

MOD

TAP Modular Pre-amplifier System

User Manual



Thank you for choosing the TAP Modular Pre-amplifier system . Your ownership experience is very important to us so if at any time you have any questions please contact us directly at:

(604)538-9812

www.bentaudio.com

An Introduction to the TAP Modular Passive Pre-amp

The TAP Modular pre-amplifier is designed to offer features never before available in a passive pre-amplifier. It is important to note however that NONE of these features adds complexity to the signal path. Throughout the design of the TAP pre-amp system we focused on maintaining a pure and direct signal path between your source and your amplifier. Keeping the signal path clean and simple allows us to use only the finest parts throughout.

For many Systems our single box TAP-X Autoformer Pre-amp will be the best choice. There are however systems that can make use of the TAP Modular System parts to put together a system that better suits your pre-amp needs. Lower cost single input systems and more exotic controller options make it a flexible alternative to the single box TAP-X.

The most basic form of TAP Modular Pre-amp is the Micro-TAP system with two Bent Units– a single input resistor based passive pre-amp. A separate document is designed just to cover this system and can be found on the website under the Micro-TAP section.

To add additional attenuation channels (for 100% passive multichannel systems) to a TAP-X Autoformer Pre-amp you simply install the Expansion Module in the TAP-X (or order your TAP-X with it installed) and then plug Bent Units into that Expansion Port. This document can be used to decide on which Bent Units best suit your application and serve as a hook-up guide when installing them.

This document includes a full description of all TAP Modular Pre-amp components – it serves as a guide to deciding if a modular system is the right answer for you. It's also a user manual for the TAP Modular Pre-amp System.

At the heart of the TAP Modular Passive is the Bent Unit – an attenuator module.

All traditional resistor passive pre-amps struggle with driving downstream cables – keeping the pre-amp to amplifier interconnect as short as possible is critical. The shorter this cable is the better the sonic and measured performance are. Our goal was to solve this problem entirely by placing the attenuator right at each amplifier input. This can be done with traditional level controls and can work very well – the classic EVS Ultimate Attenuators are an excellent implementation of this and would be a good option for a one source budget system where remote control is not needed. The only problem with this placement was that it was not all that convenient to adjust levels and remote control was not possible. The TAP Bent Unit system combines the 'correct' placement of the attenuators in an easy to use full function system.

The TAP resistor pre-amp is made up of a TAP system controller and then at least one pair of separate attenuator modules – to be located at each amplifier input. This results in a remarkable volume control device with a very clean short signal path including the following features:

- Very small 1db step size from -60 db up to +0db (unity gain)
- 100% passive signal path
- Full remote control of volume, mute, and right/left balance
- Each channel has level trim ability

This document will cover using Bent Units in typical two channel stereo systems. That is by far the most common setup. Note however that you can include as many Bent Units in your system as you'd like to – there is no limit. A six channel system for surround sound can be easily constructed using a TAP system controller and then 6 Bent Units (or 3 Stereo Bent Units).

In this document we'll list the most common Bent Units. There are many other custom Bent Unit configurations that can be built. We can build custom Autoformer Bent Units or even turn a 6 input TAP-X Autoformer pre-amp into a Bent Unit – so it could be run from a separate controller like the TRIK. If you don't see a configuration that suits your system please contact us and chances are we can make one for you.

A few notes about System Connection

The TAP Modular Passive Pre-amp results in quite a few combinations of TAP System Controllers and Bent Units. Before we dive into descriptions of each unit's features and connections we'll first describe how the system connects together.

Every TAP system includes a System Controller. This is the user interface of the system - receiving commands (like volume up, mute, etc) and then displaying the current status of the pre-amp. The System Controller is the 'front panel' of the pre-amp. Since it is entirely separate from your audio system connections it can be located anywhere in the listening room.

Every TAP system also has 2 Bent Units (or a single 2 channel Bent Unit). This is where the action is. The audio signal path is all in this box – separate from the TAP System Controller. This separation is made for one reason only – to allow the attenuator circuits to be placed right at the amplifier inputs. This keeps that all important attenuator to amp cable length VERY short.

The TAP system controller connects to the Bent Units via fiber optic cables. We use easy to obtain standard Toslink cables for this connection. This breaks all electrical connections between the System Controller and the Bent Units.

Important Note:

The fiber optic cable is NOT used as a digital audio cable! Plastic fiber cables are among the worst options for a digital connection. The TAP Modular System only uses this cable to send a data packet to the Bent Unit – telling it what volume to go to, etc. The audio signal is not connected to this cable in any way – in fact the fiber optic cable can be unplugged while the system is playing music and the music will continue on playing just fine. The audio signal path is 100% analog and 100% passive.

