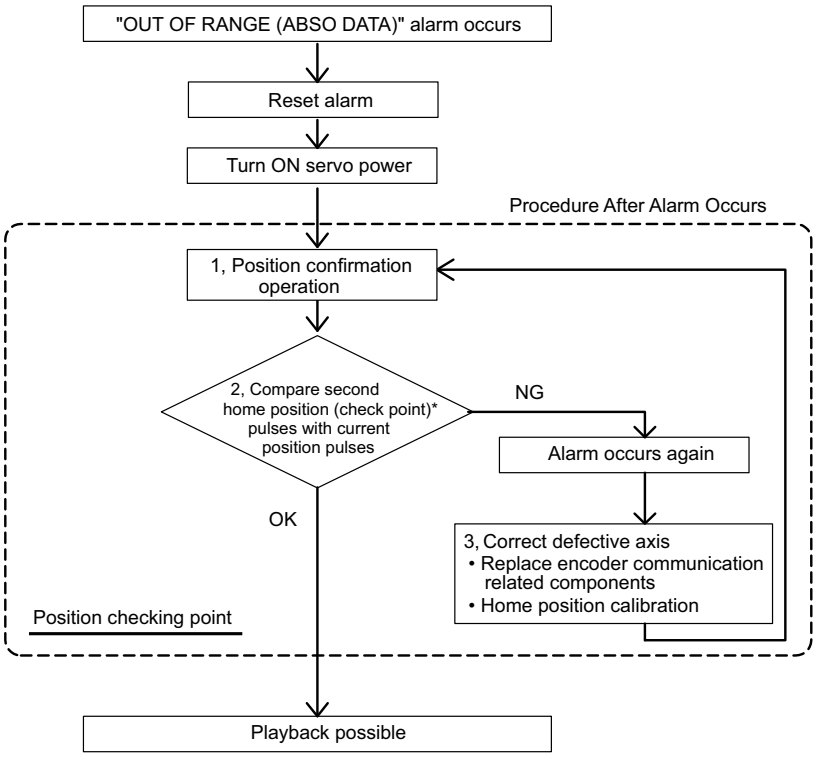
6.4.1 Purpose of Position Check Operation

If the absolute number of rotation detected at power supply ON does not match the data stored in the absolute encoder the last time the power supply was turned off, alarm 4107 “OUT OF RANGE (ABSO DATA)” is issued when the controller power is turned ON.

There are two possible causes of this alarm:

- An error was found in the encoder communication related components.
- No error was found in the encoder communication related components, but the manipulator was moved after the power supply was turned OFF.

If there is an error in the encoder communication related components, the manipulator may stall when playback is started. If the absolute data allowable range error alarm has occurred, playback and test runs will not function and the position must be checked.



1, Position Check

After the “OUT OF RANGE (ABSO DATA)” alarm occurs, move to the second home position using the axis keys and perform the position confirmation. For performing the position confirmation, refer to *chapter 6.4.3 “Procedure after the Alarm”* . Playback and test runs will not function unless “CONFIRM POSITION” is performed.

2, Pulse Difference Check

The pulse number at the second home position is compared with that at the current position. If the difference is within the allowable range, playback is enabled. If not, the alarm occurs again.

- The allowable range pulse is the number of pulses per rotation of the motor (PPR data).
- The initial value of the second home position is the home position (where all axes are at pulse 0). The second home position can be changed. For details, refer to *chapter 6.4.2 "Procedure for the Second Home Position Setting (Check Point)"* .

3, Alarm Occurrence

If the alarm occurs again, there may be an error in the encoder communication related components. Check the components. After adjusting the erroneous axis, calibrate the home position of the axis, and then check the position again.

NOTE

- When the home position calibration for all the axes is performed at the same time, playback operations are possible without the position confirmation.
- For a system with a manipulator that has no brake, after the alarm occurs, there is a case that the playback operations are possible without the position confirmation. (However, as a rule, "CONFIRM POSITION" must be performed**.)**
  Under the above special conditions, the manipulator moves as follows:

After starting, the manipulator moves at low speed (1/10 of the maximum speed) to the step indicated by the cursor.

If it is stopped and restarted during this motion, the low speed setting is kept until the step at cursor is reached. Regardless of cycle setting, the manipulator stops after the cursor step is reached.

