MOBILE APPLICATIONS

ANDROID ROBOTIC ARM
SOFTWARE DESIGN DOCUMENT

FOR THE FINAL PROJECT COURSE: MOBILE APPLICATIONS

Date: May 3, 2012

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1 IMPORTANT NOTES

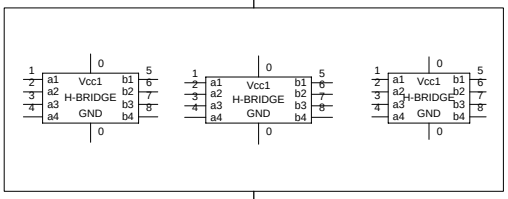
05/03/2012 - Release in Mobile Class. No important Notes at this moment

2 LIST OF SOURCE CODE FILES

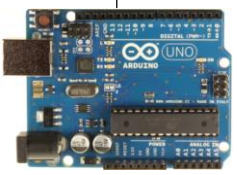
Android_Robot_Arm_Activity.java	: Implements main screen (main menu)
ManualControl.java	: Implements a manual control for Robotic Arm
ResetState.java	: Implements a Reset sequence to return the Arm to a reset state
AutomatedSequence.java	: Implements an Automated Sequence that makes the Robot arm pick some object in left side and released in the right side
CurrentState.java	: Implements a Monitor to verify Robot Arm state
DBInterface.java	: Connector Interface to a SQLite data base
Arduino_Robot_Arm	: Arduino Embedded Program (Sketch)

3 ANDROID ROBOTIC ARM DEPLOYMENT DIAGRAM

ROBOTIC ARM



H-BRIDGE CIRCUIT



ARDUINO UNO EMBEDDED SYSTEM

BLUETOOTH

ANDROID CELL PHONE

<<Manifest>>

Arduino_Robotic_Arm Sketch

<<Manifest>>

Android_Robotic_Arm

<<Manifest>>

Amarino 2.0 (Bluetooth)

<<Manifest>>

MotorState4 DATA BASE

ANDROID ROBOTIC ARM DEPLOYMENT DIAGRAM	
SW Engineers: Edgar Acosta/Abbas	
Date:04/08/2012	Software Release: 1.0
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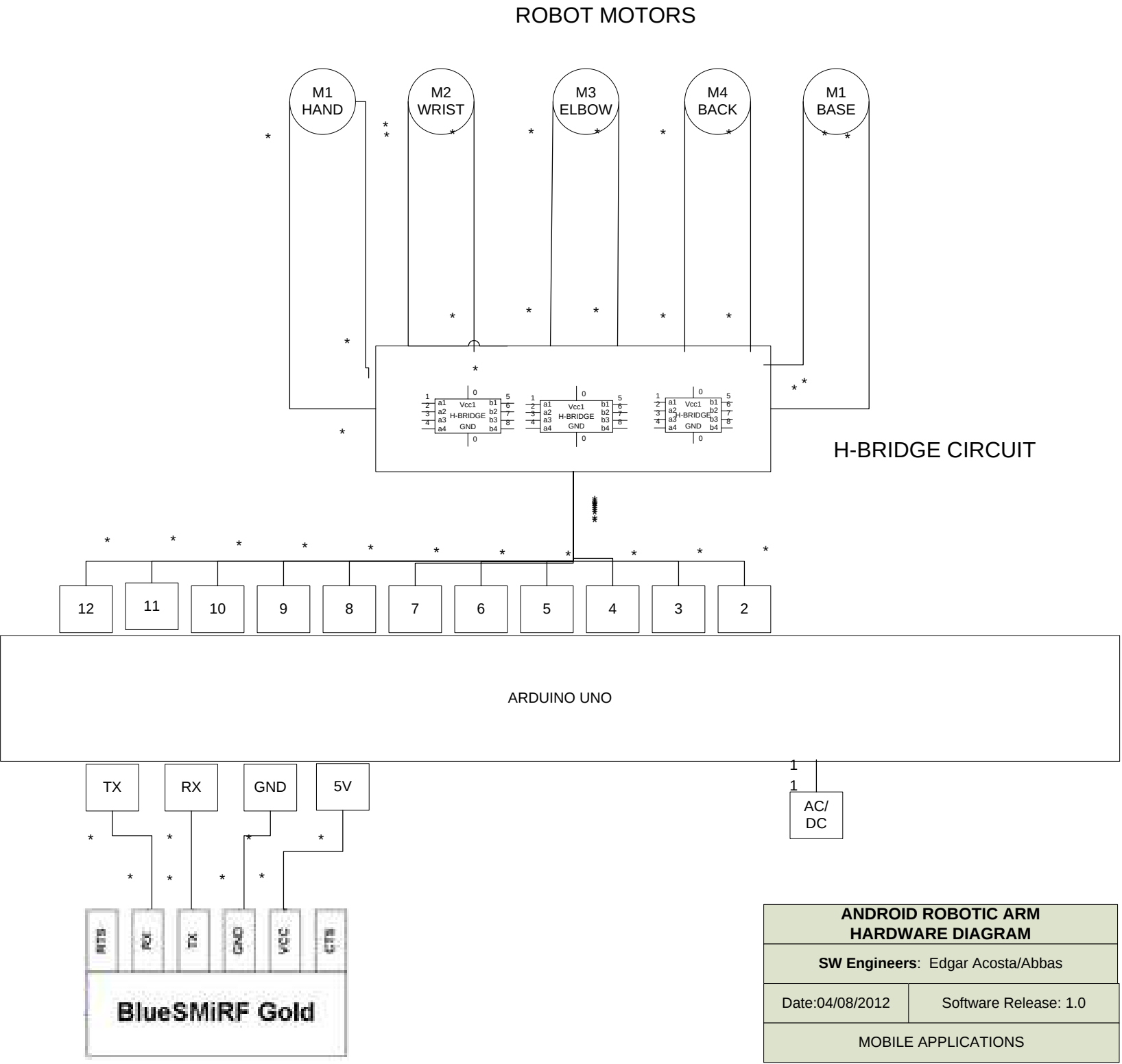
4 HARDWARE INTEGRATION DIAGRAM



