



LOCOMOTIVE  
SOFTWARE

# Defining Character Sets

- **Extra Character Sets for an external printer**  
— using **CHARKIT**

How to define new Character Set files to support extra Character Sets, fonts and printwheels on any external printer.

- **Extra Character Sets for the PCW9512 printer**  
— using **MKWHEEL**

Caters for the special case of additional wheels for the PCW9512's built-in daisy-wheel printer — in the unlikely case of a printwheel being supplied for this printer which is not supported by the files on Disc 4: the Printwheels Disc.

- **Appendices**

LocoScript Character Names; Standard Substitutions; Formal Definition of CHARKIT Character Definition files; and Troubleshooting

*Note: The Character Set files created using CHARKIT and MKWHEEL will help you support printwheels and fonts on your printer. They won't enable you to select facilities (eg. 15-pitch) that are available on your printer; which of these facilities are available to you depends on the Printer Driver file you are using. The PCW External Printers Guide will tell you if you are using the Printer Driver we currently recommend for your printer.*

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The particulars supplied in this manual are given by Locomotive Software in good faith. However, the CHARKIT and MKWHEEL programs are subject to continuous development and improvement, and it is acknowledged that there may be errors or omissions in this manual. In particular, the messages described in this manual may differ in detail from those actually shown on the screen.

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## Conventions

The following conventions are used in this booklet:

- *Italic (slanted) text* is used for descriptions of the type of information that is required, rather than the information itself. For example, *number* could be 1 or 2 or 3 etc. If the description of a single item is more than one word long, the words are joined by hyphens.
- **Text in this style** is used to indicate something to type or something displayed on the screen.
- Slanting brackets are placed round items that are optional.
- The character **+** is used to represent a carriage return at the end of a line.

# Extra Character Sets for external printers – the CHARKIT program

The CHARKIT program allows you to define new Character Sets for an external printer (ie. a printer used as an alternative to the PCW's built-in printer), describing the characters which this printer can print, for example, when a particular printwheel is fitted. (You can't, of course, print any characters other than the ones in the printer's own character set or on the printwheel you are using.) The new Character Sets can then be used as alternatives to the Character Sets provided in the supplied Printer Files. (If you need to support an additional printwheel for the PCW9512's built-in printer, you need a different program – the MKWHEEL program – described on page 26.)

The definition of a Character Set takes the form of a simple text file (which may be produced using LocoScript), from which the CHARKIT program extracts the information required and transforms it into the form required by LocoScript.

Before you use this program and the Printer Files on this disc, it is essential:

- to read the following background information, and
- to be using LocoScript 2 version 2.12 or later

The latest version of LocoScript 2 is supplied as part of the Printer Support Pack. If you are not using the latest version of LocoScript, you should create a new Start-of-day disc before you go any further: how to do this is described in the appropriate "Update Information" booklet supplied in this pack.

## Background information

When LocoScript prints a document, it sends a long list of codes to the printer which the printer's own software decides how to interpret. These codes are simply numbers, in the range 0...255. For many reasons we find it easier to consider these values in hexadecimal (base 16), so the codes are numbers in the range &00...&FF – where the '&' signals that a hexadecimal number follows. (There is an introduction to hexadecimal numbers on page 11, alongside the description of the 'File body'.)

Some codes represent characters; others are instructions to the printer to carry out actions such as moving to the beginning of the next line. Some of the codes work together as a group to carry out further actions, such as changing the character pitch or turning on or off a print effect like Bold. These groups of codes are usually called 'Escape sequences' because the first code in the group is conventionally the code known as Escape.

Ultimately, what each code represents depends on the software that is interpreting it. Fortunately, a number of conventions have been established. In particular, the codes &00...&7F usually follow the American ASCII standard in which &00...&1F, and &7F are interpreted as instructions to carry out actions, while &20...&7E represent the letters A...Z, a...z, 0...9 and the common punctuation marks. In addition, many dot-matrix printers use the same characters and codes as major manufacturers like IBM or Epson.

Outside of these conventions, there are few universal standards and each printer has its own way of interpreting the codes it receives. In addition, ASCII itself comes in a number of different 'language' variants in which some of the codes have different meanings. For example, UK ASCII differs from US ASCII in that &23 represents £ rather than #.

