



64i – 1.28i – 2.56i

DIGITAL DELAYS

OWNER'S MANUAL

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Release No.1 for <http://www.adadepot.com>

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## 1.0 INTRODUCTION

Thank you for purchasing one of our professional ADA DIGITAL DELAYS, The .64i, 1.28i, and 2.56i combine the latest in digital technology with innovative, yet cost effective designs. They fulfill your long delay and special effects processing needs with full bandwidth at all delay settings, more useful features, and better sound quality than anything else in their respective classes.

To properly set-up and familiarize yourself with your new DIGITAL DELAY, read and follow these operating instructions completely. Also, please take this time to fill-out and return your enclosed WARRANTY CARD.

## 1.1 FEATURES

- .64i —Up to 640ms of delay at 16kHz bandwidth.  
1.28i — Up to 1280ms of delay at 16kHz bandwidth.  
2.56i —Up to 2560ms of delay at 16kHz bandwidth.
- Flanging, chorusing, doubling, slapback, long echos, infinite repeat.
- LED RATE indicator displays delay time for accurate, real-time echo setting.
- WAVEFORM control continuously blends the sweep modulation from triangle to sine to square wave.
- PHASE reversal switch for positive and negative flanging.
- Remote footswitch control of EFFECT BYPASS and REPEAT HOLD (with optional FS-2 DUAL FOOTSWITCH).
- MODULATION LEDS give a visual indication of the speed, direction, and position of the sweep as it moves up and down.
- REGENERATION HI-CUT (EQ) variable between 16kHz to 1.0kHz.
- 8:1 sweep for flanging and chorusing effects that sweep over a wider range than competing digital delays.
- 90dB dynamic range.
- One year parts and labor warranty.

## 1.2 PRECAUTIONS

**WARNING:** To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

**CAUTION:** To prevent electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

## 2.0 CONTROL FUNCTIONS

<b>HEADROOM</b>	A 4-step LED meter with a 30dB range which displays signal level relative to clipping level.
<b>INPUT LEVEL</b>	A boost/attenuate preamp that accepts levels from -10dBV to +20dBV.
<b>INPUT IN</b>	Engages or bypasses the effect section. (LED indicates Effect is engaged.)
<b>OUTPUT MIX</b>	Determines the mix between the delay and dry signal.
<b>OUTPUT LEVEL</b>	Adjusts the EFFECT OUTPUT signal level up to +20dBm.
<b>REGENERATION LEVEL</b>	Controls the amount of the delayed signal fed back to the input.
<b>REGENERATION HI-CUT</b>	Reduces the high frequency content in the delayed audio signal that is fed back to the input. Adjustable from 16kHz to 1.0kHz.
<b>PHASE</b>	Reverses the polarity of the delayed audio signal which is being fed back to the delay line input and to the OUTPUT MIX.
<b>REPEAT HOLD</b>	Engages the infinite repeat function (remotely controllable).

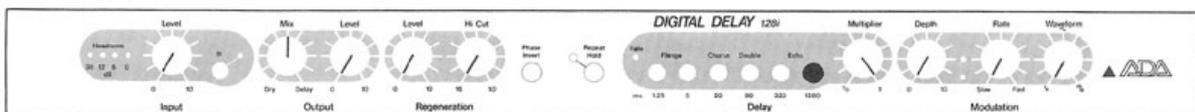


<b>DELAY RATE</b>	LED indicates REPEAT HOLD is engaged.
<b>DELAY RANGE</b>	An LED indicator that "blinks" at the rate of the delay time interval.
<b>DELAY MULTIPLIER</b>	Interlocking pushbuttons for selection of the delay time range.
<b>DELAY MULTIPLIER</b>	Allows a continuous 0.125X to 1X adjustment of any selected delay range.
<b>MODULATION DEPTH</b>	Determines the range of delay time that is swept by the low frequency oscillator.
<b>MODULATION LEADS</b>	Pair of LEDs indicates the speed, direction, and position of the sweep as it moves up and down.
<b>MODULATION SPEED</b>	Sets the speed of the low frequency oscillator that sweeps the delay time. Sweep speed varies from 0.1 sec to 25 seconds.
<b>MODULATION WAVEFORM</b>	Continuously blends the shape of the sweep modulation from a triangle to sine to square wave.
<b>TRIANGLE LED</b>	Indicates power is "ON".

