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Continued Overleaf

COMPACT

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COMPACT

IMPORTANT

AMSTRAD USERS

Please read completely through this supplement manual before you attempt to use your system.

It is assumed that users will have a good working knowledge of their Amstrad and the operating system CP/M Plus.

INITIALISATION

TO BE RUN ONCE ONLY

This version of COMPACT has been specially modified to run on the single disk drive PCW 8256. It is, therefore, necessary to load certain BASIC commands onto the program disks before they can be successfully used.

Thereafter, to run the program it will only be necessary to type in the command **SUBMIT COMPACT** on single disk drive machines OR **SUBMIT COMPACTB** on dual disk drive machines.

NOTE: Always use 'SUBMIT COMPACT' if running Nucleus, only use 'SUBMIT COMPACTB' if running generated programs and data is to be held on drive B.

FIRST Make copies of your Compact system disk as described in 'BACK–UP your programs' - Page 3.

FOLLOW THESE INSTRUCTIONS CAREFULLY

Type in the characters emphasised in bold print. Where it is necessary to key in one depression of the spacebar the term (SPACE) has been used. Where a depression of the ENTER key is required the term (ENTER) has been used. All characters should be typed in immediately after the A> , unless otherwise indicated.

1. Switch on. Load your operating system disk (CP/M Plus) in drive A.

2. At the A> prompt type the following:

   PIP(SPACE)M:=SUBMIT.COM(ENTER)

3. Then type the following:

   PIP(SPACE)M:=PIP.COM(ENTER)

4. Remove the operating system disk and insert the Start of Day disk.

5. Then type the following:

   M:SUBMIT(SPACE)SETUP(ENTER)

   and follow messages on screen . . .

   Message displayed: A>:Compact Initialisation complete

6. Users with Dual Disk Drive machines also type

   SUBMIT(SPACE)SETUPB(ENTER)

   Message displayed:A>:Setup for Drive B complete

Your system is now initialised and ready to run.

BACK–UPS

BACK–UP YOUR PROGRAM

Before using your COMPACT system program disk, it is essential to make security copies. Using the DISCKIT utility, make copies of all sides of the disks. Label carefully and store in a safe place. Do not attempt to use these back-ups. Only the original disks supplied by COMPACT can be used for operating the system.

Should any of the files on the original program disks become corrupt, it should be possible to restore them by copying back over from the security copies. Should the original disks become damaged or unusable, they can be returned to COMPACT for replacement for a small charge. However, no liability can be accepted by COMPACT for loss of data held on these disks. We recommend that disks used to store data are always verified after formatting to avoid loss of data through faulty disks.

BACK–UP YOUR DATA

If you follow the instructions for coming out of the COMPACT system successfully, you should arrive at the A> prompt, with the reminder not to forget your back-up.

THIS IS IMPERATIVE

It is recommended that complete security back-up copies of the datafiles be taken on a regular basis, onto separate back-up disks, using the DISCKIT utility. Should any problem arise with loss of data, you will then be able to load back on the most recent back-up. Three disks should be used in rotation, and a log kept of back-up activity.

These back-ups should be kept in addition to the copies taken prior to month-end run, as advised in the operating instructions (Archive copies).

TO SUM UP

There should be three sets of back-up disks:

1. SECURITY COPIES OF THE ORIGINAL PROGRAM DISKS
2. MONTH–END RUN BACK–UP OF GENERATED PROGRAM DISKETTES
3. BACK–UP OF DATA – THREE DISKS USED IN ROTATION

SINGLE DISK DRIVE USERS

Insert the Start of Day disk in drive A. At the A> prompt type:

SUBMIT(SPACE)BACKUP(ENTER)

and follow the messages displayed on the screen, making sure to insert the correct back-up disk.

DUAL DISK DRIVE USERS

Use the DISCKIT utility to make a back-up copy of your data files making sure to use the correct back-up disk.

AMSTRAD USERS PLEASE USE THIS START OF DAY PROCEDURE NOT AS DESCRIBED IN THE MAIN BODY OF THE MANUAL

START OF DAY

SINGLE DISK DRIVE

START OF DAY PROCEDURES

After following instructions for initialisation (AMSTRAD USER NOTES) insert the manufacturer's system disk into drive A and follow the manufacturer's instructions to load the CP/M Plus. If this has been carried out correctly then the CP/M prompt should appear on the screen (A>). The CP/M prompt must be displayed on the screen before the COMPACT software can be run.

Having loaded the CP/M correctly, insert the COMPACT 'Start of Day' disk into drive A. All that is required is to type **SUBMIT(SPACE)COMPACT(ENTER)**. More instructions will be displayed.

NOTE: Always use 'SUBMIT COMPACT' if running Nucleus, only use 'SUBMIT COMPACTB' if running generated programs and data is to be held on drive B.

Screen will display message:

```
A> llive
Insert LIVE DATA disk in drive A
```

Remove Start of Day disk and insert live data disk in drive A, then depress any key. Screen will display message:

```
A>m:pip m:=*.*[v]
```

and list files being copied into memory then message at bottom of screen:

```
A>|start
Insert Compact Start of Day disk in drive A
```

Remove live data disk and insert the Start of Day in drive A.

Depress any key.

Screen will display message:

```
A>LIVE DATA HAS BEEN COPIED etc.
```

and arrive at Screen 1 of COMPACT.

The next entry required by the operator will be to enter today's date. This is required in the format DayDayMonth MonthYearYear. If a date of 8th September 1984 was required it would be entered as 080984. No punctuation or spaces should be included.

After the date has been entered correctly the operator will then be asked to put the program disk on drive A and the files disk on drive M (files have been placed on drive M by the preceding routine).

Place your selected program disk in drive A and press the ENTER key.

Your Compact system is now ready to run.

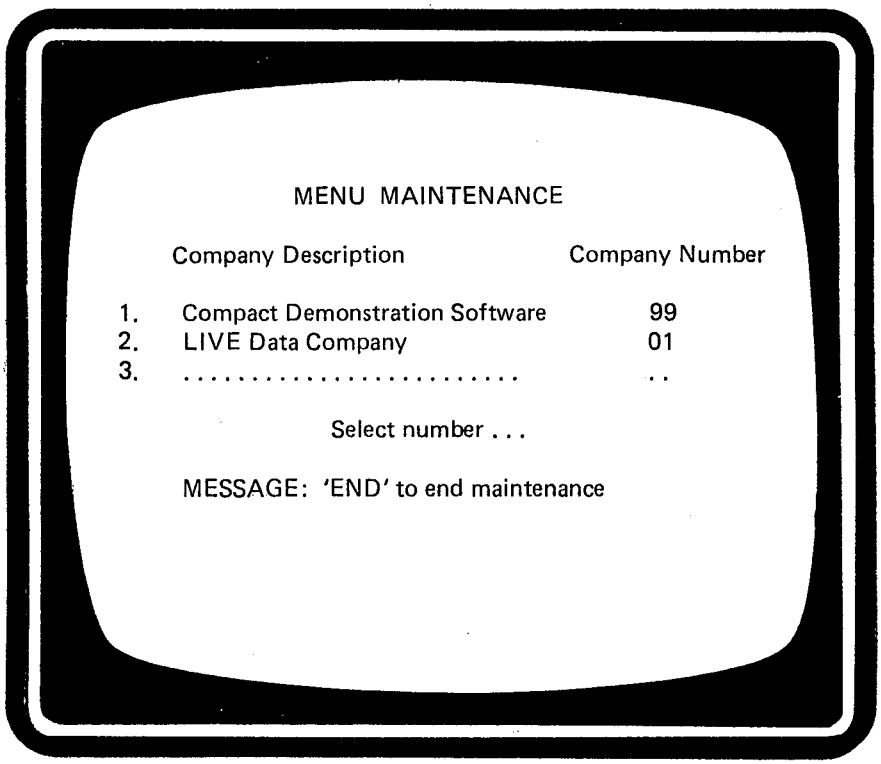
AMENDING MENUS

To amend the menu, type AME (in upper or lower case) in response to the SELECT NUMBER prompt on the menu to be changed.

It will be necessary to enter the MASTER PASSWORD (this is set by Compact XXX in upper case) - please see PASS-WORDS on page 8.

The menu will be re-displayed with the descriptions on the left-hand side and the company numbers, system prefixes or program names on the right. Immediately underneath the menu is the number of the next available menu item, with the maximum entry size indicated with full stops.

The user will be prompted to enter the number of the menu item to be amended. To add new items to the menu, the last number displayed on the screen should be selected. Selection of any other valid number will allow the amendment or deletion of a current entry.



Company menu - When amending the company menu the company name can be up to thirty characters in length. Each company name has a number between 1 and 99 associated with it known as the company number. All data files created under that company will have the company number as a suffix.

There are four modes of operation at this point:-

a) Immediately pressing the ENTER key leaves the description unchanged. The user is then given the prompt to amend the company number, the system prefix or the program file name.

   Immediately pressing the ENTER key leaves the company number, system prefix or file name unchanged.

b) The description can be changed by re-typing it. A new company number, system prefix or program file name can be entered by re-typing at the next input, or it can be left unchanged by pressing ENTER.

c) Typing 'DEL' at the description input and pressing the ENTER key causes that entry to be deleted. A space is left on the amended menu but when the menu is re-displayed on exit from the menu amendment, the menu items are re-ordered leaving no gaps on the screen display. Deletion does not remove the menu file from the disk.

d) Typing 'INS' at the description input and pressing the ENTER key will automatically insert a blank line into the menu. This item can now be amended/deleted as described above.

To leave menu amendment the user types in 'END' at the prompt for the next item to be amended.

NOTE: Only fifteen items are available for amendment on a menu at any one time. The sixteenth item is 'NEXT PAGE'. Selecting this will display the remaining menu items for amendment. When this is displayed it will have at the top of the screen item fifteen 'Previous Page'. Selection of this will re-select the first fifteen items for amendment.

PASSWORDS

The password protection module allows the user complete control over access to sensitive areas of data by unauthorised personnel.

Password protection is provided at the company, system and program menu levels. Overall password protection is provided by the Master Password facility.

The configuration of passwords is completely under the control of the user. Passwords may be set on all or just some of the companies, systems or programs.

For example, the user may wish to restrict the use of the Payroll system. Therefore, a password could be set on the Payroll option on the system menu. If no other passwords were set this program would provide access to all systems, with the exception of Payroll.

WHEN THE SOFTWARE IS SUPPLIED, THE MASTER PASSWORD WILL BE SET TO 'XXX'. NO PASSWORDS WILL BE SET ON THE COMPANY, SYSTEM OR PROGRAM MENUS.

NOTE: CARE SHOULD BE TAKEN IN AMENDING THE MASTER PASSWORD. IF THE MASTER PASSWORD IS FORGOTTEN, COMPACT WILL NOT BE ABLE TO RESET THE MASTER PASSWORD.

AMENDING PASSWORDS

To amend any password, be it the master password or any password at the company, system or program level, type 'PWD' (in upper or lower case) in response to the 'Select number' prompt on the menu whose passwords are to be changed. The master password can be changed from any menu level. A message will be displayed inviting the user to change the master password:-

'Do you want to change master password? (Y/N)'

Only answer 'Y' (Yes) if you do intend to change the Master Password. Answer 'N' (No) if you only wish to change Menu Password.

MASTER PASSWORD

On entering 'Y' the user will be prompted to enter the current master password. If the password is entered incorrectly, the cursor will return to the 'Select number' prompt outside the password amendment option. To re-try, 'PWD' must be re-entered at this prompt.

NOTE: If the master password is being changed for the first time since the receipt of the software, the master password will be 'XXX'.

If the current master password is entered correctly, the user will be prompted to enter the new master password and then to type the password again for verification purposes.

If the two entries of the new master password are not the same, the user will be warned and then invited to enter the new password and verify it again.

After successful change of the master password the cursor returns to the 'Select number' prompt outside the password amendment option.

NOTE: For added security, the master password is never echoed on the screen. The user should also take care to enter the password in the correct case (upper/lower). Failure to do this will result in the non-recognition of the master password.

MENU PASSWORDS

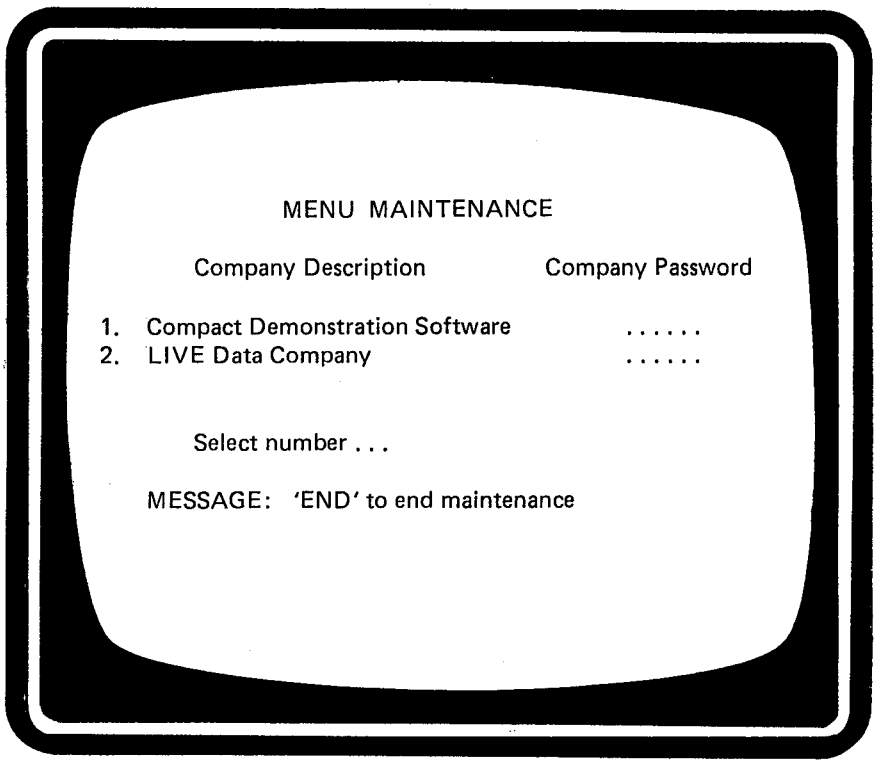
On entering 'N' to change the master password, the user will be prompted to enter the current master password.

If the current master password is not entered correctly, the cursor will return to the 'Select number' prompt outside the password amendment option. To re-try 'PWD' must be re-entered at this prompt. The user should take care to enter the password in the correct case (upper/lower). Failure to do this will result in the non-recognition of the password.

If the current master password is entered correctly, the menu screen will be displayed showing the password entries to the right-hand side.

The user will be prompted to enter the number of the password to be amended.

To end password maintenance type 'END' at the 'Select number' prompt.



When amending a company password the password can be up to six characters in length. To delete a company password overwrite the old password by entering one space followed by the Enter key.

NUCLEUS ON THE AMSTRAD PCW 8256

Nucleus is supplied on three disks as follows:

Disk	Side	
1	1	Start of Day
1	2	Definition maintenance
2	1	Create update programs
2	2	Create report programs
3	1	Create letter programs
3	2	Create document programs

Running Nucleus

TO LOAD

To run Nucleus you will need the three Nucleus program disks, the CP/M and Operating System disk and a blank formatted disk.

1. Switch on. Load operating system disk. At A> prompt, remove this disk.

2. Insert Nucleus Start of Day disk in drive A and type:

   SUBMIT(SPACE)COMPACT(ENTER)

   Follow screen messages until the instruction appears:

   A>llive
   INSERT LIVE DATA DISK IN DRIVE A: Press any key when ready

3. At this point remove S.O.D. disk and load the blank formatted disk.

   The next message will be requesting today's date. From this point follow the instructions in the manual.

SPECIAL NOTES

Generated systems and programs will be stored in drive M - the memory drive.

To save work done with Nucleus it will be necessary to copy the files held on drive M onto a disk in drive A **BEFORE SWITCHING OFF**.

When you come out of the program you will arrive back at the A prompt. Follow instructions in this supplement for SUBMIT BACK–UP ROUTINE, as this will copy files and programs onto the disk in A.

ADDENDUM – IMPORTANT

In the manual reference is made to the request for selection of Temporary or Permanent Programs being generated. Please note that with the Amstrad version of Nucleus it is not possible to generate temporary programs, so the response must be Permanent.

RUNNING GENERATED SYSTEMS

Once you have successfully created your system with Nucleus please refer to these special notes on how to access it.

1. You will need a blank, formatted disk for data files.

2. Run NUCLEUS START OF DAY as normal (Insert the disk mentioned in (1) when the message 'Insert LIVE DATA disk in drive A' appears).

3. Insert the generated system disk when the message 'Load program disk in drive A and file disk in M' appears.
   Alternatively, the generated program disk can be inserted by selecting the 'Change disk - Other menus' option of the Nucleus menus.

4. Use DISCKIT to back-up generated program disks.

DUAL DISK DRIVE MACHINES

It is important to note that Nucleus itself will only generate files on drive A and M. If you have a dual disk drive machine it will be possible to store the data files on a disk in drive B once you have created your system. Access to these systems will be activated by typing **SUBMIT COMPACTB**, at Start of Day.

NUCLEUS RESTRICTIONS

Numeric Field	14 digit maximum
Alpha Field	5 lines of 50 chrs per line

1020 byte, data record length

Keys	5 max (1 main, 4 secondary)
Fields per record	99 max (please see N.B.1)
Files	5 open at one time (see N.B.2)

* * * * * * * * * * * *

Fields per report	50 max.
Sort criteria	8 levels of sort
Boolean logic	3 lines of 40 chrs expression max.
Computed fields	20 chr formula maximum

* * * * * * * * * * * *

N.B.1 The maximum number of fields in a file can vary considerably and depends upon factors such as the hardware being used and, in particular, the application being generated in view of the number of linkages etc.

N.B.2 In cases where the Nucleus generated code is amended, this restriction can be overcome.

REMEMBER

The ability to amend any code generated by Nucleus gives tremendous flexibility and obviously increases the power of the programs generated.

Sample Work Sheet 1 System No. & Name:

FIELD DEFINITION

File No.: File Name: . . (20 chrs) . . . . File Type: (M/T)

Field No. - M/C/Generated -		--
Field Name:	20 A/N	----------
Field Type (A/N/D/R)	1 A/N	-
No. of Characters	2 N	--
No. of Lines (per above)	1 N	(No input indicates only 1 line)
No. of Digits before point	2 N	--
No. of Digits after point	2 N	--
Allow negative values? (Y/N)	1 A	-
Minimum value	8 N	--------
Maximum value	8 N	--------
Delete Protect (Y/BLANK)	1 A/N	-

Sample Work Sheet 2 System No.:
File No.:

FILE KEYS

	Field No.	Name	No. chrs.
Main key	.....	.....	....
2nd key	.....	.....	....
3rd key	.....	.....	....
4th key	.....	.....	....
5th key	.....	.....	....

NUCLEUS REPORTING

USER GUIDE

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INDEX

INTRODUCTION

The NUCLEUS Report Generator is capable of being used as a stand alone package for the generation of special reports from data held within the COMPACT standard accounting package or as an integral part of the total NUCLEUS system where the files and data have been created using the NUCLEUS System Generator.

Where the Report Generator is being used in conjunction with COMPACT standard accounting packages, file definitions will have already been set up by COMPACT software staff and supplied on the NUCLEUS disks. It will not be possible to modify or add to any of the file definitions supplied with the standard packages.

The operating instructions for producing special reports from the accounting data base or for using it in conjunction with the NUCLEUS System Generator are the same.

SYSTEM OVERVIEW

The report generator part of NUCLEUS enables users to produce a wide range of reports from either existing accounting packages or from newly generated systems. The report generator option also enables such options as self-adhesive label printing to be carried out quickly and simply in a number of label formats.

To enable the specialised requirements for producing standard letters to be carried out within NUCLEUS, a simple text editor has been provided. This module will enable simple documents to be set up and merged with such information as names and addresses or outstanding balances which may be held within the NUCLEUS generated systems or contained within one of COMPACT's standard packages. As well as being able to select fields at random for inclusion within the document, full Boolean options exist so that exception criteria can be established.

Where reports are required on preprinted paper (e.g. simple invoice or accounts statement) a special formatted report module is provided, enabling data to be selected from any of the NUCLEUS files and output to preprinted stationery.

DETAILS OF THE SYSTEM

The following broad selections are available within the system:–

1. Create Master File Print Program

This option provides the simplest level of NUCLEUS reporting. This option would be used for producing complete file listings where the format of the report was not important. These reports are produced in columnar form with the field description printed beside the data contained within the field.

2. Create Selected Report Program

This program gives the user some control over the format of the data to be printed from file. The data to be printed within the report can be selected in any order, and by using the Boolean logic contained within this module it is possible to exclude data which fulfils a certain criteria. The operator is also given control over subtotalling and start of new pages.

3. Create Label Print Program

This particular program is designed to cater for the special requirements of printing continuous labels. It is possible to specify print programs using a wide range of label formats. The Boolean logic option exists within the module to enable data to be selected from files, given that certain conditions apply. The label print option can be used in conjunction with the standard accounting packages generating labels for mailshots etc.

4. Create Letter Print Program

The letter print option enables standard text to be set up and edited using simple "Wordstar" like commands. During the creation of the standard letter it is possible to select data fields held within the accounting packages for inclusion within the text. This option is ideal for such applications as chasing letters for outstanding balances etc.

5. Create Document Print Program

This module extends the facilities contained within the letter print programto make it more suited for producing documents on preprinted stationery. Using this module, it will be possible to develop a simple invoicing or statement print routine. The document editor also has facilities for subtotalling and totalling to enable totals to be generated for documents such as invoices.

ADMINISTRATION HINTS

The NUCLEUS Report Generator has been designed to remove some of the drudgery from developing simple reporting software as well as speed up the production of bug-free, efficient program code. The NUCLEUS Report Generator does not remove the necessity for any proposed reporting to be carefully planned in advance. It is very difficult in a document of this type to cover all possible uses for the NUCLEUS Report Generator. Some of the following suggestions may assist in the use of the NUCLEUS Report Generator when generating new reports.

REPORT SPECIFICATION

Throughout the manual an example of a Personnel System has been used to illustrate the features of the NUCLEUS Report Generator. Before the example reports can be created using the NUCLEUS Report Generator a considerable amount of planning and preparation has to be carried out.

Consideration has to be given as to the reports required from the system and the information which these reports are to contain and in what order the information is to be reported.

TEST SYSTEMS

Because it is relatively quick to generate report programs using the NUCLEUS Report Generator, a method of building up some confidence with the software is to undertake some very simple report programs. Considerable experience and insight will be gained by designing a simple report and seeing what results are achieved when the report is generated. If mistakes are made in the early use of the NUCLEUS Report Generator is it a relatively simple matter to go back and re-enter the report details.

Throughout the manual in following the example of the Personnel System, attention will be drawn to report design features which may help in the subsequent design of new reports. It is also important to look at other report programs to gain a cross section of analysts thinking when developing reporting software.

START OF DAY PROCEDURES

After copying the software, insert the manufacturer's system disk into drive A and follow the manufacturer's instructions to load the CP/M or MS-DOS operating system. If this has been carried out correctly then the CP/M or MS-DOS prompt should appear on the screen (e.g. A>, A:). The CP/M or MS-DOS prompt must be displayed on the screen before the COMPACT software can be run.

Having loaded the CP/M or MS-DOS prompt correctly, insert the COMPACT 'Start of Day' disk into drive A. All that is required is to type 'COMPACT' (or 'SUBMIT COMPACT' in the case of CP/M-86 users) in lower or upper case and depress the Enter key. If the entry has been carried out correctly, the screen should reflect the following:

E.g. 'A>COMPACT' (upper or
'A>submit compact' (CP/M-86 users) lower case).

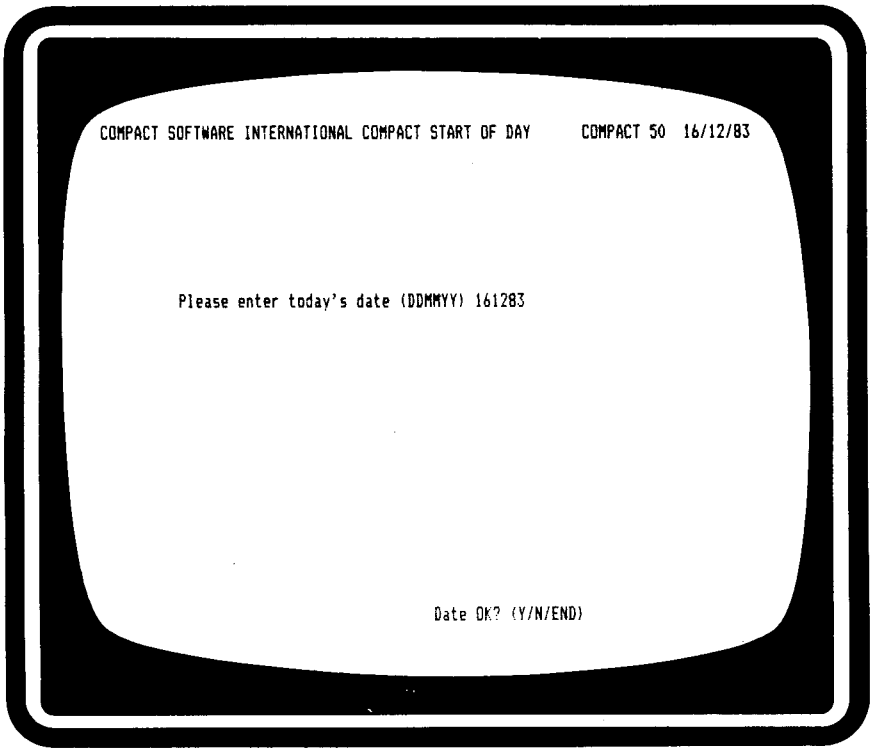
After depressing the Enter key the system will load all the necessary software.

The next entry required by the operator will be to enter today's date. This is required in the format Day Day Month Month Year Year. If a date of 8th September, 1983 is required it will need to be entered as 080983. No punctuation or spaces should be left.

After the date has been entered correctly, the operator will then be asked to put the program disk into drive A, and the data files into drive B.

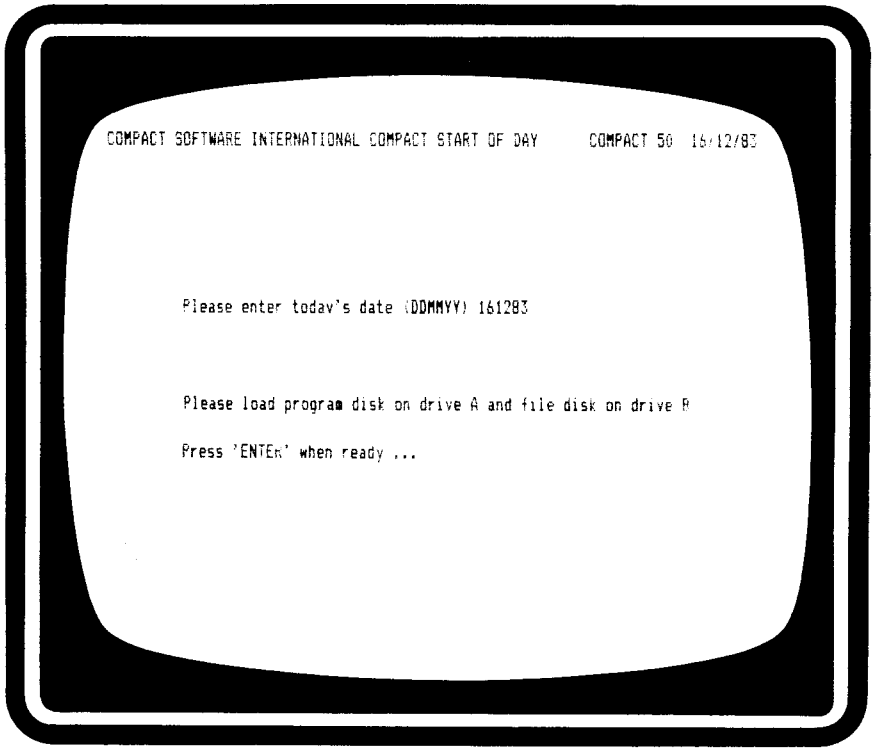
If the software is being used for the first time, then the program disk should be loaded into drive A and a blank formatted disk into drive B.

Where a hard disk system is in use, program files and data files may be mixed on the same logical unit.



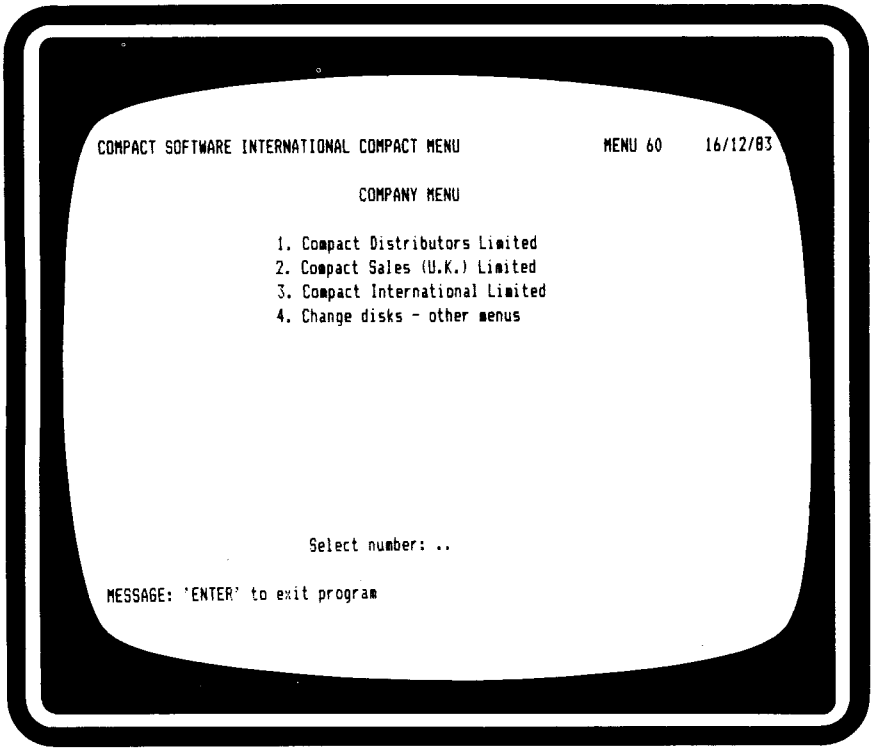
SCREEN 1

Having loaded the Start of Day disk into drive A and typed COMPACT or SUBMIT COMPACT in lower or upper case, the operator will then be asked for today's date. This routine need only be run at the start of each day or when the machine is turned on.



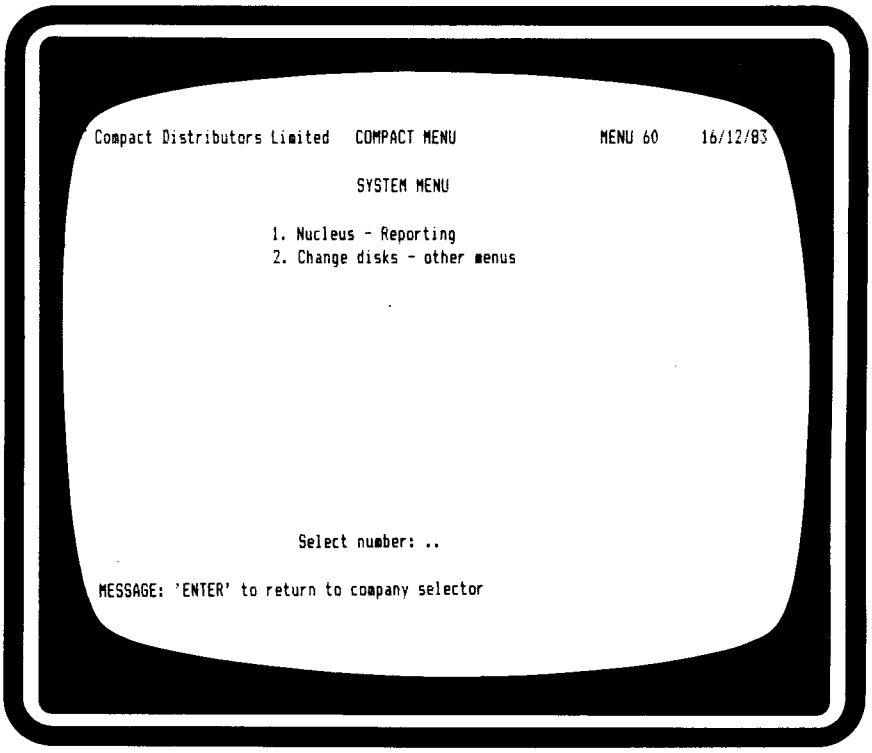
SCREEN 2

Depending on the system to be run, the Program Disk is loaded into drive A and the Data Disk into drive B. If a new system is being set up then a blank formatted disk should be used in drive B.



SCREEN 3

Programs are selected via a MENU. The first level of menu selection enables multi-company systems to be handled. Maintenance routines exist to add new companies to the system. On selecting the company, only files relating to the company can be accessed.



SCREEN 4

The second level of menu available is the System Menu. Selection of one of these options will display a more detailed list of the actual programs available within the system.

DETAILED SYSTEM NOTES

The following are detailed system notes for each program within the report generator section of NUCLEUS, along with an explanation of information held within the files maintained by the system. The notes follow the same sequence as the options given in the program menu shown in Screen 5.

Create Master File Print Program (Option 1)

The master file reporting option provides the simplest level of report generation available within NUCLEUS. The purpose of this particular option is to provide a quick method of dumping the contents of a file to a report without having to specify the format in which the report is to print. Logic exists within the generator to space the fields held within the file across the page so that the details printed are easy to read and neatly presented.

On selecting option 1, Screen 6 is displayed with the operator being asked to specify the page size on which the report is to be printed.

Although values are shown against the page size and line size, it is important that the meaning of these two values is understood.

'Enter page size for report Standard' (i.e. 66 lines)

> This field is meant to indicate the depth of the paper being used between the perforations or the number of lines available for printing. Many printers in use today use 1/6th of an inch for each line of printing. Most of the standard listing paper available is 11 inches deep, thus, the page size will enable 66 lines of printing. If paper other than 11 inch paper is in use, then the page size field should be changed. By merely depressing the Enter key the default value of 66 will be used.

