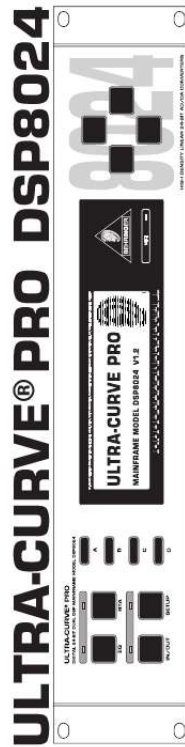




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You can read the recommendations in the user guide, the technical guide or the installation guide for BEHRINGER DSP8024. You'll find the answers to all your questions on the BEHRINGER DSP8024 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual BEHRINGER DSP8024  
User guide BEHRINGER DSP8024  
Operating instructions BEHRINGER DSP8024  
Instructions for use BEHRINGER DSP8024  
Instruction manual BEHRINGER DSP8024



User's Manual

ENGLISH

Version 1.2 June 2001



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**Manual abstract:**

*DETAILED SAFETY INSTRUCTIONS: All the safety and operation instructions should be read before the appliance is operated. Retain instructions: The safety and operating instructions should be retained for future reference. Heed warnings: All warnings on the appliance and in the operating instructions should be adhered to. Follow instructions: All operation and user instructions should be followed. Water and moisture: The appliance should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool etc.). Ventilation: The appliance should be situated so that its location or position does not interfere with its proper ventilaton. For example, the appliance should not be situated on a bed, sofa rug, or similar surface that may block the ventilation openings: or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.*

*Heat: The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat. Power source: The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance. Grounding or polarization: Precautions should be taken so that the grounding or polarization means of an appliance is not defeated. Power-cord protection: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles and the point where they exit from the appliance. Cleaning: The appliance should be cleaned only as recommended by the manufacturer.*

*Non-use periods: The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time. Object and liquid entry: Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings. Damage requiring service: The appliance should be serviced by qualified service personnel when: - the power supply cord or the plug has been damaged; or - objects have fallen, or liquid has been spilled into the appliance; or - the appliance has been exposed to rain; or - the appliance does not appear to operate normally or exhibits a marked change in performance; or - the appliance has been dropped, or the enclosure damaged. Servicing: The user should not attempt to service the appliance beyond that which is described in the operating instructions. All other servicing should be referred to qualified service personnel.*

*2 ULTRA-CURVE PRO DSP8024 FOREWORD Dear Customer, welcome to the team of ULTRA-CURVE PRO users and thank you very much for expressing your confidence in BEHRINGER products by purchasing this unit. It is one of my most pleasant tasks to write this letter to you, because it is the culmination of many months of hard work delivered by our engineering team to reach a very ambitious goal: making an outstanding device better still. The ULTRA-CURVE has for quite a long time been a standard tool used by numerous studios and PA rental companies. The task to improve one of our best-selling products certainly meant a great deal of responsibility, which we assumed by focusing on you, the discerning user and musician. It also meant a lot of work and night shifts to accomplish this goal. But it was fun, too. Developing a product usually brings a lot of people together, and what a great feeling it is when everybody who participated in such a project can be proud of what we've achieved. It is our philosophy to share our joy with you, because you are the most important member of the BEHRINGER family. With your highly competent suggestions for new products you've greatly contributed to shaping our company and making it successful. In return, we guarantee you uncompromising quality (manufactured under ISO9000 certified management system) as well as excellent technical and audio properties at an extremely favorable price.*

*All of this will enable you to fully unfold your creativity without being hampered by budget constraints. We are often asked how we can manage it to produce such high-grade devices at such unbelievably low prices. The answer is quite simple: it's you, our customers! Many satisfied customers means large sales volumes enabling us to get better conditions of purchase for components, etc. Isn't it only fair to pass this benefit back to you? Because we know that your success is our success, too! I would like to thank all people whose help on "Project ULTRA-CURVE PRO" has made it all possible. Everybody has made very personal contributions, starting from the designers of the unit via the many staff members in our company to you, the user of BEHRINGER products. My friends, it's been worth the trouble! Thank you very much, Uli Behringer 3 ULTRA-CURVE PRO DSP8024 ULTRA-CURVE PRO Ultra-high performance digital stereo mainframe powered by two 24-bit high-speed digital signal processors s High-end AKM and CRYSTAL 24-bit AD/DA converters for ultra-high dynamic range and resolution s Open-ended & "future-proof" architecture allows for future software upgrades s Ultra-musical dual 31-band graphic equalizer with "true frequency response" characteristics s Low/high/bell shelving tool with variable slope (3 - 30 dB) s Real time analyzer with peak hold, variable integration, cursor read-out and 10 user-memories s Automatic room equalization using microphone input and internal noise generator s Additional 6 bands of fully parametric equalizer/notch filter with up to 1/60th octave bandwidth s Integral fully automatic feedback destroyer with intelligent signal analyzer for ultra-fast feedback suppression s Integral digital "brick wall" limiter protects against any clipping and dangerous sound pressure levels s Integral digital noise gate with BEHRINGER's unique IRC (Interactive Ratio Control) s Integral delay with up to 2.5 seconds delay time selectable in milliseconds, meter and feet s Ultra-accurate level peak meter with peak hold and selectable reference levels (+4 dBu/-10 dBV/DIG MAX) s Full MIDI parameter and snapshot control for realtime editing s Free EQ-Design software allows for total remote control via PC (download at www.behringer.com) s 100 user memories can be stored under any alphabetic name. Memory backed by a long-life battery s Security key password can be installed for user selective RTA and EQ memory protection and unattended use s EQ and analyzer curves may be copied, compared, added or subtracted for extreme flexibility s Crossfade feature to fade between two settings and stereo link facility to synchronize both channels s 24-bit AES/EBU interface for digital inputs and outputs at 32, 44,*

*1 and 48 kHz (optional) s Large high-resolution LCD graphic display with high-contrast LED backlight s Servo-balanced inputs and outputs on gold-plated XLR and 1/4" TRS connectors for high signal integrity s Relay-controlled hard-bypass with an auto-bypass function during power failure (failsafe relay) s High-quality components and exceptionally rugged construction ensure long life and durability s Internal power supply design for professional applications s Manufactured under ISO9000 certified management system 4 DSP8024 ULTRA-CURVE PRO DSP8024 TABLE OF CONTENTS 1.*



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*INTRODUCTION....*

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Digital audio connections per AES/EBU (optional) .....

