

LISTEN.  
THINK.  
SOLVE.<sup>SM</sup>

*MicroLogix  
1100  
RSLogix 500 LAB#3*

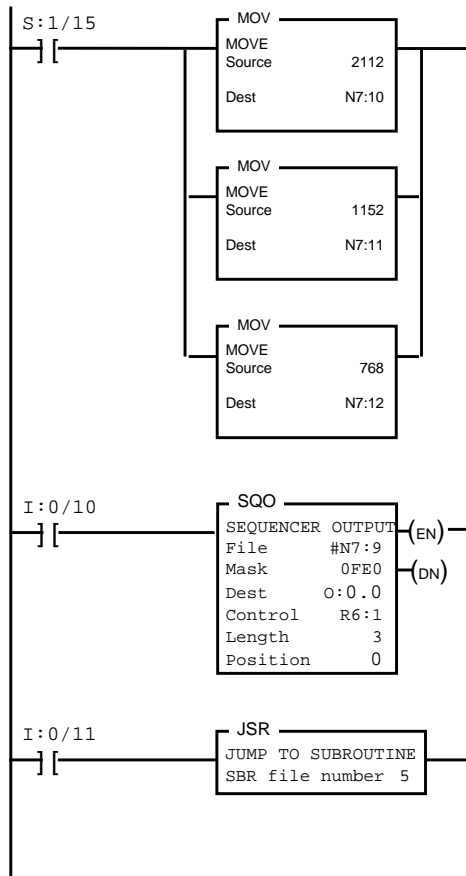


**Sequencing and Subroutines**

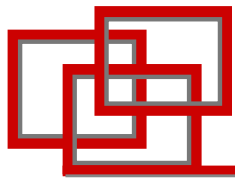
ALLEN-BRADLEY • ROCKWELL SOFTWARE

**Rockwell  
Automation**

# What we are going to do:



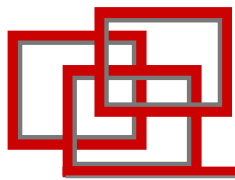
- Here we will program and run a Sequencer. Sequencers are powerful instructions that are primarily used in applications that require sequential activation of outputs. Strapping machines, Traffic light sequencing, Filter cleaning processes etc.
- We will also program a simple subroutine. This will illustrate how subroutines work, and how easy they are to use.



# Steps for Today's Assignments

---

1. Create a new file.
2. Create new program rungs including a sequencer.
3. Create a subroutine
4. Save your work.
5. Go ONLINE and transfer your program to the MicroLogix 1100 controller.
6. Put the MicroLogix 1100 into RUN mode and test your program.

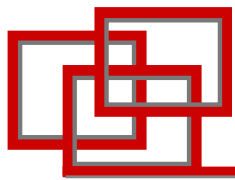


# Creating a "PROJECT"

## 1. Click "File" Menu

- Select "NEW" To Create a File
- Select "Yes" are you sure you want to close processor->M\_LAB2

The screenshot shows the RSLogix 500 software interface. The 'File' menu is open, and the 'New...' option is highlighted with a circled '1'. A warning dialog box is displayed in the foreground, asking 'Are you sure you want to close processor -> M-LAB2' with 'Yes' and 'No' buttons. The background shows a ladder logic diagram with various components like 'Input Switch 0', 'Stop Button', 'Start Button', 'Counter Done bit', 'Output 0', 'Output 1', and a 'Timer On Delay' block.



# Creating a "PROJECT"

## 2. Select Controller

- Enter Processor Name "M-LAB3"
- Using the down arrow, move to the center of the list
- "Click" Bul.1763 MicroLogix 1100 Series A or ask the instructor
- (Either double click, or select and then click OK)

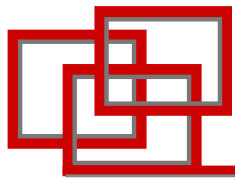
The screenshot shows the RSLogix 500 interface with the 'Select Processor Type' dialog box open. The 'Processor Name' field is set to 'M-LAB3'. The list of processor types includes:

1747-L511	5/01 CPU - 1K Mem.
Bul.1764	MicroLogix 1500 LRP Series C
Bul.1764	MicroLogix 1500 LRP Series B
Bul.1764	MicroLogix 1500 LSP Series C
Bul.1764	MicroLogix 1500 LSP Series B
Bul.1764	MicroLogix 1500 LSP Series A
Bul.1762	MicroLogix 1200 Series C (1 or 2 Comm Ports)
Bul.1762	MicroLogix 1200 Series B
Bul.1762	MicroLogix 1200 Series A
<b>Bul.1763</b>	<b>MicroLogix 1100 Series A</b>
Bul.1761	MicroLogix 1000 Analog
Bul.1761	MicroLogix 1000 DH-485/HDSlave
Bul.1761	MicroLogix 1000
1747-L40A	24-115 VAC In. 16-RLY Out

The 'Communication settings' section at the bottom shows:

- Driver: AB\_DF1-1
- Processor Node: 1
- Reply Timeout: 10 (Sec.)

A circled '2' with arrows points to the selected processor type and the OK button.

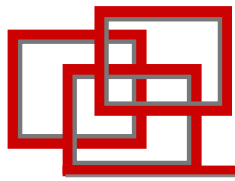


# Save Project

## 3. Click "File" Menu

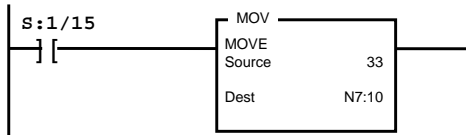
- Select "Save As"
- Type "MicroEconomix LAB3" in the "File name" box
- Click "Save"

The screenshot shows the RSLogix 500 software interface. The 'File' menu is open, and the 'Save As...' option is selected. A circled number '3' points to the 'Save As...' menu item. Below the menu, the 'Save Program As...' dialog box is open. The 'File name' field contains 'MICROECONOMIX LAB3.RSS'. The 'Save as type' is set to 'RSLogix Files (\*.RSS)'. The 'File PLC Information' section shows 'Processor Name: M-LAB3' and 'Station #: 1d'. The 'Revision Note' field is empty.