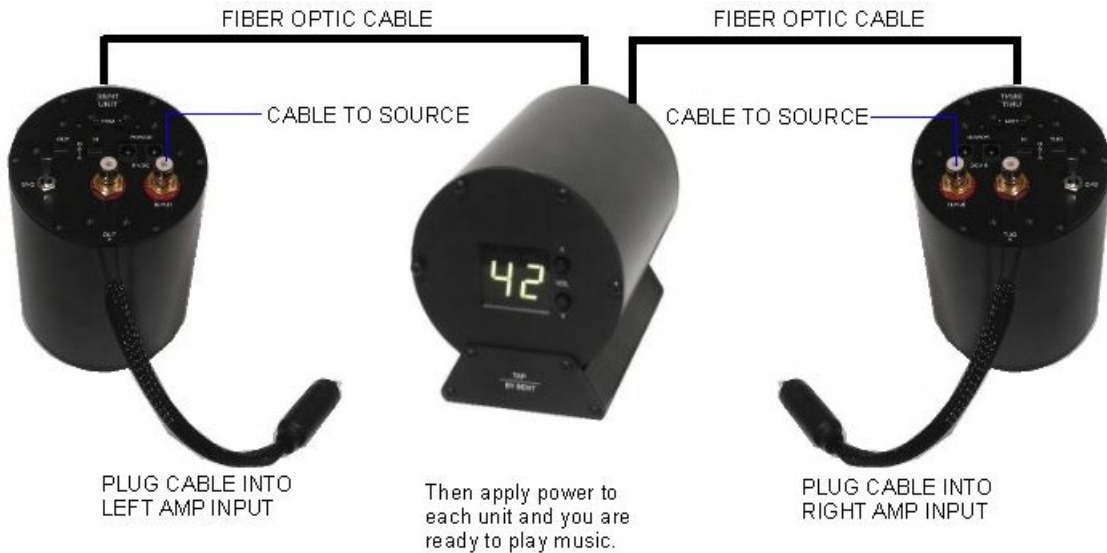
Typical TAP Resistor Passive Pre-amp Example

Here is an example of a TAP system using the MicroTAP Controller and one Bent Unit per channel. This is the most common system configuration. You require only a single interconnect from your source to each Bent Unit – you can't get a cleaner signal path than that!

This system consists of the following parts:

- 1- The MicroTAP Controller (with it's power unit)
- 2- Two Single Input Resistor Bent Units (each with it's power unit)
- 3- Two Fiber Optic Cables

Here is the general hook-up of a system like this:



The MicroTAP Controller can be placed anywhere in the listening room. The fiber optic cables are routed to each Bent Unit and each unit in the system powered up via a small 9VDC supply.

Any TAP System Controller could be chosen in place of the MicroTAP Controller as could any other Bent Unit be used in place of the Mono RCA Bent Units shown.

Remote Handset Functions

The remote handset used is the same for all TAP systems. It's functions are described below.

Display On / Off (The Red button on the upper left corner):

Each button press toggles between the 2 display modes. When the display led is on (display mode on) the display stays on continuously. When the led is off (display mode off) the display will be on while you are using the pre-amp / remote functions and then after a short timeout the display turns off for dark listening.

Mute (Center of volume/balance grid):

This button toggle between mute and normal volume modes. When the mute led is on the system is muted. The mute will be canceled when the volume is adjusted by the remote handset or by the volume knob on the front of the pre-amp.

Volume UP / Down ('+' and '-'):

The volume up and down buttons step the volume up or down 1 step (1db) per button press or if held down continuously they continuously adjust volume.

Balance Left / Right ('<' and '>'):

The Balance Left / Right buttons step the volume levels to adjust the balance. This adjustment moves the sound to the right or left side by 1 volume step per button press (or if held down continuously balance will progressively move in the desired direction). A sliding / alternating balance is implemented where the level adjustment to move balance alternates from left or right, etc... This way the overall volume level of the system is maintained. Also you can slide balance over to one side and then slide it back to the original volume by pressing the opposite balance button. If you hold the button down constantly while moving back towards center then the balance will stop as it reaches center. This is handy when adjusting balance back to the middle point.

Source Select Buttons:

The buttons labeled '1' through '6' on the bottom portion of the remote handset directly access each of the 6 source inputs. This only applies to Stereo 6 Input Bent Units. These direct buttons (rather than next/prev) are used to make sure that macro functions programmed into a (user supplied) advanced programmable handset function repeatably.



TAP System Controller #1 – The MicroTAP Controller

This is a small low cost single display system controller. The MicroTAP Controller has volume up and volume down buttons on the front panel. All TAP system functions operate via the supplied remote handset as described above.



Size: 3-1/2"W x 4-1/4"H x 4-1/4"D

Volume Up:

Volume up can be run via the upper push button on the MicroTAP Controller or via the volume up button on the remote handset.

