diameters of 5-6mm. This connector is applied with TWIN and CarLink.

1 par/bag

Also available in bulk of 50 pars.

PPX

RCA plug in gold plating with shielding housing, front mounted. Teflon insulation. Lathe turned in one piece. Maximum cable dia. 8.5 mm.

1 pair/pack.

Also available in bulk of 50 pairs.

Item	Mechanical Specifications										
	Quantity/ Pack	Quantity/ Bulk Pack	Connector	Material	Insulation	Housing	Connector Fixing	Cable Clamping	Max Cable Dia. (mm)	External Size WxHxL (mm)	Colour
Swift 3M Au Light	1 Set M/F	12 Pcs	XLR Male	24 Ct Gold Plated Cu	Noryl	Shielded, Front Mounted	Quick Lock	Screw	Ø7.4	Ø19x77	Red/Black
Swift 3F Au Light			XLR Female							Ø19x83	
RCA-6	1 Pair	50 Pairs	RCA Male		PTFE (Teflon)		-	Squeeze Lock	Ø6.0	Ø11x35	Red/White
PPX								Screw	Ø8.5	Ø13x43	Red/White/Yellow
PPSL							Squeeze Lock	Squeeze Lock	Ø7.7	Ø13x53	Red/White

Scart

Gold plated Scart connector with metalised shielding housing. Squeeze clamping of the cable.

1 pc/bag.

Bulk pack: 50 pcs.

RCA-4

Gold plated RCA (Phono) plug with Teflon insulation and metal housing. Fits 4mm cable diameter, eg. the AV-6 core. Marking rings are available in different colours.

1 pair/bag.

Bulk pack: 50 pairs.

DB25-F and DB25-M

Gold plated DB25 plugs with metalised shielding housing. Male and female

1 pc/bag.

Bulk pack: 50 pcs.

SVHS-7 and SVHS-11

Gold plated S-VHS connectors with shielding metal housing and Teflon insulation.

SVHS 7 fits cable diameter 7mm and SVHS-11 fits 11mm, e.g. the AV-6.

1 pc/bag.

Bulk pack: 50 pcs.

Item	Mechanical Specifications										
	Quantity/Pack	Quantity/Bulk	Connector	Pin Material	Insulation	Housing	Connector Fixing	Cable Clamping	Max Cable Dia. (mm)	External Size WxHxL (mm)	Colour
RCA-4	1 Pair	50 Pairs	RCA	24 Ct Gold Plated Cu	PTFE (Teflon)	Shielded	-	Squeeze Lock	Ø4.0	Ø12x50	Red/White/Yellow
SVHS-7	1 Pcs	50 Pcs	S-VHS					-	Ø7.0	Ø13x42	Yellow
SVHS-11									Ø11.0	Ø14x43	
Scart			Scart		Noryl	Shielded, Front Mounted		Squeeze Lock		48x20x60	White
DB25-M			DB25/ D-sub				Screw	-		55x17x51	
DB25-F											

For those of you who prefer to make your own interlinks or carry out service we have gathered this connection configuration tables.

Please be aware of the importance of the soldering quality. All Supra interlinks are soldered with led-free silver tin with non-corrosive flux.

Poor solderings are mostly due to either too high or too low temperature.

The flux is needed to get through the oxide and avoid a dry joint without using overheating.

A dry joint might work very well for a period of time but as the oxide will grow between the tin and the object there will eventually be a poor connection. In the worst case the conductors will get lose and make short cuts.

The Supra connectors are insulated with Teflon to stand the right soldering temperature.

Please refer to our internet home page for more detailed soldering instructions:

http://www.jenving.se

However, we always recommend to leave the soldering of interlinks with a professional workshop.

S-VHS Connector Signals			
Pin	Function	Pin	Function
1	Ground Luminance (Y)	3	Luminance (Y)
2	Ground Chrominance (C)	4	Chrominance (C)

DB-25 Connector Signals			
Pin	Function	Pin	Function
1	Left +	14	Left -
2	Center +	15	Center -
3	Right +	16	Right-
4	Sub Woofer +	17	Sub Woofer -
5	Left Surround +	18	Left Surround -
6	Right Surround +	19	Right Surround -
Housing/Ground - Housing/Ground			

S1. Scart Connector Signals			
Pin	Function	Pin	Function
1	Audio Right Out	12	Data 1
2	Audio Right In	13	Red Ground
3	Audio Left Out	14	Data Ground
4	Audio Ground	15	Red
5	Blue Ground	16	RGB Control
6	Audio Left In	17	Video Ground
7	Blue	18	RGB Control Ground
8	Function Select	19	Composite Video Out
9	Green Ground	20	Composite Video In
10	Data 2	21	Safety Ground
11	Green		

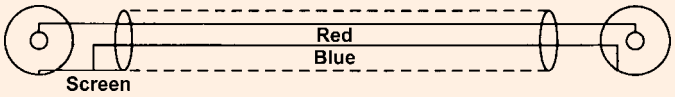
S.1 Stereo Audio, Composite and RGB Video