ANDROID ROBOTIC ARM HARDWARE DIAGRAM	
SW Engineers: Edgar Acosta/Abbas	
Date:04/08/2012	Software Release: 1.0
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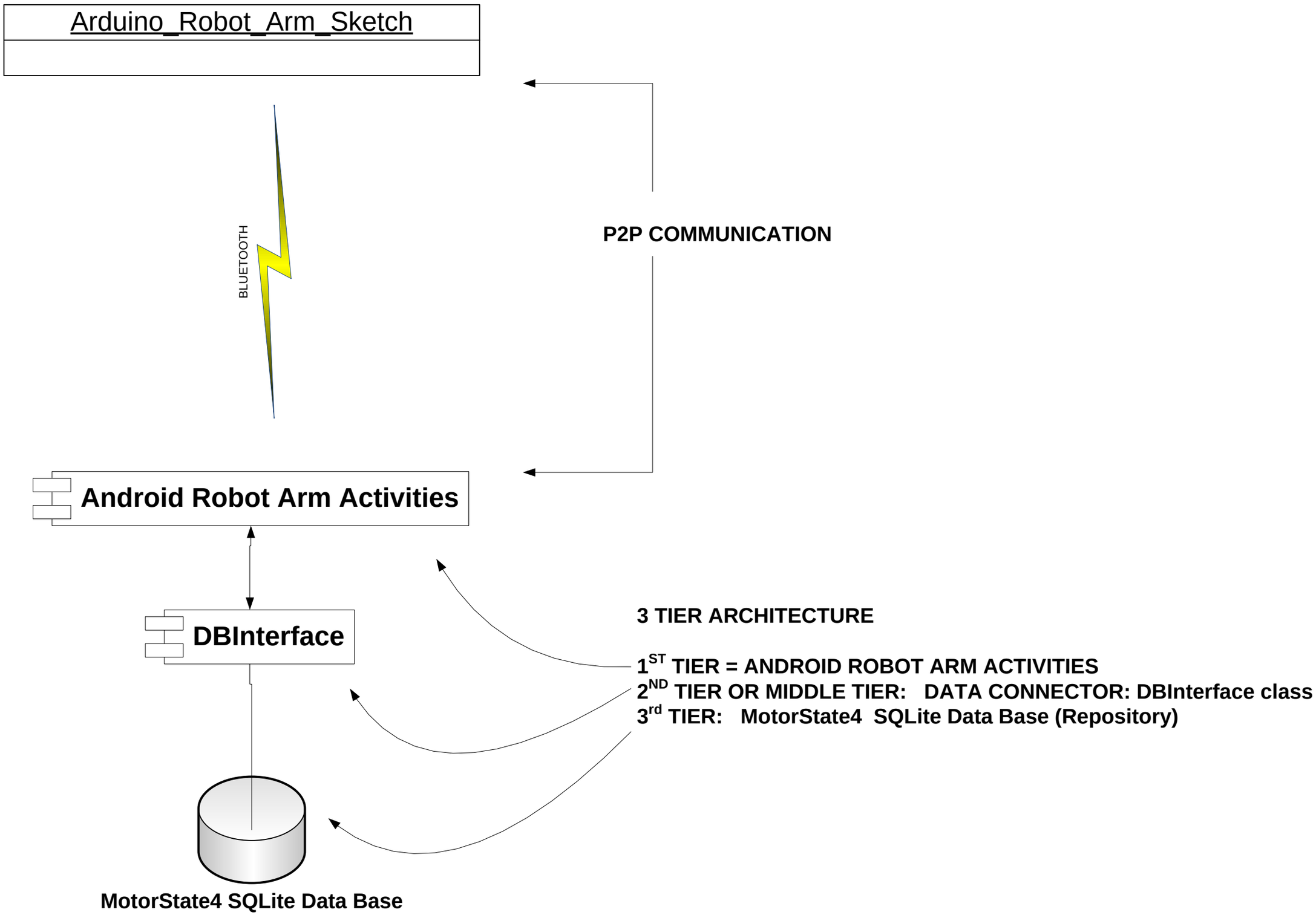
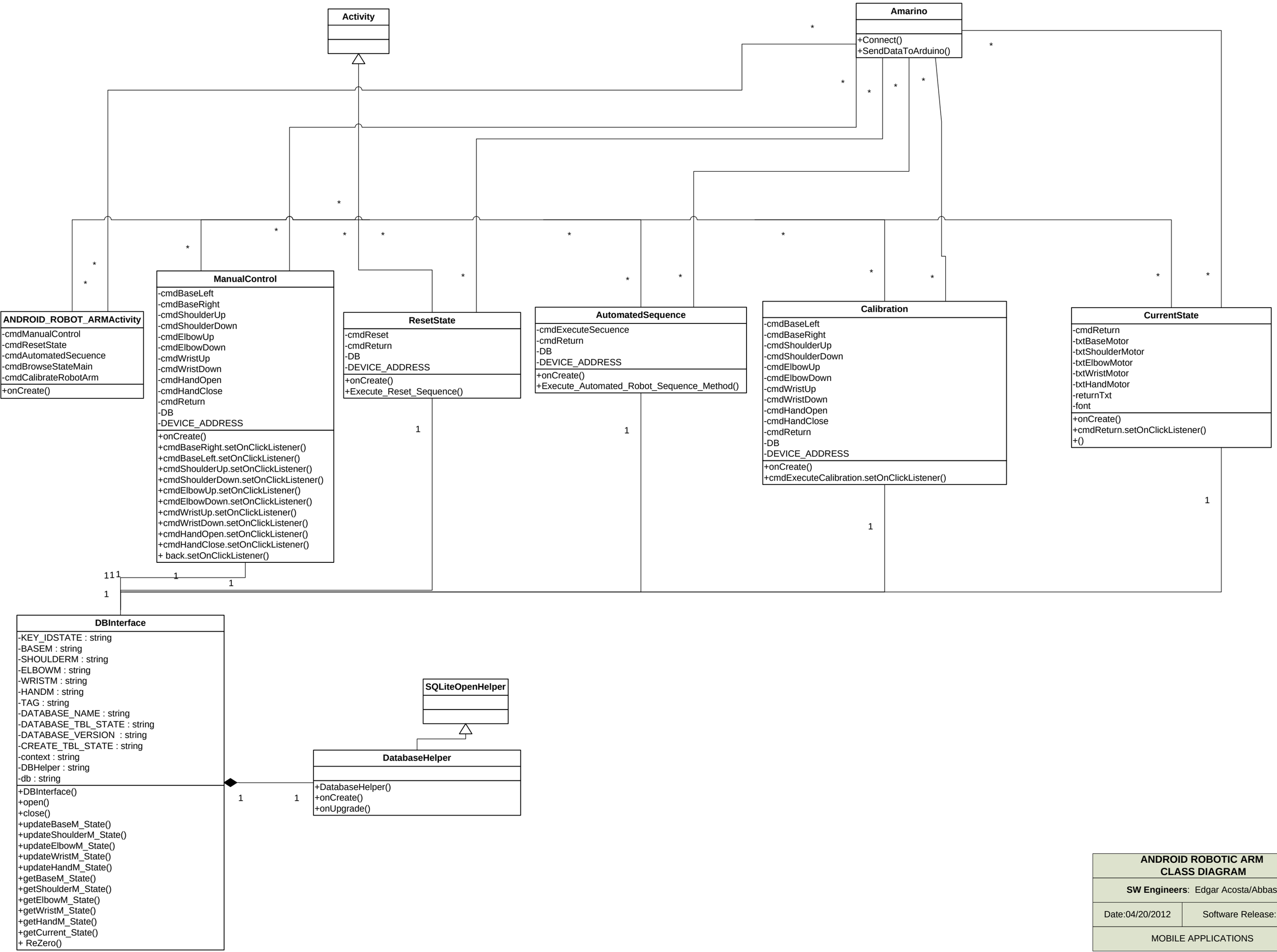
5.- SOFTWARE ARCHITECTURE/ 3 TIER – P2P