On top of this, dot-matrix printers and laser printers often support more than one set of characters, which can be selected either by setting switches on the printer itself or by sending special sequences of codes. For example, on the Amstrad DMP printers you can use either technique to choose between variants of the Epson and IBM character sets. In addition, it is often possible to select a different 'language' in both these ways - which also affects the characters available and/or the codes associated with some of the characters.

For daisy-wheel printers the issue is further complicated by the multiplicity of printwheels available, each with its own selection of characters.

To cope with the variety of characters and codes in existence, LocoScript 2 records the details of each particular printer and wheel or printer and font combination as a separate 'Character Set'. Each Character Set is essentially a list of the LocoScript characters which the printer is capable of reproducing, how wide they are (for proportional spacing) and how to invoke them. One Character Set for each printer is recorded in the Printer Driver file; the others are recorded in separate Character Set files each containing details of one Character Set. Each Printer Driver file is designed to cope not just with the printer whose name it takes but also as many printers compatible with it as possible, so the Character Set it contains is generally a 'lowest common denominator'.

Most dot-matrix printers provide the same characters as either an FX80 or an IBM printer, and in the majority of cases, the Character Set within the printer's .PRI file will cover the appropriate range of characters. However, while printers provide the same characters, there is a wide variation in their proportional spacing widths. Using the CHARKIT program you can produce a Character Set file containing the correct proportional spacing widths for your printer. However, in general we do not recommend proportional spacing on matrix printers unless this printer supports micro-justification, because we cannot guarantee Justification and Right Alignment.

The characters provided by a daisy-wheel printer depend on what printwheel is fitted. There is a huge diversity of wheels available, and it is here that alternative Character Sets and the CHARKIT program really come into their own. It is not necessary to have a Character Set for every printwheel, only one for each 'family' of wheels. For example, the JUKI 6100 printers often use Triumph Adler Group 2 printwheels, including Primus 10, Caroll 10, Helen 12, Madeleine PS, Tile PS and many others. All these wheels have the same characters on them, and the PS wheels use the same character widths. They can all, therefore, be used with the JUKI6100.#02 Character Set.

The name and pitch which identifies each wheel within a 'family' is known to LocoScript as the Character Style. The pitch portion of the Character Style is most important, since it tells LocoScript how wide the Underline character is and therefore affects underlining!

The function of the CHARKIT program is to take a text description of a Character Set, and produce from it a *printer.#xx* file. The bulk of this text description is simply a list of the LocoScript characters which the printer can reproduce, what code (or codes) must be sent to invoke each character, and its width if proportional spacing is used. The first part of the text description gives the Character Set file's Identity Text, the name of the Character Set, and other such information.

## The CHARKIT program

The CHARKIT program on Disc 1 in the Printer Support Pack allows you to specify a new Character Set. The program runs under CP/M. It reads one file containing a definition of the Character Set (the Character Definition file) and produces another file (a *printer.#xx* file) for use by LocoScript.

The Character Definition file is a simple text file, which may be produced using LocoScript. The 'Make ASCII file' command in the Disc Manager's FI Actions menu will convert a LocoScript document into a file which CHARKIT can read.

There are four stages to using the CHARKIT program:

- establishing the information that you need to include in the Character Definition file ie. the characters you can print, the codes the printer needs in order to print these characters and their widths (for printing the characters proportionally-spaced)
- preparing the Character Definition file (typically by using LocoScript to edit an existing Character Definition) and then making an ASCII version of this document
- creating a Printer File from Character Definition file - by running CHARKIT
- installing and using the new Printer File on your system

In the following instructions, we first describe how to set up and use the simplest sort of Character Definition file - containing only characters which require single printer codes and omitting all character width information. Later we will include character widths and show how sequences of printer codes may be used to access further characters.

Before you start preparing a Character Definition file for yourself, we suggest that you print out CHARKIT.EG on Printer Support Disc 1. CHARKIT.EG is a LocoScript version of an example Character Definition file, which is useful to look at as you read through the following instructions.

