BULLETIN 1203-FM1 & 1203-FB1 Use with ControlNet (PLC-5/40C, 1794-ACN)

APPLICATION NOTE # CNET - 1

May 27, 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 an example ladder program that demonstrate how to control two 1305 drives using a PLC-5/40C, 1794-ACN and 1203-FM1/FB1 module and base. This document also explains how to set safe state data using a CIO transfer instruction.

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 ControlNet, the PLC-5 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.

APPLICATION CONSIDERATIONS

These example ladder programs were written to be simple and clear examples and contain no fault handling abilities. Consult the PLC-5C, 1794-ACN and 1203-FM1/FB1 manuals for more information.

SCANport devices may assign different meanings to bits in the Logic Command and Status words. The usage of the Reference and Feedback words may also vary. Consult the manual for your SCANport device for more information.

ControlNet Configuration

The three screen prints in Figures 1 through 3 show the configuration of the ControlNet and Flex I/O system for the example program.

```
                    ControlNet - Node Information                MONITOR
                       Channel 2 Configuration                   NODE  1

Diagnostics file:          N7        Network Update Time(ms):       5
```

```
Coax Repeaters in Series:    0        Scheduled Bandwidth Usage:    3%
Fiber Repeater Pairs:        0        Media Redundancy Usage:   A Only
                                      Maximum Scheduled Node:        2


Node  Node Type        Series/Revision    Status

 1    PLC-5/40C             C/H           ACTIVE
 2    1794-ACN              A/B           ACTIVE



Press a function key, page up or page down, or enter a node. number.
>_
Rem Prog   Forces:None                                    5/40C Addr 0  CNET_APP
         Map            Node                                  Chan 2
       Monitor          Edit                                  Status
         F2              F4                                     F9
```

Figure 1 -- ControlNet Node Information Screen

```
                          ControlNet - I/O Mapping                  MONITOR
                          Channel 2 Configuration                   NODE  1

Status File:        N9       Network Update Time(ms):  5     Sch BW(%):  3
Data Input File:   N10       ------ Processor's ControlNet Resource Usage -----
Data Output File:  N11       Map Entries     PLC BW (%)      DIF (%)    DOF (%)
Dflt Config File:  N12           2              20             1          1

Node    Mod/Msg Type  Act Net Pckt   Input        Output    Status     Config
   S/M                  Time(ms)  File   Size  File   Size  Offset  File    Size

 1      PLC-5/40C         n/a     n/a     n/a  n/a     n/a          n/a      n/a
 2      1794-ACN          5       n/a       0  n/a       0     0    N12:0    121
   0    1203-FM1/A        5       N10:0     6  N11:0     5          n/a      n/a


Press a function key, page up or page down, or enter a node.s/m number.
>_
Rem Prog   Forces:None         Display:Slot/Message      5/40C Addr 0  CNET_APP
          Map   Select   Node    View   Monitor           I/O   Monitor
         Edit   Display Monitor  Times  Status          Monitor Actions
          F2      F3      F4      F5      F6              F8      F9
```

Figure 2 -- ControlNet I/O Mapping Screen

ControlNet
Configuration (Continued)

```
                          ControlNet - I/O Action                    MONITOR
                           Channel 2 Configuration                   NODE  1

Node  2 1794-ACN

   Module Type        Fault Action         Idle Action        Fault Action
Slot                                                         From Idle

 0 1203-FM1/A       Reset                Safe                Fault









Press a function key.
>_
Rem Prog   Forces:None                                  5/40C Addr 0  CNET_APP
         Map                                                    Edit
       Monitor                                                Actions
         F2                                                     F9
```

Figure 3 -- ControlNet I/O Action Screen

Ladder Program Section 1

The section of program shown in Figure 4 enables both SCANport channels on the 1203-FM1 module.