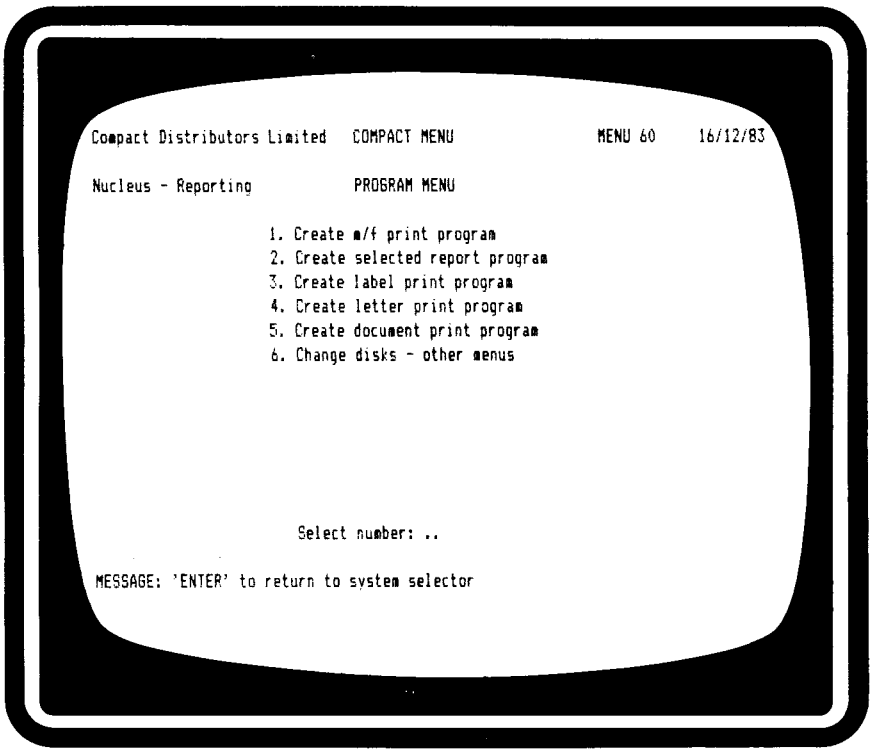
'Enter line size for report 132'

> The field for the line size is meant to indicate the maximum number of characters capable of being printed per line. A normal full size printer using 13 1/2 inch paper would be capable of printing 132 characters. This value is shown on the screen automatically and by depressing the Enter key this value will be used.

It is possible, however, to connect the system to mini printers which are capable of handling paper widths to a maximum of 8 1/2 inches. If the standard print size of 10 characters to the inch was being utilised, then a paper width of 8 1/2 inches would normally mean the line size should be set to 80 characters. However, this parameter is further complicated by the fact that some of the mini printers are capable of printing at 16.5 characters to the inch. If such a printer was connected to the system although the paper width was only 8 1/2 inches, it would be possible to have a line size of 132 characters.

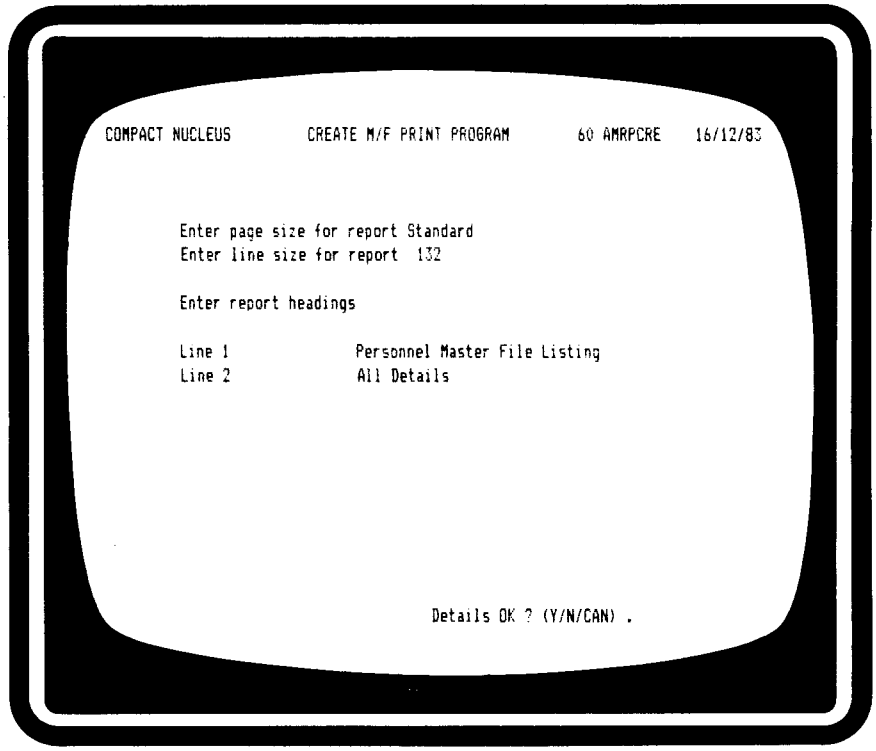
If any doubts exist regarding either of these two parameters the printer manufacturer's manual should be consulted.

It is now possible for the operator to enter two lines of heading which will appear on the top of all reports. Each of the heading lines is 40 characters long, and if the printer has the capability of printing in extended format then both lines of the heading will be done in this method. Two lines of heading may be typed without reference to spacing or positioning, since each line of the heading will be centred on the page by the software.



SCREEN 5

This screen shows the programs available within the NUCLEUS Report Generator.



SCREEN 6

At the start of creating a report program, the system needs to know the number of lines per page (for normal 11 inch deep paper this would be standard) and the number of characters for each line (for most full size printers, this would be 132 characters).

It is also possible to enter two lines of heading information for the report. Each line is 40 characters long, and if the printer has the capability of printing in extended format, then both lines of the heading will be done in this method. Each heading line will be automatically centred on the page.

Having completed the entry of the report headings, the system will display the following message:–

'Details OK ? (Y/N/CAN)'

If the details entered so far are correct, by selecting 'Y' the details will be recorded and the system will move on to the rest of the report generation.

If 'N' is selected, the operator has the opportunity of stepping back through each of the fields and making any alterations which may be necessary.

By entering 'CAN' all of the details entered to the system will be disregarded and no update will take place.

On completion of the heading details, all of the systems available for reporting along with the system numbers are displayed on the screen for selection. On selection of the system number for which the report is required, the system name is displayed and the operator is asked to respond to the following question:–

'Details OK ? (Y/N/CAN)'

If the wrong selection has been made then enter 'N' and a new choice may be made. By entering 'CAN' the system will return to the menu.

Having selected the correct system, the files contained within that system are then displayed. It is then possible to select one file which stores information from which the report is required.

On entering a file number the name will be displayed and the operator will be asked to respond to the following question:–

'Details OK ? (Y/N/CAN)'

If an incorrect selection has been made, by entering 'N' the operator is able to go back and make an alternative selection.

The use of 'CAN' will return the operator to the menu selection.

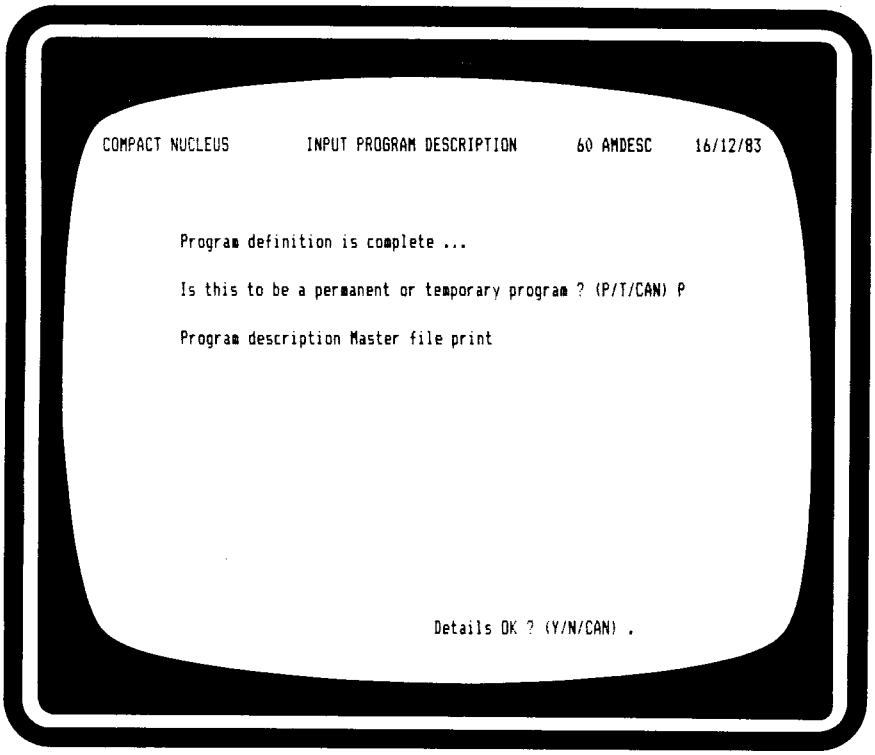
If the correct selection has been made the operator should respond 'Y'.

The program definition is now complete. Screen 7 will now be displayed and the operator will be asked to indicate whether the program being generated is a temporary or permanent program and the name which the program should be given.

Where the program is specified as a permanent program (P) then this program will be written to the diskette and stored for future use. In the case of a permanent program it will be necessary to enter a program description of a maximum of 30 alphanumeric characters which will be inserted on the next available space on the menu.

The facility offered for temporary programs is for the situation where the program is not required for future use and is not to be stored on the diskette. In this case, the temporary program will be held in the main memory of the computer and used immediately for printing purposes. It should be noted that in the case of a temporary program when the machine is turned off, or another program used, the details of the temporary programs are lost.

If all details have been entered correctly (respond 'Y') and NUCLEUS will generate the master file report program. Options exist to step back through the details that have been entered and make any corrections that may be necessary (respond 'N') or by the use of 'CAN' the details will be ignored and operator returned to the menu.



SCREEN 7

Having completed the details needed to create the report program, the system requires that the program is given a description. This program description will then be inserted on the next available space on the menu. After the report program has been named, the report program is generated, linked to the menu selector and written to the program disk.

Having successfully completed the program definition, the screen will display the following message:–

'Generating master file print
'Please wait...'

Once the generation of the report program commences, a line counter is displayed on the screen to indicate the number of lines of code generated. For large programs the generation is done in two parts and it is important to allow sufficient time for both parts of the generation to be completed. Having generated the report program the system will then request that the program disk be mounted on drive B so that the new program can be copied to the program diskette. If the programs are to be stored on the diskette already in drive B press the Enter key or place the diskette for program storage in drive B. The system will then copy the generated program to the diskette and return to the report generation menu. Before returning to the menu the system displays a reminder that if the diskette has been changed to store the generated programs then the NUCLEUS parameter file should be returned to drive B before continuing.

Because the master file print program has been devised to provide a quick method of listing the contents of a file, this type of report does not take into account any linkages which may exist during the generation of the program. It is possible to generate a master file listing, taking into account any linked fields but this report would need to be generated under option 2 (selected report program).

Create Selected Report Program (Option 2)

Whereas in option 1 the format of the report was controlled by the System Generator, within the selected report option considerable flexibility is provided to enable the user to determine the content and format that the report will take. The selected report program utilises the same files and data as covered in option 1 but at the time of creation it is possible to select only those items which are to be printed or produce additional information such as totals, percentage variances etc. which are not already maintained within the system.

On selection of option 2 Screen 8 is displayed.

'Enter page size for report Standard' (i.e. 66 lines)

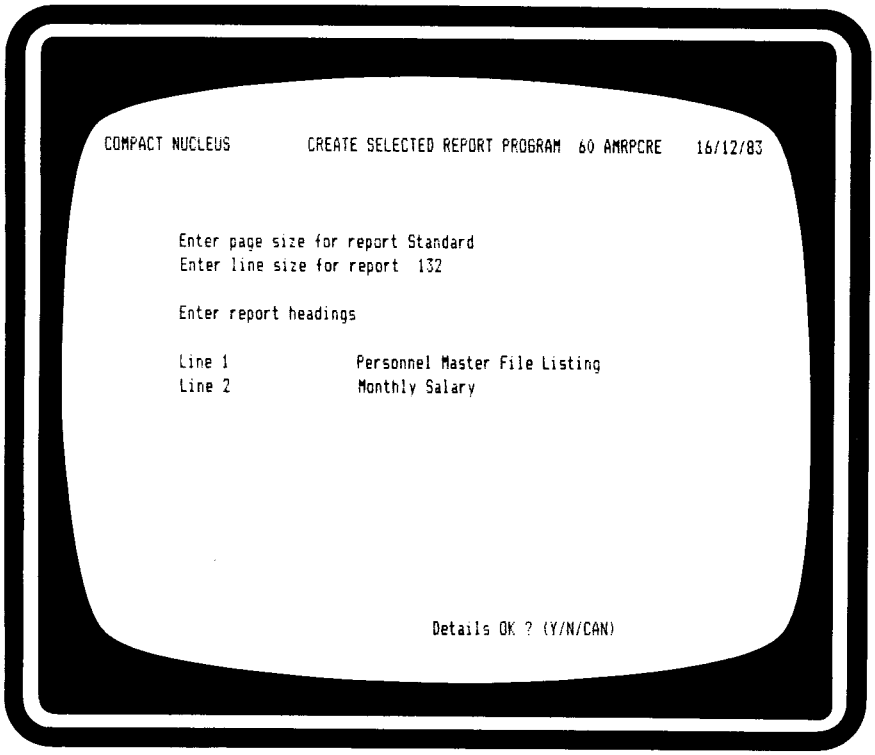
> This field is meant to indicate the depth of the paper being used between the perforations or the number of lines available for printing. Many printers in use today use 1/6th of an inch for each line of printing. Most of the standard listing paper available is 11 inches deep, thus the page size will enable 66 lines of printing. If paper other than 11 inch paper is in use then the page size field should be changed. By merely depressing the Enter key the default value of 66 will be used.

'Enter line size for report 132'

> The field for the line size is meant to indicate the maximum number of characters capable of being printed per line. A normal full size printer using 13 1/2 inch paper would be capable of printing 132 characters. This value is shown on the screen automatically and by depressing the Enter key this value will be used.
>
> It is possible, however, to connect the system to mini printers which are capable of handling paper widths to a maximum of 8 1/2 inches. If the standard print size of 10 characters to the inch is being utilised, then a paper width of 8 1/2 inches would normally mean the line size should be set to 80 characters. However, this parameter is further complicated by the fact that some of the mini printers are capable of printing at 16.5 characters to the inch. If such a printer was connected to the system although the paper width was only 8 1/2 inches it could be possible to have a line size of 132 characters.

If any doubts exist regarding either of these two parameters the printer manufacturer's manual should be consulted.

It is now possible for the operator to enter two lines of heading which will appear on the top of all reports. Each of the heading lines is 40 characters long, and if the printer has the capability of printing in extended format then both lines of the heading will be done in this method. Two lines of heading may be typed without reference to spacing or positioning, since each line of the heading will be centred on the page by the software.



SCREEN 8

At the start of creating a report program, the system needs to know the number of lines per page (for normal 11 inch deep paper this would be standard) and the number of characters for each line (for most full size printers, this would be 132 characters).

It is also possible to enter two lines of heading information for the report. Each line is 40 characters long, and if the printer has the capability of printing in extended format then both lines of the heading will be done in this method. Each heading line will be automatically centred on the page.

Having completed the entry of the report headings the system will display the following message:–

'Details OK? (Y/N/CAN)'

If the details entered so far are correct, by selecting 'Y' the details will be recorded and the system will move on to the rest of the report generation.

If 'N' is selected the operator has the opportunity of stepping back through each of the fields and making any alterations which may be necessary.

By entering 'CAN' all of the details entered to the system will be disregarded and no update will take place.

Having completed entering details for the report headings specifying the page sizes, it will then be necessary to specify the system from which the data to be printed will be selected.

Two types of system are available for use with the NUCLEUS Report Generator. System numbers 1-19 have been reserved for COMPACT standard accounting packages. Although it is not possible to change or alter any of the file definitions within this section, it is possible to use the NUCLEUS Report Generator to produce alternative formats for accounting reports. In addition to the COMPACT defined systems, user generated systems will also be shown, with the first user defined system number available being number 20.

On selection of one of the system numbers displayed on the screen the details entered will be validated and the name of the system displayed on the top line. If the system number has been entered incorrectly, the operator has the opportunity of changing this number before processing.

To terminate the program enter 'CAN' and the system will return to the program menu.

Having selected the system from which data will be used to produce the report, the files contained within the system are then displayed on the screen.

When selecting the file necessary to produce the report it is important to ensure that the principal file is selected and not the linked file. In the case of the Personnel example being used where a report is required to show details of employee names and addresses etc. as well as information that may be contained in a linked file it will be necessary to select the Personnel master file for report generation purposes. During the defining of the report any linkages which have previously been created will be taken into consideration and the operator will have the opportunity of selecting data from linked files for incorporation within the reports.

Having selected the principal file needed for the report generation the system will validate and display the file name with the operator being given the opportunity of accepting the selection or, by entering 'CAN', returning to the program menu. Having selected the principal file for producing the report the fields contained within this file are then displayed on the screen. Screen 9 shows the field numbers and descriptions available for printing.

In addition to the fields created by the user, a special field is also provided so that fields to hold information not already contained within the system can be generated at report time. This field will appear at the end of the user defined fields and will be defined as '99 Computed field'. This option may be selected as often as required during the generation of the report. Options available under this selection will be explained later in the manual.

The following prompt is now given to enable the operator to select those fields which are required to be printed within the report.

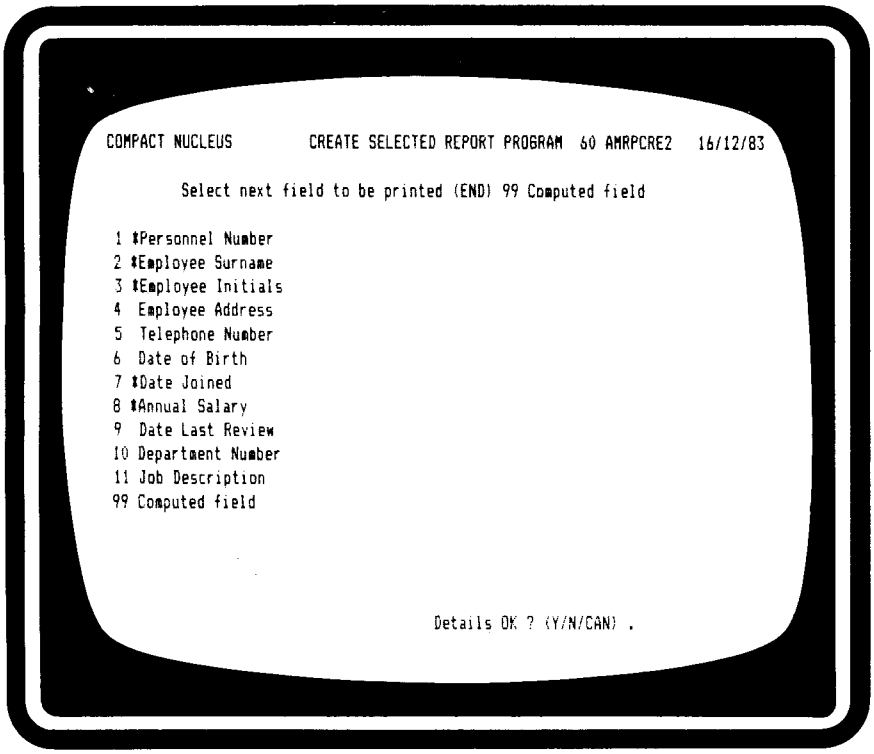
'Select next field to be printed (END)'

Although the fields are numbered consecutively it is not necessary for them to be selected in this order for printing. The operator is able to select those fields required to be printed within the report in any order necessary. It would be normal to select as the first field the main key to the file. On selection of the field number to be printed, the description of the field will be displayed beside the field number entered.

If the wrong field has been selected, by entering 'N' the operator will be able to re-enter an alternative selection.

If the report generation is to be aborted, then by entering 'CAN' the system will return to the program menu.

If the field description displayed is correct, then by entering 'Y' the system will enable a further field to be selected and at the same time display an '*' beside the field already selected. (The '*' will appear between the field number and the field description).



SCREEN 9

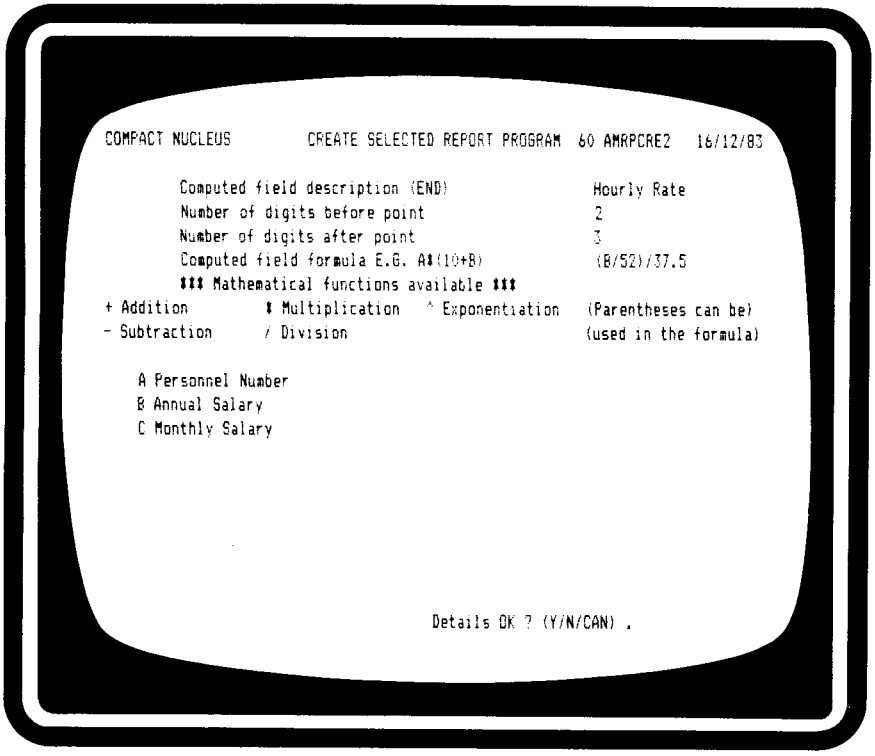
Option number 2 within the Report Generator System enables a report to be produced from the master file by the selection of fields. Fields are printed in the order in which they have been selected. As each field is selected an asterisk is placed between the field number and the field description to indicate that the selection has taken place. Option number 99 'Computed field' can be selected as often as is necessary but can only be used on numeric fields.

In the Personnel example currently being used, the employee surname was defined as a separate field to the employee's initials. This was done so that it was possible to use the first part of the surname to sort the file into alphabetical order. However, in the printing of employee records it may be more convenient to have the employee initials before the surname. By selecting field 3 (employee initials) first and then selecting field 2 (employee surname) the report will be produced with the fields printed in this order.

Field 99 provides the user with the opportunity of printing derived information which is not already contained within the files. In the case of the Personnel example, although the annual salary is shown it may be necessary for a special report to calculate an employee's hourly rate. Although an employee's hourly rate is not contained within the file as standard information the use of the computed field option will enable this value to be calculated and printed within the report. The computed field option may be selected as often as required, and on selection of option 99 Screen 10 is displayed.

The computed field option will only function on numeric fields and the fields on which the calculation is to be carried out must have already been selected for printing. This condition means that if an employee's hourly rate is to be calculated, the employee's annual salary (which will form the basis of the calculation) must have already been selected before specifying the computed field.

Although the original format of the file will not be altered to accommodate the computed field, it will be necessary to specify the computed field as if it were being added to the file.



SCREEN 10

Having selected a computed field, the system then requires the operator to key in additional information for the handling of the new field. It is possible to identify the field with a new field description and the size of the number must also be specified. In the example, two units of pounds and three units of pence have been indicated. It is then possible to input a mathematical equation to enable the computing to be carried out.

In the example shown above, the annual salary 'FIELD B' has been divided by 52 and then by 37.5 to generate the hourly rate value. Parenthesis have been used to calculate the first part of the equation. The system will accept a number of different methods for achieving the same answer.

For each computed field required the following information must be entered:

Field Description **20A/N**

The field description will be used by the report program to describe the computed field.

Digits Before Decimal Point **2N**

This field will contain the number of digits before the decimal point with 14 digits being the maximum field size permitted.

Digits After Decimal Point **1N**

This field would be used to specify the number of digits required after the decimal point.

Formula for Computed Field **Enter Equation**

To enable the computed field to be derived it will be necessary to include the variables in a simple mathematical equation. To avoid any confusion between the field numbers and any numeric constants which may be required within the equation all fields available to be included in the equation will be displayed with alphabetic identification. Only those fields which have already been selected for printing and are numeric fields will be displayed for selection. It will not be possible to select alphanumeric fields for inclusion in the equation. The following mathematical functions will apply:

Addition	+	Division	/
Subtraction	–	Percentage	%
Multiplication	*	Brackets	()
Exponentiation	↑		

It would be extremely difficult in a document of this type to provide examples of all mathematical equations capable of being used by the system. The system has sufficient logic to check that the mathematical equation being entered is capable of being executed. The system will check that where brackets are being used these are being used in the correct way, and where mathematical functions have been selected they have been entered in the correct sequence. Returning again to the example of the Personnel system the following equation would be one method of calculating the hourly rate for an employee.

One method of calculation would be to establish the weekly rate by dividing the annual salary by 52 and then dividing this figure by the number of hours in a week. One method of expressing this in mathematical form would be:

(B/52)/37.5

In the above equation where 'B' equals the annual salary the system will divide the annual salary first by 52 and then divide by 37.5 to give an hourly rate.

The formula can be made up of any combination to a maximum of 20 characters for a single expression.

Having entered the formula the system first checks that the equation is capable of being executed and then displays the following message:

'Details OK? (Y/N/CAN)'

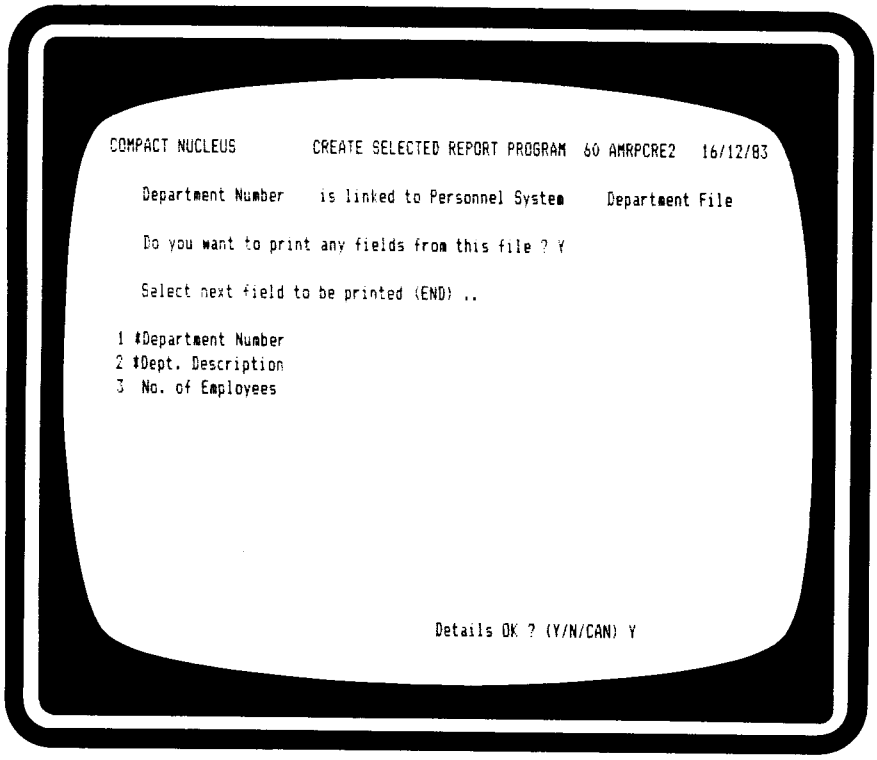
At this point it is possible to change the equation that has been entered (select 'N') or cancel the equation completely (select 'CAN') at which the system will return to the main program menu. If the equation entered is correct (select 'Y') the system will return to the field selection screen for further fields to be entered.

(Note: Where a computed field has been specified, the field description is not displayed with the standard field descriptions. Later screens, however, will reflect the details entered for computed fields).

Where a field selected for printing has been linked to another file, the operator is given the opportunity of printing details within the linked file. For example in the Personnel system within the employee master file record, the department to which the employee belongs has been coded with a two digit code. For certain reports it may be desirable to de-code that department number and print the department description. Having specified the file linkage between the department number in the employee master file with the department description in the department file it is now possible to replace the code with the department name.

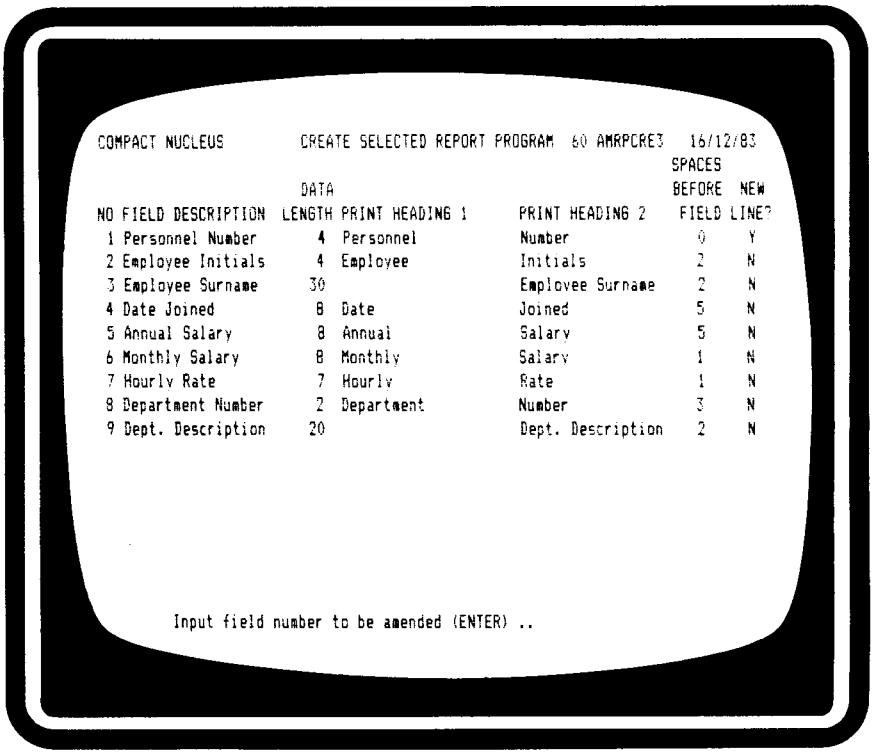
On selection of the field for which a linkage has been defined Screen 11 is displayed. The system displays the fields held within the linked file and the operator is able to select any of the fields which are required to be printed from this file. Having completed the selection process from the linked file the system will return to the main file for further selection.

Having selected those fields which are to be printed in the report and specified any derived fields or information that is to be selected from any linked files, Screen 12 is displayed which, gives the user the opportunity of manipulating the positions in which the fields are to be printed.



SCREEN 11

By selecting the department number from the Personnel master file, the operator is then asked if any of the details from the linked file are to be printed. In the example shown above the department number and the department description have been selected for printing. On selection an asterisk appears between the field number and the field description to indicate that this has taken place.



SCREEN 12

The fields are printed in the order in which they have been selected. After selecting the required fields they are displayed in order along with the headings that will print above each field. The system automatically allocates one character spacing between each field. The system also sets up the field headings based on the length of the fields. In the example above the field description for field 1 is 16 characters, whereas the data contained within this field is only 4 digits. The system has placed 'PERSONNEL' on heading line number 1 and 'NUMBER' on heading line number 2. However, where the department description data is longer than the heading the system has placed the heading on a single line. Using the print positions indicated on the screen layout, it is possible to obtain a copy of the report to establish what the report will look like before making any changes and finalising the program. An example of the first test print is included in this specification.

The system undertakes a number of basic decisions which during the next maintenance routine the user is able to amend if required. Two of the main areas available for report manipulation are detailed below:–

1. Report Headings

The system makes a simple comparison between the data length (the number of numbers or characters to be printed within the field) and the field description given during the file creation routine. If the field description exceeds the data length, then the software checks if the field description is more than one word (by checking for blank spaces) and divides the heading into two print lines. If however, the data length exceeds the field description then the print heading is placed on the second line. It is possible before obtaining a test print of the report to abbreviate or alter the print headings to suit the requirements of the report.

2. Spacing between fields

The system automatically places a single character space between each field. In the case of the first field to be printed, this is placed at position zero at the start of a new line. For each field within the line a default value of one space is provided by the software. (This default value is shown under the heading 'Spaces before field' and can be amended depending on the space required). To expand the report and provide greater space between each field this number can be changed and a new value input with the space required between each field in tenths of an inch. Where the space created between each field exceeds the space provided for a single line then it will be necessary to split the detail to be printed on the report over two lines. When the line length has been exceeded, the operator is warned by the system.

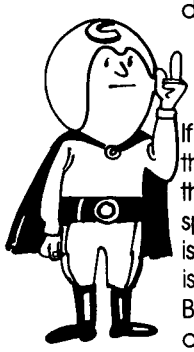
At the screen prompt 'Details OK? (Y/N/CAN)' the operator has the opportunity of either amending the details contained within the report format (depress 'N') or proceed with a test print of the details already selected (Select 'Y'). Until users become familiar with producing reports using NUCLEUS it is recommended that a test print be taken of the fields selected for printing before any attempt is made to amend the print positions.

Having responded 'Y' to the question 'Details OK?' the system then displays the following message:–

'Do you want a test print? (Y/N/CAN)'

The test print option is an important feature, enabling the user to be given an example of the report before any data has been created in the file. Since the NUCLEUS software knows the size and types of the fields which have been specified during the test print operation, the data fields are filled with a number '9' where the field is a numeric field and the letter 'X' where the field is alphanumeric. Because the headings have also been specified the system is able to create an impression of the report so far, before the format has been finalised. At this point in the system it is possible to change the layout of the report as often as required without having to go back and re- specify the fields for printing.

Having obtained a simple test print, the following message is displayed:–



'Is test print OK ? (Y/N/CAN)'

If as suggested, a test print is taken first before any amendments to the report format are carried out, then the operator should reply 'N' to this question and the system will return and allow the headings and spaces between the fields to be changed. If the format of the report is correct and no modifications are required then by responding 'Y' it is possible to continue and specify the remainder of the report. By entering 'CAN' at this point, all details of the report will be deleted and the system will return to the main program menu.

It is now possible to specify the order in which the report is to be printed. When specifying the file definition a number of keys may have been specified which would mean that the information contained within the file would be held in this order for immediate use. However, NUCLEUS also provides that for a specific report, the user may specify an alternative order for printing. It is not possible to specify the order for printing as a run time option and the details of the way in which the data is to be printed has to be imbedded within the program. The screen prompt shown in Screen 13:–

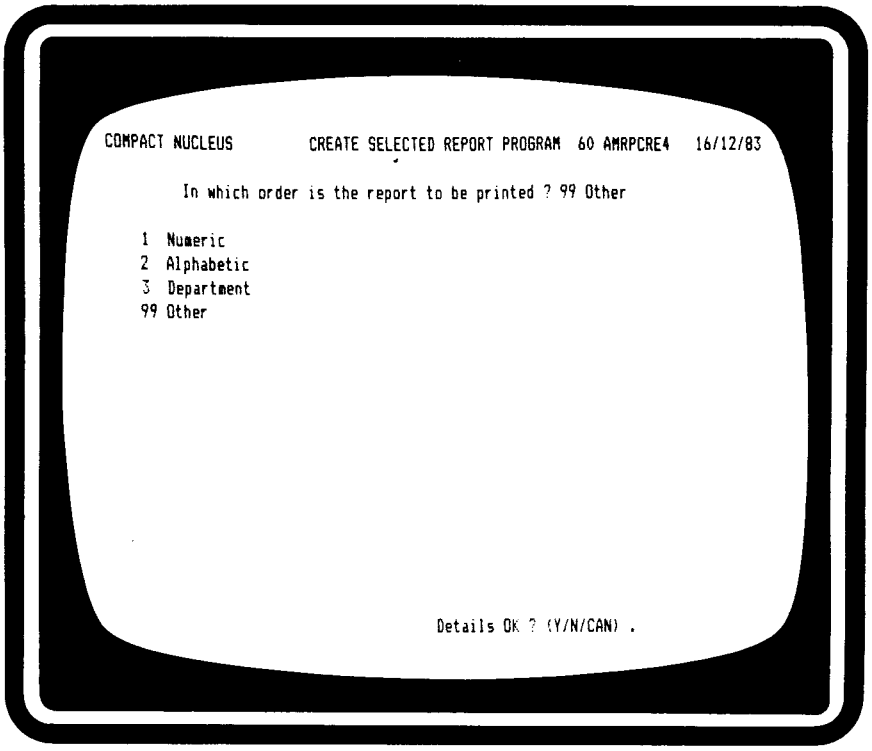
'In which order is the report to be printed ?'

will also display the keys which have been specified as well as a '99' option which will enable the user to specify an alternative order. If one of the existing keys is selected then no further input is required, if however, an alternative order is required and the '99' option is selected, Screen 14 will be displayed.

