PRODUCT GUIDE | 4.02

DESIGNED EXPRESSLY FOR BROADCAST, PRODUCTION AND POST-PRODUCTION

Bittree

HIGH-PERFORMANCE PATCHING SYSTEMS

High-Performance Patching Systems

About Bittree

Bittree was established in 1978 with the goal of providing high-quality patching systems to the entertainment and broadcast industries. In the nearly 25 years since then, we've earned an international reputation from customers like you for innovation, quality and customer satisfaction.

We offer a complete line of patching products, from audio and video to data and IPS (Integrated Patching System). To ensure the consistency, quality and responsiveness you need, all of our patching products are designed, manufactured and warehoused in our Glendale, California plant, right in the heart of the entertainment industry.

About Innovation

Bittree is committed to continually improving the patching process for our broad base of users. Innovation at Bittree comes from two areas: system design and product components.

On the system level, we were the first to design a 3-pin rear-connection interface. This system employs components with a proven "tuning fork" hermaphroditic contact, while still incorporating the positive aspects of crimp-on, snap-in technology. The result is a patching system that you'll find reliable, easy to re-configure and simple to install.

More recently, we've modified existing panels to conform to the increasingly rigid specifications and higher requirements set by systems engineers. Similarly, the new digital transmission standards have been met through a series of new jacks, patch cords and interconnection schemes.

On the component level, our advanced research and development of base materials, processing techniques and construction methodology combine to create superior products that perform beyond your highest expectations.

In addition, our "combination" IPS patch panels have answered space and functionality requirements within the multimedia environment.

About Quality

All Bittree products are stringently designed, assembled and tested to meet your rigid quality standards.

We specify only the best materials, and all components are selected from established industry sources. Then, to ensure long-term functionality and dependability, each Bittree product is rigorously tested – not only to industry standards but also to the specific demands and expectations of technicians in the field.

This meticulous attention to detail ensures that every Bittree product is as robust as it is precise, delivering a patching system you can count on again and again.

About Service

When you call Bittree, you're not only calling the leader in patching systems, but the leader in customer service. Our knowledgeable and experienced Sales Consultants will help you select the systems and products that best serve your needs.

At Bittree, we're aware that fast delivery is critical to your business. That's why we stock an extensive inventory of systems and products. We're committed to delivering the patching solution you need – when you need it.

And because we know sometimes you have very detailed and unique requirements, we'll gladly work with you to develop specific patching solutions. Our knowledgeable Sales Consultants and commitment to quality, combined with our vast inventory of products and components, allow us to build a wide range of configurations and even match most legacy installations.

This catalog contains many but not all of our patching systems and products. For your convenience, we've divided the catalog into five main sections – Video, Audio TT (Bantam), Audio 1/4"(Long Frame), Data and IPS. You'll also find matching patch cords within each of the five sections, as well as a complete accessory section on page 31. Each section also contains a list of the more common part numbers, as well as "Ordering Codes" for creating a system to your exact specifications.
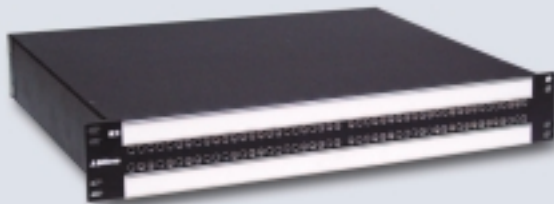
For more, call our Sales Consultants at
(800) 500-8142 or (818) 500-8142
or log onto our web site at
www.bittree.com

![Bittree logo]

VIDEO

AUDIO

DATA

IPS

ACCESSORIES

VIDEO

VIDEO

AUDIO

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ACCESSORIES

Overview

Bittree offers a full line of video patching systems. Whether you need component or composite systems, WECO or Mini-WECO, high-bandwidth or traditional, Bittree is your one-stop source for reliable, durable patching systems.

Bittree video patching systems are designed for exceptional performance in conventional analog applications such as monitor routing, primary routing, re-routing, router backup and video distribution, as well as in high bit-rate applications such as HDTV, SDI, AES and high-resolution computer graphics.

WECO vs. Mini-WECO: Most video patching systems in the U.S. use the WECO standard. WECO standards were developed by the Western Electric Company decades ago. WECO is perfectly suited for high-bandwidth applications, while Mini-WECO is designed for the highest-bandwidth applications.

VIDEO PATCHBAY FEATURES

- 30,000 minimum insertion cycles
- High-bandwidth performance up to 3GHz
- Jacks conform to SMPTE 259M and SMPTE 292M
- Panels made from 3/16" solid aluminum
- Durable powder-coat finish
- Jacks are isolated from the panel
- Extra wide designation strips

VIDEO PATCHBAY OPTIONS

- Composite video jack count may be specified as one or two rows of 24, 26, 28 (WECO), or 32 (Mini-WECO)
- RGB, RGBS, and RGBHV configurations available in both WECO and Mini-WECO
- Available in 1, 1.5 or 2 rack units (RU)
- Black or gray front panel
- Jacks may be ordered in four different configurations
  - Dual self-normaling, non-terminated
  - Dual self-normaling, terminated
  - Single self-terminating
  - Single non-terminating

VIDEO WECO COMPOSITE

Bittree

OUR WIDE RANGE OF COMPOSITE SYSTEMS are designed to meet every one of your patching needs, from base-band analog to high bit-rate digital signals.

For maximum flexibility we produce video patch panels conforming to both the WECO and Mini-WECO 75 Ohm standard.

- True 75 ohm impedance with low return loss
- BNC rear interface
- High-bandwidth performance
- Jacks conform to SMPTE 259M and 292M
- Number of jacks may be specified as 24, 26 or 28 per row. For 32 across, see Mini-WECO
- Black or gray front panel
- Jacks are isolated from the front panel
- Available in 1, 1.5 or 2 rack units (RU)
- SVHS video can be patched using two patchpoints and a TCS-418 adaptor on the rear BNC interface
- To aid in laying out designation strips, .dwg files are available at bittree.com
- For other mechanical information, visit bittree.com

GRAY 1x24 1RU

BLACK 2x24 1RU

BLACK 2x24 1.5RU

BLACK 2x26 2RU

GRAY 2x28 2RU

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number			
	Normaling	Non-Normaling	Normaling w/Terminations	Non-Normaling w/Terminations
1x24, 1RU	-----------------	B24S-1WNHD	-----------------	B24S-1WTHD
1x26, 1RU	-----------------	B26S-1WNHD	-----------------	B26S-1WTHD
2x24, 1RU	B48S-2WNHD	B48S-1WNHD	B48S-2WTHD	B48S-1WTHD
2x26, 1RU	B52S-2WNHD	B52S-1WNHD	B52S-2WTHD	B52S-1WTHD
2x24, 1.5RU	B48H-2WNHD	B48H-1WNHD	B48H-2WTHD	B48H-1WTHD
2x26, 1.5RU	B52H-2WNHD	B52H-1WNHD	B52H-2WTHD	B52H-1WTHD
2x24, 2RU	B48T-2WNHD	B48T-1WNHD	B48T-2WTHD	B48T-1WTHD
2x26, 2RU	B52T-2WNHD	B52T-1WNHD	B52T-2WTHD	B52T-1WTHD

VIDEO WECO COMPONENT

BITTREE BRINGS YOU THE MOST complete line of component patchbays in the industry. You can order RGB, RGBS and RGBHV configurations using either WECO or Mini-WECO standards (see page 7 for Mini-WECO Component patchbays). All component patchbays are available either normaled or non-normaled, and self-terminating or non-terminating.

- True 75 ohm impedance with low return loss
- BNC rear interface
- For higher density some component video patchbays come in a vertical configuration
- Jacks are isolated from the front panel
- High-bandwidth jacks are used, ensuring the best performance
- The center of the RGB circuit is offset to ensure the patch cord is inserted correctly
- A three-circuit RGB patch cord is available

BLACK 1x8 RGB CIRCUITS 1RU

BLACK 2x8 RGB CIRCUITS 2RU

BLACK 2x10 RGB CIRCUITS 2RU (VERTICALLY ARRANGED FOR GREATER DENSITY)

BLACK 1x5 RGBHV CIRCUITS 1RU

BLACK 2x5 RGBHV CIRCUITS 2RU

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number			
	Normaling	Non-Normaling	Normaling w/Terminations	Non-Normaling w/Terminations
1x8, RGB, 1RU	-----------------	BRGB8S-1WN	-----------------	BRGB8S-1WT
1x6, RGBS, 1RU	-----------------	BRGBS6S-1WN	-----------------	BRGBS6S-1WT
1x5, RGBHV, 1RU	-----------------	BRGBHV5S-1WN	-----------------	BRGBHV5S-1WT
2x8, RGB, 2RU	BRGB16T-2WN	BRGB16T-1WN	BRGB16T-2WT	BRGB16T-1WT
2x10, RGB, 2RU (Vertical)	BRGB20T-2WN	BRGB20T-1WN	BRGB20T-2WT	BRGB20T-1WT
2x6, RGBS, 2RU	BRGBS12T-2WN	BRGBS12T-1WN	BRGBS12T-2WT	BRGBS12T-1WT
2x10, RGBS, 2RU (Vertical)	BRGBS20T-2WN	BRGBS20T-1WN	BRGBS20T-2WT	BRGBS20T-1WT
2x5, RGBHV, 2RU	BRGBHV10T-2WN	BRGBHV10T-1WN	BRGBHV10T-2WT	BRGBHV10T-1WT

For more options, refer to Ordering Codes on page 5, or call your Bittree Sales Consultant.

WECO ORDERING CODES

Bittree

VIDEO WECO ACCESSORIES Bittree offers a wide variety of patch cords, looping plugs, adapters, connectors, tools, jumpers and lacing bars. Patch cords and looping plugs are shown below; other accessories are on page 31. For Mini-WECO accessories, see page 8.

WECO PATCH CORDS
VPC 24 00 – 75

Color
00= Black
02= Red
04= Yellow
05= Green
06= Blue
07= Purple

Length in Inches (cm)
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

WECO LOOPING PLUGS
LP 75 00

Color
00= Black
02= Red
04= Yellow
05= Green
06= Blue
08= Gray

WECO COMPONENT PATCH CORDS
CPC 24 00 – 75

Color
00= Black

Length in Inches (cm)
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

Our easy-to-use Ordering Codes let you order the exact patching system you need.
As shown in the charts below, simply choose the option you want for each specification.

WECO COMPOSITE
B 48 T – 2 W N HD

Bandwidth
HD = High Definition (2.5GHz)

Jack Termination
N = Non-Terminating
T = Terminating

Jack Standard
W = Weco

Jack Type
2 = Normaling
1 = Non-Normaling

Panel Height
S = 1RU
H = 1.5RU
T = 2RU

Quantity of Patch Ports
24 = 1x24 (1RU Only)
26 = 1x26 (1RU Only)
28 = 1x28 (1RU Only)
48 = 2x24
52 = 2x26
56 = 2x28

Color Choice
B = Black
G = Gray

WECO COMPONENT
B RGB 16 T – 2 W N

Jack Termination
N = Non-Terminating
T = Terminating

Jack Standard
W = Weco

Jack Type
2 = Normaling
1 = Non-Normaling

Panel Height
S = 1RU
T = 2RU

Number of Circuits
5 = 1x5 RGBHV (1RU Only)
6 = 1x6 RGBS (1RU Only)
8 = 1x8 RGB (1RU Only)
10 = 2x10 RGBHV
12 = 2x6 RGBS
16 = 2x8 RGB
20 = 2x10 RGB, RGBS

Type of Panel
RGB
RGBS
RGBHV

Color Choice
B = Black
G = Gray

OUR WIDE RANGE OF COMPOSITE SYSTEMS are designed to meet every one of your patching needs, from base-band analog to high bit-rate digital signals.

For maximum flexibility we produce video patch panels conforming to both the WECO and Mini-WECO 75 Ohm standard.

- True 75 ohm impedance with low return loss
- BNC rear interface
- High-bandwidth performance up to 3GHz
- Jacks conform to SMPTE 259M and 292M
- Number of jacks may be specified as 32 per row. For 24, 26 or 28 across, see WECO
- Black or gray front panel
- Jacks are isolated from the front panel
- Available in 1, 1.5 or 2 rack units (RU)
- SVHS video can be patched using two patchpoints and a TCS-418 adaptor on the rear BNC interface
- To aid in laying out designation strips, .dwg files are available at bittree.com
- For other mechanical information, visit bittree.com

BLACK 1x32 1RU (SINGLE ROW OF VIDEO JACKS ARE AVAILABLE IN 1RU ONLY)

BLACK 2x32 1RU

BLACK 2x32 1.5RU

GRAY 2x32 2RU

BLACK 2x32 2RU MINI-WECO w/MONITOR ROW (CALL FOR PRODUCT NUMBERS)

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number			
	Normaling	Non-Normaling	Normaling w/Terminations	Non-Normaling w/Terminations
1x32, 1RU	B32S-2MWNHD	B32S-1MWNHD	B32S-2MWTHD	B32S-1MWTHD
2x32, 1RU	B64S-2MWNHD	B64S-1MWNHD	B64S-2MWTHD	B64S-1MWTHD
2x32, 1.5RU	B64H-2MWNHD	B64H-1MWNHD	B64H-2MWTHD	B64H-1MWTHD
2x32, 2RU	B64T-2MWNHD	B64T-1MWNHD	B64T-2MWTHD	B64T-1MWTHD

MINI-WECO COMPONENT

FOR HIGHER DENSITY, consider one of our Mini-WECO configurations. You can order RGB, RGBS and RGBHV configurations using either WECO or Mini-WECO standards (see page 4 for WECO Component patchbays). All component patchbays are available either normaled or non-normaled, and self-terminating or non-terminating.

