IBM Fiscal Printer
Greece Model 4610-GR3/GR5/GB3/GB5 (Macarena)
Programming Guide Supplement
Version 10 01

Document Number (FGR90N10-PDF)

Summary of Changes

Changes resulting in document revisions will be summarized in this table in reverse chronological sequence. Revision codes - alpha characters - will be used to highlight text changed in new document versions.

Version	Date	Change Description
10 01	Jul 19, 2002	• DC cmd. (Cash Drawer Management): was added. • 16 cmd. (Set Date and Time): rules were changed. • RC 53: was eliminated. • RC 54: was changed. • This version of specification corresponds to microcode EC level 10.
0F 02	Jun 26, 2002	• Day_N_Dcx and Lif_N_Dcx counters (Number of Printer Disconnections Table entries): maximum value was changed from 200 to 999. • Fiscal Memory: printer disconnection table size was changed. • Fiscal Memory: serial number table size was changed. • DA cmd. (Read Fiscal Memory Tables) - Response Read Daily Entry Table: was changed. • 1B cmd. (Serialize Fiscal Memory): manufacturing id field size was changed. • Msg. 92: was changed. • This version of specification corresponds to microcode EC level 0F.
0E 01	May 23, 2002	• There are not changes in the spec for this version. • This version of specification corresponds to microcode EC level 0E.
0D 01	May 20, 2002	• Msg's 127 and 128: were changed. • This version of specification corresponds to microcode EC level 0D.
0C 01	May 15, 2002	• Only six (6) comments lines can be printed in any place of the fiscal voucher. • 03 cmd. (Comments Line on CR Station): the strings ″PEsTA″ (Change Due) and ″ApOdEIjH″ (Receipt) or strings containing '%' symbol as the last non-blank character are not allowed. • RC's 80 and 94: were added. • Msg's 127 and 128: were changed. • This version of specification corresponds to microcode EC level 0C.
09 01	Apr 12, 2002	• Msg's 78 & 79: were changed. • X-Report and Z-Report Printouts: Day_Net_ABCD and Day_Net_E accumulators printings were added. • X-Report and Z-Report Printouts: Day_Net_Total accumulator printings was eliminated. • This version of specification corresponds to microcode EC level 09. Internal microcode version 01.
08 01	Mar 13, 2002	• There are not changes in the spec for this version. • This version of specification corresponds to microcode EC level 08. Internal microcode version 01.
07 02	Feb 18, 2002	• HA23 msg.: KOYMpI was changed to MOYMpI. • RC 62: was added. • This version of specification corresponds to microcode EC level 07. Internal microcode version 02.
06 03	Feb 11, 2002	• Msg's 130 and 131: were added. • Extended and Short Fiscal Memory Report: closure time, closure start & end hex address and from & to closure number were added. • This version of specification corresponds to microcode EC level 06. Internal microcode version 03.

Version	Date	Change Description
05 02	Jan 31, 2002	• RC 26: was changed. • Msg's 132 and HA23: were created. • Msg's OA0, OA1, MA0, MA3, HA01, HA09: were changed. • Closure Report: msg's 119, 128, 120 and 121 were added. • Print X-Report: msg's 120 and 121 were added. • Extended Fiscal Memory Report: msg's 120 and 121 were added. • Short Fiscal Memory Report: msg's 120 and 121 were added. • Off-Line Reports: all lines are replicated on SJ station exactly as printed on CR station. • Off-Line Reports (Help Report): msg. HA23 was added. • Off-Line Reports (Help Report): after the report is printed, the paper is cut. • Off-Line Reports (Confirm Option): after the report is printed, the paper is cut. • Power-On Reports (Serialized, Fiscalized and Active): msg. 132 was added. • Power-On Reports (Serialized, Fiscalized and Active): in disconnection mode, after the report is printed, the paper is cut. • 14 cmd. (Print X-Report): the FDTS is set and check when this cmd. is issued. • This version of specification corresponds to microcode EC level 05. Internal microcode version 02.
05 01	Jan 2, 2002	• Msg's 111 and 127: were changed. • This version of specification corresponds to microcode EC level 05. Internal microcode version 01.
04 03	Dec 19, 2001	• MACARENA (Protocol USB - Cable USB) Fiscal Unit Status: byte 10 was changed. • Audit Port - Fiscal Memory Dump Record: was changed. • This version of specification corresponds to microcode EC level 04. Internal microcode version 03.
03 02	Nov 30, 2001	• D2 cmd. (Item Sale): was changed. • D3 cmd. (Negative/Positive Item Sale): was changed. • DA cmd. (Read Fiscal Memory Tables) - Response to the Read Fiscal Memory Tables command for Read Daily Entry: was changed. • DB cmd. (Read Accumulators and Counters): Day_N_Vouc was added. • Day_N_Vouc and Lif_N_Vouc accumulators: were added. • Msg's 127, 128 and 129: was added. • Msg. 67: was changed. • Closure Report and X-Report printouts: were changed. • Extended Fiscal Memory Report printout: was changed. • Power-on Report (Serialized, Fiscalized and Active): was changed. • Status Report Line Table: was changed. • Daily Entry Table: was changed. • This version of specification corresponds to microcode EC level 03. Internal microcode version 02.
02 03	Nov 14, 2001	• DA cmd. (Read Fiscal Memory Tables): in VAT rate and header table, return code 60 was added. • This version of specification corresponds to microcode EC level 02. Internal microcode version 03.

Version	Date	Change Description
02 01	Oct 09, 2001	• Off-Line Report: was added. • Printer Disconnection: was added. • Header Report: was added. • Status Report Line: was added. • Fiscal Voucher: was changed. • Closure Report: was changed. • Print X-Report: was changed. • Fiscal Memory Report (extended and short): were changed. • Fiscal Memory Map: was changed. • Serial Number Table: was changed. • Daily Entry Table: was changed. • VAT Rate Table: was changed. • Repair Action Table: was changed. • Header Table: was added. • Printer Disconnection Table: was added. • Predefined Messages: were added. • D7 cmd. (Set Header): was changed. • DA cmd. (Read Fiscal Memory Tables): was changed. • DB cmd. (Read Accumulators and Counters): was changed. • 09 cmd. (Set Last GRD Date): was eliminated. • RC 169: was added. • RC's 43 and 144: were changed. • RC 111: was eliminated. • Msg's 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126: were added. • Msg's 37 and 61: were changed. • Msg's 102, 103 and 111: were eliminated. • This version of specification corresponds to microcode EC level 02. Internal microcode version 01.
01 01	Oct 02, 2001	• C8 cmd. (Set Barcode Parameters): was added. • C9 cmd. (Print Barcode): was added. • CA cmd. (Download and Print Graphics): was added. • DD cmd. (Start Non-Fiscal Report): was changed. • E7 cmd. (Diagnostic and Alignment Utilities): was changed. • E8 cmd. (Set Number of Dot Rows per LF): was changed. • EB cmd. (Normal Printing Line on DI Station): was changed. • EC cmd. (Line Feed): was changed. • EE cmd. (Cut Paper): was changed. • EF cmd. (Document Eject): was changed. • F4 cmd. (Head Position & Open/Close Throat): was changed. • F8 cmd. (Report Printer EC): was changed. • FC cmd. (Report Microcode EC level): was changed. • RC's 45, 46, 193, 213, 225, 226 and 237: were eliminated. • RC's 105, 106, 119, 123, 124, 126, 204, 208, 209, 210 and 235: were added. • RC's 200, 203, 206 and 214: were changed. • FOPNDIP (DI Non-Fiscal Report in Progress - Portrait) flag: was added. • FOPNDIL (DI Non-Fiscal Report in Progress - Landscape) flag: was added. • Non-Fiscal Reports on DI station printouts: were changed. • Fiscal Memory Map: was changed. • Serial Number Table: was changed. • Special Greek Characters: were changed. • This version of specification corresponds to microcode EC level 01. Internal microcode version 01.

Table 1. Change Summary

A comment form is provided at the end of the document for your suggestions on the document content and format.

Contents

1.0 Scope

This document covers the programming interface and functional characteristics of the fiscal printer model 4610 for Greece.

2.0 Fiscal Hardware Technical Specification

2.1 4610 Fiscal Printer Available Models

The following models are available for Greece:

- GR3 = Fiscal RS485, Litho Gray (4694), No MICR, Yes DI
- GR5 = Fiscal RS485, Litho Gray (4694), No MICR, No DI
- GB3 = Fiscal USB Non-powered, Iron Gray (4840), No MICR, Yes DI
- GB5 = Fiscal USB Non-powered, Iron Gray (4840), No MICR, No DI

2.2 4610 Fiscal Printer Features

The printer features are:

- Customer Receipt Station (CR) - thermal printing

- Summary Journal Station (SJ) - thermal printing

- Document Insert Station (DI) - impact printing (GR3 and GB3 models only)

- User defined character sets

- RS-485 or USB communication interfaces

- Barcode printing capability (all stations)

- Paper Cutter (CR station only)

- Bar code generation (CR and SJ stations only)

2.2.1 Characters Per Inch

- Thermal Printing (CR and SJ stations)

    - 15 CPI => 44 characters/line
    - 12 CPI => 34 characters/line

- Impact Printing (DI station)

    - 15 CPI => 47 characters/line
    - 12 CPI => 37 characters/line

2.3 Fiscal Security Characteristics of the Model 4610-GR3/GR5/GB3/GB5 Fiscal Printer

The IBM POS fiscal solution is based on the concept of a ′fiscal printer′. Because of the restrictions in most countries relative to the definition of a ′fiscal machine′, a distributed POS must have the fiscal electronics sealed in the printer. The printer becomes the ′fiscal machine′ in a distributed POS.
This solution prevents fraud by ensuring absolutely that what is printed is recorded in the fiscal electronics.
In this case the only fiscal dependency remaining on the POS terminal that the printer is attached to is the ability to sense connection of the POS displays.
Our system provides that capability by having all the POS I/O wired in parallel which allows the fiscal printer to monitor the serial I/O responses to polls from the configured displays. If a display is disconnected or stops operating, the fiscal printer will inhibit further printing until the display resumes operation.

2.3.1 Fiscal Processing

The IBM fiscal printer has a special electronics board sealed in the fiscal base which intercepts the data from the POS terminal and processes it before sending it to the printer to be printed. This ensures that nothing is printed that does not completely comply with the fiscal law requirements and that all data is captured in the fiscal printer non-volatile memory.
The fiscal processor logic board has 64K bytes of static RAM and a time of day clock module both backed up by a 10 year lithium battery.
A fixed pattern in the memory is checked each time the printer is powered on as an alternative to having a battery voltage sensor.

For 4610 fiscal printer with RS-485 communication interface, the DS80C320 microprocessor is used to process the data and perform arithmetic.

For 4610 fiscal printer with USB communication interface, the DS80C390 microprocessor is used to process the data and perform arithmetic.
All fiscal data is calculated by the fiscal processor board and any totals sent from the POS terminal are verified before printing is allowed. The microprocessor has special internal circuitry which detects power down situations with enough warning to save all fiscal data in the battery backed up memory.

2.4 Fiscal Unit Status

2.4.1 4610 RS-485 (Protocol SIO - Cable RS-485) Fiscal Unit Status

The fiscal unit response to the application program is contained in the fiscal unit status, which is 9 bytes long (6 bytes for the printer status and 3 bytes for fiscal unit status).
For compatibility reasons, the printer status bytes received from the 4610 are mapped in the closest possible way to the model 3 status bytes.
The ″MAPPED FROM″ column shows from which byte/bit of the 4610 status bytes was the returned taken form.

The following figure shows the content of the fiscal unit status.

```
BYTE   BIT        CONTENT                                                MAPPED FROM
                                                                         BYTE   BIT
 0                 PRINTER UNIT STATUS                                        n/a
        0 (LSB)   COMMAND COMPLETE
                   Set to 1 when the command is complete.
        1          LEFT HOME POSITION                                      1      2
                   Set to 1 when the print head is in the left home position.
        2          RESERVED (always = '0')                                    n/a
        3          MICR PRESENT                                               n/a
                   Set to 1 when the micr is present.
        4          RESERVED (always = '0')                                    n/a
        5          HOME ERROR                                              3      1
        6          DOCUMENT ERROR                                          3      2
                   The document not inserted after document station was selected
                   and the wait timed out.
        7 (MSB)   COMMAND REJECT

    (continued on next page)
```

Figure 1. 4610 RS-485 Fiscal Unit Status - Part 1 of 3

4610 RS-485 Fiscal Unit Status continued......

```
BYTE    BIT         CONTENT                                                 MAPPED FROM

1                   PRINTER UNIT STATUS
        0 (LSB)     CASH RECEIPT PRINT ERROR                                1     6
                    Paper cover is open or the CR station is out of paper.
        1           RESERVED (always = '0')                                    n/a
        2           PRINTER KEY PRESSED                                     7     4
                    Set to 1 when a printer key operation is in progress.
        3           EC LEVEL                                                5     1
                    Set to 1 when responding to an EC level request.
        4           SJ COVER OPEN                                           5     6
                    Set to 1 when the cover on the SJ station is open.
        5           DOCUMENT READY                                          2     0
                    Set to 0 when the DI station is ready for printing.
                    This occurs when both document sensors are made and the document
                    has been fed to the first print position.
        6           DOCUMENT PRESENT UNDER THE FRONT SENSOR
                    Set to 0 when a document is under the front document sensor.   2     1
        7           CASH RECEIPT PRINT ERROR
                    Paper cover is open or the CR station is out of paper.


2                   PRINTER UNIT STATUS
        0 (LSB)     LEFT HOME POSITION                                      1     2
                    Set to 1 when the print head is in the left home position.
        1           DOCUMENT ERROR                                          3     2
                    The document not inserted after DI station was selected and
                    the wait timed out.
        2           DOCUMENT PRESENT UNDER THE TOP SENSOR                    2     2
                    Set to 0 when a document is under the top document sensor.
        3           RESERVED (always = '0')                                    n/a
        4           FLASH EPROM LOAD ERROR OR MCT LOAD ERROR                3     3
        5           RIBBON COVER OPEN                                       1     5
                    Set to 1 when the ribbon cover is open.
        6           RESERVED (always = '0')                                    n/a
        7 (MSB)     SJ STATION PAPER FAULT                                  5     7
                    Set to 1 when the paper is not present.

3                   PRINTER UNIT STATUS                                     4
                    Contains the printer EC level with all status messages.

4                   RESERVED (always = '00')                                   n/a

5                   PRINTER UNIT STATUS                                     6
                    Contains the current line count the printer is on.
```

(continued on next page)

Figure 2. 4610 RS-485 Fiscal Unit Status - Part 2 of 3

4610 RS-485 Fiscal Unit Status continued......

```
BYTE    BIT         CONTENT

 6                  FISCAL UNIT STATUS                                        (Note 1)
        0 (LSB)     RESERVED (always = '0')
        1           IPL STATUS
                    When set, it indicates that status byte 9 contains the IPL completion
                    status; and bit 4 of byte 7 is set as it was at IPL time.
        2           IPL IN PROGRESS
                    Set to indicate that the fiscal unit is performing the IPL sequence.
        3           MICROCODE EC
                    When set it indicates that status byte 8 contains the microcode EC.
        4           PLD
                    This bit is set at IPL time to indicate that a command was in execution
                    during PLD and that all modifications caused by the suspended command
                    have been deleted.
        5           ASYNCHRONOUS STATUS
                    When set it indicates that the fiscal unit is executing an internal
                    command (e.g. POR sequence) or it received an asynchronous status from
                    the printer.
        6           INTERMEDIATE STATUS
                    When set it indicates that execution of a command is still in progress.
        7 (MSB)     FISCAL UNIT BUSY
                    Set to 1 when a command is received while a previous command is still
                    in execution.

 7                  ADDITIONAL DATA/COUNTRY VERSION/COUNTRY CODE - x43 (67)
        7 (MSB)     ADDITIONAL DATA                                          (Note 2)
        6-5         COUNTRY VERSION (hardware model)
                    4610 (RS-485) = x10 (02)
        4-0         COUNTRY CODE
                    Greece = x00011 (03)

 8                  FISCAL UNIT RETURN CODE                                   (Note 3)

 9-n                ADDITIONAL DATA (if byte 7 bit 7 is on)

---------------------------------------------------------------------------------------

  Note  : Bit 7 is the most significant bit and bit 0 is the least significant bit.

  Note 1: When fiscal unit status byte 5 is 00 then command is complete.

  Note 2: Where additional data follows the nine fiscal status bytes.

  Note 3: When fiscal unit return code is 43 hex. (67_{10}), it means that
          no error is indicated on this status message.
```

Figure 3. 4610 RS-485 Fiscal Unit Status - Part 3 of 3

The fiscal unit return codes are defined in chapter 14.0, " FISCAL UNIT RETURN CODES" on page 163.

2.4.2 4610 RS-485 Version/Country Code Definitions

- Country Name = Greece

- Country Version (hardware model) = 02 (4610 (Protocol SIO, Cable RS-485))

- Country Code = 03

- Country Version + Country Code:

  - Hexadecimal = 43
  - Decimal = 67

- Fiscal Microcode EC Level = 10

2.4.3 4610 USB (Protocol USB - Cable USB) Fiscal Unit Status

The fiscal unit response to the application program is contained in the fiscal unit status, which is 15 bytes long (8 bytes for the fiscal printer status and 7 bytes for fiscal unit status).

The following figure shows the content of the fiscal status.

```
BYTE  BIT        CONTENT

 0                PRINTER UNIT STATUS
       0 (LSB)    COMMAND LOADED
                  For RS-485 buffered commands.
                  Set to 1 when the command is received into the print buffer.
                  Note: this is not when the line is actually printed.
                  COMMAND COMPLETE
                  For RS-232 and RS-485 immediate command and flash storage commands.
                  Set to 1 when the command is complete.
       1          CASH RECEIPT RIGHT HOME POSITION
                  Set to 1 when the print head is in the cash receipt right home position.
       2          LEFT HOME POSITION
                  Set to 1 when the print head is in the left home position.
       3          DOCUMENT RIGHT HOME POSITION
                  Set to 1 when the print head is in the document right home position.
       4          RESERVED (Always = '0')
       5          RIBBON COVER OPEN
                  Set to 1 when the ribbon cover is open.
       6          CASH RECEIPT PRINT ERROR
                  Paper cover is open or the CR station is out of paper.
       7 (MSB)    COMMAND REJECT

 1                PRINTER UNIT STATUS
       0 (LSB)    DOCUMENT READY
                  Set to 0 when the DI station is ready for printing. This occurs when both
                  document sensors are made and the document has been fed to the first print position.
       1          DOCUMENT PRESENT UNDER THE FRONT SENSOR
                  Set to 0 when a document is under the front document sensor.
       2          DOCUMENT PRESENT UNDER THE TOP SENSOR
                  Set to 0 when a document is under the top document sensor.
       3          RESERVED (Always = '1').
       4          PRINT BUFFER HELD
                  Set to a 1 when the print buffer is being held. Cleared when buffer released.
                  The printer may be held due to a hold buffer command or one of the following
                  printer errors:
                  - Ribbon cover open with commands to be printed on the DI station.
                  - CR print error with commands to the CR station.
       5          OPEN THROAT POSITION
                  Set to 1 when the print head is in the open throat position.
       6          BUFFER EMPTY
                  Set when there is no longer any print data or commands in the buffer.
       7 (MSB)    BUFFER FULL
                  Set when only 512 bytes remain in the buffer.
                  Cleared when 3k bytes are free (RS-485 only).
```

Figure 4. 4610 USB Fiscal Unit Status - Part 1 of 3

```
BYTE   BIT         CONTENT

2                  PRINTER UNIT STATUS
       0 (LSB)     MEMORY SECTOR IS FULL
       1           HOME ERROR
       2           DOCUMENT ERROR
                   The document not inserted after document station was selected and the wait
                   timed out.
       3           FLASH EPROM LOAD ERROR OR MCT LOAD ERROR
       4           RESERVED (Always = '0')
       5           USER FLASH STORAGE SECTOR IS FULL
       6           FIRMWARE ERROR
                   CRC on the firmware failed. The printer is running out of the boot sector.
                   ONLY system commands and firmware commands will be accepted.
       7 (MSB)     FISCAL BIT
                   Set to show a line completed printing.

3                  PRINTER UNIT STATUS
                   Contains the printer EC level with all status messages.

4                  PRINTER UNIT STATUS
       0 (LSB)     PRINTER ID REQUEST/EXTENDED ADDRESS CMD
                   Set to 1 when responding to a printer ID request.
       1           EC LEVEL
                   Set to 1 when responding to an EC level request.
       2           MICR READ
                   Set to 1 when responding to a MICR read command.
       3           MCT READ
                   Set to 1 when responding to a MCT read command.
       4           USER FLASH READ
                   Set to 1 when responding to a user flash read command.
       5           Reserved (Always = '1').
       6           SJ COVER OPEN
                   Set to 1 when the cover on the SJ station is open.
       7           SJ STATION PAPER FAULT
                   Set to 1 when the paper is not present.

5                  PRINTER UNIT STATUS
                   Contains the current line count the printer is on.

6                  PRINTER UNIT STATUS
       0 (LSB)     JOURNAL STATUS SELECTION                                      (Note 1)
                   1 = Selected
                   0 = Not Selected
       1
       2           PDF417 BAR CODE GENERATION PROBLEM
                   Set to 1 when there is a problem creating a pdf417 bar code image.
       3           CASH DRAWER STATUS
                   Set to 1 when cash draw is opened.
       4           PRINTER KEY PRESSED
                   Set to 1 when a printer key operation is in progress.
       5           RESERVED (Always = '1')
       6           STATION SELECTED
                   Set when the DI station is selected. Clear when the CR station is selected.
       7 (MSB)     DOCUMENT FEED ERROR
                   Set when there is an error after a Flip Check or a MICR command is executed.
```

Figure 5. 4610 USB Fiscal Unit Status - Part 2 of 3

4610 USB Fiscal Unit Status continued......

```
BYTE   BIT        CONTENT

7                 FISCAL UNIT STATUS (reserved for future use).

8                 FISCAL UNIT STATUS
       0          Fiscal/Printer Device Info
                  0 = Fiscal Device Info is NOT contained in this message
                  1 = Fiscal or Printer Device Info IS contained in this message
       1          IPL STATUS
                  When set, it indicates that status byte 14 contains the IPL completion status;
                  and bit 4 of byte 9 is set as it was at IPL time.
       2          IPL IN PROGRESS
                  Set to indicate that the fiscal unit is performing the IPL sequence.
       3          MICROCODE EC
                  When set it indicates that status byte 8 contains the microcode EC.
       4          PLD
                  This bit is set at IPL time to indicate that a command was in execution during
                  PLD and that all modifications caused by the suspended command have been deleted.
       5          ASYNCHRONOUS STATUS
                  When set it indicates that the fiscal unit is executing an internal command
                  (e.g. POR sequence) or it received an asynchronous status from the printer).
       6          INTERMEDIATE STATUS
                  When set it indicates that execution of a command is still in progress.
       7          FISCAL UNIT BUSY
                  Set to 1 when a command is received while a previous command is still in execution.

9                 PRINTER UNIT STATUS
       0-5        RESERVED (Always = '0')
       6          Host attempted to send a new command without reading the feature report for the
                  previous command.
       7          ADDITIONAL DATA AND COUNTRY VERSION
                  (= 1 when any data is available; otherwise = 0)

10                COUNTRY CODE
                  03 = Greece

11                COUNTRY VERSION (hardware model)

12                FISCAL MICROCODE EC LEVEL

13                FISCAL UNIT RETURN CODE                                    (Note 3)

14                FISCAL UNIT RETURN CODE (reserved for future use)

15-n              ADDITIONAL DATA (if byte 12 bit 7 is ON)
```

Note : Bit 7 is the most significant bit and bit 0 is the least significant bit.

Note 1: In order to remain compatible with existing 4610 printer status definitions,
        when reading the status bytes to determine which station is selected, the
        journal station selected status bit and the CR/DI station selected status
        bit must be checked in the following sequence:
        1 - Check byte 6, bit 0 first
            - If it is '1' then the journal station is selected
            - If it is '0' then the journal station is not selected and status byte 7,
              bit 6 must be cheched to determine which station is selected.
            If status byte 6, bit 6 is a '0' then the CR is selected.
            If status byte 6, bit 6 is a '1' then the DI is selected.

Note 2: Where additional data follows the sixteen fiscal status bytes.

Note 3: When fiscal unit return code is 43 hex. (67_{10}), it means that
        no error is indicated on this status message.

Figure 6. 4610 USB Fiscal Unit Status - Part 3 of 3

The fiscal unit return codes are defined in 14.0, " FISCAL UNIT RETURN CODES" on page 163 .

2.4.4 4610 USB Version/Country Code Definitions

- Country Name = Greece

- Country Version (hardware model) = 04 (4610 (Protocol USB, Cable USB))

- Country Code = 03

- Fiscal Microcode EC Level = 10

3.0 Command Set

In this section it is given a summary of the fiscal unit command set.
See 13.2, " 00 - SYSTEM COMMANDS" on page 78 for the command structure.
The code preceding the command name represents the hexadecimal value of command byte 0.

```
SALE TRANSACTION:

        01 - Print Header
        03 - Comments Line on CR Station
        D2 - Item Sale
        D3 - Negative/Positive Item Sale:
            Negative Item Sale:
                            Returns
                            Voids
                            Discounts
            Positive Item Sale:
                            Uplifts
        D4 - Subtotal/Total Transaction
        D9 - Discount/Uplift on Subtotal
        D5 - Payment
        06 - End Transaction
        07 - Cancel Transaction

CLOSE SALE PERIOD:

        13 - Close Sale Period

REPORTS:

        14 - Print X-Report
        15 - Fiscal Memory Report
        DD - Start Non-Fiscal Report
        DE - End Non-Fiscal Report

INITIALIZATION:

        D7 - Set Header
        16 - Set Date and Time
        1A - Set Display Address
        18 - Set Fiscal Mode
        1B - Serialize Fiscal Memory
        20 - Load VAT Rate Table
        21 - Verify VAT Rate Table
        C4 - Fiscal Parameter Configuration
```

Figure 7. Command Set Summary (Part 1 of 2).

PRINTER:

       EA – Normal Printing Line on CR/SJ Station
       EB – Normal Printing Line on DI Station
       E9 – Printer Native Commands
       E7 – Diagnostic and Alignment Utilities
       E8 – Set Number of Dot Rows per Linefeed
       EC – Line Feed
       ED – Ready Document (Top/Bottom Registration)
       EE – Cut Customer Receipt
       EF – Document Eject (Forward/Reverse Feed)
       F4 – Head Position & Open/Close Throat

UTILITIES:

       DA – Read Fiscal Memory Tables
       DB – Read Accumulators and Counters
       DC – Read FDTS
       F1 – Report IPL Completion Status
       F8 – Report Printer EC
       F9 – Report Current Status
       FA – Perform Power On Reset
       FB – Run Online Diagnostics
       FC – Report Microcode EC level
       FF – Dump Fiscal RAM and Fiscal Memory

MISCELLANEOUS:

       C8 – Set Barcode Parameters
       C9 – Print Barcode
       CA – Download and Print Graphics
       CD – Cash Drawer Management

SYSTEM:

       00 – Fiscal Unit Power On Reset
       00 – Report Current Status
       00 – Fiscal Unit Test
       00 – Report Microcode EC level

Figure 8. Command Set Summary (Part 2 of 2).

3.1 Error Conditions

Errors encountered during command execution are processed as follows:

- Command processing is suspended.

- Internal accumulators and counters are restored to their original value (the value they had before the command in error was received).

- An error is included in the final status sent over the communication link. The error type indicates the cause of the abnormal termination.

- The application program can resend the same command again or any other command that is valid for the procedure that is in progress.

To warn the operator that the same line could be printed more than once for the same item, a three characters overlay string (″###″) is provided by microcode on the first 3 character positions of the line.
This overlay operation is activated by the application program by setting the retry bit in the repeated command.
The retry bit has effect only for the following commands.

- Item Sale

- Negative Item Sale

- Positive Item Sale

- Payment

- Discount on Subtotal

- Uplift on Subtotal

Only exception to the above process is the recovery from error occurred during close sale period (closure), fiscal memory report, end transaction and cancel transaction commands processing.

- Close Sale Period command. On receipt of any command, after error, the closure function is completed in one of the following two ways:

  1. Fiscal memory already updated: The close sale period command is terminated as if error did not occur.

  2. Fiscal memory not yet updated: The daily data are restored as they were before close sale period and the customer slip is voided.

- Fiscal Memory Report command. On receipt of first command, after error, the report is terminated and the slip is voided.

- End Transaction. Only end transaction or cancel transaction commands are accepted.

- Cancel Transaction. Only cancel transaction command is accepted.

4.0 Power ON - J4 (CE) Jumper Functions

The RAM is cleared and all totals are reset when the J4 (CE) jumper is activated. Available information, such as the serial number, is loaded from the fiscal memory (EPROM) to the RAM.

The activate jumper procedure consists in:

- Turn OFF the fiscal printer
- Put the J4 (CE) jumper in ON (ACTIVE) position
- Turn ON the fiscal printer

The deactivate jumper procedure consists in:

- Turn OFF the fiscal printer
- Put the J4 (CE) jumper in OFF (STORED) position
- Turn ON the fiscal printer

4.1 Calculations while the jumper is active:

- Recover the following counters from the fiscal memory tables

  Lif_N_Clos

  Lif_N_Ract

- Operate on the following counters as shown below and they are incremented on every IPL with jumper in ON (ACTIVE) position.

  $Lif\_N\_Ract = Lif\_N\_Ract + 1$

  $Day\_N\_Ract = Day\_N\_Ract + 1$

4.2 Power ON - J4 (CE) Jumper Rules

- Only authorized service personnel can move the J4 jumper.
- The RAM pattern is initialized after all the other initialization has been completed.
- This process can take a long time if the fiscal memory is almost full or full.
- When the jumper procedure has been completed, a power-on report will be printed to inform the operator the fiscal unit status.

5.0 Power Line Disturbance (PLD)

When a PLD occurs the fiscal unit goes in a power-off state.

When power is restored the microcode checks if command execution was in progress when PLD occurred. If no command was in progress a normal IPL is performed. If command was in progress then internal accumulators and counters are restored to their original value (the value they had before the execution of the interrupted command).

A bit (PLD bit) is included in the IPL status sent over the communication link.

The PLD bit indicates to the application program that the last command sent was not executed because of PLD.

The IPL routines guarantee that accumulators and counters are restored to their original values, but no actions can be performed on totally or partially printed lines.

Only exception to the above process is the recovery from PLD occurred during close sale period (Closure) or fiscal memory report.

- Close Sale Period command.
  On IPL completion, after PLD, the closure function is completed in one of the following two ways:

  1. Fiscal memory already updated: The close sale period command is terminated as if PLD did not occur.

  2. Fiscal memory not yet updated: The daily data are restored as they were before close sale period command and the customer slip is voided.

- Fiscal Memory Report command.
  On IPL completion, after PLD, the report is terminated and the slip is voided.

6.0 Initialization Sequence

The initialization sequence for Greece is:

1. *RAM CLEAR*
   - Turn OFF the fiscal printer
   - **Put jumper in OFF position (STORED)**
   - Turn ON the fiscal printer
   - **Put jumper in ON position (ACTIVE)**
   - Turn OFF the fiscal printer
   - **Put jumper in OFF position (STORED)**
   - Turn ON the fiscal printer

2. *SERIALIZE FISCAL MEMORY*
   - Execute -->   Serialize Fiscal Memory = 1B66 1B00

3. *SET DATE AND TIME*
   - Execute -->   Set Date = 1B66 1600

4. *FISCAL MODE*
   - Execute -->   Set Fiscal Mode = 1B66 1800

5. *FISCAL PARAMETER CONFIGURATION*

   (Optional)
   - Execute -->   Display Sensing Definition = 1B66 C402

6. *SET DISPLAY ADDRESS*
   - Execute -->   Set Display = 1B66 1A00

7. *RESET FISCAL PRINTER*

   (Issue only for USB microcode version)
   - Turn OFF the fiscal printer
   - Turn ON the fiscal printer

8. *SET HEADER IN RAM*

   (Minimum = 1, Maximum = 6)
   - Execute -->   Set Header Line 1 = 1B66 D701
   - Execute -->   Set Header Line 2 = 1B66 D702
   - Execute -->   Set Header Line 3 = 1B66 D703

- Execute --> Set Header Line 4 = 1B66 D704

- Execute --> Set Header Line 5 = 1B66 D705

- Execute --> Set Header Line 6 = 1B66 D706

9. *STORE HEADER IN FISCAL MEMORY*

- Execute --> Set Header = 1B66 D700

10. *LOAD VAT RATE TABLE AND VERIFY VAT RATE TABLE*

- Execute --> Load VAT Rate Table = 1B66 2000

- Execute --> Verify VAT Rate Table = 1B66 2100

6.1 Serialize Fiscal Memory

This procedure is used at the end of the manufacturing process to store the manufacturing id, manufacturing year and serial number in fiscal memory.
This procedure can be executed only once.

6.2 Set Date And Time

This procedure is used to update the fiscal unit internal hardware TOD.
This command cannot be executed when sale period is in progress.

6.3 Set Fiscal Mode

This procedure is used to set the fiscal mode in fiscal memory.
Once this procedure has been executed the fiscal unit will operate in accordance with the country fiscal law.
This procedure can be executed only once.

6.4 Fiscal Parameter Configuration

This procedure is used to configure the number of displays to be sensed during the printer operation.
This procedure can be executed only once after.

6.5 Set Display Address

This procedure is used to set the address of the two displays that must be monitored for connection by the fiscal unit.
Microcode default addresses are x′21′, x′22′.
Display addresses are set to their default values when RAM is cleared by installation of the CE jumper.
This command cannot be executed when sale period is in progress.

6.6 Set Header

This procedure is used to load the header into RAM.
The Header is cancelled when RAM is cleared by installation of the CE jumper.
This command cannot be executed when sale period is in progress.

6.7 Load VAT Rate Table

This procedure is used to load a new VAT rate table.
This command must be issued out of the sale period.
Up to 224 fiscal memory VAT rate table entries are available for the fiscal unit life time.

6.8 Verify VAT Rate Table

This procedure is used to verify that the VAT rate table being used by the application program is the same that is used by the fiscal unit.

7.0 FDTS (Fiscal Date/Time Stamp)

The FDTS is composed by a date (RAM_FDTS_Date) and time (RAM_FDTS_Time).
The FDTS is set and check when any of the following commands are executed or the condition holds:

- 01 - Print Header
- 13 - Close Sale Period
- 14 - Print X-Report
- 20 - Load VAT Rate Table

7.1 FDTS - Rules

- The FDTS set is stored in RAM memory.

- When the jumper procedure has been completed, the FDTS take a greater value either (last FM_DE_Date and Last FM_DE_Time) and (FM_TR_Date and FM_TR_Time).

- At training mode, FDTS always keep the following date and time and never is updated by any command.
     Date: 01/01/1990
     Time: 00:00

7.2 FDTS - Operation Mode Flow

The following procedure is apply in fiscal mode only.

```
                              -----------------------
                              |         IPL          |
                              |                      |
                              | FDTS = 01/01/1990 00:00 |
                              -----------------------
                                          |
  --------------------------              |
  | Last FM Daily Entry Table |--+        v
  --------------------------    |         |
                                |   ---------------
                                |   | Updated FDTS |  FDTS
                              +->-| with the most |------->-----+
                                |   | recent date  |            |
                                |   | and time     |            |
  --------------------------    |   ---------------            |
  | Last FM VAT Rate Table    |--+        |                     |
  --------------------------             v                     |
                                          |                     |
                                     ----------                 |
       "Date & Time request" | Set Date |                 |
                 < "FDTS"     | and Time |                 |
  RC = 70 <--------------------|   x16    |                 |
                                     ----------                 |
                                          |                     |
                                          v  OK                 |
                                          |                     |
                                     ----------                 |
       "Current_Date & Time" | Load VAT | Current_Date |      ---------
           invalid or corrupt | Rate Tbl | Current_Time |      | Update  |
  RC = 104 <--------------------|   x20    |---------->----+->-|  FDTS   |
                                     ----------            |     | ( RAM ) |
                                          |                     ---------
                                          v  OK                 |
                                          |                     |
                                     ----------                 |
       "Current_Date & Time" |  Print   | Current_Date |      |
                 < "FDTS"     | Header   | Current_Time |      |
  RC = 61 <--------------------|   x01    |---------->----+      |
                                     ----------                 |
                                          |                     |
                                          v  OK                 |
                                          |                     |
                                     ----------                 |
       "Current_Date & Time" |  Print   | Current_Date |      |
                 < "FDTS"     | X-Report | Current_Time |      |
  RC = 61 <--------------------|   x14    |---------->----+      |
                                     ----------                 |
                                          |                     |
                                          v  OK                 |
                                          |                     |
                                     ----------                 |
       "Current_Date & Time" | Closure  | Current_Date |      |
                 < "FDTS"     | Sale Per.| Current_Time |      |
  RC = 61 <--------------------|   x13    |---------->----+
                                     ----------
```

Figure 9. FDTS - Operation Mode Flow.

