

```
|
| << RUNG    0 >>
|
```

```
+ [ Start of Program ]-
```

```
| << RUNG    1 >>
```

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 NONE option. No I/O addresses were converted. Each I/O addresses will point to the INT array (I[xxx].yy or O[xxx].yy).

The TRASH REGISTER option was set to R0299.

This section of rungs show how RELAYS are converted.

```
| INPUT 1 INPUT 2 INPUT 3 INPUT 4                                OUTPUT
|                                                                1
| INP_1   INP_2   INP_3   INP_4                                OUT_1
| I0001   I0002   I0003   I0004                                O0001
+--] [-----] [-----] [-----] [-----] [-----] ( )
```

```
| << RUNG    2 >>
```

```
| INPUT 5 INPUT 6 INPUT 7 INPUT 8                                OUTPUT
|                                                                2
| INP-5   INP-6   INP-7   INP 8                                OUT_2
| I0005   I0006   I0007   I0008                                O0002
+--]/[-----]/[-----]/[-----]/[-----] [-----] ( )
```

```

|
| << RUNG      3 >>
|
| INPUT 9  INPUT  INPUT  INPUT          OUTPUT
|          10    11    12              3
|
| INP 9  INP 10  INP 11  INP 12          OUT_3
| I0009  I0010  I0011  I0012          O0003
+--] [-----] [-----] [-----] [-----] ( )
|
| INPUT  INPUT  INPUT  INPUT |
|  13    14    15    16    |
|
| INP013 INP014 INP015 INP016 |
| I0013  I0014  I0015  I0016 |
+--]/[-----]/[-----]/[-----]/[-----]
|

```

|
| << RUNG 4 >>
|

INPUT 17	OUTPUT 4
I0017	OUT-4 O0004
+--] [---+	----- ()
INPUT 18	
I0018	
+--] [---+	
INPUT 19	
I0019	
+--] [---+	
INPUT 20	
I0020	
+--] [---+	
INPUT 21	
I0021	
+--] [---+	
INPUT 22	
I0022	
+--] [---+	
INPUT 23	
I0023	
+--] [---+	
INPUT 24	
I0024	
+--] [---+	

```

| << RUNG    5 >>
| INPUT                                OUTPUT
| 25                                    5
|
| I0025                                OUT-5
| ] [-----[LATCH]----( L)
|                                     ( )
| INPUT                                ( )
| 26                                    ( )
|                                     ( )
| I0026                                ( )
| ]/[-----[UL]

```

```

| << RUNG    6 >>
|
| This is a Rung Explanation.
|
|
| This is a Coil Explanation.
| If both exist then both will show with
| the rung explanation above the coil
| explanation.
|
| INPUT  INPUT  INPUT  INPUT  INPUT  INPUT  INPUT  INPUT  OUTPUT
| 27     28     29     30     31     32     33     34     6
|
| I0027  I0028  I0029  I0030  I0031  I0032  I0033  I0034  OUT-6
| ] [-----]/[-----] [-----]/[-----] [-----]/[-----] [-----]/[-----] ( )

```

```

| << RUNG    7 >>
| AUX    AUX    AUX    AUX    AUX    AUX    AUX    AUX    OUTPUT
| INPUT  INPUT  INPUT  INPUT  INPUT  INPUT  INPUT  INPUT  7
| 1      2      3      4      5      6      7      8
|
| AI0001 AI0002 AI0003 AI0004 AI0005 AI0006 AI0007 AI0008  OUT-7
| ] [-----] [-----] [-----] [-----] [-----] [-----] [-----] [-----] ( )

```

```

|
| << RUNG      8 >>
|
|   AUX          AUX          AUX          AUX          AUX          AUX          AUX          AUX          OUTPUT
|   INPUT        INPUT        INPUT        INPUT        INPUT        INPUT        INPUT        INPUT        8
|   9            10           11           12           13           14           15           16
|
| AI0009  AI0010  AI0011  AI0012  AI0013  AI0014  AI0015  AI0016          OUT-8
| +---] [-----] [-----] [-----] [-----] [-----] [-----] [-----] [-----] [-----] ( )
|

```

```

|
| << RUNG      9 >>
|
|   AUX          OUTPUT
|   INPUT        9
|   65
|
| AI0065          O0009
| +---] [-----] ( )
|

```

```

|
| << RUNG     10 >>
|
|   AUX          OUTPUT
|   INPUT        10
|   66
|
| AI0066          O0010
| +---] [-----] ( )
|

```

```

|
| << RUNG     11 >>
|
|   AUX          OUTPUT
|   INPUT        11
|   67
|
| AI0067          O0011
| +---] [-----] ( )
|