- True 75 ohm impedance with low return loss
- BNC rear interface
- For higher density some component video patchbays come in a vertical configuration
- Jacks are isolated from the front panel
- High-bandwidth jacks are used, ensuring the best performance
- The center of the RGB circuit is offset to ensure the patch cord is inserted correctly
- A three-circuit RGB patch cord is available

BLACK 1x10 RGB CIRCUITS 1RU

BLACK 2x10 RGB CIRCUITS 2RU

BLACK 2x8 RGBS CIRCUITS 2RU

CLEAR 2x10 RGBHV CIRCUITS 2RU (CLEAR ANODIZED ALUMINUM BY SPECIAL ORDER ONLY)

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number			
	Normaling	**Non-Normaling**	**Normaling w/Terminations**	**Non-Normaling w/Terminations**
2x10, RGB, 2RU	BRGB20T-2MN	BRGB20T-1MN	BRGB20T-2MT	BRGB20T-1MT
2x8, RGBS, 2RU	BRGBS16T-2MN	BRGBS16T-1MN	BRGBS16T-2MT	BRGBS16T-1MT
2x10 RGBHV, 2RU (Vertical)	BRGBHV20T-2MN	BRGBHV20T-1MN	BRGBHV20T-2MT	BRGBHV20T-1MT

VIDEO

AUDIO

DATA

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ACCESSORIES

VIDEO MINI-WECO ACCESSORIES Bittree offers a wide variety of patch cords, looping plugs, adapters, tools, connectors, jumpers and lacing bars. Patch cords and looping plugs are shown below; other accessories are on page 31. For WECO accessories, see page 5.

MINI-WECO PATCH CORDS
VPCM 24 00 – 75

Color
00= Black
02= Red
04= Yellow
05= Green
06= Blue
07= Purple

Length in Inches (cm)
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

MINI-WECO LOOPING PLUGS
LPM 75 06

Color
06 = Blue

MINI-WECO COMPONENT PATCH CORDS
CPCM 24 00 – 75

Color
00= Black

Length in Inches (cm)
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

Our easy-to-use Ordering Codes let you order the exact patching system you need. As shown in the charts below, simply choose the option you want for each specification.

MINI-WECO COMPOSITE
B 64 T – 2 MW N HD

Bandwidth
HD = High Definition (3GHz)

Jack Termination
N = Non-Terminating
T = Terminating

Jack Standard
MW = Mini-Weco

Jack Type
2 = Normaling
1 = Non-Normaling

Panel Height
S = 1RU
H = 1.5RU
T = 2RU

Quantity of Patch Ports
32 = 1x32 (1RU Only)
64 = 2x32

Color Choice
B = Black
G = Gray

MINI-WECO COMPONENT
B RGB 20 T - 2 M N

Jack Termination
N = Non-Terminating
T = Terminating

Jack Standard
M = Mini-Weco
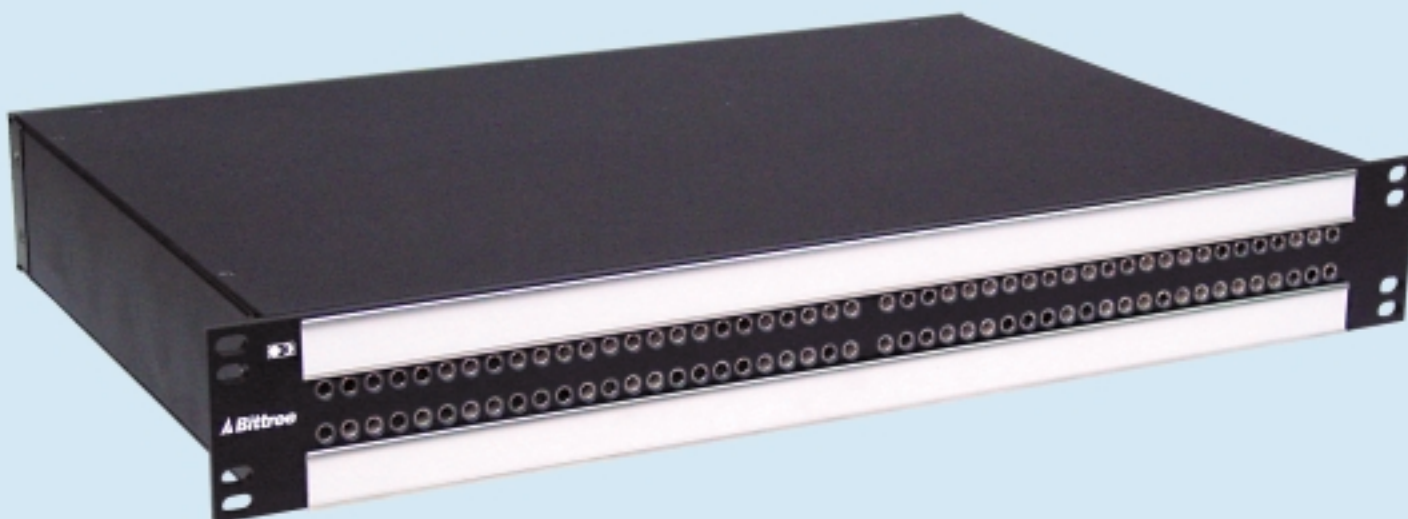
Jack Type
2 = Normaling
1 = Non-Normaling

Panel Height
S = 1RU
T = 2RU

Number of Circuits
6 = 1x6 RGBHV (1RU Only)
8 = 1x8 RGBS (1RU Only)
10 = 1x10 RGB (1RU Only)
12 = 2x6 RGBHV
16 = 2x8 RGBS
20 = 2x10 RGB, RGBS, RGBHV

Type of Panel
RGB
RGBS
RGBHV

Color Choice
B = Black
G = Gray

AUDIO ᵀᵀ 1/4"

Overview

Bittree offers two formats of audio patchbays: Bantam (TT) and Long Frame (1/4"). Both use the original 3-pin connector designed and invented by Bittree, which gives you the flexibility to pre-wire facilities, correct wiring mistakes and accommodate last-minute changes. For your convenience, we also offer a complete line of patchbays with 90-pin and punchdown rear interfaces.

Bittree audio patchbays bring you enhanced studio versatility and instant signal re-routing, and for additional flexibility they can accommodate either analog or digital signals. Our patchbays are perfect for master control and central switching I/O, audio console I/O, recording devices I/O, and audio routing switcher bypass and input rerouting.

AUDIO PATCHBAY FEATURES

- Jacks rated to 30,000 minimum insertion cycles
- Copper-nickel-silver alloy leaf springs with gold-plated cross bar switching contacts and nickel-plated sleeve bushings
- Precision-stamped reinforced steel jack frame
- Gold-plated contacts used in E3 and E90 rear interface
- Wired with low-capacitance, AES/EBU-rated shielded, twisted pair
- Large user-friendly designation strips
- Panels made from 3/16" solid aluminum with a durable powder-coat finish
- Mating connectors, contacts and normals (where applicable) are included with all standard rear interfaces

AUDIO PATCHBAY OPTIONS

- Fully enclosed chassis is available in 12" or 7" depth
- Harness available as a 48" standard, or custom length
- Wide range of rear interfaces available, including E3, E90, ID (punchdown) as standard, as well as E56, DB25 and others
- Available in 1, 1.5 or 2 rack units (RU)
- Bantam (TT) jack configuration available as 2x32 or 2x48
- Long Frame (1/4") jack configuration available as 2x24, 2x26 or 2x28
- Front panel can be ordered black or gray

OUR 961 SERIES CONTAINS our traditional workhorse audio patchbays. The 961 Series, with a jack configuration of 2x48, comes with the most options of any audio patchbay, including rear panel configurations, normals, grounds, stereo spacing, panel color and rack-unit height.

- Black or gray front panel
- 2x32 or 2x48
- Choose either fully enclosed chassis, or harness
- Can be ordered full-normal, half-normal or non-normal
- Normals looped internally or brought out to the rear interface
- Bussed, isolated, looped or switched grounds
- Available in 1, 1.5 or 2 rack units (RU)
- Standard rear interfaces include E3, E90 and ID (Punchdown)
- Mono or stereo jack spacing

BLACK 2x48 1RU STEREO SPACING OVER/UNDER DESIGNATION

BLACK 2x48 1RU MONO SPACING OVER/OVER DESIGNATION

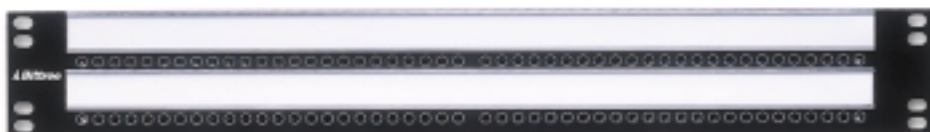**2x48 E3 1RU (REAR)**

2x48 E90 1RU (REAR)

2x48 E90 1RU NORMALS OUT (REAR)

BLACK 2x48 1.5 RU MONO SPACING OVER/OVER DESIGNATION

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number		
1RU	**3 PIN REAR**	**90 PIN REAR**	**ID (PUNCHDOWN) REAR**
2x48, Bantam, Full-Normal, Isolated Grounds, 1RU	B96DC-FNLIS/E3 M2OU12B	B96DC-FNLIS/E90 M2OU12B	-----------------
2x48, Bantam, Half-Normal, Isolated Grounds, 1RU	B96DC-HNLIS/E3 M2OU12B	B96DC-HNLIS/E90 M2OU12B	-----------------
2x48, Bantam, Non-Normal, Isolated Grounds, 1RU	B96DC-NNNIS/E3 M2OU12B	B96DC-NNNIS/E90 M2OU12B	-----------------
Normals Out			
2x48, Bantam, Full-Normal, Isolated Grounds, 1RU	-----------------	B96DC-FNOIS/E90 M2OU12B	-----------------
2x48, Bantam, Half-Normal, Isolated Grounds, 1RU	-----------------	B96DC-HNOIS/E90 M2OU12B	-----------------
1.5RU	**3 PIN REAR**	**90 PIN REAR**	**ID (PUNCHDOWN) REAR**
2x48, Bantam, Full-Normal, Isolated Grounds, 1.5RU	B96DC-FNLIH/E3 M2OU12B	B96DC-FNLIH/E90 M2OU12B	B96DC-FNLIH/ID M2OU12B
2x48, Bantam, Half-Normal, Isolated Grounds, 1.5RU	B96DC-HNLIH/E3 M2OU12B	B96DC-HNLIH/E90 M2OU12B	B96DC-HNLIH/ID M2OU12B
2x48, Bantam, Non-Normal, Isolated Grounds, 1.5RU	B96DC-NNNIH/E3 M2OU12B	B96DC-NNNIH/E90 M2OU12B	B96DC-NNNIH/ID M2OU12B
Normals Out			
2x48, Bantam, Full-Normal, Isolated Grounds, 1.5RU	-----------------	B96DC-FNOIS/E90 M2OU12B	-----------------
2x48, Bantam, Half-Normal, Isolated Grounds, 1.5RU	-----------------	B96DC-HNOIS/E90 M2OU12B	-----------------

To select other grounding, chassis, jack grouping, and designation strip options, consult Ordering Codes on page 13 or call your Bittree Sales Consultant.

ALL OUR AUDIO PATCHBAYS are built to AES/EBU specifications, and are internally wired with low-capacitance, shielded, 110-ohm twisted pairs. The low-capacitance characteristics make them ideal for both analog as well as digital applications.

All patchbays used for digital applications are typically full-normaled or non-normaled, since it is necessary to provide a single 110-ohm load for each source. This feature also ensures prevention of impedance mismatches, improper loading, multiple connections, and double termination.

