Rockwell Automation

Allen-Bradley

BULLETIN 1203-GD1, GK1
BULLETIN 1336-GM1
Block Transfer with a 1747-SN Series B

APPLICATION NOTE **JULY 10, 1997**

PURPOSE

The purpose of this document is to provide guidelines for wiring and control schemes for SCANport devices including Bulletin 1305 and 1336 PLUS AC Drives. This document is a suggestion only. Users must ensure that installations meet applicable codes and are suitable for the existing conditions.

WHAT THIS NOTE_CONTAINS

This document contains information and a simple example of an SLC ladder program to use the 1747-SN series B scanner for Block Transfer operation with a 1203-Gx1. It also includes a slightly more complex example ladder program that performs Block Transfers with two 1203-Gx1 modules.

INTENDED AUDIENCE

This application note should be used by personnel familiar with the hardware components and programming procedures necessary to operate SCANport devices. It is also assumed that the user has some familiarity with the SLC-500, 1747-SN scanner and ladder programming.

WHERE IT IS USED

The diagrams, parameter settings and auxiliary hardware used in this application note are designed to address specific issues in many different applications. Some changes by the user may be necessary to apply the concepts of this document to a specific application.

TERMS AND DEFINITIONS

BTR Block Transfer Read

BTW Block Transfer Write

1203-Gx1 1203-GD1, 1203-GK1 or 1336-GM1 RIO to SCANport communications module

DESCRIPTION

These ladder programs use an SLC and a 1747-SN series B RIO scanner to set parameters in a SCANport device via block transfer. The programs will execute a BTW and then a BTR. The programs can be used to read or write parameters depending on the information contained in the BTW data file.

APPLICATION CONSIDERATIONS

These example ladder programs were written to be simple and clear examples of block transfer. They contain no error handling. Consult the SLC or 1747-SN scanner manual for more information.

Bulletin 1203-Gx1 modules use full slot addressing, and must use the first slot assigned to the 1203-Gx1 for block transfer control. See the 1747-SN user manual or the application note “Configuring a 1747-SN RIO Scanner for use with a 1203-Gx1” for instructions on configuring the 1747-SN.

RIO RACK, GROUP, SLOT ADDRESSING

The Rack, Group, Slot address for a block transfer is calculated as shown below. This value is needed as part of the data file that is copied to the M0-file block transfer buffer in the 1747-SN RIO Scanner module.

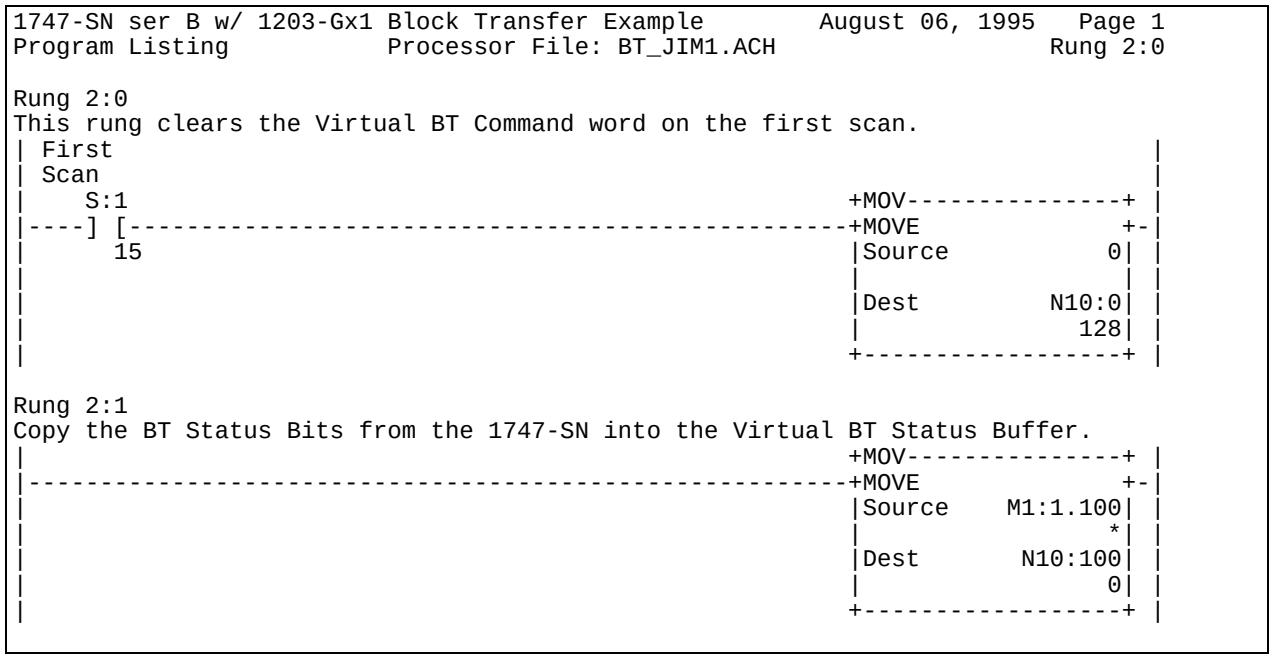
Rack, Group, Slot Address	Decimal Value
0,0,0	0
1,0,0	100
1,2,0	120
2,4,0	240