6.- ANDROID ROBOTIC ARM CLASS DIAGRAM



ANDROID ROBOTIC ARM CLASS DIAGRAM	
SW Engineers: Edgar Acosta/Abbas	
Date:04/20/2012	Software Release: 1.0
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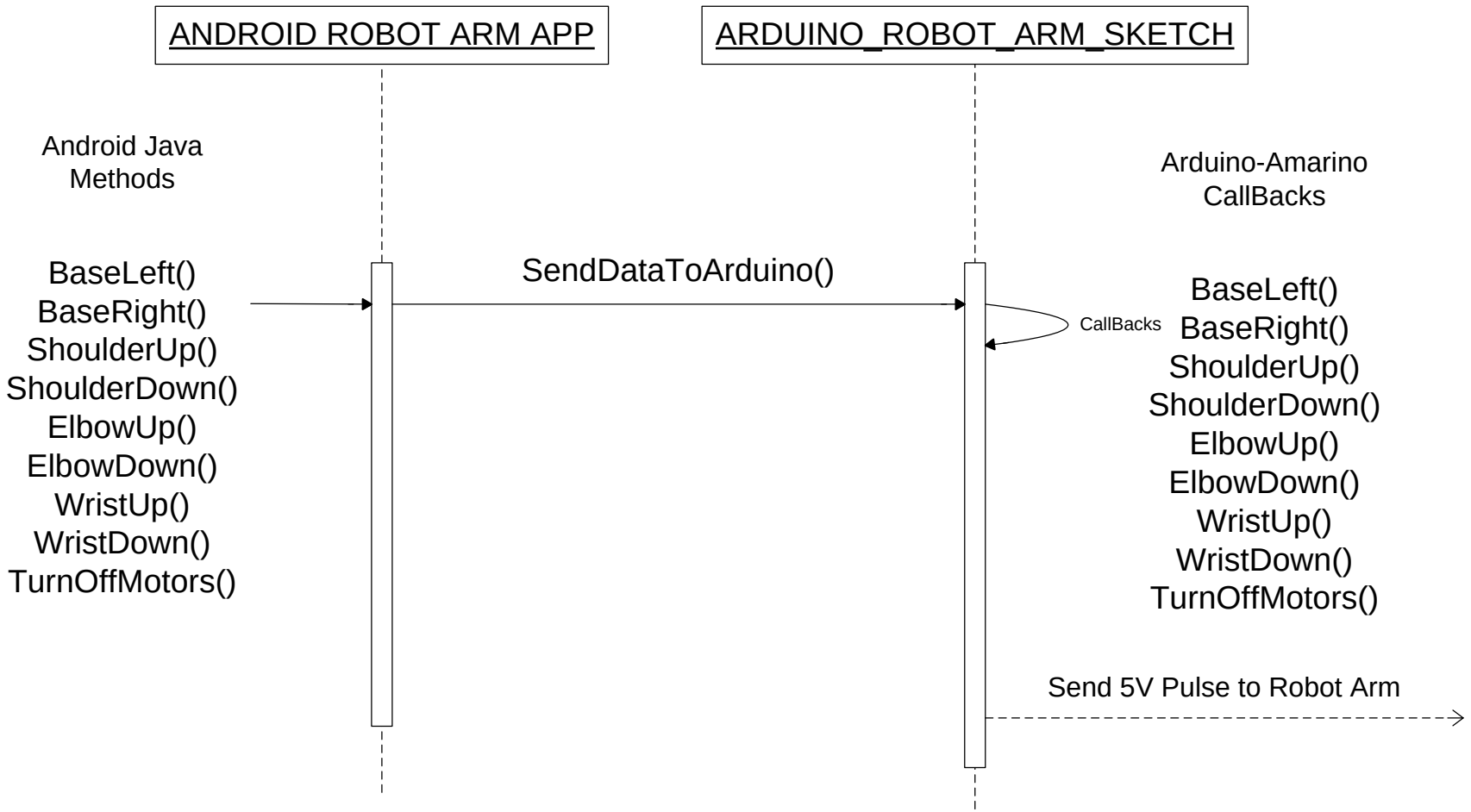
7.- Android – Arduino Interaction



