EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

USE OF VT200 AND DMT2200 TERMINALS WITH NORSK DATA

COMPUTERS IN NOTIS ENVIRONMENT

Fabien Perriollat

Abstract

The Data Mate DMT2200 terminal is a DEC VT200 compatible character display terminal selected by CERN as a standard computer terminal. The manual explains how to use this terminal within ND Sintran III and Notis environment. The facilities available by this terminal are not as complete as by the ND 320 Notis terminal offered for a comfortable program development environment.

Geneva, Switzerland

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T A B L E   O F   C O N T E N T S

1 *Introduction*

The DEC VT200 is a very popular general-purpose video display terminal family that lets you interact with software application programs. This terminal class follows ANSI and ISO standards <1> . A very large number of VT200 compatible video terminals are currently available on the market for a very attractive price. The Data Mate Co. Ltd DMT2200 was selected in 1986 by CERN to be the standard low price computer terminal for general-purpose use.

The facility described in this manual gives to the user a convenient environment for program development using the PED editor and ND utility programs. It is not at all convenient for text processing due to the lack of keys and of character sets. For the use of text processing or for very intensive use of ND software, we recommend the Norsk Data ND-320 Notis terminal.

This note does not provide all the information you need to operate and maintain your terminal. It is just a complementary to the user and operation manual from the manufacturer.

<1>   Refere to ANSI recommendations of the X3 serie, and to ISO standard
           2022

2 Generalities and login procedure

The specific features of each type of terminal are hidden to editors, utilities and applications programs by a piece of ND system software called the Virtual Terminal Manager (VTM). This software is driven by data tables which specifies the capability of each type of terminal. These tables are in files called DDBTABLES and each type of terminal is defined by a terminal type number. The allocation of these numbers is done by the manager of the VTM facility at ND-Oslo.

The terminal type is requested during login procedure on the PS/ND-500 PRDEV computers by the 'logon' program. It can be set also by the Sintran III command '∂set-terminal-type' and read by command or from application programs by monitor call or through VTM or FOCUS library routines. The terminal type can also be changed within the PED or Notis-WP editors with the '!' command.

The terminal types for the VT200 family are :

- 114 : VT200 80 columns screen mode.

- 115 : VT200 132 columns screen mode.

- 116 : DMT2200 80 columns screen mode.

- 117 : DMT2200 132 columns screen mode.

During set-up of the terminal by the editor or by programs using VTM 'vtinit' routine, the screen size (80 or 132 columns) is automatically set according to the defined terminal type.

3 _Automatic set-up state_

During initialisation the Virtual Terminal Manager is setting up the terminal
in the following state regardless of what is currently defined in the default,
or saved set-up or by a previous set-up from other computer systems :

- ANSI VT200 7-bits mode.

- Cursor display ON.

- Origin mode reset (= absolute mode).

- Auto wrap OFF.

- Keyboard action unlocked.

- Keypad mode Application.

- Cursor key mode reset (cursor mode).

- Top margin 1.

- Bottom margin 24.

- Character rendition Normal (all rendition Off).

- Selecetive erase attribute Normal.

- ASCII character set in G0.

- DEC special graphic set in G1.

- DEC supplemental graphic set in G2.

- JIS Roman set in G3.

- The screen size (80 or 132 columns) is set according to the terminal type
  selected.

Any system conditions or modes other than listed above are not affected,
except that for the DMT-2200 the function keys F6 to F11 are reprogrammed to
their default sequence.

4 _Keyboard_

The keyboard consists of the following parts.

- _Main keypad,_

- _Editing keypad,_

- _Auxiliary keypad,_

- _Top-row function keys,_

- _Visual and audible indicators,_

The recommended keyboard style is the 'North American'.

4.1 _Main keyboard_

You must refer to the manufacturer for the description and use of the main keypad.
The only restriction is that 'composing characters' does not apply to the Sintran III environment (8 bits characters are not received correctly with the recommended 7 bit character format). It must be underlined that the 'DDB-table' does not provide input translation tables for these special characters.

4.2 _Editing keypad_

The editing keypad consists of editing keys and cursor control keys.

The cursor control keys are used according to their symbol: move up, move down, move right, move left.