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...d 19" rack unit of space (2 U). Please allow at least an additional 4" depth for the connectors on the back panel. Be sure that there is enough space around the unit for cooling and please do not place the ULTRA-CURVE PRO on high temperature devices such as power amplifiers etc.

to avoid overheating. + + Before you connect your ULTRA-CURVE PRO to the mains, please make sure that your local voltage matches the voltage required by the unit! The mains connection of the ULTRA-CURVE PRO is made by using a mains cable and a standard IEC receptacle. It meets all of the international safety certification requirements. Please make sure that all units have a proper ground connection. For your own safety, never remove or disable the ground conductor of the unit or of the AC power cable. As standard, the BEHRINGER ULTRA-CURVE PRO is installed with electronically servo-balanced inputs and outputs. The circuit design features automatic hum rejection for balanced signals, permitting trouble-free operation even at the highest operating levels.

Externally induced power-line hum, etc. is thus suppressed effectively. 6 1.

INTRODUCTION ULTRA-CURVE PRO DSP8024 The automatic servo function recognizes the presence of unbalanced connectors and adjusts the nominal level internally to avoid level differences between the input and output signals (6 dB correction). The optional digital input and output (AES/EBU interface) connections are balanced with a negative ground. High-quality connectors ensure isolated, noise-free signal throughput. The MIDI connections (IN/OUT/THRU) have been realized with standardized DIN plug-in connectors. Optocouplers have been used for isolated data communications. 1.3 Control elements Fig. 1.1: The control surface of the ULTRA-CURVE PRO 1 The heart of the front panel is the LED backlit 240 x 64 active DISPLAY. The control of the ULTRA-CURVE PRO is centered around the central display.

The user interface is for a large part graphical, complemented by four text based setup menus. The function of the softkeys is displayed right next to these keys, their function changes to accommodate different features. To the right of the display you will find the MIDI LED which registers incoming MIDI messages. The EQ key switches the ULTRA-CURVE PRO into equalizer mode. In this mode, the EQ, FEEDBACK DESTROYER, LIMITER and DELAY functions may be used.

The RTA key switches the ULTRA-CURVE PRO into analyzer mode. This mode is solely concerned with measuring and signal generation, the sound will not be affected! IN/OUT key. The ULTRA-CURVE PRO can be switched into the signal path (LED is green) or switched out (bypass, LED dark). The LED flickering red indicates DSP overflow. This does not necessarily mean "clipping".

Flickering starts as soon as an internal overflow in one of the filters occurs, while input and output levels may be o.k. When this LED lights up often, reduce the input level or the ULTRA-CURVE PRO's gain level. The SETUP key allows entry into the setup menus where all the basic adjustments of the device are to be found, such as the choice of input source, sample rate, password protection, MIDI configuration etc. Pressing once will open either the EQ setup or RTA setup, depending on the function of the unit. Holding the key down for two seconds or more will open the general setup windows consisting of a global setup and a MIDI setup window. Pressing the setup key here will toggle between both general setup windows. To the left of the display four SOFTKEYS, labelled A, B, C and D respectively, are to be found arranged vertically. Their functions can be defined by the user software and displayed to the immediate right of each key by the appropriate pictogram in the display. Each pictogram and its associated functions will be comprehensively explained in chapter 2.

You will find function diagrams for both EQ and RTA mode as well as a list of all pictograms used on an extra sheet. To the right of the display the CURSOR KEYS are to be found. These are used: 1. to select individual filter frequencies, and the master fader in equalizer mode (horizontal) 2. to adjust the value of each selected frequency (vertical) 3. to position the measurement cursor in analyzer mode (horizontal) 4. in both operating modes, to choose the program position (vertical) 5. to select a field in the SETUP menu (horizontal and vertical) 1. INTRODUCTION 7 2 3 4 5 6 7 8 ULTRA-CURVE PRO DSP8024 + In each case pressing on the opposite key while holding the key being used will accelerate the operation being carried out. Fig.

1.2: The rear panel layout of the ULTRA-CURVE PRO 9 This is the MAINS CONNECTOR/FUSE HOLDER/VOLTAGE SELECTOR. Before you connect the unit, please make sure that the displayed voltage corresponds to your mains supply. Please note that, depending on the mains voltage supplied to the unit, the correct fuse type and rate must be installed. In some units, the fuse holder can be inserted in two positions to switch between 220 to 240 V and 100 to 120 V. Please note that a higher fuse rating must be used when operating the unit outside of Europe with 115 V (see chapter 6 "INSTALLATION"). Please use the enclosed mains cable to connect the unit to the mains power supply. The MAINS SWITCH is to be found above the mains socket. The switch is situated on the rear panel to make the ULTRA-CURVE PRO tamper proof with unattended use. The unit will bypass on power failure but cannot be bypassed when a password is set.

SERIAL NUMBER. Please take the time to have the warranty card filled out completely by your specialized dealer, and return it within 14 days after the date of purchase, so as to be entitled to benefit from our extended warranty. You may also use our online registration option available on the Internet at

*www.behringer.com. AES/EBU IN and AES/EBU OUT. These are the ULTRA-CURVE PRO's digital input and output (optional). The analog output signal is also present at the (analog) outputs when the digital out is used. Both signals can be used in parallel.*



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These are the ULTRA-CURVE PRO's MIDI connectors (MIDI IN/OUT/THRU).

Via these connectors total remote control is possible. ANALOG OUTPUTS. These are the ULTRA-CURVE PRO's analog outputs. When the AES/EBU option is installed the analog output will still be present at these outputs, so that both analog and digital out can be used in parallel. These are the ULTRA-CURVE PRO's ANALOG INPUTS. This is the MIC INPUT socket for the reference microphone. 10 11 12 13 14 15 16 17 2. OPERATION The BEHRINGER ULTRA-CURVE PRO is a flexible, universally applicable sound processing and measurement device, whose operations may be divided into two basic areas; signal processor (equalizer, limiter) or real Time analyzer (RTA). For this reason, you always operate in either EQ or RTA mode. Simultaneous operation of both is not possible! Upon switching on the ULTRA-CURVE PRO you will be presented either the main equalizer (EQ), or analyzer (RTA) window.

By pressing the EQ or RTA key, the ULTRA-CURVE PRO will switch from RTA- into EQ mode and vice versa. When the ULTRA-CURVE PRO is switched from one mode to the other, the outputs will be briefly muted. 8 2. OPERATION ULTRA-CURVE PRO DSP8024 2.1 EQ mode Fig.

2.1: Main EQ window of the ULTRA-CURVE PRO The display shows a 31-band graphic equalizer, along with the main fader for overall level control--slightly separated on the right hand side. On the left are the pictograms for the softkeys, which are used to open the sub-menus. 2.1.