## The files

The following files on Printer Support Disc 1 are connected with CHARKIT:

### Group 0 - CHARKIT

CHARKIT.COM the CHARKIT program  
DAISY.BAS the program that prints out the contents of wheels  
ALLCHARS a document containing all the LocoScript 2 Characters  
TEXTCHAR a document containing all the LocoScript 2 Characters, plus their LocoScript character names

### Group 1 - SIMPLE

CHARKIT.EG Example simple Character Definition file (LocoScript document)  
TEMPLATE.STD General-purpose basis for preparing Character Definition files  
Group 2 - MATRIX }  
FX.EG Example Character Definitions for dot-matrix printers  
IBM.EG (LocoScript documents)

TEMPLATE.STD

Suitable basis for setting up Character Definition files for IBM character sets on dot-matrix printers

## Group 3 - PETAL96

PETAL.96 Example Character Definition for 96-petal printwheel  
(LocoScript document)

TEMPLATE.STD Template for 96-petal Character Definition files

## Group 4 - PETAL100

PETAL.100 Example Character Definition for 100-petal printwheel  
(LocoScript document)

TEMPLATE.STD Template for 100-petal Character Definition files

We strongly advise you to prepare a copy of Printer Support Disc 1 (hereinafter called your CHARKIT disc), erase the contents of groups 6 and 7 from this copy (to give yourself some room) and then to do all your work with this copy. Treat the supplied disc as your Master copy, to use only to make a replacement working disc if your copy becomes damaged. (How to copy a disc is described in Session 7 of the LocoScript Tutorial.)

## Establishing the information

The bulk of the information that goes into the Character Definition file is a list of all the characters you can print and the code (or codes) to be sent to the printer to make it print these characters. These character details may be given in the printer manual in a number of different forms:

**I: If you are using a dot-matrix printer, the character details will probably be presented as a table showing the shape of the character and the corresponding hexadecimal or decimal code.**

Generally each character that can be printed will require a single printer code. However, some printers support a number of language variants, in which the meaning of a number of codes depends on the language selected. If the different language variants can be selected by sending escape sequences to the printer, then you can make use of any additional characters they provide. (The technique used to select these characters is described in the section on 'Advanced techniques'.)

In most cases, the printer's manual will in any case tell you whether the character set provides the same characters as an Epson FX80 printer or as an IBM printer. This in turn tells you whether you should base your Character Definition on the supplied FX.EG character definition or IBM.EG one.

**II: If you are using a daisy-wheel printer, its manual may give the 'printwheel' table it uses.**

This will normally list the characters on the printwheel generally shipped with the printer, and the codes used to access them. It may also note where there may be different characters on other printwheels. Some daisy-wheel printers come with tables for a variety of printwheels: if you are lucky, the wheel you wish to use will be one of them!

**• Don't worry about making absolutely sure that the information you've obtained at this stage is full and correct. If testing the Character Set that is produced shows up any errors, these can easily be corrected by editing the Character Definition file and then using CHARKIT to produce a new version of the Character Set file.**

## Generating character information (daisy-wheel printers only)

If your printer manual doesn't supply details of a particular printwheel, you should be able to generate the character information you require by using the DAISY.BAS program provided on your CHARKIT disc.

This program produces a table of the characters on the wheel and the codes used for these characters by your printer. Alongside each entry, the program prints short sequences of the character, printed assuming a PS width of 7, 6, 5, 4, and 3 PS units (1/60") respectively: these can be used to determine the correct PS width for each character on the wheel (see page 16).

## Running the program

- 1 Connect your printer to your PCW.

On a PCW9512, printers fitted with an IBM-type Centronics connector may be attached to the 'Parallel printer' socket on the back of the machine. Otherwise, parallel printers may be attached either to this socket by an appropriate IBM-Centronics cable or to the Parallel connector on a Serial/Parallel Interface connected to the PCW's Expansion slot. Serial printers need to be attached to the serial connector on such an interface.

- 2 Fit the printwheel for which you want to produce the character information in the printer.
- 3 Load CP/M from your CP/M disc. Leave the CP/M disc in the drive after it has loaded.  
The steps used to load CP/M are given in your PCW's manual.
- 4 Copy BASIC.COM to Drive M (the Memory disc) by typing the command:

```
PIP M:=-BASIC.COM [RETURN]
```

- 5 Use the appropriate DEVICE command to set up CP/M to send printer output to the connector to which you have attached your printer.