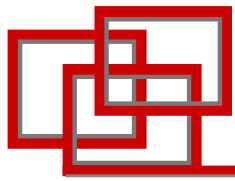
# Create the 1<sup>st</sup> Rung of Ladder Logic

Program this rung:



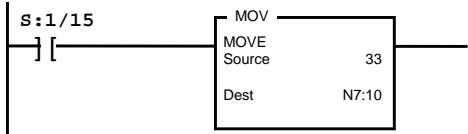
## 6. Create a New Rung

- Activate Program Window (the right window title bar is colored or highlighted)
- Click on the "User" tab.
- Click, hold and Drag the "New Rung" button over "0000". When you see a green box, release the mouse button.



# Create the 1<sup>st</sup> Rung of Ladder Logic

Program this rung:

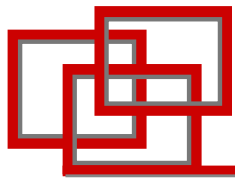


## 7. Add an Input Instruction

- Click, hold and Drag the XIC button onto the left side of the rung you just created. When you see a green box, release the mouse button.
- Type S:1/15 [Enter]. Notice this address location is already documented. This instruction will be true only for the first program scan.

## 8. Add a Move Instruction

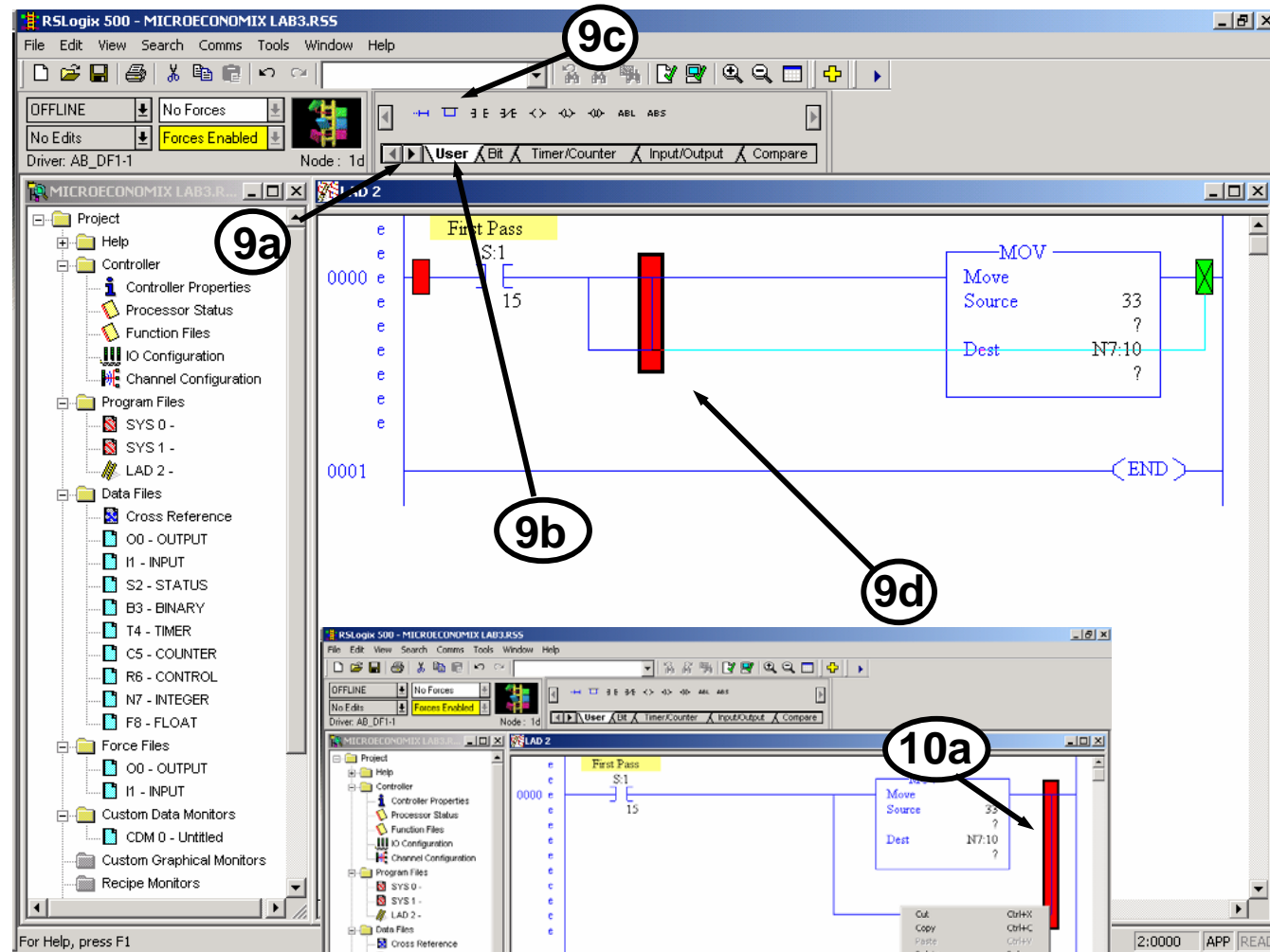
- a) Click on the tab right arrow 3 or 4 times until you see the "Move/Logical" tab
- b) Click on the "Move/Logical" Tab.
- c) Click, hold and drag the MOV button on the right side of the rung. When you see a green box, release the mouse button.
- Type 33 [Enter] for the source and N7:10 [Enter] for the "Dest" .