```

```

|
| << RUNG     12 >>
|
|   AUX          OUTPUT
|   INPUT        12
|   68
|
| AI0068          O0012
| +---] [-----] ( )
|

```



```

|
| << RUNG 23 >>
|
| AUX ONE
| OUTPUT SHOT
| 44 AO0914
|
| AO0044 AO0914
+--] [----- (OS)

```

```

|
| << RUNG 24 >>
|
| AUX LATCH
| OUTPUT AO0918
| 86
|
| AO0086 AO0918
+--] [----- [LATCH]--- ( L)

```

```

|
| AUX ( )
| OUTPUT ( )
| 919 ( )
|
| AO0919 ( )
+--] [----- (UL)

```

```

| << RUNG 25 >>

```

```

| TIMERS AND COUNTERS

```

```

|
| TIMER TIMER
| INPUT R0900
| 00-0017 DONE
|
| 00-0017 Const AO0920
+--] [----- [PRESC]--- (TS)
|
| 060 ( )
|
| TIMER TIMER ( )
| RESET SECONDS ( )
| IO-0017 R0900 ( )
|
| IO-0017 R00900 ( )
+--] [----- [ACCRG]--- ( R)
|

```

```

|
| << RUNG 26 >>
|
| TIMER                                TIMER
| INP/RST                              R0901
| I2-0017                               DONE
|
| I2-0017                               Const AO0921
+--] [-----[PRESC]---(TT)
|                                     060 ( )
| TIMER                                TIMER ( )
| INP/RST                              TENTHS ( )
| I2-0017                               R0901 ( )
|                                     SIXSEC ( )
| I2-0017                               R00901 ( )
+--]/[-----[ACCRG]---( R)
|
| << RUNG 27 >>
|
| TIMER                                TIMER  TIMER
| INP/RST                              PRESET  R0903
| O5-0555                               R0902  DONE
|
| O5-0555                               R00902  AO0922
+--] [-----[PRERG]---(TH)
|                                     ( )
| TIMER                                TIMER ( )
| INP/RST                              HUNDRED ( )
| O5-0555                               R0903 ( )
|                                     ( )
| O5-0555                               R00903 ( )
+--]/[-----[ACCRG]---( R)
|
| << RUNG 28 >>
|
| COUNTUP                              COUNTUP
| INPUT                                R0904
| O5+0555                              DONE
|
| O5+0555                               Const AO0923
+--] [-----[PRESC]---(CU)
|                                     999 ( )
| COUNTUP                              COUNT ( )
| RESET                                UP ( )
| O5+556                               R0904 ( )
|                                     ( )
| O5+0556                               R00904 ( )
+--] [-----[ACCRG]---( R)
|

```

| << RUNG 29 >>

COUNTDN		COUNT	COUNTDN
INPUT		DOWN	R0906
I9+0003		PRESET	DONE
I9+0003		R00905	A00924
+--] [-----		[PRERG]	---(CD)

COUNTDN		COUNT	()
RESET		DOWN	()
I9+0004		R0906	()
I9+0004		R00906	()
+--] [-----		[ACCRG]	---(R)

| << RUNG 30 >>

SHIFT/MOVE FUNCTIONS

THIS SHIFT USES AN ADDRESS THAT IS ON THE WORD BOUNDRY.

| SHIFT
| I0065

+ [SHIFT]-	()
------------	-----

| << RUNG 31 >>

THIS SHIFT USES AN ADDRESS THAT IS ON A BYTE BOUNDRY.
THE ADDRESS WILL CHANGE TO THE WORD BOUNDRY AND A NOTE
WILL BE MADE IN THE LOG FILE.

| SHIFT
| I0073

+ [SHIFT]-	()
------------	-----

```

|
| << RUNG 32 >>
|
| I/O REG I/O REG
| SOURCE RESULT
| I0081 R0907
|
| I0081 R0907
+ [ I/O TO REG ]- ( )
|
| << RUNG 33 >>
|
| REG I/O REG I/O
| SOURCE RESULT
| R0908 O0081
|
| R0908 O0081
+ [ REG TO I/O ]- ( )
|
| << RUNG 34 >>
|
| BIN BCD BIN BCD
| SOURCE RESULT
| R0909 O0097
|
| R0909 O0097
+ [ BIN TO BCD ]- ( )
|
| << RUNG 35 >>
|
| BCD BIN BCD BIN
| SOURCE RESULT
| I0097 R0910
|
| I0097 R0910
+ [ BCD TO BIN ]- ( )
|
* << RUNG 36 >>
*
*
*
* MCR ZONE
*
*
* MCR
* INPUT
* I0035
*
* I0035 Const
+--] [---[ MCR ]- ( )
*
* 002