The editing keys are used for Notis function as close as possible to their label.

```
          Find = shift F7 (get string)

   Insert here = EXP (set reset EXPAND mode)

        Remove = CANCEL (remove marked area or restore the last deleted line
                 with F1)

        Select = MARK (mark text field)

   Prev screen = Previous screen window displayed

   Next screen = Next screen window displayed
```

4.3 *Auxiliary keypad*

The auxiliary keypad is used in application mode to provide the most commonly used editing keys for the PED editor. The Notis ND320 yellow keys layout was followed as much as possible. The functions of ND320 F keys are the functions for PED and WP editors. For other ND utilities you must refer to their user manual.

PF1 = *shift F1 (graph in Notis WP)*

PF2 = *shift F2 (greek in Notis WP)*

PF3 = *shift F3 (math in Notis WP)*

PF4 = *DELETE (delete marked text area)*

1 = *F5 (split the line at cursor position)*

2 = *F6 (convert the marked area to lower case characters)*

3 = *F7 (continue searching)*

4 = *shift F5 (link this line to the preceding line)*

5 = *shift F6 (convert the marked area to upper case characters)*

6 = *shift F7 (search for <string>)*

7 = *F1 (delete line)*

8 = *F2 (insert line)*

9 = *F3 (underline in Notis WP)*

- = *COPY (copy the marked area, insert it at cursor position)*

' = *MOVE (move the marked area, insert it at cursor position)*

Enter = *Home or slanted arrow (move the cursor to and from HOME position)*

0 = *backward tab (move the cursor to the previous tabulator stop*

. = *forward tab (move the cursor to the next tabulator stop*

4.4 *Top-row function keys*

The top-row function keys (unshifted) are an addition to the auxiliary keypad.
The shifted size of the function keys are reserved for user programmed keys.
Before using the unshifted programmable function keys facility of the DMT2200,
you must carefully read the paragraph of this kind of terminal in this note.

The right-end 4 keys group is the image of the 4 yellow top-row keys of the
ND-320 Notis terminal.

       F6   = shift <== (move the cursor to the beginning of this line)

       F7   = shift ==> (move the cursor to the end of this line)

       F8   = <== (move to previous word, area, parameter, menu ...)

       F9   = ==> (move to next word, area, parameter, menu ...)

       F10   = INS = shift EXP (set/reset append mode)

   F11 (ESC) = EXIT (exit from the program)

   F12 (BS) =   (start a new paragraph)

   F13 (LF) = LF (move the cursor down 5 lines

   F14   = (... (set left editor border in this position)

   F16 (Help) = HELP (call the HELP facility)

   F17 (Do)   = shift CANCEL (re-mark the last marked area)

       F17   = FUNC key (function-lead-in key)

       F18   = PRINT (print the formated text, Notis WP)

       F19   = HELP (call the HELP facility)

       F20   = EXIT (exit from the program)
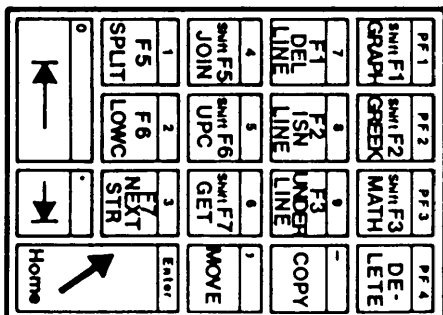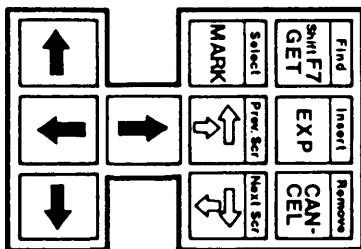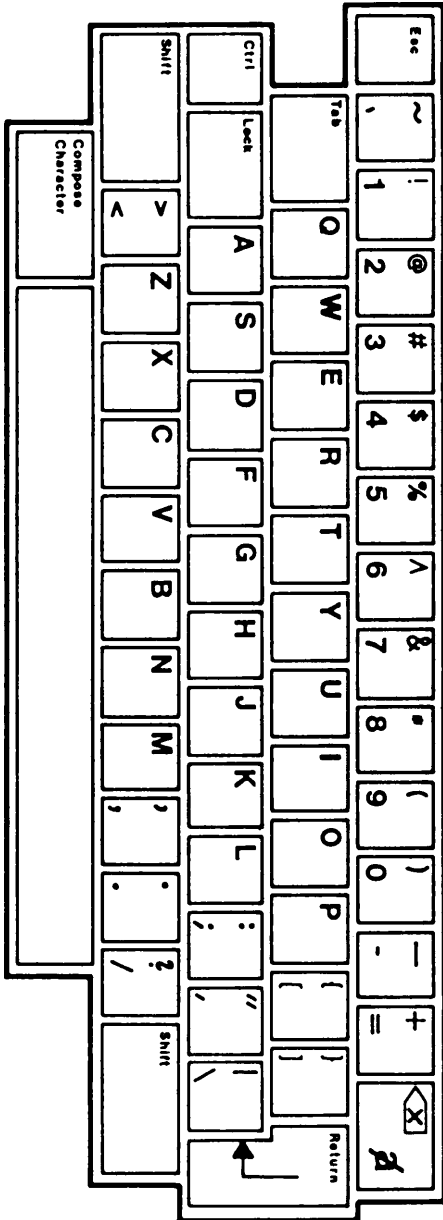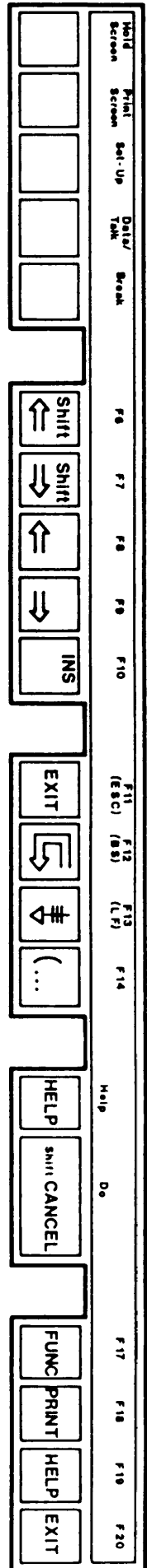
4.5 *Other keys sequence emulation*