## 2.1 REAR PANEL

<b>FUSE</b>	Externally accessible 0.5AMP fuse. Replace with equivalent type and rating only.
<b>POWER SWITCH</b>	ON/OFF rocker switch (located near power supply to prevent the leakage of AC line hum into the audio circuitry).
<b>REMOTE</b>	Remote control of EFFECT BYPASS and REPEAT HOLD functions. Used with standard ¼" stereo cord and-dual footswitch (momentary type).
<b>EFFECT OUT</b>	A 600 ohm unbalanced output. The level is set with the OUTPUT LEVEL control and carries the mix of dry and delayed signal set by the OUTPUT MIX control.
<b>DIRECT OUT</b>	A 600 ohm unbalanced output of dry signal only. The level is the same as the input signal level.
<b>INPUT</b>	An unbalanced high impedance input which interfaces with low or high impedance sources and low and high signal levels.

**FIGURE 3-1 INITIAL FRONT PANEL SET-UP**



## 3.0 INITIAL SET-UP

ADA DIGITALS interface with a wide variety of input sources including high level microphones, electronic instruments and mixing consoles. The INPUT circuitry is high impedance which functions properly with both low or high impedance sources and low (-10dBV) and high (+24dBV) signal levels.

- (A) To prepare your DIGITAL DELAY for use, set the rear panel POWER SWITCH to the "OFF" position. Also set your amplifier's power switch to the "OFF" position.
- (B) Connect your DIGITAL DELAY'S AC CORD to a grounded outlet.
- (C) Set the front panel controls as shown above (Figure 3-1). ,64i and 2.56i owner's should use the longest delay factor pushbutton, 640ms and 2560ms respectively.
- (D) Connect your signal source to the INPUT jack located on the rear panel.
- (E) Connect the EFFECT OUTPUT on your DIGITAL DELAY to your amplifier input or mixing console effects receive input. The DIRECT OUTPUT is used with a second amplifier for stereo effects.



- (F) Select the "ON" position of the rear panel POWER SWITCH (the TRIANGLE LED should now be lit), then set your amplifier's power switch to the "ON" position.
- (G) Engage the EFFECT IN pushbutton. Your DIGITAL DELAY is now ready for operation.

### 3.1 INPUT/OUTPUT ADJUSTMENT

- (A) The 4-step HEADROOM LED Meter provides accurate monitoring of the input signal level relative to the clipping level. To properly set the input level: find the strongest signal or musical passage that you will put into your DIGITAL DELAY, and set the INPUT LEVEL control to just barely light the red "0dB" HEADROOM LED. The LED should flicker only on the strongest signals or notes **Never set the INPUT LEVEL control so the "0dB" LED is constantly on.**

*Note that the HEADROOM LED Meter monitors, all Signals entering the delay line. The REGENERATION LEVEL control may effect the headroom and therefore the readings. While performing, always remember to monitor the HEADROOM LED Meter for possible overloads.*

- (B) The OUTPUT MIX control mixes the processed signal with the dry input signal. For use with instruments, the control will most often be in its center range. For studio applications where your DIGITAL DELAY is in an effects loop, the MIX control is most useful in the full clockwise, "DELAY", position. The processed signal level (and thus the dry/effect mix) is now controlled at the console.

- (C) The OUTPUT LEVEL control sets the level of the EFFECT OUTPUT whether in bypass or effect "IN" mode. In general, guitar level signals will have the control in its mid-scale or higher, line level signals will generally require positioning the control more counter-clockwise.

Remember, proper setting of the INPUT/OUTPUT LEVEL controls is necessary to achieve maximum performance with the least amount of noise and distortion.

### 3.2 REMOTE FUNCTIONS

EFFECTS BYPASS and REPEAT HOLD are remotely controllable via the rear panel jack labeled REMOTE. The REMOTE jack accepts a standard ¼" stereo cord (tip-ring-sleeve). The stereo cord connects with two momentary footswitches. In the EFFECT BYPASS mode, the input signal source is routed to the EFFECT OUTPUT. BYPASS is actuated by a momentary closure which grounds the tip to the sleeve. The REPEAT HOLD function allows non-deteriorating repeat of any source stored in the delay memory. REPEAT HOLD is actuated by a momentary closure which grounds the ring to the sleeve.

