1. Stand Alone Setup (ASRS18.EXE)

This ASRS set-up procedure is intended to be utilised when the ASRS is ready to be integrated in to a CIM system. (Note: - An axis override speed control unit has been fitted to the ASRS controller to help avoid any unwanted collisions between the end of arm tooling the ASRS framework.)

1.1 Powering Up

Connect the monitor and keyboard to the ASRS video and keyboard output ports. Plug the ASRS and monitor in to the mains supply. Ensure that the internal E-stop link is fitted between terminals 61 and 62 in the Control Cabinet see fig. 1.1.1. For location or that an I/O (E-stop) cable is fitted between the ASRS I/O Input and an active CIM Interface Module, or that an E-stop dummy plug has been fitted to the ASRS I/O socket. Insert the ASRS disk in to the floppy disk drive.

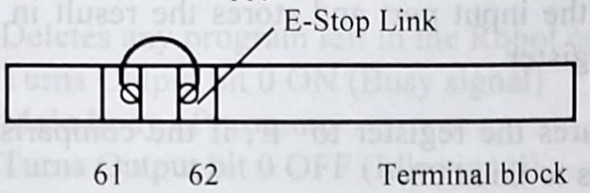

Fig 1.1.1

Depress the ASRS E-stop and switch on the ASRS. Wait for the ASRS software to activate.

1.2 Homing

When the ASRS is first powered up the software will automatically enter the Jog Mode. This is to ensure that the ASRS end of arm tooling can be "Jogged" to a safe position where it is able to travel to its 3 Home axis positions without the possibility of a collision with any part of the ASRS framework. Ensure that the ASRS E-stop is released and move the ASRS end of arm tooling to a safe position ready for homing, using the keys as detailed on the Jog Mode screen. Once in a safe position leave Jog Mode and select Home from the Main menu.
Home each of the 3 axes in turn starting with the X-axis, as detailed on the Home Mode screen.

1.3 Setting up Pallet location shelf Positions

After homing all the 3 ASRS axes. Position the Y-axis of the ASRS physically in the middle of the framework itself using JOG MODE (make a note of the Y axis value on the monitor). This means that the X, Y, Z dimension values are the same for both side 1 and side 2 of the ASRS when setting the ASRS POSITION for both sides (i.e. easier to set up). This position is set by entering the ASRS POSITION section of the SETTINGS option of the software. Once the ASRS POSITION is set for SIDE 1, ROW 1, COLUMN 1 (SRC) then by selecting the FIX PIGEONS option, this in effect calculates all side 1 ASRS POSITIONS if a COLUMN and ROW dimensions are entered in the ASRS.OPT file under (side 1 [step_1_x 260 and step_1_z 180] side 2 [step_2_x 260 and step_2_z 180]). Side 2 can be done just the same by selection "Side 2 " at the appropriate time. The "T" option can be used here for inserting the

displayed X, Y, Z dimension values as seen on the monitor. Example POSITION X=1404, Y=426, Z=955 for the side 1 top left pallet location shelve i.e. for SIDE 1, ROW 1, COLUMN 1.
The Z axis position for the ASRS POSITION needs to be taught with a pallet on the ASRS end of arm tooling so that the pallet top is in line with the top of the RSA where the pallet will eventually sit. This position is taught here because it is safe for any unscheduled movement in the Y-axis and also that the ASRS "PICK" routine is simple to construct with the first movement being on the Y-axis only.