The Notis keys not directly available on the keyboard can be emulated by a sequence as defined below.

NOTIS key	non-NOTIS key sequence	
	UNSHIFT	SHIFT
FUNC	CTRL — _	FUNC FUNC
MARK	FUNC CTRL-Z	FUNC CTRL-V
FIELD	FUNC F	FUNC CTRL-N

TAB	FUNC CTRL-I	FUNC CTRL-Y
(...)	FUNC (	FUNC)
...	FUNC _	FUNC `
↑	FUNC ↑	FUNC ←
↓	FUNC ↓	FUNC →
⇒	FUNC N	FUNC CTRL-F
⇐	FUNC B	FUNC CTRL-R
←|	CTRL-Y	FUNC V
→|	CTRL-I	FUNC K
INS EXP	CTRL-E	CTRL-B
~ 4)	FUNC -	FUNC '
£	DEL	

⤸ / ↵	LF / CR	
⤶	FUNC CR	FUNC CTRL-^
F1	FUNC CTRL-D	FUNC A
F2	FUNC CTRL-L	FUNC G
F3	FUNC CTRL-U	FUNC H
F4	FUNC +	FUNC [
F5	FUNC Y	FUNC Z
F6	FUNC L	FUNC U
F7	FUNC \ 3)	FUNC CTRL-G
F8	FUNC] 3)	FUNC	

PARA	FUNC P	FUNC CTRL-B
SENT	FUNC S	FUNC CTRL-E
WORD	FUNC W	FUNC CTRL-A
DELETE	FUNC D	FUNC ⬭
COPY	FUNC C	FUNC I
MOVE	FUNC M	FUNC E
PRINT	FUNC !	FUNC "
HELP	FUNC ?	FUNC %
EXIT	FUNC ⚡	FUNC $
CANCEL	FUNC X	FUNC Q
JUST	FUNC J	FUNC T
»«	FUNC <	FUNC >
><	FUNC =	FUNC :

4.6 _Keyboard layout_

VT 220 & DMT2200 KEYBOARD LAYOUT

Note:

FUNC ≡ Ctrl ?   ESC ≡ Ctrl [

HOME ≡ Ctrl]

Auxiliary keypad must be in "Application mode"

DMT-2200: unshift function key (F6 ...F20) must be programmed with the default string: CSI 17~ ...CSI 34 ~

5 *Character sets*

The 5 character sets available in the VT200 terminal are poor by comparison to the 15 sets of the ND-320. The following ia available :

   - A good graphic facility (especially to draw box and schema).

   - Some Greek characters, the other are converted to the Roman character.

   - In the mathematical set only superscripts 1,2 and 3 are available.

   - About all the accent letters are available.