ANDROID ROBOTIC ARM ANDROID-ARDUINO INTERACTION SEQ D.	
SW Engineers: Edgar Acosta/Abbas	
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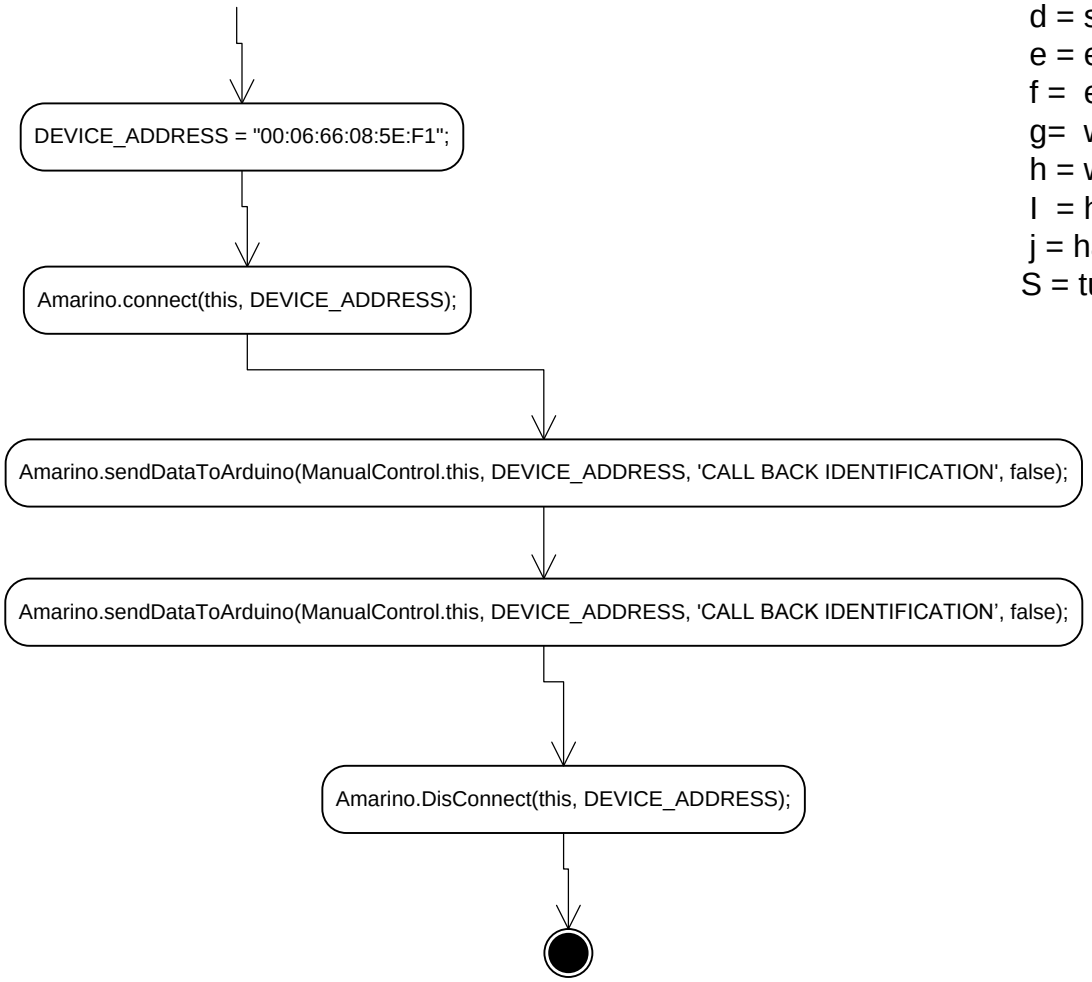
8.- ANDROID BLUETOOTH COMMUNICATIONS STEPS TO TURN ON AND TURN OFF A MOTOR

Amarino: API used to communicate using bluetooth to Arduino



CALL BACK IDENTIFICATION:

a = base left
b = base right
c = shoulder up
d = shoulder down
e = elbow up
f = elbow down
g= wrist up
h = wrist down
I = hand open
j = hand close
S = turn off motors