S2. Scart Connector Signals			
Pin	Function	Pin	Function
1	Audio Right Out	12	Data 1
2	Audio Right In	13	Ground
3	Audio Left Out	14	Data Ground
4	Audio Ground	15	Chrominance Video
5	Ground	16	
6	Audio Left In	17	Video Ground
7		18	
8	Function Select	19	Composite Video Out
9	Ground	20	Luminance Video
10	Data 2	21	Safety Ground
11			

S.2 Stereo Audio, Composite and S-VHS Video

XLR Connector Signals			
Pin	Function	Pin	Function
1	Ground	3	Cold
2	Hot		

Semibalanced connection with RCA plugs



Signal source >> Text reading this way >> Receiving device

Balanced connection with XLR connectors

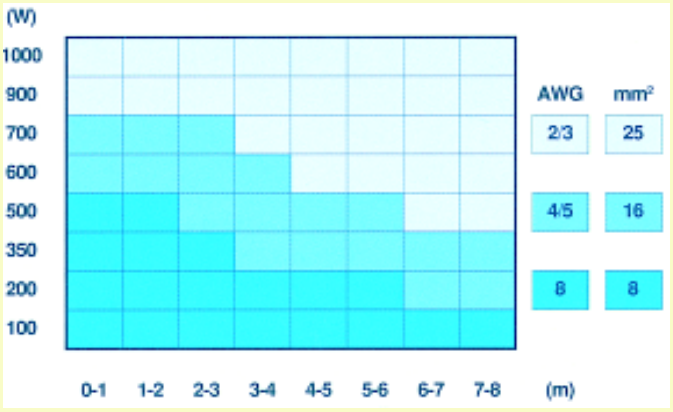
Signal source >> Text reading this way >> Receiving device

Octopower

Supra's power supply cables for car audio are tin plated to stand outdoor use in cars and to prevent from poor connections and power loss caused by corrosion.

Octopower is immune even to a salty coastal climate.

The insulation is oil resistant.



Cable choice chart

Octopower 8

Tin plated, 8 mm².

Actual size

Octopower 16

Tin plated, 16 mm².

Actual size

Octopower 25

Tin plated, 25 mm².

Actual size

Item	Mechanical Specifications								El. Spec.
	Conductor	Cross Sec. Area (mm²/AWG)	Insulation	Temp. Range (°C)	External Size (mm)	Colour	Weight (g/m)	Length/ bobbin (m / ft)	Resistance (Ω/km)
Octopower 8	252x0.19 OFC Sn	8mm²/8 AWG	Oil Resistant PVC	-35 till +75	Ø5.7	Red/ Black	92	100m / 328ft	2.4
Octopower 16	476x0.19 OFC Sn	16mm²/5 AWG			Ø7.5		172	50m / 164ft	1.3
Octopower 25	735x0.19 OFC Sn	25mm²/3 AWG			Ø9.2		244	50m / 164ft	0.8

Power Connectors

Car Audio Loudspeaker Cables

Ply 2.0 and Ply 3.4

The Ply cables are the best of Supra's loudspeaker cables. They are low inductance, tin plated and corrosion resistant. The square cross-section enables beautiful installations.

See pages 4-5.

Line Connectors for Car Audio

PPSL

Gold plated RCA plug. The squeeze locking of the connector makes a firm vibration proof connection.

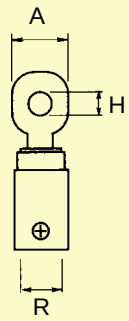
See page 9.

Speaker Connectors for Car Audio

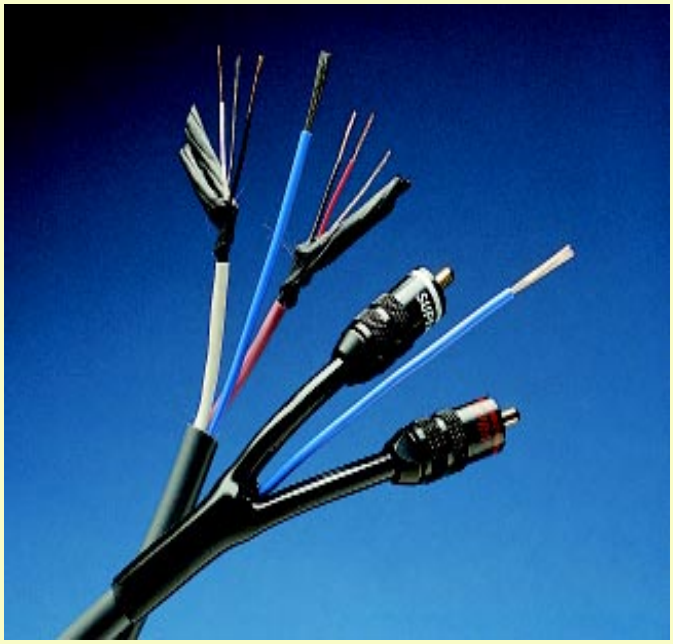
Fork

A classic Supra design that has been copied by many over the years. Here is the original - which includes an adapter screw for Banana connectors.