1.4 Pick/Place Pallet location shelf Sequences

The "Pick" and "Place" sequences refer to the loading and unloading of a pallet on to and off the ASRS end of arm tooling relative to the pallet location shelf positions.
To input a "Pick" sequence select Setup, ASRS, Pallet location shelf, Load from the menu, initially this will show a blank box. Press Insert to produce the first line to edit and press Enter to edit it. Another box will be produced on screen with the three main axes X, Y and Z the axis W will be shown if the end of arm tooling wrist is articulated (optional) and D, which is the feed rate when positive and a dwell time in seconds when negative. Move to the required field in this list using the up and down arrow keys and input the sequence move, press Esc. To enter the line in to the sequence list, repeat this process to build up a "Pick" sequence. Note that the maximum number of lines allowed in a sequence is twelve. Refer to Appendix II for an example of a load sequence.
The "Place" sequence is entered in the same way as the "Pick" sequence from the Select, Pallet location shelf, Unload menu. Refer to Appendix II for an example of an "Place" sequence. Note that a separate "Pick" and "Place" sequence will have to entered for each side if the ASRS is double sided. See appendix 111 for example and additional information

1.5 Conveyor Position Setup

Setup the Conveyor position by entering Jog Mode and moving the end of arm tooling to a position inside the conveyor cut out loading area. Ensure that the top of the end of arm tooling is at least 5mm below the top face of the conveyor belting (i.e. X=0, Y=0 and Z=0). Note the position of the X Y Z coordinates or use the "T" on the keyboard and enter them at the Setup, Conv, Position option in the Main menu.

1.6 Conveyor "Place" Sequence Setup

The Conveyor "Place" sequence refers to the unloading of a pallet on to the conveyor from the end of arm tooling. It requires that the ASRS axes move from a position around 200mm vertically above the **Conveyor Position**. It then places the end of arm tooling in to the cut out section of the conveyor, waits for a few seconds for the pallet to be taken away by the conveyor belting and returns to the original position of around 200mm vertically above the conveyor. All positions are relative to the Conveyor "Place" position (i.e. X=0, Y=0 and Z=0). The sequence is entered and saved in the same way as the Pallet location shelf sequences, for an example of a Conveyor "Place" sequence see below
E.g. of a Conveyor "PLACE" routine

X0	Y0	Z200	D2000	200mm vertically above CONVEYOR POSITION
X0	Y0	Z 0	D2000	CONVEYOR POSITION (5 mm below conveyor belt surface)

1.7 Conveyor "Pick" Sequence Setup

The Conveyor "Pick" sequence refers to the ASRS moving the end of arm tooling from a position of around 200mm vertically above the Conveyor position into the cut out section of the conveyor where the **Conveyor Position** was originally set. All moves in the sequence list are relative to the **Conveyor Position** (i.e. X=0, Y=0 and Z=0). The sequence is entered and saved in the same way as Conveyor "Place" sequence. For an example of a Conveyor "Pick" sequence see below.

e.g. of a Conveyor "PICK" routine

X0	Y0	Z0	D-5	Dwell for 5 seconds to allow pallet to clear end of arm tooling
X0	Y0	Z200	D2000	200mm vertically above CONVEYOR POSITION

1.8 AGV Position Setup

The **AGV Position** needs to be taught with the top face of the pallet end of arm tooling sited around 15mm below where the pallet is actually going to sit on the AGV pallet shelving. (Ideally the Y-axis position should be the same as that set up when setting **ASRS POSITION** above).

1.9 AGV "Place" Sequence Setup

The AGV "Place" sequence refers to the unloading of a pallet on to the AGV pallet shelf from the ASRS end of arm tooling. It requires that the ASRS axes move from a position around 200mm vertically above the **AGV Position**. The end of arm tooling then drops vertically down to around 20mm below the AGV pallet shelving and thus deposits the pallet on the AGV shelving. The end of arm tooling is then withdrawn from under the pallet, along the Y-Axis of the ASRS for about 250mm to give adequate clearance for a 200mm pallet. The end of arm tooling is then brought vertically upwards and then back to its original starting position of 200mm above the **AGV Position**. All positions are relative to the AGV "Place" position (i.e. X=0, Y=0 and Z=0). The sequence is entered and saved in the same way as the Pallet location shelf sequences, for an example of an AGV "Place" sequence see below

e.g. of a AGV PLACE routines

X0	Y0	Z200	D2000	200 mm above AGV POSITION

X0	Y0	Z 0	D2000	AGV POSITION (15 mm below frame)
X0	Y-230	Z0	D2000	Back on Y axis to clear 200 mm pallet size)
X0	Y-230	Z200	D2000	200 mm above AGV POSITION offset 230 mm in Y axis
X0	Y0	Z200	D2000	200 mm above AGV POSITION

