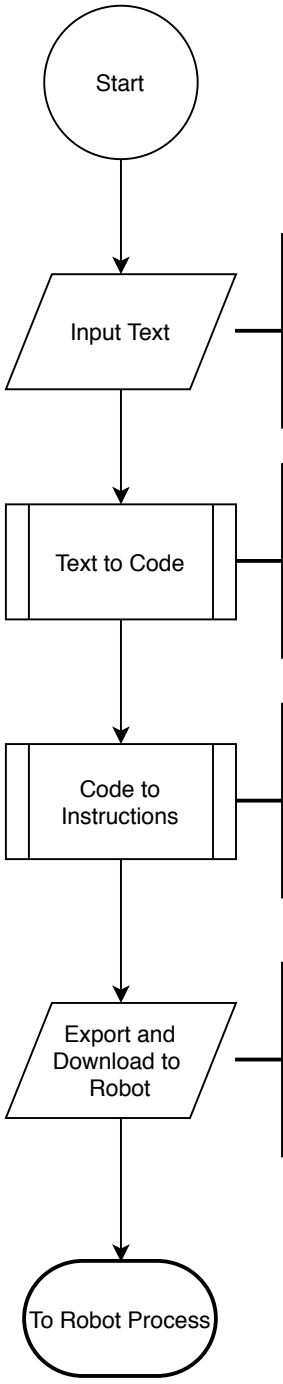
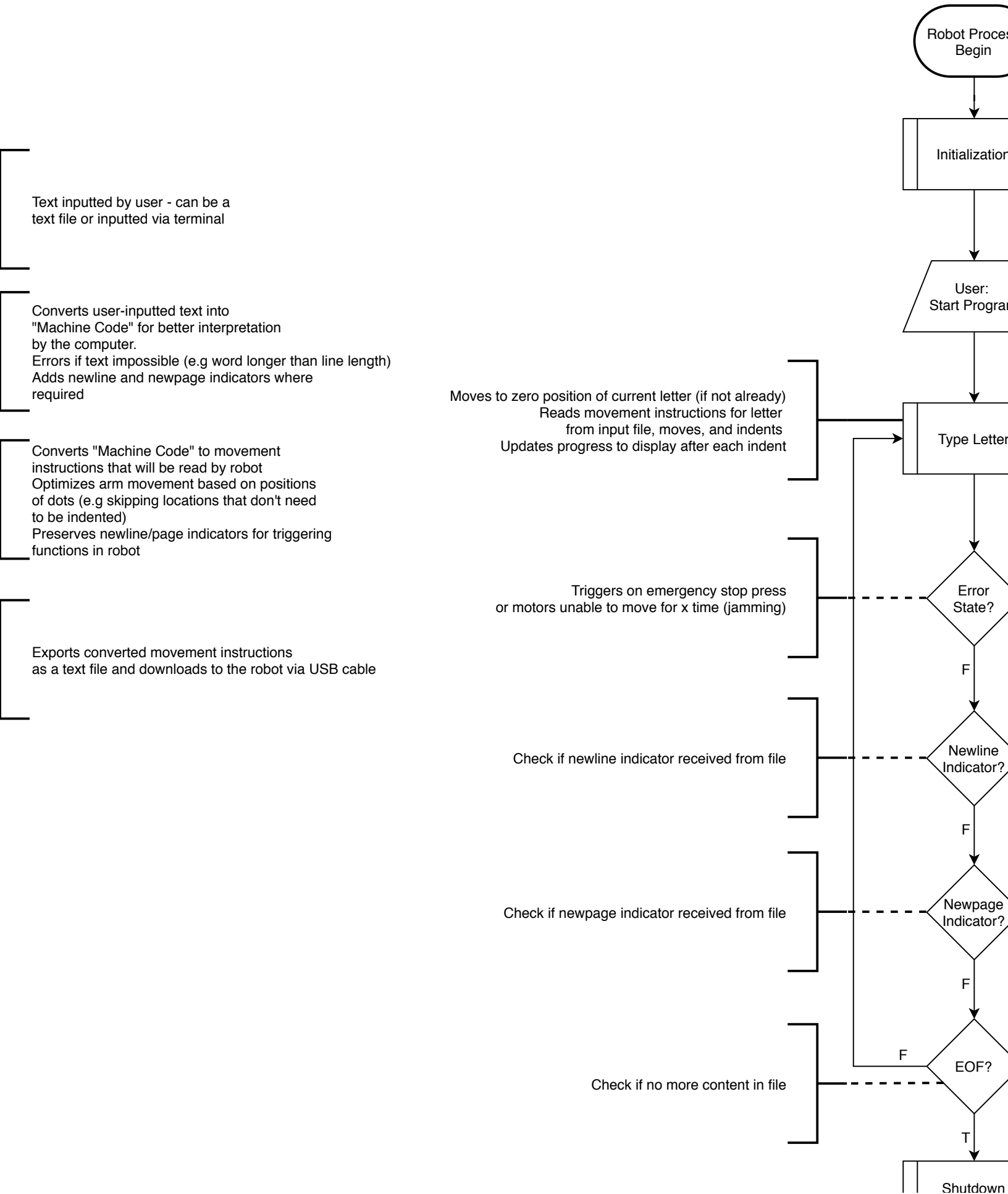
