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#ifndef __BALLBOTAUTONS__
#define __BALLBOTAUTONS__
#include "main.h"
#define NUMBER_AUTONS 5           // Number of programmed
    routines
int autonSelect = 0;             // Routine to start on
// Selecting one of the back autons will switch controls to arcade

// #defines for auton drive modes
#define DRIVEMODE_USER 0         // User mode
#define DRIVEMODE_TIME -1        // Drive for time
#define DRIVEMODE_DIST -2        // Drive for distance
#define DRIVEMODE_CUSTOM -3      // Drive custom
#define DRIVEMODE_SONAR -4       // Drive for sonar dist
#define DRIVEMODE_TURN 1         // Turn
#define TURNMODE_GYRO 1          // Do turns with gyro
#define TURNMODE_ENCODER 2       // Do turns with encoders

// #defines for commands & conditions
#define END 0                    // End of auton routine
#define DRIVE -1                 // Drive (until some condition
    met)
#define TURN -2                  // Turn to some angle at some
    speed
#define TURN_REL -3              // Turn for some angle at some
    speed
#define TURN_ENC -4              // Turn for some angle using
    encoder ticks
#define FIRE -5                  // Shoot flywheel at preset
    speed
#define FIRE_AIM -6              // Aim and fire ball
#define INTAKE_ON -7             // Turn intake on
#define INTAKE_OFF -8            // Turn intake off
#define ARMSEEK -9               // Move arm to pos
#define WRISTSEEK -10            // Move wrist to pos
#define FLIPSEEK -11             // Move flipper to pos
#define FLIP -12                 // Auto flip 180°
#define STACK_LOW -13            // Auto stack on low
#define STACK_HIGH -14           // Auto stack on high
#define STACK_LOW_FROM -15       // Auto stack from a step low
#define STACK_HIGH_FROM -16      // Auto stack from a step high
#define PAUSE -17                // Do nothing for some time
#define SET_GYRO -18             // Set gyro to some angle
#define STOP_FLYWHEEL -19        // Stop Flywheel running
#define FINISH_LOW_STACK -20      // Finish low stack
#define TURN_AIM -21             // Turn to aim at ____
    (target, location, time)
#define STOP_FIRE -22            // Cancel Fire
#define START_COAST -23          // Start flywheel coast
#define STOP_COAST -24           // Stop flywheel coast
#define DRIVE_TO -25             // Drive to point, (s,x,y,t)

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#define TURN_TO -26              // Turn to face point
#define INTAKE_FLIP -27          // Run outer intake backwards
    to flip cap
#define SCRAPER -28              // Position seek for scraper
#define FIRE_AIM_BOTH - 29

// Conditionals
#define IF -42386                // If
#define ELSE -41987              // Else
#define ENDIF -3298              // End if

#define BLUE_FLAG 1              // Blue flag for aiming
#define RED_FLAG 2               // Red flag for aiming
#define GREEN_FLAG 3             // Green flag for aiming
#define CENTER 0                 // Aim at center-most obj.
#define LEFT 1                   // Aim at left-most obj.
#define RIGHT 2                  // Aim at right-most obj.

#define CDIR -563                // Turn Parameter for drive
    facing current direction
#define DISTANCE -1              // Drive condition for
    distance based on encoders
#define LIDAR -2                 // Drive condition for
    distance based on lidar
#define SONAR -11                // Drive condition for
    distance based on sonar

// Drive conditions for white lines
#define WHITE_E -3               // Either white
#define WHITE_B -4               // Both white
#define WHITE_L -5               // Left white
#define WHITE_R -6               // Right white
#define BLACK_E -7               // Either black
#define BLACK_B -8               // Both black
#define BLACK_L -9               // Left black
#define BLACK_R -10              // Right black

#define FIRED -1                 // Pause condition wait till
    fired
#define GOTBALL -2               // Pause condition wait till
    one ball
#define GOTBALLS -3              // Pause condition wait till
    two balls
#define UNTIL -4                 // Pause condition wait till
    time (not for time)
#define STACKED -5               // Pause condition wait till
    stacked
#define AFTER -6

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#define BEFORE -7
// #define SCRAPER_UP -8
// #defines for arm positions
#define FLIP_POS1 1 // 1:1 Ratio, 0°
#define FLIP_POS2 180 // 1:1 Ratio, 180°
#define WRIST_BACK_POS (200*3) // 1:3 Ratio, 200°
#define WRIST_BACKWARD_DROP_POS (-70*3) // 1:3 Ratio, -70°
#define WRIST_FORWARD_POS (80*3) // 1:3 Ratio, 80°
#define WRIST_FORWARD_EXTRA (0*3) // 1:3 Ratio, 30°
#define WRIST_FORWARD_DROP_POS (67*3) // 1:3 Ratio, 65°
#define WRIST_VERTICAL_POS 1 // 1:3 Ratio, 0°
#define ARM_POS_HIGH (125*5) // 1:5 Ratio, 120°
#define ARM_POS_LOW (90*5) // 1:5 Ratio, 90°
#define ARM_POS_DOWN 1 // 1:5 Ratio, 0°
#define ARM_SKILLS_POS 180*5
#define ARM_HOLD_POS 25*5
#define SCRAPER_UP_POS -10

#define SCRAPER_FLIP_POS 90
#define SCRAPER_UP -10
#define SCRAPER_DOWN_POS 50
#define ARM_KNOCK_POS 200
#define WRIST_KNOCK_POS 160

#define FAR_FLAG_DIST 1.2
#define MIDDLE_FLAG_DIST 0.8
#define FIRE_TRY_TIME 2.5

#define TOP 2 // Top Flag
#define MIDDLE 1 // Middle Flag

double defaultAuton[] = {
    0,
    END
};

double redAuton[] = {
    180, // ROBOT STARTS FACING 180°

    DRIVE,50,180,DISTANCE,0.1,1, // DRIVE WITHIN EXPANSION ZONE

    WRISTSEEK,-1000, // DEPLOY FLIPPER
    PAUSE,1.5,
    FLIPSEEK,FLIP_POS1,
    WRISTSEEK,WRIST_FORWARD_POS,
    PAUSE,0.5, // DEPLOY DONE

