

Transfer Printer

Apollo 4

Operator's Manual





Gesellschaft für
Computer- und Automations-
Bausteine mbH

cab-Produkttechnik GmbH

Postfach 19 04

Haid- und Neu-Straße 7

Telefon +49 (0) 721 / 66 26-00

Telefax +49 (0) 721 / 66 26-249

Web : <http://www.cabgmbh.com>

e-mail : 101502.712@compuserve.de

D-76007 Karlsruhe

D-76131 Karlsruhe



Tharo Systems, Inc.

2866 Nationwide Parkway

P.O. Box 798

Brunswick, OH 44212-0798

Web: <http://www.tharo.com/tharo/>

E-mail: tharo@tharo.com

Tel. : +1 330-273-4408

Fax : +1 330-225-0099

copyright by cab / 900 8063 / H49 / 50

Technische Änderungen vorbehalten

In accordance with our policy of continual product improvement, we reserve the right to alter specifications without notice

Données technique modifiables sans préavis

Apollo 4

Thermal Transfer Printer Operator's Manual



All rights reserved, including those of the translations.

No part of this manual nor any translation may be reproduced or transmitted in any form or by any means, for any purpose other than the purchaser's personal use, without the express written permission of cab - Produkttechnik GmbH Karlsruhe.

Edition 11/98
Printed in Germany

Table of Contents

A General Guide to the Documentation	8
Operating Manual.....	8
Further Documentation.....	8
Trademarks	9
Characteristics of the Thermal Printhead	10
1. Product Description	11
General Information.....	11
Compliances	12
Technical Specifications	13
Optional Features	15
External Rewinder.....	15
Memory Card	15
Keyboard Adapter	15
Label Design Software EASYLABEL for Windows	15
Print Media.....	16
Print Media for Direct Thermal Printing	17
Print Media for Thermal Transfer Printing	17
Label/ Tag Media Specifications	18
Transfer Ribbon	19
2. General Safety Instructions	20
3. Unpacking and Delivery Contents	20
4. Printer Component Location	21
5. Connecting the Printer	25
Connection to Power Supply	25
Connection to a Computer.....	26
6. Media Loading.....	27
Installing the Collection Box	27
Loading Labels.....	28
Loading Transfer Ribbon	30
7. Adjustments Concerning the Labels	31
Adjustment of the Printhead Support.....	31
Adjustment of the Transfer Ribbon	32
8. Control Panel.....	33
System Mode ONLINE	34
System Mode OFFLINE	35

System Mode PRINT.....	36
System Mode PAUSE	37
System Mode FAULT-CORRECTABLE	38
System Mode FAULT-IRRECOVERABLE.....	39
System Mode SYSTEM TEST.....	40
System Mode SETUP	41
System Mode TEST PRINT.....	42
System Mode MONITORMODE / ASCII Dump Mode.....	43
System Mode LABEL FROM CARD	44
9. Setup.....	46
Start of Setup Mode	46
Overview of the Setup Parameters	47
Country/Land.....	48
Transfer Print	50
Label Sensor.....	51
Interface	52
Cut Position	53
Peel Position.....	54
Printhead Position	55
Heat Level.....	56
Printer Info	57
Set Date	58
Set Time	59
Character Set	60
Format Card.....	61
Copy Memory Card	62
Backfeed.....	63
Debug Mode.....	64
Tear-off Position	65
Pause Reprint	66
10. Self Test / Test Print	67
Start of the Test Print	67
Explanation of the Self Test Printout	68
11. Printer Info Display	72
Viewing the Printer Info Display.....	72
Definition of the Printer Info Display	72
12. Monitor Mode / ASCII Dump Mode	74
Start of the Monitor Mode / ASCII Dump Mode.....	74
Representation of the Control Characters.....	74
Example of ASCII Dump Mode.....	75

13. Options	76
Memory Cards.....	76
Preparing the Memory Card	76
Installation of the Memory Card.....	77
Formatting the Memory Card.....	78
Writing on the Memory Card	78
Printing from a Memory Card	79
Keyboard Adapter	80
Installation of the Keyboard Adapter.....	80
Key Assignment.....	81
Special Key Functions.....	81

APPENDICES

Appendix A - Character Tables	A-1
Setup Selectable Character Tables	A-1
Unicode Tables	A-9
Special Characters - Keyboard Adapter	A-13
Appendix B - Pin Assignment of the Interface Connectors	B-1
Pin Assignment of the Serial Interface Connectors	B-1
Interface Cable for RS-232	B-2
Interface Cable for RS-422/ RS-485	B-3
Pin Assignment of the Parallel Interface Connector	B-4
Centronics Interface Cable	B-4
Appendix C - Error Messages/ Problem Resolution	C-1
Correctable Errors	C-1
Irrecoverable Errors	C-2
Error Messages	C-3
Appendix D - Maintenance/ Cleaning/ Adjustment of the Printhead	D-1
General Cleaning.....	D-1
Cleaning the Media Feed Rollers.....	D-1
Cleaning the Printhead	D-2
Adjustment of the Printhead	D-3
Cleaning and Replacing the Cutter Blades.....	D-5
Appendix E - Firmware - Update	E-1
Index	
EC-Conformity Declaration	

This page is intentionally left blank.

A General Guide to the Documentation

Operating Manual

This present manual contains informations on the characteristics, features, functions, and the use of the printers of the **Apollo4**-line.

The first few chapters of this manual cover general information which is necessary for unpacking and operating the printer as well as information about accessibility to different components of the printer and on optional accessories. In the next chapters, the loading of media and ribbon, the self test of the printer, and the configuration in setup will be explained. In the appendices, you will find useful additional information, such as internal character sets of the printer, and cabling specifications. Furthermore, comments on possible error messages and printer maintenance are included.



Note the directions for use on recommended material and comments on maintenance in order to avoid damage and premature failure of your **Apollo 4**.

Every effort has been made in the creation of this manual to provide as much information as possible in an understandable manner.

We welcome your comments and suggestions regarding additions or corrections to improve future editions of this manual. Please, let us know if you have any questions.

Further Documentation

Further information on the programming of the **Apollo 4** with its own set of commands can be found in the "Programming Instructions - **Apollo**".

Detailed information about service and maintenance are included in the "Service Manuals" of the **Apollo 4** (e.g. replacement of components, adjustment instructions, circuit diagrams, spare parts lists, etc.)

Trademarks

Centronics® is a registered trademark of Centronics Data Computer Corporation.

Macintosh-Computer is a product of Apple Computer, Inc.

Microsoft® is a registered trademark of Microsoft Corporation.

Bitstream® is a registered trademark of Bitstream, Inc.

Speedo™ is a registered trademark of Bitstream, Inc.

TrueType™ is a registered trademark of Apple Computer, Inc.

Easylabel® is a registered trademark of Tharo Systems, Inc.

Characteristics of the Thermal Printhead

Dear Customer,

The thermal printhead is the most sensitive part of your printer.
Pay special attention to the following guidelines :

- 1) The glass cover on the printhead must not be touched with the hand.
Do not use any sharp items, such as knives or screwdrivers, to clean the printhead.
- 2) During printing, always take care that there is no dirt or foreign objects on the labels in order to avoid impurification of the printhead.
This way, the printhead might be damaged.
- 3) Use proper label material with a smooth surface only.
A rough surface will affect the printhead and may cause damage and reduce its operating life.
- 4) Clean the printhead regularly with a special printhead cleaning pen, or an isopropyl alcohol soaked cotton swab.
- 5) Print with the lowest possible printhead temperature.

Careful use will allow you to print approximately between 18 to 30 miles (30 to 50 km) of print media before the printhead needs replacing.

Improper usage can cause damage to the printhead.

Please note :



No manufacturer provides a warranty on the printhead, since improper usage can hardly be proved after failure, but will affect the operating life and durability of the printhead.

1 Product Description

General Information

The **Apollo 4** is an innovative label printer which may be used in either direct thermal or thermal transfer mode. It offers a virtually unlimited variety of printout design.

The **Apollo**-series will be extended with the **Apollo 4** by a printer line which connects proven performance figures and very compact designing.

The **Apollo 4** - line covers both a device type with a printhead resolution of 203 dpi for standard applications (**Apollo 4/200**), and a 300dpi-variant for refined designing of labels (**Apollo 4/300**).

Devices with integrated label cutter (**Apollo 4/200C**, **Apollo 4/300C**) complete the printer line.

With the Speedo™ and TrueType™ fonts, **Apollo** provides a wide range of different typefaces. The use of scaleable fonts and their flexibility in width and height allows exceptional flexibility in label design to suit any requirements. Additional printing features include reverse, italic, bold, underlined, and rotated characters.

The operation and usage of the **Apollo** is simple and comfortable. All printer settings can be carried out with only four function keys on the front panel of the printer. The double lined LCD display keeps the operator constantly informed about the current status of the printer. The setup menu allows easy configuration changes whenever desired.

The modular design of the **Apollo** guarantees efficient service.

The options PCMCIA-memory-card, keyboard adapter and external rewinder, which are offered in the **Apollo**-program, may also be used at the **Apollo 4**.

Compliances

Apollo 4 complies with the following safety regulations :

CE : **Apollo 4** complies with the following safety requirements:

- EC Low Voltage Directive (73/23/EEC)
- EC Machinery Directive (89/392/EEC)
- EC Electromagnetic Compatibility Directive (89/336/EEC/ foll. 93/31/EEC)

FCC : **Apollo 4** complies with the requirements of the FCC regulations part 15 for class A computers. Under disadvantageous circumstances, the operation of these devices may cause interference with radio or TV reception, which has to be eliminated by the operator.

Technical Data

Type :	Direct thermal/ Thermal transfer printer
Printhead :	Thin-film transfer printhead
Resolution:	Apollo 4/200, Apollo 4/200C : 203 dpi \pm 8 dots / mm Apollo 4/300, Apollo 4/300C : 300 dpi \pm 11,8 dots / mm
Number of dots/line :	Apollo 4/200, Apollo 4/200C : 832 Apollo 4/300, Apollo 4/300C : 1248
Print width :	Apollo 4/200, Apollo 4/200C : 4.10" (104 mm) Apollo 4/300, Apollo 4/300C : 4.16" (105,7 mm)
Print speed :	Apollo 4/200, Apollo 4/200C : 2, 3, 4, 5 ips (50, 75, 100, 125 mm/s) Apollo 4/300, Apollo 4/300C : 1.3, 2, 2.5, 3, 3.4 ips (33, 50, 63, 75, 87 mm/s)
Available fonts :	5 Bitmap fonts incl. OCR-A and OCR-B, and 3 scaleable fonts (Speedo™) - internally; Speedo™ and TrueType™ fonts - to load externally
Character sets :	Supports Windows '95 Windows 1252/1250, IBM Codepage 850/852, ISO 8859-1, ISO 8859-8, EBCDIC, Macintosh, Supports all Western and Eastern European Latin characters
Font size :	.035 to 5 in (.9-128 mm) For scaleable fonts, width and height are individually changeable For Bitmap fonts, the size is selectable up to a factor of 10
Font style :	Reverse, bold, italic, underlined, mirror-inverted, outlined, grey
Font rotation :	Bitmap fonts/ Bar codes : 0°, 90°, 180°, or 270° Scaleable fonts : optional, texts in circular format
Graphic elements :	Line, box, circle, ellipse, fill-in segment, arrow
Graphic file type :	.PCX, .IMG, .BMP, .TIF, .GIF, and .MAC files
Barcodes :	Linear codes for industry, logistics and medicine: Code 39, Code 93, Code 128 A,B,C, Codabar,FIM,German Post Office AG Identity and Lead Code, HIBC, Interleaved 2 of 5, MSI, Plessey, Postnet Linear codes for trade : EAN-8, EAN-13, EAN-128, EAN/UCC 128, EAN/UPC Appendix 2, EAN/UPC Appendix 5, JAN-8, JAN-13, UPC-A, UPC-E 2D-codes : Data Matrix, PDF417, UPS-Maxicode Bar codes variable in height, module width, and ratio. As required with test code, printed characters and start/stop code.

Processor :	32 Bit, Motorola
Memory :	Internal memory 2 MB
Interface :	Serial : RS-232, RS-422, RS-485 1200-57600 Baud Parallel : Centronics
Test features :	System test when switching on Self test with printout of firmware data and system parameters
Label material and continuous media :	Thermal paper, normal paper, plastic foil, PE, PP, PVC, Polyamid Adhesive labels : 60-160 g/sqm Tag Stock : up to 180 g/sqm Label width : 1 to 4.6 in (25-116 mm) Label length : .2 to 37.2 in (5-945 mm) Apollo 4/200 .2 to 16.8 in (5-427 mm) Apollo 4/300 Core diameter : more than 1.6 in (40 mm) Supply roll diameter : up to 8 in (200 mm) Labels may be wound face-in or face-out on the roll
Material recognition :	See-through sensor Bottom-reflective sensor (Apollo 4/200C, Apollo 4/300C only) fixed at 0.7" (17.5mm) from the paper edge
Transfer ribbon:	Length : 1,182 in (360 m) Outer diameter : 3 in (74 mm) Core diameter : 1 in (25 mm) Inkside in or inkside out
Backfeed :	In order to always start a print job from the front edge of the first label the label strip may be fed back after the completion of the previous print job.
Control features :	Paper/ ribbon out
Control panel :	4 Function keys with LED display LCD can be set to display in 6 different languages Backlit LCD with 2 lines of text, 16 characters per line
Dimensions (HxWxD):	Apollo 4/200, 4/300 : 9 x 9.8 x 15.7 in (229 x 250 x 400 mm) Apollo 4/200C, 4/300C : 9 x 9.8 x 16.3 in (229 x 250 x 415 mm) with collection box : 9 x 9.8 x 19.2 in (229 x 250 x 487 mm)
Weight :	Apollo 4/200, Apollo 4/300 : 24.3 lb. (11 kg.) Apollo 4/200C, Apollo 4/300C : 27.5 lb. (12.5 kg.)
Operating voltage :	Switchable between 230V A.C/ 50Hz or 115V A.C/ 60Hz
Maximum power input :	1 A (at 230 V) / 2 A (at 115 V)
Circuit protection :	T 1.6 A (at 230 V) / T 3.15 A (at 115 V)
Environment :	Operation at 50° to 95°F (10°-35°C) at a humidity of 30 to 85% Transport at -13° to 158°F (-25° - +70°C) at a max. humidity of 95% non-condensing Storage at 41°F to 104°F (5 bis 40 °C) at a humidity of 5 to 85%

Optional Features

External Media Rewinders

For rewinding large print jobs, an external rewinder is available to handle an entire label roll. Please note, that for an external rewinder, the maximum size of the supply roll is limited to 8 in (200 mm) with a core diameter of 3 in (75 mm), or a supply roll may be up to 7.5 in (190 mm) with a core diameter of 1.6 in (40 mm).

The power supply of the external rewinder will be realized by an integrated power pack. It is independent from the printer.

PC Memory Card

Apollo 4 includes an option for using memory cards in order to permanently store graphics, fonts, databases or whole label formats.

The data can be downloaded via interface. Alternatively, the printer is able to read cards which was written on using PC card drives of computers, lap-tops, etc.

PCMCIA 2.1 conforming sRAM cards or Flash-EPROM cards are accepted.

The maximum capacity for **Apollo 4** is 16 MegaByte.

Using a memory card, the printer can be operated **without** being connected to a computer which represents a great advantage regarding the flexibility.

Keyboard Adapter

The keyboard adapter allows you to connect your **Apollo 4** to a MF-2 compatible PC keyboard using the serial interface. This will allow you to modify variable data stored on a memory card.

Label Design Software EASYLABEL for Windows

EASYLABEL is an intelligent and useful label design software which is easy to use in connection with your **Apollo 4**.

EASYLABEL can be run on all Microsoft Windows compatible computers.

For further information about EASYLABEL, contact your local **Apollo** reseller.

Print Media

The **Apollo 4** can be operated in direct thermal as well as thermal transfer mode.

For direct thermal mode, only use print material with a thermal-reactive coating. The print image is transferred by heating the material at the printhead, causing a reaction on the surface of the paper and, consequently, darkening the material.

In thermal transfer mode, not only standard paper labels are needed but also the thermal transfer ribbon with a color surface. The printout is created by heating the transfer ribbon, causing a transfer of color particles onto the label.

Apollo 4 allows to regulate the heat level and also the print speed. Thus, the **Apollo 4** offers a wide range of opportunities for usage.

The **Apollo 4** is able to print on labels and continuous paper with a maximum supply roll diameter of 8 in (200 mm).

The minimum core diameter is 1.5 in (40 mm).

The printer can also process fanfold label material.

The ability of label edge recognition, which guarantees the precise position of the printer output, is accomplished by a moveable photocell. This sensor is controlled by the processor of the **Apollo 4** and ensures recognition for different sorts of material. There is no need for additional electronic adjustment.

On the following pages, you will find detailed information and specifications concerning suitable materials.

If you have any questions, check with your local distributor as not every material can be used for direct thermal or thermal transfer printing.

If in doubt, we will perform test prints with your label material to find the best suitable transfer ribbon.

Print Media for Direct Thermal Printing

The print material must correspond to several important specifications, in order to ensure high quality printing, and to avoid damage to the printhead or early wear.

Using labels which we have tested and which we recommend to our customers, will guarantee a gentle treatment of the printhead. If you want to use material by another supplier, please note the following requirements regarding the condition of thermal printer paper :

1. To avoid damage to the printhead, the surface coating must cover the thermal-reactive layer. If the coating is too thin, this may cause a "pitting" effect on the printhead, i.e. very small explosions during the chemical reaction of the thermal coating quickly resulting in damage to the printhead.
2. The surface of the labels should be very smooth to avoid a "sandpaper" effect on the printhead.
3. Always choose material which can be printed on with the lowest possible heat level. The greater the heat level, the shorter the life of the printhead. Moreover, with highest heat levels the phases of heating up and cooling down extend. This may have a negative effect on the print quality, especially if a high print speed is required.

Print Media for Thermal Transfer Printing

In thermal transfer mode, a wide range of different label materials may be used. (e.g. normal paper, tag stock, a variety of synthetic material such as polyester foil, etc.)



The print quality greatly depends on the right combination of label material and transfer ribbon.

The surface of the labels determines which ribbon material may be used. Unsuitable ribbons may cause an extremely poor print image.

If in doubt, your local distributor will advise you on a good combination of suitable material, or carry out tests to find out which ribbon fits your label material best.

Label/ Tag Media Specifications

Label and tag media to be used for the **Apollo 4** can be found in the table below. Note this information before ordering your labels.