- Over/under or over/over designation strips
- 12" or 7" deep chassis
- Mating connectors, contacts and normal jumpers (where applicable) are included with standard rear interfaces
- In a chassis, normals out is available in 2RU only; for normals out in 1RU or 1.5RU, consider the E90 interface

Normals out patchbays bring the normals to the rear interface so that if desired the user may de-normal a circuit by removing a jumper. The 3-pin rear interface always brings the shield to the rear interface. To loop the ground use a three-wire jumper (Normal 3-E); to isolate the ground use a two-wire jumper (Normal 2-E). **Note:** E90 normals out models do not bring the ground to the normals out connector.
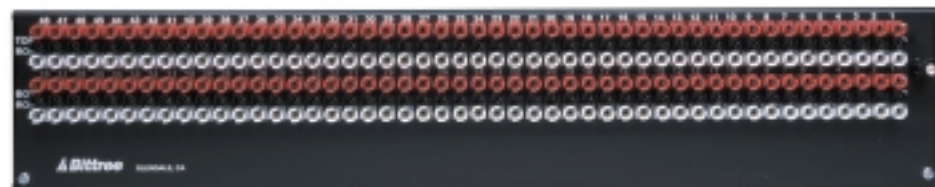

BLACK 2x48 2RU STEREO SPACING OVER/UNDER DESIGNATION
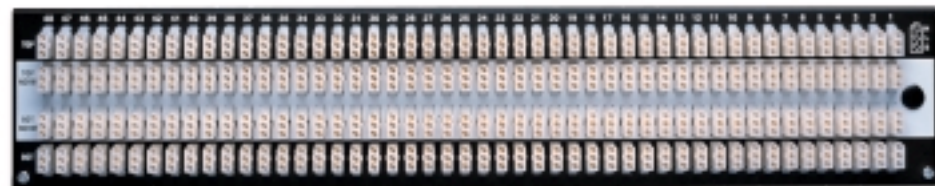
2x48 E3 2RU NORMALS OUT (REAR)

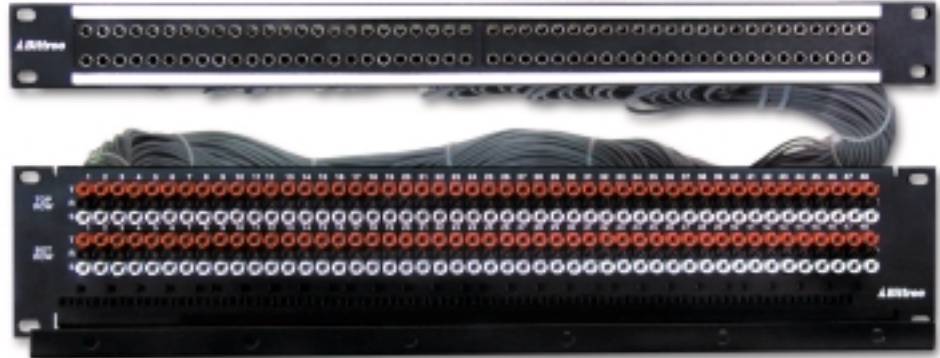**2x48 E90 2RU (REAR)**

2x48 ID (PUNCHDOWN) 2RU (REAR)

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

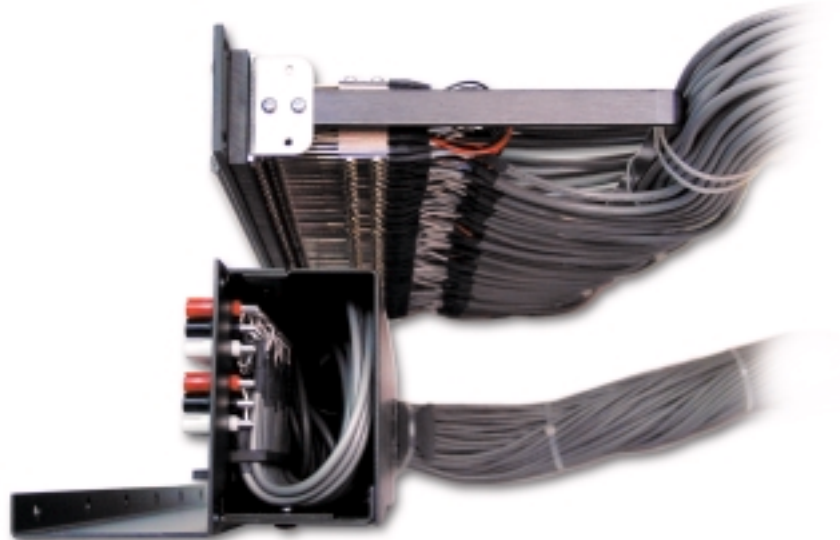| Description	Number		
2RU	**3 PIN REAR**	**90 PIN REAR**	**ID (PUNCHDOWN) REAR**
2x48, Bantam, Full-Normal, Isolated Grounds, 2RU	B96DC-FNLIT/E3 M2OU12B	B96DC-FNLIT/E90 M2OU12B	B96DC-FNLIT/ID M2OU12B
2x48, Bantam, Half-Normal, Isolated Grounds, 2RU	B96DC-HNLIT/E3 M2OU12B	B96DC-HNLIT/E90 M2OU12B	B96DC-HNLIT/ID M2OU12B
2x48, Bantam, Non-Normal, Isolated Grounds, 2RU	B96DC-NNNIT/E3 M2OU12B	B96DC-NNNIT/E90 M2OU12B	B96DC-NNNIT/ID M2OU12B
Normals Out			
2x48, Bantam, Full-Normal, Isolated Grounds, 2RU	B96DC-FNOIT/E3 M2OU12B	B96DC-FNOIT/E90 M2OU12B	-----------------
2x48, Bantam, Half-Normal, Isolated Grounds, 2RU	B96DC-HNOIT/E3 M2OU12B	B96DC-HNOIT/E90 M2OU12B	-----------------

To select other grounding, chassis, jack grouping, and designation strip options, consult Ordering Codes on page 13 or call your Bittree Sales Consultant.

VIDEO

AUDIO TT

DATA

IPS

ACCESSORIES

BITTREE HARNESS PATCHBAYS are the perfect solution when you need a small front panel and a larger rear panel. Harness patchbays feature a small rack-unit front (such as 1RU or 1.5RU), combined with a larger rear interface (such as 2RU).

- All of the same normaling, grounding and rear interface options available in a chassis are also available in a harness patchbay

- 48" standard length; any length can be ordered

- Bittree offers an enclosed real panel for the ID (Punchdown). Enclosure provides greater protection for punchdown connections

- Additional front panel/rear interface options are available in harness patchbays, such as 1RU front panel, normals out, E3 rear interface, etc.

- Customization available; call a Bittree Sales Consultant at (800) 500-8142 or (818) 500-8142

ID (PUNCHDOWN) HARNESS

ID (PUNCHDOWN) HARNESS (SIDE VIEW)

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number		
1RU	**3 PIN REAR**	**90 PIN REAR**	**ID (PUNCHDOWN) REAR**
2x48, Bantam, Full-Normal, Isolated Grounds, 1RU	B96DH-FNLIS/E3 M2OU48B	B96DH-FNLIS/E90 M2OU48B	B96DH-FNLIS/ID M2OU48B
2x48, Bantam, Half-Normal, Isolated Grounds, 1RU	B96DH-HNLIS/E3 M2OU48B	B96DH-FNLIS/E90 M2OU48B	B96DH-FNLIS/ID M2OU48B
2x48, Bantam, Non-Normal, Isolated Grounds, 1RU	B96DH-NNNIS/E3 M2OU48B	B96DH-FNLIS/E90 M2OU48B	B96DH-FNLIS/ID M2OU48B
Normals Out			
2x48, Bantam, Full-Normal, Isolated Grounds, 1RU	B96DH-FNOIS/E3 M2OU48B	B96DH-FNOIS/E90 M2OU48B	-----------------
2x48, Bantam, Half-Normal, Isolated Grounds, 1RU	B96DH-HNOIS/E3 M2OU48B	B96DH-HNOIS/E90 M2OU48B	-----------------
2RU			
2x48, Bantam, Full-Normal, Isolated Grounds, 2RU	B96DH-FNLIT/E3 M2OU48B	B96DH-FNLIT/E90 M2OU48B	B96DH-FNLIT/ID M2OU48B
2x48, Bantam, Half-Normal, Isolated Grounds, 2RU	B96DH-HNLIT/E3 M2OU48B	B96DH-HNLIT/E90 M2OU48B	B96DH-HNLIT/ID M2OU48B
2x48, Bantam, Non-Normal, Isolated Grounds, 2RU	B96DH-NNLIT/E3 M2OU48B	B96DH-NNLIT/E90 M2OU48B	B96DH-NNLIT/ID M2OU48B
Normals Out			
2x48, Bantam, Full-Normal, Isolated Grounds, 2RU	B96DH-FNOIT/E3 M2OU48B	B96DH-FNOIT/E90 M2OU48B	-----------------
2x48, Bantam, Half-Normal, Isolated Grounds, 2RU	B96DH-HNOIT/E3 M2OU48B	B96DH-HNOIT/E90 M2OU48B	-----------------

To select other grounding, chassis, jack grouping, and designation strip options, consult Ordering Codes on page 13 or call your Bittree Sales Consultant.

ACCESSORIES Bittree offers a wide variety of patch cords, adapters, connectors, tools, jumpers and lacing bars. Patch cords are shown below; other accessories are on page 31.

BPC PATCH CORDS

DPC PATCH CORDS

AUDIO BANTAM (TT)
BPC 24 00 – 110

Color
00= Black
02= Red
04= Yellow
05= Green
06= Blue
07= Purple

**Length
in Inches (cm)**
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

DUAL BANTAM (TT)
DPC 24 00

Color
00= Black
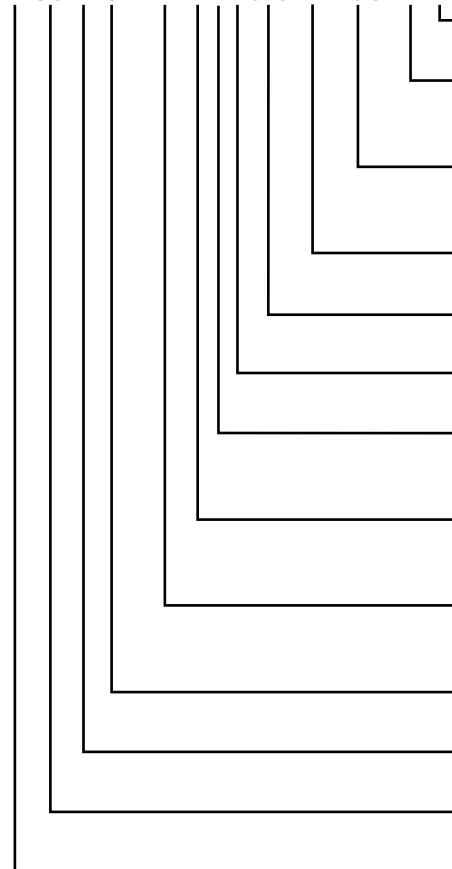02= Red
04= Yellow
05= Green
06= Blue
07= Purple

**Length
in Inches (cm)**
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

Our easy-to-use Ordering Codes let you order the exact patching system you need.
As shown in the chart below, simply choose the option you want for each specification.

B 96 D C – FN L I T /E3 M 2OU 12 B

Jack Type
B = Bantam (TT)

Depth
12 = 12" Deep Chassis   **7** = 7" Deep Chassis
48 = 48" Long Harness

Designation Strips
2OU = 2 Designation Strips Over/Under
2OO = 2 Designation Strips Over/Over

Spacing
M = Mono Spacing   **S** = Stereo Spacing

Rear Interface
E3 = 3 Pin   **E90** = 90 Pin   **ID** = Punchdown

Panel Height
S = 1RU   **H** = 1.5RU   **T** = 2RU

Grounding
B = Bussed   **I** = Isolated
L = Looped   **S** = Switched

Normaling
N = No Normals   **L** = Normals looped internally
O = Normals brought out to the rear

Type of Normaling
FN = Full-Normal   **HN** = Half-Normal
NN = Non-Normal

Style
C = Chassis   **H** = Harness

Wiring
D = Digital compatible wiring

Quantity of Patch Ports
64 = 2x32   **96** = 2x48

Color Choice
B = Black   **G** = Gray

Mating connectors, contacts and normals (where applicable) are included with standard rear interface audio patchbays. Lacing bars are included with all audio patchbays.

VIDEO

AUDIO TT

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ACCESSORIES

WE'VE CONTINUED OUR REPUTATION for innovation with the introduction of the "Programmable" patchbay. Programmable patchbays allow you to change the normaling and grounding for individual circuits just by simply changing the placement of the shunts on the patchbay front, letting you reconfigure your system quickly and cost-effectively.

- Black or gray front panel
- 2x48 jack configuration
- Fully enclosed chassis
- Normals can be pre-programmed to full-normal, half-normal or non-normal
- Grounding can be pre-programmed to bussed, isolated or looped
- Normals and grounding for individual circuits can be easily changed by the end-user
- Programming shunts located under designation strips
- Available in 1.5 or 2 rack units (RU)

BLACK 2x48 2RU MONO SPACING OVER/UNDER DESIGNATION

BLACK 2x48 1.5RU MONO SPACING OVER/UNDER DESIGNATION

2x48 E3 2RU (REAR)

2x48 E90 2RU (REAR)

2x48 ID 2RU (REAR)

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description **1.5RU**	Number **3 PIN REAR**	**90 PIN REAR**	**ID (PUNCHDOWN) REAR**
2x48, Bantam, Full-Normal, Bussed Grounds, 1.5RU	B96DC-FNPBH/E3 M2OU12B	B96DC-FNPBH/E90 M2OU12B	B96DC-FNPBH/ID M2OU12B
2x48, Bantam, Full-Normal, Isolated Grounds, 1.5RU	B96DC-FNPIH/E3 M2OU12B	B96DC-FNPIH/E90 M2OU12B	B96DC-FNPIH/ID M2OU12B
2x48, Bantam, Full-Normal, Looped Grounds, 1.5RU	B96DC-FNPLH/E3 M2OU12B	B96DC-FNPLH/E90 M2OU12B	B96DC-FNPLH/ID M2OU12B
2x48, Bantam, Half-Normal, Bussed Grounds, 1.5RU	B96DC-HNPBH/E3 M2OU12B	B96DC-HNPBH/E90 M2OU12B	B96DC-HNPBH/ID M2OU12B
2x48, Bantam, Half-Normal, Isolated Grounds, 1.5RU	B96DC-HNPIH/E3 M2OU12B	B96DC-HNPIH/E90 M2OU12B	B96DC-HNPIH/ID M2OU12B
2x48, Bantam, Half-Normal, Looped Grounds, 1.5RU	B96DC-HNPLH/E3 M2OU12B	B96DC-HNPLH/E90 M2OU12B	B96DC-HNPLH/ID M2OU12B
2x48, Bantam, Non-Normal, Bussed Grounds, 1.5RU	B96DC-NNPBH/E3 M2OU12B	B96DC-NNPBH/E90 M2OU12B	B96DC-NNPBH/ID M2OU12B
2x48, Bantam, Non-Normal, Isolated Grounds, 1.5RU	B96DC-NNPIH/E3 M2OU12B	B96DC-NNPIH/E90 M2OU12B	B96DC-NNPIH/ID M2OU12B
2x48, Bantam, Non-Normal, Looped Grounds, 1.5RU	B96DC-NNPLH/E3 M2OU12B	B96DC-NNPLH/E90 M2OU12B	B96DC-NNPLH/ID M2OU12B