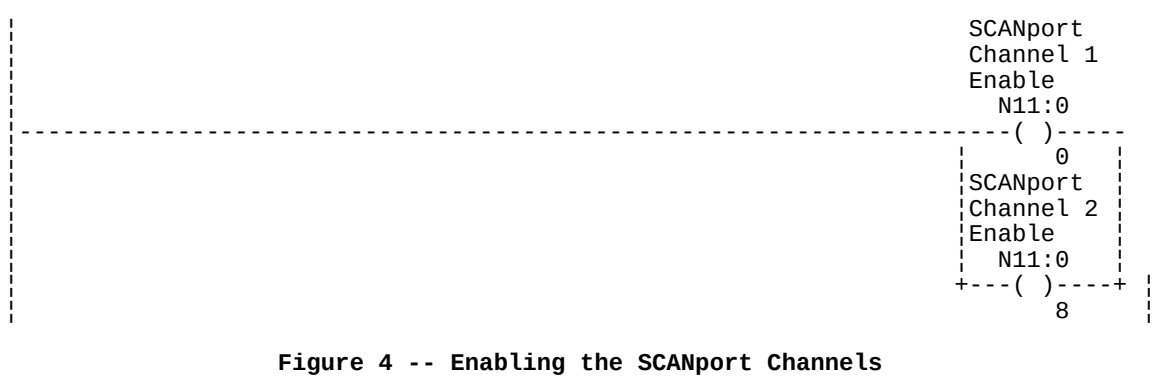


Figure 4 -- Enabling the SCANport Channels

Ladder Program Section 2

The section of program shown in Figure 5 provides START/STOP control and a frequency reference to the 1305 drive connected to SCANport channel 1.

The User Start is a normally open pushbutton while the User Stop is a normally closed pushbutton.

