



***RENKUS-HEINZ***

S O U N D   S C I E N C E

# **Model D26**

**Digital System Controller**

# **Owner's Manual**

**Rev. 2**

This equipment has been tested and found to comply with the following European and international

Standards for Electromagnetic Compatibility and Electrical Safety:

Radiated Emissions (EU):	EN55013	(1990)	Associated Equipment
RF Immunity (EU):	EN50082/1	(1992)	RF Immunity, Fast Transients ESD
Mains Disturbance (EU):	EN61000/3/2	(1995)	
Electrical Safety (EU):	EN60065	(1993)	
Radiated Emissions (USA):	FCC part 15 Class B		
Electrical Safety (USA):	UL813/ETL	(1996)	Commercial Audio Equipment
Electrical Safety (CAN):	UL813/ETLc	(1996)	Commercial Audio Equipment

#### **IMPORTANT SAFETY INFORMATION**

**DO NOT REMOVE COVERS. NO USER SERVICEABLE PARTS INSIDE, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL. THIS EQUIPMENT MUST BE EARTHED.**

**IT SHOULD NOT BE NECESSARY TO REMOVE ANY PROTECTIVE EARTH OR SIGNAL CABLE SHIELD CONNECTIONS TO PREVENT GROUND LOOPS. ANY SUCH DISCONNECTIONS ARE OUTSIDE THE RECOMMENDED PRACTISE OF CUSTOMER NAME AND WILL RENDER ANY EMC OR SAFETY CERTIFICATION VOID.**

For continued compliance with international EMC legislation ensure that all input and output cables are wired with the cable screen connected to Pin 1 of the XLR connectors. The input XLR Pin 1 is connected to the chassis via a low value capacitor, providing high immunity from ground loops whilst ensuring good EMC performance.

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## Quick Start - Reference

### AC Power connection

The D26 has a universal voltage AC Power input. Connect the D26 to AC Power with the lead supplied. The unit will switch on automatically (there is no separate on/off switch). The display will show the default screen, with the current program (if selected), and overall system response curves.

### Audio connections

Connect the inputs and outputs as desired. All inputs and outputs are electronically balanced, with Pin 2 hot signal (+ve). Do not put any audio through the unit at this time.

### Program settings

If your D26 has been already configured with a program, you only need to use the RECALL mode to set the parameters to that program.

Press RECALL. Use the Parameter UP/DOWN keys to select the designated program (which has a number and name) and press RECALL again. Programs marked with the letter 'M' are Master 'OEM' programs and have been designed to match specific sound systems.

Some units will be locked to a specific program. In this case most controls will be disabled and the unit will be ready for use.

### Setting up a system

To configure your D26, the mode of the unit should be decided upon before setting up. Once the Config is set (In the Utilities menu), the crossover points, individual band delays, any EQ, and limiter thresholds can be set up.

To enter the Utilities menu, press the RIGHT key from the default screen.

## Configuring the D26

### Band delays

Use the RIGHT/LEFT keys until the delay screen appears. The delay is adjusted by the Parameter UP/DOWN keys. Default settings for display and adjustment of delay is in meters (m), but can be changed to milliseconds (ms), or feet/inches (ft). Bands can also be linked so multiple outputs can be delayed as one using the delay link facility.

### Adding EQ

Use the RIGHT/LEFT keys to move to the EQ screen. The EQ shape can be edited first. The shape of the EQ can be selected from one of the following by pushing the Parameter UP/DOWN keys:

- Hi-Shelf with 12dB slope (Hi12)
- Hi-Shelf with 6dB slope (Hi6)
- BELL
- Low-Shelf with 6dB slope (Lo6)
- Low-Shelf with 12dB slope (Lo12).

Pushing the RIGHT key from the EQ shape screen will access the following facilities, in this order:

Filter Frequency  
Cut/Boost  
Filter Bandwidth

### **Setting the limiters**

There is one screen associated with the limiters of the D26, which allows you to set the limiter threshold.

Push the Parameter UP/DOWN keys to change the threshold. The output meters are calibrated to this threshold, so the threshold will show as 'Set the 0dB point' on the meter at all times, even if the limiters are off.