NORMALS OUT OR PROGRAMMABLE? Programmable patchbays are not only less expensive than normals out patchbays, but they're also more flexible because they allow users to change normaling and grounding options from the front of the patchbay. In addition, programmable patchbays allow your choice of either full-normal, half-normal or non-normal for each circuit.
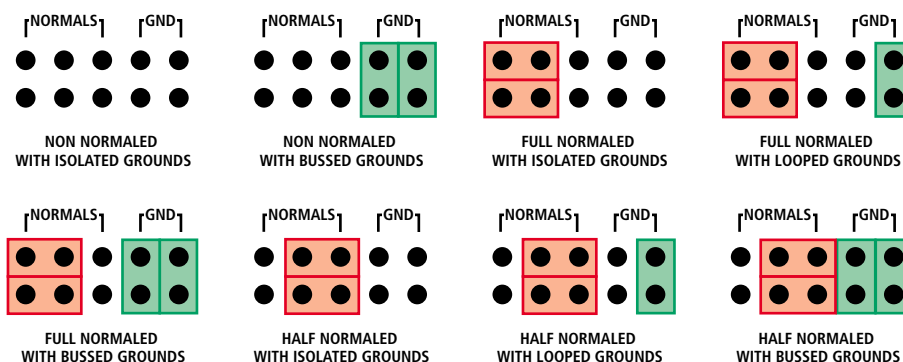
With normals out patchbays, you can re-direct the normal circuit. You can also easily switch from full-normal to non-normal, or half-normal to non-normal, by removing the external normal jumper. However, you cannot switch between full-normal and half-normal.

- Standard rear interfaces include E3, E90 and ID (Punchdown)
- 12" or 7" deep chassis
- Large, user friendly designation strips
- Normaling shunts are placed vertically
- Grounding shunts are placed horizontally
- The 969 and 489 series have the "programmable" icon located on the upper left corner of the patchbay

Patent Pending

NON NORMALED WITH ISOLATED GROUNDS	NON NORMALED WITH BUSSED GROUNDS	FULL NORMALED WITH ISOLATED GROUNDS	FULL NORMALED WITH LOOPED GROUNDS

FULL NORMALED WITH BUSSED GROUNDS	HALF NORMALED WITH ISOLATED GROUNDS	HALF NORMALED WITH LOOPED GROUNDS	HALF NORMALED WITH BUSSED GROUNDS
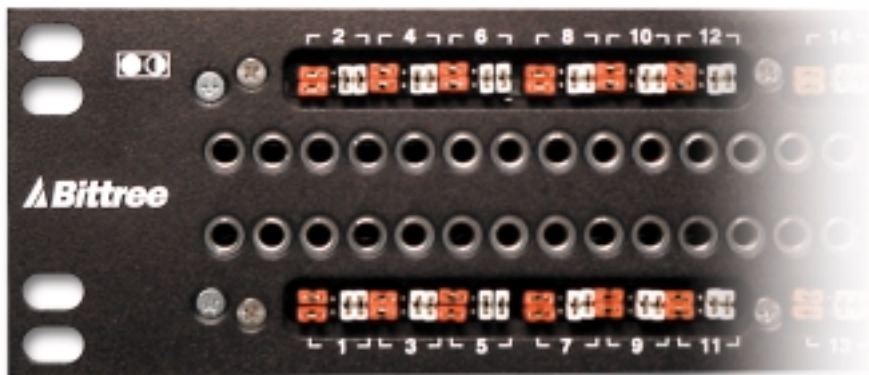
TO CHANGE THE PROGRAMMING for a circuit, first remove the designation strip. Find your desired configuration in the chart above, and arrange the programming shunts to match the appropriate diagram. Each circuit can be programmed independently. Ample shunts are provided with every programmable patchbay. Red shunts are placed horizontally and are used for normaling options. White shunts (shown as green above) are placed vertically and are used for grounding options. The circuits are numbered 1 – 48 and correspond to vertical jack pairs reading left to right.

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description 2RU	Number 3 PIN REAR	90 PIN REAR	ID (PUNCHDOWN) REAR
2x48, Bantam, Full-Normal, Bussed Grounds, 2RU	B96DC-FNPBT/E3 M2OU12B	B96DC-FNPBT/E90 M2OU12B	B96DC-FNPBT/ID M2OU12B
2x48, Bantam, Full-Normal, Isolated Grounds, 2RU	B96DC-FNPIT/E3 M2OU12B	B96DC-FNPIT/E90 M2OU12B	B96DC-FNPIT/ID M2OU12B
2x48, Bantam, Full-Normal, Looped Grounds, 2RU	B96DC-FNPLT/E3 M2OU12B	B96DC-FNPLT/E90 M2OU12B	B96DC-FNPLT/ID M2OU12B
2x48, Bantam, Half-Normal, Bussed Grounds, 2RU	B96DC-HNPBT/E3 M2OU12B	B96DC-HNPBT/E90 M2OU12B	B96DC-HNPBT/ID M2OU12B
2x48, Bantam, Half-Normal, Isolated Grounds, 2RU	B96DC-HNPIT/E3 M2OU12B	B96DC-HNPIT/E90 M2OU12B	B96DC-HNPIT/ID M2OU12B
2x48, Bantam, Half-Normal, Looped Grounds, 2RU	B96DC-HNPLT/E3 M2OU12B	B96DC-HNPLT/E90 M2OU12B	B96DC-HNPLT/ID M2OU12B
2x48, Bantam, Non-Normal, Bussed Grounds, 2RU	B96DC-NNPBT/E3 M2OU12B	B96DC-NNPBT/E90 M2OU12B	B96DC-NNPBT/ID M2OU12B
2x48, Bantam, Non-Normal, Isolated Grounds, 2RU	B96DC-NNPIT/E3 M2OU12B	B96DC-NNPIT/E90 M2OU12B	B96DC-NNPIT/ID M2OU12B
2x48, Bantam, Non-Normal, Looped Grounds, 2RU	B96DC-NNPLT/E3 M2OU12B	B96DC-NNPLT/E90 M2OU12B	B96DC-NNPLT/ID M2OU12B

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ACCESSORIES

ACCESSORIES Bittree offers a wide variety of patch cords, adapters, connectors, tools, jumpers and lacing bars. Patch cords are shown below; other accessories are on page 31.
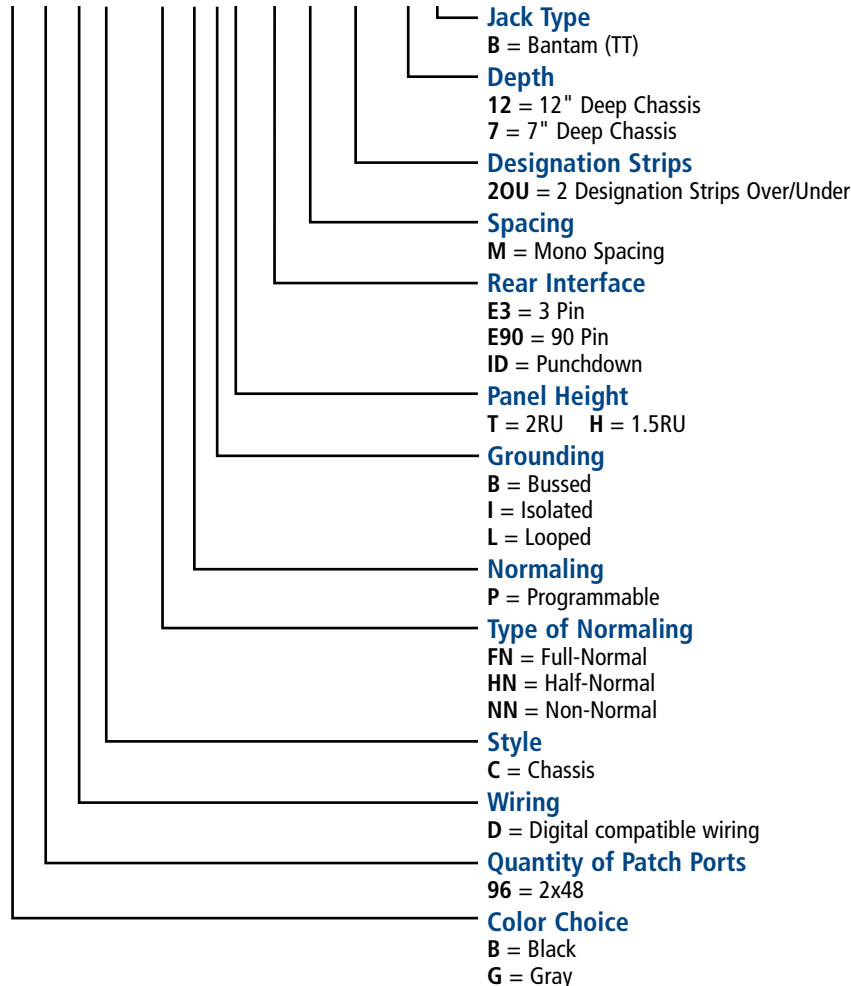
AUDIO BANTAM (TT)

BPC 24 00 – 110

Color
00= Black
02= Red
04= Yellow
05= Green
06= Blue
07= Purple

Length in Inches (cm)
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

BPC PATCH CORDS

Our easy-to-use Ordering Codes let you order the exact patching system you need.
As shown in the chart below, simply choose the option you want for each specification.

B 96 D C – FN P I T /E3 M 2OU 12 B

Jack Type
B = Bantam (TT)

Depth
12 = 12" Deep Chassis
7 = 7" Deep Chassis

Designation Strips
2OU = 2 Designation Strips Over/Under

Spacing
M = Mono Spacing

Rear Interface
E3 = 3 Pin
E90 = 90 Pin
ID = Punchdown

Panel Height
T = 2RU   **H** = 1.5RU

Grounding
B = Bussed
I = Isolated
L = Looped

Normaling
P = Programmable

Type of Normaling
FN = Full-Normal
HN = Half-Normal
NN = Non-Normal

Style
C = Chassis

Wiring
D = Digital compatible wiring

Quantity of Patch Ports
96 = 2x48

Color Choice
**B** = Black
G = Gray

> **Mating connectors, contacts and normals (where applicable) are included with standard rear interface audio patchbays. Lacing bars are included with all audio patchbays.**

WHEN YOU NEED A PROGRAMMABLE PATCHBAY, but have only one rack-unit of space, consider our 968 Series. It comes with the same programming capability as the 969 Series (pages 14-16), but since the programming is done internally it can fit into one rack unit.

- Black or gray front panel
- 2x48 jack configuration
- Fully enclosed chassis
- Normals can be pre-programmed to full-normal, half-normal or non-normal
- Grounding can be pre-programmed to bussed, isolated or looped
- Normals and grounding for individual circuits can be easily changed
- 1RU panel
- Standard rear interfaces include E3 and E90
- 12" or 7" deep chassis
- Other rear interfaces available; call a Bittree Sales Consultant at (800) 500-8142

BLACK 2x48 1RU MONO SPACING OVER/UNDER DESIGNATION
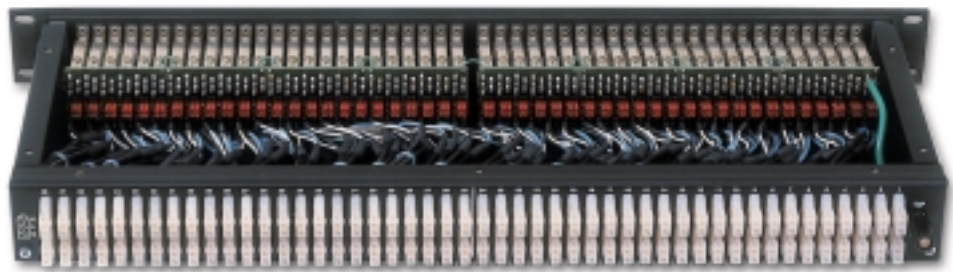
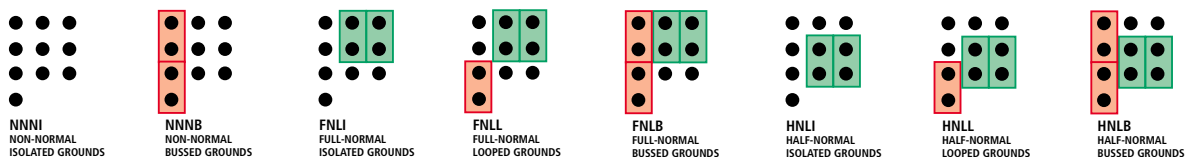**2x48 E3 1RU (REAR)** WITH COVER REMOVED AND PROGRAMMING SHUNTS SHOWN

2x48 E90 1RU (REAR)

2x48 E56 1RU (REAR)

TO CHANGE THE PROGRAMMING on a 968 Series internally programmable patchbay, remove the top dust cover to expose the programming shunts. Find your desired configuration in the chart below, and arrange the programming shunts to match the appropriate diagram. Each circuit can be programmed independently. All shunts should be placed vertically. Red shunts are used for normaling options. White shunts (shown as green below) are used for grounding options.