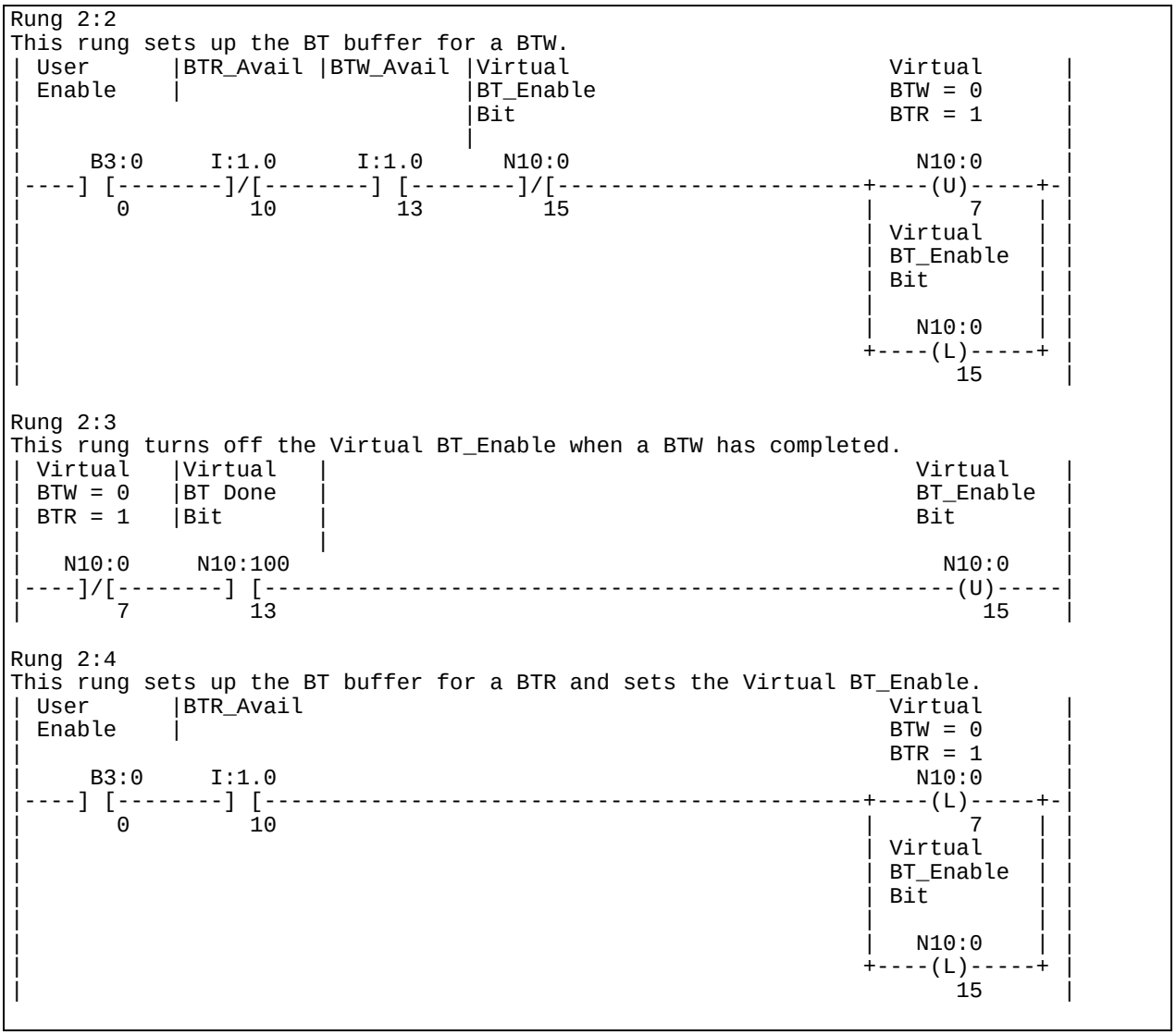
PROGRAM OPERATION - SINGLE BLOCK TRANSFER EXAMPLE

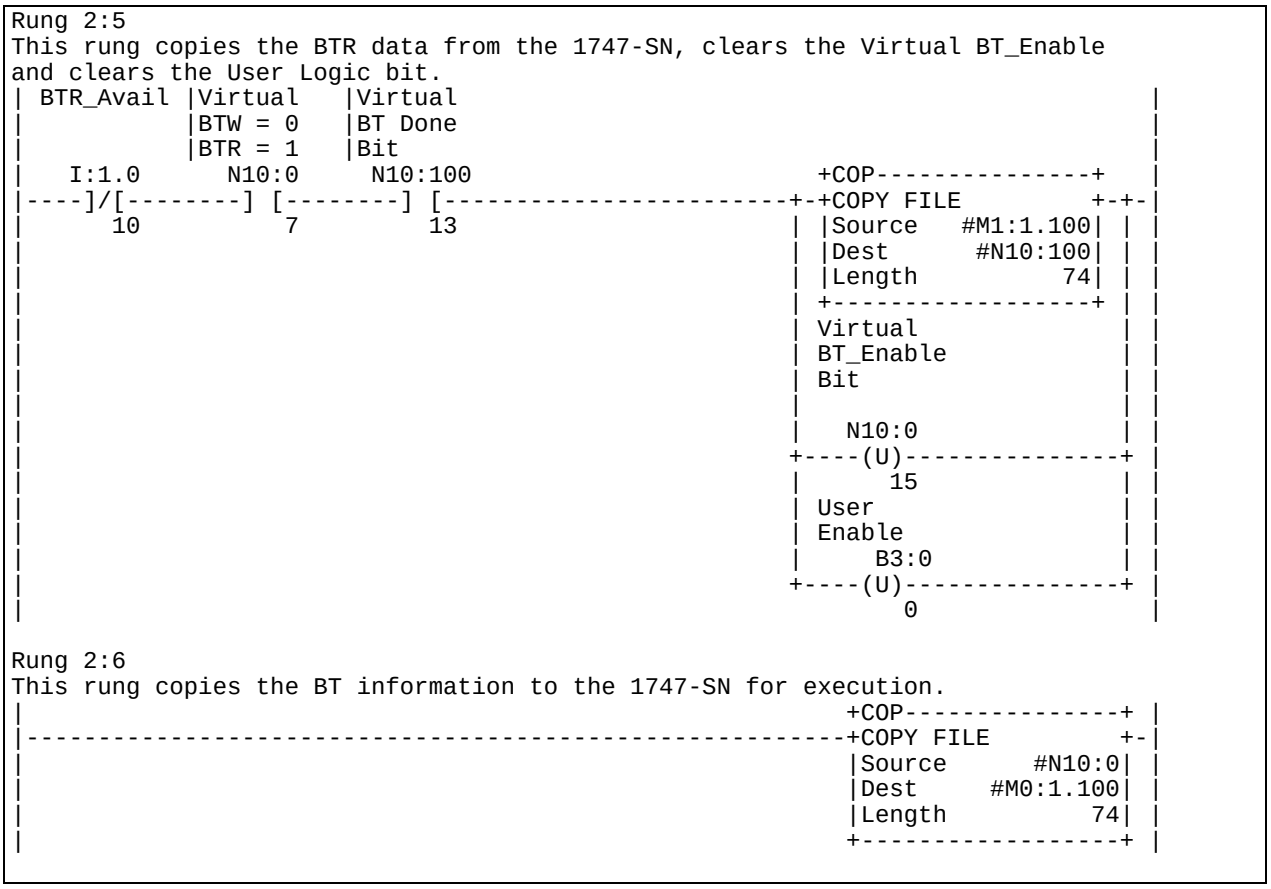
This program uses the first block transfer area in the scanner located in the first slot. The program also uses data files N10 and B3.

The length of the block transfer data file is loaded into N10:1. The rack, group, slot address for the block transfer is loaded into N10:2. In this example the rack, group, slot address is 0, 0, 0.

Data for the BTW is loaded into N10:10. The example data file shown after the ladder program contains the data needed to request a read full of parameter 78. Once the data has been loaded the user enable bit B3:0/0 is set. When the block transfers have completed the BTR data is copied into N10 starting at N10:100 and B3:0/0 is cleared by the program.




Rung 2:2
This rung sets up the BT buffer for a BTW.
User Enable
BTR_Avail
BTW_Avail
Virtual BT_Enable Bit
Virtual BTW = 0 BTR = 1
B3:0 0
I:1.0 10
I:1.0 13
N10:0 15
N10:0 7
Virtual BT_Enable Bit
N10:0 15
Rung 2:3
This rung turns off the Virtual BT_Enable when a BTW has completed.
Virtual BTW = 0 BTR = 1
Virtual BT Done Bit
Virtual BT_Enable Bit
N10:0 7
N10:100 13
N10:0 15
Rung 2:4
This rung sets up the BT buffer for a BTR and sets the Virtual BT_Enable.
User Enable
BTR_Avail
Virtual BTW = 0 BTR = 1
B3:0 0
I:1.0 10
N10:0 7
Virtual BT_Enable Bit
N10:0 15