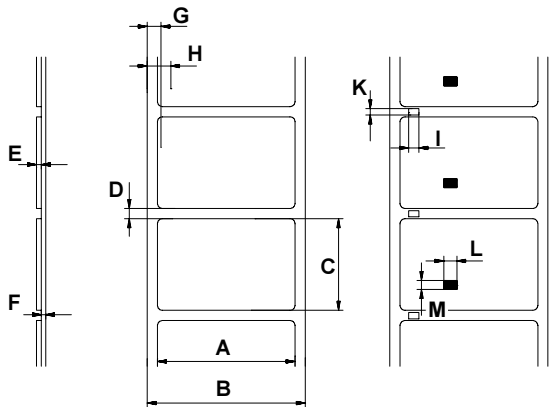


Fig. 1 Label formats

Item		MINIMUM	MAXIMUM
A	Label width	1 (25)	4.6 (116)
B	Width of silicon liner	1 (25)	4.6 (116)
C	Label length	Apollo 4/200(C) Apollo 4/300(C)	37.2 (945) 16.8 (427)
D	Gap between labels	Apollo 4/200(C) Apollo 4/300(C)	37.2 (945) 16.8 (427)
E	Label thickness	.0024 (.06)	.01 (.25)
F	Thickness of silicon liner	.0024 (.06)	.01 (.25)
G	Distance of the first printing position from the edge of the silicon liner	.08 (2)	
H	Distance of the label sensor from the edge of the silicon liner	.7 (17.5)	
I	Width of punch hole	.2 (5)	-
K	Height of punch hole	.08 (2)	.2 (5)
L*	Width of reflective mark	.2 (5)	-
M*	Height of reflective mark	.08 (2)	.2 (5)

Table 1 Label formats in inches (figures in brackets are in mm)
* ... Apollo 4/200C and Apollo 4/300C only

Transfer Ribbon

The choice of a suitable transfer ribbon is important for the print quality of your printer as well as the useful life of the printhead.

Transfer ribbons of inferior quality may cause premature deterioration of the printhead !

The ribbon material must be antistatic, because the extremely thin surface coating of the thermal printhead can be damaged by electrostatic discharge.

Also, the material must be extremely resistant to high temperatures to avoid melting the ribbon with the printhead.

The heat which arises during printing must be carried off by the label and by the transfer ribbon itself. Transfer ribbons of inferior quality are often poor heat conductors. This may cause overheating of the printhead in spite of electronic protection.

Poor transfer ribbons also tend to lose parts of the coating which leads to accumulating dirt on the printhead and the sensors. With some ribbons the color rubs off and soils the printhead. All of these effects contribute to poor print quality.

We have carried out numerous tests with many different ribbons and we recommend you use transfer ribbons made by well-known/ brand manufacturers only. Depending on the label material, several transfer ribbons may be suitable.

The quality of print is determined by the right combination of these materials.

The recognition of the transfer ribbon is sensed by the rotation control of the transfer ribbon unwinder, rather than by photocell sensors. As a result, ribbons with a thinner coating or those with a colored coating can be used safely. To be able to print all labels up to the exact end of the transfer ribbon, the length of the uncoated trailer is limited.

When buying transfer ribbons, make sure that the trailer of the ribbon does not exceed a length of 5.9 in (150 mm).

2 General Safety Instructions



- The printers of the **Apollo 4** series are built exclusively to print labels and tags, continuous paper, etc. Do not use other materials than listed in Chapter 1.
- Connect the printer only to an outlet with the correct voltage !
The printer is configured for either 230V or 115V power supply, which can be switched using the input voltage selector at the back of the printer. Connect only to a power outlet with a **grounded** contact.
- The printer must only be connected to devices which have extra low voltage.
- Power must be OFF before plugging in any accessory or connecting the printer to a computer, etc. Also switch power off on all appliances before disconnecting.
- Do not expose the printer to any moisture, or use in damp or wet areas.
- The printer will operate with the cover open if necessary. This is not recommended, as moving or rotating parts become accessible. Keep long hair, jewelry, loose clothes away from the moving parts.
- During the print process the printhead will become hot. Use extra caution when touching the printhead.

3 Unpacking and Delivery Contents

Inspect the **Apollo's** packaging and contents immediately after receipt for possible damage caused by shipping.



The supplied equipment of the **Apollo 4** depends on the requested options. Compare the delivered accessories with your order.

Please keep the original packaging in case the printer must be returned.

4 Printer Component Location

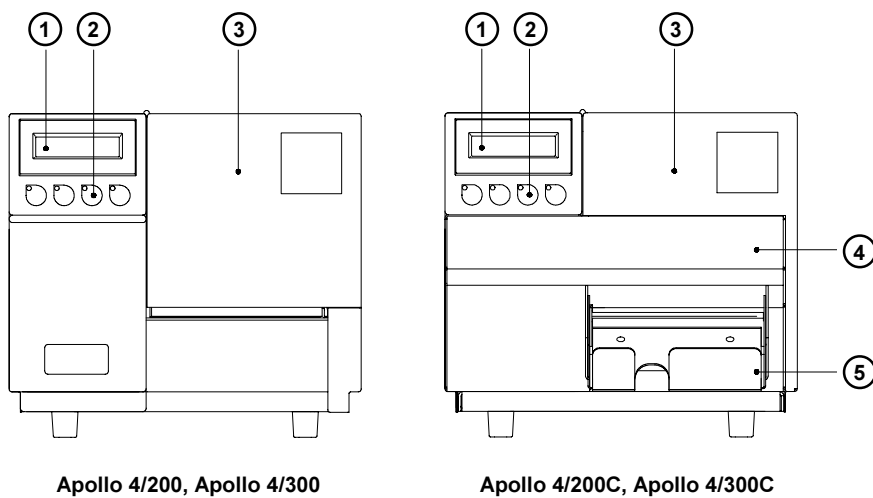


Fig. 4 a Front view

- 1 - Display
- 2 - Function keys with indicator LEDs
- 3 - Cover
- 4 - Cutter
- 5 - Collection box

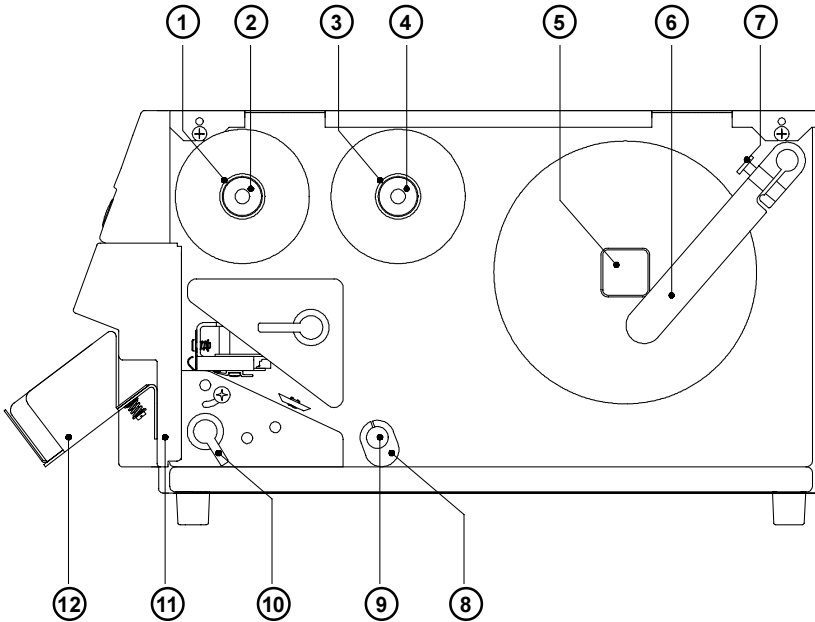
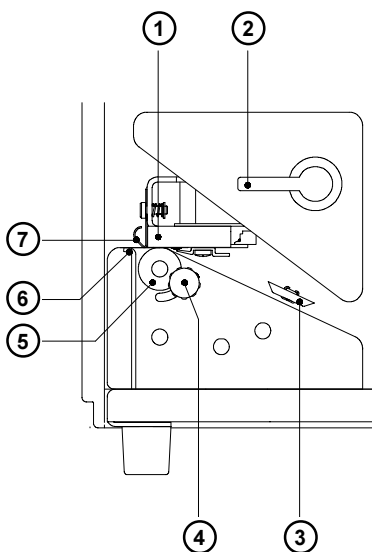
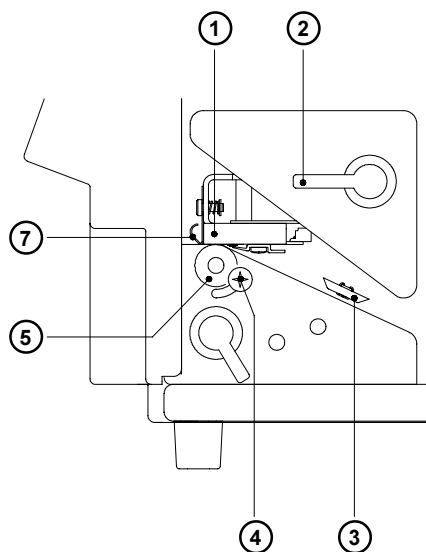


Fig. 4 b Side view Apollo 1 (with cover open)

- 1 - Ribbon take up hub
- 2 - Knurled knob
- 3 - Ribbon supply hub
- 4 - Knurled knob
- 5 - Media hub
- 6 - Media retainer
- 7 - Media retainer knurled head screw
- 8 - Media guide
- 9 - Media assist bar
- 10 - Cutter locking lever (**Apollo 4/200C** and **Apollo 4/300C** only)
- 11 - Cutter (**Apollo 4/200C** and **Apollo 4/300C** only)
- 12 - Collection box (**Apollo 4/200C** and **Apollo 4/300C** only)



Apollo 4/200, Apollo 4/300



Apollo 4/200C, Apollo 4/300C

Fig. 4c Detailed view of the print mechanism

- 1 - Thermal printhead
- 2 - Printhead lever
- 3 - Label edge sensor
- 4 - Printhead levelling adjustment screw
- 5 - Media feed roller
- 6 - Tear-off plate
- 7 - Ribbon shield

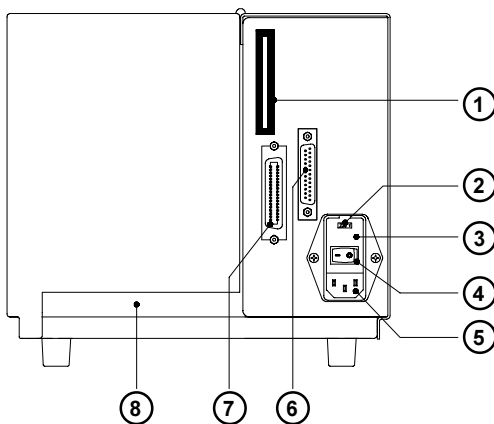


Fig. 4 d Back view

- 1 - Memory card module slot
- 2 - Input voltage selector / Fuse holder
- 3 - Input voltage selector cover
- 4 - Power switch
- 5 - Power supply connector
- 6 - Serial interface port
- 7 - Parallel interface port
- 8 - Slot for fanfold paper

5 Connecting the Printer

Connection to Power Supply

The **Apollo 4** is designed for use with 230V A.C/ 50Hz (standard) or 115V A.C/ 60Hz.



Before connecting the printer to the power supply, make sure that the voltage selected on the power supply module of the printer is the same as your main power supply !

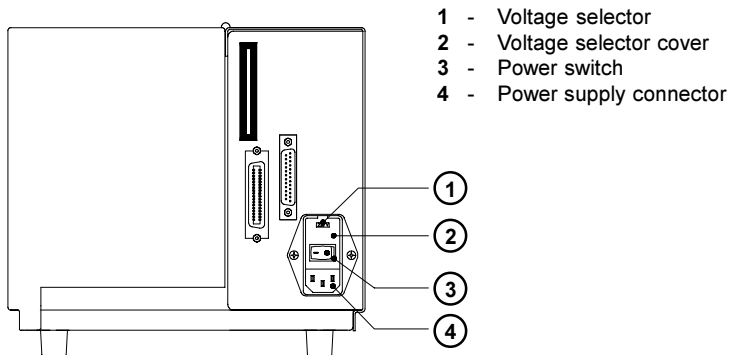


Fig. 5 a Power supply module (rear view of the printer)

To change the voltage setting, open the cover (2) and remove the voltage selector from the power unit.



If you have changed the operating voltage of your printer the fuses need replacing as stated below !

230V - 2 x T 1,6A

115V - 2 x T 3,15A

When delivered, the correct fuses for the pre-selected operative voltage are installed. You will find the necessary fuses for the other voltage in the accessories package. Slide the voltage selector back into the power supply module so that the correct voltage is visible in the lid window (2).

Connect the printer to a **grounded** outlet using the power cable supplied in the accessories package.

Connection to a Computer

The **Apollo** is equipped with three serial interfaces, these are RS-232, RS-422, and RS-485, all of them using the 25 pin interface connector (2) at the back. In most cases, you can use the RS-232 interface for the connection to the computer. If your computer is located more than 50 ft (15m) away from the printer you should use the RS-422 interface. The RS-485 interface is provided for using the **Apollo** as part of a networked system.

In addition to the serial port, the **Apollo** also provides a parallel (Centronics) interface which offers a faster transfer of data than the serial interfaces. Therefore, we recommend you use the parallel interface for those applications where a large number of loadable fonts or complex graphics have to be printed. For the Centronics interface use the 36 pin interface connector (1).

Select the required interface settings using the Setup procedure (see Chapter 9) and connect the printer to the computer by a suitable interface cable. You will find a list of typical cables as well as a description of the pin assignment of the interface connectors in Appendix B.



Make sure that all connected computers and their connecting cables are correctly grounded.

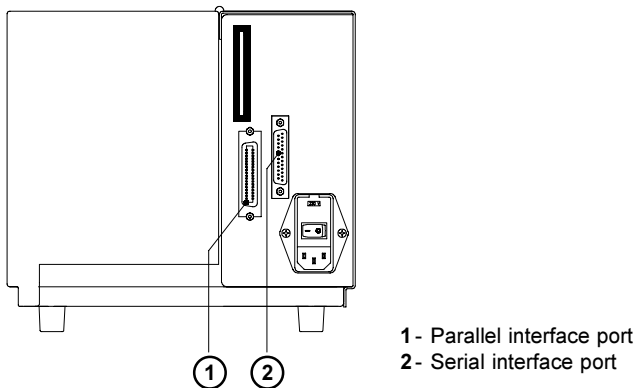


Fig. 5 b Interface ports (rear view of the printer)

6 Media Loading

Installing the Collection Box

The delivery content of the devices with integrated cutter (**Apollo 4/200C**, **Apollo 4/300C**) contains a box for collecting cut labels. The box may be mounted at the front side of the cutter. The length of the box is adjustable (max. 4.5 in or 115 mm).

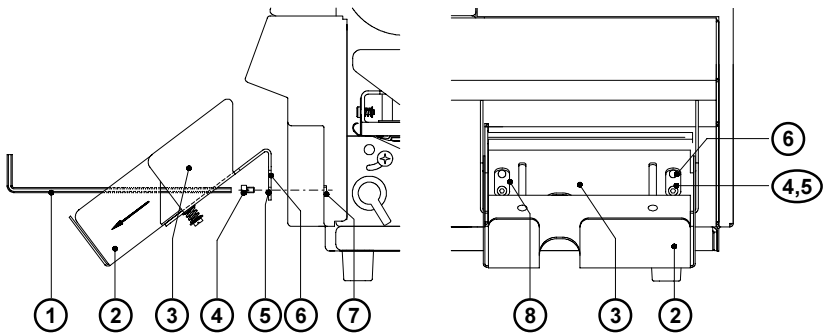


Fig. 6a Installing the collection box (Apollo 4/200C, Apollo 4/300C)

The box may be mounted in two different positions dependent on the label length and the required stack height. For that there are two pairs of holes (5,6) in the bracket (3). They may be used for mounting alternatively.

1. Draw the sliding bracket (2) to extend the box to the maximum size. After that the elongated holes (8) are accessible.
2. Push the hex wrench (1) thru the elongated holes (8) and fix the collection box with the screws (4) included in the delivery contents at the threaded holes (7) in the cutter cover.
3. Adjust the position of the sliding bracket (2) if required.

Loading Labels

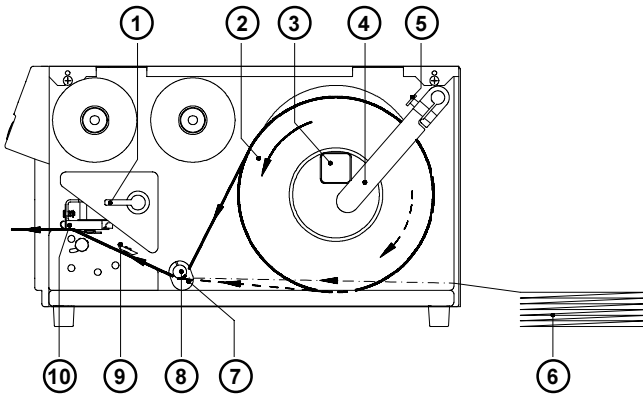


Fig. 6b Loading labels (Apollo 4/200, Apollo 4/300)

1. Lift the printhead (10) by rotating the lever (1) clockwise until it stops.
2. Loosen the media retainer knurled screw (5) and swing the media retainer (4) counterclockwise.
3. Place the label roll (2) onto the media hub (3).
The solid line represents the feed path of outside-rolled labels, the broken line of inside-rolled labels. The broken-dotted line shows the media path of fanfold paper (6).
4. Swing the media retainer (4) clockwise to the media hub (3) and push it inwards until it rests against the side of the label roll. Tighten the knurled screw (5).
5. Slide the media guide (7) into its outermost position.
6. Unroll a length of label stock from the media roll and feed it through as shown in Figure 6 b/c.
It is particularly important to ensure that the media strip slides properly between the fittings of the adjustable photocell assembly (9).
7. Slide the media strip right through the space between the print roller and the printhead.