    DRIVE,-70,180,DISTANCE,0.6,1, // DRIVE TO LINE UP FOR CAP
    TURN,135,1, // AIM AT CAP

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TURN,135,2, // AIM AT CAP

DRIVE,-50,135,DISTANCE,1,2, // DRIVE TO CAP 1
WRISTSEEK,WRIST_VERTICAL_POS, // PICK IT UP
GRAB CAP 1
PAUSE,1, // TIME TO PICK UP

DRIVE,70,135,WHITE_R,2, // DRIVE TILL RIGHT SENSOR IS
OVER START TILE
TURN,180,2, // TURN FOR NEXT DRIVE
DRIVE,70,180,BLACK_R,2, // DRIVE UNTIL OFF START TILE
DRIVE,-90,180,DISTANCE,0.1,1, // DRIVE TO LINE UP
TURN,90,2, // TURN TO LINE UP

DRIVE,-90,90,0.1, // DRIVE AWAY FROM POLE
TURN,90,2, // TURN TO LINE UP
DRIVE,70,90,0.1, // DRIVE BACK TO WALL

DRIVE,50,90,DISTANCE,0.4,2, // DRIVE TO WALL

STACK_HIGH, // STACK CAP 1
STACK CAP 1
PAUSE,STACKED,10, // WAIT TILL STACKED

TURN,90,2, // TURN STRAIGHT
DRIVE,-90,90,DISTANCE,0.5,1, // DRIVE AWAY FROM POLE
TURN,0,2, // TURN TO FACE FLAGS
DRIVE,90,0,WHITE_L,2, // DRIVE ONTO TILE
DRIVE,90,0,0.1, // MAKE SURE ON TILE
DRIVE,90,0,BLACK_B,2, // DRIVE OFF TILE
DRIVE,-90,0,0.1, // DRIVE TO BREAK
DRIVE,-90,0,DISTANCE,1,2, // DRIVE TO LINE UP

TURN,270,2, // TURN TO FACE CAP
INTAKE_ON, // START INTAKE
WRISTSEEK,WRIST_VERTICAL_POS, // STOP DEPLOY
DRIVE,80,270,BLACK_B,1, // DRIVE OFF TILE
DRIVE,80,270,DISTANCE,1.4,2, // DRIVE TO GET BALL
DRIVE,-80,270,DISTANCE,0.125,2, // DRIVE BACK FROM CAP
KNOCK CAP 2

TURN,345,2, // TURN TO FACE FLAGS
DRIVE,90,345,DISTANCE,0.65,2, // DRIVE TO FLAG DISTANCE
TURN,330,2, // TURN TO FACE FLAGS
TURN_AIM,BLUE_FLAG,CENTER,2, // AIM AT CENTRE-MOST BLUE
FLAG

PAUSE,2, // PAUSE AFTER TURN
PAUSE,UNTIL,35, // WAIT AS LATE AS POSSIBLE
START_COAST, // SPINUP FLYWHEEL

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TURN_AIM,BLUE_FLAG,CENTER,2,    // AIM AT CENTRE-MOST BLUE
FLAG
PAUSE,2,                        // PAUSE AFTER TURNING
PAUSE,UNTIL,41.25,              // WAIT AS LATE AS POSSIBLE

FIRE_AIM,TOP,                   // SHOOT TOP FLAG
TOP MIDDLE FLAG
PAUSE,FIRED,FIRE_TRY_TIME,      // WAIT TILL SHOT
PAUSE,0.1,                      // SHORT PAUSE
STOP_FIRE,                     // STOP FLYWHEEL

DRIVE,127,CDIR,DISTANCE,        // CONTINUED ON NEXT LINE
MIDDLE_FLAG_DIST,2,            // DRIVE TO MIDDLE FLAG DIST
FIRE_AIM,TOP,                  // SHOOT MIDDLE FLAG
MIDDLE MIDDLE FLAG
PAUSE,FIRED,FIRE_TRY_TIME,      // WAIT TILL SHOT
PAUSE,0.1,                     // SHORT PAUSE
STOP_FIRE,                     // STOP FLYWHEEL

INTAKE_OFF,                     // TURN INTAKE OFF
DRIVE,127,CDIR,0.5,            // DRIVE TO TOGGLE BOTTOM FLAG
BOTTOM MIDDLE FLAG
DRIVE,-127,0,0.5,              // DRIVE AWAY FROM FLAG
INTAKE_ON,                     // TURN INTAKE BACK ON

END                             // END OF ROUTINE
};

double blueAuton[] = {
180,                            // ROBOT STARTS FACING 180°

DRIVE,50,180,DISTANCE,0.1,1,    // DRIVE WITHIN EXPANSION ZONE

WRISTSEEK,-1000,                // DEPLOY FLIPPER
PAUSE,1.5,
FLIPSEEK,FLIP_POS1,
WRISTSEEK,WRIST_FORWARD_POS,
PAUSE,0.5,                      // DEPLOY DONE

DRIVE,-70,180,DISTANCE,0.7,1,   // DRIVE TO LINE UP FOR CAP
TURN,225,1,                    // AIM AT CAP
TURN,225,2,                    // AIM AT CAP

DRIVE,-50,225,DISTANCE,1,2,     // DRIVE TO CAP 1
WRISTSEEK,WRIST_VERTICAL_POS,   // PICK IT UP
GRAB CAP 1
PAUSE,0.25,                    // TIME TO PICK UP
FLIP,                          // FLIP SO BALLS ROLL OFF
PAUSE,0.75,                    // LET FLIP HAPPEN