Rung 2:5
This rung copies the BTR data from the 1747-SN, clears the Virtual BT_Enable
and clears the User Logic bit.
BTR_Avail
Virtual BTW = 0
Virtual BTR = 1
Virtual BT Done Bit
I:1.0 10
N10:0 7
N10:100 13
COP
COPY FILE
Source #M1:1.100
Dest #N10:100
Length 74
Virtual BT_Enable Bit
N10:0 15
User Enable
B3:0 0
Rung 2:6
This rung copies the BT information to the 1747-SN for execution.
COP
COPY FILE
Source #N10:0
Dest #M0:1.100
Length 74

```
 1747-SN ser B w/ 1203-Gx1 Block Transfer Example        August 06, 1995   Page 3
Data Table               Processor File: BT_JIM1.ACH         Data Table File B3

Address   Data  (Radix=BINARY)    Address   Data  (Radix=BINARY)
B3:0      0000 0000 0000 0000

Address   Data  (Radix=DECIMAL)
N10:0         128     64      0       0       0       0       0       0       0
N10:10          3    768     78       0       0       0       0       0       0
N10:20          0      0      0       0       0       0       0       0       0
N10:30          0      0      0       0       0       0       0       0       0
N10:40          0      0      0       0       0       0       0       0       0
N10:50          0      0      0       0       0       0       0       0       0
N10:60          0      0      0       0       0       0       0       0       0
N10:70          0      0      0       0       0       0       0       0       0
N10:80          0      0      0       0       0       0       0       0       0
N10:90          0      0      0       0       0       0       0       0       0
N10:100         0     64      0       0       0       0       0       0       0
N10:110        24    768     78       7     354       1       1       1       0  24900
N10:120     24948  20256  29813   17440    8241    8224    8224    3850       0    125
N10:130         0   8224   8224       0       0       0       0       0       0       0
N10:140         0      0      0       0       0       0       0       0       0       0
N10:150         0      0      0       0       0       0       0       0       0       0
N10:160         0      0      0       0       0       0       0       0       0       0
N10:170         0      0      0       0       0       0       0       0       0       0
N10:180         0      0      0       0       0       0       0       0       0       0
N10:190         0      0      0       0       0       0       0       0       0       0
N10:200         0

M0:1 File Length:3300
M0:2 File Length:0
M0:3 File Length:0
M0:4 File Length:0

M1:1 File Length:3300
M1:2 File Length:0
M1:3 File Length:0
M1:4 File Length:0

Address   Data  (Radix=HEX)
G1:0         2020   0001   000F
```

PROGRAM OPERATION - DUAL BLOCK TRANSFER EXAMPLE

This program uses the first and second block transfer areas in the scanner located in the first slot. The program also uses data files N10, N11 and B3.

BLOCK TRANSFER #1

The length of the block transfer data file is loaded into N10:1. The rack, group, slot address for the block transfer is loaded into N10:2. In this example the rack, group, slot address is 0, 0, 0.