Note that the front panel switches may also be used while the dual footswitch is connected

### 3.3 REGENERATION SECTION

As the REGENERATION LEVEL control is turned clockwise, more of the delayed audio signal is sent back to the input of your DIGITAL DELAY. When using short delay settings, from 0.15 to 40ms, the REGENERATION LEVEL control adds emphasis or resonance to flanging and chorusing. At longer time delays, from 80 to 2560ms the REGENERATION LEVEL control adds repeat echos extending to 50 seconds or more.

Room ambience or naturally reflected sounds are quite different from the original signal because reflective surfaces of a room absorb high frequencies more quickly than low frequencies. ADA DIGITALS can simulate room acoustics by rolling-off the higher frequencies with the continuously variable REGENERATION HI-CUT control. At minimum cut (16kHz), the delayed signal is not altered. In the maximum cut position (1.0kHz), all



regenerated signal content above the mid-range frequencies is attenuated to simulate highly damped room acoustics. The frequency spectrum of the sound source generally decays as it would in a natural environment.

### 3.4 PHASE

The delayed signal's phase is inverted when the PHASE pushbutton is engaged. "Inverted phase" may correct phasing problems in mixing consoles, or alter the tonal characteristics of short delay effects such as resonant flanging and doppler chorusing.

### 3.5 REPEAT HOLD

When engaged, the REPEAT HOLD pushbutton will capture and repeat the signal stored in memory indefinitely without any loss of audio quality. Up to 2560ms (on the 2.561) of a musical passage may be repeated as a counterpoint or a background rhythm.

When your DIGITAL DELAY is initially powered up, an internal protection circuit switches the REPEAT HOLD function out to prevent "howling."

### 3.6 DELAY SECTION

The DELAY MULTIPLIER control allows continuous 0.125X to 1X adjustment of the delay time selected from any one of the interlocking DELAY range pushbuttons. The ranges of each of the DELAY pushbuttons are as follows:

FIGURE 3-2

	Left to right PUSHBUTTON	.64 DELAY TIME RANGES		EFFECT
		MIN	MAX	
#1		.31	2.5	Hi Flange
#2		1.25	10	Lo Flange
#3		5	40	Chorus
#4		20	160	Double/Echo
#5		80	640	Echo

FIGURE 3-4

	Left to right PUSHBUTTON	1.28i DELAY TIME RANGES		EFFECT
		MIN	MAX	
#1		.15	1.25	Hi Flange
#2		.62	5	Lo Flange
#3		2.5	20	Chorus
#4		10	80	Chorus/DbL.
#5		40	320	Double/Echo
#6		160	1280	Echo

FIGURE 3-4

	Left to right PUSHBUTTON	2.56i DELAY TIME RANGES		EFFECT
		MIN	MAX	
#1		.31	2.5	Hi Flange
#2		1.25	10	Lo Flange
#3		5	40	Chorus
#4		20	160	Double/Echo
#5		80	640	Echo
#6		320	2650	Long Echo



### 3.7 MODULATION

The MODULATION DEPTH control allows you to fade between the static setting of the DELAY MULTIPLIER control and the sweeping voltage of the internal low frequency oscillator. When the DEPTH control is set at "0", the delayed signal is not swept and the delay time remains stationary.

As the DEPTH control is turned clockwise, a wider range of the selected time delay is swept. With the DEPTH control set at "10", the full 8:1 range is swept and the MULTIPLIER control is disabled. At settings less than "10", the MULTIPLIER sets the center of the sweep range. The MODULATION RATE LEDS give a visual indication of the sweep speed, the direction the sweep is moving (up or down), and how close the sweep is to its upper or lower limits. The RATE LEDS increase in brightness as they reach their upper or lower limits, giving a visual indication of the point where your effect is starting to "turn around."

The MODULATION WAVEFORM control continuously blends the shape of the modulation function from a triangle to a square wave. Full counterclockwise position of the knob selects a triangle wave for delay times that reach a peak or dip and quickly turnaround — especially useful for flanging effects. Advancing the knob towards the 12 o'clock position selects pure sine wave modulation for delay times that smoothly increase and decrease at a speed corresponding to the RATE control, useful for chorusing and vibrato effects. Full clockwise position selects a square wave for delay times that jump up, then down, for stepped pitch-shifting effects. The MODULATION SPEED control adjusts the low frequency oscillator from (Msec to 25sec. Extremely slow sweeps are useful for chorusing, flanging and subtle effects. Faster sweeps can produce vibrato, fast flanging and rotating speaker simulation.