Volume Down:

Volume Down can be run via the lower push button on the MicroTAP Controller or via the volume down button on the remote handset.

Balance Right / Balance Left:

Even though the MicroTAP Controller only has a single 2 digit level display it can still adjust right/left balance using the remote handset < and > buttons. For user feedback of balance there are 2 small leds just above the display. If balance is centered then both leds are off. As balance is adjusted to the right the rightmost led will turn green then orange and finally red as the balance is adjusted further to the right side. The left led behaves the same way as balanced is adjusted to the left side.

Mute:

If the mute button on the remote handset is pressed the display will change to two dashes ('--') and the system will mute. Pressing the button again (or pressing a volume up or down button) will un-mute the system and the display will return to showing the volume level.

Source Selection:

The remote handset is used to change the source selected. The display will show the source number selected preceded by an underscore (ie. for source 5 it will show '_5') and after a few seconds the display will return to showing the volume level.

TAP System Controller #1 – The MicroTAP Controller

Back Panel Hook-up



Power:

Plug the supplied 9Vdc power adapter into either of the 2 power jacks.

Data Out:

Plug one end of the supplied Toslink Cables into one of the Data OUT jacks. Then plug the other end of each Toslink cable into the “Data In” jack on top of each Bent Unit (located at the amplifier inputs). Alternately – if the system layout suits it better – plug a single fiber optic cable into Data Out on the MicroTAP Controller and plug the end into the “Data IN” on the closest Bent Unit. Then route the second cable from that Bent Unit’s “Data OUT” jack on to the “Data IN” jack on the second Bent Unit. This is an example of a what is called a 'daisy chained' connection.

TAP System Controller #2 – TRIK

The TRIK has a few additional buttons and a rotary level knob but it does not 'sound better' than the MicroTAP Controller. It's the “what the heck is that?” System Controller option.



Size: 17”W x 2”H x 5”D

Buttons (from the left side)

TAPE:

Pressing this button toggles the tape output on and off. This only is used in a system with a 6 input Bent Unit – since that is the only Bent Unit with a tape output. When the Tape Out is on a blue led behind the frosted rod in the front of the trick will light up.

Prev Source:

Pressing this button lowers the source number by 1. If the source selected is already source 1 then the source selected wraps around to source number 6. The source is displayed via the led behind the frosted bar across the front of the unit.

Buffer Mode:

Only of use in systems using the Bent TAP-X Autoformer Pre-amp (configured as a Bent Unit) run from the TRIK Controller. In that system this button toggles between Buffer and 100% passive mode – the input led will turn orange to indicate buffer mode is on. See the TAP-X Instruction Manual for a full description of the buffer mode.

Next Source:

Pressing this button raises the source number by 1. If the source selected is already source 6 then the source selected wraps around to source number 1. The source is displayed via the led behind the frosted bar across the front of the unit.

TAP System Controller #2 – TRIK

Mute:

If the mute button is pressed the frosted display ball will turn off and the blue mute led (behind the frosted rod in the front panel) will turn on and the system will mute. Pressing the button again (or pressing a volume up or down button) will un-mute the system and the frosted display ball will return to showing the volume level.

Volume Knob:

On the far right of the TRIK is the level control knob. Spinning it will adjust the volume up and down. The volume is 'displayed' via the frosted ball on the far left of the unit. The ball will be off for mute then glow blue for lower volumes and then continuously change color to green, orange, and finally red as the volume is raised higher and higher. It's easy to see at a glance from anywhere in the listening room what the current level is set to.

TAP System Controller #2 - TRIK

Back Panel Connections



Power (9VDC):

Plug the supplied 9VDC power supply into the TRIK controller power input. The display will light up. The following is the system configuration of a new TRIK on initial power up:

- Volume is muted
- Source 1 is selected in Normal (no buffer) mode (green led)
- Display Mode is set to match the display toggle on the back of the unit (ON = display stays on / OFF = display goes off after a command is finished).
- TAPE Output is off

Display Toggle:

On the back of the TRIK is a display toggle switch. Since the display mode can also be selected via remote control all this toggle switch does is set the display mode on power up of the system - so after a power cycle it will power up in your preferred mode. The two selections for the toggle are:

'ON' - When this mode is selected the TRIK will power up with the display mode set to ON. In this mode the front panel display will stay on continuously.

'OFF' - When this mode is selected the TRIK will power up with the display mode set to OFF. In this mode the front panel display will be on while the TRIK is executing a command and then turn off after a short timeout period. Use this mode if you prefer to have a dark listening room while listening.