- If the printer is connected to the parallel connector on the interface, type the command:  
DEVICE LST:=-CEN [RETURN]
- If the printer is connected to the serial connector on the interface, first use the SETSIO command to set the baud rate, parity, protocol etc. that your printer requires (as described in your CP/M User Guide); then type the command:  
DEVICE LST:=-SIO [RETURN]

- If the printer is connected to the Parallel printer socket on the back of a PCW9512, type the command:

```
DEVICE LST:=-PAR [RETURN]
```

**Note:** Details of the DEVICE command and of the SETSIO command are given in the CP/M section of your PCW's manual.

- 6 Load some paper into your printer - either continuous stationery or a sheet of A4.

- 7 Insert your CHARKIT disc and press **ALT** C

- 8 Type M: BASIC DAISY [RETURN]

9 The program then asks you to identify the type of daisy-wheel printer you have:

D630 - a Diablo-type 96 Petal printer (ie. can be used with one of the following Printer Drivers: D630.PRI; D1610.PRI; IF50.PRI; IF60AX.PRI; IF60CE.PRI)  
QUME - Qume-type 96 Petal printer (ie. can be used with one of the following Printer Drivers: QUME.PRI; GAKKEN.PRI)  
JUKI6100 - a Juki 100 Petal printer or compatible (ie. can be used with the JUKI6100.PRI Printer Driver)

Select the option for the printer that most closely matches your printer. The program will then run - first resetting the printer and then printing a two-page table giving the character set you require.

(If the printer is off-line when the program tries to reset it, you will see a message of the form 'device not ready - Retry, Ignore or Cancel'. If this appears, simply check that the printer has paper in it, set it on-line, and then type R to tell the program to re-try. A message of this type will also appear you specified the wrong device in your DEVICE command. Note: This message may also appear while the table is being printed. In this case, it indicates that the program is sending information to the printer faster than the printer can handle it. Give the printer a chance to catch up and then type R.)

The program pauses at the end of the first page to allow you to load fresh paper: When you are ready for it to print the second page, press the Space bar. Note: The message appears when the program has finished sending the first page to the printer: at this point, your printer will probably have some lines of the first page still to print and you should wait a few moments for it to finish before loading the next sheet of paper. Of course, if you are printing on continuous stationery, you can press the Space bar straight away.

The structure of the table is as follows:

- Column 1 The value of code that the printer uses to access the character, written in the form specified for the CHARKIT program.
- Column 2 The form of the code we recommend in the Character Definition file - single character, ! followed by single character or '!&xx'.  
Note: This column will be affected by the printwheel you are using: always refer to the table on page 12 for the correct code to use.
- Column 3 The character accessed by the code.
- Columns 4-8 Samples of the character printed assuming PS widths of 7, 6, 5, 4 and 3 PS units, respectively.

The lines of the table are in code order and are grouped in eights. This structure is also used in the Character Definition files supplied on the disc and in the Character Definition file templates, so that you can readily see how to insert the information in the table into your Character Definition file.

∞ When the program is finished, you remain in BASIC. If you want to produce similar information about another printwheel for this printer, simply replace the printwheel in the printer and then type the command: RUN . To return to CP/M, type the command: SYSTEM . If when you return to CP/M, you want to use the built-in printer, follow this command by typing:

DEVICE LST:=LPT

## Creating the Character Definition file

The Character Definition file you need to prepare is essentially just a simple text file containing details about the Character Set file CHARKIT will make, followed by a list of printer codes and character names. However, the information it contains must be set out correctly according to a fixed set of rules if CHARKIT is to work correctly.

Each Character Definition file has two main sections:

- the 'Header' containing the basic file details
- the 'File body' containing the table of characters, codes and character widths

In this section we look at these two sections in the simplest type of Character Definition file - ie. one without either character width information or subtle methods of printing additional characters. The details given here apply to all Character Definition files.