# Create and Extend a Branch

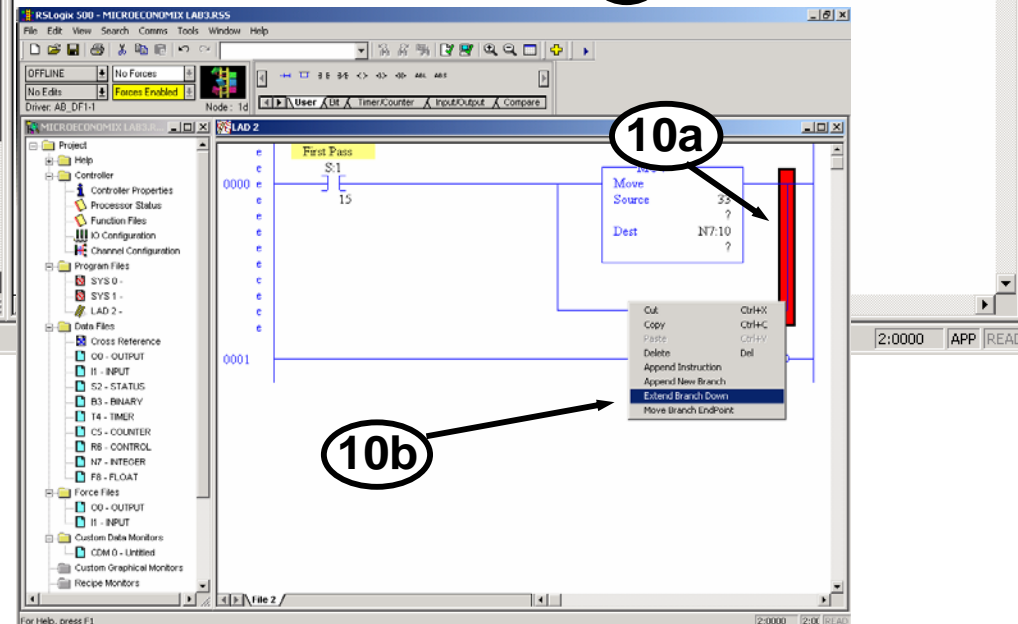
## 9. Add an empty branch

- a) Click on the tab left arrow 3 or 4 times until you see the "User" tab.
- b) Click on the "User" tab.
- c) Click, hold and Drag the RUNG BRANCH button in-between the XIC and the MOV instructions. When you see a green box, release the mouse button.
- d) Click, hold and Drag the highlighted branch leg to the right of the MOV instruction. When you see a green box, release the mouse button.



## 10. Extend the branch down

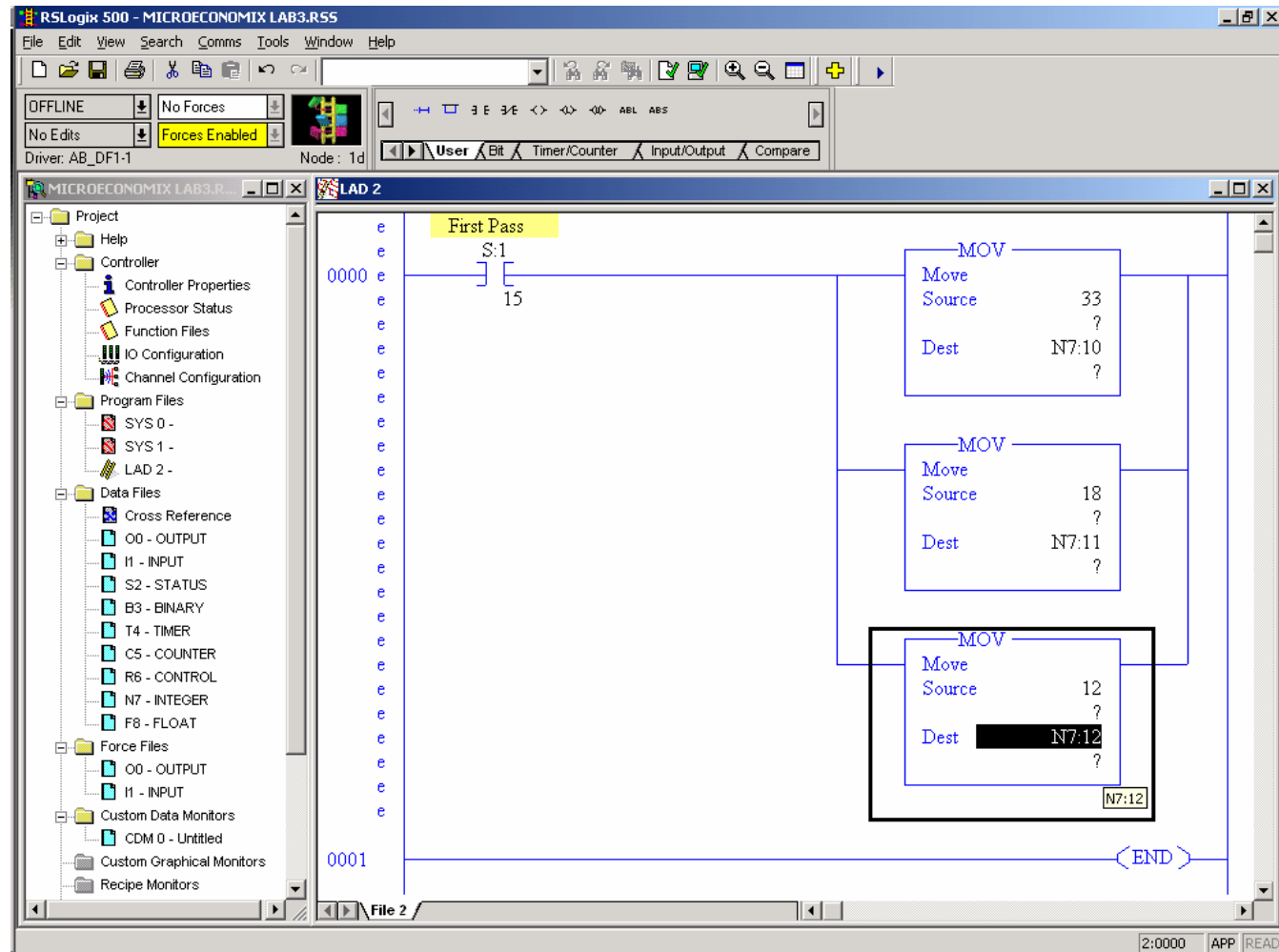
- a) Right click on the highlighted leg of the branch.
- b) Click on "Extend Branch Down"

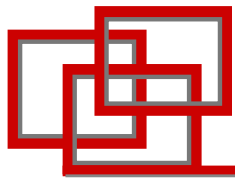


# Create and Extend a Branch

## 11. Add Instructions to the branch

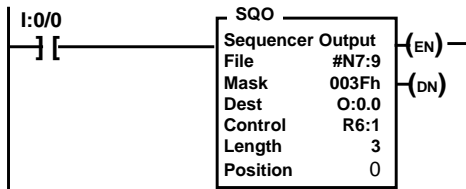
- Click on the tab right arrow 3 or 4 times until you see the "Move/Logical" tab.
- Click on the "Move/Logical" Tab
- Click, hold and Drag the MOV button onto the middle level of the branch you just created. When you see a green box, release the mouse button.
- Type 18 [Enter] for the "Source" and N7:11 [Enter] for the "Dest".
- Click, hold and Drag the MOV button onto the bottom level of the branch you just created. When you see a green box, release the mouse button.
- Type 12 [Enter] for the "Source" and N7:12 [Enter] for the "Dest"





# Creating the 2<sup>nd</sup> Rung of Logic

Program this rung:



## 12. Create a New Rung

- Click on the tab left arrow 3 or 4 times until you see the "User" tab.
- b) Click on the "User" tab.
- Click, hold and Drag the "New Rung" button over "0001" until you see a green box. When you see a green box, release the mouse button.