8.0 Off-Line Report

Off-Line report is a functionality that allows the user to execute some fiscal commands thru printer's buttons.
The activation sequence will print a menu from which fiscal commands can be selected.

Fiscal commands available with button sequences are closure report (13 cmd.) and fiscal memory report (15 cmd.).

Off-Line report functionality is allowed regardless of the disconnection and connection state of the fiscal unit.

8.1 Off-Line Report - Rules

- When the fiscal printer is connected off-line reports are not allowed if a voucher or a non-fiscal report is in progress, and the activation sequence will have no other effect than producing a printer reset.

- When the fiscal printer is disconnected, the activation sequence will cancel a voucher in progress or end a non-fiscal report in progress before entering the off-line reports menu.

- Requested commands will be executed according to current system flags.

- Return codes will be printed after the execution of the requested command.

8.2 Off-Line Report Flow

```
                    ----------
                   |  Start   |
                   | Off-Line |
                   | Report   |
                    ----------
                        |<-------------------+--------<------------+-------------------------<--------------------+
                        v                     |                    |                                              |
     -----------------------------            |                    |                                              |
    | Main Menu                   |           |                    |                                              |
    |  0. Help (upper left button)|           |                    |                                              |
    |  1. Closure                 |           |                    |                                              |
    |  2. Fiscal Memory Report    |           |                    |                                              |
    |  3. End Off-Line Report Mode |          |                    |                                              |
     -----------------------------            |                    |                                              |
           |                                  |                    |                                              |
           |   0    --------------------      |                    |                                              |
           +----->| Print "Help Report" |     |               | NO |                                             |
           |   1    --------------------       ------------------          YES    ------------------             |
           +------------------------------------->| Confirm Options ? |----->| Print "Z-Report" |------------>+ |
           |            --------------------------    ------------------          ------------------             |
           |           | Fiscal Memory Report menu |                                                             |
           |   2       |  0. Return to main menu   |                                                            |
           +----->|  1. FM content by closure |                                                                |
           |           |  2. FM content by date    |                                                           |
           |           |  3. All fiscal memory     |                                                           |
           |            --------------------------                                                             |
           |                      |                           +----------------->-------------------->+       |
           |                      | 1    ---------------                          |                   |       |
           |                      +--->| FM content b/ |--+                       |                   |       |
           |                      |    | closure nbrs. |  |                       |                   |       |
           |                      |     ---------------   |                       | NO                |       |
           |                      | 2    ---------------   |      ------------------          YES    ------------------   |
           |                      +--->| FM content b/ |--+---->| Confirm Options ? |----->| Print "FM Report" |-->-+
           |                      |    | closure dates |  |      ------------------          ------------------
           |                      |     --------------    |
           |                      | 3    -----------      |
           |                      +--->| All fiscal |-----+
           |                      |    | memory     |
           |                      |     -----------
           |
           |                 ----------
           |   3       |  End     |
           +----->| Off-Line |
                   | Report   |
                    ----------
```

Figure 10. Off-Line Report Flow

8.3 Off-Line Report Operation

- **Start Off-Line Mode**

USER ACTION
PRESS BOTTON DI & BUTTON SJ
Press and hold both buttons for at least 5 seconds until DI button LED starts flashing.

Table 2. Start Off-Line Mode

- **Main Menu**

OPTIONS	USER ACTION		
DESCRIPTION	**PRESS BUTTON DI**	**PRESS BUTTON CR**	**PRESS BUTTON SJ**
0. Help		1 time	
1. Closure	1 time	then.. 1 time	
2. Fiscal Memory Reports	2 times	then.. 1 time	
3. End Offline Reports Mode	3 times	then.. 1 time	
Cancel			Once at any time

Table 3. Main Menu

- **Closure**

OPTIONS	USER ACTION		
DESCRIPTION	**PRESS BUTTON DI**	**PRESS BUTTON CR**	**PRESS BUTTON SJ**
Confirm		1 time	
Cancel			Once at any time

Table 4. Closure

- **Fiscal Memory Reports menu**

OPTIONS	USER ACTION		
DESCRIPTION	**PRESS BUTTON DI**	**PRESS BUTTON CR**	**PRESS BUTTON SJ**
0. Return to main menu		1 time	
1. FM content b/ closure numbers	1 time	then.. 1 time	
2. FM content b/ closure dates	2 times	then.. 1 time	
3. All fiscal memory	3 times	then.. 1 time	
Cancel			Once at any time

Table 5. Fiscal Memory Reports menu

- **FM content between closure numbers**

OPTIONS	USER ACTION		
DESCRIPTION	PRESS BUTTON DI	PRESS BUTTON CR	PRESS BUTTON SJ
First Closure Nbr. - 1st. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
First Closure Nbr. - 2nd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
First Closure Nbr. - 3rd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
First Closure Nbr. - 4th. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Last Closure Nbr. - 1st. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Last Closure Nbr. - 2nd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Last Closure Nbr. - 3rd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Last Closure Nbr. - 4th. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Confirm Option (Accept)	N times	then.. 1 time	
Confirm Option (Cancel)	N times		then.. 1 time
Cancel			Once at any time

Table 6. FM content between closure numbers

- **FM content between closure dates**

OPTIONS	USER ACTION		
DESCRIPTION	PRESS BUTTON DI	PRESS BUTTON CR	PRESS BUTTON SJ
First Closure Day - 1st. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 3 times for digit 3 Press 4 times for digit 0	then.. 1 time	
First Closure Day - 2nd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
First Closure Month - 1st. digit	Press 0 time for digit 0 Press 1 time for digit 1 Press 2 times for digit 0	then.. 1 time	
First Closure Month - 2nd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
First Closure Year - 1st. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
First Closure Year - 2nd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Last Closure Day - 1st. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 3 times for digit 3 Press 4 times for digit 0	then.. 1 time	
Last Closure Day - 2nd. digit	Press 0 time for digit 0 Press 1 time for digit 1 Press 2 times for digit 0	then.. 1 time	
Last Closure Month - 1st. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Last Closure Month - 2nd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Last Closure Year - 1st. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Last Closure Year - 2nd. digit	Press 0 time for digit 0 Press 1 time for digit 1 .... Press 9 times for digit 9 Press 10 times for digit 0	then.. 1 time	
Confirm		1 time	

OPTIONS	USER ACTION		
DESCRIPTION	PRESS BUTTON DI	PRESS BUTTON CR	PRESS BUTTON SJ
Cancel			Once at any time

Table 7. FM content between closure dates

- **All Fiscal Memory Report**

OPTIONS	USER ACTION		
DESCRIPTION	PRESS BUTTON DI	PRESS BUTTON CR	PRESS BUTTON SJ
Confirm		1 time	
Cancel			Once at any time

Table 8. All Fiscal Memory Report

9.0 Printer Disconnection

9.1 Printer Disconnection Start and End Procedure

- Start ″Printer Disconnection Mode″

  1. Power-OFF POS (during homologation testing this might NOT be done).
  2. Disconnect printer from POS (Cable 7 is disconnected). .Connect printer to ′Power Brick′.
  3. Power-ON printer with ′Power Brick′.
  4. At power on, during the microcode initialization sequence, the fiscal microcode will check the 24v line to detect Power Supply is connected to the printer or not.
     - The disconnection has been recognized because the ′Power Brick′ is connected.
     - Start ″Stand Alone″ mode (No more commands are attended from the POS until the end ″Stand Alone″ mode).
     - A new disconnection is counted (See 9.5, "Printer Disconnection Calculations" on page 46).
     - A new entry is stored in printer disconnection table (See 9.5, "Printer Disconnection Calculations" on page 46).
     - The printer disconnection msg′s are printed in ″Power-ON Report″ (Serialized, Fiscalized and Active)″.

- End ″Printer Disconnection Mode″

  1. Power-OFF printer.
  2. Disconnect ′Power Brick′.
  3. Connect to POS (Cable 7 is connected).
  4. Power ON POS (if it was OFF. During homologation testing the POS might have remained ON).
  5. At power on, during the microcode initialization sequence, the fiscal microcode will check the 24v line to detect Power Supply is connected to the printer or not.
     - The connection has been recognized because the ′Power Brick′ is not connected.
     - End ″Stand Alone″ mode (Resume ″normal″ operation).
     - The printer connection msg′s are printed in ″Power-ON Report″ (Serialized, Fiscalized and Active)″.

9.2 Printer Disconnection Mode Operation

- IPL: When multiple IPL′s occurs while the printer is in ″Printer Disconnection Mode″:

  - With jumper OFF:

    — No a new disconnection is counted.
    — No new entry is stored in printer disconnection table.
    — The printer connection msg′s are printed in ″Power-ON Report″ (Serialized, Fiscalized and Active)″.

  - With jumper ON:

    — A new disconnection is counted (See 9.5, "Printer Disconnection Calculations" on page 46).
    — A new entry is stored in printer disconnection table (See 9.5, "Printer Disconnection Calculations" on page 46).
    — The printer disconnection msg′s are printed in ″Power-ON Report″ (Serialized, Fiscalized and Active)″.

- Closure Report and Fiscal Memory Report: While disconnected, the microcode must be able to print the following reports thru the ″Off-Line Report″ (Buttons Menu) and the message ″THE FISCAL PRINTER IS DISCONNECTED″ will be printed.

- Closure Report.
- Fiscal Memory Report (by closure date or number ranges).

9.3 Notes

- If the fiscal printer is disconnected during a fiscal voucher/non-fiscal report in progress:
  - Start ″Stand Alone″ mode
  - A new disconnection is counted (See 9.5, "Printer Disconnection Calculations").
  - A new entry is stored in printer disconnection table (See 9.5, "Printer Disconnection Calculations"). li.The fiscal disconnection msg's are printed in ″Power-ON Report″ (Serialized, Fiscalized and Active)″.
  - If ″Off-Line Report″ (Buttons Menu) is used, the fiscal voucher/non-fiscal report will be closed (cancel voucher/end non-fiscal report).
- When end ″Stand Alone″ mode is done, resume ″normal″ operation without the need for CE jumpering.
- A display is NOT a requirement. Data may be printed instead of displayed.
- A keyboard is not a requirement.
- Only one power brick as fiscal units is sufficient to operate one or more fiscal printers in stand-alone mode.
- If a power supply is connected at any other time after power-on, while the printer is working connected to the cable 7, this will be ignored by the fiscal microcode and the printer will continue to work normally in ″standard″ fiscal mode. The 24v line won't be checked outside the power-on initialization.

9.4 Printer Disconnection Table Full

When the ″Printer Disconnection Table″ is full, the following operations will be not allowed:

- Fiscal Voucher
- Non-Fiscal Report
- Normal Lines
- Comment Lines
- BarCodes
- Graphics
- Ready Document
- Document Eject

9.5 Printer Disconnection Calculations

- When printer disconnection occurs, the following counters are incremented:

$Lif\_N\_Dcx = Lif\_N\_Dcx + 1$
$Day\_N\_Dcx = Day\_N\_Dcx + 1$

10.0 Audit Port

10.1 Serial Communication Protocol

The Fiscal Printer will have a Serial Communication Port for Electronic Data Collection.
The communication will be performed with "packet" transmissions.

10.1.1 Packets Type

10.1.1.1 Single Byte Packets

The Single Byte Packets are 1 byte long packets used for communication flow control. The types are:

- ACK (Acknowledge, hexadecimal 6), means that the "packet" was received with the correct data. The sending of this packet is "bidirectional". The fiscal printer(FP)/Device Data Collection(DDC) can send this package. After the ACK, FP/DDC will transmit the following "packet".
- NAK (Negative Acknowledge, hexadecimal 15), means that the "packet" was received with the incorrect data or the data was not received. If the DDC send this package, then the FP will retransmit the last "packet".
  If the FP send this package, then the DDC must retransmit the last "packet".
- ENQ (ENQuiry, hexadecimal 05): This "packet" is the Test Link Command (TLC). Anytime, the DDC can send a unique character ASCIIENQ and the FP will response with an ACK character. This will allow to verify the link communication integrity and restore it in case of a temporary break.

10.1.1.2 Block Packets

The Block Packets are multi-byte packets used for meaningful data trasmission between FP and DDC. See the format packet in 10.1.4, "Transmission Block Format" on page 49.
The types are:

- Data Fiscal Record (DFR): This record is used by the fiscal printer (FP) to send fiscal data to DDC. The first byte of this record specify the record type: Header, TAX Rate, Daily Total, Fiscal Memory Dump or Error.
- Audit Commands: This record is used for the DDC to request fiscal data from the fiscal printer (FP). It is transmitted at the begining of the communication. The data field have a fixed lenght of fourteen (14) bytes and its content will depend on he specific command requested.
- Finish Report Record (FRR): This record is used for the fiscal printer (FP) to indicate the DDC the end of fiscal data transmission. The data field has fixed length of four (4) ASCII characters corresponding to the number of four (4) digits indicating the quantity DFR sent. If this number is less than 4 digits, it will be padded left with '0'.

10.1.2 Packets Transmission

10.1.2.1 Description

The information transfer will be initiated for a Device Data Collection (DDC) sending an audit command (Block Packet) to the fiscal printer (FP).
The fiscal printer (FP) will respond with a Data Fiscal Record (DFR) (Block Packet). Each time that the fiscal printer (FP) finishes to transmit a DFR, will wait a response from DDC which will be one of the following Single Byte Packets: ACK or NAK.

The fiscal printer (FP) will always wait ACK or NAK (Single Byte Packets) after transmit a DFR (Block Packet) and will not accomplish any other task (unless to answer a unexpected Test Link Command (TLC) (Single Byte Packet)).

From this condition will only come out with some external operation communication, for instance, turn ON/OFF the fiscal printer.

After receiving the ACK (Single Byte Packet) response corresponding to the last DFR (Block Packet) transmited, the fiscal printer will send a Finish Report Record (FRR) (Block Packet).

10.1.2.2 Flow

```
        APPLICATION UNIT                    FISCAL PRINTER (FP)
     Device Data Collection(DDC)


     _____
    |      Audit Command        |   (1)
    |      (Block Packet)        |---------->
     _____

                                            _____
                                  (2)       |   Data Fiscal Record (DFR)  |
                                <----------|       (Block Packet)        |
                                            _____

     _____
    |         ACK/NAK           |   (3)
    |    (Single Byte Packet)   |---------->
     _____        ...


                                  (2)
                                <---------
                                  (3)
                                --------->
                                  ...
                                  (2)
                                <---------
                                  (3)
                                --------->
                                            _____
                                            | Finish Report Record (FRR)|
                                <----------|       (Block Packet)       |
                                            _____



                     DB9           DB9
                     Female        Male


                      2             2
                         *      *
                            *
        to PC             *     *           to fiscal printer
                      3             3

                      5  *******  5
```
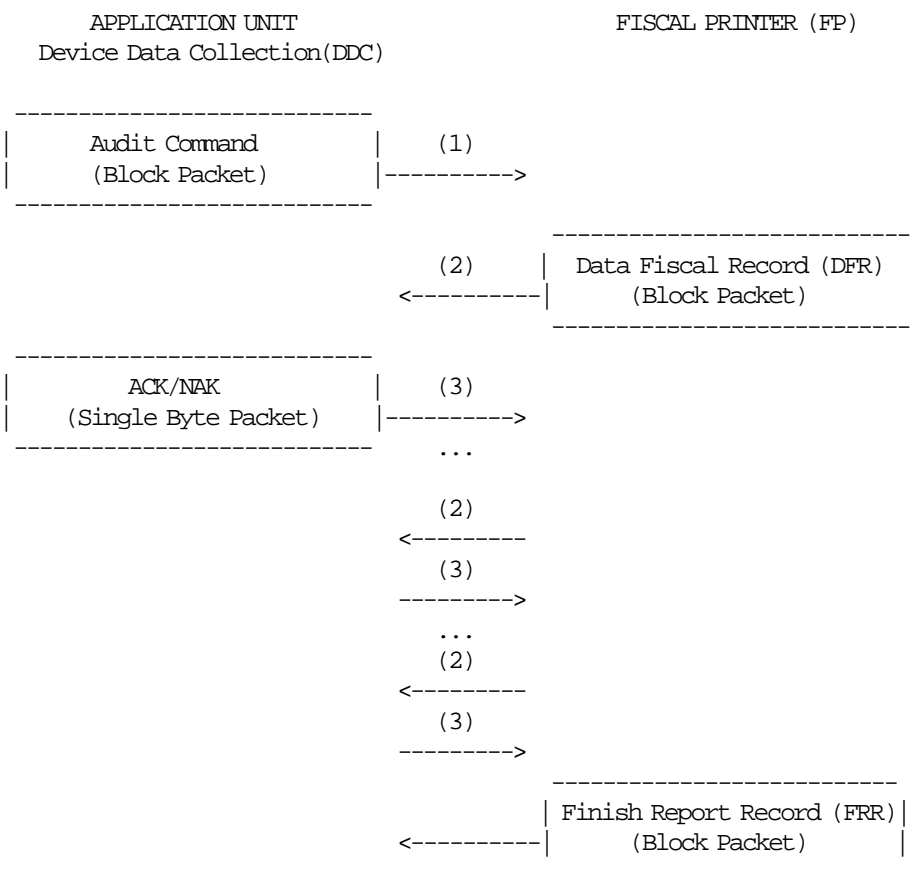
10.1.3 Communications Parameters

The communication will be handled thru the RS-232 standard. Only the Tx/Rx signals are currently used. Ground line must be connected also.
The communications parameters will be:

- 8 bits character lenght
- 1 start bit
- 1 stop bit
- parity none
- 9600 bauds transmission speed

10.1.4 Transmission Block Format

The transmission block format for the Block Packet is shown in the following table:

```
*********************************
*  STX  *  DATA  *  ETX  *  CHK  *
*********************************


******************************************************************************
* FIELD * LENGHT   * DESCRIPTION                                             *
******************************************************************************
* STX   * 1 byte   * ASCII character STX (Start of Text, hexadecimal 02).    *
*       *          * Indicate the record start.                              *
*-------*----------*---------------------------------------------------------*
* DATA  * variable * Set of ASCII characters with data to transmit.          *
*       *          * The lenght depend on the Record Type.                   *
*-------*----------*---------------------------------------------------------*
* ETX   * 1 byte   * ASCII character ETX (End of Text, hexadecimal 03).      *
*       *          * Indicate the record end.                                *
*-------*----------*---------------------------------------------------------*
* CHK   * 1 byte   * Check Byte. Will be the negative value (two's complement) *
*       *          * of the modulus 2**8 sum of the data, the start and the  *
*       *          * end characters record. (STX + DATA + ETX).              *
******************************************************************************
```

10.2 Audit Command

This record is used for the DDC to request fiscal data from the fiscal printer (FP). It is transmitted at the begining of the communication. The data field have a fixed lenght of fourteen (14) bytes and its content will depend on the specific command requested.

```
*****************************************************************************
*        DESCRIPTION        *    COMMAND    *         RANGE         *    FORMAT   *
*****************************************************************************
* ZN (Closures by Number) * ZN00nnnn00nnnn * nnnn = 0001..9999      * decimal     *
*--------------------------*----------------*-----------------------*-------------*
* ZD (Closures by Date)    * ZDYYMMDDYYMMDD * yymmdd = 900101..891231 *           *
*--------------------------*----------------*-----------------------*-------------*
* VN (Vats by Number)      * VN000nnn000nnn * nnn = 001..999         * decimal    *
*--------------------------*----------------*-----------------------*-------------*
* VD (Vats by Date)        * VDYYMMDDYYMMDD * yymmdd = 900101..891231 *           *
*--------------------------*----------------*-----------------------*-------------*
* WN (Wording by Number)   * WN0000nn0000nn * nn = 01..99            * decimal    *
*--------------------------*----------------*-----------------------*-------------*
* WD (Wording by Date)     * WNYYMMDDYYMMDD * yymmdd = 900101..891231 *           *
*--------------------------*----------------*-----------------------*-------------*
* RB (Raw Binary)          * RB0hhhhh0hhhhh * hhhhh  = 00000.. FFFFF * hexadecimal *
*****************************************************************************
```

- Request by Date

  The field data will be the following: YYMMDDYYMMDD
  Where:

  – YYMMDD = ASCII character indicating the period date (YY=year, MM=month, DD=day) initial and final.
  – The first YYMMDD set is initial date and second YYMMDD set is final date.

- Request Fiscal by Decimal Number

  The field data will be the following: 00nnnn00nnnn
  Where:

  – 00nnnn = set of six (6) digits compound for ASCII characters, indicating initial number and final number of audit period. The first digits have fixed value (ASCII character 0, hexadecimal 30) while the four remaining indicate the closure number.
    If the number is less than indicated digits, this field must be padded left with '0'.
  – The first 00nnnn set is initial number and second 00nnnn set is final number.

- Request Fiscal by Hexadecimal Number

  The field data will be the following: 0hhhhh0hhhhh
  Where:

  – 0hhhhh = set of six (6) digits compound for ASCII characters, indicating initial number and final number of audit period.
    The first digits have fixed value (ASCII character 0, hexadecimal 30) while the four remaining indicate the closure number.
    If the number is less than indicated digits, this field must be padded left with '0'.
  – The first 0hhhhh set is initial number and second 0hhhhh set is final number.

10.3 Electronic Data Collection

When the DDC send a audit command (block packet), the fiscal printer (FP) responds with a data fiscal record (DFR) (block packet). This record will be one of the following record types.

- Header Record
- VAT Rate Record
- Daily Entry Record
- Fiscal Memory Dump Record
- Error Record

10.3.1 Header Record

For the following audit command, one header record is returned for each header table entry of the requested period:

- WN (Wording by Number): WN0000nn0000nn
- WD (Wording by Date) : WNYYMMDDYYMMDD

```
**************************************************************************
* FIELD * FROM *  TO  *  SIZE   *       DATA       * TYPE  * ACCUMULATOR/ *
*  NBR. *      *      * (BYTES) *                  *       * COUNTER      *
**************************************************************************
*    1 *   1 *   1 *      1 * Record Type      * ASCII * Constant 'W' *
*-------*------*------*---------*------------------*----------------------*
*    2 *   2 *  11 *     10 * Date (dd/mm/yyyy) * ASCII * FM_HE_Date    *
*-------*------*------*---------*------------------*----------------------*
*    3 *  12 *  16 *      5 * Time (hh:mm)     * ASCII * FM_HE_Time    *
*-------*------*------*---------*------------------*----------------------*
*    4 *  17 *  20 *      4 * Closure Number   * ASCII * FM_HE_N_Clos *
*-------*------*------*---------*------------------*----------------------*
*    5 *  21 *  58 *     38 * Header Descrip. 1 * ASCII * FM_HE_Desc1  *
*-------*------*------*---------*------------------*----------------------*
*    6 *  59 *  96 *     38 * Header Descrip. 2 * ASCII * FM_HE_Desc2  *
*-------*------*------*---------*------------------*----------------------*
*    7 *  97 * 134 *     38 * Header Descrip. 3 * ASCII * FM_HE_Desc3  *
*-------*------*------*---------*------------------*----------------------*
*    8 * 135 * 172 *     38 * Header Descrip. 4 * ASCII * FM_HE_Desc4  *
*-------*------*------*---------*------------------*----------------------*
*    9 * 173 * 210 *     38 * Header Descrip. 5 * ASCII * FM_HE_Desc5  *
*-------*------*------*---------*------------------*----------------------*
*   10 * 211 * 248 *     38 * Header Descrip. 6 * ASCII * FM_HE_Desc6  *
**************************************************************************
```

10.3.2 VAT Rate Record

For the following audit command, one VAT rate record is returned for each VAT Rate table entry of the requested period:

- VN (VAT's by Number): VN000nnn000nnn
- VD (VAT's by Date) : VDYYMMDDYYMMDD

```
****************************************************************************
* FIELD * FROM *  TO  * SIZE    *          DATA          * TYPE  * ACCUMULATOR/ *
* NBR.  *      *      * (BYTES) *                        *       * COUNTER      *
****************************************************************************
*    1 *   1 *   1 *     1 * Record Type             * ASCII * Constant 'V' *
*-------*------*------*---------*------------------------------*-------*--------------*
*    2 *   2 *  11 *    10 * Date (dd/mm/yyyy)       * ASCII * FM_TR_Date   *
*-------*------*------*---------*------------------------------*-------*--------------*
*    3 *  12 *  16 *     5 * Time (hh:mm)            * ASCII * FM_TR_Time   *
*-------*------*------*---------*------------------------------*-------*--------------*
*    4 *  17 *  20 *     4 * Closure Number          * ASCII * FM_TR_N_Clos *
*-------*------*------*---------*------------------------------*-------*--------------*
*    5 *  21 *  26 *     6 * VAT Rate Category A (rr,rr%) * ASCII * FM_TR_Rate_A *
*-------*------*------*---------*------------------------------*-------*--------------*
*    6 *  27 *  32 *     6 * VAT Rate Category B (rr,rr%) * ASCII * FM_TR_Rate_B *
*-------*------*------*---------*------------------------------*-------*--------------*
*    7 *  33 *  38 *     6 * VAT Rate Category C (rr,rr%) * ASCII * FM_TR_Rate_C *
*-------*------*------*---------*------------------------------*-------*--------------*
*    8 *  39 *  44 *     6 * VAT Rate Category C (rr,rr%) * ASCII * FM_TR_Rate_D *
*-------*------*------*---------*------------------------------*-------*--------------*
*    9 *  45 *  50 *     6 * VAT Rate Category E (rr,rr%) * ASCII * FM_TR_Rate_E *
****************************************************************************
```

10.3.3 Daily Entry Record

For the following audit command, one daily entry record is returned for each daily entry table entry of the requested period:

- ZN (Closures by Number): ZN00nnnn00nnnn
- ZD (Closures by Date) : ZDYYMMDDYYMMDD

```
***************************************************************************
* FIELD * FROM *  TO  *  SIZE  *         DATA           * TYPE  * ACCUMULATOR/    *
* NBR.  *      *      * (BYTES) *                        *       *   COUNTER       *
***************************************************************************
*    1 *    1 *   1 *     1 * Record Type               * ASCII * Constant 'Z'    *
*_____*_____*_____*_____*_____*_____*_____*
*    2 *    2 *  11 *    10 * Date (dd/mm/yyyy)          * ASCII * FM_DE_Date      *
*_____*_____*_____*_____*_____*_____*_____*
*    3 *   12 *  16 *     5 * Time (hh:mm)               * ASCII * FM_DE_Time      *
*_____*_____*_____*_____*_____*_____*_____*
*    4 *   17 *  20 *     4 * Closure Number             * ASCII * FM_DE_N_Clos    *
*_____*_____*_____*_____*_____*_____*_____*
*    5 *   21 *  30 *    10 * Slip Number                * ASCII * FM_DE_N_Slip    *
*_____*_____*_____*_____*_____*_____*_____*
*    6 *   31 *  40 *    10 * Fiscal Voucher Number      * ASCII * FM_DE_N_Vouc    *
*_____*_____*_____*_____*_____*_____*_____*
*    7 *   41 *  60 *    20 * Cumulative Net Sales  (A+B+C+D)* ASCII * FM_DE_Net_ABDC *
*      *      *      *        * (format: a.aaa.aaa.aaa.aaa,aa) *       *                 *
*_____*_____*_____*_____*_____*_____*_____*
*    8 *   61 *  80 *    20 * Cumulative Net Sales  (E)  * ASCII * FM_DE_Net_E     *
*      *      *      *        * (format: a.aaa.aaa.aaa.aaa,aa) *       *                 *
*_____*_____*_____*_____*_____*_____*_____*
*    9 *   81 * 100 *    20 * Cumulative VAT Amount (A)  * ASCII * FM_DE_VAT_A     *
*      *      *      *        * (format: a.aaa.aaa.aaa.aaa,aa) *       *                 *
*_____*_____*_____*_____*_____*_____*_____*
*   10 *  101 * 120 *    20 * Cumulative VAT Amount (B)  * ASCII * FM_DE_VAT_B     *
*      *      *      *        * (format: a.aaa.aaa.aaa.aaa,aa) *       *                 *
*_____*_____*_____*_____*_____*_____*_____*
*   11 *  121 * 140 *    20 * Cumulative VAT Amount (C)  * ASCII * FM_DE_VAT_C     *
*      *      *      *        * (format: a.aaa.aaa.aaa.aaa,aa) *       *                 *
*_____*_____*_____*_____*_____*_____*_____*
*   12 *  141 * 160 *    20 * Cumulative VAT Amount (D)  * ASCII * FM_DE_VAT_D     *
*      *      *      *        * (format: a.aaa.aaa.aaa.aaa,aa) *       *                 *
*_____*_____*_____*_____*_____*_____*_____*
*   13 *  161 * 180 *    20 * Cumulative VAT Amount (E)  * ASCII * FM_DE_VAT_E     *
*      *      *      *        * (format: a.aaa.aaa.aaa.aaa,aa) *       *                 *
*_____*_____*_____*_____*_____*_____*_____*
*   14 *  181 * 183 *     3 * Repair Action Number       * ASCII * FM_DE_N_Ract    *
*_____*_____*_____*_____*_____*_____*_____*
*   15 *  184 * 186 *     3 * VAT Changes Number         * ASCII * FM_DE_N_VAT     *
*_____*_____*_____*_____*_____*_____*_____*
*   16 *  187 * 188 *     2 * Header Changes Number      * ASCII * FM_DE_N_Head    *
*_____*_____*_____*_____*_____*_____*_____*
*   17 *  189 * 191 *     3 * Printer Disconnections Number * ASCII * FM_DE_N_Dcx   *
***************************************************************************
```

10.3.4 Fiscal Memory Dump Record

For the following audit command, one record is returned for each 240 bytes of the requested period of the fiscal memory:

- RB (Raw Binary): RB0hhhhh0hhhhh

```
*********************************************************************************
* FIELD * FROM *  TO   *  SIZE   *         DATA         * TYPE  * OBSERVATION          *
*  NBR. *      *       * (BYTES) *                      *       *                      *
*********************************************************************************
*   1 *   1 *     1 *       1 * Record Type          * ASCII * Constant 'D'         *
*-------*------*---------*---------*----------------------*-------*----------------------*
*   2 *   2 *     6 *       5 * Dumped Address       * ASCII * hhhhh =              *
*       *      *         *         * (format: hhhhh)      *       * hexadecimal represent. *
*-------*------*---------*---------*----------------------*-------*----------------------*
*   3 *   7 *     9 *       3 * Block Size           * ASCII * 001   =< nnn <= 120  *
*       *      *         *         * (format: nnn)        *       * decimal representation *
*-------*------*---------*---------*----------------------*-------*----------------------*
*   4 *  10 * (n*2)+9 *   (n*2) * Bytes in Hexadecimal * ASCII * hh..hh =             *
*       *      *         *         * (format: hhhh...hhhh) *       * hexadecimal represent. *
*       *      *         *         *                      *       * 1 < x <= 120         *
*********************************************************************************
```

```
For every byte requested, 2 bytes are returned in the ASCII representation of
the hex value for the byte. If the x00082 position in fiscal memory contains
A5, the RB command will return '41 35'.
```

10.4 Errors

When a error occurs a error record is returned instead of the corresponding header, VAT rate, daily entry or fiscal memory dump record.