Data OUT:

On the back of the TRIK are 3 Toslink Data OUT connectors. Plug one end of each supplied Toslink Cable into any Data OUT jack. Then plug the other end of each Toslink cable into the "Data In" jack on top of each Bent Unit (located at the amplifier inputs). Alternately – if the system layout suits it better – plug a single fiber optic cable into Data Out on the TRIK and plug the other end into the "Data IN" on the closest Bent Unit. Then route the second cable from that Bent Unit's "Data OUT" jack on to the "Data IN" jack on the second Bent Unit. This is an example of a what is called a 'daisy chained' connection.

TAP System Controller #2 - TRIK

Back Panel Connections

Bypass:

This small push button programs an input to lock the volume level – used to set an input to HT Bypass mode and always jump to a particular volume level when that input is selected. This is only used in systems using 6 input Bent Units. If you only have a single input system then it is unlikely you'll want to program it to always stay on one volume level!

Pressing this button programs the currently selected input to lock to the current volume and pressing the button again 'unlocks' the volume setting. The status of each input is shown via that inputs led:

For normal (unlocked) mode the led is green (or orange if the main path buffer for that input is set to is active mode).

For lock (or bypass) mode the led will turn red.

The HT mode of each input is saved in non volatile memory so even after a power outage this programming is stored inside the TRIK.

Most often this is used to program an input connected to a home theater processor so that the input will jump to level 61 (unity gain) when that input is selected. When a non HT input is once again selected the level jumps back to the prior volume level setting. A level 61 setting connects the input jack directly to the output jack. An alternate level can also be used if you'd like. Each time that source is selected the level will jump to the programmed level and you use the HT processors level control to set the volume - which also controls the other channels such as rear channels, etc... If your HT processor already had it's levels set for the same amplifiers directly connected to the HT Processor then using level 61 (unity gain) on the TRIK will maintain proper surround channel vs main channel levels. If you are installing the processor new or making other changes in the system then you should set the TRIK to an HT mode for that processor input BEFORE you set your surround levels. That way the system levels will be correct each time that input is selected.

The volume could simply be set manually to the same level each time you use that HT input. The HT button is simply a handy way to make the level jump automatically to the same volume each time that input is selected and more importantly to automatically return to the previous level setting when a non HT input is again selected.

NOTE:

In some systems switching to an unused input will cause a small amount of hum at the speakers. This is because with no input connected the signal path is 'hanging in the breeze' picking up whatever noise is floating by. For unused inputs HT mode can be engaged and set to volume level 1. Then when selected the level is so low that there will be no hum.

TAP System Controller #3 - TAP Controller

This controller can be used where more front panel functionality than the MicroTAP Controller is required. It can be configured for special applications to also act as a 6 input switch center to perform source selection in the TAP Modular system. .

Front Panel



Size: 17"W x 2"H x 10"D

Display Button / Led:

Each button press toggles between the 2 display modes. When the led is on (display mode on) the display stays on continuously. When the led is off (display mode off) the display will be on while you are using the pre-amp / remote functions and then after a short timeout the display turns off for dark listening. The Red button on the upper left corner of the remote also toggles the display mode.

TAPE Button / Led:

The TAPE button toggles between TAPE Output On and TAPE Output off. See TAPE output connection details on the 6 input Bent Unit description below for information on how the TAPE Output functions.

Mute Button / Led:

This button toggles between mute and normal volume modes. When the mute led is on the system is muted. The mute button on the remote also toggles mute mode. Adjusting volume via the remote or the volume knob resets the TAP to not muted.

Left Channel Volume Display:

This numeric led displays the current volume of the left channel.

- In Mute Mode the display reads double dashes "--"
- The lowest volume level (level 1) is -60db attenuation
- Unity Gain (0db attenuation) is at level 61

Volume Knob:

Not much to say - it's a volume knob.

Right Channel Volume Display:

This numeric led displays the current volume of the right channel.

- In Mute Mode the display reads double dashes "--"
- The lowest volume level (level 1) is -60db attenuation
- Unity Gain (0db attenuation) is at level 61

TAP System Controller #3 – TAP Controller

TAP Controller – Front Panel (continued)

Just to the right of the Right channel numeric display are the source select functions. These are only of interest when using a 6 Input Bent Unit in the system . If you have only single input Bent Units you are still welcome to press these buttons but it will have no affect on the system.

Source Down Button:

Each button press changes the selected source to the next lower source. If this button is pressed while source 1 is selected the source wraps around to source 6. The current source is indicated via a row of leds just above the source buttons.

Buffer Mode:

Only of use in systems using the Bent TAP-X Autoformer Pre-amp (configured as a Bent Unit) run from the TAP Controller. In that system this button toggles between Buffer and 100% passive mode – the input led will turn orange to indicate buffer mode is on. See the TAP-X Instruction Manual for a full description of the buffer mode.

