

AlphaTrack™ Native Mode MIDI Interface Description

Revision: 1.0

Date: 12/21/2006

Revision History

1.0	061221	CH	Releasing it as v1.0.
0.93	061220	BB	Changed polarity of footswitch (now 7F == “Down”)
0.92	061116	CH	Changed graphic of unit to represent the final button layout.
0.91	061115	CH	Changed In and Out buttons to TrackL and TrackR. Updated the local operations section.
0.9	060907	CH	Changed all name references to AlphaTrack.
0.8	060525	CH	Added 5 th LCD mode button, and renamed several buttons. Eliminated provision for custom characters.
0.7	060304	CH	Major changes for new layout and features.
0.6	051230	CH	Added FLIP LED message and LCD “control” sysex message.
0.5	051212	CH	Added sysex message to write custom characters.
0.4	051209	CH	Took out “Go to Native Mode” message, and updated Device Inquiry response. Also filled out the “local” actions somewhat.
0.3	051202	CH	Changed touch strip movement to be like the fader
0.2	051202	CH	Changed touch strip movement to be like the data wheel encoder
0.1	051101	CH	Original

Introduction

This document describes how to gain access to the AlphaTrack’s controls and display elements using Native mode MIDI messages. It is useful to software developer’s, but most users do not need to refer to it. The Frontier Design Group’s *AlphaTrack* provides “channel strip” and global controls for PC- and Mac-based Digital Audio Workstation (DAW) software. The AlphaTrack consists of a compact unit that plugs into a USB port of either a Mac- or Windows-based PC. For DAW software packages that allow for the creation of custom control surface plug-ins, the driver provides what we refer to as “Native” mode. For other DAW software packages, the AlphaTrack USB driver provides HUI emulation. The AlphaTrack driver applet allows the user to select which mode (Native or HUI emulation) the driver operates in. AlphaTrack presents itself as a MIDI input/output device, and the driver converts all inputs (buttons, encoder, and fader) and all outputs (LED’s and LCD) on the unit to common MIDI messages.



Fig. 1: AlphaTrack Unit

AlphaTrack Elements

The AlphaTrack is shown in Fig. 1 above and Fig. 2 below. The unit has a 100mm touch-sensitive, motorized fader, 22 momentary pushbuttons, a touch-sensitive horizontal strip, three encoders (which also act as pushbuttons), 21 LED's, and one 16-character by 2-line backlit LCD display. (Note that 4 buttons on the left have LED's under them used in a backlit fashion. It is powered from its USB cable.

The following sections describe the MIDI implementation for each of the AlphaTrack's elements. Note that any LED that is associated with a button shares the MIDI note number with that button; the button activity is reported via the AlphaTrack MIDI IN device, and the LED is controlled via the AlphaTrack MIDI OUT device. The AlphaTrack makes no internal logical connection between a button and an LED – the application must control LED's directly.