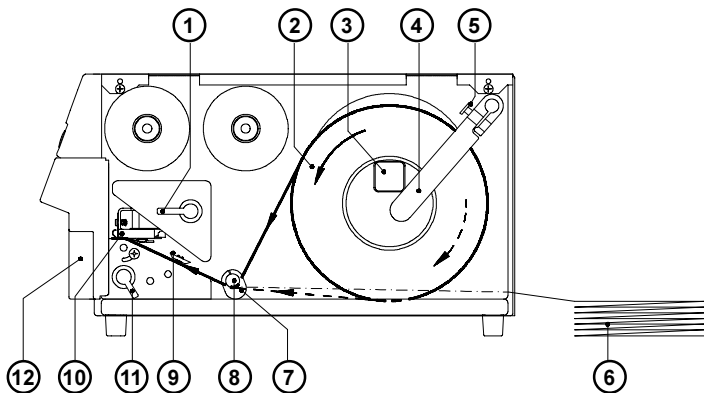



Fig. 6c Loading labels (Apollo 4/200C, Apollo 4/300C)

8. At devices with integrated cutter the label loading can be eased by swinging away the cutter.
Turn the lever (11) counterclockwise until it stops. This way the cutter (12) will be unlocked and may be swung away sideways.
After label loading relock the cutter.
9. Slide the media guide (7) back towards the edge of the media strip.
10. Turn the lever (1) counterclockwise until it stops and, thereby, lock the printhead (10).
11. At devices with integrated cutter it is recommended to press the  key after switching on the printer. This way the label feed will be synchronised for the first print job.



If you do not use the printer for an extended period of time, lift the printhead to avoid possible flattening of the print roller.

Loading Transfer Ribbon

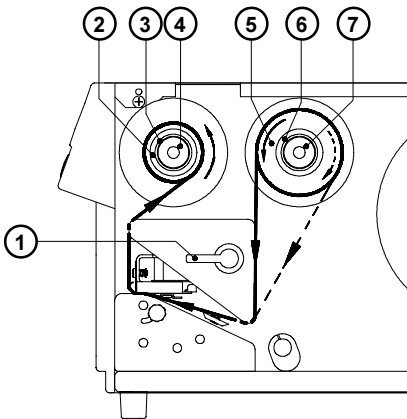


Fig. 6d Loading thermal transfer ribbon

1. To lift the printhead, turn the printhead lever (1) clockwise until it stops.
2. Slide the roll of transfer ribbon (5) onto the ribbon supply hub (6) as far as possible.

Pay attention to the side of the ribbon material which is coated with ink ! The inked side is generally the dull side. When the ribbon is inserted, the inked side must face the opposite side of the printhead !

In Figure 6 d, the solid line shows the path of inside wound ribbon, and the broken line represents the path of outside wound ribbon.

3. Turn the knurled knob (7) until offering resistance and so jam fast the transfer ribbon (5) at the ribbon supply hub (6).
4. Slide an empty cardboard core (2) onto the ribbon take up hub (3) and jam fast it by turning the knurled knob (4).
5. From the side, feed the transfer ribbon along the path as shown in Figure 6d, then attach it to the core (2) using adhesive tape or a label.
6. Turn take up hub (3) in order to smooth and stretch the ribbon.
7. To lock the printhead, turn the lever (1) back counterclockwise.

7 Adjustments Concerning the Labels

Adjustment of the Printhead Support

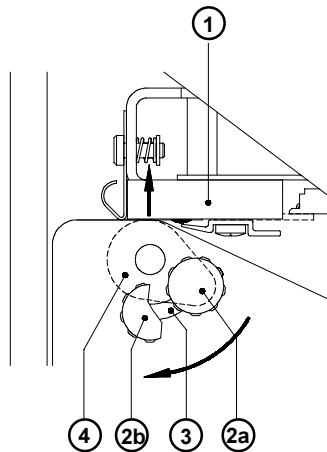


Fig. 7 a Adjustment of the printhead support

When printing narrow labels (width less than 2.5 in or 60 mm), it is possible that the printhead will come into direct contact with the drive roller. This will lead to premature wear on the printhead. In addition, the printhead will be at a slight angle to the label, thus, the uneven pressure may result in an inconsistent image density from one edge of the label to the other.

To correct this problem, the printhead support (4) may be adjusted. Adjust printhead support as follows :

1. Loosen the locking screw (2).
2. Move the locking screw (2) as required within the adjustment slot (3). This will cause the cam shaped printhead support (4) to rotate, in effect, providing a higher or lower base on which the printhead mounting (1) rests.
3. It is convenient to use the position 2a to printout large labels. The printhead support (4) is total inactiv here.
4. By using small labels it is necessary to adjust the printhead support. In this case insert a second strip of the label at the front side of the print roller. Now slide the locking screw (2) as far as possible to position 2b in the adjustment slot (3), until the printhead support (4) touches the printhead mounting (1). Take away the second label strip.
5. Tighten the locking screw (2).

Adjustment of the Transfer Ribbon

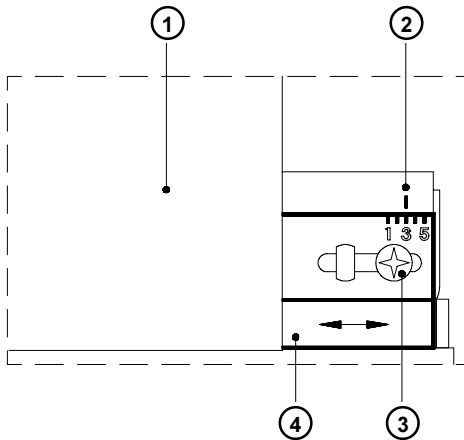


Fig. 7 b Adjustment of the transfer ribbon

If creases, lines or black patches appear in the print image resulting in a poor print quality, this may be caused by wrinkles in the transfer ribbon (1). To remove the wrinkles, the tension of the ribbon should be made even from the left to the right by moving the ribbon shield (4) up or down.

1. Loosen the adjustment screw (3).
2. Shift the transfer ribbon shield (4) sideways into the direction of the wrinkle. Moving it to the left will increase the tension on the left. Use the scale (2) provided to monitor the adjustments made. If the screw is in position "1", the tension is highest on the outside, and if it is in position "5", the tension is highest on the inside.
3. After completing the adjustment, tighten the securing screw (3).

8 Control Panel

The front control panel of the Apollo is fitted with 4 function keys with indicator LEDs, and a 2x16 character digital LCD display.

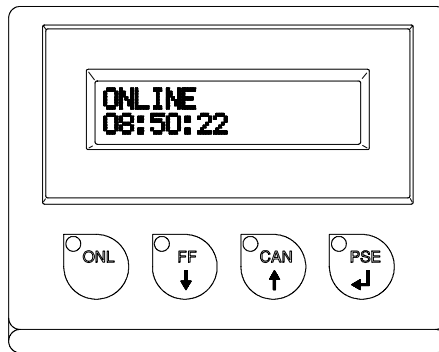


Fig. 8 Front control panel

The control panel display constantly provides the operator with the actual information concerning the current printer mode and label processing. The indicator LEDs support the information shown in the display by indicating which keys have to be pressed. (e.g. in the event of a fault)

On the following pages, you will find descriptions of the system modes of the **Apollo 4**, the related indications by the LCD display and the LEDs as well as a description of the function keys under differing conditions.

System Mode ONLINE

The printer is switched ON and ready to receive data.

Display

The top line of the display shows "ONLINE".
The bottom line of the display shows the time of day.
During the transfer of data, a rotating pointer appears in the right hand corner of the bottom line of the display.
When saving data on the PC card, a filled rectangle appears in the right hand corner of the bottom line of the display.

LED Display

LED ONL on.

Function Keys







	ONL key	Switch into OFFLINE mode. (LED ONL off)
	FF key	Provides label feed. The leading edge of the next label to be printed is in print position.
	CAN key	Deletes data of the previous print job in internal memory. Following that, "Pause reprint" is not available. (see PSE key)
	PSE key	Repeats the print of the last label, after the previous print job has been completed. (only when setup parameter "Pause reprint" is on)
 	ONL key + CAN key	Pressing both keys together for at least 5 seconds will switch into the SETUP mode. (LED ONL off)

Table 8 a Key functions in ONLINE mode

System Mode OFFLINE

The printer is not ready to print or to receive data.
The status of the printer may be requested.

Display

The top line of the display shows "OFFLINE".
By repeatedly pressing the PSE key, the status of the printer will be shown.
(see also Chapter 11)

LED Display

The display is blank.

Function Keys





	ONL key	Switch into ONLINE mode. (LED ONL on)
	FF key	Provides label feed. The leading edge of the next label to be printed is in print position.
	CAN key	Switch into LABEL FROM CARD mode. (only if memory card is installed and formats are stored on it)
	PSE key	Display shows current printer mode. ("Printer info"/ see also Chapter 11)

Table 8 b Function keys in OFFLINE mode

System Mode PRINT

The printer is in operation.
In this mode, the transfer of data is possible. New print jobs will be carried out immediately following the completion of the previous job.

Display

The top line of the display shows the message "Printing label".
The bottom line displays the current number of printed labels.
During the transfer of data, a rotating pointer appears in the right hand corner of the lower display line.

LED Display

LED ONL on.

Function Keys



	CAN key	<div>short pressing : Cancels the current print job. Switch to the next job, which is available in the input buffer</div> <div>longer pressing (>1s): Cancels the current print job. Clears the input buffer (LED CAN blinks), Switch into ONLINE mode.(LED ONL on)</div>
	PSE key	<div>Interrupts the current print job.</div> <div>Switch into PAUSE mode. (LED PSE on)</div>

Table 8 c Function keys in PRINT mode

System Mode PAUSE

The printing process is temporarily interrupted by the operator.

Display

The top line of the display shows "PAUSE".

LED Display

LED ONL on, LED PSE on.

Function Keys




	FF key	Provides label feed. The leading edge of the next label to be printed is in print position.
	CAN key	<div>short pressing : Cancels the current print job. Switch to the next job, which is available in the input buffer</div> <div>longer pressing (>1s): Cancels the current print job. Clears the input buffer (LED CAN blinks), Switch into ONLINE mode.(LED ONL on)</div>
	PSE key	<div>Continues the current print job.</div> <div>Switch into PRINT mode. (LED PSE off)</div>

Table 8 d Function keys in PAUSE mode

System Mode FAULT-CORRECTABLE

The printer has encountered a fault during printing which is easily correctable by the operator (e.g. "Out of paper"), following which the printing process may be continued.

Display

The top line of the display shows alternately the type of fault and the total of the remaining labels of the current print job.

LED Display

LED CAN on, LED PSE is flashing.
If an applicator is connected: LED FF is flashing.

Function Keys



	CAN key	<div>short pressing : Cancels the current print job. Switch to the next job, which is available in the input buffer</div> <div>longer pressing (>1s): Cancels the current print job. Clears the input buffer (LED CAN blinks), Switch into ONLINE mode.(LED ONL on)</div>
	PSE key	Continues current print job after error correction. Switch into PRINT mode. (LED ONL on, LED CAN off, LED PSE off)

Table 8 e Function keys in mode FAULT-CORRECTABLE

System Mode FAULT-IRRECOVERABLE

While switching on the printer or during printing, a fault has occurred which cannot be cleared by the operator without cancelling the current print run. (e.g. hardware fault)

Display

The display shows the type of fault.

LED Display

LED CAN is flashing.

Function Keys


	CAN key	Cancels the current print job. Switch into ONLINE mode. (LED ONL on, LED CAN off, LED PSE off) If ONLINE mode cannot be entered, switch printer on and off again. If the fault remains contact Technical Service.
---	---------	---

Table 8 f Function keys in mode FAULT - IRRECOVERABLE

System Mode SYSTEM TEST

When switched on, the **Apollo 4** automatically performs an internal self test. If the test is completed successfully, the Apollo proceeds to the ONLINE mode, or otherwise the printer switches to system mode FAULT - IRRECOVERABLE.

Display

The top line of the display shows the version of the printer :

" **** APOLLO 4/300 **** ".

The bottom line of the display shows the numbers "123456" one after the other depending on the progress of the several test steps.

LED Display





All LEDs flash up once briefly.

Function keys

The function keys have no effect.

System Mode SETUP

To enter the SETUP mode, use either one of the procedures described below :

- either :** press both keys, the  key and the  key simultaneously when switching on the printer, and keep them pressed down, until the system test is completed;
- or :** in ONLINE mode, press both keys, the  key and the  key simultaneously for at least 5 seconds.

In SETUP mode, various printer parameters can be specified to suit the current print requirements. (for details see Chapter 9)

Display

Following the completion of the system test, the display briefly shows "SET-UP", followed by "Land" or "Country". Depending on the selection, all of the setup parameters and their settings will be shown.

LED Display

All LEDs off.

Function Keys






	ONL key	Stores the chosen settings of the setup parameters and completes the SETUP mode. (i.e. switch into ONLINE mode/ LED ONL on)
	FF key	Skips to next setup parameter. Reduces numerical setup values.
	CAN key	Skips to previous setup parameter. Increases numerical setup values.
	PSE key	Confirms selected settings for parameters.

Table 8 g Function keys in SETUP mode

System Mode TEST PRINT

The TEST PRINT mode is entered by pressing the  key when switching on the printer, and keeping it pressed down until the system test is completed. Following, an internal test sample will be printed. (for details see Chapter 10) Then, the system test will be repeated.

Display

Following the completion of the system test, the display shows "Test print".

LED Display

LED ONL on.

Function Keys



	CAN key	Cancels the test print. Switch into SYSTEMTEST mode.
---	---------	---

Table 8 h Function keys in TEST PRINT mode

System Mode MONITOR MODE/ ASCII Dump Mode

The monitor mode/ ASCII Dump mode is entered by pressing the  key when switching on the printer, and keeping it pressed down until the system test is completed. In this mode, the control codes received by the printer are directly printed as text corresponding to the set font, rather than being interpreted as defined by the programming.

Display

After the completion of the system test, the display shows "ASCII Dump Mode".

LED Display

LED ONL on.

Function Keys




	ONL key	Switch into ONLINE mode.
	FF key	Initiates a paper feed of about .8 in (21 mm).

Table 8 i Function keys in MONITOR MODE/ ASCII Dump mode

System Mode LABEL FROM CARD

Provided that a memory card is installed and a label format is present, in OFFLINE mode, press the  key to enter the LABEL FROM CARD mode.

In this mode, the labels stored on the card can be selected to print; for files with a variable number of labels the quantity of labels to be printed can be set.

Display

The top line of the display shows "Label from card". The bottom line of the display shows the file name of the first label file in the list stored on the card. After the requested label has been selected, for files without a fixed number of labels the display shows "No. of labels" in the top line and "00001" in the bottom line.

LED Display

All LED's off.

Function keys





	ONL key	Switch into OFFLINE mode.
	FF key	For scrolling down within the file list stored on the card. Reduces the quantity of labels to be printed.
	CAN key	For scrolling up within the file list of the card. Increases the quantity of labels to be printed.
	PSE key	Confirms file selection. Moves the cursor to the right when setting the quantity of labels to print. Switch into PRINT mode.



Table 8 k Function keys in the LABEL FROM CARD mode

This page is intentionally left blank.

9 Setup



Using the setup mode, the configuration of the **Apollo 4** may be customized to suit specific requirements. Initial setup should be performed when operating the printer for the first time. Changes which become necessary to process different print jobs, e.g. when different materials are used, can mostly be accomplished by changing the software settings.

Start of Setup Mode

This mode is initiated by **either** simultaneously pressing the  key and the  key when switching on the printer and keep them pressed down until the system test is completed, **or** in ONLINE mode, press the same two keys down for at least 5 seconds.




Starting the setup mode, the display shows "SETUP" for about one second , followed by "Land" or "Country" which represents the first of the parameters to select from. Depending on the selection, the setup parameters and their settings will be shown. The list of parameters is brought up in a row and may be run through repeatedly.

Each time a parameter setting has been changed, there will be a request for confirmation. There will not be a general request before leaving the setup mode.

 **The setup mode can be left at any point by pressing the  key.**

The confirmed parameters will be saved.

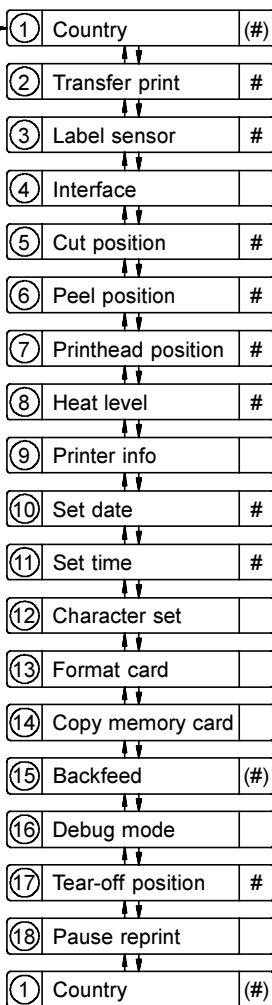
If an already confirmed setting is not desired any more, switch off the printer during the setup mode to cancel changes.

To return to the original factory default settings, press all three keys, the  key, the  key, and the  key simultaneously and keep them pressed down until the display shows "--- RESTORE ---".

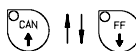
Note, that in some cases the printer may initially be set to certain parameters which may differ from the default settings. (e.g. "Country")
On the following pages, you will find details to change the setting of the parameters.

Overview of the Setup Parameters

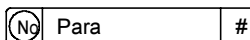
Starting Setup



Scrolling up/down the parameters :



Definition of the list items :



- No Item number
- Para Name of the parameter
- # Parameter may be altered via software
- (#) Parameter is limited changeable via software

Fig. 9 a Setup parameters

Country/Land

The Parameter "Country" (or "Land") allows the LCD display language to be set, which also dictates the format of date and time used for the printer display as well as for printing.

The formats of date and time used for the printout can be altered via software. The language that the prompts on the LCD are displayed in cannot be altered through software, only with the front panel.

Default Setting : USA

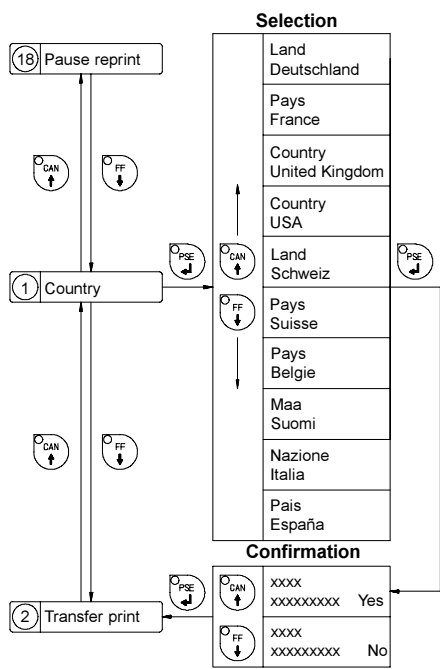


Fig. 9 b Set "Country" parameter

The following table shows the specific settings for the date format and the time format of all countries available.

