

# Procedure to Operate the Manipulator Arm

Prepared by Norman Blythe

Reviewed by Mark Klaene and Jon Brinkmann

Maintained by Gretchen Van Doren

Last modified on 2001-09-10 at 18:22:35

The proper method to move data cartridges using the manipulator arm(s) to and from storage racks, mapping station, or Lindy cart.

[Cautionary Notes](#)

[Equipment Involved in this Procedure](#)

[Procedure](#)

## CAUTIONARY NOTES:

You must be properly trained on the use of the manipulator arm prior to accomplishing this procedure; see [training list](#).

TRIPPING HAZARDS are present. Clear the general work area to maneuver the manipulator arm.

CRUSH HAZARDS are present. Be sure to allow for enough room to accomplish the task.

FALL HAZARDS are present. There is a large trench (5' wide X 6' deep X 15' long) in the cartridge elevator bay - use caution when elevator doors are open.

THIS OPERATION CAN BE ACCOMPLISHED BY ONE PERSON; TWO PERSONS ARE REQUIRED IF THERE IS A HEAVY WORKLOAD.

There is no emergency back-up power to the manipulator. If power is interrupted, contact site staff.

SAFETY WEAR: (recommended) rubber-soled shoes

## EQUIPMENT INVOLVED IN THIS PROCEDURE

**Data cartridge;** Location: stored on racks inside elevator bay, plugging station, or mapping station; Appearance: approx 4.5' dia X 3' thick., fiber optic wire interior, plate top, protected sides, top, and bottom; nine total; 400 lbs. each.

**Manipulator arm; Location:** mounted on a rail both inside and outside, adjacent to the elevator bay; **Appearance:** grey main body and double-pivot, articulated fork (arm) with two tines; weight supported.

---

**PROCEDURE: accomplish in numerical order**

1. Turn on the power to the manipulator using the switch marked "Manipulator Power" to the right of the interior elevator bay door. The electrical power to the manipulator is normally turned off when not in use.

2. A light tree located on the arm will cycle indicated the location and status of the arm. Flashing red lights at top or bottom of tree indicate arm is at either its top or bottom limits. Flashing yellow lights indicate whether arm is at proper level for mapping station, plug station, or mapping table.

3. To move the manipulator along the rail to the desired location, push or pull (depending on the direction of travel) the aluminum handle located on the side of the main body. To stop motion, let go of the handle.

4. The arm has a double-pivot elbow. You can lock the elbow by engaging the red-knobbed handle at the arm's elbow.

5. To manipulate the arm, grasp the horizontal plastic bar with two hands. You will hear a clicking sound. This is the manipulator air brake being released. There is a small light beam passing over the bar acting as an interlock. When you remove your hands during operation the arm self-locks and is safe to leave. **Do not leave the arm unattended when a cartridge is engaged.**

6. Pressing one side of the bar or the other moves the arm left or right; raising or dropping the bar moves the arm up or down. The indicator lights will change with the arm's position. The toggle switch in the middle of the horizontal bar

allows the operator to slowly move the manipulator along the rail without using the aluminum handle.

7. Maneuver the manipulator so that the tines of the arm are underneath the aluminum "ears" on either side of the data cartridge. Pull up on the bar so that the arms engage the cartridge "ears". There are pressure-sensitive interlocks at the end of the tines and are very sensitive. Several attempts may have to be made in order to seat the tines and "ears" correctly.

8. Once properly engaged, lift the arm. The arm will stop when it has reached its maximum height. After checking your surroundings, you are now able to move the arm in ANY direction.

**Do not move the data cartridge or arm without being sure your path is clear.**

**END OF PROCEDURE**

---