1.10 AGV "Pick" Sequence Setup

The AGV "Pick" sequence refers to the ASRS moving the end of arm tooling from a position of around 200mm vertically above the AGV position into the cut out section of the AGV where the **AGV Position** was originally set. All moves in the sequence list are relative to the **AGV Position** (i.e. X=0, Y=0 and Z=0). The sequence is entered and saved in the same way as AGV "Place" sequence. For an example of an AGV "Pick" sequence see below.

e.g. of a AGV PICK routines

X0	Y0	Z200	D2000	200 mm above AGV POSITION
X0	Y-230	Z 200	D2000	200 mm above AGV POSITION offset 230 mm in Y axis
X0	Y-230	Z0	D2000	Back on Y axis to clear 200 mm pallet size)
X0	Y0	Z0	D2000	AGV POSITION (15 mm below frame)
X0	Y0	Z200	D2000	200 mm above AGV POSITION

2 Local Command Control

2.1 Moving to a Safe Position

Before a local command can be carried out the end of arm tooling must be jogged to a safe position, this is to prevent a collision. A safe position is anywhere within a bounding box defined in the ASRS.opt file. Any axis in an unsafe position will have is decimal position value high lighted with a RED banner, this RED banner will disappear when the offending axis is Jogged to a safe position

2.2 Testing Pallet location shelf and Station Positions

In order to test the Pallet location shelf and Station positions the Move command is used. This command simply moves the ASRS end of arm tooling from its present position to the position defined in the command line. Caution should be taken when using this command as the end of arm tooling will take the shortest route between the two points without regard for the ASRS frame and a collision may occur.

A number defines each Pallet location shelf and Station as follows :-

ASRS (Pallet location shelves)	0

Side 1 or 2 (i.e. 1 or 2 sided ASRS)
Row Range 1 to 5
Column Range 1 to 7

E.g. PICK ASRS 1 1 1 - Move to ASRS, side 1, row 1, column 1

Conveyor 1
AGV 2

The PICK and PLACE commands can be carried out from the Local Option in the Main Menu. Select this option and type in the command as described above, to move to the desired position. The positions can then be tested to ensure that the end of arm tooling is moving to the correct co-ordinates, as defined in the Setup procedures. (Note: Use the axis override speed control override knob to help avoid any collision with the ASRS framework.)

3 Remote Command Control

3.1 Connection to CIM Cell

Before an ASRS can operate remotely it must have its E-stop/ Control and RS232 cables connected to the CIM Cell (i.e. Interface Module and PC serial port). In order for the E-Stop line to be effective the external E-Stop link bypass should be removed, see Fig 1.1 for location of link. The E-Stop/Control cable fits between the I/O socket connector on the ASRS and usually to a two-bit port on the Cell Interface Module (i.e. port 2A or 2B). The RS232 cable is connected between the ASRS RS232 connector and a serial port on the Cell PC (i.e. COM1, COM2 etc.)

3.2 Communication Settings

To enable the E-Stop/Control line to work, the Cell Interface Module port must be set to the correct port in the ASRS.ini file, in the CIM\OTHER or CIM\CELL1 directory, on the Cell PC. The RS232 link must also be set in this file, defining the RS232 port, Baud Rate, Data Bits, Stop Bits, Parity, Flags and In and Out Buffer size, see example Fig 3.2. The Flag setting defines the flow control of the RS232 link i.e. H2 is software control - Xon/Xoff, H1 is hardware control and H0 is no flow control. The Setting command defines the Baud Rate, Parity, Data Bits and Stop Bits, in that order. Parity is defined as e = Even, o = Odd and n = No.

```
[IO PORT DATA]                  -       -
Interface Module Port = Port2A
[SERVICE]                       -       -
Machine Name                    =       ASRS
[FILES]                         -       -
Status History                  =       asrs.log
Commands File                   =       asrs.cmd
[COMMS]
Port                            =       COM1
Settings                                =       4800,e,7,2
Flags                           =       H2
```

```
OutBufferSize    =    128
InBufferSize     =    128
```

