OPERATION MANUAL
FOR
NRT102
DATA TERMINAL

1.   CERTIFICATION

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.   INTRODUCTION

The NRT102 data terminal is a hand-held wireless keypad and display for entry of numeric data. This terminal provides the primary data entry method of the NOMAD system.

Data entry is guided by menus displayed on the 16 character by 2 line display.

The terminal is powered by a rechargeable battery with a built in charger that draws DC power from a charging adapter. In an emergency the rechargeable battery may be replaced by a standard PP3 providing no attempt is made to charge the unit while fitted with the non-rechargeable battery.

The terminal does not have to be in radio range for data entry to take place. All data entered is stored in the terminals own memory (the memory is maintained even if the battery is discharged) and then sent to the NOMAD system whenever there is a good communication link. To the operator this is a seamless process. This is a key strength of the NOMAD system - essential operation is guaranteed regardless of sporadic radio interference.

3. SETTING UP A TERMINAL FOR FIRST USE

Before a terminal can be used on the NOMAD network it must be assigned a node number so that the system can distinguish it from other terminals in the system. This will also clear the memory of the terminal and inform the system that all relevant menus should be loaded into the terminal.

3.1 ENTERING A NODE NUMBER

After inserting a battery or removing the terminal from its charging bracket a startup message is displayed.

While this message is displayed hold the 3 and the 9 keys down until prompted with the message "Enter node". The node number is entered as 5 decimal digits

xyzzz

zzz = the node number.
y = the language.
x = the system number.

The node number itself can be in the range 1 to 199. It is these three digits that identify the terminal on the system.

The language number can be in the range 0 to 3 and indicates which language the menus should be. The default system language is 0. Additional languages (up to three) can be defined in the system setup for NOMAD and individual nodes then initialised to one of these. This way employees of different languages may work on the system side by side. Note that to change language the terminal has to re-initialised and its memory cleared as above. If a language number is entered that hasn't been defined in the NOMAD system then the default language is used.

The system number can be in the range 0 to 3. The default system number is 0. Different system numbers can be entered in the Radionet application and a terminal will only communicate with a system on its own number. This allows adjacent systems to work independently.

After entering the node number as above press the 'ENT' key. The terminal will then spend 30 seconds initialising its memory after which the startup message will be displayed again.

3.2 CHANGING OPERATING MODES

The terminal can be set to be used by an individual or by a group. The normal mode after initialisation is for individual use.

Multi-user mode is intended for the situation where a supervisor is entering in data for several employees. It allows the operator number and time to be set for each data entry.

To change modes remove the terminal from its charge bracket to cause the startup message to be displayed. While this message is displayed press and hold the 4 and the 'CLR' keys. Each time this is performed the mode will toggle between normal and multi-user.

4.   THE LCD SCREEN

4.1 STARTUP MESSAGE

The startup message indicates the software version for the terminal along with the system and node numbers.

```
Hoogendoorn
EN2 3.2.6   1#123
```

In the example above the software is variant EN2, version 3.2.6. The system number is 1 and the node number is 123.

4.2 STANDBY MODE

The default display for the terminal takes the general form below,

```
         06:30
   123   00%
```

A typical display after removing a terminal from the charging bracket. It shows the time, the node number and the percentage of memory used.

```
#002         06:30
         123  01%
```

This shows that operator 2 has clocked on. There is one message (01%) waiting to be sent to the system (the clock on message).

```
A SMITH      06:32
         123  00%
```

The message has been sent (00%) and confirmation that operator 2 is recognised in the system by displaying their name. If operator 2 had not been recognised then the following would be displayed.

```
#002 VOID  06:32
         123  00%
```

If the battery starts to get low the "Batt" symbol will alternate with the time. When the battery has insufficient power to operate the terminal reliably the "Batt" symbol will be displayed continuously.

```
A SMITH      Batt
         123  00%
```

Whenever a terminal detects a valid transmission from a link unit a '!' flashes in lower left corner of the display.   This is useful for confirming communication.

```
A SMITH      06:30
!        123  00%
```

4.3   PAGING FACILITY

There is a facility within the NOMAD system to send short text messages to specific terminals. When such a message is received and the terminal is in standby mode it will give a series of beeps and the standard display will be replaced by the text message, which will flash on and off.

To cancel the message and return to normal standby mode press and hold the 4 and 6 keys as if about to enter data. This will cancel the page message. Press the 'CLR' key to return to standby mode.

4.4   FEEDBACK

If operator feedback is enabled on the NOMAD system a message is sent to the operator after each job code (for which feedback has been defined) has been received by the system. When the terminal receives the message a single beep will be emitted.