DRIVE,70,225,WHITE_L,2,        // DRIVE TILL LEFT SENSOR IS
OVER START TILE
TURN,180,2,                    // TURN FOR NEXT DRIVE
FLIP,                          // FLIP CAP BACK
DRIVE,70,180,BLACK_L,2,        // DRIVE UNTIL OFF START TILE
DRIVE,-70,180,0.05,           // DRIVE TO BREAK
DRIVE,-70,180,DISTANCE,0.05,1, // DRIVE TO LINE UP
TURN,270,2,                   // TURN TO LINE UP

DRIVE,-90,270,0.1,             // DRIVE AWAY FROM POLE
TURN,265,2,                   // TURN TO LINE UP
DRIVE,70,270,0.1,             // DRIVE BACK TO WALL

DRIVE,50,270,DISTANCE,0.4,2,   // DRIVE TO WALL

STACK_HIGH,                    // STACK CAP 1
STACK CAP 1
PAUSE,STACKED,10,             // WAIT TILL STACKED

TURN,270,2,                    // TURN STRAIGHT
DRIVE,-90,270,DISTANCE,0.5,1,  // DRIVE AWAY FROM POLE
TURN,0,2,                     // TURN TO FACE FLAGS
DRIVE,90,0,WHITE_R,2,         // DRIVE ONTO TILE
DRIVE,90,0,0.1,              // MAKE SURE ON TILE
DRIVE,90,0,BLACK_B,2,         // DRIVE OFF TILE
DRIVE,-90,0,0.1,             // DRIVE TO BREAK
DRIVE,-90,0,DISTANCE,0.9,2,    // DRIVE TO LINE UP

TURN,90,2,                     // TURN TO FACE CAP
INTAKE_ON,                    // START INTAKE
WRISTSEEK,WRIST_VERTICAL_POS,  // STOP DEPLOY
DRIVE,80,90,BLACK_B,1,        // DRIVE OFF TILE
DRIVE,80,90,DISTANCE,1.4,2,    // DRIVE TO GET BALL
DRIVE,-80,90,DISTANCE,0.25,2,  // DRIVE BACK FROM CAP
KNOCK CAP 2

TURN,5,2,                      // TURN TO FACE FLAGS
DRIVE,90,5,DISTANCE,0.6,2,     // DRIVE TO FLAG DISTANCE
TURN,15,2,                    // TURN TO FACE FLAGS
TURN_AIM,RED_FLAG,CENTER,2,   // AIM AT CENTRE-MOST BLUE
FLAG

PAUSE,2,                      // PAUSE AFTER TURN
PAUSE,UNTIL,35,               // WAIT AS LATE AS POSSIBLE
START_COAST,                  // SPINUP FLYWHEEL
TURN_AIM,RED_FLAG,CENTER,2,   // AIM AT CENTRE-MOST BLUE
FLAG

PAUSE,2,                      // PAUSE AFTER TURNING
PAUSE,UNTIL,41.25,           // WAIT AS LATE AS POSSIBLE

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FIRE_AIM,TOP,                // SHOOT TOP FLAG
  TOP MIDDLE FLAG
PAUSE,FIRED,FIRE_TRY_TIME,    // WAIT TILL SHOT
PAUSE,0.1,                    // SHORT PAUSE
STOP_FIRE,                    // STOP FLYWHEEL

DRIVE,127,CDIR,DISTANCE,      // CONTINUED ON NEXT LINE
MIDDLE_FLAG_DIST-0.2,2,      // DRIVE TO MIDDLE FLAG DIST
FIRE_AIM,TOP,                // SHOOT MIDDLE FLAG
  MIDDLE MIDDLE FLAG
PAUSE,FIRED,FIRE_TRY_TIME,    // WAIT TILL SHOT
PAUSE,0.1,                    // SHORT PAUSE
STOP_FIRE,                    // STOP FLYWHEEL

TURN,0,0.5,                   // TURN TO 0°
INTAKE_OFF,                   // TURN INTAKE OFF
DRIVE,127,CDIR,0.5,           // DRIVE TO TOGGLE BOTTOM FLAG
  BOTTOM MIDDLE FLAG
DRIVE,-127,0,0.5,             // DRIVE AWAY FROM FLAG
INTAKE_ON,                     // TURN INTAKE BACK ON

END                             // END OF ROUTINE
};

double redBackAuton[] = {
  270,                          // ROBOT STARTS FACING 270°

  WRISTSEEK,WRIST_FORWARD_POS,  // START DEPLOY FLIPPER
  FLIPSEEK,FLIP_POS1,           // MAKE SURE FLIPPER STRAIGHT
  INTAKE_ON,                     // START INTAKE
  DRIVE,127,270,BLACK_B,0.5,     // DRIVE OFF TILE
  DRIVE,80,270,DISTANCE,1.3,2,   // DRIVE TO FLIP CAP
  KNOCK CAP 1
  WRISTSEEK,WRIST_VERTICAL_POS,  // FINISH DEPLOY FLIPPER
  PAUSE,0.5,                     // SHORT PAUSE
  WRISTSEEK,WRIST_VERTICAL_POS,  // STOP DEPLOY

  DRIVE,-127,270,DISTANCE,1,2,   // DRIVE AWAY FROM CAP
  TURN,0,0.125,                 // SHORT TURN TO CONTROL
  DIRECTION
  TURN,90,2,                     // TURN TO FACE CAP
  WRISTSEEK,WRIST_FORWARD_POS,   // LOWER FLIPPER
  PAUSE,0.5,                     // PAUSE TO LET FLIPPER DOWN
  DRIVE,-70,90,DISTANCE,1,2,     // DRIVE TO GET CAP
  WRISTSEEK,WRIST_VERTICAL_POS,  // LIFT CAP UP
  COLLECT CAP 1

  PAUSE,0.5,                     // WAIT FOR CAP TO LIFT
  DRIVE,90,90,WHITE_R,3,         // DRIVE TO START TILE
  DRIVE,-90,90,0.05,            // DRIVE TO BREAK
  PAUSE,1,                       // PAUSE TO STOP TIP

