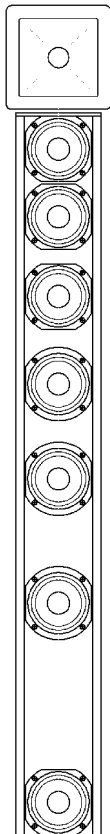
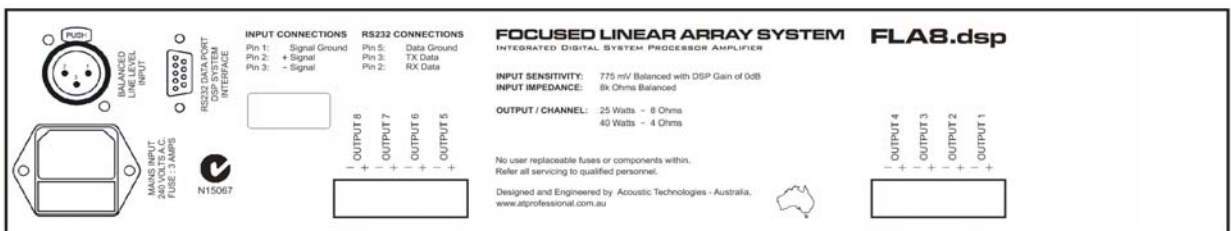
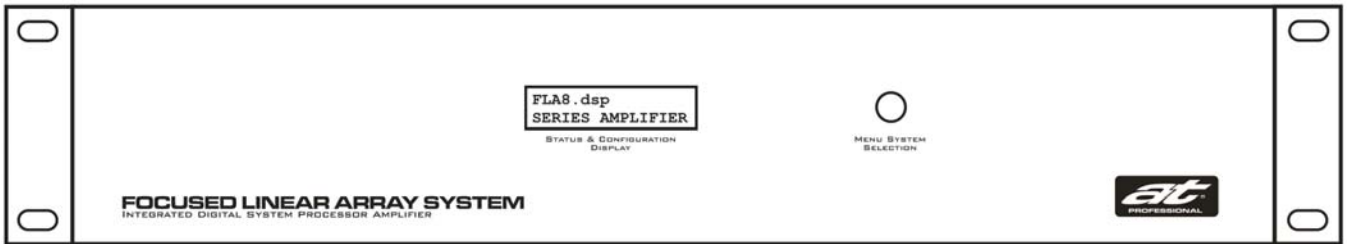
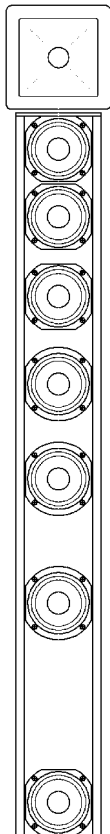


# FLA8.dsp

## FOCUSED LINEAR ARRAY SYSTEM INTEGRATED DIGITAL SYSTEM PROCESSOR AMPLIFIER FOR ALA07C SERIES BEAM STEERED ARRAYS



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**ACOUSTIC TECHNOLOGIES**  
8-10 Staple Street  
Seventeen Mile Rocks  
Queensland, 4073 Australia.

**Telephone (617) 3376-4122**  
**Fax (617) 3376-5793**  
**Email info@atprofessional.com.au**  
**Web www.atprofessional.com.au**

# FLA8.dsp

## OWNERS MANUAL



### FLA8.dsp PRODUCT DESCRIPTION

The Acoustic Technologies FLA8 is an elegantly designed eight channel audio amplifier featuring an extensive and fully integrated Digital Signal Processing system.

The FLA8's DSP Steering Presets perform the complex processing required to implement a Beam Steered Array System which has been tailored for the Acoustic Technologies ALA07C Series of loudspeaker enclosures.

The FLA8 / ALA07C Beam Steered Array System is specifically designed to meet the complex audio amplification requirements often found in sophisticated installations including:

- Houses of Worship
- Courts of Law
- Public Transportation Terminals such as Airports, Bus Terminals, Ship Ways and Railway Stations
- Parliamentary Debating Chambers
- Supermarkets & Shopping Centres
- Conference Centres
- Corporate Board Rooms
- Museums & Art Galleries
- Theatre Foyers
- Public Parks and Performance Spaces
- Difficult Reverberant Acoustic Environments
- Noise Sensitive Areas

The FLA8's amplifiers produce 40 Watts into 4 Ohm Loads, are highly linear, unconditionally stable and feature extensive on-chip thermal management & protection circuitry.