	Date	Time
Land Deutschland	08.06.1998	13:51:23
Pays France	08.06.1998	13:51:23
Country United Kingdom	08/06/1998	13:51:23
Country USA	06-08-1998	01:51:23 pm
Land Schweiz	08.06.1998	13,51,23
Pays Suisse	08.06.1998	13,51,23
Pays Belgie	08/06/1998	13:51:23
Maa Suomi	08.06.1998	13:51:23
Nazione Italia	08-06-1998	13:51:23
Pais España	08-06-1998	13:51:23

Table 9 Specific format settings for date and time

Transfer Print

The parameter "Transfer print" is used to set the **Apollo 4** to the print mode, either direct thermal printing or thermal transfer printing. This setting has an influence on two factors. On one hand, in thermal transfer mode the printer works at a lower heat level compared to the direct thermal printing mode. On the other hand, the ribbon sensor is only active in thermal transfer printing mode.



This parameters can also be changed via software. For different print jobs it is recommended that you carry out all changes in the **software**.

Default Setting : Transfer print ON

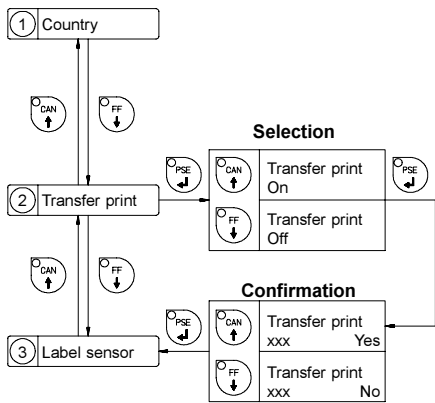


Fig. 9 c Set "Transfer print" parameter

Label Sensor

The printers of the **Apollo 4** series are generally equipped with a gap sensor recognizing the front edge of the label. This sensor evaluates the different transparency of the material in the area of the labels and the label gaps.

For the **Apollo 4** printers with integrated cutter (**Apollo 4/200C**, **Apollo 4/300C**) which will be prepared it is also possible to recognize the labels through reflective marks at the bottom side of the material.



This parameter can also be changed via software. For different print jobs it is recommended that you do the changes in the **software**.

Default Setting : Gap sensor

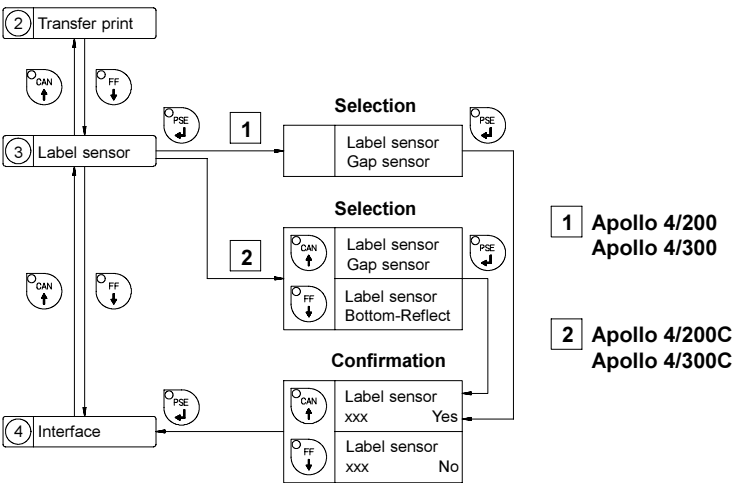


Fig. 9 d Set "Label sensor" parameter

Interface

The settings of this parameter determine the method of communication between printer and computer.

Therefore, the type of interface and, if necessary, the baud rate, and the protocol or network address can be specified.

The parameter setting cannot be changed via software.

Default Setting : Interface RS-232, baud rate 9600, protocol RTS/CTS
 (network address A)

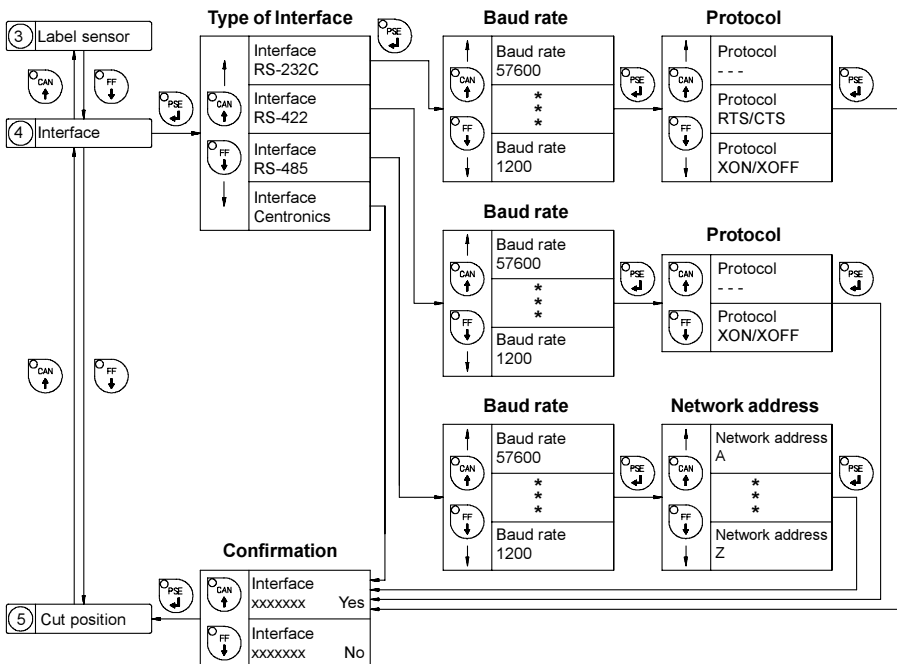


Fig. 9 e Set "Interface" parameter

Cut Position

The parameter "Cut Position" is only important for the **Apollo 4** with integrated cutter (**Apollo 4/200C,Apollo 4/300C**). The distance between cutting edge and rear label edge may be altered at these devices by using this parameter. Normally, with the initial offset value of "0" the cutting edge is in the middle of the gap between two labels. Adjustments have to be carried out only once after a cutter has been installed. (range from -.33 to +.33 in or -8.4mm to +8.4mm) If the cut position value is positive, the media will be advanced before it is cut, that means there is a greater distance between the cutting edge and the rear edge of the label.



It is recommended that you carry out changes for single print jobs in the software. (e.g. if the cut is not wanted in the middle of the gap)
The software provides a second value for individual adjustments.

Any front panel value and software command value are totaled together for printing.

The current field to be changed is flashing in the display.

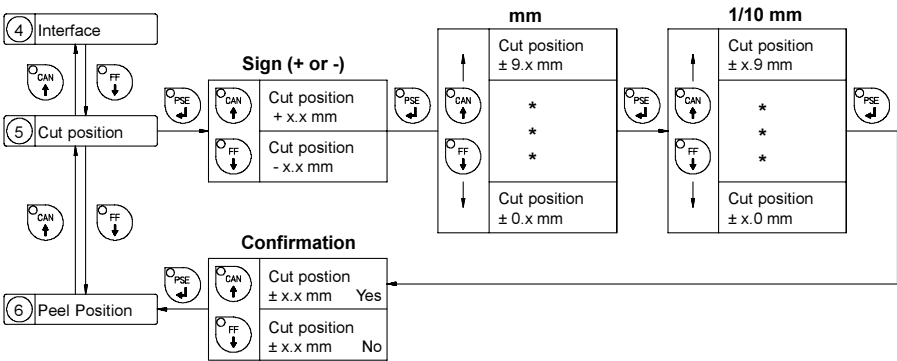


Fig. 9 f Set "Cut Position" parameter

Peel Position

By activating the function "Tear-off Position" (see also page 65) an additional feed forward will take place after completion of the print job. This additional forward allows to separate the finished job at the tear-off plate in the label gap after the last printed label.

The tear-off edge should be in the middle of the label gap, if the value of the peel position is "0".

Tolerances may be equalized by adjusting the peel position (adjustment range - 8,4mm until +8,4mm). If the offset values are positive, the paper will be forwarded after completion of the print job. It means that the distance between the tear-off #edge and the rear label edge will be greater.

The current field to be changed is flashing in the display.

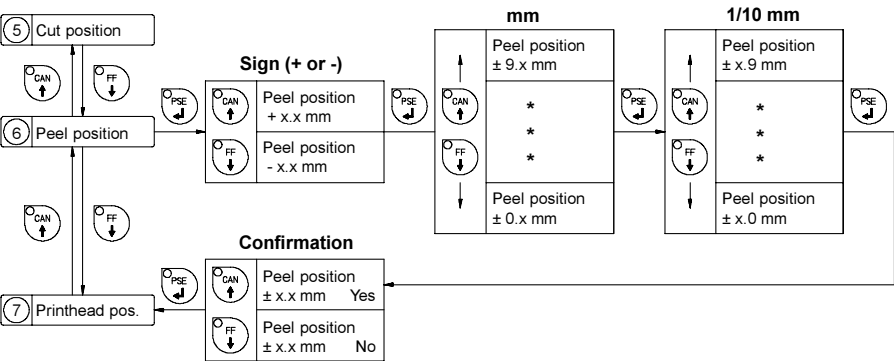


Fig. 9 g Set "Peel Position" parameter

Printhead Position

The "Printhead position" parameter defines the location of the print image on the label. The parameter should especially be altered if you are using the same label formats on several printers, and you find the print image located differently on the labels when they were printed on another printer. (range from -.33 to +.33 in or -8.4 mm to +8.4 mm). If the printhead position value is positive, the print image is shifted further to the rear edge of the label.



Attention ! A change of the printhead position value influences the tear-off and the cut position. For that reason alter the values of the parameters "Peel position" and "Cut position" by the same amount like the "Printhead position" but in the opposite direction.

Adjustments for various print jobs may also be carried out via software which provides an additional offset value. Any front panel value and software command value are totaled together for printing.

The current field to be changed is flashing.

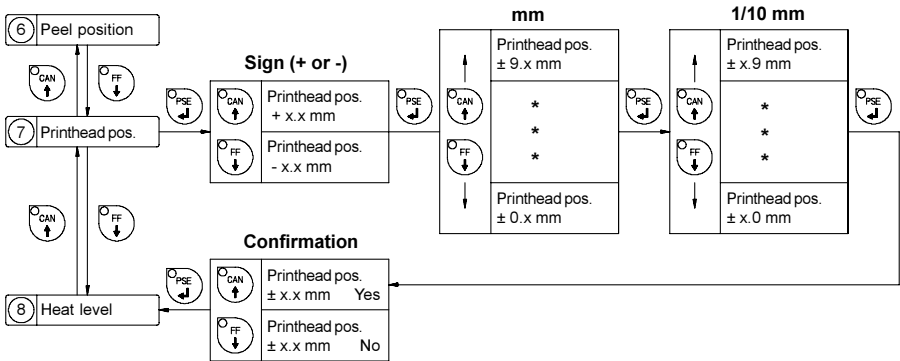


Fig. 9 h Set "Printhead position" parameter

Heat Level

The parameter "Heat level" enables the printer to adapt to possible differences in the thermal properties of different printheads.

The parameter scale is from -9 to +9.

A previous adjustment has already been carried out in the factory.

In the event of replacing the printhead, the setting possibly has to be adjusted.



To adjust the printer to current print jobs, it is recommended that you alter the heat level parameter via software. (e.g. for different material and speed)

Any front panel value and software command value are totaled together for printing.

The current field to be changed is flashing in the display.

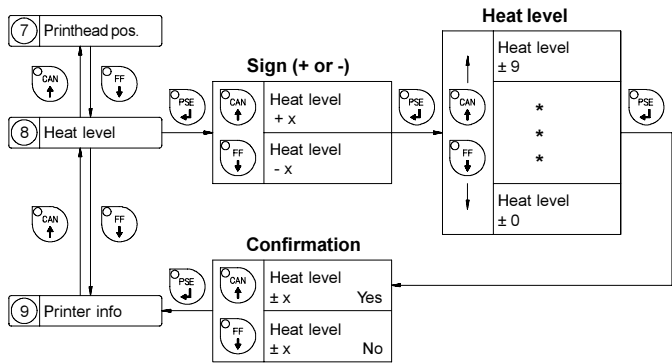


Fig. 9 i Set "Heat level" parameter

Printer Info

The "Printer info" parameter provides information about the firmware. Furthermore, information about the cumulative length of printed media as well as the number of operating hours are shown.

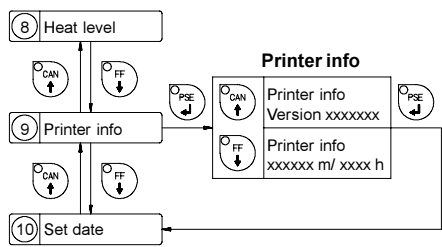



Fig. 9 k Printer info display

Set Date

The "Set date" parameter allows you to change the system date of the **Apollo 4**.
The date format shown depends on the selected "Country" parameter.
Regardless of the format, the order of data to be changed (day - month - year) always follows the same routine as shown below. (Figure 9 I)

The date range available is from January 1, 1970, to December 31, 2069.

If an invalid date entry is made, the display shows "Invalid input!"

After pressing the  key the parameter may be set again.

Date changes in the software will only influence the date on the printout but not affect the system date as stored in the setup.

The current field to be changed is flashing in the display.

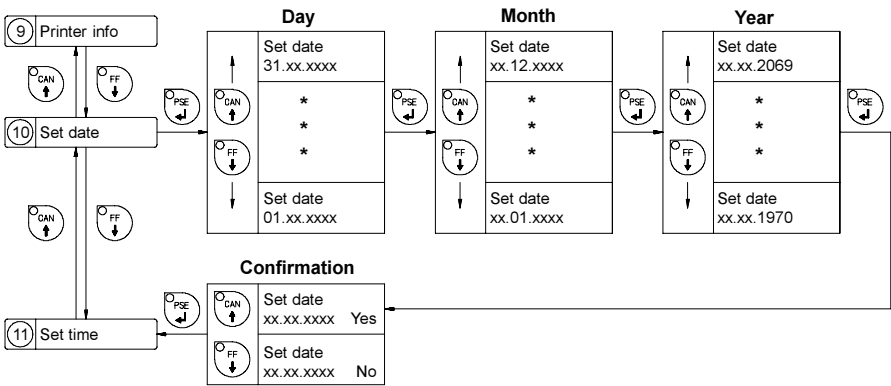


Fig. 9 I Set system date

Set Time

The "Set time" parameter allows you to change the system time of the **Apollo 4**.
The time format shown in the display depends on the selected "Country" parameter.

Time changes in the software will only influence the printout but not affect the system time of the printer. The changed time will neither be shown in the display nor be stored in the printer setup.

The current field to be changed is flashing in the display.

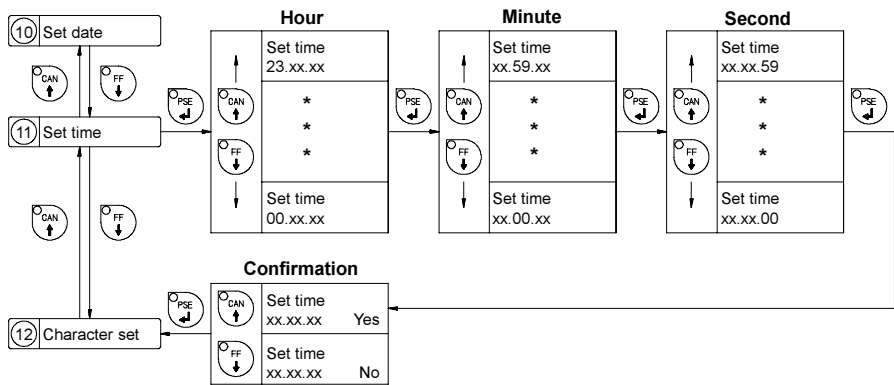


Fig. 9 m Set system time

Character Set

Before starting to operate the **Apollo 4**, the "Character set" of the printer should be adapted to the character set of the computer.

Adjustment via software is not possible, however, for characters which are not included in the selected fonts the Unicode character table can be used.

The character set tables are included in Appendix A.

Default Setting : Windows 1252

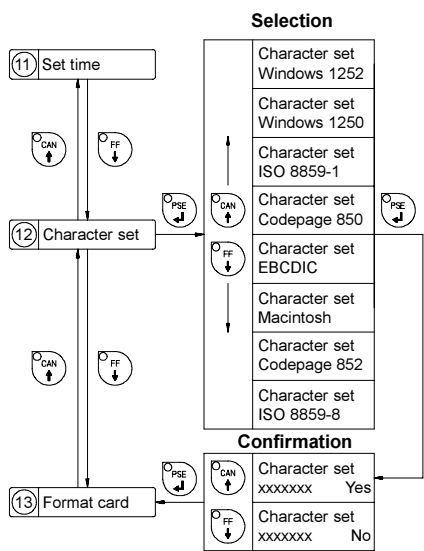


Fig. 9 n Set "Character set" parameter

Format Card

The "Format card" facility may be used to delete all stored data from a memory card, for instance PC card, PCMCIA card, etc. (optional)
The delete process will format the card. Therefore, this option may also be used to prepare new memory cards for operation.

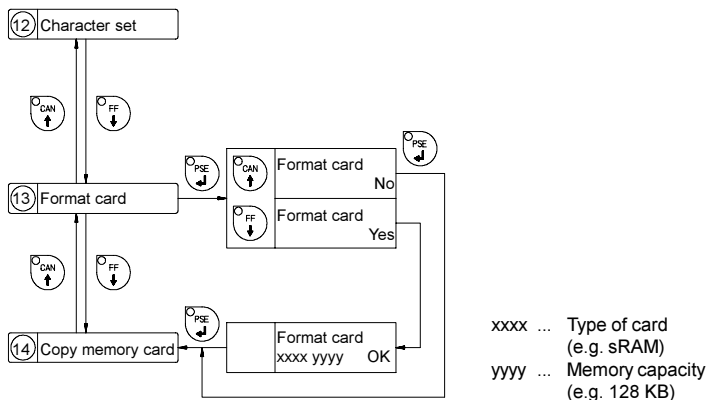



Fig. 9 o Delete/Format a memory card

If the procedure has been started without having a card installed the display will show "No card".

Pressing the  key will skip to the following parameter.

Copy Memory Card

The "Copy memory card" facility may be used to copy information from one memory card, for instance PC card, PCMCIA card, etc., onto another one.



Before starting the duplication, the source card has to be installed.