## 13. Add an Input Instruction

- Click, hold and Drag the XIC button onto the left side of the rung you just created. When you see a green box, release the mouse button.
- Type I:0.0/0 [Enter].

RSLogix 500 - MICROECONOMIX LAB3.R55

OFFLINE | No Forces | Forces Enabled

Driver: AB\_DF1-1 | Node: 1d

Project Tree:

- Project
  - Help
  - Controller
    - Controller Properties
    - Processor Status
    - Function Files
    - IO Configuration
    - Channel Configuration
  - Program Files
    - SYS 0 -
    - SYS 1 -
    - LAD 2 -
  - Data Files
    - Cross Reference
    - O0 - OUTPUT
    - I1 - INPUT
    - S2 - STATUS
    - B3 - BINARY
    - T4 - TIMER
    - C5 - COUNTER
    - R6 - CONTROL
    - N7 - INTEGER
    - F8 - FLOAT
  - Force Files
    - O0 - OUTPUT
    - I1 - INPUT
  - Custom Data Monitors
    - CDM 0 - Untitled
  - Custom Graphical Monitors
  - Recipe Monitors

LAD 2 Editor:

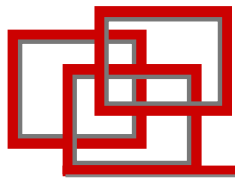
0000 e | | 15

0001 e | | I0

MOV Instructions:

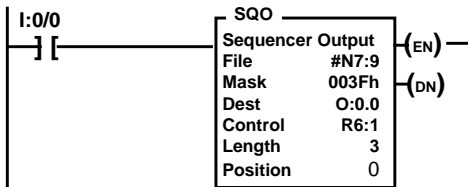
- Move Source: 33, Dest: N7:10
- MOV Move Source: 18, Dest: N7:11
- MOV Move Source: 12, Dest: N7:12

File 2 | Entry is Valid | 2:0001 | APP | READ



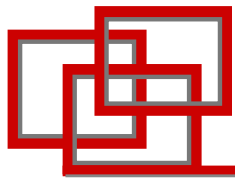
# Creating the 2<sup>nd</sup> Rung of Logic

Program this rung:



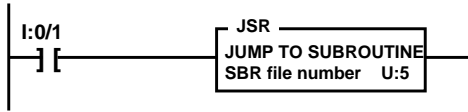
## 14. Add a Sequencer Instruction

- a) Click on the tab right arrow 4 or 5 times until you see the "File Shift/Sequencer" tab.
- b) Click on the "File Shift/Sequencer" tab
- b) Click, hold and Drag the SQR button to the right of the XIC you just created. When you see a green box, release the mouse button.
- Enter these parameters:
  - File: #N7:9 [Enter]
  - Mask: 003Fh [Enter] (zero,zero,3,F,H)
  - Dest: O:0.0 [Enter]
  - Control: R6:0 [Enter]
  - Length: 3 [Enter]
  - Position: 0 [Enter]



# Creating the 3<sup>rd</sup> Rung of Logic

Program this rung:

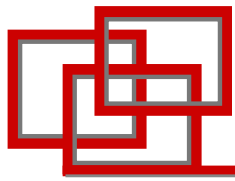


## 15. Create a New Rung

- Click on the tab left arrow 4 or 5 times until you see the "User" tab.
- Click, hold and Drag the "New Rung" button over "0002" until you see a green box. When you see a green box, release the mouse button.

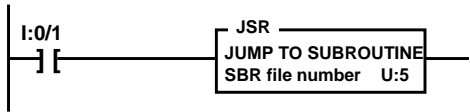
## 16. Add an Input Instruction

- Click, hold and Drag the XIC button onto the left side of the rung you just created. When you see a green box, release the mouse button.
- Type I:0.0/1 [Enter].



# Creating the 3<sup>rd</sup> Rung of Logic

Program this rung:



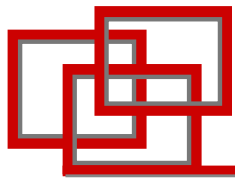
## 17. Add a JSR, Jump to Subroutine Instruction.

- Click on the tab right arrow 6 or 7 times until you see the "Program control" tab.
- a) Click on the "Program Control" tab
- b) Click, hold and Drag the JSR button to the right of the XIC you just created. When you see a green box, release the mouse button.
- Type 6 [Enter] for the "SBR File Number"

The screenshot shows the RSLogix 500 interface with the following details:

- Toolbar:** The 'Program Control' tab is selected. The JSR button is highlighted with callout 17a.
- Ladder Editor:** Rung 0002 contains a JSR instruction (Jump To Subroutine) with 'SBR File Number' set to U:6. Callout 17b points to this instruction.
- Properties Panel:** The JSR instruction properties are shown:
 

File	#N7:9
Mask	003Fh
Dest	O:0.0
Control	R6:0
Length	3
Position	0
- Other Instructions:** A MOV instruction (Move) is visible above the JSR, and an SQO instruction (Sequencer Output) is visible to the right of the JSR.



# Create the Subroutine

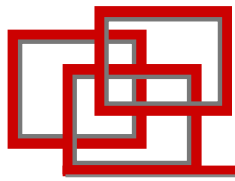
## 18. Create Subroutine 6

- Right mouse click on "Program Files"
- Select "New"
- Type 6 for Number
- Type SUB #6 for name
- Select "OK".

The screenshot shows the RSLogix 500 interface with the 'Create Program File' dialog box open. The dialog box contains the following fields and options:

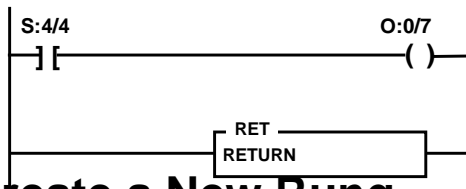
- Program File**: A section header for the dialog.
- Number**: A text box containing the value '6'. To its right is the instruction: "Enter file number(s) or range(s) separated by commas. For example: 5,6,8-12".
- Name**: A text box containing the value 'SUB #6'.
- Description**: An empty text box.
- Attributes**: A section with a checkbox labeled 'Debug' which is currently unchecked.
- Buttons**: 'OK', 'Cancel', and 'Help' buttons are located on the right side of the dialog.

