HA-8-3 Troubleshooting using the H8 Front Panel

The H8 Front Panel can be used to verify and troubleshoot basic board operation
These instructions assume you are already familiar with how to use the
front panel to OUTput values to a port, and INput values from a port

ADC and 8-channel MUX

ADC port is 366Q by default (JP14 off), 276Q in NOGDS mode (JP14 on)
Connect 5v from pin 2 of any joystick header to an analog input on pins 9 or 10
OUTput an ADC channel number (0-7) to the ADC port

000 366	OUT	selects analog input 0
000 366	IN	reads the value from the ADC
xxx 366		xxx should be approximately half-scale
		(between 170Q-210Q)

You can also connect GND from pin 1 or Vref from pin 3 of any joystick header
GND should result in an Input value close to 000Q, Vref should be close to 377Q

APU Basic Function Test

APU port is 364Q by default (JP14 off), 274Q in NOGDS mode (JP14 on)
To quickly test basic APU function, you can push several values onto
the APU stack and verify they read back correctly. For example:

000 364	OUT	
001 364	OUT	
123 364	OUT	
377 364	OUT	
000 364	IN	
377 364	IN	377 is TOS (top of stack)
123 364	IN	readback in reverse order
001 364	IN	
000 364		first value written, last value read

VDP VRAM Function Test

VDP port is 270Q
There are easier ways to test VRAM, but it can be done from the FP!
To test VRAM address 000.000:

000 271	OUT	low order address byte
100 271	OUT	high order address byte with high order bit set
123 270	OUT	value to store at address 000.000
000 271	OUT	low order address byte
000 271	OUT	high order address byte with high order bit cleared
000 270	IN	
123 270		should read back the value you wrote

PSG Function Test

PSG port is 272Q

Connect amplified speakers to the CH0 and CH1 audio outputs

010 273	OUT	select "C" channel volume register
017 272	OUT	highest volume
005 273	OUT	select "C" channel frequency register
004 272	OUT	coarse frequency (period) value
007 273	OUT	select ENABLE register
373 272	OUT	enable the "C" sound generator

You should hear sound from both the CH0 and CH1 outputs

(On this board, the "C" channel is mixed to both CH0 and CH1 outputs)

Turn it off by a FP reset, or

007 273	OUT	ENABLE register
377 272	OUT	disable everything