Hardware Memo 7A

Using the analog & digital interface of the demo box

-Bill Freeman January 20,1972

The digital & analog interface is part of the turtle controller, and as such only sees characters when device "A" is enabled. This can be accomplished by sending lower case i, k, l or m at the demobox (ascii 151, 153, 154 or 151). In the case of l & m device "A" is multiplexed with another device, but gets the first character after being enabled in this mode and every other character thereafter.

Having done this, most characters sent will get to the interface. All of the sixbit ones do, at any rate, which is fine, beecause nothing in device "A" pays attention to anything else.

The characters that affect the interface may also affect the turtle to toot or raise or lower its pen, if desired. The functions that the interface will perform are: send one analog sample to the computer (analog once), send one digital sample to the computer (digital once), send 30 analog samples per second to the computer (analog spew), send 30 digital samples per second to the computer (digital spew), & stop whichever spew mode is happening, if either, (stop spew).

The following table indicates which characters do what:

Effect on the turtle / Effect on the interface	no effect	toot	pen down	pen up
analog once	#	+	3	;
analog spew	$	,	4	<
stop spew	%	-	5	=
digital once	&	.	6	>
digital spew	'	/	7	?

In addition, devices graced with the appropriate hardware may take advantage of the "here, you take it" feature, whereby an otherwise idle interface may be caused to execute a digital input cycle or cycles by doing the right thing to one of pins of the input connector (yes, there really is a place to connect this input to).

We take no responsibility for the input derived when one issues commands of a digital nature when the interface is in analog spew mode without first issuing a stop spew command or when one issues analog commands when (the interface is in digital spew mode without first issuing a stop spew command) or (digital input is being caused by the "here, you take it" mechinism).

Now as to the input connector: it is so labeled ("input" that is) and plugs may be found if you know where to look, or you can ask John

Roe for one. The pins are numbered from 1 to 14 and do the following:

1. to 6. bits one to six of the teletype character sent (digital mode).
7. ground.
8. analog ground.
9. 0-20 volt analog input (probably not the one you want).
10. 0-10 volt analog input.
11. a source of +15 volts.
12. here, you take it bar.
13. you have been selected (open collector) digital.
14. 5 volt logic supply.

If you are hacking digital, the pins you are probably concerned with are 1-7,14,and maybe 12. If you are hacking analog, probably pins 8,10, and 11. Pins 1-6 and 12 expect to see ttl levels. Pin 12 causes at least one digital input character and will continue to cause characters as long as it is asserted (assert by pulling to ground).

Well, that's it. Happy motoring back on the freeway, which is already in progress.