As the Character Definition file is a simple text file, you can use just about any text editor or word processing program to prepare it as long as your final version is a simple text file free of any special commands and codes. You could, for example, use the RPED editor supplied on your CP/M disc provided the definition doesn't exceed 200 screen lines: the files this handles are all simple text files. However, we recommend using LocoScript to prepare the file in the first instance and then using the Make ASCII file option in the Disc Manager's f1 Actions menu to create a simple text file you need. Not only will you find the file easier to edit with LocoScript (and there is no limit on its size) but we have set up the templates on your CHARKIT disc in such a way that you can create new documents with most of the information you need already in them.

In these instructions, we assume that you will be using LocoScript.

**Notes:** (i) Lines of the Character Definition file can be up to 255 characters long, if necessary wrapping from one screen line onto the next. The end of each line of the file is marked by a carriage return (↵).

(ii) Any number of comments can be inserted into this file, either at the ends of lines containing character definitions or on separate lines interspersed between the definition lines. These comments have to start with a semicolon (;) but otherwise can contain any text provided the total length of the line (up to the carriage return) doesn't exceed 255 characters. Their role is to make the file readable. We don't include any comments below so that the central structure of the Character Definition file is not obscured. You can see them in action in the example Character Definition file CHARKIT.EG.

## Initial steps

**Note:** The first time you work through these instructions, skip these initial steps. Instead edit the document CHARKIT.EG in group 1. This gives you a ready-made example document to compare with the following description.

- 1 Load LocoScript 2: then insert your CHARKIT disc.
- 2 Create a new document in the appropriate group of your CHARKIT disc and give it an appropriate name for the Character set you want to support.

For example, if you want to support 'Bilingual' wheels you might call the new document BILINGUAL.WHL.

In general, we recommend you to create your new document in the 'SIMPLE' group: this will give you a suitable basis for either a simple set of character definitions or for a more complex Character Definition file. However:

- if you have a dot-matrix printer and the character set you want to define is a version of the IBM character set, create your new document in the MATRIX group
- if you have a dot-matrix printer and the character set you want to define is a version of the Epson FX-80 character set, create your new document by copying the FX80.EG document in the MATRIX group
- if you have a 96-petal printer (eg. a Qume Sprint), create your new document in the PETAL96 group
- if you have a 100-petal printer (eg. a Juki 6100), create your new document in the PETAL100 group

The document you create by following the steps given above will contain a complete Character Definition file of approximately the same form as the one you require. All you have to do to tailor it to your printwheel or printer character set is work through the file changing the details where necessary.

## The Header

- 1 ! "*title-line1*" ←  
2 ! "*title-line2*" ←
- 3 ! "*author-name dd mmm yy*" ←  

**Title lines:** The text of these lines is used in the file's Identity text which you can inspect from LocoScript's Disc Manager. This gives you a quick way of seeing what is in the file. Each *title-line* is up to 30 characters long.

**Issue details:** also included in the file's Identity text, so that you can readily see who prepared the file and when this was done. *author-name* needs to be exactly 20 characters long (so if you want a shorter name here, this will need to be padded out to 20 characters with spaces); *dd* is the day (01...31); *mmm* is the first three letters of the month (Jan, Feb etc.) and *yy* is the year (00...99).

Note the single spaces between the items on this line.

- 4 "*set-name*" [*default-PS-width*] ←  

**Character Set name and default width:** The Character Set name is the name by which this character set will be identified in the relevant LocoScript menus. *set-name* may be up to 12 characters long. You will probably take this name straight from the character set or the 'family' of printwheels that you are working on. For example, you might select the name 'Bilingual'.

The *default-PS-width* is only needed if character widths are being specified. Details on page 18.

- 5 "*style-name*" *pitch* ←

**Character Style name:** *style-name* is up to 12 characters long, and *pitch* is 10, 12, 15, 17 or PS.

If you are setting up the file to support a range of printwheels, you can usually take the style name and the pitch from the wheel you will be using most often with this character set. For example, if the wheel is called some name like Letter Gothic 12, then you would use the style-name LetterGothic and set the pitch to 12 - just as you do when you are introducing a new printwheel for one of the supplied character sets (see Part II of the PCW External Printers Guide). If the character set is for a dot-matrix printer, you can give a dummy name like Standard and set any pitch. (We recommend 10.)

