

|This is a rung comment.

|This program is totally useless...

|as far as controlling any process. Now on the other hand if you would like to see how different instructions are converted read on.

|This program was converted using the DHRIO option. Bits in the rack range will be remapped to I/O. Bits outside of this range will point to the INT array (I000 or O000).

|I/O bit addresses use the format: _RRS:I.Data[M].B where:

- |RR = rack in octal
- |S = Starting module group
- |I = Input (or O for output)
- |M = Module group offset
- |B = Terminal number in decimal

|This section of rungs show how bits are converted.

THIS IS AN ADDRESS COMMENT	THIS IS AN ADDRESS COMMENT	THIS IS AN ADDRESS COMMENT	THIS IS AN ADDRESS COMMENT	THIS IS AN ADDRESS COMMENT	
FOR INPUT I0001/00	FOR INPUT I0001/01	FOR INPUT I0001/02	FOR INPUT I0001/03	FOR OUTPUT O0010/00	
SYM_I001_00 I0001	SYM_I001_01 I0001	SYM_I001_02 I0001	SYM_I001_03 I0001	SYM_O010_00 O0010	
0+-----] [-----] [-----] [-----] [-----] ()-----+	00	01	02	03	00
THIS IS AN ADDRESS COMMENT	THIS IS AN ADDRESS COMMENT	THIS IS AN ADDRESS COMMENT	THIS IS AN ADDRESS COMMENT		
FOR INPUT I0001/04	FOR INPUT I0001/05	FOR INPUT I0001/06	FOR INPUT I0001/07		
SYM_I001_04 I0001	SYM_I001_05 I0001	SYM_I001_06 I0001	SYM_I001_07 I0001		
+-----] [-----] [-----] [-----] [-----] +	04	05	06	07	