1 Operating the graphic equalizer The selected controller is illustrated highlighted in the display. The vertical cursor keys are used to adjust levels, the horizontal keys to select the controller to be adjusted. When you depress a cursor key, an information window appears showing the selected frequency, the level of boost or attenuation applied to each of the two channels, as well as the program number and program name: Fig. 2.2: Graphic EQ information window The information window disappears after four seconds if no further key has been pressed. Depressing a key once will result in a parameter changing by the smallest applicable increment. The adjacent fader will be selected, or a level will be adjusted by 0.5 dB. Depressing and holding the cursor key results in a continuous change in the parameter. The rate of change remains constant.

You can increase the rate of change by first depressing and holding the key used to change the relevant parameter, and then--still holding the first key--depress the one opposite. 2.1.2 The level meter By pressing softkey A you leave the main EQ window and access the menu to display levels. Fig. 2.3: LEVEL METER display You can use the level meter to control the input and output levels of the ULTRA-CURVE PRO. The bargraph display controls the effective RMS level (massive parts of the bars), and the peak level (checkered tips of the bars), both simultaneously. To save your eyes, the release time of the peak display is 20 dB/s. The maximum levels are memorized and numerically displayed.

2. OPERATION 9 ULTRA-CURVE PRO DSP8024 When the limiter threshold is exceeded, the indication LIM will appear in the level meter display to indicate that the limiter is attenuating the output. With softkey A With softkey B With softkey C you leave the level meter, and return to the main EQ window. you erase the maximum levels from the memory. / you switch the display from the ULTRA-CURVE PRO input and output.

With key D you can choose between three different tables of reference levels. The 0 dB point is indicated by a bold marker, while at the same time, the numerical display changes. refers to the digital peak level. This level may not--under any circumstances--be exceeded! This will result in a very noticeable form of distortion, which occurs much faster, and sounds very much more unpleasant, than the familiar distortion associated with analog devices. refers to the operating level found in professional audio equipment (analog inputs and outputs of the ULTRA-CURVE PRO).

refers to the operating level found in homerecording and domestic audio equipment, a typical example being tape recorders with RCA connectors. When setting the ULTRA-CURVE PRO internal level, or when using the optional AES/EBU interface, the peak level display of the DIG MAX scale is the only one to use. The +4 dBu and -10 dBV scales serve to monitor the analog inputs and outputs of the ULTRA-CURVE PRO. Please note that the RMS level will usually be quoted in the technical specifications of analog devices for example, for the input sensitivity of power amplifiers. The effective level always lies below the peak level. + The difference between them depends on the signal characteristics for a static sine wave, the effective level is about 3 dB below the peak level. For a dynamic signal the difference is in the region of 8 dB. The DIG MAX level is, of course, related to the analog input and output levels, as 0 dB DIG MAX corresponds to the maximum output level of the ULTRA-CURVE PRO. The following example, using a sine wave at maximum amplitude, clearly illustrates the relationship between the various scales: Reading RMS -3 dB +6 dB +21 dB +16 dBu PEAK 0 dB +12 dB +24 dB Scale DIGMAX +4 dBu -10 dBV  
Maximum level: Tab. 2.

1: Level meter scale correlation As can be seen from the above table, the ULTRA-CURVE PROs maximum analog output level is +16 dBu, or +14 dBV. The ULTRA-CURVE PROs analog inputs can handle signals of up to +21 dBu, but it is important to remember that, in case of such high input levels, the digital limiter may operate if the level in the equalizer is not appropriately lowered. Please refer to the operation of the digital limiter explained in section 2.1.6.

2.1.3 The FEEDBACK DESTROYER By pressing softkey B you leave the main EQ window and go into the FEEDBACK DESTROYER menu. Fig. 2.

4: FEEDBACK DESTROYER menu The display will show the current settings for all six of the ULTRA-CURVE PRO parametric equalizers (selected frequency, bandwidth and degree of boost or attenuation). Additionally it will show whether the parameters are fixed (PAR), or are set for automatic search, to function as the FEEDBACK DESTROYER (AUT or SGL). Auto 10 2. OPERATION ULTRA-CURVE PRO DSP8024 search means that the audio signal is continuously examined for signs of feedback. If feedback is detected, the ULTRA-CURVE PRO will assign an appropriate filter to the relevant frequency and apply narrow band attenuation, also known as a "notch filter".

The parameters which have been used will be continuously displayed. The next feedback will be dealt with by the next available filter. When all the filters have been used, and feedback still occurs, the filter used for the first, or oldest frequency will be released to deal with the newest one. If feedback occurs very close to a frequency already being treated, or reappears at a frequency to which a filter has already been applied, the filter already in use will have its parameters changed to deal with the new problem--i.



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e.

the bandwidth will be widened, or the attenuation increased. In single shot mode (SGL) the filter will not release a setting which has been achieved, this is particularly useful with problems at fixed frequencies like turntable resonances and fixed microphone and monitor positions. If feedback is detected the filter will deal with that frequency and the status of that filter will change to locked (LCK). It will only widen its bandwidth or increase the attenuation but it will not release that frequency to deal with a new feedback frequency. Please note the application example in section 3.2. 2.1.4 Delay By pressing softkey C current status: 1. 2.

= switched off = switched on, signal will be delayed by the preset numerical value. / the built in signal delay can be switched on or off. The display shows the You can set the delay time in the EQ SETUP menu (see chapter 2.1.6). Among its many uses, it can be used to compensate for time path differences between two sets of loudspeakers set at different distances to the listener. See chapter 3.4 for an application example. 2.1.

5 Equalizer editing By pressing softkey D or by using a cursor key, the function of the softkeys is changed, and this is highlighted by a new set of pictograms. With these, you can access either further sub-menus with their own functions, or carry out important switching functions. We remind you to the function diagrams on the extra sheet. They give you an overview of the way all the menus and sub menus are inserted into one other, in EQ and RTA mode respectively. Fig.

2.5: EQ EDITING display You can now enter with softkey A the program administration to store, load and name settings with softkey B the tools menu, with softkey C / the channel switching (stereolink on), / the channel switching (stereolink off) and with softkey D / the comparison functions. Program administration A program contains the settings for the graphic equalizer, the parametric filters and the delay. Softkey A allows access to further sub menus which are used to organize the program administration: a) Loading programs Softkey A : This shows, in the equalizer display, the same information window as shown when operating a fader. However, in contrast to normal equalizer operation, you cannot change the level with the cursor key, instead you can select a new program.