The FLA8 has no end-user controls. During normal operation the amplifier's software operating system is locked, safeguarding the internal DSP Steering Presets and the amplifier's Configuration Options.

However: Suitably qualified system engineers can readily configure the FLA8 to the exact requirements of the overall installation.

The FLA8 is a highly refined system building block, intended for use in professional audio applications.

Such systems will generally employ multiple amplifiers within the overall system. With this in mind the FLA8 is convection cooled, eliminating the noise, maintenance and reliability issues associated with in-built cooling fans.

The FLA8 is a standard 2 Rack Unit component.

In summary: The FLA8, integrated digital system processor amplifier offers superb audio performance with extensive configuration capabilities in a footprint specifically engineered to meet the complex requirements encountered within large scale installations.

---

### FLA8.dsp PRODUCT FEATURES

- Eight High Linearity Integrated Amplifiers
- XLR Electronic Balanced Input
- Amplifiers Muted during Power On & Power Off Events
- Soft Start and Intelligent Mains Monitoring
- Metering of Input Signal prior to DSP Processing
- Phoenix Style Output Connections
- Convective Cooling - No fan maintenance and noise free
- Backlit LCD Display for easy system configuration
- LCD Display information customizable for the installation
- Configurable Options available to the installer
- No Front or Rear Panel Controls
- 2RU system oriented building block

### FLA8.dsp DSP SYSTEM PROCESSING

- Comprehensive Digital Signal Processing providing a tightly Integrated Beam Steered Array System tailored for the Acoustic Technologies ALA07C Series Loudspeakers
- Preset Steering Angles
  - 30.0°
  - 37.5°
  - 45.0°
  - 52.5°
  - 60.0°
  - 70.0°
  - 80.0°
- System Test Preset

### SPECIFICATIONS - AUDIO AMPLIFIERS

Number of Channels	8 Output Channels
Output Power per Channel (See Note 1)	25 Watts RMS @ 1kHz - 8 Ohms 40 Watts RMS @ 1kHz - 4 Ohms
Frequency Response (See Note 2)	10Hz to 22kHz +0dB , -3dB
Input Sensitivity	0.755 Volts RMS for 25 Watts into 8 Ohm
Input Impedance	4k Ohms Balanced Input
Load Impedance	4 Ohms to 16 Ohms
Damping Factor	Greater than 100:1 referenced to 8 Ohms @ 1kHz
Signal to Noise Ratio	Greater than 85dB
Audio Output Connections	Phoenix Style Screw Terminal Plug
Mains Connector & Fuse	IEC Mains Inlet / Fuse Holder. 3 Amp M205 Ceramic Fuse.
RS232 Programming Connector (Factory use only)	Female DB9
User Interface	16 Character x 2 Line LCD with blue Backlight, Recessed push button switch for Menu Selection.
Power Requirements	240 Volts AC @ 2 Amps
Dimensions	Standard 19" x 3½" (2RU) Rack Mount 345mm Deep excluding connectors
Weight	11.2 Kgs Net 13.2 Kgs Shipping

### SPECIFICATIONS - DIGITAL SIGNAL PROCESSING SYSTEM

Steering Angles (See Diagram below for the definition of Steering Angle)	30.0°, 37.5°, 45.0°, 52.5°, 60.0°, 70.0°, 80.0°
Sample Rate	48kHz 256 x Oversampling
Word Size	24 Bit
Internal Processing	48 Bits double precision floating point
Latency	0.833mSec
Dynamic Range	105dB

1. All power measurements conducted according to the IHF202A Standard.

Acoustic Technologies reserve the right to alter or amend the FLA8.dsp without prior warning in the interests of product improvement.