It is now possible to select any of the fields contained within the file as a basis for sorting the data for the reports. It is not possible to use derived fields for sorting purposes.

On selection of the fields for which the sort is to be carried out the system will display the field description for the field selected. Where the field selected is an alphanumeric field it is necessary for the operator to indicate the number of characters on which the sort is to be carried out. If for example the report is required in alphabetical order and an employee surname is selected for sorting purposes, it would be extremely slow and time consuming if the whole employee surname was used for the sort.

The file handling module also imposes a restriction on the user that any key used by the software must not exceed 26 alphanumeric characters. Where reports are required in alphabetical order, an acceptable result would almost certainly be provided if the sort was carried out on the first few characters of the field. In response to the question 'Number of characters?' it would be more efficient and certainly much quicker if instead of using the full 26 character capability that the sorting was restricted to the first 4 or 5 characters of the name. Having specified the number of characters on which the sort will be carried out, it is now possible for the user to specify whether the sequence is to be in ascending order or descending order. In the case of alphabetical listings where they are required to be printed starting with the letter 'A' and completing with the letter 'Z' then it would be necessary to indicate ascending order. Although on alphabetical listings the descending order option has a limited value, it is more relevant when considering the reports required in numeric sequence. (See Screen 14).



SCREEN 13

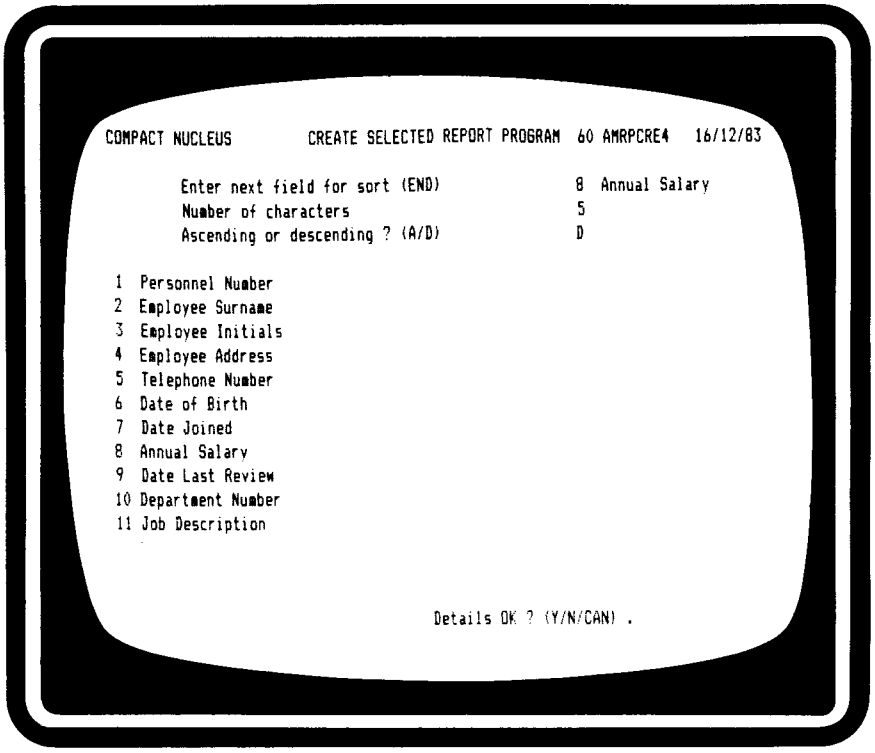
Having completed the adjustments to the printout format, it is now possible to determine the order in which the report is to be printed. In the original setting up of the system, three keys were chosen but an option '99' gives the operator the opportunity of producing a report in an alternative order.

Having specified one sequence in which the records are to be printed it is then possible to specify a secondary order for the records to be printed. In fact up to five supplementary sort sequences can be specified within this section of the system. This particular option is relevant when, for example, the report is required in department order and within each department the records are then to be sorted alphabetically.

On completion of any sort details an '*' is displayed beside the field name to indicate the field on which the sorting will be carried out. Having completed the specification of the sort details then enter 'END' to proceed to the next screen. Having entered 'END' Screen 15 is displayed which gives the operator a final opportunity of checking that the sort details entered are correct. Each of the sorts that have been specified in the previous routine are displayed on the screen with the operator being required to respond to the following prompt:–

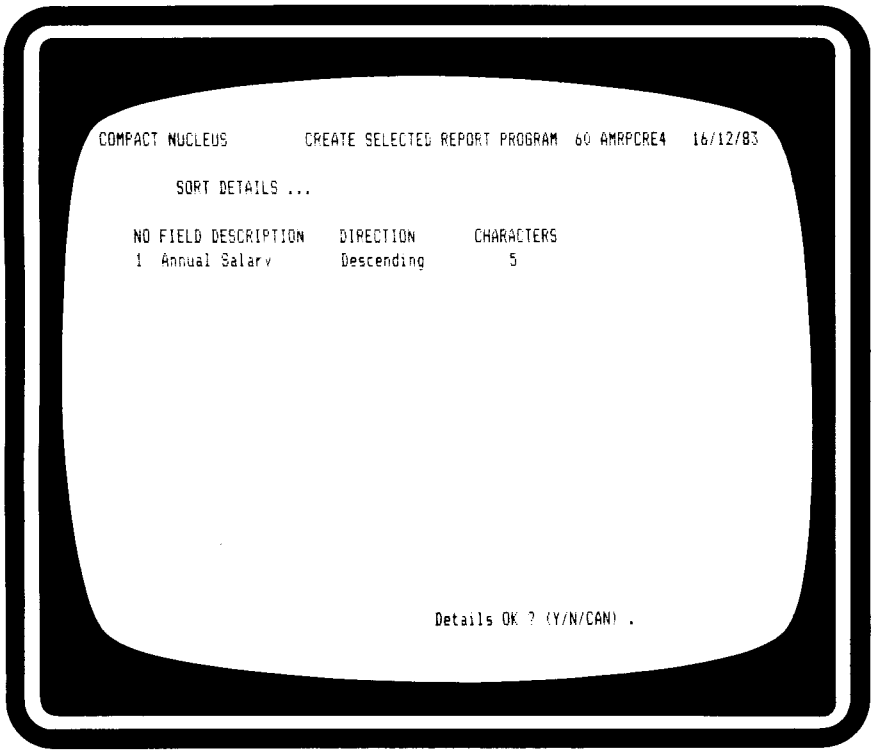
'Details OK? (Y/N/CAN)'

If the sort details are correct then respond 'Y'. If an error has been made then it is possible to exclude from the details held within the file those records which are not required by the report. By then using the Boolean logic provided in Screen 16 it is possible to produce a report with only those records that are required. In the case of the Personnel example, it may be that a report is required which excludes people in certain departments or it may be a report that requires the staff of a company sorted into annual salary order but also excludes those employees which have a salary in excess of a certain sum. This type of flexibility is easily catered for within this section of NUCLEUS.



SCREEN 14

By selecting option '99' for an alternative order the fields are displayed to enable the operator to select the field on which the sort is to be carried out. In this example the annual salary field has been selected and the system has been instructed to sort on the annual salary field and print the records in descending order.



SCREEN 15

Having completed the alternative sort selection, the system will check that the sort instructions given are valid and then will display the details of the sort that will be carried out.

If all records are not to be printed from the file then the operator should respond 'N' to the following message:-

'Do you want to print all records? (Y/N)'

If all records are not required, it will be necessary using the symbols displayed on the screen to enter a simple equation specifying those records which are to be printed. The following Boolean functions are available:-

= Equal to	<>Not Equal to
< Less Than	>Greater Than
<= Less Than or Equal to	>= Greater Than or Equal to
& And	! Or

Returning to the Personnel example, if records were required for those employees having an annual salary of less than £10,000 per annum and were all employed in department number 15, the following equation would have to be

H<10000&J=15

NOTE: In addition to the Boolean functions two additional options are available to make the generation of reports more flexible. Within the generated program it is possible to specify sub-totalling or printing options that are entered at run-time. This means that if a special Sales Ledger output file is being generated and this file is to be sorted by Rep/Territory but not all Territories are required at each time, then the Territory field may be specified as a run-time option.

Because this is a more complex option within the system some syntax rules must be followed specifying the options required. If a file was being generated from the Sales Ledger and the Account Number (Field A) was going to be a run-time option, then some sample expressions are shown below:-

1. If only one Account Number was required for each file produced then a possible expression could be:-

   A=$1

   Where 'A' is the field identification and '$1' is the first run-time option.

2. If a range of Account Numbers were to be selected for each file produced then the expression could be:-

   A>=$1&A<=$2

   Where 'A' is the field identification and '$1' is the first 'FROM' run-time option and '$2' is the second 'TO' run-time option (see Screen 15A).

The second of these two examples, while offering the flexibility of 'FROM/TO' reports, would also work a single Account Number by entering the same value for both options.

Having specified the expression for the run-time option, Screen 15B is displayed and it is necessary to give additional details about the field being used for the run-time option. If more than one one-time option is used, then the question must be answered for each one. (See Screen 15C.

(i) Number of digits before point
(ii) Number of digits after point
(iii) Allow negative values?

These three questions relate to the field being used for the run-time option and this information can be taken from a print of the file definition.

(iv) Enter description

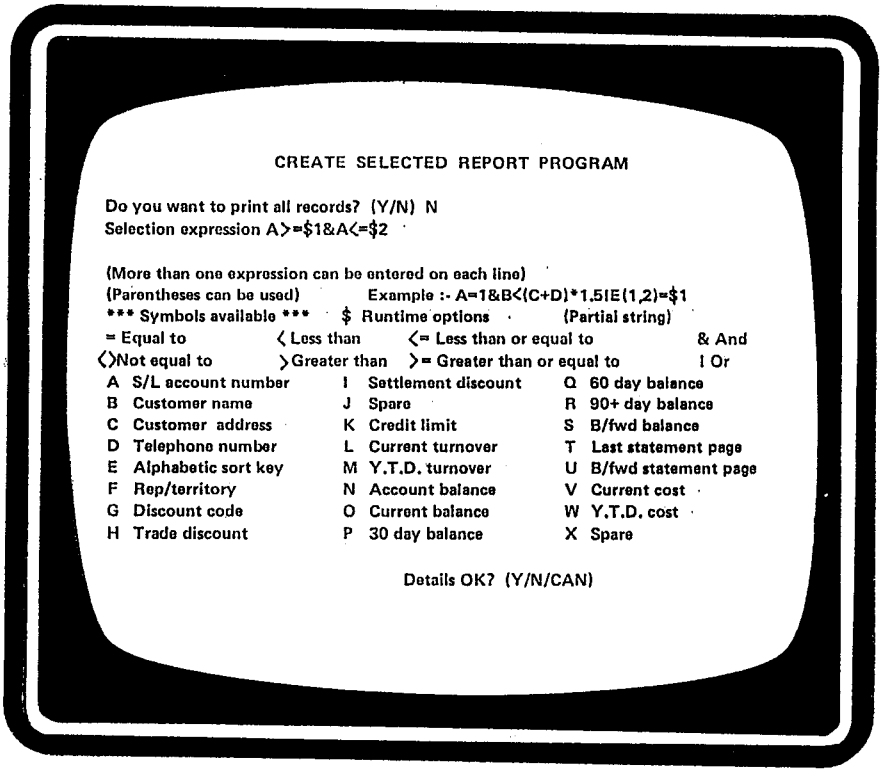
A twenty character description of the option being specified is used to display on the run-time screen.

Having completed the run-time details a further opportunity to change the information is provided with Screen 15D being displayed.

A further feature to improve flexibility is the ability to select records based on a part of the field only. If records were to be selected from the Nominal Ledger and only accounts with the last three digits greater than '400' were relevant then the option for 'Partial String' selection can be used. Continuing with the Nominal Ledger example, the total N/L Account Number is eight digits and the order in which the number is stored is from left to right. The syntax for using the partial string option is that the position in the field of the first digit and the last digit have to be specified. To separate the last three digits within the N/L Account No. (Field A) the following expression would be needed:

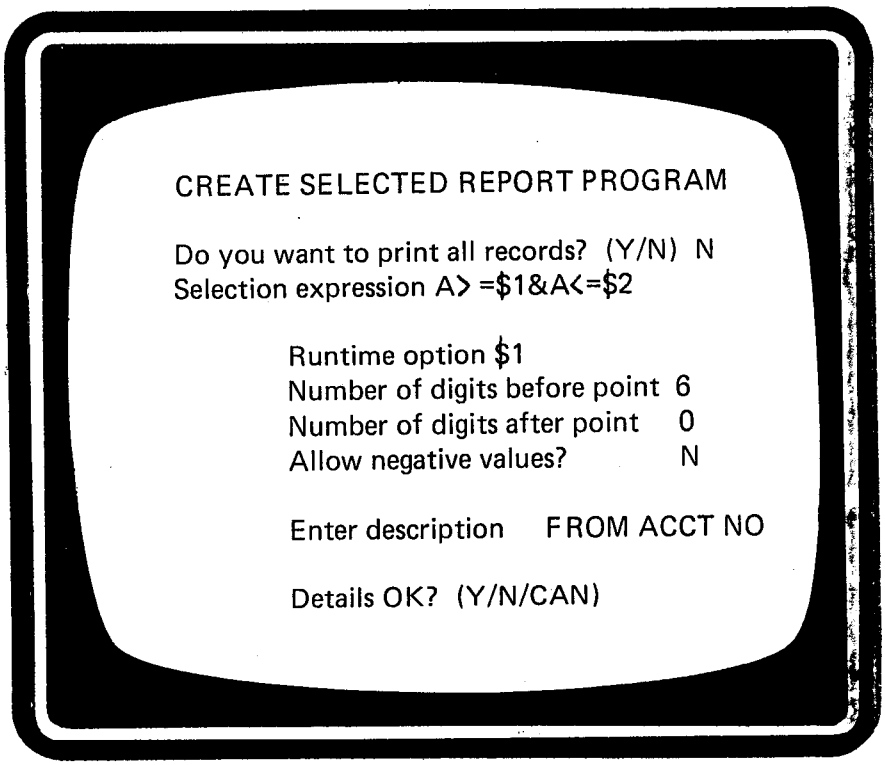
A(6,8)>'400'

The two digits within parentheses refer to the starting point and finishing point of the part of the code to be separated (i.e. position 6 is the third digit from the right of an eight digit number). (See Screen 15E.)



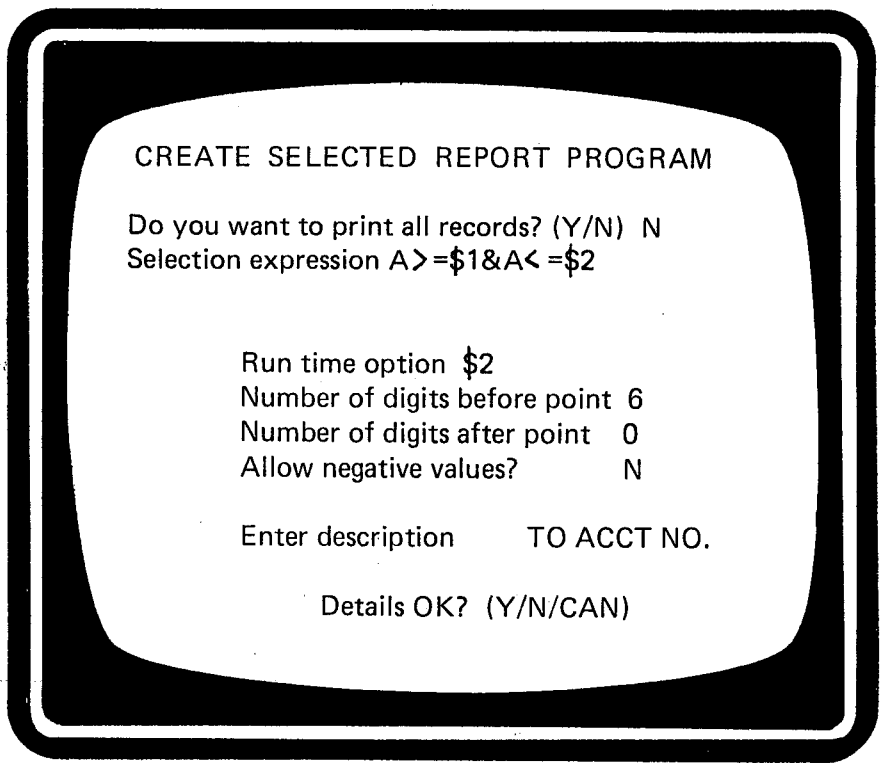
SCREEN 15A

This screen shows the input of a formula to provide 2 run time options in respect of field 'A' (S/L account number).



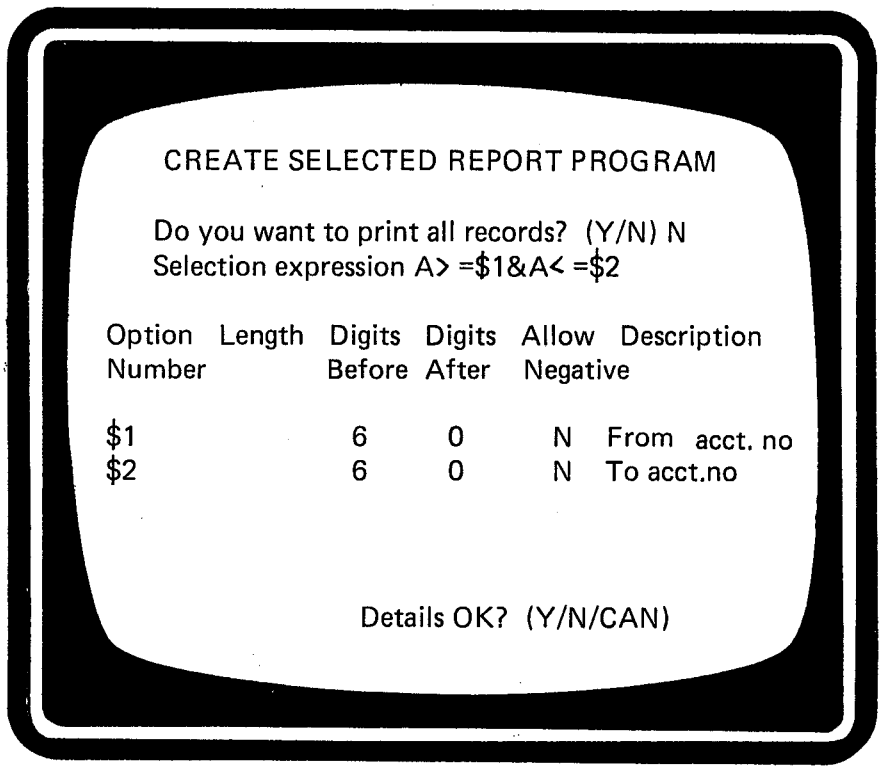
SCREEN 15B

This screen shows the responses that can be made regarding the first run time option ($1)



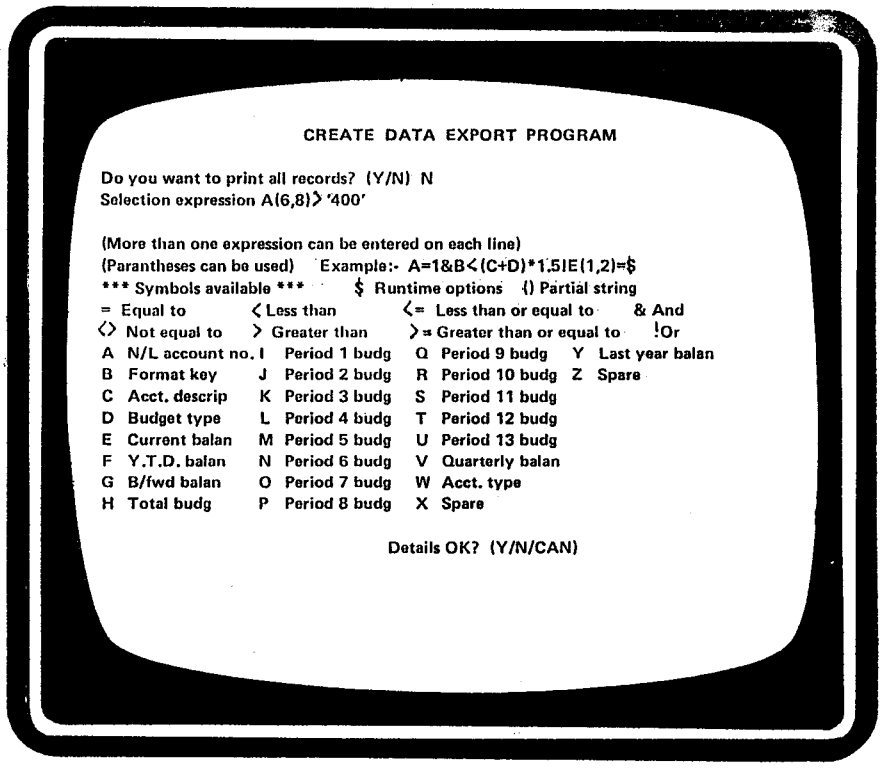
SCREEN 15C

This screen shows the responses that can be made regarding the second run time option ($2)



SCREEN 15D

This screen allows confirmation of the run time options that have been specified.



SCREEN 15E

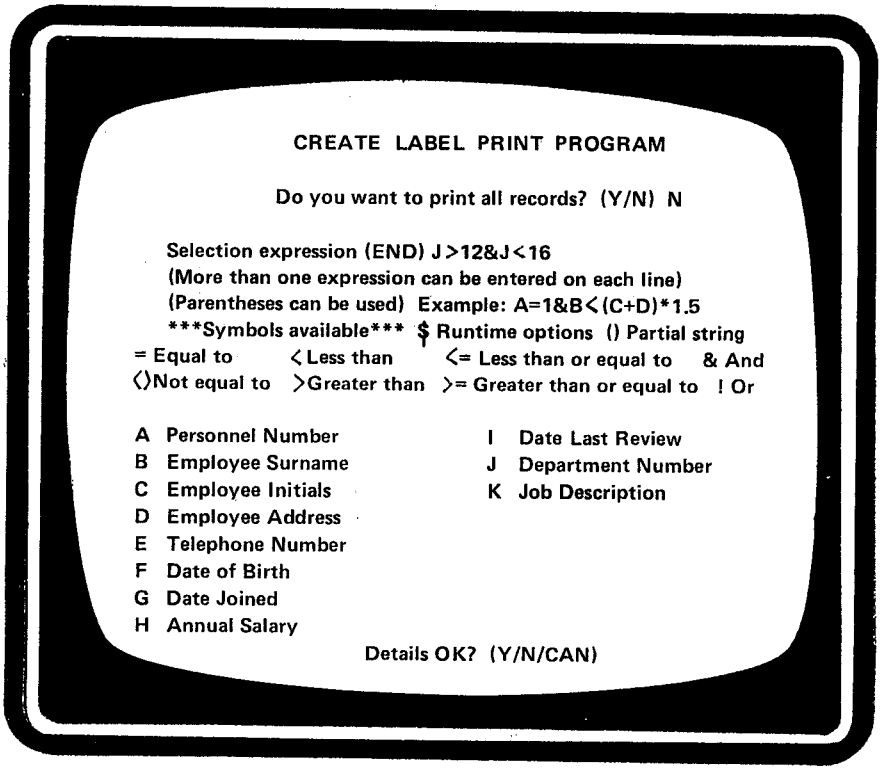
This screen shows the input of a 'Partial String' formula to select records where the last three digits are '400'.

The Boolean expressions, run-time options and partial string facilities can be mixed in any combination.

The system will then check that the expression is capable of being executed, and if the equation has been entered correctly, the operator will be asked to respond to the following prompt:-

'Details OK? (Y/N/CAN)'

If the expression has been entered incorrectly, then by selecting 'N' it is possible for the operator to re-enter the expression. By selecting 'CAN' the system will return to the main program menu. If the expression has been entered correctly, then respond 'Y' and the system will return to allow a further expression to be entered. It will be possible to enter up to 5 Boolean expressions for any one report. (See Screen 16).



SCREEN 16

By the use of Boolean Logic provided by the system, it is now possible to exclude or identify certain records for printing. In the example above, all departments greater than 12 and less than 16 will be printed and any department numbers outside this range will be excluded from the re - ort. The system will check that the Boolean expression entered by the operator is capable of being executed by the system. It is possible to input up to 5 Boolean expressions for any one report.

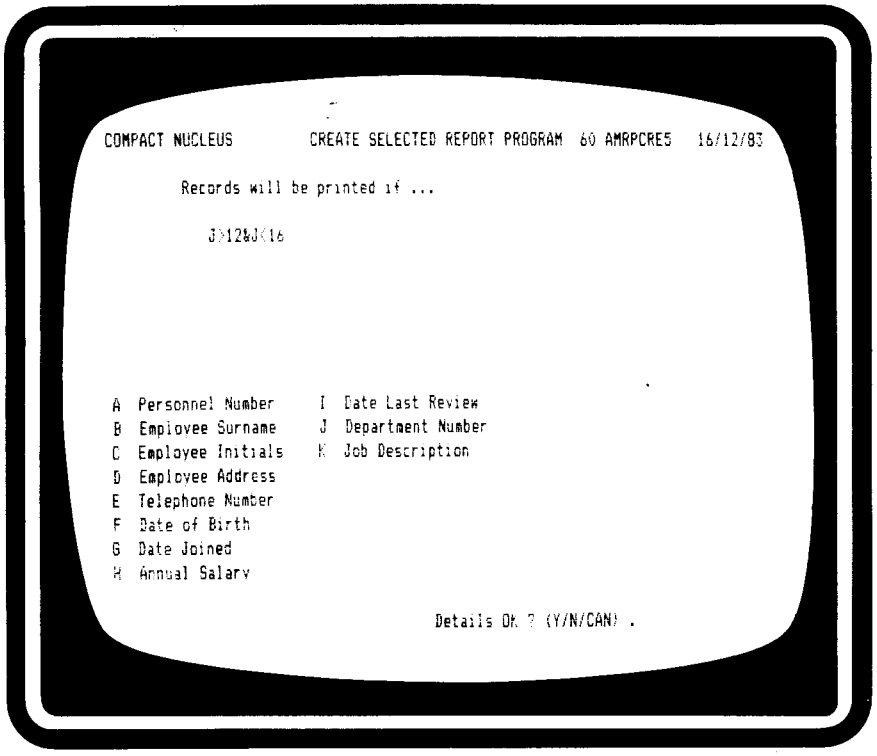
Having completed the Boolean selection process by typing 'END' the system will display the expressions entered, before moving onto the next screen. If the expression displayed is not correct, then a further opportunity exists for the operator to change these details. If the details are correct then by entering 'Y' the system will move to the final phase of the report specification. (See Screen 17).

Having completed the sort specification it is now possible to specify any totals which may have to be produced by the system, as well as where new pages are to be started.

A new page or sub-total is capable of being produced on the change of a key. It will be necessary to carefully analyse the keys that have been selected for the report before answering this question. If for example the key to file is the employee surname then by specifying a new page on the change of a key would mean that the resultant report would have a new page for each employee surname. However, when the key for sorting purposes has been a department number then certain advantages may be achieved by having each department on a separate page. The feature to provide a new page on the change of a key is one which must be planned at the time when the keys are being specified for the report.

If totals or page changes are not required, then respond 'N' to the question and no further input will be required. If new pages and totals are required then enter 'Y'; it will then be necessary for the operator to specify a new page or total for each of the keys displayed on the screen.

It is possible to have a new page for any of the keys specified, and it is also possible to produce totals on the change of any of the keys. Where a total is specified the software provides that the user may enter a 20 character description which will be printed on the report.



SCREEN 17

If the Boolean expression entered is a valid expression, the system will display the expression before moving on to the next section of the system. If the expression displayed is not correct, the operator has the opportunity of cancelling it or changing it.

Having indicated where new pages and totals are to occur the operator is asked to respond to the prompt:–

'Details OK ? (Y/N/CAN)'

If the items have been entered correctly, then by responding 'Y' the system will move onto Screen 18.

If any details have been entered incorrectly, then by entering 'N' it is possible to go back and make any necessary alterations.

By entering 'CAN' the system will delete all information entered so far and return to the program menu.

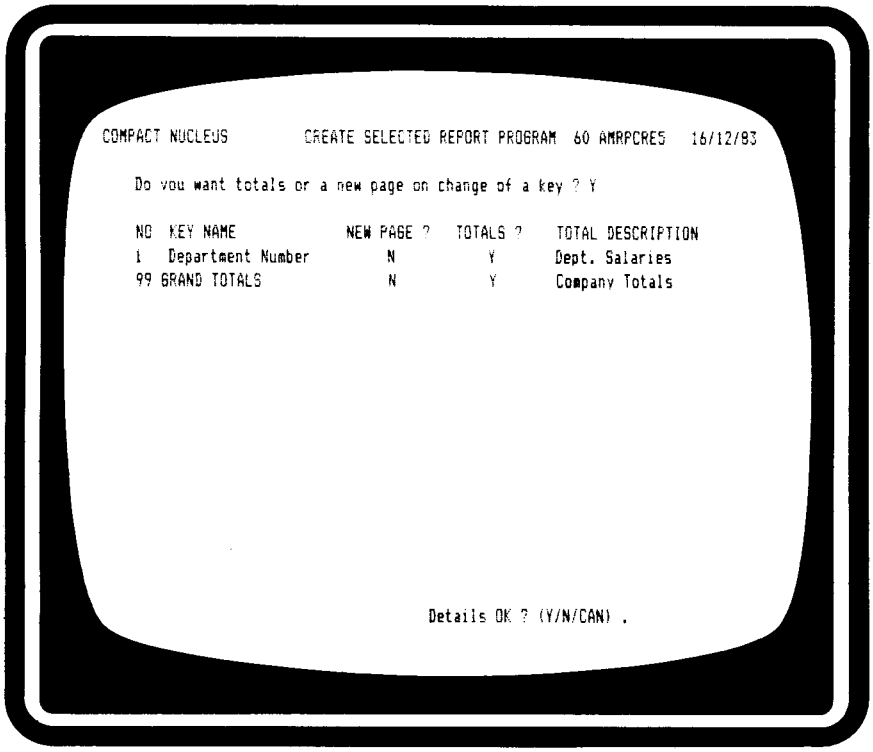
Where totalling has been specified for the report, it is now necessary to indicate which fields within the record totals are required. Screen 18 displays those fields for which totals are possible. Within the Personnel example, the personnel number is a numeric field and capable of being totalled, but such a total would have little relevance within the report. However, a field such as the annual salary totalled by department could be beneficial as a statistic contained within the report.

It is now necessary to select those fields for which totals are required. It will be necessary to enter each field number separately for which totals are required. As each field is selected for totalling an '*' is displayed beside the name. Having completed the selection of fields for totalling, the operator is asked to respond to the following prompt:–

'Details OK ? (Y/N/CAN)'

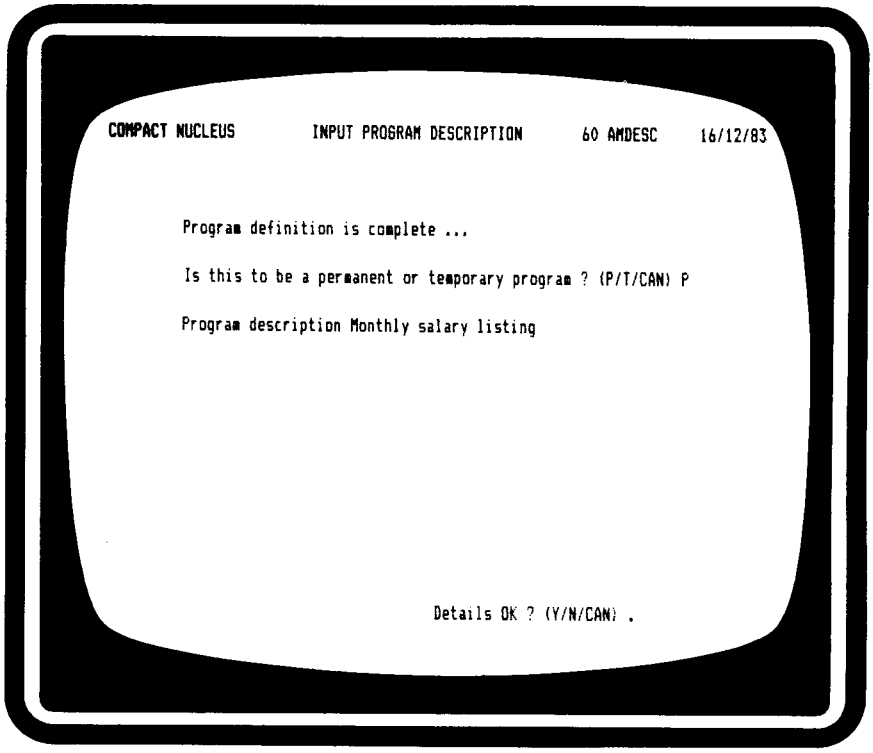
If more than one level of totalling has been requested, then the same procedure as specified above would have to be followed for grand totals.

Having completed specifying those fields for which grand totals are required, Screen 19 is displayed. This is the final input required by the operator and within this section of the system it is necessary to specify whether the report is to be a permanent or temporary program and the name of the program for menu selection purposes.



SCREEN 18

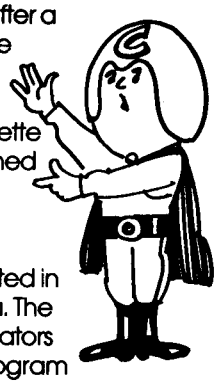
Having completed the selection criteria, it is then possible to specify whether totals or page changes are required by the system. In the example shown above, department totals and grand totals have been requested but change of page was not required. It is also possible for the operator to indicate the type of "total description" required for the report.



SCREEN 19

Having completed the full description of the report program it is then possible for the operator to indicate whether this program should be saved and become a permanent part of the system or whether it is to be treated as a temporary program and deleted after the print has taken place. Where the program is to become a permanent program the operator has the opportunity of indicating the description for this program which will then be written to the program menu.