```

```

*
* << RUNG 37 >>
*
*
* BASIC ARITHMETIC FUNCTIONS
*
*
* ADD      ADD      ADD
*SOURCE   SOURCE   RESULT
*  A      B      C
*OPER_A   OPER B   OPER-C
* R0911   R0912   R0913
+[ A + B = C ]- ( )
*
* << RUNG 38 >>
*
* TIMER      ADD      ADD
*TENTHS     SOURCE   RESULT
* R0901      B      C
*SIXSEC
* R0901      R0915   R0916
+[ A + B = C ]----- ( )
*
* << RUNG 39 >>
*
*COMPARE   COMPARE   SUB      SUB      TRASH
*SOURCE   SOURCE   SOURCE   SOURCE   REGISTR
*  A      B      A      B
*
* R0917   R0918   R0919   R0920   R0299
+[ A : B ]-[ A - B = C ]- ( )
*
* << RUNG 40 >>
*
*
* SUBTRACT WITH A RESULT OF THE "TRASH REGISTER" WILL REMOVE
* THE SUBTRACT INSTRUCTION AND LEAVE THE COMPARE.
*
*
* SUB      SUB      TRASH
*SOURCE   SOURCE   REGISTR
*  A      B
*
* R0921   R0922   R0299
+[ A - B = C ]----- ( )
*

```

```

*
* << RUNG 41 >>
*
*
* SKIP ZONE
*
*
*
*
* Const
+ [NO OP] - [SKIP ] - ( )
* 002
*
* << RUNG 42 >>
*
*
* SPECIAL FUNCTIONS
*
*
* SERIAL SCREQ
* COMM COMM
* REQUEST FAILURE
*
* R0890 AO0927
+ [SCREQ] ----- ( )
*
* << RUNG 43 >>
*
* DATA DPREQ
* PROCESS COMM
* REQUEST FAILURE
*
* R0880 AO0928
+ [DPREQ] ----- ( )
*

```

```

|
| << RUNG 44 >>
|
| DATA MOVE FUNCTIONS
|
| MOVE
| RESULT
| B
|
| Const R00923
+ [ A MOVE B ]- ( )
| +00123
|
| << RUNG 45 >>
|
| MOVE MOVE
| L/R LEFT
| SOURCE RESULT
|
| I0129 R00924
+ [ MOVE LEFT 8 BITS ]- ( )
|
| << RUNG 46 >>
|
| MOVE MOVE
| L/R RIGHT
| SOURCE RESULT
|
| I0129 R00925
+ [ MOVE RIGHT 8 BITS ]- ( )
|
| << RUNG 47 >>
|
| DATA
| PROCESS
| REQUEST
|
| R00880
+ [ BLOCK MOVE ]- ( )
| +01257 +00002 +00000 +00321 +00211 +00000 +00000

```

```

| << RUNG 48 >>
|
| SIGNED ARITHMETIC FUNCTIONS
|
| ADDX      ADDX      ADDX
|SOURCE     SOURCE    RESULT
|  A        B        C
|
| R00926 R00927 R00928
+ [  A ADDX B =  C ]- ( )
|
| << RUNG 49 >>
|
| SUBX      TRASH
|SOURCE     REGISTR
|  A
|
| R00929 Const R00299
+ [  A SUBX B =  C ]- ( )
|   +00002
|
| << RUNG 50 >>
|
|          SUBX      TRASH
|          SOURCE    REGISTR
|          B
|
| Const R00930 R00299
+ [  A SUBX B =  C ]----- AO0929 ( )
| +00050
|
| << RUNG 51 >>
|
| MPY      MPY      MPY
|SOURCE    SOURCE    RESULT
|  A        B        C
|
| R00931 R00932 R00933
+ [  A MPY  B =  C ]- ( )
|
| << RUNG 52 >>
|
| DVD      DVD      DVD
|SOURCE    RESULT   RESULT
|  A              QUO   REM
|
| R00934      Const R00935 R00936
+ [  A DVD      B      QUO   REM ]- ( )
|   +00002

```



```

|
| << RUNG 53 >>
|
| DVD DVD TRASH
|SOURCE SOURCE REGISTR
| A QUO
|
| R00937 Const R00938 R00299
+ [ A DVD B QUO REM ]- ( )
| +00003
|
| << RUNG 54 >>
|
| DOUBLE PRECISION ARITHMETIC
|
| DPADD DPADD
|SOURCE RESULT
| A C
|
| R00939 Const R00941
+ [ A DPADD B = C ]- ( )
| +0000075000
|
| << RUNG 55 >>
|
| DPSUB DPSUB DPSUB
|SOURCE SOURCE RESULT
| A B C
|
| R00943 R00945 R00947
+ [ A DPSUB B = C ]- ( )
|
| << RUNG 56 >>
|
| DPSUB DP
|RESULT GREATER
| C RESULT
|
| R00947 Const AO0930
+ [ A GREATER THAN B ]----- ( )
| +0000032768