In the background, the RSLogix 500 software is open to the 'Program Files' folder in the project tree. A right-click context menu is visible over this folder, with the 'New...' option highlighted. A large circled number '18' is placed over the 'New...' option, with an arrow pointing to it from the left.



# Create the Subroutine

Program these rungs:

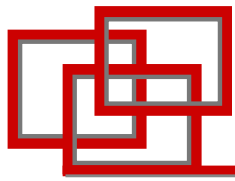


## 19. Create a New Rung

- Double click on "LAD6"
- Click on the tab left arrow 4 or 5 times until you see the "User" tab
- Click on the "User" tab
- Click, hold and Drag the "New Rung" button over "0000". When you see a green box, release the mouse button.

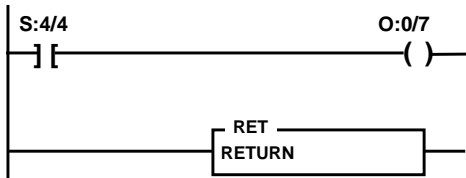
## 20. Program the 1st rung

- Click, hold and Drag the XIC button onto the left side of the rung you just created. When you see a green box, release the mouse button.
- Type S:4/4 [Enter].
- Click, hold and Drag the OTE button onto the right side of the rung you just created. When you see a green box, release the mouse button.
- Type O:0.0/7 [Enter].



# Create the Subroutine

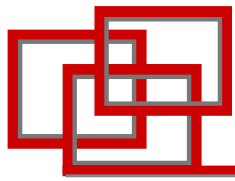
Program these rungs:



## 21. Program the 2nd rung

- Click, hold and Drag the "New Rung" button over "0001". When you see a green box, release the mouse button.
- Click on the tab left arrow 6 or 7 times until you see the "Program Control" tab.
- Click on the "Program Control" tab.
- "Click, hold and Drag the RET button to the right side of the new rung. When you see a green box, release the mouse button."

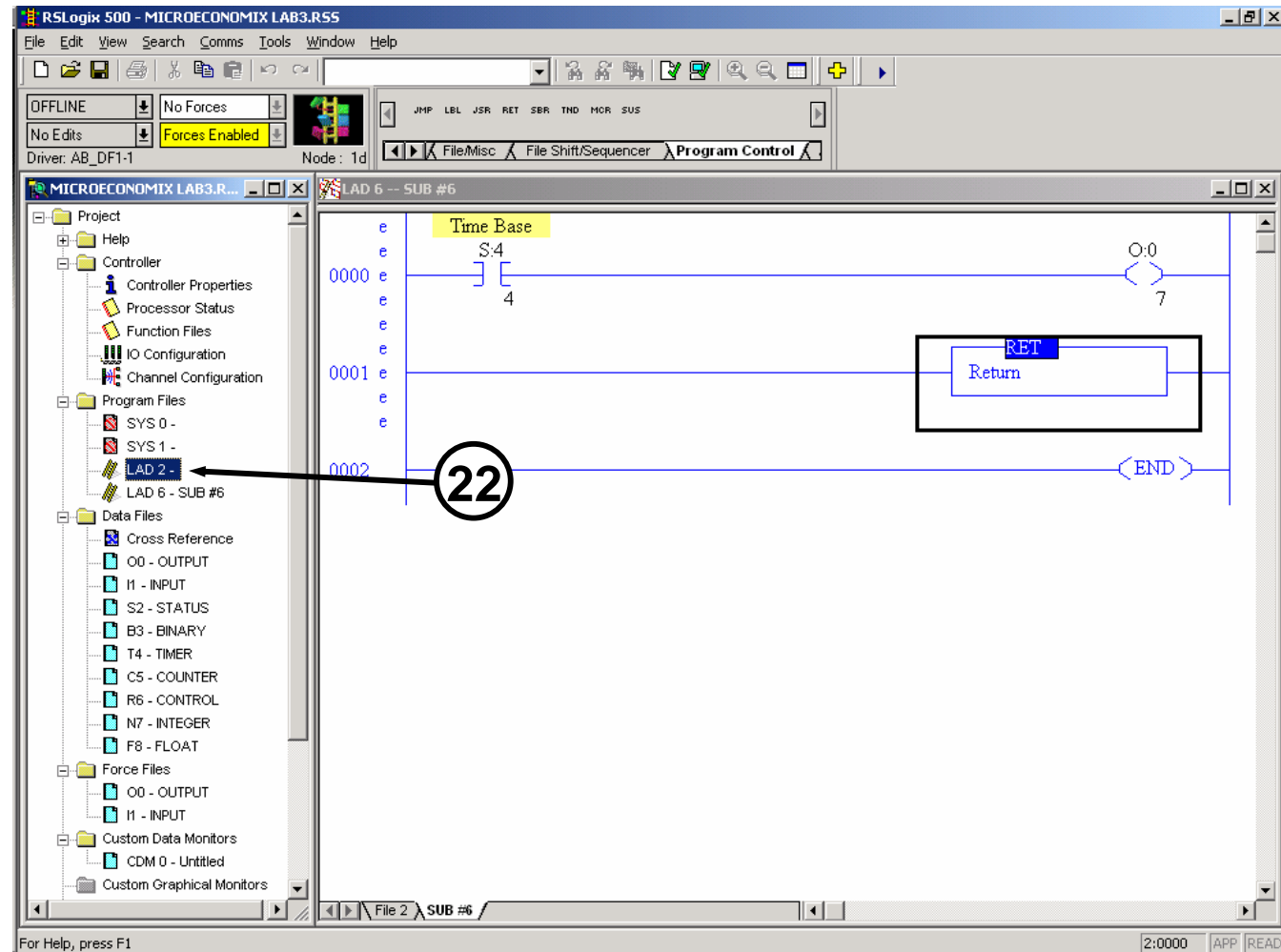
The screenshot shows the RSLogix 500 software interface. The main window displays the Ladder Logic (LAD) editor for a subroutine named "SUB #6". The editor shows a single rung with a normally open contact labeled "S:4/4" and a coil labeled "O:0/7". A box labeled "RET Return" is placed on the right side of the rung. A circled number "21" is positioned near the bottom of the rung, with arrows pointing to the "RET" button and the coil. The software interface includes a menu bar, toolbar, and a project tree on the left side.