Source Up Button:

Each button press changes the selected source to the next higher source. If this button is pressed while source 6 is selected the source wraps around to source 1. The current source is indicated via a row of leds just above the source buttons.

Source LEDs:

Above the source/phase buttons are a row of 6 leds. They indicate the selected source number. The left most led is source 1 and the right most led is source 6.

Green = Normal (Buffer Mode Off)
Orange = Buffer Mode On
Red = HT bypass (lock to volume 'xx').

TAP System Controller #3 – TAP Controller

Back Panel



Power Connection:

Once the TAP Main Controller is in position you can connect its power supply. Plug the supplied 9VDC power unit into the power jack on the back panel. There is no electrical connection from the TAP Controller to the audio signal path so any handy outlet can be used. The display will light up. The following is the system configuration of a new TAP-X on initial power up:

- Volume is muted
- Source 1 is selected in Normal (no buffer) mode (green led)
- Display Mode is set to match the display toggle on the back of the unit (ON = display stays on / OFF = display goes off after a command is finished).
- TAPE Output is off

Display Toggle:

On the back of the TAP Main Controller is a display toggle switch. Since the display mode can also be selected via the front panel and via remote control all this toggle switch does is set the display mode on power up of the system - so after a power cycle it will power up in your preferred mode. The two selections for the toggle are:

'ON' - When this mode is selected the TAP will power up with the display mode set to ON. In this mode the front panel display will stay on continuously.

'OFF' - When this mode is selected the TAP will power up with the display mode set to OFF. In this mode the front panel display will be on while the TAP is executing a command and then turn off after a short timeout period. Use this mode if you prefer to have a dark listening room while listening.

Data OUT:

On the back of the TAP are 3 Toslink Data OUT connectors. Plug one end of each supplied Toslink Cable into a Data OUT jack. Then plug the other end of each Toslink cable into the "Data In" jack on top of each Bent Unit (located at the amplifier inputs). Alternately – if the system layout suits it better – plug a single fiber optic cable into Data Out on the TAP Controller and plug the other end into the "Data IN" on the closest Bent Unit. Then route the second cable from that Bent Unit's "Data OUT" jack on to the "Data IN" jack on the second Bent Unit. This is an example of a what is called a 'daisy chained' connection.

Data IN:

The Data IN connection is not used on a TAP System Controller.

TAP System Controller #3 – TAP Controller

Back Panel - Continued

Bypass - Home Theater Bypass Button:

This small push button programs an input to lock the volume level – used to set an input to HT Bypass mode and always jump to a particular volume level when that input is selected. This is only used in systems using 6 Input Bent Units. If you only have one input it is unlikely you'll want to program it to always stay on one volume level!

Pressing this button programs the currently selected input to lock to the current volume and pressing the button again 'unlocks' the volume setting. The status of each input is shown via that inputs led:

For normal (unlocked) mode the led is green (or orange if the main path buffer for that input is set to is active mode).

For lock (or bypass) mode the led will turn red.

The HT mode of each input is saved in non volatile memory so even after a power outage this programming is stored inside the TAP Controller.

Most often this is used to program an input connected to a home theater processor so that the input will jump to level 61 (unity gain) when that input is selected. As a non HT input is once again selected the level jumps back to the prior level setting. A level 61 setting connects the input jack directly to the output jack. An alternate level can also be used if you'd like. Each time that source is selected the level will jump to the programmed level and you use the HT processors level control to set the volume - which also controls the other channels such as rear channels, etc... If your HT processor already had it's levels set for the same amplifiers directly connected to the HT Processor then using level 61 (unity gain) on the TAP Controller will maintain proper surround channel vs main channel levels. If you are installing the processor new or making other changes in the system then you should set the TAP to an HT mode for that processor input BEFORE you set your surround levels. That way the system levels will be correct each time that input is selected.

The volume could simply be set manually to the same level each time you use that input. The HT button is simply a handy way to make the level jump automatically to the same volume each time that input is selected and more importantly to automatically return to the previous level setting when a non HT input is again selected.

NOTE:

In some systems switching to an unused input will cause a small amount of hum at the speakers. This is because with no input connected the signal path is 'hanging in the breeze' picking up whatever noise is floating by. For unused inputs HT mode can be engaged and set to volume level 1. Then when selected the level is so low that there will be no hum.

Bent Units

Any of our attenuator options can be made into mono or stereo Bent Units – including the Autoformer attenuators. Autoformer systems do NOT have to be located close to amp inputs like resistor passive pre-amps do and so those are made up on a special order basis only – to suit particular system needs.