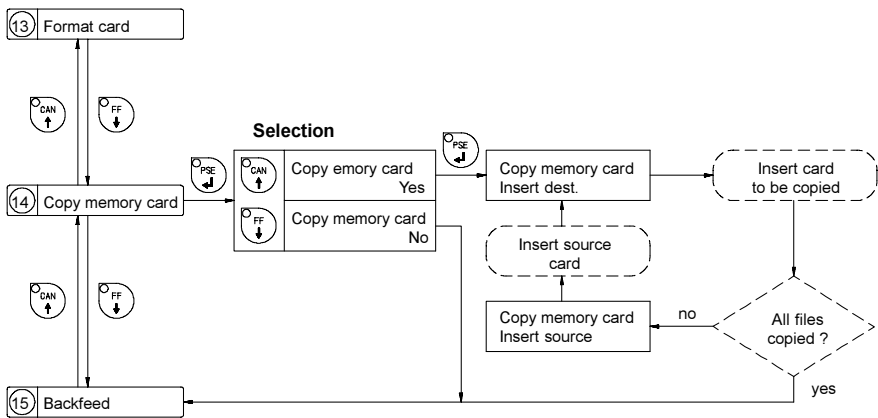


Fig. 9 p Copy memory card

The duplication is carried out file by file. This allows the usage of memory cards with different capacities.

When the duplicate card cannot store any more information the display shows "Card full".

If data with a capacity of more than 1Megabyte has to be copied, the duplication process will be divided into several cycles. Alternately, the printer display will ask to insert either the source card or the duplicate card.

Backfeed

In the cut mode (**Apollo 4/200C**, **Apollo 4/300C**), the material will be stopped in a position where the front edge of the following label has already been forwarded over the print line. The **Apollo 4** will carry out a backfeed of the label material from its cut position to the print line. Thus, the next label can be printed all at once.

The backfeed will be performed independent of the label design if the parameter is set on "always". If the setting is on "smart", the backfeed will only be performed if the front label is in its cut position and the **Apollo 4** has not yet received all of the data for printing the following label. Otherwise, the print of the second label will be started, but only completed after the first one has been picked up. Smart backfeed can cause flaws in the printed image.

Default Setting : smart

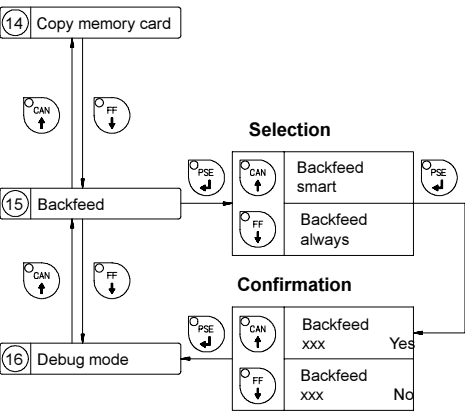


Fig. 9 q Set "Backfeed" parameter

Debug Mode

The "Debug mode" represents a tool for the firmware programmer. It will help to recognize faults and their possible sources beyond standard error messages.

For standard use of the printer, the parameter should always be switched OFF.

Default Setting : Debug mode OFF

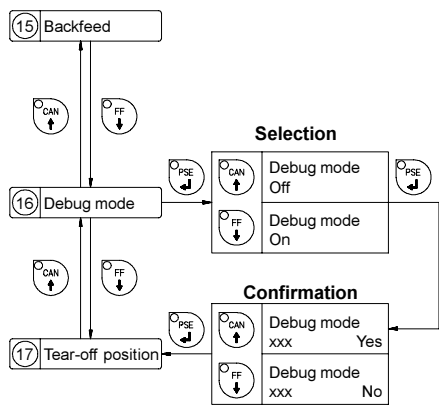


Fig. 9 r Set "Debug mode"

Tear-off Position

If the "Tear-off position" is active, an additional feed forward will take place after completion of the print job. This makes it possible to tear off the last label at the tear-off plate. After starting a new print job, first the label material will be fed back until the front edge of the first label is located at the print line. If the parameter is OFF, the label dispense stops immediately after the last label has completely passed the print line.

Default Setting : Tear-off position OFF

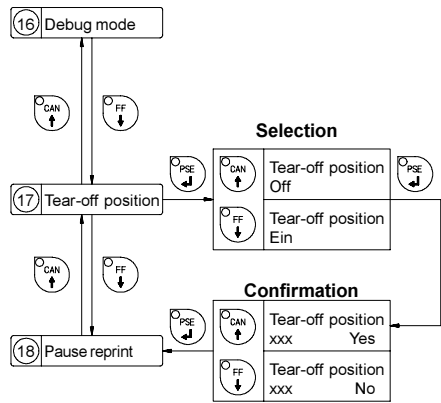



Fig. 9 s Set "Tear-off position" parameter

Pause Reprint

After completion of a print job, the print of the last label may be repeated by pressing the  key.

This function may be switched ON or OFF in the "Pause reprint" parameter of the setup mode.

Default Setting : Pause Reprint ON

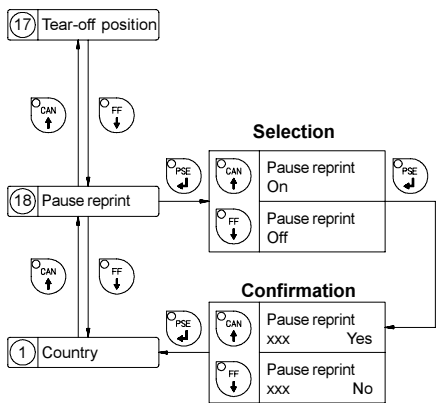


Fig. 9 t Set "Pause Reprint" parameter

10 Self Test / Test Print


Start of Test Print

To prepare a test print, load media (labels or continuous paper) which extends over the entire print width of the **Apollo 4**.

If you want to perform the test print in thermal transfer mode, also use transfer ribbon of the maximum width.



During test print, the Apollo will not sense any label gaps. The length of the printout will be about 9 in (230 mm). Endless paper would suit best for test prints, otherwise, a normal sheet of A4 paper which is cut to a width of 4.6 in (116 mm) can be used in thermal transfer mode.


To initiate a self test printout, press the  key when switching on the printer and keep it pressed down until the system test is completed.

The display shows "Test print", and the **Apollo 4** will print an internal test sample which contains a variety of information about the configuration of the printer as well as the results of the internal test.

The test printout can also include a range of hardware errors which have occurred previously, even if they have disappeared again. This information is important for service purposes and can only be deleted by Technical Support.

The information in the printout is also useful for checking the print quality, such as differences in the blackness left/right, missing ink dots, etc. It is recommended you carry out a print test immediately after receiving the printer.

After completing the test print, the **Apollo 4** will run the system test once again. Then, the printer proceeds to ONLINE mode.

To cancel the test print press the  key.

Explanation of the Self Test Printout

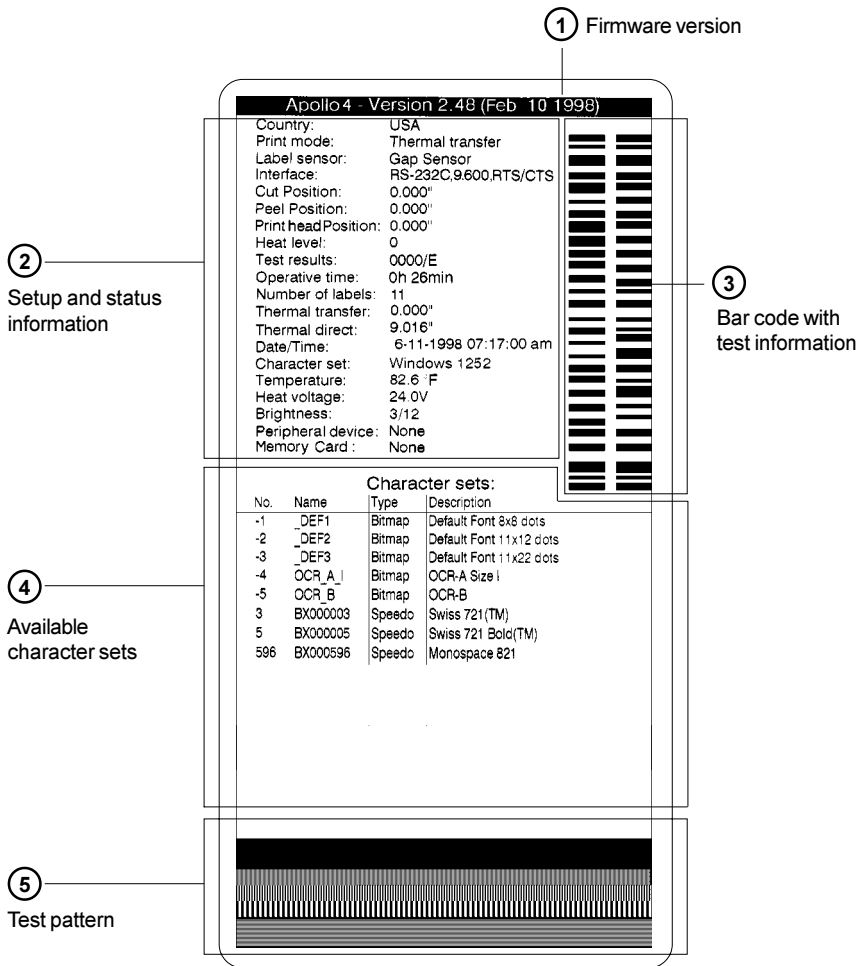


Fig. 10 Self test printout

On the following pages you will find detailed information about the contents of the test printout.

① Firmware Version

Type of device, part number, and date of the firmware version.

② Setup and Status Information

Country	: Setting of the "Country" parameter
Print mode	: Setting of the "Transfer print" parameter
Label sensor	: Setting of the "Label sensor" parameter
Interface	: Setting of the "Interface" parameter
Cut Position	: Setting of the "Cut position" parameter
Peel Position	: Setting of the "Peel position" parameter
Printhead Pos.	: Setting of the "Printhead position" parameter
Heat level	: Setting of the "Heat level" parameter
Test result	: Result of the system test. Any errors will be shown coded as four digit hexadecimal numbers. (see Table 10) (for fault correction see Appendix C) The letter behind the "/" sign indicates the state of modification of the hardware. (board)
Operative time	: Cumulative operating time of the printer
Number of labels:	: Cumulative amount of printed labels
Thermal transfer:	: Cumulative length of printed material in thermal transfer mode
Thermal direct	: Cumulative length of printed material in direct thermal mode
Date/Time	: Setting of system date and system time
Character set	: Setting of the "Character set" parameter
Temperature	: Printhead temperature
Heat voltage	: Current value of heat voltage at Apollo 4/200 and Apollo 4/200C approx. 24V at Apollo 4/300 and Apollo 4/300C approx. 20V
Brightness	: Service information on brightness used at gap sensor
Peripheral device:	: Type of device connected to peripheral port
Memory card	: Type and capacity of memory card (PCMCIA/PC card)

Error code		Type of error
HEX	DEC	
0001	1	dRAM fault
0002	2	dRAM multiplexer fault
0004	4	A/D converter fault
0008	8	
0010	16	sRAM fault
0020	32	LCD damaged
0040	64	Cutter fault
0080	128	ROM fault
0100	256	Voltage error
0200	512	
0400	1024	
0800	2048	
1000	4096	Wrong board revision Setup invalid
2000	8192	
4000	16384	
8000	32768	

For the test result, the codes of occurred errors are added up to a four-digit hexadecimal number to determine the final test result.

For example : A/D converter fault + LCD damaged : Test result = 0024

Table 10 Self test - Test result error codes

③ Bar Code with Test Information

This special bar code is designed for use by Technical Service. It contains compressed information about the current configuration of the **Apollo 4** as well as previously occurred faults.

④ Existing Character Sets

No.	:	Identification No. of the font for programming (command T)
Name	:	Name of font used for internal storing Name of command (query sequence) q...CR
Type	:	Method of generating the characters (see programming of command T)
Description	:	Font description (size, type)



⑤ Test Pattern


The test pattern field contains seven areas with different stroke patterns. With these patterns a range of print faults can be analyzed. The printout shows errors such as varying print intensity which indicates the printhead being misadjusted or dirty, or missing ink dots causing vertical white lines.

11 Printer Info Display

Viewing the Printer Info Display

Apollo 4 offers a convenient option for retrieving and viewing information about the printer configuration and occurred hardware problems without using setup mode or test print mode.

After switching on, or completing the system test or print jobs, the printer is in ONLINE mode. Pressing the  key will switch into OFFLINE mode where the display shows the status information on five different pages which are accessible by repeatedly pressing the  key.

The printer info display can be exited by pressing the  key. (back into ONLINE mode)

Definition of the Printer Info Display

Printer info
1: RS 232 / RTS/CTS

Fig. 11 a Printer info display 1

On the first page, the selected interface (RS-232, RS-422, RS-485, Centronics) and, in case of a serial interface, the handshake or protocol (RTS/ CTS or - - -) will be shown.

Printer info
2: 9.600

Fig. 11 b Printer info display 2

The second page contains information about the fixed baud rate of the serial interface. When the parallel interface has been selected (Centronics), the second page of the display is not applicable and shows three dashes.

Printer info
3: 2.48 / Feb 10 98

Fig. 11 c Printer info display 3

On the third page, the version and the date of the firmware are shown. The example as shown in Figure 11c represents the firmware version No. 2.48 as at February 10, 1998.

Printer info
4: 0000 / 3 / 5 / E

Fig. 11 d Printer info display 4

The fourth page of the info display contains coded informations on the configuration of the printer and the internal test results in the format "xxxx / y / z / C".

- xxxx Result of the system test
The four-digit hexadecimal number contains (coded) hardware faults.
The figure is the same as in the printout of the self test.
For fault encoding see code Table 10 in chapter 10 "Self Test".
The example, as shown in Figure 11d, displays "0000" indicating that there have been no hardware faults.
- y Type of peripheral device
0 : Cutter
3 : None fitted
4 : External print start
For example, Figure 11 d : "3" - No peripheral device connected.
- z Configuration setting Transfer print/ Label sensor
The value of z results from adding the code numbers for selected settings.
Transfer print : 1 = ON
 0 = OFF
Label sensor : 8 = Bottom-Reflect
 4 = Gap sensor
For example, Figure 11d : "5" - Transfer print ON (1) + Gap sensor (4).
- C The letter behind the "/" sign represents the state of modification of the hardware. (board)

Printer info
5: Windows 1252

Fig. 11 e Printer info display 5

The last of the info pages shows the name of the character set as selected in setup.


12 Monitor Mode/ ASCII Dump Mode


If programming directly, the monitor mode provides a method to print control sequences which were received at the interface. The commands will be printed in text format depending on the selected character set. Error messages will be printed directly behind the fault, e.g. for unknown commands. In monitor mode, the **Apollo** will not recognize gaps between labels nor control the ribbon feed.




The font used for printouts in monitor mode is suitable to send by facsimile. For questions or future reference, print and retain one copy of the label format for each label printed.

Start of Monitor Mode/ ASCII Dump Mode

To start the monitor mode, press the  key while switching on the printer, and keep it pressed down until the system test is completed. The display shows "ASCII Dump Mode".

To cancel ASCII Dump mode, press the  key.

In monitor mode, the print of data will be started after every four lines of data received. Therefore, in some cases, the last lines of the label have to be retrieved by pressing the  key.

Representation of the Control Characters

The control characters (ASCII Code 00 ... 31) as shown in monitor mode printouts are as follows.

Code DEC | HEX	Druck	Code DEC | HEX	Druck	Code DEC | HEX	Druck	Code DEC | HEX	Druck
00 | 00	N _L	08 | 08	B _S	16 | 10	D _L E	24 | 18	C _A N
01 | 01	S _O H	09 | 09	H _T	17 | 11	D _C 1	25 | 19	E _M
02 | 02	S _T X	10 | 0A	L _F	18 | 12	D _C 2	26 | 1A	S _U B
03 | 03	E _T X	11 | 0B	V _T	19 | 13	D _C 3	27 | 1B	E _S C
04 | 04	E _O T	12 | 0C	F _F	20 | 14	D _C 4	28 | 1C	F _S
05 | 05	E _N D	13 | 0D	C _R	21 | 15	N _A K	29 | 1D	G _S
06 | 06	A _C K	14 | 0E	S _O	22 | 16	S _Y N	30 | 1E	R _S
07 | 07	B _E L	15 | 0F	S _I	23 | 17	E _T B	31 | 1F	U _S

Table 12 Representation of the control characters in monitor mode

Example of ASCII Dump Mode

The following figures show the "normal" appearance of a printed label, and the appearance of the same label when its commands are printed in ASCII Dump mode.

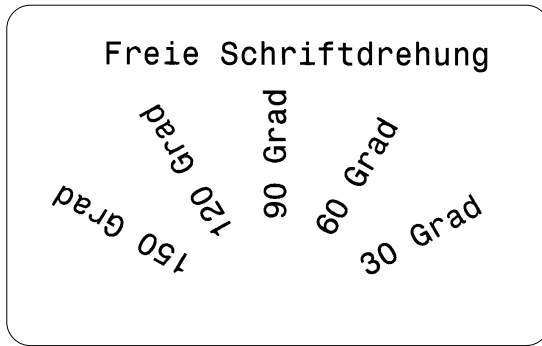


Fig. 12 a "Normal" label

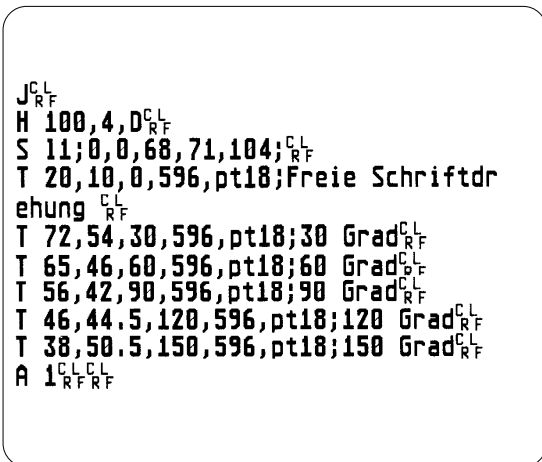


Fig. 12 b The same label as above printed in ASCII Dump mode

13 Options

Memory Cards

The printers of the **Apollo 4** series provide an option for using memory cards to permanently save graphics, fonts, complete label formats, or database information. Data transfer may be performed via interface. Alternatively, the printer is able to read from cards which has been written on in PC card drives of lap-tops or other computers, etc.



Note : Even though PCMCIA cards are non-volatile memory it is a good practice to have a back up in case the original card malfunction.

The **Apollo 4** is able to read from PCMCIA version 2.1 compatible sRAM cards or Flash-EPROM cards. The maximum memory capacity is 16 MegaByte.