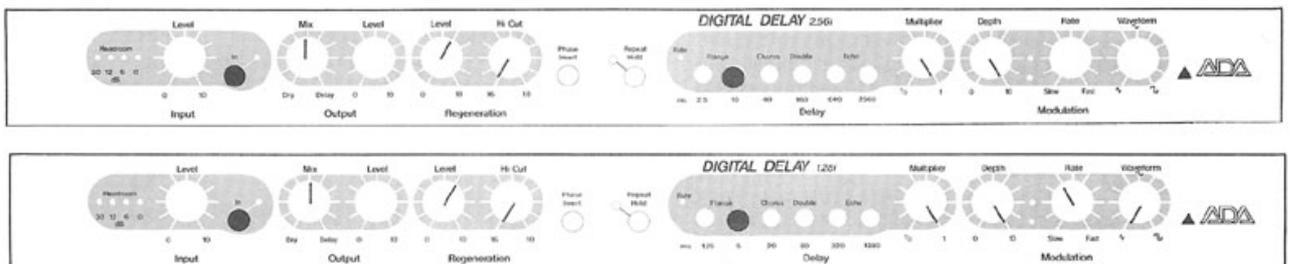
### 4.0 PATCH DIAGRAMS

#### IMPORTANT NOTICE:

.64i OWNERS SHOULD USE DIAGRAMS OF 2.561 TO SET FRONT PANEL CONTROLS, AS THE FIRST FIVE DELAY PUSHBUTTONS ON THE 2.561 ARE IDENTICAL TO THE THOSE ON THE .64

#### FIGURE 4-1 / CLASSIC FLANGE

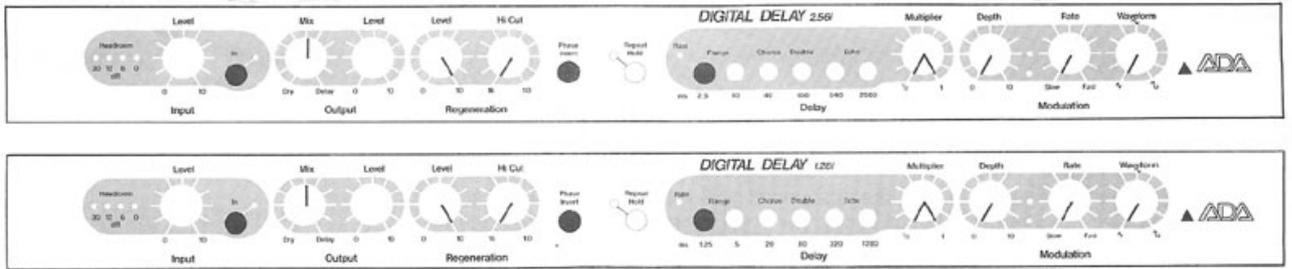
This demonstrates the full 8:1 sweep range of your digital delay. Turning the REGENERATION LEVEL



#### FIGURE 4-2 / EVEN/ODD HARMONIC

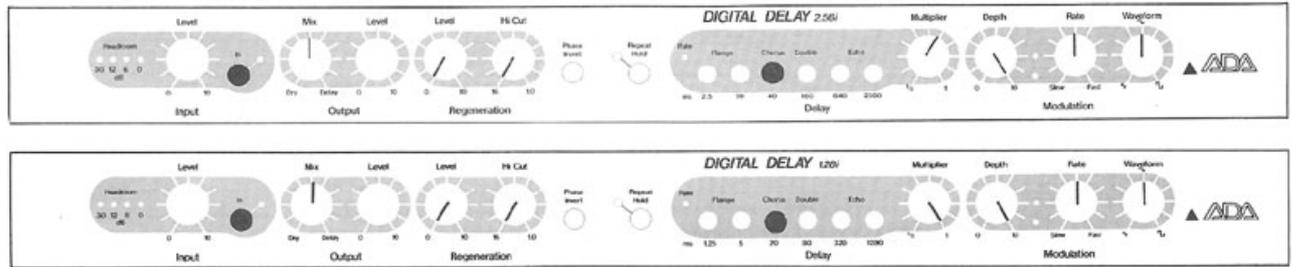
At minimum MULTIPLIER control settings, switch between in-phase and out-of-phase settings with the PHASE switch. Inverted signals will cancel lower-frequencies thereby apparently emphasizing treble content.





