

CMPT 276 Group 20

Macrohard Corp.

TrackMaster

Release 5

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Release History Page

- | | |
|---------------|--|
| Rel. 1 | <ul style="list-style-type: none">- 2024/06/07- Was composed of just the preliminary Requirements Spec. |
| Rel. 2 | <ul style="list-style-type: none">- 2024/06/19- Initial release of the user manual, providing comprehensive guidance on <i>TrackMaster's</i> features and functionalities |

Release Table Page

Configuration Item:	Version	Number of Each Configuration Item in:			
	Rel. 1	Rel. 2			
<u>Documents</u>					
Requirements Spec	1	1	1	1	1
User Manual		1	1	1	2
Architectural Design Document			1	1	1
Detailed Design Document				1	1
Integration Report					1
<u>Modules</u>					
Main.cpp			1	1	2
Backup.h				1	2
Backup.cpp				1	2
Change.h			1	1	2
Change.cpp				1	2
EntityIO.h					1
EntityIO.cpp					1
FileNotOpenException.h				1	1
FileNotOpenException.cpp				1	1
FileOpenFailedException.h				1	1
FileOpenFailedException.cpp				1	1
GlobalEntities.h					1
LifeCycleController.cpp					1

LifeCycleController.h			1
RecordNotFoundException.h		1	1
RecordNotFoundException.cpp		1	1
Request.h	1	1	2
Request.cpp		1	2
Requester.h	1	1	2
Requester.cpp		1	2
PrintController.h	1	1	2
PrintController.cpp		1	2
Product.h	1	1	2
Product.cpp		1	2
ProductRelease.h	1	1	2
ProductRelease.cpp		1	2
ScenarioController.h	1	1	2
ScenarioController.cpp		1	2
testFileOps.cpp		1	2
UI.h	1	1	2
UI.cpp	1	1	2
unitTestMain.cpp	1	1	2

CMPT 276 Group 20

Macrohard Corp.

TrackMaster

User Manual

Version 2

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Document Version History

Version 1 - Original version released in 2024/06/19 by James Isaac, Jin Bowen, Saadati Aryan, and Sit Kwan Wai

Table of Contents

Content	Page
Title Page	1
Release History	2
Release Table	3
User Manual Title Page	4
Document Version History	5
Table of Contents	6
Section 1: Introduction	8
Section 1.1: Welcome	
Section 1.2: System Overview	
Section 1.3: Conventions Used in this Manual	
Section 2: Installation	11
Section 2.1: System Requirements	
Section 2.2: Back-up of Distribution Disks	
Section 2.3: Installation Steps	
Section 2.4: How to Start TrackMaster	
Section 3: Introduction to User Interface	14
Section 3.1: General Overview	
Section 3.2: Menu System and Navigation	
Section 3.3: User Input	
Section 3.4: Scrolling	
Section 4: Operating Procedures	17
Section 4.1: Create Request	
Section 4.2: Create Requester	
Section 4.3: Create Product	
Section 4.4: Assess New Change Items	
Section 4.5: Update a Change Item	
Section 4.6: Inquire a Change Item	
Section 4.7: Print Report	
Section 4.8: Back-up	
Section 5: Back-up Procedures	34
Section 6: References	35
Section 6.1: Operational Exceptions	
Section 6.2: Listing of Data Formats and Fields	
Section 6.3: Menu Tree	

1) Introduction

1.1) Welcome

Welcome to *TrackMaster*! Macrohard Corp. is pleased to introduce you to the newest generation of software bug tracking systems. Our goal is to provide the most robust, efficient, effective and user friendly method of tracking software issues.

This user manual document is meant to serve as a step by step guidance tool for all users from all different technological backgrounds to successfully operate and master the use of *TrackMaster*.

For any inquiries or information regarding the manual, please contact our toll-free customer support line at 1-778-MACROHD or write to us at customer.support@MHD.ca. Our trained and talented staff support members would be delighted to answer any questions.

1.2) System Overview

TrackMaster is designed to allow its users to effortlessly create records of issues and track several other related information, including keeping track of all the issue requests and items and their corresponding product information while also keeping a record of all customers and employees who are involved with each and every item.

The key features of the system include:

- Creating a request item
- Creating a requester
- Creating a product
- Assessing new change items
- Updating change items
- Inquiring a change item
- Printing a report

Integrating *TrackMaster* into your company's workflow allows you to fully digitalize your issue tracking system, saving you time and money on the cumbersome, inconvenient and environmentally damaging use of paper records.

The number one priority behind the design of *TrackMaster*, after reliability and robustness, is user friendliness. Our program promises a streamlined and easy to master user-software interaction environment. Any new user, regardless of their computer skills, can learn to use the system with minimal training time.

The automated system allows the user to input and inquire information at a much faster rate. This advantage allows for saving time and effort that can be spent on various different tasks by the employees.

TrackMaster also provides daily reports to the operators on new information that need to be worked on, further highlighting the streamlined process that is provided by our system.

The diagram below is meant to illustrate the relationship between *TrackMaster* and its users.