  DRIVE,-90,90,DISTANCE,0.125,1, // DRIVE AWAY A LITTLE
  PAUSE,0.25,                    // SHORT PAUSE
  TURN,180,2,                    // TURN TO LINE UP
  PAUSE,0.5,                      // SHORT PAUSE
  DRIVE,90,180,WHITE_L,2,        // DRIVE TO WHITE LINE
  DRIVE,-90,180,0.1,            // DRIVE TO BREAK
  DRIVE,-60,180,DISTANCE,0.125,1, // DRIVE BACK A LITTLE
  PAUSE,0.5,                      // SHORT PAUSE
  TURN,270,2,                    // TURN TO FACE POLE
  PAUSE,0.25,                     // SHORT PAUSE
  ARMSEEK,ARM_POS_LOW,          // RAISE ARM
  PAUSE,2,                        // WAIT FOR ARM TO RAISE

  DRIVE,-90,270,WHITE_L,2,       // DRIVE ONTO TILE
  DRIVE,-90,270,DISTANCE,0.5,2,  // DRIVE TO POLE
  PAUSE,0.5,                      // PAUSE TO STOP MOMENTUM
  WRISTSEEK,-1,                  // DROP CAP
  HIGH SCORE CAP 1
  PAUSE,1,                        // LET CAP SCORE
  DRIVE,90,270,DISTANCE,0.5,2,   // DRIVE AWAY
  ARMSEEK,1,                      // LOWER ARM
  WRISTSEEK,WRIST_FORWARD_POS,   // RAISE WRIST
  PAUSE,0.5,                      // SHORT PAUSE
  WRISTSEEK,WRIST_VERTICAL_POS,  // RAISE WRIST

  TURN,180,2,                    // TURN TO FACE WALL
  DRIVE,127,180,DISTANCE,1,1,    // DRIVE TO WALL
  DRIVE,127,180,0.5,            // ENSURE AGAINST WALL
  SET_GYRO,180,                  // RESET GYRO TO 180

  DRIVE,-127,180,DISTANCE,0.2,1, // DRIVE AWAY FROM WALL
  TURN,90,2,                      // TURN TO FACE NEXT CAP
  WRISTSEEK,WRIST_FORWARD_POS,   // LOWER FLIPPER
  PAUSE,0.5,                      // PAUSE TO LET FLIPPER DOWN
  DRIVE,-80,90,DISTANCE,1.5,2,   // DRIVE TO NEXT CAP
  WRISTSEEK,WRIST_VERTICAL_POS,  // LIFT CAP
  COLLECT CAP 2
  PAUSE,0.5,                      // PAUSE SO CAP LIFTS
  DRIVE,127,90,DISTANCE,0.25,1,  // DRIVE TO LINE UP
  TURN,45,1,                      // TURN READY TO DRIVE
  DRIVE,127,45,DISTANCE,0.8,1,   // DRIVE TO LINE UP
  TURN,0,2,                       // TURN TO FACE POLE
  ARMSEEK,ARM_POS_LOW,          // RAISE ARM
  FLIP,                           // FLIP CAP
  PAUSE,2,                        // WAIT FOR ARM TO RAIS

  DRIVE,-90,0,WHITE_E,1,         // DRIVE TO LINE
  DRIVE,-90,0,DISTANCE,0.5,2,    // DRIVE TO POLE
  PAUSE,0.5,                      // PAUSE TO STOP MOMENTUM
  WRISTSEEK,-1,                  // DROP CAP
  HIGH SCORE CAP 2

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    PAUSE,1,
    DRIVE,90,0,WHITE_R,2,
    ARMSEEK,1,
    WRISTSEEK,WRIST_VERTICAL_POS,

    START_COAST,
    TURN,90,2,
    DRIVE,127,90,WHITE_R,2,
    DRIVE,127,90,DISTANCE,0.125,1,

    TURN,1,2,

    DRIVE,127,1,WHITE_L,2,
    DRIVE,127,1,0.1,
    TILE
    DRIVE,127,1,BLACK_L,2,
    DRIVE,127,1,0.1,
    TILE
    DRIVE,127,1,WHITE_L,2,
    DRIVE,127,1,DISTANCE,0.8,1,

    PAUSE,UNTIL,41.25,

    FIRE_AIM,TOP,
    TOP LEFT FLAG
    PAUSE,FIRED,FIRE_TRY_TIME,
    PAUSE,0.1,
    STOP_FIRE,

    DRIVE,127,CDIR,DISTANCE,
    MIDDLE_FLAG_DIST+0.1,2,
    FIRE_AIM,TOP,
    MIDDLE LEFT FLAG
    PAUSE,FIRED,FIRE_TRY_TIME,
    PAUSE,0.1,
    STOP_FIRE,
    FLIP,

    INTAKE_OFF,
    DRIVE,127,CDIR,0.5,
    BOTTOM LEFT FLAG
    DRIVE,-127,0,0.5,
    INTAKE_ON,

    END,

};

double blueBackAuton[] = {
    90,

    // LET CAP SCORE
    // DRIVE AWAY
    // LOWER ARM
    // RAISE WRIST

    // LET FLYWHEEL SPIN UP
    // TURN TO FACE START TILE
    // DRIVE TO START TILE
    // DRIVE A LITTLE MORE

    // TURN TO FACE FLAGS

    // DRIVE TO TILE
    // DRIVE TO ENSURE FULLY ON

    // DRIVE OFF START TILE
    // DRIVE TO ENSURE FULLY ON

    // DRIVE TO NEXT TILE
    // LINE UP FOR SHOT

    // WAIT AS LATE AS POSSIBLE

    // SHOOT TOP FLAG

    // WAIT TILL SHOT
    // SHORT PAUSE
    // STOP FLYWHEEL

    // CONTINUED ON NEXT LINE
    // DRIVE TO MIDDLE FLAG DIST
    // SHOOT MIDDLE FLAG

    // WAIT TILL SHOT
    // SHORT PAUSE
    // STOP FLYWHEEL
    // PUT FLIPPER STRAIGHT

    // TURN INTAKE OFF
    // DRIVE TO TOGGLE BOTTOM FLAG

    // DRIVE AWAY FROM FLAG
    // TURN INTAKE BACK ON

    // END OF ROUTINE

    // ROBOT STARTS FACING 90°

    WRISTSEEK,WRIST_FORWARD_POS,
    FLIPSEEK,FLIP_POS1,
    INTAKE_ON,
    DRIVE,127,90,BLACK_B,0.5,
    DRIVE,80,90,DISTANCE,1.3,2,
    KNOCK CAP 1
    WRISTSEEK,WRIST_VERTICAL_POS,
    PAUSE,0.5,
    WRISTSEEK,WRIST_VERTICAL_POS,