- 6 "*selection-sequence*" ←

**Printer Selection sequence:** This is intended for use with printers on which you can select different character sets by sending escape sequences (see 'Advanced techniques', below). If the printer doesn't have this feature or if the character set you want can be selected by setting switches on the printer, all you need here is "" ←

- 7 [*PS-units PS-origin*] ←

**Specification for Character widths:** This line is only required if your Character Definition includes PS widths. Details are given on page 16.

- 8 [*underline-code*] [*width*] ←

**Underline Character information:** The first item specifies the code for the underline character. If the printer uses the ASCII code for the underline character (&SF, decimal 95), you can write it simply as: " " ← Otherwise use "'*value*'" ← where *value* is the printer code used for underline (written as either a decimal or a hexadecimal number - see the box on page 12). The *width* is only needed if your Character Definition includes PS widths. (Details on page 16.)

**Note:** If your printer has an auto-underlining facility, you can omit this line altogether. Nearly all dot-matrix printers have auto-underlining.

- 9 ! ←

**Marks the end of the Header part of the file.**

The Header of the file which gives a straightforward definition of Bilingual wheels might therefore be:

```
1 ! "Bilingual wheels" ←
2 ! "" ←
3 ! "My Name          25 Dec 90" ←
4 "Bilingual" ←
5 "LetterGothic" 12 ←
6 "" ←
(No Character width (PS) information, so no line 7)
8 " _ ←
9 ! ←
```

## The File Body

The File Body essentially consists of lines of the following form:

```
code name [PS-width-info] ←
```

each of which specify that this *code* should be sent to the printer whenever you want to print the LocoScript character with the given *name* and the width of the character for use in proportionally-spaced text. The *PS-width-info* is used to specify the width of the character. As this is optional, we will ignore it for the moment. (We look at character widths in detail on page 16.)

In the simplest type of character definition, the *code* is expressed as:

```
letter
or ! letter
or ! ' value '
or ! ' special-name '
where:
```

*letter* is A...Z, a...z, 0...9 or a number of the more common punctuation and other symbols. The code specified is the ASCII value for the given *letter*

! *letter* is used where the *letter* has special meaning in the character definition ie. \* ! ; ". The code specified is the ASCII value for the given *letter*

! ' *value* ' directly specifies the code to be sent by number. *value* is the decimal or hexadecimal value of the code to be sent

! ' *special-name* ' specifies a code by the name of an ASCII control character (see page 25)

The *name* is expressed as "*character-name*" or "*accent-name*". The CHARKIT names for characters and accents are given in Appendix I. Any mixture of upper and lower case letters can be used when typing these names. If you specify a code for an accent then LocoScript will use this in combination with other characters to print accented characters.

For example, the line defining capital A would be:

```
A "A Upper" ←
whereas the line defining exclamation mark would be:
!! "Exclamation mark" ←
```

Most (but not all) of the codes between &20 and &7E can be expressed in terms of the ASCII character with this value. The main exceptions are the codes which vary depending on which language is selected. A case in point is the code &5B (decimal 91). In US ASCII this is a square bracket, but in other language versions of ASCII, this code is used to represent characters in common use in that language – such as é. So the way to express this code is the ! ' *value* ' form, ie:

```
! '&5B' "Open Square Bracket"
! '91' "Open Square Bracket"
```

The way in which we recommend you to express each of the codes required by the printer is explained in the box below (and listed in the table overleaf).

The simplest form of Character Definition file just requires you to set up one of these definitions for every LocoScript character and accent for which there is a corresponding character on the printwheel or in the printer's own character set. If you do as we suggest and use the LocoScript templates on your CHARKIT disc to set up your Character Definition file, most of these definitions will already be correctly specified. Typically, you will have to change no more than a dozen of the definitions in order to produce suitable definitions for all the characters on your printwheel.

• When you have finished preparing the LocoScript document containing your character definitions, press **EXIT** and save the document to disc in the usual way.

### Expressing the codes required by the printer

The codes that a printer will respond to are numbers in the range 0..255. These numbers are also referred to as the 'values' of the codes.

A few of the codes with values in the range 0..127 are expressed in terms of their values, but most of them are expressed in terms of the characters etc. they represent in the ASCII character set. Details are given in the table overleaf.