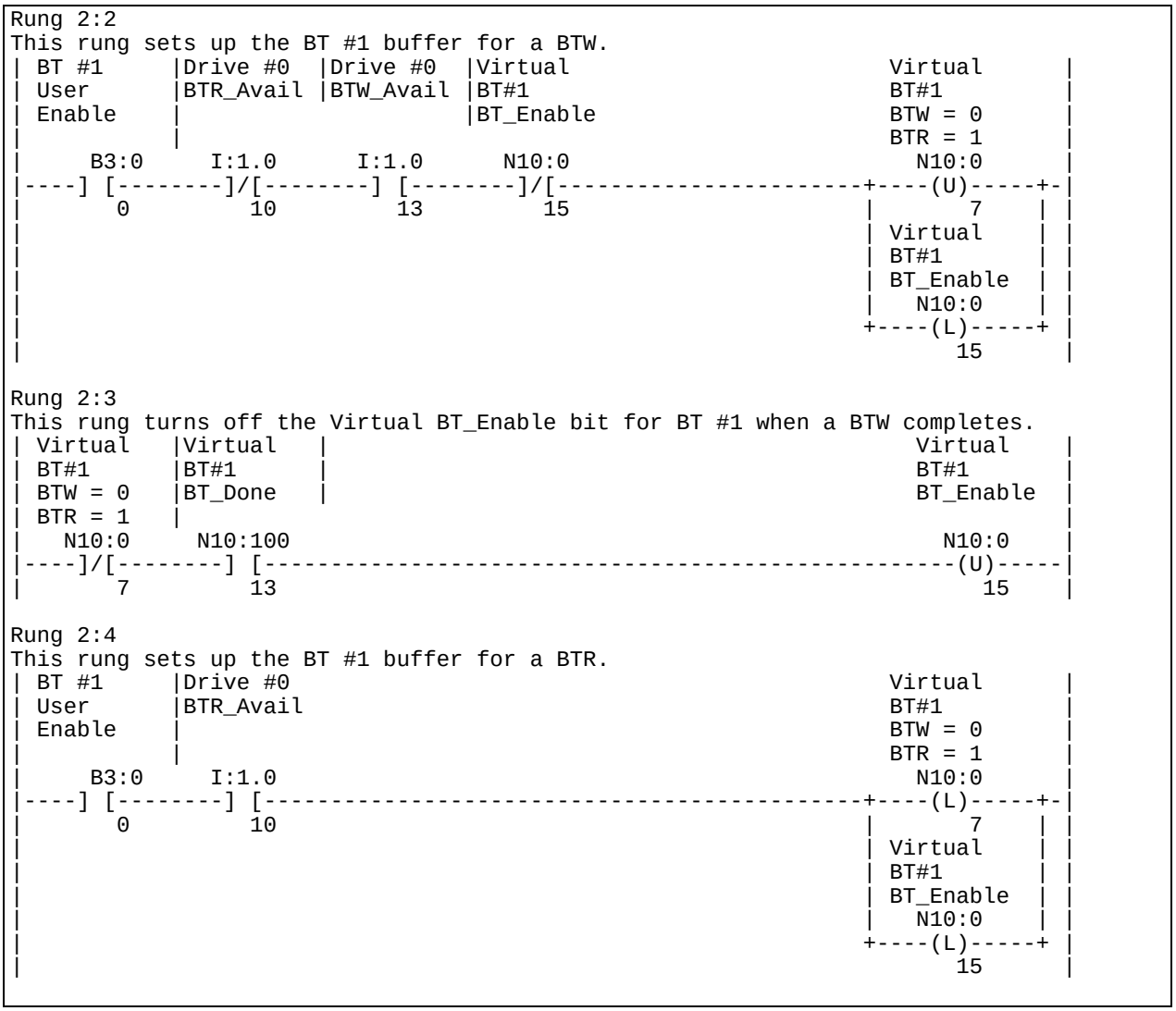
Data for the BTW is loaded into N10:10. In this example the program is requesting a read full of parameter 78. Once the data has been loaded the user enable bit B3:0/0 is set. When the block transfers have completed the BTR data is copied into N10 starting at N10:100 and B3:0/0 is cleared by the program.

BLOCK TRANSFER #2

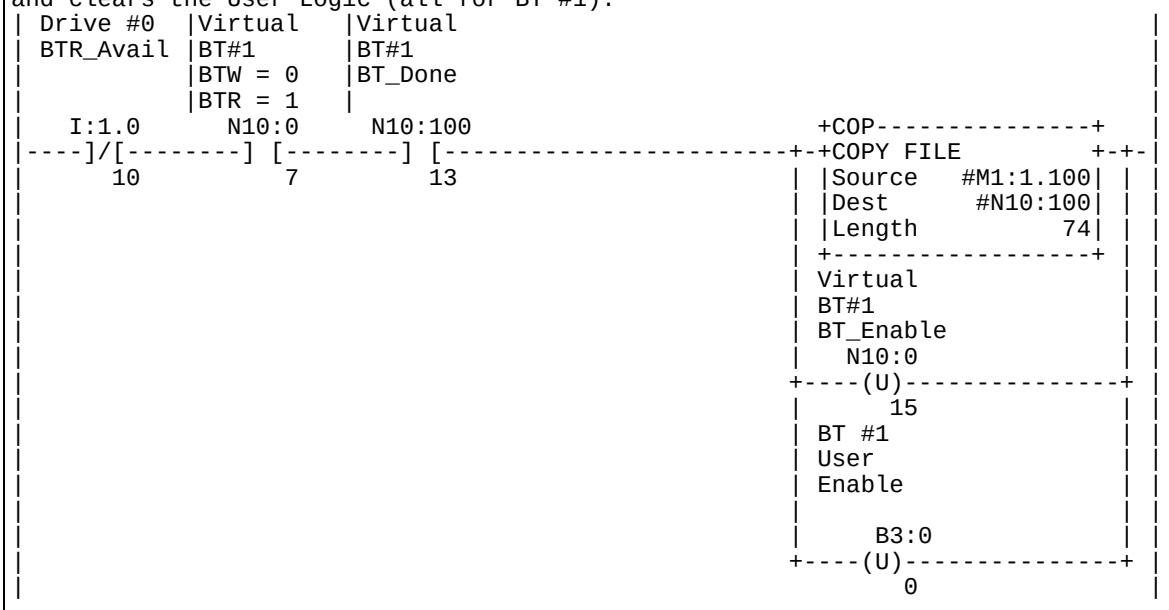
The length of the block transfer data file is loaded into N11:1. The rack, group, slot address for the block transfer is loaded into N11:2. In this example the rack, group, slot address is 1, 0, 0.