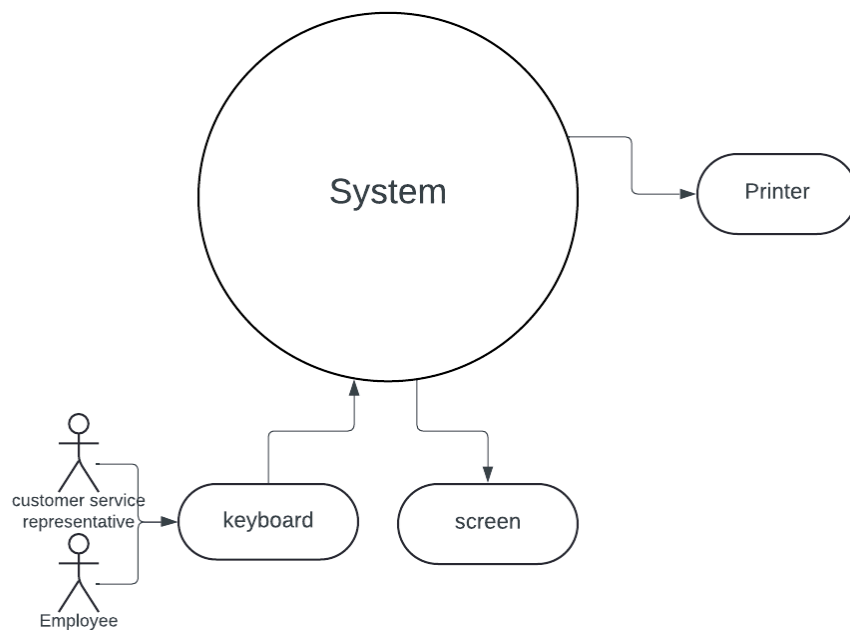


Figure 1.2.1: Level 0 Context Diagram

1.3) Conventions Used in this Manual

Throughout the rest of the manual the user will be related to as “you” and the MacroHard development team will be related to as “us”.

The following point are meant to clarify some of the conventions that will be used throughout the rest of this document:

- Screen output will be shown as: Please enter the product name
- Pressing the ENTER key will be denoted as: **<ENTER>**
- The phrase “ENTER ...” implies a user input followed by pressing the ENTER key. For example “ ENTER customer name”.
- The Backspace Key will be denoted as: **<BACKSPACE>**
- A numbered list indicates a sequence of steps that must be followed in the ordered direction
- The expression **(Y/N)** is prompting the user to ENTER **<Y>** for yes or **<N>** for no. The input is case insensitive.

2) Installation

2.1) System Requirements

To use *TrackMaster* you will need:

1. Monitors

Resolution: 1920x1080

Size: 21"

Ports: HDMI

2. PC System

Processor: Dual core 2.8 GHz

RAM: 2 GB

Storage: 4 GB Hard Disk

Operating System: Linux Ubuntu 22.04 (Jammy Jellyfish)

Ports: USB 3.0/3.1

3. Keyboard

Model: Standard QWERTY

Connectivity: USB

4. Printer

Model: Dot Matrix

Speed: 30 pages per minute

Resolution: 1200x1200 DPI

Connectivity: USB

5. External Hard Disk

Capacity: 4 GB

Connectivity: USB

2.2) Back-up of Distribution Disks

Please back-up the distribution disk to a blank external hard disk before beginning installation process of *TrackMaster*. The procedures are as follows:

1. Insert the USB disk of *TrackMaster* into the PC system.
2. Connect the external hard disk with a USB into the PC system.
3. Launch *TrackMaster*.
4. Click on option: 'Backup'.
5. Enter the destination directory when prompted.
 - For example: If the external hard disk is identified by the PC system as 'drive', enter: 'dev/drive'
 - The chosen directory will be used to store backup of both installation and data
6. Monitor and ensure the process completes without any errors.
7. Disconnect the external hard disk and *TrackMaster* USB disk.

Please ensure that the external hard disk is stored in a secure location.

2.3) Installation Steps

Install *TrackMaster* by following the steps below:

1. Insert the USB disk of *TrackMaster* into the PC system.
2. Launch *TrackMaster*.
3. Click on option: 'Install'.
4. Enter the installation directory when prompted.
 - Default is set as 'usr/bin/TrackMaster'. Edit if necessary.
 - After the installation directory is set as desired, click 'Next'.
5. Enter the data directory when prompted.
 - Default is set as 'usr/bin/TrackMaster/data'. Edit if necessary.
 - After the data directory is set as desired, click 'Next'.
6. Check either/both boxes for 'Create desktop shortcut' and 'Create start menu shortcut'.
 - You must pick at least 1 option. After at least 1 option is picked, the 'Install Now' option will appear and you can click on it.
7. Monitor and ensure the process completes without any errors.
8. Disconnect the *TrackMaster* USB disk.

Common errors during installation are commonly a result of insufficient storage space or incompatible hardware.

If the system detects **insufficient storage space**, the user may receive the following error message:

Insufficient Storage Space For Installation

In this case, free up space from the installation directory by removing unwanted files and programs to allow for installation

If the user receives this following error message regarding the **hardware**:

Hardware Incompatible

It is implied that the PC system used to install *TrackMaster* does not meet the minimum requirements specified. For more details, refer to the minimum requirements mentioned in *Section 2.1*.

2.4) How to Start TrackMaster

To run *TrackMaster*, click on the *TrackMaster* icon either in the start menu or desktop. The program will start to run and you can interact with the user interface.

3) Introduction to the User Interface

3.1) General Overview

TrackMaster's user interface is a character-based, text-only terminal program, designed for **keyboard-only input**. The **display has a fixed height**, limiting the number of lines shown at once, but the terminal window itself can be resized by clicking and dragging its corner. This provides a consistent and predictable interface while allowing you to adjust the window size to your preference. However, it is recommended that you stick to the default terminal size to prevent any unexpected display issues.

3.2) Menu System and Navigation

TrackMaster features a hierarchical menu system comprising a main menu and various sub-menus. Navigation within the menus is straightforward—you input the corresponding command character to initiate the desired action. These command options are consistently displayed beside their associated actions.