You can confirm this with or cancel it with . In both cases you are then returned back to the EDIT menu. Using softkey D you can reset all the current ULTRA-CURVE PRO settings--the graphic equalizer, the parametric filters (also in feedback destroyer mode) and the delay--to zero. You will first be presented with the 2. OPERATION 11 ULTRA-CURVE PRO DSP8024 question "CLEAR PROGRAM IN MEMORY?" which can be confirmed with at this point and leave the settings as they are. . By using you can stop We recommend that you make use of this feature whenever you have something completely new to do and have to start from scratch. This way, you can carry on without the danger that maybe an old feedback destroyer setting is in the place which could cause problems. In any case it is the quickest and most convenient way to reset all the parametric filters. b) Saving programs Softkey B : The procedure of saving a program is analogous to that of loading one.

The memory location is selected with the vertical cursor keys, is confirmed with or cancelled with . If a program location is already occupied, the warning "OVERWRITE PROGRAM?" will appear. Pressing once more allows you to confirm the save, means it does not take place, and the program already in place remains undisturbed. When is pressed a window is opened where the name can be entered when an empty memory place is used or the previous name can be edited. Important to note here is that program names can have a maximum of twelve characters. You will see a window in the equalizer display, showing the available characters. Choose the character you require with the cursor key, which is to be found in the part of the name field highlighted by blinking. You can change position using / , removes all characters. Having completed the name you wish to use, the arrows keys pressing returns you to the EDIT menu. c)

Additive and subtractive editing of programs Load firstly the program to which you wish to add or subtract another program, then press softkey D . In the pictograms either a plus or a minus will appear or disappear. If you now wish to load and add a program onto the one already in memory, press softkey D until a + appears. Using key A , you can now choose and load a further program, which will be added to the one already in memory. The same procedures apply for subtraction and saving. The tools menu Using softkey B you can enter the sub-menus which contain a number of tools to edit the graphic equalizer. They affect the selected channel, except when the stereolink function is active (see section 2.1.6) when they effect both channels. a) Resetting all faders to zero Softkey A : All the graphic equalizer faders including the master fader will be reset to zero. Having carried this out, you can confirm the changes made with or you can cancel them with .

In either case, you will be then returned to the EDIT menu. With softkey C / or / respectively, you can check the status of each channel on the display, before confirming the changes as mentioned above. While doing this, you cannot make any other changes. b) Inverting the current settings Softkey B This causes the levels of all the graphic faders, with the exception of the master fader, to invert. I. e. a value of +5 becomes -5, -2 becomes +2 etc. This edit can be confirmed as above. c) Copying the current setting to the other channel Softkey C / The current setting will be copied to the other channel. Confirmation as above.

d) The shelving tool : You will be presented with the shelving menu. By repeatedly pressing softkey D you can Softkey D switch between three different tools: creates a shelving curve below the selected frequency. creates a shelving curve above the selected frequency. creates a peaking response centered on the selected frequency. You can use the horizontal cursor keys to choose the frequency at which or from which the tool will operate. You can use the vertical cursor keys to adjust the level. The shelving function is always superimposed upon any graphic or parametric curve already existing in RAM. In other words, the relative levels of adjacent frequency bands are maintained, while the overall slope is altered. You can create curves with varying slopes, the slope can be adjusted, in 3 dB steps, from a slope of 6 to 30 dB per octave. Having confirmed the edit with , the ULTRA-CURVE PRO will leave the shelving mode, and return to the EDIT menu.

By pressing the settings made in the shelving menu will be cancelled, and you return to the EDIT menu. 12 2. OPERATION ULTRA-CURVE PRO DSP8024 Channel switching In the EDIT menu, you can switch back and forth between the two channels, using softkey C. The pictogram for softkey C will show you which channel is active, and whether or not the channels are connected to each other via the stereolink function: left channel, stereolink on right channel, stereolink on left channel, stereolink off right channel, stereolink off.



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Comparison functions Softkey D (A highlighted) or (B highlighted) allows you to compare the current setting with the settings pertaining to the program as it was loaded.

(A highlighted) denotes the program as it was on loading. (B highlighted) denotes the most recent setting. If you are not satisfied with the new setting, you can return to start again. Once you start to edit, the pictogram will change to new status of the program. Upon loading a new program, indicating the "not-yet-edited" status of the program.

2.1.6 EQ setup You can access the EQ SETUP menu by pressing the SETUP key while the ULTRA-CURVE PRO is in EQ mode. The EQ SETUP window appears in the display and the LED above the SETUP key starts to flash. (A highlighted), and from there you can (B highlighted), immediately showing the (neither A nor B highlighted) will be shown, Fig. 2.6: EQ SETUP window You can use the cursor key to choose either the value or the condition to be changed. The active edit field will be highlighted by being displayed inverted. You can change status or value by using the softkeys marked / and / respectively. STEREO LINK ON The intelligent stereolink function links the two channels, forming a stereo pair, in which all adjustments made have an equal, simultaneous effect on both channels.

It is important to understand that this also applies when the two channels have different response curves set! The edits performed will make adjustments of equal value, independent of the original settings. For example: right channel, fader 4 was at +3, increasing 5 dB bring it to +8. Left channel, fader was at -4. It will be moved to +1 (in other words, the incremental changes are the same on both channels, but the absolute settings may still differ from each other). A further point to watch out for is the situation where a fader on one channel has been raised by a value which will take the corresponding fader on the other, linked channel above the maximum boost which the ULTRA-CURVE PRO is capable of making, namely 16 dB. Because this is not possible, all the other faders will be automatically attenuated by the appropriate amount, and the master channel fader will be raised in compensation, in order to achieve the desired frequency response. STEREO LINK OFF Switches off the channel link. The two channels can now be set fully independent of each other. CROSSFADE The CROSSFADE function causes a "soft" or gradual transition from one program when switching into another. This helps prevent any clicks or other noises, which can be caused by very sudden changes to a program.

The faders are seen to creep to their new positions on the display. You may choose the time taken for this to occur, from 0 to 15 seconds being allowed. Please note that a setting of 0 seconds results in a "hard" switch over. 2. OPERATION 13 ULTRA-CURVE PRO DSP8024 possibly causing the noises mentioned above. SHELVING SLOPE This is a tool which you can use to easily add high shelving, low shelving and bell-shaped response curves to the graphic equalizer (see section 2.

1.5 on previous page). LIMIT THRESHOLD The ULTRA-CURVE PRO has an integrated digital limiter to protect against overloading and resulting distortion. Its Attack Time is zero, in other words, it reacts "in advance". This way it acts as a real "brick wall" and can be used in combination with the security password to create an absolute limiter to prevent noise pollution.