It is important to understand the distinction between permanent and temporary in the context of NUCLEUS. A temporary program will only be held in the memory of machine for immediate use. If after a temporary program had been generated, the disks were to be changed and a new program loaded, then the temporary generated program would be lost for ever. In the case of a permanent program this program would be written to the diskette and stored for future use. Until some experience has been gained with the software, it would be normal to specify all generated programs as 'Permanent'. For a permanent program it will be necessary for the operator to enter the program description (maximum of 30 alphanumeric characters) which will be inserted in the next available space within the generated program menu. The program name entered at this point will be that by which operators will select the program for normal running. The name of the program entered should be concise and given some indication of the function carried out by the program.



After completion of the program description and provided that the details entered are correct, the system will then start to generate the program. The speed at which programs are generated can vary considerably from machine to machine, so it is important that during times when the processing is taking place, that sufficient time is given for the machine to complete these functions. Messages are displayed on the screen to indicate that the generation process is taking place.

Having completed the generation of this report program, the operator will be asked to place the program disk in drive B. If the programs are to be stored with the NUCLEUS parameter file already created, then this file will exist on drive B already and by pressing the ENTER key the system will automatically store the program on the same diskette. If however, the programs are required on a separate diskette, then change the diskette on drive B and press the ENTER key. As soon as the generated program has been written to the program disk, the operator will be prompted to replace the NUCLEUS parameter file in drive B and the system will return to the main program menu.

Having completed the generation of the report program and stored the program on diskette, it is now possible to list either via the VDU or the printer the generated program, it is also possible to modify the program to include enhancements or alterations that are not capable of being produced within NUCLEUS. Where users of NUCLEUS intend to carry out modifications on generated programs, it is important that they obtain documentation from COMPACT Software International on the file handling utility and the standard input subroutines which are a feature of the software. Copies of this documentation can be obtained from your Software Support Representative.

Create Label Print Program (Option 3)

The label print program enables the user to specify the report format that will enable self-adhesive labels in a variety of formats to be printed using data held within the system.

Having selected option 3 Screen 20 is displayed.

Before the generation of the label program takes place, it will be necessary for the operator to answer the following questions:–

1. Enter Label Description **30A/N**

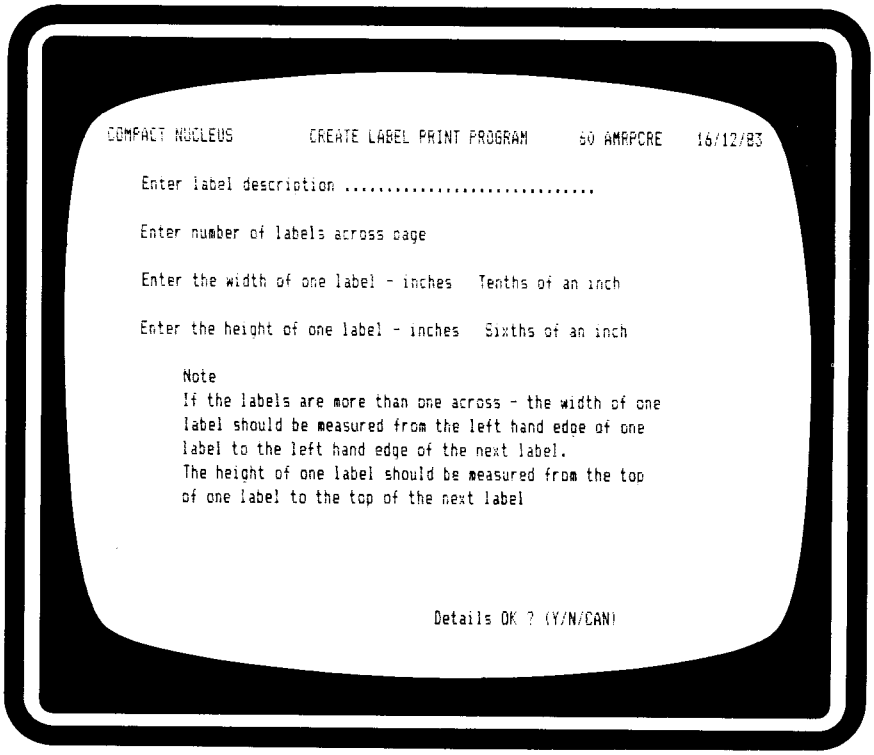
The label description is an alphanumeric field with a maximum of 30 characters which will be inserted in the generated program menu. This description will be used for selection purposes when running the program.

2. Enter Number of Labels Across Page **1N**

A single numeric digit field used to indicate the number of labels positioned across the page.

Because of printer characteristics it will be necessary to specify the width of a label in inches and tenths of an inch whilst the height of a label must be expressed in inches and sixths of an inch.

When answering these questions, it is necessary to enter two values – the first being the number of whole inches for either the width or the height of the label. The second part of the input would be the number of tenths of an inch or sixths of an inch necssary to complete the exact size of one label. In the case of a label 4 1/2" wide it will be necessary to enter 4 for the first input and 5 (1/2" equals 5/10) as the second input.



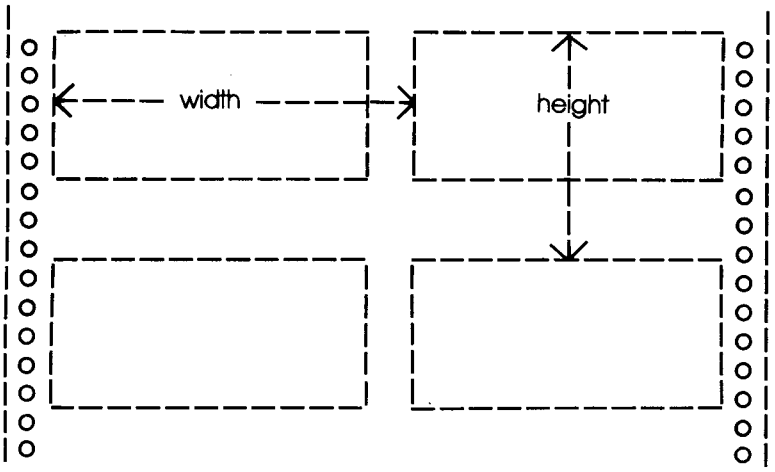
SCREEN 20

Having selected option 3, the above screen is displayed. This program enables the user to spescify the report format that will enable self-adhesive labels to be printed in a variety of formats using data held within the system. Before generation takes place it will be necessary to enter the label description, the number of labels across the page and the width and height of one label.

Because of the way in which labels are manufactured it is important that the following note displayed on the screen is read carefully before proceeding with the generation of the print program:–

> 'Note
> If the labels are more than one across – the width of one label should be measured from the left hand edge of one label to the left hand edge of the next label. The height of one label should be measured from the top of one label to the top of the next label.'

A diagram is given below of exactly how these measurements should be taken. It is important that these instructions are carried out correctly since if the method of measurement is not adhered to problems will occur in line spacing during the printing of the labels.



Having entered the details of the label sizes correctly, the operator is asked to respond to the following prompt:–

'Details OK ? (Y/N/CAN)'

If the details are correct, then select 'Y', but if any of the values have been entered incorrectly, enter 'N'. By entering 'CAN' all input will be disregarded and the system will return to the main program menu.

Having completed the specification of the label dimensions, it is now possible to identify the system from which the data to be printed on the labels is to be taken.

Having selected the system from which the details are to be printed, it will now be necessary to identify the file from which these details will be taken.

Having selected the file, Screen 21 will display those fields available within the file for printing. As each field is selected an '*' is displayed against the field description.

Although it is not possible to generate derived fields for inclusion during the label print routine, the system will take into account any file linkages which exist for the fields that have been selected.

Having selected the fields to be printed on the label, screen 22 is displayed. This screen gives the operator the opportunity of manipulating the fields for printing on the label. The system has automatically assumed that each field will be printed on a separate line.

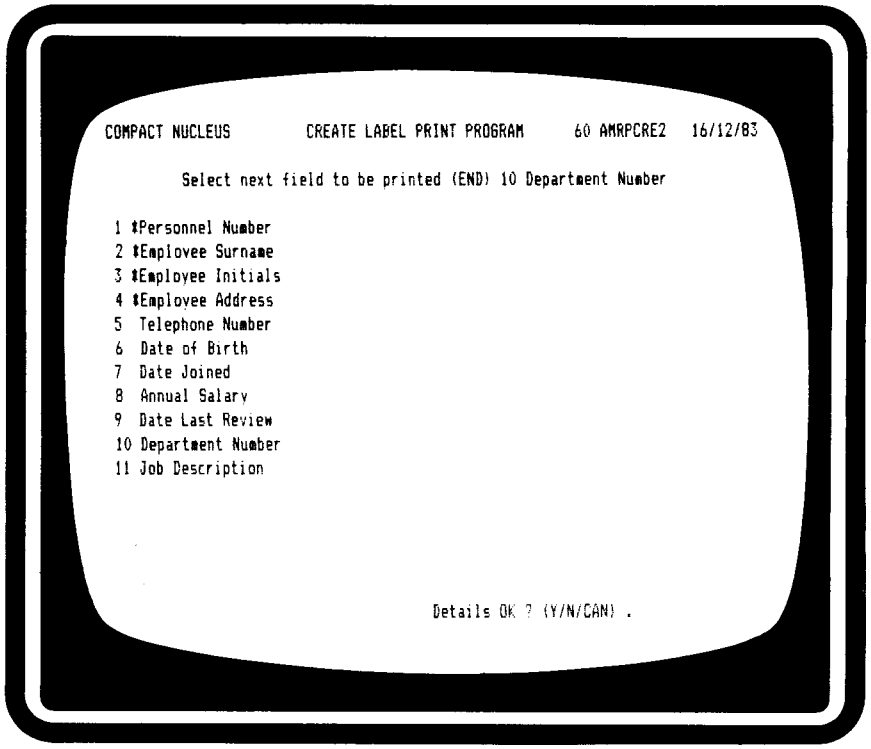
If this automatic formatting is acceptable, then respond 'Y' to the question:–

'Details OK ? (Y/N/CAN)'

If however, the format needs to be altered, then respond 'N'.

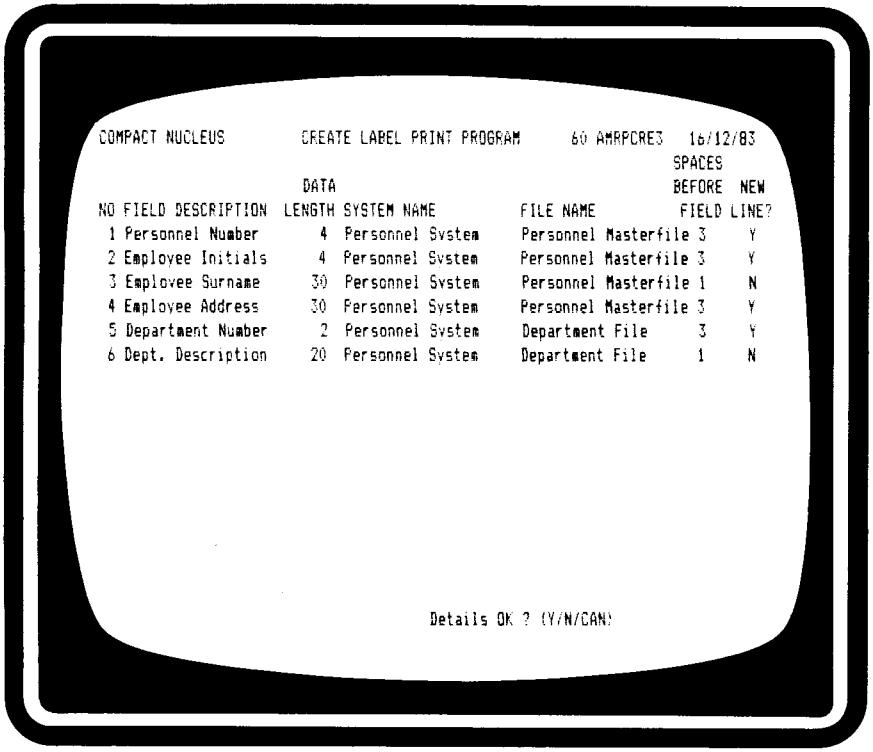
There are two ways in which the data can be manipulated using this option. Firstly, by changing the number of spaces before the field, print positions can be moved further to the right of the label. Where two fields are to be printed side by side on the same line, then the response 'Y' to the question 'NEW LINE?' should be changed to 'N'.

Having completed the alterations to the label format, it is then possible to obtain a test print reflecting the changes that have been made. The test print will give the opportunity to check not only the format of the printing but also if the dimensions of the labels have been correctly specified. If the label stationery being used has more than one label across the paper, then the test print will fill the first row of labels with 'X's and then space to the second row of labels and repeat this process. As well as checking that the data to be printed on the label is in the correct position, it is also important to check that the second row of labels is correctly printed. If the alignment is incorrect and the label size has been incorrectly specified, it will be necessary to cancel the work done so far and start again. If it is merely changes in the print positions that are required, then by responding 'N' to the question 'Is test print OK? (Y/N/CAN)' then it will be possible to go back and make any alterations that may be necessary.



SCREEN 21

Having selected the file from which information is to be taken for printing on the labels, the fields within that file are displayed. Fields are printed in the order in which they have been selected. As each field is selected an asterisk is placed between the field number and the field description to indicate that the selection has taken place.



SCREEN 22

Screen 22 gives the operator the opportunity of manipulating the fields for printing on the label.

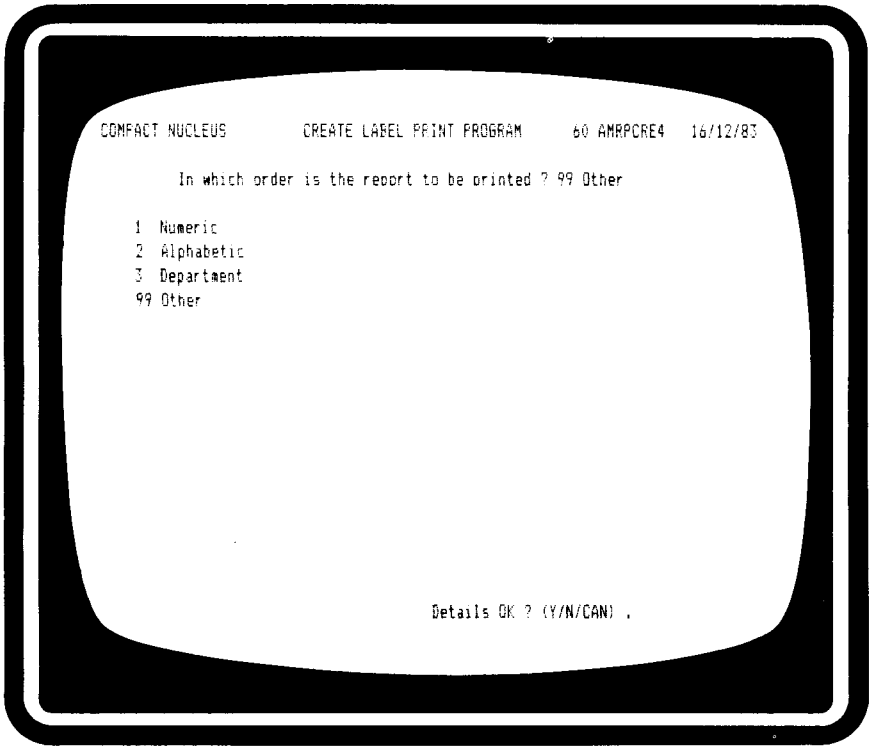
If the test print for the labels has been carried out satisfactorily, then respond 'N' to indicate that no further test print is required, the system will then allow the operator to specify the order in which the labels are required.

To specify the way in which the labels are to be printed, Screen 23 will be displayed. The operator is asked to respond to the following prompt:–

'In which order is the report to be printed?'

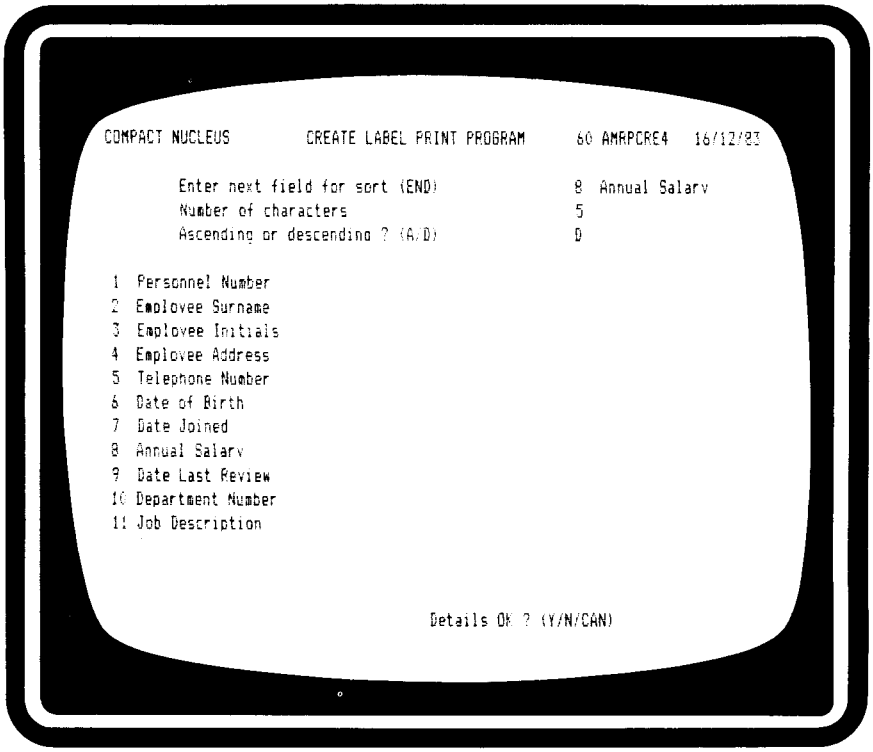
The screen will display those keys which have been specified within the file generation program and which are available for immediate use. It will also be possible to specify an alternative order for the labels to be printed by selecting the '99' option. If the '99' option is selected, then Screen 24 is displayed. Within this section of the system, it is possible to specify the order in which the labels are to be printed, other than an order already maintained by one of the keys specified in the file generation.

It is now possible to select any of the fields contained within the file as a basis for sorting the data for the report.



SCREEN 23

Having completed the adjustments to the printout format, it is now possible to determine the order in which the report should be printed. In the original setting up of the system, three keys were chosen but an option '99' gives the operator the opportunity of producing a report in an alternative order.



SCREEN 24

By selecting option '99' for an alternative order the fields are displayed to enable the operator to select the field on which the sort is to be carried out. In this example the annual salary field has been selected, the system has been instructed to sort on the annual salary field and print the records in descending order.

On selection of the field for which the sort is to be carried out, the system will display the field name with the field selected. Where the field selected is an alphanumeric field it will be necessary for the operator to indicate the number of characters on which the sort is to be carried out. If for example the report is required in alphabetical order and the employee surname is selected for sorting purposes, it will be extremely slow and time consuming if the whole employee surname is used for the sort.

The file handling module also imposes a restriction on the user, that any key used by the software must not exceed 26 alphanumeric characters. Where reports are required in alphabetical order an acceptable result would almost certainly be provided if the sort was carried out on the first few characters of the field. In response to the question 'Number of characters?' it would be more efficient and certainly much quicker, rather than using the full 26 character capability, if the sorting was restricted to the first 4 or 5 characters of the name. Having specified the number of characters on which the sort will be carried out, it is now possible for the user to specify whether the sequence is to be in ascending order or descending order. In the case of alphabetical listings, where they are required to be printed starting with the letter 'A' and completing with the letter 'Z' then it would be necessary to indicate ascending order.

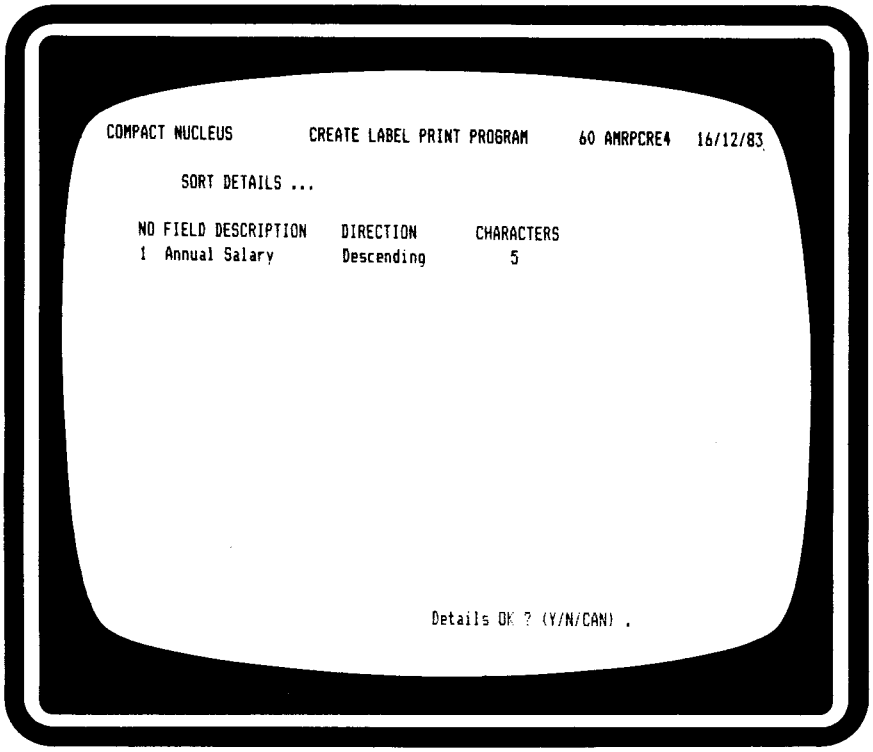
Although in alphabetical listings, the descending order option has a limited value, it is more relevant when considering the reports required in numeric sequence.

Having specified one sort sequence in which the records are to be printed, it is then possible to specify a secondary order for the records to be printed. In fact up to five supplemenary sort sequences can be specified within this section of the system. This particular option is relevant, when for example a report in department order and within each department the records are then to be sorted alphabetically. On completion of any sort details an '*' is displayed beside the field name, to indicate the field on which the sorting will be carried out. Having completed specification of the sort details, then enter 'END' to proceed to the next screen.

Having entered 'END' Screen 25 is displayed which gives the operator the final opportunity of checking that the sort details entered have been done correctly. Each of the sorts that have been specified in the previous routine are displayed on the screen with the operator being required to respond to the following prompt:–

'Details OK ? (Y/N/CAN)'

If the sort details are correct, then respond 'Y'. If an error has been made then it is possible by selecting 'N' to return and amend the sort details. By entering 'CAN' the system will return to the main program menu.



SCREEN 25

Having completed the alternative sort selection, the system will check that the sort instructions given are valid and will then display the details of the sort that will be carried out.

Having entered the details specifying the order in which the labels are to be printed, it is now possible to exclude from the label print routine those details of the records which may not be required. To enter the selection details Screen 26 will be displayed giving access to the Boolean logic facilities contained within the system. The following Boolean expressions are available:-

= Equal to	<> Not Equal to
< Less Than	> Greater Than
<= Less Than or Equal to	>= Greater than or Equal to
& And	! Or

Returning to the Personnel example, if records were required for those employees having an annual salary of less than £10,000 per annum and were all employed in department 15, the following equation would have to be entered:-

H<10000&J=15

NOTE: In addition to the Boolean functions two additional options are available to make the generation of reports more flexible. Within the generated program it is possible to specify sub-totalling or printing options that are entered at run-time. This means that if a special Sales Ledger output file is being generated and this file is to be sorted by Rep/Territory but not all Territories are required at each time, then the Territory field may be specified as a run-time option.

Because this is a more complex option within the system some syntax rules must be followed specifying the options required. If a file was being generated from the Sales Ledger and the Account Number (Field A) was going to be a run-time option, then some sample expressions are shown below:-

1. If only one Account Number was required for each file produced then a possible expression could be:-

   A=$1

   Where 'A' is the field identification and '$1' is the first run-time option.

2. If a range of Account Numbers were to be selected for each file produced then the expression could be:-

   A>=$1&A<=$2

   Where 'A' is the field identification and '$1' is the first 'FROM' run-time option and '$2' is the second 'TO' run-time option (see Screen 25A).

The second of these two examples, while offering the flexibility of 'FROM/TO' reports, would also work a single Account Number by entering the same value for both options.

Having specified the expression for the run-time option, Screen 25B is displayed and it is necessary to give additional details about the field being used for the run-time option. If more than one one-time option is used, then the question must be answered for each one. (See Screen 25C).

(i) Number of digits before point
(ii) Number of digits after point
(iii) Allow negative values?

These three questions relate to the field being used for the run-time option and this information can be taken from a print of the file definition.

(iv) Enter description

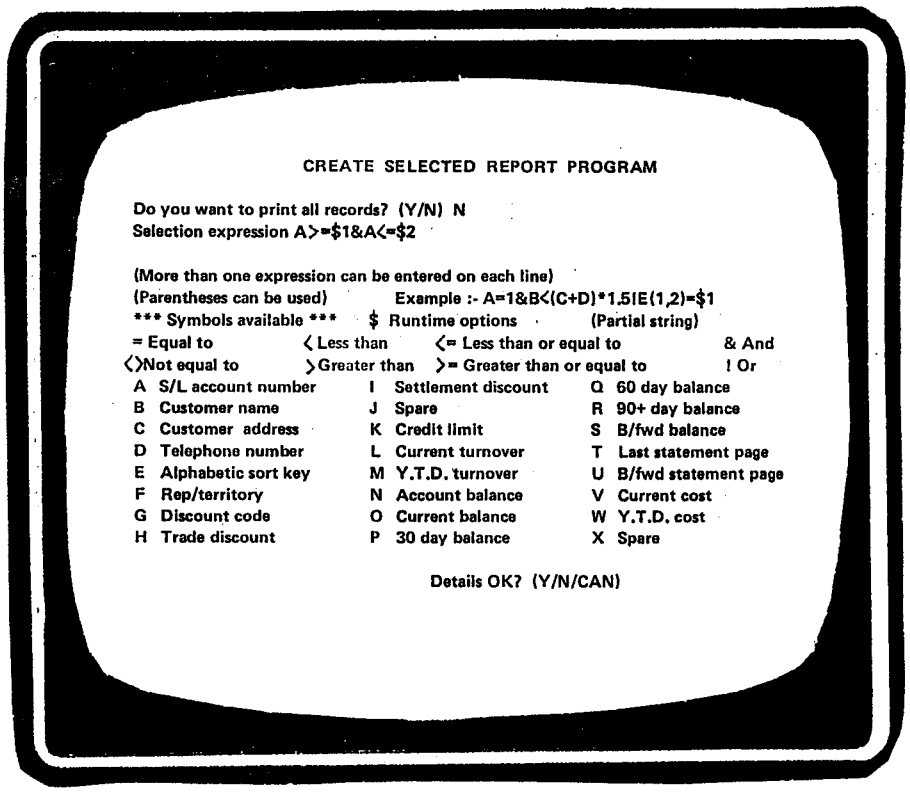
A twenty character description of the option being specified is used to display on the run-time screen.

Having completed the run-time details a further opportunity to change the information is provided with Screen 25 being displayed.

A further feature to improve flexibility is the ability to select records based on a part of the field only. If records were to be selected from the Nominal Ledger and only accounts with the last three digits greater than '400' were relevant then the option for 'Partial String' selection can be used. Continuing with the Nominal Ledger example, the total N/L Account Number is eight digits and the order in which the number is stored is from left to right. The syntax for using the partial string option is that the position in the field of the first digit and the last digit have to be specified. To separate the last three digits within the N/L Account No. (Field A) the following expression would be needed:

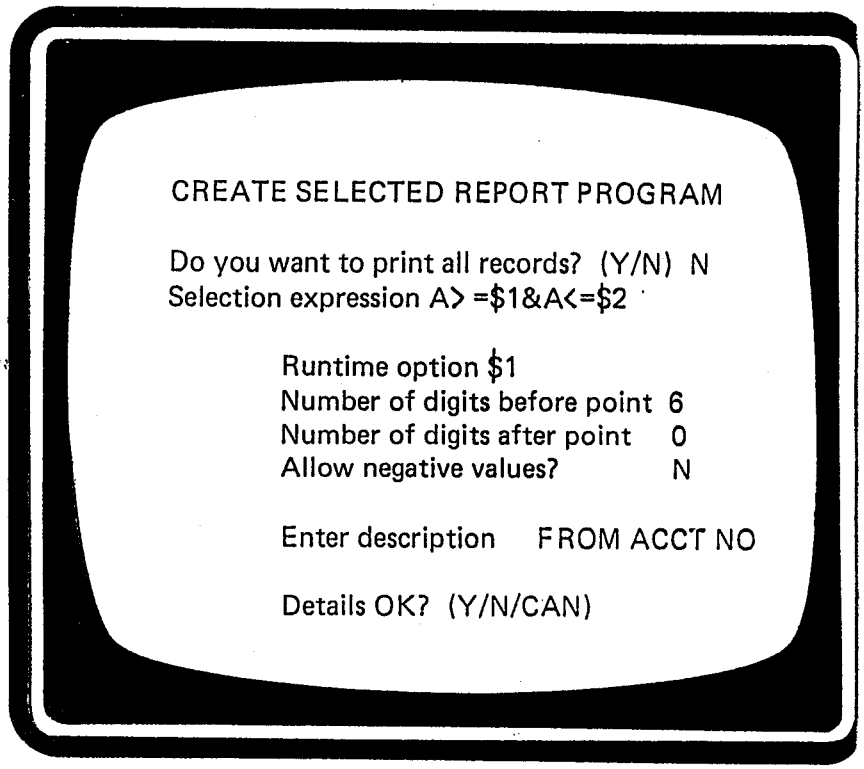
A(6,8)>'400'

The two digits within parentheses refer to the starting point and finishing point of the part of the code to be separated (i.e. position 6 is the third digit from the right of an eight digit number).



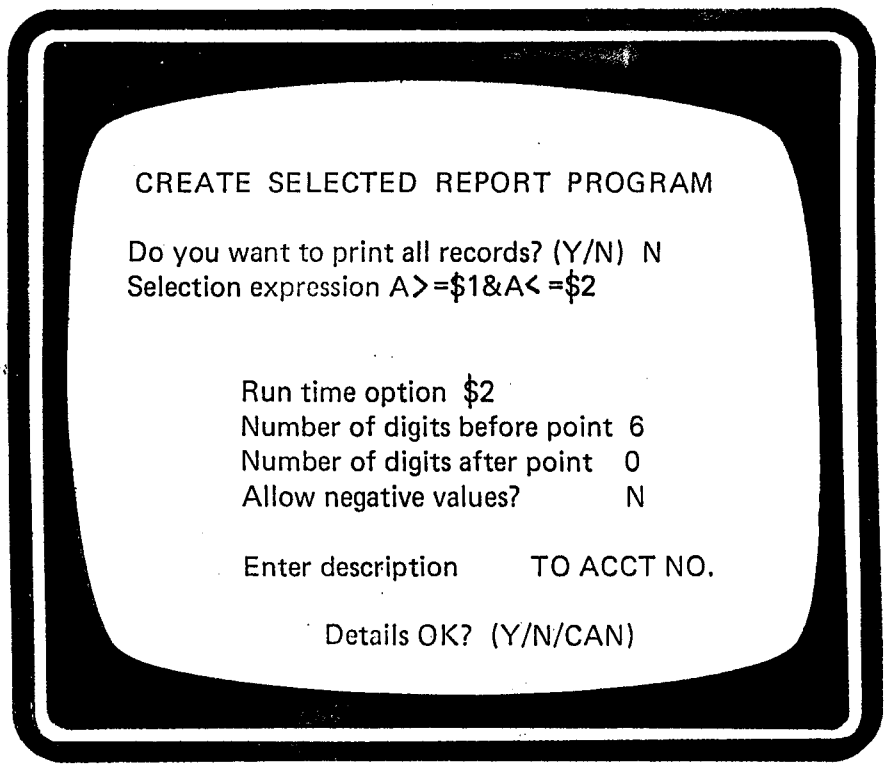
SCREEN 25A

This screen shows the input of a formula to provide 2 run time options in respect of field 'A' (S/L account number).



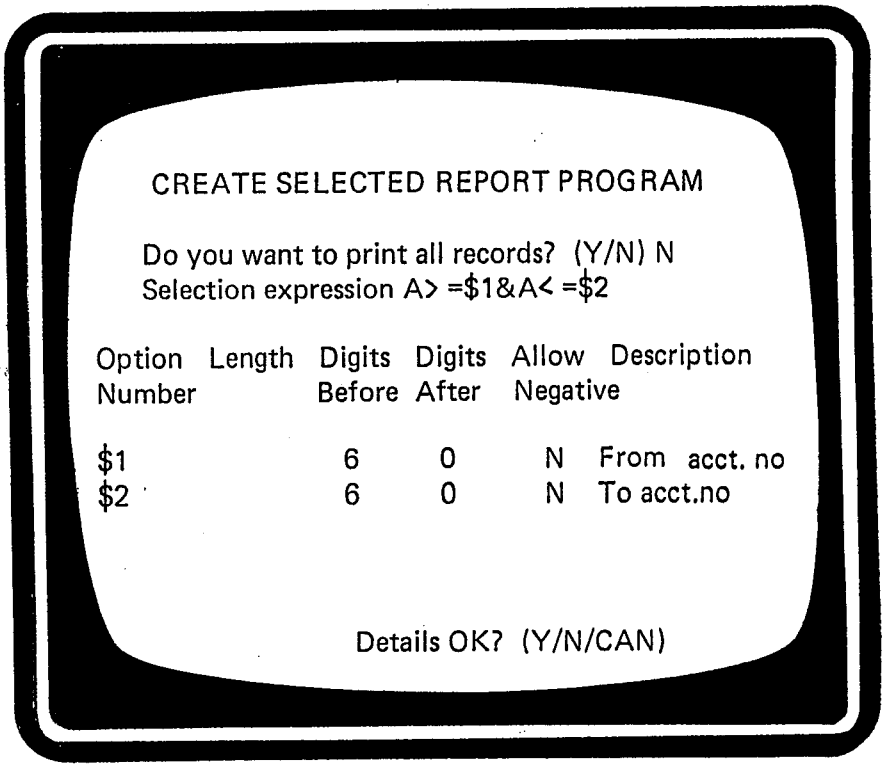
SCREEN 25B

This screen shows the responses that can be made regarding the first run time option ($1)



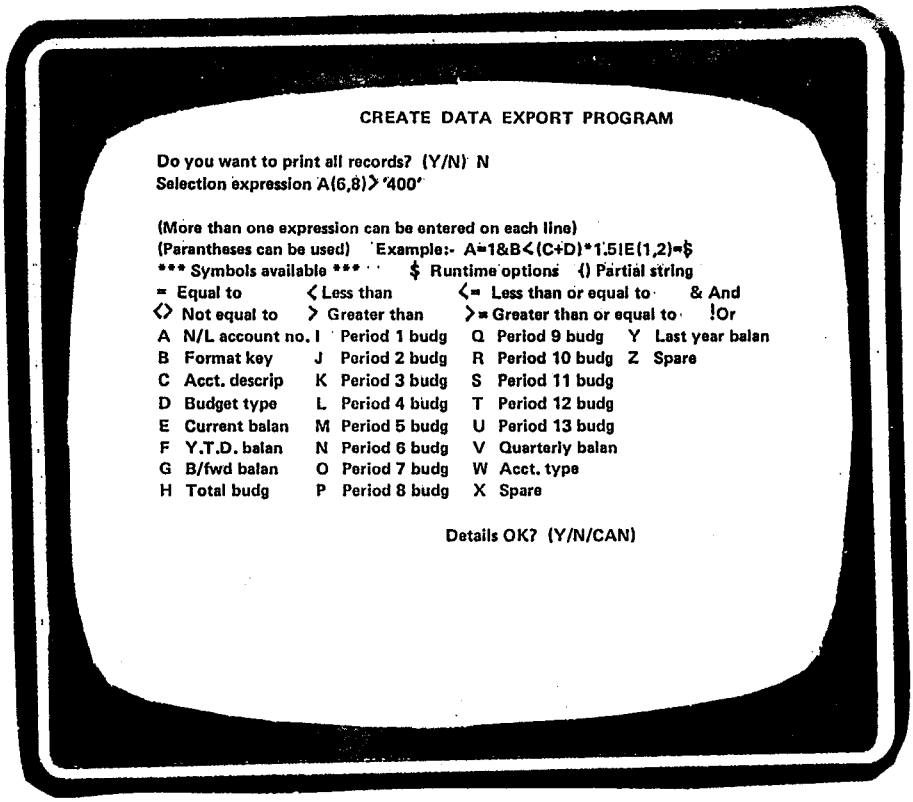
SCREEN 25C

This screen shows the responses that can be made regarding the second run time option ($2).