ANDROID BLUETOOTH COMMUNICATIONS	
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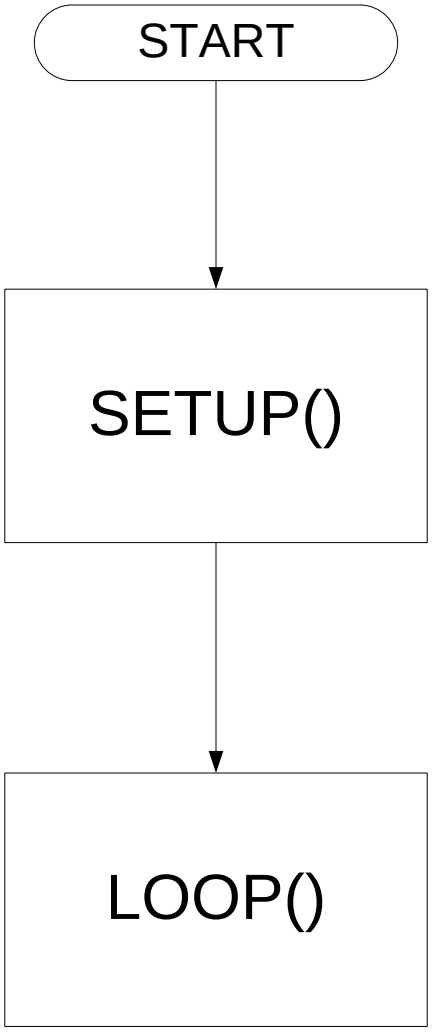
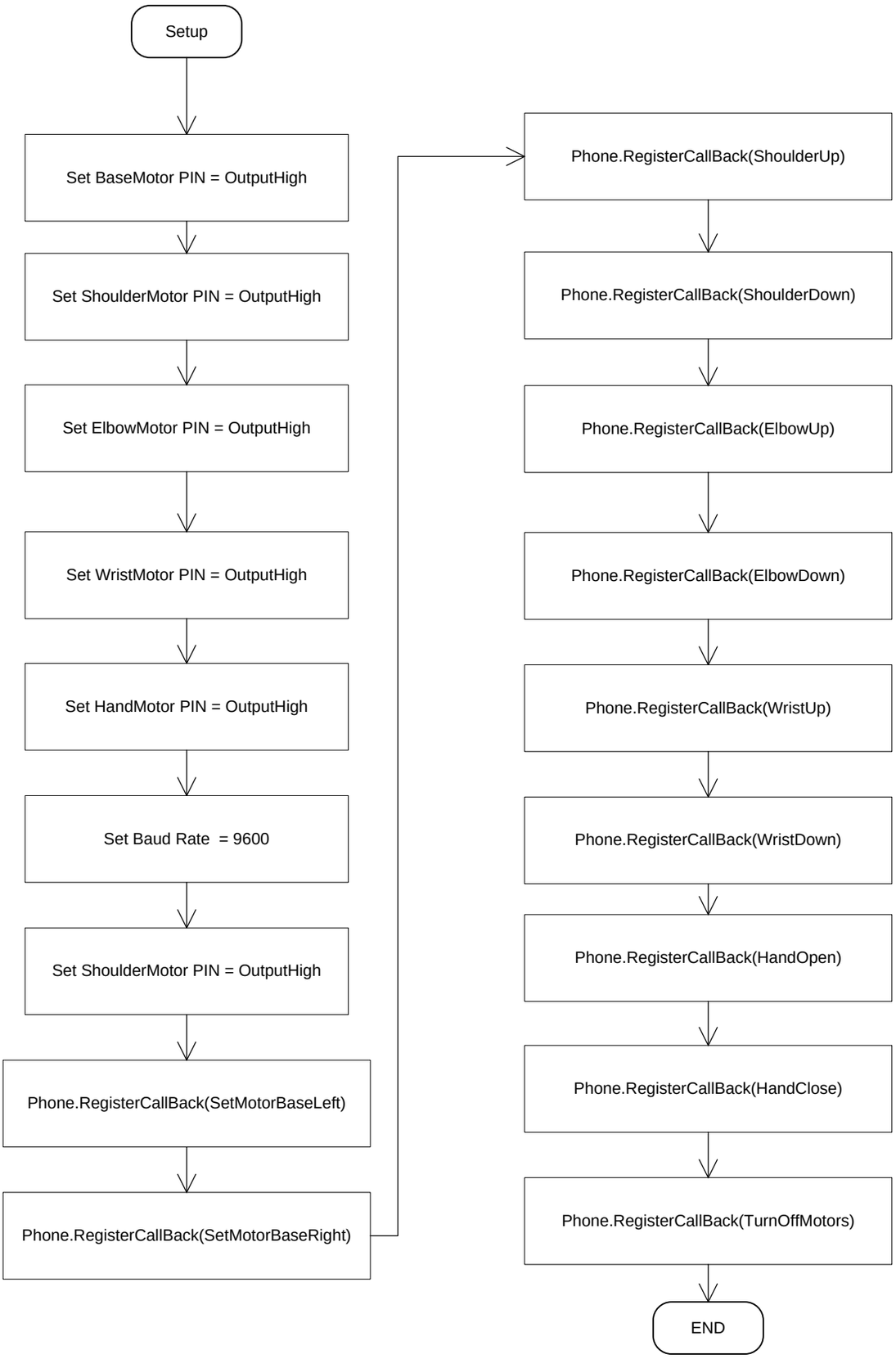
9.- ARDUINO EMBEDDED PROGRAM GENERAL STRUCTURE