NNNI	NNNB	FNLI	FNLL	FNLB	HNLI	HNLL	HNLB
NON-NORMAL ISOLATED GROUNDS	NON-NORMAL BUSSED GROUNDS	FULL-NORMAL ISOLATED GROUNDS	FULL-NORMAL LOOPED GROUNDS	FULL-NORMAL BUSSED GROUNDS	HALF-NORMAL ISOLATED GROUNDS	HALF-NORMAL LOOPED GROUNDS	HALF-NORMAL BUSSED GROUNDS

Note: This is an exact PDF of the latest Product Guide. Please note that the red and green programming colors above were inadvertently switched when producing the Product Guide. Therefore, contrary to the text above, the red shunts actually indicate grounding options, and the white shunts (shown as green) indicate normaling options.

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description 1RU	Number 3 PIN REAR	90 PIN REAR	56 PIN REAR
2x48, Bantam, Full-Normal, Bussed Grounds, 1RU	B96DC-FNIBS/E3 M2OU12B	B96DC-FNIBS/E90 M2OU12B	B96DC-FNIBS/E56 M2OU12B
2x48, Bantam, Full-Normal, Isolated Grounds, 1RU	B96DC-FNIIS/E3 M2OU12B	B96DC-FNIIS/E90 M2OU12B	B96DC-FNIIS/E56 M2OU12B
2x48, Bantam, Full-Normal, Looped Grounds, 1RU	B96DC-FNILS/E3 M2OU12B	B96DC-FNILS/E90 M2OU12B	B96DC-FNILS/E56 M2OU12B
2x48, Bantam, Half-Normal, Bussed Grounds, 1RU	B96DC-HNIBS/E3 M2OU12B	B96DC-HNIBS/E90 M2OU12B	B96DC-HNIBS/E56 M2OU12B
2x48, Bantam, Half-Normal, Isolated Grounds, 1RU	B96DC-HNIIS/E3 M2OU12B	B96DC-HNIIS/E90 M2OU12B	B96DC-HNIIS/E56 M2OU12B
2x48, Bantam, Half-Normal, Looped Grounds, 1RU	B96DC-HNILS/E3 M2OU12B	B96DC-HNILS/E90 M2OU12B	B96DC-HNILS/E56 M2OU12B
2x48, Bantam, Non-Normal, Bussed Grounds, 1RU	B96DC-NNIBS/E3 M2OU12B	B96DC-NNIBS/E90 M2OU12B	B96DC-NNIBS/E56 M2OU12B
2x48, Bantam, Non-Normal, Isolated Grounds, 1RU	B96DC-NNIIS/E3 M2OU12B	B96DC-NNIIS/E90 M2OU12B	B96DC-NNIIS/E56 M2OU12B
2x48, Bantam, Non-Normal, Looped Grounds, 1RU	B96DC-NNILS/E3 M2OU12B	B96DC-NNILS/E90 M2OU12B	B96DC-NNILS/E56 M2OU12B

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ACCESSORIES

ACCESSORIES Bittree offers a wide variety of patch cords, adapters, connectors, tools, jumpers and lacing bars. Patch cords are shown below; other accessories are on page 31.
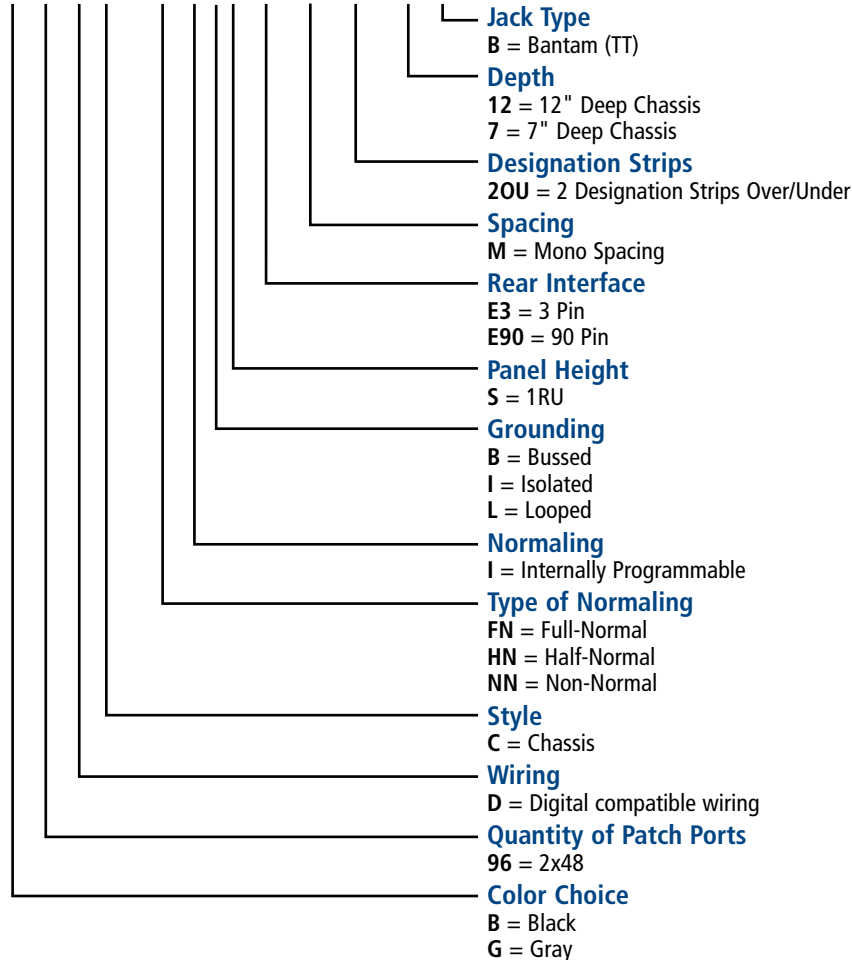
BPC PATCH CORDS

AUDIO BANTAM (TT)
BPC 24 00 – 110

Color
00= Black
02= Red
04= Yellow
05= Green
06= Blue
07= Purple

**Length
in Inches (cm)**
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

Our easy-to-use Ordering Codes let you order the exact patching system you need. As shown in the chart below, simply choose the option you want for each specification.

B 96 D C – FN I I S /E3 M 2OU 12 B

Jack Type
B = Bantam (TT)

Depth
12 = 12" Deep Chassis
7 = 7" Deep Chassis

Designation Strips
2OU = 2 Designation Strips Over/Under

Spacing
M = Mono Spacing

Rear Interface
E3 = 3 Pin
E90 = 90 Pin

Panel Height
S = 1RU

Grounding
B = Bussed
I = Isolated
L = Looped

Normaling
I = Internally Programmable

Type of Normaling
FN = Full-Normal
HN = Half-Normal
NN = Non-Normal

Style
C = Chassis

Wiring
D = Digital compatible wiring

Quantity of Patch Ports
96 = 2x48

Color Choice
B = Black
G = Gray

> **Mating connectors, contacts and normals (where applicable) are included with standard rear interface audio patchbays. Lacing bars are included with all audio patchbays.**

ASIDE FROM THE JACK COUNT, our 481 and 521 Series are similar to our 961 Series traditional workhorse audio patchbays. The 481 Series has a jack configuration of 2x24, while the 521 Series has a count of 2x26. Both the 481 and 521 Series come with numerous options, including rear panel configurations, normals, grounds, stereo spacing, panel color and rack-unit height.

- Black or gray front panel
- 2x24 or 2x26 jack configuration
- Choose either fully enclosed chassis, or harness
- Can be ordered full-normal, half-normal or non-normal
- Normals looped internally or brought out to the rear interface
- Bussed, isolated, looped or switched grounds
- Available in 1, 1.5 or 2 rack units (RU)
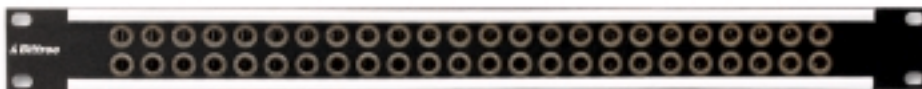
BLACK 2x24 1RU MONO SPACING OVER/UNDER DESIGNATION

BLACK 2x24 1RU MONO SPACING OVER/OVER DESIGNATION

2x24 E3 1RU (REAR)

2x24 E3 1RU NORMALS OUT (REAR)

2x24 E90 1RU (REAR)

2x24 E90 1RU NORMALS OUT (REAR)

521 Series feature 2x26 rows of jacks, and use similar front and rear panels as shown above.

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number		
1RU	**3 PIN REAR**	**90 PIN REAR**	**ID (PUNCHDOWN) REAR**
2x24, Long Frame, Full-Normal, Isolated Grounds, 1RU	B48DC-FNLIS/E3 M2OU12B	B48DC-FNLIS/E90 M2OU12B	B48DC-FNLIS/ID M2OU12B
2x24, Long Frame, Half-Normal, Isolated Grounds, 1RU	B48DC-HNLIS/E3 M2OU12B	B48DC-HNLIS/E90 M2OU12B	B48DC-HNLIS/ID M2OU12B
2x24, Long Frame, Non-Normal, Isolated Grounds, 1RU	B48DC-NNNIS/E3 M2OU12B	B48DC-NNNIS/E90 M2OU12B	B48DC-NNNIS/ID M2OU12B
2x26, Long Frame, Full-Normal, Isolated Grounds, 1RU	B52DC-FNLIS/E3 M2OU12B	B52DC-FNLIS/E90 M2OU12B	-----------------
2x26, Long Frame, Half-Normal, Isolated Grounds, 1RU	B52DC-HNLIS/E3 M2OU12B	B52DC-HNLIS/E90 M2OU12B	-----------------
2x26, Long Frame, Non-Normal, Isolated Grounds, 1RU	B52DC-NNNIS/E3 M2OU12B	B52DC-NNNIS/E90 M2OU12B	-----------------
Normals Out			
2x24, Long Frame, Full-Normal, Isolated Grounds, 1RU	B48DC-FNOIS/E3 M2OU12B	B48DC-FNOIS/E90 M2OU12B	-----------------
2x24, Long Frame, Half-Normal, Isolated Grounds, 1RU	B48DC-HNOIS/E3 M2OU12B	B48DC-HNOIS/E90 M2OU12B	-----------------
2x26, Long Frame, Full-Normal, Isolated Grounds, 1RU	B52DC-FNOIS/E3 M2OU12B	B52DC-FNOIS/E90 M2OU12B	-----------------
2x26, Long Frame, Half-Normal, Isolated Grounds, 1RU	B52DC-HNOIS/E3 M2OU12B	B52DC-HNOIS/E90 M2OU12B	-----------------

To select other grounding, chassis, jack grouping, and designation strip options, consult Ordering Codes on page 21 or call your Bittree Sales Consultant.

VIDEO

AUDIO 1/4"

DATA

IPS

ACCESSORIES

OUR PATCHBAY DESIGN allows for a wide range of options and configurations to meet your individual requirements. Options include rear panel configurations, normals, grounds, stereo spacing, panel color and rack unit height.

- Standard rear interfaces include E3, E90 and ID (Punchdown)
- Mono or stereo jack spacing
- Over/under or over/over designation strips
- 12" or 7" deep chassis
- Mating connectors, contacts and normal jumpers (where applicable) are included

Normals out patchbays bring the normals to the rear interface so that if desired the user may de-normal a circuit by removing a jumper. The 3-pin rear interface always brings the shield to the rear interface. To loop the ground use a three-wire jumper (Normal 3-E); to isolate the ground use a two-wire jumper (Normal 2-E). **Note:** E90 normals out models do not bring the ground to the normals out connector.

BLACK 2x26 2RU MONO SPACING OVER/UNDER DESIGNATION
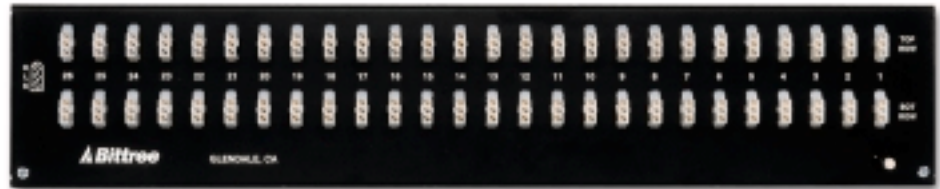
2x26 E3 2RU (REAR)

2x26 E3 2RU NORMALS OUT (REAR) JUMPERS ATTACHED

2x26 E3 2RU NORMALS OUT (REAR) JUMPERS REMOVED

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number		
2RU	**3 PIN REAR**	**90 PIN REAR**	**ID (PUNCHDOWN) REAR**
2x24, Long Frame, Full Normal, Isolated Grounds, 2RU	B48DC-FNLIT/E3 M2OU12B	B48DC-FNLIT/E90 M2OU12B	B48DC-FNLIT/ID M2OU12B
2x24, Long Frame, Half Normal, Isolated Grounds, 2RU	B48DC-HNLIT/E3 M2OU12B	B48DC-HNLIT/E90 M2OU12B	B48DC-HNLIT/ID M2OU12B
2x24, Long Frame, Non Normal, Isolated Grounds, 2RU	B48DC-NNNIT/E3 M2OU12B	B48DC-NNNIT/E90 M2OU12B	B48DC-NNNIT/ID M2OU12B
2x26, Long Frame, Full Normal, Isolated Grounds, 2RU	B52DC-FNLIT/E3 M2OU12B	B52DC-FNLIT/E90 M2OU12B	------------------
2x26, Long Frame, Half Normal, Isolated Grounds, 2RU	B52DC-HNLIT/E3 M2OU12B	B52DC-HNLIT/E90 M2OU12B	------------------
2x26, Long Frame, Non Normal, Isolated Grounds, 2RU	B52DC-NNNIT/E3 M2OU12B	B52DC-NNNIT/E90 M2OU12B	------------------
Normals Out			
2x24, Long Frame, Full Normal, Isolated Grounds, 1RU	B48DC-FNOIT/E3 M2OU12B	B48DC-FNOIT/E90 M2OU12B	------------------
2x24, Long Frame, Half Normal, Isolated Grounds, 1RU	B48DC-HNOIT/E3 M2OU12B	B48DC-HNOIT/E90 M2OU12B	------------------
2x26, Long Frame, Full Normal, Isolated Grounds, 1RU	B52DC-FNOIT/E3 M2OU12B	B52DC-FNOIT/E90 M2OU12B	------------------
2x26, Long Frame, Half Normal, Isolated Grounds, 1RU	B52DC-HNOIT/E3 M2OU12B	B52DC-HNOIT/E90 M2OU12B	--------------

To select other grounding, chassis, jack grouping, and designation strip options, consult Ordering Codes on page 21 or call your Bittree Sales Consultant.