Data for the BTW is loaded into N11:10. In this example the program is requesting a read full of parameter 78. Once the data has been loaded the user enable bit B3:0/1 is set. When the block transfers have completed the BTR data is copied into N11 starting at N11:100 and B3:0/1 is cleared by the program.

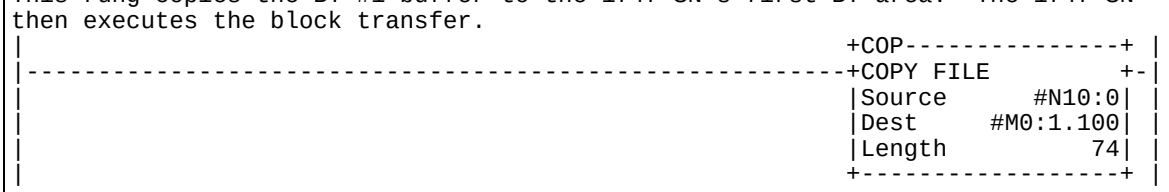
```
1747-SN ser B w/ 1203-Gx1 Block Transfer Example        August 19, 1995   Page 1
Program Listing           Processor File: BT_JIM2.ACH                   Rung 2:0

Rung 2:0
This rung clears both Virtual BT Command words on the first program scan.
| First                                                                      |
| Scan                                                                       |
| Bit                                                                        |
|    S:1                                              +MOV---------------+   |
|----] [----------------------------------------------+-+MOVE              +-+-|
|      15                                             | |Source           0| | |
|                                                     | |                  | | |
|                                                     | |Dest         N10:0| | |
|                                                     | |                  0| | |
|                                                     | +------------------+ | |
|                                                     | +MOV---------------+ | |
|                                                     +-+MOVE              +-+ |
|                                                       |Source           0|   |
|                                                       |                  |   |
|                                                       |Dest         N11:0|   |
|                                                       |                  0|   |
|                                                       +------------------+   |

Rung 2:1
This rung copies the status of the first BT area into the Virtual BT Status
buffer #1.
|                                                           +MOV---------------+ |
|-----------------------------------------------------------+MOVE              +-|
|                                                           |Source    M1:1.100| |
|                                                           |                  *| |
|                                                           |Dest       N10:100| |
|                                                           |                  0| |
|                                                           +------------------+ |
```


Rung 2:2
This rung sets up the BT #1 buffer for a BTW.
BT #1 User Enable
Drive #0 BTR_Avail
Drive #0 BTW_Avail
Virtual BT#1 BT_Enable
Virtual BT#1 BTW = 0 BTR = 1
B3:0 0
I:1.0 10
I:1.0 13
N10:0 15
N10:0 7
Virtual BT#1 BT_Enable N10:0 15
Rung 2:3
This rung turns off the Virtual BT_Enable bit for BT #1 when a BTW completes.
Virtual BT#1 BTW = 0 BTR = 1
Virtual BT#1 BT_Done
Virtual BT#1 BT_Enable
N10:0 7
N10:100 13
N10:0 15
Rung 2:4
This rung sets up the BT #1 buffer for a BTR.
BT #1 User Enable
Drive #0 BTR_Avail
Virtual BT#1 BTW = 0 BTR = 1
B3:0 0
I:1.0 10
N10:0 7
Virtual BT#1 BT_Enable N10:0 15

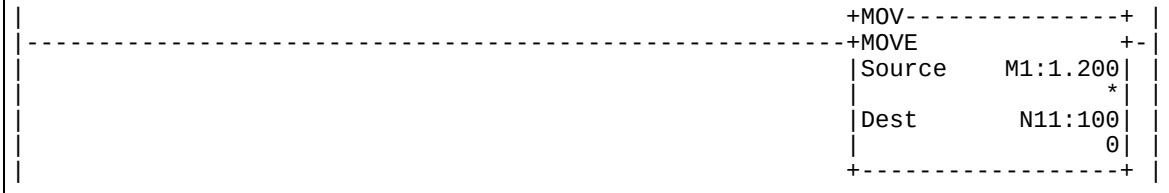
Rung 2:5
This rung copies the BTR data from the 1747-SN, clears the Virtual BT_Enable and clears the User Logic (all for BT #1).



