LECTURE - 13

File Shift /Sequencer.

BSL   **(Bit Shift Left)**

BSR   **(Bit Shift Right)**

SQL   **(Sequencer Load)**

SQO   **(Sequencer Output)**

FFL   **(FIFO Load)**

FFU   **(FIFO Unload)**

LFL   **(LIFO Load)**

LFU   **(LIFO Unload)**

BSL (BIT SHIFT LEFT)
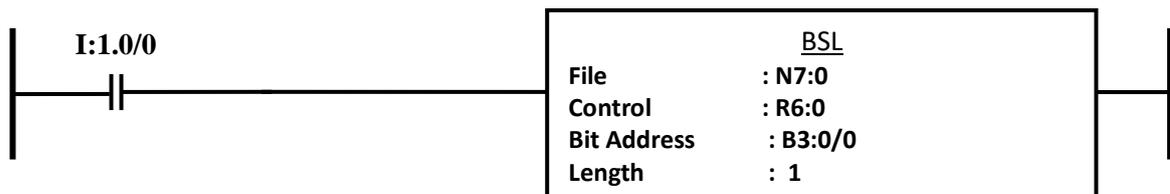
```
 I:1.0/0                          ┌──────────────────────────────┐
────┤↑├─────────────────────────  │              BSL             │
                                  │ File          : N7:0         │
                                  │ Control       : R6:0         │
                                  │ Bit Address   : B3:0/0       │
                                  │ Length        : 1            │
                                  └──────────────────────────────┘
```

On each false-to-true transition, this output instruction loads a bit of data into a bit array, shifts the pattern of data through the array to the left.
**File is the address of the bit array you want to shift.**
Control is the unique address of the control structure.
Bit Address is the location of the bit which will be added to the array.
Length is the total number of bits to be shifted by the BSL.

BSR (BIT SHIFT RIGHT)
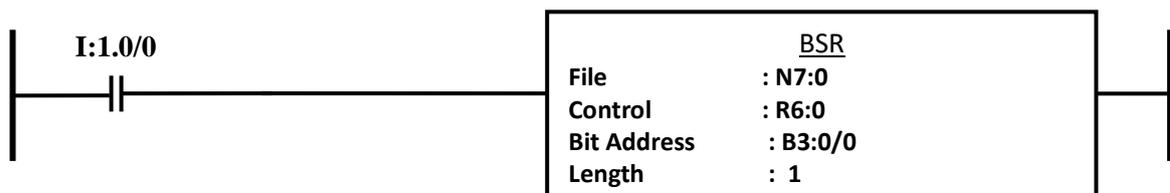
```
 I:1.0/0                          ┌──────────────────────────────┐
────┤↑├─────────────────────────  │              BSR             │
                                  │ File          : N7:0         │
                                  │ Control       : R6:0         │
                                  │ Bit Address   : B3:0/0       │
                                  │ Length        : 1            │
                                  └──────────────────────────────┘
```

On each false-to-true transition, this output instruction loads a bit of data into a bit array, shifts the pattern of data through the array to the right.
**File is the address of the bit array you want to shift.**

Control is the unique address of the control structure.

Bit Address is the location of the bit which will be added to the array.

Length is the total number of bits to be shifted by the BSL.

SQL (SEQUENCER LOAD)

```
        I:1.0/0                          ┌──────────────────────────┐
                                         │                    SQL   │
          ┤├                             │ File          : #N7:0    │
                                         │ Source        : N7:1     │
                                         │ Control       : R6:0     │
                                         │ Length        : 10       │
                                         │ Position      : 0        │
                                         └──────────────────────────┘
```
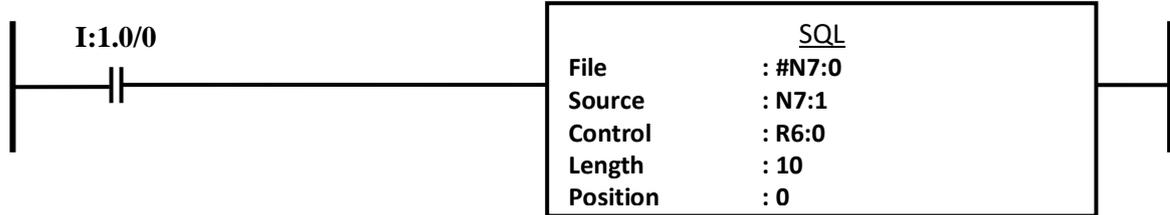
On successive false-to-true transitions, the SQL moves a step through the sequencer file, loading a word of source data into the current element of the sequencer file. The source of this data can be an I/O storage word address, a file address. Length decides the number of storage location and position shows the number of position stored or used. Its done (DN) bit is high when length = position.

SQO (SEQUENCER OUTPUT)

```
        I:1.0/0                          ┌──────────────────────────┐
                                         │                    SQO   │
          ┤├                             │ File          : #N7:0    │
                                         │ Mask          : 0FFFFh   │
                                         │ Dest.         : N7:20    │
                                         │ Control       : R6:1     │
                                         │ Length        : 10       │
                                         │ Position      : 0        │
                                         └──────────────────────────┘
```
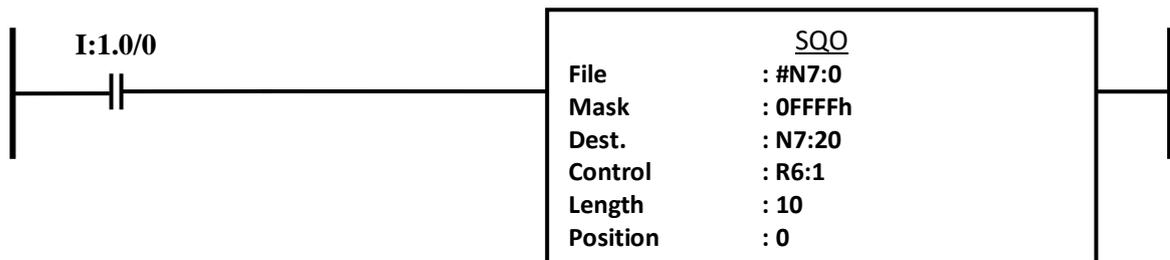
Use the SQO instruction with the SQL instruction to transfer 16-bit data to word addresses for the control of sequential machine operations.

On successive false-to-true transitions, the SQO instruction moves a step through the programmed sequencer file, transferring step data through a mask to a destination word. The done bit is set when the last word of the sequencer file is transferred. On the next false-to-true transition, the instruction resets the position to step one. Length decides the number of storage location and position shows the number of position stored or used. Its done (DN) bit is high when length = position.