ACCESSORIES Bittree offers a wide variety of patch cords, adapters, connectors, tools, jumpers and lacing bars. Patch cords are shown below; other accessories are on page 31.

LPC PATCH CORDS

AUDIO LONG FRAME (1/4")

LPC 24 00 – 110

Color
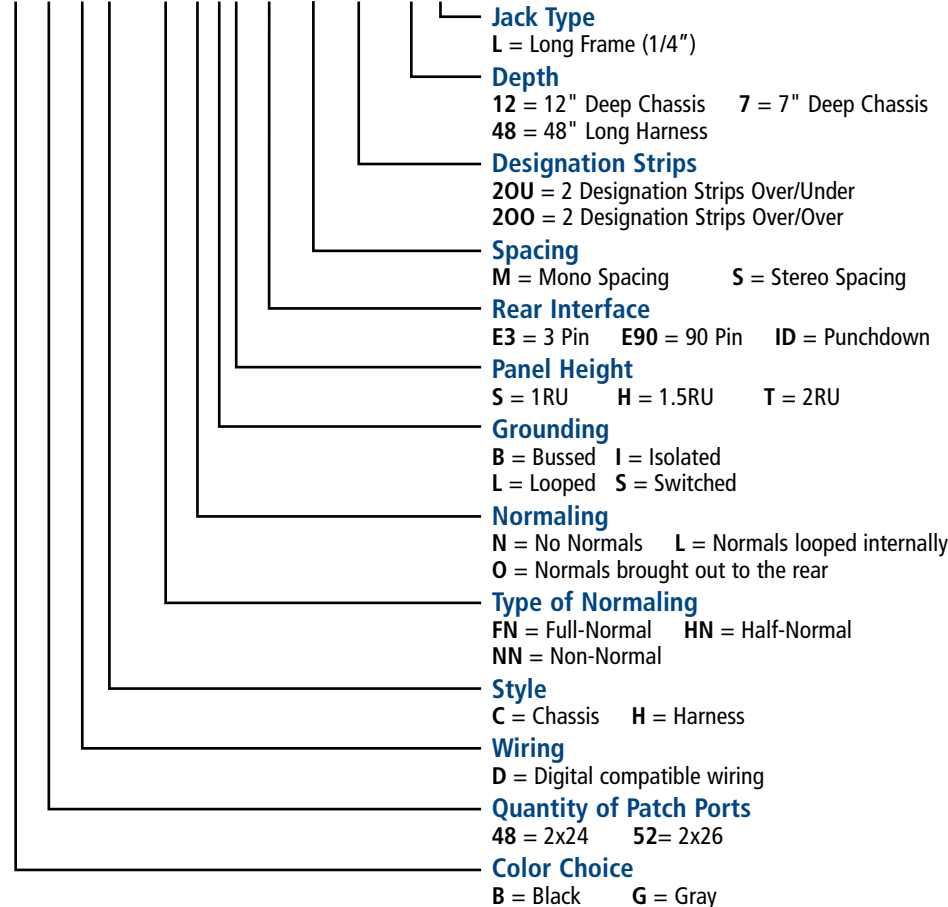00= Black
02= Red
04= Yellow
05= Green
06= Blue
07= Purple

Length in Inches (cm)
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

Our easy-to-use Ordering Codes let you order the exact patching system you need.
As shown in the chart below, simply choose the option you want for each specification.

B 48 D C – FN L I T /E3 M 2OU 12 L

Jack Type
L = Long Frame (1/4")

Depth
12 = 12" Deep Chassis   **7** = 7" Deep Chassis
48 = 48" Long Harness

Designation Strips
2OU = 2 Designation Strips Over/Under
2OO = 2 Designation Strips Over/Over

Spacing
M = Mono Spacing   **S** = Stereo Spacing

Rear Interface
E3 = 3 Pin   **E90** = 90 Pin   **ID** = Punchdown

Panel Height
S = 1RU   **H** = 1.5RU   **T** = 2RU

Grounding
B = Bussed   **I** = Isolated
L = Looped   **S** = Switched

Normaling
N = No Normals   **L** = Normals looped internally
O = Normals brought out to the rear

Type of Normaling
FN = Full-Normal   **HN** = Half-Normal
NN = Non-Normal

Style
C = Chassis   **H** = Harness

Wiring
D = Digital compatible wiring

Quantity of Patch Ports
48 = 2x24   **52**= 2x26

Color Choice
B = Black   **G** = Gray

> **Mating connectors, contacts and normals (where applicable) are included with standard rear interface audio patchbays. Lacing bars are included with all audio patchbays.**

VIDEO

AUDIO 1/4"

DATA

IPS

ACCESSORIES

ASIDE FROM ITS 2x24 JACK CONFIGURATION, our 489 Series is identical to our 969 Series programmable patchbays. Our programmable patchbays allow you to change the normaling and grounding for individual circuits just by changing the placement of the shunts on the patchbay front, letting you reconfigure your system quickly and cost-effectively.

- Black or gray front panel
- 2x24 jack configuration
- Fully enclosed chassis
- Normals can be pre-programmed to full-normal, half-normal or non-normal
- Grounding can be pre-programmed to bussed, isolated or looped
- Normals and grounding for individual circuits can be easily changed by the end-user
- Available in 1.5 or 2 rack unit (RU)
- Standard rear interfaces include E3, E90 and ID (Punchdown)
- Large, user friendly designation strips
- 12" or 7" deep chassis
- For programming instructions, see page 15

BLACK 2x24 2RU MONO SPACING OVER/UNDER DESIGNATION

2x24 E3 2RU (REAR)
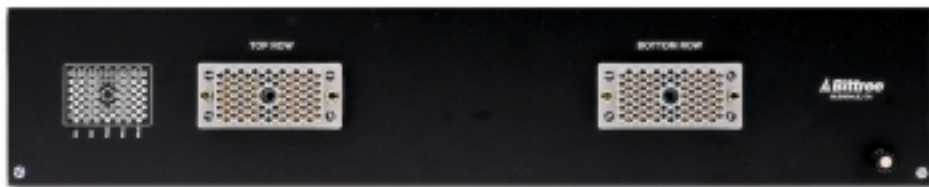
2x24 E90 2RU (REAR)

2x24 ID (PUNCHDOWN) 2RU (REAR)

If you require either 2x26 stereo spacing, or over/over designation, see the 481/521 Series on pages 19-21.

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description 2RU	Number 3 PIN REAR	90 PIN REAR	ID (PUNCHDOWN) REAR
2x24, Long Frame, Full-Normal, Bussed Grounds, 2RU	B48DC-FNPBT/E3 M2OU12B	B48DC-FNPBT/E90 M2OU12B	B48DC-FNPBT/ID M2OU12B
2x24, Long Frame, Full-Normal, Isolated Grounds, 2RU	B48DC-FNPIT/E3 M2OU12B	B48DC-FNPIT/E90 M2OU12B	B48DC-FNPIT/ID M2OU12B
2x24, Long Frame, Full-Normal, Looped Grounds, 2RU	B48DC-FNPLT/E3 M2OU12B	B48DC-FNPLT/E90 M2OU12B	B48DC-FNPLT/ID M2OU12B
2x24, Long Frame, Half-Normal, Bussed Grounds, 2RU	B48DC-HNPBT/E3 M2OU12B	B48DC-HNPBT/E90 M2OU12B	B48DC-HNPBT/ID M2OU12B
2x24, Long Frame, Half-Normal, Isolated Grounds, 2RU	B48DC-HNPIT/E3 M2OU12B	B48DC-HNPIT/E90 M2OU12B	B48DC-HNPIT/ID M2OU12B
2x24, Long Frame, Half-Normal, Looped Grounds, 2RU	B48DC-HNPLT/E3 M2OU12B	B48DC-HNPLT/E90 M2OU12B	B48DC-HNPLT/ID M2OU12B
2x24, Long Frame, Non-Normal, Bussed Grounds, 2RU	B48DC-NNPBT/E3 M2OU12B	B48DC-NNPBT/E90 M2OU12B	B48DC-NNPBT/ID M2OU12B
2x24, Long Frame, Non-Normal, Isolated Grounds, 2RU	B48DC-NNPIT/E3 M2OU12B	B48DC-NNPIT/E90 M2OU12B	B48DC-NNPIT/ID M2OU12B
2x24, Long Frame, Non-Normal, Looped Grounds, 2RU	B48DC-NNPLT/E3 M2OU12B	B48DC-NNPLT/E90 M2OU12B	B48DC-NNPLT/ID M2OU12B

For more options, refer to Ordering Codes on page 23, or call your Bittree Sales Consultant.

ACCESSORIES Bittree offers a wide variety of patch cords, adapters, connectors, tools, jumpers and lacing bars. Patch cords are shown below; other accessories are on page 31.

LPC PATCH CORDS

AUDIO LONG FRAME (1/4")

LPC 24 00 – 110

Color
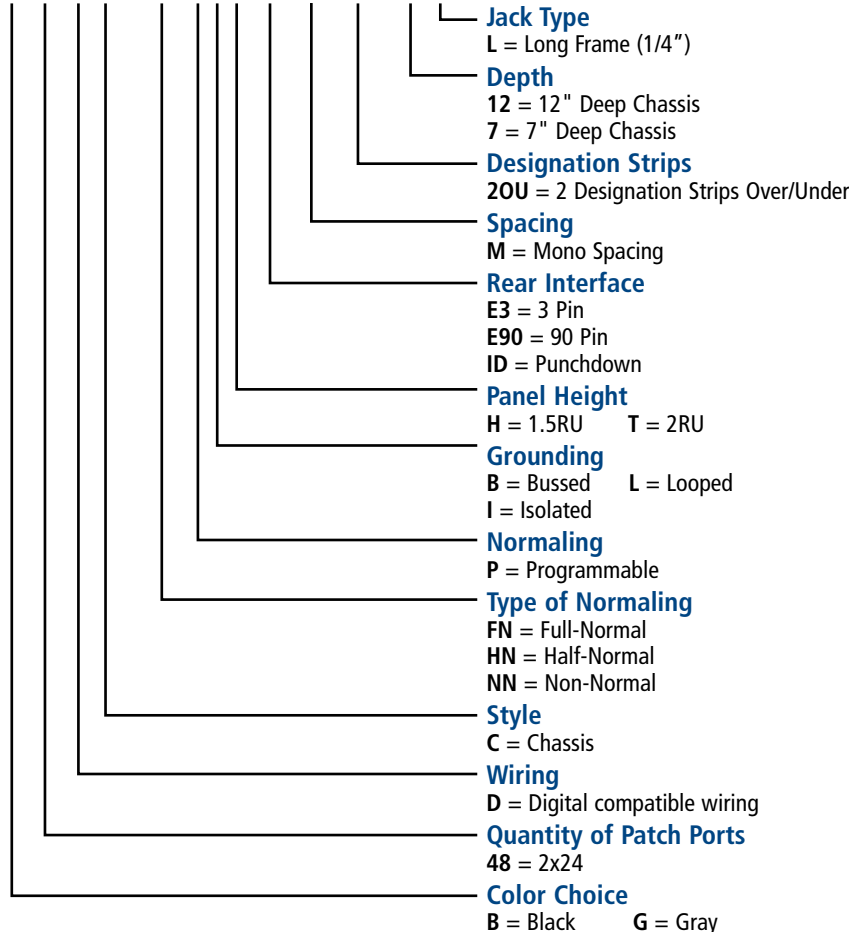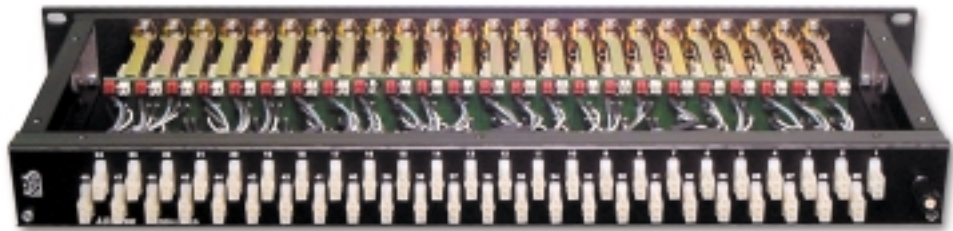00= Black
02= Red
04= Yellow
05= Green
06= Blue
07= Purple

Length in Inches (cm)
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

Our easy-to-use Ordering Codes let you order the exact patching system you need. As shown in the chart below, simply choose the option you want for each specification.