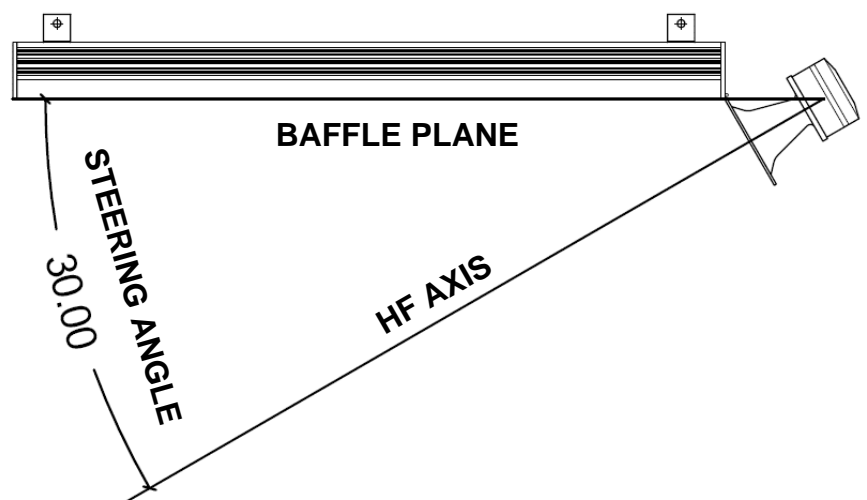
2. Frequency response limits determined by DSP Sample Rate.

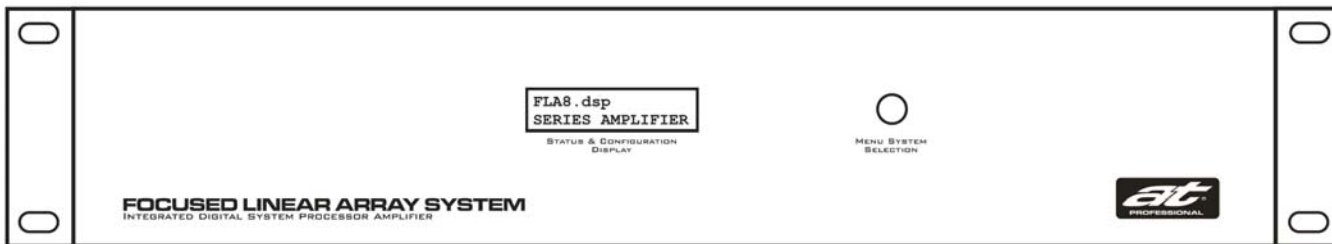
### STEERING ANGLE DEFINITION

The Steering Angle is defined as the angle between the Plane of the Baffle of the ALA07C Enclosure and the Axis of the High Frequency Horn.

The diagram shows the system geometry for a horizontally mounted ALA07C with a Steering Angle of 30.0°

Note that the Steering Angle Definition is the same for horizontally mounted and vertically mounted ALA07C Enclosures.





## LCD DISPLAY - Power On

At power-on the FLA8 Status & Configuration Display (LCD Display) briefly shows the System Software Revision Number and Issue Date.

**[PRESS]** the Menu Key during power-on to increase the time that the System Software Revision Number and Issue Date is shown.

## LCD DISPLAY - Normal / Lock Operation

During Normal / Lock Operation the FLA8 LCD Display scrolls through four screens of information.

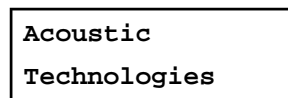
For Screen 3 and Screen 4 custom information such as the location and amplifier application can be displayed.

Note that this information is embedded at the time of manufacture. Contact Acoustic Technologies for additional information on this feature.

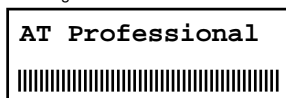
### SCREEN 1

The manufacturer's name.

Information Mode



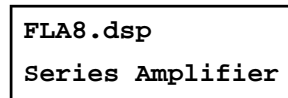
Metering Mode



### SCREEN 2

The product name.

Information Mode



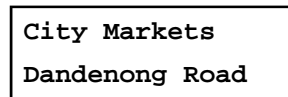
Metering Mode



### SCREEN 3

Custom information such as the installation location.

Information Mode



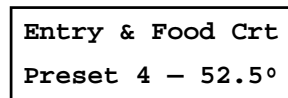
Metering Mode



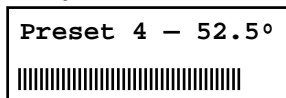
### SCREEN 4

Custom information such as loudspeaker zoning.  
(Only displayed when in Information Mode)

Information Mode



Metering Mode



## LCD DISPLAY - Configure & Program

When the FLA8 is being configured the LCD Display, along with the Menu Key, provides an interactive Menu Selection System allowing all programmed parameters of the amplifier's operation to be selected.