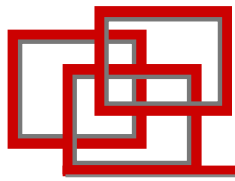


# Return to Main Program

## 22. Return to Main Program

- Double Click on LAD 2. This will take you out of LAD 6 subroutine and open the main program.





# Verify your work

## 23. To verify your work

- There are two types of verify. The first one verifies the file you are in and only that file. The second verifies all the files created or the total project created. Because this program resides in more than one file we will use the second one.
- Click on the "Verify Project" button
- When the verify is completed and no errors are found all program edit markers will disappear and no errors found is displayed at the bottom.
- Go to next step if errors are found

The screenshot shows the RSLogix 500 interface for a project named MICROECONOMIX LAB3.R55. The main window displays a Ladder Logic (LAD) diagram for File 2, SUB #6. The diagram includes a normally open contact labeled 'I0' with a '1' below it, leading to a JSR (Jump To Subroutine) instruction. The JSR instruction is highlighted with a black box and contains the text 'Jump To Subroutine' and 'SBR File Number U:6'. Above the JSR instruction is an SQO (Sequencer Output) instruction with parameters: File #N7:9, Mask 003Fh, Dest O:0.0, Control R6:0, Length 3, and Position 0. Further up is a MOV (Move) instruction with Source 12 and Dest N7:12. A circled number '23' is placed over the 'Verify Project' button in the top toolbar. The status bar at the bottom left shows 'Verify entire project' and the bottom right shows '2:0002 APP READ'.

# Verify your work

## 24. Program has errors

- To find the errors in the program click on the error message in the "Verify results window" the error is then highlighted in the ladder window
- Fix the error and run "Verify Project" again
- When all the errors are fixed you can then save and download the program

24

The screenshot displays the RSLogix 500 interface for a project named 'MICROECONOMIX LAB3.R55'. The main window shows a ladder logic diagram with three rungs. Rung 1 (address 0001) contains an I/O module (I0) and a MOV instruction. Rung 2 (address 0002) contains an I/O module (I0) and a JSR instruction. The MOV instruction has the following parameters: Source 12, Dest N7:12. The JSR instruction has the parameter SBR File Number U:6. The JSR instruction is highlighted in blue. The 'Verify Results' window at the bottom shows an error message: 'Rung 1 Ins 1: ERROR: Invalid Direct File Offset'. A callout box with the number '24' points to this error message and the corresponding MOV instruction in the ladder logic.

RSLogix 500 - MICROECONOMIX LAB3.R55

File Edit View Search Comms Tools Window Help

OFFLINE No Forces

No Edits Forces Enabled

Driver: AB\_DF1-1 Node: 1d

JMP LBL JSR RET SBR TND MCR SUS

File Misc File Shift/Sequencer Program Control

MICROECONOMIX LAB3.R... LAD 2

Project

- Help
- Controller
  - Controller Properties
  - Processor Status
  - Function Files
  - IO Configuration
  - Channel Configuration
- Program Files
  - SYS 0 -
  - SYS 1 -
  - LAD 2 -
  - LAD 6 - SUB #6
- Data Files
  - Cross Reference
  - O0 - OUTPUT
  - I1 - INPUT
  - S2 - STATUS
  - B3 - BINARY
  - T4 - TIMER
  - C5 - COUNTER
  - R6 - CONTROL
  - N7 - INTEGER

0001 e

0002 e

I/O

I/O

MOV

Move

Source 12

Dest N7:12

SQO

Sequencer Output

File #N7:9

Mask 003Fh

Dest O:0.0

Control R6:0

Length 3

Position 0

JSR

Jump To Subroutine

SBR File Number U:6

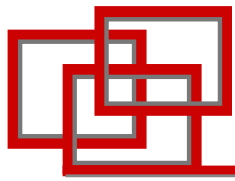
Errors

- Program Files
- File 2
- Rung 1 Ins 1: ERROR: Invalid Direct File Offset

Verify Results Search Results

To navigate to the error cursor on the error

2:0001 APP READ



# Documenting your Program

## 25. Documenting your work

- Click on the Input I:0/0 to highlight
- Right mouse on I:0/0 and select "Edit Description- I:0/0"
- Select "Address"
- Type "Input 0" in the Edit window
- Select "OK"

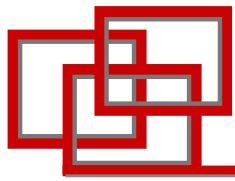
The screenshot shows the RSLogix 500 interface for a MicroECONOMIX LAB3.R55 project. The main window displays Ladder Logic Diagram (LAD) 2. A context menu is open over the input symbol I:0/0, with the option "Edit Description - I:0/0" selected. An "Edit Description" dialog box is open in the foreground, showing the "Address" tab with the text "Input 0" entered. The background ladder logic includes a normally open contact labeled "0001" leading to a branch. The branch contains three parallel paths: a normally open contact labeled "T0" leading to a "MOV" (Move) instruction with Source 12 and Dest N7:12; a normally open contact labeled "Bt" leading to an "SQO" (Sequencer Output) instruction with File #N7:9, Mask 003Fh, Dest O:0.0, Control R6:0, Length 3, and Position 0; and a normally open contact labeled "Bt" leading to a "JSR" (Jump To Subroutine) instruction with SBR File Number U:6. The ladder logic ends with a normally open contact labeled "END".

# Documenting your Program

## 26. Documenting your work

- Click on the Input I:0/1 to highlight
- Right mouse on I:0/1 and select "Edit Description- I:0/1"
- Select "Address"
- Type "Input 1" in the Edit window
- Select "OK"

The screenshot displays the RSLogix 500 software interface. The main window shows a Ladder Logic (LAD) diagram with several rungs. A context menu is open over an input symbol labeled 'I:0/1'. The menu options include Cut, Copy, Paste, Delete, Insert, Insert New Branch, Append, Append New Branch, Find All, Change Instruction Type, Edit Symbol - I:0/1, Edit Description - I:0/1, Cross Reference - I:0/1, Goto DataTable - I:0/1, Toggle Bit, Force On, and Force Off. The 'Edit Description - I:0/1' option is highlighted. In the foreground, the 'Edit Description' dialog box is open, showing the 'Address' radio button selected and the text 'Input 1' entered in the description field. The dialog also has fields for 'Symbol' and 'Address' and 'OK' and 'Cancel' buttons.