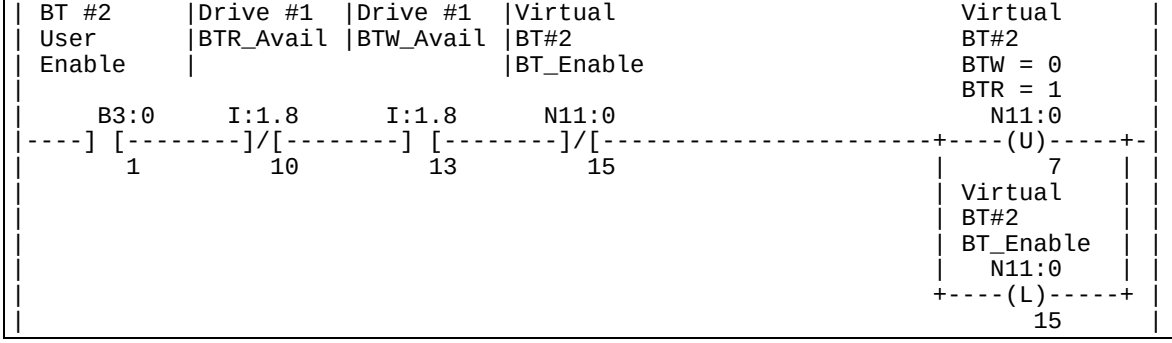
Rung 2:6
This rung copies the BT #1 buffer to the 1747-SN's first BT area. The 1747-SN then executes the block transfer.

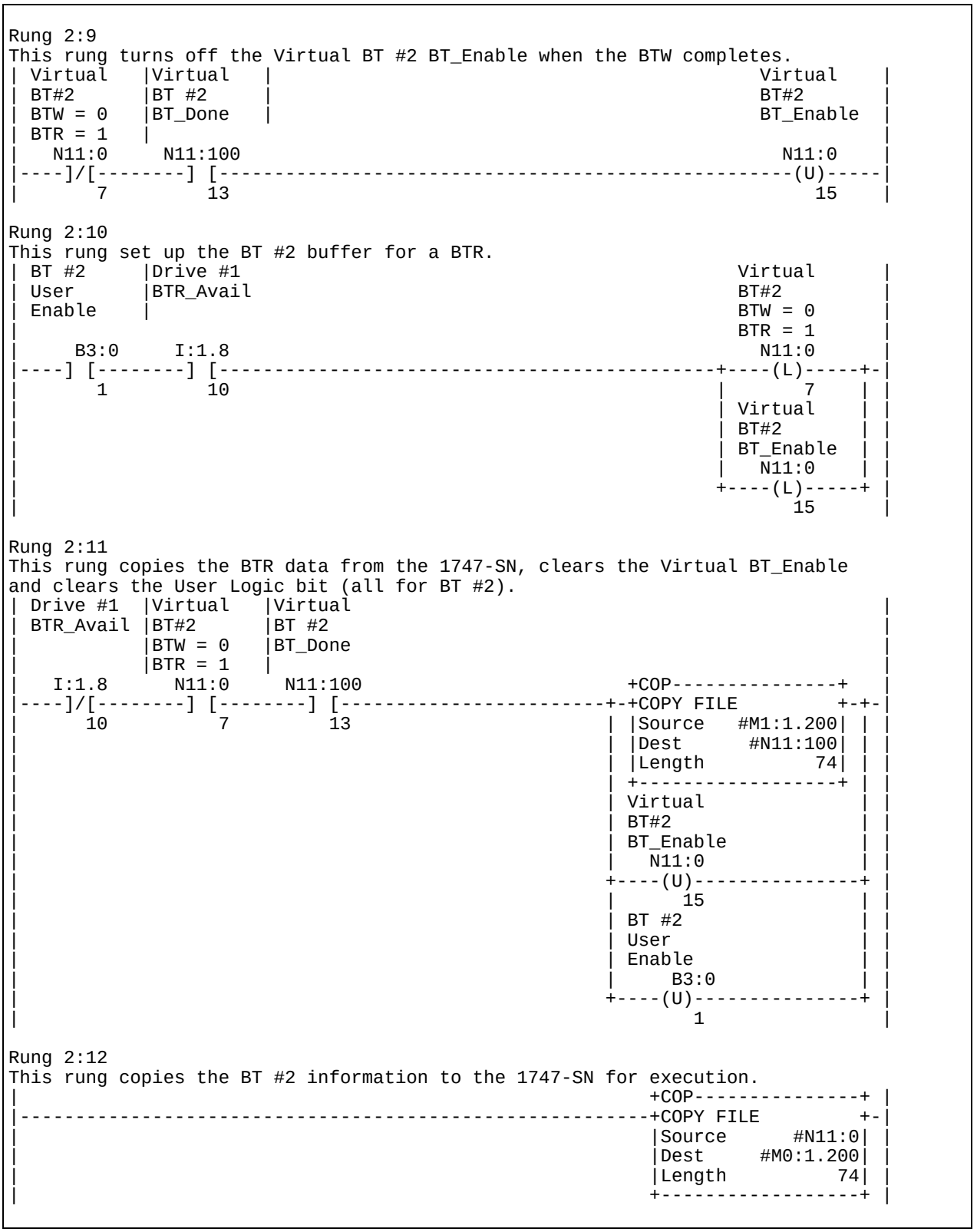


Rung 2:7
This rung copies the BT Status bits from the 1747-SN's second BT area into the Virtual BT #2 Status buffer.