The operating threshold of the limiter can be set, in 1 dB steps, anywhere from 0 dB down to -36 dB. The levels given in dB are relative to the maximum output signal (DIG MAX) of the ULTRA-CURVE PRO (0 dB DIG MAX equates to +16 dBu or +14 dBV). Additionally, you can deactivate the limiter by choosing the setting OFF. LIMIT RELEASE When the signal falls below the limiter threshold, the gain reduction is returned to zero. The rate of change is governed by a time constant (release time) which can be defined between 0.5 and 5 seconds. NOISE GATE THRESHOLD You can mute noise (e. g. from a mixing desk, or keyboards) which might appear during program pauses, by using the built in NOISE GATE function. As soon as the signal level is lower than the Threshold you will have set, the ULTRA-CURVE PRO's outputs will be muted.

The Threshold may be anywhere from OFF to -44 dB, the scale again referring to the digital maximum. Additionally, you can deactivate the noise gate by choosing the setting OFF. DELAY The delay is adjustable in steps of 0.1 ms. The maximum delay time you can choose is limited to 2.5 seconds-- for both channels independently, of course. You can adjust the delay value in meters and feet as well. The edited value is automatically converted (temperature 20° C and relative air humidity of 80%). 2.2 Real time analyzer The integrated real time analyzer of the BEHRINGER ULTRA-CURVE PRO enables 1/3-octave measurements with a precision of 0.

25 dB. Of course, you can adapt the display to your own needs and habits. By pressing the RTA key you enter the RTA mode. Fig. 2.

7: Main RTA window The RTA display shows the 31 1/3-octave frequencies, with the overall level to the right, similar in general to the equalizer display. To the left is the pictogram containing the softkeys. By moving the horizontal cursor keys or the one pointing upwards, you can "freeze" the display, simultaneously displaying a set of crosshairs, and an information window (see figure on top of next page). Using the cursor key pointing downwards will make the crosshairs and the information window disappear as well as "de-freeze" the display. The information window displays the precise values pertaining to the selected frequency, along with the number of the RTA program currently in use.

By moving the crosshairs to any given frequency band, or the overall level, you can display the details of the chosen band in the information window. Fig. 2.8: RTA display with information window 14 2. OPERATION ULTRA-CURVE PRO DSP8024 f: the frequency in Hertz of the selected band, act: the level present as the display was frozen, max: the highest level reached on this frequency up to the point in time when the display was frozen (the maximum values stored in memory can be replaced). + The levels displayed in the RTA refer to the digital maximum. PROGRAM: Shows the current RTA program number (1-10). In contrast to EQ programs, it is not possible to name RTA programs. If after approx. four seconds, no cursor key is pressed, the information window will disappear.

The display, however, remains frozen. By re-pressing the RTA key, you can return the ULTRA-CURVE PRO to the dynamic display. 2.2.1 Program administration By using softkey A you gain access to the sub-menus used for program administration. a) Loading measurements Softkey A : The information window appears in the display, and the measurement will simultaneously be displayed in the selected memory location. You can use the vertical cursor key to select the 10 memory locations. In doing this, their current contents will be displayed.



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By using you load the stored measurement. The horizontal cursor may be used here to select individual bands, whose values will also be displayed. stops the loading procedure. In either case, you will then be returned to the RTA menu. Press the RTA key once more when you wish to leave the stored display, and return to the current, dynamic display. b) Storing measurements : Storing involves the same procedure as loading, you choose the memory location with the Softkey B vertical cursor keys, confirm with , cancel with . In contrast to the equalizer, memory locations already filled will be overwritten without further warning.

c) Transferring measurements to the equalizer Softkey C : The measurement currently displayed will be transferred to the equalizer, but with its values inverted (+5 becomes -5 etc.). This feature enables minor compensating settings to be easily made. By means of a sub menu you can decide if you want the measurement to be transferred to the left, the right or both channels: left channel, right channel, both channels. 2.

2.2 Toolbox , you can access the toolbox menu. With softkey A you can start the Using softkey B ULTRA-CURVE PRO automatic measurement sequence. You can choose, using a sub menu, whether to have the left, right, or both channels automatically measured. See for the AUTO-Q function chapter 2.3. With softkey B you can toggle between maximum hold on/off. To indicate that the hold function is on, will become bold. The softkey C will reset the maximum value indicators. + With softkey D or you can switch between manual and automatic level correction for the RTA display.

The pictogram shows the current status. The automatic gain function is very useful in providing an ideal RTA display. Various types of program material and different level will always be displayed conveniently in the middle of the display. In the RTA SETUP menu the gain can be set manually. You can return to the first RTA window by pressing the RTA switch. A quick and convenient way to find a suitable manual gain setting is to engage automatic gain until normal levels are reached and then switch to manual gain. 2.2.3 Choosing a source With softkey C you can decide which signal is to be analyzed. The choices available are shown in the pictogram: : The left channel will be measured.

: The right channel will be measured. mono: the two channels are summed, and then measured. : The signal at the reference microphone Input will be measured. 2.2.

4 Decay With softkey D /// you can set the decay time for measurements. Values of 15, 65, 250 and 1000 milliseconds (1.0 s) can be entered. The current value is shown in the pictogram. Please note that 2.

OPERATION 15 ULTRA-CURVE PRO DSP8024 increasing the decay results in a slower display. + Short decays are necessary to display fast processes, whereas using long decays with static signals will result in a "quieter" display, which is usually desirable for this type of signal. 2.2.5 RTA setup The RTA SETUP menu is opened by pressing the SETUP key. The RTA SETUP window appears in the display and the LED above the SETUP key flashes. Fig. 2.9: RTA SETUP window You can use the cursor key to choose the parameters or values you wish to edit. The currently selected field is highlighted by inverting.

You can change parameters or values with the softkeys marked / and / respectively. SOURCE This field is used, as is the case in the RTA menu to select the signal source for the analyzer. The display here reads as follows: mono, left, right and micro, each referring to the sources available. PEAK HOLD ON = peak level indicator ON, OFF = peak level indicator OFF. RESOLUTION You can use this field to set the resolution of the graphic display, choosing between 0.5 dB per pixel, or 1 dB per pixel. (A pixel is the smallest single point the display screen can generate). When measuring a steady signal e. g. when using pink noise to adjust a loudspeaker system, the use of the finer resolution is recommended.

ANALYZER Used to switch the measurement filter between peak and RMS characteristics. DECAY Setting the decay: 15, 65, 250 or 1000 milliseconds per 20 dB. AUTO-Q CURVE You can use one of the 100 stored equalizer settings as a target curve for the auto-q function. @@GAIN MODE The ULTRA-CURVE PRO analyzer is capable of setting itself dynamically to suit the input signal level. This frees you from adjusting the input level manually.