B 48 D C – FN P I T /E3 M 2OU 12 L

Jack Type
L = Long Frame (1/4")

Depth
12 = 12" Deep Chassis
7 = 7" Deep Chassis

Designation Strips
2OU = 2 Designation Strips Over/Under

Spacing
M = Mono Spacing

Rear Interface
E3 = 3 Pin
E90 = 90 Pin
ID = Punchdown

Panel Height
H = 1.5RU   **T** = 2RU

Grounding
B = Bussed   **L** = Looped
I = Isolated

Normaling
P = Programmable

Type of Normaling
FN = Full-Normal
HN = Half-Normal
NN = Non-Normal

Style
C = Chassis

Wiring
D = Digital compatible wiring

Quantity of Patch Ports
48 = 2x24

Color Choice
B = Black   **G** = Gray

Mating connectors, contacts and normals (where applicable) are included with standard rear interface audio patchbays. Lacing bars are included with all audio patchbays.

VIDEO

AUDIO 1/4"

DATA

IPS

ACCESSORIES

OUR 488 SERIES, with a 2x24 jack configuration, is ideal when you need a programmable patchbay but have only one rack-unit of space. It comes with the same programming capability as the 489 Series (pages 22-23), but since the programming is done internally it can fit into one rack unit.
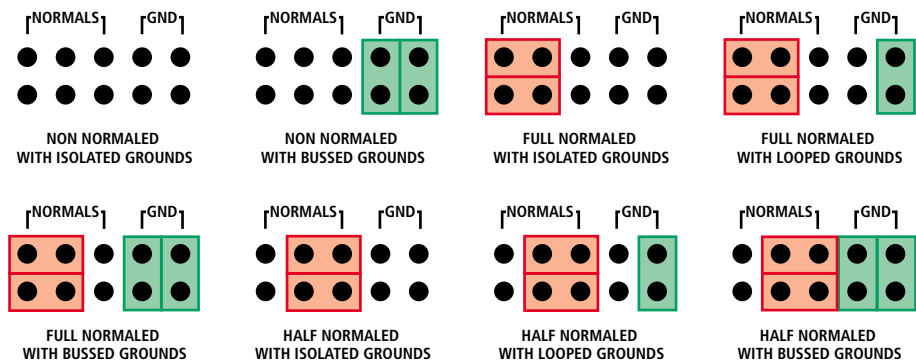
- Black or gray front panel
- 2x24 jack configuration
- Fully enclosed chassis
- Normals can be pre-programmed to full-normal, half-normal or non-normal
- Grounding can be pre-programmed to bussed, isolated or looped
- Normals and grounding for individual circuits can be easily changed
- 1RU panel
- Standard rear interfaces include E3 and E90
- Large bar-and-cap designation strips on all 1RU patchbays
- 12" or 7" deep chassis
- Other rear interfaces available; call a Bittree Sales Consultant at (800) 500-8142 or (818) 500-8142
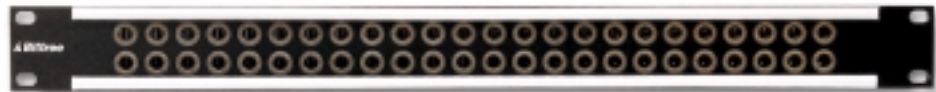
BLACK 2x24 1RU MONO SPACING OVER/UNDER DESIGNATION

2x24 E3 1RU (REAR) WITH COVER REMOVED AND PROGRAMMING SHUNTS SHOWN

NON NORMALED WITH ISOLATED GROUNDS

NON NORMALED WITH BUSSED GROUNDS

FULL NORMALED WITH ISOLATED GROUNDS

FULL NORMALED WITH LOOPED GROUNDS

FULL NORMALED WITH BUSSED GROUNDS

HALF NORMALED WITH ISOLATED GROUNDS

HALF NORMALED WITH LOOPED GROUNDS

HALF NORMALED WITH BUSSED GROUNDS

TO CHANGE THE PROGRAMMING on a 488 Series internally programmable patchbay, remove the top dust cover to expose the programming shunts. Find your desired configuration in the chart above, and arrange the programming shunts to match the appropriate diagram. Each circuit can be programmed independently. Ample shunts are provided with every programmable patchbay. Red shunts are placed horizontally and are used for normaling options. White shunts (shown as green above) are placed vertically and are used for grounding options.

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description 1RU	Number 3 PIN REAR	90 PIN REAR	ID (PUNCHDOWN) REAR
2x24, Long Frame, Full-Normal, Bussed Grounds, 1RU	B48DC-FNIBS/E3 M2OU12B	B48DC-FNIBS/E90 M2OU12B	B48DC-FNPBT/ID M2OU12B
2x24, Long Frame, Full-Normal, Isolated Grounds, 1RU	B48DC-FNIIS/E3 M2OU12B	B48DC-FNIIS/E90 M2OU12B	B48DC-FNPIT/ID M2OU12B
2x24, Long Frame, Full-Normal, Looped Grounds, 1RU	B48DC-FNILS/E3 M2OU12B	B48DC-FNILS/E90 M2OU12B	B48DC-FNPLT/ID M2OU12B
2x24, Long Frame, Half-Normal, Bussed Grounds, 1RU	B48DC-HNIBS/E3 M2OU12B	B48DC-HNIBS/E90 M2OU12B	B48DC-HNPBT/ID M2OU12B
2x24, Long Frame, Half-Normal, Isolated Grounds, 1RU	B48DC-HNIIS/E3 M2OU12B	B48DC-HNIIS/E90 M2OU12B	B48DC-HNPIT/ID M2OU12B
2x24, Long Frame, Half-Normal, Looped Grounds, 1RU	B48DC-HNILS/E3 M2OU12B	B48DC-HNILS/E90 M2OU12B	B48DC-HNPLT/ID M2OU12B
2x24, Long Frame, Non-Normal, Bussed Grounds, 1RU	B48DC-NNIBS/E3 M2OU12B	B48DC-NNIBS/E90 M2OU12B	B48DC-NNPBT/ID M2OU12B
2x24, Long Frame, Non-Normal, Isolated Grounds, 1RU	B48DC-NNIIS/E3 M2OU12B	B48DC-NNIIS/E90 M2OU12B	B48DC-NNPIT/ID M2OU12B
2x24, Long Frame, Non-Normal, Looped Grounds, 1RU	B48DC-NNILS/E3 M2OU12B	B48DC-NNILS/E90 M2OU12B	B48DC-NNPLT/ID M2OU12B

ACCESSORIES Bittree offers a wide variety of patch cords, adapters, connectors, tools, jumpers and lacing bars. Patch cords are shown below; other accessories are on page 31.
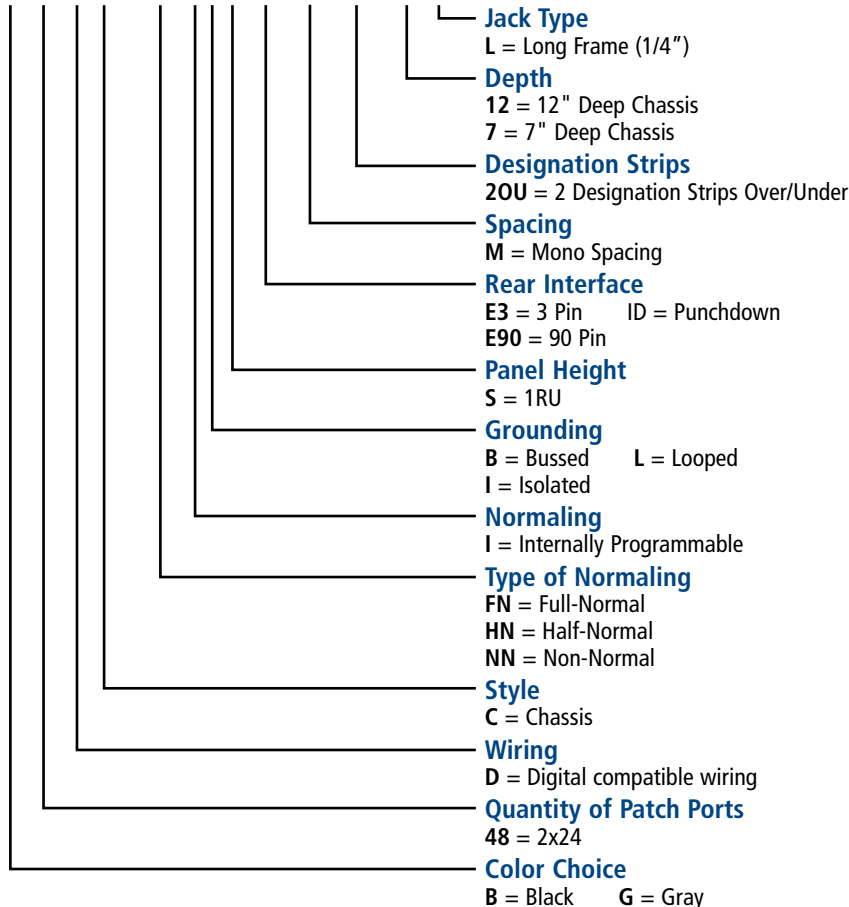

LPC PATCH CORDS

AUDIO LONG FRAME (1/4")

LPC 24 00 – 110

Color
00= Black
02= Red
04= Yellow
05= Green
06= Blue
07= Purple

**Length in Inches (cm)**
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

Our easy-to-use Ordering Codes let you order the exact patching system you need. As shown in the chart below, simply choose the option you want for each specification.

B 48 D C – FN I I S /E3 M 2OU 12 L

Jack Type
L = Long Frame (1/4")

Depth
12 = 12" Deep Chassis
7 = 7" Deep Chassis

Designation Strips
2OU = 2 Designation Strips Over/Under

Spacing
M = Mono Spacing

Rear Interface
E3 = 3 Pin   **ID** = Punchdown
E90 = 90 Pin

Panel Height
S = 1RU

Grounding
B = Bussed   **L** = Looped
I = Isolated

Normaling
I = Internally Programmable

Type of Normaling
FN = Full-Normal
HN = Half-Normal
NN = Non-Normal

Style
C = Chassis

Wiring
D = Digital compatible wiring

Quantity of Patch Ports
48 = 2x24

Color Choice
B = Black   **G** = Gray

> Mating connectors, contacts and normals (where applicable) are included with standard rear interface audio patchbays. Lacing bars are included with all audio patchbays.

VIDEO
AUDIO 1/4"
DATA
IPS
ACCESSORIES
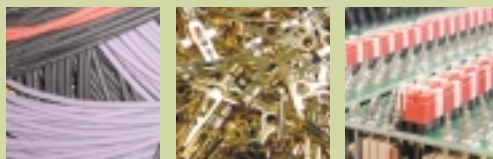
DATA

Overview

Bittree Serial Data patching systems are expressly designed to meet the needs of RS-422 serial data patching, such as the kind typically required in television broadcast or postproduction facilities. Employing our data patching systems offers a simpler, less expensive approach than using active routing systems.

DATA PATCHBAY FEATURES

- Jacks rated to 30,000 minimum insertion cycles
- Copper-nickel-silver alloy leaf springs with gold-plated cross bar switching contacts and nickel-plated sleeve bushings
- Precision-stamped reinforced steel jack frame
- Handles data rates up to 1Mb/s
- Handles bi-directional signals such as SMPTE 207M, RS-422 or RS-232
- DB9 female rear interface

DATA PATCHBAY OPTIONS

- 2x6 and 2x12 available in 1RU; 2x12, 2x18 and 2x24 available in 2RU
- Black or gray front panel
- 12" or 7" deep chassis
- Normal or non-normal I/O paired ports
- RS422 (four wire), RS422 + 1 (five wire) or RS422 + 2 (GPI) (six wire)

ALL BITTREE DATA PATCHING SYSTEMS are held to strict electrical and mechanical specifications to guarantee exceptional performance in traditional serial data applications.

APPLICATIONS

- RS-422 serial data patching
- Edit system to VTR patching
- Remote control delegation (e.g., Sony and Lynx systems)
- Computer data interconnection
- Control panel re-routing
- Central distribution of 422 signals

RS422 OPTIONS

RS422 is for standard four-wire serial data patching. RS422 + 1 is for five-wire patching, such as for remote control delegation. RS422 + 2 (GPI) is for six-wire patching. GPI stands for General Purpose Interface.

BLACK 2x6 1RU

BLACK 2x12 2RU

BLACK 2x18 2RU

GRAY 2x24 2RU

2x24 2RU DB9 FEMALE (REAR)

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Description	Number			
1RU	**RS422 Non-Normaling**	**RS422**	**RS422 + 1**	**RS422 + 2 (GPI)**
2x6	B422-NNS/6	B422-N4S/6	B422-N5S/6	BGPI-N6S/6
2x12	B422-NNS/12	B422-N4S/12	B422-N5S/12	BGPI-N6S/12
2RU				
2x12	B422-NNT/12	B422-N4T/12	B422-N5T/12	BGPI-N6T/12
2x18	B422-NNT/18	B422-N4T/18	B422-N5T/18	BGPI-N6T/18
2x24	B422-NNT/24	B422-N4T/24	----------------	----------------

For more options, refer to Ordering Codes on page 28, or call your Bittree Sales Consultant.

ACCESSORIES Bittree offers a wide variety of patch cords, adapters, connectors, tools, jumpers and lacing bars. Patch cords are shown below; other accessories are on page 31.