Preparing the Memory Card

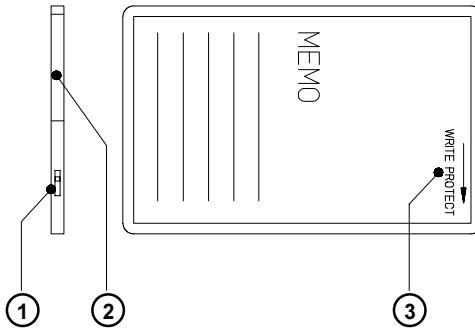


Fig. 13 a Write protection/ Inserting the battery

The write protection of the card may be activated or deactivated by shifting the switch (1) located at the front side of the card. The interpretation of the setting may be read from an imprint (3) on the back of the card.

If you want to format the card or write on it, switch off the write protection.

In case the battery has to be replaced, it is usually found in a slot (2) above the switch (1).

For replacing or inserting the battery in sRAM cards refer to the instructions of the manufacturer.

Installation of the Memory Card

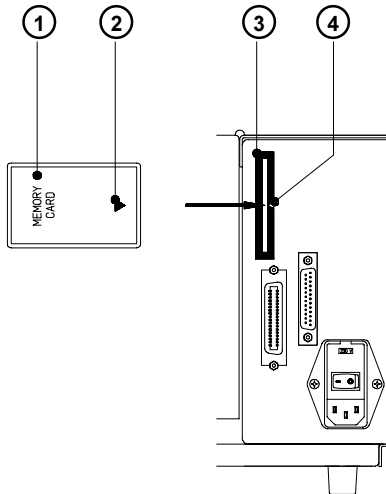


Fig. 13 b Installation of the memory card

Fig. 13 c Connecting side



The front side of the memory card (1) is usually marked by the inscription "MEMORY CARD", and an arrow (2) representing the direction of inserting the card into the drive. There is also an arrow (4) impressed into the frame of the memory card slot of the **Apollo 4**.

Insert the card (1) into the slot (3) so that the front of the card faces the arrow (4).

At the connecting side of the card there are different guides on the top and the bottom which make it impossible to insert the card incorrectly.

Formatting the Memory Card

For operation, the memory card first has to be structured internally in a certain way. Normally, memory cards are already pre-formatted in a suitable manner. If the card you are using is not formatted at all, the **Apollo 4** will bring up one of the messages "Unknown card" or "Structural err." Then, you may format the card using one of the following three methods :

- 1. Formatting the card using a PC card drive of a lap-top and the DOS command "FORMAT".
- 2. Formatting the card using the **Apollo 4** setup command "Format card". (see Chapter 9)
- 3. Formatting the card using the **Apollo 4** interface and the printer command "Mf;name CR".

Writing on the Memory Card

There are also different methods to write onto a memory card. The easiest way is to copy label formats, graphics, or font files directly onto the card using a PC card drive of a lap-top or another computer and the DOS command "COPY".

Another way is to write on the card using the card drive of the **Apollo 4** and transfer the data via interface.

For saving a label, you need to put the label design commands into "brackets" consisting of "Ms"-commands :

Ms LBL;ABC	Command to save a file called "ABC"
J	|
H 100,0,T	|
S I1;0,0,68,71,108	| Contents of the file "ABC"
T 10,10,0,3,pt15;Memory card	|
A 1[NOPRINT]	|
Ms LBL	End of Save File command










After completing the commands the file "ABC" is stored on the card with all commands from "J" to "A" which describe the label format. The parameter [NOPRINT] used within the command A line will suppress the print of the label while saving the file. Whenever the file "ABC" is called up, exactly one label will be printed. If you want to print the label in a variable quantity do not use the A command within the label description.

Printing from a Memory Card



Using a memory card provides the opportunity to print without a connection of the **Apollo 4** to a computer.

Follow the instructions below, after the card has been installed and the printer has been switched ON :

1. Switch printer into OFFLINE mode by pressing the  key.
2. After pressing the  key, the file name of the first label saved on the card will be shown.
3. Using the  key and the  key, you may scroll up and down the contents of the card. Confirm the selection by pressing the  key.
4. If you have chosen a label with a set number of labels to print, the **Apollo 4** will instantly start printing.
5. For labels with a variable number of labels, the top line of the display shows "Number of labels", the bottom line shows "00001" with the first figure flashing. (cursor)
Using the  key and the  key, the figure at the position of the cursor may be altered. By pressing the  key the cursor can be moved on to the next figure. After confirming of the last figure, the **Apollo 4** starts to print.
6. To pause the selection of a label or the input of the number of labels you may press the  key.

The data saved on the card is also accessible via interface and computer.

Keyboard Adapter

The **keyboard adapter** option offers to connect the **Apollo** to a standard PC keyboard or any other compatible input device (e.g. a bar code scanner) via its serial interface. Using the keyboard, print jobs of an internal PC card may be loaded and variable data may be altered. Input data requests as well as data received from the keyboard will be shown in the display of the **Apollo**.

The keyboard adapter is designed for use with all keyboards which fulfill the following requirements : MF-2 compatible, having a 5pin DIN plug, supporting code set 3, and also operating with a maximum of 15 kBaud.



The current consumption of the connected keyboard or scanner must not exceed **100 mA**.

Installation of the Keyboard Adapter

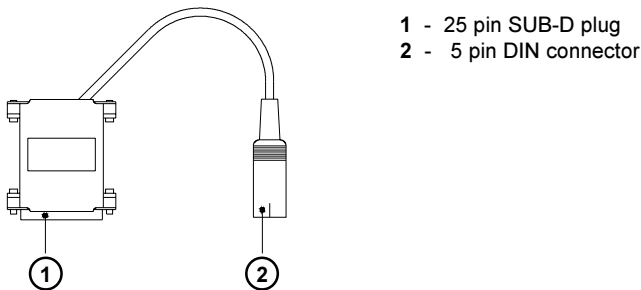


Fig. 13 d Keyboard adapter

1. Change the interface setting to "RS232C, 9600 Baud, RTS/CTS" and confirm.
2. Connect the 25 pin plug (1) of the keyboard adapter to the serial interface connector at the rear of the printer.
Make sure that the printer is switched OFF !
3. Connect the keyboard to the 5 pin DIN connector (2) of the keyboard adapter.

Key Assignment

The **Apollo 4** can easily be adjusted to the keyboard configuration of the particular country by using the setup parameter "Country". For each of the available settings the **Apollo 4** has a different table of key assignment, which, generally, complies with the assignment under Microsoft DOS.

The [ALTGR] key has no function. Therefore, all signs which are located on the right hand side of the key opposite of the normal characters (e.g. { } [] \) can be generated by pressing the [ALT] key. A few of the other special signs (e.g. " ° × ÷) may also be generated the same way. (see Appendix A Table A-3a)

Other special characters (e.g. ñ ç œ) can be generated by inserting two characters one after the other, where the second input is a combination with the [ALT] key. (see Appendix A Table A-3b)

Some of the special characters cannot be shown in the display of the printer. In that case, the **Apollo 4** will use a character which looks similar to the required character.



When using a scanner, the character set of the scanner has to be the same as used by the **Apollo 4**.

Special Key Functions

[F1]	To enter the list of labels stored on the memory card.
[F2]	To repeat the print of the last label. (as command A 1 CR)
[F3]	To repeat the print of the last label including a new enquiry for variable data.
[Shift]+[F5]	To start the monitor mode/ASCII dump mode.
[Shift]+[F6]	To start the self test printout.
[F7]	Printer Info Display
[F8]	Form feed
[ENTER] or [RETURN]	Without a current print job : to switch between ONLINE and OFFLINE; While processing a print job : to confirm the data input.
[ESC]	To cancel the data input. (while printing same effect as CANCEL)
[SPACE]	While printing same effect as PAUSE.
[Shift]+[Del]	To delete the input line.
[↑],[↓]	To scroll up/down the list of labels on the memory card.

This page is intentionally left blank.

Appendix A - Character Tables

Setup Selectable Character Tables

	0..	1..	2..	3..	4..	5..	6..	7..	8..	9..	A..	B..	C..	D..	E..	F..
..0	□	□		0	@	P	`	p	□	□		°	À	Ð	à	ð
..1	□	□	!	1	A	Q	a	q	□	‘	i	±	Á	Ñ	á	ñ
..2	□	□	"	2	B	R	b	r	,	'	¢	²	Â	Ò	â	ò
..3	□	□	#	3	C	S	c	s	f	“	£	³	Ã	Ó	ã	ó
..4	□	□	\$	4	D	T	d	t	”	”	¤	´	Ä	Ô	ä	ô
..5	□	□	%	5	E	U	e	u	...	•	¥	μ	Å	Ö	å	ö
..6	□	□	&	6	F	V	f	v	†	—	|	¶	Æ	Ö	æ	ö
..7	□	□	'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
..8	□	□	(	8	H	X	h	x	ˆ	˜	¨	˘	È	Ø	è	ø
..9	□	□	)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
..A	□	□	*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú
..B	□	□	+	;	K	[	k	{	‹	›	«	»	Ë	Û	ë	û
..C	□	□	,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü
..D	□	□	-	=	M	]	m	}	□	□	-	½	Í	Ý	í	ý
..E	□	□	.	>	N	^	n	~	□	□	®	¾	Î	Þ	î	þ
..F	□	□	/	?	O	_	o	△	□	ÿ	˘	¿	Ï	ß	ï	ÿ

Table A-1 a Character set "Windows 1252"

	0..	1..	2..	3..	4..	5..	6..	7..	8..	9..	A..	B..	C..	D..	E..	F..
..0	□	□		0	@	P	`	p	□	□		°		Đ		đ
..1	□	□	!	1	A	Q	a	q	□	‘	˘	±	Á	Ñ	á	ñ
..2	□	□	"	2	B	R	b	r	,	'	˘		Â	Ň	â	ň
..3	□	□	#	3	C	S	c	s	□	“	Ł	ł	Ă	Ó	ă	ó
..4	□	□	\$	4	D	T	d	t	„	”	ⱡ	’	Ä	Ô	ä	ô
..5	□	□	%	5	E	U	e	u	...	•	À	μ	Í	Õ	í	õ
..6	□	□	&	6	F	V	f	v	†	—	ı	¶	Č	Ö	č	ö
..7	□	□	'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
..8	□	□	(	8	H	X	h	x	□	□	”	„	Č	Ř	č	ř
..9	□	□	)	9	I	Y	i	y	‰	™	©	ạ	É	Ů	é	ů
..A	□	□	*	:	J	Z	j	z	Š	š	Ş	ş	È	Ú	è	ú
..B	□	□	+	;	K	[	k	{	‹	›	«	»	Ě	Ů	ě	ů
..C	□	□	,	<	L	\	l	|	Š	ś	¬	Ł	Ě	Ü	ě	ü
..D	□	□	-	=	M	]	m	}	T	t	-	”	Í	Ý	í	ý
..E	□	□	.	>	N	^	n	~	Ž	ž	®	İ	Î	Ț	î	ț
..F	□	□	/	?	O	_	o	△	Ž	ž	Ž	ž	D'	ß	d'	·

Table A-1 b Character set " Windows 1250"

	0..	1..	2..	3..	4..	5..	6..	7..	8..	9..	A..	B..	C..	D..	E..	F..
..0	□	□		0	@	P	`	p	□	□		°	À	Đ	à	ð
..1	□	□	!	1	A	Q	a	q	□	□	i	±	Á	Ñ	á	ñ
..2	□	□	"	2	B	R	b	r	□	□	¢	²	Â	Ò	â	ò
..3	□	□	#	3	C	S	c	s	□	□	£	³	Ã	Ó	ã	ó
..4	□	□	\$	4	D	T	d	t	□	□	¤	´	Ä	Ô	ä	ô
..5	□	□	%	5	E	U	e	u	□	□	¥	µ	Å	Ö	å	ö
..6	□	□	&	6	F	V	f	v	□	□	|	¶	Æ	Ö	æ	ö
..7	□	□	'	7	G	W	g	w	□	□	§	·	Ç	×	ç	÷
..8	□	□	(	8	H	X	h	x	□	□	¨	¸	È	Ø	è	ø
..9	□	□	)	9	I	Y	i	y	□	□	©	¹	É	Ù	é	ù
..A	□	□	*	:	J	Z	j	z	□	□	ª	º	Ê	Ú	ê	ú
..B	□	□	+	;	K	[	k	{	□	□	«	»	Ë	Û	ë	û
..C	□	□	,	<	L	\	l	|	□	□	¬	¼	Ì	Ü	ì	ü
..D	□	□	-	=	M	]	m	}	□	□	-	½	Í	Ý	í	ý
..E	□	□	.	>	N	^	n	~	□	□	®	¾	Î	Þ	î	þ
..F	□	□	/	?	O	_	o	△	□	□	™	¿	Ï	ß	ï	ÿ

Table A-1 c Character set " ISO 8859-1"

	0..	1..	2..	3..	4..	5..	6..	7..	8..	9..	A..	B..	C..	D..	E..	F..
..0	□	□		0	@	P	`	p	Ç	É	á	■	⌌	ø	Ó	-
..1	□	□	!	1	A	Q	a	q	ü	æ	í	■	⌌	Ð	β	±
..2	□	□	"	2	B	R	b	r	é	Æ	ó	■	⌌	Ê	Ô	=
..3	□	□	#	3	C	S	c	s	â	ô	ú	⌌	⌌	Ë	Ò	¾
..4	□	□	\$	4	D	T	d	t	ä	ö	ñ	⌌	⌌	È	õ	¶
..5	□	□	%	5	E	U	e	u	à	ò	Ñ	Á	⌌	ı	Õ	§
..6	□	□	&	6	F	V	f	v	â	û	ª	Â	ã	ı	μ	÷
..7	□	□	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	°
..8	□	□	(	8	H	X	h	x	ê	ÿ	ı	©	⌌	İ	ƒ	
..9	□	□	)	9	I	Y	i	y	ë	Ö	®	⌌	⌌	⌌	Ú	"
..A	□	□	*	:	J	Z	j	z	è	Ü	¬	⌌	⌌	⌌	Û	·
..B	□	□	+	;	K	[	k	{	ï	ø	½	⌌	⌌	■	Ü	¹
..C	□	□	,	<	L	\	l	|	î	£	¼	⌌	⌌	■	Ý	³
..D	□	□	-	=	M	]	m	}	ì	Ø	ı	¢	=	ı	Ÿ	²
..E	□	□	.	>	N	^	n	~	Ä	×	«	¥	⌌	ı	˘	■
..F	□	□	/	?	O	_	o	△	Å	f	»	⌌	⌌	■	'	

Table A-1 d Character set "Codepage 850"

	0..	1..	2..	3..	4..	5..	6..	7..	8..	9..	A..	B..	C..	D..	E..	F..
..0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		&	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	{	}	\	0
..1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	/	<input type="checkbox"/>	a	j	~	<input type="checkbox"/>	A	J	<input type="checkbox"/>	1
..2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	b	k	s	<input type="checkbox"/>	B	K	S	2
..3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	c	l	t	<input type="checkbox"/>	C	L	T	3
..4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	d	m	u	<input type="checkbox"/>	D	M	U	4
..5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	e	n	v	<input type="checkbox"/>	E	N	V	5
..6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	f	o	w	<input type="checkbox"/>	F	O	W	6
..7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	g	p	x	<input type="checkbox"/>	G	P	X	7
..8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	h	q	y	<input type="checkbox"/>	H	Q	Y	8
..9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	i	r	z	<input type="checkbox"/>	I	R	Z	9
..A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	¢	!	<input type="checkbox"/>	:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
..B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.	\$,	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
..C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<	*	%	@	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
..D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	()	_	'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
..E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	+	;	>	=	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
..F	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		¬	?	"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table A-1 e Character set "EBCDIC"

	0..	1..	2..	3..	4..	5..	6..	7..	8..	9..	A..	B..	C..	D..	E..	F..
..0	□	□		0	@	P	`	p	Ä	ê	†	∞	ı	-	‡	
..1	□	□	!	1	A	Q	a	q	Å	ë	°	±	ı	—	·	Ò
..2	□	□	"	2	B	R	b	r	Ç	í	¢	≤	¬	“	,	Ó
..3	□	□	#	3	C	S	c	s	É	ì	£	≥	√	”	„	Ô
..4	□	□	\$	4	D	T	d	t	Ñ	î	§	¥	f	‘	‰	Ù
..5	□	□	%	5	E	U	e	u	Ö	ï	•	μ	≈	’	Â	ı
..6	□	□	&	6	F	V	f	v	Ü	ñ	¶		Δ	÷	Ê	˘
..7	□	□	'	7	G	W	g	w	á	ó	ß	Σ	«		Á	˜
..8	□	□	(	8	H	X	h	x	à	ò	®		»	ÿ	Ë	-
..9	□	□	)	9	I	Y	i	y	â	ô	©	π	...	Ÿ	È	˘
..A	□	□	*	:	J	Z	j	z	ä	ö	™		/	Í	·	
..B	□	□	+	;	K	[	k	{	ã	õ	’	a	Á	¤	Î	°
..C	□	□	,	<	L	\	l	|	å	ú	”	°	Ã	<	Ï	
..D	□	□	-	=	M	]	m	}	ç	ù	≠	Ω	Õ	>	Ì	»
..E	□	□	.	>	N	^	n	~	é	û	Æ	æ	Œ	fi	Ó	
..F	□	□	/	?	O	_	o	△	è	ü	Ø	ø	œ	fl	Ô	§

Table A-1 f Character set "Macintosh"

	0..	1..	2..	3..	4..	5..	6..	7..	8..	9..	A..	B..	C..	D..	E..	F..
..0	□	□		0	@	P	`	p	Ç	É	á	▣	⊥	đ	Ó	-
..1	□	□	!	1	A	Q	a	q	ü	Í	í	▤	⊥	Đ	ß	"
..2	□	□	"	2	B	R	b	r	é	Í	ó	▥	⊥	Đ	Ö	˘
..3	□	□	#	3	C	S	c	s	â	ô	ú	|	|	È	Ń	˙
..4	□	□	\$	4	D	T	d	t	ä	ö	À	|	—	đ	ń	˙
..5	□	□	%	5	E	U	e	u	û	Ł	ą	À	⊥	Ń	ň	\$
..6	□	□	&	6	F	V	f	v	ć	ł	Ż	À	À	í	Š	÷
..7	□	□	'	7	G	W	g	w	ç	Š	ž	Ě	ă	Î	š	˘
..8	□	□	(	8	H	X	h	x	ł	ś	Ę	Ś	⊥	ě		˘
..9	□	□	)	9	I	Y	i	y	ë	Ö	ę	⊥	⊥	⊥	Ú	"
..A	□	□	*	:	J	Z	j	z	Ő	Ü	⊥	⊥	⊥	⊥	·	
..B	□	□	+	;	K	[	k	{	ő	T	ž	⊥	⊥	■	Ů	ů
..C	□	□	,	<	L	\	l	|	î	t'	Č	⊥	⊥	■	ý	Ř
..D	□	□	-	=	M	]	m	}	Ž	Ł	š	Ž	=	Ť	Ý	ř
..E	□	□	.	>	N	^	n	~	Ä	×	«	ž	⊥	Ů	ť	■
..F	□	□	/	?	O	_	o	⏞	Ć	č	»	⊥	⊥	■	'	