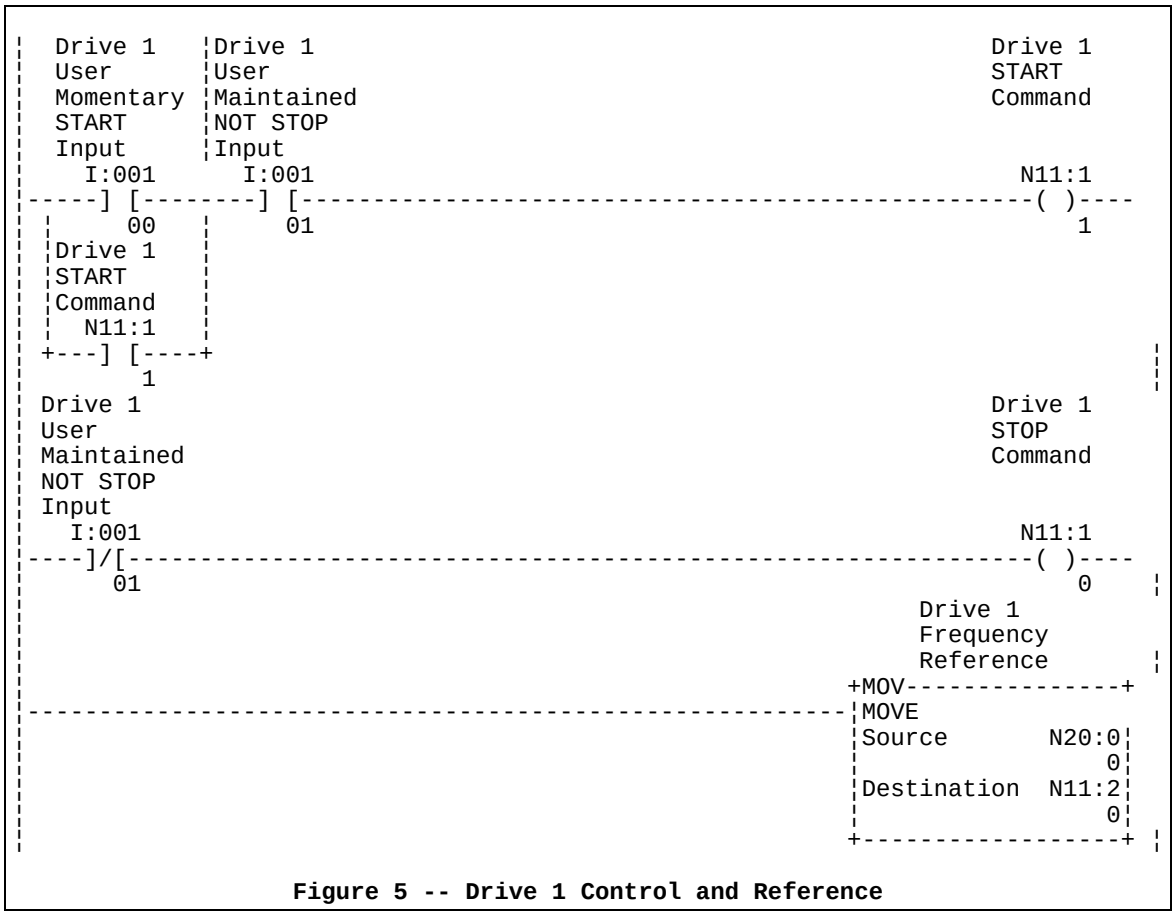


Figure 5 -- Drive 1 Control and Reference

Ladder Program Section 3

The section of program shown in Figure 6 provides START/STOP control and a frequency reference to the 1305 drive connected to SCANport channel 2. This section functions identically to that shown in Figure 5 except for the changes in addresses.