Here we'll describe the most common choices of Bent Units. These are:

- 1- Mono RCA Bent Unit
- 2- Mono XLR Bent Unit
- 3- Single Input Stereo Bent Unit
- 4- Six Input Stereo Bent Unit

In all cases the Bent Unit(s) should be located at the amplifier input. The Mono Bent Units have a short cable to plug into the amp input. If using a stereo Bent Unit with output RCA jacks then use a short (0.5M or less) cable to connect the output of the Bent Unit to the Amp Inputs. All Bent Units use the same high quality Hybrid Attenuator Boards from Bent Audio.

How To Select Bent Units Needed In Your System

If your system has only one source and you use monoblock amps then choose one pair of the Mono Bent Units. If you use XLR connections at both your source and your amplifier. Then use the XLR (fully Balanced) Bent Units.

. If your system has only one source and you use a stereo amp with RCA type connections you may choose either the Mono or Single Input Stereo Bent Units. Most of the time the Mono Bent Units - with their short integral cable - will be the best choice.

If your system has more than one input then choose the 6 Input Stereo Bent Unit.

Important Note:

Since the cost of the TAP Modular Passive Pre-amp system with a 6 Input Stereo Resistor Bent Unit approaches the cost of a TAP-X Autoformer Pre-amp in almost all cases the TAP-X will be the best choice. The Autoformers generally will perform better sonically than the resistor passive. Also because the Autoformer controls are NOT required to be close to the amplifier input the TAP-X can (and is) implemented as a single box pre-amp and is located in your system rack just like an active pre-amp would be. There are cases - such as when putting together a complex surround system – where the 6 input Resistor Bent Unit can be a logical choice as part of that system.

Bent Unit #1 - Mono RCA Bent Unit



Size: 3-1/2"Diam x 5" High

This is the most common Bent Unit and it was shown in the system connection example at the beginning of this document. Designed to be plugged directly in to your amp input this Bent Unit can be run from any of the TAP Controller Options described above.

Inside this Bent Unit is the high quality Bent Audio Hybrid Resistor Attenuator circuit. This circuit combines a very short clean signal path of a shunt type control but has a much more controlled impedance range than a traditional shunt type attenuator. The input impedance is 9K nominal.

The Mono Bent Units are shipped as a pair including one left (white RCA) and one right (red RCA). For multichannel systems they can be configured as neither right or left channels – ie. for a center channel attenuator. This balance function setting can be changed via jumper settings inside the Bent Unit if you need to in the future.

The output cable is an unshielded version of the cable used on the highly regarded MU Moving Coil Step-up. This custom cable is made from OCC copper with a natural wool damping wrap and is of MUCH higher quality than the internal wiring found inside even very high end pre-amps. Think of it as very high quality internal wiring that you happen to be able to see. The second RCA output jack on the top of the Bent Unit may be used to connect to your amp via your own cable but this cable must be kept 0.5M or shorter in length for optimum operation. This second RCA jack can also connect to a nearby subwoofer input.

Single Input RCA Bent Unit

Top Plate



INPUT:

Plug the Interconnect cable from your source into this RCA jack.

OUT:

Plug the integral cable into your amps RCA input jack. If you have a subwoofer then connect an RCA Interconnect cable from the OUT RCA jack on top of the Bent Unit into the subwoofer RCA Input Jack.

DATA IN:

Connect the Toslink Fiber Optic cable from the TAP Controller to the Data In jack on the Bent Unit.

DATA OUT:

If connecting the Bent Unit's from one to another (Daisy Chaining) then connect the Toslink Fiber Optic cable from the DATA OUT jack to the DATA IN jack on the next Bent Unit. Any number of Bent Units can be connected in this way.

POWER:

Connect the supplied 9VDC power unit to either Power Jack on top of the Bent Unit.

Ground (GND) Switch:

This switch is used to optimize the system grounding. The GND selects between two alternate internal grounding options. Try each setting and combinations of settings with other Bent Units in the system to get the system completely quiet.

Trim Up/Down:

These buttons can be used in multichannel systems to adjust the level up or down relative to the other Bent Units in the system. Each button press is a 1db step adjustment. The leds light up to show if trim is adjusted up or down. With both leds off the trim is set to it's middle point – this will be the setting for all two channel systems.

Bent Unit #2 - Mono XLR Bent Unit



Size: 3-1/2”Diam x 5” High

This is a fully balanced (XLR type) Bent Unit. Designed to be plugged directly in to your amp input this Bent Unit can be run from any of the TAP Controller Options described above. This would be a good fit for a system using a single fully balanced source and a fully balanced amplifier.

Inside this Bent Unit is a pair of high quality Bent Audio Hybrid Resistor Attenuator circuit – making it a true balanced attenuator. This circuit combines a very short clean signal path of a shunt type control but has a much more controlled impedance range than a traditional shunt type attenuator. The input impedance is 9K nominal from each side of the connection (pin2 or pin3) to ground (pin1).