10.4.1 Error Record

```
***********************************************************************************
* FIELD * FROM *  TO  *  SIZE   *         DATA       *           OBSERVATIONS           *
*  NBR. *      *      * (BYTES) *                    *                                  *
***********************************************************************************
*    1 *   1 *   1 *       1 * Record Type       * Constant 'E'                     *
*-------*------*------*---------*--------------------*----------------------------------*
*    2 *   2 *   7 *       6 * First Return Code * '000 067': Good Completion       *
*      *      *      *         *                    * '000 xxx': Error Code            *
*      *      *      *         *                    *            (the error descriptions are *
*      *      *      *         *                    *            in the Fiscal Unit Return   *
*      *      *      *         *                    *            Codes chapter in the        *
*      *      *      *         *                    *            Technical Specification)    *
*-------*------*------*---------*--------------------*----------------------------------*
*    3 *   8 *  10 *       3 * Second Return Code * if First Return Code = '067'     *
*      *      *      *         *                    * '067': Good Completion           *
*      *      *      *         *                    * '090': Data Not Found            *
*      *      *      *         *                    * '100': Error Reading Fiscal Memory *
***********************************************************************************
```

10.4.2 Invalid Commmands

```
************************************
* INVALID COMMAND *   ERROR RECORD   *
************************************
* JN000001123456  * 'E 000 065 000' *
*-----------------*-----------------*
* ZH000001123456  * 'E 000 066 000' *
************************************
```

10.4.3 Errors by Flags

```
***************************************************************************
*                       FLAGS                        *   ERROR RECORD    *
***************************************************************************
* FMEMNIT (Fiscal Memory Serialized.................) = NO  *'E 000 128 000' *
*-------------------------------------------------------------*----------------*
* FISCFLG (Fiscal Printer Set in Fiscal Mode .......) = NO  *'E 000 129 000' *
*-------------------------------------------------------------*----------------*
* FIPLINP (Power On in Progress.....................) = YES *'E 000 164 000' *
*-------------------------------------------------------------*----------------*
* FEPROMC (Fiscal Memory Connected..................) = NO  *'E 000 109 000' *
*-------------------------------------------------------------*----------------*
* FISCRDY (Fiscal Printer Ready.....................) = NO  *'E 000 134 000' *
*-------------------------------------------------------------*----------------*
* FHDRPRT (Voucher Header Printed...................) = YES *'E 000 172 000' *
*-------------------------------------------------------------*----------------*
* FENDTRA (End of Transaction Attempted.............) = YES *'E 000 182 000' *
*-------------------------------------------------------------*----------------*
* FCANCEL (Cancel Transaction Attempted.............) = YES *'E 000 183 000' *
*-------------------------------------------------------------*----------------*
* FOPENCR (CR Non-Fiscal Report in Prog.............) = YES *'E 000 184 000' *
*-------------------------------------------------------------*----------------*
* FOPENSJ (SJ Non-Fiscal Report in Prog.............) = YES *'E 000 184 000' *
*-------------------------------------------------------------*----------------*
* FOPNDIP (DI Non-Fiscal Report in Prog. - Portrait.) = YES *'E 000 184 000' *
*-------------------------------------------------------------*----------------*
* FOPNDIL (DI Non-Fiscal Report in Prog. - Landscape) = YES *'E 000 184 000' *
***************************************************************************
```

10.4.4 Errors by Data

10.4.4.1 Fiscal Memory Report by Date

The following Audit command errors are described below:

- WD (Wording by Date): WNYYMMDDYYMMDD
- VD (Vats by Date): VDYYMMDDYYMMDD
- ZD (Closures by Date): ZDYYMMDDYYMMDD

Example:

- Valid Range = 900101-891231 (first:01/01/1990 - last:31/12/2089)
- First Header/TAX Rate/Closure Date stored = 020101 (s:01/01/2002)
- Last Header/TAX Rate/Closure Date stored = 020311 (e:11/03/2002)

```
***************************************************************************
* ERROR DESCRIPTION *      START       *       END       *     RETURN      *
***************************************************************************
* Invalid Number    * 'xxxxxxxx'       * '020101'        * 'E 000 096 000' *
*-------------------*------------------*-----------------*-----------------*
* Invalid Number    * '020101'         * 'xxxxxxxx'      * 'E 000 096 000' *
*-------------------*------------------*-----------------*-----------------*
* Invalid Data      * '020230' (error) * '020301'        * 'E 000 103 000' *
*-------------------*------------------*-----------------*-----------------*
* Invalid Data      * '020228'         * '020230' (error)* 'E 000 103 000' *
*-------------------*------------------*-----------------*-----------------*
* Invalid Period    * '021103'         * '020101'        * 'E 000 103 000' *
*-------------------*------------------*-----------------*-----------------*
* Data Not Found    * '900101' (first) * '011020'  (a)   * 'E 000 067 090' *
* (first < a < s)   *                  *                 *                 *
*-------------------*------------------*-----------------*-----------------*
* Data Not Found    * '020320' (c)     * '891231' (last) * 'E 000 067 090' *
* (e < c < last)    *                  *                 *                 *
***************************************************************************
```

10.4.4.2 Fiscal Memory Report by Number

The following Audit command errors are described below:

- WD (Wording by Number): WN0000nn0000nn
- VD (Vats by Number): VN000nnn000nnn
- ZD (Closures by Number): ZN00nnnn00nnnn

Example (Closure by Number):

- Valid Range = 000001-009999 (s-lastv)
- Last Closure Number stored = 000010 (e)
- Last Closure Number available = 003840 (lastc)

Note: The Wording/Vats by Number commands examples are similar, but with the corresponding values.

```
****************************************************************************
*    ERROR DESCRIPTION    *    START    *    END    *    RETURN    *
****************************************************************************
* Invalid Number          * 'xxxxxx'    * '000001'  * 'E 000 096 000' *
*-------------------------*-------------*-----------*---------------*
* Invalid Number          * '000001'    * 'xxxxxx'  * 'E 000 096 000' *
*-------------------------*-------------*-----------*---------------*
* Invalid Parameter       * 'nn0001'    * '009999'  * 'E 000 096 000' *
* (nn not equal 00)       *             *           *               *
*-------------------------*-------------*-----------*---------------*
* Invalid Parameter       * '000001'    * 'nn9999'  * 'E 000 096 000' *
* (nn not equal 00)       *             *           *               *
*-------------------------*-------------*-----------*---------------*
* Invalid Data            * '000000' (zero) * '000000' (zero) * 'E 000 103 000' *
*-------------------------*-------------*-----------*---------------*
* Invalid Data            * '000000' (zero) * '000001'  * 'E 000 103 000' *
*-------------------------*-------------*-----------*---------------*
* Invalid Data            * '000001'    * '000000' (zero) * 'E 000 103 000' *
*-------------------------*-------------*-----------*---------------*
* Invalid Period          * '009999'    * '000001'  * 'E 000 103 000' *
*-------------------------*-------------*-----------*---------------*
* Data Not Found          * '000015' (b) * '003840' (lastc) * 'E 000 067 090' *
* (e < b < lastc)         *             *           *               *
*-------------------------*-------------*-----------*---------------*
* Data Not Found          * '000015' (b) * '009999' (lastv) * 'E 000 067 090' *
* (e < b < lastv)         *             *           *               *
*-------------------------*-------------*-----------*---------------*
* Data Not Found          * '004000' (c) * '009999' (lastv) * 'E 000 067 090' *
* (e < lastc < c < lastc) *             *           *               *
****************************************************************************
```

10.4.4.3 'Fiscal Memory Dump' by Address

The following Audit command errors are described below:

- RB (Raw Binary): RB0hhhhh0hhhhh

Example:

- Valid Range = 000000-0FFFFF (s-lastv)
- Last Address Available = 07FFFF (e)

```
***********************************************************************
* ERROR DESCRIPTION *    START    *        END        *      RETURN      *
***********************************************************************
* Invalid Number    * 'xxxxxx'    *  '000001'         * 'E 000 096 000' *
*-------------------*-------------*-------------------*-----------------*
* Invalid Number    * '000001'    *  'xxxxxx'         * 'E 000 096 000' *
*-------------------*-------------*-------------------*-----------------*
* Invalid Data      * 'n00001'    *  '0FFFFF'         * 'E 000 103 000' *
* (nn not equal 00) *             *                   *                 *
*-------------------*-------------*-------------------*-----------------*
* Invalid Data      * '000001'    *  'n99999'         * 'E 000 103 000' *
* (nn not equal 00) *             *                   *                 *         *
*-------------------*-------------*-------------------*-----------------*
* Invalid Period    * '0FFFFF'    *  '000001'         * 'E 000 095 000' *
*-------------------*-------------*-------------------*-----------------*
* Data Not Found    * '000015'    *  '0FFFFF' (lastv) * 'E 000 095 000' *
* (b < e < lastv)   *             *                   *                 *
*-------------------*-------------*-------------------*-----------------*
* Data Not Found    * '08FFFF' (c) *  '0FFFFF' (lastv) * 'E 000 095 000' *
* (e < c < lastv)   *             *                   *                 *
***********************************************************************
```

10.4.5 Errors by Information

```
***************************************************************************
*   ERROR TYPE    *                      ERROR RECORD                     *
***************************************************************************
* Reading Error * The entry of the Fiscal Memory Table is bad * 'E 000 067 100' *
***************************************************************************
```

11.0 Accumulators and Counters

To describe how the microcode maintains amounts and counters printed on various reports and stored in fiscal memory it is necessary to define some internal accumulators and counters.

11.1 Transaction Accumulators

The following accumulators are used during a sale transaction:

	RANGE	
	Min	Max
Tra_Total (Transaction total)	-2147483648	2147483647
Tra_Tot_A (Gross amount for VAT category A)	-2147483648	2147483647
Tra_Tot_B (Gross amount for VAT category B)	-2147483648	2147483647
Tra_Tot_C (Gross amount for VAT category C)	-2147483648	2147483647
Tra_Tot_D (Gross amount for VAT category D)	-2147483648	2147483647
Tra_Tot_E (Gross amount for VAT category E)	-2147483648	2147483647
Tra_Retn (Transaction Item Returns)	-2147483648	2147483647
Tra_Void (Transaction Item Voids)	-2147483648	2147483647
Tra_Disc (Transaction Item Discounts)	-2147483648	2147483647
Tra_Uplf (Transaction Item Uplifts)	-2147483648	2147483647
Tra_Tdsc (Transaction Discount on Subtotal)	-2147483648	2147483647
Tra_Tupl (Transaction Uplift on Subtotal)	-2147483648	2147483647
Tra_Amt_Due (Transaction Amount Due)	-2147483648	2147483647
Tra_Chg_Due (Transaction Change Due)	-2147483648	2147483647

Figure 11. Transaction Accumulators.

11.2 Transaction Counters

The following counters are used during a Sale Transaction:

	RANGE	
	Min	Max
Tra_N_Retn (Number of Returned items)	0	65535
Tra_N_Void (Number of Voided Items)	0	65535
Tra_N_Disc (Number of Discounted Items)	0	65535
Tra_N_Uplf (Number of Uplifted Items)	0	65535
Tra_N_Tdsc (Number of Discounts on Subtotal)	0	65535
Tra_N_Tupl (Number of Uplifts on Subtotal)	0	65535

Figure 12.   Transaction Counters.

11.3 Daily Accumulators

The following accumulators are used during a Sale Period:

	RANGE	
	Min	Max
Day_Tot_A (Gross Amount for VAT Category A)	0	4294967295
Day_Tot_B (Gross Amount for VAT Category B)	0	4294967295
Day_Tot_C (Gross Amount for VAT Category C)	0	4294967295
Day_Tot_D (Gross Amount for VAT Category D)	0	4294967295
Day_Tot_E (Gross Amount for VAT Category E)	0	4294967295
Day_VAT_A (Gross Amount for VAT Category A)	0	4294967295
Day_VAT_B (Gross Amount for VAT Category B)	0	4294967295
Day_VAT_C (Gross Amount for VAT Category C)	0	4294967295
Day_VAT_D (Gross Amount for VAT Category D)	0	4294967295
Day_VAT_E (Gross Amount for VAT Category E)	0	4294967295
Day_Net_A (Net Amount for VAT Category A)	0	4294967295
Day_Net_B (Net Amount for VAT Category B)	0	4294967295
Day_Net_C (Net Amount for VAT Category C)	0	4294967295
Day_Net_D (Net Amount for VAT Category D)	0	4294967295
Day_Net_E (Net Amount for VAT Category E)	0	4294967295
Day_Net_ABCD (Net Amount for VAT Category A, B, C, D)	0	4294967295
Day_Total (Gross Amount Total)	0	4294967295
Day_Net_Total (Net Amount Total)	0	4294967295
Day_VAT_Total (VAT Amount Total)	0	4294967295
Day_Retn (Daily Item Returns)	-2147483648	2147483647
Day_Void (Daily Item Voids)	-2147483648	2147483647
Day_Disc (Daily Item Discounts)	-2147483648	2147483647
Day_Uplf (Daily Item Uplifts)	-2147483648	2147483647
Day_Tdsc (Daily Discount on Subtotal)	-2147483648	2147483647
Day_Tupl (Daily Uplift on Subtotal)	-2147483648	2147483647
Day_Canc (Daily Cancel Transaction)	-2147483648	2147483647

Figure 13.   Daily Accumulators.

11.4 Daily Counters

The following counters are used during a sale period:

	RANGE	
	Min	Max
Day_N_Clos (Daily Closure Number)	0	3840
Day_N_Ract (Number of Repair Actions)	0	200
Day_N_Slip (Number of Slips)	0	65535
Day_N_Vouc (Number of Fiscal Vouchers)	0	65535
Day_N_Retn (Number of Returned items)	0	65535
Day_N_Void (Number of Voided Items)	0	65535
Day_N_Disc (Number of Discounted Items)	0	65535
Day_N_Uplf (Number of Uplifted Items)	0	65535
Day_N_Tdsc (Number of Discounts on Subtotal)	0	65535
Day_N_Tupl (Number of Uplifts on Subtotal)	0	65535
Day_N_Canc (Number of Cancelled Transactions)	0	65535
Day_N_Head (Number of Header Table entries)	0	30
Day_N_VAT (Number of VAT Rate Table entries)	0	224
Day_N_Dcx (Number of Printer Disconnections Table entries)	0	999

Figure 14. Daily Counters.

11.5 Lifetime Counters

	RANGE	
	Min	Max
Lif_N_Ract (Number of Repair Actions)	0	200
Lif_N_Clos (Closure Number)	0	3840
Lif_N_Vouc (Number of Fiscal Vouchers)	0	4294967295
Lif_N_Slip (Number of Slips)	0	4294967295
Lif_N_Head (Number of Header Table entries)	0	30
Lif_N_VAT (Number of VAT Rate Table entries)	0	224
Lif_N_Dcx (Number of Printer Disconnections Table entries)	0	999

Figure 15.   Lifetime Counters.

12.0 Fiscal Unit

12.1 Fiscal Unit States

In this section are defined the fiscal unit states that are important for the comprehension of the fiscal rules.

- *SALE PERIOD IN PROGRESS*

  This state indicates that since the execution of the last close sale period procedure at least one of the following commands have been executed:

  > Item Sale.

  > Negative Item Sale.

  > Positive Item Sale.

  > Fiscal Memory Report.

  > Print X-Report.

  > End Non-Fiscal Report.

  This state is ended by:

  > Close Sale Period command.

  The following commands are not accepted while in this state:

  > Set Display Address.

  > Set Date and Time.

  > Load VAT Rate Table.

  > Set Header.

  > Set Fiscal Mode.

  > Serialize Fiscal Memory.

- *SALE TRANSACTION IN PROGRESS*

  Sale Transaction is in progress when any one of the following commands have been executed:

  > Item Sale.

  > Negative Item Sale.

  > Positive Item Sale.

  This state is ended by:

  > End Transaction.

  > Cancel Transaction.

  > Excess of Normal Printing lines.

  The following commands are not accepted while in this state:

  > Set Display Address.

  > Set Date and Time.

  > Load VAT Rate Table.

Set Header.

Print Header.

Close Sale Period.

Print X-Report.

Fiscal Memory Report.

Start Non-Fiscal Report.

End Non-Fiscal Report.

Set Fiscal Mode.

Serialize Fiscal Memory.

- *NON-FISCAL REPORT IN PROGRESS*

Non-Fiscal report is in progress when:

Start Non-Fiscal Report command has been executed.

This state is ended by:

End Non-Fiscal Report.

The following commands are not accepted while in this state:

Set Display Address.

Set Date and Time.

Load VAT Rate Table.

Set Header.

Print Header.

Close Sale Period.

Print X-Report.

Fiscal Memory Report.

Start Non-Fiscal Report.

Set Fiscal Mode.

12.2 Operational Modes

The fiscal unit can operate in two different modes depending on fiscal mode setting.

1. Training Mode

    Fiscal rules are not applied and fiscal memory is not used.

2. Fiscal Mode

    Fiscal rules are applied and fiscal memory is used.

12.2.1 Training Mode

The following rules apply to training mode operation in the fiscal unit:

- After serialization and before fiscalization the fiscal unit is in training mode state.

- In this mode the fiscal unit allows regular operations without writing in fiscal memory.

- Training mode is disabled when the fiscal unit has been fiscalized.

- The accumulators and counters are not stored in RAM neither in fiscal memory.

- The manufacturing ID, manufacturing year and serial number is not printed in any document.

- The set header cmd. (xD700) can be issued but not write in fiscal memory.

- The load TAX rate table cmd. (x20) can be issued but not write in fiscal memory.

- The verify TAX rate table cmd. (x20) can be issued but not write in fiscal memory.

- After jumper operation, the xD7ii and xD700 cmds. must be set.

- During training mode the following documents are allowed:

    - Fiscal Voucher

    - X-Report

    - Closure Report

    - Non-Fiscal Report

    - Off-Line Report

    - Header Report

- During training mode the following documents are not allowed:

    - Fiscal Memory Report

12.2.2 Fiscal Unit Rules

The following rules are applicable when fiscal mode is set:

1. Each line printed on CR station is replicated on SJ station.

2. Each time the RAM is cleared using the CE jumper, the repair action counter residing in fiscal memory is increased by 1 and the fiscal unit current time is recorded for later printing on close sale period report.

3. Fiscal memory may not be disconnected. The microcode checks for it before execution of the following commands:

    - Print Header.

- End Transaction.

- Fiscal Memory Report.

- Close Sale Period.

- Load VAT Rate Table.

- Verify VAT Rate Table.

- Start Non-Fiscal Report.

If fiscal memory is not connected an error is reported to the application program. Recovery from this error requires the RAM to be cleared using the CE jumper.

4. The vouchers produced are identified by consecutive numbers. Number 1 is assigned to the first voucher produced after close sale period report.

5. Any command that would print a character string with the serial number on CR or SJ stations is not accepted.
   In this case, serial number means: the year of manufacturing (2 digits) and the actual serial number (6 digits) all together.

6. Before execution of any command the microcode checks that two displays are operational. The displays to be monitored are defined using "Set Display Address" command.

7. While CE jumper is in ON position (ACTIVE) only the following commands are allowed:

   - System Commands.

   - Report Microcode EC level.

   - Report Printer EC level.

   - Report Current Status.

   - Report IPL Completion Status.

   - Perform Fiscal Unit Power On Reset.

   - Perform Printer Power On Reset.

   - Dump Fiscal RAM and Fiscal Memory.

   - Set Date and Time.

   - Set Display Address.

   - Head Position & Open/Close Throat.

8. Upon IPL completion the fiscal unit requires that:

   a. The following commands have been executed successfully, at least once since last CE jumper procedure, before the execution of any fiscal procedure:

      - Set Header.

      - Set Date and Time.

      - Set Display Address.

   b. The following command is executed successfully, before a sale transaction is started:

      - Load VAT Rate Table.

      - Verify VAT Rate Table.

12.3 Fiscal Operations

This section gives a detailed description of fiscal procedures and their effect on fiscal memory, accumulators, counters and printed slips.

12.3.1 Printer Operations

The following printer model 4610 print modes are supported:

- 15 CPI, single high
- 15 CPI, double high
- 12 CPI, single high
- 15 CPI, single high, emphasized
- 15 CPI, double high, emphasized
- 12 CPI, single high, emphasized

The application program controls the print mode by setting the required bits in the command extension. The selected print mode applies to all characters on the same line. It is also possible to print one or more substrings, within the same printed line, with a double wide character size.
The size of each double wide substring can range from one character up to the number of characters of the printed line.

12.3.2 Printed Amounts

The following rules apply to amounts printed on slips:

- A full stop character will be inserted every three digits from right to left, starting from the units.
- When amount and description fields overlap the amount will overlay the description.
- The amount string will always be preceded by at least one blank character.

12.3.3 Automatic Customer Receipt Slip Cut.

The following slips will be automatically cut (partial cut):

- Fiscal voucher.
- Close sale period report.
- Fiscal memory report.
- X-Report.
- Non-fiscal report on customer receipt.
- Slip produced by set date command.
- IPL messages (when not within sale transaction nor within non-fiscal report on customer receipt).

12.3.4 Sale Transaction

The following diagram shows the command sequence to perform a sale transaction:

```
                             |
                        PRINT HEADER
                             |
                             +---------------------> CANCEL
              ----------------->+
              |                 |
              |            -------+-------
              |            |      |      |
              |         POSITEM  ITEM  NEGITEM
              |            |      |      |
              |            ------>+<------
              |                   |
              |            --------+--------
              |            |       |       |
              |     ----->|        |       |<-----
              |     |     |        |       |     |
              |     |   TOTAL      |     TOTAL    |
              |     |     |        |       |      |
              |     |     +------- | ------+----- | ------> CANCEL
              |     +----->+       |       +<-----+
              |     |     |        |       |      |
              |     |  DISCOUNT    |     UPLIFT   |
              |     |     |        |       |      |
              |     ------+------->+<-------+------
              |                   |
              |                   +---------------------> CANCEL
              |<-----------------+
              |                   |
              |                 TOTAL
              |                   |
              |                   +----------------> CANCEL
              <-----------------+
                        ------>+
                        |      |
                        |   PAYMENT
                        |      |
                        |      +----------------> CANCEL
                         -------+
                               |
                            ENDTRAN
                               |
                               |
```
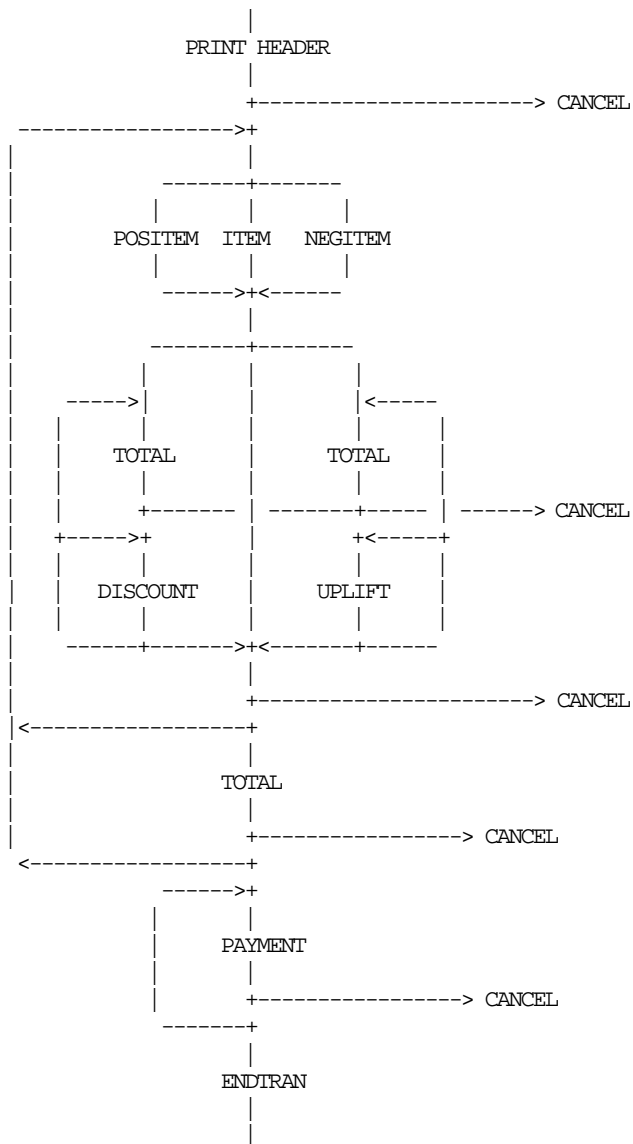
Figure 16. Sale Transaction Flow.

12.3.4.1 Print Header

This procedure is used to print the header on CR station.

12.3.4.2 Item Sale

This procedure is used to record the amount of an item and to print the line(s) containing informations related to it.

12.3.4.3 Negative Item Sale

This procedure is used to record the amount of a negative item and to print the line(s) containing informations related to it.

12.3.4.4 Positive Item Sale

This procedure is used to record the amount of a positive item and to print the line(s) containing informations related to it.

12.3.4.5 Transaction Total

This procedure is used to verify that the total amount accumulated by the fiscal unit matches the amount accumulated by the application program.

12.3.4.6 Discount on Subtotal

This procedure is used to apply discount on subtotal. The discount amount is distributed to the gross sale accumulators proportionally to their amount.

12.3.4.7 Uplift on Subtotal

This procedure is used to apply uplift on subtotal. The uplift amount is distributed to the gross sale accumulators proportionally to their amount.

12.3.4.8 Payment

This procedure is used to control the payment phase.
Document insert station can be used in the payment phase only.

12.3.4.9 End Transaction

This procedure is used to end the sale transaction.

12.3.4.10 Cancel Transaction

This procedure is used to void the sale transaction.

12.3.4.11 Sale Transaction Rules

A sale transaction is processed according to the following rules:

- Amount field in command string of item/negative item/positive item can be blank. This allows the processing of items with description longer than the number of characters allowed in one line.

  Consecutive item/negative item/positive item with blank amount are not allowed.

- A minus sign is printed for negative items with rectify NO.

- A minus sign is printed for positive items with rectify YES.

- A minus sign is printed for payment with rectify YES.

- Any gross transaction total accumulators for VAT categories must NOT be negative when transaction total command is received.

- Payment phase is mandatory.

- Printing on DI station is allowed in the PAYMENT phase only.

- End transaction command is executed only if the total paid amount is not less than the transaction total amount.

12.4 FISCAL UNIT PRINTER

12.4.1 Normal Printing

Normal printing refers to a set of commands used to request the fiscal unit to print a string of data on one of the printer stations.

12.4.2 Line Feed

Line feed refers to a set of commands used to request the fiscal unit to feed the paper for a specified number of lines on one of the printer stations.

12.4.3 Ready Document

This command is used to request the printer to advance the document in the DI station for top or bottom registration.

12.4.4 Eject Document

This command is used to request the printer to advance the document in the DI station to the end of form. Either forward feed or reverse feed can be specified.

12.4.5 Home

This command is used to request the printer to return the print head to center or left home position.

12.4.6 Set Number of Dot Rows per Linefeed

This command is used to set the number of dot rows per linefeed of each printer station to the default or alternate value.
default value = 12 (6 lines/inch), alternate value = 9 (8 lines/inch).
Dot rows per linefeed values are restored to their default values when RAM is cleared by installation of the CE jumper.

12.4.7 Print DI Adjustment Data Patterns

This command is for RAS, for document insert station adjustment.

12.5 Fiscal Unit Utilities

12.5.1 Read Fiscal Memory

This command is used to request the fiscal unit to report the fiscal memory content. The totals and counters related to each sale period are read from the fiscal memory and sent over the serial communication link.

12.5.2 Read Accumulators and Counters

This command is used to request the fiscal unit to report the content of accumulators and counters.

12.5.3 Report Microcode EC

This command is used to request the fiscal unit to report the microcode EC level. Microcode EC level is returned in the fiscal unit status byte 8. (The usual fiscal unit return code byte).

12.5.4 Report Printer EC

This command is used to request the fiscal unit to report the printer EC level. Printer EC level is always returned in the fiscal unit status byte 3.

12.5.5 Report Current Status

This command is used to request the fiscal unit to report its current status.

12.5.6 Report IPL Completion Status

This command is used to request the fiscal unit to report the IPL completion status.

12.5.7 Run Online Diagnostics

This command is used to request the fiscal unit to run online tests. Completion code is returned in the fiscal unit status.

12.5.8 Perform Fiscal Unit Power On Reset

This command is used to request the fiscal unit to perform a software power on reset.

12.5.9 Perform Printer Power On Reset

This command is used to request the fiscal unit to perform a printer software power on reset.

12.5.10 Dump Fiscal RAM and Fiscal Memory

This command is used to request the fiscal unit to print the fiscal RAM or the fiscal memory content. The dump can be used for problem analysis.

13.0 System Commands

See 13.2, " 00 - SYSTEM COMMANDS" on page 78.

13.1 Command Set Reference

A command consists of a string of data received from the serial communication link. The minimum length of a command string is four bytes (except system commands, that are two bytes long); the maximum length depends on the command type.

The microcode checks that the length is not less than the minimum required for the command type specified in command byte 2. (Command byte 0 for system commands).

A command is composed of four parts:

1. **Command Prefix.**
   It consists of two constant bytes x′1B66′ (ESC f).
   Command prefix is not present in system commands.

2. **Command Code.**
   Command code is in command string byte 2 (command string byte 0 for system commands). It identifies the command to be executed.
   Its value can range from x′00′ to x′FF′, but only defined command codes will be accepted. All other commands will be rejected with Invalid Command Byte 0 error code.

3. **Command Extension.**
   Command extension is in command string byte 3 (command string byte 1 for system commands). It contains command options.

   Reserved bits must be set to 0. Only exception is retry bit which is ignored by microcode on commands where it has not any effect.

4. **Command Data.**
   Command data starts from command string byte 4 (command string byte 2 for system commands). Its content depends on the command type.
   Numeric fields must be right aligned.
   Non significant digits in numeric fields can be blank.

At least one fiscal unit status is sent in response to a command.

The only exception is related to system commands: no response is sent for system commands not recognized by the fiscal unit. The format of the fiscal unit status is described in 2.4, "Fiscal Unit Status" on page 17.

Note: Through this section, 7 is always the most significant bit and 0 is the least significant bit.

13.2 00 - SYSTEM COMMANDS

13.2.1 Command Format

```
--------------------------------------------------------------------

BYTE       CONTENT                                    TYPE    LENGTH

0          00 - System Command                        hex        1
1          10 - Fiscal Unit Test                      hex        1
           20 - Report Current Status
           40 - Fiscal Unit Power On Reset
           80 - Report Microcode EC Level


--------------------------------------------------------------------
```

System commands are processed as follows:

- Fiscal Unit Test
  Fiscal unit test is performed and then the fiscal unit status is sent over the serial communication link.

- Report Current Status
  The fiscal unit current status is sent over the serial communication link.

- Fiscal Unit Power On Reset
  The microcode performs a fiscal unit software power on reset.

- Report Microcode EC Level
  The fiscal unit status containing the microcode EC level in byte 8 (the usual fiscal unit return code byte) is sent over the serial communication link.

If command byte 1 is different than those defined above, no processing is performed and no response is sent.

13.3 01 - PRINT HEADER

This command is used to print the header lines.

13.3.1 Command Format

```
------------------------------------------------------------------------

BYTE BIT   CONTENT                                        TYPE    LENGTH

 0-1       1B66 - cmd prefix                              hex        2
 2         01 - Print Header                              hex        1
 3         Cmd. Extension                                 hex        1
     7-0   Reserved (always = '0x00')
 4-7       Operator Number                                ASCII      4
 8-10      Terminal Number                                ASCII      3


------------------------------------------------------------------------
```

13.3.2 Command Example

```
Byte  0          2       3       4       8
      +---------+------+------+--------+------+
      | x'1B66' | x'01'| x'00'| 'oooo' | 'ttt'|
      +---------+------+------+--------+------+
           |        |      |      |        |
           |        |      |      |        --------> Terminal Number
           |        |      |      ----------------> Operator Number
           |        |      -----------------------> Cmd. Extension
           |        -----------------------------> Print Header
           -------------------------------------> Escape Sequence
```
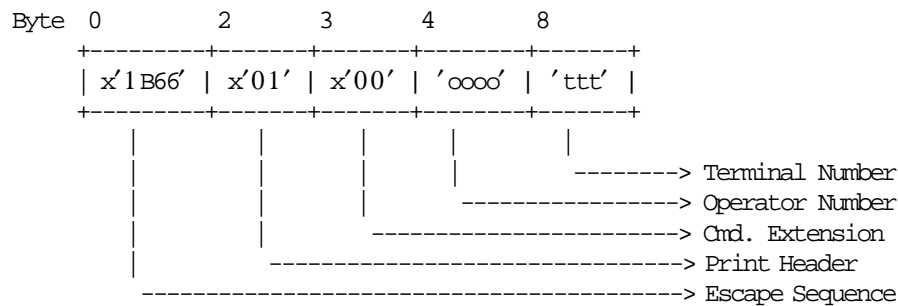
13.3.3 Print Header Calculations

```
If (Current_Date and Current_Time) ≥ (last RAM_FDTS_Date and last RAM_FDTS_Time)
{
   RAM_FDTS_Date = Current_Date
   RAM_FDTS_Time = Current_Time
}
else
{
   Error code 61 is returned
   The following message is printed in CR & SJ stations
   ************************************
        lANuAsMENH HMEPOMHNIA/vPA
           ZHTHsTE EpIsKEYH
   ************************************
}
```

13.3.4 Print Header Rules

• When this command is issued, the current date and time can not be previous to the FDTS.

13.4 03 - COMMENTS LINE ON CR STATION

This command is used to print one comment line on CR station.

13.4.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE   LENGTH

 0-1      1B66 - cmd prefix                          hex       2
 2        03 - Comments Line on CR Station           hex       1
 3        Cmd. Extension                             hex       1
      7   Retry
          0 = NO
          1 = YES
    6-3   Reserved (always = '0')
    2-0   Print Mode
          000 = 15 CPI Single-High, Normal
          001 = 15 CPI Single-High, Emphasized
          010 = 15 CPI Double-High, Normal
          011 = 15 CPI Double-High, Emphasized
          100 = 12 CPI Single-High, Normal
          101 = 12 CPI Single-High, Emphasized
          110 = Reserved
          111 = Reserved
 4-33     Comment                                    ASCII    30  (Note 1)


----------------------------------------------------------------------
```

Notes:

1. The comment line is printed as follows:
   30 characters for 15 CPI.
   22 characters for 12 CPI.

13.4.2 Command Example

```
Byte  0        2       3       4
      +--------+------+------+---------------+
      | x'1B66'| x'03'| x'00'| 'Today is ...'|
      +--------+------+------+---------------+
          |       |      |      |
          |       |      |      ------------> Description
          |       |      -------------------> Cmd. Extension
          |       |                           (Retry NO, 15 CPI Single-High, Normal)
          |       ---------------------------> Comments Line on CR Station
          ------------------------------------> Escape Sequence
```
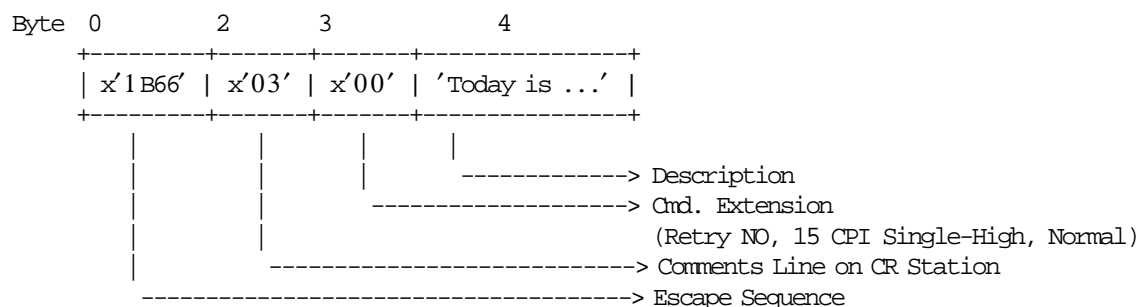
13.4.3 Comments Line on CR Station Rules

- The comments line is printed on CR station and replicated on SJ station.
- The strings ″PEsTA″ (Change Due) and ″ApOdEIjH″ (Receipt) in upper, lower, mixed, or these words interleaved with blanks, or strings containing '%' symbol as the last non-blank character are not allowed in the comment field of this command.

  This control will be performed thru validation algorithm and the following ALT-xxx chars will be filtered:

  - `ApOdEIjH (Receipt):`
    ```
    A : 065, 164
    p : 198, 221
    O : 079, 190
    d : 167, 217
    E : 069, 168
    I : 073, 108 (because it looks like 'I'), 124 (looks like 'I'), 173, 255
    j : 189, 220
    H : 072, 170, 254
    ```

  - `PEsTA (Change Due):`
    ```
    P : 080, 199
    E : 069, 168
    s : 207, 222
    T : 084, 208
    A : 065, 164
    ```

  - `Interleaving Char:`
    ```
    (Blank): 000, 030, 032
    ```

- The comments line can be printed:
  - Outside any document

    Before the first comment line is printed, the microcode will insert the ″ILLEGAL RECEIPT″ (92 msg.).
  - Inside a CR non-fiscal report

    — Unlimited number of the comments lines can be printed in any place.
  - Inside a SJ non-fiscal report

    — Unlimited number of the comments lines can be printed in any place.
  - Inside a fiscal voucher

    — Only six (6) comments lines can be printed in any place.

13.5 06 - END TRANSACTION

This command is used to end the sale transactions.

13.5.1 Command Format

```
-----------------------------------------------------------------------

BYTE BIT  CONTENT                                        TYPE   LENGTH

 0-1      1B66 - cmd prefix                              hex       2
 2        06 - End Transaction                           hex       1
 3        Cmd. Extension                                 hex       1
     7-0  Reserved (always = '0x00')


-----------------------------------------------------------------------
```

13.5.2 Command Example

```
Byte  0         2      3
      +--------+------+------+
      | x'1B66' | x'06' | x'00' |
      +--------+------+------+
           |        |      |
           |        |      ------------------------> Cmd. Extension
           |            ------------------------------> End Transaction
           ---------------------------------------------> Escape Sequence
```
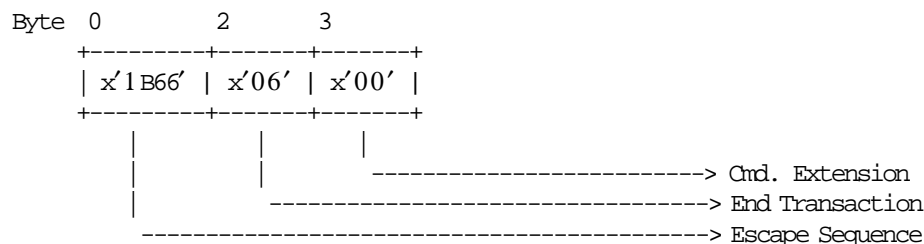
13.5.3 End Transaction Calculations

$Day\_N\_Slip = Day\_N\_Slip + 1$

$Day\_N\_Vouc = Day\_N\_Vouc + 1$

$Day\_N\_Retn = Day\_N\_Retn + Tra\_N\_Retn$
$Day\_N\_Void = Day\_N\_Void + Tra\_N\_Void$
$Day\_N\_Disc = Day\_N\_Disc + Tra\_N\_Disc$
$Day\_N\_Uplf = Day\_N\_Uplf + Tra\_N\_Uplf$

$Day\_N\_Tdsc = Day\_N\_Tdsc + Tra\_N\_Tdsc$
$Day\_N\_Tupl = Day\_N\_Tupl + Tra\_N\_Tupl$

$Day\_Tot\_A = Day\_Tot\_A + Tra\_Tot\_A$
$Day\_Tot\_B = Day\_Tot\_B + Tra\_Tot\_B$
$Day\_Tot\_C = Day\_Tot\_C + Tra\_Tot\_C$
$Day\_Tot\_D = Day\_Tot\_D + Tra\_Tot\_D$
$Day\_Tot\_E = Day\_Tot\_E + Tra\_Tot\_E$

$Day\_Total = Day\_Total + Tra\_Total$

$Day\_Retn = Day\_Retn + Tra\_Retn$
$Day\_Void = Day\_Void + Tra\_Void$
$Day\_Disc = Day\_Disc + Tra\_Disc$

$Day\_Uplf = Day\_Uplf + Tra\_Uplf$

$Day\_Tdsc = Day\_Tdsc + Tra\_Tdsc$
$Day\_Tupl = Day\_Tupl + Tra\_Tupl$

Clearing Transaction Counters

$Tra\_N\_Retn = 0$
$Tra\_N\_Void = 0$
$Tra\_N\_Disc = 0$
$Tra\_N\_Uplf = 0$

$Tra\_N\_Tdsc = 0$
$Tra\_N\_Tupl = 0$

Clearing Transaction Accumulators

$Tra\_Total = 0$

$Tra\_Tot\_A = 0$
$Tra\_Tot\_B = 0$
$Tra\_Tot\_C = 0$
$Tra\_Tot\_D = 0$
$Tra\_Tot\_E = 0$

$Tra\_Retn = 0$
$Tra\_Void = 0$
$Tra\_Disc = 0$
$Tra\_Uplf = 0$

$Tra\_Tdsc = 0$
$Tra\_Tupl = 0$

13.5.4 End Transaction Rules

There are not rules for this command.

13.6 07 - CANCEL TRANSACTION

This command is used to cancel the sale transaction at any point.

13.6.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                        TYPE   LENGTH

 0-1      1B66 - cmd prefix                              hex      2
 2        07 - Cancel Transaction                        hex      1
 3        Cmd. Extension                                 hex      1
    7-0   Reserved (always = '0x00')


----------------------------------------------------------------------
```

13.6.2 Command Example

```
Byte  0        2      3
      +--------+------+------+
      | x'1B66' | x'07' | x'00' |
      +--------+------+------+
          |       |      |
          |       |      ----------------------> Cmd. Extension
          |          ------------------------------> Cancel Transaction
           ------------------------------------------> Escape Sequence
```
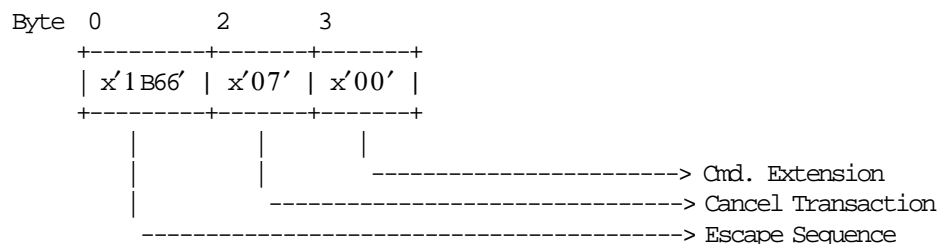
13.6.3 Cancel Transaction Calculations

$Day\_N\_Slip = Day\_N\_Slip + 1$ (only if any item sold)
$Day\_N\_Canc = Day\_N\_Canc + 1$ (only if any item sold)

$Day\_Canc = Day\_Canc + Tra\_Total$

Clearing Transaction Counters:

$Tra\_N\_Retn = 0$
$Tra\_N\_Void = 0$
$Tra\_N\_Disc = 0$
$Tra\_N\_Uplf = 0$

$Tra\_N\_Tdsc = 0$
$Tra\_N\_Tupl = 0$

Clearing Transaction Accumulators:

$Tra\_Total = 0$

$Tra\_Tot\_A = 0$
$Tra\_Tot\_B = 0$
$Tra\_Tot\_C = 0$
$Tra\_Tot\_D = 0$

Tra_Tot_E = 0

Tra_Retn = 0
Tra_Void = 0
Tra_Disc = 0
Tra_Uplf = 0

Tra_Tdsc = 0
Tra_Tupl = 0

13.6.4 Cancel Transaction Rules

- The sale transaction can be cancelled when:
    - Only header was printed.
    - Any item was sold.
    - Payment phase is in progress.
    - By excess the normal print lines with only header printed
    - By excess the normal print lines with any item sold.
- If the sale transaction is cancelled when the payment is in progress, all payments are automatically voided by the fiscal microcode.