In this AUTO mode, the gain levels selected by the ULTRA-CURVE PRO will be shown in the respective LINE GAIN and MIC GAIN fields. The automatic adjustment can be switched off (MANUAL). LINE GAIN When operating in manual mode, the input amplification for the internal signal is displayed in this field. It can be adjusted, in 4 dB steps, from 0 to 60 dB. (This feature is solely used in RTA mode).

MIC GAIN As above, for the reference microphone Input. Gain can be adjusted from 20 to 80 dB. MIC CORR You can use one of the stored EQ curves as a corrective curve for the analyzer measurement, to compensate for any frequency response variations caused by the reference microphone. @@NONE = no corrective curve. There are three fields in which you can choose which type of output signal from the ULTRA-CURVE PRO digital generator you wish to use to make a measurement. RTA OUTPUT You can choose the type of output signal you need in this field: PINK = pink noise, WHITE = white noise, SINE 16 2.

OPERATION ULTRA-CURVE PRO DSP8024 = sine wave, OFF = signal generator off or INPUT = input signal. White noise is composed of multitudes of sine waves packed close together, of equal amplitude, whose phases are random compared to each other (statistically different from each other). Their "density" or, spectral intensity is constant at any given frequency. With pink noise, the spectral intensity is inversely proportional to the frequency.

In other words, the intensity of White Noise is constant for an absolute bandwidth e. g. 50 to 100 Hz, or 5,000 to 5,050 Hz whereas for pink noise, the intensity is constant over a relative bandwidth e. g. an octave (50 to 100Hz, 5,000 to 10,000 Hz). The difference between white and pink noise can be highlighted by the following example. By taking a situation where the intensity of both pink and white noise found between 20 and 40 Hz is arranged to be the same for both types of noise, it follows that, in the case of pink noise, the same intensity will be found between 10,000 and 20,000 Hz, both bandwidths being one octave. However, as the number of discrete frequencies between 10,000 and 20,000 Hz is five hundred times greater than between 20 and 40 Hz, it follows that the intensity of White Noise present between these two frequencies is correspondingly greater. SINE f You use this field to set the frequency of the sine wave. It is adjustable in 1/60 octave steps from 20 Hz to 20 kHz.

LEVEL The output level can be adjusted in 1 dB steps from 0 dB to -48 dB (with reference to the digital maximum). The internal digital signal generator is routed into the outputs when you switch into RTA mode.



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As a rule, pink noise is used for system measurement. ++ Use the RTA-lock function to prevent accidental signal interruption when using the ULTRA-CURVE PRO for live purposes. @@@@e.

@@@@@ (The target curves for each channel may differ from each other). @@@@NONE = no corrective curve. @@@@Make sure that the RTA setup is correct. @@@@Pressing the softkey A will open the AUTO-Q menu. @@@@left channel, right channel, both channels, first left, then right. @@@@For example, it will question whether a band has to be boosted by 2. @@@@This will avoid any overloading of the loudspeakers. @@@@The level detected by the ULTRA-CURVE PRO in that region will not be sufficient to boost those frequencies. On the other hand, boosting frequencies beforehand can result in them being loud enough to be automatically equalized. This makes sense when they would normally be unaffected by the automatic procedure. You can for instance boost frequencies below 80 Hz or above 10 kHz to extend the frequency range contributing to the measurement. The latter option will put extra strain on the used system but that can be acceptable under certain conditions i. e. when the levels are relatively low and the highest quality sound is required. The measuring process begins with the automatic levelling.

Then you will notice the coloring of the pink noise test signal. This means that the individual EQ-bands are adjusted. When the auto-Q process is finished the ULTRA-CURVE PRO can be set in EQ mode where it automatically displays the achieved EQ setting. ++ After using the auto-Q it is well-advised to even out great differences between individual bands to avoid overflow problems. Especially in the low frequency region it is best to have a more gentle flowing frequency response. When you want to finish the measuring process prematurely and save the filter setting, press . By pressing the measuring process will be aborted, without changing the original setting. In the event of the error message "NO SIGNAL DETECTED", check the measuring microphone. It is possible that the sensitivity is too low. In this case another microphone should be used, or measuring should be carried out over an external preamplifier.

The adjusted curve is automatically displayed, you can further edit and save this curve. It is important to use a high quality reference microphone with a flat frequency response. The BEHRINGER ECM8000 measurement microphone especially designed for this purpose and forms a balanced combination with the ULTRA-CURVE PRO. Correct positioning is also fundamental to achieving a good result. It is often best to perform several measurements on slightly different locations to avoid problems as overcompensating one single position.

See chapter 3 for correct microphone positioning. 2.4 General setup The SETUP menu consists of four windows. Having the EQ or RTA mode active will determine which window is opened on going into SETUP. Pressing the SETUP key for more than two seconds will enter the general setup mode which consists of two windows, the GLOBAL SETUP window and the MIDI SETUP window.

These windows contain the basic functions shared by, and affecting both operating modes. The basic configuration will be determined in these windows, which will be referred to as the configuration windows. Pressing the setup key will toggle between page 1 & 2. The other windows can only be reached from here by leaving the SETUP menu by pressing either the EQ or RTA key, and then re-pressing the SETUP key to enter the relevant window. Fig. 2.10:

GLOBAL SETUP menu The cursor keys are used to select the value or parameter to be changed. The active edit field will be highlighted in reverse color. Changing status or a value can be achieved by use of the / and / softkeys. INPUT The input field is used to determine whether the input signal should be derived from the optional digital input, or from the analog input.

Furthermore, in analog mode, this is where you can select the sampling rate, 44.1 kHz or 48 kHz. The digital input will automatically synchronize to either 32, 44.1 or 48 kHz. When changing sample 18 2. OPERATION ULTRA-CURVE PRO DSP8024 rates, the ULTRA-CURVE PRO will be muted for approx. 1 sec., as all the filter parameters have to be recalculated. In purely analog mode the 48 kHz rate should be used. Apart from the fact that the high sample rate gives the widest frequency response and correspondingly the best possible sound, at this rate the fastest signal processing takes place.

VIEWING ANGLE Viewing angle controls the contrast adjustment for the display, in increments from 0 to 31. A second possibility to adjust display contrast is pressing cursor UP or cursor DOWN respectively while pressing the SETUP key. RTA LOCK When RTA lock is switched on, it is not possible to enter RTA mode. This is designed to prevent unauthorized or accidental selection of this mode. RTA LOCK should only be deactivated when the ULTRA-CURVE PRO is to be used specifically to analyze sound, or if it is to be used in conjunction with another ULTRA-CURVE PRO operating as an equalizer solely for analysis purposes.