See page 8.



Item	Mechanical Specifications						
	Quantity/ Pack	Material	Insulation	Max. Cable Area A (mm²/AWG)	Wire Connection	Fix.Hole H (mm)	Spade/Ring Width R (mm)
Spade Terminal 8	2 Pair	24 Ct Gold-Plated Cu	PVC, Red/ Black	8mm²/8 AWG	Crimp	Ø4.2	8
Ring Terminal 8M6						Ø6.3	11
Ring Terminal 8M8						Ø8.3	14
Ring Terminal 16M8				16mm²/5 AWG			16
Ring Terminal 25	1 Pcs		-	25mm²/3 AWG	Screw	Ø8.1	15



CarLink Cable
CarLink-IR Interconnect

Car Interconnect with Remote-on

CarLink is a twin-pair interconnect cable with remote control conductor. Each pair is screened and jacketed to make a complete cable which can be configured for unbalanced, balanced or semi-balanced connections.

Special design attention has been paid to achieving extremely efficient noise rejection.

CarLink-IR is a semi-balanced interconnect cable with RCA plugs and remote-on conductor.

Item	Mechanical Specifications												El. Spec.	
	No. Of Channels	Connector	Conductor	Insulation	Remote Wire	Remote Insulation	Shield	Jacket	Screen Connection	External Size (mm)	Colour	Weight (g/m)	Length (m / ft)	R (Ω/km)	C (pF/m)
CarLink	2	-	4x7x0.20 OFC	PE	1x28x0.2 OFC Sn, 1mm²/ 17 AWG	PVC	Semi-Cond. Nylon	PVC	-	Ø8.0	Anthracite Grey	71	50m /164ft	180	90
CarLink-IR 1m		RCA-6							Semi-Balanced				1m / 3.3ft		
CarLink-IR 5m													5m / 16.5ft		

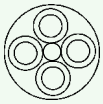
Classic 2.5 Anthracite

High flexibility, 2x2.5 mm² tin plated OFC copper. Fits XLR connectors.

Actual size 

Quattro 4x4 Anthracite

High flexibility, 4x4.0 mm². Fits Speakon connectors. For low inductance connection, see page 3.

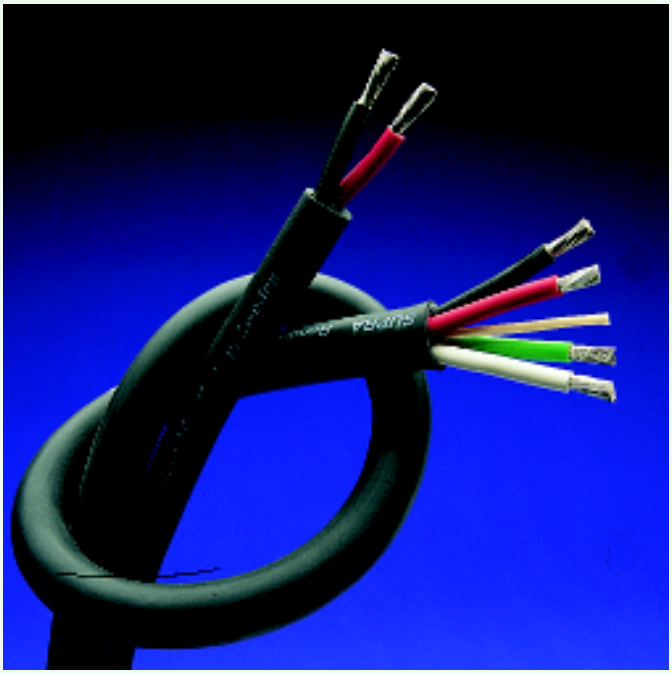
Actual size 

Rondo 2x2.5 and Rondo 4x2.5

Rondo is a round flexible loudspeaker cable for professional use as well as for car hi-fi and marine applications. The conductor area is 2.5 sqmm and the conductors are twisted for low inductance. Rondo is available in two versions: a pair cable and a 4-conductor cable. The wires are tin plated in order to stand outdoor use and prevent corrosion. The tin plating also minimises the current jumps from strand to strand and makes less distortion. (See page 2 about tin plating.)

Rondo 2x2.5 fits XLR connectors and Rondo 4x2.5 fits Speakon connectors.

Also, for professional applications: Supra Linc Fix, screened loudspeaker cables for fixed installations.
Page 6.



Rondo 2x2.5

2x2.5 mm². Tin plated.

Actual size 

Rondo 4x2.5

4x2.5 mm². Tin plated.