13.7 13 - CLOSE SALE PERIOD

This command is used to close the sale period, update the fiscal memory (when fiscal mode is seted) and issued the closure report.
Up to 3840 fiscal memory entries are available for the fiscal unit lifetime.

13.7.1 Command Format

```
 --------------------------------------------------------------------


BYTE BIT  CONTENT                                       TYPE    LENGTH


 0-1      1B66 - cmd prefix                             hex         2
 2        13 - Close Sale Period                        hex         1
 3        Cmd. Extension                                hex         1
     7-0  Reserved (always = '0x00')
 4-7      Operator Number                               ASCII       4
 8-10     Terminal Number                               ASCII       3



 --------------------------------------------------------------------
```

13.7.2 Command Example

```
Byte  0         2       3       4       8
      +---------+-------+-------+--------+-------+
      | x'1B66' | x'13' | x'00' | 'oooo' | 'ttt' |
      +---------+-------+-------+--------+-------+
           |         |       |       |       |
           |         |       |       |        --------> Terminal Number
           |         |       |        -----------------> Operator Number
           |         |        ----------------------> Cmd. Extension
           |          -------------------------------> Close Sale Period
            ----------------------------------------> Escape Sequence
```
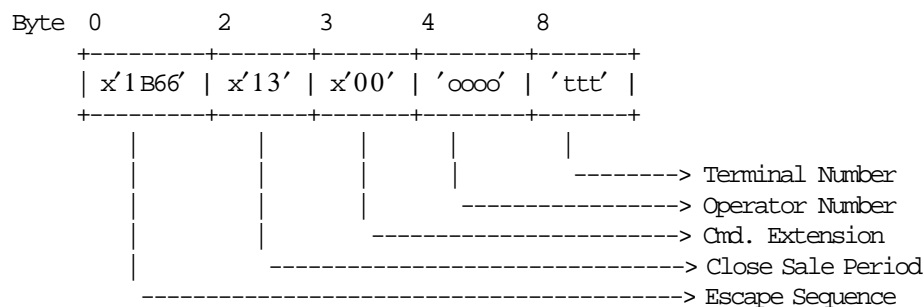
13.7.3 Close Sale Period Calculations

The following operations are performed before printing the report and writing the fiscal memory:

- **Update Daily Accumulators:**

$$Day\_Net\_A = TRUNC(\frac{Day\_Tot\_A}{1 + Rate\_A} + 0.5)$$

$$Day\_Net\_B = TRUNC(\frac{Day\_Tot\_B}{1 + Rate\_B} + 0.5)$$

$$Day\_Net\_C = TRUNC(\frac{Day\_Tot\_C}{1 + Rate\_C} + 0.5)$$

$$Day\_Net\_D = TRUNC(\frac{Day\_Tot\_D}{1 + Rate\_D} + 0.5)$$

$$Day\_Net\_E = TRUNC(\frac{Day\_Tot\_E}{1 + Rate\_E} + 0.5)$$

$Day\_Net\_ABDC = Day\_Net\_A + Day\_Net\_B + Day\_Net\_C + Day\_Net\_D$
$Day\_Net\_Total = Day\_Net\_A + Day\_Net\_B + Day\_Net\_C + Day\_Net\_D + Day\_Net\_E$

$Day\_VAT\_A = Day\_Tot\_A - Day\_Net\_A$
$Day\_VAT\_B = Day\_Tot\_B - Day\_Net\_B$
$Day\_VAT\_C = Day\_Tot\_C - Day\_Net\_C$
$Day\_VAT\_D = Day\_Tot\_D - Day\_Net\_D$
$Day\_VAT\_E = Day\_Tot\_E - Day\_Net\_E$

$Day\_VAT\_Total = Day\_VAT\_A + Day\_VAT\_B + Day\_VAT\_C + Day\_VAT\_D + Day\_VAT\_E$

- **Update Daily Counters:**

$Day\_N\_Slip = Day\_N\_Slip + 1$
$Day\_N\_Clos = Day\_N\_Clos + 1$

- **Update Lifetime Counters:**

$Lif\_N\_Clos = Lif\_N\_Clos + 1$

$Lif\_N\_Vouc = Lif\_N\_Vouc + Day\_N\_Vouc$
$Lif\_N\_Slip = Lif\_N\_Slip + Day\_N\_Slip$

- **The following operations are performed after writing the fiscal memory:**

  - **Clearing Daily Counters**

    $Day\_N\_Clos = 0$
    $Day\_N\_Slip = 0$
    $Day\_N\_Vouc = 0$

    $Day\_N\_Retn = 0$
    $Day\_N\_Void = 0$
    $Day\_N\_Disc = 0$
    $Day\_N\_Uplf = 0$

    $Day\_N\_Tdsc = 0$
    $Day\_N\_Tupl = 0$

    $Day\_N\_Canc = 0$

    $Day\_N\_Ract = 0$

    $Day\_N\_Head = 0$

    $Day\_N\_VAT = 0$

    $Day\_N\_Dcx = 0$

  - **Clearing Daily Accumulators**

    $Day\_Total = 0$
    $Day\_Net\_Total = 0$

    $Day\_Tot\_A = 0$
    $Day\_Tot\_B = 0$
    $Day\_Tot\_C = 0$
    $Day\_Tot\_D = 0$
    $Day\_Tot\_E = 0$

    $Day\_Net\_A = 0$
    $Day\_Net\_B = 0$
    $Day\_Net\_C = 0$
    $Day\_Net\_D = 0$
    $Day\_Net\_E = 0$

Day_Net_Total = 0

Day_Retn = 0

Day_Void = 0

Day_Disc = 0

Day_Uplf = 0

Day_Tdsc = 0

Day_Tupl = 0

Day_Canc = 0

- − **Update FDTS:**

```
If (last FM_DE_Date and Last FM_DE_Time) ≥ (last RAM_FDTS_Date and last RAM_FDTS_Time)
{
   RAM_FDTS_Date = FM_NC_Date
   RAM_FDTS_Time = FM_NC_Time
}
else
{
   Error code 61 is returned
   The following message is printed in CR & SJ stations
   *************************************
        lANuAsMENH HMEPOMHNIA/vPA
            ZHTHsTE EpIsKEYH
   *************************************
}
```

13.7.4 Close Sale Period (Z-Report) Rules

- The closure date and time can not be previous to the FDTS, otherwise this command is not issued.

13.8 14 - PRINT X-REPORT

This command is used to print the accumulators and counters, like the closure report, without writing anything in the fiscal memory and can be executed at any time during the day.

13.8.1 Command Format

```
-----------------------------------------------------------------------

BYTE BIT   CONTENT                                       TYPE    LENGTH


 0-1       1B66 - cmd prefix                             hex        2
 2         14 - Print X-Report                           hex        1
 3         Cmd. Extension                                hex        1
     7-0   Reserved (always = '0x00')
 4-7       Operator Number                               ASCII      4
 8-10      Terminal Number                               ASCII      3


-----------------------------------------------------------------------
```

13.8.2 Command Example

```
Byte  0         2       3       4        8
     +---------+-------+-------+--------+-------+
     | x'1B66' | x'14' | x'00' | 'oooo' | 'ttt' |
     +---------+-------+-------+--------+-------+
          |         |       |       |       |
          |         |       |       |        ------> Terminal Number
          |         |       |        ---------------> Operator Number
          |         |        ----------------------> Cmd. Extension
          |          ----------------------------> Print X-Report
           ----------------------------------------> Escape Sequence
```
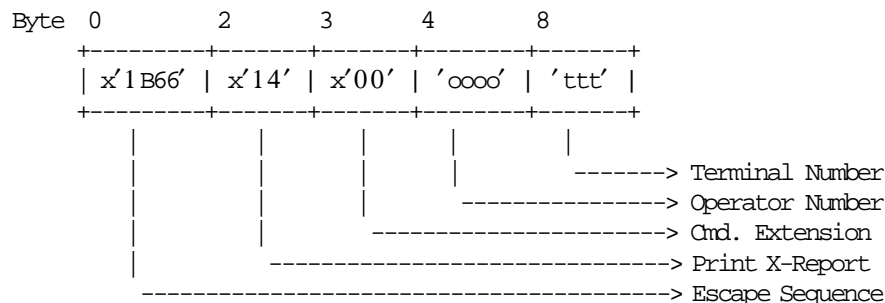
13.8.3 Print X-Report Calculations

The calculations done during the print x-report are the same as those done during the close sale period (13 cmd.) before the fiscal memory is written.

Day_N_Slip = Day_N_Slip + 1

The calculations done during the close sale period command (after the fiscal memory is written) are NOT done during the print x-report command.

Update FDTS:

```
If (Current_Date and Current_Time) ≥ (last RAM_FDTS_Date and last RAM_FDTS_Time)
{
    RAM_FDTS_Date = Current_Date
    RAM_FDTS_Time = Current_Time
}
else
{
    Error code 61 is returned
    The following message is printed in CR & SJ stations
    ************************************
        lANuAsMENH HMEPOMHNIA/vPA
            ZHTHsTE EpIsKEYH
    ************************************
}
```

13.8.4 Print X-Report Rules

- The current date and time can not be previous to the FDTS, otherwise this command is not issued.

13.9 15 - FISCAL MEMORY REPORT

This command is used to print the fiscal memory content on customer receipt station.

13.9.1 Command Format

```
--------------------------------------------------------------------

BYTE BIT   CONTENT                                    TYPE    LENGTH

 0-1       1B66 - cmd prefix                          hex        2
 2         15 - Fiscal Memory Report                  hex        1
 3         Cmd. Extension                             hex        1
       7   Reserved (always = '0')
       6   Type
           0 = Extended
           1 = Short
     5-3   Reserved
     2-0   Range
           100 (4) = Between Closure Numbers
           010 (2) = Between Closure Dates
           001 (1) = All Fiscal Memory

     If range = 1 specify:
 4-19      Reserved                                   ASCII      16
20-23      Password                                   ASCII      4
24-27      Operator Number                            ASCII      4
28-30      Terminal Number                            ASCII      3

     If range = 2 specify:
 4-11      First Date                                 ASCII      8   (Note 1)
12-19      Last  Date                                 ASCII      8   (Note 1)
20-23      Password                                   ASCII      4
24-27      Operator Number                            ASCII      4
28-30      Terminal Number                            ASCII      3

     If range = 4 specify:
 4-7       First Closure Number                       ASCII      4
 8-11      Last  Closure Number                       ASCII      4
12-19      Reserved                                   ASCII      8
20-23      Password                                   ASCII      4
24-27      Operator Number                            ASCII      4
28-30      Terminal Number                            ASCII      3


--------------------------------------------------------------------
```

Notes:

1. Dates strings must be formatted as: ddmmyyyy

   where:

   - dd   = day   (range allowed from '01' to '31')

   - mm   = month (range allowed from '01' to '12')

   - yyyy = year   (range allowed from '1990' to '2089')

13.9.2 Command Example

```
Byte   0          2       3
      +---------+-------+-------+---
      | x'1B66' | x'15' | x'04' |
      +---------+-------+-------+---
           |         |       |
           |         |       ----------------------> Cmd Extension
           |         |                               (extended, between closure nbr.)
           |         --------------------------------> Fiscal Memory Report
           ----------------------------------------> Escape Sequence


Byte   4        8       20       24      28
      +--------+-------+--------+--------+-------+
      | '0001' | '0010' | '     ' | 'oooo' | 'ttt' |
      +--------+-------+--------+--------+-------+
           |        |       |        |       |
           |        |       |        |       --------> Terminal Number
           |        |       |        ----------------> Operator Number
           |        |       ------------------------> Reserved
           |        ----------------------------------> Last  Closure Number
           --------------------------------------------> First Closure Number
```
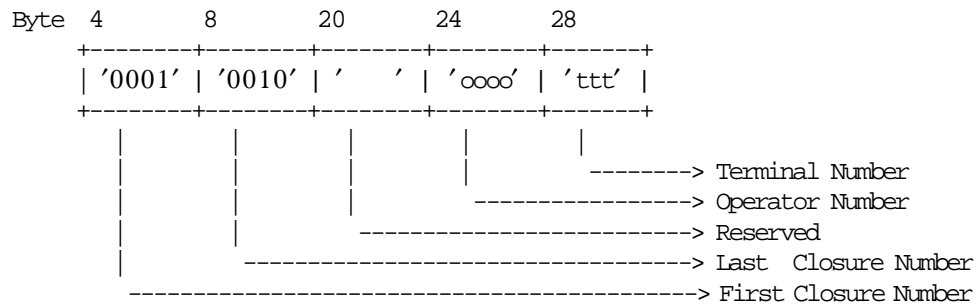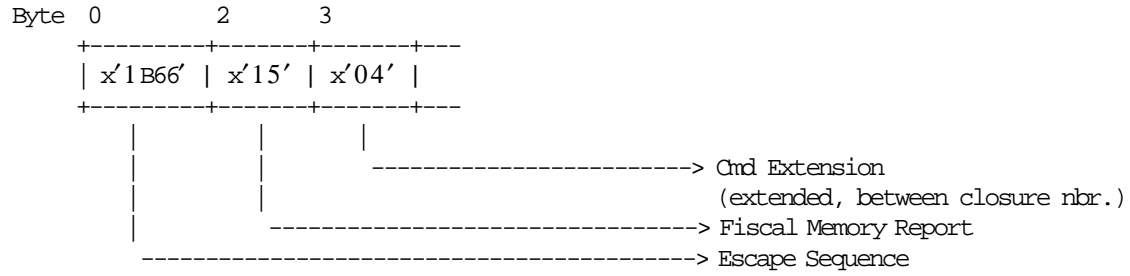
13.9.3 Fiscal Memory Report Calculations

Day_N_Slip = Day_N_Slip + 1

13.9.4 Fiscal Memory Report Rules

There are not rules for this command.

13.10 16 - SET DATE AND TIME

This command is used to update the fiscal printer time of day clock.

13.10.1 Command Format

```
 --------------------------------------------------------------------

 BYTE BIT  CONTENT                                    TYPE    LENGTH

  0-1       1B66 - cmd prefix                         hex       2
  2         16 - Set Date and Time                    hex       1
  3         Cmd. Extension                            hex       1
      7-0   Reserved (always = '0x00')
  4-5       Day      (dd)                             ASCII     2   (Note 1)
  6-7       Month    (mm)                             ASCII     2   (Note 2)
  8-11      Year     (yyyy)                           ASCII     4   (Note 3)
 12-13      Hours    (hh)                             ASCII     2   (Note 4)
 14-15      Minutes  (mm)                             ASCII     2   (Note 5)
 16-17      Seconds  (ss)                             ASCII     2   (Note 5)


 --------------------------------------------------------------------
```

Notes:

1. Values from '01' to '31' are allowed according to month and leap year.

2. Values from '01' to '12' are allowed.

3. Values from '1990' to '2089' are allowed.

4. Values from '00' to '23' are allowed.

5. Values from '00' to '59' are allowed.

13.10.2 Command Example

```
Byte  0         2       3
     +---------+-------+-------+---
     | x'1B66' | x'16' | x'00' |
     +---------+-------+-------+---
          |        |       |
          |        |       ----------------------> Cmd Extension
          |        -------------------------------> Set Date and Time
          -----------------------------------------> Escape Sequence

Byte  4      6      8        12     14     16
     +------+------+--------+------+------+------+
     | '22' | '05' | '1997' | '08' | '11' | '27' |
     +------+------+--------+------+------+------+
         |      |      |        |      |      |
         |      |      |        |      |      ------> Seconds
         |      |      |        |      -------------> Minutes
         |      |      |        --------------------> Hours
         |      |      ----------------------------> Year
         |      ---------------------------------> Month
         -------------------------------------------> Day
```

13.10.3 Set Date and Time Rules

- With CE Jumper OFF
  - The set date and time is free if no FDTS is set.
  - If FDTS is set, the new date and time can not be previous to FDTS.
  - If FDTS is set, the set date and time is accepted only after the CE Jumper ON operation is performed. When any of the FDTS set commands are executed and the set date command is issued, the return code 54 is returned, so a jumper operation is required.
- With CE Jumper ON
  - The set date and time is free if no FDTS is set.
  - If FDTS is set, the new date and time can not be previous to FDTS.
  - The date and time can be set unlimited times.

13.11 18 - SET FISCAL MODE

This command is used to set the fiscal unit to fiscal mode. In this mode the information is write in fiscal memory.

13.11.1 Command Format

```
------------------------------------------------------------------------

BYTE BIT   CONTENT                                      TYPE    LENGTH

  0-1      1B66 - cmd prefix                            hex        2
  2        18 - Set Fiscal Mode                         hex        1
  3        Cmd. Extension                               hex        1
      7-0  Reserved (always = '0x00')
  4-7      Password                                     ASCII      4


------------------------------------------------------------------------
```

13.11.2 Command Example

```
Byte  0         2       3       4
      +---------+-------+-------+--------+
      | x'1B66' | x'18' | x'00' | 'pppp' |
      +---------+-------+-------+--------+
           |         |       |       |
           |         |       |       ----------------> Password
           |         |       ------------------------> Cmd Extension
           |         -------------------------------> Set Fiscal Mode
           -------------------------------------------> Escape Sequence
```
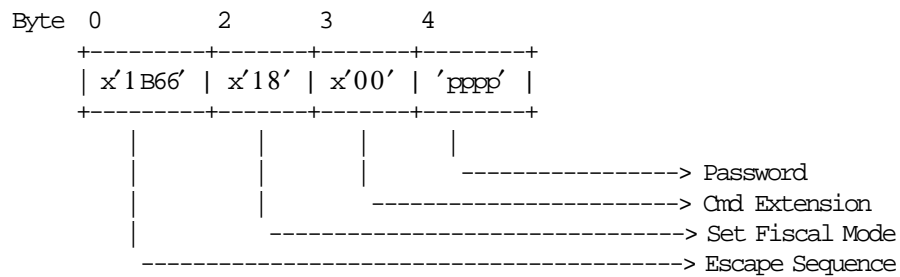
13.11.3 Set Fiscal Mode Calculations

There are not calculations for this command.

13.12 1A - SET DISPLAY ADDRESS

This command is used to set into fiscal printer battery backed up RAM the addresses of the display(s) that have to be monitored for connection by the fiscal unit.

13.12.1 Command Format

```
   ----------------------------------------------------------------------

   BYTE BIT   CONTENT                                     TYPE    LENGTH

    0-1        1B66 - cmd prefix                          hex      2
    2          1A - Set Display Address                   hex      1
    3          Cmd. Extension                             hex      1
        7-0    Reserved (always = '0x00')
    4-7        Password                                   ASCII    4
    8-9        First  Display Address                     ASCII    2 (Note 1)
   10-11       Second Display Address                     ASCII    2 (Note 1, 2)


   ----------------------------------------------------------------------
```

Notes:

1. Specify the ASCII representation of the hexadecimal address.
   Example: for hexadecimal address x'2A' specify ASCII characters '2', 'A'.
   The display addresses are the SIO addresses of the displays attached.
   The valid display addresses goes from x'20' to x'27' and from x'2A' to x'2F'.

2. If C4 cmd. was issued to allow single display, specify the second address as x'0000' for single display sensing.

13.12.2 Command Example

```
Byte  0         2       3       4         8      10
      +---------+------+-------+--------+------+------+
      | x'1B66' | x'1A'| x'00' | 'nnnn' | '22' | '2C' |
      +---------+------+-------+--------+------+------+
           |         |      |       |        |      |
           |         |      |       |        |      ------> 2nd. display address
           |         |      |       |        -------------> 1st. display address
           |         |      |       ----------------------> Password
           |         |      ---------------------------> Cmd Extension
           |         ------------------------------------> Set Display Address
           ----------------------------------------------> Escape Sequence
```

13.13 1B - SERIALIZE FISCAL MEMORY

This command is used at the end of the manufacturing process to store the manufacturing id, manufacturing year and serial number in a fixed area of the fiscal memory.

13.13.1 Command Format

```
--------------------------------------------------------------------

BYTE BIT  CONTENT                                 TYPE    LENGTH

 0-1      1B66 - cmd prefix                       hex       2
 2        1B - Serialize Fiscal Memory            hex       1
 3        Cmd. Extension                          hex       1
     7-0  Reserved (always = '0x00')
 4-6      Manufacturing_ID                        ASCII     3    (Note 1)
 7-8      Manufacturing_Year                      ASCII     2    (Note 2)
 9-14     Serial_Number                           ASCII     6


--------------------------------------------------------------------
```

Notes:

1. Assigned by Government.

2. Values from '00' to '90' are allowed.

13.13.2 Command Example

```
Byte  0        2       3       4       7      9
     +--------+------+------+------+-----+---------+
     | x'1B66'| x'1B'| x'00'| 'I11'| '99'| 'ABC123'|
     +--------+------+------+------+-----+---------+
        |        |      |      |      |      |
        |        |      |      |      |      ---------> Serial Number
        |        |      |      |      ----------------> Manufacturing Year
        |        |      |      -----------------------> Manufacturing ID
        |        |      -----------------------------> Cmd Extension
        |        ------------------------------------> Serialize Fiscal Memory
        -----------------------------------------------> Escape Sequence
```
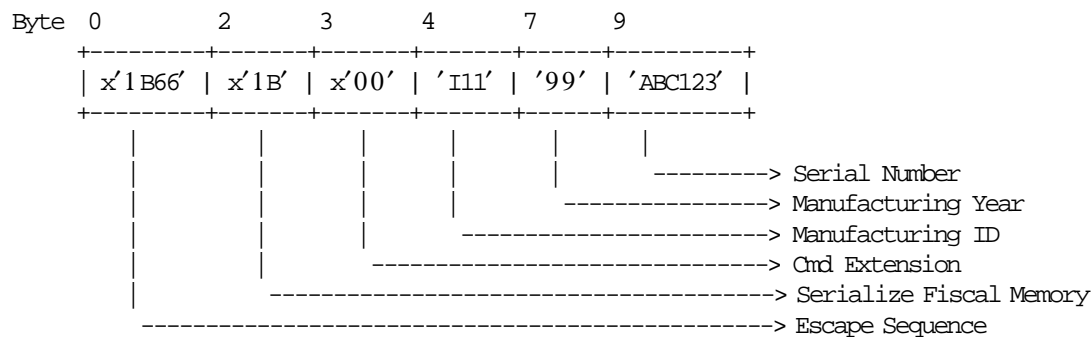
13.13.3 Serialize Fiscal Memory Rules

- This procedure can be executed only once and updates the fiscal memory.

13.14 20 - LOAD VAT RATE TABLE

This command is used to store the VAT rate table into fiscal memory.

13.14.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                     TYPE   LENGTH

 0-1       1B66 - cmd prefix                          hex      2
 2         20 - Load VAT Rate Table                   hex      1
 3         Cmd. Extension                             hex      1
     7-0   Reserved (always = '0x00')
 4-7       VAT_Rate_for_Category_A (eedd)             ASCII    4   (Note 1, 2)
 8-11      VAT_Rate_for_Category_B (eedd)             ASCII    4   (Note 1, 2)
12-15      VAT_Rate_for_Category_C (eedd)             ASCII    4   (Note 1, 2)
16-19      VAT_Rate_for_Category_D (eedd)             ASCII    4   (Note 1, 2)
20-23      VAT_Rate_for_Category_E (eedd)             ASCII    4   (Note 1, 3)


----------------------------------------------------------------------
```

Notes:

1. VAT rate is composed by 2 integer digits (ee) and 2 decimal digits (dd).
   VAT rates decimal digits are forced to '00' by microcode.
   Separator character must not be included in the VAT rate string.
   For example for VAT rate 8% specify '0800'.

2. VAT rate field can range from '0100' to '9999'.
   Only the VAT rate integer part is printed on slips.

3. VAT rate field can range from '0000' to '0099'.
   '0' is printed on slips.

13.14.2 Command Example

```
Byte  0        2       3
      +---------+-------+-------+---
      | x'1B66' | x'20' | x'01' |
      +---------+-------+-------+---
           |        |       |
           |        |       --------------------------> Cmd Extension
           |        |                                   (VAT category A - E)
           |        --------------------------------> Load VAT Rate Table
           ------------------------------------------> Escape Sequence

Byte  4        8        12      16      20
      +--------+--------+-------+-------+-------+
      | '0144' | '2000' | '0360'| '4000'| '0099'|
      +--------+--------+-------+-------+-------+
          |        |        |       |       |
          |        |        |       |       ------------> VAT Rate for Category E (0%)
          |        |        |       ----------------------> VAT Rate for Category D (40%)
          |        |        -----------------------------> VAT Rate for Category C (3%)
          |        ---------------------------------------> VAT Rate for Category B (20%)
          ------------------------------------------------> VAT Rate for Category A (1%)
```
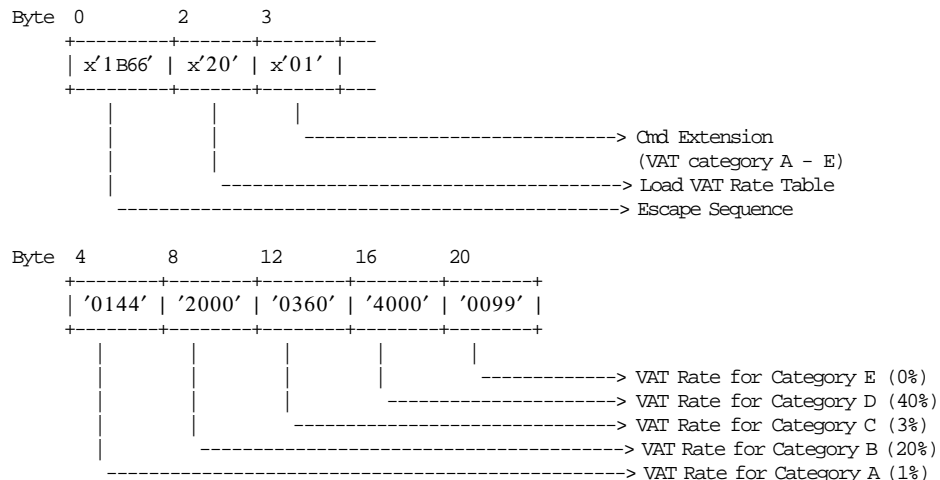
13.14.3 Load VAT Rate Table Calculations

$Day\_N\_VAT = Day\_N\_VAT + 1$
$Lif\_N\_VAT = Lif\_N\_VAT + 1$

- **UPDATE FDTS**

```
If Current_Date and Current_Time) ≥ (last RAM_FDTS_Date and last RAM_FDTS_Time)
{
   If (New entry is stored in VAT rate table)
   {
      RAM_FDTS_Date = Current_Date
      RAM_FDTS_Time = Current_Time
   }
}
else
{
   Error code 104 is returned
}
```

13.14.4 Load VAT Rate Table Rules

- This command can be executed out of the sale period only.
- First Jumper ON/OFF after the fiscalization:
    This cmd. is 'mandatory' before the the start of sale period.
- Next Jumper ON/OFF after the fiscalization:
    – The VAT rate values are restored from the latest entry of the VAT rate table in fiscal memory.
    – This cmd. is optional when the VAT rate table has been stored in fiscal memory.
    – When this cmd. is issued:
        — If the new entry is different at the lastest entry stored in VAT rate table in RAM memory, it is stored in VAT rate table in fiscal memory and the RAM_FDTS_Date and RAM_FDTS_Time are set.
        — If the new entry is equal at the lastest entry stored in VAT rate rable in RAM memory, it is not stored in VAT rate table in fiscal memory and the RAM_FDTS_Date and RAM_FDTS_Time are not set.
- The VAT rate table can be changed up to 224 times during the life of the fiscal printer.
- 5 categories must be load before the VAT rate table load status is set.
- If the new entry is different at the lastest entry stored in VAT rate table, it is stored in VAT rate table in fiscal memory.
- If the new entry is equal at the lastest entry stored in VAT rate table, the RAM_FDTS_Date and RAM_FDTS_Time is not set.
- When new entry is stored in VAT rate table, the new FM_TR_Date and FM_TR_Time can not be previous to the RAM_FDTS_Date and RAM_FDTS_Time.
- When VAT rate table is full, the new entry stored in RAM memory must be equal at the lastest entry stored in VAT rate table in fiscal memory.
- When new entry is stored in VAT rate table in fiscal memory, these data are printed in the VAT coefficients report.
- When no new entry in VAT rate table, the lastest entry is printed in the VAT coefficients report.

13.14.5 VERY IMPORTANT

ATTENTION: is very important to check that the current date is correct before to issue this command because the FDTS will be updated.

One example when the current date in not correct:

- Today is: 11/09/2000 (dd/mm/yyyy).
- Set date (16 cmd.) is issued to set the current date with day = 01, month = 10 and year = 2001.
- Load VAT Rate Table (20 cmd.) is issued and FDTS is updated in RAM memory with date 01/10/2001 (dd/mm/yyyy).
- Set Date (16 cmd.) is issued again with day = 11, month = 09 and year = 2000, and then the error code 70 is returned.

In this case the fiscal printer will be useless until the current date ≥ 01/10/2001 (dd/mm/yyyy).

The procedure to use when the current date is not correct is to issue the 16 cmd. to set the correct date and then to issue the 20 cmd.

13.15 21 - VERIFY VAT RATE TABLE

This command is used to compare the VAT rates loaded with 20 command.

13.15.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE   LENGTH

 0-1      1B66 - cmd prefix                          hex       2
 2        21 - Verify VAT Rate Table                 hex       1
 3        Cmd. Extension                             hex       1
    7-0   Reserved (always = '0x00')
 4-7      VAT Rate for Category A (eedd)             ASCII     4   (Note 1, 2)
 8-11     VAT Rate for Category B (eedd)             ASCII     4   (Note 1, 2)
12-15     VAT Rate for Category C (eedd)             ASCII     4   (Note 1, 2)
16-19     VAT Rate for Category D (eedd)             ASCII     4   (Note 1, 2)
20-23     VAT Rate for Category E (eedd)             ASCII     4   (Note 1, 3)


----------------------------------------------------------------------
```
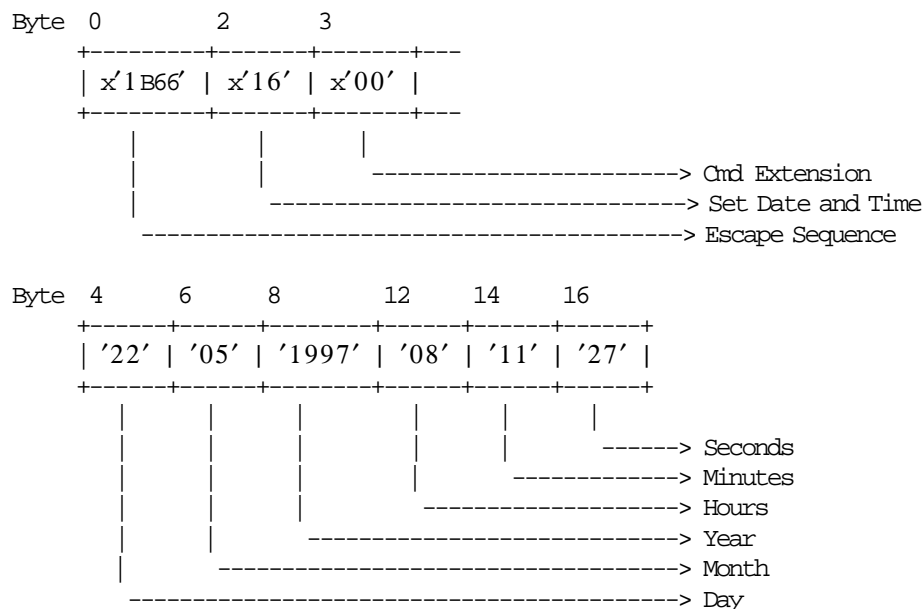
Notes:

1. VAT rate is composed by 2 integer digits (ee) and 2 decimal digits (dd).
   VAT rates decimal digits are forced to '00' by microcode.
   Separator character must not be included in the VAT rate string.
   For example for VAT rate 8% specify '0800'.