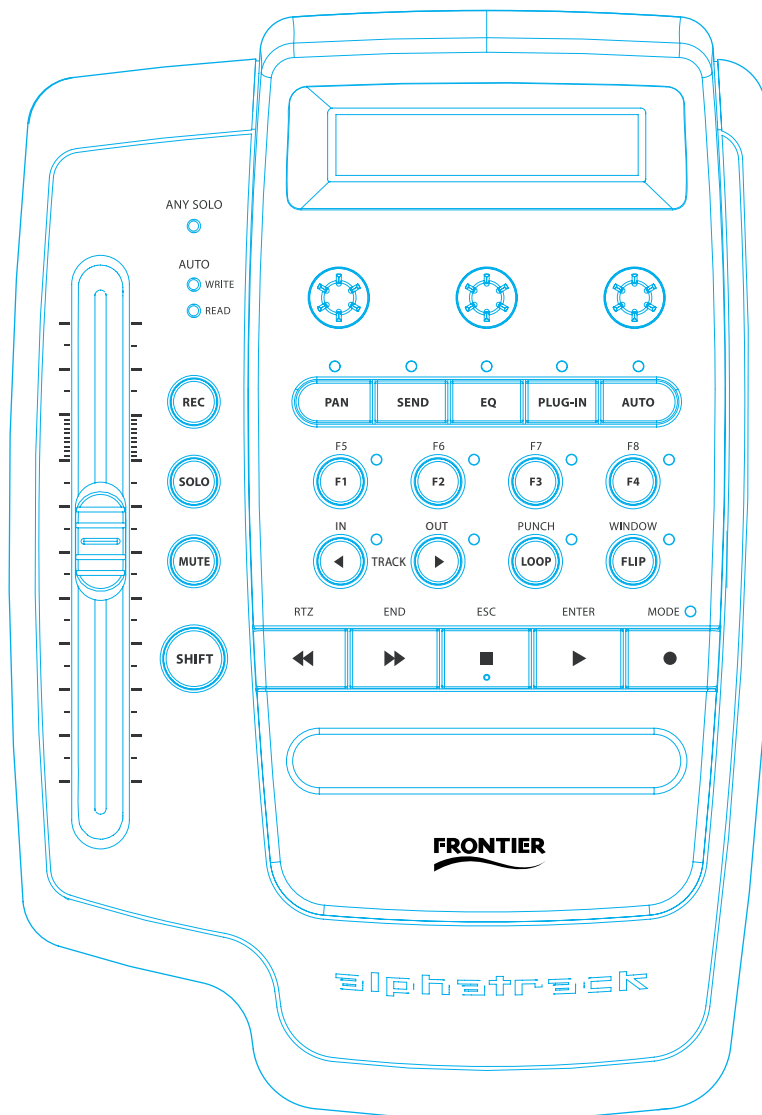


Fig. 2: Top view of AlphaTrack

There are a few “local” adjustments on the AlphaTrack. The first adjusts the LCD's contrast. To access it, hold the SHIFT and STOP buttons down. The LCD will display local operation labels.

Keeping both SHIFT and STOP buttons held down, turn the left knob to adjust the LCD's contrast. Still keeping both buttons down, turn the middle knob to turn the LCD Backlight Hi or Lo. Turning the right knob adjusts the idle timeout duration. (Once this timeout is reached without any user actions or host messages, the LED's turn off and the LCD goes dim. Touching any button or knob brings them back on.) You can also initiate a calibration of the touch sensors and the fader by holding SHIFT and STOP and pressing the F4 button.

Selecting Native Mode

The AlphaTrack control panel (manager application) allows the user to select the driver's mode of operation as either an emulation or native mode. Alternatively, the application may force the driver into native mode by sending the following system exclusive message. This ensures that AlphaTrack will be in the proper mode without requiring any user action other than running the application.

f0 00 01 40 20 01 00 f7 Force the AlphaTrack driver into native mode

Important: All the other messages defined in this document are only valid when the TranzPort driver is set to native mode.

Device Inquiry

When in native mode, the AlphaTrack will respond to a MIDI Device Inquiry message.

f0 7e 00 06 01 f7 Inquiry sent to AlphaTrack

The AlphaTrack then responds with the following message:

f0 7e 00 06 02 00 01 40 20 00 01 00 30 31 30 30 f7

In this response, "00 01 40" is the Frontier Design Group manufacturer's system exclusive ID code. The next bytes, "20 00 01 00," represent AlphaTrack (different that "00 00 01 00" for the TranzPort, for example). The final four bytes before the end of sysex give the software revision in ASCII (30 31 30 30 = "v01.00"). This value may change with software updates.

Buttons and LED's

REW Button	Button Down: 90 5b 7f	MIDI IN
	Button Up: 90 5b 00	MIDI IN
FFWD Button	Button Down: 90 5c 7f	MIDI IN
	Button Up: 90 5c 00	MIDI IN
STOP Button	Button Down: 90 5d 7f	MIDI IN
	Button Up: 90 5d 00	MIDI IN