DUAL BANTAM (TT)
DPC 24 00

Color
00= Black
02= Red*
04= Yellow*
05= Green*
06= Blue*

**Length
in Inches (cm)**
24 (61)
36 (92)
48 (122)
60 (153)
72 (184)

*Available in 24"
and 36" only

DUAL BANTAM (TT) SIX-WIRE
GPI 24 00

Color
00= Black

**Length
in Inches (cm)**
24 (61)
36 (92)

DPC PATCH CORDS

GPI Patch Cords have gray overmold to differentiate from DPC Patch Cords.

Our easy-to-use Ordering Codes let you order the exact patching system you need.
As shown in the charts below, simply choose the option you want for each specification.

DATA
B 422 – N4 T / 24

Number of Circuits
6 = 2x6
12= 2x12
18= 2x18
24= 2x24

Panel Height
S = 1RU
T = 2RU

Number of Switched Normals
NN = 4 Circuits Non-Normal (RS422)
N4 = 4 Circuits (RS422)
N5 = 5 Circuits (RS422 + 1)
N6 = 6 Circuits (RS422 + 2) (GPI)

Type
422 = RS422 Patching
GPI = General Purpose Interface

Color Choice
B = Black
G = Gray

Sidebar labels: VIDEO AUDIO DATA IPS ACCESSORIES

IPS
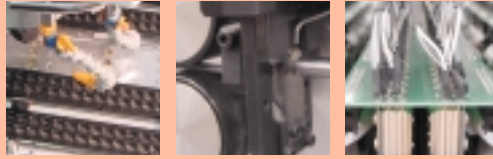
Overview

IPS is the abbreviation for our Integrated Patching Systems. The idea behind IPS is to combine the three main patching requirements – audio, video and data – into a single unit. Our IPS patching systems therefore have the same professional quality and finish as the rest of our line, avoiding the loose pieces and sloppy look of modular patchbays.

IPS PATCHBAY FEATURES: VIDEO
- 30,000 minimum insertions cycles
- High-bandwidth performance up to 2.5GHz
- Jacks conform to SMPTE 259M and SMPTE 292M

IPS PATCHBAY FEATURES: AUDIO/DATA
- Jacks rated to 30,000 minimum insertion cycles
- Copper-nickel-silver alloy leaf springs with gold-plated cross bar switching contacts and nickel-plated sleeve bushings
- Precision-stamped reinforced steel jack frame
- Gold-plated contacts used in E3 and E90 rear interface
- Wired with low-capacitance, AES/EBU-rated, shielded, twisted pair
- Mating audio connectors and contacts are included

IPS PATCHBAY OPTIONS
- Black or gray front panel
- 12" or 7" deep full chassis
- Half chassis available for some configurations
- Bantam (TT) or Long Frame (1/4") Audio
- Jacks may be ordered in four different configurations
  - Dual self-normaling, non-terminated
  - Dual self-normaling, terminated
  - Single self-terminating
  - Single non-terminating
- Other configurations available; call a Bittree Sales Consultant at (800) 500-8142

IPS PATCHBAYS ARE IDEAL for environments such as edit rooms and professional home studios with multiple *types* of patching requirements (audio, video and data), but that have a minimal *number* of patching requirements. They are a cost-effective way to have the convenience, functionality and reliability of a multiple-patch system, without having to purchase three separate patchbays.

- Original IPS systems feature 2x10 video, 2x20 audio and 2x4 data
- All contain E3 rear interface and stereo-spaced Bantam (TT) audio
- Video BNC rear interface
- Data DB9 female rear interface
- Video
  - Dual self-normaling, non-terminated
  - Dual self-normaling, terminated
  - Single self-terminating
  - Single non-terminating
- Audio
  - Can be ordered full-normal, half-normal or non-normal
- Data
  - RS422 normal or non-normal
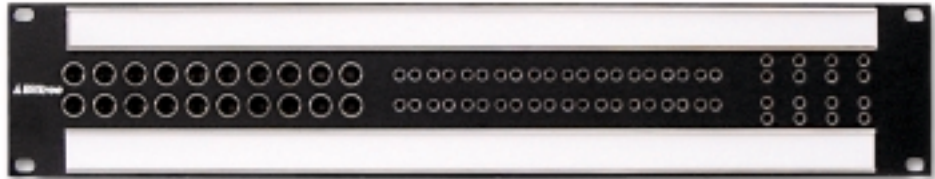
BLACK 2x10 VIDEO; 2x20 STEREO SPACED BANTAM (TT) AUDIO; 2x4 DATA

2x10 VIDEO BNC; 2x20 AUDIO E3; 2x4 DB9 FEMALE (REAR)

BLACK 2x12 VIDEO; 2x12 LONG FRAME (1/4") AUDIO

2x12 VIDEO BNC; 2x12 AUDIO E3; HALF CHASSIS (REAR)

PRODUCT NUMBERS (PARTIAL LISTING ONLY)

Number	Description VIDEO	AUDIO	DATA	
BIPS-1	2x10 Non-Normal, Non-Terminated	2x20 Non-Normal	2x4 Non-Normal	Full Chassis
BIPS-2	2x10 Normal, Non-Terminated	2x20 Full-Normal	2x4 Full-Normal	Full Chassis
BIPS-3	2x10 Normal, Non-Terminated	2x20 Half-Normal	2x4 Full-Normal	Full Chassis
BIPS-4	2x10 Normal, Terminated	2x20 Full-Normal	2x4 Full-Normal	Full Chassis
BIPS-7	2x10 Normal, Terminated	2x20 Half-Normal	2x4 Full-Normal	Full Chassis
BIPS-63	2x12 Non-Normal, Non-Terminated	2x12 Non-Normal	--------------------------	Half Chassis
BIPS-55	2x12 Normal, Non-Terminated	2x12 Full-Normal	--------------------------	Half Chassis
BIPS-78	2x12 Normal, Non-Terminated	2x12 Half-Normal	--------------------------	Half Chassis

Ask your Bittree Sales Consultant about other video, audio and data options.

ACCESSORIES

![Bittree logo]

ACCESSORIES Bittree offers a wide variety of accessories, including tools, adapters, connectors, jumpers and lacing bars as listed below. For patch cords and looping plugs, turn to the relevant section within the catalog. For additional information, log on to our web site at www.bittree.com

06-1742-04

RT1L

06-1877-04

Tools

K2MA-01	Crimp Tool for EPin
06-1877-04	Extraction Tool for EPin
06-1742-04	Insertion Tool for EPin
PT1	Punchdown Tool for ID Pins
RT1S	BNC Extraction Tool, 6"
RT1L	BNC Extraction Tool, 12"
RT1XL	BNC Extraction Tool, 22"
RTMW1L	BNC Extraction Tool, 12" (Mini-WECO)

K2MA-01
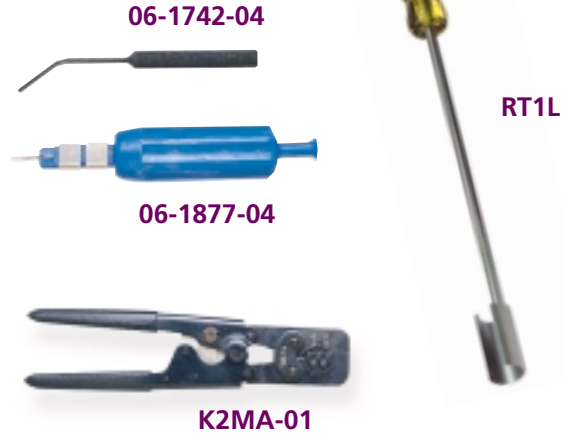
Adapters

AD1W	BNC to WECO Patch
ADMW12	BNC to Mini-WECO Patch
TCS-418	SVHS to two BNCs

AD1W **ADMW12**

E90MS

Connectors

E3M	Male 3 Pin Connector
E90MS	Male w/Screw 90 Pin Connector
E90HOOD	90 Pin Hood
EPIN	Pin (Crimp type)
K51002	Punchdown Housing (Red)
K51009	Punchdown Housing (White)
K51000	Punchdown Housing (Black)
K514	Punchdown Contact

PUNCHDOWN HOUSINGS & PINS

E3M **EPIN**

NORMAL-2E

Jumpers

NORMAL-2E	Two-Wire E3 Normal Jumper (Isolated Ground)
NORMAL-3E	Three-Wire E3 Normal Jumper (Looped Ground)
NORMAL-48	48-Wire Normal Jumper
382811-2	Programmable Series Shunts (Red)
382811-9	Programmable Series Shunts (White)

PROGRAMMING SHUNTS
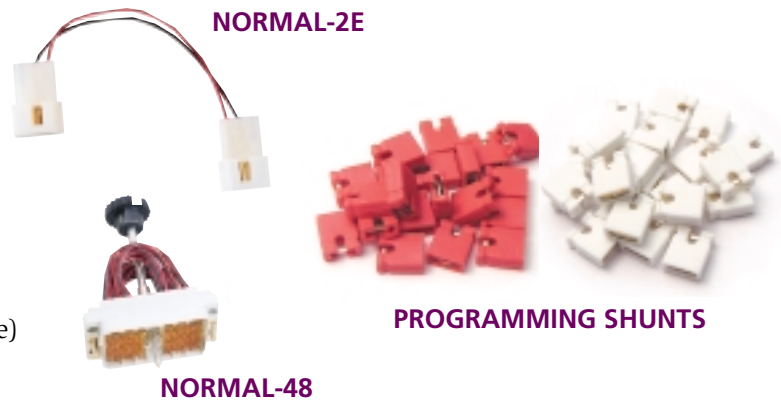
NORMAL-48

Lacing Bars

LB-17500	6" Deep Lacing Bar
LB175-3	3" Deep Lacing Bar
LB-1900	19" Wide Rack-Rail Lacing Bar

LB-1900

SCHEMATICS

DATA PATCHING SCHEMATICS
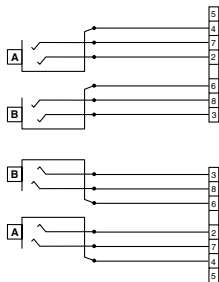
RS422/NNT
Non-normal wiring,
single-patch connection.
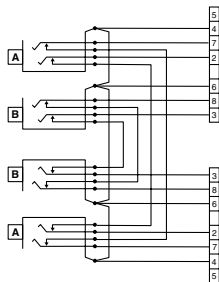
RS422/N4T
4 normals wiring,
single-patch connection.
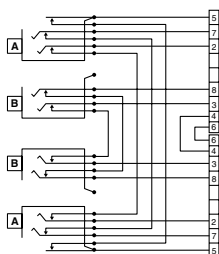
RS422+1/N5T
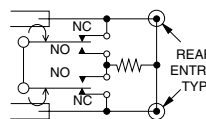5 normals wiring,
single-patch connection.
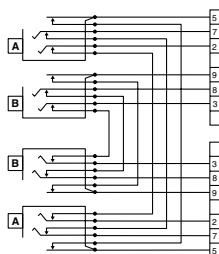
RS422+2 /N6T (GPI)
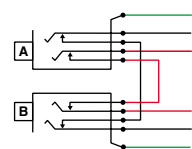6 normals wiring,
single-patch connection.

AUDIO GROUNDING SCHEMATICS
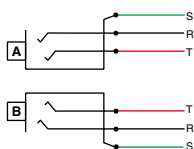
Non-Normal, Isolated Ground
Non-normal circuits are provided
internally or externally.

Isolated Ground
Each audio circuit has shield isolated
from the front panel and each other.
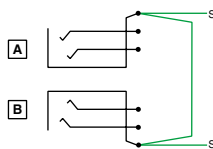
Looped Ground
Each vertical pair of audio
circuits has shields common
and is isolated from the front
panel and adjacent circuits.
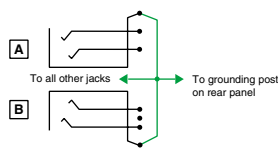
Bussed Ground
Every audio circuit has common
shield, isolated from the front
panel and bussed to a grounding
post on the rear panel.
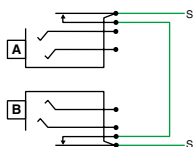
Switched Ground (Looped)
Each vertical pair of audio circuits
has shields common and is isolated
from the front panel and adjacent
circuits. Inserting a plug lifts shield.
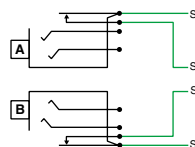
Switched Ground (Out)
Normal circuits are
connectorized externally to
allow manual non-normaling
of individual positions.

Grounds (Out)
Shields are connectorized externally
to allow manual multing of
individual positions.

VIDEO PATCHING SCHEMATICS

Non-Normaling, Self-Terminating
Circuit is terminated when plug is removed.

Normaling, Self-Terminating
Inserting a plug automatically
terminates the unused side.

AUDIO NORMALING SCHEMATICS

Full-Normal (Looped), Isolated Ground
Inserting a plug into either side
breaks the normal-through.

Full-Normal (Out), Isolated Ground
Normaling circuits are connectorized
externally to allow manual non-normaling
of individual positions.

Half-Normal (Looped), Isolated Ground
Inserting a plug into the top row monitors
the circuit. Inserting a plug into the
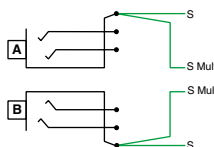bottom row breaks the normal-through.

Half-Normal (Out), Isolated Ground
Normaling circuits are connectorized
externally to allow manual non-normaling
of individual positions.

VIDEO

AUDIO

DATA

IPS

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