

1

PYC SAIL BOAT RACE STARTER CONTROL LOGIC  
Jim Abraham 7-14-11 ver 1.00

## POWER UP SECTION

**T 1**  
4 sec Power-Up  
( )

**T 1**  
4 sec Power-Up  
| |

**MB 0**  
GOTO Power-Up 1  
( )

**MB 0**  
GOTO Power-Up 1  
| |

**T 2**  
4 Sec OPER SEL  
( )

**T 2**  
4 Sec OPER SEL  
| |

**MB 2**  
GOTO Oper Sel  
( )

5 OR 10 MINUTE - START SELECTED

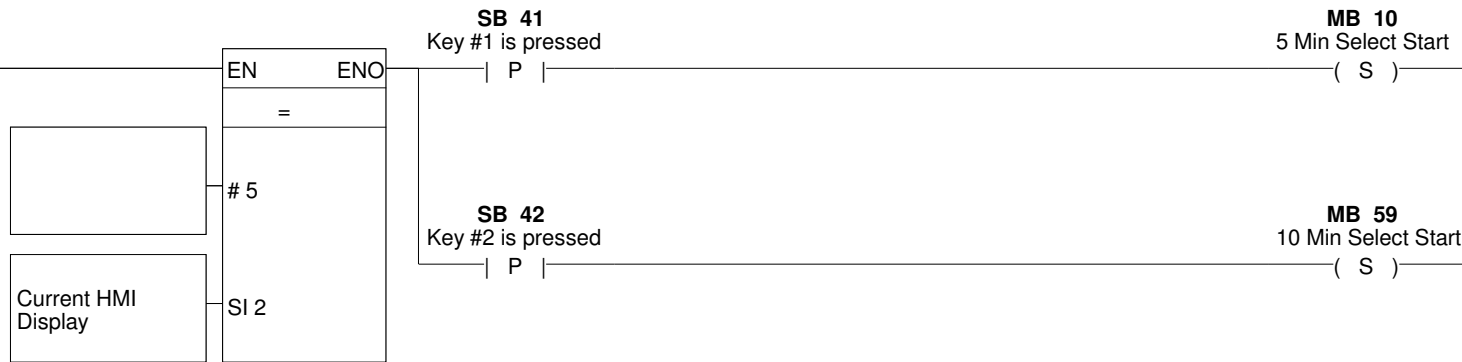
Project:

RSG.U90

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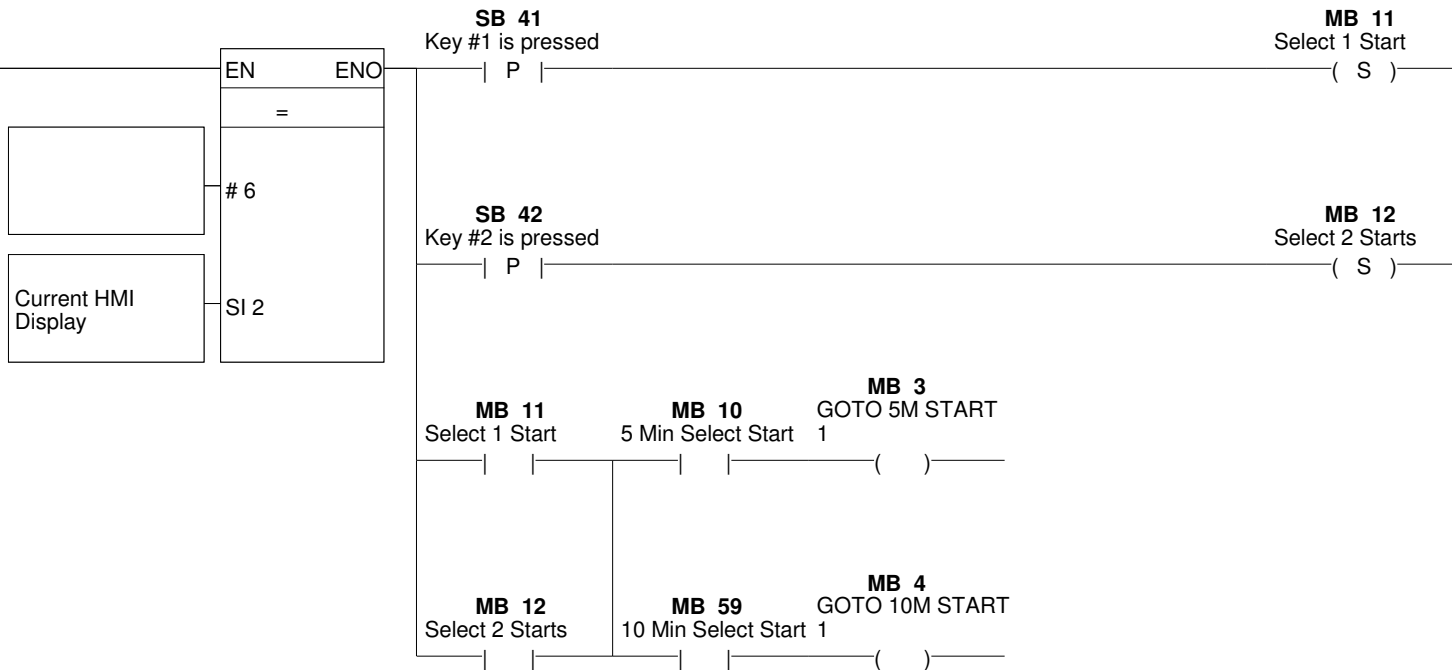
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2



1 OR 2 START SELECTED

3



5 MINUTE - START 1 TIME ENTERED, AM OR PM SELECTED

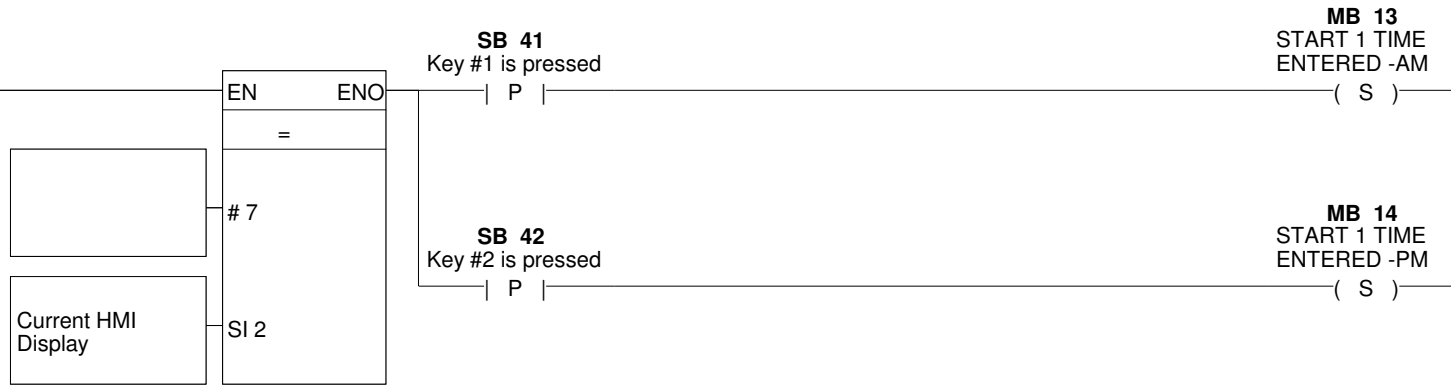
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4



CONVERT FROM 24 HOUR TO 12 HOUR  
(1-12 AM, 13-24 PM) Convert Hour part of time.  
AM: 1-9, Calc = HH x 256  
AM 10-12, Calc = (HH +6) x 256

Project:

RSG.U90

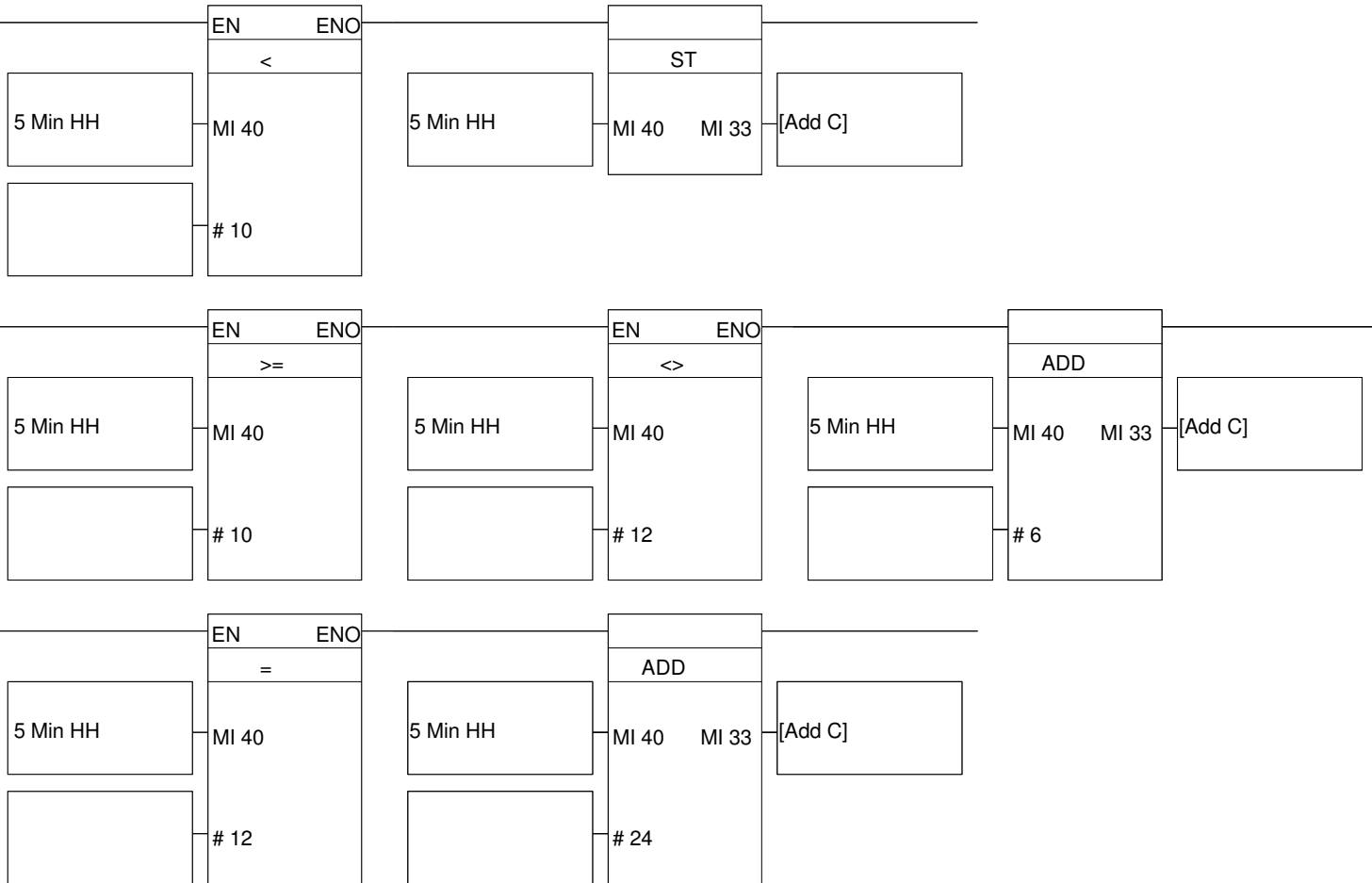
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5

**MB 13**  
START 1 TIME  
ENTERED -AM

| P |



Project:

RSG.U90

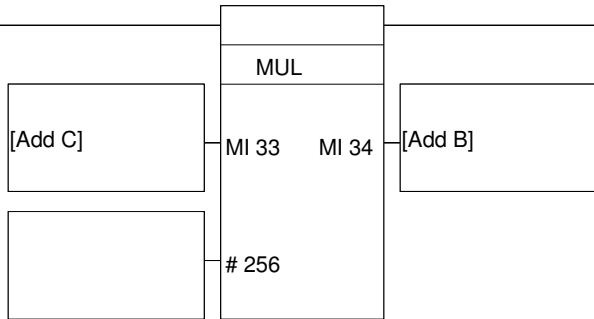
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6

**MB 13**  
START 1 TIME  
ENTERED -AM

| P |



CONVERT FROM 24 HOUR TO 12 HOUR  
(13-24 PM) Convert Hour part of time.  
PM: 1-7, Calc = (HH + 18) x 256  
PM 8-12, Calc = (HH +24) x 256

Project:

RSG.U90

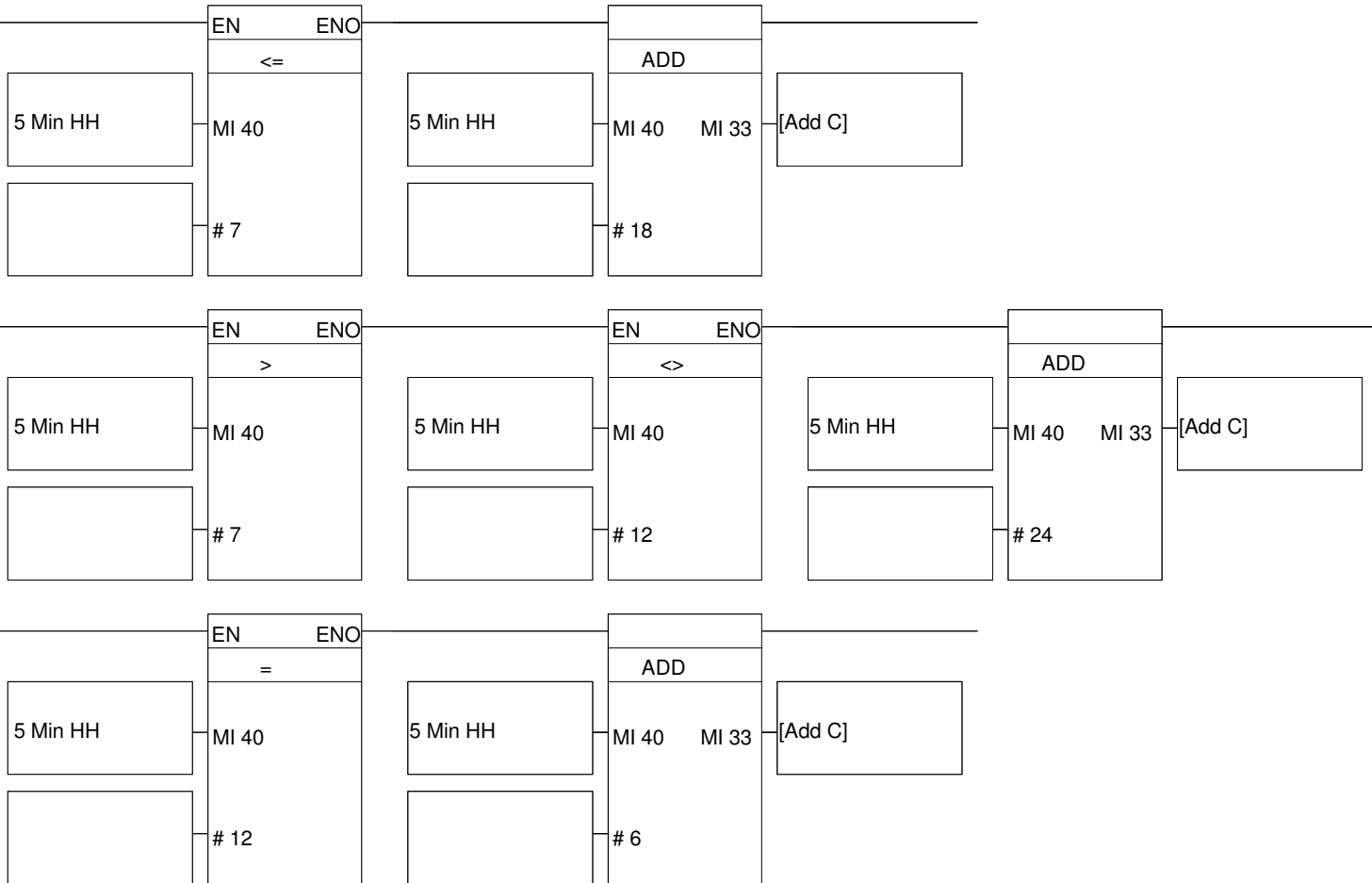
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7