```

```

|
| << RUNG 57 >>
|
| FLOATING POINT ARITHMETIC
|
| FADD          FADD
|SOURCE         RESULT
|  A           C
|
| R00949      Const   R00951
+ [  A      FADD    B   =   C           ]-      ( )
|           +5.000000-01
|
| << RUNG 58 >>
|
| FSUB          FSUB          FSUB
|SOURCE         SOURCE        RESULT
|  A           B           C
|
| R00953      R00955      R00957
+ [  A      FSUB    B   =   C           ]-      ( )
|
| << RUNG 59 >>
|
| FMULT         FMULT
|SOURCE         RESULT
|  A           C
|
| R00960      Const   R00962
+ [  A      FMULT    B   =   C           ]-      ( )
|           +1.000000+01
|
| << RUNG 60 >>
|
| FDIV          FDIV          FDIV
|SOURCE         SOURCE        RESULT
|  A           B           C
|
| R00964      R00966      R00968
+ [  A      FDIV    B   =   C           ]-      ( )
|
| << RUNG 61 >>
|
| FDIV          FP
|RESULT         GREATER
|  C           RESULT
|
| R00968      Const   AO0931
+ [  A      FP GREATER THAN B   =   ]----- ( )
|           +0.000000+00

```

```

|
| << RUNG 62 >>
|
| INT FP          INT FP
| SOURCE          RESULT
| I4+0001        R0970
|
| I4+0001        R00970
+ [ INTEGER TO FLOATING POINT ]- ( )
|
| << RUNG 63 >>
|
| INT FP          FP INT
| RESULT         RESULT
| R0970          I4+0033
|
| R00970         I4+0033
+ [ FLOATING POINT TO INTEGER ]- ( )
|
| << RUNG 64 >>
|
| EQUAL          EQUAL          A = B
| SOURCE SOURCE  RESULT
| A              B
|
| R06230 R06231          AO0932
+ [ A EQUAL B ]----- ( )
|
| << RUNG 65 >>
|
| TABLE MOVE FUNCTIONS
|
| SRC TAB SRC TAB
| SOURCE POINTER
| R1000
|
| R01000 R01001 Const
+ [ SRC-TO-TABLE LEN]- ( )
|
| 001
|
| << RUNG 66 >>
|
| SRC TAB SRC TAB
| SOURCE POINTER
|
| R01003 R01004 Const
+ [ SRC-TO-TABLE LEN]- ( )
|
| 005

```

```
|
| << RUNG 67 >>
|
| TAB DST TAB DST
| TABLE POINTER
|
| R01010 R01012 Const
|[TABLE-TO-DEST LEN]- ( )
| 001
|
| << RUNG 68 >>
|
| TAB DST TAB DST
| TABLE POINTER
|
| R01013 R01019 Const
|[TABLE-TO-DEST LEN]- ( )
| 005
|
| << RUNG 69 >>
|
| TAB TAB TAB TAB
| TABLE TABLE
| A B
|
| R01020 R01025 Const
|[TBL A MOVE TBL B LEN]- ( )
| 001
|
| << RUNG 70 >>
|
| TAB TAB TAB TAB
| TABLE TABLE
| A B
|
| R01020 R01025 Const
|[TBL A MOVE TBL B LEN]- ( )
| 005
|
| << RUNG 71 >>
|
| TAB EXT TAB EXT
| TABLE TABLE
| A B
|
| R06355 R07634 Const
|[ A MOVE TBL EXT B LEN ]- ( )
| 064
|
```

```
| << RUNG 72 >>
```

```
| THIS RUNG IS SHOWING THE INDIRECT ADDRESS FUNCTION.
```

```
| IR00301          IR00302  Const
+ [  A  MOVE TBL EXT B    LEN ]-      ( )
|                               001
```

```
| << RUNG 73 >>
```

```
| LIST FUNCTIONS
```

```
| ADD TOP          ADD TOP
| SOURCE           POINTER
|
| I0113           R01030  Const
+ [ SRC ADD-TO-TOP LIST   LEN ]-      ( )
|                               010
```

```
| << RUNG 74 >>
```

```
| ADD TOP          REM BOT
| POINTER          DEST
|
| R01030           O0113  Const
+ [ LIST REM-FM-BOT DEST   LEN ]-      ( )
|                               010
```

```
| << RUNG 75 >>
```

```
| LIST TO          LIST
| SORT             ORDER
|
| R01040           R01050  Const
+ [ LIST A  SORT  LIST B   LEN ]-      ( )
|                               010
```

```

|
| << RUNG 76 >>
|
| MATRIX FUNCTIONS
|
| AND AND AND
|SOURCE SOURCE RESULT
| A B C
|
| R01060 R01061 R01062 Const
+[ A AND B = C LEN ]- ( )
| 001
|
| << RUNG 77 >>
|
| AND AND AND
|SOURCE SOURCE RESULT
| A B C
|
| R01063 R01066 R01069 Const
+[ A AND B = C LEN ]- ( )
| 003
|
| << RUNG 78 >>
|
| IOR IOR IOR
|SOURCE SOURCE RESULT
| A B C
|
| R01072 R01073 R01074 Const
+[ A IOR B = C LEN ]- ( )
| 001
|
| << RUNG 79 >>
|
| IOR IOR IOR
|SOURCE SOURCE RESULT
| A B C
|
| R01075 R01078 R01081 Const
+[ A IOR B = C LEN ]- ( )
| 003
|
| << RUNG 80 >>
|
| EOR EOR EOR
|SOURCE SOURCE RESULT
| A B C
|
| R01084 R01085 R01086 Const
+[ A EOR B = C LEN ]- ( )
| 001
|