2. VAT rate field can range from '0100' to '9999'.
   Only the VAT rate integer part is printed on slips.

3. VAT rate field can range from '0000' to '0099'.
   '0' is printed on slips.

13.15.2 Command Example

```
Byte  0          2       3
      +---------+-------+-------+---
      | x'1B66' | x'21' | x'01' |
      +---------+-------+-------+---
           |         |       |
           |         |       ----------------------------> Cmd Extension
           |         |                                     (VAT category A - E)
           |         -------------------------------------> Verify VAT Rate Table
           ----------------------------------------------> Escape Sequence


Byte  4        8        12       16       20
      +--------+--------+--------+--------+--------+
      | '0144' | '2000' | '0360' | '4000' | '0099' |
      +--------+--------+--------+--------+--------+
           |        |        |        |        |
           |        |        |        |        ------------> VAT Rate for Category E (0%)
           |        |        |        --------------------> VAT Rate for Category D (40%)
           |        |        ----------------------------> VAT Rate for Category C (3%)
           |        ------------------------------------> VAT Rate for Category B (20%)
           --------------------------------------------> VAT Rate for Category A (1%)
```
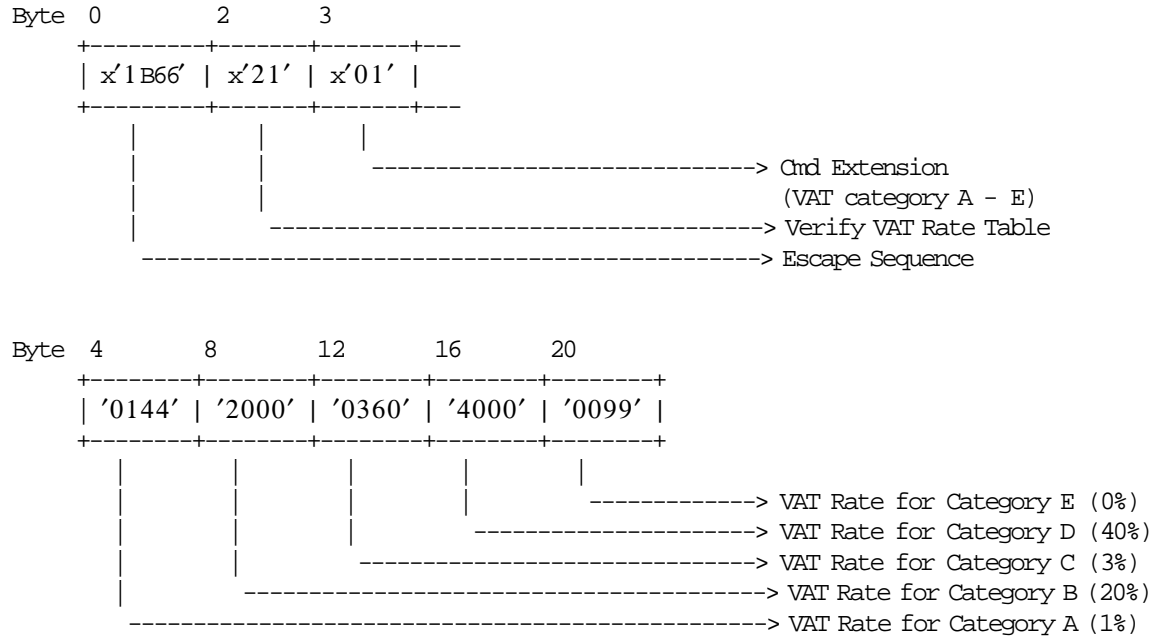
13.15.3 Verify VAT Rate Table Rules

- This cmd. is 'mandatory' after each 20 cmd. (Load VAT Rate Table) issued.
- If jumper ON/OFF is issued and there is at least one entry on VAT rate table, the rates will be restored from the latest entry of the table and this cmd. is optional.
- This command is not mandatory after IPL procedure.

13.16 C4 - FISCAL PARAMETER CONFIGURATION

This command is used to configure the number of displays to be sensed during the printer operation.
This command can be executed only once after CE jumper.

13.16.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT   CONTENT                                     TYPE    LENGTH

 0-1       1B66 - cmd prefix                           hex       2
 2         C4 - Fiscal Parameter Configuration         hex       1
 3         Cmd. Extension                              hex       1
           02 = Display Sensing Definition
 4-7       Password                                    ASCII     4

If Cmd. Extension = 02
 8         Display Sensing Definition                  ASCII     1   (Note 1)
           1 = Single/Dual Display
           2 = Dual Display


----------------------------------------------------------------------
```

Notes:

1. This field is for cmd. extension 02, it must be executed before the set display (1A cmd.),
   otherwise the code will sense two displays.

13.16.2 Command Example

```
Byte  0        2       3       4             8
     +---------+-------+-------+--------------+
     | x'1B66' | x'C4' | x'02' | 'pppp' | '2' |
     +---------+-------+-------+--------------+
        |         |       |       |       |
        |         |       |       |       --------> Dual Display
        |         |       |       -----------------> Password
        |         |       -----------------------> Cmd Extension
        |         ------------------------------> Fiscal Parameter Configuration
        ----------------------------------------> Escape Sequence
```
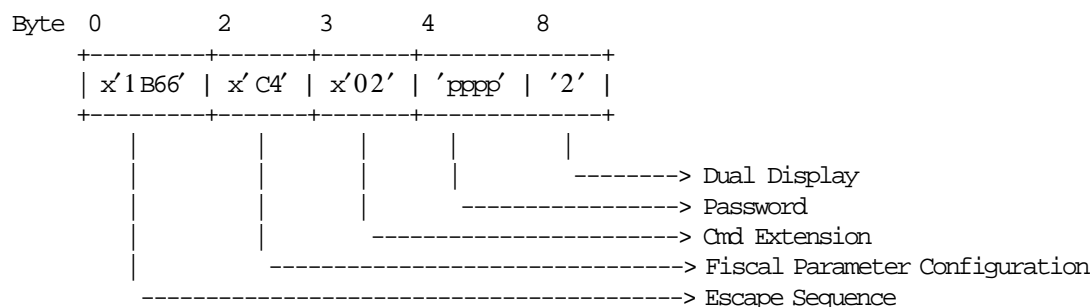
13.16.3 Fiscal Parameter Configuration Rules

• When RC 102 is returned:

   – Trying to execute C4 cmd. with cmd. extension 02 succesfully more than once.
     Explanation: If two displays were sensed, can't change to a single display sensing until a CE jumper
     is performed.

   – If set display address (1A cmd.) is issue, the use of C402 is not allowed, not even once.
     Explanation: Issuing 1A cmd. without previous C4 cmd. with cmd. extension 02 only allows two
     display addresses. So, this way it is assumed that two displays will be used. So, the only meaning to
     issue a C4 cmd. with cmd. extension 02 after a 1A cmd. is to try to sense only a display. But,
     because this could be performed by an application or a user with bad intentions this is not allowed.

13.17 C8 - SET BARCODE PARAMETERS

This command is used to set the barcode parameters.

13.17.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                   TYPE    LENGTH

 0-1      1B66 - Cmd Prefix                         hex        2
 2        C8 - Set Barcode Parameters               hex        1
 3        Cmd. Extension                            hex        1
          00 = Size Selection
          01 = Station Selection

 If Cmd. Extension = 00 specify
  4         Barcode Width                           ASCII      1 (Note 1)
  5-7       Barcode Height                          ASCII      3 (Note 2)

 If Cmd. Extension = 01 specify
  4         Station Selection                       hex        1
            0 = CR
            1 = SJ
            2 = DI

----------------------------------------------------------------------
```
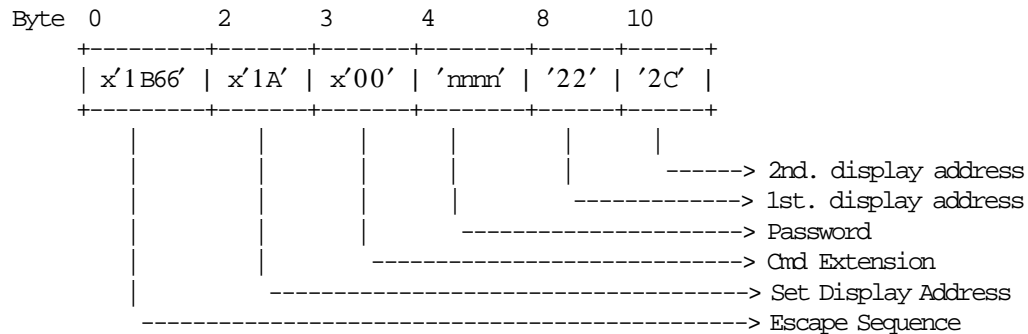
Notes:

```
1. Horizontal magnification of the line width in the barcode.
      Minimum = 2
      Maximum = 4

2. The dot height of the barcode.
      Minimum = 001
      Maximum = 255
```

13.17.2 Set Barcode Parameters Rules

- Horizontal default magnification of the line width is 3.
- The dot height default is 162.
- Default printing is CR station.
- After PLD or (J4) CE jumper operation, the printer returns to its default station (CR).

13.18 C9 - PRINT BARCODE

This command is used to print barcode.

13.18.1 Command Format

```
-----------------------------------------------------------------------

BYTE BIT  CONTENT                                      TYPE   LENGTH

 0-1      1B66 – Cmd Prefix                            hex       2
 2        C9 – Print Barcode                           hex       1
 3        Cmd. Extension                               hex       1
      7   Reserved (always = '0')
      6   HRI font                                            (Note 1)
          0 = 15 CPI
          1 = 12 CPI
    5-4   HRI location                                        (Note 2)
          00 = Not printed
          01 = Above the barcode
          10 = Below the barcode
          11 = Both above and below the barcode
    3-0   Barcode Type
          0000 = UPC_A
          0001 = UPC_E
          0010 = JAN13 (EAN-13)
          0011 = JAN8  (EAN-8)
          0100 = CODE39
          0101 = ITF
          0110 = CODABAR
          0111 = CODE128
          1000 = CODE93
          1001 = Reserved
          1010 = Reserved
          1011 = Reserved
          1100 = Reserved
          1101 = Reserved
          1110 = Reserved
          1111 = Reserved
 4-n      Barcode Data                                 ASCII     n (Note 3)

-----------------------------------------------------------------------
```

Notes:

1. The Human Readable Characters font, if it must be printed.

2. Printing Position of the Human Readable Characters.

3. Data to be encoded in the barcode. The data must be null terminated and each barcode type has it's own rules.

13.18.2 Print Barcode Rules

- In barcode types CODE39 and CODE93, if the width is ≥ 3, the barcode might not fit in the sheet. In this case, it will be truncated.
- The barcodes can be printed:
  - **During Sale Period**
    — Inside of fiscal vouchers
    — Inside of non-fiscal reports
    — Outside of any document
  - **Outside Sale Period**
    — Inside of non-fiscal reports
    — Outside of any document

13.19 CA - DOWNLOAD AND PRINT GRAPHICS

This command is used to download and print graphics.

13.19.1 Command Format

```
-------------------------------------------------------------------

BYTE BIT  CONTENT                                  TYPE   LENGTH


 0-1      1B66 - Cmd Prefix                        hex       2
 2        CA - Download and Print Graphics         hex       1
 3        Cmd. Extension                           hex       1
          00 = Reserved
          01 = Reserved
          02 = First Download Packet                         (Note 1)
          08 = Next Packet
          09 = Last Packet
          0A = Cancel Graphics Transmission
          10 = Erase Graphics Download Area
          11 = Reserved
          12 = Print Downloaded 200 DPI

    If Cmd. Extension = 02 specify
 4        Width                                    hex       1  (Note 2)
 5        Height                                   hex       1  (Note 2)
 6        Graphic Number                           hex       1  (Note 3)
 7-65     First Pixels in Graphics                 hex      59

    If Cmd. Extension = 08 or 09 specify
 4-65     Pixels in Graphics                       hex      62

    If Cmd. Extension = 12 specify
 4        Graphic Number                           hex       1  (Note 3)


-------------------------------------------------------------------
```

Notes:

1. If the number of data bytes exceeds 61 or 62 (depending on the cmd. extension), the POS will need to send a next or last packet after the first packet.

2. The number given in this field should be multiplied by 8 in order to get the number of pixels.
    Size max:

             width = 72 (72*8 = 576 pixels)
             heigth = 25 (25*8 = 200 pixels)

3. The fiscal printer can store up to 40 graphics in its internal memory so they can be printed later. The valid range is from x01 to x28.

Response to the Cmd. Extension 02 will be formatted as follows:

```
--------------------------------------------------------------------------------

BYTE        BYTE        CONTENT                                       TYPE    LENGTH
RS-485      USB


 0-8                    Fiscal Unit Status                            hex        9
            0-14        Fiscal Unit Status                            hex       15

 9          15          CA - Record Identification                    hex        1
10          16          Return Code                                   hex        1
                        43 = Good Completion
                        74 = Invalid Sequence
                        75 = Invalid Size
                        76 = Invalid Graphic Number
                        77 = Graphic with same number already in printer flash


--------------------------------------------------------------------------------
```

Response to the Cmd. Extension 08 or 09 will be formatted as follows:

```
--------------------------------------------------------------------------------

BYTE        BYTE        CONTENT                                       TYPE    LENGTH
RS-485      USB

 0-8                    Fiscal Unit Status                            hex        9
            0-14        Fiscal Unit Status                            hex       15

 9          15          CA - Record Identification                    hex        1
10          16          Return Code                                   hex        1
                        43 = Good Completion
                        74 = Invalid Sequence


--------------------------------------------------------------------------------
```

Response to the Cmd. Extension 12 will be formatted as follows:

```
--------------------------------------------------------------------------------

BYTE        BYTE        CONTENT                                       TYPE    LENGTH
RS-485      USB

 0-8                    Fiscal Unit Status                            hex        9
            0-14        Fiscal Unit Status                            hex       15

 9          15          CA - Record Identification                    hex        1
10          16          Return Code                                   hex        1
                        43 = Good Completion
                        76 = Invalid Graphic Number


--------------------------------------------------------------------------------
```

13.19.2 Print Graphic Example.

In order to understand the graphic data format used for the fiscal printer an example will be given.

- The number of bytes per row is specified in the width field and they represent the graphic row from left to right. The leftmost pixel is the most significant bit.
- The first data bytes correspond to the upper row.
- The last data bytes correspond to the bottom row.
- A bit should be set to '1' when the corresponding pixel is black and '0' when it is white. In the example below the 'X's are black and the '.'s are white.

```
Example: width = 2 (16 pixels) & heigth = 2 (16 pixels)

Column #  1   2   3   4   5   6   7   8   9   10  11  12  13  14  15  16    DATA BYTES

Row #
0         X   .   X   .   X   .   X   .   X   .   X   .   X   .   X   .     1    2
1         X   .   X   .   X   .   X   .   X   .   X   .   X   .   X   .     3    4
2         X   .   X   .   X   .   X   .   X   .   X   .   X   .   X   .     5    6
3         X   .   X   .   X   .   X   .   X   .   X   .   X   .   X   .     7    8
4         X   .   X   .   X   .   X   .   X   .   X   .   X   .   X   .     9    10
5         X   .   X   .   X   .   X   .   X   .   X   .   X   .   X   .     11   12
6         X   .   X   .   X   .   X   .   X   .   X   .   X   .   X   .     13   14
7         X   .   X   .   X   .   X   .   X   .   X   .   X   .   X   .     15   16
8         .   X   .   X   .   X   .   X   .   X   .   X   .   X   .   X     17   18
9         .   X   .   X   .   X   .   X   .   X   .   X   .   X   .   X     19   20
10        .   X   .   X   .   X   .   X   .   X   .   X   .   X   .   X     21   22
11        .   X   .   X   .   X   .   X   .   X   .   X   .   X   .   X     23   24
12        .   X   .   X   .   X   .   X   .   X   .   X   .   X   .   X     25   26
13        .   X   .   X   .   X   .   X   .   X   .   X   .   X   .   X     27   28
14        .   X   .   X   .   X   .   X   .   X   .   X   .   X   .   X     29   30
15        .   X   .   X   .   X   .   X   .   X   .   X   .   X   .   X     31   32
```

Send the following packet in order to print the above graphic in 100 DPI in the CR station.
The semicolons (;) are used only to separate bytes in this example.

x'1B;66;CA;00;02;02;AA;AA;AA;AA;AA;AA;AA;AA;AA;AA;AA;AA;AA;AA;AA;AA;55;55;55;55;55;55;55;55;55;55;55;55;55;55;55;55'

Figure 17.   Print Graphic Example.

13.19.3 Download and Print Graphics Rules

- When a PLD, CE jumper intervention, reset printer or cancel graphics transmission occur during the download packet, the graphics download area is corrupted. In this case, issue initialize graphics download area (CA cmd. - cmd. extension 10) and then download packet again.

13.19.4 CD - CASH DRAWER MANAGEMENT

This command is used to open and read status of the chash drawer.

13.19.4.1 Command Format

```
------------------------------------------------------------------------

BYTE BIT   CONTENT                                   TYPE    LENGTH

 0-1       1B66 - Cmd Prefix                         hex        2
 2         CD - Cash Drawer Management               hex        1
 3         Cmd. Extension                            hex        1
           00 = Open Cash Drawer
           01 = Get   Cash Drawer Status

 If Cmd. Extension = 00 specify

 4         Cash Drawer Number                        hex        1 (Note 1)
 5         Pulse Width ON  Time                      hex        1 (Note 2)
 6         Pulse Width OFF Time                      hex        1 (Note 2)


------------------------------------------------------------------------
```

Notes:

1. Numbers allowed: 0 and 1.

2. The value given in this field must be multiplied by 2 in order to get the pulse width on/off in
   miliseconds.
   Range allowed: from x00 to xFF.

Response to the Cmd. Extension 01 will be formatted as follows:

```
------------------------------------------------------------------------

BYTE BIT   CONTENT                                   TYPE    LENGTH

 0-14      Fiscal Unit Status                        hex       15
15         Cash Drawer Status                        hex        1
           00 = Open
           01 = Close


------------------------------------------------------------------------
```

13.20 D2 - ITEM SALE

This command is used to record the amount of an item and to print lines containing description, amount and VAT category.

13.20.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                  TYPE    LENGTH

 0-1      1B66 - cmd prefix                        hex       2
 2        D2 - Item Sale                           hex       1
 3        Cmd. Extension                           hex       1
      7   Retry
          1 = YES
          0 = NO
      6   Reserved (always = '0')
    5-3   Print Mode
          000 = 15 CPI
          001 = 12 CPI
          010 = Reserved
          011 = Reserved
          100 = 15 CPI Emphasized
          101 = 12 CPI Emphasized
          110 = Reserved
          111 = Reserved
    2-0   Reserved (always = '0')
 4-4      Reserved (always = 'x00')                hex       1   (Note 1)
 5-14     Amount                                   ASCII    10   (Note 2, 3)
15-16     VAT Category                             ASCII     2   (Note 4, 5)
17-45     Description                              ASCII    29
46-51     Reserved (always = 'x20')                hex       6   (Note 6)


----------------------------------------------------------------------
```

Notes:

1. Reserved for future use (secondary command extension)

2. Amount string can be blank.

3. If amount string is blank then the transaction counters are not affected.

4. VAT Category must be blank if amount string is blank.

5. Specify one of the following: x1, x2, x3, x4, x5 (x can be any character) OR
   specify one of the following: xA, xB, xC, xD, xE (x can be any character).

6. Reserved for future use (additional description)

13.20.2 Command Example

```
Byte  0          2        3
      +---------+-------+-------+---
      | x'1B66' | x'D2' | x'00' |
      +---------+-------+-------+---
           |         |       |
           |         |       ----------------------------------------> Cmd. Extension (retry NO, 15 CPI)
           |         ------------------------------------------------> Item Sale
           ------------------------------------------------------------> Escape Sequence


Byte  4       5              15     17          46
      +-------+-------------+------+-----------+-----------------+
      | x'00' | '0000001000' | '02' | 'ddd..ddd' | 'x202020202020' |
      +-------+-------------+------+-----------+-----------------+
          |        |            |        |            |
          |        |            |        |            -----------------> Reserved
          |        |            |        ----------------------------> Description
          |        |            ------------------------------------> VAT Category
          |        ---------------------------------------------------> Amount
          ------------------------------------------------------------> Reserved
```
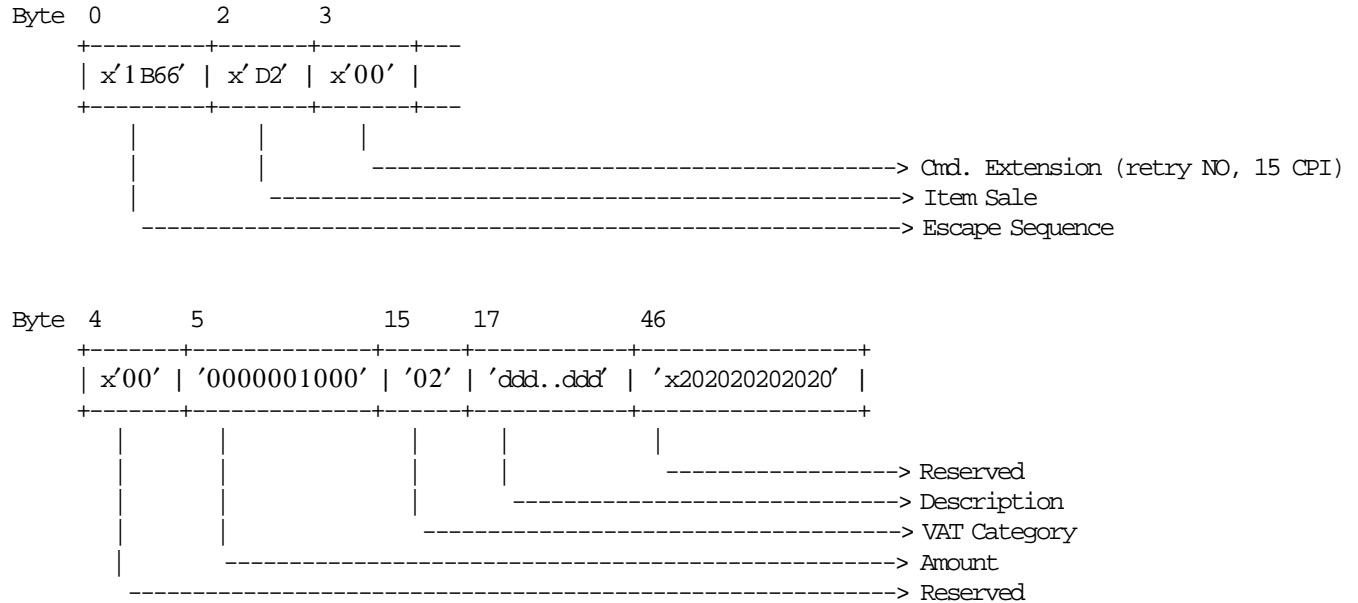
13.20.3 Item Sale Calculations

$Tra\_Total = Tra\_Total + Amount$

$Tra\_Tot\_A = Tra\_Tot\_A + Amount$ (If VAT category is A)
$Tra\_Tot\_B = Tra\_Tot\_B + Amount$ (If VAT category is B)
$Tra\_Tot\_C = Tra\_Tot\_C + Amount$ (If VAT category is C)
$Tra\_Tot\_D = Tra\_Tot\_D + Amount$ (If VAT category is D)
$Tra\_Tot\_E = Tra\_Tot\_E + Amount$ (If VAT category is E)

13.20.4 Item Sale Rules

• Amount field can be blank. This allows the processing of items with description longer than the number of characters allowed in one line.
  Consecutive items with blank amount are not allowed.
• Any gross transaction total accumulators for VAT categories must NOT be negative when transaction total command is received.

13.21 D3 - NEGATIVE/POSITIVE ITEM SALE

This command is used to record the amount of a negative/positive item and prints lines containing description, amount and TAX category.

13.21.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                  TYPE    LENGTH


 0-1      1B66 – cmd prefix                        hex        2
 2        D3 – Negative/Positive Item Sale         hex        1
 3        Cmd. Extension                           hex        1
     7    Cmd Retry
          0 = NO
          1 = YES
     6    Rectify
          0 = NO
          1 = YES
   5-3    Print Mode
          000 = 15 CPI
          001 = 12 CPI
          010 = Reserved
          011 = Reserved
          100 = 15 CPI Emphasized
          101 = 12 CPI Emphasized
          110 = Reserved
          111 = Reserved
   2-0    Negative/Positive Item Type
          000 = RETURN
          001 = VOID
          010 = Reserved
          011 = DISCOUNT
          100 = Reserved
          101 = Reserved
          110 = UPLIFT
          111 = Reserved
 4-4      Reserved (always = 'x00')                hex        1    (Note 1)
 5-14     Amount                                   ASCII     10    (Note 2, 3)
15-16     VAT Category                             ASCII      2    (Note 4, 5)
17-45     Description                              ASCII     29
46-51     Reserved (always = 'x20')                hex        6    (Note 6)


----------------------------------------------------------------------
```

Notes:

1. Reserved for future use (secondary command extension)

2. Amount string can be blank.

3. If amount string is blank then the transaction counters are not affected.

4. VAT category must be blank if amount string is blank.

5. Specify one of the following: x1, x2, x3, x4, x5 (x can be any character) OR
   specify one of the following: xA, xB, xC, xD, xE (x can be any character).

6. Reserved for future use (additional description)

13.21.2 Command Example

```
Byte  0          2       3
     +---------+-------+-------+---
     | x'1B66' | x'D3' | x'00' |
     +---------+-------+-------+---
          |        |       |
          |        |       ---------------------------------------> Cmd. Extension (retry NO, 15 CPI, Return)
          |        -----------------------------------------------> Negative/Positive Item Sale
          ------------------------------------------------------> Escape Sequence


Byte  4       5              15    17          46
     +-------+-------------+------+-----------+----------------+
     | x'00' | '0000001000' | '02' | 'ddd..ddd' | 'x202020202020' |
     +-------+-------------+------+-----------+----------------+
         |        |            |      |            |
         |        |            |      |            -----------------> Reserved
         |        |            |      ----------------------------> Description
         |        |            -------------------------------------> VAT Category
         |        -------------------------------------------------> Amount
         ---------------------------------------------------------> Reserved
```
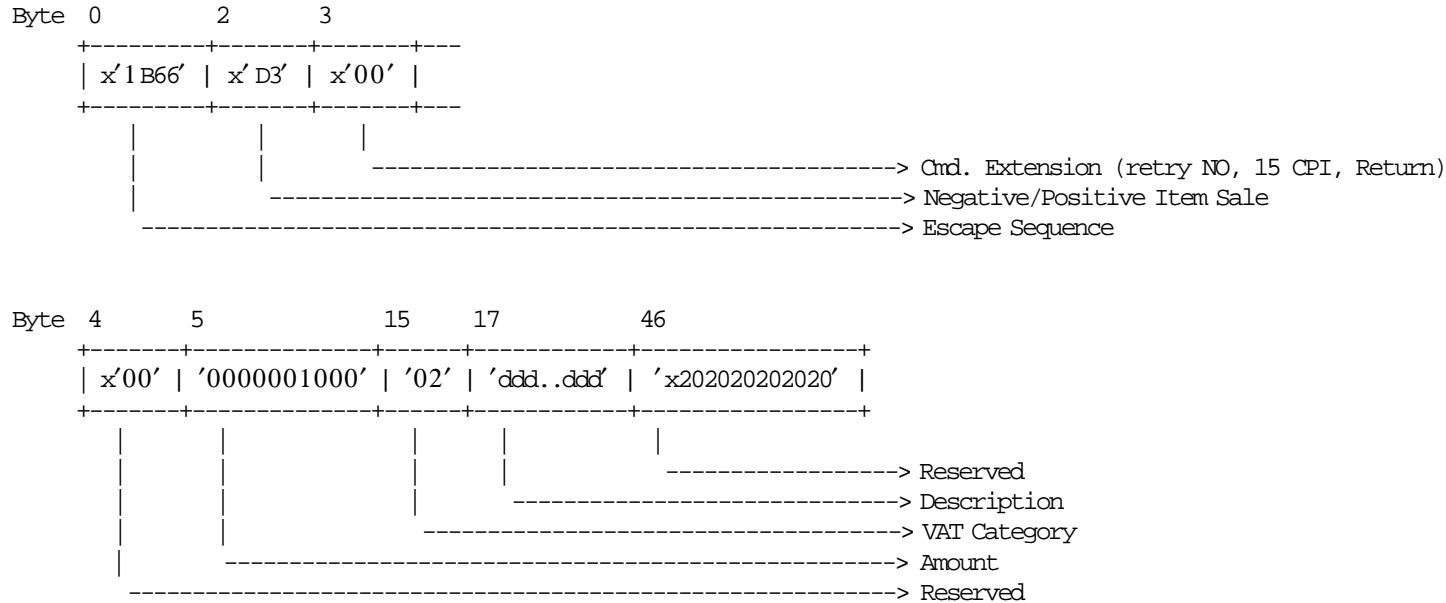
13.21.3 Negative/Positive Item Sale Calculations

- **For Rectify Option = NO and Negative Items:**

  $Tra\_Total = Tra\_Total - Amount$

  $Tra\_Tot\_A = Tra\_Tot\_A - Amount$ (If VAT Category is A)
  $Tra\_Tot\_B = Tra\_Tot\_B - Amount$ (If VAT Category is B)
  $Tra\_Tot\_C = Tra\_Tot\_C - Amount$ (If VAT Category is C)
  $Tra\_Tot\_D = Tra\_Tot\_D - Amount$ (If VAT Category is D)
  $Tra\_Tot\_E = Tra\_Tot\_E - Amount$ (If VAT Category is E)

  $Tra\_Void = Tra\_Void + Amount$ (If Type = VOID)
  $Tra\_Retn = Tra\_Retn + Amount$ (If Type = RETURN)
  $Tra\_Disc = Tra\_Disc + Amount$ (If Type = DISCOUNT)

  $Tra\_N\_Retn = Tra\_N\_Retn + 1$ (If Type = RETURN)
  $Tra\_N\_Void = Tra\_N\_Void + 1$ (If Type = VOID)
  $Tra\_N\_Disc = Tra\_N\_Disc + 1$ (If Type = DISCOUNT)

- **For Rectify Option = YES and Negative Items:**

  $Tra\_Total = Tra\_Total + Amount$

  $Tra\_Tot\_A = Tra\_Tot\_A + Amount$ (If VAT Category is A)
  $Tra\_Tot\_B = Tra\_Tot\_B + Amount$ (If VAT Category is B)
  $Tra\_Tot\_C = Tra\_Tot\_C + Amount$ (If VAT Category is C)
  $Tra\_Tot\_D = Tra\_Tot\_D + Amount$ (If VAT Category is D)
  $Tra\_Tot\_E = Tra\_Tot\_E + Amount$ (If VAT Category is E)

  $Tra\_Void = Tra\_Void - Amount$ (If Type = VOID)
  $Tra\_Retn = Tra\_Retn - Amount$ (If Type = RETURN)
  $Tra\_Disc = Tra\_Disc - Amount$ (If Type = DISCOUNT)

  $Tra\_N\_Retn = Tra\_N\_Retn - 1$ (If Type = RETURN)
  $Tra\_N\_Void = Tra\_N\_Void - 1$ (If Type = VOID)

$Tra\_N\_Disc = Tra\_N\_Disc - 1$ (If Type = DISCOUNT)

- **For Rectify Option = NO and Positive Items:**

$Tra\_Total = Tra\_Total + Amount$

$Tra\_Tot\_A = Tra\_Tot\_A + Amount$ (If VAT Category is A)
$Tra\_Tot\_B = Tra\_Tot\_B + Amount$ (If VAT Category is B)
$Tra\_Tot\_C = Tra\_Tot\_C + Amount$ (If VAT Category is C)
$Tra\_Tot\_D = Tra\_Tot\_D + Amount$ (If VAT Category is D)
$Tra\_Tot\_E = Tra\_Tot\_E + Amount$ (If VAT Category is E)

$Tra\_Uplf = Tra\_Uplf + Amount$ (If Type = UPLIFT)

$Tra\_N\_Uplf = Tra\_N\_Uplf + 1$ (If Type = UPLIFT)

- **For Rectify Option = YES and Positive Items:**

$Tra\_Total = Tra\_Total - Amount$

$Tra\_Tot\_A = Tra\_Tot\_A - Amount$ (If VAT Category is A)
$Tra\_Tot\_B = Tra\_Tot\_B - Amount$ (If VAT Category is B)
$Tra\_Tot\_C = Tra\_Tot\_C - Amount$ (If VAT Category is C)
$Tra\_Tot\_D = Tra\_Tot\_D - Amount$ (If VAT Category is D)
$Tra\_Tot\_E = Tra\_Tot\_E - Amount$ (If VAT Category is E)

$Tra\_Uplf = Tra\_Uplf - Amount$ (If Type = UPLIFT)

$Tra\_N\_Uplf = Tra\_N\_Uplf - 1$ (If Type = UPLIFT)

13.21.4 Negative/Positive Item Sale Rules

- Amount field can be blank. This allows the processing of items with description longer than the number of characters allowed in one line.
  Consecutive negative/positive items with blank amount are not allowed.
- Any gross transaction total accumulators for VAT categories must NOT be negative when transaction total command is received.

13.22 D4 - SUBTOTAL/TOTAL TRANSACTION

This command is used to verify that the total amount accumulated by the fiscal unit matches the amount accumulated by the application program.

13.22.1 Command Format

```
-----------------------------------------------------------------------

BYTE BIT  CONTENT                                          TYPE   LENGTH

 0-1      1B66 - cmd prefix                                hex      2
 2        D4 - Subtotal/Total Transaction                 hex      1
 3        Cmd. Extension                                   hex      1
    7-6   Reserved (always = '0')
    5-0   Print Mode                                                     (Note 1)
          00 = 15 CPI, Single Wide
          20 = 15 CPI, Single Wide, Emphasized
          01 = 15 CPI, Double Wide
          21 = 15 CPI, Double Wide, Emphasized
          19 = 15 CPI, Double High, Double Wide
          39 = 15 CPI, Double High, Double Wide, Emphasized
 4-13     Total_Amount                                     ASCII    10

-----------------------------------------------------------------------
```

Notes:

1. The number of CPI and emphasized apply to both the description and the total_amount.
   Double wide apply to total_amount only.
   Print mode is also applied to predefined msg. 35 (FISCAL TOTAL).

13.22.2 Command Example

```
Byte  0        2       3       4
      +---------+-------+-------+-------------+
      | x'1B66' | x'D4' | x'00' | '0000001000' |
      +---------+-------+-------+-------------+
          |         |       |         |
          |         |       |         ----------------> Amount
          |         |       ----------------------> Cmd. Extension (15 CPI, single wide )
          |         --------------------------------> Subtotal/Total Transacton
          ----------------------------------------> Escape Sequence
```

13.22.3 Subtotal/Total Transaction Calculations

Tra_Amt_Due = Total_Amount

13.23 D5 - PAYMENT

This command is used to apply the paid amount.