### **Other features**

- Crossover slopes of 6,12, 18, 24 or 48dB per octave, filter types Butterworth or Linkwitz-Riley, preset at the factory as appropriate.
- Output limiters on each band (mid-filter).
- High resolution input and output delays up to 630 seconds in 22 microsecond steps.
- Input LED metering, showing signals from -20dB to clip level.
- Output LED metering, showing signals from -20dB to +6dB over limit threshold.
- Front panel mutes.
- Polarity reverse on each output.
- Electronically balanced inputs and outputs.
- MIDI and RS-232 ports on rear panel.

### **Voltage setting**

The D26 uses a switched-mode power supply which offers high efficiency and low heat generation. This power supply accepts universal AC Power input voltages in the range 100V AC to 240V AC (nominal), and requires no setting adjustment for AC power voltages in this range. Minimum AC input voltage is 90 Volts, and the maximum is 264 volts. Outside these ranges the unit will not work satisfactorily, if at all. Voltages in excess of the maximum will probably cause damage. Voltages below the minimum will cause complete system shutdown. The flash memory in the unit will preserve all data in the event of a power failure.

### **AC Power fusing**

The Green-and-Yellow wire of the mains cord must always be connected to an installation Safety Earth or Ground. The Earth is essential for personal safety as well as the correct operation of the system, and is internally connected to all exposed metal surfaces. Any rack framework into which this unit may be mounted is assumed to be connected to the same grounding circuit.

The incoming mains power is fused within the D26 by the fuse holder mounted on the rear panel. Always replace with an identical 20mm x 5mm 'T' fuse, rated at 1A for continued protection from equipment damage and fire.

It is most important for continued safety that this specification is strictly adhered to.

## Mechanical Installation

A vertical rack space of 1U (1¾" / 44.5 mm high) is required. Ventilation gaps are unnecessary.

If the D26 is likely to undergo extreme vibration through extensive road trucking and touring, it is advisable to support the unit at the rear and/or sides to lessen the stress on the front mounting flange. The necessary support can generally be bought ready-built as a rack tray. As with any low-level signal processing electronics, it is best to avoid mounting the unit next to a strong source of magnetic radiation, for example, a high power amplifier, to help keep residual noise levels in the system to a minimum.

## Mains Power Connection

### Mains power

**WARNING! THIS APPLIANCE MUST BE EARTHED.**

**IMPORTANT: The wires in the mains lead are colour coded in accordance with the following code.**

- ? The wire which is coloured Green and Yellow or Green must be connected to the terminal which is marked with the letter 'E' or by the Earth signal or which is coloured Green and Yellow or Green.
- ? The wire which is coloured Blue must be connected to the terminal labelled 'N' or coloured Black or Blue.
- ? The wire which is coloured Brown must be connected to the terminal labelled 'L' or coloured Red or Brown.

## Controls

### Input section

#### Store/Recall keys

Program data can be stored to internal memory, and is done by using the store facility. The STORE key also doubles as an ENTER key for confirmation of some actions. Program data is recalled to the unit from internal memory using the recall facility.

#### RIGHT/LEFT Keys

Controller keys for editing parameters displayed by the LCD screen.

#### RIGHT/LEFT/UP/DOWN Access Keys

Controller keys for selecting a parameter to edit.



#### Main Display

The main LCD screen displays current parameters being edited.

#### Input meter

Input signal level referenced to the clip level. Actual signal clipping will occur slightly above the 'clip' indicator.

### Output section

#### Mute LED

Shows the mute status of the output band.

### **Mute key**

Pressing a mute key will toggle the associated band output on and off. The mute LED is illuminated when the output is MUTED. Mute status is saved when a program is stored.

### **Output meter**

Shows the output on each channel relative to the limiter threshold.

### **Rear panel**

#### **Mains power input**

The Power inlet for the D26. Note that there is no On/Off switch for the unit.

#### **RS-232 connector**

For connection to a PC for access to one or more D26s on a MIDI loop, which provides an easy way to upload new software.

#### **6 Band outputs**

The D26 audio outputs are electronically balanced and floating. Transformer balancing is available as a retrofit option.