Rung 2:8
This rung sets up the BT #2 buffer for a BTW.




Rung 2:9
This rung turns off the Virtual BT #2 BT_Enable when the BTW completes.
Virtual BT#2 BTW = 0 BTR = 1
Virtual BT #2 BT_Done
N11:0 7
N11:100 13
Virtual BT#2 BT_Enable
N11:0 15
Rung 2:10
This rung set up the BT #2 buffer for a BTR.
BT #2 User Enable
Drive #1 BTR_Avail
B3:0 1
I:1.8 10
Virtual BT#2 BTW = 0 BTR = 1
N11:0 7
Virtual BT#2 BT_Enable
N11:0 15
Rung 2:11
This rung copies the BTR data from the 1747-SN, clears the Virtual BT_Enable
and clears the User Logic bit (all for BT #2).
Drive #1 BTR_Avail
Virtual BT#2 BTW = 0 BTR = 1
Virtual BT #2 BT_Done
I:1.8 10
N11:0 7
N11:100 13
COP
COPY FILE
Source #M1:1.200
Dest #N11:100
Length 74
Virtual BT#2 BT_Enable
N11:0 15
BT #2 User Enable
B3:0 1
Rung 2:12
This rung copies the BT #2 information to the 1747-SN for execution.
COP
COPY FILE
Source #N11:0
Dest #M0:1.200
Length 74

```
1747-SN ser B w/ 1203-Gx1 Block Transfer Example        August 19, 1995
Data Table               Processor File: BT_JIM2.ACH         Data Table Files

Address   Data  (Radix=BINARY)    Address   Data  (Radix=BINARY)
B3:0      0000 0000 0000 0000

Address   Data  (Radix=DECIMAL)
N10:0          0     64      0      0      0      0      0      0      0
N10:10         3    768     78      0      0      0      0      0      0      0
N10:20         0      0      0      0      0      0      0      0      0      0
N10:30         0      0      0      0      0      0      0      0      0      0
N10:40         0      0      0      0      0      0      0      0      0      0
N10:50         0      0      0      0      0      0      0      0      0      0
N10:60         0      0      0      0      0      0      0      0      0      0
N10:70         0      0      0      0      0      0      0      0      0      0
N10:80         0      0      0      0      0      0      0      0      0      0
N10:90         0      0      0      0      0      0      0      0      0      0
N10:100        0     64      0      0      0      0      0      0      0      0
N10:110       24    768     78      7    354      1      1      1      0  24900
N10:120    24948  20256  29813  17440   8241   8224   8224   3850      0    125
N10:130        0   8224   8224      0      0      0      0      0      0      0
N10:140        0      0      0      0      0      0      0      0      0      0
N10:150        0      0      0      0      0      0      0      0      0      0
N10:160        0      0      0      0      0      0      0      0      0      0
N10:170        0      0      0      0

Address   Data  (Radix=DECIMAL)
N11:0          0     64    100      0      0      0      0      0      0      0
N11:10         3    768     78      0      0      0      0      0      0      0
N11:20         0      0      0      0      0      0      0      0      0      0
N11:30         0      0      0      0      0      0      0      0      0      0
N11:40         0      0      0      0      0      0      0      0      0      0
N11:50         0      0      0      0      0      0      0      0      0      0
N11:60         0      0      0      0      0      0      0      0      0      0
N11:70         0      0      0      0      0      0      0      0      0      0
N11:80         0      0      0      0      0      0      0      0      0      0
N11:90         0      0      0      0      0      0      0      0      0      0
N11:100        0     64    100      0      0      0      0      0      0      0
N11:110       24    768     78      7    354      1      1      1      0  24900
N11:120    24948  20256  29813  17440   8241   8224   8224   3850      0    125
N11:130        0   8224   8224      0      0      0      0      0      0      0
N11:140        0      0      0      0      0      0      0      0      0      0
N11:150        0      0      0      0      0      0      0      0      0      0
N11:160        0      0      0      0      0      0      0      0      0      0
N11:170        0      0      0      0

M0:1 File Length:3300
M0:2 File Length:0
M0:3 File Length:0
M0:4 File Length:0

M1:1 File Length:3300
M1:2 File Length:0
M1:3 File Length:0
M1:4 File Length:0

Address   Data  (Radix=HEX)
G1:0         2020   0011   00FF
```