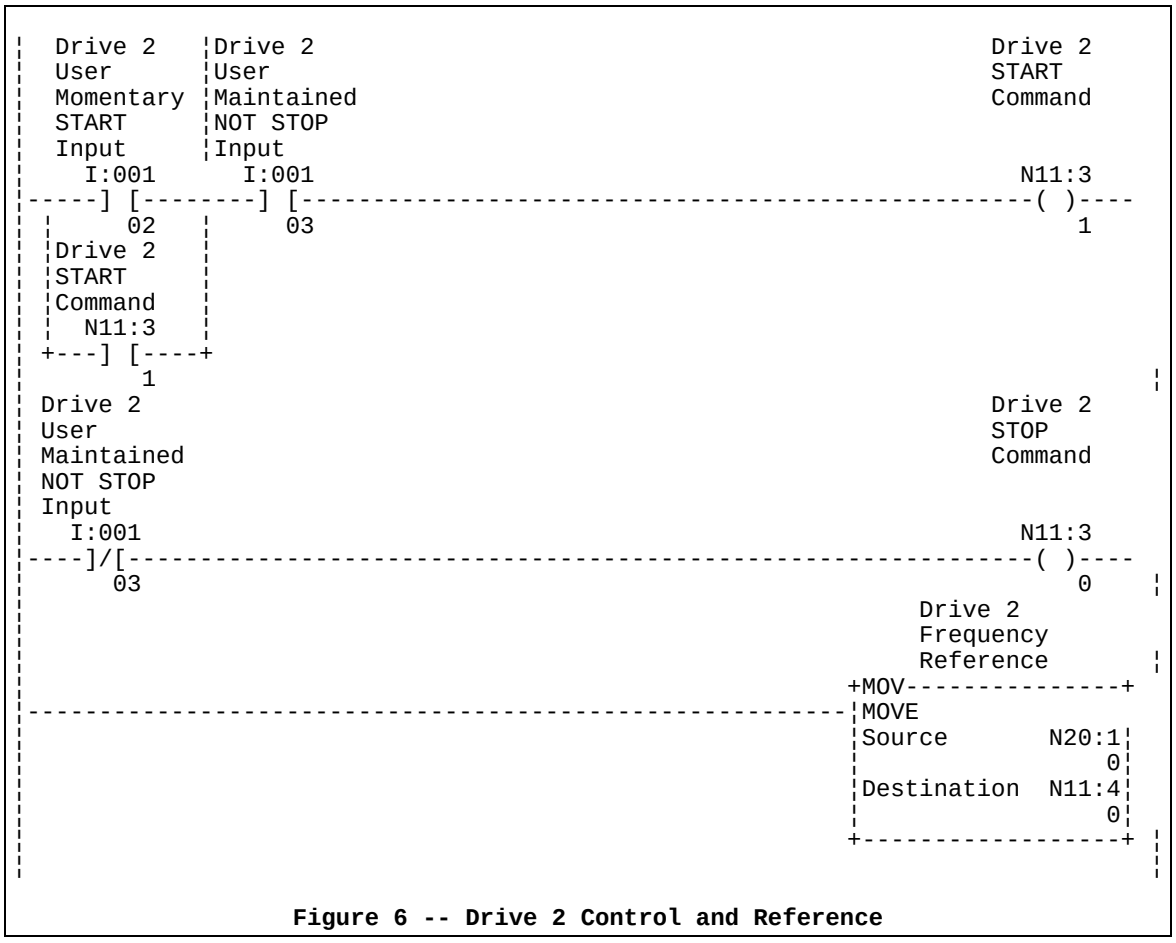


Figure 6 -- Drive 2 Control and Reference

Input Data Table File

The data table file shown in Figure 6 is the input data read from the 1203-FM1 via ControlNet.

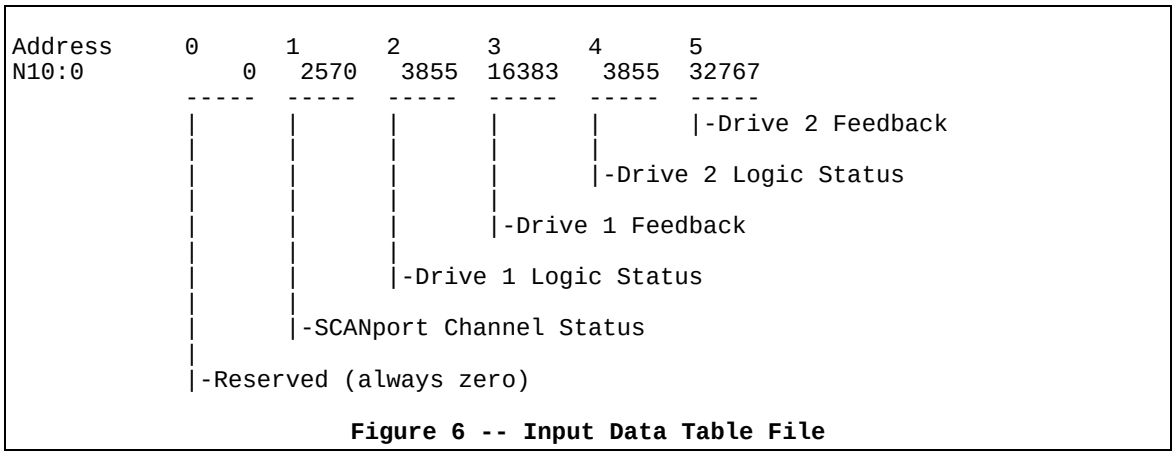


Figure 6 -- Input Data Table File

Output Data Table File

The data table file shown in Figure 7 is the data to be sent to the 1203-FM1 via ControlNet.

