First Ten Ångstroms

Sequencer Examples

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The following two examples show realistic Sequencer programs. The first is a short program that interfaces to an external robot to place drops on the sample stage.

Line	Operation	Parameters	Comment
10	Video	1	Ensure video on
20	Go to line	110	Skips table movement first time
100	Move Q (theta) by	10	Increment stage
110	Pretrigger images	2; .016	Start setup of capture
120	Posttrigger images	60; .016; 1	
130	Video trigger by gray level	1; 320; 400	Trigger location
140	Save movies as		Movie name from Robot message
200	Wait for external device	0; 1000	Wait here for OK from Robot
210	Run		
220	Open movie	60	Wait max 60 seconds
300	Non-spherical mode analysis	1	Begin setup of analysis
310	Reflection image type baseline	1	
350	Begin loop	2; 4	Begin loop for skipping first images
360	Move to next image in movie		
370	End loop	2	
400	Begin loop	1; 58	Loop for analyzing each image
410	Do contact angle measurement		
420	Move to next image in movie		
430	End loop	1	
440	Close movie		
450	Video	1	
490	Move external device		Send 'P' to Robot
500	Go to line	100	Back to beginning, no formal end to prog
1000	Quit		Put error handler here if required

The second program is much longer and uses subroutines to perform both interfacial tension and contact angle analysis.

Line	Operation	Parameters	Comment
1	No operation		Your program title
10	Call subroutine	9000	Call home sub
100	Begin loop	3; 10	Begin overall measurement loop
110	Call subroutine	8000	Call sample position sub
120	Call subroutine	7000	Call liquid pickup sub
130	Call subroutine	6000	Call IFT sub
140	Call subroutine	4000	Call contact angle (C.A.) sub
150	Call subroutine	5000	Call liquid dispense sub
160	End loop	3	End overall measurement loop
4000	Move tip Z to	-80	Begin contact angle sub
4010	Pump volume, rate	14; 3	form drop to touch off
4020	Pretrigger images	5; .033	setup movie timing
4030	Posttrigger images	60; .1; 1.03	
4040	Video trigger by gray change	1; 320; 400	adjust to detect dispensed drop
4050	Run		start capture
4060	Move tip Z by	-2	touch off drop, should Trigger movie
4070	Move tip Z by	2	
4080	Open movie		no time entry means wait indefinitely
4090	Non-spherical mode analysis	1	setup analysis

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4100    Reflection image type baseline
4110    Begin loop                          1; 7            begin loop to skip first 7 images
4111    Move to next image in movie
4112    End loop                            1               end loop to skip some images at start
4120    Begin loop                          2; 58           begin loop to analyze each image
4121    Do contact angle measurement
4122    Move to next image in movie
4123    End loop                            2               end analysis loop
4130    Close movie                                         will save movie because name setup
4140    Video                               1               ensure video on
4150    Return subroutine                                   End contact angle sub
5000    Call subroutine                                     Begin liquid disposal sub
5010    Tip to vial                         1; 17           will toss old liquid here
5020    Move tip Z by                       -25
5030    Pump volume, rate                   6; 10           this will dispense remainder after CA
5040    Pump volume, rate                   10; 10          this is extra to force air out
5050    Pump volume, rate                   -10; 10         brings pump back to original position
5060    Tip to video                        1               return to video position, as example
5070    Return subroutine                                   End liquid disposal sub
6000    Move tip Z to                       -80             Begin IFT sub, adjust so tip in video
6010    Pump volume, rate                   13; 2           form pendant drop
6020    Snap shot                                           grab image
6030    Open movie                          5               open movie for analysis;
                                                            will timeout if no movie found
6040    Do interfacial tension measurement
6050    Close movie                                         will save movie as name set in 9060
6060    Pump volume, rate                   -13; 5          pull drop back in
6070    Move tip Z to                       0               tip back high
6080    Video                               1               ensure video back on
6090    Return subroutine                                   End IFT sub
7000    Liquid index                        1               Begin liquid pickup sub
7010    Valve to tip                        1               Water index (see Cal tab), choose tip
7020    Move tip Z by                       -30             adjust so tip enters vial liquid
7030    Pump volume, rate                   -20; 5          aspirate 20ul at 5ul/s
7040    Tip to video                        1               raise tip and move to video position
7050    Return subroutine                                   End liquid pickup sub
8000    Move R (radial) to                  125             Begin sample position sub
8010    Move Q (theta) by                   15              R=125mm, Q incremented by 15deg
8020    Move Z to                           18              adjust to place sample in video image
8030    Return subroutine                                   End sample position sub
9000    Home Z stage                                        Begin home sub
9010    Home R (radial) stage
9020    Home Q (theta) stage
9030    Home autosampler                                    assume pump primed
9040    Video                               1               video on
9050    Back light                          1               backlight on
9060    Save movies as                      MyMovie; 1      base name and suffix for saved movies
9070    Return subroutine                                   End home sub
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