Pin 1	Shield/Ground
Pin 2	Signal Hot (+)
Pin 3	Signal Cold (-)

#### **2 Channel inputs**

The D26 audio inputs are electronically balanced. Transformer balancing is available as a retrofit option.

Pin 1	Open circuit
Pin 2	Signal Hot (+)
Pin 3	Signal Cold (-)

## **Moving about the screens**

Use the Parameter UP/DOWN keys to move between Default, Utility, Input and Output menus (Horizontal columns).

Use the RIGHT and LEFT keys to move along each menu. Use the Parameter LEFT/RIGHT keys to select a parameter to adjust.

Moving to a new menu may not bring up the first screen shown in each row, as the D26 remembers, and moves you to, the last screen accessed in each menu.

Store and Recall are accessed by pressing their respective keys.

After powering up, the D26 performs internal checks and sets up the audio path before releasing the output mute relays. This takes a few seconds.

## **Default Screen**

When the D26 is powered up the Default Screen is shown. This shows the current program name and number.

### **Utilities Menu**

Pushing the RIGHT key while viewing the default screen will move you into the Utilities menu. The RIGHT and LEFT keys are used to move along the 'Utilities' path, and the Parameter UP/DOWN keys are used to change the selected parameter.

### **Stereo link**

This mode selects whether parameters will be adjusted together, or independently on each channel.

The stereo link pairs in 2 channel 3 way are 1 & 2, 3 & 4 and 5 & 6.

The stereo link pairs in 3 channel 2 way are 1 & 3, and 4 & 6.

Pushing the Parameter UP/DOWN keys selects Stereo Link: ON and OFF.

### **Configuration**

#### **Delay units**

This selects the units used for displaying and adjusting delays. 'ms' represents milliseconds, 'ft' represents feet (and feet and inches for short delays), and 'm' represents metres.

#### **Lock out**

The Lock Out mode prevents access to editing functions on the input and output channels. Since this utility is not password-protected, Lock Out can still be accessed and turned off. This mode is intended only as a precaution against accidental adjustments, and not as a tamper-proof security lock.

#### **MIDI channel**

Here, you can select the MIDI channel that the unit is assigned to (Channels 1 through 16 are available).

#### **Contrast**

This allows you to change the contrast of the LCD display.

#### **(Turn to) MIDI dump**

This mode allows you to dump the current program settings to another D26, or a MIDI storage device for backup.

The default position for this screen is MIDI DUMP: NO. Use the Parameter UP/DOWN keys to select YES will ask you to press STORE to confirm the dump. A percentage complete figure will show how much data has been transferred. When the dump is complete, the screen defaults to NO.

If you are using the MIDI Dump to transfer data to another D26, ensure that both devices are set to the same MIDI channel, and connect the MIDI OUT of the sending device to the MIDI IN of the receiving device. The MIDI Dump mode is totally independent of the MIDI MODE.

#### **(Turn to) Delete program**

This facility allow any stored program to be removed from the unit. Use the Parameter UP/DOWN keys to select the desired program, and press STORE to confirm deletion. Programs marked with a letter 'M' on a D26 cannot be deleted as they are manufacturer Master programs.



## Inputs Menu

There are two inputs available for routing to outputs plus an internal mono sum of inputs A and B, referred to as A+B. This gives the Input Channels:

A, B, and A+B.

The facilities described in this section are common to all inputs, except EQ, which is not possible on the mono sum A+B signal.

The first screen in the input menu is the DELAY SCREEN. Pressing the RIGHT key will access the EQ screens.

### Delay

The delay on each input channel can be adjusted individually, in 22 microsecond steps. Pushing the Parameter UP/DOWN keys will set the amount of delay required on the input. This delay is typically used to set the delay for delay towers etc., or to stagger the delays between the left and right channels to 'move' sound lobes in an installation.

Delays can be viewed and adjusted in metres (default), feet/inches, or milliseconds.

**Note: The maximum delay value is restricted by any delay on an output which the current input feeds.**

Input delay and output delay for any signal path is limited to 630ms.