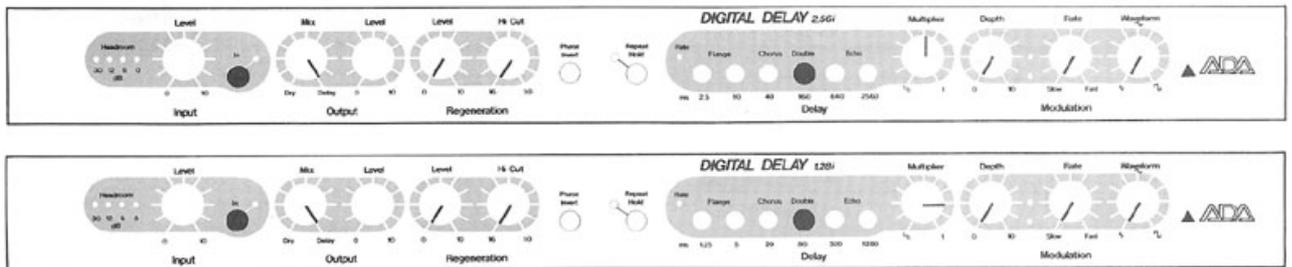
**FIGURE 4-3 / THICK CHORUS**

This is a dramatic, very deep chorus. Adjust the SPEED control for the desired effect.



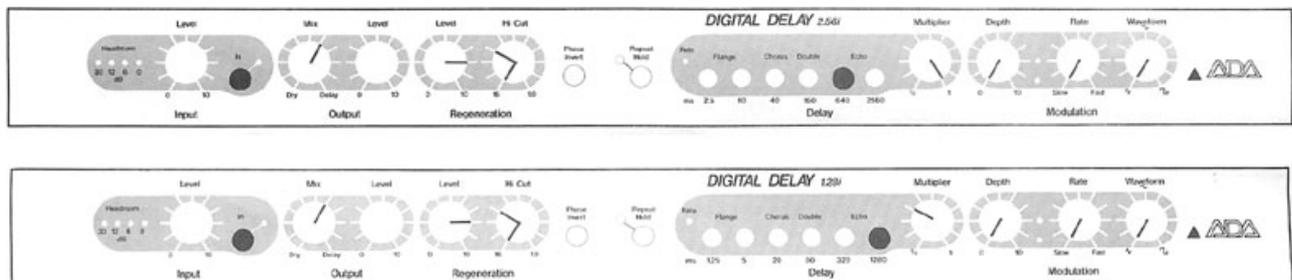
**FIGURE 4-4 / STEREO DOUBLING**

The OUTPUT MIX control is set at full delay (10) for double tracking when using the DIRECT OUTPUT and the EFFECT OUTPUT in a stereo PA or recording system. In mono systems, set the OUTPUT MIX control in its center position (5). A single short repeat of the note or chord is produced for added



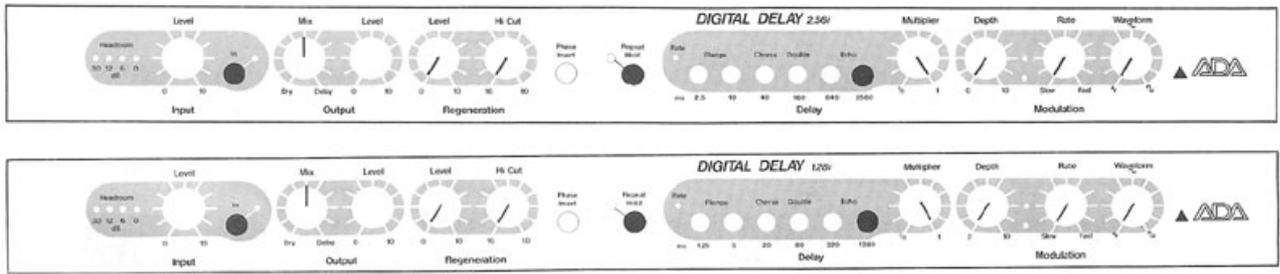
**FIGURE 4-5 / REPEAT ECHO**

By carefully adjusting the REGENERATION LEVEL control, you can select from one repeat to multiple repeats lasting 30 seconds or more. Vary the HI-CUT control to further modify the repeat echo by



