Generate a PWM Signal to Drive Victor or Jaguar Motor Controller

You can easily generate a PWM signal to drive a Victor or Jaguar motor controller by using an old junker laptop with a Pentium[1] or 486 processor.

Create a DOS boot diskette, if the laptop has a 3.5" drive. Or create a bootable FreeDOS USB thumb drive[2]. Or re-format the hard disk and install FreeDOS[3]. DOS gives you direct and unimpeded access to the hardware, and there is no preemptive multitasking to interfere with critical timing operations.

Write a 16 bit real mode app[4] to toggle the RTS pin of the RS232 port. The timing for the pulse width can be established using the RDTSC[5] CPU cycle counter, or the 8254 Programmable Interval Timer[6], or the MC146818A real time clock interrupt[7].

Convert the RS232 voltage from the RTS pin to appropriate PWM signal current with a transistor, as explained in other attachments. **Do <u>not</u> connect the RTS pin voltage directly to the Vic (or Jag) photocoupler input. Doing so may damage the photocoupler LED.**

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1 More modern Pentiums with dual core, dynamic frequency switching, or advanced out-of-order execution may have RDTSC timing issues.

2 See separate attachments for instructions.

3 http://www.freedos.org/

4 Turbo Pascal 7 is ideal for this. As of this writing it is available for download at various sites. You can also use TP5.5, but it does not support the inline assembler. You can use inline machine code instead with TP5.5, but it's not as convenient.

5 http://www.ccsl.carleton.ca/~jamuir/rdtscpm1.pdf

6 If the laptop is really old and has a 486 instead of a Pentium, or if your Pentium is too modern and the timing is erratic, you can use the 8254 Programmable Interval Timer channel 0 or 2 instead of RDTSC for timing. Resolution will be approx 1 us instead of nanoseconds.

7 http://courses.engr.illinois.edu/ece391/references/mc146818.pdf
Int 70h is limited to 8192 Hz (0.1 ms resolution), probably not adequate for most RC servo applications http://www.compuphase.com/int70.asm