Guitar Playing Machine

Alex Manoilo
Colin Tombari
Materials

- 1 guitar
- HCS12 Microcontroller
- SSMI Board
- 3 servomotors
- 2 “fingers”
- 1 stepper motor
- 1 slider
- 1 Keypad
- 1 EasyDriver
Cross-Sectional View of Fretting Setup
Side View of Picking Setup
Map of Guitar Neck

Dimensions in cm
Several things have changed:

- R0-R3 go to AN0-AN3
- C0-C2 go to PM3-PM5

Servos are connected to PT0-PT1.

Stepper Motor controlled by 2 pins that go through a driver.
Flow Chart

- Keypad
  - Key Pressed
  - Move Stepper motor to correct position
  - Activate SERVO1
  - Activate SERVO2

  - Key Released
    - Move SERVO1 back
  - Key Held
    - Keep SERVO1 in place
Pseudocode

Create position array based on start of slider

Main()

Enable PWM on PTT for SERVO1, SERVO2, (SERVO3)
Enable PPT for stepper motor controlling slider
Enable outputs on PTTM for keypad
   FM3, FM4, and FM5 output
Enable ATD for keypad in
   AN0, AN1, AN2, AN3

Loop forever()

   Wait for key press

   If key pressed (high on AN0-3)
      Delay until end of nested if-statements
      Calculate approximate necessary move time
      Ignore other key presses
      Move stepper to correct position (+/- based on index,
      convert to cycles to spin)

   If at correct position
      PWM SERVO1 to push on frets

   If SERVO1 is rotated
      PWM SERVO2 to strum

   If key is no longer pressed
      PWM SERVO1 in other direction (output to
      PT4)

}
Timing Diagram