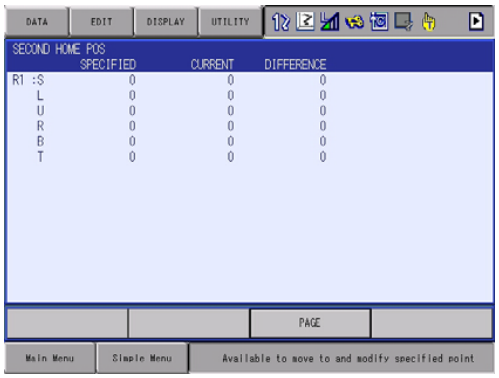
When starting the manipulator again after it is stopped, the manipulator operates at the programmed speed and cycle of the job.

6.4.2 Procedure for the Second Home Position Setting (Check Point)

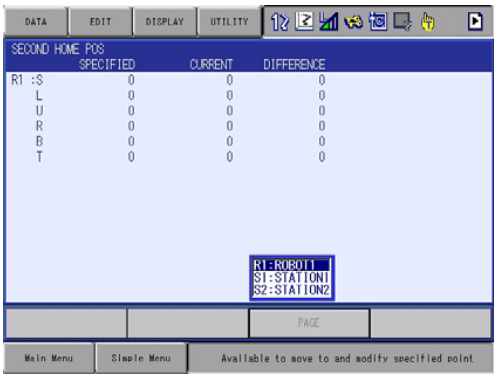
Apart from the “home position” of the manipulator, the second home position can be set up as a check point for absolute data. Perform the following steps to set the specified point.

If two or more manipulators or stations are controlled by one controller, the second home position must be set for each manipulator or station.

1. Select {ROBOT} under the main menu.
2. Select {SECOND HOME POS}.
   – The SECOND HOME POS window appears.
   The message “Available to move to and modify specified point” is shown.



3. Press the page key [PAGE], or select “PAGE” to display the selection window for the control group.
   – The group axes by which the second home position is set is selected when there are two or more group axes.



4. Press the axis keys.
   – Move the manipulator to the new second home position.
5. Press [MODIFY] and [ENTER].
   – The second home position is changed.

6.4.3 Procedure after the Alarm

WARNING

- When performing the position check operation, pay careful attention to ensure the safety of the surrounding operation environment.

An error in the encoder communication related components may be the cause of the alarm. In this case, the manipulator may move in an unexpected direction, which may result in personal injury and/or equipment damage.

If the “OUT OF RANGE (ABSO DATA)” alarm occurs, perform the followings:

- Reset the alarm
- Turn Servo power ON

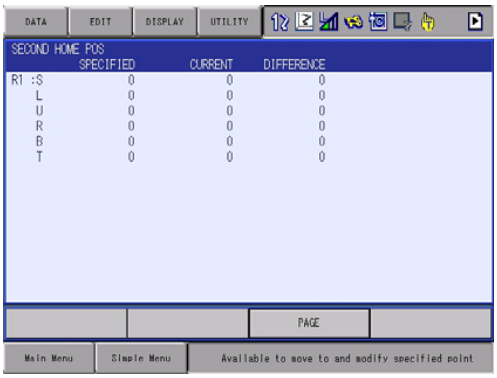
And then confirm the second home position. After the confirmation, if the encoder communication related components are found to be the cause of the alarm, perform the necessary operations, such as replacing the encoder communication related components, etc.

The robot current position data when turning main power supply OFF and ON can be confirmed in “POWER ON/OFF POS” window.

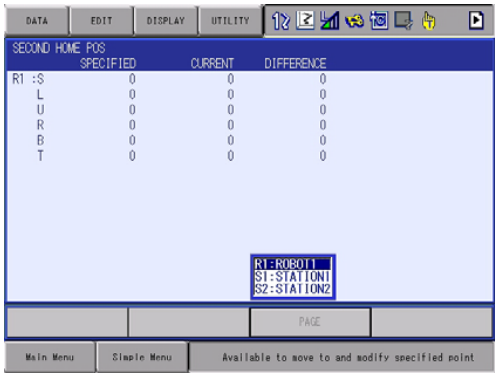
SUPPLE-MENT

Refer to*chapter 7.7 “Position Data When Power Is Turned ON/OFF”* for details on the “POWER ON/OFF POS” window.

1. Select {ROBOT} under the main menu.
2. Select {SECOND HOME POS}.
   – The SECOND HOME POS window appears.



3. Press the page key [PAGE], or select "PAGE" to display the selection window for the control group.
   – The group axes by which the second home position is set is selected when there are two or more group axes.



4. Press [FWD].
   – TCP moves to the second home position. The robot moving speed is set as selected manual speed.

5. Select {DATA} under the menu.
6. Select {CONFIRM POSITION}.
   – The message “Home position checked” is shown.
   Pulse data of the second home position and current pulse data are compared. If the compared error is in allowed range, playback operation can be done.
   If the error is beyond the allowed range, the alarm occurs again.