The Mono Bent Units are shipped as a pair including one left and one right. For multichannel systems they can be configured as neither right or left channels – ie. for a center channel attenuator. This balance setting can be changed via jumper settings inside the Bent Unit if you need to in the future.

The output cable is an unshielded version of the cable used on the highly regarded MU Moving Coil Step-up. This custom cable is made from OCC copper with a natural wool damping wrap and is of MUCH higher quality than the internal wiring found inside even very high end pre-amps. Think of it as very high quality internal wiring that you happen to be able to see. The second RCA output jack on the top of the Bent Unit may be used to connect to your amp via your own cable but this cable must be kept shorter than 0.5M in length for optimum operation.

Single Input XLR Bent Unit

Top Plate



INPUT:

Plug the Interconnect cable from your source into this XLR jack.

OUT:

Plug the integral cable into your amps XLR input jack.

DATA IN:

Connect the Toslink Fiber Optic cable from the TAP Controller to the Data In jack on the Bent Unit.

DATA OUT:

If connecting the Bent Unit's from one to another (Daisy Chaining) then connect the Toslink Fiber Optic cable from the DATA OUT jack to the DATA IN jack on the next Bent Unit. Any number of Bent Units can be connected in this way.

POWER:

Connect the supplied 9VDC power unit to either Power Jack on top of the Bent Unit.

Ground (GND) Switch:

This switch is used to optimize the system grounding. The GND selects between two alternate internal grounding options. Try each setting and combinations of settings with other Bent Units in the system to get the system completely quiet.

Trim Up/Down:

These buttons can be used in multichannel systems to adjust the level up or down relative to the other Bent Units in the system. Each button press is a 1db step adjustment. The leds light up to show if trim is adjusted up or down. With both leds off the trim is set to it's middle point – this will be the setting for all two channel systems.

Single Input Stereo Bent Unit

Front Panel



Size: 17"W x 2"H x 10"D

Inside this Bent Unit is a pair of the high quality Bent Audio Hybrid Resistor Attenuator circuit boards. It combines a very short clean signal path of a shunt type control but has a much more controlled impedance range than a traditional shunt type attenuator. The input impedance is 9K nominal.

The Stereo Bent Unit is shipped with the channels set for right (Red RCA) and left (White RCA) balance function. For multichannel systems they can be configured as neither right or left channels – ie. for a center channel attenuator. This balance setting can be easily changed via jumper settings inside the Bent Unit if you need to in the future.

Trim Up/Down:

These buttons can be used in multichannel systems to adjust the level up or down relative to the other Bent Units in the system. Each button press is a 1db step adjustment. The leds light up to show if trim is adjusted up or down. With both leds off the trim is not used – this will be the setting for all two channel systems.

Single Input Stereo Bent Unit

Back Panel



IN:

Connect your source component to this RCA input jack. The upper (red) RCA input is for the right channel and the lower (white) RCA input is for the left channel connection. Inputs are staggered to allow easier access to tighten the cable's RCA connectors.

Out 1:

Connect the Output #1 RCA jack to your main amps RCA Inputs. Use cables 0.5M or shorter to make this connection.

Out 2:

If you have a subwoofer or if you bi-amp connect Output #2 to the input RCA jack on the subwoofer or on the bass amp.

Power:

Once the Bent Unit is in position and wired up you can connect it's power supply. Plug the supplied 9VDC power unit into the power jack on the back of the Bent Unit.

Expansion Port IN:

Connect the Toslink Fiber Optic cable from your TAP Controller to this Toslink Input connector.

Expansion Port OUT:

These 3 Toslink Fiber Optic connectors can be connected via Toslink cable to Input Toslink connectors on other Bent Units in the system.

Display Toggle:

The Display Toggle is not used on Bent Units – it is only used on TAP Controllers.

Bypass Button:

The HT (home theater) Bypass Button is not used on Bent Units – it is only used on TAP Controllers.

6 Input Stereo Bent Unit

Front Panel



Size: 17"W x 2"H x 10"D

Inside this Bent Unit is a pair of high quality Bent Audio Hybrid Resistor Attenuator circuit boards. This circuit combines a very short clean signal path of a shunt type control but has a much more controlled impedance range than a traditional shunt type attenuator. The input impedance is 9K nominal.

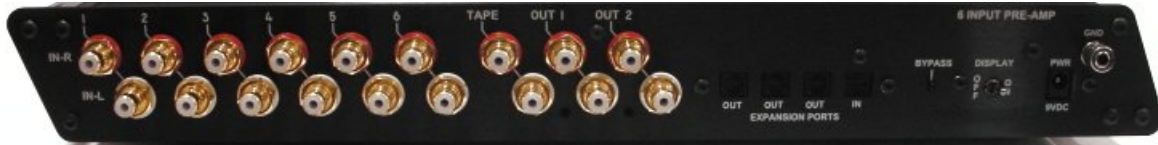
The Stereo Bent Unit is shipped with the channels set for right (Red RCA) and left (White RCA) balance function. For multichannel systems they can be configured as neither right or left channels – ie. for a center channel attenuator. This balance setting can be changed via jumper settings inside the Bent Unit if you need to in the future.