## LCD BACKLIGHT - Normal / Lock Operation

The FLA8's LCD Backlight can be configured to be:

- ON** always,
- ON** for a period of time from **1 - 60 Minutes** or
- OFF** always.

## LCD BACKLIGHT - Programming

When the FLA8 is being configured the LCD's Backlight is always on.

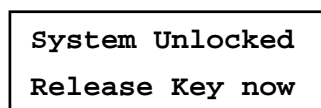
## MENU SYSTEM SELECTION KEY

During Normal / Lock Operation a **[TAP]** or **[PRESS]** on the Menu System Selection Key (Menu Key) switches the LCD Backlight on if it were currently off due to the LCD Backlight Time expiring.

Other than switching the LCD Backlight, there is no apparent response to the Menu Key having being pressed.

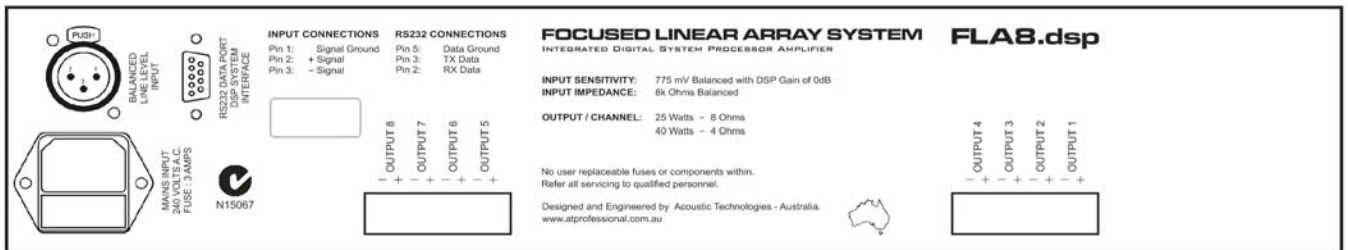
## UNLOCKING THE FLA8

However, continuing to **[PRESS]** the Menu Key for approximately 10 Seconds unlocks the FLA8, providing access to the interactive Menu Selection System.



# FLA8.dsp OWNERS MANUAL

# 4



## MAINS INPUT

The FLA8 amplifier is supplied with and should only use an Authority Approved 3 Pin IEC Mains Power Lead with an Earth Connection.

FLA8 amplifiers are supplied configured for 240 Volt AC Mains operation.

### CAUTION:

*Under no circumstances should an FLA8 Amplifier be operated without a suitable Earth Connection which is provided for important safety reasons.*

## MAINS FUSE

The FLA8 Mains Fuse is located within the IEC Mains Connector Socket. For safety always remove the Mains Power Lead prior to replacing the fuse.

Only use a replacement fuse of the same type and rating as that which was originally supplied with the amplifier.

TYPE: M205 Ceramic  
RATING: 3 Amp

If the Mains Fuse blows repeatedly, investigate the installation for possible causes such as shorted output wiring or inappropriate loads. If the Mains Fuse blows repeatedly with no outputs connected, refer the amplifier to qualified service personnel.

## RS232 DATA PORT

The RS232 Data Port is used by the manufacturer for system initialisation and testing.

## INPUT CONNECTIONS

The FLA8 Balanced Input connection is made via an industry standard XLR connector.

Always use high quality screened audio cable for input cabling, connected as shown on the rear of amplifier.

If an unbalanced output device is being used, connect:

Pin 1 Input Screen  
Pin 2 Input Signal  
Pin 3 Connect to Pin 1

Alternatively, consider using a balancing transformer at the output device end to maximise the rejection of electrical noise at the amplifier's input.

## OUTPUT CONNECTIONS

The FLA8 Output Connections are made via industry standard "Phoenix Style" multi-pin connectors, which are supplied with the amplifier.

Always use high quality cable for loudspeaker cabling, connected as shown on the rear of the amplifier.

Ensure that the cable has sufficient conductor area to minimize ohmic losses in the installation.

### CAUTION:

*Under no circumstances should a channel output be connected to the output of another channel or to mains or amplifier ground.*

## RACK MOUNTING CONSIDERATIONS

The FLA8 is designed as a system oriented building block. The majority of installations will employ several amplifiers within the system.

With this in mind the FLA8 is cooled by convection. Cool air enters through the bottom of the amplifier, flows over the amplifier heat sinks and exits through the chassis top. Convection cooling eliminates the maintenance and reliability issues associated with in-built cooling fans. Furthermore, fan noise in multi-amplifier installations becomes a real issue.