SCREEN 25D

This screen allows confirmation of the run time options that have been specified.



SCREEN 25E

This screen shows the input of a 'Partial String' formula to select records where the last three digits are '400'.

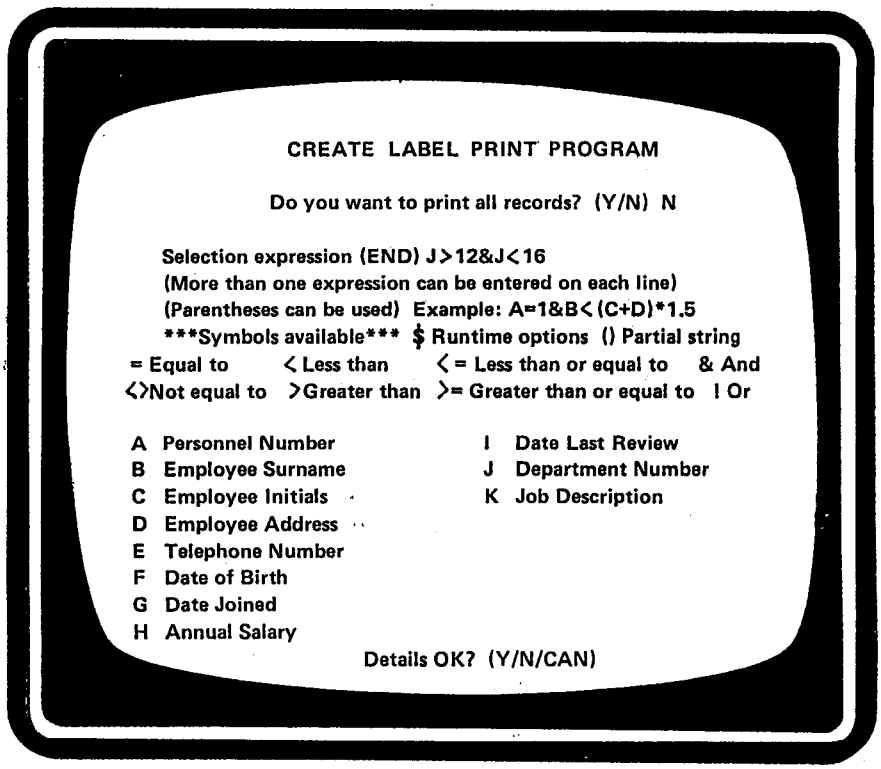
The Boolean expressions, run-time options and partial string facilities can be mixed in any combination.

The system will then check that the expression is capable of being executed, and if the equation has been entered correctly, the operator will be asked to respond to the following prompt:-

'Details OK? (Y/N/CAN)'

If the expression has been entered incorrectly, then by selecting 'N' it is possible for the operator to re-enter the expression.

By selecting 'CAN' the system will return to the main program menu.



SCREEN 26

By the use of the Boolean Logic provided by the system, it is now possible to exclude or identify certain records for printing. In the example above, all departments greater than 12 and less than 16 will be printed and any department numbers outside this range will be excluded from the report. The system will check that the Boolean expression entered by the operator is capable of being executed by the system. It is possible to input up to 5 Boolean expressions for any one report.

If the expression has been entered correctly, then respond 'Y' and the system will return to allow a further expression to be entered. It will be possible to enter up to 5 Boolean expressions for any one report. Having completed the Boolean selection process by typing 'END' the system will display the expressions entered before moving onto the next screen. If the expression displayed is not correct then a further opportunity exists for the operator to change these details. If the details are correct then by entering 'Y' the system will move to the final phase of the report specification.

Having satisfactorily identified those records which are to be printed for the label print run, the program definition is now complete and it is possible to specify whether the program generated is to be a temporary or a permanent one.

It is important to understand the distinction between permanent and temporary in the context of NUCLEUS. A temporary program will only be held in the memory of the machine for immediate use. If after a temporary program had been generated the disks were to be changed and a new program loaded, then the temporary generated program would be lost for ever. In the case of a permanent program, this program would be written to the diskette and stored for future use. Until some experience has been gained with the software, it would be normal to specify all generated programs as permanent programs. Where a permanent program has been specified, it will be necessary for the operator to enter a program description (maximum 30 alphanumeric characters) which will be inserted in the next available space within the generated program menu. The program name entered at this point will be that by which operators will select the program for normal running. The name of the program entered should be concise and give some indication of the function carried out by the program.

After completion of the program description and provided that the details entered are correct the system will then start to generate the program. The speed at which programs are generated can vary considerably from machine to machine, so it is important that during times when processing is taking place, sufficient time is given for the machine to complete these functions. Messages are displayed on the screen to indicate that the generation process is taking place.

Having completed the generation of the report program, the operator will be asked to place the program disk in drive B. If the programs are to be stored with the NUCLEUS parameter file already created then this file will exist on drive B already and by depressing the ENTER key the system will automatically store the program on the same diskette. If however, the programs are required on a separate diskette, then change the diskette on drive B and depress the ENTER key. As soon as the generated program has been written to the program disk, the operator will be prompted to replace the NUCLEUS parameter file in drive B and the system will return to the main program menu.

Having completed the generation of the report program and stored the program on diskette, it is now possible to list either via the VDU or the printer the generated program, it is also possible to modify the program to include enhancements or alterations that are not capable of being produced within NUCLEUS. Where users of NUCLEUS intend to carry out modifications on generated programs it is important that they obtain the documentation from COMPACT Software International on the file handling utility and the standard input subroutines which are a feature of the software. Copies of this documentation can be obtained from your Software Support Representative.

LETTER WRITER

Using the NUCLEUS letter writer program four separate programs are provided as shown in screen 27. These four modules are to be used in the following way:–

1. Amend Letter Editor Parameters

During the editing of the document, the standard software enables the cursor to be moved to whatever position is necessary using the standard keys. Provision is also made to configure the software to take advantage of special word processing keys which may be provided with the hardware. Since these special function keys differ from machine to machine, it is not possible for the standard software to be configured to take advantage of them. Screen 28 shows the editor parameters which are available within the system and the manufacturers manual will need to be consulted to enter the relevant decimal details for each of the keys. If any difficulties are experienced in configuring special key functions then the COMPACT Software Dealer should be contacted.

2. Create Letter Program

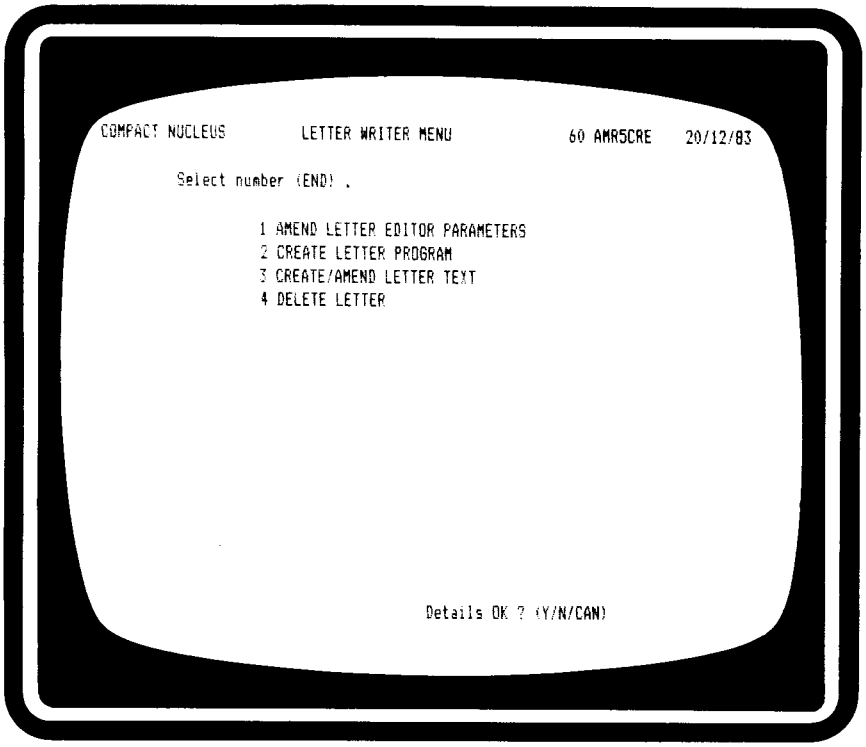
The letter program consists of special software which will extract from the relevant data files any text which has to be inserted into the document and will contain other essential information such as the order in which the letters are to be produced as well as any special exclusion criteria which may be applicable. The letter program identifying the data to be inserted in the text must be created before any attempt is made to enter the document.

3. Create/Amend Letter Text

This section of the system enables the text of the document to be created along with the positions in which data selected from the relevant files is to be inserted. Having created a document it is possible to go back at a later stage and amend a document where any changes and conditions may apply.

4. Delete Letter

This option enables letters which have already been created to be deleted from the system to make room for new documents which may have to be added.



SCREEN 27

On selection of the NUCLEUS letter writer program from the program menu, the above screen will be displayed showing the four modules available within the program.

DETAILED SYSTEM NOTES

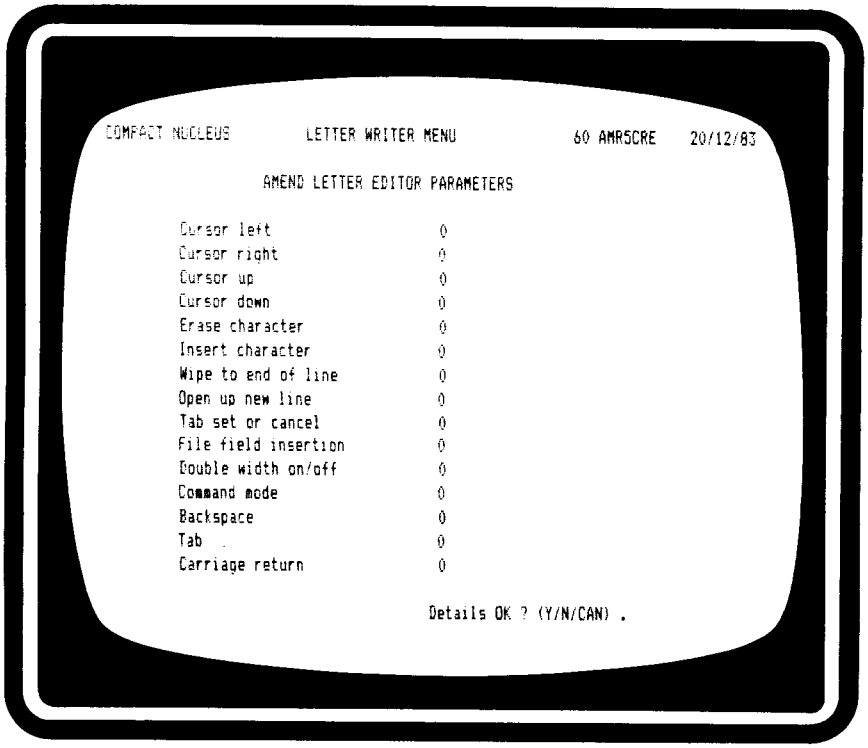
1. Amend Letter Editor Parameters

This option within the letter editor program enables special function keys which may exist on the terminal to be configured for use within the program. Such special function keys could be the ones controlling the upward, downward and sideward movement of the cursor for instance. Since each VDU will have different values for these special function keys, this program can only be used in conjunction with the manufacturer's hardware manual.

Screen 28 displays the range of function keys available within the system. Some of these function keys may not exist within the hardware being used. Where the function key is not required the value should be left at zero.

The values assigned to these function keys by the manufacturer will be contained within the ASCII table within the hardware manual and the decimal representation of these values should be used in setting up the parameters. Where a function key has more than one value, then these should be separated by commas.

If any difficulties are experienced in setting up special function keys within this section of the system, then the Software Dealer should be contacted.



SCREEN 28

The above screen displays the range of function keys available within the system. Some of these function keys may not exist within the hardware being used. Where the function key is not required the value should be left at zero.

2. Create Letter Program

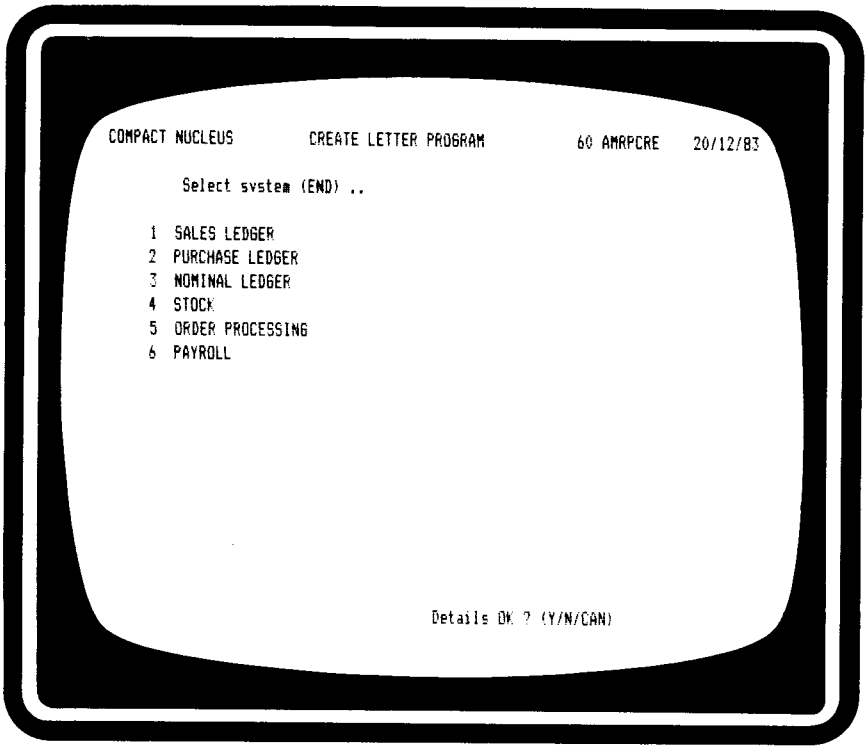
The creation and printing of standard letters must be considered in two parts. The creation of the letter program will control the extraction of any information that is required from the standard accounting files and the order in which the letters are to be printed. Option 3 create/amend text will enable the letter to be formatted and the system told exactly where the data extracted from the files is to be inserted. The letter program created under this option will carry out the merging of the extracted data with the letter text and control the printing.

On selection of option 2 (Create Letter Program) it will be necessary for the operator to enter a letter description. This description will be used for later identification of the letter program and provides for a description of a maximum of 20 characters. Having entered the letter description, the following prompt is displayed:–

'Details OK? (Y/N/CAN)'

If the description is incorrect, then by responding 'N' the letter description can be re-entered. By entering 'CAN' the operator is returned to the main menu. If the description is correct, by responding 'Y' the operator will be able to then select the data files from which the merged information is to be extracted.

Screen 29 displays the available systems from which data may be extracted. Systems numbered 1-19 are reserved for COMPACT developed applications and any user developed systems created under NUCLEUS will commence at system number 20. Having selected the system from which data is to be extracted, the user is then given the opportunity of selecting files from which data is to be extracted.



SCREEN 29

Having entered the letter description, the above screen will be displayed which shows the available systems from which data may be extracted.

Having selected the file, the system will validate and display the file name, with the operator being given the opportunity of accepting the selection, or by entering 'CAN' returning to the previous selector. Having agreed the file selection the fields contained within this file are then displayed on the screen. Screen 30 shows the field numbers and descriptions available for inclusion within the letter.

In addition to the fields contained within the file, a special field is also provided so that information not already contained within the system can be generated at report time. This field will appear at the end of the fields and be defined as '99 Computed field'. This option may be selected as often as required during the generation of the letter program.

The following prompt is now given to enable the operator to select those fields which are required to be printed within the letter:–

'Select next field to be printed (END)'

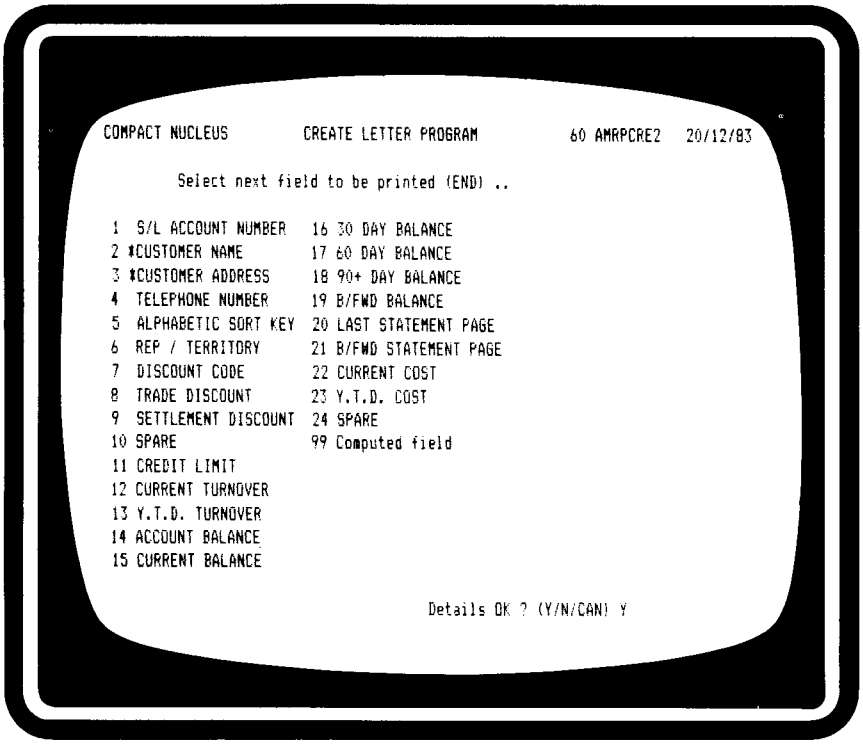
Although the fields are numbered consecutively it is not necessary for them to be selected in this order for printing. The operator is able to select those fields required in whatever order is necessary.

On selection of the field number to be included, the description of the field will be displayed beside the field number entered. If the wrong field has been selected, the operator by entering 'N' will be able to re-enter an alternative selection.

If the letter generation is to be aborted then by entering 'CAN' the system will return to the main menu.

If the field description displayed is correct then by entering 'Y' the system will enable a further field to be selected and at the same time display an '*' symbol beside the field selected (the asterisk will appear between the field number and the field description).

For further information on the use of 'computed fields', please refer to the section 'Selected Reports' within the NUCLEUS Reporter Manual.



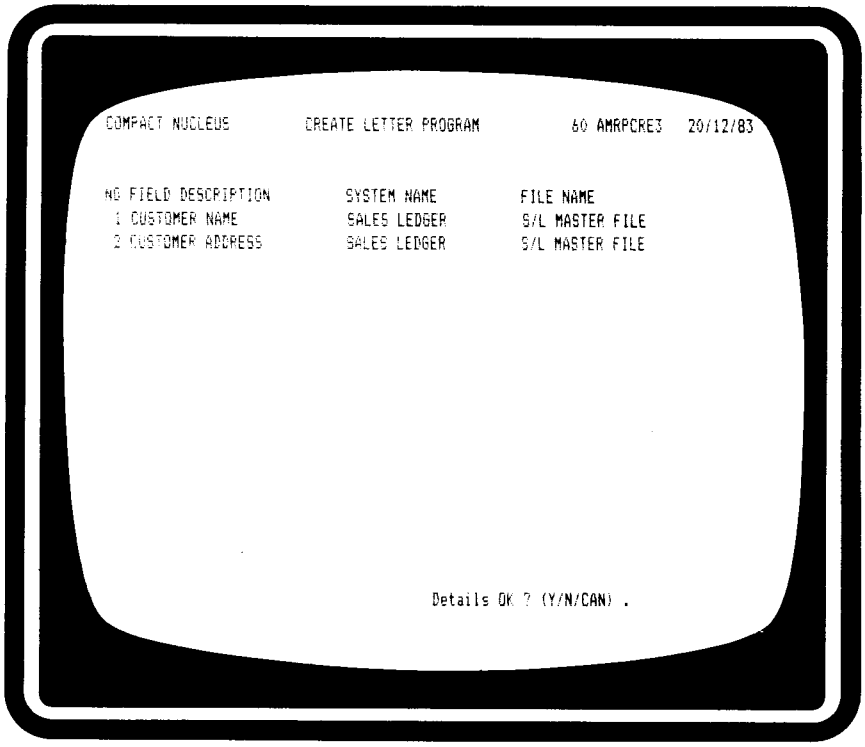
SCREEN 30

This screen shows the field numbers and descriptions available for inclusion within the letter.

Having completed the selection of fields to be included within the letter and specified any derived fields, the selection process can be terminated by entering 'END'. On completion of the selection, screen 31 is displayed, which summarises those fields that are available for inclusion within the letter and the system from which they have been extracted. If this summary is incorrect, then by responding 'N' it is possible to go back and make any alterations necessary. By entering 'CAN' the system will abort and return to the main menu.

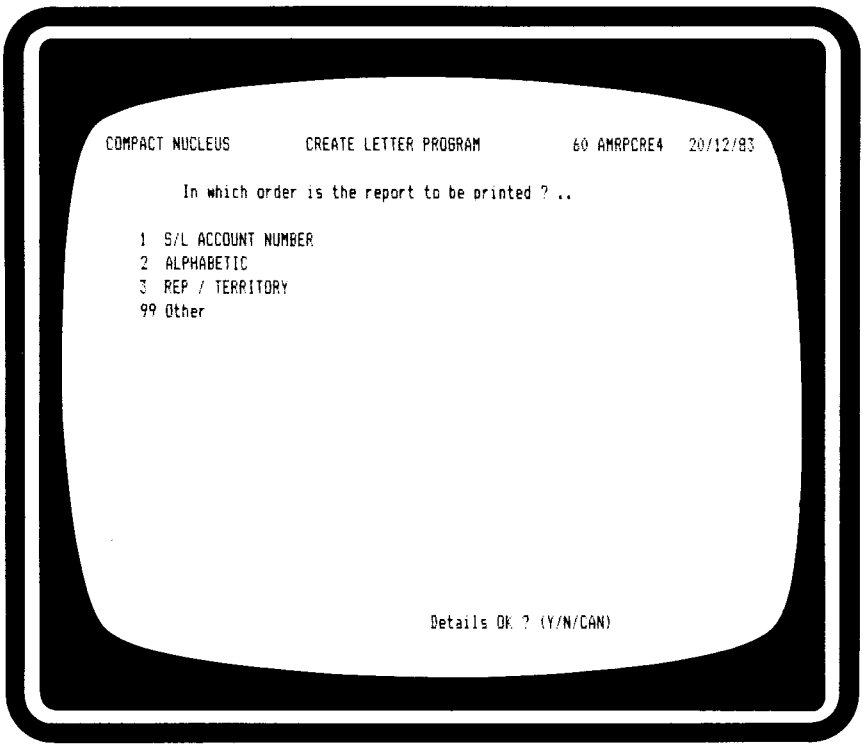
If the field selection is correct, it is now possible to specify the order in which the letters will be printed. Within the files storing the data for extraction, a number of keys may have been specified which means that the information contained within the file will be held in this order for immediate use. However, within NUCLEUS it is possible to specify an alternative order for printing.

Screen 32 shows the available keys, as well as a '99' option which will enable the user to specify an alternative order. If one of the existing keys is selected, then no further input is required. However, if an alternative order is required, then the '99' option should be selected. It will now be possible to select any of the fields contained within the file as a basis for sorting the letters into order. It will not be possible to use derived fields for sorting purposes. On selection of the field for which the sort is to be carried out, the system will display the field description of the field selected. Where the field selected is an alphanumeric field, it will be necessary for the operator to indicate the number of characters on which the sort is to be carried out. If for example a report is required in alphabetical order and the customer name is selected for sorting purposes, it will be extremely slow and time consuming for the whole name to be used as a key.



SCREEN 31

On completion of the selection process, the above screen is displayed, which summarises those fields that are available for inclusion within the letter and the system from which they have been extracted.



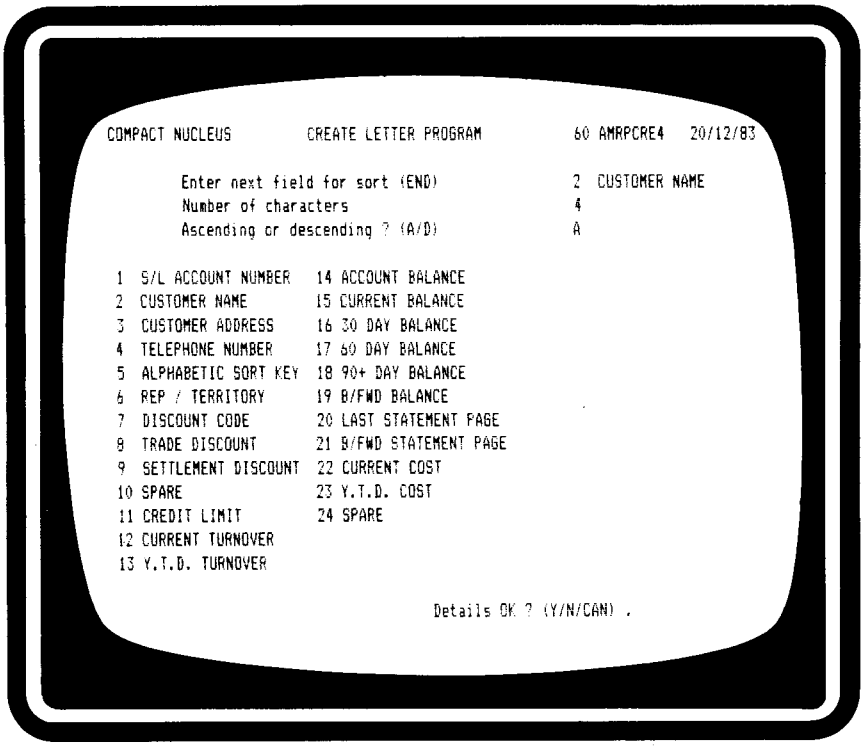
SCREEN 32

Having specified that the field selection is correct the above screen is displayed. This screen shows the available keys to enable printing of the letters in a specified order. A '99' option is also available which allows the user to specify an alternative order.

The file handling module also imposes a restriction on the user, that any key used by the software must not exceed 26 alphanumeric characters. Where reports are required in alphabetical order an acceptable result would certainly be provided if the sort was carried out on the first few characters of the field.

In response to the question 'Number of characters' it will be more efficient and much quicker to restrict the sorting to the first four or five characters, than use the full 26 character capability. Having specified the number of characters on which the sort is to be carried out it is now possible for the user to specify whether the sequence is to be ascending or descending. (See screen 33).

Having completed the specification of the sort details, then enter 'END' to proceed to the next screen. The system will then display each of the sort sequences that have been specified in a previous routine, and an opportunity for the operator to make any corrections that may be necessary. If the sort details are correct, then respond 'Y'. If an error has been made then it is possible by selecting 'N' to return and amend the sort details. By entering 'CAN' the system will return to the main program menu.



SCREEN 33

On selection of the '99' option the above screen is displayed which enables the user to specify the sort in an alternative order.

Having accepted the details of the sort specification it is now possible to exclude from the information held within the file those records which are not required for printing. By using the Boolean logic provided in screen 34 it is possible to produce a report with only those records that are required.

If all records are not to be printed from the file then the operator should respond 'N' to the following message:–

'Do you want to print all records ? (Y/N)'

If all records are not required, it will be necessary using the symbols displayed on the screen to enter a simple equation specifying those records which are to be printed. The following Boolean functions are available:–

= Equal to	< Not equal to
< Less than	> Greater than
<= Less than or equal to	>= Greater than or equal to
& And	! Or

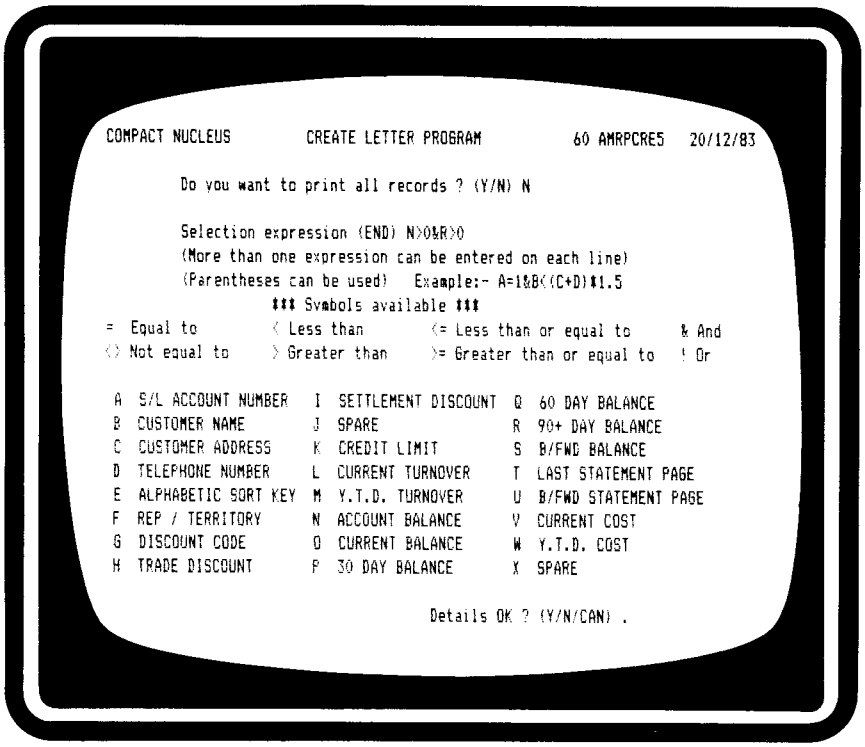
If information was being extracted to send letters to outstanding debtors, a condition for printing the record could be that the account balance was greater than zero and also that an outstanding balance existed in the 90 day category. To satisfy this condition the following equation would have to be entered:–

N>0&R>0

The system will check that the expression is capable of being executed and if the syntax of the equation is correct, the operator will be asked to respond to the following prompt:–

'Details OK ? (Y/N/CAN)'

It will be possible to enter up to five Boolean expressions for any one report. (See screen 34).



SCREEN 34

Having accepted the details of the sort specification, it is now possible to exclude from the information held within the file those records which are not required for printing. By using the Boolean logic provided in the above screen, it is possible to produce a report with only those records that are required.

In the example above, Sales Ledger accounts with an outstanding balance greater than zero and an existing 90 day balance will be printed.

Having decided on which records are to be printed or excluded the definition phase of the letter program is complete. All that remains to be done is to give the letter program a description which will be used and inserted on the system program menu. The program description should be carefully prepared so that it gives some indication in the description as to the function of the program. After entering the letter program description NUCLEUS will generate the necessary software and copy the generated program to the program disk. After the update has been completed successfully the system will return to the letter writer menu.

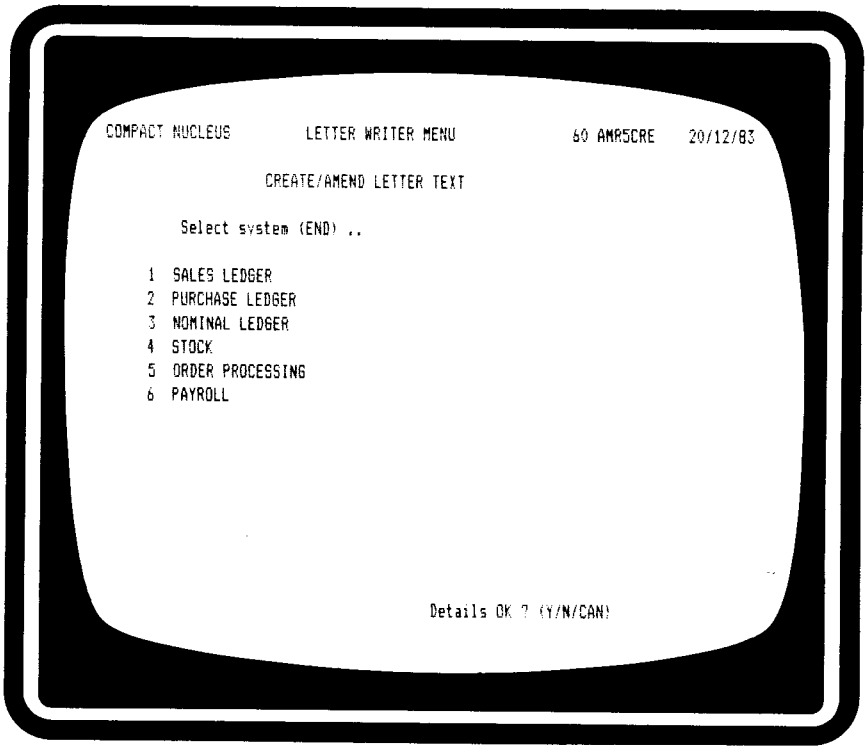
3. Create/Amend Letter Text

Having created the program to extract data from the system to be inserted within the text, it is now necessary to create the basic text for the document. It is not possible to create a document without first having created a letter program.

The process for entry to the system is similar to that experienced under option 2. Firstly, it is necessary to identify the system under which the letter is to be created. The systems available are displayed on the screen (see screen 35) with systems 1-19 being reserved for COMPACT generated systems and any user defined systems being numbered from 20 onwards. Having selected the system, any letter programs that have already been created under the system will then be displayed. It is possible using the letter editor to create a whole range of letters under one particular system. For example, under a Sales Ledger it may be necessary to have a range of debtor chasing letters as well as standard letters advising customers of offices being closed over holiday periods etc.
From the letters displayed under the system, it is necessary for the operator to select one of these so that the text can be created.