    DRIVE,-127,90,DISTANCE,1,2,
    TURN,0,0.25,
    DIRECTION
    TURN,270,2,
    WRISTSEEK,WRIST_FORWARD_POS,
    PAUSE,0.5,
    DRIVE,-70,270,DISTANCE,1,2,
    WRISTSEEK,WRIST_VERTICAL_POS,
    COLLECT CAP 1

    PAUSE,0.5,
    DRIVE,90,270,WHITE_L,3,
    DRIVE,-90,270,0.05,
    PAUSE,1,
    DRIVE,-90,270,DISTANCE,0.125,1,
    PAUSE,0.25,
    TURN,180,2,
    PAUSE,0.5,
    DRIVE,90,180,WHITE_R,2,
    DRIVE,-90,180,0.1,
    DRIVE,-60,180,DISTANCE,0.125,1,
    PAUSE,0.5,
    TURN,90,2,
    PAUSE,0.25,
    ARMSEEK,ARM_POS_LOW,
    PAUSE,2,

    DRIVE,-90,90,WHITE_R,2,
    DRIVE,-90,90,DISTANCE,0.5,2,
    PAUSE,0.5,
    WRISTSEEK,-1,
    HIGH SCORE CAP 1
    PAUSE,1,
    DRIVE,90,90,DISTANCE,0.5,2,
    ARMSEEK,1,
    WRISTSEEK,WRIST_FORWARD_POS,
    PAUSE,0.5,
    WRISTSEEK,WRIST_VERTICAL_POS,

    TURN,180,2,

    // START DEPLOY FLIPPER
    // MAKE SURE FLIPPER STRAIGHT
    // START INTAKE
    // DRIVE OFF TILE
    // DRIVE TO FLIP CAP

    // FINISH DEPLOY FLIPPER
    // SHORT PAUSE
    // STOP DEPLOY

    // DRIVE AWAY FROM CAP
    // SHORT TURN TO CONTROL

    // TURN TO FACE CAP
    // LOWER FLIPPER
    // PAUSE TO LET FLIPPER DOWN
    // DRIVE TO GET CAP
    // LIFT CAP UP

    // WAIT FOR CAP TO LIFT
    // DRIVE TO START TILE
    // DRIVE TO BREAK
    // PAUSE TO STOP TIP
    // DRIVE AWAY A LITTLE
    // SHORT PAUSE
    // TURN TO LINE UP
    // SHORT PAUSE
    // DRIVE TO WHITE LINE
    // DRIVE TO BREAK
    // DRIVE BACK A LITTLE
    // SHORT PAUSE
    // TURN TO FACE POLE
    // SHORT PAUSE
    // RAISE ARM
    // WAIT FOR ARM TO RAISE

    // DRIVE ONTO TILE
    // DRIVE TO POLE
    // PAUSE TO STOP MOMENTUM
    // DROP CAP

    // LET CAP SCORE
    // DRIVE AWAY
    // LOWER ARM
    // RAISE WRIST
    // SHORT PAUSE
    // RAISE WRIST

    // TURN TO FACE WALL

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DRIVE,127,180,DISTANCE,1,1,      // DRIVE TO WALL
DRIVE,127,180,0.5,              // ENSURE AGAINST WALL
SET_GYRO,180,                   // RESET GYRO TO 180

DRIVE,-127,180,DISTANCE,0.2,1,   // DRIVE AWAY FROM WALL
TURN,270,2,                     // TURN TO FACE NEXT CAP
WRISTSEEK,WRIST_FORWARD_POS,     // LOWER FLIPPER
PAUSE,0.5,                      // PAUSE TO LET FLIPPER DOWN
DRIVE,-80,270,DISTANCE,1.35,2,   // DRIVE TO NEXT CAP
WRISTSEEK,WRIST_VERTICAL_POS,    // LIFT CAP
    COLLECT CAP 2
PAUSE,0.5,                      // PAUSE SO CAP LIFTS
DRIVE,127,270,DISTANCE,0.25,1,   // DRIVE TO LINE UP
TURN,315,1,                     // TURN READY TO DRIVE
DRIVE,127,315,DISTANCE,0.8,1,    // DRIVE TO LINE UP
TURN,0,2,                       // TURN TO FACE POLE
ARMSEEK,ARM_POS_LOW,            // RAISE ARM
FLIP,                           // FLIP CAP
PAUSE,2,                        // WAIT FOR ARM TO RAISE

DRIVE,-90,0,WHITE_E,1,          // DRIVE TO LINE
DRIVE,-90,0,DISTANCE,0.5,2,      // DRIVE TO POLE
PAUSE,0.5,                      // PAUSE TO STOP MOMENTUM
WRISTSEEK,-1,                   // DROP CAPHIGH SCORE CAP 2
    HIGH SCORE CAP 2
PAUSE,1,                        // LET CAP SCORE
DRIVE,90,0,WHITE_L,2,           // DRIVE AWAY
ARMSEEK,1,                      // LOWER ARM
WRISTSEEK,WRIST_VERTICAL_POS,   // RAISE WRIST

START_COAST,                    // LET FLYWHEEL SPIN UP
TURN,270,2,                     // TURN TO FACE START TILE
DRIVE,127,270,WHITE_L,2,        // DRIVE TO START TILE
DRIVE,127,270,DISTANCE,0.125,1, // DRIVE A LITTLE MORE