6 Recommended terminal set-up

For the terminal usually connected through the PS PACX it is advisable to set-up the communication parameters as follows:

- Transmit baud rate = 4800

- Receive = transmit

- no XOFF

- character : 7 bits, space parity (this parity set- up allows direct use with IBM VM/CMS and Wylbur system).

- 2 stop bit

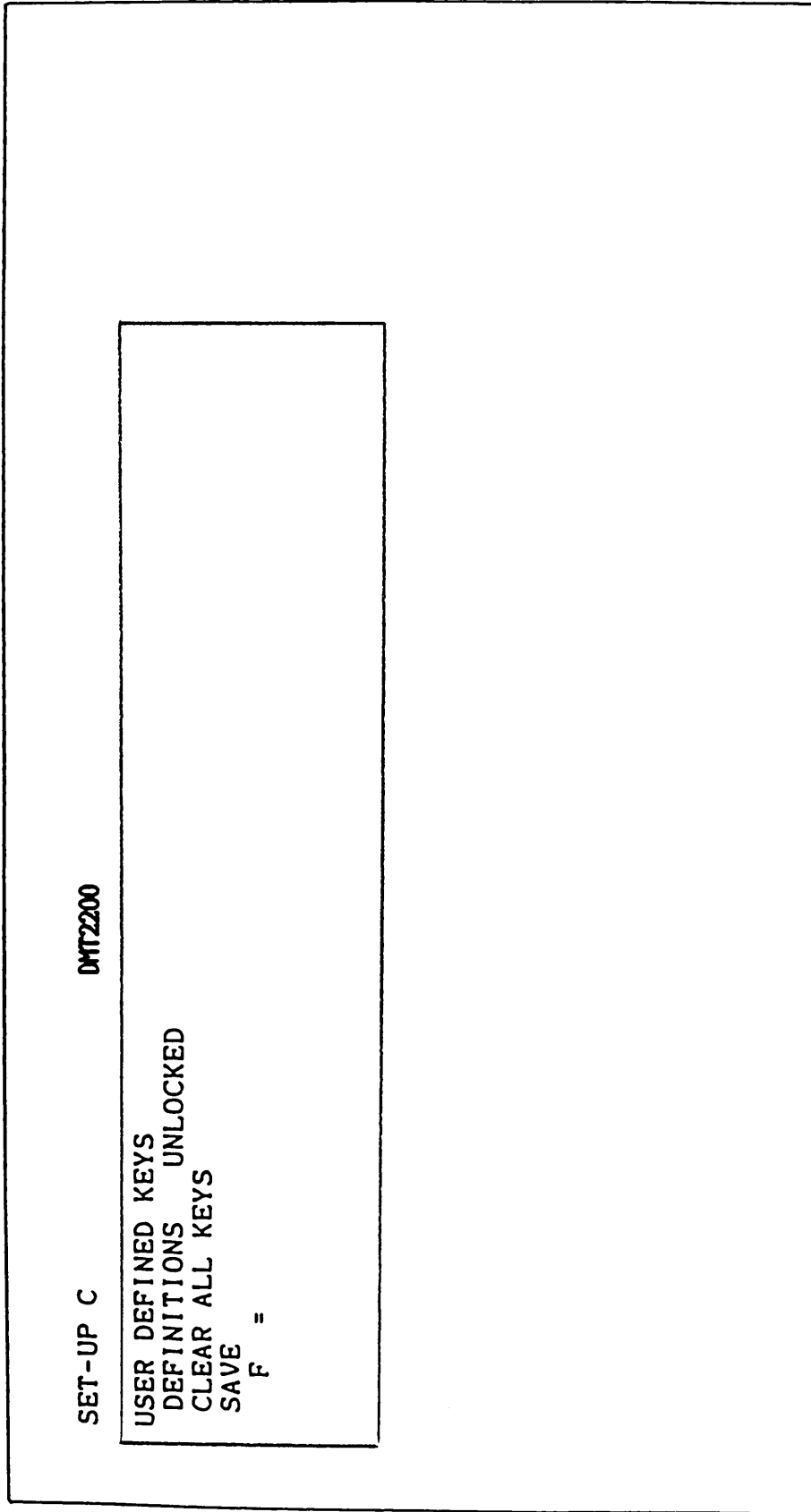- Local echo OFF

- 20mA port (or interface)

The recommended value for the other parameters is:

- Auto wrap ON (or New Line)

- Jump scroll mode

- Break Enable

- Character set : ASCII or multinational

- VT200 mode, 7 bits controls

- User feature Unlocked (mandatory value)