Fig 3.2.1 ASRS.ini File (part) - RS232 Settings

The RS232 setting defined in the ASRS.ini file must be defined similarly in the ASRS.opt file on the ASRS floppy disk. Again these setting define Baud rate, Parity, etc. and must match those settings defined in the ASRS.ini file for correct RS232 communication to be established, see example Fig. 3.2.2.

```
EXTCOMM_ENABLE 1
EXTCOMM_ROUTE 1
EXTCOMM_SDEVICE MASTER
EXTCOMM_BAUD 4800
EXTCOMM_PARITY 2
EXTCOMM_DATABITS 7
EXTCOMM_STOPBITS 1
EXTCOMM_LF 1
EXTCOMM_ES 1
EXTCOMM_EE 2
```

Fig. 3.2.2 ASRS.opt File (part) - RS232 Settings

To test that RS232 communications is working correctly, place ASRS in REMOTE mode, selected from the main menu, the ASRS end of arm tooling will have to be in a safe position first, refer to section 2.1 Moving to a Safe Position. Select the ASRS device driver on the Cell PC and ensure that the ASRS Status is idle, if not check that the E-Stop/Control cable connections and the ASRS.ini file is correct. If the Status on the device driver still reads Busy or Local Control only after this, check that the Control line pull-up resisters have been fitted in the ASRS.

Once the ASRS device driver Status is Idle, type in the device drivers command line, a simple command to ensure there is RS232 communication. Type for example PICK ASRS 1 1 1, which will move the end of arm tooling to ASRS side 1, column 1, row 1, without carrying out any "Place" sequences, this assumes that this position has been set for this particular pallet location shelf. If the end of arm tooling does not move, check that the ASRS has received the command, which will be displayed in the bottom left hand corner of the screen. Again if this fails to work correctly, ensure that RS232 settings in both the ASRS.opt and ASRS.ini files match. This failing check that the Address and Interrupt Request levels (IRQ) have been set correctly, for the ASRS in the ASRS.go file and for the Cell PC in Settings, Control Panel, System, Device Manager, Ports (COM & LPT) in Windows 95.

NOTE: There have been some problems with the RS232 communications in relation to Apricot Computers (Cell PC). The IRQ of the serial port is not recognised unless it is set again to the level it is displaying, i.e. even though it may be displaying the correct IRQ level it does not recognise it and has to be set again.

3.3 Device Driver Control

To ensure correct control of the ASRS from the Device Driver the ASRS.ini file should be set up to reflect the dimensions of the ASRS, in relation to the number of sides, rows and columns. The name of the inventory file should also be included and a list of the ASRS stations, see Fig. 3.3.1 for example.

```
[ASRS]
Rows=5
Columns=5
Sides=1
InventoryFile = invent.dat
ASRS=0
Conveyor=1
AGV=2
```

Fig. 3.3.1 ASRS.ini (part) - Dimensions and Station Settings

With the latest version of the ASRS device driver (April 1996 onwards) the command line no longer accepts ASRS Local type commands in the form, From *station* to *station*, where the station is a pallet location shelf. Instead it requires a Part name, the location of that part is looked up in the invent.dat file and the relavent position sent with the rest of the command to ASRS. For this reason the invent.dat file should be written in a grid format to represent what is held in each pallet location shelf, see Fig. 3.3.2 for an example on an invent.dat.

```
part1  part2  part3  part1  part2
part1  part2  part3  part1  part2
part1  part2  part3  part1  part2
part1  part2  part3  part1  part2
part1  part2  part3  part1  part2
```