10.- ARDUINO SETUP PROGRAM



ANDROID ROBOTIC ARM ARDUINO SETUP PROGRAM	
SW Engineers: Edgar Acosta/Abbas	
Date:04/20/2012	Software Release: 1.0
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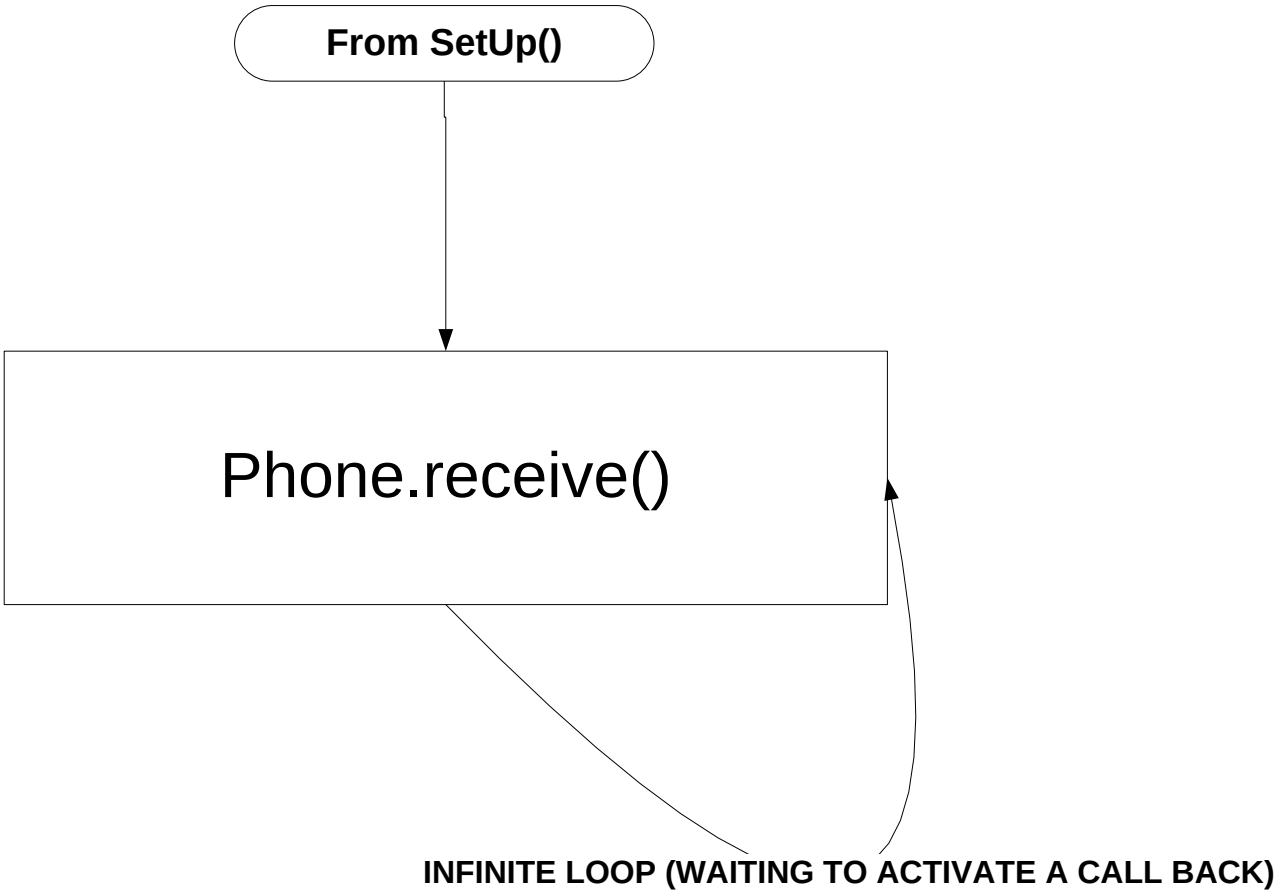
11.- ARDUINO EMBEDDED PROGRAM DETAIL METHOD



ANDROID ROBOTIC ARM ARDUINO LOOP PROGRAM	
SW Engineers: Edgar Acosta/Abbas	
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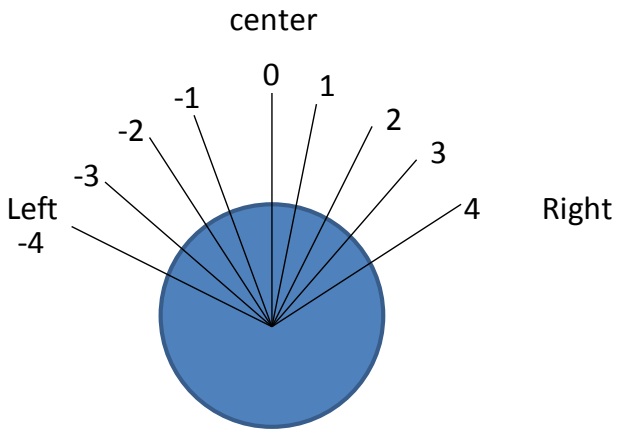
12.- BASE MOTOR STATE MACHINE

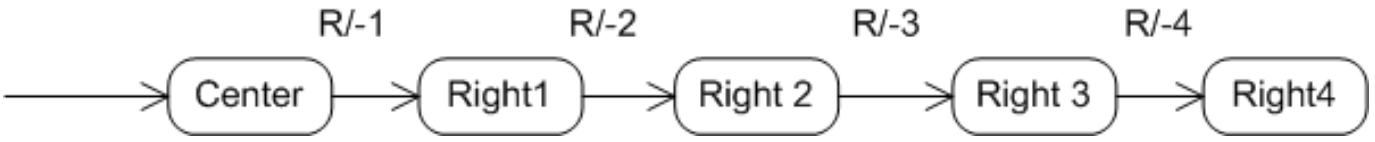
Note: Motor States are managed in Android Robot Arm Application