- User defined keys Unlocked (mandatory for the DMT-2200 terminal)

6.1 *Example of set-up for DMT-2200*

SET-UP A

DMT2200

MAIN PORT
OPERATING	ON-LINE
XMT LIMIT	150
TRANSMIT	4800
RECEIVE	TRANSMIT
XON/XOFF	OFF
CHARACTER	7S
STOP BIT	2
LOCAL ECHO	OFF
INTERFACE	20mA
DUPLEX	FDX A
NUL/DEL	IGNORE

DISPLAY
BACKGROUND	DARK
CURSOR DISP.	ON
CURSOR STYLE	BLOCK(S)
COLUMNS	80
CONTROLS	INTERPRET
AUTO WRAP	ON
SCROLL	JUMP
CHARA. SET	ASCII
SCROLL SPEED	SLOW
SCREEN SAVER	30 MIN
COLUMN CHANGE	CLEAR
REFRESH RATE	60 Hz

KEYBOARD
LOCK KEY	CAPS
AUTO REPEAT	ON
KEYCLICK	OFF
BREAK	ENABLE
AUX KEYPAD	NUMERIC
CURSOR KEYS	NORMAL
NEW LINE	OFF
REPEAT RATE	30 Hz
REPEAT DELAY	0.5 SEC

AUX PORT
OPERATING	DISABLE
TRANSPARENT	OFF
ABORT	10 SEC
SPEED	4800
XON/XOFF	ON
CHARACTER	8N
STOP BIT	1
DUPLEX	FDX A

PRINTER
OPERATING	NORMAL
EXTENT	FULL PAGE
DATA TYPE	ASCII
TERMINATOR	NONE
PORT	SERIAL
FAULT WAIT	NO

GENERAL
EMULATION	VT200(7)
FEATURES	UNLOCKED
MARGIN BELL	OFF
WARNING BELL	ON
BELL LENGTH	0. SEC

SET-UP B

DMT2200

OPERATION
CLEAR DISPLAY
CLEAR COMM
RESET TERMINAL
RECALL
SAVE FEATURES
DEFAULT
CLEAR SOFT CHARA.
SAVE SOFT CHARA.

ANSWERBACK
AUTO ANSWBK   OFF
CONCEALED   OFF
ANSWERBACK=

TAB
CLEAR ALL TABS
SET 8 COLUMN TABS

123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

MAIN: DSR CTS CD
AUX : DSR CTS

REPLACE MODE

SET-UP C   DMT2200

USER DEFINED KEYS
DEFINITIONS   UNLOCKED
CLEAR ALL KEYS
SAVE
F "

7 *Special features of terminal*

7.1 *Data Mate DMT-2200 terminal*

The DMT-2200 terminal allows programming of the unshifted upper-row of function keys. This feature is absolutely outside the scope of the VT200 compatible terminal, and unfortunately there is no way to force globally the default sequence from the computer. Also it is difficult to set-up by hand the default because you have to kill all your settings saved in E-Eprom.
It is strongly advised not to re-define the non-shift function keys. But the function keys F6 to F11 are automatically re-programmed to the default value on initialization. It can also be possible to use F6 to F10 (F11 as to be reserved for Escape).
If it is needed to re-program the function keys to their default value a program is provided for that. On the CERN/PS program development machine this program is (UTIL)DMT2200-FKEY:PROG. Notice that in the set-up C panel the 'definitions' must be 'unlocked' before running the program and after the run you must save the new set-up with the 'save' feature. This program does not modify any of the Shift function keys definition.

7.2 *DEC VT-220 terminal*

The DEC VT-220 terminal has no dedicated 'Escape' key in the main keypad. This key is very useful within the Sintran III environment. You have to use the 'Crtl [' or to set your terminal in VT-100 mode for which F11 gives the Escape key. But you must be aware of the fact that "exiting" from the Virtual Terminal Manager leaves the terminal in VT-200 mode.

8 *DDB tables availables*

In order to update the DDB-tables of a given installation, the indiviual DDB
for the various new terminal types are needed.
The files DDB114:VTM DDB115:VTM DDB116:VTM DDB1127:VTM for VT-200 and DMT-2200
are currently available in the PS/Control ND500 computer (cernet name = NDPSC)
in the user UTIL. The file VTM-ALL-TYPES:VTM is available in the user SYSTEM.
Updating of the DDB-tables is done with the ND VTM-COMPOUND:PROG, the
description of this program is available in the Sintran III Utilities Manual.