Fig. 3.3.2 Invent.dat

Appendix I

The main reason for wanting to edit the ASRS.opt file to change the pallet location shelf positions, is speed. Using the ASRS software to enter all the pallet location shelf positions is time consuming and it is easy to loose track of the position to be entered. Below is an example of a 1 sided, 4 column by 5 row ASRS.opt file (part), where each pallet location shelves X,Y,Z co-ordinates are reprsented in the form *side_column_row_axis co-ordinates.* In order to edit these co-ordinates use an editor or word processor that has Find and Replace options in the Edit menu, such as Microsoft WordPad (i.e. Notepad does not have this facility). As each column has the same Z co-ordinates the existing Z co-ordinates can be found and then replaced by selecting the Replace option in the Edit menu, typing in the value that is already there in the Find box, then typing in the replacement in the Replace box. Taking the example below, all the Z co-ordinates for column 1 equal 930.00, so by finding the Z co-ordinates for each of the four columns all the Z co-ordinates can be changed. This

procedure can be repeated for rows and X co-ordinates. Note that all Y co-ordinates are the same and therefore can be replaced in a single Find and Replace operation.

Appendix II;

```
; options file for the ASRS (ASRU18.EXE 20.5.99)
;
-----------------------
--
; Disable the test menu option
TEST 0
; Enable the feed override pot
NOPOTS 0
; Disable graphics screen mode
SHOWINTEXT 1
-----------------------
--
; External RS233 communication parameters
EXTCOMM_ENABLE 1
EXTCOMM_ROUTE 1
EXTCOMM_SDEVICE MASTER
EXTCOMM_BAUD 4800
EXTCOMM_PARITY 2
EXTCOMM_DATABITS 7
EXTCOMM_STOPBITS 1
EXTCOMM_LF 1
EXTCOMM_ES 1
EXTCOMM_EE 2
-----------------------
--
; CANDATUM 1
IOBASE $300
STEPSPERMM 274.1
ACCEL 1600
RAMP 0
HIGHFEED 30000
DATUMFEED 5000
MOVEFEED 20000
JOGFEED 5000
LIMIT_X 3050
LIMIT_Y 800
LIMIT_Z 1000
; MAXDATUM_X 0
MAXDATUM_Y 1
MAXDATUM_Z 1
DATUMKEY_Z 0
GAIN_X 0.2
GAIN_Y 0.2
GAIN_Z 0.2
rem KV_X 1
rem KV_Y 1
rem KV_Z 1
rem KR_X 3
rem KR_Y 3