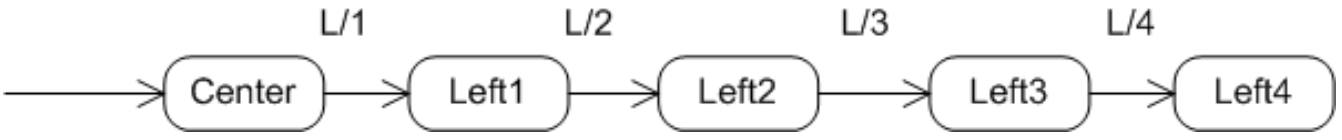
BASE MOTOR

RANGE OF MOVEMENTS (STATES)
[4 – 0 – 4]

BASE MOTOR STATE MACHINE FROM CENTER POINT TO RIGHT



BASE MOTOR STATE MACHINE FROM CENTER TO LEFT



ANDROID ROBOTIC ARM BASE MOTOR STATE MACHINES	
SW Engineers: Edgar Acosta/Abbas	
Date:04/20/2012	Software Release: 1.0
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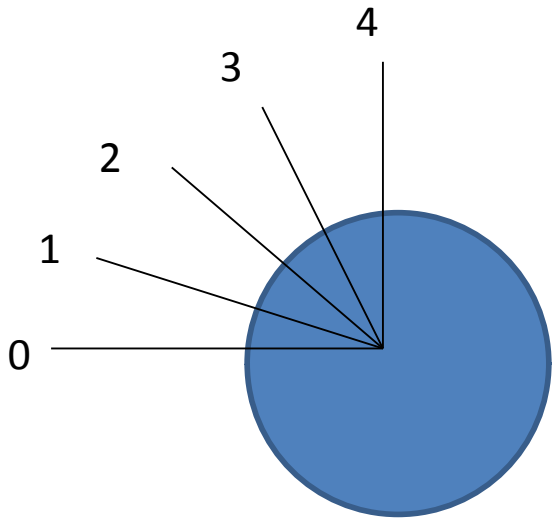
13.- SHOULDER MOTOR STATE MACHINE

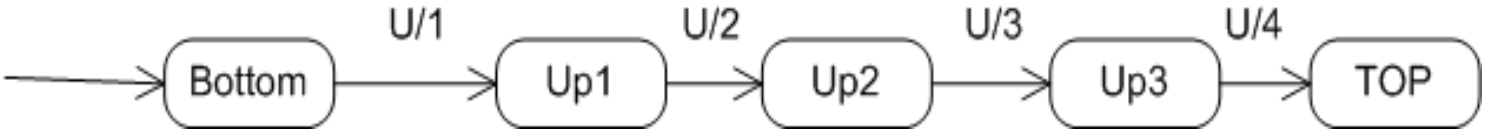
Note: Motor States are managed in Android Robot Arm Application



SHOULDER MOTOR

RANGE OF MOVEMENTS (STATES)
[0-4]

SHOULDER UP STATE MACHINE



SHOULDER DOWN STATE MACHINE

ANDROID ROBOTIC ARM SHOULDER MOTOR STATE MACHINES	
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Date:04/20/2012	Software Release: 1.0
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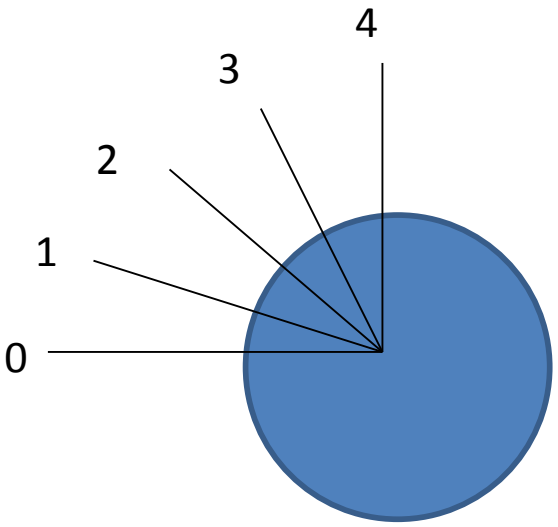
14.- ELBOW MOTOR STATE MACHINE

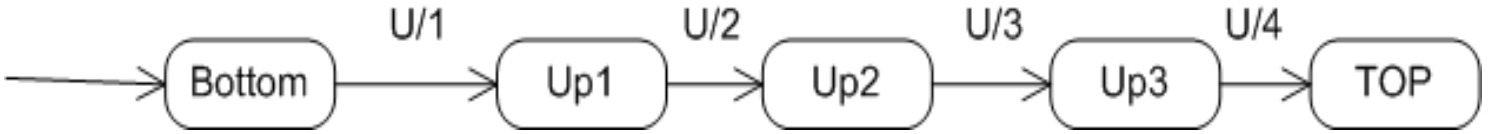
Note: Motor States are managed in Android Robot Arm Application



EIBOW MOTOR

RANGE OF MOVEMENTS (STATES)
[0-4]