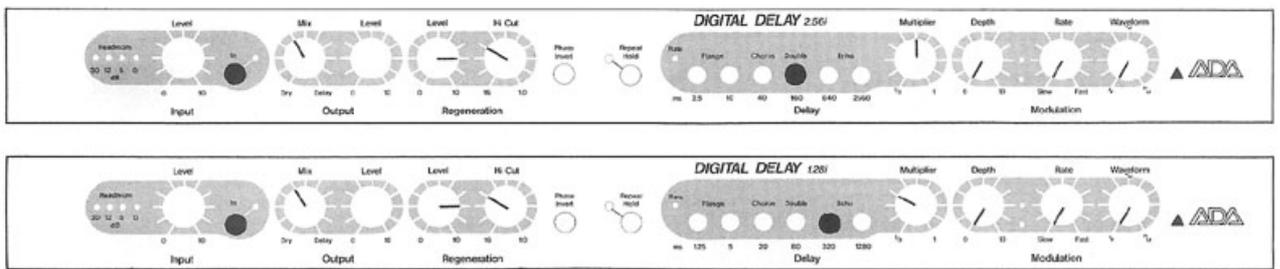
**FIGURE 4-6 / REPEAT HOLD**

This captures, stores, and repeats a segment of sound without signal degradation. The pitch and repeat rate may be modified by using the DELAY MULTIPLIER control. Many useful special effects



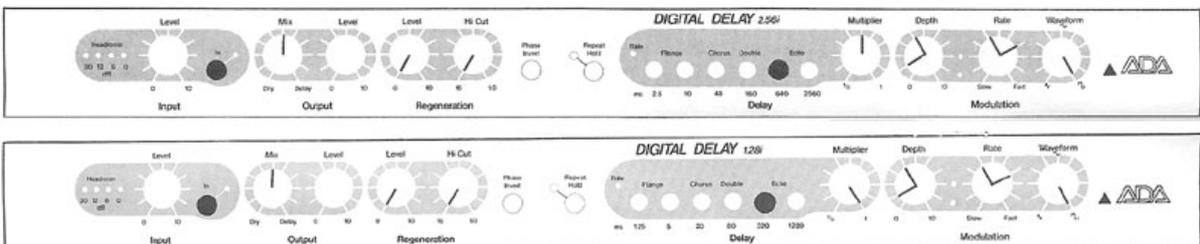
**FIGURE 4-7 / REVERB**

Mixing a higher percentage of dry signal will position the reverb further into the background.

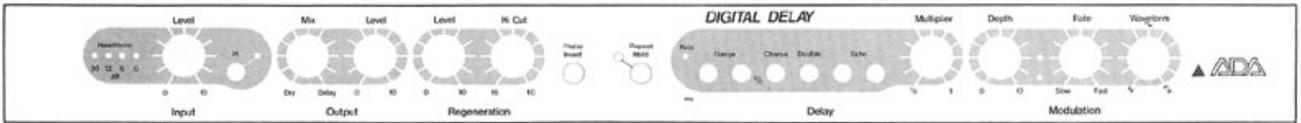


**FIGURE 4-8 / STEPPED PITCH-SHIFTING**

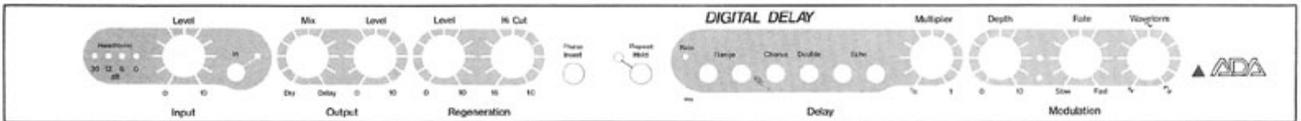
This produces a "stepped" pitch-shifting as the delay time jumps up, then down, according to the SWEEP