### EQ

To add EQ to an input, step through the functions on the desired channel using the RIGHT/LEFT keys until you reach the screen that shows the EQ parameter you wish to edit. (See 'EQ screens' for more details).

## Outputs Menu

To select any of the output bands, press the UP/DOWN keys until the output is shown on the screen.

### Name

The first screen in the Output menu is the Name function. Here you can identify each output with a name suitable to its function, selecting from a list of names in the D26, such as SUB, or 2" HORN. Use the Parameter UP/DOWN keys to select the desired name. If the name selected while stereo is NOT linked begins with L<space> or R<space>, then the L or R will not be displayed when stereo linking is on.

### Source

To change the source input, use the Parameter UP/DOWN keys until the desired input source is selected.

### Band gain

Adjusts the output gain from -25dB to +4dB using the Parameter UP/DOWN keys.

### Limiter threshold

The band limiter threshold can be adjusted by pushing the Parameter UP/DOWN keys to set the desired value to match the sensitivity of the amplifier in use. The default units are dBu, but can be changed to mV. CUSTOMER NAME recommends setting the limiter thresholds below the amplifier clipping sensitivity by about 2dB. This prevents any

transient overshoot driving the amplifier into clip and so damaging your loudspeakers. Threshold setting also determines the output meter sensitivity.

### **Delay**

The output delays are most often used to electronically align the driver voice coils with the other drivers in the system, so the sound sources are coherent to the listener. Each increment is only 22 microseconds, which translates in physical terms to a distance of 6.8mm

### **Delay link**

The Delay Link option allows you to control several band delays with a single adjustment. This means that once all the drivers in a single cabinet have been aligned, the whole cabinet can be delayed relative to the input signal, or another cabinet, by linking these band delays as one. Any offsets applied before linking will be retained after linking. In the Delay Link screen, Use the Parameter UP/DOWN keys until the desired linking configuration is shown.

In mono configuration, 1 will link to 2, 2 will link to 3 etc.

In 2 channel 3 way configuration, 1 will link to 3, 3 will link to 5, 2 will link to 4 and 4 will link to 6.

In 3 channel 2 way configuration, 1 will link to 4, 2 will link to 5 and 3 will link to 6.

### **Polarity**

The polarity invert function. Default is uninverted. Pushing the Parameter UP/DOWN keys will invert the polarity of the output. Turning anticlockwise will return the polarity to uninverted.

### **EQ**

To add EQ to an input, step through the functions on the desired channel using the RIGHT/LEFT keys until you reach the screen that shows the EQ parameter you wish to edit. (See 'EQ screens' for more details).

## **EQ Screens**

If the D26 is configured for MONO, all EQs will be mono. If configured for 2x2+1 ("stereo"), EQs will be marked as Stereo 'S' when STEREO LINK is ON, and the stereo marker will show an 'S' next to the EQ number. Available spare EQ filters are also shown.

### **Adding a new EQ:**

If you press the RIGHT key and the screen does not change, then you have reached the last EQ currently in use. To add an EQ, the cut/boost of the highest EQ must be edited. Another EQ (assuming there are spare EQs) will then be inserted automatically.

NOTE: The A+B signal is mixed after the EQ sections on A and B, so the A+B signal is affected by A and B EQ.

### **EQ shape**

The shape of the EQ can be selected from one of the following by pushing the Parameter UP/DOWN keys:

Hi shelving with 6dB slope (Hi6)  
Hi shelving with 12dB slope (Hi12)  
BELL  
Low shelving with 6dB slope (Lo6)  
Low shelving with 12dB slope (Lo12).

### **Frequency**

Pushing the Parameter UP/DOWN keys adjusts the EQ frequency. The filter position is shown graphically by the cursor, and the Frequency of EQs can range between 15Hz and 16kHz.

### **Cut/Boost**

Pushing the Parameter UP/DOWN keys to add boost (+ gain) or anti-clockwise for cut (- gain). Cut/boost is available between +15dB and -15dB, in 0.2dB increments.

### **Width**

Pushing the Parameter UP key widens the EQ (lower Q), pushing the DOWN key makes the EQ narrower (higher Q). EQ Width is available between 0.05 and 3 Octaves, in 0.05 increments.