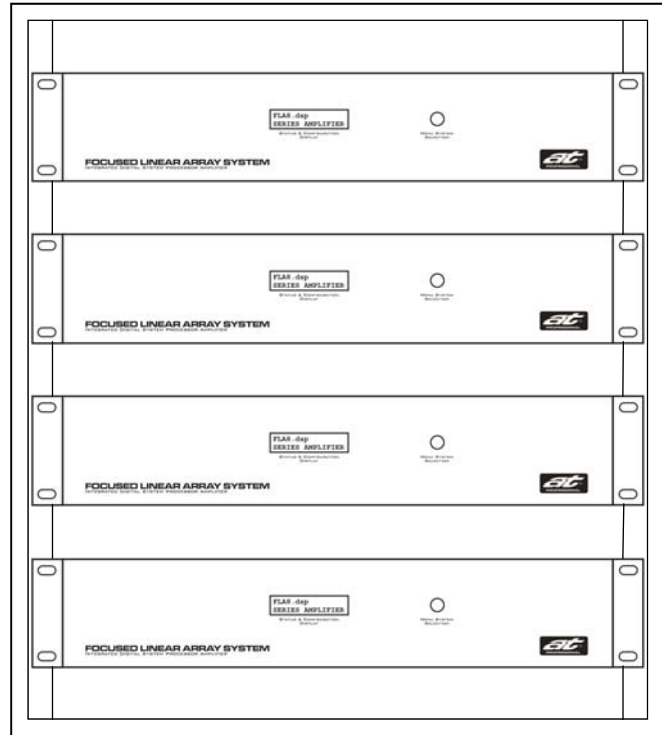
For maximum long term reliability, FLA8 amplifiers should be installed in a professional manner in suitably engineered equipment racks with appropriate attention to cabling, electrical supply and air quality, quantity and flow.

## RACK SPACING BETWEEN AMPLIFIERS

Because the FLA8 is convection cooled, it is mandatory that a 1RU space be allowed between amplifiers.

In addition a non-circulating airflow through the equipment rack should be provided. The inflowing air should be filtered prior to entering the equipment rack.

An environmentally controlled equipment room provides the ideal operating conditions for all electronic equipment, resulting in a long-term high reliability installation.



## FLA8 TERMINOLOGY

### ***NORMAL / LOCKED OPERATION***

Normal / Locked Operation is the normal mode of operation for the FLA8. The LCD Display shows relevant system information and the Menu Key does not respond to casual pushing. Effectively the amplifier's operating system is locked, safeguarding the internal Steering Presets and the amplifiers configuration settings.

### ***STATUS & CONFIGURATION DISPLAY -- LCD DISPLAY***

The Status & Configuration Display (LCD Display) shows relevant system information during Normal / Locked Operation and is used in conjunction with the Menu Key to configure the FLA8.

### ***MENU SYSTEM SELECTION KEY -- MENU KEY***

The Menu System Selection Key (Menu Key) is the push button switch located behind the FLA8's front panel. The Menu Key is used in conjunction with the LCD Display to configure the FLA8.

### ***MENU SELECTION SYSTEM***

The Menu Selection System is the FLA8's internal software which allows access to the amplifier's configuration settings.

The installer interacts with the Menu Selection System using the LCD Display and the Menu Key.

### ***CONFIGURE***

Configuring a FLA8 means to access, change and save parameters that control the overall operation of the FLA8. Configurable Parameters are Steering Preset, LCD Backlight Time, Autolock and Information/ Metering Mode.

### ***TAP the Menu Key***

**[TAP]** the Menu Key means a short push and immediate release of the Menu Key, typically less than 200mSecs.

**[TAP]** is used to select from a set of values for a Parameter Option such as Backlight Time.

### ***PRESS the Menu Key***

**[PRESS]** the Menu Key means to push and hold the Menu Key, typically longer than 500mSecs.

**[PRESS]** is used to scroll through the Menu Selection System and is also used to exit from various operations.

## USING THE MENU SELECTION SYSTEM

The FLA8 Menu Selection System is accessed by a **[PRESS]** of the Menu Key. The Menu System scrolls the available Configuration Options on the LCD Display in the order shown on the following page of this manual.