MB 14  
START 1 TIME  
ENTERED -PM

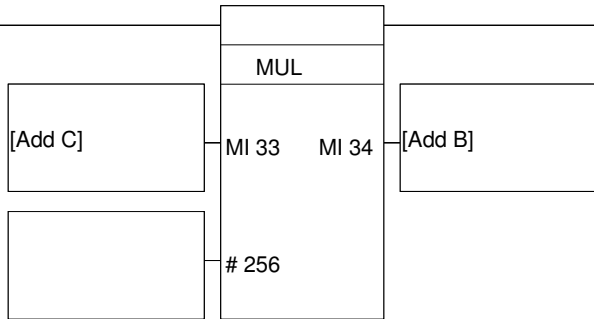
P



8

**MB 14**  
START 1 TIME  
ENTERED -PM

| P |



Convert Minute Part of Time  
Calc = ((MM/10) x 6) + MM

Project:

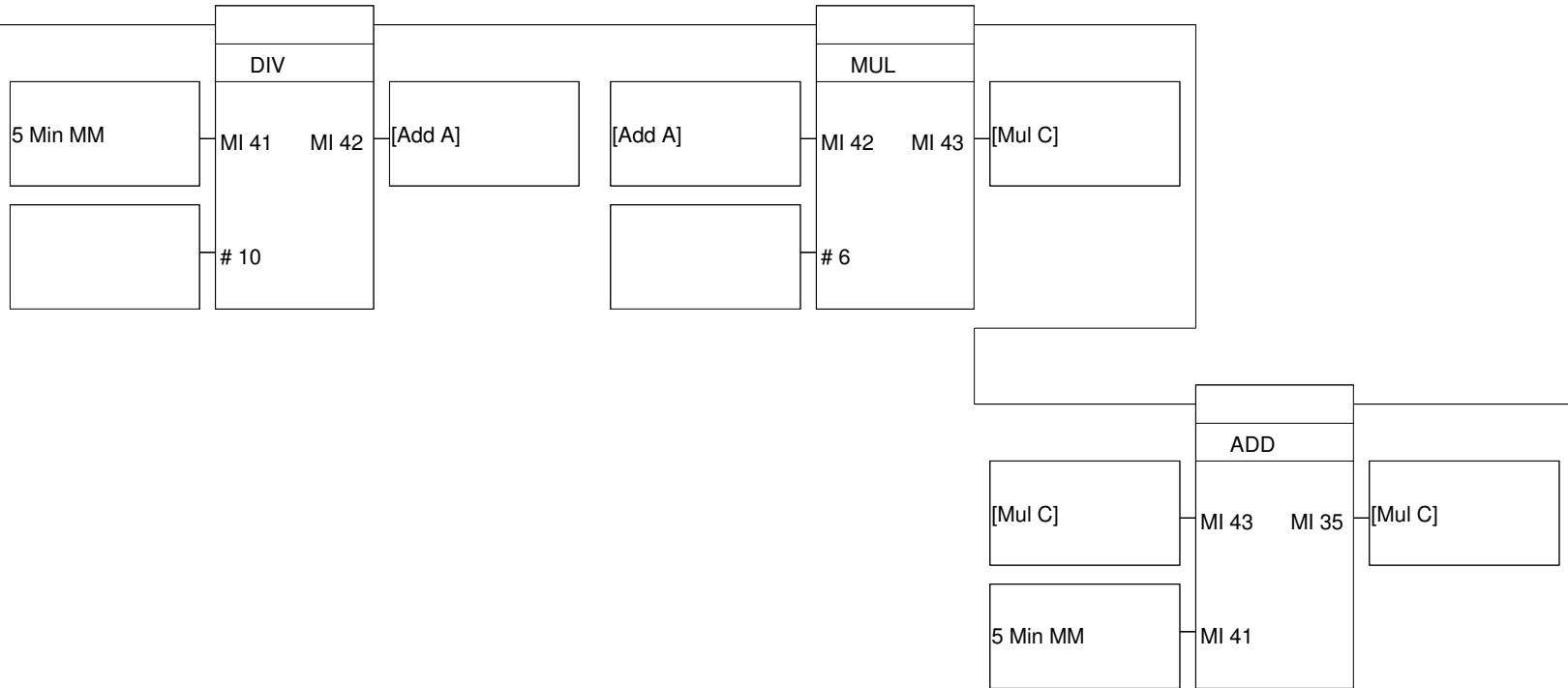
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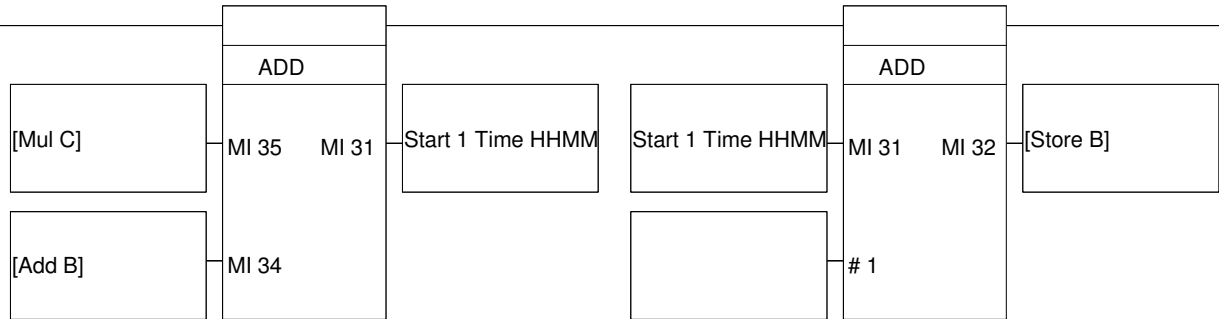
Project:

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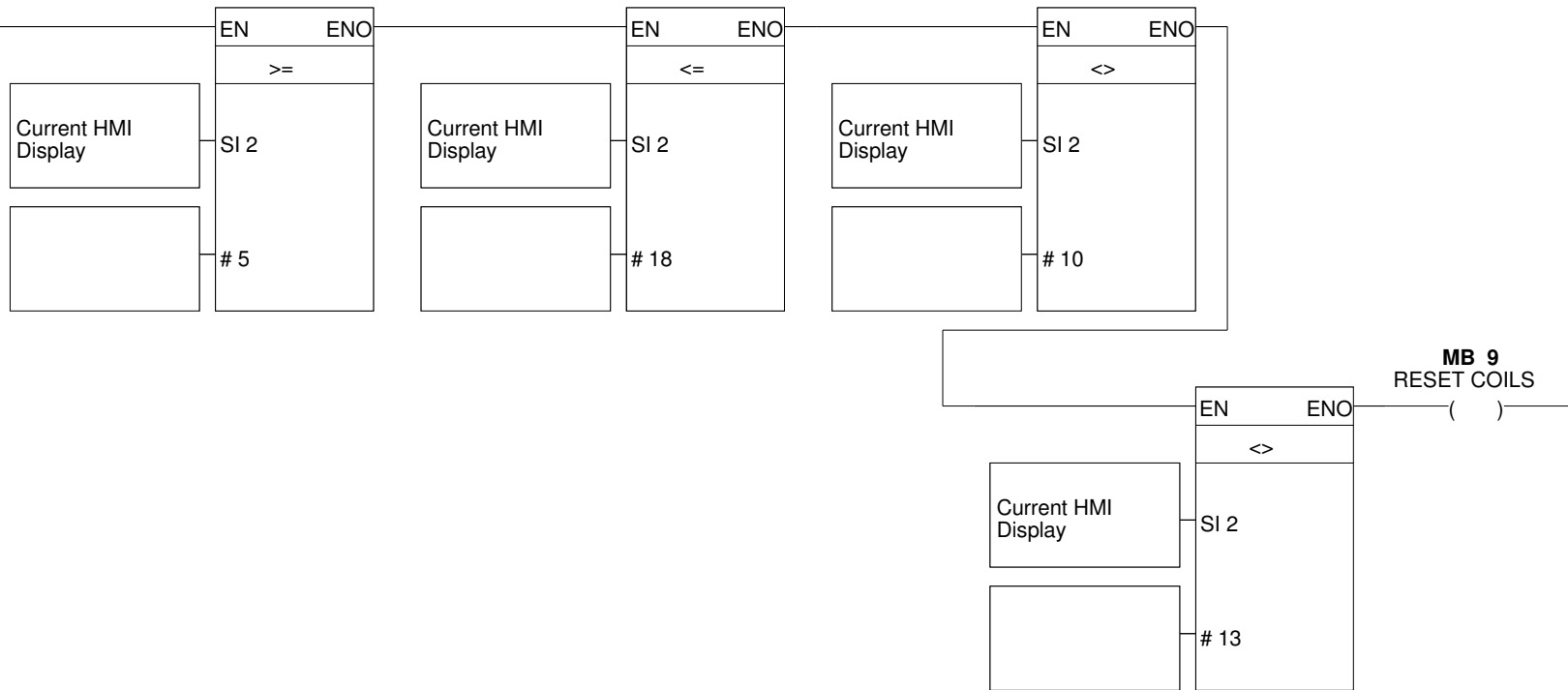
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<b>MB 9</b> RESET COILS	<b>SB 55</b> Up Arrow Key is pressed P	<b>MB 10</b> 5 Min Select Start ( R )	<b>MB 59</b> 10 Min Select Start ( R )	<b>MB 7</b> START 2 TIME ENTERED ( R )	<b>MB 94</b> START 2 TIME ENTERED-PM ( R )
		<b>MB 13</b> START 1 TIME ENTERED -AM ( R )	<b>MB 53</b> START 2 TIME ENTERED-AM ( R )	<b>MB 8</b> START 1 TIME ENTERED ON DISPLAY 7 ( R )	<b>MB 95</b> 10 Min Start 2 Enable ( R )
		<b>MB 14</b> START 1 TIME ENTERED -PM ( R )	<b>MB 54</b> START 2 TIME ENTERED-PM ( R )	<b>MB 88</b> START 2 TIME ENTERED ( R )	<b>MB 85</b> START 1 TIME ENTERED ON DISPLAY 15 ( R )
		<b>MB 11</b> Select 1 Start ( R )	<b>MB 15</b> Display (9) Start 1 Time ( R )	<b>MB 91</b> DISPLAY START 2 TIME ( R )	<b>MB 87</b> Display (17) Start 1 Time ( R )
		<b>MB 12</b> Select 2 Starts ( R )	<b>MB 55</b> DISPLAY START 2 TIME ( R )	<b>MB 93</b> START 2 TIME ENTERED-AM ( R )	<b>MB 84</b> START 1 TIME ENTERED -PM ( R )
					<b>MB 83</b> START 1 TIME ENTERED -AM ( R )

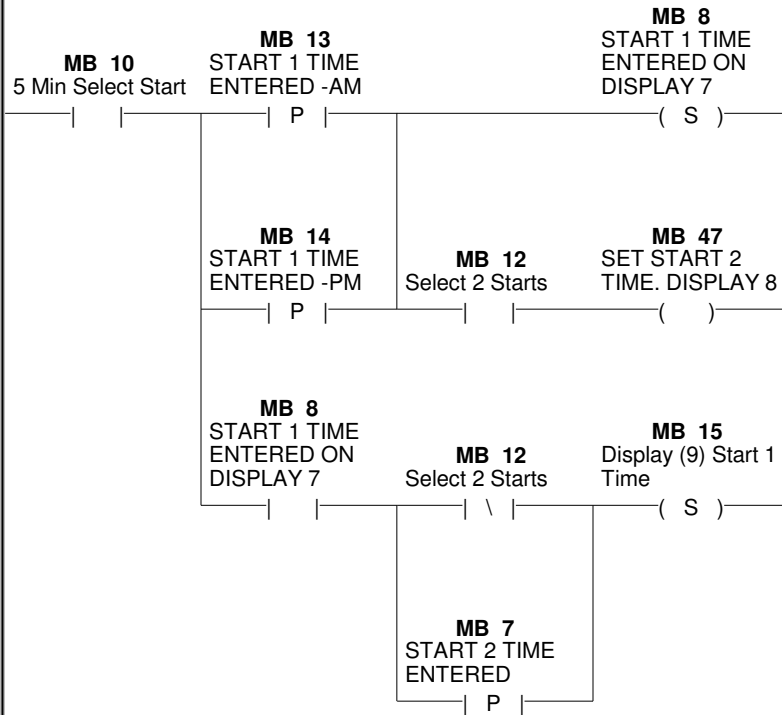
Project:

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DISPLAY START 1 AND 2 SEQUENCE SCREENS

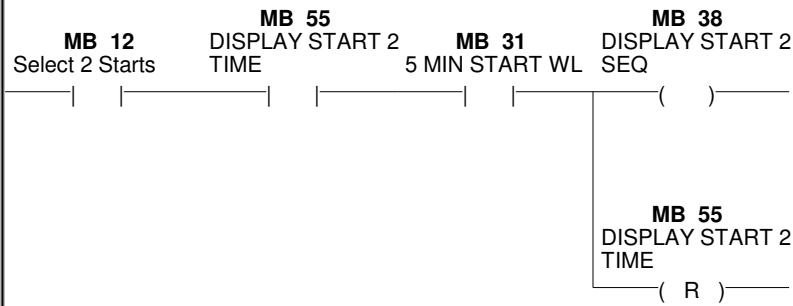
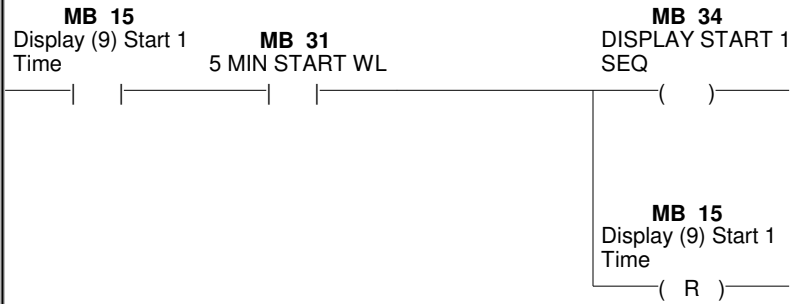
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CHECK FOR WHEN TO START 1 RACE

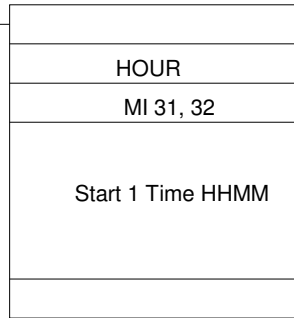
Project:

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15

**MB 15**  
Display (9) Start 1  
Time

**MB 30**  
5 Min Start 1  
Enable

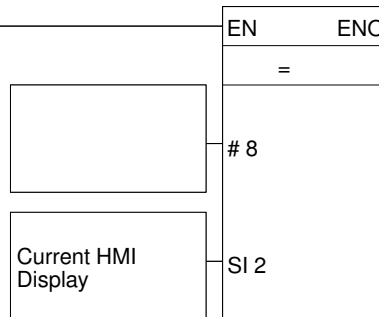
( )

**MB 8**  
START 1 TIME  
ENTERED ON  
DISPLAY 7

( R )

5 MINUTE - START 2 TIME ENTERED, AM OR PM SELECTED

16


**SB 41**  
Key #1 is pressed

P

**MB 53**  
START 2 TIME  
ENTERED-AM

( S )

**SB 42**  
Key #2 is pressed

P

**MB 54**  
START 2 TIME  
ENTERED-PM

( S )

Project:

RSG.U90

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CONVERT FROM 24 HOUR TO 12 HOUR  
(1-12 AM, 13-24 PM) Convert Hour part of time.  
AM: 1-9, Calc = HH x 256  
AM 10-12, Calc = (HH +6) x 256

Project:

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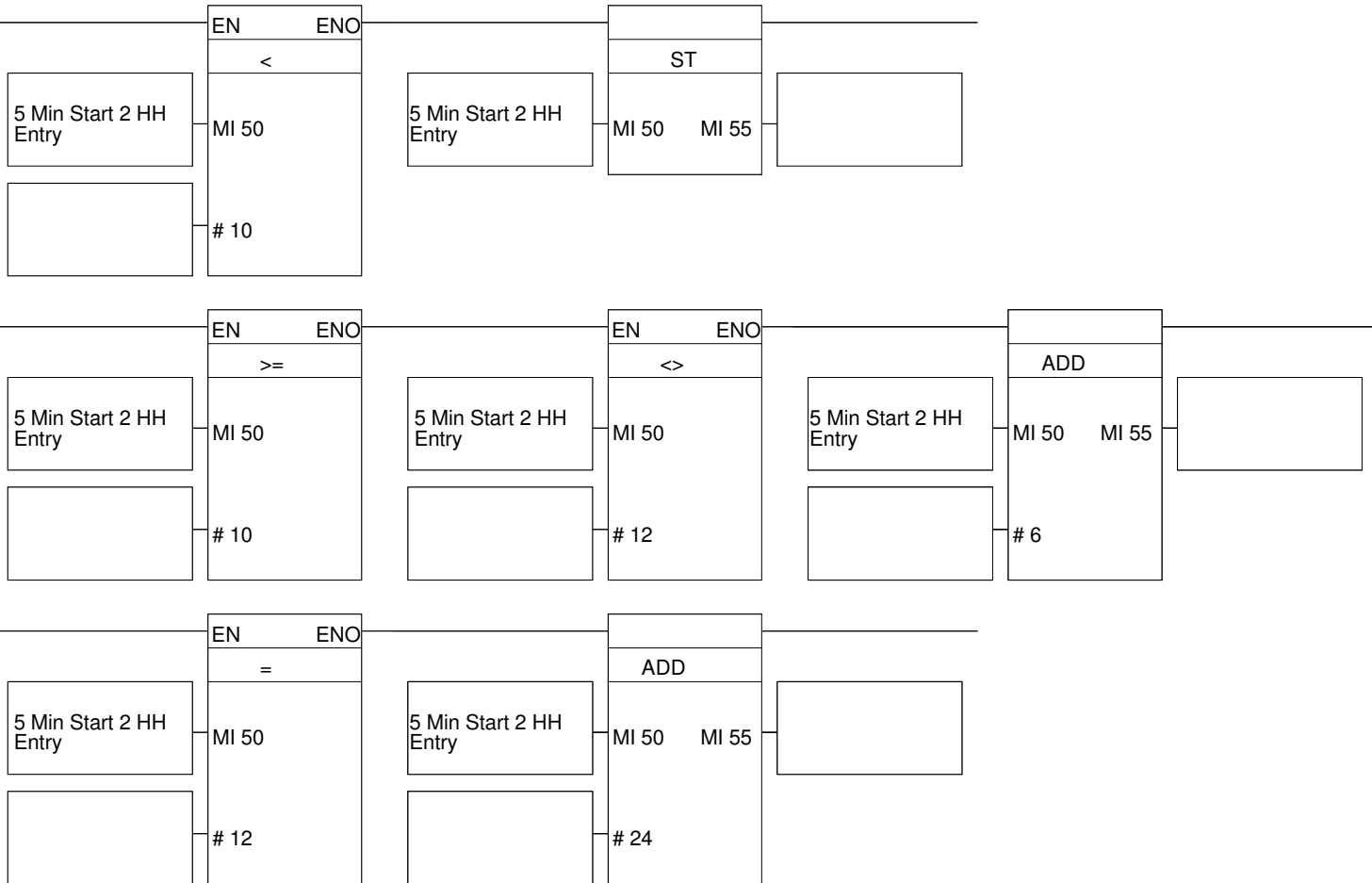
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17

**MB 53**  
START 2 TIME  
ENTERED-AM

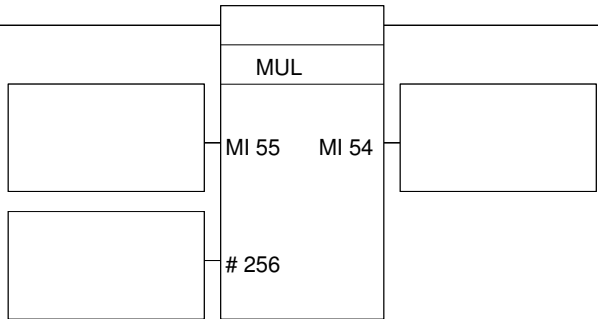
| P |



18

MB 53  
START 2 TIME  
ENTERED-AM

| P |



CONVERT FROM 24 HOUR TO 12 HOUR  
(13-24 PM) Convert Hour part of time.  
PM: 1-7, Calc = (HH + 18) x 256  
PM 8-12, Calc = (HH +24) x 256

Project:

RSG.U90

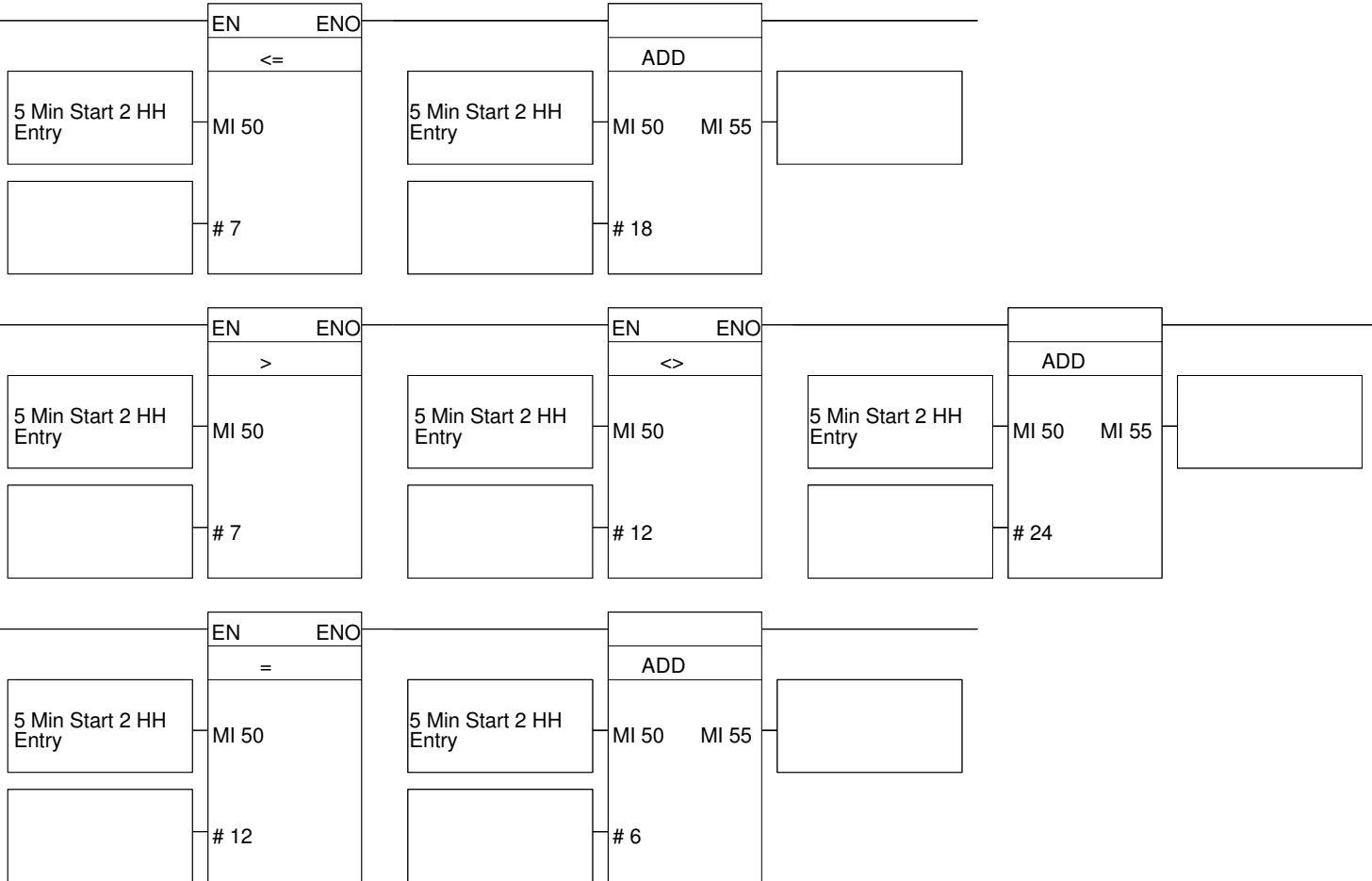
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19

**MB 54**  
START 2 TIME  
ENTERED-PM

| P |



Project:

RSG.U90

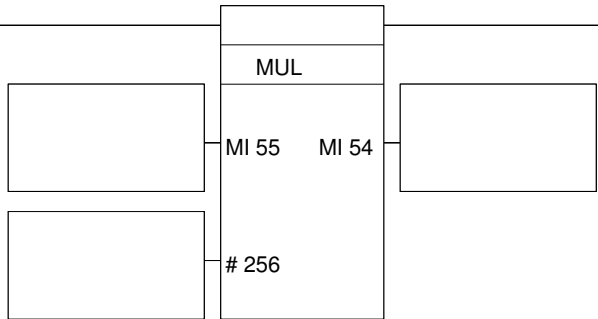
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20

**MB 54**  
START 2 TIME  
ENTERED-PM

| P |



Convert Minute Part of Time  
Calc = ((MM/10) x 6) + MM

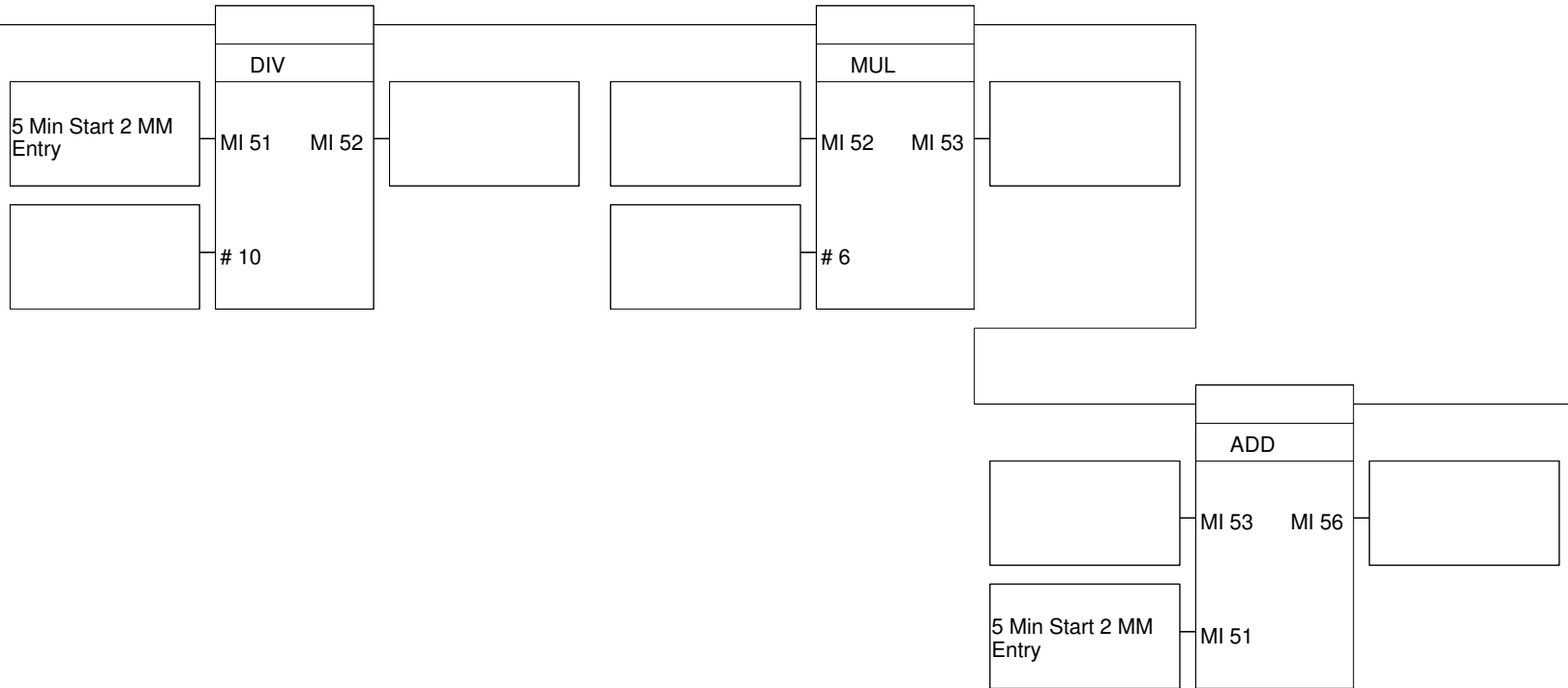
Project:

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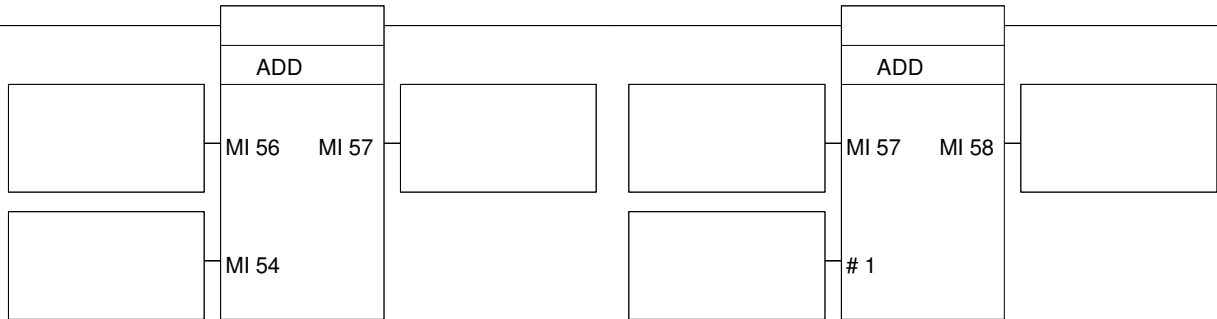
Project:

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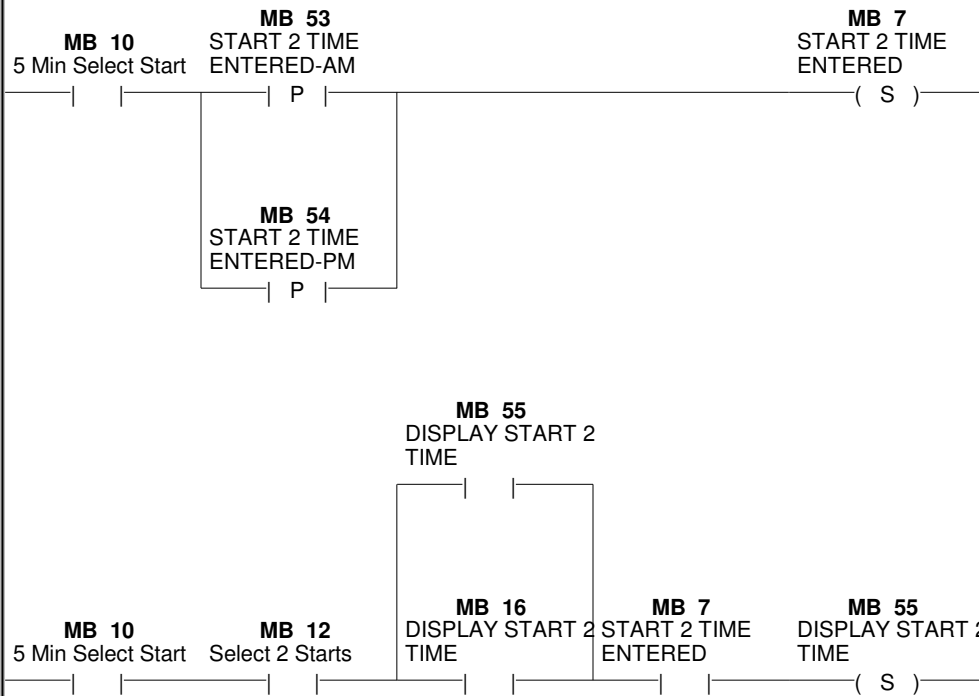
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CHECK FOR WHEN TO START 2 RACE

Project:

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24

**MB 55**  
DISPLAY START 2  
TIME

HOUR
MI 57, 58

**MB 60**  
5 Min Start 2  
Enable

(   )

**MB 7**  
START 2 TIME  
ENTERED

( R )

=====

5 MINUTE START SEQUENCE

=====

TURN ON HORN FOR 10 SECONDS AND WHITE LIGHT FOR 1 MINUTE

Project:

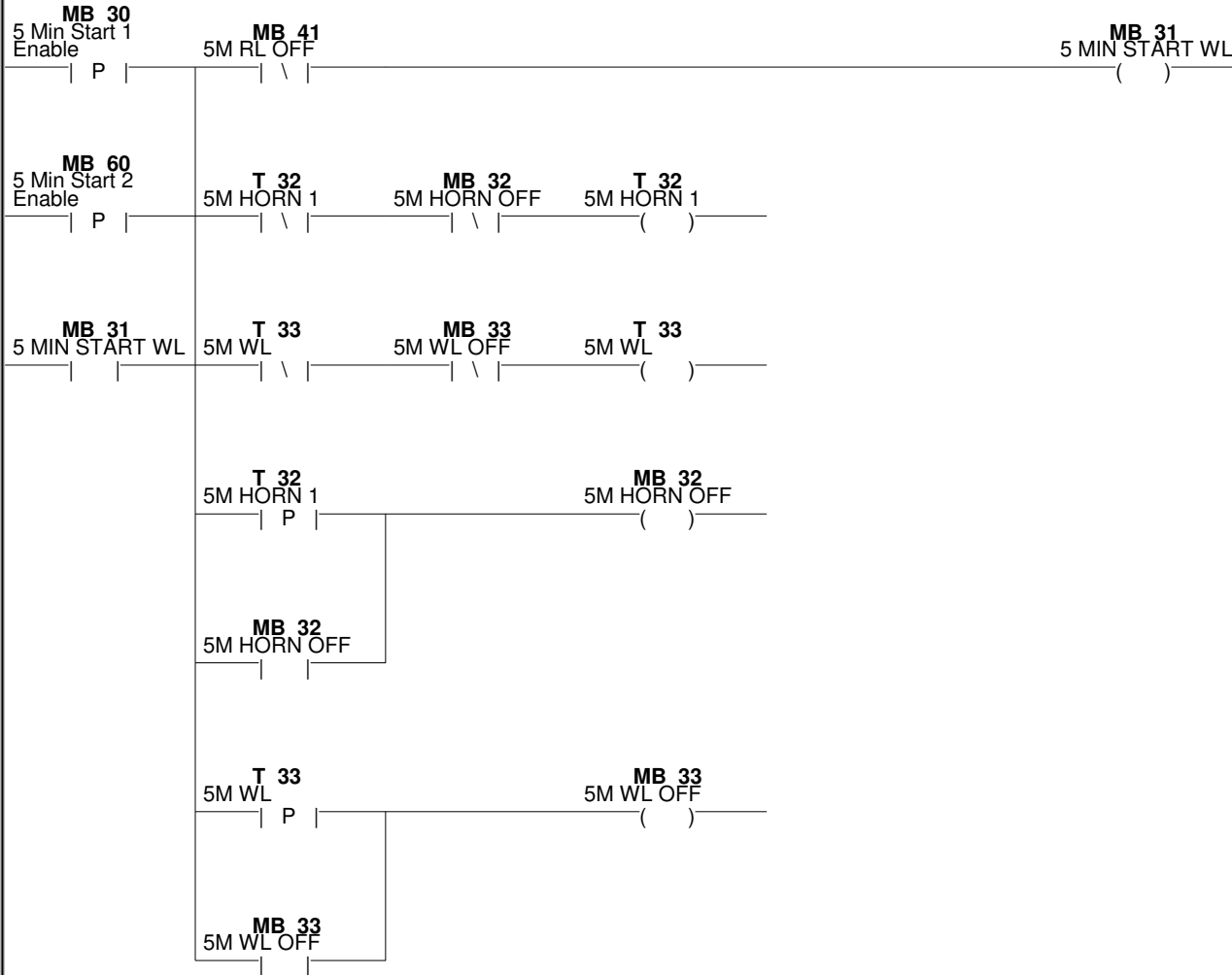
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25



26

WAIT 1 MINUTE

<b>MB 31</b>	<b>MB 33</b>	<b>MB 35</b>	<b>T 34</b>
5 MIN START WL	5M WL OFF	5M START BL	5M MIN WAIT 1
		\	( )

TURN ON HORN FOR 10 SECONDS AND BLUE LIGHT FOR 2 MINUTE

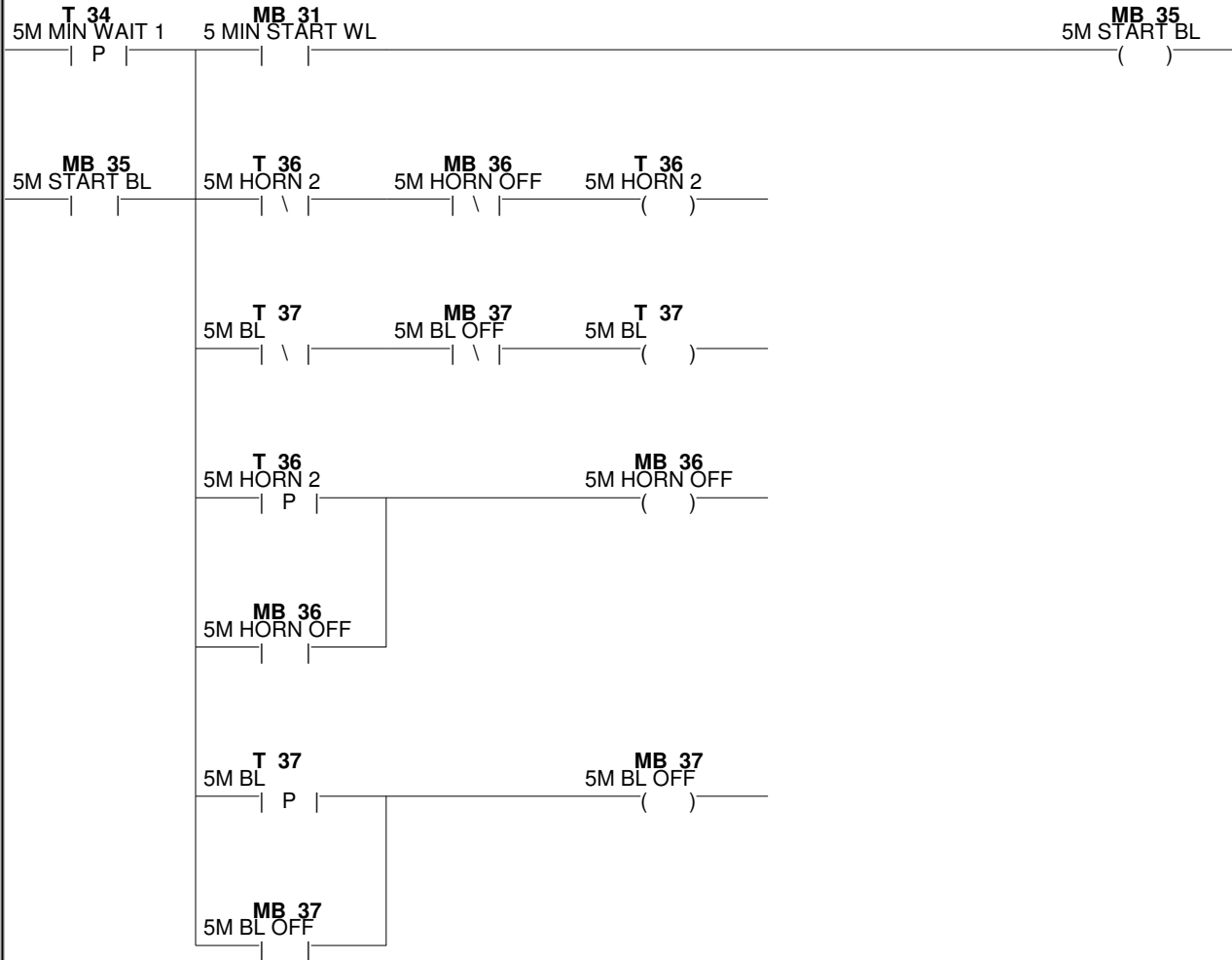
Project:

RSG.U90

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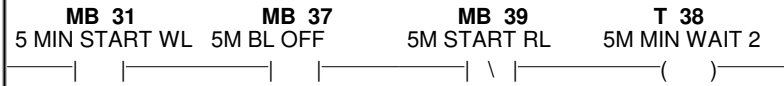
27





28

WAIT 1 MINUTE



TURN ON HORN FOR 10 SECONDS AND RED LIGHT FOR 1 MINUTE

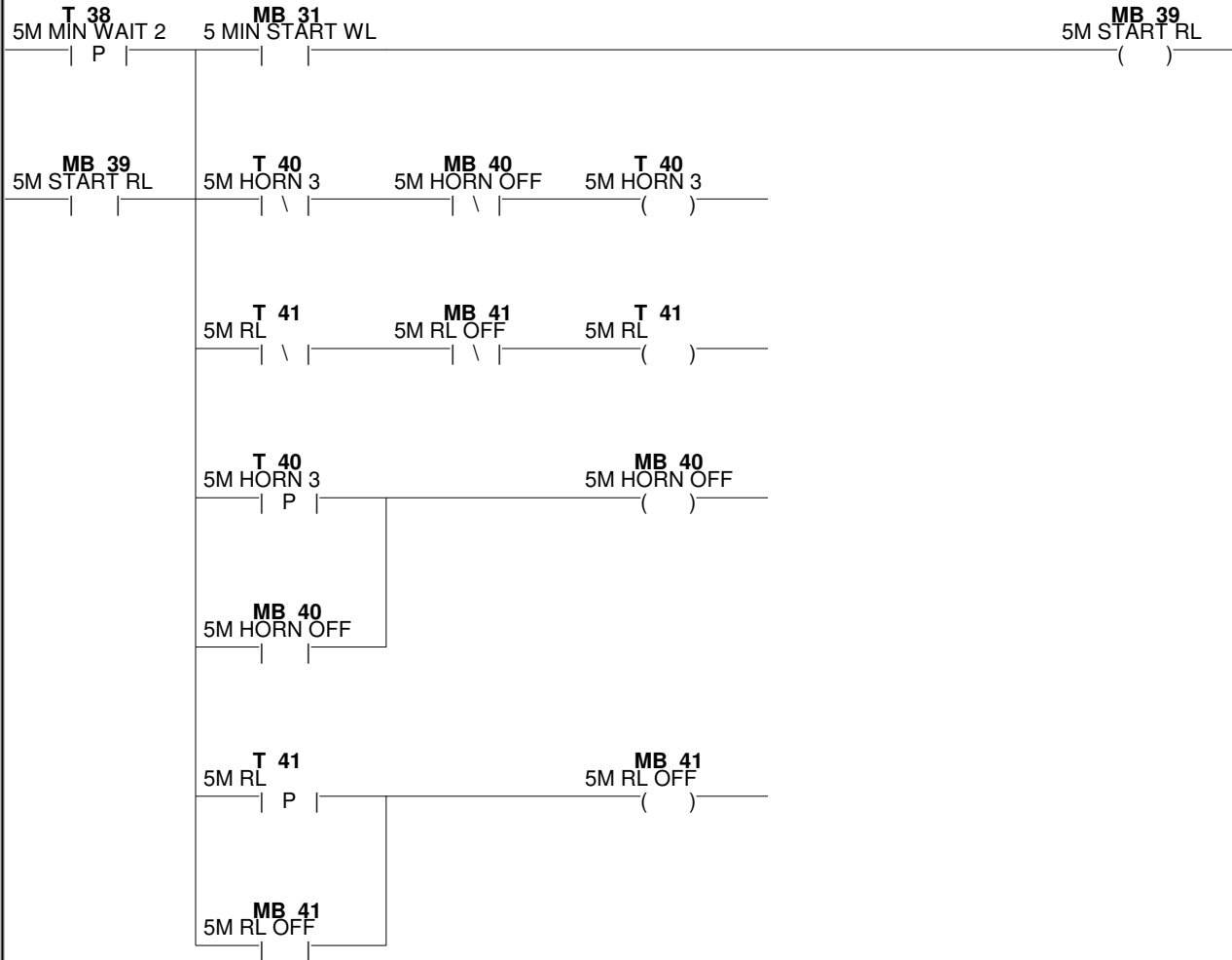
Project:

RSG.U90

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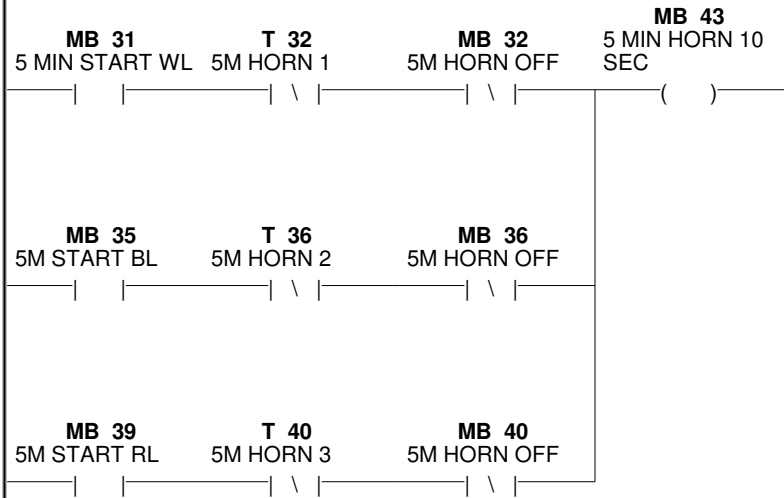
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29



30

WAIT 1 MINUTE



LIGHT CONTROL

Project:

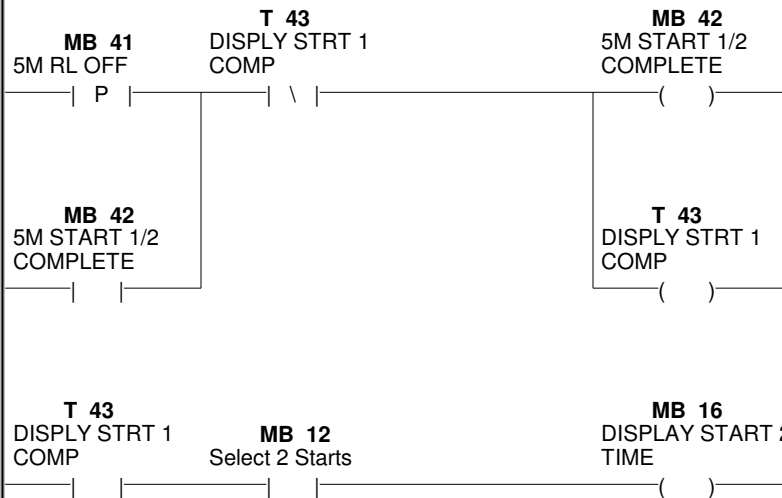
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=====

END OF 5 MINUTE START SEQUENCES

=====

10 MINUTE - START 1 TIME ENTERED, AM OR PM SELECTED

Project:

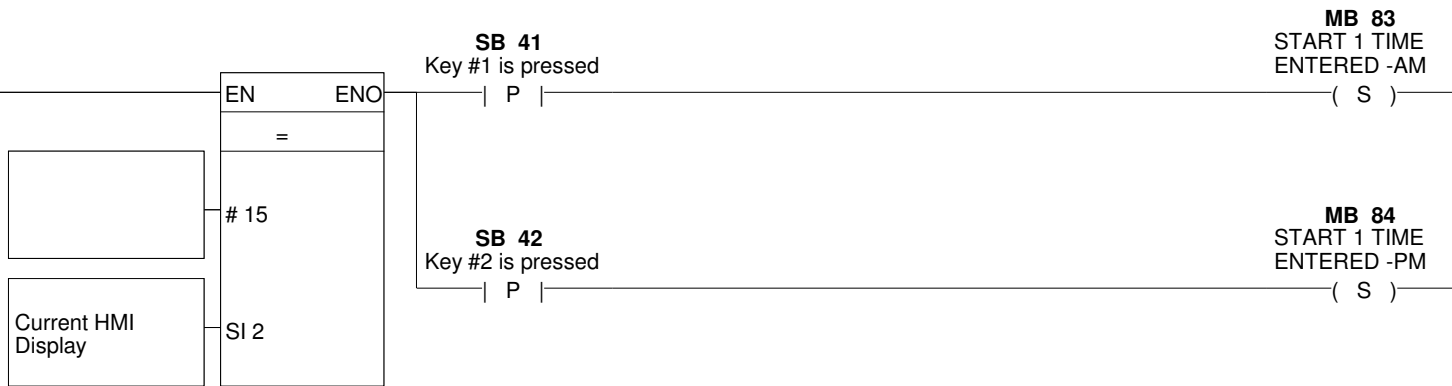
RSG.U90

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CONVERT FROM 24 HOUR TO 12 HOUR  
(1-12 AM, 13-24 PM) Convert Hour part of time.  
AM: 1-9, Calc = HH x 256  
AM 10-12, Calc = (HH +6) x 256

Project:

RSG.U90

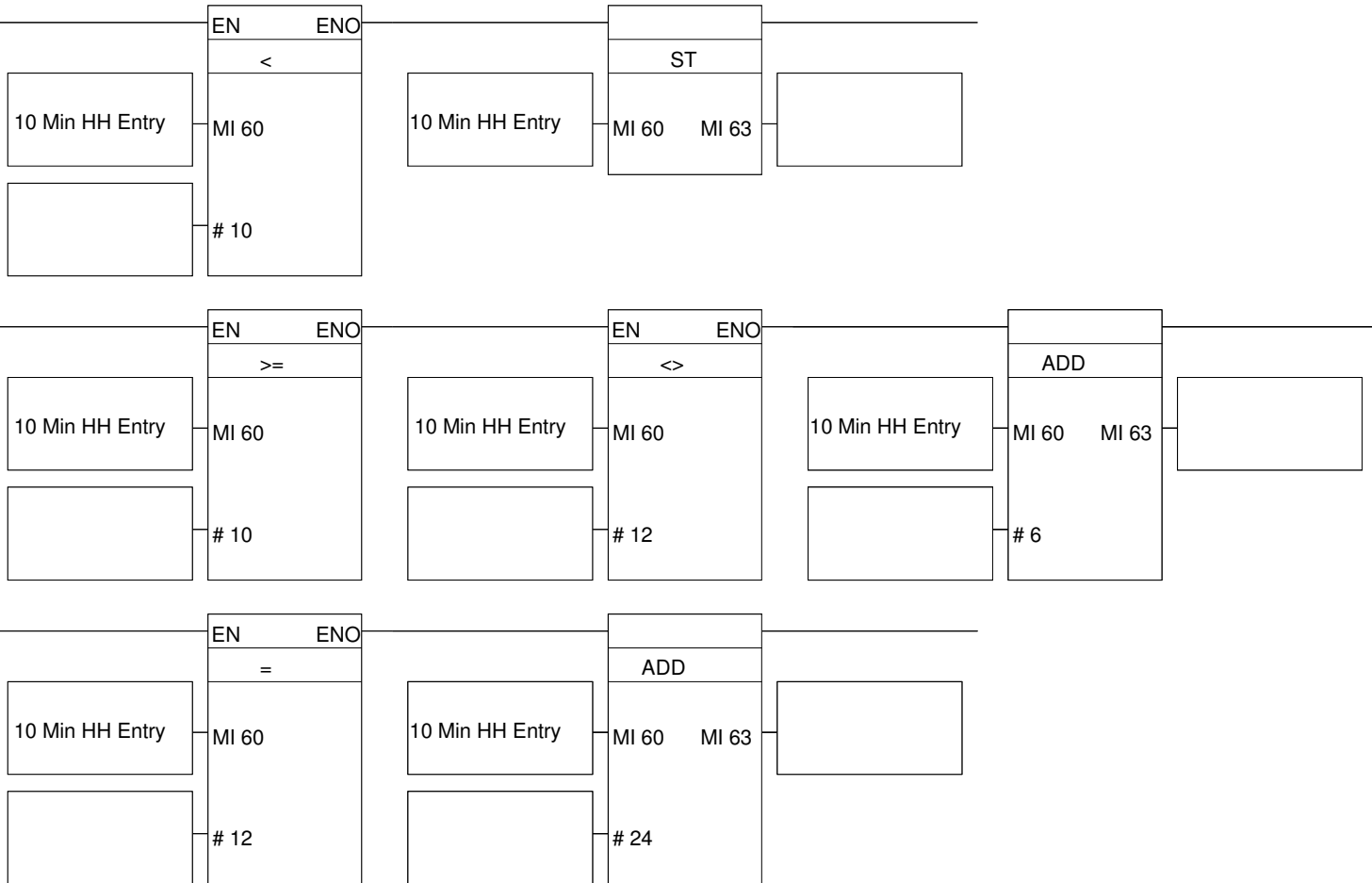
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34

**MB 83**  
START 1 TIME  
ENTERED -AM

| P |



Project:

RSG.U90

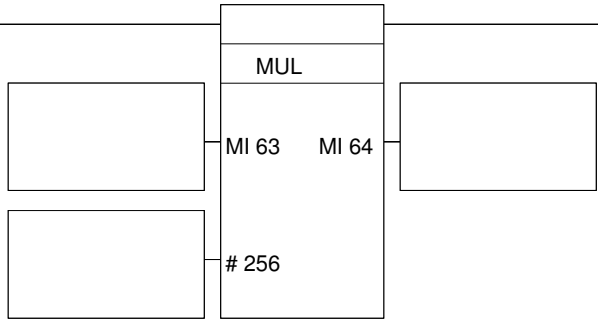
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35

MB 83  
START 1 TIME  
ENTERED -AM

| P |



CONVERT FROM 24 HOUR TO 12 HOUR  
(13-24 PM) Convert Hour part of time.  
PM: 1-7, Calc = (HH + 18) x 256  
PM 8-12, Calc = (HH +24) x 256

Project:

RSG.U90

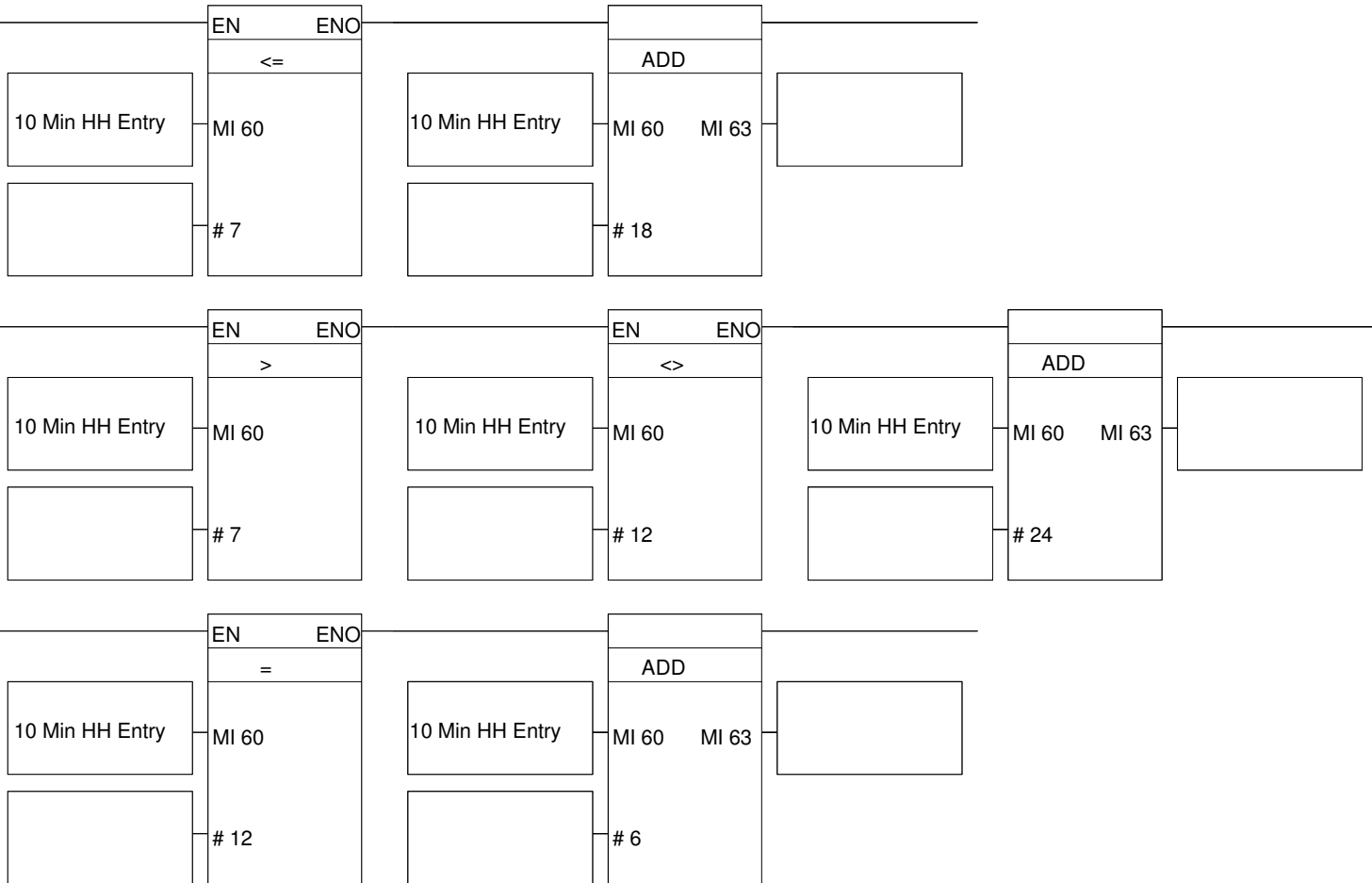
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36

MB 84  
START 1 TIME  
ENTERED -PM

P



Project:

RSG.U90

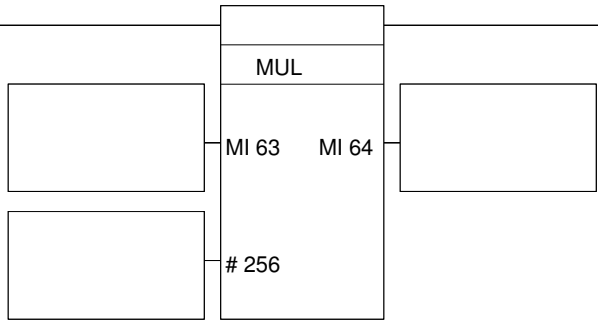
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37

MB 84  
START 1 TIME  
ENTERED -PM

P



Convert Minute Part of Time  
Calc = ((MM/10) x 6) + MM

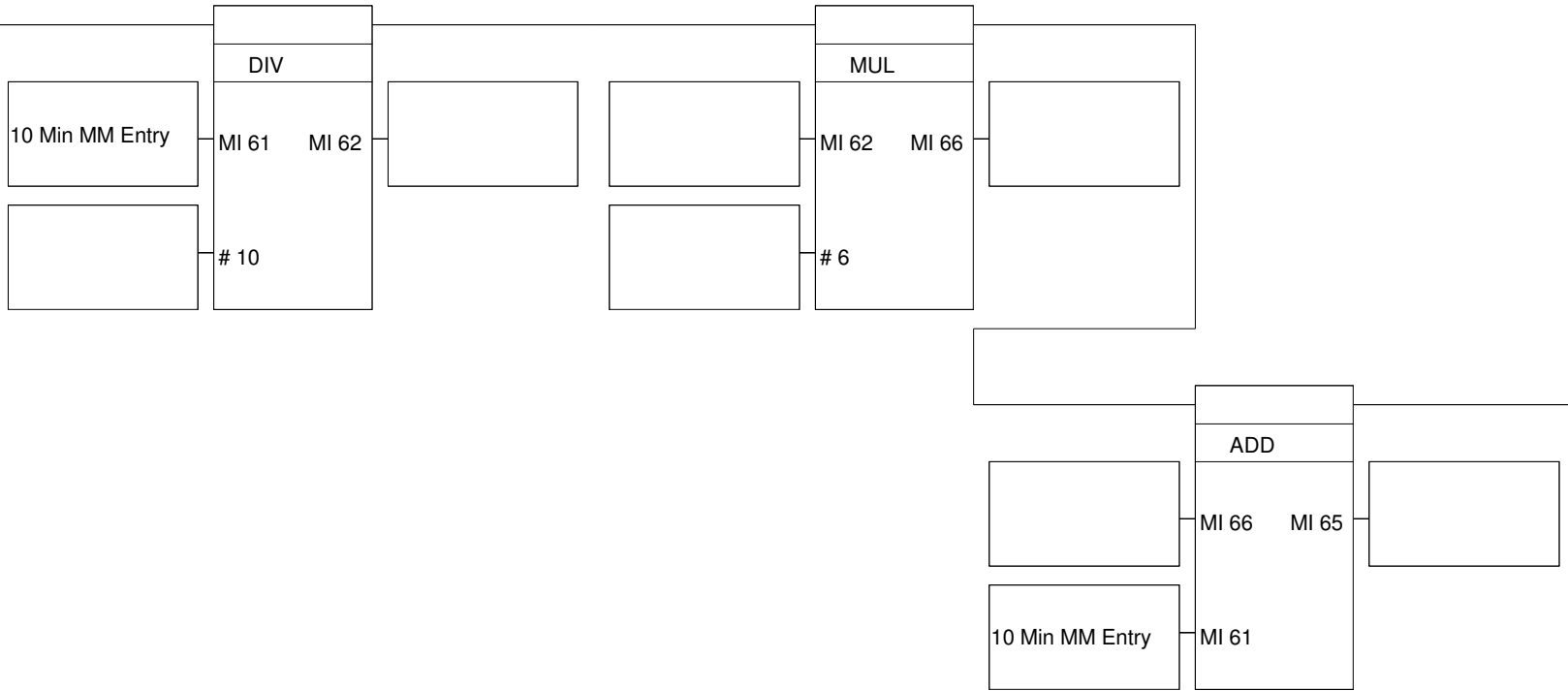
Project:

RSG.U90

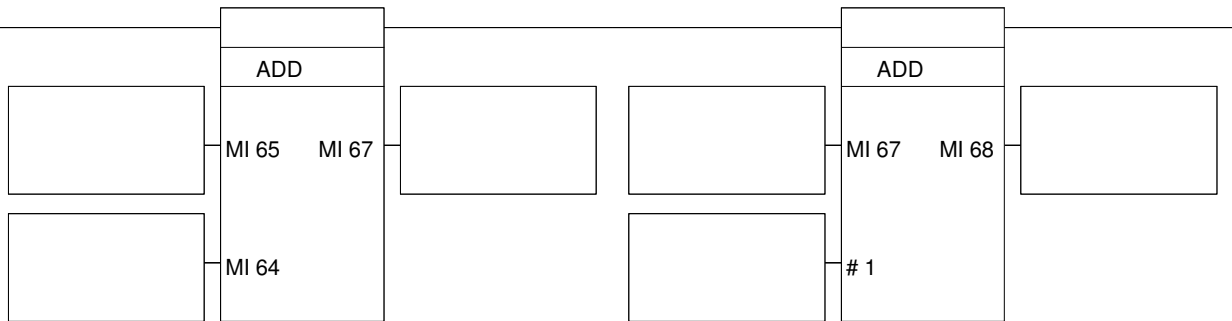
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Project:

RSG.U90

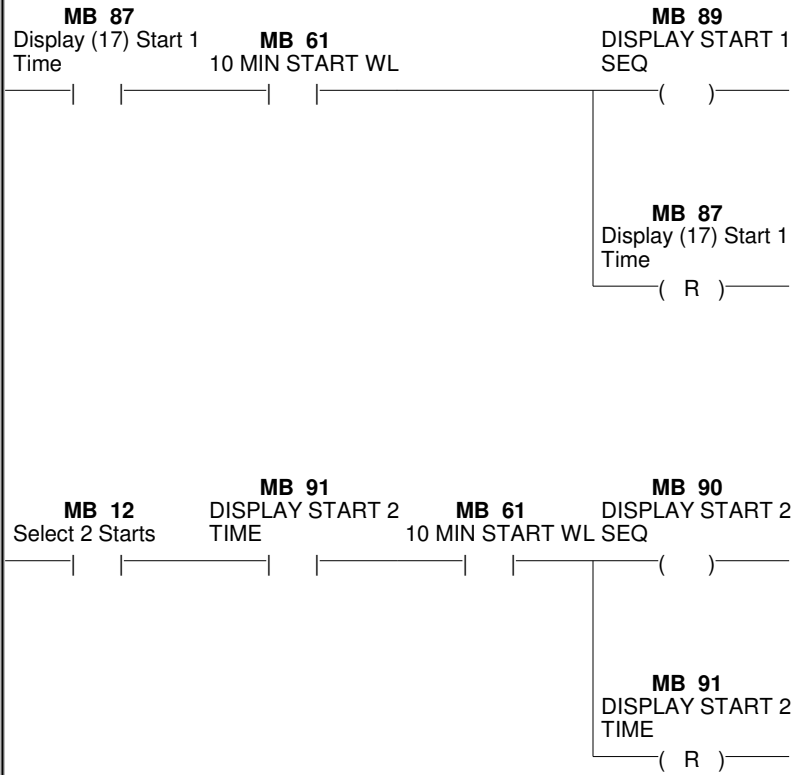
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CHECK FOR WHEN TO START 1 RACE

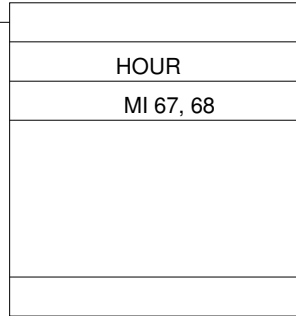
Project:

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42

**MB 87**  
Display (17) Start 1  
Time

**MB 92**  
10 Min Start 1  
Enable

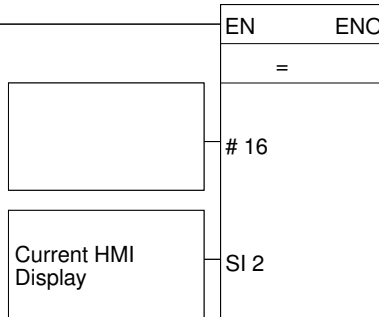
( )

**MB 85**  
START 1 TIME  
ENTERED ON  
DISPLAY 15

( R )

10 MINUTE - START 2 TIME ENTERED, AM OR PM SELECTED

43


**SB 41**  
Key #1 is pressed

P

**MB 93**  
START 2 TIME  
ENTERED-AM

( S )

**SB 42**  
Key #2 is pressed

P

**MB 94**  
START 2 TIME  
ENTERED-PM

( S )

Project:

RSG.U90

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CONVERT FROM 24 HOUR TO 12 HOUR  
(1-12 AM, 13-24 PM) Convert Hour part of time.  
AM: 1-9, Calc = HH x 256  
AM 10-12, Calc = (HH +6) x 256

Project:

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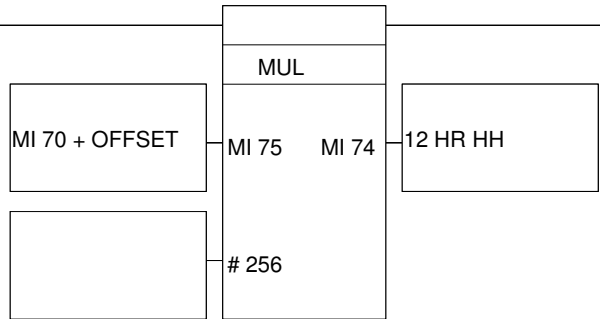
**MB 93**  
START 2 TIME  
ENTERED-AM



45

**MB 93**  
START 2 TIME  
ENTERED-AM

| P |



CONVERT FROM 24 HOUR TO 12 HOUR  
(13-24 PM) Convert Hour part of time.  
PM: 1-7, Calc = (HH + 18) x 256  
PM 8-12, Calc = (HH +24) x 256

Project:

RSG.U90

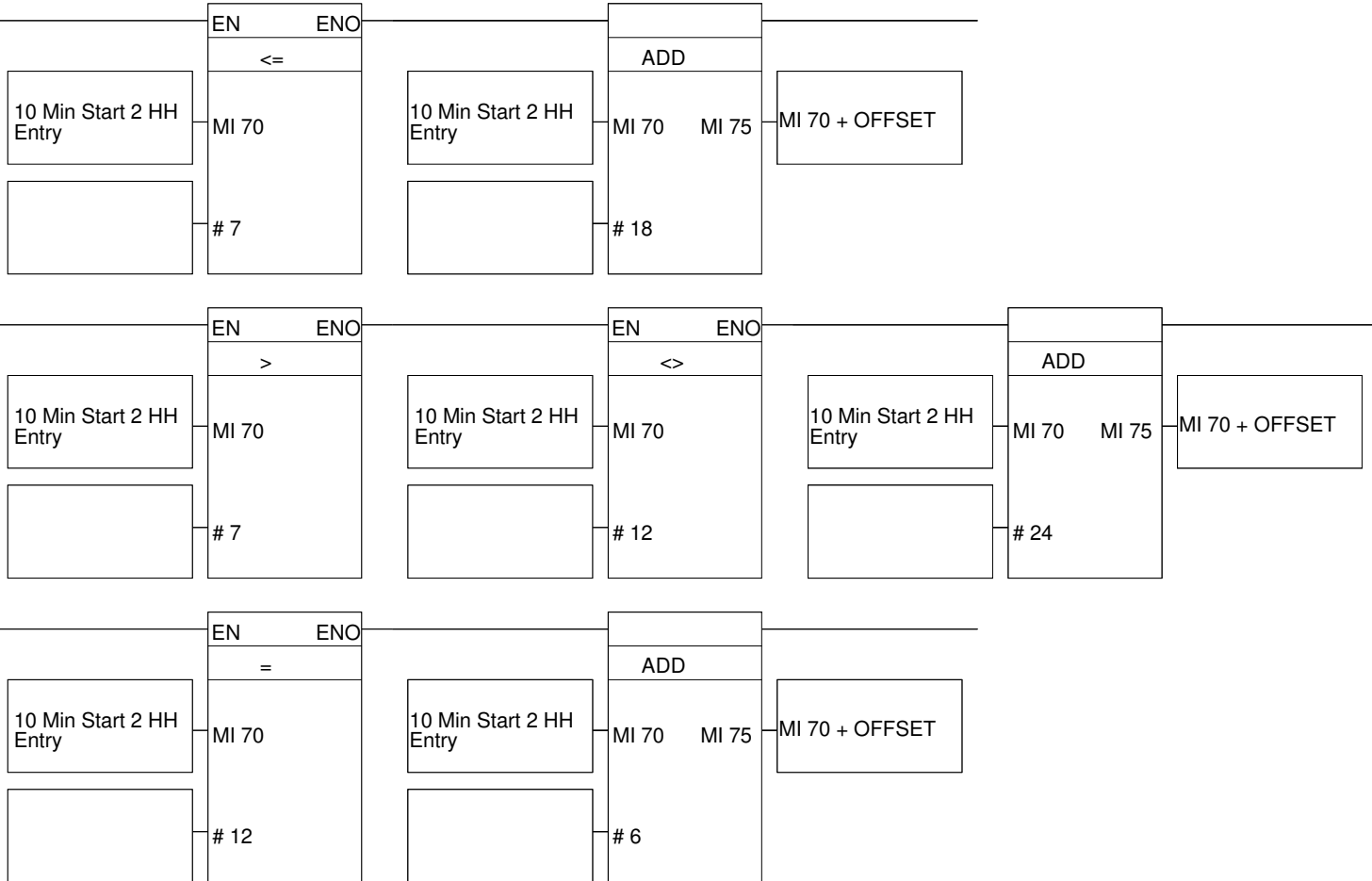
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**MB 94**  
START 2 TIME  
ENTERED-PM

| P |



Project:

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47

MB 94  
START 2 TIME  
ENTERED-PM

| P |

MI 70 + OFFSET

MI 75

MI 74

12 HR HH

# 256

MUL

Convert Minute Part of Time  
Calc = ((MM/10) x 6) + MM

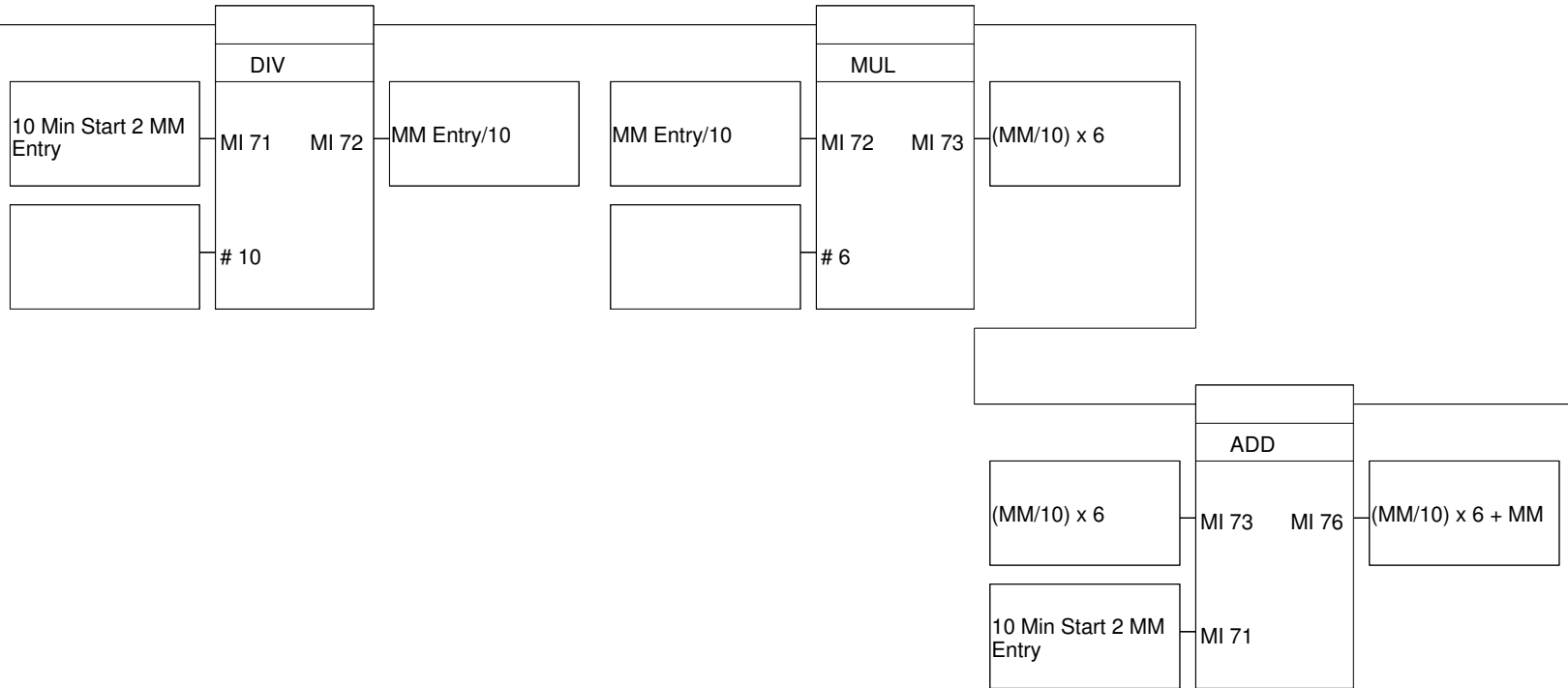
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Project:

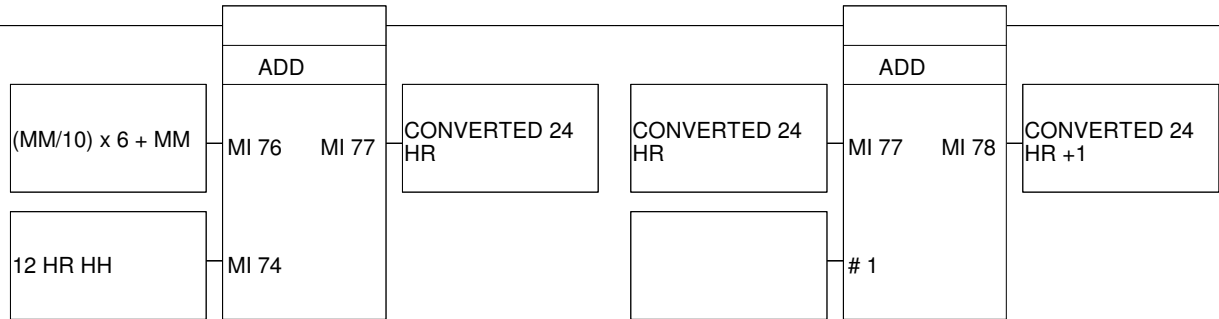
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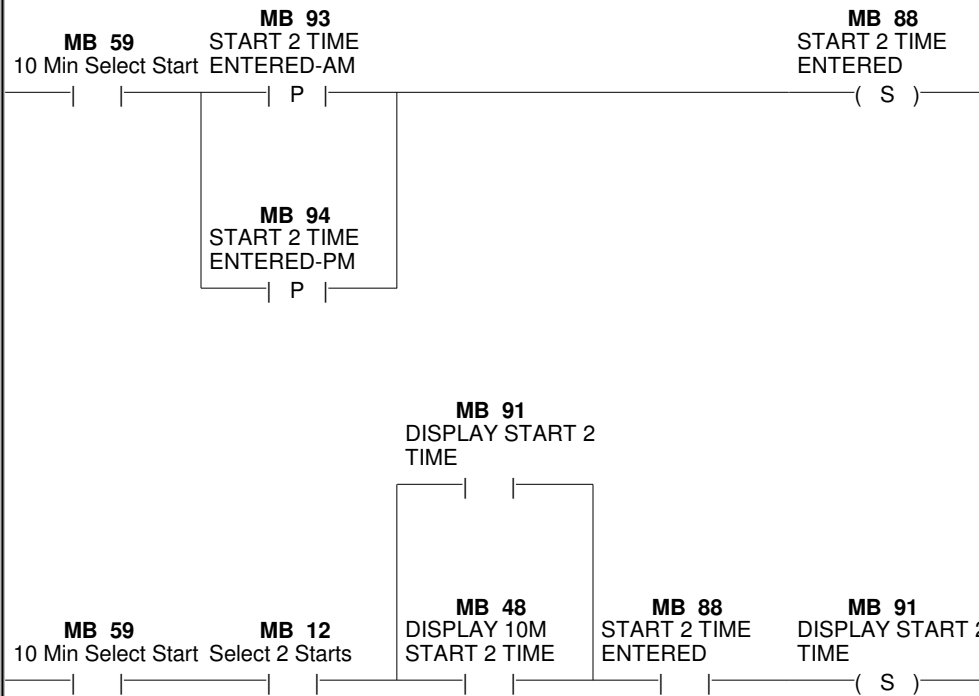
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CHECK FOR WHEN TO START 2 RACE

Project:

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51

**MB 91**  
DISPLAY START 2  
TIME

HOUR
MI 77, 78
CONVERTED 24 HR

**MB 95**  
10 Min Start 2  
Enable

(   )

**MB 88**  
START 2 TIME  
ENTERED

( R )

=====

10 MINUTE START SEQUENCE

=====

TURN ON HORN FOR 10 SECONDS AND WHITE LIGHT FOR 1 MINUTE

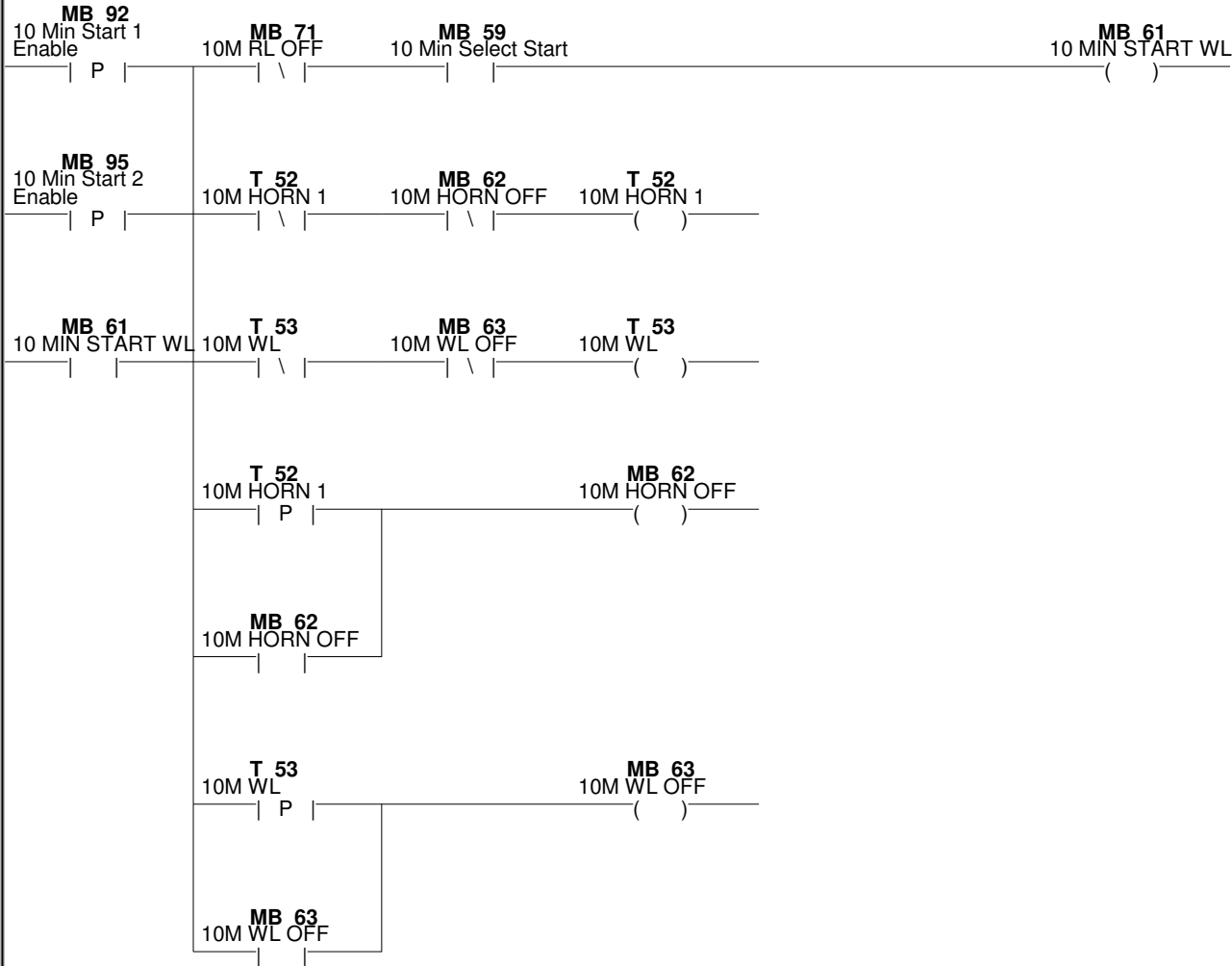
Project:

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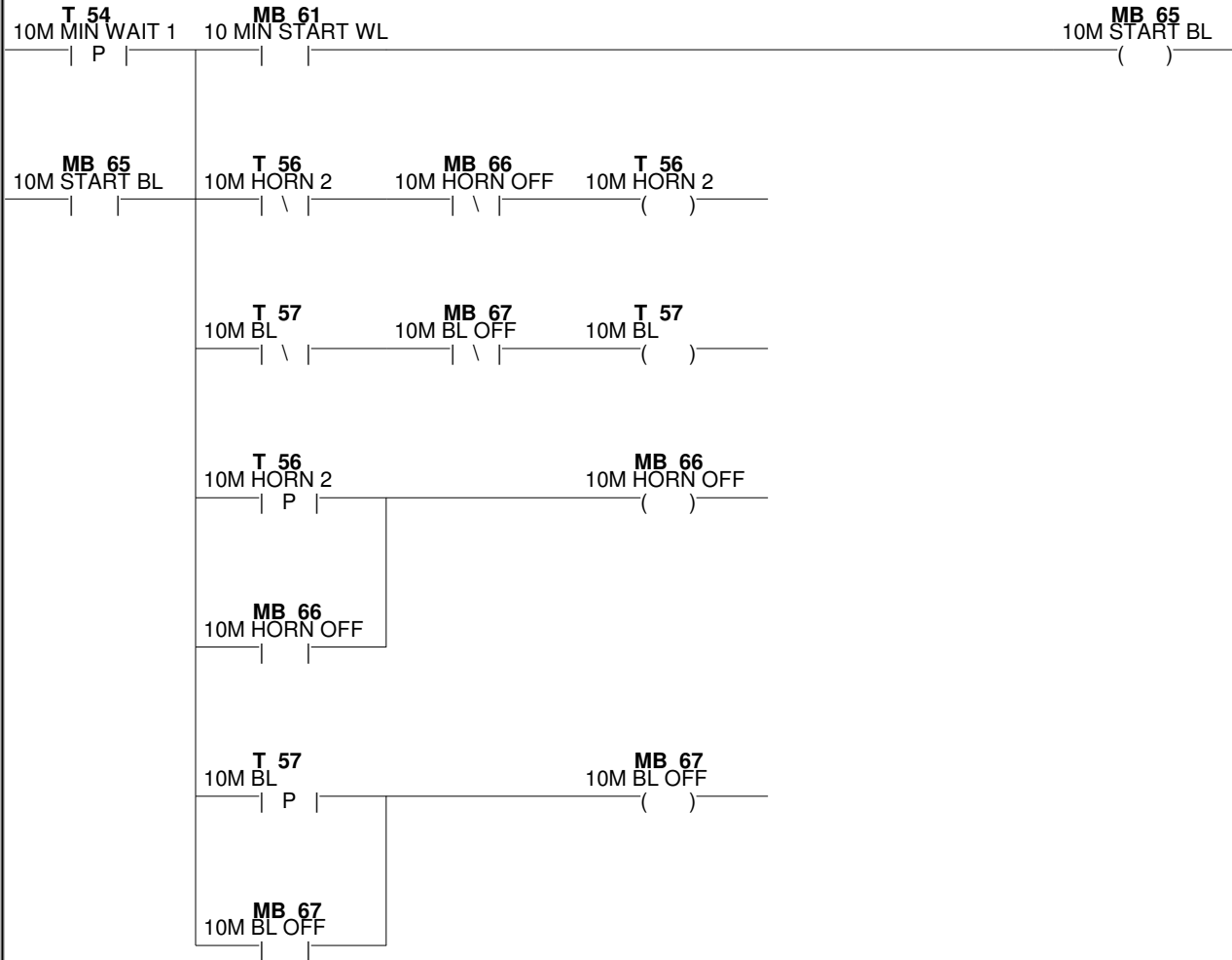
53

TURN ON HORN FOR 6 SECONDS

<b>MB 61</b>	<b>MB 63</b>	<b>MB 65</b>	<b>T 54</b>
10 MIN START WL	10M WL OFF	10M START BL	10M MIN WAIT 1
		\	( )

TURN ON HORN FOR 10 SECONDS AND BLUE LIGHT FOR 2 MINUTE

54



55

WAIT 1 MINUTE



TURN ON HORN FOR 10 SECONDS AND RED LIGHT FOR 1 MINUTE

Project:

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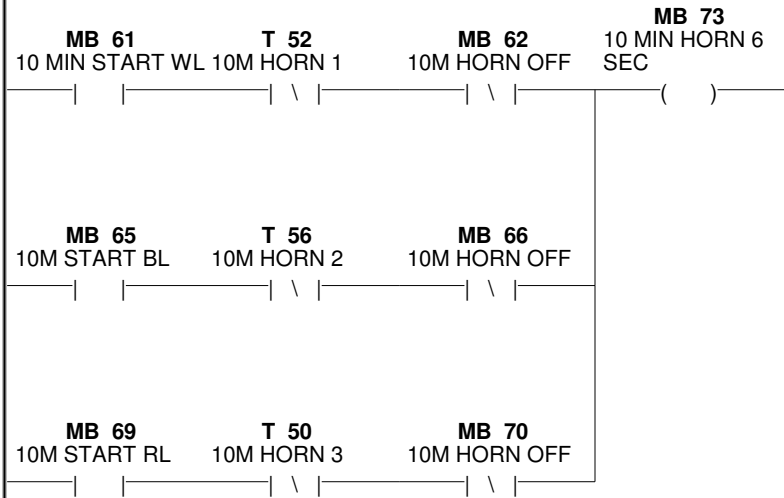


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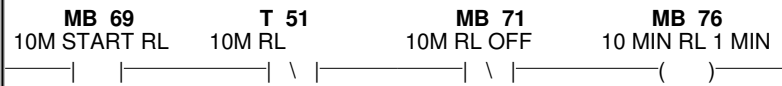
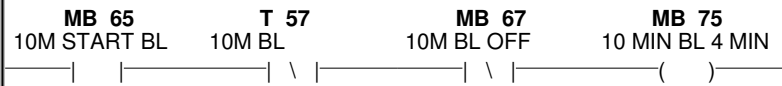
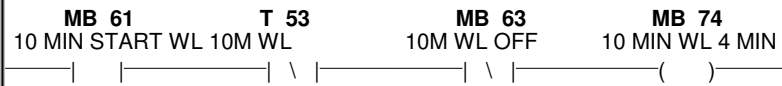
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TURN ON HORN FOR 6 SECONDS

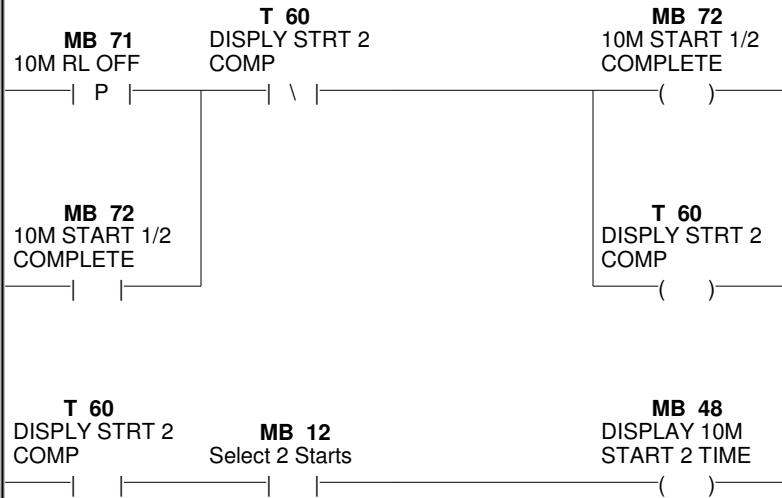


LIGHT CONTROL

58



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=====

END OF 10 MINUTE START SEQUENCES

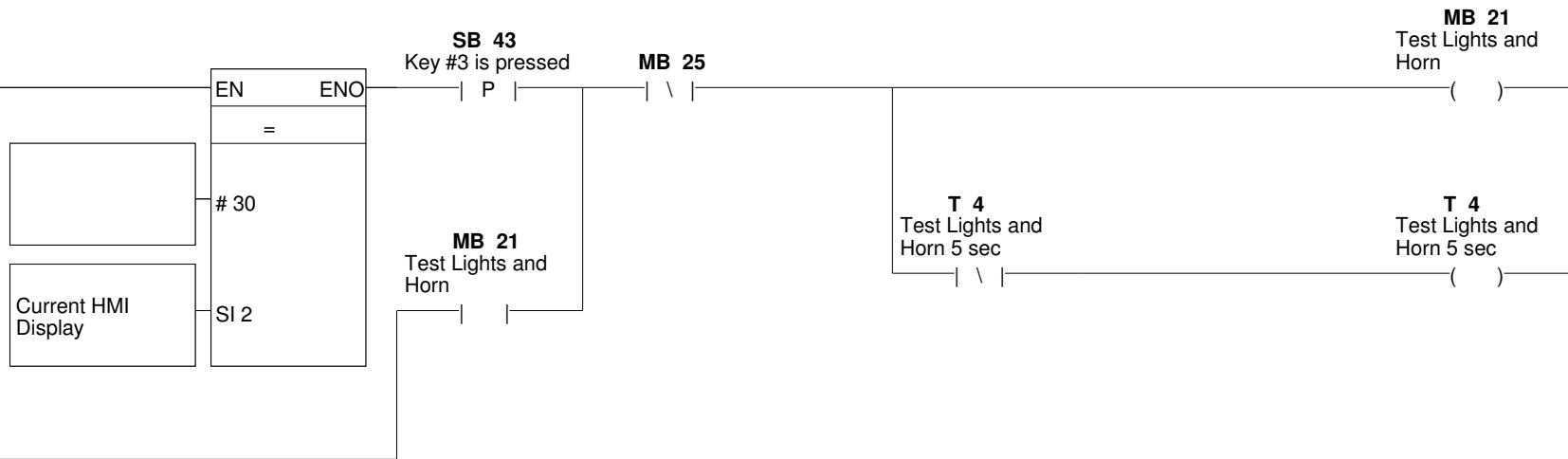
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=====

TEST LIGHTS AND HORN

=====

60



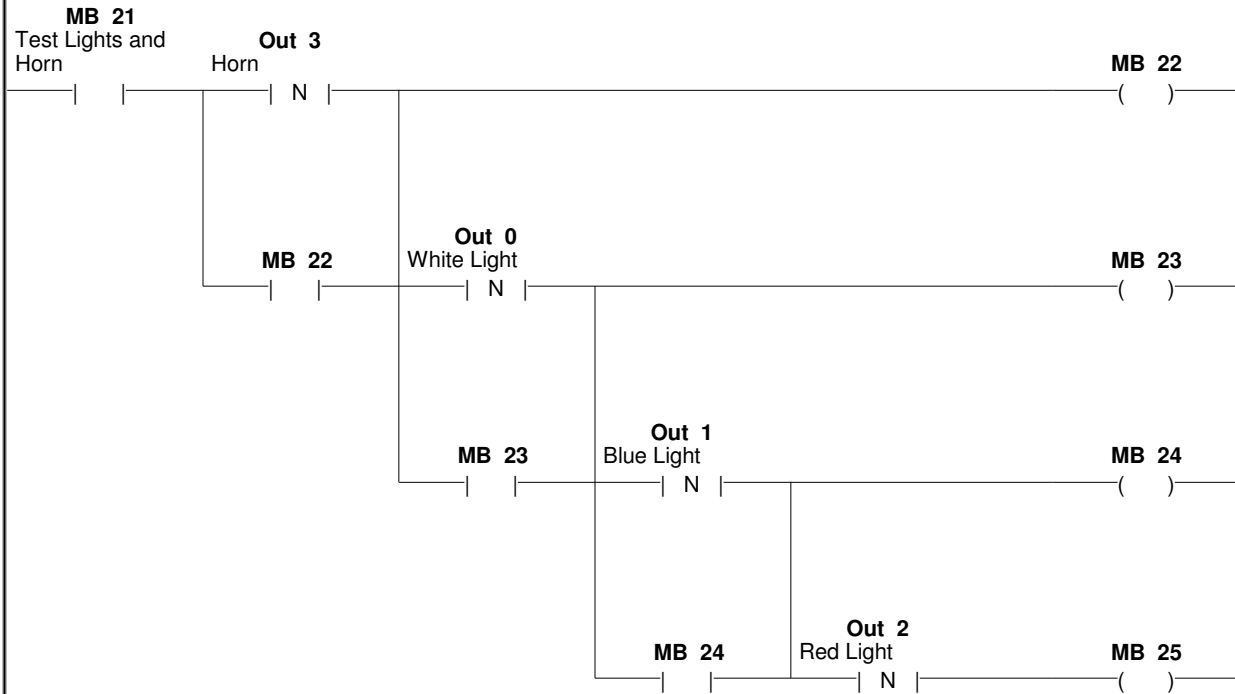
Project:

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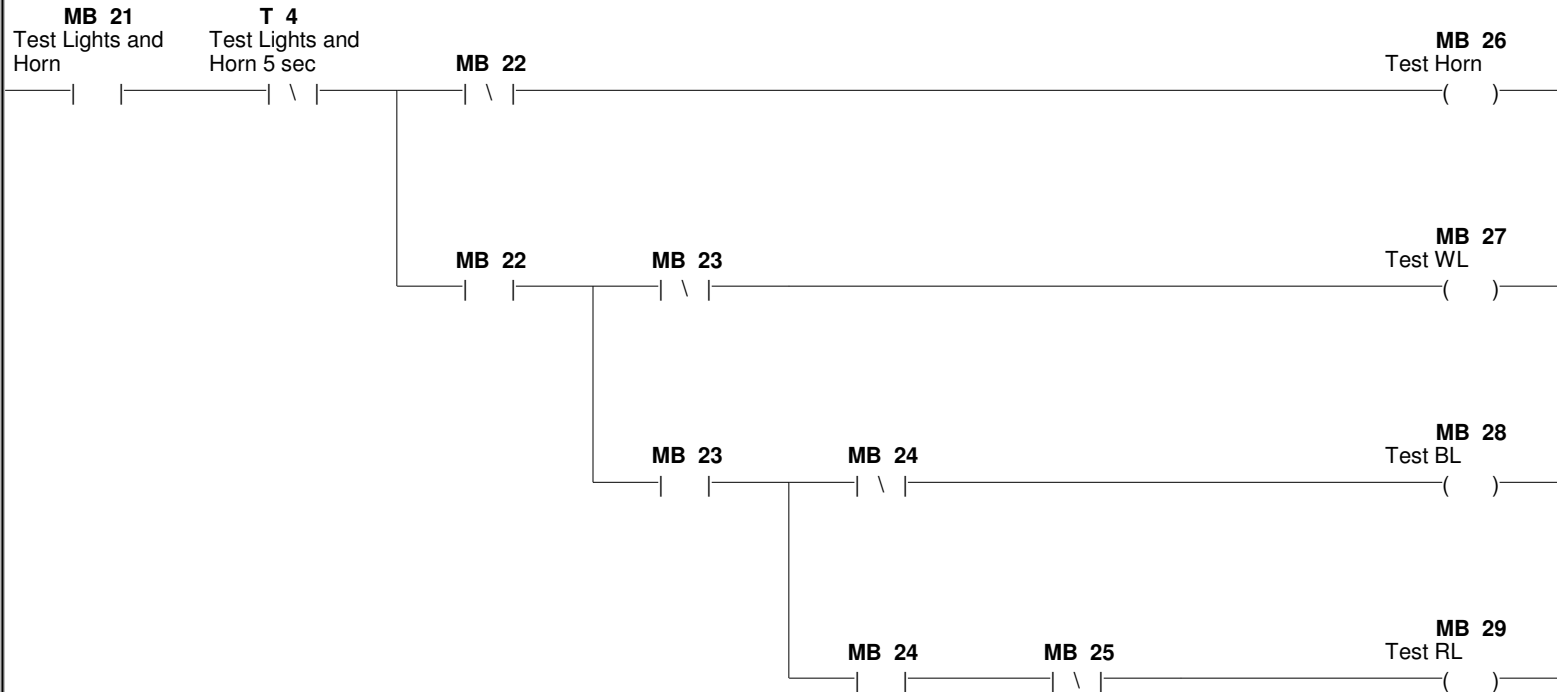
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PLC HARDWARE OUTPUT SECTION