## **Store and Recall**

Storing and Recalling a program can be done at any time using the STORE and RECALL keys on the left hand side of the LCD, unless Backup and Swap has been turned on. The D26 can hold 60 programs internally. To reset a unit to default values, use the configuration parameter in the utilities screen.

NOTE: If the unit is prompting for confirmation of an action at any time, the STORE key is used to conform the action, and pressing it at this point will not access the STORE facility.

### **Storing**

Pressing the STORE key will access the Store screen.

Use the RIGHT/LEFT keys (or push the Parameter UP/DOWN keys ) to move along the program name.

While the Program number is highlighted, pushing the Parameter UP/DOWN keys will cycle through programs 1-60.

While each of the letters in the Program name are highlighted, pushing the Parameter UP/DOWN keys will cycle through all available characters.

The last space in the program name is reserved for Program lock. Pushing the Parameter UP/DOWN keys will turn this on/off. If a program has this flag set to on (so the program name displays a key at the right hand side), a new program, or edited version of the current program, cannot later be stored in this location. This lock can be turned off at any time in order to delete or overwrite the program. If you try to store a program in place of a locked program, the unit will display "PROGRAM LOCKED!", but will then highlight the key icon, giving you the option to turn off the lock if you wish to overwrite the existing program.

**NOTE: The edit flag appears when there are unsaved changes to a program, compared to the initial status of the last recalled/stored program.** When a program is stored to internal memory, the edit flag will disappear. Once the program name has been entered, and the Program lock status cleared, pressing the STORE key again will prompt the message "STORE UNLOCKED?", asking whether the program should be stored with a Program lock on/off. Use the Parameter UP/DOWN keys to turn the Lock on/off, the default setting being ON. Once the Lock status is set, push the STORE key a final time to commit the program to memory. The display will now default back to the screen displayed before the STORE facility was accessed. To exit from the store screen without storing a program, press the recall button.

### **Recalling**

Pressing the RECALL key will access the recall screen. This facility is displayed in the same way as the store facility.

The Parameter UP/DOWN keys are used to select the program number to recall (when highlighted). When the program you wish to recall has been selected, push the RECALL key again to recall the program. The unit will display a message showing that data is being recalled, and will then display the default screen once the recall is complete.

To exit from the recall screen without recalling a program, press the store button.

## System Security

Any changes made to an audio system have the potential to be damaging, even if only accidentally made. For this reason several different security systems are built in to the D26 to protect the speakers. Each of the security levels locks different groups of variables away from accidental or malicious adjustment.

### Program lock

This is a flag that is available for each stored program. A program can be locked when it is stored - the user is prompted when Store is pressed for the second time. Locking a program in this way is purely to protect the user against accidentally overwriting a stored file. The lock status can be changed by anyone unless the program is OEM locked (see next page).

### Lock mode

The Lock Mode in the Utility Menu can be turned on at any time.

When Lock Mode is set to ON, no variables can be changed except for the Display Angle and Backlight and, of course, the Lock Mode. The user can move around the screens to look at any variable mutes are available to be adjusted.

Locking the unit in this way is only to protect the user against other users changing the system setup accidentally or against unauthorised people intentionally changing the system. This status can be changed by anyone who knows how to operate the D26.

## Specifications

<b>Dynamic Range</b>	Typically >99dB, unweighted 22Hz to 22kHz
<b>Frequency Response</b>	<±0.25dB, 15Hz-20kHz with filters out
<b>Distortion (THD)</b>	<0.01%, 20Hz-20kHz @+10dBu input level
<b>Inputs</b>	Electronically balanced & floating
<b>Input Impedance</b>	10k?
<b>Maximum Input Level</b>	+20dBu, balanced
<b>Outputs</b>	Electronically balanced & floating
<b>Maximum Output Level</b>	+10dBu into 600?
<b>Channel Separation</b>	>80dB, 20Hz-20kHz
<b>Power Supply</b>	AC Mains 50/60Hz, 90V - 264V
<b>Power Consumption</b>	<30VA