USING THE EPROM+ SYSTEM AND ACOM2 ADAPTER TO ACCESS THE MC68HC05X16/X32 MICROCONTROLLER IN THE SAAB TWICE MODULE

The Motorola MC68HC05X16/X32 microcontroller conforms to the 68HC05 architecture components required for communication with the part using the EPROM+ and ACOM2. Since the part is usually fabricated in a 64 pin QFP (Quad Flat Pack) package, the lead pitch makes connection to the part more difficult than a typical PLCC device. The recommended connection mechanism is the Andromeda Research Precision Probe Set (#PPS8). The precision probe set offers the best option for attaching to the QFP package without shorting adjacent pins. The precision probe set consists of eight individual color coded microprobes. Each probe color corresponds to the EIA (Electronic Industry Association) standard color code where BROWN (BRN)=1, RED=2, ORANGE (ORN)=3, YELLOW (YEL)=4, GREEN (GRN)=5, BLUE (BLU)=6, VIOLET (VIO)=7 and GRAY (GRY)=8.

IN-CIRCUIT PRECONNECTION REQUIREMENTS

Before attempting communication with the microcontroller, two pins must be isolated (lifted) from the underlying assembly to prevent interference from existing circuit connections or components. A common method to lift a pin is to use a small, low wattage soldering iron and sharp point x-acto knife blade or dental pick. While heating the pin with the soldering iron insert the x-acto knife blade or pick probe behind the pin and apply sufficient pressure to lift the pin to about a 45 degree angle. Be sure no residual solder is contacting the board pad. Also be careful not to lift the pin too high as this will stress the lead at the package which may cause the pin to break. The pin numbers which must be lifted are 8 and 31. Reference the diagram to determine the pin locations. Unsolder and lift each corresponding pin. **NOTE:** Pin 31 is soldered to a single track. You may cut this track if you do not wish to lift (unsolder) the pin. PIN 8 must be lifted as it is connected to a track under the chip.

CONNECTING THE ACOM2 TO THE MICROCONTROLLER USING THE PRECISION PROBE SET

Attach the Precision Probe Set to the ACOM2 then carefully attach each probe to the corresponding microcontroller pin **EXCEPT GRAY**. First connect to pins 8, 10, 30, 31 and 58. The GRAY probe is the 5 volt source and must feed pins 19, 20 and 21. To accomplish this fully open the probe jaws until they span pins 19 and 20 then release. This connection applies +5 volts to pins 19 and 20. Now remove either the RED or YELLOW probe from the red or yellow lead by gripping the black slide-on connector and pulling the probe body until the connector slides off. Fully open the jaws of the free probe until they span pins 20 and 21 then release. This free probe serves as a connection between the 5 volt source (pin 20) and pin 21.

NOTE: For in-circuit operation this module will already operate at the correct clock frequency (4.0MHZ). Therefore the CLK (yellow) and GND (red) are not necessary.
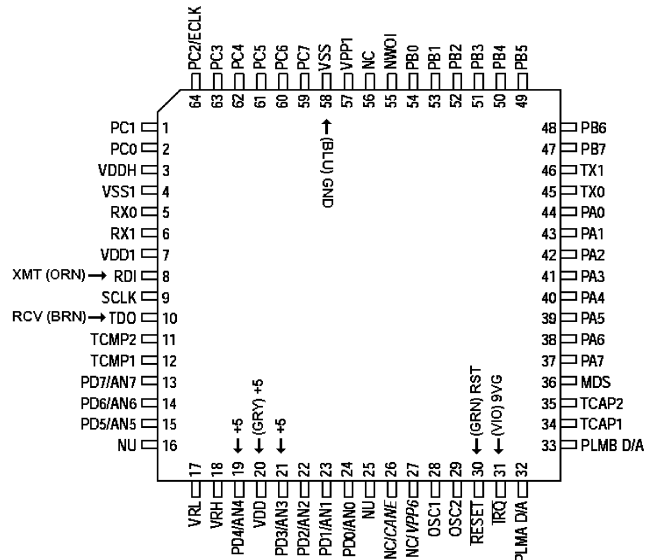
ESTABLISHING COMMUNICATION WITH THE 68HC05X16/X32 MICROCONTROLLER

Before establishing communication be sure the EPROM+ system is active, you have installed the ACOM2 and you have selected the proper part (68HC05X16 or 68HC05X32). Additional information can be found in the ACOM2 addendum. Once the ACOM2 is connected to the microcontroller, proceed to establish communication with the part. Turn on the ACOM2. The LED will light. Press "Z" then "1". The system will upload the communication program into the microcontroller. Wait until the upload completes then confirm that you see "COMMUNICATION VERIFIED" below the "BUFFER UPLOAD COMPLETE" message. If you do not see "COMMUNICATION VERIFIED" do not proceed. Examine the connections to the part and be sure the ACOM2 dip switch is properly set. Once the "COMMUNICATION VERIFIED" message appears the system returns to the COMMAND LIST. At this point you may perform any operation on the internal eeprom. **EXAMPLE:** To read the eeprom contents into the buffer Press "5" to enter the BUFFER EDITOR. Then press "3" then "Y". The data will be read from the microcontroller into the buffer. **IMPORTANT:** If you turn off the ACOM2 adapter you must reestablish communication by pressing "Z" then "1".

Once your work is complete carefully press the lifted pins back onto the module track. Apply a small amount of heat to each pin until the underlying solder reflows to the pin. You may add a small amount of solder but this is not usually necessary.