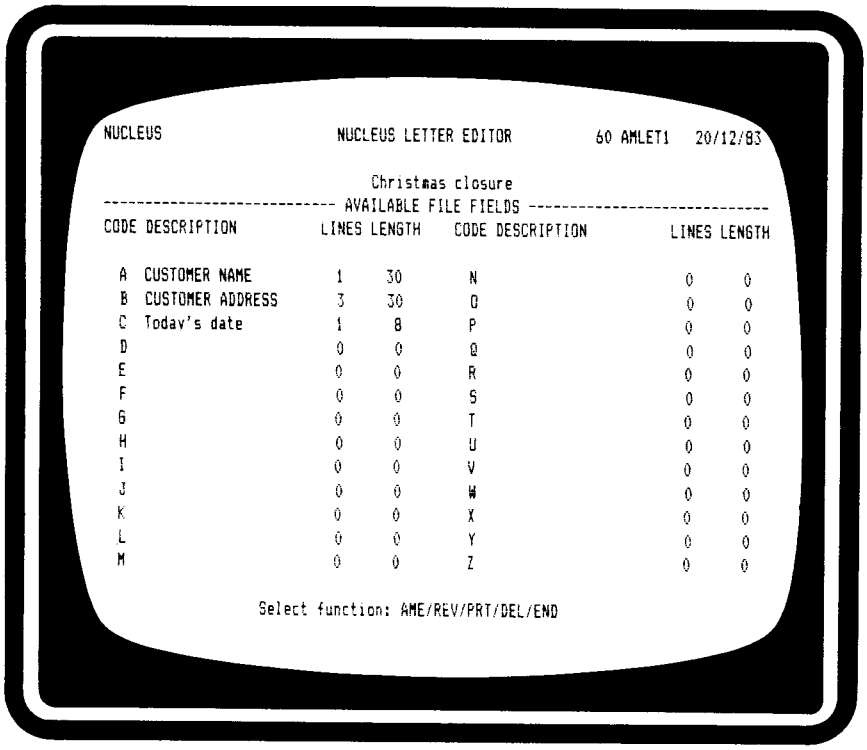
Having selected the letter generated under option 2, screen 36 is displayed. This screen displays details of the fields selected under option 2 which are available for insertion within the text along with the length of the data contained within these fields.

This information can be used as a reference during the creation of the text file.



SCREEN 35

On selection of Create/Amend Letter text, screen 35 is displayed showing the systems available for selection. Numbers 1 to 19 are reserved for COMPACT generated systems and any user defined systems are numbered from 20 onwards.



SCREEN 36

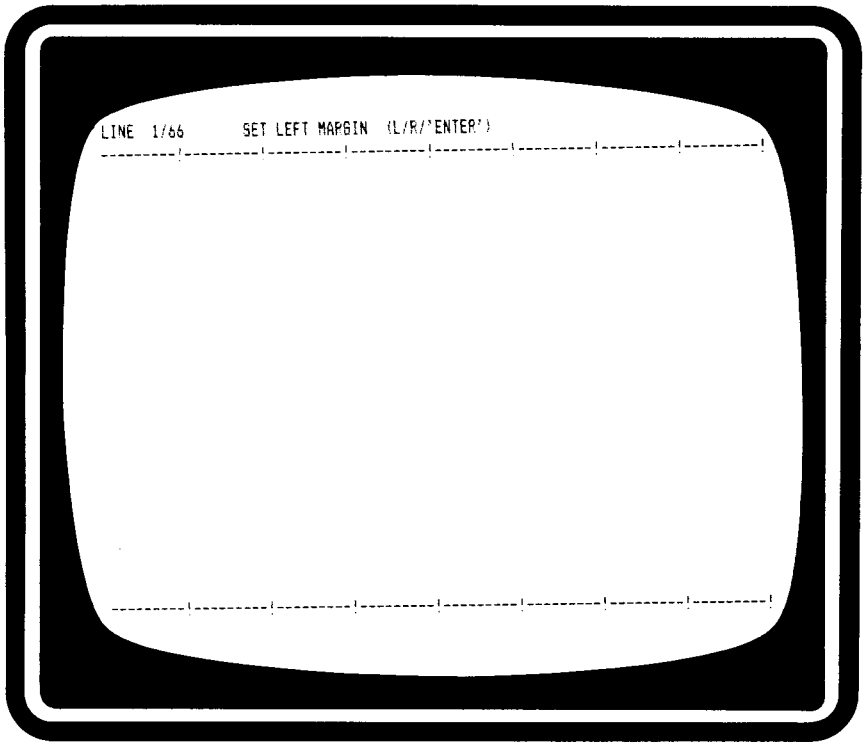
Having selected the letter generated under option 2, the above screen is displayed. This screen displays details of the fields selected under option 2 which are available for insertion within the text along with the length of the data contained within these fields.

To create a new document enter 'CRE' or to return to the main menu enter 'END'. Before creating the text file, the operator is asked to enter the page length of the document that is to be created. Options are available between 1 and 80 lines. When calculating the length of the page, it should be borne in mind that normal printers would function at six lines to the inch. Having set the page size for the document, screen 37 is displayed.

The first option available before any text can be entered, is to set the left and right margins. On the top left hand corner of the screen after the word 'line' is displayed firstly, the line number on which the cursor is currently located and secondly, after the '/' the total number of lines for the document. The left hand margin is set by moving the cursor by depressing the 'R' key until the required number of spaces have been left for a margin. By depressing the 'Enter' key, the cursor will then move to the right hand margin so that this can be set. The right margin is set by depressing the 'L' key for the required number of spaces and then depressing the 'Enter' key.

Having set the margins, the cursor then returns to the first print position on the first line and the system is ready to accept text. During the entry of the text, the space bar, the back space and the carriage return key will all function in the same way as a typewriter. As a new line is started, the line number counter on the top left hand corner of the screen will change automatically.

The system is now in text entry mode, and input may be carried out as if the system was a typewriter. However, a number of special facilities are available, and where text is to be inserted from the data that has already been selected the second mode will have to be used. During normal text entry, the only other option available to the operator is to press the 'Escape' key (ESC). By pressing the 'Escape' key the range of special options is displayed on the top status line. Set out below is a detailed description of each of these special functions and how they may be used in conjunction with creating the text files.



SCREEN 37

Having set the page size for the document and responded 'Y' to 'Details OK? (Y/N/CAN)' the above screen is displayed.

Edit Mode

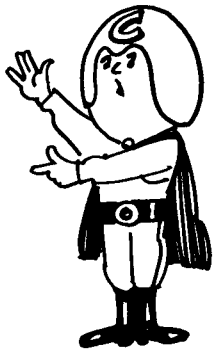
In this mode the standard alphanumeric keyboard is disabled and certain of these keys are assigned to initiate the edit commands. These are:–

Key	Function
L	Left cursor move
R	Right cursor move
U	Up cursor move
D	Down cursor move
E	Erase character /
I	Insert character /
W	Wipe from cursor to end of line (delete if cursor on left margin)
O	Open up new line at cursor position
T	Tabulator set/cancel
F	File. (Insert field from NUCLEUS file)
S	Size. (Change between double and single spacing)
C	Command. (Return to command menu)
'ESC'	Switch to text mode.

In addition the carriage return, backspace and tab move keys remain effective.

If an illegal move is requested, a bell is sounded. Except for the file command, no other explanation of the error is given.

The detailed operations of the edit mode commands are described below:–



i Left cursor

Moves the cursor one character left.

ii Right cursor

Moves the cursor one character right.

iii Up cursor

Moves the cursor up one line.

(N.B. On entering a double spaced line, the cursor will sidestep if necessary to align with the start of a character position).

iv Down cursor

Moves the cursor down one line.

(N.B. On entering a double spaced line, the cursor will sidestep if necessary to align with the start of a character position).

v Erase character

Deletes the character at the cursor position and moves the line to the right of the cursor back one space.

(N.B. Erase is disabled whenever the cursor is within a NUCLEUS field).

vi Insert character

Inserts a blank space at the cursor position and moves the line to the right of the cursor forward one space, dropping characters at the right hand margin.

(N.B. Insert cannot be used in any way that would damage a NUCLEUS field. Fields to the right of the cursor are 'shunted' together on reaching the end of the line and the rightmost non-field is discarded).

vii Wipe

Deletes the line from the cursor to the end of the line. If the cursor was at the leftmost position, the entire line is removed and the lines below are moved up to fill the gap.
(N.B. Wipe can delete any complete NUCLEUS field or a line of a multi-line field; but not part of a field or field line).

viii Open

Inserts a new blank line at the current cursor position and moves the remaining lines down.

(N.B. Open is disabled when the last page line contains text or is set to double spacing).

ix Tabulator set/cancel

Sets or cancels a tab at the current cursor column. When a tab is set a 'T' symbol is placed in the ruler at the top and bottom of the text.

x File

Enables insertion of a NUCLEUS field, commencing at the current cursor position. Multi-line fields will be placed with subsequent lines on the lines immediately below the first and starting at the cursor column; although this can be amended later using erase, insert, wipe and open.

The procedure for field definition is as follows:

a) On initial selection the available NUCLEUS fields are displayed as for the command menu, followed by the prompt 'Field code? (A-Z/CAN)'. (The 'Z' is changed according to the number of available fields).

b) The operator should then key in the alphabetic code for the choice of field, followed by a carriage return. The program then performs a check to ascertain whether or not the choice is valid. If not, one of the following error messages is generated:

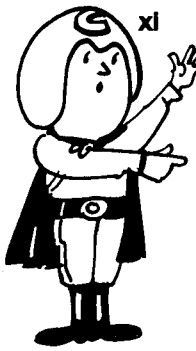
MESSAGE	COMMENTS
Not enough space	Either the remainder of the line is too short or there is already a field within the space this would have to occupy or there are insufficient lines left for a multi-line field.
Too many fields in line	A maximum of 22 fields can be accommodated in any one line.
Invalid double width column	When inserting a multi-line field, if the field started in an even numbered column, then correct alignment of the first character of one of the following lines is not possible if it is double spaced.

An error message is followed by the prompt 'AME/CAN?'. An 'AME' response returns the operator to the start of step (b); a 'CAN' response to either the error message or field code prompt aborts the file command and restores the text display.

c) If no error is found, the operator is then given the prompt, 'Fixed length? (Y/N)'. A 'N' response means that, during final printing of the field data, leading and trailing spaces are deleted, and text to the right of the field is closed up accordingly. A 'Y' response means that the field will always be printed to its maximum length, space filled if necessary.

d) The next prompt is, 'Fixed position? (Y/N)'. A 'Y' response means that, regardless of any rearrangement of text during printing due to a 'N' response to the 'fixed length option on any preceding field in a line, the field will always start at the column shown by the text editor display or test print. A 'N' response means that the field may be moved along the line during printing when closing up spaces in a preceding field. (For this reason, the operator is recommended to use the fixed position option for multi-line fields or for data displayed in columns).

e) The final prompt is, 'Details OK? (Y/N)'. A 'N' response returns the operator to the start of step (b). A 'Y' response inserts the field code into the text, restores the text screen and sets the cursor to the end of the first line of field.



xi Size

A line may be specified as double or single spaced, with single spacing as the default type. The size command alters a line from one type to the other, with any text on that line re-displayed, starting from the left margin. (If, when attempting to set double spacing, the text on the line extends more than halfway to the right margin the command is refused). Double spaced lines are marked by an '=' symbol after every character.

(N.B. Double spaced characters always start in odd column numbers and occupy two printer columns. For this reason it is advised that, if double spacing is to be used, the left and right margins should be set to start the line at an odd column number and finish at an even number, otherwise correct text alignment at the margins will not be possible).

By combining the normal text entry with the special features available when the 'Escape' key is depressed it is possible to produce a document with the fields specified under option 2 imbedded within the text. The special command 'F' (for file) enables fields to be inserted within the text that have been selected from the accounting files. When inserting a field in the text the fields available are displayed for selection. The first letter or number of the field selected will be located at the position of the cursor, so that before carrying out the selection, the cursor should be positioned in the exact position where the inserted field is to start.

When the field for insertion is selected the operator will be asked 'Fixed length? (Y/N)'. This facility is provided so that where a field is to be inserted into the text of a letter, the following text will appear one space after the last character contained within the field. For example in the COMPACT Sales Ledger the customers name can be a maximum of 30 characters. If however, a small name such as 'Smith' is selected, the five characters of the name Smith will appear in the first five character spaces with the remaining 25 characters being left as blank. If in the response to the 'Fixed length' question, the operator responds 'Y' then the 25 blank spaces will be left after the name Smith before the text continued. If a 'N' response was given, then the text would continue one space after the end of the customer name.

Having established whether the inserted field is to be a 'fixed' or a 'variable' length field, the operator is then asked if the field is to be in a 'Fixed position (Y/N)'. If there has been a 'N' response to the previous question, then it would be difficult to establish exactly where in the line of text an inserted field will appear. When the text is displayed on the screen the inserted field will show as the maximum number of characters possible, but during the actual printing, if the variable length option has been selected the text will be re-arranged to take into account the blank spaces.

In the case of an inserted field such as today's date which would normally be required to be displayed in a fixed position at the top of the letter it would be necessary to have this field printed in the same position irrespective of any text re- arrangement because of blank spaces. Where a field is being inserted within the text and variable length fields are being used then the operator should respond 'N' to the field being displayed in a fixed position. However, in the case of a date that is required to be printed in a fixed position for all letters then the operator should respond 'Y'.

Fields that have been selected for insertion can be used as often as required and may be repeated within the same document.

Having completed the entry of the text, the operator should use the 'Escape' key to return to the special edit commands. By depressing 'C' (for command menu) the operator will then be given the opportunity of selecting one of the following functions:–

'Select function: AME/REV/PRT/SAV/CAN'

AME (Amend) This function will return the operator to the text that has been entered and give the opportunity of making any amendments that may be necessary. On completion of the amendments to the text, it will be necessary to exit from the editor by use of the 'C' editor function.

REV (Review) This function will enable the text that has already been created to be displayed on the screen without the ability to make any amendments.

PRT (Print) The text currently being edited is held in memory and the print function enables the operator to output to the printer the text entered for a sample print.

SAV (Save) When the operator is satisfied that the text entered is correct the save option will write the text held in memory to disk. Having written the text to disk, it will then be necessary to re- enter the amend option if any corrections are necessary.

CAN (Cancel) The cancel option will delete any text held in memory and return the operator to the main menu.

Once the text has been saved and written to the file the command 'END' will return the operator to the main menu.

Now that the text has been created and the letter program generated and written to the program disk, letters can now be printed by returning to the system under which the letter had been created and selecting it from the main program menu.

4. Delete Letter

On selection of the delete letter option from the letter writer menu, the systems available for selection are displayed. Numbers 1-19 are reserved for the standard COMPACT systems therefore user defined systems will start at number 20. (See screen 38).

By typing 'END' in response to 'select system', return will be made to the letter writer menu.

After having selected the system, the operator has the opportunity of re-selection, if the system chosen is incorrect by typing 'N' to the question 'Details OK? (Y/N/CAN)'. By typing 'CAN' in response to the question return will be made to the letter writer menu.

If 'Y' is entered, the system will then display the letters available for deletion within the selected system. (See screen 39). If 'END' is input at 'Select letter', the system will return to the previous screen for selection of another system or 'END'.

Having selected the letter for deletion, the operator again has the opportunity of re-selection, if the letter chosen is incorrect by typing 'N' to the question 'Details OK? (Y/N/CAN)'. By typing 'CAN' the system will return to the previous screen for selection of another system or 'END'.

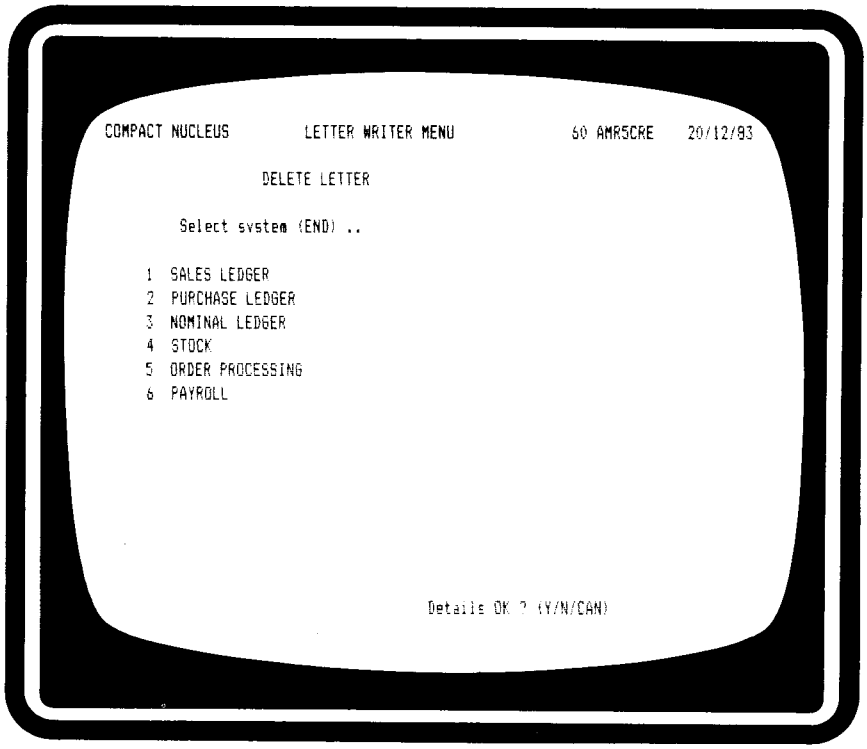
If the letter selected for deletion is correct, by responding 'Y' to the question the system will then request the operator to input the system program disk into drive B.

Having input the system program disk into drive B and depressed 'Enter' the following message will be displayed as shown in screen 40:–

'Letter deleted'

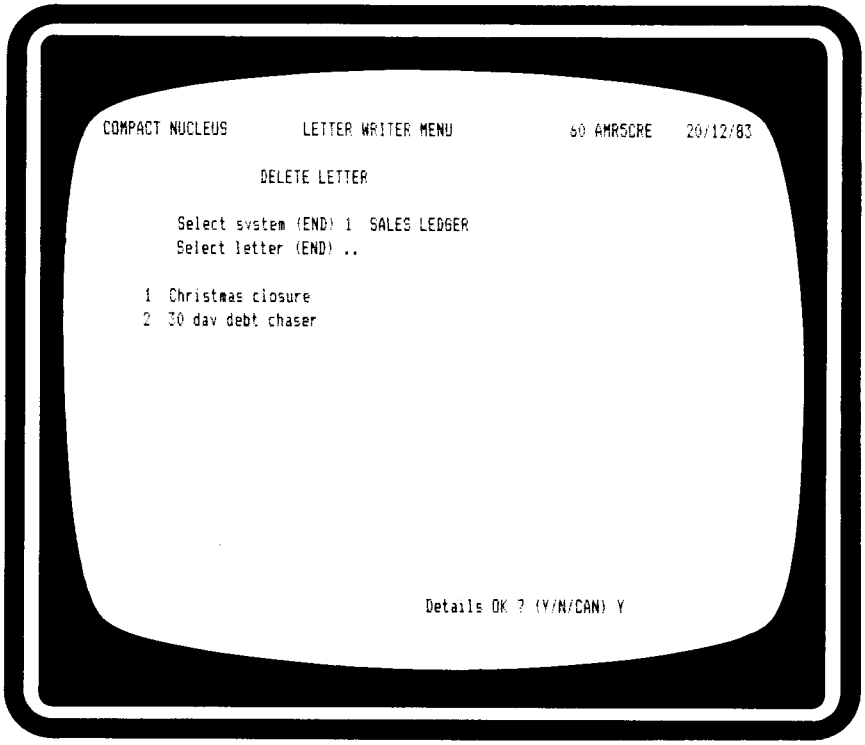
This message indicates that the letter has been successfully removed from the system program disk. By depressing 'Enter' in response to the above message the prompt 'Mount Nucleus parameter file disk on drive B' will be displayed.

After inputting the Nucleus parameter file disk in to drive B and depressing 'Enter' the system will return to the letter writer menu.



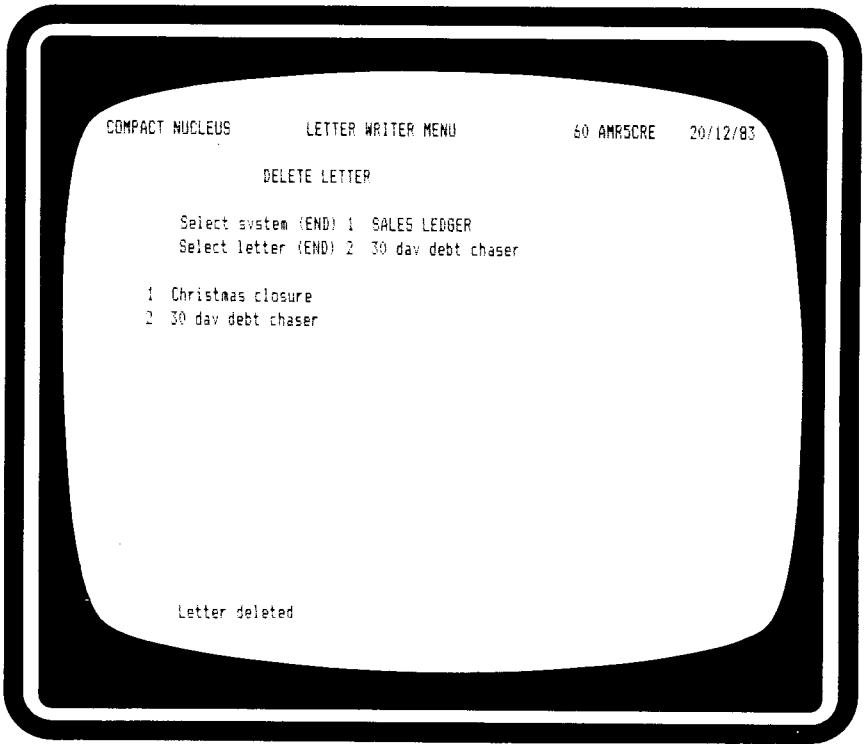
SCREEN 38

On selection of the delete letter option, the systems available for selection are displayed. Numbers 1 to 19 are reserved for the standard COMPACT systems, therefore, user defined systems will start at number 20.



SCREEN 39

Having selected and accepted the system, screen 39 will be displayed. This screen shows the letters available for deletion within the selected system.



SCREEN 40

The above message will be displayed after inputting the system program disk into drive B and depressing enter. The message indicates that the letter has been successfully deleted from the system program disk.

DOCUMENT WRITER

Using the NUCLEUS document writer program four separate modules are provided as shown in screen 41. These four modules are to be used in the following way:–

1. Amend Document Parameters

During the editing of the document, the standard software enables the cursor to be moved to whatever position is necessary using the standard keys. Provision is also made to configure the software to take advantage of special word processing keys which may be provided with the hardware. Since these special function keys differ from machine to machine, it is not possible for the standard software to be configured to take advantage of them. Screen 42 shows the editor parameters that are available within the system and the manufacturers manual will need to be consulted to enter the relevant decimal details for each of the keys. If any difficulties are experienced in configuring special key functions then the COMPACT Software Dealer should be contacted.

2. Create Document Program

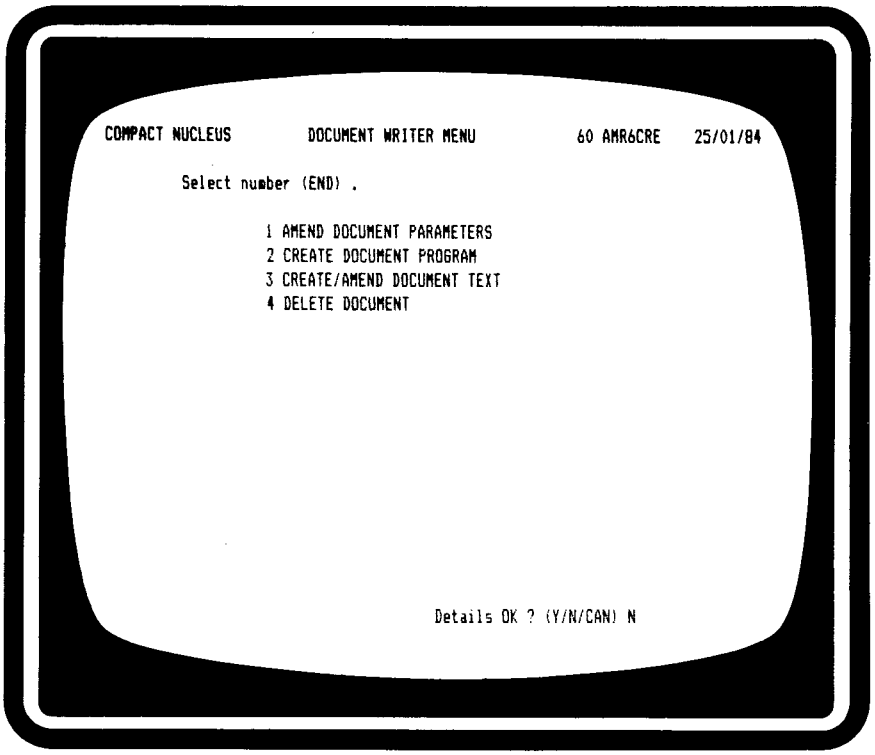
The document program consists of special software which will extract from the relevant transaction files any records that are to be printed within the document. Within this program it is possible to specify any special exclusion criteria which may be applicable as well as select fields for totalling on change of a key. The document program identifying the data to be extracted from the file must be created before any attempt is made to enter the document text.

3. Create/Amend Document Text

This section of the system enables the format of the document to be specified along with the positions for any headings or fields that are to be printed. It is possible to produce sample printouts of the documents so that where pre-printed stationery is being used this can be checked before the format is finalised.

4. Delete Document

This option enables documents which have already been created to be deleted from the system to make room for new documents which may have to be added.



SCREEN 41

On selection of the NUCLEUS document writer program from the program menu, the above screen will be displayed showing the four modules available within the program.

DETAILED SYSTEM NOTES

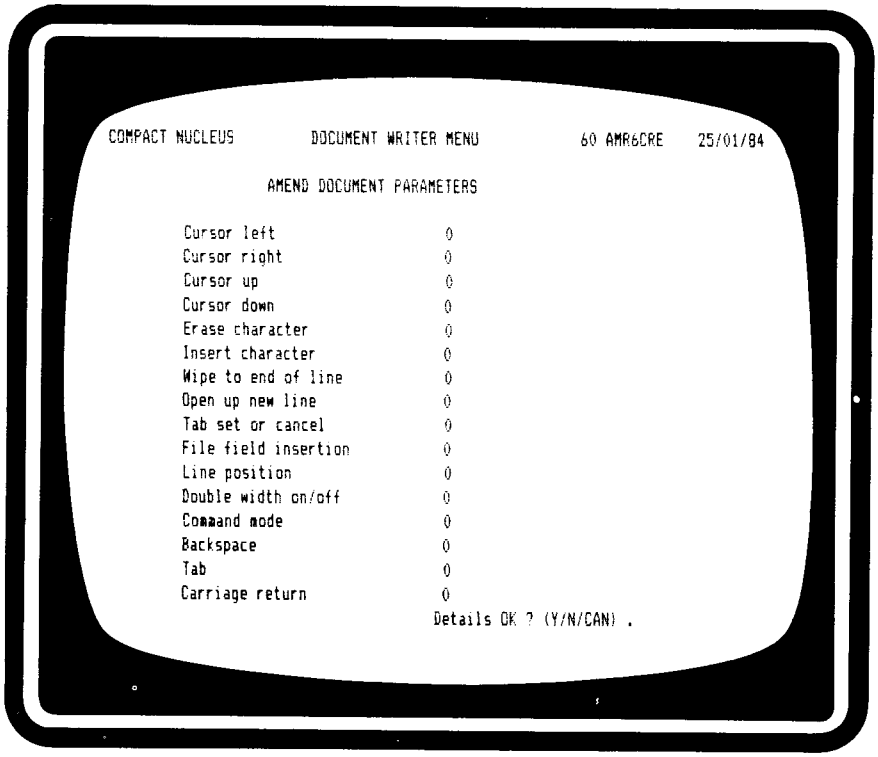
1. Amend Document Parameters

This option within the document editor program enables special function keys which may exist on the terminal to be configured for use within the program. Such special function keys could be the ones controlling the upward, downward and sideward movement of the cursor for instance. Since each VDU will have different values for these special function keys, this program can only be used in conjunction with the manufacturer's hardware manual.

Screen 42 displays the range of function keys available within the system. Some of these function keys may not exist within the hardware being used. Where the function key is not required the value should be left at zero.

The values assigned to these function keys by the manufacturer will be contained within the ASCII table within the hardware manual and the decimal representation of these values should be used in setting up the parameters. Where a function key has more than one value, then these should be separated by commas.

If any difficulties are experienced in setting up special function keys within this section of the system, then the Software Dealer should be contacted.



SCREEN 42

The above screen displays the range of function keys available within the system. Some of these function keys may not exist within the hardware being used. Where the function key is not required the value should be left at zero.

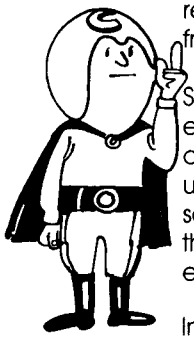
2. Create Document Program

The creation of the document program will control the extraction of the information that is required from the standard accounting files. Option 3 create/amend text will enable the document to be formatted and the system told exactly where the data extracted from the files is to be inserted. The document program created under this option will carry out the merging of the extracted data with the document text and control the printing.

On selection of option 2 (Create Document Program) it will be necessary for the operator to enter a document description. This description will be used for later identification of the document program and provides for a maximum of 20 characters. Having entered the document description, the following prompt is displayed:–

'Details OK? (Y/N/CAN)'

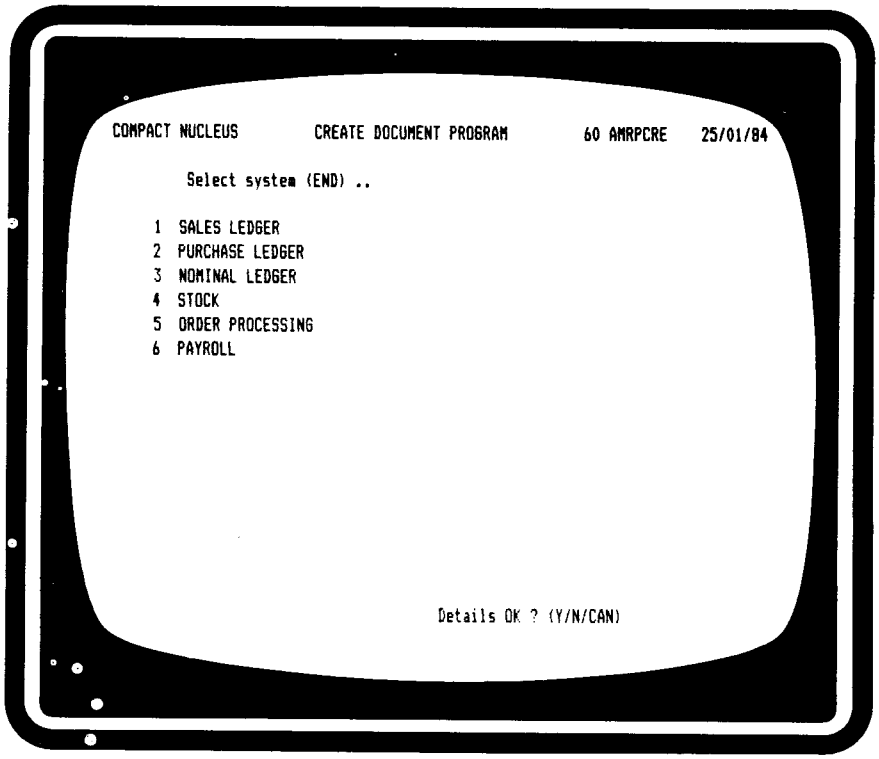
If the description is incorrect, then by responding 'N' the document description can be re-entered. By entering 'CAN' the operator is returned to the main menu. If the description is correct, by responding 'Y' the operator will be able to then select the data files from which the merged information is to be extracted.



Screen 43 displays the available systems from which data may be extracted. Systems numbered 1-19 are reserved for COMPACT developed applications and any user developed systems created under NUCLEUS will commence at system number 20. Having selected the system from which data is to be extracted, the user is then given the opportunity of selecting files from which data is to be extracted.

In selecting a file for extracting data, it is only possible to select a transaction file (type T). The purpose of the document editor is to be able to produce reports such as invoices or statements where a number of records or transactions exist for the same principal key. Features within the document editor enable a heading to be produced and then any transactions required for a particular account or key before moving to the next document.

Where a transaction file is linked to a master file, details may also be extracted for printing from the linked file.



SCREEN 43

Having entered the document description, the above screen is displayed which shows the available systems from which data may be extracted.

Having selected the file, the system will validate and display the file name, with the operator being given the opportunity of accepting the selection, or by entering 'CAN' returning to the previous selector. Having agreed the file selection, the fields contained within this file are then displayed on the screen. Screen 44 shows the field numbers and descriptions available for inclusion within the document.

In addition to the fields contained within the file, a special field is also provided so that information not already contained within the system can be generated at report time. This field will appear at the end of the fields and be defined as '99 Computed field'. This option may be selected as often as required during the generation of the document program.

The following prompt is now given to enable the operator to select those fields which are required to be printed within the document:–

'Select next field to be printed (END)'

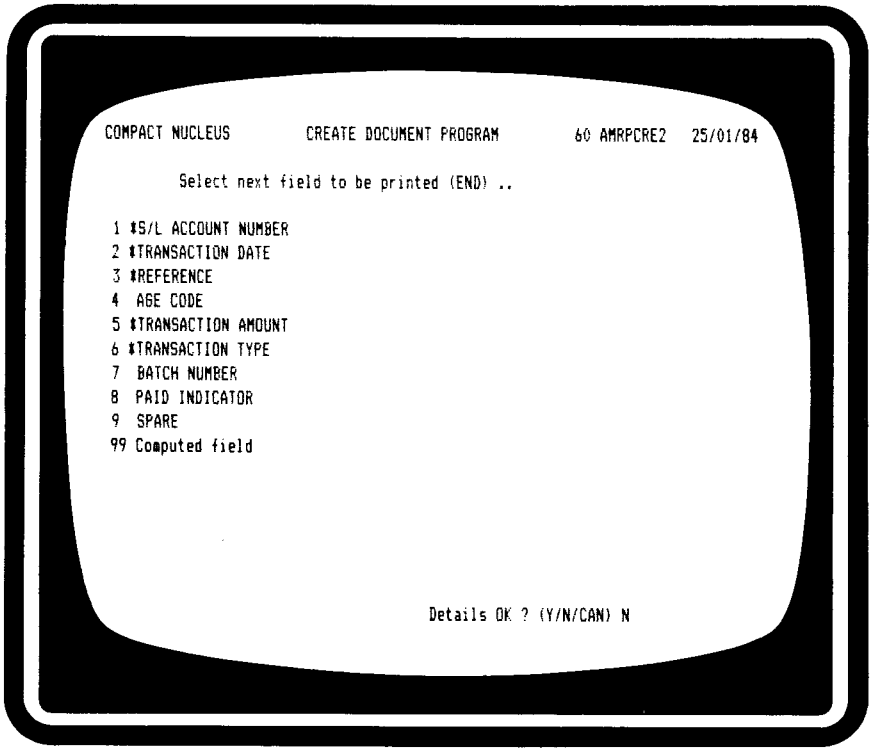
Although the fields are numbered consecutively it is not necessary for them to be selected in this order for printing. The operator is able to select those fields required in whatever order is necessary.