(Think of the consequences of the situation where you are using the ULTRA-CURVE PRO as a PA equalizer, and somebody, by accident, presses the RTA key. This could even, in the worst case, result in the concert sound which you had so carefully equalized being replaced by the pink noise of the analyzer, and this at the full power rating of your system!) SECURITY The SECURITY function offers effective protection against unauthorized use of the ULTRA-CURVE PRO. UNLOCK means, that all functions may be accessed, with the exception of the programs which are secured under PROTECT MEMORY. LOCK prevents any of the adjustment parameters on the device being accessed, the only exceptions being the DISPLAY of the present equalizer setting, plus the input and output level with the LEVEL METER. The only other way to make changes is via MIDI.

In order to use the SECURITY function, a PASSWORD must be entered, which is done using the cursor keys and the softkeys. The softkeys are used to select the letter or symbol to be used, and they have the following functions: Softkey A = Softkey B = Softkey D = confirms entry of the password and immediately activates the LOCK status. and C = move the cursor left and right within the password. erases any characters which may have already been entered. To unlock: go into the SETUP menu. The relevant password field is immediately accessed, and the password may be re-entered. This causes the ULTRA-CURVE PRO to return to the unlock status. If the device is locked without entering the password, simply enter OK to unlock. + Do not forget the password! If this happens, there is only one way to remove it: You must open the casing of the ULTRA-CURVE PRO, and take the battery out for a short while. After replacing it, and switching back on, the original factory presets will be reloaded.

Warning! Doing this means you loose all your programs, and void the warranty! PROTECT MEM The protect memory function switches the write protect for the program memory on and off.



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You can use a password in this case, too. EQ LO/EQ HI The two functions EQ LO and EQ HI determine the area of program memory which will be protected by the protect memory function. EQ LO determines the lowest, EQ HI the highest program number of the protected area. Switching OFF means the protect memory function is deactivated only for the equalizer. RTA LO/RTA HI The two functions operate identically to EQ LO and EQ HI, except they determine the protection of the RTA programs. All the SETUP settings are stored when switching off the ULTRA-CURVE PRO, and remain unchanged until you re-edit them. Refer to the MIDI SETUP for all MIDI settings. Fig. 2.

11: MIDI Setup window 2. OPERATION 19 ULTRA-CURVE PRO DSP8024 MIDI Here the MIDI function is switched on or off. Toggle between ON and OFF with the +/- buttons. CHANNEL This field indicates the current MIDI channel. OMNI MODE signifies that MIDI commands from all channels are received.

SND MEMORY DUMP You can send a MIDI dump using the +/- buttons. The complete memory will be transferred and can be stored externally. RCV MEMORY DUMP You can start the reception of a MIDI dump using the +/- buttons. The externally saved data can be reloaded. CNTL MIDI control change data can be sent and received.

The first controller number is selected using the +/- buttons. The following 64 numbers correspond to the frequencies 20 Hz to 20 kHz and Master. First the left, and then the right channel. PROG MIDI program changes can be sent and received. This is chosen by ON and OFF respectively in the display. EXCL System exclusive data can be sent and received. This is advantageous for communication with the EQ-Design remote control software. 3. APPLICATIONS The open mainframe architecture of the BEHRINGER ULTRA-CURVE PRO with its many audio processing features allows it to be used in a multitude of different ways. The following examples will give you an idea of the versatility of the device.

3.1 Using the ULTRA-CURVE PRO as a summing EQ in a PA This will probably be the most common use for the ULTRA-CURVE PRO. Fig. 3.1: The ULTRA-CURVE PRO as a summing equalizer in a PA 20 3. APPLICATIONS ULTRA-CURVE PRO DSP8024 To obtain the best results the following points should be paid close attention to: Experience has shown that, before beginning to use the equalizer, it is sensible to listen to a variety of music and speech material with which you are thoroughly familiar, playing these references "straight" through the system without any corrective EQ. Should any form of distortion, or unwanted effect be noticed, it will most likely be due to overloading or signal mismatch within the system, which should first be corrected. The importance of loudspeaker positioning cannot be overemphasized! There is no equalizer available which can compensate for sound which is "washed out", imprecise and unclear due to interference from walls or ceilings. You can achieve drastic improvements in sound quality by careful repositioning of your loudspeakers. In the case of an active system with two, three or more loudspeakers served by a crossover you must pay particular attention to travel path time differences and phase coherence between the different components of the system.

(The BEHRINGER SUPER-X PRO CX2310 and CX3400 crossovers, with variable crossover frequency settings, phase reverse and electronic time path correction give you all the tools required to carry out these corrections.) Once the above points have been attended to, the ULTRA-CURVE PRO may be put to work. By using the automatic measurement procedure you will quickly get a usable basic EQ setting. Pay particular attention to the placement of the reference microphone. It should be placed in the direct radiation path of the loudspeaker system and may not be interfered with by anything causing a disturbance in the room acoustic.

Placement behind curtains, less than three feet from side or rear walls, or on a balcony is to be avoided, as these positions inevitably exhibit a "colored", false acoustic. Background noise should be at least 6 dB (preferably 10 dB) below the nominal working level, otherwise it will influence the measurement to the extent that it cannot be relied upon to proceed with a workable system equalization. Disturbances such as mains hum, or narrow band resonances may be effectively eliminated with the ULTRA-CURVE PRO's parametric filters. They should be dealt with before proceeding with a measurement. After the automatic measurement has been completed you have a basic setup, which you should start to finely adjust manually.

A linear or "flat" frequency response is not always the setting to go for. In the case of a system which will be used for speech purposes, the priority has to be ease of intelligibility, which requires that the bass response of the system should fall off. Anything below the fundamental frequency of speech will cause problems. Very low and high frequencies will usually be amplified (carried over) to a much lesser extent. There is no sense in driving a loudspeaker cabinet designed only for speech/vocal use hard at frequencies below 50 Hz. Apart from the increase in power required, this can also result in very expensive loudspeaker repairs. Always be aware of and work within the physical limitations of your system. + If time allows make several measurements with the reference microphone in different positions. The next figure shows some suitable positions for taking measurements. Fig.