13.23.1 Command Format

```
-----------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE    LENGTH

 0-1      1B66 - cmd prefix                          hex        2
 2        D5 - Payment                               hex        1
 3        Cmd. Extension                             hex        1
     7    Retry
          0 = NO
          1 = YES
     6    Rectify
          0 = NO
          1 = YES
   5-3    Print Mode                                          (Note 1)
          000 = 15 CPI
          001 = 12 CPI
          010 = Reserved
          011 = Reserved
          100 = 15 CPI Emphasized
          101 = 12 CPI Emphasized
          110 = Reserved
          111 = Reserved
   2-0    Reserved
 4-15     Description                                ASCII     12
16-25     Payment_Amount                             ASCII     10


-----------------------------------------------------------------------
```

Notes:

1. Print mode is also applied to predefined message 34.

13.23.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+---
      | x'1B66' | x'D5' | x'00' |
      +---------+-------+-------+---
           |        |        |
           |        |        ----------------------> Cmd Extension
           |        |                                (retry NO, rectify NO, 15 CPI)
           |        -------------------------------> Payment
           -----------------------------------------> Escape Sequence


Byte  4             16
      +------------+--------------+
      | 'ddd...ddd' | '0000001000' |
      +------------+--------------+
           |             |
           |             ---------------------------> Amount
           -----------------------------------------> Description
```
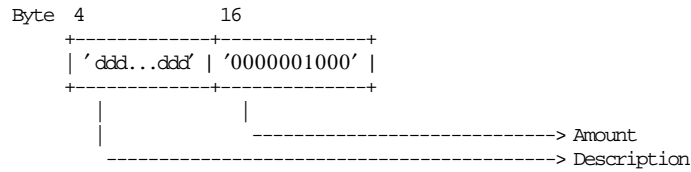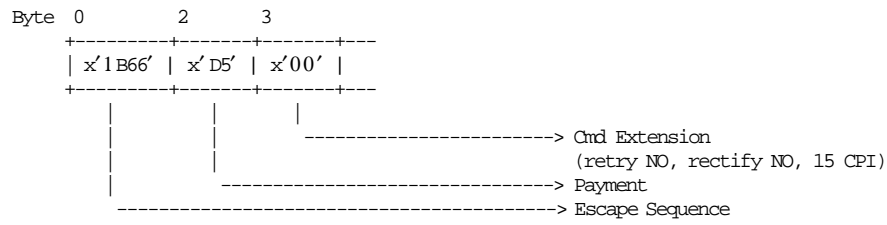
13.23.3 Payment Calculations

- **For Rectify = NO**

  Tra_Chg_Due = Tra_Amt_Due − Payment_Amount

- **For Rectify = YES**

  Tra_Chg_Due = Tra_Amt_Due + Payment_Amount

13.24 D7 - SET HEADER

This command is used to load the store header into fiscal printer battery backed up RAM and Fiscal Memory.

13.24.1 Command Format

```
------------------------------------------------------------------------

BYTE BIT  CONTENT                                      TYPE   LENGTH

 0-1      1B66 - cmd prefix                            hex       2
 2        D7 - Set Header                              hex       1
 3        Cmd. Extension                               hex       1
          If Store Header in Fiscal Memory
     7-0  00 = Store in Fiscal Memory

          If Set Header in RAM Memory
     7-6  Reserved (always = '0')
     5-3  Print Mode
          000 = 15 CPI
          001 = 12 CPI
          010 = Reserved
          011 = 15 CPI Double-High
          100 = 15 CPI Emphasized
          101 = 12 CPI Emphasized
          110 = Reserved
          111 = 15 CPI Double-High, Emphasized
     2-0  Header Line Number
          001 = First
          010 = Second
          011 = Third
          100 = Fourth
          101 = Fifth
          110 = Sixth

          If Set Header in RAM Memory
 4-41     Description                                  ASCII    38  (Note 1, 2)

------------------------------------------------------------------------
```

Notes:

1. If an all blank characters string is specified then the corresponding header line is not printed.

2. If all header lines are not set, not fiscal operations are allowed.

13.24.2 Command Example

```
Byte  0         2       3       4
     +---------+-------+-------+------------------+
     | x'1B66' | x'D7' | x'01' | 'Supermarket....'|
     +---------+-------+-------+------------------+
          |         |       |        |
          |         |       |        --------------------> Description
          |         |       --------------------------> Cmd Extension
          |         |                                    (15 CPI, 1st. line)
          |         ----------------------------------> Set Header
          ----------------------------------------------> Escape Sequence
```
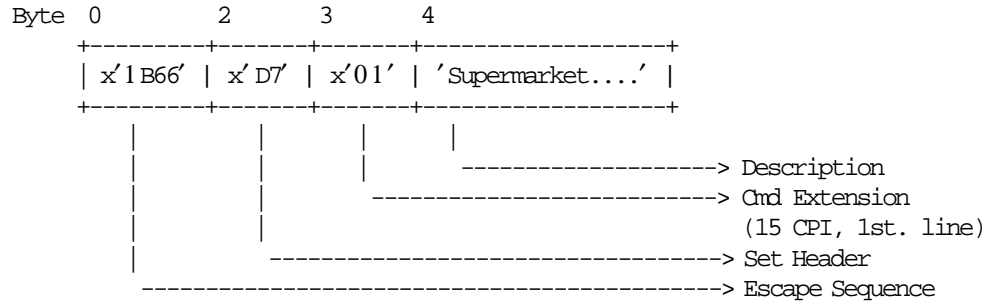
13.24.3 Set Header Calculations

Day_N_Head = Day_N_Head + 1
Lif_N_Head = Lif_N_Head + 1

13.24.4 Set Header Rules

- This command can be executed out of the sale period.
- If the new entry set in RAM memory is different at the last entry stored in fiscal memory (Header Table), it should be writed in fiscal memory issuing the D7 00 cmd..
- When new entry is stored in header table, these data are printed in the header report.
- When no new entry in header table, the last entry is printed in the header report.
- When the Header Table is full, the new entry set in RAM memory must be equal at the last entry stored in fiscal memory (Header Table).
- To store a new entry in fiscal memory (Header Table), the new entry in RAM memory can't be blank.
- First Jumper On/Off after the fiscalization:
  - After the first jumper ON/OFF procedure the commands xD7ii/xD700 are 'mandatory' before the start of sale period.
- Next Jumper On/Off after the fiscalization:
  - After the jumper ON/OFF procedure the header lines are restored from the latest entry of the Header Table in fiscal memory.
  - After the jumper ON/OFF procedure the commands xD7 are 'optional'.

13.25 D9 - DISCOUNT/UPLIFT ON SUBTOTAL

This command is used to apply discount or uplift on subtotal.

13.25.1 Command Format

```
--------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE    LENGTH

 0-1      1B66 - cmd prefix                          hex        2
 2        D9 - Discount/Uplift on Subtotal           hex        1
 3        Cmd. Extension                             hex        1
     7    Retry
          0 = NO
          1 = YES
     6    Rectify
          0 = NO
          1 = YES
   5-3    Print Mode
          000 = 15 CPI
          001 = 12 CPI
          010 = Reserved
          011 = Reserved
          100 = 15 CPI Emphasized
          101 = 12 CPI Emphasized
          110 = Reserved
          111 = Reserved
   2-1    Reserved
     0    Type
          0 = DISCOUNT ON SUBTOTAL
          1 = UPLIFT   ON SUBTOTAL
 4-27     Description                                ASCII     24
28-37     Amount                                     ASCII     10  (Note 1)


--------------------------------------------------------------------
```

Notes:

1. Amount string can be blank.
   If amount string is blank then the transaction counters are not affected.

13.25.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+---
      | x'1B66' | x'D9' | x'00' |
      +---------+-------+-------+---
           |        |       |
           |        |       ------------------> Cmd Extension
           |        |                           (retry NO, rectify NO, disc. on subt.)
           |        --------------------------> Discount/Uplift on Subtotal
           ----------------------------------> Escape Sequence


Byte  4            28
      +------------+--------------+
      | 'ddd...ddd'| '0000001000' |
      +------------+--------------+
           |            |
           |            -----------------------> Amount
           -----------------------------------> Description
```
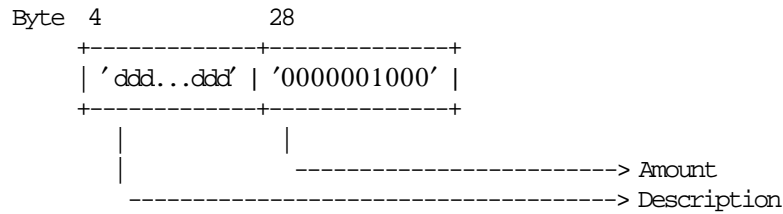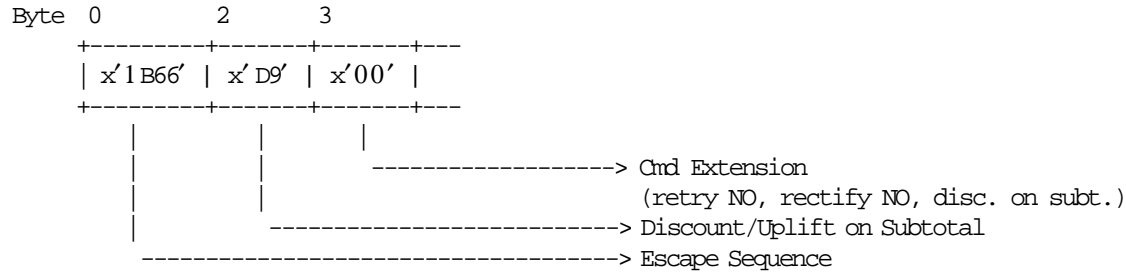
13.25.3 Discount/Uplift on Subtotal Calculations

- **Discount on Subtotal (Rectify = NO)**

  $Tra\_N\_Tdsc = Tra\_N\_Tdsc + 1$

  $Tra\_Total = Tra\_Total - Amount$

  $Tra\_Tot\_A = Tra\_Tot\_A - (Tra\_Tot\_A \times Amount)/Tra\_Total$
  $Tra\_Tot\_B = Tra\_Tot\_B - (Tra\_Tot\_B \times Amount)/Tra\_Total$
  $Tra\_Tot\_C = Tra\_Tot\_C - (Tra\_Tot\_C \times Amount)/Tra\_Total$
  $Tra\_Tot\_D = Tra\_Tot\_D - (Tra\_Tot\_D \times Amount)/Tra\_Total$
  $Tra\_Tot\_E = Tra\_Tot\_E - (Tra\_Tot\_E \times Amount)/Tra\_Total$

  $Tra\_Tdsc = Tra\_Tdsc + Amount$

- **Discount on Subtotal (Rectify = YES)**

  $Tra\_N\_Tdsc = Tra\_N\_Tdsc - 1$

  $Tra\_Total = Tra\_Total + Amount$

  $Tra\_Tot\_A = Tra\_Tot\_A + (Tra\_Tot\_A \times Amount)/Tra\_Total$
  $Tra\_Tot\_B = Tra\_Tot\_B + (Tra\_Tot\_B \times Amount)/Tra\_Total$
  $Tra\_Tot\_C = Tra\_Tot\_C + (Tra\_Tot\_C \times Amount)/Tra\_Total$
  $Tra\_Tot\_D = Tra\_Tot\_D + (Tra\_Tot\_D \times Amount)/Tra\_Total$
  $Tra\_Tot\_E = Tra\_Tot\_E + (Tra\_Tot\_E \times Amount)/Tra\_Total$

  $Tra\_Tdsc = Tra\_Tdsc - Amount$

- **Uplift on Subtotal (Rectify = NO)**

  $Tra\_N\_Tupl = Tra\_N\_Tupl + 1$

  $Tra\_Total = Tra\_Total + Amount$

  $Tra\_Tot\_A = Tra\_Tot\_A + (Tra\_Tot\_A \times Amount)/Tra\_Total$
  $Tra\_Tot\_B = Tra\_Tot\_B + (Tra\_Tot\_B \times Amount)/Tra\_Total$
  $Tra\_Tot\_C = Tra\_Tot\_C + (Tra\_Tot\_C \times Amount)/Tra\_Total$

$$Tra\_Tot\_D = Tra\_Tot\_D + (Tra\_Tot\_D \times Amount)/Tra\_Total$$
$$Tra\_Tot\_E = Tra\_Tot\_E + (Tra\_Tot\_E \times Amount)/Tra\_Total$$

$$Tra\_Tupl = Tra\_Tupl + Amount$$

- **Uplift on Subtotal (Rectify = YES)**

$$Tra\_N\_Tupl = Tra\_N\_Tupl - 1$$

$$Tra\_Total = Tra\_Total - Amount$$

$$Tra\_Tot\_A = Tra\_Tot\_A - (Tra\_Tot\_A \times Amount)/Tra\_Total$$
$$Tra\_Tot\_B = Tra\_Tot\_B - (Tra\_Tot\_B \times Amount)/Tra\_Total$$
$$Tra\_Tot\_C = Tra\_Tot\_C - (Tra\_Tot\_C \times Amount)/Tra\_Total$$
$$Tra\_Tot\_D = Tra\_Tot\_D - (Tra\_Tot\_D \times Amount)/Tra\_Total$$
$$Tra\_Tot\_E = Tra\_Tot\_E - (Tra\_Tot\_E \times Amount)/Tra\_Total$$

$$Tra\_Tupl = Tra\_Tupl - Amount$$

13.25.4 Discount/Uplift on Subtotal Rules

- The discount or uplift amount is distributed (subtracted or added) to the VAT category accumulators proportionally to their current amount.
- The amount field must be greater than 0, otherwise return code 133 is issued.
- This command is not allowed if the transaction total is zero.
  This is to protect the VAT category accumulators from the proportional distribution of the discount or uplift amount, since they are all zero.
- Any gross transaction total accumulators for VAT categories must NOT be negative when transaction total command is received.

13.26 DA - READ FISCAL MEMORY TABLES

This command is used to request the fiscal unit to report the fiscal memory content.

13.26.1 Command Format

```
-----------------------------------------------------------------------

BYTE BIT   CONTENT                                    TYPE    LENGTH

 0-1       1B66 - cmd prefix                          hex        2
 2         DA - Read Fiscal Memory Tables             hex        1
 3         Cmd. Extension                             hex        1
     7-4   Reserved (always = '0')
     3-1   Tables
           000 = Daily Entry Table
           001 = VAT Rate Table
           100 = Header Table
           101 = Repair Action Table
           110 = Printer Disconnection Table
      0    Read Block
           0 = Start                                          (Note 1)
           1 = Next                                           (Note 1, 2)
 4-7       Password                                   ASCII      4

   If Daily Entry Table or VAT Rate Table specify:
 8-11      Closure Number                             ASCII      4

   If Header Table specify:
 8-9       Header Number                              ASCII      2 (Note 3)


-----------------------------------------------------------------------
```

Notes:

 1. For Daily Entry Table (byte 3, bit 3-1 = 000):

     • The read start block will show the first entry stored in the table.
     • The read next block will show the next consecutive entries stored in the table.

    For VAT Rate Table (byte 3, bit 3-1 = 001):

     • The read start block will show the first entry stored in the table.
     • The read next block will show the next consecutive entries stored in the table.

    For Header Table (byte 3, bit 3-1 = 100):

     • The read start block will show the first half (header lines 1, 2 and 3) of the entry number
       indicate in Header Number field (bytes 8-9).
     • The read next block will show the second half (header lines 4, 5 and 6) of the entry number
       indicate in Header Number field (bytes 8-9).

    For Repair Action Table (byte 3, bit 3-1 = 101):

     • The read start block will show the first entry stored in the table.
     • The read next block will show the next consecutive entries stored in the table.

    For Printer Disconnection Table (byte 3, bit 3-1 = 111):

     • The read start block will show the first entry stored in the table.
     • The read next block will show the next consecutive entries stored in the table.

 2. If read next block option is specified, then bytes 8-11 are ignored, but are still required.

 3. Range allowed from 1 to 30.

Response Read Daily Entry Table will be formatted as follows:

```
-------------------------------------------------------------------------------

    BYTE      BYTE     CONTENT                                     TYPE   LENGTH
    RS-485    USB

    0-8                Fiscal Unit Status                          hex       9
              0-14     Fiscal Unit Status                          hex      15

    9         15       DA - Record Identification                  hex       1

    10-23     16-29    Request Date and Time                       ASCII    14
                        (dd/mm/yy hh:mm)
    24        30       Return Code                                 hex       1
                       43 = Good Completion
                       5A = Register Not Found
                       60 = Invalid Character in Command Bytes 8-9
                       64 = Error on Reading Fiscal Memory
    25-26     31-32    Reserved                                    hex       2
    27-30     33-36    Closure Number                              ASCII     4


    31-38     37-44    Closure Date (dd/mm/yy)                     ASCII     8
    39-42     45-48    Number of Slips                             hex       4
    43-48     49-54    Cumulative Net Sales   (A+B+C+D)            hex       6
    49-54     55-60    Cumulative Net Sales   (E)                  hex       6
    55-60     61-66    Cumulative VAT Amount (A)                   hex       6
    61-66     67-72    Cumulative VAT Amount (B)                   hex       6
    67-72     73-78    Cumulative VAT Amount (C)                   hex       6
    73-78     79-84    Cumulative VAT Amount (D)                   hex       6
    79-84     85-90    Cumulative VAT Amount (E)                   hex       6
    85        91       Number of Repair Actions                    hex       1
    86-87     92-93    Number of Printer Disconnections            hex       2
    88        94       Number of Header's Changed                  hex       1
    89        95       Number of Previous Header's Changed         hex       1
    90        96       Number of VAT's Rates Changed               hex       1
    91        97       Number of Previous VAT's Rates Changed      hex       1
    92-95     98-101   Number of Fiscal Vouchers                   hex       4


-------------------------------------------------------------------------------
```

Note: If return code indicates an error, then daily entry table data are meaningless.

Response for Read VAT Rate Table will be formatted as follows:

```
--------------------------------------------------------------------------------

BYTE        BYTE        CONTENT                                     TYPE    LENGTH
RS-485      USB

 0-8                    Fiscal Unit Status                          hex        9
            0-14        Fiscal Unit Status                          hex       15

 9          15          DA - Record Identification                  hex        1
10-23       16-29       Request Date and Time                       ASCII     14
                        (dd/mm/yy hh:mm)
24          30          Return Code                                 hex        1
                        43 = Good Completion
                        5A = Register Not Found
                        60 = Invalid Character in Command Bytes 8-9
                        64 = Error on Reading Fiscal Memory
25-26       31-32       Reserved                                    hex        2
27-30       33-36       First Applicable Closure Number             ASCII      4
31-38       37-44       Date (dd/mm/yy)                             ASCII      8
39-40       45-46       VAT Rate (A)  (x 100)                       hex        2
41-42       47-48       VAT Rate (B)  (x 100)                       hex        2
43-44       49-50       VAT Rate (C)  (x 100)                       hex        2
45-46       51-52       VAT Rate (D)  (x 100)                       hex        2
47-48       53-54       VAT Rate (E)  (x 100)                       hex        2
49-50       55-56       Reserved                                    hex        2


--------------------------------------------------------------------------------
```

Note: If return code indicates an error, then VAT rate table data are meaningless.

Response for Header Table will be formatted as follows:

```
--------------------------------------------------------------------------------

BYTE     BYTE    CONTENT                                      TYPE    LENGTH
RS-485   USB

 0-8             Fiscal Unit Status                           hex        9
         0-14    Fiscal Unit Status                           hex       15

 9       15      DA - Record Identification                   hex        1
10-23    16-29   Request Date and Time                        ASCII     14
                 (dd/mm/yy hh:mm)
24       30      Return Code                                  hex        1
                 43 = Good Completion
                 5A = Register Not Found
                 60 = Invalid Character in Command Bytes 8-9
                 64 = Error on Reading Fiscal Memory
25-26    31-32   Reserved                                     hex        2
27-30    33-36   Closure Number                               ASCII      4
31-38    37-44   Date (dd/mm/yy)                              ASCII      8
39-76    45-82   Header Description 1                         ASCII     38
77-82    83-88   Reserved                                     hex        6
83-120   89-126  Header Description 2                         ASCII     38
121-126  127-132 Reserved                                     hex        6
127-164  133-170 Header Description 3                         ASCII     38
165-170  171-176 Reserved                                     hex        6

--------------------------------------------------------------------------------
```

Response for Header Table will be formatted as follows:

```
--------------------------------------------------------------------------------

BYTE     BYTE    CONTENT                                      TYPE    LENGTH
RS-485   USB

 0-8             Fiscal Unit Status                           hex        9
         0-14    Fiscal Unit Status                           hex       15

 9       15      DA - Record Identification                   hex        1
10-23    16-29   Request Date and Time                        ASCII     14
                 (dd/mm/yy hh:mm)
24       30      Return Code                                  hex        1
                 43 = Good Completion
                 5A = Register Not Found
                 64 = Error on Reading Fiscal Memory
25-26    31-32   Reserved                                     hex        2
27-30    33-36   Closure Number                               ASCII      4
31-38    37-44   Date (dd/mm/yy)                              ASCII      8
39-76    45-82   Header Description 4                         ASCII     38
77-82    83-88   Reserved                                     hex        6
83-120   89-126  Header Description 5                         ASCII     38
121-126  127-132 Reserved                                     hex        6
127-164  133-170 Header Description 6                         ASCII     38
165-170  171-176 Reserved                                     hex        6

--------------------------------------------------------------------------------
```

Response for Repair Action Table will be formatted as follows:

```
--------------------------------------------------------------------------------

  BYTE      BYTE     CONTENT                                         TYPE   LENGTH
  RS-485    USB

  0-8                Fiscal Unit Status                              hex        9
            0-14     Fiscal Unit Status                              hex       15

  9         15       DA - Record Identification                      hex        1
  10-23     16-29    Request Date and Time                           ASCII     14
                     (dd/mm/yy hh:mm)
  24        30       Return Code                                     hex        1
                     43 = Good Completion
                     5A = Register Not Found
                     64 = Error on Reading Fiscal Memory
  25-26     31-32    Repair Action Number                            hex        2
  27-30     33-36    Closure Number                                  ASCII      4
  31-38     37-44    Date (dd/mm/yy)                                 ASCII      8
  39-43     45-49    Time (hh:mm)                                    ASCII      5


--------------------------------------------------------------------------------
```

Note: If return code indicates an error, then repair action table data are meaningless.

Response for Printer Disconnection Table will be formatted as follows:

```
--------------------------------------------------------------------------------

  BYTE      BYTE     CONTENT                                         TYPE   LENGTH
  RS-485    USB

  0-8                Fiscal Unit Status                              hex        9
            0-14     Fiscal Unit Status                              hex       15

  9         15       DA - Record Identification                      hex        1
  10-23     16-29    Request Date and Time                           ASCII     14
                     (dd/mm/yy hh:mm)
  24        30       Return Code                                     hex        1
                     43 = Good Completion
                     5A = Register Not Found
                     64 = Error on Reading Fiscal Memory
  25-26     31-32    Printer Disconnection Number                    hex        2
  27-30     33-36    Closure Number                                  ASCII      4
  31-38     37-44    Date (dd/mm/yy)                                 ASCII      8
  39-43     45-49    Time (hh:mm)                                    ASCII      5


--------------------------------------------------------------------------------
```

Note: If return code indicates an error, then printer disconnection table data
      are meaningless.

13.26.2 Command Example

```
Byte  0         2       3       4       8
      +---------+-------+-------+--------+--------+
      | x'1B66' | x'DA' | x'00' | 'pppp' | '0011' |
      +---------+-------+-------+--------+--------+
           |        |       |       |        |
           |        |       |       |        --------> Closure Number
           |        |       |       ----------------> Password
           |        |       -----------------------> Cmd Extension
           |        |                                 (daily entry, start read)
           |        ------------------------------> Read Fiscal Memory Tables
           -----------------------------------------> Escape Sequence
```
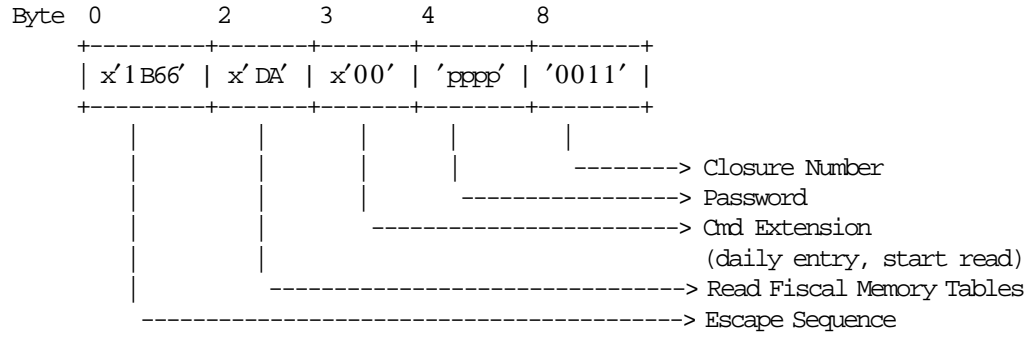
13.27 DB - READ ACCUMULATORS AND COUNTERS

This command is used to request the fiscal unit to report the content of transaction and daily accumulators and counters.

13.27.1 Command Format

```
 ---------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE    LENGTH

 0-1      1B66 - cmd prefix                          hex          2
 2        DB - Read Accumulators and Counters        hex          1
 3        Cmd. Extension                             hex          1
    7-0   Reserved (always = '0x00')


 ---------------------------------------------------------------------
```

Response to the Read Accumulators and Counters command will be formatted as follows:

```
 ---------------------------------------------------------------------------------
```

BYTE RS-485	BYTE USB	BIT	CONTENT	TYPE	LENGTH
0-8			Fiscal Unit Status	hex	9
	0-14		Fiscal Unit Status	hex	15
9	15		DB - Record Identification	hex	1
10-23	16-29		Request Date and Time (dd/mm/yy hh:mm)	ASCII	14
24	30		Return Code 43 = Good Completion	hex	1
25	31		FISCAL UNIT STATE 00 = No Procedure in Progress 01 = Sale Transaction in Progress 02 = Non-Fiscal Report on CR in Progress 03 = Non-Fiscal Report on SJ in Progress 04 = Non-Fiscal Report on DI Landscape in Progress 05 = Non-Fiscal Report on DI Portrait in Progress	hex	1
26	32		SALE TRANSACTION STEP	hex	1
		7	1 = Header Printed		
		6	1 = Item or Negative/Positive Item Sold		
		5	1 = Total Requested		
		4	1 = Payment in Progress		
		3	1 = End Transaction in Progress		
		2	1 = Cancel Transaction in Progress		
		1-0	Reserved		
27	33		FISCAL UNIT MODE	hex	1
		7	1 = Fiscal Mode Set		
		6	Reserved		
		5	1 = Sale Period in Progress		
		4-0	Reserved		
28-30	34-36		Reserved	hex	3

```
 -----------------------------------------------------------------------------------------
```

(Continued in the next page)

```
---------------------------------------------------------------------------------------

   BYTE    BYTE  BIT  CONTENT                                  TYPE    LENGTH  VARIABLE NAME
   RS-485  USB


                         TRANSACTION ACCUMULATORS

   31-34   37-40      Transaction Total                        hex        4  Tra_Total
   35-38   41-44      Total for VAT Rate (A)                   hex        4  Tra_Total_A
   39-42   45-48      Total for VAT Rate (B)                   hex        4  Tra_Total_B
   43-46   49-52      Total for VAT Rate (C)                   hex        4  Tra_Total_C
   47-50   53-56      Total for VAT Rate (D)                   hex        4  Tra_Total_D
   51-54   57-60      Total for VAT Rate (E)                   hex        4  Tra_Total_E
   55-58   61-64      Discount on Subtotal                     hex        4  Tra_Tdsc
   59-62   65-68      Uplift   on Subtotal                     hex        4  Tra_Tupl
   63-66   69-72      Item Returns                             hex        4  Tra_Retn
   67-70   73-76      Item Voids                               hex        4  Tra_Void
   71-74   77-80      Item Discounts                           hex        4  Tra_Disc
   75-78   81-84      Item Uplifts                             hex        4  Tra_Uplf
   79-82   85-88      Amount Due - Change Due                  hex        4  (1)

                         TRANSACTION COUNTERS

   83-84   89-90      Number of Discount on Subtotal           hex        2  Tra_N_Tdsc
   85-86   91-92      Number of Uplift   on Subtotal           hex        2  Tra_N_Tupl
   87-88   93-94      Number of Return Item                    hex        2  Tra_N_Retn
   89-90   95-96      Number of Void Item                      hex        2  Tra_N_Void
   91-92   97-98      Number of Discount Item                  hex        2  Tra_N_Disc
   93-94   99-100     Number of Uplift Item                    hex        2  Tra_N_Uplf


---------------------------------------------------------------------------------------


      (Continued in the next page)
```
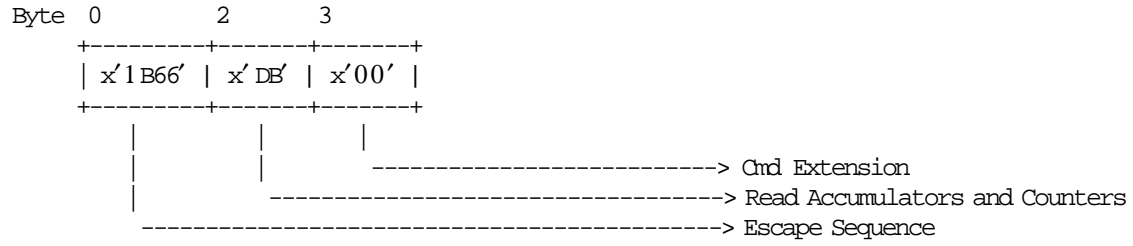
Notes:

1. > 0 = Amount due;   < 0 = Change due.

```
----------------------------------------------------------------------------------------

   BYTE    BYTE  BIT  CONTENT                                  TYPE    LENGTH  VARIABLE NAME
   RS-485  USB


                     DAILY ACCUMULATORS


    95-98   101-104     Total for VAT Rate (A)               hex        4  Day_Tot_A
    99-102  105-108     Total for VAT Rate (B)               hex        4  Day_Tot_B
   103-106  109-112     Total for VAT Rate (C)               hex        4  Day_Tot_C
   107-110  113-116     Total for VAT Rate (D)               hex        4  Day_Tot_D
   111-112  117-120     Total for VAT Rate (E)               hex        4  Day_Tot_E
   115-116  121-124     Discount on Subtotal                 hex        4  Day_Tdsc
   119-122  125-128     Uplift   on Subtotal                 hex        4  Day_Tupl
   123-126  129-132     Return   Item                        hex        4  Day_Retn
   127-130  133-136     Void     Item                        hex        4  Day_Void
   131-134  137-140     Discount Item                        hex        4  Day_Disc
   135-138  141-144     Uplift   Item                        hex        4  Day_Uplf
   139-142  145-148     Cancel Transaction Total             hex        4  Day_Canc


                     DAILY COUNTERS


   143-144  149-150     Number of Slips                      hex        2  Day_N_Slip
   145-146  151-152     Number of Discounts on Subtotal      hex        2  Day_N_Tdsc
   147-148  153-154     Number of Uplifts on Subtotal        hex        2  Day_N_Tupl
   149-150  155-156     Number of Return Items               hex        2  Day_N_Retn
   151-152  157-158     Number of Void Items                 hex        2  Day_N_Void
   153-154  159-160     Number of Discount Items             hex        2  Day_N_Disc
   155-156  161-162     Number of Uplift Items               hex        2  Day_N_Uplf
   157-158  163-164     Number of Cancel Transactions        hex        2  Day_N_Canc
   159-160  165-166     Number of Daily Closures             hex        2  Day_N_Clos
   161-162  167-168     Number of Repair Actions             hex        2  Day_N_Ract
   163-164  169-170     Number of Printer Disconnections     hex        2  Day_N_Dcx
   165-166  171-172     Number of Fiscal Vouchers            hex        2  Day_N_Vouc
   167-170  173-176     Reserved                             hex        4


                     CURRENT VAT RATES


   171-172  177-178     Current VAT Rate (A)  (x 100)        hex        2  Rate_A
   173-174  179-180     Current VAT Rate (B)  (x 100)        hex        2  Rate_B
   175-176  181-182     Current VAT Rate (C)  (x 100)        hex        2  Rate_C
   177-178  183-184     Current VAT Rate (D)  (x 100)        hex        2  Rate_D
   179-180  185-186     Current VAT Rate (E)  (x 100)        hex        2  Rate_E


                     FISCAL MEMORY


   181-183  187-189     Manufacturing ID                     ASCII      3  FM_SN_MF_ID
   184-185  190-191     Manufacturing Year                   ASCII      2  FM_SN_MF_YEAR
   186-191  192-197     Fiscal Unit Serial Number            ASCII      6  FM_SN_SERNUM
   192-193  198-199     Available Empty Closure Entries      hex        2
   194-195  200-201     Available Empty VAT Table Entries    hex        2
   196-197  202-203     Available Empty Header Table Entries hex        2


----------------------------------------------------------------------------------------
```

13.27.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+
      | x'1B66' | x'DB' | x'00' |
      +---------+-------+-------+
           |         |       |
           |         |        ------------------------> Cmd Extension
           |          --------------------------------> Read Accumulators and Counters
            -------------------------------------------> Escape Sequence
```

13.28 DC - READ FDTS

This command is used to request the fiscal unit to report the content of FDTS set.

13.28.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                       TYPE    LENGTH

 0-1      1B66 - cmd prefix                             hex        2
 2        DC - Read FDTS                                hex        1
 3        Cmd. Extension                                hex        1
     7-0  Reserved (always = '0x00')


----------------------------------------------------------------------
```

Response to the Read FDTS will be formatted as follows:

```
---------------------------------------------------------------------------------

BYTE    BYTE    CONTENT                                    TYPE    LENGTH
RS-485  USB

 0-8            Fiscal Unit Status                         hex          9
        0-14    Fiscal Unit Status                         hex         15

 9      15      DC - Record Identification                 hex          1
10-23   16-29   Request Date and Time                      ASCII       14
                (dd/mm/yy hh:mm)
24      30      Return Code                                hex          1
                43 = Good Completion
25-32   31-38   FDTS Date (ddmmyyyy)                        ASCII        8
33-37   39-43   FDTS Time (hh:mm)                          ASCII        5


---------------------------------------------------------------------------------
```

13.29 DD - START NON-FISCAL REPORT

This command is used to start a non-fiscal documents.

13.29.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                      TYPE   LENGTH

 0-1      1B66 - cmd prefix                            hex      2
 2        DD - Start Non-Fiscal Report                 hex      1
 3        Cmd. Extension                               hex      1
      7-2 Reserved (always = '0')
      1-0 Station
          00 = CR
          01 = SJ
          10 = DI Landscape
          11 = DI Portrait
 4-7      Operator Number                              ASCII    4  (Note 1)
 8-10     Terminal Number                              ASCII    3  (Note 1)


----------------------------------------------------------------------
```
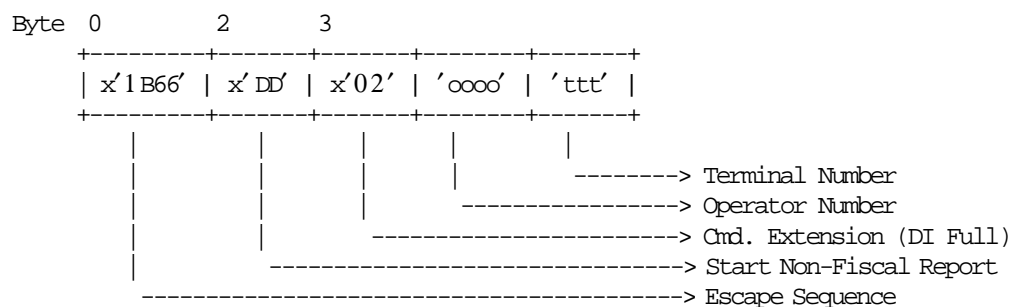
Notes:

1. Operator number and terminal number are optional.
   Blank characters are assumed if they are not provided.

13.29.2 Command Example

```
Byte  0        2       3
      +--------+------+------+-------+------+
      | x'1B66'| x'DD'| x'02'| 'oooo'| 'ttt'|
      +--------+------+------+-------+------+
          |       |     |      |       |
          |       |     |      |       --------> Terminal Number
          |       |     |      ----------------> Operator Number
          |       |     ----------------------> Cmd. Extension (DI Full)
          |       ------------------------------> Start Non-Fiscal Report
          ----------------------------------------> Escape Sequence
```

13.29.3 Start Non-Fiscal Report Calculations

There are no calculations for this command.

13.29.4 Start Non-Fiscal Report Rules

- The execution of the Start Application-Originated Report command sets the fiscal unit into the Non-Fiscal Report in Progress.
- This report can be printed on CR, SJ and DI stations.
- When this command is executed on CR station, the header lines followed by the terminal/operator number line and ″ILLEGAL RECEIPT″ (92 msg.) line are printed.
- When this command is executed on CR station, the terminal/operator number line and ″ILLEGAL RECEIPT″ (92 msg.) line are replicated to SJ station.
- When this command is executed on SJ or DI stations, the ″ILLEGAL RECEIPT″ (92 msg.) is printed as first line of the non-fiscal report.
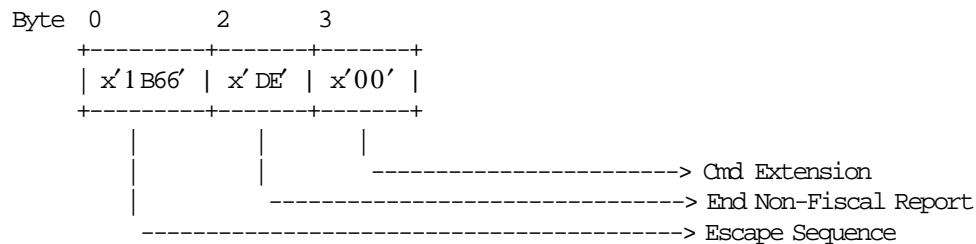- When this command is executed on SJ station, all lines are replicated on CR station.

13.30 DE - END NON-FISCAL REPORT

This command is used to end a non-fiscal documents.

13.30.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                      TYPE   LENGTH

 0-1      1B66 - cmd prefix                            hex       2
 2        DE - End Non-Fiscal Report                   hex       1
 3        Cmd. Extension                               hex       1
     7-0  Reserved (always = '0x00')


----------------------------------------------------------------------
```

13.30.2 Command Example

```
Byte  0         2       3
      +---------+-------+------+
      | x'1B66' | x'DE' | x'00' |
      +---------+-------+------+
           |        |       |
           |        |       ----------------------> Cmd Extension
           |         ------------------------------> End Non-Fiscal Report
            -----------------------------------------> Escape Sequence
```

13.30.3 End Non-Fiscal Report Calculations

There are no calculations for this command.