Table A-1 g Character set "Codepage 852"

	0..	1..	2..	3..	4..	5..	6..	7..	8..	9..	A..	B..	C..	D..	E..	F..
..0	□	□		0	@	P	`	p	□	□		°	□	□	א	נ
..1	□	□	!	1	A	Q	a	q	□	□	□	±	□	□	ב	ס
..2	□	□	"	2	B	R	b	r	□	□	¢	²	□	□	ג	ע
..3	□	□	#	3	C	S	c	s	□	□	£	³	□	□	ד	ף
..4	□	□	\$	4	D	T	d	t	□	□	¤	'	□	□	ה	פ
..5	□	□	%	5	E	U	e	u	□	□	¥	μ	□	□	ו	ץ
..6	□	□	&	6	F	V	f	v	□	□	¦	¶	□	□	ז	צ
..7	□	□	'	7	G	W	g	w	□	□	\$	·	□	□	ח	ק
..8	□	□	(	8	H	X	h	x	□	□	"	,	□	□	ט	ך
..9	□	□	)	9	I	Y	i	y	□	□	©	¹	□	□	ש	
..A	□	□	*	:	J	Z	j	z	□	□	×	÷	□	□	ך	ת
..B	□	□	+	;	K	[	k	{	□	□	«	»	□	□	כ	□
..C	□	□	,	<	L	\	l	|	□	□	¬	¼	□	□	ל	□
..D	□	□	-	=	M	]	m	}	□	□	-	½	□	□	ם	□
..E	□	□	.	>	N	^	n	~	□	□	®	¾	□	□	מ	□
..F	□	□	/	?	O	_	o	△	□	□	-	□	□	□	ו	□

Table A-1 h Character set "ISO 8859-8"

Unicode Tables

	Control		ASCII					Control		Latin1						
	000	001	002	003	004	005	006	007	008	009	00A	00B	00C	00D	00E	00F
0	NUL	SLE		0	@	P	·	p	CTL	CTL		°	À	Ä	à	ä
1	SOH	DC1	!	1	A	Q	a	q	CTL	CTL	¡	±	Á	Ñ	á	ñ
2	STX	DC2	"	2	B	R	b	r	CTL	CTL	¢	²	Â	Ò	â	ò
3	ETX	DC3	#	3	C	S	c	s	CTL	CTL	£	³	Ã	Ó	ã	ó
4	END	DC4	\$%	4	D	T	d	t	CTL	CTL	¤	´	Ä	Ô	ä	ô
5	ENQ	NAK	%	5	E	U	e	u	CTL	CTL	¥	µ	Å	Ö	å	ö
6	ACK	SYN	&	6	F	V	f	v	CTL	CTL	¦	¶	Æ	Ø	æ	ø
7	DEL	ETB	'	7	G	W	g	w	CTL	CTL	§	·	Ç	×	ç	-
8	BS	CAN	(	8	H	X	h	x	CTL	CTL	¨	¸	È	Ø	è	ø
9	HT	BR	)	9	I	Y	i	y	CTL	CTL	©	¹	É	Ù	é	ù
A	LF	SUB	*	:	J	Z	j	z	CTL	CTL	ª	º	Ê	Ú	ê	û
B	VT	ESC	+	;	K	[	k	{	CTL	CTL	«	»	Ë	Û	ë	ü
C	FF	FS	,	<	L	\	l	|	CTL	CTL	¬	¼	Ì	Ü	ì	ü
D	CR	GS	-	=	M	]	m	}	CTL	CTL	­	½	Í	Ý	í	ý
E	SO	RS	.	>	N	^	n	~	CTL	CTL	®	¾	Î	Þ	î	þ
F	SI	US	/	?	O	_	o	DEL	CTL	CTL	¯	¿	Ï	ß	ï	ÿ

Table A-2 a "Unicode" (0000 - 00FF)

European Latin									Extended Latin							
	010	011	012	013	014	015	016	017	018	019	01A	01B	01C	01D	01E	01F
0	À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	É	Ê	Ë	Ì	Í	Î	Ï
1	à	á	â	ã	ä	å	æ	ç	ð	é	ê	ë	ì	í	î	ï
2	Ā	Ă	Ą	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
3	ā	ă	ą	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
4	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
5	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
6	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
7	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
8	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
9	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
A	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
B	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
C	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
D	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
E	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ
F	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ	Ȧ

Table A-2 b "Unicode" (0100 - 01FF)

General Punctuation							Sups & Subs			Currency			Diacritics			
	200	201	202	203	204	205	206	207	208	209	20A	20B	20C	20D	20E	20F
0	¶	—	‡	‰	™			°	¢		£			◊	⊗	
1	§	≡	±	‰	ℓ				₱		₹			◊	⊕	
2	⋮	⋮	•	′	″				₪		₺			‡		
3	⋮	—	•	″	—				₹		₺			‡		
4	⋮	—	•	″	—			°	¢		₹			◊		
5	⋮	—	•	″				°	¢		₹			◊		
6	⋮	—	•	″				°	¢		₹			◊		
7	⋮	—	•	″				°	¢		₹			◊		
8	⋮	—	•	″				°	¢		₹			◊		
9	⋮	—	•	″				°	¢		₹			◊		
A	⋮	—	•	″				°	¢		₹			◊		
B	⋮	—	•	″				°	¢		₹			◊		
C	⋮	—	•	″				°	¢		₹			◊		
D	⋮	—	•	″				°	¢		₹			◊		
E	⋮	—	•	″				°	¢		₹			◊		
F	⋮	—	•	″				°	¢		₹			◊		

Table A-2 c "Unicode" (2000 - 20FF)

	Letterlike Symbols					Number Forms				Arrows						
	210	211	212	213	214	215	216	217	218	219	21A	21B	21C	21D	21E	21F
0	‰	ℳ	℞	ℵ			I	i	∅	←	→	↖	↗	↘	↙	
1	‱	℔	℥	ℷ			II	ii	∅	↑	↓	↖	↗	↘	↙	
2	ℭ	℔	℥	ℷ			III	iii	∅	→	←	↖	↗	↘	↙	
3	™	ℓ	℥	ℷ		½	IV	iv		↓	↗	↖	↘	↙	↘	
4	ℤ	℔	℥	ℷ		¾	V	v		↔	↔	↖	↗	↘	↙	
5	‰	N	℔	℥		⅕	VI	vi		↑	↓	↖	↗	↘	↙	
6	‰	N	℔	℥		⅔	VII	vii		↖	↗	↘	↙	↘	↙	
7	ℰ	℔	℥	ℷ		⅓	VIII	viii		↖	↗	↘	↙	↘	↙	
8	ℰ	℔	℥	ℷ		⅓	IX	ix		↖	↗	↘	↙	↘	↙	
9	ℰ	℔	℥	ℷ		⅓	X	x		↖	↗	↘	↙	↘	↙	
A	ℰ	℔	℥	ℷ		⅓	XI	xi		↖	↗	↘	↙	↘	↙	
B	ℰ	℔	℥	ℷ		⅓	XII	xii		↖	↗	↘	↙	↘	↙	
C	ℰ	℔	℥	ℷ		⅓	L	l		↖	↗	↘	↙	↘	↙	
D	ℰ	℔	℥	ℷ		⅓	C	c		↖	↗	↘	↙	↘	↙	
E	ℰ	℔	℥	ℷ		⅓	D	d		↖	↗	↘	↙	↘	↙	
F	ℰ	℔	℥	ℷ		⅓	M	m		↖	↗	↘	↙	↘	↙	

Table A-2 d "Unicode" (2100 - 21FF)

Special Characters - Keyboard Adapter

Characters	[ALT] + Key ...										
{	7	'			ä	à	ç	7	8	'	
}	0	=			\$	\$	à	0	9	ç	
[	8	(			ü	è	^	8	è	`	
]	9	)			"	"	\$	9	+	+	
\	ß	_			<	<	<	+		°	
|	<	-	`		1	1	&	<		1	
,									\	0	
'			'	`	'	'	ù				
`		è					μ		'		
^		ç					\$				
˘	^	^	6	6	\$	\$	2	\$	ì	<	
"	
~	+	é			^	^	=	"	ù	4	
°			0	0				'	0	0	
²	2								2		
³	3								3		
#		"			3	3	"		à	3	
\$								4			
¢					8	8					
£								3			
¤		\$									
@	q	à			2	2	é	2	ò	2	
μ	m								m	m	
¬					6	6				6	
÷	/	/	/	/	/	/	/	/	/	/	/
×	*	*	*	*	*	*	*	*	*	*	*
	GR	FR	UK	US	SG	SF	BE	SU	IT	SP	

Table A-3a Special characters as used by the keyboard adapter with reference to different country settings
Use with the [ALT] key

/ / | | * | ... Keys of the numeric keyboard

GR :	Deutschland	SF :	Suisse
FR :	France	BE :	Belgie
UK :	United Kingdom	SU :	Suomi
US :	USA	IT :	Italia
SG :	Schweiz	SP :	España

ZZ	Z1	Z2	ZZ	Z1	Z2	ZZ	Z1	Z2	ZZ	Z1	Z2
À	`	A	Ò	`	O	å	°	a	ò	`	o
Á	´	A	Ó	´	O	æ	a	e	ó	´	o
Â	^	A	Ô	^	O	a	—	a	ô	^	o
Ã	~	A	Õ	~	O	ç	,	c	õ	~	o
Ä	¨	A	Ö	¨	O	ç	|	c	ö	¨	o
Å	°	A	Ø	/	O	č	ˇ	c	ø	/	o
Æ	A	E	Œ	O	E	d'	'	d	œ	o	e
Ç	,	C	Ř	ˇ	R	è	`	e	°	—	o
Č	ˇ	C	Š	ˇ	S	é	´	e	í	´	r
D'	'	D	Ù	`	U	ê	^	e	ř	ˇ	r
È	`	E	Ú	´	U	ë	¨	e	š	ˇ	s
É	´	E	Û	^	U	ě	ˇ	e	ß	s	s
Ê	^	E	Ü	¨	U	ì	`	i	t'	'	t
Ë	¨	E	Ý	´	Y	í	´	i	ù	`	u
Ì	`	I	¥	-	Y	î	^	i	ú	´	u
Í	´	I	Ž	ˇ	Z	ï	¨	i	û	^	u
Î	^	I	à	`	a	ij	i	j	ü	¨	u
Ï	¨	I	á	´	a	l'	'	l	û	°	u
J	I	J	â	^	a	í	´	l	ý	´	y
£	-	L	ã	~	a	ñ	~	n	ÿ	¨	y
Ñ	~	N	ä	¨	a	ň	ˇ	n	ž	ˇ	z

Table A-3b Special characters as used by the keyboard adapter which may be generated by inserting two characters one after the other

To generate the character **ZZ**: 1st character **[Z1]** - 2nd character **[ALT-Z2]**

For example: For "ñ": 1st character **[~]** - 2nd character **[ALT-n]**



For inserting the Z1 character, you may use the information as in Table A-3a.

Appendix B - Pin Assignment of the Interface Connectors

Pin Assignment of the Serial Interface Connectors

The **Apollo 4** provides a 25 pin SUB-D connector for the serial interfaces which are internally available, i.e. RS-232, RS-422 and RS-485.

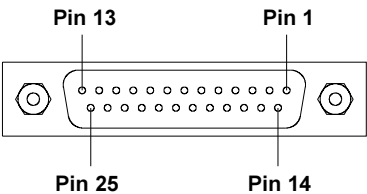


Fig. B-1 Connector of the serial interface (rear of the printer)

Pin	Signal	Function
1	CG	Protective Ground
2	TxD	Transmit Data (RS-232)
3	RxD	Receive Data (RS-232)
4	RTS	Request to send
5	CTS	Clear to send
7	GND	Logic Ground
9	TDATA+	Transmit Data (RS-422, RS-485)
10	TDATA-	Transmit Data (RS-422, RS-485)
18	RDATA+	Receive Data (RS-422, RS-485)
19	RDATA-	Receive Data (RS-422, RS-485)
20	DTR	Data Terminal Ready

Table B-1 Signals of the serial interface connector

Interface Cable for RS-232

The following chapter shows some typical RS-232 interface cable configurations. Note, that the pin assignment may vary for different computers. If you have any problems with the connections, contact the manufacturer of your computer on the pin assignment of the interface. Use the pin assignment of the printer as shown in Table B-1 to obtain a suitable cable.

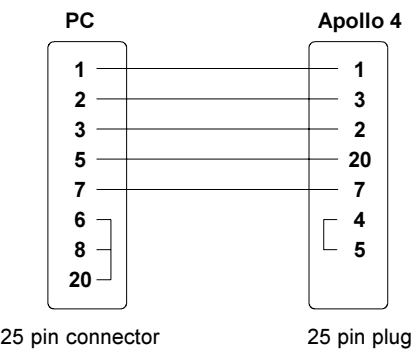


Fig. B-2 Interface cable with 25 pin computer connector for RS-232 with protocol " ---" or "XON/XOFF"

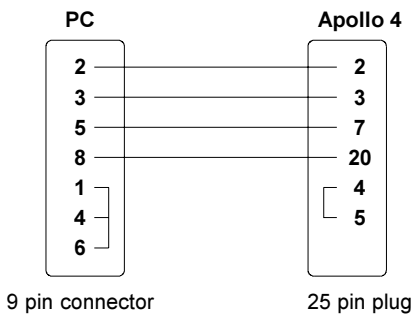


Fig. B-3 Interface cable with 9 pin computer connector for RS-232 with protocol " ---" or "XON/XOFF"

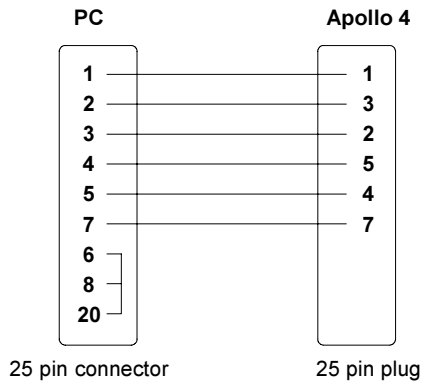


Fig. B-4 Interface cable with 25 pin computer connector for RS-232 with protocol "RTS/CTS" or "XON/XOFF"

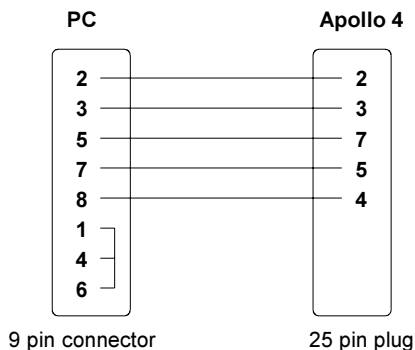


Fig. B-5 Interface cable with 9 pin computer connector for RS-232 with protocol "RTS/CTS" or "XON/XOFF"

Interface Cable for RS-422/ RS-485

To control the **Apollo 4** by RS-422/ RS-485 interface, only the signals TDATA+, TDATA-, RDATA+, and RDATA- are necessary.

Check the pin assignment of the interface of your computer, and use the pin assignment of the printer as shown in Table B-1 to obtain a suitable cable.

Pin Assignment of the Parallel Interface Connector

The **Apollo 4** provides a 36 pin connector for the parallel Centronics interface.

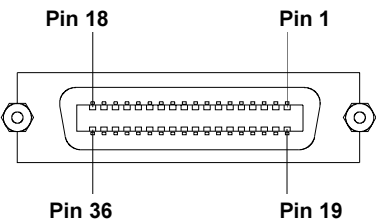


Fig. B-6 Centronics interface connector (rear of the printer)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	/STROBE	10	/ACKNLG	19	GND	28	GND
2	DATA 1	11	BUSY	20	GND	29	GND
3	DATA 2	12	PE	21	GND	30	GND
4	DATA 3	13	SLCT	22	GND	31	nc
5	DATA 4	14	nc	23	GND	32	nc
6	DATA 5	15	nc	24	GND	33	nc
7	DATA 6	16	GND	25	GND	34	nc
8	DATA 7	17	nc	26	GND	35	nc
9	DATA 8	18	nc	27	GND	36	nc

Table B-2 Signals of the Centronics interface

Centronics Interface Cable

The cables used for Centronics interface connectors are standard cables, so that normally there are no problems with the external control of the **Apollo 4**.

In the event of any difficulties, consult the manufacturer of your computer on the pin assignment of the computer's interface. Use the pin assignment of the printer as shown in Table B-2 to obtain a suitable cable.

Appendix C - Error Messages/ Problem Solution

The following section describes possible errors and their suggested solutions.

The **Apollo 4** is equipped with a comprehensive self diagnostic system which will indicate errors in the display of the printer. Also, the operator will be informed by the LEDs whether the fault is correctable and will, therefore, allow to continue the current print job after corrections (e.g. "Out of paper"), or the fault may require you to cancel the current print job.

Correctable Errors

While processing a print job, an error has occurred which may be corrected by the operator, and also allows you to continue the print job after fault correction.

Display

The top line of the display shows alternately the type of fault and the total of the remaining labels of the current print job.

LED Display

LED CAN on, LED PSE is flashing.

If an applicator is connected : LED FF is flashing.

Function Keys



	CAN key	short pressing : longer pressing (>1s):	Cancels the current print job. Switch to the next job, which is available in the input buffer Cancels the current print job. Clears the input buffer (LED CAN blinks), Switch into ONLINE mode.(LED ONL on)
	PSE key	Continues current print job after error correction. Switch into PRINT mode. (LED ONL on, LED CAN off, LED PSE off)	

Table C-1 Function keys in mode FAULT-CORRECTABLE

Irrecoverable Errors

While switching on the printer or during printing, a fault has occurred which cannot be cleared by the operator without cancelling the current print run.
(e.g. hardware fault)

Display

The display shows the type of fault.

LED Display

LED CAN is flashing.

Function Keys


	CAN key	Cancels the current print job. Switch into ONLINE mode. (LED ONL on, LED CAN off, LED PSE off) If ONLINE mode cannot be entered, switch printer on and off again. If the fault remains again, contact Technical Service
---	---------	---

Table C-2 Function keys in mode FAULT-IRRECOVERABLE

Error Messages

The following table contains an overview of possible error messages, their possible causes as well as solutions to the problems.