rem KR_Z 3
KF_X 1
KF_Y 1
KF_Z 1
rem KI_X 0
rem KI_Y 0
rem KI_Z 0
step_1_x 260
step_1_z -180
step_2_x 260
step_2_z -180
-----------------------
--
; Safe Zone parameters...
SAFELOW_X 0
SAFEHIGH_X 3050
SAFELOW_Y 395
SAFEHIGH_Y 460
SAFELOW_Z 0
SAFEHIGH_Z 1000
-----------------------
--
; No of (axes) :- 3 = gantry, 4 = gantry + wrist
AXES 3
-----------------------
--
; ASRS Physical make up
ROWS 5
COLUMNS 5
SIDES 2
-----------------------
--
;Number of Stations
S 2
;Names of stations
S_1 Conveyor
S_2 Agv
;S_3 Unload_Conveyor
============
; ASRS
============

;Side 1 Pigeon Holes
1_1_1_X 1402.00
1_1_1_Y 426.00
1_1_1_Z 955.00
1_1_2_X 1662.00
1_1_2_Y 426.00
1_1_2_Z 955.00
1_1_3_X 1922.00
1_1_3_Y 426.00
1_1_3_Z 955.00
1_1_4_X 2182.00
1_1_4_Y 426.00
1_1_4_Z 955.00
1_1_5_X 2442.00
1_1_5_Y 426.00
1_1_5_Z 955.00
1_2_1_X 1402.00
1_2_1_Y 426.00
1_2_1_Z 775.00
1_2_2_X 1662.00
1_2_2_Y 426.00
1_2_2_Z 775.00
1_2_3_X 1922.00
1_2_3_Y 426.00
1_2_3_Z 775.00
1_2_4_X 2182.00
1_2_4_Y 426.00
1_2_4_Z 775.00
1_2_5_X 2442.00
1_2_5_Y 426.00
1_2_5_Z 775.00
1_3_1_X 1402.00
1_3_1_Y 426.00
1_3_1_Z 595.00
1_3_2_X 1662.00
1_3_2_Y 426.00
1_3_2_Z 595.00
1_3_3_X 1922.00
1_3_3_Y 426.00
1_3_3_Z 595.00
1_3_4_X 2182.00
1_3_4_Y 426.00
1_3_4_Z 595.00
1_3_5_X 2442.00
1_3_5_Y 426.00
1_3_5_Z 595.00
1_4_1_X 1402.00
1_4_1_Y 426.00
1_4_1_Z 415.00
1_4_2_X 1662.00
1_4_2_Y 426.00
1_4_2_Z 415.00
1_4_3_X 1922.00
1_4_3_Y 426.00
1_4_3_Z 415.00
1_4_4_X 2182.00
1_4_4_Y 426.00
1_4_4_Z 415.00
1_4_5_X 2442.00
1_4_5_Y 426.00
1_4_5_Z 415.00
1_5_1_X 1402.00
1_5_1_Y 426.00
1_5_1_Z 235.00
1_5_2_X 1662.00
1_5_2_Y 426.00
1_5_2_Z 235.00
1_5_3_X 1922.00
1_5_3_Y 426.00
1_5_3_Z 235.00
1_5_4_X 2182.00
1_5_4_Y 426.00
1_5_4_Z 235.00
```

```
1_5_5_X 2442.00
1_5_5_Y 426.00
1_5_5_Z 235.00
;Side 2 Pigeon
Holes
2_1_1_X 1402.00
2_1_1_Y 426.00
2_1_1_Z 955.00
2_1_2_X 1662.00
2_1_2_Y 426.00
2_1_2_Z 955.00
2_1_3_X 1922.00
2_1_3_Y 426.00
2_1_3_Z 955.00
2_1_4_X 2182.00
2_1_4_Y 426.00
2_1_4_Z 955.00
2_1_5_X 2442.00
2_1_5_Y 426.00
2_1_5_Z 955.00
2_2_1_X 1402.00
2_2_1_Y 426.00
2_2_1_Z 775.00
2_2_2_X 1662.00
2_2_2_Y 426.00
2_2_2_Z 775.00