For instance, in the main menu:

```
=== MAIN MENU ===
1) Create
2) Update
3) Inquire
4) Print
5) Backup
0) Quit TrackMaster
ENTER selection [0-5]:
```

Entering **<1>** will send you to the Create sub-menu. The command **<0>** is always reserved for either exiting the program, exiting a sub-menu, or aborting a procedure in progress (e.g., abort while creating a new request).

Upon navigating to a different section within the program, such as the Create sub-menu, the previous menu will be cleared from the terminal. Additionally, if the system prompts the user for subsequent inputs during a procedure, previous inputs may also be cleared to make room for the new inputs.

3.3) User Input

TrackMaster will prompt the user whenever input is required, with the prompt always appearing as the last line of displayed text. Each prompt includes clear instructions on what the system expects. For instance, in the main menu:

```
ENTER selection [0-5]:
```

Here, the user is prompted to select a menu option by entering a number from 0 to 5.

User input generally involves selecting navigation options or items from a list by entering corresponding numbers, or providing text inputs such as names or dates. Input is confirmed by pressing the **<ENTER>** key, and you can delete characters from your input using the **<BACKSPACE>** key.

Single-character commands (such as yes **<Y>** or no **<N>**) are not case-sensitive. Therefore, the user may choose to enter them in either lowercase or uppercase.

In the case of invalid input¹, the system displays an error message along with the expected input and then refreshes the screen with the prompt.

```
Error: Input is invalid. Re-enter input.  
Enter 0 to abort and return to the main menu.
```

```
=== MAIN MENU ===  
1) Create  
2) Update  
3) Inquire  
4) Print  
5) Backup  
0) Quit TrackMaster  
ENTER selection [0-5]:
```

¹ Invalid Input details are specified in *Section 6.1: Operational Exceptions (page 35)*

3.4) Scrolling

As outlined in the user interface general overview in *Section 3.1*, the display maintains a fixed height, necessitating a strategy for handling cases where there's insufficient space to show all items, such as an extensive list. In such situations, additional commands for scrolling are provided below the displayed list.

For example:

```
=== LIST ===
1) Item 1
2) Item 2
3) Item 3
4) Item 4
5) Item 5
*...
n) display next items
0) Exit List
ENTER selection [0-20] or n:
```

Here, the system indicates that there are more items to display beyond what's shown.

If the user chooses to ENTER **<n>**, the next set of items is displayed:

```
=== LIST ===
6) Item 6
7) Item 7
8) Item 8
9) Item 9
10) Item 10
*...
p) display previous items
n) display next items
0) Exit List
ENTER selection [0-20] or p/n:
```

In this updated view, the user can choose to display the previous set of items by ENTERING **<p>** or proceed with viewing the next set by ENTERING **<n>**. These instructions are only displayed when there are additional items beyond the current display range.

4) Operating Procedures

This section provides a list of procedures you, as a user, may go through, along with the steps, prompts, and inputs to expect. Please refer to the conventions outlined in *Section 1.3* of this user manual to understand how to follow these procedures.

Each procedure will alternate between what the system displays and the expected user input.

At the end of each procedure, there will be a table highlighting steps where a system error may occur. The table will include the step, the reason for the possible error, and a brief description of how to avoid it.

4.1) Create Request

The user must start in the main menu

```
=== MAIN MENU ===
```

```
1) Create
2) Update
3) Inquire
4) Print
5) Backup
0) Quit TrackMaster
```

```
ENTER selection [0-5]: 1
```

Step 1: ENTER <1> to enter the Create menu.

```
=== Create Menu ===
```

```
1) Create Request
2) Create Requester
3) Create Product
4) Create Product Release
0) Main Menu
```

```
ENTER selection [0-5]: 1
```

Step 2: Once in the create sub-menu, ENTER <1> to create a request.

```
Is this request coming from a customer or an employee?
```

```
ENTER a selection [c - customer/e - employee]
```

```
OR ENTER <0> to abort and exit to the main menu: c
```

Step 3: ENTER the command specifying whether the request is from a customer or an employee. Customer and employee lists are similar; whichever list is displayed does not affect the subsequent steps.

=== Select Customer ===

Name	Email
1) Front Tussel	ft@sfu.ca
2) Mark Zuck	markzuck@metuh.com
3) Jeff Bozos	jeffb@amoozon.com
4) New Customer	

ENTER selection [1-4] OR <0> to abort and exit to the main menu: **2**

Step 4: ENTER the number corresponding to the customer (or employee) from whom the request is coming. If the customer (or employee) is not on the list, ENTER the last number (4 in this case) and follow steps 3-6 of the Create Requester (4.2) procedure, then return to this step.

ENTER the DATE of the request (YYYY-MM-DD) OR ENTER <0> to abort and exit to the main menu: **20240614**

Step 5: ENTER the date of the request in the requested format.

=== Select Product ===

- 1) TakTak
- 2) FreddyBear
- 3) Cheeses
- 4) Rudolph
- 5) New Product

ENTER selection [1-5] OR <0> to abort and exit to the main menu: **2**

Step 6: ENTER the number corresponding to the product related to the request. If the product is not on the list, ENTER the last number (5 in this case), complete step 3 of the *Section 4.3: Create Product* procedure, and then return to this step.

=== Select Product Release ===

- 1) 1001
- 2) 1002
- 3) 1003
- 4) 1004

ENTER selection [1-4] OR <0> to abort and exit to the main menu: **3**

Step 7: ENTER the number corresponding to the product release that the request is about.