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|This is also a
|rung comment,
|but it is attached to the rung.
| THIS IS AN      THIS IS AN      THIS IS AN      THIS IS AN
| ADDRESS COMMENT ADDRESS COMMENT ADDRESS COMMENT ADDRESS COMMENT
| FOR INPUT      FOR INPUT      FOR INPUT      FOR INPUT      COMMENT FOR
| I0001/10      I0001/11      I0001/12      I0001/13      O020/07
| SYM_I001_10  SYM_I001_11  SYM_I0001_12  SYM_I001_13  SYM_O020_07
| I0001         I0001         I0001         I0001         O0020
1+-----]/[-----]/[-----]/[-----]/[-----]/[-----] (L)-----+
| | 10          11          12          13          |
| |THIS IS AN  THIS IS AN  THIS IS AN  THIS IS AN  |
| |ADDRESS COMMENT ADDRESS COMMENT ADDRESS COMMENT ADDRESS COMMENT |
| |FOR INPUT   FOR INPUT   FOR INPUT   FOR INPUT   |
| |I0001/14   I0001/15   I0001/16   I0001/17   |
| |SYM_I001_14 SYM_I001_15 SYM_I001_16 SYM_I001_17 |
| | I0001     I0001     I0001     I0001     |
| +-----]/[-----]/[-----]/[-----]/[-----]+
| | 14          15          16          17          |
| COMMENT FOR
| B FILE 0 WORD 0
| BIT 17 OCTAL          COMMENT FOR COMMENT FOR          COMMENT FOR
| (15 DECIMAL)        B0001    B007:0002    B007:0017          D0:200/13
| B0000                B0001    B007:0002    B007:0017          D0200
2+-----]/[-----] [-----] [-----] [-----] (U)-----+
| | 17          01          05          10          |
| |COMMENT FOR
| |BIT 17 OCTAL          COMMENT FOR COMMENT FOR          |
| |(15 DECIMAL) COMMENT N7:2/05    N7:17/10          |
| | N0000          N0001    N007:0002    N007:0017          |
| +-----]/[-----] [-----] [-----] [-----]+
| | 17          01          05          10          |
| BIT FILE BIT FILE
| ADDRESS ADDRESS          BIT FILE
| #B000:0000 #N004:0004          #B000:0000
3+-----] [-----]/[-----] ( )-----+
| | 0260          0044          |
| INDEX
| COUNTER
| +---XIN-----+
| INDEX
| COUNTER
| +---BIN-----+
4+EXAMINE BIT ON +-----+INDEXED BIT ON +-----+
| |ADDR: #B000:0004| |ADDR: #B000:0004| |
| |COUNTER: C0000| |COUNTER: C0000| |
| |POSITION: 2| |POSITION: 2| |
| |LENGTH: 32| |LENGTH: 32| |
| +-----+ |
| INDEX
| COUNTER
| +---XIF-----+ |
| INDEXED BIT RESET+-----+
| |ADDR: #B000:0004| |ADDR: #B000:0004| |
| |COUNTER: C0000| |COUNTER: C0000| |
| |POSITION: 2| |POSITION: 2| |
| |LENGTH: 32| |LENGTH: 32| |
| +-----+ |

```

6	<p>THIS IS THE TON 0.01 T0000</p> <p>THIS IS THE TIMER TIMING T0000</p> <p>THIS IS THE DONE BIT T0000</p>	<p>TON TIMER FOR 9.99 SECONDS +---TON-----+</p> <p>+TIMER ON T0000+- (TE) -+ 0.01 SECOND PRE: 999 ACC: 0+- (TD) +-----+</p>
7	<p>THIS IS THE TOF 0.1 TIMER DONE BIT T0001</p> <p>TD</p>	<p>TOF TIMER FOR 99.9 SECONDS +---TOF-----+</p> <p>+TIMER OFF T0001+- (TE) -+ 0.1 SECOND PRE: 999 ACC: 0+- (TD) +-----+</p>
8	<p>THIS IS THE RTO 1.0 TIMER ENABLE BIT T0300</p> <p>TE</p>	<p>RTO TIMER FOR 65535.0 SECONDS +---RTO-----+</p> <p>+RETENTIVE T0300+- (TE) -+ 1.0 SECOND PRE: 65535 ACC: 0+- (TD) +-----+</p>
9	<p>THIS IS THE RTO 1.0 TIMER L:004 T0300</p> <p>TD</p>	<p>RTO TIMER FOR 65535.0 SECONDS T0300 (RES)</p>
10	<p>THIS IS THE TOS 0.01 TIMER TIMER TIMING BIT T0065</p> <p>M:00004 TT</p>	<p>TOS TIMER FOR 9.99 SECONDS +---TOS-----+</p> <p>+ONE SHOT T0065+- (TE) -+ 0.01 SECOND PRE: 999 ACC: 0+- (TT) +-----+</p>
11	<p>LABEL FIVE L:005 M:00005</p>	<p>TON TIMER FOR 100 CPU SCANS +---TON-----+</p> <p>+TIMER ON T0301+- (TE) -+ CPU SCANS PRE: 100 ACC: 0+- (TD) +-----+</p>

12	CTU ENABLE BIT C0253	CTU DONE BIT C0253	CTU OVER FLOW BIT C0253	COUNTER UP +---CTU-----+
	CU	DN	OV	+COUNTER UP C0253+- (CU) -+
				PRE: 32767
				ACC: 0+- (DN)
				+-----+
13	CTD ENABLE BIT C0254	CTD DONE BIT C0254	CTD UNDER FLOW BIT C0254	COUNTER DOWN +---CTD-----+
	CD	DN	UF	+COUNTER DOWN C0254+- (CD) -+
				PRE: 35
				ACC: 0+- (DN)
				+-----+
14	CTD DONE BIT C0254			COUNTER DOWN C0254
	DN			(RES) -----


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-----
| MSG          MSG          MESSAGE          |
| ENABLE BIT  DONE BIT    CONTROL          |
| B005:0010  B005:0010    WORD            |
17+-----] [-----] [-----] +--MSG-----+
|      16      15          +MESSAGE          +- (EN) -+
|                                |MESSAGE TYPE  1|
|                                |CTL=   #B005:0010|
|                                | 0000000000000000+- (DN) |
|                                |CH:    E2.8.1.3.2|
|                                |      @ABCDEF|
|                                |              +- (ER) |
|                                +-----+