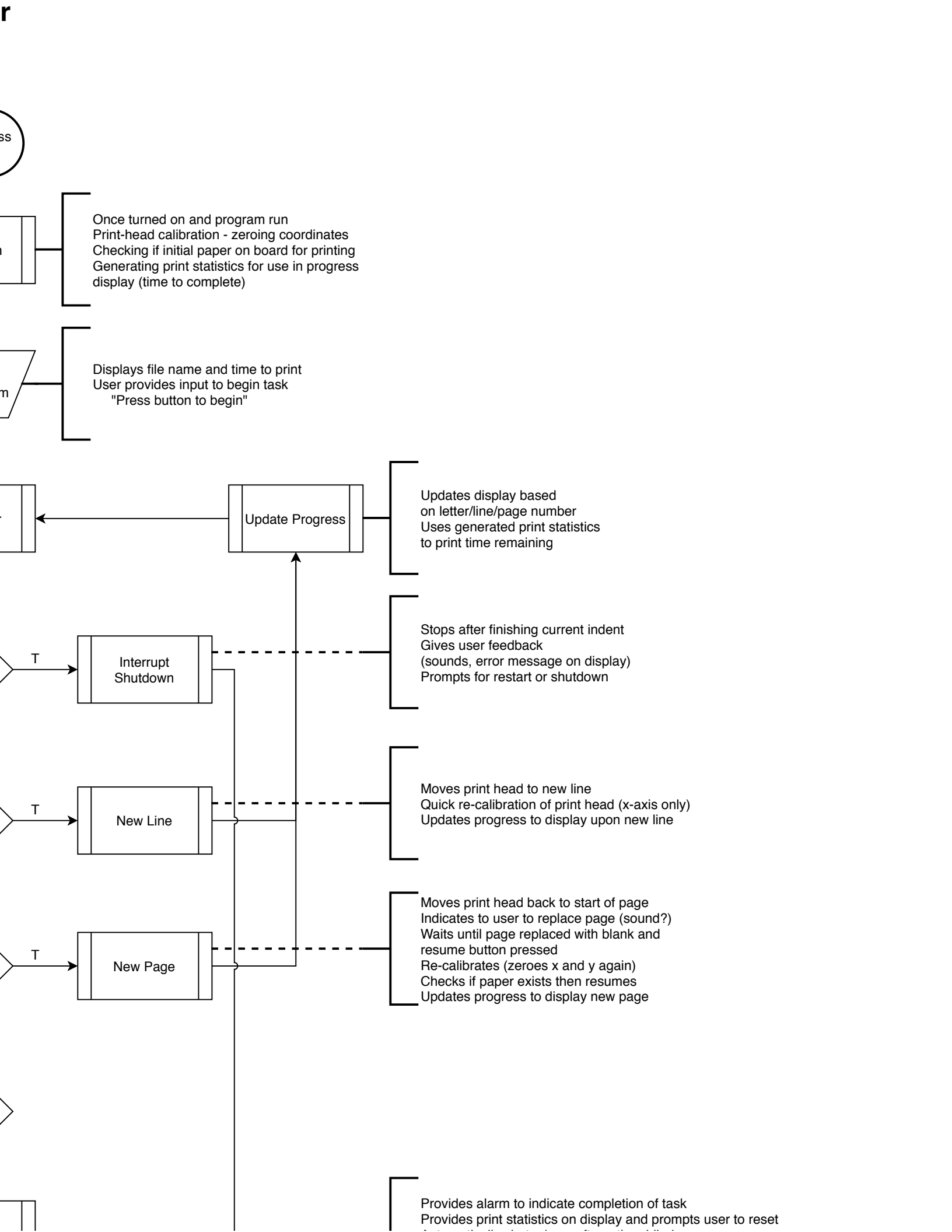
on