ELBOW UP STATE MACHINE



ELBOW DOWN STATE MACHINE

ANDROID ROBOTIC ARM ELBOW MOTOR STATE MACHINES	
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Date:04/20/2012	Software Release: 1.0
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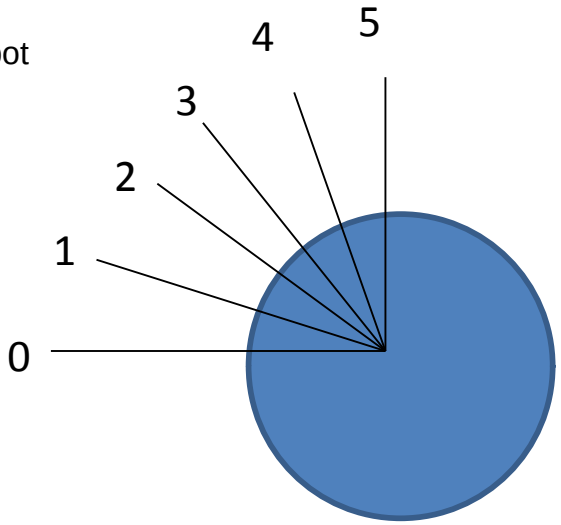
15.- WRIST MOTOR STATE MACHINE

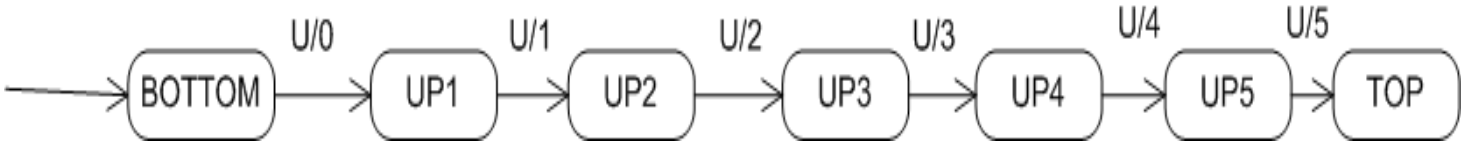
Note: Motor States are managed in Android Robot Arm Application



WRIST MOTOR

RANGE OF MOVEMENTS (STATES)
[0-5]

WRIST UP STATE MACHINE



WRIST DOWN STATE MACHINE

ANDROID ROBOTIC ARM WRIST MOTOR STATE MACHINES	
SW Engineers: Edgar Acosta/Abbas	
Date:04/20/2012	Software Release: 1.0
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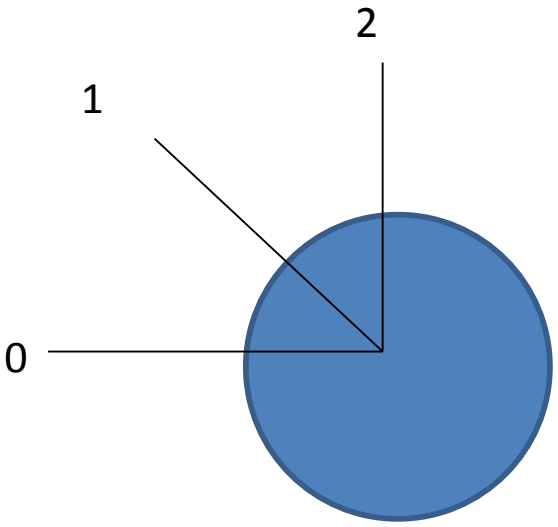
16.- HAND MOTOR STATE MACHINE

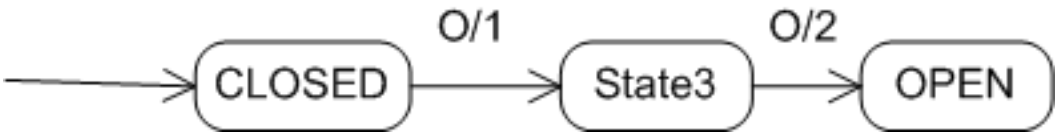
Note: Motor States are managed in Android Robot Arm Application



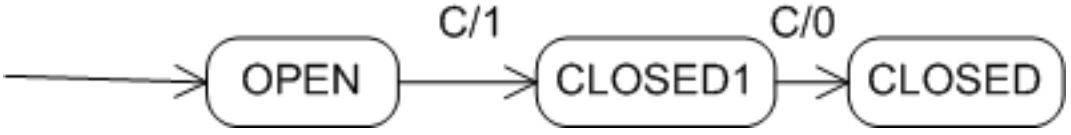
HAND MOTOR

RANGE OF MOVEMENTS (STATES)
[0-2]

HAND OPEN STATE MACHINE



HAND CLOSE STATE MACHINE



ANDROID ROBOTIC ARM HAND MOTOR STATE MACHINES	
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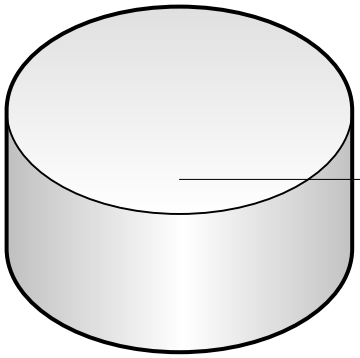
17.- SQLITE DATA BASE SCHEMA



<<Manifest>>

MotorState4 SQLite Data Base

_id	Integer Autoincrement
BaseM	Integer
ShoulderM	Integer
ElbowM	Integer
WristM	Integer
HandM	Integer

PRIMARY KEY

Base Motor State

Shoulder Motor State

Elbow Motor State

Wrist Motor State

Hand Motor state

ANDROID ROBOTIC ARM SQLITE DATA BASE SCHEMA	
SW Engineers: Edgar Acosta/Abbas	
Date:04/20/2012	Software Release: 1.0
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