```

EQUAL TO		NOT EQUAL		LESS THAN		MOVE WORD	
+--EQU-----+		+--NEQ-----+		+--LES-----+		+--MOV-----+	
18	++A = B	++A <> B		++A < B		FROM A TO R	++
	A: N004:0000	A: N004:0002		A: N004:0004		A: N004:0006	
	0	2		4		6	
	B: N004:0001	B: N004:0003		B: N004:0005		R: N004:0007	
	1	3		5		7	
+-----+		+-----+		+-----+		+-----+	
LESS THAN		GREATER THAN		GREATER THAN		MOVE WORD	
OR EQUAL TO		OR EQUAL TO		OR EQUAL TO		WITH MASK	
+--LEQ-----+		+--GRT-----+		+--GEQ-----+		+--MVM-----+	
19	++A <= B	++A > B		++A >= B		MOVE W/MASK	++
	A: N004:0008	A: N004:0010		A: N004:0012		A: N004:0014	
	8	10		12		14	
	B: N004:0009	B: N004:0011		B: N004:0013		B: N004:0015	
	9	11		13		15	
						R: N004:0016	
						16	
+-----+		+-----+		+-----+		+-----+	
LIMIT TEST						+--MVS-----+	
+--LIM-----+						+--MOVE STATUS +--+	
20	++A <= B <= C					FROM: E2.1.1.1.0	++
	A: N004:0018					?	
	18					?	
	B: N004:0019					TO: N004:0021	
	19					21	
	C: N004:0020					+-----+	
	20						
+-----+						+-----+	
						+--MVS-----+	
						++MOVE STATUS +--+	
						FROM: N004:0022	
						0	
						TO: E2.1.1.1.1	
						?	
						+-----+	

	SECTION POINTER	FILE POINTER	WORD POINTER	INDIRECT ADDRESS MOVE WORD
21	---+FROM A TO R	---+FROM A TO R	---+FROM A TO R	---+FROM A TO R
	A: N003:0005	A: N003:0000	A: N003:0080	A: PIND:0005
	5	0	80	462
	R: PSEC:0005	R: PFIL:0005	R: PWRD:0005	R: N000:0087
	5	0	80	462
	-----+	-----+	-----+	-----+
	INDIRECT			INDIRECT
	BIT ADDRESS			BIT ADDRESS
	XIC			OTE
	P0005			P0005
22	-----] [-----			----- ()-----
	04			17