13.30.4 End Non-Fiscal Report Rules

- When this command is executed on CR station, the date/time line followed by the ″ILLEGAL RECEIPT″ (92 msg.) line are printed.
- When this command is executed on DI or SJ stations, the ″ILLEGAL RECEIPT″ (92 msg.) line is printed as last line of the non-fiscal report.

13.31 E7 - DIAGNOSTIC AND ALIGNMENT UTILITIES

This command is used to diagnostics and alignmets.

13.31.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE    LENGTH

 0-1      1B66 - cmd prefix                          hex        2
 2        E7 - Diagnostic and Alignment Utilities    hex        1
 3        Cmd. Extension                             hex        1
          00 = Set MCT Value
          01 = DI Print Document Top    Registration Pattern
          02 = DI Print Document Bottom Registration Pattern
          03 = DI Print Backlash    Adjustment Pattern
          04 = DI Print Reinsertion Adjustment Pattern
          05 = CR Read MCT Value
          06 = Reserved
          07 = Reserved
          08 = CR Print Test Command
          09 = SJ Print "HIHI...HIHI" Pattern
          0A = DI Print "HIHI...HIHI" Pattern
          0B = DI Character Alignment
          0C = DI MICR Read, Print Front Check,
               Print Back Check & CR Print MICR data
          0D = CR Cut Paper
          0E = DI Head Left
          0F = DI Head Right

If Cmd. Extension = 00 or 01

 4-4      MCT Number                                 hex        1
 5-5      MCT Value - High Order Byte                hex        1
 6-6      MCT Value - Low  Order Byte                hex        1


----------------------------------------------------------------------
```

(Continued in the next page)

Diagnostic and Alignment Utilities Command continued ....

```
    --------------------------------------------------------------------

    BYTE BIT   CONTENT                                      TYPE    LENGTH

    If Cmd. Extension = 03 or 0B

     4-4       MCT Number 1                                 hex       1
     5-5       MCT Value  1 - High Order Byte               hex       1
     6-6       MCT Value  1 - Low  Order Byte               hex       1
     7-7       MCT Number 2                                 hex       1
     8-8       MCT Value  2 - High Order Byte               hex       1
     9-9       MCT Value  2 - Low  Order Byte               hex       1
    10-10      MCT Number 3                                 hex       1
    11-11      MCT Value  3 - High Order Byte               hex       1
    12-12      MCT Value  3 - Low  Order Byte               hex       1
    13-13      MCT Number 4                                 hex       1
    14-14      MCT Value  4 - High Order Byte               hex       1
    15-15      MCT Value  4 - Low  Order Byte               hex       1
    16-16      MCT Number 5                                 hex       1
    17-17      MCT Value  5 - High Order Byte               hex       1
    18-18      MCT Value  5 - Low  Order Byte               hex       1
    19-19      MCT Number 6                                 hex       1
    20-20      MCT Value  6 - High Order Byte               hex       1
    21-21      MCT Value  6 - Low  Order Byte               hex       1
    22-22      MCT Number 7                                 hex       1
    23-23      MCT Value  7 - High Order Byte               hex       1
    24-24      MCT Value  7 - Low  Order Byte               hex       1
    25-25      MCT Number 8                                 hex       1
    26-26      MCT Value  8 - High Order Byte               hex       1
    27-27      MCT Value  8 - Low  Order Byte               hex       1
    28-28      MCT Number 9                                 hex       1
    29-29      MCT Value  9 - High Order Byte               hex       1
    30-30      MCT Value  9 - Low  Order Byte               hex       1

    If Cmd. Extension = 05

     4-4       MCT Number                                   hex       1


    --------------------------------------------------------------------

        (Continued in the next page)
```
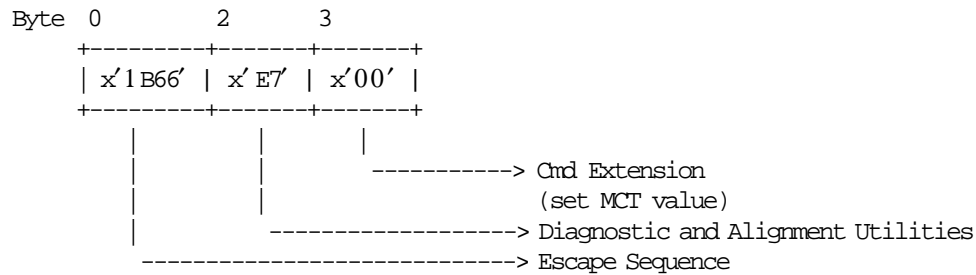
Diagnostic and Alignment Utilities Command continued ....

Response for Read MCT Value (Cmd. Extension 05):

```
---------------------------------------------------------------------------

BYTE       BYTE      CONTENT                               TYPE    LENGTH
RS-485     USB

 0-8                 Fiscal Unit Status                    hex          9
           0-14      Fiscal Unit Status                    hex         15

 9         15        MCT Value - High Order Byte           hex          1
10         16        MCT Value - Low  Order Byte           hex         14


---------------------------------------------------------------------------
```

13.31.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+
      | x'1B66' | x'E7' | x'00' |
      +---------+-------+-------+
           |        |       |
           |        |       -----------> Cmd Extension
           |        |                    (set MCT value)
           |        -------------------> Diagnostic and Alignment Utilities
           ---------------------------> Escape Sequence
```

13.31.3 Diagnostic and Alignment Utilities Rules

- The printed documents are fixed format and cannot be modified by the users.
- The printed documents on CR, SJ or DI stations are not replicated.

13.32 E8 - SET NUMBER OF DOT ROWS PER LINEFEED

This command is used to change the number of dot rows per line feed from 12 (default - 6 lines/inch) to 9 (alternate - 8 lines/inch).

13.32.1 Command Format

```
--------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE    LENGTH


 0-1      1B66 - cmd prefix                          hex       2
 2        E8 - Set Number of Dot Rows per LF         hex       1
 3        Cmd. Extension                             hex       1
     7-4  Reserved (always = '0')
      3   DI Station - Landscape                                   (Note 1)
          0 = Set Default    Value for DI
          1 = Set Alternate Value for DI
      2   DI Station - Portrait                                    (Note 1)
          0 = Set Default    Value for DI
          1 = Set Alternate Value for DI
      1   SJ Station                                               (Note 1, 2)
          0 = Set Default    Value
          1 = Set Alternate Value
      0   CR Station                                               (Note 1, 3)
          0 = Set Default    Value
          1 = Set Alternate Value


--------------------------------------------------------------------
```

Notes:

1. Alternate = 12 Dot Rows per LF (6 lines/inch).
   Default = 9 Dot Rows per LF (8 lines/inch).

2. The setting will be done for the lines printed on SJ station.

3. The setting will be done for the lines printed on CR and SJ station (original and replica).

13.32.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+
      | x'1B66' | x'E8' | x'00' |
      +---------+-------+-------+
          |         |       |
          |         |       --------------> Cmd Extension
          |         |                       (set default value DI,
          |         |                        set default value SJ,
          |         |                        set default valud CR)
          |         --------------------> Set Number of Dot Rows per LF
          -------------------------------> Escape Sequence
```
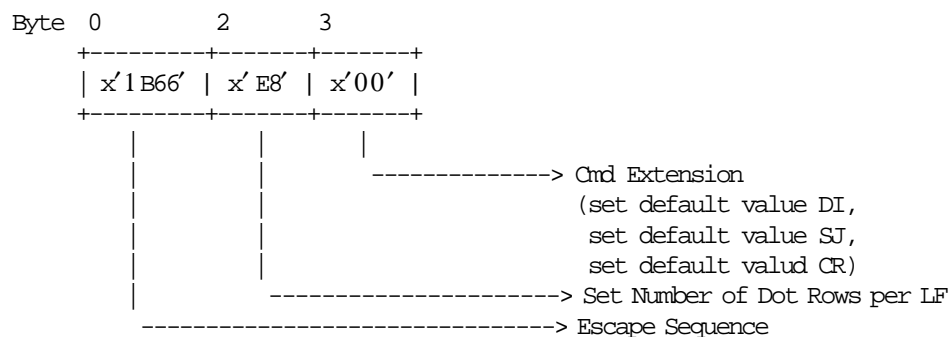
13.32.3 Set Number of Dot Rows per Line Feed Rules

- The number of dot rows per line feed are restored to the default value when RAM is cleared by installing the J4 (CE) jumper.

13.33 E9 - PRINTER NATIVE COMMANDS

This command is used to execute the printer native commands.

13.33.1 Command Format

```
---------------------------------------------------------------------

BYTE BIT   CONTENT                                     TYPE    LENGTH

 0-1       1B66 - cmd prefix                           hex        2
 2         E9 - Printer Native Commands                hex        1
 3         Cmd. Extension                              hex        1
     7-0   Reserved (always = '0x00')


---------------------------------------------------------------------
```

13.34 EA - NORMAL PRINTING LINE ON CR/SJ STATION

This command is used to print one line on CR or SJ stations.

13.34.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT   CONTENT                                    TYPE    LENGTH

 0-1       1B66 - cmd prefix                          hex        2
 2         EA - Normal Printing Line on CR/SJ Station hex        1
 3         Cmd. Extension                             hex        1
      7    Reserved (always = '0')
      6    Station
           0 = CR
           1 = SJ
    5-3    Print Mode
           000 = 15 CPI
           001 = 12 CPI
           010 = Reserved
           011 = 15 CPI Double-High
           100 = 15 CPI Emphasized
           101 = 12 CPI Emphasized
           110 = Reserved
           111 = 15 CPI Double-High, Emphasized
    2-0    Number of Line-Feed (min 1, max 7)                  (Note 1)
 4-41      Print Data                                 ASCII     38


----------------------------------------------------------------------
```
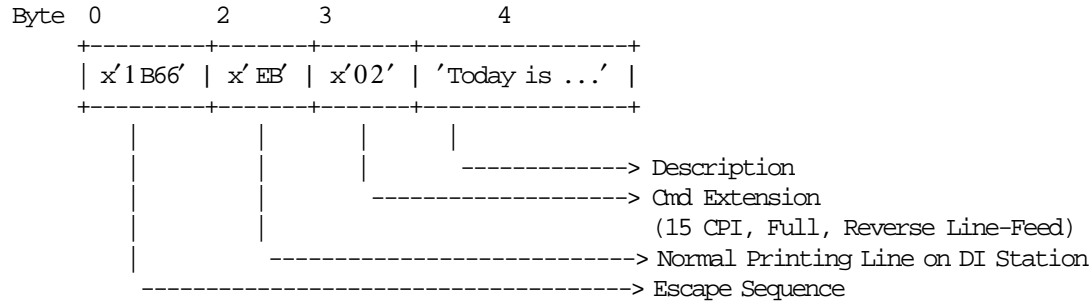
Notes:

1. One line feed is assumed if number of line feed is 0.

13.34.2 Command Example

```
Byte  0          2       3         4
     +---------+-------+-------+---------------+
     | x'1B66' | x'EA' | x'00' | 'Today is ...'|
     +---------+-------+-------+---------------+
          |        |       |        |
          |        |       |        ------------> Description
          |        |       -------------------> Cmd Extension
          |        |                            (CR station, 15 CPI)
          |        --------------------------> Normal Printing Line on CR/SJ Station
          -------------------------------------> Escape Sequence
```
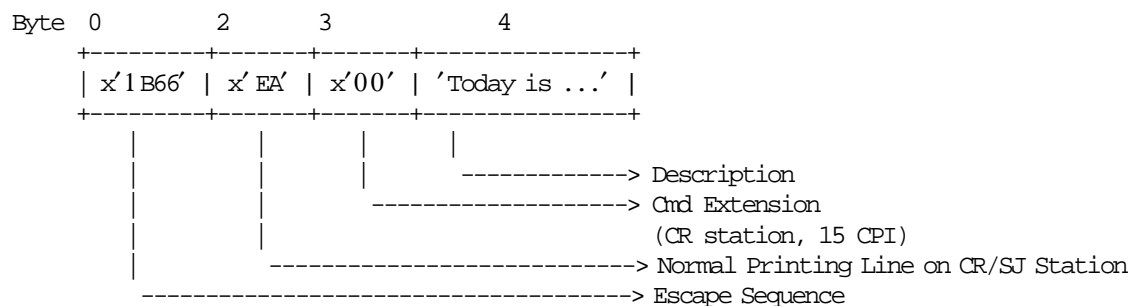
13.34.3 Normal Printing Line on CR/SJ Station Calculations

There are no calculations for this command.

13.34.4 Normal Printing Line on CR/SJ Station Rules

- Outside any document.
  - Before the first normal printing line is printed, the microcode will insert the ″ILLEGAL RECEIPT″ (msg. 92) in CR or SJ station.
  - The ″ILLEGAL RECEIPT″ (msg. 92) is inserted every three (3) normal printing lines.
  - A normal printing line on CR or SJ station is preceded by ″ILLEGAL RECEIPT″ (msg. 92), if previous normal printing lines were addressed (and executed successfully) to DI station.
  - Normal printing lines on SJ station are replicated on CR station.
- Inside a non-fiscal report.
  - Before the first normal printing line is printed, the microcode will insert the ″ILLEGAL RECEIPT″ (92 msg.).
  - The ″ILLEGAL RECEIPT″ (92 msg.) line on CR or SJ station is inserted every 3 normal printing lines.
  - The normal printing line on CR station is replicated to SJ station.
  - The normal printing line on SJ station is replicated to CR station.
- Inside a fiscal vouchers.
  - Only 5 normal printing lines on CR or SJ station can be sent.
    On receipt of the sixth normal printing line the fiscal voucher is voided by the microcode.
    If payment phase is in progress, the fiscal voucher is not voided by the microcode, but the error 069 is returned to the application program.
  - When print header has been executed without items sold, if more than 5 normal printing lines on CR or SJ stations are received, the voucher is voided by the microcode.
  - The normal printing line on CR station is replicated to SJ station.
  - The normal printing line on SJ station is not replicated to CR station.

13.35 EB - NORMAL PRINTING LINE ON DI STATION

This command is used to print one line on DI station.

13.35.1 Command Format

```
---------------------------------------------------------------------

BYTE BIT   CONTENT                                    TYPE    LENGTH

 0-1       1B66 – cmd prefix                          hex        2
 2         EB – Normal Printing Line on DI Station    hex        1
 3         Cmd. Extension                             hex        1
      7-6  Reserved (always = '0')
      5-3  Print Mode
           000 = 15 CPI
           001 = 12 CPI
           010 = Reserved
           011 = 15 CPI Double-High
           100 = 15 CPI Emphasized
           101 = 12 CPI Emphasized
           110 = Reserved
           111 = 15 CPI Double-High, Emphasized
      2-0  Stat. and Doc. Line-Feed Direction
           000 = Reserved
           001 = Reserved
           010 = Landscape                                    (Note 1, 2)
           011 = Portrait - Reverse Line-Feed
           100 = Reserved
           101 = Landscape                                    (Note 1, 2)
           110 = Portrait - Forward Line-Feed
           111 = Reserved
 4-89      Print Data                                 ASCII     86  (Note 3, 4)

---------------------------------------------------------------------
```

Notes:

1. The emphasized option is ingnored during landscape orientation print.

2. The print lines sent are from bottom-of-form to the top-of-form.

3. Description field will be truncated as follows:
   Portrait   orientation at 15 CPI to 47 characters.
   Portrait   orientation at 12 CPI to 37 characters.
   Landscape orientation at 15 CPI to 86 characters.
   Landscape orientation at 12 CPI to 86 characters.

4. Number of line feed is always set to 1.

13.35.2 Command Example

```
Byte  0          2       3       4
      +---------+-------+-------+----------------+
      | x'1B66' | x'EB' | x'02' | 'Today is ...' |
      +---------+-------+-------+----------------+
           |         |     |       |
           |         |     |       ------------> Description
           |         |     --------------------> Cmd Extension
           |         |                           (15 CPI, Full, Reverse Line-Feed)
           |         --------------------------> Normal Printing Line on DI Station
           ------------------------------------> Escape Sequence
```

13.35.3 Normal Printing Line on DI Station Calculations

There are no calculations for this command.

13.35.4 Normal Printing Line on DI Station Rules

- **Outside any document**

  - The "ILLEGAL RECEIPT" (92 msg.) is inserted every every 5 normal print lines.
  - A normal printing line is preceded by "ILLEGAL RECEIPT" (92 msg.), if previous normal printing lines were addressed (and executed successfully) to CR or SJ station.

- **Inside a non-fiscal report**

  - Before the first normal print line, the microcode will insert the "ILLEGAL RECEIPT" (92 msg.).
  - The "ILLEGAL RECEIPT" (92 msg.) is inserted every 5 normal printing lines.

- **Inside a sale transaction (fiscal voucher)**

  - Normal printing lines are allowed in the PAYMENT phase only.

13.36 EC - LINE-FEED

This command is used to feed the paper a specified number of lines on one of the printer stations.

13.36.1 Command Format

```
------------------------------------------------------------------------

BYTE BIT  CONTENT                                          TYPE    LENGTH

 0-1      1B66 - cmd prefix                                hex        2
 2        EC - Line-Feed                                   hex        1
 3        Cmd. Extension                                   hex        1
     7-6  Reserved (always = '0')
     5-4  Station
          00 = CR
          01 = SJ
          10 = DI Portrait (Forward)
          11 = DI Portrait (Reverse)
     3-0  Number of Line-Feed (min 0, max 15)


------------------------------------------------------------------------
```
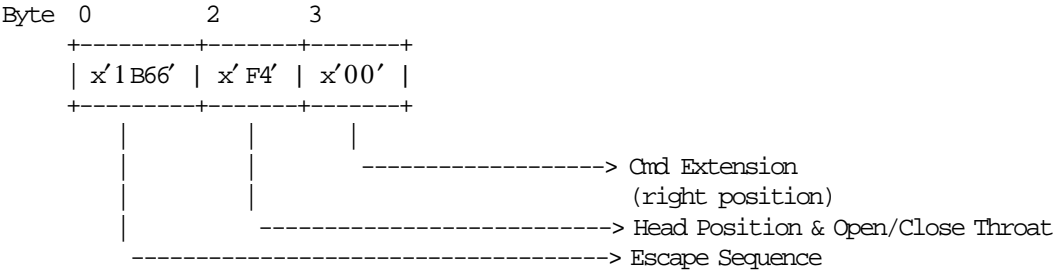
13.36.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+
      | x'1B66' | x'EC' | x'11' |
      +---------+-------+-------+
           |         |       |
           |         |       ----------------------> Cmd Extension
           |         |                               (CR station, 3 line-feed)
           |         -----------------------------> Line Feed
           -----------------------------------------> Escape Sequence
```
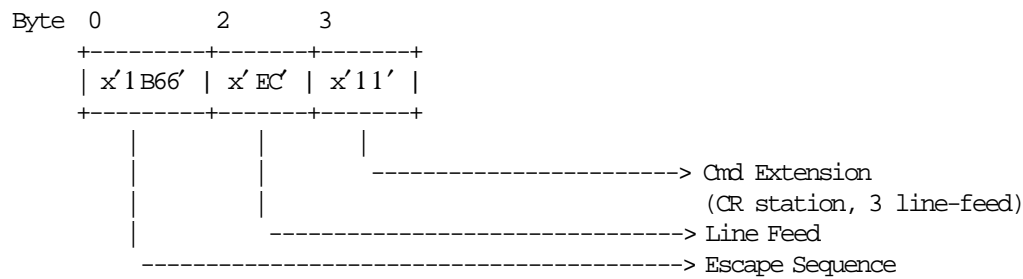
13.36.3 Line Feed Rules

- Line Feed on DI station is processed inserting the line "ILLEGAL RECEIPT" (92 msg.) every 29 consecutive line feeds.

13.37 ED - READY DOCUMENT

This command is used to request the printer to advance the inserted document to the first print position.

13.37.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE    LENGTH

 0-1      1B66 - command prefix                      hex       2
 2        ED - Ready Document                        hex       1
 3        Cmd. Extension                             hex       1
     7-1  Reserved (always = '0')
     0    Document Registration
          0 = Top
          1 = Bottom                                               (Note 1)


----------------------------------------------------------------------
```

Notes:

1. The bottom margin is greater than 3F bottom margin.

13.37.2 Command Example

```
Byte  0        2       3
     +---------+-------+-------+
     | x'1B66' | x'ED' | x'00' |
     +---------+-------+-------+
          |        |       |
          |        |       -------------------> Cmd Extension
          |        |                            (top registration.)
          |        --------------------------> Ready Document
          -------------------------------------> Escape Sequence
```
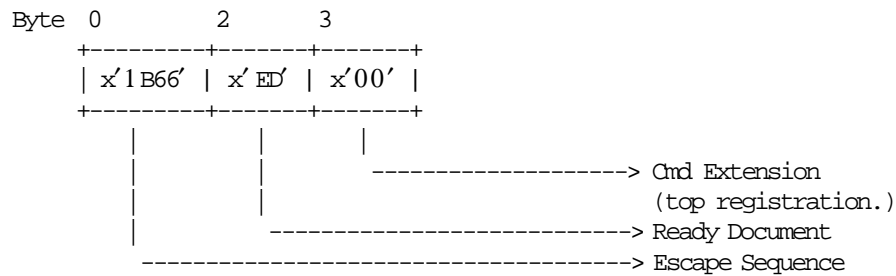
13.38 EE - CUT CUSTOMER RECEIPT

This command is used to do a partial cut of the customer receipt paper.

13.38.1 Command Format

```
------------------------------------------------------------------------

BYTE BIT  CONTENT                                          TYPE   LENGTH

 0-1      1B66 - command prefix                            hex        2
 2        EE - Cut Paper                                   hex        1
 3        Cmd. Extension                                   hex        1
     7-2  Reserved (always = '0')
     1-0  Guillotine
          00 = Partial Cut
          01 = Partial Cut


------------------------------------------------------------------------
```

13.38.2 Command Example

```
Byte  0        2       3
      +--------+------+------+
      | x'1B66'| x'EE'| x'01'|
      +--------+------+------+
          |        |      |
          |        |      ----------------------> Cmd Extension
          |        |                              (partial cut)
          |         ----------------------------> Cut Paper
           -------------------------------------> Escape Sequence
```
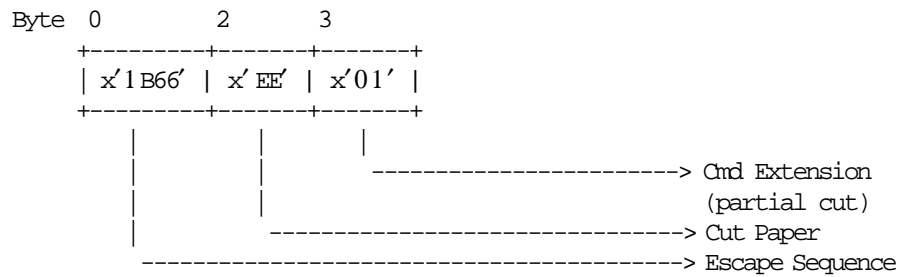
13.39 EF - DOCUMENT EJECT

This command is used to request the printer to line feed a document until EOF sensor is broken.

13.39.1 Command Format

```
------------------------------------------------------------------------

BYTE BIT  CONTENT                                         TYPE    LENGTH

 0-1      1B66 - command prefix                           hex        2
 2        EF - Document Eject                             hex        1
 3        Cmd. Extension                                  hex        1
     7-1  Reserved (always = '0')
     0    Direction
          0 = Forward (Portrait)
          1 = Reverse (Portrait)


------------------------------------------------------------------------
```

13.39.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+
      | x'1B66' | x'EF' | x'00' |
      +---------+-------+-------+
           |         |       |
           |         |       ----------------------> Cmd Extension
           |         |                               (forward)
           |         ------------------------------> Document Eject
           ----------------------------------------> Escape Sequence
```
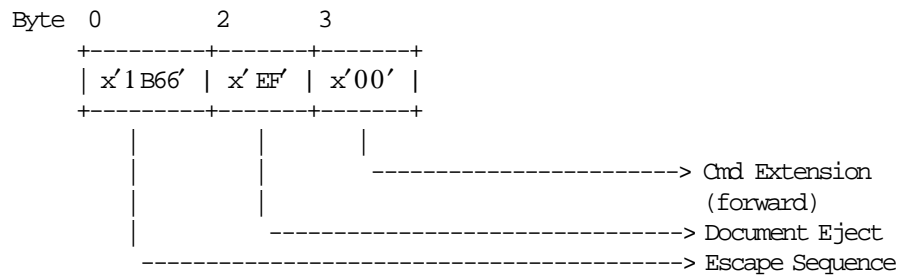
13.40 F1 - REPORT IPL COMPLETION STATUS

This command requests the fiscal unit to communicate the power-on completion status.

13.40.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                      TYPE   LENGTH

 0-1      1B66 - Command prefix                        hex       2
 2        F1 - Report IPL Completion Status            hex       1
 3        Cmd. Extension                               hex       1
    7-0   Reserved (always = '0x00')


----------------------------------------------------------------------
```

13.40.2 Command Example

```
Byte  0         2       3
     +---------+-------+-------+
     | x'1B66' | x'F1' | x'00' |
     +---------+-------+-------+
          |        |       |
          |        |       ---------------------> Cmd Extension
          |            ----------------------------> Report IPL Completion Status
           ----------------------------------------> Escape Sequence
```
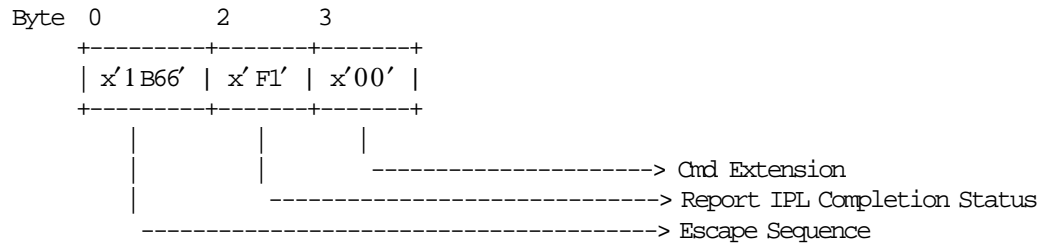
13.41 F4 - HEAD POSITION & OPEN/CLOSE THROAT

This command requests the printer to return the print head to right or left position and open or close the throat.

13.41.1 Command Format

```
---------------------------------------------------------------------

BYTE BIT  CONTENT                                        TYPE    LENGTH


 0-1       1B66 - cmd prefix                             hex        2
 2         F4 - Head Position & Open/Close Throat        hex        1
 3         Cmd. Extension                                hex        1
     7-2   Reserved (always = '0')
     1-0   Head Position & Throat
           00 = Right
           01 = Left
           02 = Open  Throat
           03 = Close Throat


---------------------------------------------------------------------
```

13.41.2 Command Example

```
Byte  0          2       3
      +---------+------+------+
      | x'1B66' | x'F4'| x'00'|
      +---------+------+------+
           |       |      |
           |       |      ------------------> Cmd Extension
           |       |                           (right position)
           |       --------------------------> Head Position & Open/Close Throat
           --------------------------------> Escape Sequence
```

13.42 F8 - REPORT PRINTER EC

This command is used to retrieve the printer EC.

13.42.1 Command Format

```
-----------------------------------------------------------------------

BYTE BIT   CONTENT                                  TYPE    LENGTH

 0-1       1B66 - command prefix                    hex        2
 2         F8 - Report Printer EC                   hex        1
 3         Cmd. Extension                           hex        1
           00 (00) = Fiscal Unit
           01 (01) = Fiscal  Device Information
           10 (02) = Printer Device Information


-----------------------------------------------------------------------
```
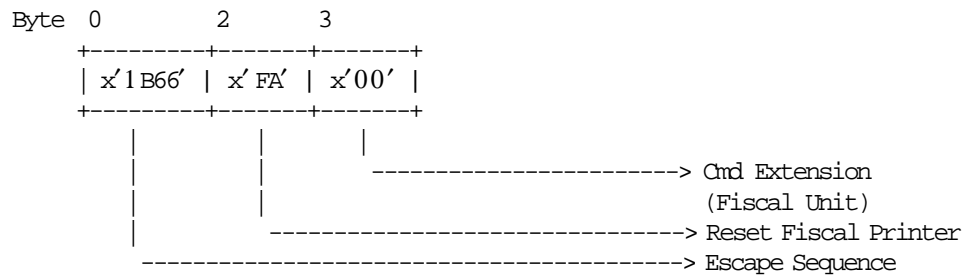
Response to the Fiscal Unit:

```
--------------------------------------------------------------------------------

BYTE     BYTE     CONTENT                                      TYPE    LENGTH
RS-485   USB

 0-8              Fiscal Unit Status                           hex         9
         0-14     Fiscal Unit Status                           hex        15


--------------------------------------------------------------------------------
```

Response to the Fiscal Device Information:

```
--------------------------------------------------------------------------------
```

BYTE RS-485	BYTE USB	BIT	CONTENT	TYPE	LENGTH
0-5			PRINTER STATUS	hex	6
	0-7		PRINTER STATUS	hex	8
6	8		FISCAL STATUS & DEVICE INFO	hex	1
		7-1	Fiscal Status		
		0	(For RS-485) Fiscal/Printer Device Info		
			0 = Fiscal Device Info is NOT contained		
			in this message		
			1 = Fiscal or Printer Device Info IS contained		
			in this message		
		0	(For USB) Reserved		
7			COUNTRY VERSION - COUNTRY CODE	hex	1
	9		ADDITIONAL STATUS	hex	1
		7	Device Information Response		
			0 = NO		
			1 = YES		
		6-0	Reserved		
	10		COUNTRY CODE	hex	1
	11		COUNTRY VERSION	hex	1
	12		COUNTRY EC LEVEL	hex	1
8	13		FISCAL RETURN CODE	hex	1
	14		FISCAL RETURN CODE	hex	1
9	15		DEVICE TYPE	hex	1
			0x31 = Fiscal Printer		
10	16		DEVICE ID	hex	1
			0x00 = Jacare		
			0x01 = Macarena		
			0x02 - 0xFF = Reserved		
11	17		FEATURE BYTE #1	hex	1
		7-4	Reserved (always = '0')		
		3	Reference Data Base Present		
			0 = NOT		
			1 = YES		
		2	Microcode Flash Can be Updated		
			0 = NO		
			1 = YES		
		1	Compact Flash Present		
			0 = NO		
			1 = YES		
		0	Fiscal Memory Size		
			0 = 512 KB		
			1 = 256 KB		
12	18		RESERVED (always '0x00')	hex	1
13	19		FISCAL EC LEVEL	hex	1

```
--------------------------------------------------------------------------------
```

(Continued in the next page)

Response to the Printer Device Information:

```
--------------------------------------------------------------------------------

BYTE    BYTE  BIT  CONTENT                                     TYPE   LENGTH
RS-485  USB

 0-5                PRINTER STATUS                             hex      6

        0-7         PRINTER STATUS                             hex      8

 6       8          FISCAL STATUS & DEVICE INFO                hex      1
              7-1   Fiscal Status
              0     (For RS-485) Fiscal/Printer Device Info
                    0 = Fiscal Device Info is NOT contained
                          in this message
                    1 = Fiscal or Printer Device Info IS contained
                          in this message
              0     (For USB) Reserved

 7                  COUNTRY VERSION - COUNTRY CODE             hex      1

         9          ADDITIONAL STATUS                          hex      1
              7     Device Information Response
                    0 = NO
                    1 = YES
              6-0   Reserved

        10          COUNTRY CODE                               hex      1

        11          COUNTRY VERSION                            hex      1

        12          COUNTRY EC LEVEL                           hex      1

 8      13          FISCAL RETURN CODE                         hex      1

        14          FISCAL RETURN CODE                         hex      1

 9-13   15-19       DEVICE INFO BYTES                          hex      5
                    (exactly as received from the printer
                    microcode - See SureMark User Guide
                    Extended Address Command)

--------------------------------------------------------------------------------
```

13.42.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+
      | x'1B66' | x'F8' | x'00' |
      +---------+-------+-------+
           |        |       |
           |        |       ----------------------> Cmd Extension
           |        ------------------------------> Report Printer EC
           ------------------------------------------> Escape Sequence
```
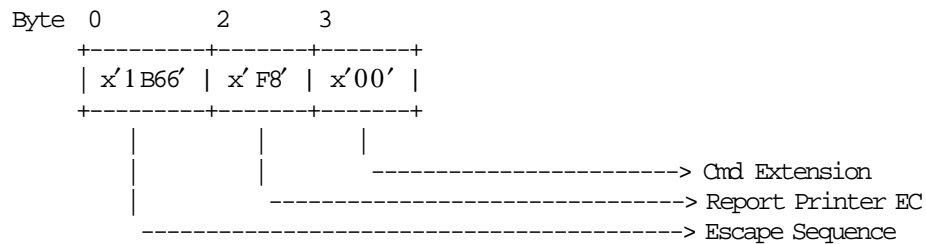
13.43 F9 - REPORT CURRENT STATUS

This command is used to requests the fiscal unit to report its current status.

13.43.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                     TYPE    LENGTH

 0-1      1B66 - command prefix                       hex       2
 2        F9 - Report Current Status                  hex       1
 3        Cmd. Extension                              hex       1
    7-0   Reserved (always = '0x00')


----------------------------------------------------------------------
```

13.43.2 Command Example

```
Byte  0        2       3
     +---------+-------+-------+
     | x'1B66' | x'F9' | x'00' |
     +---------+-------+-------+
          |        |       |
          |        |       ----------------------> Cmd Extension
          |          ------------------------------> Report Current Status
           ------------------------------------------> Escape Sequence
```
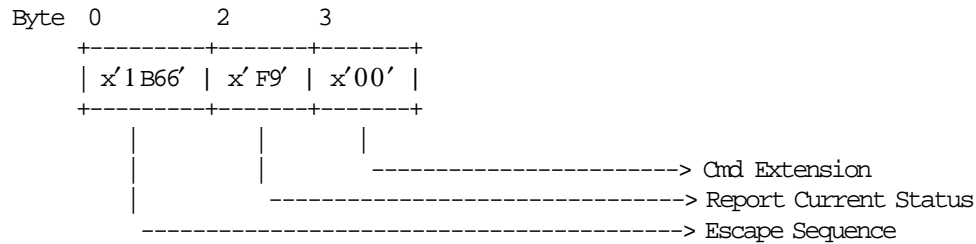
13.44 FA - PERFORM POWER ON RESET

This command is used to reset the fiscal unit and fiscal printer.