3.2: Recommended positions for measurements with the reference microphone 3. APPLICATIONS 21 ULTRA-CURVE PRO DSP8024 Positions 1 and 2 are about three feet directly in front of the loudspeaker system, positioned halfway between the middle and high frequency components. These measurements can be used as a control of the basic system functions. Position 3 is about seven feet in front of the stage centre. Measurements taken here should show an identical response above 250 Hz as obtained from positions 1 and 2. Due to the summing of both loudspeaker systems, the level below 250 Hz should be 3 dB higher. Position 4 is some way back from position 3, directly in front of the FOH mixing position. (FOH means front of house). The measurements here should be the same as at position 3, with a lower level.

Positions 5 and 6 are on the axes of the two loudspeaker systems, three feet away from the rear wall. These measurements are used to detect any problems caused by standing waves or reflections. Make sure to save the resulting frequency response curves for comparison purposes. Any major differences between the various measurements should be interpreted as warnings of phase problems within the system or acoustical problems in the room. If you are not able to deal with the source of these problems (by moving speakers, or changing the venue), then you can only attempt to find a workable compromise with the equalizer.

For this purpose, the various stored measurements will be of great assistance. After reaching the desired frequency settings on the equalizer, walk around the room and pay particular attention to any change in the sound as you move around.



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Don't forget to periodically listen to your reference music and spoken material to help "refresh" your ears and particularly to get a more objective feeling for the characteristics and sound of your system and the room. You must be prepared to invest plenty of time and patience to obtain an effective equalizer setting!

Beware of using extreme settings to achieve the sound you are looking for. They are inevitably a warning that something is wrong with your system.

An equalizer cannot compensate for a bad sound system, however it is a flexible and very useful tool for fine tuning sound. With practice you will see that subtle changes brought about with the equalizer can greatly enhance the ability of your system to deliver a clear, well defined sound, measurably improving its overall quality. 3.2 Using the ULTRA-CURVE PRO for monitor EQ purposes In using the ULTRA-CURVE PRO in a monitor signal path, you should apply the ground rules discussed in the last section for PA use. In addition, the ULTRA-CURVE PRO has a number of features designed specifically to assist in monitor equalizing. The feedback destroyer enables you, during sound check, to locate and control any frequencies causing feedback problems. (In this case, having detected a problem frequency, you match the filter to the frequency by switching to either SGL (Single Shot) or OFF (static) in the FB D menu). In the case of microphones which are constantly moving (typically hand held vocal microphones) the feedback conditions are continuously changing. Use the feedback destroyer filter in searching mode ("S") to compensate for this. The feedback destroyer is only suitable for use with signals with a large, changing dynamic (speech, singing, percussion).

Long, static signals such as synthesizer or flute, whose sound characteristics have similarities to sine waves, cannot be distinguished from feedback, resulting in their signal being constantly dampened. If, in „SEARCH" mode, all the available filters are being used, in the case of a new frequency being found, the "oldest" filter in use will be released from its set frequency and made available for the new one. The feedback destroyer cannot work miracles! It is capable of raising the feedback threshold by several dB. Seeing the feedback destroyer switching on should be interpreted as a warning signal. Lower the overall volume on stage. + The feedback destroyer remains active in all (graphic) EQ menus. In the setup menus as well as the level meter menu the parameters of all filters are fixed. The feedback destroyer pauses activity in these menus. In principle the stage volume really should be kept as low as possible, because: 1. It is better for everybody's hearing, 2.

it results in fewer feedback problems and 3. it is easier to get a good FOH sound. The monitor level tends to rise during the course of a concert. Therefore you should use any pause in the concert to reduce all monitor levels by about 3 dB. This reduction will, if at all, be barely noticeable to the 22 3.

APPLICATIONS ULTRA-CURVE PRO DSP8024 musicians--their hearing will recover sensitivity during a pause--the end result is that you recover valuable headroom. If you are repeatedly using the same monitor loudspeakers, you can save the EQ settings which you have set for these speakers (store them under names such as wedge 15" or drumfill). Extremely low frequencies should be filtered out to avoid a "muddy" stage sound. Set the shelving tool to give you a high pass filter. (Set the shelving slope in EQ SETUP to 12 to 18 dB/oct.

) By using the horizontal cursor keys you can easily change the cut-off frequency for the high pass filter, to enable you to rapidly tailor the monitor sound to suit the program being reproduced. + If you have a large system with a separate monitor mix and more than four independent monitor submixes, we recommend the use of one ULTRA-CURVE PRO solely as an analyzer. The next figure gives an example for the use of several ULTRA-CURVE PRO in a multiway monitor application. The AFL output from the monitor mixing desk is normally used to feed a loudspeaker at the mixing position. You can feed this output through the analyzer line input. The ULTRA-CURVE PRO will then switch its display from microphone to line, and the output signal from the AFL will be present at the line input to be analyzed. Fig. 3.3: Several ULTRA-CURVE PRO in a multiway monitor application 3.3 Using the ULTRA-CURVE PRO in the recording studio There are countless uses for the ULTRA-CURVE PRO in the studio.

The only limits are those set by your own imagination. Here are a few examples: As the equalizer for the studio monitor system. In addition to the usual graphic EQ use, you can use the parametric filters to eliminate narrow band room resonances, standing waves etc. As mastering equalizer. By using the STEREO LINK function you need only set one channel of the equalizer to achieve the desired EQ setting. The parametric filters are also very useful for this purpose. By using the optional AES/EBU digital inputs and outputs you can treat material working solely in a digital environment. + The STEREO LINK function does not apply to the parametric filters! As a sound tool for any purpose. If you are working with a sequencer, you can program the equalizer, via MIDI, to give you a "moving EQ" automation - you can control individual graphic faders, and store their movements per MIDI, enabling you to reproduce the EQ mix settings at any time. 3.

4 The ULTRA-CURVE PRO as a delay unit In a large sound installation loudspeaker systems are often placed a considerable distance away from the stage, or are suspended at a height (flown), in order to give those sections of the audience further away from the stage the same clear, direct sound as those with better positions. In order to compensate for the time differences existing between the main L and R loudspeakers and those further away, the signal to the latter will be sent through an electronic delay device. This usually is a separate line-delay unit designated solely for this purpose. The ULTRA-CURVE PRO removes the necessity of a separate delay unit, as it can produce a signal delay for the material it is processing.

This operates just as comfortably and effectively as having a dedicated delay unit. The delay settings are be stored with the program. If several groups of identical loudspeakers are being used, each having a different Delay time, they can be controlled by a multiple ULTRA-CURVE PRO system, interconnected via the optional AES/EBU digital interfaces, thus avoiding any signal deterioration. If we assume, for the purposes of this example, that the same type of loudspeakers are being used in the various locations, under similar acoustic conditions (e.g. open air), then we can operate the system as follows: The first ULTRA-CURVE PRO in the chain will be set up as in section 3.1, operating here as the signal source.



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