Actual size 

Item	Mechanical Specifications									Elec. Spec.	
	Conductor	Cross Sec. Area (mm²/AWG)	Insulation	Jacket	Temp. Range (°C)	External Size (mm)	Colour	Weight (g/m)	Length/ Bobbin (m / ft)	Resistance (Ω/km)	Inductance (µH/m)
Classic 2.5	2x322x0.10 OFC, Sn	2x2.5 / 13 AWG	Chloride Ion-Stabilized PVC	-	-30 till +70	3.6x7.4	Anth. Grey/ Ice Blue	66	200m / 656ft	6.8	0.45
Quattro 4x4	4x1020x0.07 OFC	4x4.0 / 11 AWG		PVC		Ø12.5		283	50m / 164ft	4.4	0.37
Rondo 2x2.5	2x322x0.10 OFC, Sn	2x2.5 / 13 AWG				Ø7.5	Anth. Grey	95	150m / 164ft	6.8	0.48
Rondo 4x2.5	4x322x0.10 OFC, Sn	4x2.5 / 13 AWG				Ø8.5		125	100m / 164ft	6.8	0.35

Supra's unique screen concept makes pro-tech products that are feasable for military use as well as for industry or stage use. The screen is made of semiconductive Nylon, a very strong and flexible wrapping that so far has only been used around very high voltage power station cables, for field equalizing.

The advantages of Supra nylon screened cables over ordinary braided cables are:

• Mechanically stronger
The nylon screen, with its tensile strength of 500 N/50mm, is many times stronger than ordinary screens, also with respect to bending fatigue.

• Enviromental and climate immunity
Humidity does not influence the cable's electrical properties.

• Noise rejection

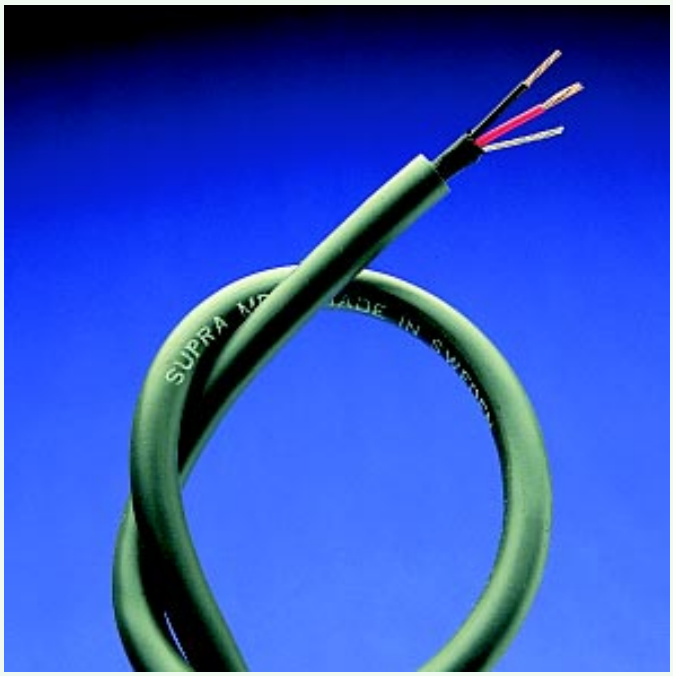
Besides the extremely good shielding properties of the semiconductive screen, the cores are symmetrically twisted to avoid the magnetic pickup. Tests under very severe conditions have been carried out and whereas no ordinary cable has been free from noise pickups, Supra MBS has still been quiet.

Carry out your own test: Tape a nylon-screened Supra cable along the mains flex of a thyristor controlled device, for example, a drilling machine. Connect the Supra cable to a pre-amplifier, run the machine and listen to the crosstalk noise. Do the same with other cables. Compare!

MBS Microphone Cable, Balanced

A non-compromise design, both mechanically and electrically. Negligable microphony, high noise rejection, low capacitance, high flexibility, high bending strength. The best microphone cable.

Actual size



MBC Microphone Cable, Balanced

An economy variation of the MBS design.

Actual size

DAC Digital Audio Line Cable, Bal.

110 Ohm, AES/EBU harmonised

Insulation of gas blown PE foam skin for lowest capacitance. For further design description, see page 6.