When the required Configuration Option is showing on the LCD Display, release the Menu Key to select that Configuration Option for change.

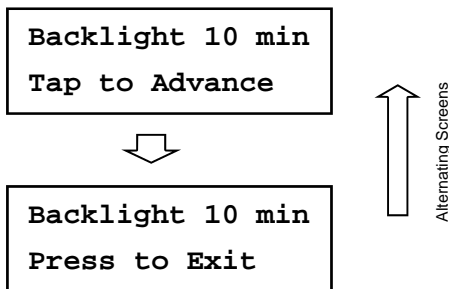
## CHANGING AN OPTION VALUE

After a Configuration Option has been accessed for change, the FLA8 prompts the operator to select a new value for the selected Configuration Option or to Exit to the Menu Selection System.

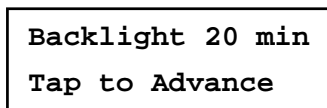
### Using Backlight Time as an example:

The LCD Display will alternate between the two screens shown below which show that the current Backlight Time is 10 minutes.

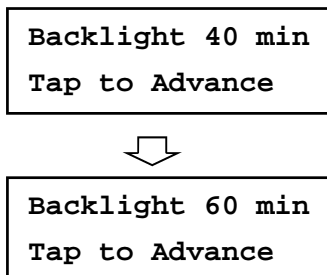
The LCD Display is prompting for an operator action.



A **[TAP]** on the Menu Key will advance the Backlight Time to the next available value, which is a Backlight Time of 20 Mins.

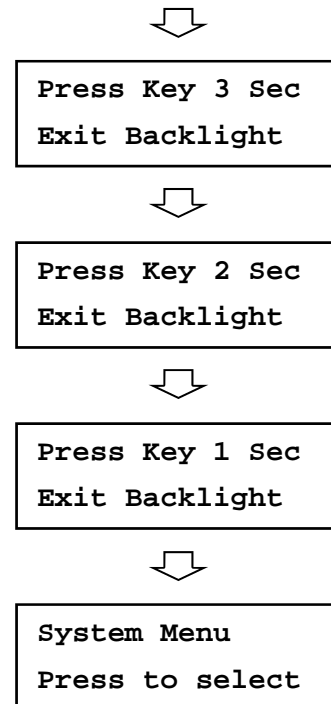


Repeatedly tapping the Menu Key advances the Backlight Time through all available values, after which they repeat.



When the desired value is showing on the LCD Display, **[PRESS]** the Menu Key for 3 Seconds to store the selected value and return to the Menu Selection System.

As the Menu Key is pressed the LCD Display confirms the store operation.



### MENU SELECTION SYSTEM SCREENS

**System Menu**  
Press to select

The Menu Selection System is waiting for the Operator to **[PRESS]** the Menu Key



**Entering**  
**System Menu**

The operator has pressed the Menu Key  
The Menu Selection System is about to be accessed.



**Release Key for**  
**System Lock/Exit**

Releasing the Menu Key now will lock the FLA8, exit the Menu Selection System & start the LCD Backlight Timer



**Release Key for**  
**Preset Select**

Releasing the Menu Key now will allow the selected Steering Preset to be changed.



**Release Key for**  
**Backlight Time**

Releasing the Menu Key now will allow the Backlight Time to be changed.



**Release Key for**  
**Info/Meter Mode**

Releasing the Menu Key now will allow the selection of Information Mode or Metering Mode for display when the FLA8 is locked.



**Release Key for**  
**Autolock Mode**

Releasing the Menu Key now will allow the Autolock Mode to be changed.



**Menu Ended**  
**Release Key now**

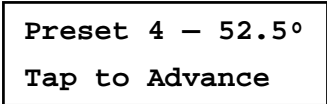
The end of the Menu Selection System has been reached.  
Release the Menu Key to return to the start of the Menu Selection System.



### STEERING PRESET SELECTION

The FLA8's internal DSP system stores seven Steering Presets plus a System Test Preset.

The Steering Preset Select Option allows the selection of which of the eight DSP Presets is recalled.



The Steering Angles provided by the FLA8 are

- Preset 1 - 30.0°
- Preset 2 - 37.5°
- Preset 3 - 45.0°
- Preset 4 - 52.5°
- Preset 5 - 60.0°
- Preset 6 - 70.0°
- Preset 7 - 80.0°
- Preset 8 - System Test

Refer to Page 2 of this manual for the definition of Steering Angle.