On selection of the field number to be included, the description of the field will be displayed beside the field number entered. If the wrong field has been selected, then by entering 'N', the operator will be able to re-enter an alternative selection.

If the document generation is to be aborted then by entering 'CAN' the system will return to the main menu.

If the field description displayed is correct then, by entering 'Y', the system will enable a further field to be selected and at the same time display an '*' symbol beside the field selected. (The asterisk will appear between the field number and the field description).

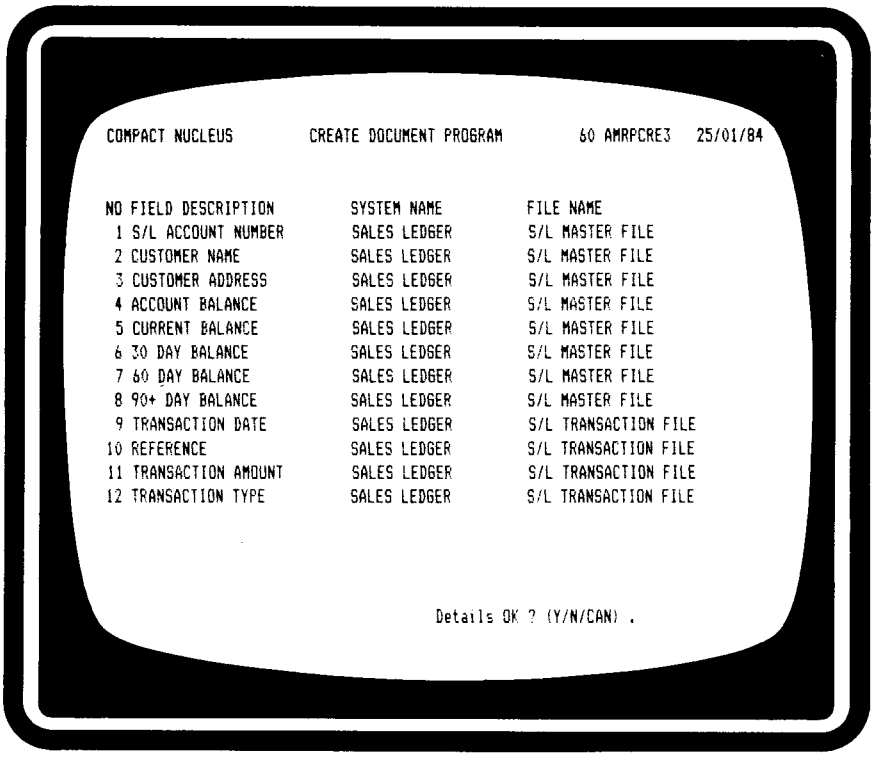
For further information on the use of 'computed fields', please refer to the section 'Selected Reports' within the NUCLEUS Reporter Manual.



SCREEN 44

This screen shows the field numbers and descriptions available for inclusion within the document.

Having completed the selection of fields to be included within the document and specified any computed fields, the selection process can be terminated by entering 'END'. On completion of the selection, screen 45 is displayed. This summarises those fields that are available for inclusion within the document and the system from which they have been extracted. If this summary is incorrect, then by responding 'N' it is possible to go back and make any alterations necessary. By entering 'CAN' the system will abort and return to the main menu.



SCREEN 45

On completion of the selection process, the above screen is displayed which summarises those fields that are available for inclusion within the document and the system from which they have been extracted.

If the field selection is correct, it is now possible to exclude from the information held within the file those records which are not required for printing. By using the Boolean logic provided in screen 46 it is possible to produce a report containing only those records that are required.

If all records are not to be printed from the file then the operator should respond 'N' to the following message:–

'Do you want to print all records ? (Y/N)'

If all records are not required, it will be necessary using the symbols displayed on the screen to enter a simple equation specifying those records which are to be printed. The following Boolean functions are available:–

= Equal to	<> Not equal to
> Less than	> Greater than
<= Less than or equal to	>= Greater than or equal to
& And	! Or

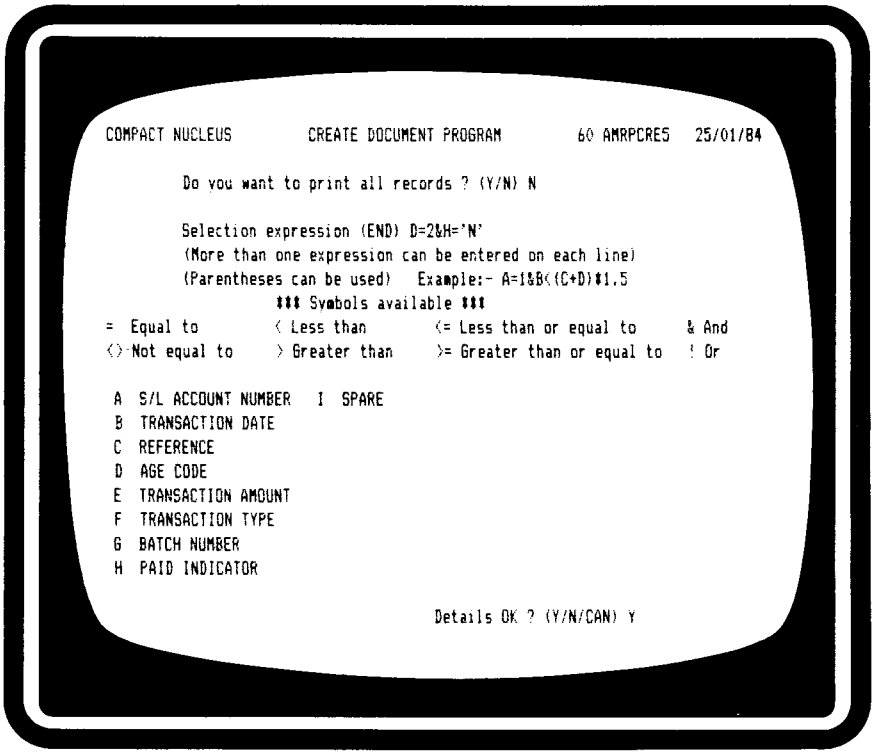
If information was being extracted to send statements to outstanding debtors, a condition for printing the record could be that an outstanding balance existed in the 60 day category and the system could be instructed not to print any transactions within that category that are flagged as paid. To satisfy this condition the following equation would have to be entered:–

D=2&H='N'

where a code of 2 is equivalent to 60 days. The system will check that the expression is capable of being executed and, if the syntax of the equation is correct, the operator will be asked to respond to the following prompt:–

'Details OK ? (Y/N/CAN)'

It will be possible to enter up to five Boolean expressions for any one report. (See screen 46).



SCREEN 46

Having accepted the field selection, it is now possible to exclude from the information held within the file those records which are not required for printing. By using the Boolean logic provided in the above screen, it is possible to produce a report with only those records that are required.

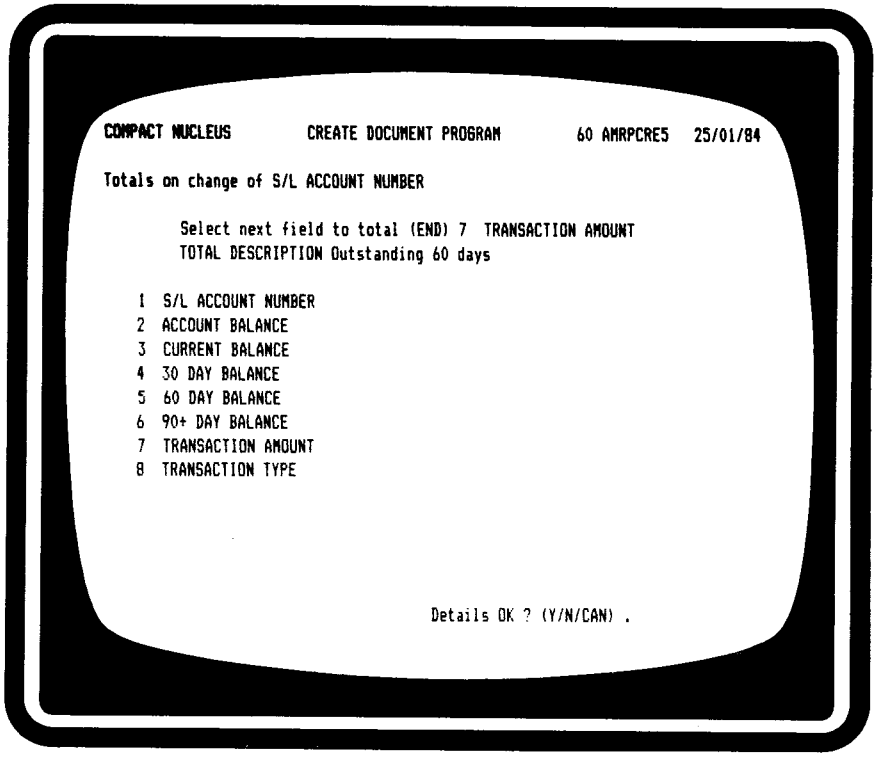
In the example above, Sales Ledger transactions with a 60 day balance will be printed, but only those that have the paid indicator set to 'N'.

If the Boolean expressions entered are correct, screen 47 is displayed. This gives the operator the opportunity of selecting fields for totalling on change of a key. In the example only one key has been defined, i.e. Sales Ledger account number.

After selecting the next field to total, a 'total description' may be entered. This description is only used to name the total field and it will not be printed on the document.

The system automatically displays an '*' between the field number and the field description indicating those fields that have been selected for totalling.

As many fields as required may be selected for totalling.



SCREEN 47

If the Boolean expressions are correct, the above screen is displayed. The operator now has the opportunity of selecting fields for totalling on change of a key.

Having selected the fields for totalling, the definition phase of the document program is complete. All that remains to be done is to give the document program a description which will be used and inserted on the system program menu. The program description should be carefully prepared so that it gives some indication as to the function of the program. After entering the document program description NUCLEUS will generate the necessary software and copy the generated program to the program disk. After the update has been completed successfully the system will return to the document writer menu.

3. Create/Amend Document Text

This module provides the software necessary for formatting data extracted from the files (as specified in option 2) on preprinted stationery or in a special format. On selecting this option the systems available for use are displayed on the screen. Systems 1-19 are reserved for COMPACT developed packages whilst systems 20 onwards will identify any user defined systems. Having selected the system, the documents available within the system (those that have been created in option 2) are then displayed. (See screen 48).

Screen 49 will then display fields which have been selected for printing under option 2 along with some special fields which will assist in producing a more flexible style of document. Fields displayed may be selected in any order and as frequently as required. Special fields provided are as follows:–

Today's date

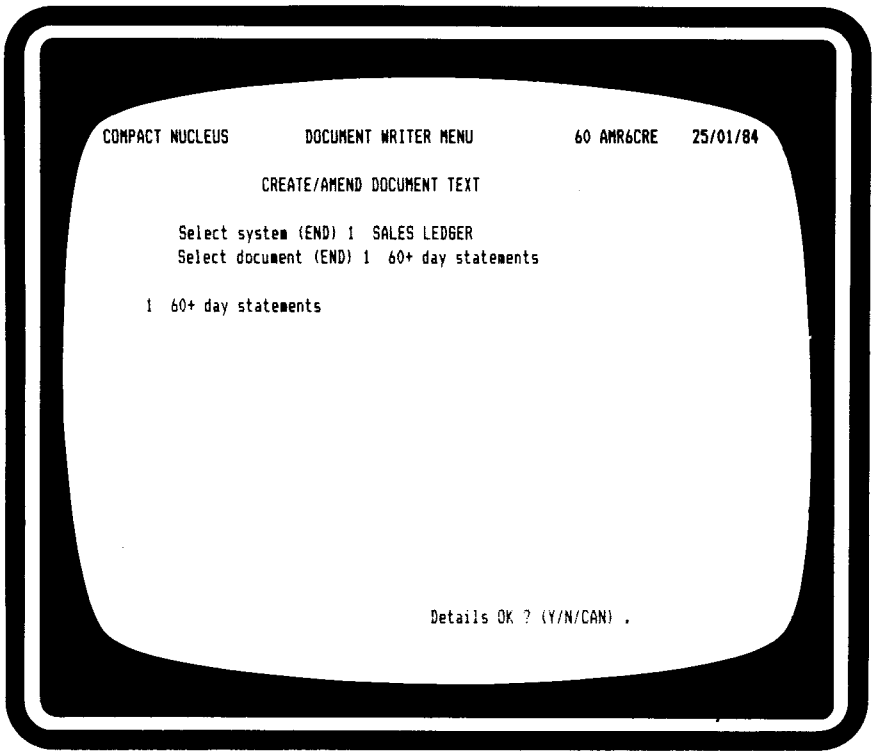
This will take the system date shown in the top right hand corner of the screen which can then be incorporated within the document.

Page Number

Where multipage documents are being prepared, if the page number facility is included then automatic page numbering will take place.

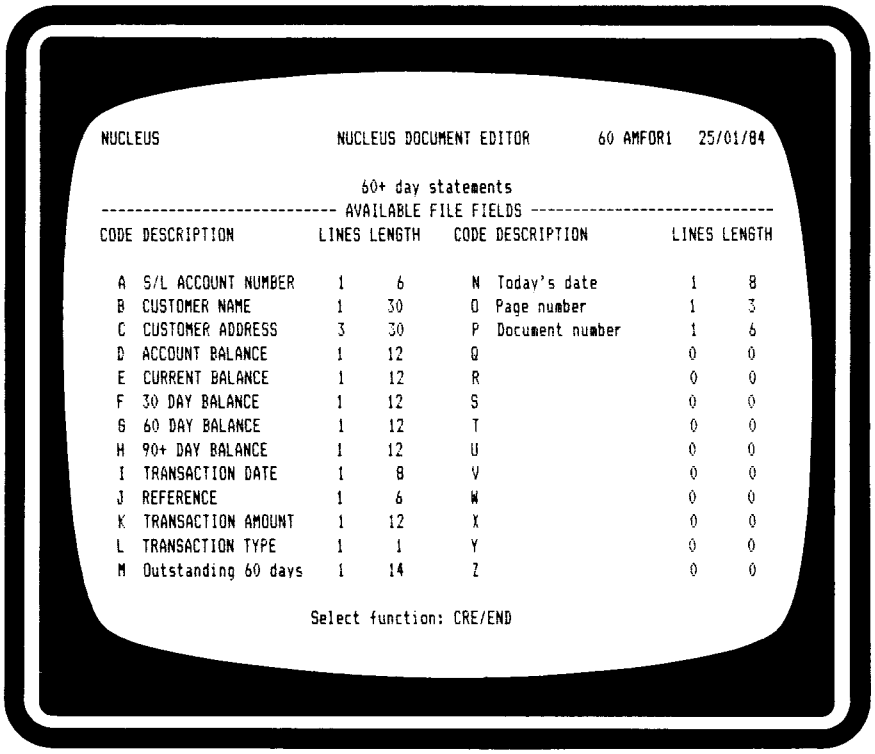
Document Number

Where sequential document numbers are required the document number facility is included. Once selected, the numbering will be automatic.



SCREEN 48

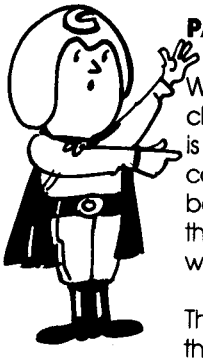
Having selected the system the above screen is displayed. This shows the documents that will have been created in option 2 (Create Document Program) and are thus available for selection within the system.



```
NUCLEUS                    NUCLEUS DOCUMENT EDITOR        60 AMFOR1   25/01/84

                              60+ day statements
---------------------------- AVAILABLE FILE FIELDS -----------------------------
CODE DESCRIPTION          LINES LENGTH    CODE DESCRIPTION          LINES LENGTH

  A  S/L ACCOUNT NUMBER     1     6        N  Today's date           1     8
  B  CUSTOMER NAME          1    30        O  Page number            1     3
  C  CUSTOMER ADDRESS       3    30        P  Document number        1     6
  D  ACCOUNT BALANCE        1    12        Q                         0     0
  E  CURRENT BALANCE        1    12        R                         0     0
  F  30 DAY BALANCE         1    12        S                         0     0
  G  60 DAY BALANCE         1    12        T                         0     0
  H  90+ DAY BALANCE        1    12        U                         0     0
  I  TRANSACTION DATE       1     8        V                         0     0
  J  REFERENCE              1     6        W                         0     0
  K  TRANSACTION AMOUNT     1    12        X                         0     0
  L  TRANSACTION TYPE       1     1        Y                         0     0
  M  Outstanding 60 days    1    14        Z                         0     0

                        Select function: CRE/END
```

SCREEN 49

Having selected the document, screen 49 is displayed. This shows the fields that have been selected for printing under option 2 (Create Document Program), along with some special fields which will assist in producing a more flexible style document.



PAGE SIZE

When creating a document for the first time, a number of general characteristics of the document need to be identified. The operator is firstly asked to specify the total number of lines per page. Where continuous stationery is being used, this will be the number of lines between the horizontal perforations. Where cut paper is being used then it is the overall length of the page. Note that the standard printer will work at six lines per inch.

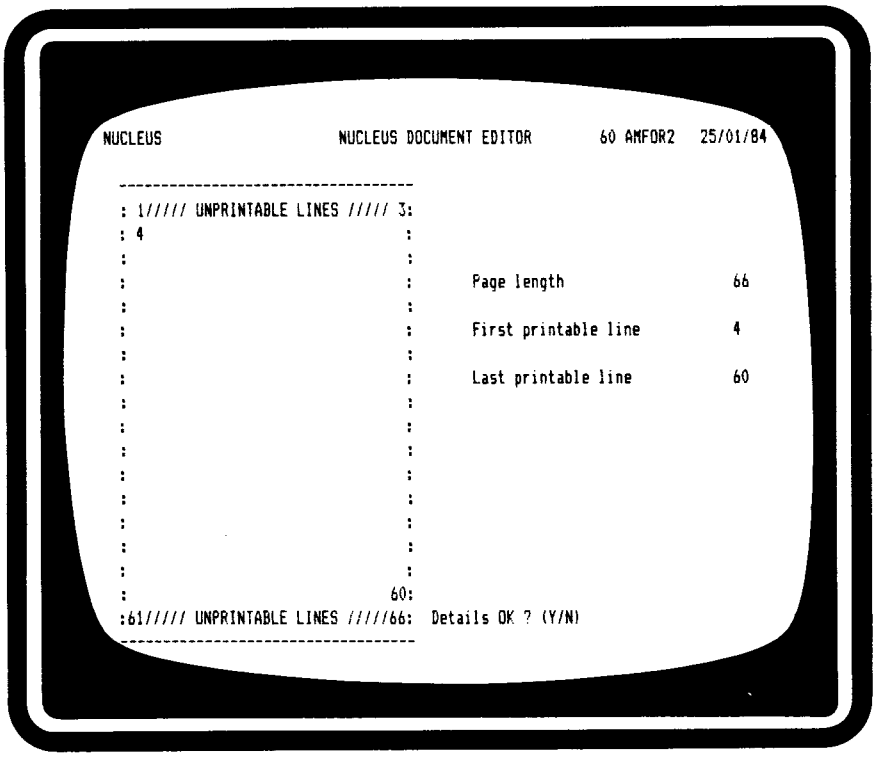
The second general characteristic is the number of lines at the top of the page which have been taken up by any preprinted company logo or name and address, etc. 'Lowest line number which may be used' is intended to mean the first line on which printing may occur after the preprinted heading on the page.

It is then necessary to specify the last line on the page on which printing will take place. Lines are counted from the first line at the top of the page – line no. 1. Therefore the highest line number which may be used will be the total number of lines on the page less the number of blank lines to be left at the end of the page. It is always advisable to leave four or five lines at the bottom of the page.

Having entered the first and last printable lines, screen 50 will be displayed with a graphical representation of the document including the unprintable lines shown at the top and bottom. If this format is not correct then the operator has the opportunity of going back and making any necessary alterations. If the details entered are correct, then respond 'Y' and the system will then move on to specifying the margin.

MARGINS

The first option available before any text can be entered, is to set the left and right margins. On the top left hand corner of the screen (after the word 'line') is the line number on which the cursor is currently located followed (after the '/') by the total number of lines for the document. The left hand margin is set by moving the cursor right (using the 'R' key) until the required number of spaces have been reserved and then depressing the 'Enter' key. X's will be displayed to mark the margin and then the cursor will move to the right hand side of the screen. The right margin can now be set by moving the cursor left (using the 'L' key) to the required position and again depressing 'Enter'.



SCREEN 50

Having entered the first and last printable lines, the above screen is displayed with a graphical representation of the document with the unprintable lines shown at the top and bottom.

By pressing the Escape key, a number of special editor functions are available and the meaning of each of these commands is set out below.

Edit Mode

In this mode the standard alphanumeric keyboard is disabled and certain of these keys are assigned to initiate the edit commands. These are:

Key	Function
L	Left cursor move
R	Right cursor move
U	Up cursor move
D	Down cursor move
E	Erase character
I	Insert character
W	Wipe from cursor to end of line
O	Open up new line at cursor position
T	Tabulator set/cancel
N	Number line
F	Field (insert data field from NUCLEUS file)
S	Size (change between double and single spacing)
C	Command (return to command menu)
'ESC'	Switch to text mode

In addition the carriage return, backspace and tab move keys remain effective.

If an illegal move is requested, a bell is sounded. Except for the field and number line commands no other explanation of the error is given.

The detailed operations of the edit mode commands are described below:

i Left cursor

Moves the cursor one character to the left.

ii Right cursor

Moves the cursor one character to the right.

iii Up cursor

Moves the cursor up one line.

N.B.: On entering a double-spaced line, the cursor will sidestep if necessary to align with the start of a character position.

iv Down cursor

Moves the cursor down a line.

N.B.: On entering a double-spaced line, the cursor will sidestep if necessary to align with the start of a character position.

v Erase character

Deletes the character at the cursor position and moves the line to the right of the cursor back one space.

N.B.: Erase is disabled whenever the cursor is within a NUCLEUS field.

vi Insert character

Inserts a blank space at the cursor position and moves the line to the right of the cursor forward one space, dropping characters at the right-hand margin.

N.B.: Insert cannot be used in any way that would damage a NUCLEUS field. Fields to the right of the cursor are 'shunted' together on reaching the end of the line and the rightmost non-field character is discarded.

vii Wipe

Deletes line from the cursor to the end of the line. If the cursor is at the leftmost position, the entire line is removed and the lines below are moved up to fill the gap.

N.B.: Wipe can delete any complete NUCLEUS field or a line of a multi-line field; but not part of a field or a field line.

If the line was the last line of the text, the cursor is moved up one line and the text length is reduced; except that when only one line of the main text remains it simply clears the line. In the case of headers and footers, it is possible to delete the text completely by issuing a wipe command when only one line remains. In this case the message 'NO TEXT' is displayed and the program automatically executes the command function.

viii Open

Inserts a new blank line at any current cursor position and moves the remaining lines down.

N.B.: Open is disabled when the last page contains text or is set to double-spacing.

ix Tabulator set/cancel

Sets or cancels a tab at the current cursor column. When a tab is set a 'T' symbol is placed in the ruler at the top and bottom of the screen.

x Number line

Enables the operator to specify the actual page line number at which a line of text is to be printed. On selection, a new line is opened at the current cursor position and the message 'Next line commences at page line ...' will be displayed, surrounded by " symbols. The operator may then enter the page line number at which the line is to print. If the number keyed in exceeds the range of printable page lines, the error message 'THIS LINE IS UNPRINTABLE' is displayed on the screen. If the number is valid the cursor returns to the start of the line following the line position instruction.

N.B.: A line position instruction may not be amended or altered in any way, but may be deleted by a 'wipe' command from the leftmost column of the line.

xi Field

Enables insertion of a NUCLEUS field, commencing at the current cursor position. Multi-line fields will be placed with subsequent lines immediately below the first and starting at the cursor column; although this can be amended later using erase, insert, wipe or open.

The procedure for field definition is as follows:

a) On initial selection the available NUCLEUS data fields are displayed as for the command menu, followed by the prompt 'Field code? (A-Z/CAN)'. The 'Z' is changed according to the number of available fields.

b) The operator should then key in the alphabetic code for the choice of field, followed by a carriage return. The program then performs a check to ascertain whether or not the choice is valid. If not, one of the following error messages is generated:

MESSAGE	**COMMENTS**
Not enough space	Either the remainder of the line is too short or there is already a field within the space this would have to occupy or there are insufficient lines left open for a multi-line field.
Too many fields in line	A maximum of 22 fields can be accommodated in any one line.
Invalid double width column	When inserting a multi-line field, if the field started in an even-numbered column, then correct alignment of the first character of one of the following lines is not possible if it is double-spaced.

An error message is followed by the prompt 'AME/CRE'. An 'AME' response returns the operator to the start of step (b) above; a 'CAN' response to either the error message or field prompt aborts the field command and restores the text display.

c) If no error is found, the operator is given the prompt 'Fixed length? (Y/N)'. An 'N' response means that, during final printing of the field data, leading and trailing spaces are deleted, and text to the right of the field is closed up accordingly. A 'Y' response means that the field will always be printed to its maximum length, space-filled if necessary.

d) The next prompt is 'Fixed position? (Y/N)'. A 'Y' response means that regardless of any re-arrangement of text (i.e. due to an 'N' response to the 'Fixed length' option on any preceding field in a line) this field will always start at the column shown by the text editor display or test print. An 'N' response means that the field may be moved along the line during printing when closing up spaces in a preceding field. For this reason, the operator is recommended to use the 'Fixed position' option for multi-line fields or for data displayed in columns.

e) The final prompt is 'Details OK? (Y/N)'. An 'N' response returns the operator to the start of step (b) above. A 'Y' response inserts the field code into the text, restores the text screen and sets the cursor position to the end of the first line of field.

xii Size

A line may be specified as double or single spaced, with single spacing as the default type. The size command alters a line from one type to the other, with any text on that line re-displayed, starting from the left margin. If, when attempting to set double-spacing, the text on the line extends more than halfway to the right margin, the command is refused. Double-spaced lines are marked by an '=' symbol after every character.
N.B.: Double-spaced characters always start in odd column numbers and occupy two printer columns. For this reason it is advised that, if double-spacing is to be used, the left and right margins should be set to start the line at an odd column number and finish at an even number; otherwise correct text alignment at the margins will not be possible.

xiii Command

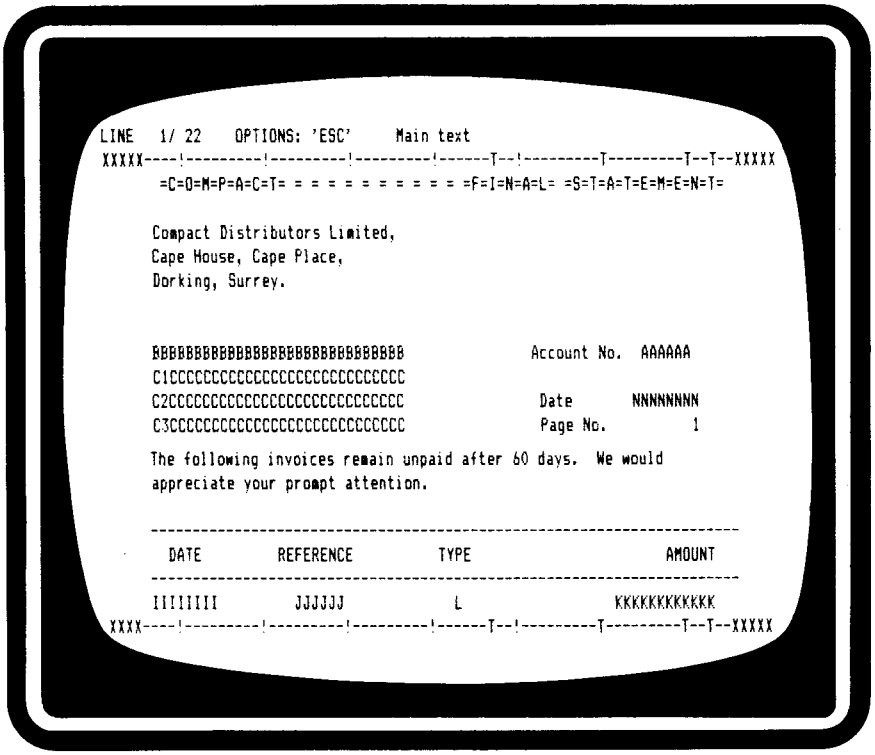
Returns the operator to the command menu. If the operator has elected to enter or amend headers and footers, use of the command function will pass him to the next header or footer due for entry or, if all entries have been completed, back to the command menu.

MAIN TEXT

The operator is now able to enter the main text. 'Main text' can be defined as representing the general format of the overall document. It includes the text that is to be printed once, both at the very beginning and end of each document and also a representation of the transaction data to be printed in the body of the document. (Opportunity is given later to expand on this basis by defining continuation page, or data, headers and footers).

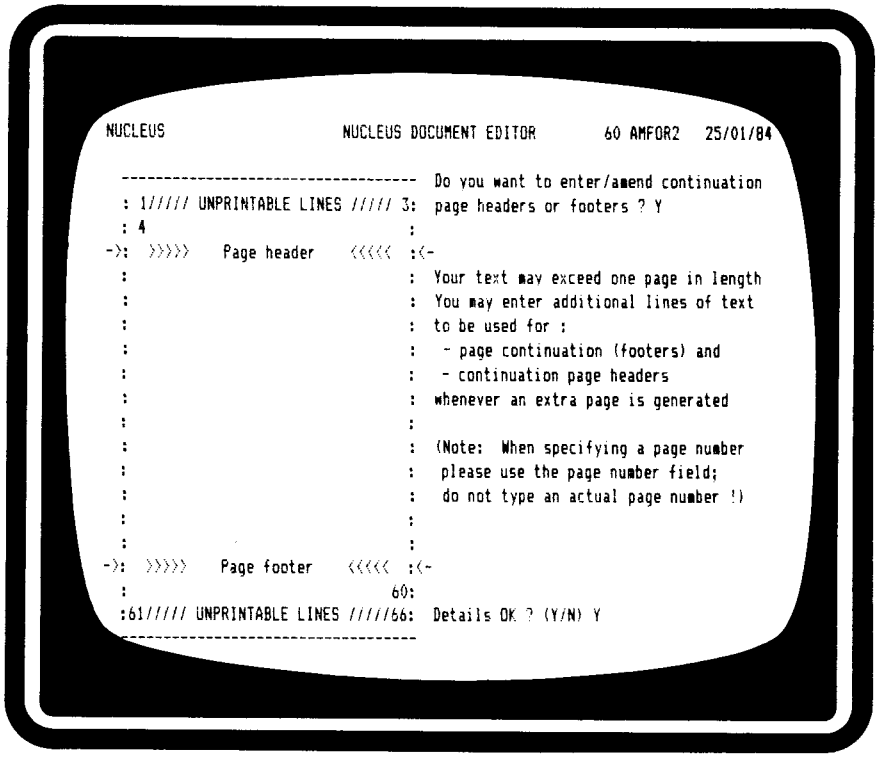
In the case of an invoice style of document the main text could perhaps contain a date, page number, customer name and address plus some statement as to what the document is. This would be followed by a single transaction line perhaps containing the date, reference and amount. Finally comes the end of the document which could contain a total due and perhaps some payment instructions. (See screen 51).

Having completed the main text and specified the format for the transaction records, entry to the system can be terminated by returning to the editor mode and depressing 'C' to be returned to the command mode. If no amendments are required to the entries made to the file, then by responding 'Y' to the question 'Details OK? (Y/N)', the system will then move through screens 52, 52a and 52b.



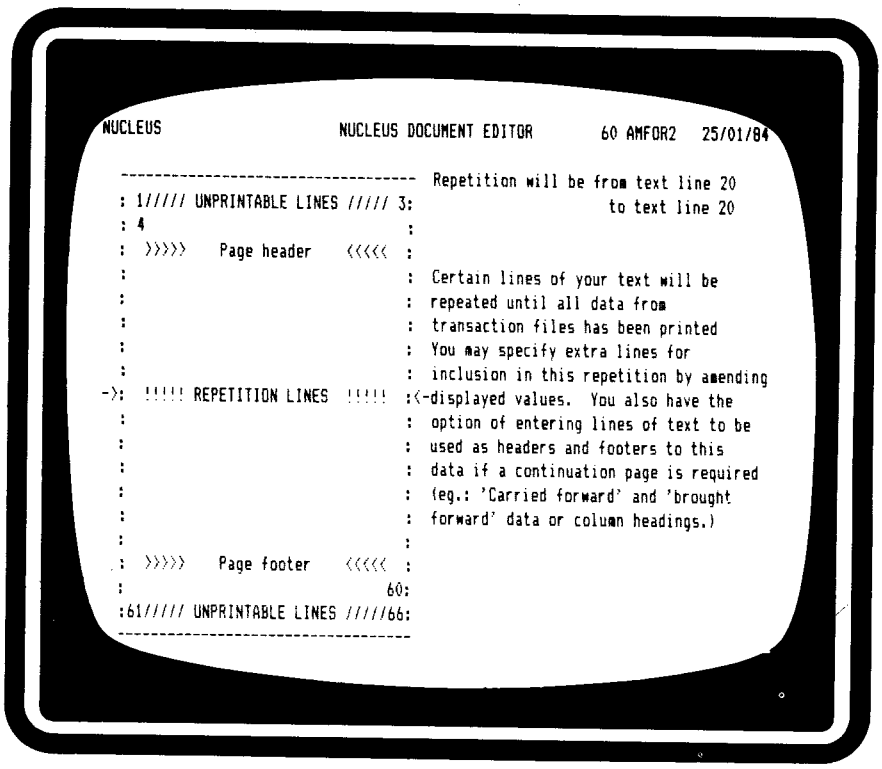
SCREEN 51

The information selected from the transaction file in option 2 can be printed in whatever order is required and should be presented across the page.



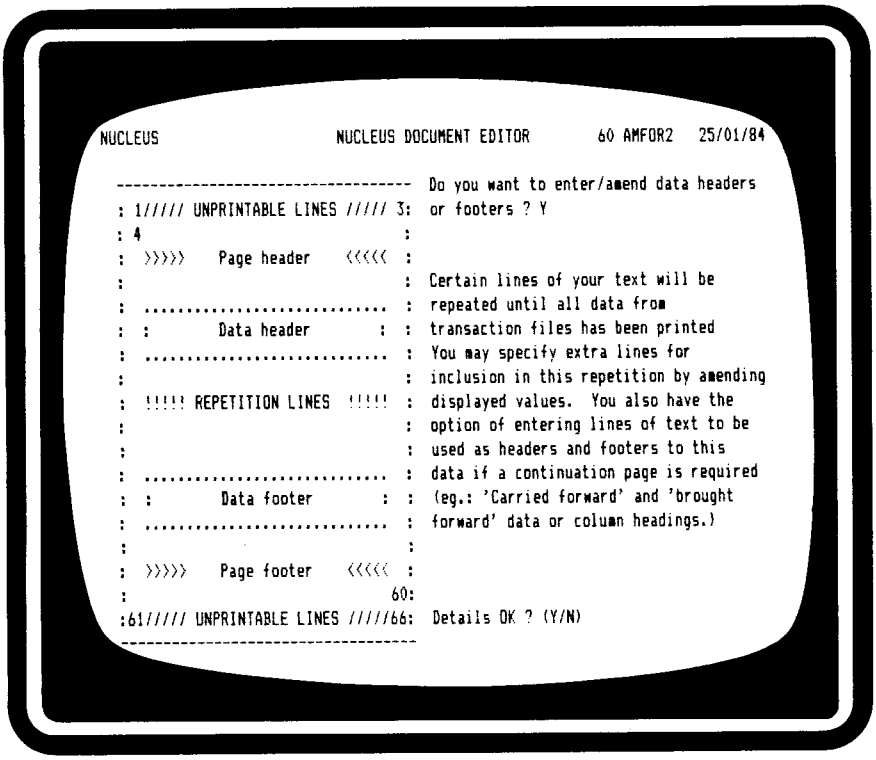
SCREEN 52

Having completed the main text, specified the format for the transaction records and returned to the command mode, by responding 'Y' to 'Details OK? (Y/N)' the above screen is displayed. The operator now has the opportunity of specifying whether page headers and footers for continuation pages are required.