2_2_3_X 1922.00
2_2_3_Y 426.00
2_2_3_Z 775.00
2_2_4_X 2182.00
2_2_4_Y 426.00
2_2_4_Z 775.00
2_2_5_X 2442.00
2_2_5_Y 426.00
2_2_5_Z 775.00
2_3_1_X 1402.00
2_3_1_Y 426.00
2_3_1_Z 595.00
2_3_2_X 1662.00
2_3_2_Y 426.00
2_3_2_Z 595.00
2_3_3_X 1922.00
2_3_3_Y 426.00
2_3_3_Z 595.00
2_3_4_X 2182.00
2_3_4_Y 426.00
2_3_4_Z 595.00
2_3_5_X 2442.00
2_3_5_Y 426.00
2_3_5_Z 595.00
2_4_1_X 1402.00
2_4_1_Y 426.00
2_4_1_Z 415.00
2_4_2_X 1662.00
2_4_2_Y 426.00
2_4_2_Z 415.00
2_4_3_X 1922.00
2_4_3_Y 426.00
2_4_3_Z 415.00
2_4_4_X 2182.00
2_4_4_Y 426.00
2_4_4_Z 415.00
2_4_5_X 2442.00
2_4_5_Y 426.00
2_4_5_Z 415.00
2_5_1_X 1402.00
2_5_1_Y 426.00
2_5_1_Z 235.00
2_5_2_X 1662.00
2_5_2_Y 426.00
2_5_2_Z 235.00
2_5_3_X 1922.00
2_5_3_Y 426.00
2_5_3_Z 235.00
2_5_4_X 2182.00
2_5_4_Y 426.00
2_5_4_Z 235.00
2_5_5_X 2442.00
2_5_5_Y 426.00
2_5_5_Z 235.00
;Number of steps
to load and unload
side 1
A_1_OFF 4
A_1_ON 5
;Number of steps
to load and unload
side 2
A_2_OFF 5
A_2_ON 4
;ASRS side 1 Load
& Unload
sequences
A_1_ON_1_X
0.00
A_1_ON_1_Y
0.00
A_1_ON_1_Z 0.00
A_1_ON_1_D
10000.0
A_1_ON_1_W 0
A_1_ON_2_X
0.00
A_1_ON_2_Y
0.00
A_1_ON_2_Z -
19.00
A_1_ON_2_D
3000.0
A_1_ON_2_W 0
A_1_ON_3_X
0.00
A_1_ON_3_Y -
240.00
A_1_ON_3_Z -
19.00
A_1_ON_3_D
3000.0
A_1_ON_3_W 0
A_1_ON_4_X
0.00
A_1_ON_4_Y -
240.00
A_1_ON_4_Z 5.00
A_1_ON_4_D
3000.0
A_1_ON_4_W 0
S_1_X 506.00
S_1_Y 426.00
S_1_Z 78.00
S_1_OFF 2
S_1_ON 2
S_2_X 3031.00
S_2_Y 426.00
S_2_Z 68.00
S_2_OFF 5
S_2_ON 5
S_3_X 0.00
S_3_Y 0.00
S_3_Z 0.00
S_3_OFF 0
S_3_ON 0
S_4_X 0.00
S_4_Y 0.00
S_4_Z 0.00
S_4_OFF 0
S_4_ON 0
A_1_OFF_1_X
0.00
A_1_OFF_1_Y
0.00
A_1_OFF_1_Z
0.00
A_1_OFF_1_D 0.0
A_1_OFF_1_W 0
A_1_OFF_2_X
0.00
A_1_OFF_2_Y
0.00
A_1_OFF_2_Z
0.00
A_1_OFF_2_D 0.0
A_1_OFF_2_W 0
A_1_OFF_3_X
0.00
A_1_OFF_3_Y
0.00
A_1_OFF_3_Z
0.00
A_1_OFF_3_D 0.0
A_1_OFF_3_W 0
A_1_OFF_4_X
0.00
A_1_OFF_4_Y
0.00
A_1_OFF_4_Z
0.00
A_1_OFF_4_D 0.0
A_1_OFF_4_W 0
A_2_OFF_1_X
0.00
A_2_OFF_1_Y
0.00
A_2_OFF_1_Z
0.04
A_2_OFF_1_D
10000.0
A_2_OFF_1_W 0
A_2_OFF_2_X
0.00
A_2_OFF_2_Y
240.00
A_2_OFF_2_Z
0.00
A_2_OFF_2_D
3000.0
A_2_OFF_2_W 0
A_2_OFF_3_X
0.04
A_2_OFF_3_Y
240.00
```