To view the feedback message press and hold the 'SHIFT' key while in standby mode. Releasing the 'SHIFT' key will return the terminal to standby mode.

4.5   MULTI-USER

If in multi-user mode the operator name will be replaced by "M-USER"

```
M-USER      06:30
            123  00%
```

5.   ENTERING DATA

The normal state of the terminal is standby - the keypad is locked against accidental operation.

5.1   NORMAL MODE

To exit the standby mode press and hold the 4 and the 6 keys together. A prompt inviting the user to "Enter Command" will be displayed.

Note that all or some of the prompts may have been redefined in the NOMAD system depending on the language settings.

Key in the number of the job or task to be entered. As the digits are keyed in a menu prompt will be displayed if the job code is one that has been defined.

Alternatively, if the job code is not known press and hold 'SHIFT' key and then use the 3 and 9 keys to scroll up and down through the available job codes.

Press the 'ENT' key when desired job code is displayed. Further prompts may be displayed requesting the user to in turn enter any additional parameters required by the job code. For example, after pressing 'ENT' for "Clock In" the user is prompted for "Operator" and should enter their works number.

The number of digits that the terminal will accept will vary depending on the parameter and the setting made in the NOMAD system.

Note that the terminal will only accept codes other than "Clock In" (code 0) if the user has clocked in. Once clocked in the prompt for code 0 will change to "Clock Out". After pressing enter to "Clock Out" the user will be prompted to "Confirm". This is done by pressing the 'ENT' key again.

5.2   MULTI-USER MODE

To exit the standby mode press and hold the 4 and the 6 keys together. A prompt inviting the user to "Enter Operator" will be displayed.

Enter the operator number for the job to be entered and press 'ENT'. A prompt inviting the user to "Enter Time" will be displayed.

The current time will be display in the lower right corner of the screen. To accept this press the 'ENT' key, else key in the required time and press the 'ENT' key.

The rest of the process is as per section 5.1 above.

6.   ERROR MESSAGES

6.1   CLOCK NOT SET

If the internal clock has not acquired the current time from the NOMAD system then an error message will be displayed "CLOCK NOT SET". If this message is displayed ensure that the terminal is within range of a link unit to allow the terminal to acquire the time. Once the time is acquired the internal clock of the terminal will maintain the time until power is lost.

6.2 FLAT BATTERY

If the rechargeable battery is at a level where safe data entry cannot be guaranteed the terminal will prevent the operator from entering data and a "Flat Battery" message will be displayed whenever data entry is attempted.

The terminal should be placed back in its charger and the battery allowed to charge. Alternatively, the battery could be replaced with a spare fully charged battery.

DATA WIIL NOT BE LOST IF THE BATTERY RUNS OUT COMPLETELY.

6.3 MEMORY FULL

If the memory has insufficient space to make another entry the "Memory Full" message will be displayed. If this happens ensure that the terminal is in communication range of a link unit to allow the system to extract the data and therefore free up memory. While this is happening the % meter in the lower right corner of the display will be seen to decrement as each message is sent.

7. CHARGING

There is no on/off switch on the terminal. It is intended that it is either in use or on charge. No harm will be done to the battery if the terminal is left on charge for indefinite periods.

To charge the terminal place it in the charging bracket so that it is sitting with the display showing and the spring of the charging bracket against the keypad. After a second has elapsed the terminal will beep and the message "CHG1" or "CHG3" will be displayed. These messages indicate that the terminal is charging.

The charging cycle and the meaning of the "CHG" messages is as follows.

CHG1   The battery is very discharged and is being slow charged. When sufficient charge has been put into the battery it will switch to fast charge.

CHG3   The battery is being fast charged. When the battery is fully charged it will switch to trickle charge.

CHG4   The battery is fully charged and is now being trickle charged to maintain its charge.

A fully discharged battery will take around 7 hours to recharge.

8. MAINTAINENCE AND CARE

The NRT102 terminal has been designed to give reliable service in the intended environment and is largely maintenance free.

8.1 CLEANING

Periodically wipe the front face of the terminal with a damp cloth to remove dirt. If necessary a water based cleaner may be used to remove stubborn deposits.

DO NOT USE SOLVENT CLEANERS.

8.2 BATTERIES

With normal use the expected life time of the supplied battery is 500 charge/discharge cycles, after which it should be replaced.

8.3 KEYPAD

On no account should the keys of the terminal be pressed with sharp or hard objects - including fingernails. Use of such objects may result in premature failure of the keypad.