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| INPUT
| CONDITION
| FOR MCR
| I0037
23+----] [-----] (MCR) +
|      17
|
| C0024
24+----]/[-----] +-----+
|      CU
|
| C0024
25+----] [-----] +-----+
|      CU
|
| MVF      MVF      MVF
| ENABLE BIT  DONE BIT  ERROR BIT
| C0025      C0025      C0025
26+----] [-----] [-----] [-----] +-----+
|      EN      DN      UF
|
| MMF      MMF      MMF
| ENABLE BIT  DONE BIT  ERROR BIT
| C0026      C0026      C0026
27+----] [-----] [-----] [-----] +-----+
|      EN      DN      UF
|
|
28+----] [-----] (MCR) +

```

MOVE FILE
CONTROL WORD
WITH NONE/SCAN
+--CTU-----+
+COUNTER UP C0024+- (CU) +
| PRE: 5|
| ACC: 2+- (DN) |
+-----+
MOVE FILE
CONTROL WORD
WITH NONE/SCAN
+--MVF-----+
+FILE MOVE +- (EN) +
| A: B006:0000|
| R: #B006:0005|
| +- (DN) |
| COUNTER: C0024|
| POSITION: 2|
| LENGTH: 5+- (ER) |
| MODE: NONE/SCAN|
+-----+
MOVE FILE
CONTROL
WORD
+--MVF-----+
+FILE MOVE +- (EN) +
| A: #B006:0010|
| R: #B006:0015|
| +- (DN) |
| COUNTER: C0025|
| POSITION: 0|
| LENGTH: 5+- (ER) |
| MODE: ALL/SCAN|
+-----+
MASKED
MOVE FILE
CONTROL
WORD
+--MMF-----+
+FILE MOVE W/MASK+- (EN) +
| A: #B006:0020|
| B: B006:0025|
| R: #B006:0030+- (DN) |
| COUNTER: C0026|
| POSITION: 0|
| LENGTH: 5+- (ER) |
| MODE: 1/SCAN|
+-----+

29	SEQ ENABLE BIT C0027 EN	SEQ DONE BIT C0027 DN	SEQ FOUND BIT C0027 FN	FILE SEARCH EQUAL CONTROL WORD +--SEQ-----+ +SEARCH EQUAL +- (EN) -+ A: #B006:0040 B: #B006:0050 COUNTER: C0027+- (DN) POSITION: 0 LENGTH: 10 MODE: INCREMENT+- (FN) +-----+
30	SNE ENABLE BIT C0028 EN	SNE DONE BIT C0028 DN	SNE FOUND BIT C0028 FN	FILE SEARCH NOT EQUAL CONTROL WORD +--SNE-----+ +SEARCH NOT EQUAL+- (EN) -+ A: #B006:0060 B: #B006:0070 COUNTER: C0028+- (DN) POSITION: 0 LENGTH: 10 MODE: ALL/SCAN+- (FN) +-----+
31	SLS ENABLE BIT C0029 EN	SLS DONE BIT C0029 DN	SLS FOUND BIT C0029 FN	FILE SEARCH LESS THAN CONTROL WORD +--SLS-----+ +SEARCH LESS THAN+- (EN) -+ A: #B006:0080 B: #B006:0090 COUNTER: C0029+- (DN) POSITION: 0 LENGTH: 10 MODE: 1/SCAN+- (FN) +-----+
32	SLE ENABLE BIT C0030 EN	SLE DONE BIT C0030 DN	SLE FOUND BIT C0030 FN	FILE SEARCH LESS THAN OR EQUAL TO CONTROL WORD +--SLE-----+ +SEARCH LESS/EQUAL+- (EN) -+ A: #B006:0100 B: #B006:0110 COUNTER: C0030+- (DN) POSITION: 0 LENGTH: 10 MODE: ALL/SCAN+- (FN) +-----+

				FILE SEARCH
				GREATER THAN
				CONTROL
				WORD
				+--SGR-----+
33	SGR	SGR	SGR	+SEARCH GREATER THAN+- (EN) -+
	ENABLE BIT	DONE BIT	FOUND BIT	A: #B006:0120
	C0031	C0031	C0031	B: #B006:0130
	EN	DN	FN	COUNTER: C0031+- (DN)
				POSITION: 0
				LENGTH: 10
				MODE: ALL/SCAN+- (FN)
				+-----+
				FILE SEARCH
				GREATER THAN
				OR EQUAL TO
				CONTROL
				WORD
				+--SGE-----+
34	SGE	SGE	SGE	+SEARCH GREATER/EQUAL+- (EN) -+
	ENABLE BIT	DONE BIT	FOUND BIT	A: #B006:0140
	C0032	C0032	C0032	B: #B006:0150
	EN	DN	FN	COUNTER: C0032+- (DN)
				POSITION: 0
				LENGTH: 10
				MODE: ALL/SCAN+- (FN)
				+-----+

35	<p>ADDITION +--ADD-----+ +A + B = R A: N004:0030 1 B: N004:0031 1 R: N004:0032 2 +-----+</p>
36	<p>SUBTRACTION +--SUB-----+ +A - B = R A: N004:0033 7 B: N004:0034 4 R: N004:0035 3 +-----+</p>
37	<p>MULTIPLICATION +--MUL-----+ +A * B = R A: H006:0001 999 B: H006:0002 1000 R: H006:0009 999000 +-----+</p>
38	<p>DIVISION +--DIV-----+ +A / B = R A: F000:0000 50 B: F000:0001 100 R: F000:0002 0.5 +-----+</p>
39	<p>SQUARE ROOT +--SQR-----+ +SQRT A = R A: N004:0042 0 R: N004:0043 0 +-----+</p>
40	<p>NEGATE +--NEG-----+ + A = R A: N004:0044 0 R: N004:0045 0 +-----+</p>


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|These rungs show the program control instructions. |  
|REAL TIME |  
|CLOCK | SUBROUTINE |  
|SECONDS | THREE |  
| S001:0005 | L:003 |  
45+----] [----- (JSR)-----+  
| 00 |  
|REAL TIME |  
|CLOCK | LABEL FOUR |  
|SECONDS | L:004 |  
46+----]/[----- (JMP)-----+  
| 00 |  
47+--NOP----- (END)+  
48+----- (EOP)-----+  
-----
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| SQF          SQF          SQF          SQR ROOT FILE
| ENABLE BIT  DONE BIT  ERROR BIT  CONTROL
|   C0044      C0044      C0044      WORD
4+-----] [-----] [-----] [-----] +---SQF-----+
|           EN          DN          UF          |FILE SQR          +- (EN) -+
|           |           |           |          |A:   #N004:0140|
|           |           |           |          |R:   #N004:0145|
|           |           |           |          |           +- (DN) |
|           |           |           |          |COUNTER:  C0044|
|           |           |           |          |POSITION:   0|
|           |           |           |          |LENGTH:    5+- (ER)
|           |           |           |          |MODE:   ALL/SCAN|
|           |           |           |          +-----+
| NGF          NGF          NGF          NEGATE FILE