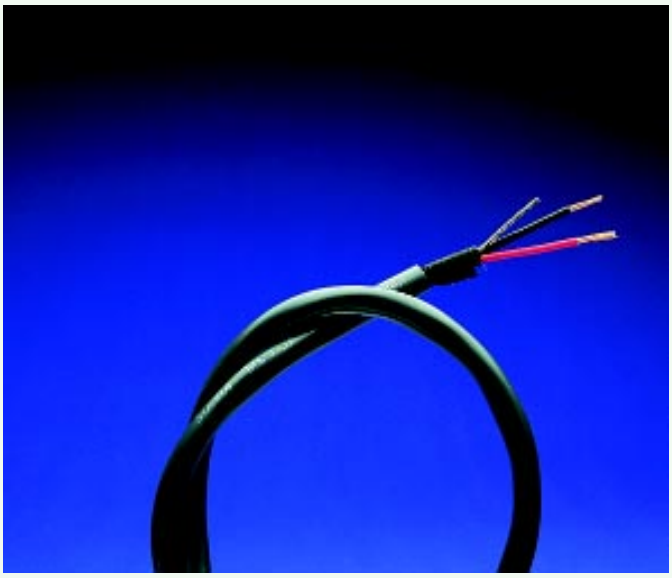
Actual size

Item	Mechanical Specifications										Electrical Specifications		
	No. Of Channels	Conductor	Insulation	Shield	Jacket	Temp. Range (°C)	External Size (mm)	Colour	Weight (g/m)	Length/ Bobbin (m /	Resistance (Ω/km)	Capacitance (pF/m)	Propagation Velocity
MBC	1	2x7x0.20 OFC	PE	Semi-Cond. Nylon	PVC	-30 till +70	Ø5.8	Anthracite Grey	45	150m / 492ft	180	90	0.66c
MBS		2x19x0.127 OFC					Ø6.0		43		72	52	
DAC		2x19x0.19 OFC	PE Foam				Ø6.5	Ice Blue/Anth. Grey	35	50m / /164ft	80	45	0.78c

Multicore Cables for Stage Use, Pair Jacketed and Stretch-Proof

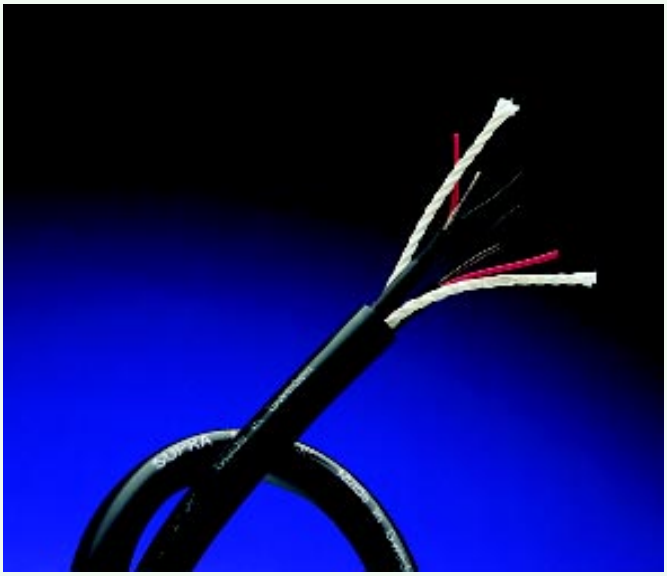
Supra has developed a flexible multi-core cable for use on stage and in heavy and rough handling situations. Every pair is individually jacketed and is a complete cable. Just simply solder on a contact - you don't even need to use heat-shrink. Perfect when you need to make up a line to a stage box. The screen is of semiconductive nylon which is extremely strong with regard to bend-fatigue and which at the same time is highly resistant to electro-magnetic interference. A usual problem with multi-core cables which are used on stage and in other non-permanent applications, is that the pairs in the middle of the multicable have less stretch tolerance than the outer layers, owing to the spiralized configuration of the cable. Consequently the inner cables are often stretched so much that the solder joints give way or the conductors break when forced to take the whole strain. Supra have solved this through increasing spiralization of the pairs towards the centre, plus the omission of a pair at the exact centre, this being replaced with a flexible plastic core.

The pairs are identified with jacket colours as well as with numbers. See identification chart below.



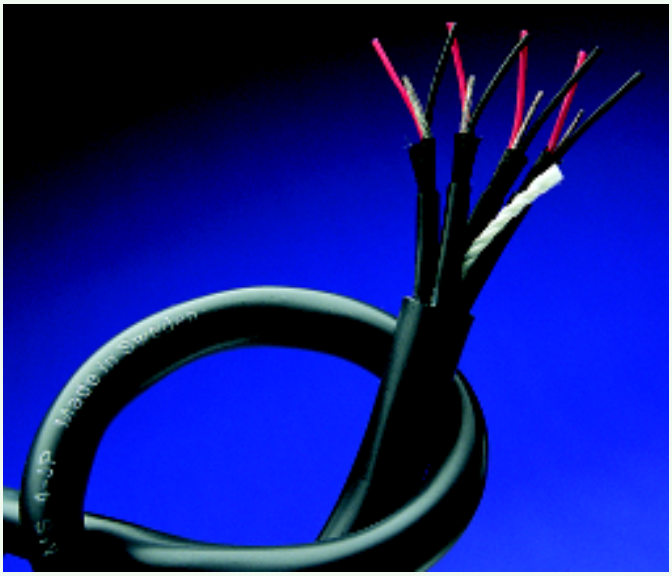
MS01-JP
1 jacketed and screened pair x 0.22 mm². This is an installation cable and does not actually belong to the 'Stage Multi'series other than designwise.

Actual size 



MS02-JP 2 jacketed and screened pairs x 0.22 mm².