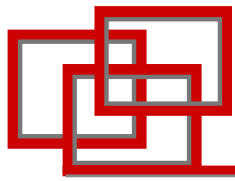


# Documenting your Program

## 27. Documenting your work

- Click on rung 0000 to highlight
- Right mouse on rung 0000 and select "Edit Comment"
- Select "File/Rung"
- Type "Rung 0000 - Loads the values for the SQO".
- Select "OK"

The screenshot displays the RSLogix 500 interface for editing a Ladder Logic (LAD) program. The main window shows LAD 2 with rung 0000 highlighted in red. A context menu is open over rung 0000, and the 'Edit Comment' option is selected. A 'Rung 2:0' dialog box is open, showing the 'File/Rung' option selected under 'Attach To'. The 'Rung Comment' field contains the text 'Rung 0000 - Loads the values for the SQO'. The background shows the LAD editor with various rungs and components like 'First Pass' and 'Input 0'.



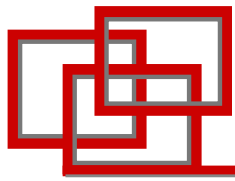
# Documenting your Program

## 28. Documenting your work

- Click on rung 0001 to highlight
- Right mouse on rung 0001 and select "Edit Comment"
- Select "File/Rung"
- Type "Rung 0001 -Toggle Input 0 this Controls the Outputs displayed by way of the SQO".
- Select "OK"

The screenshot shows the RSLogix 500 software interface. The main window displays a Ladder Logic Diagram (LAD) with a rung highlighted in red. A context menu is open over the rung, with "Edit Comment" selected. The "Rung 2:1" dialog box is open, showing the "Attach To" section with "File/Rung" selected and "File: 2" and "Rung: 1" entered. The "Rung Comment" section contains the text: "Rung 0001 -Toggle Input 0 this Controls the Outputs displayed by way of the SQO".

Valid Entry created in Database!

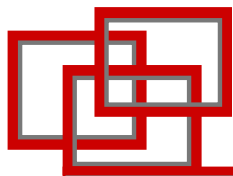


# Documenting your Program

## 29. Documenting your work

- Click on rung 0002 to highlight
- Right mouse on rung 0002 and select "Edit Comment"
- Select "File/Rung"
- Type "Rung 0002 - Input 0001 will enable the jump to subroutine".
- Select "OK"

The screenshot shows the RSLogix 500 interface for editing a Ladder Logic (LAD) program. The main window displays a ladder logic diagram with a highlighted rung (0002) and a context menu open over it. The menu includes options like Cut, Copy, Paste, and Edit Comment. A yellow highlight is visible on the text "0 this Controls the Outputs displayed by way of the SQO" in the diagram. The 'Rung 2:2' dialog box is open, showing the 'Attach To' section with 'File/Rung' selected and 'File: 2' and 'Rung: 2' entered. The 'Page Title' field is empty. The 'Rung Comment' field contains the text: "Rung 0002 - Input 0001 will enable the jump to subroutine". The 'OK' and 'Cancel' buttons are at the bottom of the dialog.



# Save your work

## 30. Save your work

- Click on the "Save" button
- Click "Ok" for Revision note box. The revision note box is used to keep track of changes made to the existing program. You can create many revisions of the same program. This feature can be disabled if desired.

The screenshot shows the RSLogix 500 software interface. The main window displays a ladder logic diagram with two rungs. Rung 0001 is highlighted in yellow and contains the text: "Rung 0001 - Toggle Input 0 this Controls the Outputs displayed by way of the SQO". Below this text is a normally open contact labeled "Input 0" connected to a coil labeled "SQO". The SQO coil has two outputs: "EN" and "DN". A data table for the SQO coil is shown to the right:

Sequencer Output	
File	#N7:9
Mask	003Fh
Dest	O:0.0
Control	R6:0
Length	3<
Position	0<

Rung 0002 is highlighted in red and contains the text: "Rung 0002 - Input 0001 will enable the jump to subroutine". Below this text is a normally open contact labeled "Input 1" connected to a coil labeled "JSR". The JSR coil has one output: "Jump To Subroutine" with the parameter "SBR File Number" set to "U:6".

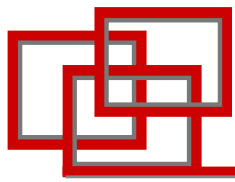
A "Revision Note" dialog box is open in the foreground. It has a checkbox "Do not prompt me for revision notes again." which is unchecked. The "Path" is "D:\ROCKWELL SOFTWARE\RSLOGIX 500 STARTER". The "Version" is "0". The "Revision Note" text area is empty. The "File PLC Information" section shows "Processor Name: M-LAB3" and "Station #: 1d". The "Processor Type" is "Bul.1762 MicroLogix 1200 Series C". The "OK" button is highlighted with a red circle and a black arrow pointing to it from the number "30" in a white circle.

# Transfer the Program to the Micro

## 31. Download the Program

- Select the menu item "Comms>System Comms"
- Three primary selections
  - "Online" Establish the "path"
  - "Upload" Receive from the controller
  - "Download" Send to the controller
- Highlight the device at Node 01.
- Select "Download"

The screenshot displays the RSLogix 500 interface. The 'System Comms' menu is open, showing options like 'Who Active Go Online', 'Go Online', 'Upload...', and 'Download...'. The 'Download...' option is highlighted. In the background, a ladder logic diagram is visible with rungs 0001 and 0002 highlighted in yellow. Rung 0001 contains an 'SQO' (Sequencer Output) block, and Rung 0002 contains a 'JSR' (Jump To Subroutine) block. A 'Communications' dialog box is open in the foreground, showing a tree view of network devices. The device '01, MicroLogix 1100, M-LAB1' is selected and highlighted in blue. The 'Download' button in the dialog is also highlighted. A circled number '31' is positioned at the bottom left of the dialog box, with arrows pointing to the 'System Comms' menu and the selected device.