TURN,359,2,                     // TURN TO FACE FLAGS

DRIVE,127,359,WHITE_R,2,        // DRIVE TO TILE
DRIVE,127,359,0.1,             // DRIVE TO ENSURE FULLY ON
    TILE
DRIVE,127,359,BLACK_R,2,        // DRIVE OFF START TILE
DRIVE,127,359,0.1,             // DRIVE TO ENSURE FULLY ON
    TILE
DRIVE,127,359,WHITE_R,2,        // DRIVE TO NEXT TILE
DRIVE,127,359,DISTANCE,0.8,1,   // LINE UP FOR SHOT

PAUSE,UNTIL,41.25,              // WAIT AS LATE AS POSSIBLE

FIRE_AIM,TOP,                   // SHOOT TOP FLAG
    TOP LEFT FLAG

PAUSE,FIRED,FIRE_TRY_TIME,      // WAIT TILL SHOT
PAUSE,0.1,                      // SHORT PAUSE
STOP_FIRE,                      // STOP FLYWHEEL

DRIVE,127,CDIR,DISTANCE,        // CONTINUED ON NEXT LINE
MIDDLE_FLAG_DIST+0.1,2,         // DRIVE TO MIDDLE FLAG DIST
FIRE_AIM,TOP,                   // SHOOT MIDDLE FLAG
    MIDDLE LEFT FLAG
PAUSE,FIRED,FIRE_TRY_TIME,      // WAIT TILL SHOT
PAUSE,0.1,                      // SHORT PAUSE
STOP_FIRE,                      // STOP FLYWHEEL
FLIP,                           // PUT FLIPPER STRAIGHT

TURN,0,0.5,                     // TURN STRAIGHT
INTAKE_OFF,                     // TURN INTAKE OFF
DRIVE,127,CDIR,0.5,             // DRIVE TO TOGGLE BOTTOM FLAG
    BOTTOM LEFT FLAG
DRIVE,-127,0,0.5,               // DRIVE AWAY FROM FLAG
INTAKE_ON,                      // TURN INTAKE BACK ON

    END,                        // END OF ROUTINE
};

double skills[] = {
    270,                        // ROBOT STARTS FACING 270°

    WRISTSEEK,-1000,            // DEPLOY FLIPPER
    FLIPSEEK,FLIP_POS1,        // MAKE SURE FLIPPER STRAIGHT
    INTAKE_ON,                 // START INTAKE
    SCRAPER,SCRAPER_DOWN_POS, // LOWER SCRAPER
    PAUSE,0.5,                 // PAUSE TO LET SCRAPER DOWN
    DRIVE,127,270,BLACK_B,0.5, // DRIVE OFF TILE
    DRIVE,110,270,DISTANCE,1.25,2, // DRIVE TO FLIP CAP
        FLIP CAP 1
    WRISTSEEK,WRIST_VERTICAL_POS, // STOP DEPLOY

    FLIPSEEK,FLIP_POS1,        // RAISE SCRAPER
    SCRAPER,SCRAPER_UP_POS,    // TURN TO FACE CAP
    TURN,45,2,                 // LOWER FLIPPER
    WRISTSEEK,WRIST_FORWARD_POS, // PAUSE TO LET FLIPPER
        //PAUSE,0.25,           DOWN
    DRIVE,-50,45,DISTANCE,1,2, // DRIVE TO CAP
    WRISTSEEK,-1,              // TURN WRIST MOTOR OFF
    //WRISTSEEK,WRIST_VERTICAL_POS, // RAISE FORKS
    FLIPSEEK,FLIP_POS2,        // FLIP
        FLIP CAP 2
    PAUSE,0.125,               // DRIVE AWAY
    DRIVE,90,45,DISTANCE,1.2,2,

```

```

FLIPSEEK,FLIP_POS1,

////////////////////////////////////
// COMMENT THIS BLOCK IF SKILLS TAKING TOO LONG
// SAVES ~5s AT THE EXPENSE OF 1 POINT
TURN,10,2,                // TURN TO FACE NEXT CAP
WRISTSEEK,WRIST_FORWARD_POS, // LOWER FORKS
DRIVE,-50,10,DISTANCE,0.5,2, // DRIVE TO CAP
WRISTSEEK,WRIST_VERTICAL_POS, // RAISE FORKS
DRIVE,60,10,DISTANCE,0.1,0.5, // DRIVE AWAY FROM WALL
DRIVE,90,10,DISTANCE,0.4,1,   // DRIVE AWAY
// STOP COMMENTING HERE
////////////////////////////////////

START_COAST,              // LET FLYWHEEL SPIN UP TO
    SPEED

TURN,90,1.5,              // TURN TO FACE START TILE
FLIPSEEK,FLIP_POS2,      // FLIP
    FLIP CAP 3
WRISTSEEK,-1,
DRIVE,127,90,WHITE_R,2,   // DRIVE TO START TILE
DRIVE,-80,90,0.05,       // BREAK TO STOP
TURN,0,2,                // TURN TO FACE FLAGS
WRISTSEEK,WRIST_VERTICAL_POS,
FLIPSEEK,FLIP_POS1,

DRIVE,127,1,BLACK_L,2,    // DRIVE OFF START TILE
DRIVE,127,1,0.1,         // DRIVE TO ENSURE FULLY ON
    TILE
DRIVE,127,1,WHITE_L,2,    // DRIVE TO NEXT TILE
DRIVE,127,2,DISTANCE,0.8,1, // LINE UP FOR SHOT

PAUSE,0.1,               // STOP BOUNCE

FIRE_AIM,TOP,            // SHOOT TOP FLAG
    TOP LEFT FLAG
PAUSE,FIRED,FIRE_TRY_TIME, // WAIT TILL SHOT
PAUSE,0.1,              // SHORT PAUSE
STOP_FIRE,              // STOP FLYWHEEL