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63

**MB 43**  
5 MIN HORN 10  
SEC

**MB 73**  
10 MIN HORN 6  
SEC

**MB 26**  
Test Horn

**Out 3**  
Horn

( )

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**MB 44**  
5 MIN WL 1 MIN

**Out 0**  
White Light

**MB 74**  
10 MIN WL 4 MIN

**MB 27**  
Test WL

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**MB 45**  
5 MIN BL 2 MIN

**Out 1**  
Blue Light

( )

**MB 75**  
10 MIN BL 4 MIN

**MB 28**  
Test BL

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66

**MB 46**  
5 MIN RL 1 MIN

**Out 2**  
Red Light

( )

**MB 76**  
10 MIN RL 1 MIN

**MB 29**  
Test RL

DISPLAY THE CONVERSION OF THE SYSTEM 24 HOUR TIME TO 12 HOUR AM TIME  
GET 24 HR TIME /100 = 12 HR HH

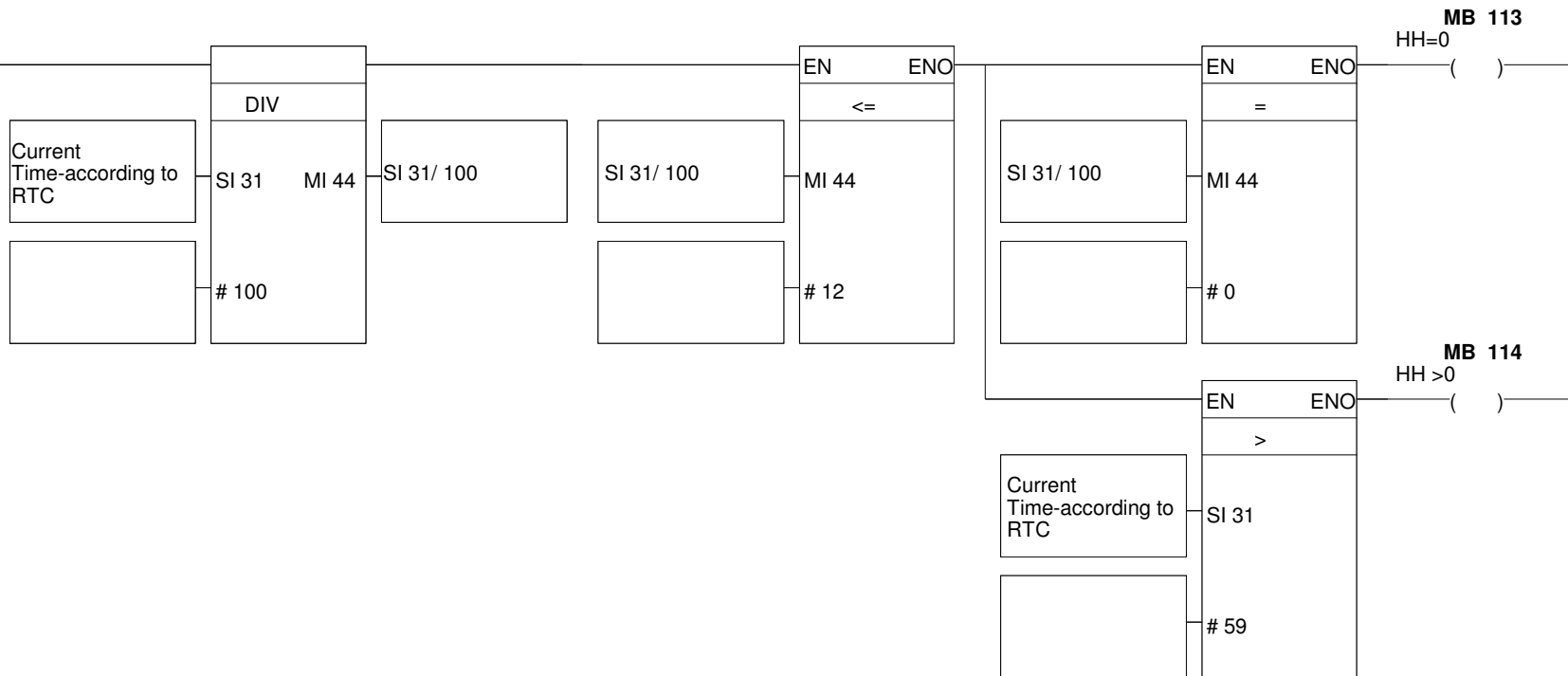
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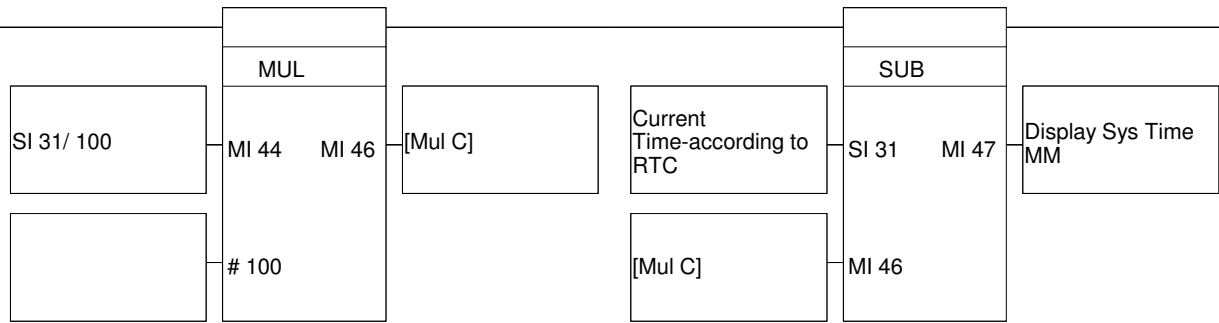


DISPLAY THE CONVERSION OF THE SYSTEM 24 HOUR TIME TO 12 HOUR AM TIME  
IF 12 HR HH =0 THEN = 12. IF MIDNIGHT 00:00:00 DISPLAY RTC



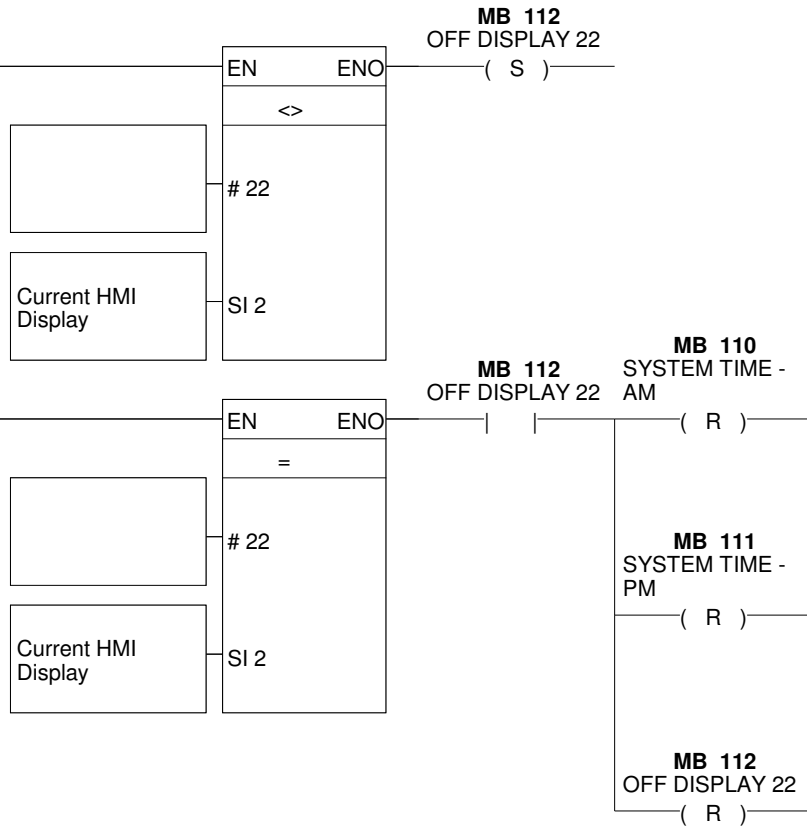
70

DISPLAY THE CONVERSION OF THE SYSTEM 24 HOUR TIME TO 12 HOUR PM TIME  
GET 24 HR TIME /100 = 12 HR HH



SET SYSTEM TIME USING 12 HOUR TIME INPUT

71



KEEP TRACK OF SYSTEM TIME AM/PM STATUS

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72

**MB 112**  
OFF DISPLAY 22

Current  
Time-according to  
RTC

SI 31

# 1200

EN ENO

&lt;

**MB 110**  
SYSTEM TIME -  
AM

( S )

**MB 111**  
SYSTEM TIME -  
PM

( R )

Current  
Time-according to  
RTC

SI 31

# 1200

EN ENO

&gt;=

**MB 111**  
SYSTEM TIME -  
PM

( S )

**MB 110**  
SYSTEM TIME -  
AM

( R )

SET TIME AM/PM

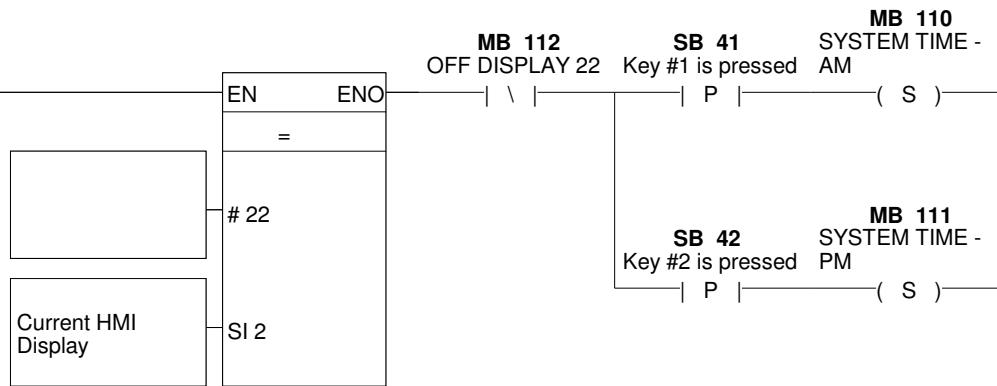
Project:

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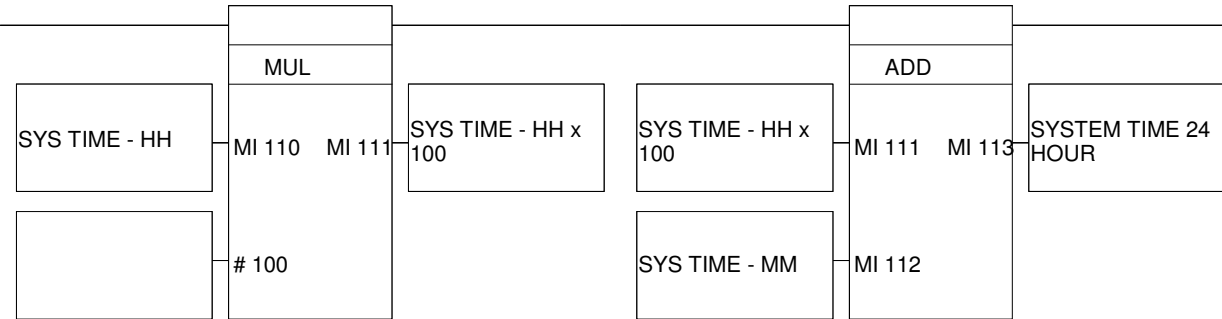
SYSTEM CURRENT TIME: CONVERT FROM 12 HR TO 24 HR



74

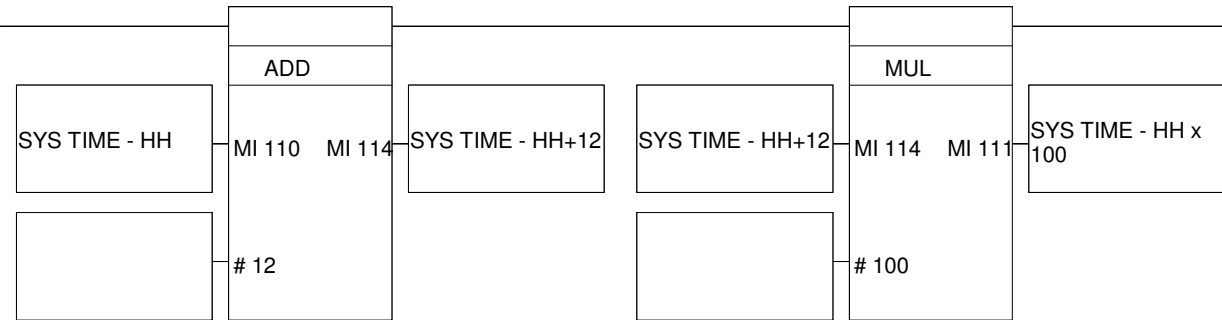
**MB 110**  
SYSTEM TIME -  
AM

**MB 112**  
OFF DISPLAY 22



**MB 111**  
SYSTEM TIME -  
PM

**MB 112**  
OFF DISPLAY 22



SET SYSTEM CURRENT TIME

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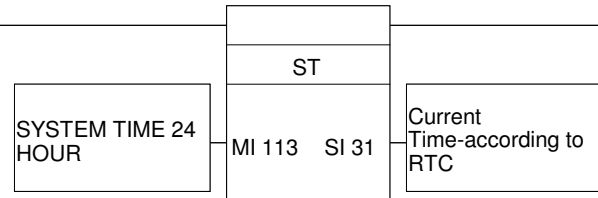
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**MB 110**  
SYSTEM TIME -  
AM

**MB 112**  
OFF DISPLAY 22

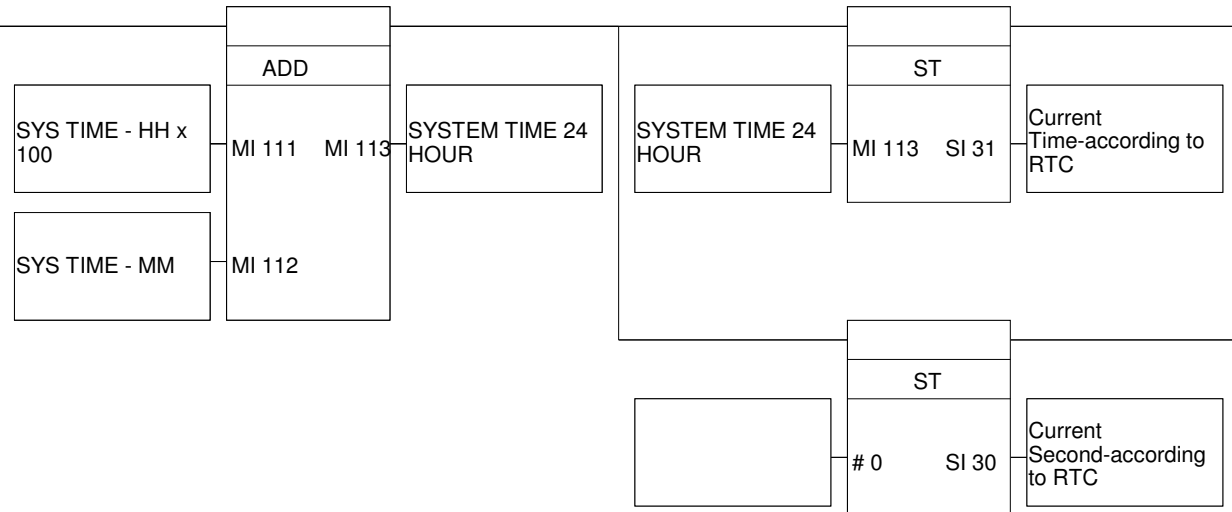
| P | | \ |



**MB 111**  
SYSTEM TIME -  
PM

**MB 112**  
OFF DISPLAY 22

| P | | \ |



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DISPLAY VERSION #

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