### SYSTEM TEST PRESET

The System Test Preset is provided to allow testing of the amplification, cabling and loudspeaker systems.

Channel 1 is used to drive the H.F. Horn on the ALA07C-H loudspeaker system.

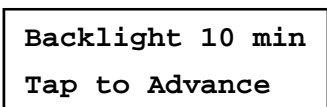
For Channel 1 the input signal is attenuated by 6dB and a 1kHz High Pass Filter is inserted between the DSP input and output.

For Channels 2-8 the signal passes through the DSP without any signal processing being applied.

### BACKLIGHT TIME VALUES

The QDC42 provides control of the LCD Display's Backlight during Normal / Locked Operation.

The Backlight Time Configuration Option allows the selection of the Backlight On Time.



The allowable Backlight Times are:

- 1, 2, 5, 10, 20, 40, 60 Minutes
- ON always and
- OFF always.

#### NOTES

- The LCD Backlight is always on during Configuration
- During Normal / Locked Operation a **[PRESS]** or **[TAP]** on the Menu Key switches the LCD Backlight on and resets the Backlight Timer.

### INFORMATION / METER MODE

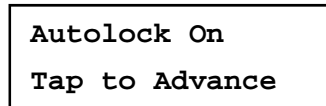
The FLA8 provides alternative display modes when in Normal / Locked Operation. The text that is displayed when the FLA8 is locked can be customized for the installation at the time of product manufacture. Contact Acoustic Technologies for more information regarding this feature.

Information Mode provides two lines of text on the LCD Display.

Metering Mode provides one line of text on the top row of the LCD Display and an Input Signal Meter on the lower row of the LCD Display.

### AUTOLOCK MODE

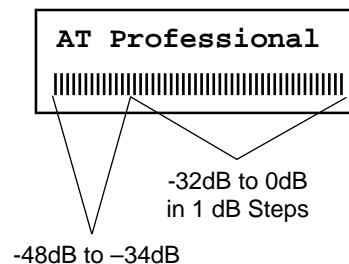
The Autolock Configuration Option, when selected to On, allows the FLA8 to automatically revert to Normal / Locked Operation from Configure Mode if there has been no Menu Key activity for greater than 60 minutes.



#### NOTES

At Power-On the FLA8 always starts in Normal /Locked Operation

### METER CALIBRATION



The 0dB calibration point equals the onset of amplifier clipping when a beam steering preset has been recalled.

# FLA8.dsp

## OWNERS MANUAL

9

### WARRANTY REGISTRATION

When you receive the FLA8 amplifier, complete the Warranty Page (the last page of this manual) and return it to Acoustic Technologies within 14 days of the purchase date.

Alternatively, the FLA8 Warranty Registration can be completed online at:

[www.atprofessional.com.au/products/warrantyregister.html](http://www.atprofessional.com.au/products/warrantyregister.html)

### SERVICE AFTER THE WARRANTY PERIOD

Acoustic Technologies offers a quick service facility for repairs outside the warranty period.

Charges are kept to the minimum possible for parts and labour. It is strongly recommended that the FLA8 amplifier be repaired by the manufacturer or authorised repair facility.

### WARRANTY PERIOD

Acoustic Technologies provides a comprehensive 1 Year Warranty on all parts and labour for the FLA8 Amplifier to the original owner from the purchase date.