Correctable faults as defined above are marked with a " * ".

If the suggested solutions turn out unsuccessful, contact our Technical Service.


Error message	Possible cause	Solution
ADC malfunction	Hardware error	Switch printer off and then on. If error recurs → contact Service.
Battery low	PC card error	Replace battery inside the PC card.
Buffer overflow	The data receive buffer is full but the computer is still transmitting data	Use the protocol (preferably RTS/CTS) for data transmission.
Card full	Refers to the optional memory card; No more data can be stored on the card	Replace card.
Cutter blocked	Refers to the integrated cutter; (Apollo 200C, Apollo 300C) The cutter is unable to cut the labels due to the extreme thickness of the material; Cutter cannot return into its home position and stays in an undefined position	Switch printer off, remove material from the cutter, switch printer on. If then the error message "Cutter stuck" appears → contact Service. Otherwise, check the thickness of the label material and replace if necessary.
Cutter jammed *	Refers to the integrated cutter; (Apollo 200C, Apollo 300C) The cutter is unable to cut the labels due to the extreme thickness of the material but is able to return into its home position	Switch printer off, and check the material in the cutter area for possible double laying. Start test cut by pressing the  key. If error recurs, replace the label material.

Table C-3 Error messages

Error message	Possible cause	Solution
Cutter stuck	Hardware error, refers to the integrated cutter; (Apollo 200C, Apollo 300C)	Switch printer off and then on. If error recurs → contact Service.
dRAM malfunction	Hardware error	Switch printer off and then on. If error recurs → contact Service.
File not found	Requested file is not on the card	Check the contents of the card.
FPGA malfunction	Hardware error	Switch printer off and then on. If error recurs → contact Service.
Head too hot *	Printhead is overheated due to labels containing a lot of graphics, text, bar codes, etc.	After pausing to cool down the printhead, the print job will be continued automatically. If the fault recurs repeatedly, reduce the heat level or the print speed via the software.
Invalid data	Fault while downloading graphic data	Cancel current print job. Check data.
Invalid outline	Error with the selected font (download font)	Cancel current print job. Change font.
Invalid setup	Setup is invalid	Use RESTORE function to reset all settings back to factory settings. Configure setup. (see Chapter 9) If error recurs → contact Service.
LCD malfunction	Hardware error	Switch printer off and then on. If error recurs → contact Service.
Memory overflow	Current print job contains too much information (selected fonts, large graphics)	Cancel current print job. Reduce amount of information.

Table C-3 Error messages (continuation)


Error message	Possible cause	Solution
No label found *	There are labels missing on the label material	Press  key repeatedly until printer recognizes the next label on the material.
	The label format as set in the software does not correspond with the real label format	Cancel current print job. Change the label format set in the software. Restart print job.
	Printer is loaded with continuous paper but the software is set on labels	Cancel current print job. Change either software setting or print media. Restart print job.
No label size	Definition of the label size is missing at the label description	Check programming.
No record found	Refers to the optional memory card; database access error	Check programming and card contents
Out of paper *	Out of label material	Insert new supply roll
	Label has not properly been loaded in the label sensor fittings	Check paper feed.
Out of ribbon *	Out of transfer ribbon	Load new supply roll of transfer ribbon.
	Ribbon melted during printing	Cancel the current print job. Change the heat level via software, clean the printhead , load transfer ribbon, restart print job.
	The printer is loaded with thermal labels for direct thermal mode (without transfer ribbon); but the software is set for transfer printing.	Cancel current print job. Set software to direct thermal mode. Restart print job.
	The supply roll of transfer ribbon is not jammed tight at the supply hub.	Jam tight the supply roll of transfer ribbon by turning the knurled knob at the supply hub.

Table C-3 Error messages (continuation)



Error message	Possible cause	Solution
Protocol error (*)	Printer has received an unknown or invalid command (display shows command abbreviated)	Depending on the type of fault, the command can be skipped by pressing the  key or the print job has to be cancelled by pressing the  key.
	The interfaces of computer and printer are set differently	Switch printer off. Correct the interface setting in the printer setup. (see chapter 9)
Read error	Refers to the optional memory card; Read error when reading from the card	There is no solution. Check the battery. Reformat card. Copy backup files onto the card.
ROM malfunction	Hardware error	Switch printer off and then on. If error recurs → contact Service.
Structural err.	Refers to the optional memory card; Fault in file list	Data access is uncertain. Format card.
Unknown card	Refers to the optional memory card; Card not formatted, or Card not supported by printer	Format card. Use different type of card.
Voltage error	Hardware error	Switch printer off and then on. If error recurs → contact Service.
Write error	Refers to the optional memory card; Hardware error	Repeat the write process or format the card.
Write protected	Refers to the optional memory card; Write protection is activated	Deactivate write protection.
Wrong revision	Error during firmware update. Firmware version is not valid for the present hardware version	Load a valid firmware version

Table C-3 Error messages (continuation)

Appendix D - Maintenance / Cleaning / Adjustment of the Printhead

The printers of the **Apollo 4** series require only a minimum of maintenance.

It is most important to clean the printhead on a regular basis. This will guarantee a permanent high quality of the print image. Moreover, it helps to prevent an early wear of the printhead.

Apart from that, the servicing only requires you to clean the outside of the printer occasionally.



Before starting any maintenance, switch the printer OFF and disconnect it from the power supply !

General Cleaning

While operating, dust accumulates especially within the printer mechanism. Remove dirt and dust regularly using a soft brush or a vacuum.

The cover of the **Apollo 4** may be cleaned using standard cleanser.



Do not use abrasive cleaning powders or solvents !

Cleaning the Media Feed Rollers

Accumulations of dirt on the media feed rollers or the guides may impair the media transport and the print quality.

Clean the rollers as follows :

1. Lift the printhead.
2. Remove the label stock and transfer ribbon from the printer.
3. Remove all accumulations of dirt and dust with isopropyl alcohol and a soft cloth.

Cleaning the Printhead

While operating, dirt such as paper dust or particles of ink or back coating from the ribbon may accumulate on the thermal printhead.

This can cause a deterioration of the print quality. (e.g. different contrasts on the label, appearance of light horizontal lines, etc.)

In that case, the printhead needs cleaning.

Recommended cleaning intervals :

Direct Thermal Printing : at every 1,300 yd or 1,200 m

Thermal Transfer Printing : each time you change the ribbon



Do not use any sharp objects for cleaning the printhead !

Do not touch the protective glass layer of the printhead !

Clean the printhead as follows :

1. Lift the printhead.
2. Remove label material and transfer ribbon from the printer.
3. Clean the printhead surface with a special cleaning pen, or use a cotton swab soaked with isopropyl alcohol.
4. Allow it to dry for about 2 to 3 minutes before restarting the printer.

Adjustment of the Printhead

For optimum print quality, the line of heating elements on the printhead must be parallel and aligned correctly to the print roller. This alignment has already been performed in the factory. Nevertheless, it may become necessary to adjust it.

A misaligned printhead causes a poor print quality which appears as described below :

- the print image looks generally light, spotted, and irregular; or
- the print image appears uneven from one side to the other.

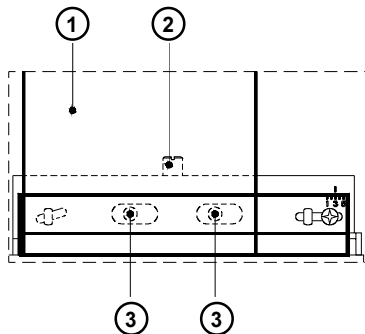


Fig. D Adjustment of the printhead

Adjust the printhead as follows :

1. You may leave the transfer ribbon (1) inside the printer, and simply poke through it with your hex wrench.
2. Loosen the locking screw (2) on the printhead by half a turn. This will allow for the required horizontal adjustment of the printhead.
3. By turning the two screws underneath (3) you may shift the printhead as follows :
 - The overall distance for adjusting is .1 in or 2.5 mm.
 - By turning the screws clockwise, the printhead will be shifted backwards. (about .02 in or .5 mm per turn)
 - Adjust in small steps ! (quarter turns only)
 - First, turn both screws constantly until at least one side of the print image is optimum.Following, adjust the screw which is located at the side of the label where the quality is still poor.

4. Note, that the printhead must be closed after every single adjustment step to make the change effective.
5. Tighten the locking screw (2).
6. Perform a test print, for instance a wide black line over the whole width of the label, and review the results.
7. Repeat steps 2 to 6 as necessary to complete the adjustment.

Cleaning and Replacing the Cutter Blades

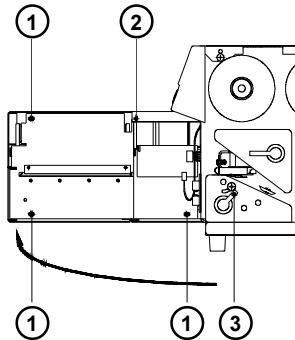


Fig. D-2a Cleaning and replacing the cutter blades (1)



1. **Switch the printer OFF and disconnect it from the power supply !**
2. Turn the lever (3) counterclockwise until it stops. This way the cutter unit will be unlocked.
3. Swing away the cutter unit.
4. Loosen the screws (1) and remove the cutter cover (2) .
5. Swing back the cutter unit to the front of the **Apollo 4**.
6. Turn the lever (3) clockwise until it stops and so re-lock the cutter.
7. Swing the upper blade carrier upward by pressing the lever (4).

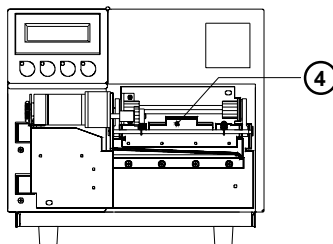


Fig. D-2b Cleaning and replacing the cutter blades (2)

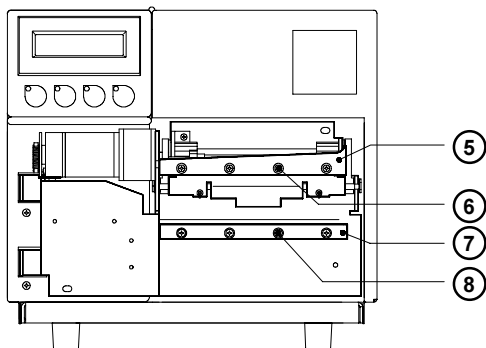


Fig. D-2c Cleaning and replacing the cutter blades (3)

8. The blades can now be cleaned using label remover or spirits and a non-fraying cloth.

Caution ! Risk of Injury !

9. To replace the cutter blades (5,7) loosen and remove the respective 4 counter-sunk screws (6,8) which hold each of the blades. After that the blades can be removed.
Mount the new blades. It is not necessary to re-adjust the new blades once they are mounted.

10. Following the blades having been cleaned or replaced, using the screws (1) re-mount the cutter cover (2)

Important! Under no circumstances may the cutter assembly be used without cover !

Appendix E - Firmware Updates

General Updates

The firmware of the **Apollo** printer series is subject to constant development, e.g. a growing variety of features available, easier fault correction, etc. In **Apollo 4**, the firmware is stored in a flash-EPROM, which represents a new technology. For updates, only a file containing the up-dated version needs to be copied via interface.

The file may be distributed on a disk or else is available on the Internet.

The **cab** and **THARO** Internet addresses are included in our latest brochures.

Firmware Updates

1. In Setup mode, set the serial interface of the **Apollo 4** on the highest possible speed that is supported by your computer, or else use the Centronics interface.
2. When switching the **Apollo 4** ON, press all of the four function keys at once.
The display will show "SYSTEM UPDATE".
3. Transmit the data to the printer. Under DOS, use the following copy command: **COPY AP4_XXX.FMW COM2: /b**
4. During processing, the printer display indicates the progress with a ". " after each block completed. (total number of blocks is 11)
After completing the copy process the display shows "OK", and all LEDs are flashing. This also indicates the completion of the up-dating. Switch the printer OFF.
5. In the event of an error during the up-dating process, the error code will be shown in the display :

'C' : Check sum error (possibly "/b" missing in COPY command or file faulty)

'H' : Header fault (possibly "/b" missing in COPY command or file faulty)

'E' : EPROM could not be deleted

'V' : Programming voltage too low

'P' : Programming fault



If any one of the faults described above occurs, the previous firmware setting is invalid and the programming has to be started again.

This page is intentionally left blank.

Index

A

ADC malfunction C-3
Adjustment of the printhead D-3f.
Adjustment of the printhead support 31
Adjustment of the transfer ribbon 32

B

Backfeed 63
Bar codes 13
Battery low C-3
Buffer overflow C-3

C

CAN (key) 33ff.
Card, copy 62
Card, format 61
Card full C-3
CE 12
Centronics 26, 52, B-4
Character set 13, 60, 73, A-1f.
Cleaning, general D-1
Codepage 850 (character set) A-4
Codepage 852 (character set) A-7
Collection box 21f., 27
Compliances 12
Computer connection 26
Connections 25f.
Control characters for the monitor mode 72
Control panel 14, 33f.
Correctable errors C-1
Country 48f.
Cover 20, 21
Cut position 49, 51
Cutter 11, 21f., 27, 29, 51, 53, C-3f.
Cutter blocked C-3
Cutter jammed C-3
Cutter stuck C-3

D

Date 49, 58
Debug mode 64
Dimensions 14

Direct thermal printing 17
Display 21, 33f.
Documentation 8
dRAM malfunction C-4

E

EASYLABEL 15
EBCDIC (character set) A-5
Error messages C-1ff.

F

Fanfold paper 24, 28
FAULT CORRECTABLE
(system mode) 38
FAULT-IRRECOVERABLE
(system mode) 39
FCC 12
FF (key) 33ff.
File not found C-4
Firmware up-dates E-1
Firmware version 68f., 72
Font style 13
FPGA malfunction C-4
Function keys 21, 33f.
Fuse 14, 25
Fuse holder 24f.

G

Gap sensor 51
Graphic elements 13
Graphic file type 13
Guide 22, 28f.

H

Head too hot C-4
Heat level 56

I

Interface 14, 24, 26, 52, 80, B-1ff.
Interface, parallel 24, 26
Interface, serial 24, 26, 80
Invalid data C-4
Invalid outline C-4

Invalid setup C-4
Irrecoverable errors C-2
ISO 8859-1 (character set) A-3
ISO 8859-8 (character set) A-8

K

Keyboard adapter 15, 80f., A-13f.
Key CAN 33f.
Key FF 33ff.
Key ONL 33ff.
Key PSE 33ff.

L

Label, backfeed 14, 63
Label edge sensor 23, 51
Label, formats 18
LABEL FROM CARD
(system mode) 44
LCD malfunction C-4
LED 33f.
Loading labels 28f.
Loading transfer ribbon 30

M

Macintosh (character set) A-6
Material recognition 14, 49
Media feed roller 23
Media feed roller, cleaning D-1
Media hub 22, 28
Media loading 27f.
Media rewinder, external 15
Memory card 15, 24, 44, 61f., 76ff.
Memory card, installing 77
Memory card, formatting 78
Memory card, module slot 24f., 77
Memory card, writing on 78
Memory card, printing from 79
Memory overflow C-4
Monitor mode 74f.
MONITOR MODE (system mode) 50

N

No label found C-4
No label size C-5
No record found C-5

O

OFFLINE (system mode) 35
ONL (key) 33f.
ONLINE (system mode) 34
Operating manual 8
Options 15, 76f.
Out of paper C-5
Out of ribbon C-5

P

Parallel interface port 24, 26
Pause reprint 66
PAUSE (system mode) 37
Peel position 54
Power supply 25
Power supply connector 24f.
Power switch 24f.
Printer info 57
Printer info display 72f.
Printhead 10, 13
Printhead, adjustment D-3f.
Printhead, cleaning D-2
Printhead position 55
Print, mechanism 23
Print media 16f.
Print speed 13
PRINT (system mode) 36
Print, type 13
Print width 13
Product description 11f.
Programming 8
Programming instructions 8
Protocol 52
Protocol error C-6
PSE (key) 33
Punch hole 18

R

Read error C-6
Reflective mark 18, 51
Reflex from bottom 51
Restore 46
Ribbon take up hub 22, 30
Ribbon shield 23, 30
Ribbon supply hub 22, 30, C-3
ROM malfunction C-6
RS-232 26, 52, 80
RS-422 26, 52
RS-485 26, 52

S

See through sensor 14
Safety instructions 20
Self test 67f.
Self test printout 68
Serial interface port 24, 26
Service manual 8
Setup 46ff.
Setup parameters, overview 47
SETUP (system mode) 41
Slot for fanfold paper 24
Slot for memory card 24
Structural error C-6
System modes 34f.
SYSTEM TEST (system mode) 40

T

Tear-off plate 23, 65
Tear-off position 65
Technical Specifications 13ff.
TEST PRINTOUT
(system mode) 42
Test printout 67ff.
Thermal printhead 10, 23, D-1f.
Thermal transfer printing 17
Time 49,59
Trademarks 9
Transfer print 50
Transfer ribbon 14,19,30

U

Unicode Table A-9ff.
Unknown card C-6
Unpacking and delivery contents 20

V

Voltage error C-6
Voltage selector 24f.

W

Windows 1250 (Zeichensatz) A-2
Windows 1252 (Zeichensatz) A-1
Write error C-6
Write protected C-6
Wrong revision C-6



Gesellschaft für Computer-
und Automations-
Bausteine mbH
Haid-und-Neu-Straße 7
D-76131 Karlsruhe

EU - Conformity Declaration

We declare herewith that as a result of the manner in which the machine designated below was designed, the type of construction and the machines which, as a result have been brought on to the general market comply with the relevant fundamental regulations of the EU Rules for Safety and Health.

In the event of any alteration which has not been approved by us being made to any machine as designated below, this statement shall thereby be made invalid.

Description:
Thermal Transfer Printer

Type:
Apollo 4

Applied EU Regulations and Norms:

- **EC Machinery Regulations**
- Machine Safety

89/392/EEC, Appendix IIA
EN 292 T1 & T2:1991-11

- **EC Low Voltage Regulations**
- Data and Office Machine Safety

73/23/EEC
EN60950:1992 & A1:1993
EN 60950/A2:1993

- **EC Electromagnetic Compatibility Regulations**
- Threshold values for the Interference
of Data Machines
- Interference Resistance in both
Industrial and Small Plants

89/336/EEC
EN 55022:1995-05
EN 50082-1: 1992-12

Signed for, and on behalf of, the Manufacturer :

cab Produkttechnik Sömmerda
Gesellschaft für Computer-
und Automationsbausteine mbH
99610 Sömmerda

Sömmerda, 11.05.98

Erwin Fascher
Managing Director