APGAR V1.0 Build Specification.

Author: Peter Anderson
Date: 23rd May 2005
Version number: 1.0
Document number: APGAR/V1.0/BS

The following are required for final assembly of the APGAR timer:

Item	Quantity	Viamed Part Number
Machined and painted case	1	
BE60 battery compartment assembly	1	
PCB assembly	1	
3mm flat spacer strip	2	
LCD	1	
Membrane keypad	1	
Soft cloth	1	
6mm tubular spacer	2	
M3 full hex nut	2	
"AA" batteries	4	
Firmware – APGAR V1.10 Final	1	
Small plastic zipper bag	1	
APGAR Timer User Instructions	1	
Top label	1	
Bottom label	1	
APGAR Timer packaging	1	

Notes:

1   ESD precautions must be observed during the final assembly procedure.
2   Read and understand these instructions before attempting final assembly.
3   If in doubt – ASK.

Procedure.

1   Separate the machined and painted case into its component parts – top lid, top seal,
     front extrusion, rear extrusion, bottom seal and bottom lid.

2   Fit the battery compartment into the rear extrusion so that access to the compartment
     is from the outside of the extrusion. The battery compartment lid release catch
     makes that end the bottom of the extrusion.

     Remove the battery compartment lid (for later assembly) using the following method.
     Place a small flat bladed screwdriver in the lid release catch. Use a twisting action to
     release the catch. If a levering action is used, the catch will be damaged.

     Insert the eight battery contacts into their sockets in the compartment. Attach the two
     "AA" style adhesive labels onto the back of the compartment, one on each side of the
     horizontal plastic divider with the correct orientation. Discard the "PP3" label.

3   Fit the PCB assembly over the eight battery contacts so that the non-component side of the PCB is towards the battery compartment and the LCD outline is towards the top of the extrusion. The lid release catch end of the battery compartment shows the bottom of the extrusion. Ensure that the PCB is tight against the battery compartment. Solder all eight-battery contact to the PCB. Carefully cut off the excess length of all eight-battery contacts.

4   Next fit the LCD to the PCB. The two 3mm flat spacer strips act to space the LCD off the PCB to stop the LCD fouling the battery contacts protruding through the PCB. The two strips will be removed after the LCD has been fitted.

        Place the two strips between the battery contacts in the LCD outline on the PCB. The mid-point bump on the side of the LCD should be on the left when the LCD is at the top of the board. Fit the LCD pins into the PCB. Make sure that the LCD is flat against the spacers. Quickly and carefully solder all the LCD pins. Finally, remove the two spacer strips.

5   Write the APGAR's serial number, using an indelible pen, in the space provided on the PCB. This completes the back assembly.

6   The membrane keypad is now fitted to the front metal extrusion.
        Note – this must be done very carefully and got right first time. Removing an attached membrane to refit it is a last resort solution.

        Remove the protective strip covering the adhesive on the back of the membrane. Place the tail through the small slot in the extrusion and very carefully align the membrane in the recess of the extrusion – keeping equal gaps at the top and bottom of the membrane. When the membrane is correctly positioned, gently flatten the membrane onto the front extrusion, using the cloth, working from the middle to the edges to expel any air bubbles. Make sure that the LCD window is flat and not bowed.

7   Assemble the two halves of the case with the following procedure.

        With the front and back extrusions the correct way up, fit the membrane tail onto CN1.

        Slide the two 6mm spacers over the threaded studs in the front extrusion – one each side.

        Align the two studs with the holes in the PCB. Align the two halves of the extrusion and snap them together.

        Screw on the two M3 nuts, one to each stud and tighten until the PCB sits firmly onto the spacer.

        Fit the top end cap using the two screws. Make sure that the blue sealing gasket sits correctly on the front and back extrusions. Insert the two grey caps into the holes over the screws.

8   The firmware has now to be loaded into the ST micro-controller and the basic functions tested.

Fit the four "AA" batteries, observing correct polarity.

Connect the SofTec inDART-STX development board to the APGAR PCB using CN2.

Using the DataBlaze Programmer software on the PC, program the firmware into the ST micro-controller. If programming fails, reject the APGAR Timer assembly to Quarantine together with a note detailing any error messages produced by the programmer.

When programming has finished, disconnect the development board from CN2.

Remove one of the "AA" batteries, wait 10 seconds and refit it. The display should show the software version number, clear and the produce a slowly flashing colon.

Press the Start key – the display should start counting from 00:00 at one second intervals.

After a few seconds press the Freeze key. The display should stop counting and the colon start flashing.

Again, after a few seconds, press the Freeze key. The colon should stop flashing and the count resume from where it would have been if the display had not been frozen.

Wait until one minute has elapsed. The sounder should beep once as the display rolls over one minute.

Press the Reset key and the display should clear to give a flashing colon.

If any of the above tests fails, reject the APGAR Timer assembly to Quarantine together with a note detailing what the failure is.

9   Fit the bottom end cap using the two screws. Make sure that the blue sealing gasket sits correctly on the front and back extrusions. Insert the two grey caps into the holes over the screws.

10   Check that the colon is still flashing. If it is, remove the four batteries and seal them in the small plastic zipper bag. If not, remove the batteries and reject the APGAR Timer assembly to Quarantine together with a note detailing that the unit has stopped working.

11   The top label describes the functioning of the keys whilst the bottom label has Viamed's details on it.

Affix the top and bottom labels to the end caps such that when the timer is tipped forward or backward, the labels read correctly from the front.

12   Place the APGAR Timer together with the pack of batteries and the User Instructions into the packaging.

That completes final assembly of the APGAR Timer.