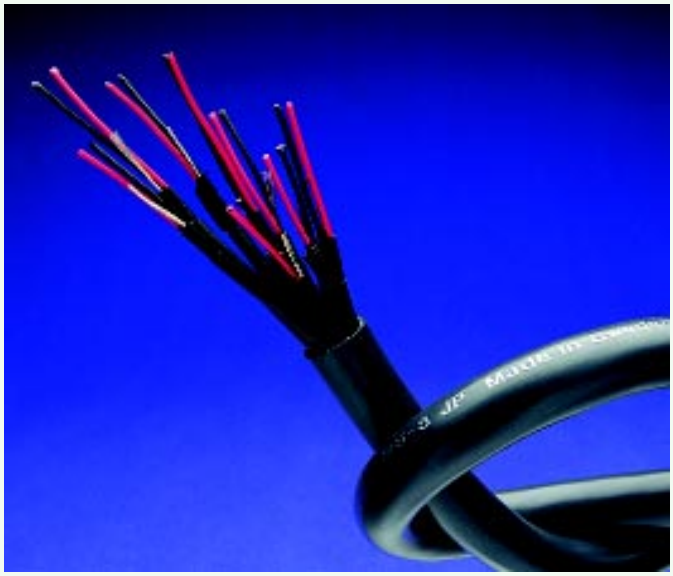
Actual size 



MS04-JP 4 jacketed and screened pairs x 0.22 mm².

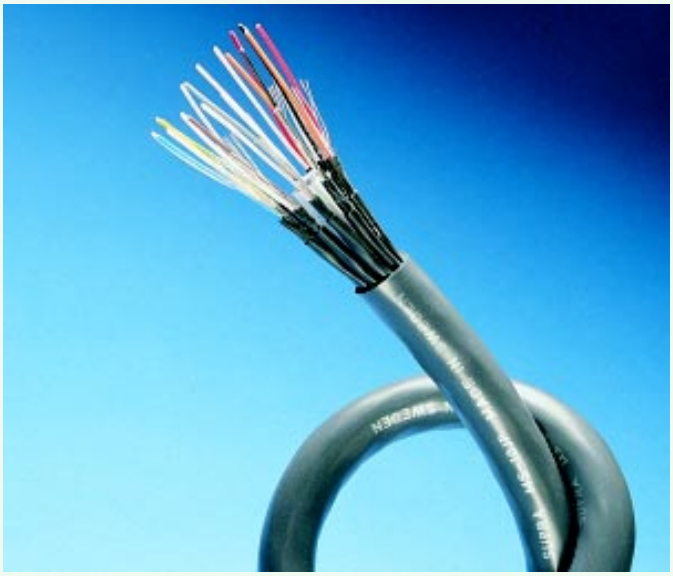
Actual size 

MS-JP Series Color and Number Codes																													
Pair No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Pair Jacket Colour	Black									Brown										Red										Orange		
Conductors	Red/Black and with a drain wire for the Nylon screen connection																															



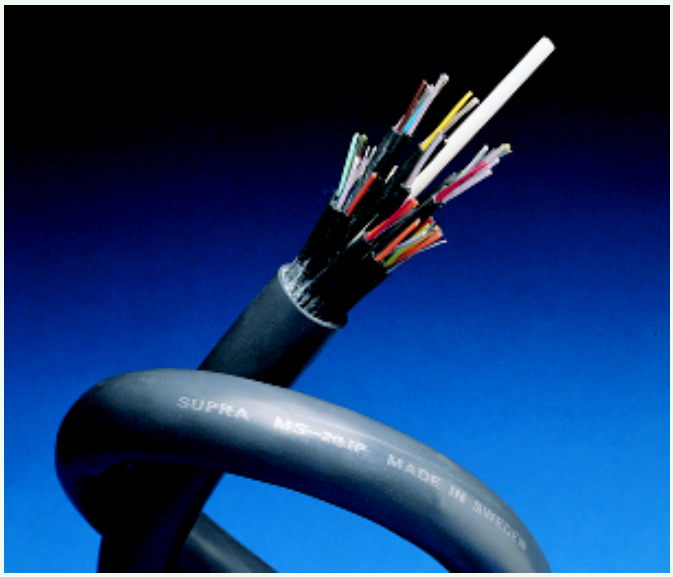
MS08-JP 8 jacketed and screened pairs x 0.22 mm².

Actual size 

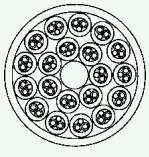


MS10-JP 10 jacketed and screened pairs x 0.22 mm².

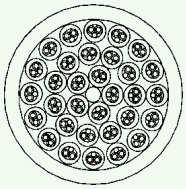
Actual size 



MS20-JP 20 jacketed and screened pairs x 0.22 mm².

Actual size 

MS32-JP 32 jacketed and screened paris x 0.22 mm².