=== Select a Priority ===

- 1) Low
- 2) Medium
- 3) High
- 4) Very High
- 5) Critical

ENTER selection [1-5] OR <0> to abort and exit to the main menu: **3**

Step 8: ENTER the number corresponding to the priority of the request.

=== Select Change Item ===

Description	ChangeID
1) Freddy's voice is squeaky	1234
2) New Change	

ENTER selection [1-2] OR <0> to abort and exit to the main menu: **1**

Step 9: ENTER the number corresponding to the change item related to the request. If no relevant change exists, ENTER the last option (2 in this example) to create a new change. Otherwise, skip to step 12.

ENTER a description for the new change (30 char. max) OR ENTER <0> to abort and exit to the main menu: **Freddy bites too much.**

Step 10: ENTER a description for the new change item.

Select a product release that the change is anticipated to be completed for.

=== Select Product Release ===

- 1) 1001
- 2) 1002
- 3) 1003
- 4) 1004
- 5) Skip

ENTER selection [1-4] OR <0> to abort and exit to the main menu:

Step 11: ENTER the number corresponding to the product release that the change item is anticipated to be completed for, or skip selection.

=== New Request Information===

Requester (employee): Mark Zuck - markzuck@metuh.com

Product: FreddyBear

Release: 1.2

Priority: 2 - Medium

Change ID: 1234

ENTER <1> to confirm OR <0> to abort and exit to main menu:

Step 12: ENTER <1> to confirm, and then you will be redirected to the main menu.

Step	Reason	Description
1, 2, 4, 6-9, 11	- Input Validity	- The user input must be one of the displayed numbered options
3	- Input Validity	- The command must be one of <c> or <e>
5	- Input Validity	- The date must be in the format YYYY-MM-DD
10	- Input Validity	- The description must be a maximum length of 30 characters
Upon Completion	- Hard Disk May Be Full	- Refer to section 6.1.1

4.2) Create Requester

The user must start from the main menu

```
=== MAIN MENU ===
```

```
1) Create
2) Update
3) Inquire
4) Print
5) Backup
0) Quit TrackMaster
```

```
ENTER selection [0-5]: 1
```

Step 1: ENTER <1> to enter the Create menu.

```
=== Create Menu ===
```

```
1) Create Request
2) Create Requester
3) Create Product
4) Create Product Release
0) Main Menu
```

```
ENTER selection [0-4]: 2
```

Step 2: Once in the create sub-menu, ENTER <2> to create a requester.

ENTER the EMAIL ADDRESS of the requester (Length: max 30)

OR ENTER <0> to abort and go back to the main menu: **ExampleEmail@Email.ca**

Step 3: ENTER the email of the requester.

ENTER the PHONE NUMBER of the requester (Length: Exactly 10)
OR ENTER <0> to abort and exit to the main menu: **7781234567**

Step 4: ENTER the phone number of the requester.

ENTER the LAST NAME followed by the FIRST NAME of the requester
(Length: max 15) OR ENTER <0> to exit to the main menu: **Front Tussel**

Step 5: ENTER the name of the requester in the prompted format.

ENTER the DEPARTMENT NAME of the requester (Length: max 12)
Must be left blank if requester is not an employee of the company
OR ENTER <0> to abort and exit to the main menu: **Marketing**

Step 6: ENTER the DEPARTMENT NAME of the requester.

The new requester has been successfully added to the system.
ENTER <0> to go back to the main menu.

Step 7: ENTER <0> to go back to the Main Menu.

Step	Reason	Description
1, 2	- Input Validity	- The user input must be one of the displayed numbered options
3	- Data Range	- The email must have a maximum of 30 characters
4	- Data Range	- The phone number must consist of exactly 10 characters
5	- Data Range	- The requester name must have a maximum of 15 characters, entered at the right order of the last name followed by the first name
	- Key Uniqueness	- The entered requester name must not already exist in the system
6	- Data Range	- The department name must have a maximum of 12 characters
Upon Completion	- Hard Disk May Be Full	- Refer to section 6.1.1

4.3) Create Product

The user must start from the main menu

```
=== MAIN MENU ===
```

- 1) Create
- 2) Update
- 3) Inquire
- 4) Print
- 5) Backup
- 0) Quit TrackMaster

```
ENTER selection [0-5]: 1
```

Step 1: ENTER <1> to enter the Create menu.

```
=== Create Menu ===
```

- 1) Create Request
- 2) Create Requester
- 3) Create Product
- 4) Create Product Release
- 0) Main Menu

```
ENTER selection [0-4]: 3
```

Step 2: Once in the create sub-menu, ENTER <3> to create a product.

ENTER the PRODUCT NAME (Length: max 10) OR ENTER <0> to abort and exit to the main menu: **TakTak**

Step 3: ENTER the product name.

The new product has been successfully added to the system.

ENTER <0> to go back to the main menu.

Step 4: ENTER <0> to go back to the Main Menu.

Step	Reason	Description
1, 2	- Input Validity	- The user input must be one of the displayed numbered options
3	- Data Range	- The product name must have a maximum of 10 characters
Upon Completion	- Hard Disk May Be Full	- Refer to section 6.1.1

4.4) Assess New Change Items

The user must start from the main menu

=== MAIN MENU ===

- 1) Create
- 2) Update
- 3) Inquire
- 4) Print
- 5) Backup
- 0) Quit TrackMaster

ENTER selection [0-5]: **2**

Step 1: ENTER <2> to enter the Update menu.

=== Update Menu ===

- 1) Assess new change items
- 2) Update a change item
- 0) Main Menu

ENTER selection [0-2]: **1**

Step 2: ENTER <1> to assess new change items.