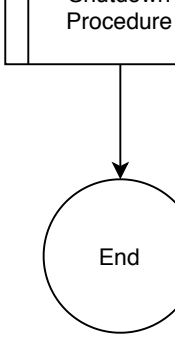

Start
Input Text
Text to Code
Code to Instructions
Export and Download to Robot
To Robot Process

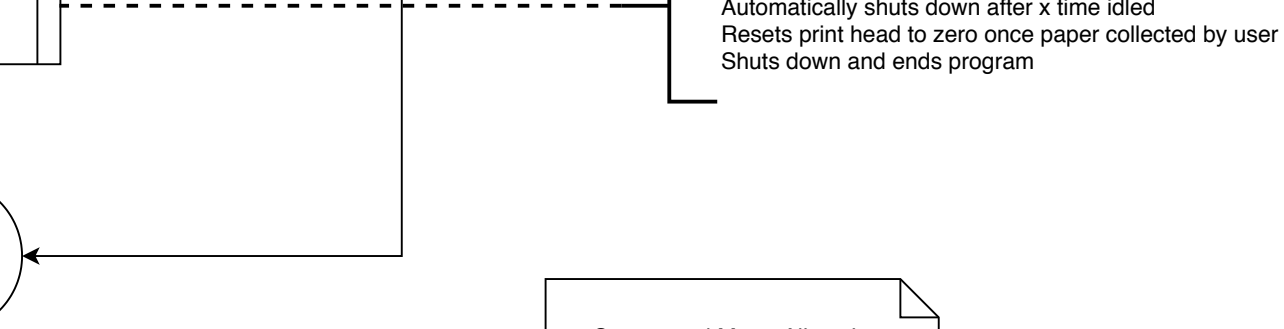
Printe


Robot Proces
Begin
Initialization
User:
Start Progra
Type Letter
Error
State?
F
Newline
Indicator?
F
Newpage
Indicator?
F
EOF?
F
T
Shutdown
Text inputted by user - can be a
text file or inputted via terminal
Converts user-inputted text into
"Machine Code" for better interpretation
by the computer.
Errors if text impossible (e.g word longer than line length)
Adds newline and newpage indicators where
required
Converts "Machine Code" to movement
instructions that will be read by robot
Optimizes arm movement based on positions
of dots (e.g skipping locations that don't need
to be indented)
Preserves newline/page indicators for triggering
functions in robot
Exports converted movement instructions
as a text file and downloads to the robot via USB cable
Moves to zero position of current letter (if not already)
Reads movement instructions for letter
from input file, moves, and indents
Updates progress to display after each indent
Triggers on emergency stop press
or motors unable to move for x time (jamming)
Check if newline indicator received from file
Check if newpage indicator received from file
Check if no more content in file

r


ss
Once turned on and program run
Print-head calibration - zeroing coordinates
Checking if initial paper on board for printing
Generating print statistics for use in progress display (time to complete)
m
Displays file name and time to print
User provides input to begin task
"Press button to begin"
Update Progress
Updates display based on letter/line/page number
Uses generated print statistics to print time remaining
T
Interrupt Shutdown
Stops after finishing current indent
Gives user feedback (sounds, error message on display)
Prompts for restart or shutdown
T
New Line
Moves print head to new line
Quick re-calibration of print head (x-axis only)
Updates progress to display upon new line
T
New Page
Moves print head back to start of page
Indicates to user to replace page (sound?)
Waits until page replaced with blank and resume button pressed
Re-calibrates (zeroes x and y again)
Checks if paper exists then resumes
Updates progress to display new page
Provides alarm to indicate completion of task
Provides print statistics on display and prompts user to reset


Procedure
End



Sensor and Motor Allocation:

Sensors:
1x Color Sensor (Paper Detection)
2x Touch Sensor (Calibration)

Motors:
1x X Motor (optimal 2)
1x Y Motor (optimal 2)
1x Indent Motor
1x Buzzer (If possible, sketch wiring)