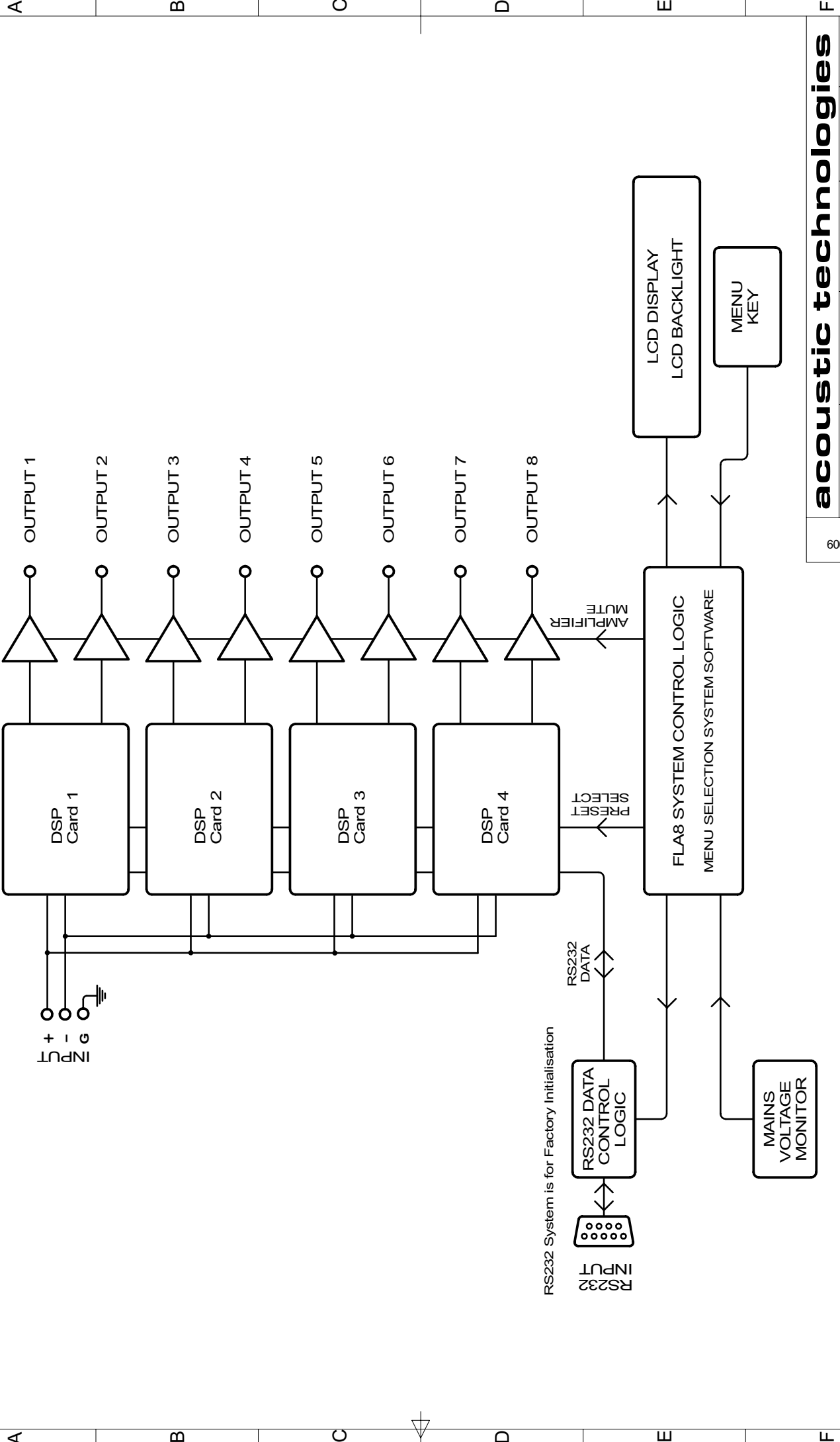
#### PLEASE NOTE:

Acoustic Technologies reserves the right to ascertain the reason for the amplifier's failure, and if attributed to operator negligence or improper operating conditions, reserves the right to refuse warranty service.

Any transportation costs incurred are to be met by the customer claiming warranty service.

#### PLEASE NOTE:

Acoustic Technologies reserves the right to alter or amend the FLA8 amplifier without prior warning, in the interests of product improvement.



<b>acoustic technologies</b>		Revision A	Scale NTS
Drawn R. Faint	Checked	Approved	
Original Issue		Sheet 1 of 1	
<b>FLA8 BLOCK DIAGRAM</b>		<b>AT-A3-372</b>	

02.07.2009

FLA8.dsp  
OWNERS MANUAL

1 1

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# Warranty Registration

Acoustic Technologies  
PO Box 107  
Sumner Park  
Queensland 4074  
Australia

NAME / PROJECT : .....

ADDRESS : .....  
: .....  
: .....

**PURCHASED FROM**

SUPPLIER : .....

ADDRESS : .....  
: .....  
: .....

AMPLIFIER MODEL : FLA8.dsp

SERIAL NUMBER : .....

DATE of PURCHASE : ...../...../.....

The FLA8.dsp Warranty Registration can be completed online at the following address:  
<http://www.atprofessional.com.au/products/warrantyregister.html>