=== Select Change Item ===

Product	Description	Status
1) FreddyBear	Freddy's voice is squeaky	Open
2) FreddyBear	Freddy Bites too much	Open

ENTER selection [1-2] OR ENTER <0> to abort and exit to main menu: **2**

Step 3: ENTER a number that corresponds to the change item you want to assess.

=== Select Status ===

- 1) Assessed
- 2) Canceled

ENTER selection [1-2] OR ENTER <0> to abort and exit to main menu: **1**

Step 4: ENTER a number that corresponds to the new status you'd like to give the change item.

ENTER a new description for the change [max 30 characters, leave blank to skip] OR <0> to abort and exit to main menu:

Step 5: ENTER a new description for the change item, or leave the field blank to indicate no update to the description.

Select a product release that the change is anticipated to be completed for.

=== Select Product Release ===

- 1) 1001
- 2) 1002
- 3) 1003
- 4) 1004
- 5) Skip

ENTER Selection [1-4] OR <0> to abort and exit to main menu: **3**

Step 6: ENTER the number corresponding to the product release that the change is anticipated to be completed for, or skip selection.

=== Assessed Change Item Information ===

Product: FreddyBear

Description: Freddy bites too much

Anticipated release: 1.3

Status: Assessed

Change ID: 1246

ENTER <1> character to confirm OR <0> to abort and exit to main menu:

Step 7: ENTER <1> to confirm the assessed change item, and then you will be redirected to the main menu.

Step	Reason	Description
1-4, 6	- Input Validity	- The user input must be one of the displayed numbered options
5	- Data Range	- The description must be a maximum of 30 characters long

4.5) Update a Change Item

The user must start from the main menu

```
=== MAIN MENU ===
```

- 1) Create
- 2) Update
- 3) Inquire
- 4) Print
- 5) Backup
- 0) Quit TrackMaster

```
ENTER selection [0-5]: 2
```

Step 1: ENTER <2> to enter the Update menu.

```
=== Update Menu ===
```

- 1) Assess new change items
- 2) Update a change item
- 0) Main Menu

```
ENTER selection [0-2]: 2
```

Step 2: ENTER <2> to update a change item.

```
=== Select Product ===
```

- 1) TakTak
- 2) FreddyBear
- 3) Cheeses
- 4) Rudolph
- 5) New Product

```
ENTER selection [1-5] OR <0> to abort and exit to the main menu: 2
```

Step 3: ENTER a number that corresponds to the product of the change item you want to update.

```
=== Select Change Item ===
```

Description	Status	ChangeID
1) Freddy's voice is squeaky	Assessed	1235
2) Freddy Bites too much	Assessed	1246

```
ENTER selection [1-2] OR <0> to abort and exit to main menu: 2
```

Step 4: ENTER a number that the change item you want to update

```
=== Select Status ===
```

- 1) In Progress
- 2) Done
- 3) Canceled
- 4) Skip

```
ENTER selection [1-4] OR <0> to abort and exit to main menu: 1
```

Step 5: ENTER a number that corresponds to the new status you'd like to give the change item, or skip.

ENTER a new description for the change (leave blank to skip) OR <0> to abort and exit to main menu [max 30 characters]:

Step 6: ENTER a new description for the change item, or leave the field blank to indicate no update to the description.

Select a product release that the change is anticipated to be completed for.

=== Select Product Release ===

- 1) 1001
- 2) 1002
- 3) 1003
- 4) 1004
- 5) Skip

ENTER Selection [1-4] OR <0> to abort and exit to main menu: **4**

Step 7: ENTER the number corresponding to the product release that the change is anticipated to be completed for, or skip selection.

=== Updated Change Information ===

Product: FreddyBear

Description: Freddy bites too much

Anticipated release: 1.3

Status: In Progress

Change ID: 1246

ENTER <1> character to confirm OR 0 to abort and exit to main menu:

Step 8: ENTER <1> to confirm the updated change item, and then you will be redirected to the main menu.

Step	Reason	Description
1-5, 7	- Input Validity	- The user input must be one of the displayed numbered options
6	- Data Range	- The description must be a maximum of 30 characters long
Upon Completion	- Hard Disk May Be Full	- Refer to section 6.1.1

4.6) Inquire a Change Item

The user must start from the main menu

```
=== MAIN MENU ===
```

- 1) Create
- 2) Update
- 3) Inquire
- 4) Print
- 5) Backup
- 0) Quit TrackMaster

```
ENTER selection [0-5]: 3
```

Step 1: ENTER **<3>** to enter the Inquire menu.

```
=== Select Product ===
```

- 1) TakTak
- 2) FreddyBear
- 3) Cheeses
- 4) Rudolph
- 0) Exit

```
ENTER Selection [0-4]: 3
```

Step 2: ENTER the number corresponding to the inquired change items product.

```
=== Select Change Item ===
```

Description	Status	ChangeID
1)Crashes when adding new cheese	In Progress	1235
2)Cannot find cheddar anymore	Completed	3453

```
ENTER selection [1-2] OR <0> to abort and exit to main menu: 1
```

Step 3: ENTER the number corresponding to the inquired description.

Change Item Report:

Product name: Cheese
ChangeID: 1234
First Reported: 2024-06-18
Statues: In Progress
Priority: 5
Anticipated release: 1.2
Description: Crashes when adding new cheese

Enter <0> to and go back to the main menu:

Step 4: ENTER <1> to go back to Step 3 or ENTER <0> to go back to the Main Menu.

Step	Reason	Description
1, 2, 3, 4	- Input Validity	- The user input must be one of the displayed numbered options

4.7) Print Report

The user must start from the main menu

=== MAIN MENU ===

1) Create
2) Update
3) Inquire
4) Print
5) Back-up
0) Quit TrackMaster

ENTER selection [0-5]: **4**

Step 1: ENTER <4> to enter the print menu.