The codes with values 128..255 are all expressed as ! ' *value* '. The *value* can be given either as a decimal number or as a hexadecimal number.

The digits of a hexadecimal number take values in the range 0..15 (just as the digits of a decimal number take values in the range 0..9). These digits are expressed as 0..9 and A..F (or a..f), where 'A' represents the value 10, 'B' the value 11, and so on.

Just as a two-digit decimal number is the value of the first digit times ten plus the value of the second digit, a two-digit hexadecimal number is the value of the first digit times sixteen plus the value of the second digit. For example, the hexadecimal number E7 is  $E * 16 + 7 = 14 * 16 + 7 = 231$ .

Where codes are expressed as ! ' *value* ', and you want to express this *value* as a hexadecimal number, you write *value* as & followed by the digits of the hexadecimal number. The & simply signals that the value is a hexadecimal number.

## Creating the new Character Set File

Creating the Character Set file itself is firstly a matter of putting the Character Definition file into a suitable form for use with CHARKIT and then of running CHARKIT itself.

### Getting the file ready for CHARKIT

So far, you have created a LocoScript document containing the information that you want in the Character Definition file. The next step is to create a simple text file version of this LocoScript document - ie. the Character Definition file itself. The steps are as follows:

- 1 When you return to the Disc Manager Screen, check that the File cursor is still on the Character Definition document you have just prepared, then press [7].
- 2 Select the Make ASCII file option and press [ENTER].
- 3 Move the Group cursor to group 0 on your CHARKIT disc; then press [ENTER] again. You have to pick out group 0 so that CHARKIT can access the file under CP/M.
- 4 When the menu appears, check that Simple text file is currently selected at the bottom of the menu (and the name that LocoScript is proposing to give the file is suitable) and then press [ENTER].

The Character Definition file you require will then be created and stored in group 0 on your CHARKIT disc.

- 5 Use the f8 Options menu to display Limbo files; then use the f3 File menu to erase these. If you don't do this, your disc may seem full when you come to use it with the CHARKIT program. CP/M doesn't have the same system as LocoScript for clearing out Limbo files in order to make room for new files.

### Running CHARKIT

To create the Character Set file:

- 1 Load CP/M.
- 2 Insert your CHARKIT disc and press [ALT]C
- 3 Type the command:  
CHARKIT *printer-filename*=*character-filename* [RETURN]

where *printer-filename* is the name of the Character Set file you want to create and *character-filename* is the name of your Character Definition file.

The *printer-filename* must, of course, have the same main part to its name as the rest of the Printer Files you are using for this printer. The extension to the name must start with a # and the complete name must, of course, be a legal CP/M filename. For example, if you are creating an extra Printer File so that you can use a Bilingual wheel on your Juki 6100, you might call this JUKI6100.#BL. If you had called your Character Definition file BILINGUAL.WHL, the complete command would be:

CHARKIT JUKI6100.#BL=BILINGUAL.WHL [RETURN]

Dec	0	16	32	48	64	80	96	112
	Hex							
0	'NUL'	'DLE'	'SP'	0	'&40'	P	'&60'	P
1	'SOH'	'DC1'	!	1	A	Q	a	q
2	'STX'	'DC2'	"	2	B	R	b	r
3	'ETX'	'DC3'	'&23'	3	C	S	c	s
4	'EOT'	'DC4'	'&24'	4	D	T	d	t
5	'ENQ'	'NAK'	&	5	E	U	e	u
6	'ACK'	'SYN'	&	6	F	V	f	v
7	'BEL'	'ETB'	'&27'	7	G	W	g	w
8	'BS'	'CAN'	(	8	H	X	h	x
9	'HT'	'EM'	)	9	I	Y	i	y
10	'LF'	'SUB'	*	:	J	Z	j	z
11	'VT'	'ESC'	+	!	'&5B'	K	'&7B'	'&7B'
12	'FF'	'FS'	,	<	'&5C'	L	'&7C'	'&7C'
13	'CR'	'GS'	-	=	'&5D'	M	'&7D'	'&7D'
14	'SO'	'RS'	.	>	'&5E'	N	'&7E'	'&7E'
15	'SI'	'US'	/	?	O	-	O	'DEL'