13.44.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                       TYPE   LENGTH

 0-1      1B66 - command prefix                         hex       2
 2        FA - Perform Power On Reset                   hex       1
 3        Cmd. Extension                                hex       1
     7-1  Reserved (always = '0')
       0  Hardware
          0 = Fiscal Unit
          1 = Fiscal Printer


----------------------------------------------------------------------
```

13.44.2 Command Example

```
Byte  0         2       3
      +---------+-------+-------+
      | x'1B66' | x'FA' | x'00' |
      +---------+-------+-------+
           |        |       |
           |        |       |
           |        |       ----------------------> Cmd Extension
           |        |                               (Fiscal Unit)
           |        ------------------------------> Reset Fiscal Printer
           -------------------------------------------> Escape Sequence
```

13.45 FB - RUN ONLINE DIAGNOSTICS

This command is used to run the print diagnostics.

13.45.1 Command format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE    LENGTH

 0-1      1B66 - cmd prefix                          hex        2
 2        FB - Run Online Diagnostics                hex        1
 3        Cmd. Extension                             hex        1
      7-2 Reserved (always = '0')
      1-0 Unit
          01 = Fiscal Unit
          10 = Fiscal Printer
          11 = Both


----------------------------------------------------------------------
```

13.45.2 Command Example

```
Byte  0        2      3
     +---------+-------+-------+
     | x'1B66' | x'FB' | x'01' |
     +---------+-------+-------+
         |         |       |
         |         |       ----------------> Cmd. Extension (Fiscal Unit)
         |          -----------------------> Run Diagnostics
          --------------------------------> Escape Sequence
```

13.46 FC - REPORT MICROCODE EC LEVEL

This command is used to retrieve the fiscal code EC level in the return code.

13.46.1 Command Format

```
----------------------------------------------------------------------

BYTE BIT  CONTENT                                      TYPE   LENGTH

 0-1      1B66 - cmd prefix                            hex      2
  2       FC - Report Microcode EC                     hex      1
          00 (00) = Fiscal Microcode EC Level
          01 (01) = Fiscal Microcode Internal EC Level
          10 (02) = Country Code                               (Note 1)
          11 (03) = Country Version (Hardware Model)           (Note 2)


----------------------------------------------------------------------
```

Notes:

1. Country Code = 03.

2. For 4610 Hardware Model with:

   - RS-485 communication interface
     Country Version = 02
   - USB communication interface
     Country Version = 04

13.46.2 Command Example

```
Byte  0        2       3
     +---------+-------+-------+
     | x'1B66' | x'FC' | x'03' |
     +---------+-------+-------+
         |         |       |
         |         |        ----------------> Cmd. Extension (country version)
         |          ------------------------> Report Microcode EC Level
          -------------------------------> Escape Sequence
```

13.47 FF - DUMP FISCAL RAM AND FISCAL MEMORY

This command is used to print the content of the fiscal RAM and fiscal memory in hexadecimal format.

13.47.1 Command Format

```
-----------------------------------------------------------------------

BYTE BIT  CONTENT                                    TYPE    LENGTH

 0-1      1B66 - cmd prefix                          hex        2
  2       FF - Dump Fiscal RAM and Fiscal Memory     hex        1
  3       Cmd. Extension                             hex        1
      7-5 Reserved (always = '0')
       4  Type Report
          0 = Printed    (on paper)
          1 = Electronic (on screen)
      3-1 Reserved (always = '0')
       0  Type
          0 = RAM
          1 = EPROM
 4-8      Start Address                              ASCII      5   (Note 1, 2)
 9-13     End   Address                              ASCII      5   (Note 1, 2)
14-17     Password                                   ASCII      4

-----------------------------------------------------------------------
```

Notes:

1. The fiscal RAM   address range is X'00000' - X'0FFFF'

2. The fiscal EPROM address range is X'00000' - X'3FFFF'

13.47.2 Command Example

```
Byte  0         2       3       4         9
      +---------+-------+-------+---------+---------+--------+
      | x'1B66' | x'FF' | x'00' | '00000' | '00100' | 'pppp' |
      +---------+-------+-------+---------+---------+--------+
           |        |       |       |         |         |
           |        |       |       |         |         ------> Password
           |        |       |       |         ----------------> End   Address (00100)
           |        |       |       ------------------------->  Start Address (00000)
           |        |       ---------------------------------> Cmd. Extension (RAM Memory)
           |        -----------------------------------------> Dump Fiscal RAM and Fiscal Memory
           -------------------------------------------------> Escape Sequence
```
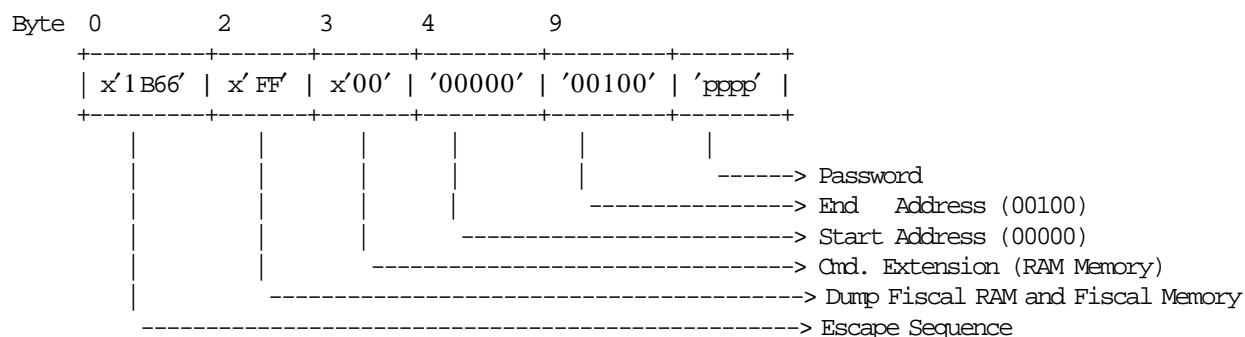
14.0 FISCAL UNIT RETURN CODES

The following descriptions define the meaning of fiscal unit return codes reported in byte 8 of Fiscal Unit status.

000 => DOS/WINDOWS 80900100 => 4690 OS

Explanation: An overflow occurred. The transaction gross total or one of the five transaction VAT gross total exceeds the maximum allowed value (2147483647) on an Item fiscal request. The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

001 => DOS/WINDOWS 80900101 => 4690 OS

Explanation: An overflow occurred. The transaction return total exceeds the maximum allowed value (2147483647). The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

002 => DOS/WINDOWS 80900102 => 4690 OS

Explanation: An overflow occurred. The transaction void total exceeds the maximum allowed value (2147483647). The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

004 => DOS/WINDOWS 80900104 => 4690 OS

Explanation: An overflow occurred. The transaction discount total exceeds the maximum allowed value (2147483647). The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

006 => DOS/WINDOWS 80900106 => 4690 OS

Explanation: An overflow occurred. The transaction uplift total exceeds the maximum allowed value (2147483647). The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

008 => DOS/WINDOWS 80900108 => 4690 OS

Explanation: An underflow occurred. The transaction total or one of the five transaction VAT gross total is less than the minimum allowed value (-2147483648). The request is not processed.

User Response: Cancel the transaction, or make the total greater than the minimum allowed value.

009 => DOS/WINDOWS 80900109 => 4690 OS

Explanation: An underflow occurred. The transaction return total is less than the minimum allowed value (-2147483648). The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

010 => DOS/WINDOWS 80900110 => 4690 OS

Explanation: An underflow occurred. The transaction void total is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

012 => DOS/WINDOWS 80900112 => 4690 OS

Explanation: An underflow occurred. The transaction discount total is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

014 => DOS/WINDOWS 80900114 => 4690 OS

Explanation: An underflow occurred. The transaction uplift total is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Issue a total command and an end transaction command to close the voucher.

016 => DOS/WINDOWS 80900116 => 4690 OS

Explanation: An overflow occurred. The daily gross total or one of the five daily VAT gross total exceeds the maximum allowed value (4294967295) at total request time. The request is not processed.

User Response: Make the total less than or equal to the maximum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

017 => DOS/WINDOWS 80900117 => 4690 OS

Explanation: An overflow occurred. The daily return total exceeded the maximum allowed value (2147483647) at end transaction time. The request is not processed.

User Response: Make the total less than or equal to the maximum allowed value, then close the transaction or issue a cancel transaction command, and then issue a closure request.

018 => DOS/WINDOWS 80900118 => 4690 OS

Explanation: An overflow occurred. The daily void total exceeded the maximum allowed value (2147483647) at end transaction time. The request is not processed.

User Response: Make the total less than or equal to the maximum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

020 => DOS/WINDOWS 80900120 => 4690 OS

Explanation: An overflow occurred. The daily discount total exceeded the maximum allowed value (2147483647) at end transaction time. The request is not processed.

User Response: Make the total lesser than or equal to the maximum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

022 => DOS/WINDOWS 80900122 => 4690 OS

Explanation: An overflow occurred. The daily uplift total exceeded the maximum allowed value (2147483647) at end transaction time. The request is not processed.

User Response: Make the total lesser than or equal to the maximum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

024 => DOS/WINDOWS 80900124 => 4690 OS

Explanation: The user total amount is not equal to the fiscal total amount. The values associated with the total request do not reflect the totals stored in the fiscal memory. The request is not processed.

User Response: Correct the computation procedure of the total, and then close the transaction or issue a cancel transaction command.

025 => DOS/WINDOWS 80900125 => 4690 OS

Explanation: The fiscal unit serial number found in message. The request is not processed.

User Response: Issue a new request without using the fiscal unit serial number.

026 => DOS/WINDOWS 80900126 => 4690 OS

Explanation: An underflow occurred. The transaction total or one of the five transaction VAT total was negative at total time. The request is not processed.

User Response: Make the amount positive or equal to zero and then close the transaction or issue a cancel transaction command.

027 => DOS/WINDOWS 8090061B => 4690 OS

Explanation: An overflow occurred. The transaction discount on subtotal exceeds the maximum allowed value (2147483647). The request is not processed.

User Response: Make the amount less than the maximum value, and then close the transaction or issue a cancel transaction command.

028 => DOS/WINDOWS 8090061C => 4690 OS

Explanation: An overflow occurred. The transaction uplift on subtotal exceeds the maximum allowed value (2147483647). The request is not processed.

User Response: Make the amount less than the maximum value, and then close the transaction or issue a cancel transaction command.

029 => DOS/WINDOWS 80900129 => 4690 OS

Explanation: An underflow occurred. The payment total was less than the amount to be cashed. The request is not processed.

User Response: Correct the computation procedure of payment or issue a payment command to complete processing.

033 => DOS/WINDOWS 80900141 => 4690 OS

Explanation: An underflow occurred. The daily return total is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Make the total greater than or equal to the minimum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

---

034 => DOS/WINDOWS 80900142 => 4690 OS

Explanation: An underflow occurred. The daily void total is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Make the total greater than or equal to the minimum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

---

036 => DOS/WINDOWS 80900144 => 4690 OS

Explanation: An underflow occurred. The daily discount total is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Make the total greater than or equal to the minimum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

---

038 => DOS/WINDOWS 80900146 => 4690 OS

Explanation: An underflow occurred. The daily uplift total is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Make the total greater than or equal to the minimum allowed value, then close the transaction or issue a cancel transaction command, and then issue a closure request.

---

039 => DOS/WINDOWS 80900627 => 4690 OS

Explanation: An overflow occurred (internal error). The request is not processed.

User Response: Please, report the problem indicating this return code.

---

040 => DOS/WINDOWS 80900628 => 4690 OS

Explanation: The VAT category field is not blank while the amount is blank in a item sale transaction. The request is not processed.

User Response: Correct the application program.

---

041 => DOS/WINDOWS 80900629 => 4690 OS

Explanation: The current VAT rate table is not verified. The request is not processed.

User Response: Check the application program. The program must issue a compare VAT table command before further operations can be processed.

---

042 => DOS/WINDOWS 8090062A => 4690 OS

Explanation: There is a VAT rate table mismatch. The request is not processed.

User Response: Correct the application VAT table and reissue the command.

043 => DOS/WINDOWS 8090062B => 4690 OS

Explanation: The VAT rate table or header table in fiscal memory is full. The request is not processed.

User Response: Call for service. The fiscal base unit must be replaced to load news VAT rates or headers.

---

044 => DOS/WINDOWS 8090062C => 4690 OS

Explanation: The VAT category specified in item sale transaction is not valid. The request is not processed.

User Response: Correct the application program.

---

048 => DOS/WINDOWS 80900630 => 4690 OS

Explanation: An overflow occurred. The daily discount on subtotal exceeded the maximum allowed value (2147483647) at end transaction time. The request is not processed.

User Response: Make the total lesser than or equal to the maximum allowed value, then close the transaction or issue a Cancel command, and then issue a Closure request.

---

049 => DOS/WINDOWS 80900631 => 4690 OS

Explanation: An overflow occurred. The daily uplift on subtotal exceeds maximum allowed value (2147483647). The request is not processed.

User Response: Make the total lesser than or equal to the maximum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

---

050 => DOS/WINDOWS 80900632 => 4690 OS

Explanation: An underflow occurred. The daily discount on subtotal is less than the minimum allowed value (−2147483647). The request is not processed.

User Response: Make the total greater than the minimum allowed value, then close the transaction or issue a cancel transaction command and then issue a closure request.

---

051 => DOS/WINDOWS 80900633 => 4690 OS

Explanation: An overflow occurred. The daily uplift on subtotal exceeds maximum allowed value (2147483647). The request is not processed.

User Response: Make the total lesser than or equal to the maximum allowed value, the close the transaction or issue a cancel transaction command and then issue a closure request.

---

052 => DOS/WINDOWS 80900634 => 4690 OS

Explanation: The uplift and discount on subtotal commands are not allowed when the transaction total is equal to zero.

User Response: Adjust the transaction total or cancel the transaction.

---

054 => DOS/WINDOWS 80900636 => 4690 OS

Explanation: Set date command attempted without CE jumper operation since last set. The request is not processed.

User Response: CE jumpering must be performed before the set date and time (16 cmd.) is issued.

055 => DOS/WINDOWS 80900203 => 4690 OS

Explanation: The fiscal request message length is less than the minimum required. The request is not processed.

User Response: Check the application program.

056 => DOS/WINDOWS 80900150 => 4690 OS

Explanation: An overflow occurred. The daily cancel total exceeded the maximum allowed value (2147483647) at cancel transaction time. The request is not processed.

User Response: Make the total lesser than or equal to the maximum allowed value, then issue a cancel transaction command and then issue a closure request.

057 => DOS/WINDOWS 80900151 => 4690 OS

Explanation: An underflow occurred. The daily cancel total is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Make the total greater than or equal to the minimum allowed value, then issue a cancel transaction command and then issue a closure request.

058 => DOS/WINDOWS 8090063A => 4690 OS

Explanation: An overflow occurred. The amount due accumulator exceeds the maximum allowed value (2147483647). The request is not processed.

User Response: Correct the payment amount and issue the request again.

059 => DOS/WINDOWS 8090063B => 4690 OS

Explanation: An underflow occurred. The amount due accumulator is less than the minimum allowed value (−2147483648). The request is not processed.

User Response: Correct the payment amount and issue the request again.

060 => DOS/WINDOWS 8090063C => 4690 OS

Explanation: An underflow occurred (internal error). The request is not processed.

User Response: Please, report the problem indicating this return code.

061 => DOS/WINDOWS 8090063D => 4690 OS

Explanation: The current date/time is previous to the FDTS set during a close sale period or print header table corrupted.
During close sale period: when 13 cmd. is issued, the FDTS is updated with the current date/time value, but if the current date/time is previous to the FDTS stored in RAM memory, the error 061 is returned.
During print header: when the 01 cmd. is issued, the FDTS is updated with the current date/time value, but if the current date/time is previous to the FDTS stored in RAM memory, the error 061 is returned.
The request is not processed.

User Response: Reset the printer using the CE jumper and reinitialize setting date/time equal or greater to the FDTS.

062 => DOS/WINDOWS 8090063E => 4690 OS

Explanation: Fiscal RAM is in error.

User Response: Service the printer.

064 => DOS/WINDOWS 80900127 => 4690 OS

Explanation: An overflow occurred. The specified value-received amount from the application program exceeds the maximum amount allowed. The request is not processed.

User Response: Retry the operation with a correct value.

065 => DOS/WINDOWS 80900201 => 4690 OS

Explanation: A request has been sent to the fiscal unit and the fiscal command byte cannot be recognized. The request is not processed.

User Response: Check the application program.

066 => DOS/WINDOWS 80900202 => 4690 OS

Explanation: A request has been sent to the fiscal unit and the fiscal command byte extension cannot be recognized. The request is not processed.

User Response: Check the application program.

067 => DOS/WINDOWS 80900643 => 4690 OS

Explanation: The command was processed successfully. No error.

User Response: No action is required.

069 => DOS/WINDOWS 80900205 => 4690 OS

Explanation: An attempt was made to print a line on the customer receipt that would void the transaction while payment was in progress. The request is not processed.

User Response: Set the payment value to "0" and issue the request again.
If this error was encountered during the online printer diagnostic test, it indicates that the test cannot be completed because a sale transaction is in progress.
Either have the salesperson end the transaction, or diagnose the printer problem using the offline printer test that is invoked by pressing the keys on the printer in the correct sequence.

070 => DOS/WINDOWS 80900646 => 4690 OS

Explanation: The date and time set with 16 cmd. is previous to the FDTS stored in RAM memory. The request is not processed.

User Response: Issue the 16 cmd. again with date and time later to the FDTS.

071 => DOS/WINDOWS 80900302 => 4690 OS

Explanation: An error occurred while printing on a customer receipt. The request is not processed.

User Response: Issue the command again. If the problem persists, service the printer.

073 => DOS/WINDOWS 80900303 => 4690 OS

Explanation: An error occurred while printing on an inserted document. The request is not processed.

User Response: Issue the command again. If the problem persists, service the printer.

---

076 => DOS/WINDOWS 80900210 => 4690 OS

Explanation: An attempt was made to print a line on a nonexistent print station. The request is not processed.

User Response: Check the application program.

---

078 => DOS/WINDOWS 80900304 => 4690 OS

Explanation: An error occurred while printing on the SJ station. The request is not processed.

User Response: Issue the command again. If the problem persists, service the printer.

---

080 => DOS/WINDOWS 80900213 => 4690 OS

Explanation: An attempt to print PEsTA (Change Due) or ApOdEIjH (Receipt) or ′%′ as the last non-blank character has been detected. The request is not processed.

User Response: Check the application program.

---

081 => DOS/WINDOWS 80900651 => 4690 OS

Explanation: The print mode specified is not valid. The request is not processed.

User Response: Specify a valid print mode.

---

082 => DOS/WINDOWS 80900306 => 4690 OS

Explanation: A request to print on the CR, SJ or DI was made without the correct non-fiscal report mode selected. The request is not processed.

User Response: Check the application program sequence.

---

083 => DOS/WINDOWS 80900307 => 4690 OS

Explanation: An unrecoverable error occurred reading the fiscal memory identification/status area.

User Response: Issue the command again. If the problem persists, service the printer.

---

086 => DOS/WINDOWS 80900401 => 4690 OS

Explanation: The password entered is not valid. The request is not processed.

User Response: Re-enter using the correct password.

Note: Only authorized service personnel can perform functions that require a password.

---

087 => DOS/WINDOWS 80900657 => 4690 OS

Explanation: The printer command issued is not valid. The request is not processed.

User Response: Issue a valid printer command.

089 => DOS/WINDOWS 80900312 => 4690 OS

Explanation: Fiscal memory is full. All fiscal requests are rejected except the fiscal memory report function.

User Response: Call for service. The fiscal base unit must be replaced to load news daily entries.

---

090 => DOS/WINDOWS 8090065A => 4690 OS

Explanation: The requested closure was not found in the fiscal memory. The request is not processed.

User Response: Specify a valid closure number or valid dates for the fiscal memory report function.

---

091 => DOS/WINDOWS 80900314 => 4690 OS

Explanation: An error occurred while printing the end of a start-up message.

User Response: Service the printer.

---

094 => DOS/WINDOWS 80900317 => 4690 OS

Explanation: The comment lines inside a fiscal voucher exceeded the maximum allowed (6). The request is not processed.

User Response: Correct the application program sequence.

---

095 => DOS/WINDOWS 80900425 => 4690 OS

Explanation: The address or length data is not valid. The requested address range is not valid or wrong in the dump fiscal RAM and fiscal memory command. The request is not processed.

User Response: Correct the input data and reissue the command.

---

096 => DOS/WINDOWS 80900140 => 4690 OS

Explanation: A numeric field contains characters that are not valid. The request is not processed.

User Response: Correct the value and reissue the command.

---

098 => DOS/WINDOWS 80900411 => 4690 OS

Explanation: Fiscal RAM restored.

User Response: Put the J4 (CE) jumper in OFF (STORED) position to restore normal operation.

Note: Only authorized service personnel can move the J4 jumper.

---

099 => DOS/WINDOWS 80900318 => 4690 OS

Explanation: The maximum number of repair actions have been reached.

User Response: Exchange the fiscal printer at the next failure occurrence.

---

100 => DOS/WINDOWS 80900329 => 4690 OS

Explanation: An error occurred while reading from the fiscal memory. The request is not processed.

User Response: Issue the command again. If the problem persists, service the printer.

101 => DOS/WINDOWS 80900326 => 4690 OS

Explanation: An unrecoverable error occurred when writing to fiscal memory. The request is not processed.

User Response: Issue the command again. If the problem persists, service the printer.

---

102 => DOS/WINDOWS 80900327 => 4690 OS

Explanation: Command ′C4′ attempted more than once with the same extension or ′C402′ with display address already set. The request is not processed.

User Response: Reset the printer using the CE jumper and reinitialize.

---

103 => DOS/WINDOWS 80900421 => 4690 OS

Explanation: The data is not valid. The requested data or number is out of range. The request is not processed.

User Response: Correct the input data.

---

104 => DOS/WINDOWS 80900422 => 4690 OS

Explanation: The current date/time is previous to the FDTS set during a load VAT rate table.
When 20 cmd. is issued, the FDTS is updated with the current date/time value, but if the current date/time is previous to the FDTS stored in RAM memory, the error 104 is returned. The request is not processed.

User Response: Issue the 16 cmd. (set date and time) with date and time greater than FDTS stored in RAM memory.

---

105 = DOS/WINDOWS 80900361 = 4690 OS

Explanation: The barcode size is invalid OR the graphic size is invalid. The width is greater than 62 (0x3E) or the height is greater than 21 (0x15). The request is not processed.

User Response: Correct the barcode size and issue the command again OR correct the graphic size an the issue the CA cmd. (cmd. extension 02) again.

---

106 = DOS/WINDOWS 80900363 = 4690 OS

Explanation: The barcode data must be null terminated. The request is not processed.

User Response: Correct the barcode data and issue the command again.

---

109 => DOS/WINDOWS 80900324 => 4690 OS

Explanation: Fiscal memory is not connected. The fiscal unit cannot restart processing.

User Response: Service the printer.

When servicing, first check to ensure the cable connections on the fiscal processor card are correct.

---

112 => DOS/WINDOWS 80900670 => 4690 OS

Explanation: The fiscal printer was reset.

User Response: No action is required.

113 => DOS/WINDOWS 80900341 => 4690 OS

Explanation: An unrecoverable printer error occurred after two power-on resets.

User Response: Turn the power OFF and then ON again. If the problem persists, service the printer.

114 => DOS/WINDOWS 80900363 => 4690 OS

Explanation: A printer communication error occurred.

User Response: Issue the command again. If the problem persists, service the printer.

119 = DOS/WINDOWS 80900677 = 4690 OS

Explanation: Invalid Sequence. This command can only be sent inside a download graphics command set.

User Response: Issue the FA cmd. (cmd. extension 01) and then restart the print or download sequence.

120 => DOS/WINDOWS 80900678 => 4690 OS

Explanation: A printer card time-out occurred while executing a command.

User Response: Turn the power OFF and then ON again. If the problem persists, service the printer.

121 => DOS/WINDOWS 80900679 => 4690 OS

Explanation: A printer card time-out occurred while executing a command.

User Response: Turn the power OFF and then ON again. If the problem persists, service the printer.

123 = DOS/WINDOWS 8090067B = 4690 OS

Explanation: Invalid Size. The width is greater than 72 (0x48) or height is greater than 25 (0x19).

User Response: Correct the value and issue the CA cmd. (cmd. extension 02) again.

124 = DOS/WINDOWS 8090067C = 4690 OS

Explanation: Graphic with same number already in printer flash. The user attempted to download a graphic using a number already in printer flash.

User Response: Correct the graphic number or erase all graphics from printer flash using the CA cmd. (cmd. extension 10) and then issue the CA cmd. (cmd. extension 02) again.

125 => DOS/WINDOWS 80900317 => 4690 OS

Explanation: An EPROM load error occurred on the printer logic card. The request is not processed.

User Response: Issue the command again. If the problem persists, service the printer.

126 = DOS/WINDOWS 8090067E => 4690 OS

Explanation: Graphic not downloaded yet.

User Response: Download graphic with CA cmd. (cmd. extension 02) before using the CA cmd. (cmd. extension 11 or 12).

128 => DOS/WINDOWS 80900320 => 4690 OS

Explanation: Fiscal memory is not yet initialized. The requested command cannot be executed.

User Response: Issue the command again. If the problem persists, service the printer.

129 => DOS/WINDOWS 80900321 => 4690 OS

Explanation: Unit is not yet in fiscal mode state. The requested command cannot be executed.

User Response: Issue the command again. If the problem persists, service the printer.

131 => DOS/WINDOWS 80900323 => 4690 OS

Explanation: A problem has been detected in a display.
No fiscal commands can be executed.
There must be two displays configured.
They must be a combination of the following:

- Alphanumeric, operator display or integrated keyboard display.
- Shopper display.

User Response: Follow the maintenance manual procedures to set the configuration correctly.

If problem persists, service the POS terminal.

134 => DOS/WINDOWS 80900325 => 4690 OS

Explanation: The fiscal unit detected an internal hardware error. The requested command cannot be executed.

User Response: Run the printer test to determine the cause of the problem.

136 => DOS/WINDOWS 80900221 => 4690 OS

Explanation: Voucher related command was issued while a voucher transaction was not in progress. The request is not processed.

User Response: Correct the application program sequence.

140 => DOS/WINDOWS 80900225 => 4690 OS

Explanation: A voucher related command was issued before printing of the voucher header. The requested command cannot be executed.

User Response: Correct the application program sequence.

141 => DOS/WINDOWS 80900226 => 4690 OS

Explanation: A payment command or end transaction command was issued before a total command. The requested command cannot be executed.

User Response: Correct the application program sequence.

142 => DOS/WINDOWS 80900227 => 4690 OS

Explanation: Transaction payment procedure not in progress. The requested command cannot be executed.

User Response: Correct the application program sequence.

144 => DOS/WINDOWS 80900229 => 4690 OS

Explanation: A print header cmd. was issued and a header had not yet been set or set header cmd. was issued and all description lines are blank. The request is not processed.

User Response: Correct the application program sequence.

---

145 => DOS/WINDOWS 80900691 => 4690 OS

Explanation: The command is not accepted when the J4 (CE) jumper is not active. The request is not processed.

User Response: Activate the CE jumper and try issuing the command again.

---

146 => DOS/WINDOWS 80900231 => 4690

Explanation: Mismatch between RAM fiscalization flag and EPROM mark. The request is not processed.

User Response: Insert the jumper and reinitialize the printer.

If the problem persists, service the printer.

---

158 => DOS/WINDOWS 8090069E => 4690 OS

Explanation: Date not yet set by application. The request is not processed.

User Response: Correct the application program sequence.

---

160 => DOS/WINDOWS 80900330 => 4690 OS

Explanation: Fiscal memory already serialized. The requested command cannot be executed.

User Response: No action is required.

---

161 => DOS/WINDOWS 80900331 => 4690 OS

Explanation: The unit is already in fiscal mode. The requested command cannot be executed.

User Response: No action is required.

---

164 => DOS/WINDOWS 80900350 => 4690 OS

Explanation: The IPL is in process.

User Response: No action is required.

---

167 => DOS/WINDOWS 80900230 => 4690 OS

Explanation: The requested command cannot be issued while a sales period is in progress. A closure request must be performed first. The request is not processed.

User Response: Issue the command again when the sales period is not in progress.

168 => DOS/WINDOWS 80900231 => 4690 OS

Explanation: A command not related to a fiscal voucher was issued while a fiscal voucher transaction was in progress. The request is not processed.

User Response: Issue the command again when the fiscal voucher is completed.
If this error was encountered during the online printer diagnostic test, it indicates that the test cannot be completed because a sale transaction is in progress.
Either have the salesperson end the transaction, or diagnose the printer problem using the offline printer test that is invoked by pressing the keys on the printer in the correct sequence.

169 => DOS/WINDOWS 80900232 => 4690 OS

Explanation: The maximum number of printer disconnections have been reached. The request is not processed.

User Response: Exchange the fiscal printer at the next printer disconnection occurence.

172 => DOS/WINDOWS 80900235 => 4690 OS

Explanation: Only a voucher related command can be accepted after a voucher header is printed. The request is not processed.

User Response: Check the application program.

173 => DOS/WINDOWS 80900236 => 4690 OS

Explanation: Only cancel, payment, end, item, negitem, uplift and discount commands can follow a total request. The request is not processed.

User Response: Check the application program.

174 => DOS/WINDOWS 80900237 => 4690 OS

Explanation: A payment was in progress. The command that was issued cannot be executed.

User Response: Complete the Payment processing.

178 => DOS/WINDOWS 809006B2 => 4690 OS

Explanation: Fiscal EPROM is in error. EPROM serialized but pattern not found.

User Response: Issue the command again. If the problem persists, service the printer.

179 => DOS/WINDOWS 809006B3 => 4690 OS

Explanation: Fiscal RAM is in error. Return to the FB command.

User Response: Issue the command again. If the problem persists, service the printer.

182 => DOS/WINDOWS 809006B6 => 4690 OS

Explanation: An error occurred on an end transaction command. The request is not processed.

User Response: Reissue the end transaction command or issue a cancel transaction command.
If this error was encountered during the online printer diagnostic test, it indicates that the test cannot be completed because a sale transaction is in progress.
Either have the salesperson end the transaction, or diagnose the printer problem using the offline printer test that is invoked by pressing the keys on the printer in the correct sequence.

183 => DOS/WINDOWS 809006B7 => 4690 OS

Explanation: An error occurred on a cancel command. The request is not processed.

User Response: Reissue the cancel command. If this error was encountered during the online printer diagnostic test, it indicates that the test cannot be completed because a sale transaction is in progress.
Either have the salesperson end the transaction, or diagnose the printer problem using the offline printer test that is invoked by pressing the keys on the printer in the correct sequence.

184 => DOS/WINDOWS 809006B8 => 4690 OS

Explanation: The command sequence is not valid. A command was requested that is not allowed during a non-fiscal report. The request is not processed.

User Response: Check the application program sequence.

189 => DOS/WINDOWS 809006BD => 4690 OS

Explanation: Invalid value in the daily table pointer. The request is not processed.

User Response: Insert the jumper and reinitialize the printer.

If the problem persists, service the printer.

192 => DOS/WINDOWS 80900524 => 4690 OS

Explanation: Command reject from printer logic card.

User Response: Check for device driver programming error.

194 => DOS/WINDOWS 80900521 => 4690 OS

Explanation: A print head home error occurred. The request is not processed.

User Response: Issue the command again. If the problem persists, service the printer.

200 => DOS/WINDOWS 8090070D => 4690 OS

ONLY VALID FOR MACARENA USB

Explanation: CR printer cover is open or CR out of paper occurred. The request is not processed.

User Response: Close the CR cover or ensure the CR paper is installed correctly. If the problem persists, service the printer.

201 => DOS/WINDOWS 80900528 => 4690 OS

ONLY VALID FOR MACARENA RS-485

Explanation: CR, SJ or DI printer cover is open or CR out of paper occurred. The request is not processed.

User Response: Close the SJ, CR or DI cover or ensure the CR paper is installed correctly. If the problem persists, service the printer.

202 => DOS/WINDOWS 80900527 => 4690 OS

Explanation: The DI out of paper occured. The request is not processed.

User Response: Ensure the DI paper is installed correctly. If the problem persists, service the printer.

203 = DOS/WINDOWS 80900522 = 4690 OS

ONLY VALID FOR MACARENA USB

Explanation: The DI printer cover is open. The request is not processed.

User Response: Close the DI printer cover.

If the cover is already closed, service the printer.

204 => DOS/WINDOWS 80900711 => 4690 OS

Explanation: Internal Error. The request is not processed.

User Response: Service the printer.

205 => DOS/WINDOWS 80900526 => 4690 OS

Explanation: A printer key is pressed. The request is not processed.

User Response: Release the pressed key.

If a key is not pressed, service the printer.

206 => DOS/WINDOWS 80900525 => 4690 OS

Explanation: SJ paper error occurred. The request is not processed.

User Response: Ensure the paper is installed correctly.

If the problem persists, service the printer.

208 => DOS/WINDOWS 809006D0 => 4690 OS

Explanation: Printer Error. The request is not processed.

User Response: Service the printer.

209 = DOS/WINDOWS 80900522 = 4690 OS

ONLY VALID FOR MACARENA USB

Explanation: The SJ printer cover is open. The request is not processed.

User Response: Close the SJ printer cover.

If the cover is already closed, service the printer.

210 => DOS/WINDOWS 809006D2 => 4690 OS

Explanation: Printer DI throat is opened. The request is not processed.

User Response: Close the throat and issue the command print again.

214 => DOS/WINDOWS 80900527 => 4690 OS

Explanation: A feed paper error occurred. The request is not processed.

User Response: Ensure that the paper is inserted correctly.

---

235 => DOS/WINDOWS 809006EB => 4690 OS

Explanation: EPROM load error. The request is not processed.

User Response: Service the printer.

14.1 Return Code Conversion Table (4690 OS to DOS/WINDOWS)

The following table is for converting 4690 OS return codes into DOS/WINDOWS return codes. Find the DOS/WINDOWS return code under 14.0, " FISCAL UNIT RETURN CODES" on page 163.

Table 9 (Page 1 of 2). 4690 OS to DOS/WINDOWS Return Code Conversion

4690 OS Return Code	Equivalent DOS/WINDOWS Return Code	4690 OS Return Code	Equivalent DOS/WINDOWS Return Code
80900100	000	80900312	089
80900101	001	80900314	091
80900102	002	80900317	094
80900104	004	80900318	099
80900106	006	80900320	128
80900108	008	80900321	129
80900109	009	80900323	131
80900110	010	80900324	109
80900112	012	80900325	134
80900114	014	80900326	101
80900116	016	80900327	102
80900117	017	80900329	100
80900118	018	80900330	160
80900120	020	80900331	161
80900122	022	80900332	162
80900124	024	80900341	113
80900125	025	80900350	164
80900126	026	80900401	086
80900127	064	80900411	098
80900129	029	80900421	103
80900140	096	80900422	104
80900141	033	80900425	095
80900142	034	80900521	194
80900144	036	80900522	203
80900146	038	80900524	192
80900150	056	80900525	206
80900151	057	80900526	205
80900201	065	80900527	202
80900202	066	80900527	214
80900203	055	80900528	201
80900205	069	8090061B	027
80900210	076	8090061C	028
80900221	136	80900627	039
80900225	140	80900628	040
80900226	141	80900629	041
80900227	142	8090062A	042
80900229	144	8090062B	043
80900230	167	8090062C	044
80900231	168	80900630	048
80900232	169	80900631	049
80900235	172	80900632	050
80900236	173	80900633	051
80900237	174	80900634	052
80900238	175	80900636	054
80900302	071	8090063A	058
80900303	073	8090063B	059
80900304	078	8090063C	060
80900213	080	8090063D	061
80900306	082	80900643	067
80900307	083	80900646	070

Table 9 (Page 2 of 2). 4690 OS to DOS/WINDOWS
Return Code Conversion

4690 OS Return Code	Equivalent DOS/WINDOWS Return Code
80900651	081
80900657	087
8090065A	090
80900670	112
80900677	119
80900678	120
80900679	121
8090067B	123
8090067C	124
8090067D	125
8090067E	126
80900691	145
80900692	146
8090069E	158
809006B2	178
809006B3	179
809006B6	182
809006B7	183
809006B8	184
809006D0	208
809006D1	209
809006D2	210
809006EB	235
8090070D	200
80900711	204

15.0 Comments

WDIS Document Control Procedures

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