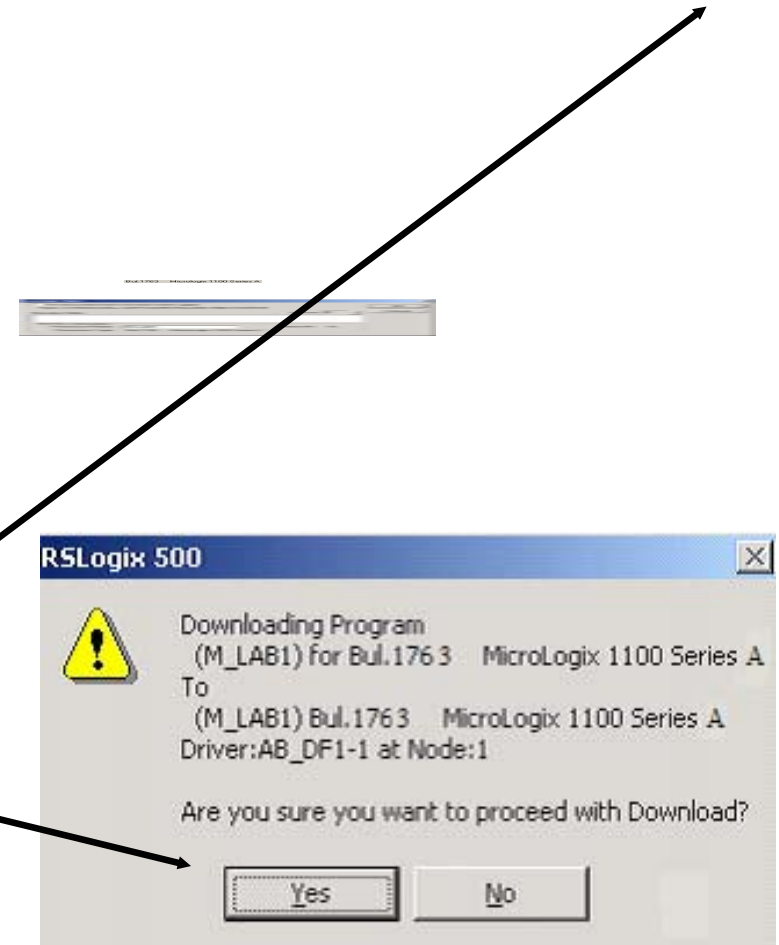


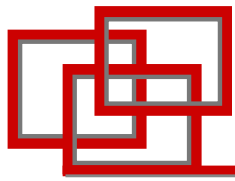
# Transfer the Program to the Micro

## 32. Download the Program

- Select "OK" in the Revision note window. The revision note box is used to keep track of changes made to the existing program. You can create many revisions of the same program. This feature can be disabled if desired.
- Select "Yes" to download your program over the existing program that resides in the processor. This window will appear when ever a program is being downloaded to the processor.

32



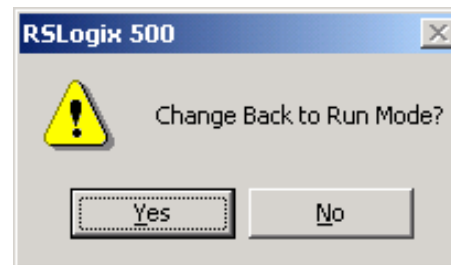
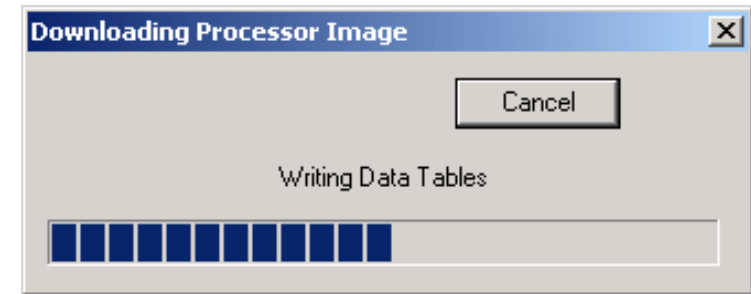
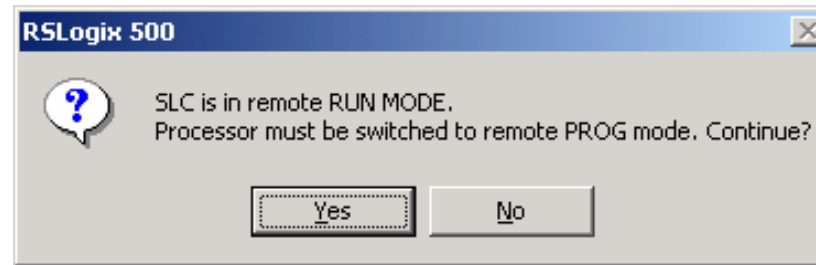


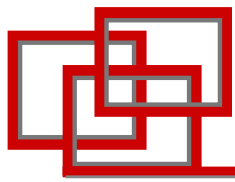
# Transfer the Program to the Micro

## 33. Download the Program

- Select "Yes" to put the processor in Program. The processor must be in program mode to download the program
- The download window will appear when the download occurs.
- Select "Yes" to change back to run mode
- Select "Yes" to go online. This will allow you to monitor the program that now resides in the processor.

## 34. Test your program using the switches and lights. Does it work the way you expect it to?





# Monitoring Your Program

## PROGRAM OPERATION

**Rung 0-** During the first scan of the program, data is written to locations N7:10, N7:11, and N7:12 with the Move instructions. This will only happen once.

**Rung 1-** Each time you Push button #0 ON, the sequencer sends data to outputs 6 thru 10. This sequencer has 3 steps:

- turn ON outputs 0 & 5
- turn ON outputs 1 & 4
- turn ON outputs 2 & 3

- When the sequencer is finished with step 3 it wraps back around to step 1 again.

**Rung 2-** When you push ON button #1 the MicroLogix scans subroutine file 5 and executes it's logic. If button #1 is OFF, the MicroLogix skips the logic in subroutine file 6.

### Subroutine File 6

**Rung 0-** Address S:4/4 pulses ON and OFF based on an internal clock. This turns output 4 ON and OFF.

**Rung 1-** RET instruction tells the program scan to return to the main program file.

The top screenshot shows the RSLogix 500 interface for 'MICROECONOMIX LAB3.R55'. The main window displays 'Rung 0000 - Loads the values for the SQO'. The ladder logic consists of a normally open contact labeled 'First Pass' with timer 'S:1' and value '15'. This is connected to a 'MOV' instruction. The instruction details are: Move Source 33, Dest N7:10, and another Dest 33. The bottom screenshot shows the same software for 'LAD 6 - SUB #6'. Rung 0000 features a 'Time Base' timer 'S:4' with value '4' connected to a coil labeled 'O:0' with value '7'. Rung 0001 contains a 'RET' instruction in a box, and Rung 0002 contains an 'END' instruction. The project tree on the left shows files like SYS 0-1, LAD 2, and LAD 6 - SUB #6.

LISTEN.  
THINK.  
SOLVE.<sup>SM</sup>

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