=== Print Menu ===

1) Print a Report of Upcoming Release Changes

Description: A list of all assessed changes for a specific product that are anticipated to be included in an upcoming release and have not been completed or canceled.

2) Print a Report of Change Requesters to Notify

Description: A list of all customers and staff who need to be notified about the completion of a specific change and the release in which the change is or will be available.

0) Exit

ENTER selection [0-2]: **3**

Step 2: The user may choose to either ENTER **<1>** to print reports for a specific product OR ENTER **<2>** to print reports for a completed change item. Please proceed to its respective instructions below.

Option 1:

If the user chooses to ENTER **<1>** to print reports for a specific product:

=== Select Product ===

1) TakTak

2) FreddyBear

3) Cheeses

4) Rudolph

ENTER Selection [1-4] OR 0 to abort and exit to the main menu: **2**

Step 3: ENTER the number corresponding to the inquired product.

=== Select Product Release ===

1) 1001

2) 1002

3) 1003

4) 1004

ENTER Selection [1-4] OR 0 to abort and exit to the main menu: **3**

Step 4: ENTER the number corresponding to the inquired product release.

Report has been successfully printed.

ENTER **<0>** to and go back to the main menu: **0**

Step 5: ENTER **<1>** to go back to Step 3 or ENTER **<0>** to return to the main menu.

Option 2:

If the user chooses to ENTER **<2>** to print reports for a for a completed change item:

=== Select Product ===

- 1) TakTak
- 2) FreddyBear
- 3) Cheeses
- 4) Rudolph

ENTER Selection [1-4] OR 0 to abort and exit to the main menu: **3**

Step 4: ENTER the number corresponding to the inquired product.

=== Select Change Item ===

Description	Status	ChangeID
1)Cannot find cheddar anymore	Done	3453

ENTER selection [1] OR <0> to abort and exit to main menu: **1**

Step 5: ENTER the number corresponding to the inquired description.

The report has been successfully printed.

ENTER <0> to and go back to the main menu: **0**

Step 6: ENTER <1> to go back to Step 3, ENTER <0> to return to the main menu.

Step	Reason	Description
1, 2, 3, 4, 5	- Input Validity	- The user input must be one of the displayed numbered options
Upon Completion	- Hard Disk May Be Full	- Refer to section 6.1.1
	- Printer connectivity issues	- User must ensure that their printing device is connected to their operating system and running properly

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Report for "FreddyBear" release: "1.2"																																																	
Change item report 1:																																																	
Product Name: FreddyBear																																																	
ChangeID: 1234																																																	
First Reported: 2024-06-18																																																	
Statues: Assessed																																																	
Priority: 5																																																	
Anticipated Release: 1.2																																																	
Description: Crashes when adding new cheese																																																	
Change item report X:																																																	
Product Name: CCCCCCCCCCCCCCCCCC																																																	
ChangeID: XXXX																																																	
First Reported: XXXX-XX-XX																																																	
Statues: CCCCCCCC																																																	
Priority: 5																																																	
Anticipated Release: X.X																																																	
Description: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC																																																	
Change item report X:																																																	
Product Name: CCCCCCCCCCCCCCCCCC																																																	
ChangeID: XXXX																																																	
First Reported: XXXX-XX-XX																																																	
Statues: CCCCCCCC																																																	
Priority: 5																																																	
Anticipated Release: X.X																																																	
Description: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC																																																	
Change item report X:																																																	
Product Name: CCCCCCCCCCCCCCCCCC																																																	
ChangeID: XXXX																																																	
First Reported: XXXX-XX-XX																																																	
Statues: CCCCCCCC																																																	
Priority: 5																																																	
Anticipated Release: X.X																																																	
Description: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC																																																	

[illegible]

4.8) Back-Up

The user must start from the main menu.

```
=== MAIN MENU ===
```

```
1) Create
2) Update
3) Inquire
4) Print
5) Backup
0) Quit TrackMaster
```

```
ENTER selection [1-5]: 5
```

Step 1: ENTER <5> to enter to back-up the data.

Your backed-up files will be stored in your external hard drive, please
Make sure the drive is connected.

The back-up process can take up to 10 minutes.

Do you wish to proceed with the back-up procedure ? (Y/N)

```
ENTER Selection: Y
```

Step 2: ENTER <Y> to back-up the data or ENTER <N> to return to the main menu.

The back-up procedure has completed successfully

Enter <0> to go back to the main menu.

```
ENTER selection: 0
```

Step 3: ENTER <0> to return to the main menu,

Step	Reason	Description
1	- Input Validity	- The user input must be one of the displayed numbered options
2	- Input Validity	- The user input must be one of the displayed numbered options
	- Hard Disk Connectivity	- User must be sure that their hard disk drive is connected to their operating system
Upon Completion	- Hard Disk May Be Full	- Refer to section 6.1.1

4.9) Create Product Release

The user must start from the main menu

```
=== MAIN MENU ===
```

- 1) Create
- 2) Update
- 3) Inquire
- 4) Print
- 5) Backup
- 0) Quit TrackMaster

```
ENTER selection [0-5]: 1
```

Step 1: ENTER <1> to enter the Create menu.

```
=== Create Menu ===
```

- 1) Create Request
- 2) Create Requester
- 3) Create Product
- 4) Create Product Release
- 0) Main Menu

```
ENTER selection [0-4]: 4
```

Step 2: Once in the create sub-menu, ENTER <4> to create a product release.

```
=== Select Product ===
```

- 1) TakTak
- 2) FreddyBear
- 3) Cheeses
- 4) Rudolph
- 5) New Product

```
ENTER selection [1-5] OR <0> to abort and exit to the main menu: 2
```

Step 3: Select product.

```
ENTER the release ID of the Product Release (4 Digit integer DDDD)
```

```
OR ENTER <0> to abort and exit to the main menu: 1005
```

Step 4: Enter release ID.

```
ENTER the DATE of the release (YYYY-MM-DD) OR ENTER <0> to abort and  
exit to the main menu: 20240101
```

Step 5: Enter date of the release.

```
The new product release has been successfully added to the system.
```

```
ENTER <0> to go back to the main menu: 0
```

Step 6: Enter <0> to return to the main menu.