Actual size 

Item	Mechanical Specifications										Electrical Specifications		
	No. Of Channels	Conductor	Insulation	Shield	Pair- /External Jacket	External Size	Temp. Range (°C)	Colour	Weight (g/m)	Length/ Bobbin (m / ft)	Resistance (Ω/km)	Capacitance (pF/m)	Propagation Velocity
MS01-JP	1	2x7x0.20 OFC	PE	Semi-Cond. Nylon	Numbered & Colour-Coded PVC / PVC	Ø3.8	-30 till +70	Anthracite Grey	20	400m / 1312ft	180	90	0.66c
MS02-JP	2					Ø8.0			61	200m / 656ft			
MS04-JP	4					Ø9.7			90	100m / 328ft			
MS08-JP	8					Ø13.1			116				
MS10-JP	10					Ø14.0			250				
MS20-JP	20					Ø18.7			263				
MS32-JP	32					Ø23.5			427				

SUPRA Stage Box SB 16/4

16 channels and 4 returns.

XLR connectors with locking.

Countersunk panels protect the connectors.

Cable inlet/anchorage:
Skindicht-SR21/19.

Cable:
Supra MS20-JP. Flexible, stretch-proof.
(See page 15.)

Cord connectors:
Supra Swift Light (See page 17.)

The stage box is available with any requested length of cable, and in Kit or Ready Made.

Kit

Ready Made

Item	Mechanical Specifications					
Stagebox 16/4	Box Material	Box Connectors	Cord Connectors	Cable Inlet/ Anchorage	External Size WxHxL (mm)	Weight (kg)
Kit / **Ready Made**	Aluminium, Black	16 Pcs XLR C3F, 4 Pcs XLR C3M	4 pcs Swift XLR Light, 16 pcs Swift XLR light	Skindicht-SR21/19	58x220x320	3.0

Swift XLR Connectors

Patented by Tommy Jenving. Swift has several advantages over other XLR connectors.

- **Totally shielded. No electromagnetic leakage.**
- **No loseable screws. Only one retained screw.**
- **Nothing to slip on the cable before soldering.**
- **Strain relief: The screw serves also as a clamp screw and since it is placed at a considerable distance from the apperture there will be no bending forces on the cable at the clamping point.**

Swift 3F XLR Light and Swift 3M XLR Light

3-pole Female and Male

XLR-C3F and XLR-C3M

3-pole Female and Male

Speakon Connectors

Not for export. Distributed in Sweden only as they are not of Supra origin.

Jack Plug Mono and Stereo

Dia. 6.35 mm. Stereo or Mono version. Rigid design. Front mounted housing, i.e. you can put the housing on after soldering the cable. Strain relief with squeeze clamping. (Patented.) Provided with three differently coloured marking rings for identification. Cable sizes: 5 - 6.5 mm. Supra Jack Plugs are fully shielded for noise rejection.

Item	Mechanical Specifications											
	Quantity/ Pack	Quantity/ Bulk Pack	Connector Type	Pin Material	Insulation	Housing	Connector Fixing	Cable Clamping	Max Cable Dia. (mm)	External Size WxHxL (mm)	Mounting Hole (mm)	Colour
Swift XLR 3M Light	1 Pc	12 Pcs	XLR Cord Male	24 Ct Gold Plated Cu	Noryl	Shielded, Front Mounted	Quick Lock	Screw	Ø7.7	Ø19x70	-	Red/Black
Swift XLR 3F Light			XLR Cord Female							Ø19x75		
XLR-C3F		25 Pcs	XLR Chassis Female			Shielded		-	-	27x37x31	Ø23.5	-
XLR-C3M		20 Pcs	XLR Chassis Male							22x37x21	Ø19.0	
Teleplugg Mono		10 Pcs	6.35mm, 1/4" Jack Plug	Sn Plat. Brass	PTFE (Teflon)	Shielded, Front Mounted	-	Squeeze	Ø6.5	Ø13x79	-	Red/Black
Teleplugg Stereo												
Speakon SL-4 NL4FC		50 Pcs	Neutrik 4-pol Cord Female	24 Ct Gold Plated Cu	PA	PA	Quick Lock	Squeeze	Ø15	Ø26x70		-
Speakon SL-8 NL8FC		25 Pcs	Neutrik 8-pol Cord Male						Ø20	Ø35x83		
Speakon CH-4R NL4MPR		25 Pcs	Neu. 4-pol Chassis Female, Round					-	-	Ø51x28	Ø23.6	
Speakon CH-8R NL8MPR			Neu. 8-pol chassihona, Round									
Speakon SK-4 NL4MM		10 Pcs	Neutrik 4-pol Female-Female							Ø24x54	-	
Speakon SK-8 NL8MM			Neutrik 8-pol Female-Female							Ø50x80		

Supra Pro-Interlinks comprehend the efficient screening and mechanically strong semiconductive nylon screen of the cables in combination with the entirely shielded and user friendly Supra connectors.

We do not know of any other audio connector as efficiently shielded as the Supra Swift XLR and the Supra Jack Plugs. For more information about the connectors and the cables see pages 13 and 17.