| ENABLE BIT  DONE BIT  ERROR BIT  CONTROL
|   C0045      C0045      C0045      WORD
5+-----] [-----] [-----] [-----] +---NGF-----+
|           EN          DN          UF          |FILE NEGATE      +- (EN) -+
|           |           |           |          |A:   #N004:0150|
|           |           |           |          |R:   #N004:0155|
|           |           |           |          |           +- (DN) |
|           |           |           |          |COUNTER:  C0045|
|           |           |           |          |POSITION:   0|
|           |           |           |          |LENGTH:    5+- (ER)
|           |           |           |          |MODE:   ALL/SCAN|
|           |           |           |          +-----+
| ANF          ANF          ANF          AND FILE
| ENABLE BIT  DONE BIT  ERROR BIT  CONTROL
|   C0046      C0046      C0046      WORD
6+-----] [-----] [-----] [-----] +---ANF-----+
|           EN          DN          UF          |FILE AND          +- (EN) -+
|           |           |           |          |A:   #B006:0200|
|           |           |           |          |B:   #B006:0210|
|           |           |           |          |R:   #B006:0220+- (DN)
|           |           |           |          |COUNTER:  C0046|
|           |           |           |          |POSITION:   0|
|           |           |           |          |LENGTH:   10+- (ER)
|           |           |           |          |MODE:   ALL/SCAN|
|           |           |           |          +-----+
| ORF          ORF          ORF          OR FILE
| ENABLE BIT  DONE BIT  DONE BIT  CONTROL
|   C0047      C0047      C0047      WORD
7+-----] [-----] [-----] [-----] +---ORF-----+
|           EN          DN          UF          |FILE OR          +- (EN) -+
|           |           |           |          |A:   #B006:0230|
|           |           |           |          |B:   #B006:0240|
|           |           |           |          |R:   #B006:0250+- (DN)
|           |           |           |          |COUNTER:  C0047|
|           |           |           |          |POSITION:   0|
|           |           |           |          |LENGTH:   10+- (ER)
|           |           |           |          |MODE:   ALL/SCAN|
|           |           |           |          +-----+

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-----
|                                     | FILE BIT |                                     |
|                                     | COMPARE |                                     |
| FBC          FBC          FBC      | CONTROL |                                     |
| ENABLE BIT   DONE BIT   FOUND BIT  | WORD    |                                     |
|  C0053       C0053       C0053     | +---FBC-----+ |
15+-----] [-----] [-----] [-----] +FILE BIT COMPARE+- (EN) -+
|         EN         DN         FN    | |A:   #N005:0000| |
|                                     | |B:   #N005:0010| |
|                                     | |C:   N005:0020+- (DN) |
|                                     | |COUNTER:  C0053| |
|                                     | |POSITION:   0| |
|                                     | |LENGTH:    10+- (FN) |
|                                     | |MODE:   ALL/SCAN| |
|                                     | +-----+ |
|                                     | DIAGNOSTIC |
|                                     | DETECT    |
| DDT          DDT          DDT      | CONTROL  |
| ENABLE BIT   DONE BIT   FOUND BIT  | WORD    |
|  C0054       C0054       C0054     | +---DDT-----+ |
16+-----] [-----] [-----] [-----] +DIAGNOSTIC DETECT+- (EN) -+
|         EN         DN         FN    | |A:   #N005:0030| |
|                                     | |B:   #N005:0040| |
|                                     | |C:   N005:0050+- (DN) |
|                                     | |COUNTER:  C0054| |
|                                     | |POSITION:   0| |
|                                     | |LENGTH:    10+- (FN) |
|                                     | |MODE:   ALL/SCAN| |
|                                     | +-----+ |
17+----- (RET) -+
18+----- (EOP) -+
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```
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| L:000                                     +--CTU-----+ |
0+ ]LBL[-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|                                     ||PRE:      1000| |
|                                     ||ACC:      0+- (DN) | |
|                                     |-----+ |
| C0001 | |
|                                     +-- (U)-----+ |
|                                     CU |
1+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ (RET) -+
2+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ (EOP) -+
```