```

```

|
| << RUNG 81 >>
|
| EOR EOR EOR
|SOURCE SOURCE RESULT
| A B C
|
| R01087 R01090 R01093 Const
+ [ A EOR B = C LEN ]- ( )
| 003
|
| << RUNG 82 >>
|
| INV INV
|SOURCE RESULT
| A B
|
| R01096 R01097 Const
+ [ A INV B LEN ]- ( )
| 001
|
| << RUNG 83 >>
|
| INV INV
|SOURCE RESULT
| A B
|
| R01098 R01101 Const
+ [ A INV B LEN ]- ( )
| 003
|
| << RUNG 84 >>
|
| COMPARE COMPARE COMPARE COMPARE
| INPUT REFER MASK FAULT
| BIT NUM
|
| I0137 R01110 R01111 R01112 Const
+ [COMPARE INPUT REF MASK FAULT LEN]- ( )
| 001
|
| << RUNG 85 >>
|
| INPUT BIT AUX
| 133 SET/RST OUTPUT
| MATRIX 933
|
| I0133 Const R01130 Const AO933
+--] [---[ BIT SET MATRIX LEN]----- ( )
| 00001 001

```

```

| << RUNG 86 >>
| INPUT BIT AUX
| 134 SET/RST OUTPUT
| MATRIX 934
| I0134 Const R01130 Const AO0934
+--] [---[ BIT CLEAR MATRIX LEN]----- ( )
| 00001 001
| << RUNG 87 >>
| SHIFT L
| MATRIX
| Const R01131 Const
+[ SHIFT LEFT N MATRIX LEN ]- ( )
| 00001 002
| << RUNG 88 >>
| SHIFT R
| MATRIX
| Const R01133 Const
+[ SHIFT RT N MATRIX LEN ]- ( )
| 00001 002
| << RUNG 89 >>
| CONTROL FUNCTIONS
| DO SUB
| COUNT
| Const R01150
+[ DO SUB N REPS ]- ( )
| 001
| << RUNG 90 >>
|[ENDSW]-
|

```


| << RUNG 91 >>

| SUBROUTINE 1
| CONTROL FUNCTIONS

AUX
OUTPUT
935

+ [NO OP]----- ()

| << RUNG 92 >>

+ [SUSPEND I/O]- ()

| << RUNG 93 >>

+ [DO I/O START END]- ()
| 00001 00997

| << RUNG 94 >>

| STATUS

| R01151
+ [STATUS]- ()

```
|
| << RUNG 95 >>
|
|
| +[ 90-70 I/O Const RACK SERVICE ]- ( )
|   001
|
| << RUNG 96 >>
|
|           COMM
|           BLOCK
|
| Const R01160
|[WINDOW ADDRESS COMM BLOCK]- ( )
|   0259
|
| << RUNG 97 >>
|
|
| +[ Return ]-
|
| << RUNG 98 >>
|
|
| +[ENDSW]-
|
| << RUNG 99 >>
|
|
|[ENDSW]-
|
```

***** UNREFERENCED RUNG EXPLANATION LIST *****

NO UNREFERENCED RUNG NUMBERS FOUND