Step	Reason	Description
1-3	- Input Validity	- The user input must be one of the displayed numbered options
3-6	- Data Range	- Input must congruent with prompted format
Upon Completion	- Hard Disk May Be Full	- Refer to section 6.1.1

5) Back-up Procedures

To ensure the protection and security of important data, you should create regular backups to prevent data loss due to hardware failure, accidental deletion or other unforeseen events. Assuming *TrackMaster* is already installed and in use (refer to section 2 if *TrackMaster* is not yet installed), you can backup your data with the following procedures:

1. Connect the external hard disk with a USB into the PC system.
2. Navigate to the main menu of *TrackMaster*.
3. Enter <5> to select option “Backup”.
4. Enter <Y> to proceed with the procedure.
5. Monitor and ensure the process completes without any errors.
6. Disconnect the external hard disk.

After the backup process is finished, *TrackMaster* will return to the start menu and you can proceed with other operations.

6) References

6.1) Operational Exceptions

6.1.1) Full Storage of Hard Disk

The system will require a hard disk² to store any data inputted by the user for future retrieval. If the storage of the hard disk becomes full, the user may encounter the following message:

```
Error: The operation cannot be completed due to full storage on hard drive.
```

```
Enter 1 to retry.  
Enter 0 to abort and return to main menu.
```

The user may choose to enter <1> to retry the operation. Otherwise, ENTERING <0> will abort the operation and return the user to the main menu

6.1.2) Key Uniqueness

When creating a new item, users may encounter situations where another item with the same key already exists. This may be due to the assumption that the item entered does not exist, but actually does. In this case, the following message may appear:

```
Error: This item already exists.
```

```
Enter 1 to enter another item.  
Enter 0 to abort and return to main menu.
```

The user may choose to enter <1> to re-enter another unique item. Otherwise, ENTERING <0> will abort the operation and return the user to the main menu.

² Hard disk requirements are specified in *Section 2.1: System Requirements (page 11)*

6.1.3) Compromised Referential Integrity

If an item expected to exist in the system is missing, the referential integrity may be compromised. In this case, the following message may appear:

```
Error: The item referred to does not exist in the system. Please re-enter  
the item again.
```

```
If you believe this is an error, please contact support.
```

```
Enter 0 to abort and return to main menu.
```

The user will be prompted to re-enter the item again. Otherwise, ENTERING <0> will abort the operation and return the user to the main menu.

6.1.4) Option Does Not Exist

The system will prompt the user to select a choice when a list of items are displayed. If the user enters an option that does not exist on the list, the following message may appear:

```
Error: The option entered does not exist on the list.
```

The list of options will appear again below and the user will be prompted to select another option.

6.1.5) Invalid Input

If the data entered by the user is deemed invalid by the system, due to reasons such as entering a string when prompted for an integer, the following message may appear:

```
Error: Input is invalid. Re-enter input.
```

```
Enter 0 to abort and return to the main menu.
```

The user will be prompted to re-enter the item again. Otherwise, ENTERING <0> will abort the operation and return the user to the main menu.

6.1.6) Unexpected Error

A generic error message for any unforeseen issues or errors that may arise during runtime.

Unexpected Error has occurred.

In this case, the user will be redirected back to the main menu.

6.1.7) Operation Cannot Be Completed

If the system fails to complete an operation specified by the user, the following message may appear with an attached reason³:

Error: The selected operation cannot be completed due to disk failure.

In most cases, the user will be redirected back to the main menu.

Otherwise, the system may ask the user if they would like to retry the operation or abort to the main menu.

Enter 1 to retry operation.

Enter 0 to abort and return to main menu.

The user may choose to retry the operation by ENTERING <1>. Otherwise, the user can abort the operation by ENTERING <0> and returning to the main menu.

³ This is likely the result of disk failure. Refer to *TrackMaster's* hardware requirements specified in *Section 2.1: System Requirements (page 11)*

6.2) Listing of Data Formats and Fields

Digit

A numerical integer. In BNF, a digit is specified as:

("0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" | "8" | "9")

ChangeID

A unique ID generated for each change item by *TrackMaster* staff. This is a sequence that can range from 1 to 6 digits. The ChangeID must satisfy the following requirements expressed in BNF:

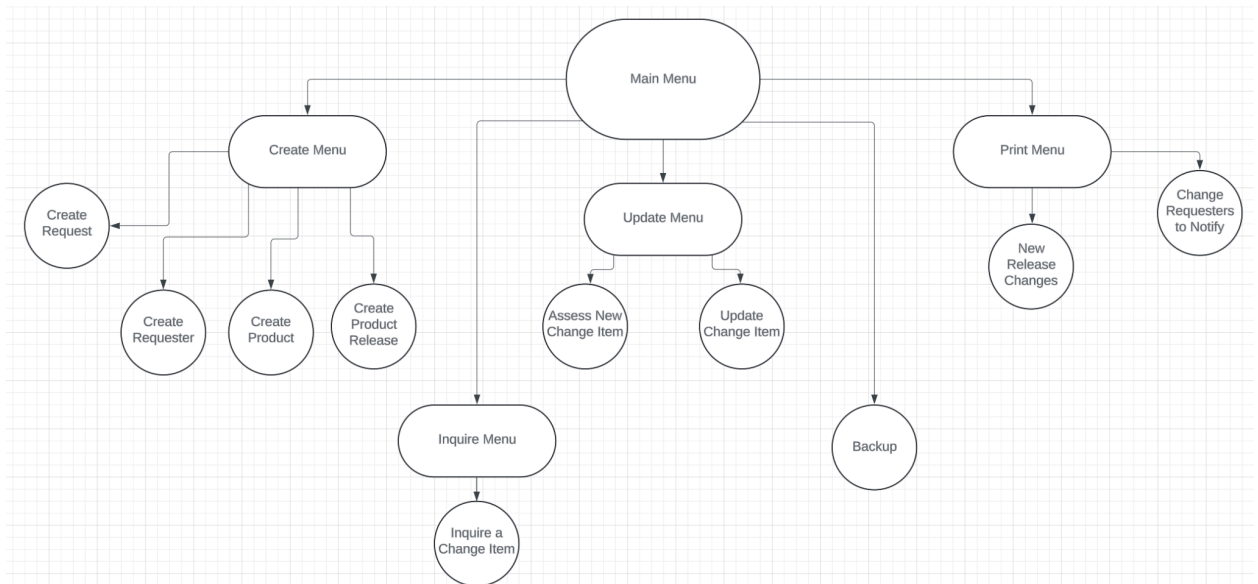
({digit} | {digit}² | {digit}³ | {digit}⁴ | {digit}⁵ | {digit}⁶)

Date

Formatted in YYYY/MM/DD, stored as an 8 digit integer.

6.3) Menu Tree

The main menu and its submenus, such as the create menu, are represented by ovals. Operations accessible through these menus are depicted by circles.



Visual of Main Menu

```
=== MAIN MENU ===  
1) Create  
2) Update  
3) Inquire  
4) Print  
5) Backup  
0) Quit TrackMaster  
ENTER selection [0-5]:
```

Accessing and Navigating the Create Menu

ENTERING <1> in the main menu will direct the user to the create menu.

```
=== Create Menu ===  
1) Create Request  
2) Create Requester  
3) Create Product  
4) Create Product Release  
0) Main Menu  
ENTER selection [0-5]:
```

Use cases regarding the create menu are specified in subsections 4.1, 4.2, and 4.3 of *Section 4: Operating Procedures*.

Accessing and Navigating the Update Menu

ENTERING <2> in the main menu will direct the user to the update menu.

```
=== Update Menu ===  
1) Assess new change items  
2) Update a change item  
0) Main Menu  
ENTER selection [0-2]:
```

Use cases regarding the update menu are specified in subsections 4.4 and 4.5 of *Section 4: Operating Procedures*.

Accessing and Navigating the Inquire Menu

ENTERING <3> in the main menu will direct the user to the inquire menu.

=== Inquire Menu ===

Select the product you wish to inquire a change item from:

- 1) TakTak
- 2) FreddyBear
- 3) Cheeses
- 4) Rudolph
- 0) Exit

ENTER Selection [0-4]:

Use cases regarding the inquire menu are specified in subsection 4.6 of *Section 4: Operating Procedures*.

Accessing and Navigating the Print Menu

ENTERING <4> in the main menu will direct the user to the print menu.

=== Print Menu ===

- 1) Print a Report of Upcoming Release Changes

Description: A list of all assessed changes for a specific product that are anticipated to be included in an upcoming release and have not been completed or canceled.

- 2) Print a Report of Change Requesters to Notify

Description: A list of all customers and staff who need to be notified about the completion of a specific change and the release in which the change is or will be available.

- 0) Exit

ENTER selection [0-2]:

Use cases regarding the print menu are specified in subsection 4.7 of *Section 4: Operating Procedures*.

Appendix A

Glossary of Terms

BNF (Backus-Naur Form)

A notation used to formally express the grammar of program inputs.

Dot Matrix Printers

These printers are capable of printing on continuous paper, which can be ideal for printing long lists, logs, or data from systems that generate continuous output.

DPI (Dots Per Inch)

This measures the resolution of a printing device. Higher DPI values generally result in better print quality, with more detailed images.

HDMI (High-Definition Multimedia Interface)

A port that allows for transmitting high-quality audio and video signals. This will allow your PC to connect to other input/output devices.

PC (Personal Computer)

A computer that is designed for personal use. The PC⁴ consists of several hardware components such as storage and memory. Furthermore, a typical PC also includes input/output devices such as a monitor and keyboard.

QWERTY Keyboards

The most common keyboard layout found today for Latin-script alphabets. The name originates from the order of the first six keys on the top left letter row of the keyboard.

RAM (Random Access Memory)

This is used by the computer to store data that is being used or processed actively, allowing for quick read and write access.

Referential Integrity

Requires the validity of all references between items. This ensures that relationships between data remain accurate and consistent.

⁴ The hardware requirements for a personal computer intended to install and run *TrackMaster* are specified in *Section 2.1: System Requirements (page 11)*

Runtime

The period during which a program is running or being executed.

String

A sequence of characters used for text data in programs. These typically consist of letters, symbols, and spaces.

USB (Universal Serial Bus)

A port that allows for cables for connection between computers and other electronic devices.