Jack Plug - Jack Plug

6m unbalanced
with MBS, MBC and DAC
Guitar cable: MBS

Jack Plug - XLR

6m unbalanced
with MBS, MBC and DAC
Microphone cable: MBS or MBC
Line cable: DAC

XLR-XLR

6m balanced
with MBS, MBC and DAC
Microphone cable: MBS or MBC
Line cable: DAC
DAC is AES/EBU harmonised

Item	Mechanical Specifications						
	No. Of Channels	Connector	Cable	Standard Length (m/ft)	Screen Connection	Solder Tin	Colour
MBC Jack-Jack	1	Jack Plugg Mono	MBC	5m / 16.5ft	Semi-Balanced	Lead-Free, Sn 96.3%, Ag 3.7%, Flux 3.5% Corrosion Resistance	Anthracite Grey
MBS Jack-Jack			MBS				
DAC Jack-Jack			DAC				
MBC Jack-XLR		Jack Plug Mono, Swift XLR Light	MBC				
MBS Jack-XLR			MBS				
DAC Jack-XLR			DAC				
MBC XLR-XLR		Swift XLR Light	MBC		Balanced		
MBS XLR-XLR			MBS				
DAC XLR-XLR			DAC				

Conversion Tables

Conductor dimensions in AWG to Metric

AWG (No.)	Cond. Dia. (mm)	Area (mm²)	AWG (No.)	Cond. Dia. (mm)	Area (mm²)	AWG (No.)	Cond. Dia. (mm)	Area (mm²)
6/0	14,73	170,3	10	2,59	5,27	25	0,455	0,163
5/0	13,12	135,1	11	2,3	4,15	26	0,405	0,128
4/0	11,68	107,2	12	2,05	3,31	27	0,361	0,102
3/0	10,4	85	13	1,83	2,63	28	0,321	0,0804
2/0	9,27	67,5	14	1,63	2,08	29	0,286	0,0646
0	8,25	53,4	15	1,45	1,65	30	0,255	0,0503
1	7,35	42,4	16	1,29	1,31	31	0,227	0,04
2	6,54	33,6	17	1,15	1,04	32	0,202	0,032
3	5,83	26,7	18	1,024	0,823	33	0,18	0,0252
4	5,19	21,2	19	0,912	0,653	34	0,16	0,02
5	4,62	16,8	20	0,812	0,519	35	0,143	0,0161
6	4,11	13,3	21	0,723	0,412	36	0,127	0,0123
7	3,67	10,6	22	0,644	0,325	37	0,113	0,01
8	3,26	8,35	23	0,573	0,259	38	0,101	0,00795
9	2,91	6,62	24	0,511	0,205	39	0,0897	0,00632

Anglo/American vs. Metric

1 foot = 0.3048 m	1m = 3.281 feet
1 yard = 0.9144 m	1m = 1.094 yards
1 pound = 0.4536 kg	1kg = 2.205 pounds
F° = (C° x 9/5) + 32	C° = (F°-32) x 5/9

Formulas

Characteristic Impedance (Simplified formula)

$Z = \sqrt{L/C}$ where L = inductance and C = capacitance

Velocity Factor (Simplified formula)

$n = \sqrt{1/K}$ where K = dielectricity of the insulation

Effective Skin Depth

$d = 1/\sqrt{p m_r m_0 s f}$ where s = conductivity = 1/resistivity
f = frequency
m_r = permeability of the conductor
m_0 = permeability of air

Conductor Resistance

R = L x r / A where L = length in m
r = resistivity
A = cross section area in mm²

Material Constants

Material	Dielectricity (K)	Permeability (μ_r)	Resistivity (Ω x mm²/m)
PVC	4-5	-	-
PE	2.3	-	-
PTFE/Teflon	2.0	-	-
Supra Foam Skin	1.64	-	-
Tin (Sn)	-	μ_r>1 but approximately equal to 1	11.5
Copper (Cu)	-		1.72
Silver (Ag)	-		1.59
Gold (Au)	-		2.21
Air/Vacuum	-	$4\pi x10^{-7}$ (μ_0)	-

Index

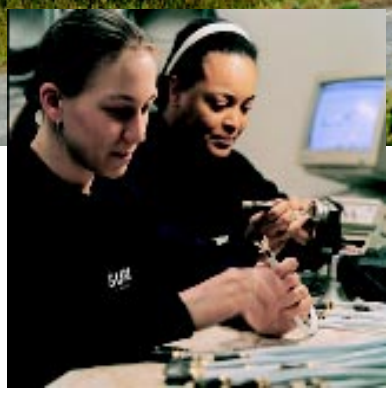
Supra Colours

Ice Blue **Anthracite**

Office and factory in tune with nature. All plastic and copper are recycled.

Checking braiding of Ply conductor

Extrusion of insulation



Soldering of interlinks

Jenving Technology AB

Backamo Grinneröd 12800, S-459 91 Ljungskile, Sweden
Telephone: +46 (0)522-23460, Telefax +46 (0)522-23131
http://www.jenving.se, e-mail: supra@jenving.se