DRIVE,127,CDIR,DISTANCE, // CONTINUED ON NEXT LINE
MIDDLE_FLAG_DIST-0.05,2, // DRIVE TO MIDDLE FLAG DIST
FIRE_AIM,TOP,           // SHOOT MIDDLE FLAG
    MIDDLE LEFT FLAG
PAUSE,FIRED,FIRE_TRY_TIME, // WAIT TILL SHOT
PAUSE,0.1,              // SHORT PAUSE
STOP_FIRE,              // STOP FLYWHEEL

```

```

INTAKE_OFF,              // TURN INTAKE OFF
DRIVE,127,0,0.5,         // DRIVE TO TOGGLE BOTTOM FLAG
    BOTTOM LEFT FLAG
//SCRAPER,SCRAPER_DOWN_POS, // LOWER SCRAPER SO IT
    DOESN'T CATCH THE FLAG
DRIVE,-127,0,0.5,        // DRIVE AWAY FROM FLAG
INTAKE_ON,              // TURN INTAKE BACK ON
SCRAPER,SCRAPER_UP_POS, // RAISE SCRAPER AGAIN
FLIPSEEK,-1,            // STOP TANGLE WITH NET

TURN,0,1,               // TURN TO LINE UP
DRIVE,-127,0,WHITE_L,2, // DRIVE TO RED TILE
DRIVE,90,0,0.05,        // BREAK TO STOP
DRIVE,-127,0,DISTANCE,0.5,1, // DRIVE TO MIDDLE OF IT
TURN,90,0,              // TURN TO FACE WALL

FLIPSEEK,FLIP_POS1,     // PUT FLIPPER BACK
DRIVE,100,90,0.5,      // DRIVE TO WALL
SET_GYRO,90,           // SET GYRO

WRISTSEEK,WRIST_FORWARD_POS, // LOWER FLIPPER
DRIVE,-100,90,DISTANCE,0.1,1, // DRIVE AWAY FROM WALL
TURN,135,2,            // TURN TO FACE NEXT CAP

DRIVE,-90,135,DISTANCE,1.7,3, // DRIVE TO NEXT CAP
WRISTSEEK,WRIST_VERTICAL_POS, // LIFT CAP
PAUSE,0.25,            // PAUSE TO LET IT LIFT
FLIP,                  // FLIP THE CAP
//WRISTSEEK,WRIST_FORWARD_POS, // DROP CAP
    FLIP CAP 4

TURN,180,2,            // TURN TO FACE PLATFORM
WRISTSEEK,-1,          // DROP CAP
    FLIP CAP 4
SCRAPER,SCRAPER_UP_POS, // ENSURE SCRAPER IS UP
DRIVE,127,180,DISTANCE,1.3,2, // DRIVE TO PLATFORM
SCRAPER,SCRAPER_DOWN_POS, // LOWER SCRAPER
WRISTSEEK,WRIST_VERTICAL_POS, // LIFT FLIPPER
FLIPSEEK,FLIP_POS1,      // REVERT FLIPPER
PAUSE,0.25,            // PAUSE TO LET SCRAPER DROP
DRIVE,-127,180,DISTANCE,0.25,1, // DRIVE AWAY FROM PLATFORM
PAUSE,0.25,            // LET BALL ROLL IN

SCRAPER,SCRAPER_DOWN_POS, // MOVE SCRAPER TO CAP FLIP
    POSITION
TURN,270,1,            // TURN TO FACE NEXT CAP - WAS
    2                FLIP CAP 5
DRIVE,90,270,DISTANCE,1.1,1, // DRIVE TO FLIP NEXT CAP
PAUSE,0.25,            // PAUSE TO LET BALL INTAKE
DRIVE,-127,270,DISTANCE,0.25,1, // DRIVE AWAY FROM CAP

```



```

SCRAPER,SCRAPER_UP_POS,          // LIFT SCRAPER TO SAFETY

TURN,315,2,                        // TURN TO FACE 315
DRIVE,127,315,DISTANCE,0.35,2,    // DRIVE TO LINE UP

TURN,350,0.5,                      // TURN TO FACE 350
FIRE_AIM,TOP,                      // SHOOT TOP FLAG
    TOP MIDDLE FLAG
PAUSE,FIRED,FIRE_TRY_TIME,        // WAIT TILL SHOT
PAUSE,0.1,                        // SHORT PAUSE
STOP_FIRE,                        // STOP FLYWHEEL

DRIVE,127,CDIR,DISTANCE,          // CONTINUED ON NEXT LINE
MIDDLE_FLAG_DIST,2,              // DRIVE TO MIDDLE FLAG DIST
FIRE,TOP,                        // SHOOT MIDDLE FLAG
    MIDDLE MIDDLE FLAG
PAUSE,FIRED,FIRE_TRY_TIME,        // WAIT TILL SHOT
PAUSE,0.1,                        // SHORT PAUSE
STOP_FIRE,                        // STOP FLYWHEEL

INTAKE_OFF,                       // TURN INTAKE OFF
DRIVE,127,0,0.5,                 // DRIVE TO TOGGLE BOTTOM FLAG
    BOTTOM MIDDLE FLAG
// SCRAPER,SCRAPER_DOWN_POS,      // LOWER SCRAPER SO IT
    DOESN'T CATCH THE FLAG
DRIVE,-127,0,0.5,                // DRIVE AWAY FROM FLAG
INTAKE_ON,                       // TURN INTAKE BACK ON
SCRAPER,SCRAPER_UP_POS,          // RAISE SCRAPER AGAIN

TURN,0,0.5,                       // TURN TO LINE UP
DRIVE,-127,0,SONAR,1.25,2,        // LINE UP FOR NEXT CAP

FLIPSEEK,FLIP_POS1,              // PUT FLIPPER CORRECT WAY UP
TURN,90,0,                       // TURN TO FACE NEXT CAP
WRISTSEEK,WRIST_FORWARD_POS,      // LOWER FLIPPER
DRIVE,-127,90,WHITE_E,1,          // DRIVE ACROSS CENTER WHITE
    LINE
DRIVE,-90,90,DISTANCE,2.5,2,      // DRIVE TO GET NEXT CAP
    (SLOWLY)