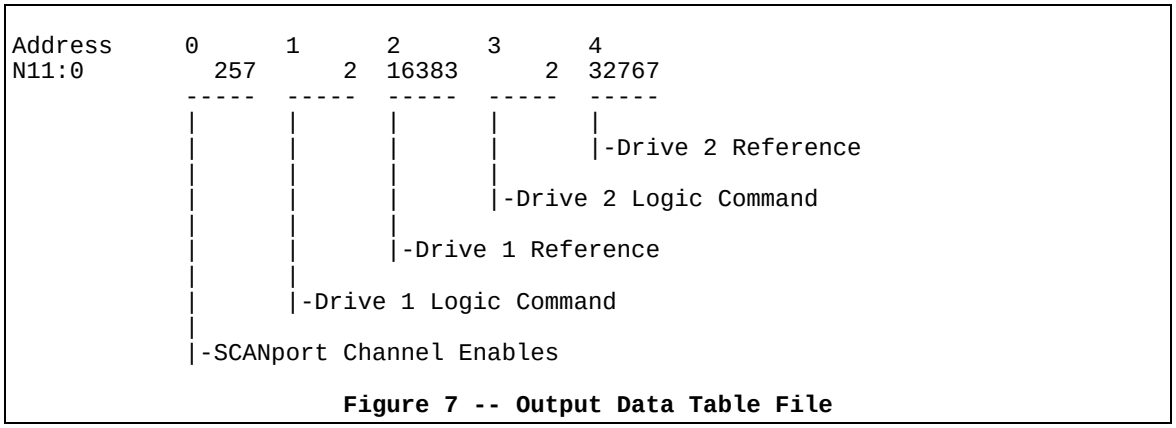


Figure 7 -- Output Data Table File

Setting Safe State Data

The program segment shown in Figure 8 will write safe state data to the 1203-FM1. The user must have configured the module to use safe state data (refer to Figure 3).

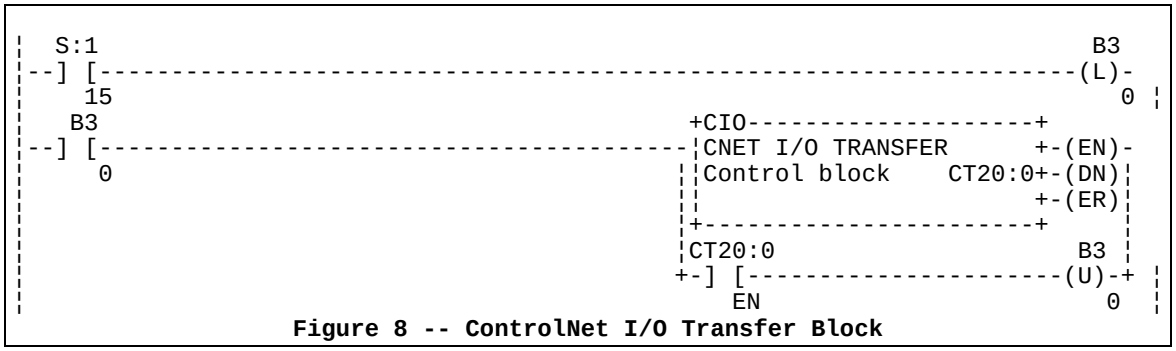
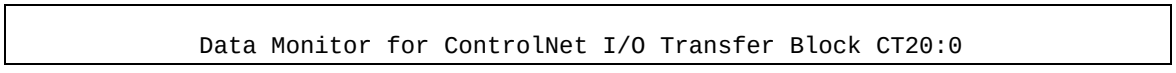


Figure 8 -- ControlNet I/O Transfer Block

CIO Transfer Block Data Table File

The data table file shown in Figure 9 configures the CIO transfer block to write five words of safe state data from N21 (starting at word 0) to the 1203-FM1.



```
Communication Command:          1794 Safe State Data
PLC-5 Data Table Address:       N21:0            ignore if timed-out:  0 TO
Size in Elements:               5                 awaiting execution:  0 EW
Elements Transmitted:           5                          continuous:  0 CO
                                                              error:  0 ER
                                                     transfer done:  1 DN
                                                   transfer started:  0 ST
Local ControlNet Node:          2                  transfer enabled:  0 EN
Slot Number:                    1
Port Number:                    2

Error Code: 0000 (HEX)
```

Figure 9 -- Configuring the ControlNet Transfer Block

Safe State Data Table File

The data table file shown in Figure 10 will be sent to the 1203-FM1 to use as safe state data. As shown, drive 1 will be commanded to stop while drive 2 will be left in whatever state it was last commanded to be in and will be sent a reference of 1/4 speed.

```
Address     0      1      2      3      4
N21:0         257      1      0      0   8192
            -----  -----  -----  -----  -----
            |      |      |      |      |
            |      |      |      |      |-Drive 2 Reference (Freq. Command)
            |      |      |      |
            |      |      |      |-Drive 2 Logic Command
            |      |      |
            |      |      |-Drive 1 Reference (Frequency Command)
            |      |
            |      |-Drive 1 Logic Command
            |
            |-SCANport Channel Enables
```

Figure 10 -- Safe State Data Table File