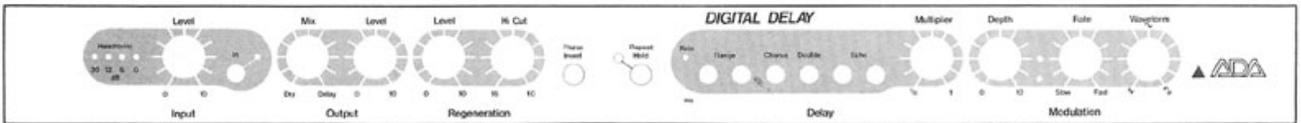
### 4.1 BLANK PATCH SHEETS



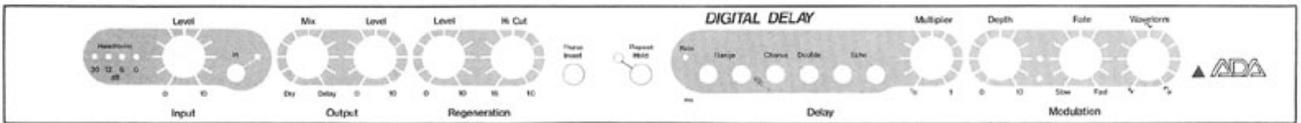
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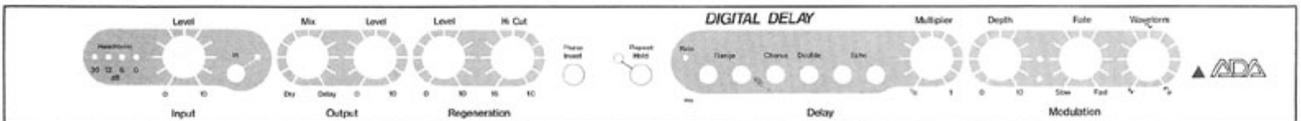
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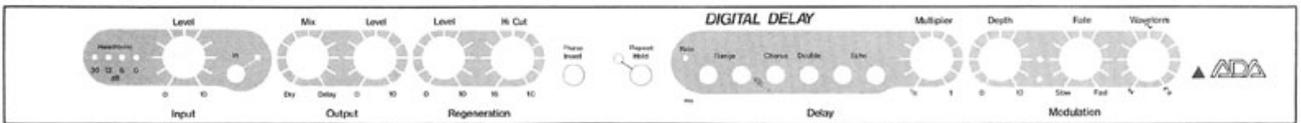
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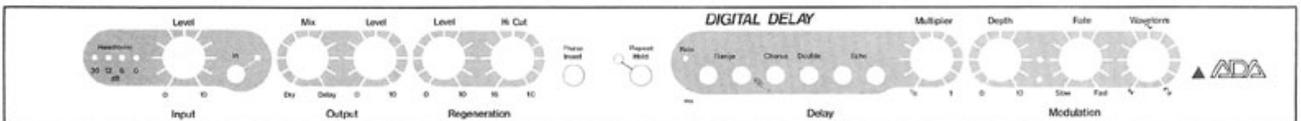
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## 5.0 SPECIFICATIONS

<b>DYNAMIC RANGE</b>		90dB
<b>BANDWIDTH,</b>	<b>DRY</b>	10Hz to 20kHz
	<b>DELAY</b>	20Hz to 16kHz
<b>DISTORTION (THD) @ 1 kHz</b>		dry, 0dBV, 0.5% max. wet, 0dBV, 1.0% max. dry, +4dBV, 0.65% max. wet, +4dBV, 1.2% max.
<b>DELAY RANGE</b>		.64i — 0.31 to 640ms 1.28i — 0.15 to 1280ms 2.56i — 0.31 to 2560ms
<b>MODULATION DEPTH</b>		0 (none) to 8:1
<b>SWEEP SPEED</b>		0.1 sec to 25sec
<b>INPUT</b>		510k ohm single-ended, 1/4" phone jack, handles instrument and single-ended line-level signals.
<b>OUTPUT(S)</b>		Single-ended, 1/4" phone jacks, drives 600 ohms.
<b>MAX. INPUT LEVEL</b>		+20dBV (ref. .775VRMS)
<b>MAX. OUTPUT</b>		+20dBm (ref. 775VRMS)
<b>REMOTE SWITCH LOGIC</b>		Grounding terminal engages.
<b>POWER CONSUMPTION</b>		20 watts
<b>POWER</b>		120 VAC, 50/60HZ
<b>DIMENSIONS</b>		L-10.5" x W-19" x H-1.75" (483 x 44 x 269mm)
<b>WEIGHT</b>		6.5lbs (14.33kg); 10lbs (22kg) shipping
<b>OPTION</b>		220 or 240 VAC 50/60Hz
<b>ACCESSORY</b>		FS-2 DUAL FOOTSWITCH (with 1/4" STEREO CORD)

## 6.0 BLOCK DIAGRAM