A_2_OFF_3_Z -19.00
A_2_OFF_3_D 3000.0
A_2_OFF_3_W 0
A_2_OFF_4_X 0.04
A_2_OFF_4_Y 0.00
A_2_OFF_4_Z -19.00
A_2_OFF_4_D 3000.0
A_2_OFF_4_W 0
A_2_ON_1_X 0.00
A_2_ON_1_Y 0.00
A_2_ON_1_Z 0.00
A_2_ON_1_D 0.0
A_2_ON_1_W 0
A_2_ON_2_X 0.00
A_2_ON_2_Y 0.00
A_2_ON_2_Z 0.00
A_2_ON_2_D 0.0
A_2_ON_2_W 0
A_2_ON_3_X 0.00
A_2_ON_3_Y 0.00
A_2_ON_3_Z 0.00
A_2_ON_3_D 0.0
A_2_ON_3_W 0
A_2_ON_4_X 0.00
A_2_ON_4_Y 0.00
A_2_ON_4_Z 0.00
A_2_ON_4_D 0.0
A_2_ON_4_W 0
S_1_OFF_1_X 0.00
S_1_OFF_1_Y 0.00
S_1_OFF_1_Z 200.00
S_1_OFF_1_D 10000.0
S_1_OFF_1_W 0
S_1_OFF_2_X 0.00
S_1_OFF_2_Y 0.00
S_1_OFF_2_Z 0.00
S_1_OFF_2_D 3000.0
S_1_OFF_2_W 0
S_1_ON_1_X 0.00
S_1_ON_1_Y 0.00
S_1_ON_1_Z 0.00
S_1_ON_1_D -2.0
S_1_ON_1_W 0
S_2_OFF_1_X 0.00
S_2_OFF_1_Y 0.00
S_2_OFF_1_Z 200.00
S_2_OFF_1_D 10000.0
S_2_OFF_1_W 0
S_2_OFF_2_X 0.00
S_2_OFF_2_Y 0.00
S_2_OFF_2_Z -10.00
S_2_OFF_2_D 3000.0
S_2_OFF_2_W 0
S_2_OFF_3_X 0.00
S_2_OFF_3_Y -220.00
S_2_OFF_3_Z -10.00
S_2_OFF_3_D 3000.0
S_2_OFF_3_W 0
S_2_OFF_4_X 0.00
S_2_OFF_4_Y -220.00
S_2_OFF_4_Z 200.00
S_2_OFF_4_D 3000.0
S_2_OFF_4_W 0
S_2_OFF_5_X 0.00
S_2_OFF_5_Y 0.00
S_2_OFF_5_Z 200.00
S_2_OFF_5_D 3000.0
S_2_OFF_5_W 0
S_2_ON_1_X 0.00
S_2_ON_1_Y 0.00
S_2_ON_1_Z 200.00
S_2_ON_1_D 10000.0
S_2_ON_1_W 0
S_2_ON_2_X 0.00
S_2_ON_2_Y -220.00
S_2_ON_2_Z 200.00
S_2_ON_2_D 3000.0
S_2_ON_2_W 0
A_1_ON_5_X 0.00
A_1_ON_5_Y 0.00
A_1_ON_5_Z 0.00
A_1_ON_5_D 3000.0
A_1_ON_5_W 0
A_2_OFF_5_X 0.00
A_2_OFF_5_Y 0.00
A_2_OFF_5_Z 0.00
A_2_OFF_5_D 3000.0
A_2_OFF_5_W 0
S_2_ON_3_X 0.00
S_2_ON_3_Y -220.00
S_2_ON_3_Z -10.00
S_2_ON_3_D 3000.0
S_2_ON_3_W 0
S_2_ON_4_X 0.00
S_2_ON_4_Y 0.00
S_2_ON_4_Z -10.00
S_2_ON_4_D 3000.0
S_2_ON_4_W 0
S_2_ON_5_X 0.00
S_2_ON_5_Y 0.00
S_2_ON_5_Z 200.00
S_2_ON_5_D 3000.0
S_2_ON_5_W 0
S_1_ON_2_X 0.00
S_1_ON_2_Y 0.00
S_1_ON_2_Z 200.00
S_1_ON_2_D 3000.0
S_1_ON_2_W