PLAY Button	Button Down: 90 5e 7f	MIDI IN
	Button Up: 90 5e 00	MIDI IN
Record Button and LED	Button Down: 90 5f 7f	MIDI IN
	Button Up: 90 5f 00	MIDI IN
	LED On: 90 5f 7f	MIDI OUT
	LED Off: 90 5f 00	MIDI OUT
SHIFT Button and LED	Button Down: 90 46 7f	MIDI IN
	Button Up: 90 46 00	MIDI IN
	LED On: 90 46 7f	MIDI OUT
	LED Off: 90 46 00	MIDI OUT
TRACKL Button and LED	Button Down: 90 57 7f	MIDI IN
	Button Up: 90 57 00	MIDI IN
	LED On: 90 57 7f	MIDI OUT
	LED Off: 90 57 00	MIDI OUT
TRACKR Button and LED.....	Button Down: 90 58 7f	MIDI IN
	Button Up: 90 58 00	MIDI IN
	LED On: 90 58 7f	MIDI OUT
	LED Off: 90 58 00	MIDI OUT
LOOP Button and LED	Button Down: 90 56 7f	MIDI IN
	Button Up: 90 56 00	MIDI IN
	LED On: 90 56 7f	MIDI OUT
	LED Off: 90 56 00	MIDI OUT
FLIP Button and LED.....	Button Down: 90 32 7f	MIDI IN
	Button Up: 90 32 00	MIDI IN
	LED On: 90 32 7f	MIDI OUT
	LED Off: 90 32 00	MIDI OUT
MUTE Button and LED.....	Button Down: 90 10 7f	MIDI IN
	Button Up: 90 10 00	MIDI IN
	LED On: 90 10 7f	MIDI OUT
	LED Off: 90 10 00	MIDI OUT
F1 Button and LED.....	Button Down: 90 36 7f	MIDI IN
	Button Up: 90 36 00	MIDI IN
	LED On: 90 36 7f	MIDI OUT
	LED Off: 90 36 00	MIDI OUT
F2 Button and LED.....	Button Down: 90 37 7f	MIDI IN
	Button Up: 90 37 00	MIDI IN
	LED On: 90 37 7f	MIDI OUT
	LED Off: 90 37 00	MIDI OUT
F3 Button and LED.....	Button Down: 90 38 7f	MIDI IN

	Button Up: 90 38 00	MIDI IN
	LED On: 90 38 7f	MIDI OUT
	LED Off: 90 38 00	MIDI OUT
F4 Button and LED.....	Button Down: 90 39 7f	MIDI IN
	Button Up: 90 39 00	MIDI IN
	LED On: 90 39 7f	MIDI OUT
	LED Off: 90 39 00	MIDI OUT
SOLO Button and LED.....	Button Down: 90 08 7f	MIDI IN
	Button Up: 90 08 00	MIDI IN
	LED On: 90 08 7f	MIDI OUT
	LED Off: 90 08 00	MIDI OUT
ANY (Any Solo) LED	LED On: 90 73 7f	MIDI OUT
	LED Off: 90 73 00	MIDI OUT
PAN Button and LED.....	Button Down: 90 2a 7f	MIDI IN
	Button Up: 90 2a 00	MIDI IN
	LED On: 90 2a 7f	MIDI OUT
	LED Off: 90 2a 00	MIDI OUT
SEND Button and LED.....	Button Down: 90 29 7f	MIDI IN
	Button Up: 90 29 00	MIDI IN
	LED On: 90 29 7f	MIDI OUT
	LED Off: 90 29 00	MIDI OUT
EQ Button and LED.....	Button Down: 90 2c 7f	MIDI IN
	Button Up: 90 2c 00	MIDI IN
	LED On: 90 2c 7f	MIDI OUT
	LED Off: 90 2c 00	MIDI OUT
PLUG-IN Button and LED	Button Down: 90 2b 7f	MIDI IN
	Button Up: 90 2b 00	MIDI IN
	LED On: 90 2b 7f	MIDI OUT
	LED Off: 90 2b 00	MIDI OUT
AUTO Button and LED	Button Down: 90 4a 7f	MIDI IN
	Button Up: 90 4a 00	MIDI IN
	LED On: 90 4a 7f	MIDI OUT
	LED Off: 90 4a 00	MIDI OUT
AUTO WRITE LED	LED On: 90 4b 7f	MIDI OUT
	LED Off: 90 4b 00	MIDI OUT
AUTO READ LED.....	LED On: 90 4e 7f	MIDI OUT
	LED Off: 90 4e 00	MIDI OUT
REC (Arm) Button and LED	Button Down: 90 00 7f	MIDI IN

Button Up: 90 00 00 MIDI IN
 LED On: 90 00 7f MIDI OUT
 LED Off: 90 00 00 MIDI OUT

Footswitch..... Footswitch Pressed: 90 67 7f MIDI IN
 Footswitch Released: 90 67 00 MIDI IN

Note: The footswitch is assumed unpressed at power-up, and the polarity set accordingly.