Trim Up/Down:

These buttons can be used in multichannel systems to adjust the level up or down relative to the other Bent Units in the system. Each button press is a 1db step adjustment. The leds light up to show the trim is adjusted up or down. With both leds off the trim is not used – this will be the setting for all two channel systems.

6 Input Stereo Bent Unit

Back Panel



Inputs 1 to 6:

Connect your source components to these RCA input jacks. If you use less than 6 inputs then plug them into adjacent inputs starting at input number 1. The upper (red) RCA inputs are for the right channel and the lower (white) RCA inputs are for the left channel connections. Inputs are staggered to allow easier access to tighten the cable's RCA connectors.

Out 1:

Connect the Output #1 RCA jack to your main amps RCA Inputs. Use cables 0.5M or shorter to make this connection.

Out 2:

If you have a subwoofer or you bi-amp connect Output #2 to the input RCA jack on the subwoofer or on the bass amp.

Tape Output:

Not Often used in a Bent Unit system. If your Bent Unit is in your main rack along with your amplifier(s) then the Tape Out jacks can be used to feed a Tape Deck or CDR's input jack. These output jacks are switched on and off via a button on the front panel of the TAP System Controller (the TAPE button - as you might expect). When the TAPE function is on the output jacks are connected straight from the currently selected input jack - at unity gain just as if you plugged your source directly into your recorder.

Note:

This is a bit different than a traditional 'tape loop'. We have chosen this method over a tape loop because the traditional tape loop introduces additional contacts to the main signal path all the time - even when the tape function is not used. We prefer to keep the main signal path as clean as we can and only add features 'around' that main signal path.

These switched tape outputs can also be used to feed a headphone amp with it's own built in volume control.

Power:

Once the Bent Unit is in position and wired up you can connect it's power supply. Plug the supplied 9VDC power unit into the power jack on the back of the Bent Unit.

Display Toggle:

The Display Toggle is not used on Bent Units – it is only used on TAP Controllers.

Bypass Button:

The HT Bypass Button is not used on Bent Units – it is only used on TAP Controllers.

TAP Modular Pre-amp Features and Specifications

Because all Bent Units share the same circuits for attenuation the specifications below apply to all models.

Features:

- * Continuous 1db Level Steps from -60 to +0db (unity gain)
- * Remote Control of Level, Balance, Input Select, Buffer Mode, Mute, and Display
- * Front Panel Control of Level, Input Select, Buffer Mode, Mute, TAPE, and Display
- * Buffered and Switched TAPE Output (6 input version only)
- * Any Input(s) can be programmed as an HT Input via a simple back panel button press
- * Six input Bent Units = 6 RCA Inputs + Dual RCA outputs.
- * One input Bent Unit = 1 RCA In + Dual RCA outputs
- * Custom Remote Control Handset
- * Display Dark setting for HT or dark listening
- * Bent Units have trim up / trim down buttons for each channel

Performance:

- * Bent Units located at the amp inputs – the only place for a resistor passive to be located!
- * Bent Audio Hybrid Resistor Attenuator Board.
- * 'Teflon like' Arlon PCB Material used for Signal Path Circuit Boards
- * Extreme quality relays rated for billions of operations
- * Modular Design for minimum internal wiring keeping the signal path VERY clean
- * Expansion modules connect via fiber optic cables - no chance of ground loops
- * Entire Control System enters sleep mode after each command - NO clock noise

Endurance:

- * A Minimum of Mechanical Parts - Maintenance free operation
- * All switching via sealed relays rated for billions of operations
- * Optical Encoder Level Control rated for millions of operations
- * Optional Fiber Optic Expansion ports to add unlimited additional channels

Resistor Pre-amp Specifications:

- * Bandwidth: Below 10 Hz to over 100 KHz (+/- 1db)
- * Right Channel to Left Channel Level Matching: Closer than +/- .1dB
- * THD: < 0.01%
- * Step Size: 1db (Mute / -60dB to +0db)
- * Maximum Input Level: > 10V RMS
- * Maximum Channels: Unlimited
- * Inputs: 1 RCA or 6 RCA (depending on Bent Units chosen)
- * Outputs: 2 RCA
- * TAPE Outputs: 1 RCA (6 input version only)
- * HT Bypass Inputs: Any of the 6 inputs programmed as HT via button press