WRISTSEEK,WRIST_VERTICAL_POS,     // LIFT CAP
//PAUSE,0.25,                    // PAUSE TO LIFT    0.25
DRIVE,127,90,DISTANCE,0.1,1,      // DRIVE AWAY FROM WALL
FLIP,                             // FLIP CAP
//PAUSE,0.25,                    // PAUSE TO LET FLIP    0.25
//WRISTSEEK,WRIST_FORWARD_POS,    // DROP CAP
    FLIP CAP 6
WRISTSEEK,-1,                    // DROP CAP
    FLIP CAP 6
TURN,155,2,                      // TURN TO FACE PLATFORM
SCRAPER,SCRAPER_DOWN_POS/3,      // LOWER SCRAPER HALF WAY

DRIVE,127,155,DISTANCE,1.4,2,    // DRIVE TO PLATFORM

SCRAPER,SCRAPER_DOWN_POS,        // LOWER SCRAPER
WRISTSEEK,WRIST_VERTICAL_POS,     // LIFT FLIPPER
FLIPSEEK,FLIP_POS1,              // REVERT FLIPPER
PAUSE,0.25,                      // PAUSE TO LET SCRAPER DROP
DRIVE,-127,155,DISTANCE,0.5,1,    // DRIVE AWAY FROM PLATFORM
PAUSE,0.25,                      // PAUSE TO LET BALL ROLL IN

TURN,90,2,                       // TURN TO FACE NEXT CAP
SCRAPER,SCRAPER_DOWN_POS,        // MOVE SCRAPER TO CAP FLIP
    POSITION
DRIVE,127,90,DISTANCE,1.25,2,     // DRIVE TO FLIP CAP
    FLIP CAP 7
SCRAPER,SCRAPER_UP_POS,          // LIFT TO FLIP CAP FAR
PAUSE,0.25,                      // PAUSE TO LET BALL INTAKE
DRIVE,-127,90,WHITE_E,2,         // DRIVE TO LINE UP FOR FLAGS
DRIVE,90,90,0.05,                // DRIVE TO BREAK
PAUSE,0.5,                      // PAUSE TO STOP TIPPING

TURN,1,2,                        //
DRIVE,90,0,BLACK_B,2,            // DRIVE TO EDGE OF TILE
DRIVE,-90,0,WHITE_E,2,          // DRIVE ONTO TILE
DRIVE,-80,0,DISTANCE,0.1,1,      // DRIVE TO BREAK

//
// DRIVE,127,90,DISTANCE,0.75,2,  // DRIVE TO LINE UP
// SCRAPER,SCRAPER_UP_POS,        // LIFT SCRAPER TO
// SAFETY
// TURN,0,1,                      // TURN TO FACE FLAGS
// DRIVE,60,0,SONAR,              // CONTINUED ON NEXT
// LINE
// FAR_FLAG_DIST+0.5,2,           // LINE UP FOR SHOT
// TURN,335,1,                   // TURN ROUGHLY TO FACE
// FLAG

FIRE_AIM,TOP,                    // SHOOT TOP FLAG
    TOP RIGHT FLAG
PAUSE,FIRED,FIRE_TRY_TIME,        // WAIT TILL SHOT
PAUSE,0.1,                      // SHORT PAUSE
STOP_FIRE,                      // STOP FLYWHEEL

DRIVE,127,CDIR,DISTANCE,          // CONTINUED ON NEXT LINE
MIDDLE_FLAG_DIST,2,              // DRIVE TO MIDDLE FLAG DIST
IF,GOTBALL,                      // IF WE'VE GOT A BALL
FIRE,TOP,                        // SHOOT MIDDLE FLAG
    MIDDLE RIGHT FLAG
PAUSE,FIRED,FIRE_TRY_TIME,        // WAIT TILL SHOT
PAUSE,0.1,                      // SHORT PAUSE
ENDIF,
STOP_FIRE,                      // STOP FLYWHEEL

```



```

TURN,5,0.25,
INTAKE_OFF,
DRIVE,127,0,0.5,
    BOTTOM RIGHT FLAG
//SCRAPER,SCRAPER_DOWN_POS,
    DOESN'T CATCH THE FLAG
DRIVE,-127,0,0.5,
INTAKE_ON,
SCRAPER,SCRAPER_UP_POS,

STOP_COAST,

INTAKE_FLIP,
    LOSE ANY BALLS

FLIPSEEK,-1,
    CAUGHT

TURN,20,0.8,
DRIVE,-127,20,WHITE_R,2,
DRIVE,-127,20,0.1,
TURN,0,0.5,
DRIVE,-127,0,BLACK_R,2,
DRIVE,-127,0,DISTANCE,0.4,2,

TURN,80,0.8,
INTAKE_ON,
WRISTSEEK,WRIST_FORWARD_POS,
FLIPSEEK,FLIP_POS1,
DRIVE,127,80,DISTANCE,0.75,1,
DRIVE,127,80,WHITE_B,1,
DRIVE,127,80,DISTANCE,2,4,

END,

};

#endif

```

```

// TURN A LITTLE BIT
// TURN INTAKE OFF
// DRIVE TO TOGGLE BOTTOM FLAG

// LOWER SCRAPER SO IT

// DRIVE AWAY FROM FLAG
// TURN INTAKE BACK ON
// RAISE SCRAPER AGAIN

// TURN FLYWHEEL OFF NOW

// TURN INTAKE BACKWARDS TO

// DON'T LET THE FORKS GET

// TURN TO LINE UP
// DRIVE UNTIL ON THE TILE
// DRIVE TO BE FULLY ON TILE
// TURN TO LINE UP
// DRIVE UNTIL OFF THE TILE
// DRIVE TO LINE UP

// TURN TO FACE PLATFORM
// ENSURE INTAKE IS RUNNING
// PUT FLIPPER DOWN
// MAKE SURE FLIPPER STRAIGHT
// DRIVE TO PLATFORM
// DRIVE UP FIRST PLATFORM
// DRIVE UP PLATFORM 2.75

// END OF ROUTINE

```