Encoders, Fader, and Touchstrip

LEFT ENCODER (touch).....Down: 90 78 7f MIDI IN
 Up: 90 78 00 MIDI IN

LEFT ENCODER (push knob).....Down: 90 20 7f MIDI IN
 Up: 90 20 00 MIDI IN

LEFT ENCODER (turn)..... Change: b0 10 nn MIDI IN

MIDDLE ENCODER (touch).....Down: 90 79 7f MIDI IN
 Up: 90 79 00 MIDI IN

MIDDLE ENCODER (push knob).....Down: 90 21 7f MIDI IN
 Up: 90 21 00 MIDI IN

MIDDLE ENCODER (turn)..... Change: b0 11 nn MIDI IN

RIGHT ENCODER (touch).....Down: 90 7a 7f MIDI IN
 Up: 90 7a 00 MIDI IN

RIGHT ENCODER (push knob)Down: 90 22 7f MIDI IN
 Up: 90 22 00 MIDI IN

RIGHT ENCODER (turn) Change: b0 12 nn MIDI IN

where nn: forward 01 – 3f
 backward 41 – 7f

Note: When changing, an encoder knob turn is updated via the MIDI IN port at a maximum rate of about once every 15 msecs, although it is polled internally at a much higher rate. Therefore, the encoder turn messages contain the number of positive or negative ticks since the last encoder turn message. This is similar for the touch strip, which senses at most 15 horizontal positions.

Examples:

4 middle encoder ticks clockwise rotation: 90 3c 04
 3 right encoder ticks counterclockwise rotation: 90 3c 43

FADER (touch).....Start Touch: 90 68 7f MIDI IN

	Stop Touch: 90 68 00	MIDI IN
FADER (move).....	Movement update to computer: e0 yy zz	MIDI IN
	Command from computer: e0 yy zz	MIDI OUT

where yy: 3 LSB's in the form 00, 10, ... 70
 where zz: 7 MSB's in the form 00, 01, ... 7f
 Together, yy and xx form a 10-bit fader position.

STRIP 1 Finger Touch	Start Touch: 90 74 7f	MIDI IN
	Stop Touch: 90 74 00	MIDI IN

STRIP 2 Finger Touch	Start Touch: 90 7b 7f	MIDI IN
	Stop Touch: 90 7b 00	MIDI IN

STRIP Position	Position: e9 00 nn	MIDI IN
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where nn = 00, 04, 08, ... 74, 78, 7C (upper 5 bits give absolute position 0..31)

LCD Display

The AlphaTrack Remote has a 16-character by 2-line backlit LCD display. In addition to the standard ASCII character set, the display has 8 custom characters to support typical DAW functions. The ASCII character implementation is shown in Table 1 below.

		MS bits (hex)							
		0	1	2	3	4	5	6	7
LS bits	0	■	☺	☹	☺	P	`	P	
	1	■	ä	!	1	A	Q	a	q
	2	■	I	"	2	B	R	b	r
	3	■	☐	#	3	C	S	c	s
	4	■	☐	\$	4	D	T	d	t
	5	■	ü	%	5	E	U	e	u
	6	■	☐	&	6	F	V	f	v
	7	■	°	'	7	G	W	g	w
	8	■	*	(	8	H	X	h	x
	9	■	☐	)	9	I	Y	i	y
	A	■	☐	*	:	J	Z	j	z
	B	■	☐	+	;	K	[	k	{
	C	■	☐	,	<	L	¥	l	|
	D	■	☐	-	=	M	]	m	}
	E	■	☐	.	>	N	^	n	~
	F	■	☐	/	?	O	_	o	€

Table 1: AlphaTrack LCD Character Set

The display may be written to by using the following MIDI SysEx message format:

```
f0 00 01 40 20 00 pp c1 c2 c3 c4 ... cn f7
```

Where: pp is the starting character position, 0 – 0x1f
 c1, c2, c3 are the ASCII codes to display.
 n can range from 1 to (0x20 – pp)

```
Example: f0 00 01 40 20 00 10 48 65 6c 6c 6f f7
```

Writes “Hello” to the beginning of the lower line of the LCD display.

The LCD should be cleared (filled with character 0x20) when the DAW application is closed.

Suggested Practices

We have found it very useful to treat 1-finger touch strip moves as timeline scroll operations, and 2 finger moves as timeline shuttle operations. For shuttling, the initial 2-finger position is “0” speed, with moves to the right increasing positive shuttle speed.