

DESIGN SHOWCASE

μP-Supervisor Chip Controls Programmable Filter

Certain dual-section filter ICs have a common 7-bit port for programming the two cutoff frequencies (f_c). If both sections require the same f_c , you can strap an appropriate code to the port pins, but other applications require a different f_c for each section. In such cases, a microprocessor is the obvious tool for sequentially programming the two filter sections, but lacking a μP, you can do the job with the circuit of **Figure 1**.

IC₂ is a continuous, dual-lowpass filter containing identical 2nd-order sections A and B. To program desired f_c values, obtain corresponding codes from the data sheet and connect each pin of A0-A6 and B0-B6 to 5V ("1") or GND ("0") accordingly. (The latches internal to inputs D0-D6 remain "transparent" because inputs WR and CS are wired low.)

Latch IC₃ also remains transparent because pin 11 is wired high. The latch outputs (1Q-7Q) are three-stated when the Output Control (OC, pin 1) is driven high. When OC is high, therefore, A0-A6 data drives the filter port (D0-D6). When OC is low, B0-B6 data appears at the latch outputs and overrides A0-A6.

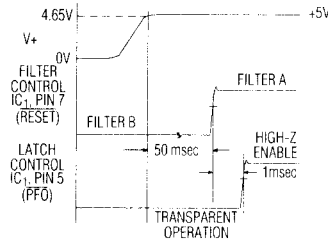


Figure 2. Timing relationships for the Figure 1 circuit.

The μP-supervisory chip IC₁, though normally used to monitor supply voltage and software execution in a μP system, generates directly usable signals for controlling IC₂ and IC₃: RESET (pin 7), which remains low for 50msec after power-up, directs the input port of IC₂ first to filter section A, then to section B. PFO (Power Fail Output, pin 5), which goes high a few milliseconds after RESET, provides a properly timed control signal for three-stating the latch outputs of IC₃ (**Figure 2**).

The circuit as shown requires ±5V supplies. To operate on ±2.5V or on 5V alone, connect IC₁'s GND pin to the lower supply rail and drive IC₂'s pin 12 through a resistive divider (see the MAX270 data sheet, Figure3).

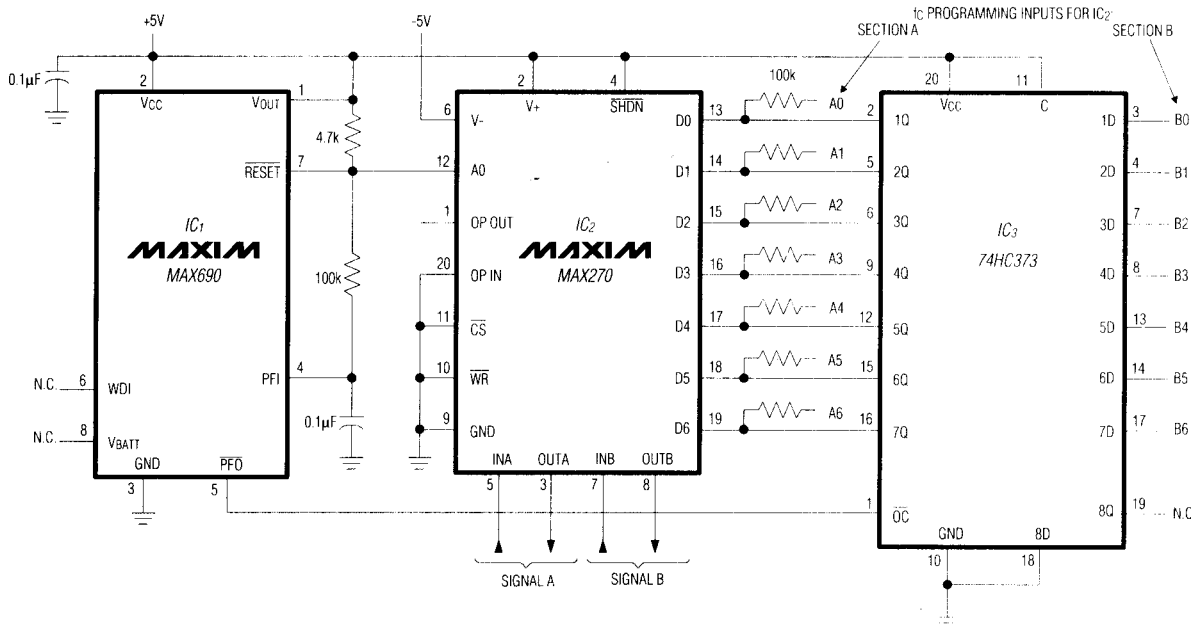


Figure 1. A μP-supervisory chip (IC₁) directs the sequential loading of f_c data into the dual, programmable lowpass filter IC₂. The circuit reloads this f_c data following each power-up.