SCREEN 52a

Screen 52a requests a range of lines within the main text which are to be repeated for each transaction.



SCREEN 52b

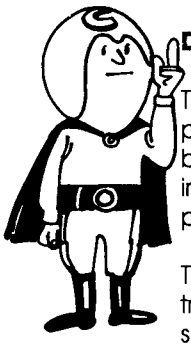
The operator has the opportunity of specifying whether data headers and footers are required.

TRANSACTION LINE REPETITION

The operator is now asked which lines within the main text are to be used for the transaction format. Because the document editor will be processing a number of transactions from a file for the same key (e.g. customer or account), the format in which the transactions are to be printed will repeat until all the records for that particular account have been printed. The system will automatically assume that the range of lines for the transaction format are those on which the transaction fields have been selected for printing.

It is possible to change the repetition line values but care should be taken to ensure that the correct end result is achieved. If for example the first line at which repetition was to take place was changed to include the headings above the transaction fields, then this would mean that after each transaction the headings would reproduce. If any doubt exists about the effect of this parameter then a test print should be carried out before finalising the format.

Having finalised the parameter for repetition, it is then necessary to indicate where the data headers or data footers are required.



DATA HEADERS AND FOOTERS

The data header relates to continuation pages only and will be printed immediately after the page heading and immediately before the first transaction. For example, this would be used to indicate a brought forward situation where transactions were being printed on more than one page.

The data footer will print at the end of the first page after the last transaction for that page has been printed and at the end of each subsequent page excepting the very last page of each document. This can be used to describe a carried forward situation where financial transactions were being printed.

If data footers or headers are required, the system will return to the text input mode and the data footer details can then be entered. The cursor will position at line 1 for input purposes but the system will then locate the footer or the header in the correct position on the document.

Having entered the data footer, it will be necessary to press the escape key to return to the special functions mode and press 'C' to proceed to the data header. Having entered the data header details, the same procedure should be followed for exiting from the text input mode.

PAGE HEADERS AND FOOTERS

Having completed the entry of the data header and data footer, two further options are available. In addition to the data footer that will be printed immediately after the last transaction, a further continuation page footer is available for general text which is not necessarily related to the transaction. The page footer will print at the bottom of the first page and each subsequent page thereafter excepting the very last page of each document. Having entered the page footer, press the Escape key to return to the main edit mode and then press 'C' to exit.

Having completed the page footer, it is now possible to enter the continuation page header. The continuation page header will be printed at the top of the page before the continuation data header and any of the transactions are printed. The continuation page header will normally be an abbreviated form of the main document text used at the beginning of the document. For example, it may be required that a page number be printed along with the transaction heading. Having entered the continuation page header, press the Escape key to return to the main edit mode and 'C' to exit from the editor.

FINALISING THE DOCUMENT

The system will now return to the screen displaying the fields that were selected under option 2 for insertion in the document. At this point, it is advisable to take a sample print 'PRT' of the document that has just been created. If the test print is not satisfactory, it is possible by selecting 'AME' to return to the document and make any changes that are necessary. If the input is being carried out correctly then the document that has been created must be saved using the function 'SAV'.

N.B.: IF THE DOCUMENT EDITOR IS EXITED BEFORE THE SAVE (SAV) FUNCTION HAS BEEN CARRIED OUT, THE TOTAL DOCUMENT INPUT DETAILS WILL BE LOST.

Having saved the document, it is still possible to go back at a later date and amend, review or print the document. However, if any modifications are made, it will be necessary to save the document again so that these modifications are written to the file.

On completion of the entry of the document and any changes, enter 'END' to return to the document writer menu.

Having completed the document entry, by returning to the system for which the document was created the menu selection for the document will appear. By selecting the menu option, the software will automatically extract the necessary records from the data files and combine them with the document text to produce the document.

4. Delete Document

On selection of the delete document option from the document writer menu, the systems available for selection are displayed. Numbers 1-19 are reserved for the standard COMPACT systems therefore user defined systems will start at number 20. (See screen 53).

By typing 'END' in response to 'select system', return will be made to the document writer menu.

After having selected the system, the operator has the opportunity of re-selection, if the system chosen is incorrect, by typing 'N' to the question 'Details OK? (Y/N/CAN)'. By typing 'CAN' in response to the question, return will be made to the document writer menu.

If 'Y' is entered, the system will then display the documents available for deletion within the selected system. (See screen 54). If 'END' is input at 'Select document', the system will return to the previous screen for selection of another system or 'END'.

Having selected the document for deletion, the operator again has the opportunity of re-selection, if the document chosen is incorrect, by typing 'N' to the question 'Details OK? (Y/N/CAN)'. By typing 'CAN' the system will return to the previous screen for selection of another system or 'END'.

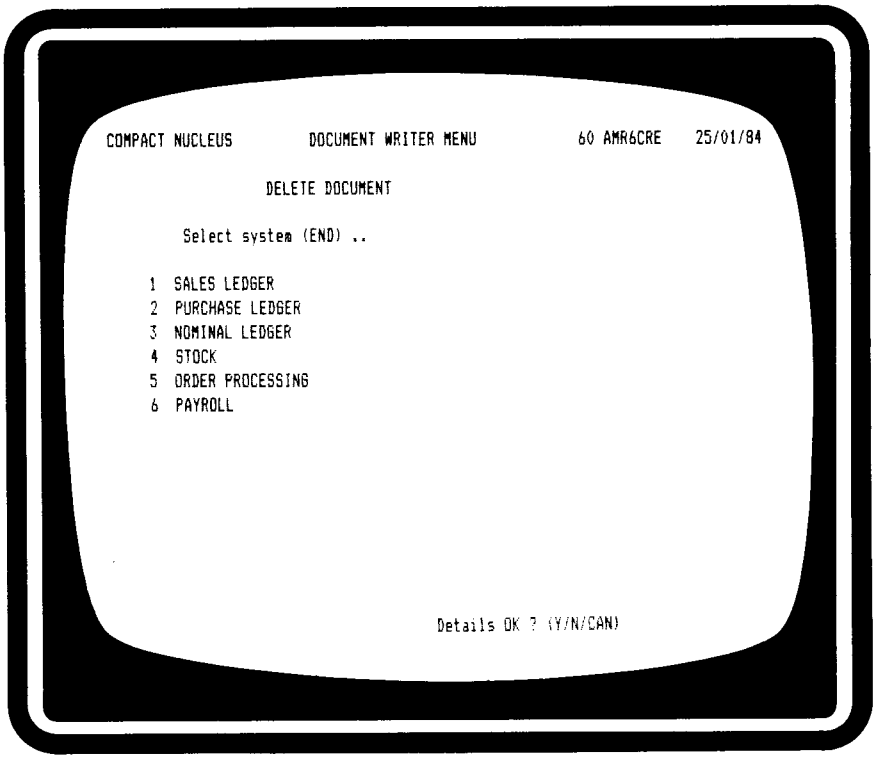
If the document selected for deletion is correct, then after a response of 'Y' to the question, the system will request the operator to input the system program disk into drive B.

Having input the system program disk into drive B and depressed 'Enter' the following message will be displayed as shown in screen 55:–

'Document deleted'

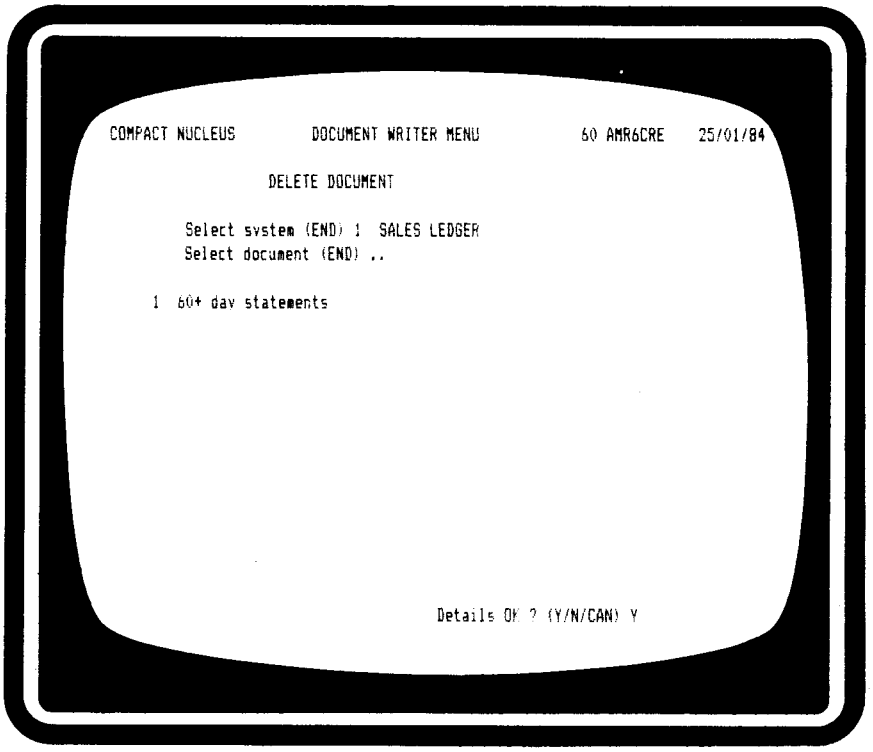
This message indicates that the document has been successfully removed from the system program disk. By depressing 'Enter' in response to the above message the prompt 'Mount Nucleus parameter file disk on drive B' will be displayed.

After inputting the Nucleus parameter file disk into drive B and depressing 'Enter' the system will return to the document writer menu.



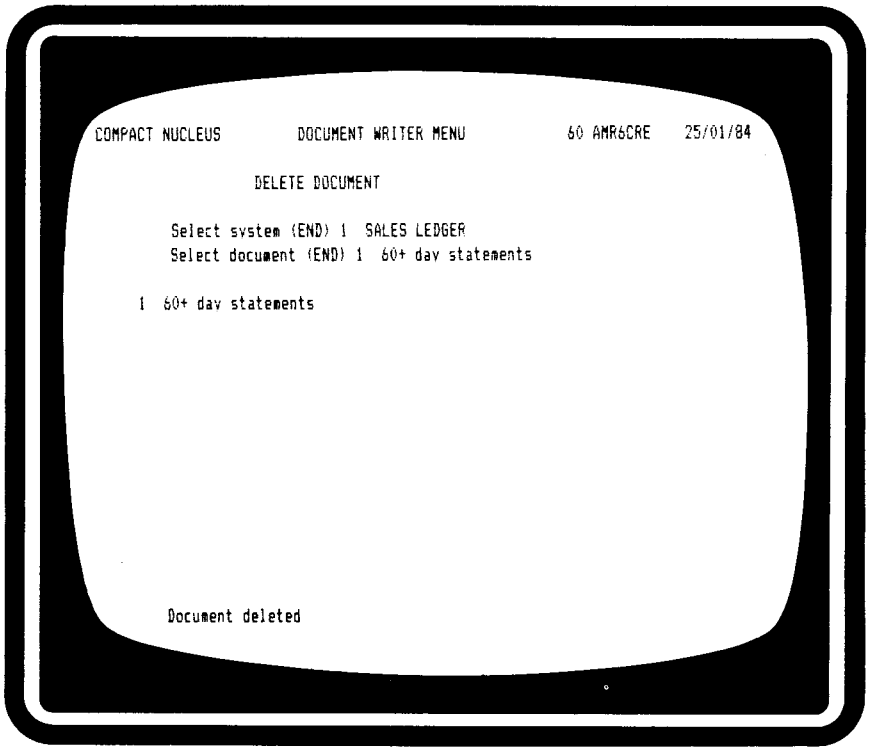
SCREEN 53

On selection of the delete document option, the systems available for selection are displayed. Numbers 1 to 19 are reserved for the standard COMPACT systems. User defined systems will start at number 20.



SCREEN 54

Having selected and accepted the system, screen 54 will be displayed. This screen shows the documents available for deletion within the selected system.



SCREEN 55

The above message will be displayed after inputting the system program disk into drive B and depressing enter. The message indicates that the document has been successfully deleted from the system program disk.

ALPHA

This term usually applies to the abbreviation of "alphabetic" where alpha input was required the system would only accept alphabetic characters from A-Z.

ALPHANUMERIC

Where this type of data is specified by the system it will be possible to enter the full alphabetic character set along with numbers (0-9) symbols and any other special characters which may be provided by the system.

AUDIT TRAIL

This term refers to the printed record supplied by the computer of those items which have been entered by the operator along with a full description of any calculation, updating or change to the original information which may have taken place. From audit trails provided by the system it should be possible to reconstruct exactly what has taken place during any input to the system.

BATCH

Batch can represent a group of documents or entries prepared in advance for entering to the system. The philosophy of batch processing is that the information is not added to the files and no update takes place until the operator has completed the input and is satisfied that the information entered is correct. Most batch options within the software enable the operator to change or delete the incorrect entries prior to any update of the system taking place.

BACKUP

This term will usually be used to refer to security copies of data files and programs. To simplify the recovery procedure in the event of mechanical or software failure, regular backup copies of all data must be taken by the operator. Instructions supplied by the hardware manufacturer explain how this procedure is carried out.

BOOLEAN

This is a system of algebraic expressions (named after the mathematician Boole) and allows the operator to determine relationships between variables held within the system. By use of Boolean algebra it is possible to produce selection criteria for the updating or the printing of records within the system. Using such a system of selection it would be possible, for example, to select from a group of records people whose ages were between 30 and 45 and who lived in a certain location.

C.P.U.

The C.P.U. or Central Processing Unit contains the main memory of the system along with the necessary circuits to execute the programs and control peripheral devices which may be attached to the system.

CURSOR

The Cursor is a prompt appearing on the screen (V.D.U.) which indicates to the operator where the next character will appear as it is input to the system. There are a number of different methods of identifying the cursor on the screen – some systems use an underline character and some use a small rectangle, approximately the size of a character. In some instances the cursor will pulsate or flash whereas in other systems no movement takes place at all.

DATA

Data is a general term for any information which has been entered to the system or can be used to refer to source documents or information being prepared to be entered to the system. Data may be in the format of alpha, alphanumeric or numeric information.

ENQUIRY

Certain options within the system will allow the operator to interrogate information held within the system. Often the system will offer two levels of enquiry, one where summary information is displayed or printed, the second level which enables more detailed information to be provided.

ERROR MESSAGE

Error Messages provide prompts to the operator displayed on the screen to indicate that incorrect information has been entered or that a fault has occurred within the system. The error message will indicate what action has to be taken by the operator.

FIELD

The field is an area within a computer record which will have predetermined characteristics and be used to store information in a specified format. (See Supplementary Notes on File Handling).

FILE

A file is an area of storage on the disk or diskette which may be used to store computer programs or data entered to the system. Where a file is used to store data, the data is normally organised in records within the file. (See Supplementary Notes on File Handling).

HASH TOTAL

A hash total is a predetermined value for a batch of information prepared for entry to the system and is used to establish the accuracy of the data which the operator has entered to the system. Where the predetermined hash total and the value generated by the system do not agree, provision is made to make the necessary adjustments before any update takes place.

INDEX

An index in computer terminology has the same concept as an index in a book. The index is the method of locating within a file a required record.

INITIALISE

Initialisation is the function carried out by the system to prepare files or storage areas ready for certain functions to be carried out. Initialisation could be carried out when the new system is created so that blank files are set up or it may occur at the start of batch processing where certain constants and standard values are loaded into the memory of the machine.

KEY

Key is the code used to identify a record within a file. The key may be numeric or alphanumeric. The number of keys will form the index to a file. It is possible to have more than one key for any record within the system. (See Supplementary Notes on File Handling).

MASTER FILE

The master file is a category of file where each of the records within the file has its own unique key. An example of a master file would be a file containing details of employees within a company where each employee's record had its own employee number.

NUMERIC

Data comprising of numbers only – the system would recognise numbers from zero to nine and these could be either positive or negative values.

OUTPUT

Output is usually used to refer to the product produced after some input has taken place to the system. Output can be in the form of printed hard copy record, the display of information on the screen, or information that has been processed and passed to another file or storage medium.

PARAMETER

The parameter is a constant value held by the system used from time to time in processing. An example of a parameter would be a company name where this information is entered to the system once and used throughout the system for headings of reports and displaying on the top line of the screen.

RECORD

A record is the basic element within a file and is usually made up of a number of fields. Records vary in length, the length of the record being controlled by the file structure. (See Supplementary Notes on File Handling).

TRANSACTION FILE

The transaction file is a special classification file where a number of records within the file may have the same key. An example of a transaction file would be where outstanding invoices were held by a customer, it would be possible to have a number of outstanding invoies for the same customer.

VALIDATION

Validation is the system of checking at the time of data entry to ensure that the information entered meets the requirements laid out by the program. Date validation for example would check that dates such as 31st June were not accepted by the system.

V.D.U.

The V.D.U. is the acronym for Visual Display Unit. The visual display unit would normally comprise of a screen containing 25 lines each of 80 characters long, along with a keyboard for alphabetic and numeric data input.

SUPPLEMENTARY NOTES ON FILE HANDLING

Most of the standard software revolves around the maintainance and manipulation of data held within files. It is essential therefore that before any attempt is made to use the system that the basic concept of file handling is understood clearly. The following notes may be of some assistance.

The file is a storage unit maintained on a diskette or hard disk and is comprised of a number of records. Within any system the number of files used may be considerable so that each file is identified by a unique file name. The file name can be alpha or alphanumeric and will sometimes include punctuation. Some typical formats of file names used within the system could be:–

- SLMAST.DAT
- PEMENU.BAS
- PEPRG001.BAS

The files maintained by the system contain information or data in the form of records. Any files may contain an infinite number of records each with predefined attributes. These attributes or items within the record are referred to as fields. A field may be used to store a numeric value or a string of alphabetic characters.

To locate a record within a file the system uses a key to retrieve the record it needs. The key for each record is held within an index.

The file handling section of the operating system will maintain the index automatically, and the operator need only be aware of the fields which the system uses as keys.

A simple example would be a file containing the Personnel records of all employees for a company. A method of identifying each employee would be to give them each a number. This would then become the main key to records contained within this file. It may however be necessary to have employees grouped by department. A second index could then be maintained of employees within department order.

FIELDS WITHIN A RECORD

FIELD 1	FIELD 2	FIELD 3	FIELD 4

The fields within a record would be determined by the system and could have values similar to the example given below:–

FIELD 1 :Employee Number – four digits and the main key for the record

FIELD 2 :Employee Number – thirty characters

FIELD 3 :Employee Address – ninety characters

FIELD 4 :Department Number – two digits

RECORD 1
RECORD 2
RECORD 3
RECORD etc.

A File is an area (on diskette or disk) defined within the system containing a number of records.

Personnel Master File Listing
All Details

From Personnel Number : FIRST
to Personnel Number : LAST

Personnel Number	: 1001	Telephone Number	: 516 5625	Job Description	: Clerk
Employee Surname	: Davidson	Date of Birth	: 20/05/48		
Employee Initials	: S.K.	Date Joined	: 15/04/79		
Employee Address	: 145 South Mall	Annual Salary	: 7500.00		
	: Highbury	Date Last Review	: 01/01/83		
	:	Department Number	: 10		
Personnel Number	: 1002	Telephone Number	: 523 9861	Job Description	: General Manager
Employee Surname	: Fitzgerald	Date of Birth	: 05/04/36		
Employee Initials	: J.R.	Date Joined	: 12/05/77		
Employee Address	: The Rectory	Annual Salary	: 12000.00		
	: Greenhills Estate	Date Last Review	: 01/01/83		
	: Range View	Department Number	: 13		
Personnel Number	: 1003	Telephone Number	: 441 5822	Job Description	: Draughtsman
Employee Surname	: Davis (Mrs.)	Date of Birth	: 23/06/45		
Employee Initials	: B.A.	Date Joined	: 11/04/79		
Employee Address	: Railway Cottage	Annual Salary	: 12500.00		
	: 154 High Street	Date Last Review	: 01/01/83		
	: Eastleigh	Department Number	: 16		
Personnel Number	: 1004	Telephone Number	: 662 5532	Job Description	: Director
Employee Surname	: Rogers	Date of Birth	: 18/05/46		
Employee Initials	: B.F.	Date Joined	: 15/02/77		
Employee Address	: 15 Sydney Close	Annual Salary	: 13000.00		
	: Broadlands	Date Last Review	: 01/01/83		
	:	Department Number	: 11		
Personnel Number	: 1005	Telephone Number	: 951 5224	Job Description	: Shift Foreman
Employee Surname	: Phillips	Date of Birth	: 30/09/40		
Employee Initials	: G.H.	Date Joined	: 11/08/77		
Employee Address	: 55 Station Approach	Annual Salary	: 15000.00		
	: Oldbury	Date Last Review	: 01/01/83		
	:	Department Number	: 12		
Personnel Number	: 1006	Telephone Number	: 541 8874	Job Description	: Accountant
Employee Surname	: Willis	Date of Birth	: 14/08/37		
Employee Initials	: D.P.	Date Joined	: 25/06/76		
Employee Address	: 45 Mountfield Gardes	Annual Salary	: 7950.00		
	: Downlands Estate	Date Last Review	: 01/01/83		
	: Crowfield	Department Number	: 14		
Personnel Number	: 1007	Telephone Number	: 936 2210	Job Description	: Manager
Employee Surname	: Collins	Date of Birth	: 20/08/49		
Employee Initials	: J.K.	Date Joined	: 22/07/79		
Employee Address	: 55 Newbury Road	Annual Salary	: 10000.00		
	: Frengrove	Date Last Review	: 01/01/83		
	:	Department Number	: 15		

Personnel Master File Listing
Alphabetical Summary

Pers. No.	Empl. Init.	Employee Surname	Telephone Number	Dept. No.	Dept. Description	Job Description
1012	M.J.	Browning	256 8974	14	Accounting	Trainee Accountant
1017	G.M.	Bullen (Mrs.)	856 4788	10	Administration	Personal Secretary
1013	G.	Burgess	222 6635	16	Design & Draughting	Design Manager
1007	J.K.	Collins	936 2210	15	Technical	Manager
1011	L.	Cooper (Mrs.)	321 8564	11	Sales & Marketing	Sales Executive
1015	J.H.	Crowther (Mrs.)	255 7854	17	Software Support	Support Manager
1001	S.K.	Davidson	516 5625	10	Administration	Clerk
1003	B.A.	Davis (Mrs.)	441 5822	16	Design & Draughting	Draughtsman
1009	L.M.	Elliott	258 9632	14	Accounting	Chief Accountant
1002	J.R.	Fitzgerald	523 9861	13	Transport & Despatch	General Manager
1018	L.M.	Harris (Miss)	223 5522	10	Administration	Telephonist
1020	P.K.	James	522 6988	12	Production	General Manager
1016	K.J.	Johnson (Miss)	128 9955	10	Administration	Receptionist
1029	I.L.	Johnstone	564 2121	12	Production	Packer
1026	C.M.	Jones	855 8897	11	Sales & Marketing	Sales Executive
1023	J.	Lines	125 4578	13	Transport & Despatch	Driver
1027	D.J.	Littleman (Miss)	863 2314	11	Sales & Marketing	Sales Co-ordinator
1014	I.J.	McClachlan	884 0101	17	Software Support	Support Assistant
1019	P.J.	Parsons	879 6789	11	Sales & Marketing	Marketing Director
1005	G.H.	Phillips	951 5224	12	Production	Shift Foreman
1025	G.	Pritchard	856 4465	13	Transport & Despatch	Foreman
1008	I.J.	Richardson	552 4458	15	Technical	Director
1004	B.F.	Rogers	662 5532	11	Sales & Marketing	Director
1028	M.	Smedley (Mrs.)	987 4523	12	Production	Secretary
1024	I.M.	Smythe	254 8745	13	Transport & Despatch	Driver
1010	S.J.	Stanton (Miss)	255 4545	12	Production	Production Manager

Personnel Master File Listing
Monthly Salary

Personnel Number	Employee Initials	Employee Surname	Date Joined	Annual Salary	Monthly Salary	Hourly Rate	Department Number	Dept. Description
1008	I.J.	Richardson	02/02/80	12500.00	1041.67	6.410	15	Technical
1009	L.M.	Elliott	25/06/79	12500.00	1041.67	6.410	14	Accounting
1002	J.R.	Fitzgerald	12/05/77	12000.00	1000.00	6.154	13	Transport & Despatch
1025	G.	Pritchard	06/06/81	11000.00	916.67	5.641	13	Transport & Despatch
1007	J.K.	Collins	22/07/79	10000.00	833.33	5.128	15	Technical
1023	J.	Lines	05/06/80	8500.00	708.33	4.359	13	Transport & Despatch
1006	D.P.	Willis	25/06/76	7950.00	662.50	4.077	14	Accounting
1024	I.M.	Smythe	02/06/81	7500.00	625.00	3.846	13	Transport & Despatch
1012	M.J.	Browning	05/02/82	5500.00	458.33	2.821	14	Accounting
COMPANY SALARY				87450.00	7287.50			

Personnel Master File Listing
Hourly Salary Analysis

Pers. No.	Empl. Init.	Employee Surname	Annual Salary	Hourly Rate	Dept. No.	Dept. Description	Job Description
1008	I.J.	Richardson	12500.00	6.410	15	Technical	Director
1009	L.M.	Elliott	12500.00	6.410	14	Accounting	Chief Accountant
1002	J.R.	Fitzgerald	12000.00	6.154	13	Transport & Despatch	General Manager
1025	G.	Pritchard	11000.00	5.641	13	Transport & Despatch	Foreman
1007	J.K.	Collins	10000.00	5.128	15	Technical	Manager
1023	J.	Lines	8500.00	4.359	13	Transport & Despatch	Driver
1006	D.P.	Willis	7950.00	4.077	14	Accounting	Accountant
1024	I.M.	Smythe	7500.00	3.846	13	Transport & Despatch	Driver
1012	M.J.	Browning	5500.00	2.821	14	Accounting	Trainee Accountant
COMPANY TOTAL			87450.00				

Personnel Master File Listing
Department Analysis

Pers. No.	Empl. Init.	Employee Surname	Date Joined	Date Last Review	Annual Salary	Hourly Rate	Dept. No.	Dept. Description
1001	S.K.	Davidson	15/04/79	01/01/83	7500.00	3.846	10	Administration
1016	K.J.	Johnson (Miss)	05/04/78	01/01/83	5500.00	2.821	10	Administration
1017	G.M.	Bullen (Mrs.)	02/05/81	01/01/83	7500.00	3.846	10	Administration
1018	L.M.	Harris (Miss)	05/06/82	01/01/83	4500.00	2.308	10	Administration
DEPT. SALARIES					25000.00			
1004	B.F.	Rogers	15/02/77	01/01/83	13000.00	6.667	11	Sales & Marketing
1011	L.	Cooper (Mrs.)	25/05/81	01/01/83	10000.00	5.128	11	Sales & Marketing
1019	P.J.	Parsons	05/06/78	01/01/83	15000.00	7.692	11	Sales & Marketing
1026	C.M.	Jones	01/04/79	01/01/83	10000.00	5.128	11	Sales & Marketing
1027	D.J.	Littleman (Miss)	05/06/81	01/01/83	6500.00	3.333	11	Sales & Marketing
DEPT. SALARIES					54500.00			
1005	G.H.	Phillips	11/08/77	01/01/83	15000.00	7.692	12	Production
1010	S.J.	Stanton (Miss)	29/05/44	01/01/83	8500.00	4.359	12	Production
1020	P.K.	James	05/12/82	01/01/83	15000.00	7.692	12	Production
1028	M.	Smedley (Mrs.)	23/06/82	01/01/83	6500.00	3.333	12	Production
1029	I.L.	Johnstone	05/06/82	01/01/83	5000.00	2.564	12	Production
DEPT. SALARIES					50000.00			
1002	J.R.	Fitzgerald	12/05/77	01/01/83	12000.00	6.154	13	Transport & Despatch
1023	J.	Lines	05/06/80	01/01/83	8500.00	4.359	13	Transport & Despatch
1024	I.M.	Smythe	02/06/81	01/01/83	7500.00	3.846	13	Transport & Despatch
1025	G.	Pritchard	06/06/81	01/01/83	11000.00	5.641	13	Transport & Despatch

Personnel Master File Listing
Department Analysis

Pers. No.	Empl. Init.	Employee Surname	Date Joined	Date Last Review	Annual Salary	Hourly Rate	Dept. No.	Dept. Description
DEPT. SALARIES					39000.00			
1006	D.P.	Willis	25/06/76	01/01/83	7950.00	4.077	14	Accounting
1009	L.M.	Elliott	25/06/79	01/01/83	12500.00	6.410	14	Accounting
1012	M.J.	Browning	05/02/82	01/01/83	5500.00	2.821	14	Accounting
DEPT. SALARIES					25950.00			
1007	J.K.	Collins	22/07/79	01/01/83	10000.00	5.128	15	Technical
1008	I.J.	Richardson	02/02/80	01/01/83	12500.00	6.410	15	Technical
DEPT. SALARIES					22500.00			
1003	B.A.	Davis (Mrs.)	11/04/79	01/01/83	12500.00	6.410	16	Design & Draughting
1013	G.	Burgess	05/05/79	01/01/83	12500.00	6.410	16	Design & Draughting
DEPT. SALARIES					25000.00			
1014	I.J.	McClachlan	01/01/78	01/01/83	6500.00	3.333	17	Software Support
1015	J.H.	Crowther (Mrs.)	12/08/82	01/01/83	8500.00	4.359	17	Software Support
DEPT. SALARIES					15000.00			
1021	N.J.	Thompson	12/12/82	01/01/83	4500.00	2.308	18	Programming
1022	N.G.	Tompkins	01/05/75	01/01/83	8500.00	4.359	18	Programming
DEPT. SALARIES					13000.00			

Personnel Master File Listing
Department Analysis

Pers. No.	Empl. Init.	Employee Surname	Date Joined	Date Last Review	Annual Salary	Hourly Rate	Dept. No.	Dept. Description

COMPANY TOTALS

269950.00

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX Date : 99/99/99 Page : 999

Personnel Master File Listing
Alphabetical Summary

Pers. No.	Empl. Init.	Employee Surname	Telephone Number	Dept. No.	Dept. Description	Job Description
9999	XXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	99	XXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXX Date : 99/99/99 Page : 999

Personnel Master File Listing
Monthly Salary

Personnel Number	Employee Initials	Employee Surname	Date Joined	Annual Salary	Monthly Salary	Hourly Rate	Department Number	Dept. Description
9999	XXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	99/99/99	99999.99	99999.99	999.999	99	XXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX Date : 99/99/99 Page : 999

Personnel Master File Listing
Hourly Salary Analysis

Pers. No.	Empl. Init.	Employee Surname	Annual Salary	Hourly Rate	Dept. No.	Dept. Description	Job Description
9999	XXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	99999.99	999.999	99	XXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXX Date : 99/99/99 Page : 999

Personnel Master File Listing
Department Analysis

Pers. No.	Empl. Init.	Employee Surname	Date Joined	Date Last Review	Annual Salary	Hourly Rate	Dept. No.	Dept. Description
9999	XXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	99/99/99	99/99/99	99999.99	999.999	99	XXXXXXXXXXXXXXXXXXX

COMPACT

The Computer Specialists

Compact Software International Limited
Head Office: Cape House Cape Place Dorking Surrey
Telephone (0306) 887373 Telex 859435 COMPAC G

15/12/83

D.P. SMITH & SON
FROGS LANE
COWLEY
OXFORD

Dear Sirs,

CHRISTMAS/NEW YEAR CLOSURE

The office will close at 1.00pm on Friday 23rd December 1983 and will re-open on Tuesday 3rd January 1984.

On Tuesday 20th December 1983, the office will be un-manned except for brief messages between 12 noon and 4.00pm. Please bear this in mind, particularly with regard to support requirements.

We would like to wish you all a very happy Christmas, and hope that we can all look forward to a prosperous 1984.

Yours faithfully,

J.N. Carmichael
Office Manager.

Offices also in Bolton Canterbury Huddersfield Sydney Australia
Reg Office 30-36 Fife Road Kingston upon Thames Surrey KT1 1SZ
Reg in England No 1232452
Directors: T.Blumenau P.A.Bronson (Aust.) (Managing)
D.H.Bronson (Aust) P.L.C.Diggory R.A.Frankel C.R.C.Morgan FCMA
D.J.Parson M.Sykes P.Sykes

COMPACT

The Computer Specialists

Compact Software International Limited
Head Office: Cape House Cape Place Dorking Surrey
Telephone (0306) 887373 Telex 859435 COMPAC G

Our ref: MJW/ijr

13/01/84

JOHNSON & CO (U.K.) LTD
12 BIRCH GROVE
STANSTEAD
HERTS

Dear Sirs,

OUTSTANDING ACCOUNT £ 2990.00

We refer to the above account, which appears to have escaped your notice.

As our terms for payment are STRICTLY NET 30 DAY SETTLEMENT, we would appreciate your immediate attention to this matter, letting us have your remittance by return of post.

Yours faithfully,

Martin J. Wright
ACCOUNTANT.

Offices also in Bolton Canterbury Huddersfield Sydney-Australia
Reg. Office: 30-36 Fife Road Kingston-upon-Thames Surrey KT1 1SZ
Reg. in England No. 1232452
Directors: T.Blumenau P.A.Bronson (Aust.) (Managing)
D.H.Bronson (Aust) P.L.C.Diggory R.A.Frankel C.R.C.Morgan FCMA
D.J.Parson M.Sykes P.Sykes

CCCCCCCC

AAAAAAAAAAAAAAAAAAAAAAAAAAAAA
B1BBBBBBBBBBBBBBBBBBBBBBBBBBB
B2BBBBBBBBBBBBBBBBBBBBBBBBBBB
B3BBBBBBBBBBBBBBBBBBBBBBBBBBB

Dear Sirs,

CHRISTMAS/NEW YEAR CLOSURE

The office will close at 1.00pm on Friday 23rd December 1983 and will re-open on Tuesday 3rd January 1984.

On Tuesday 20th December 1983, the office will be un-manned except for brief messages between 12 noon and 4.00pm. Please bear this in mind, particularly with regard to support requirements.

We would like to wish you all a very happy Christmas, and hope that we can all look forward to a prosperous 1984.

Yours faithfully,

J.N. Carmichael
Office Manager.

Our ref: MJW/iir

DDDDDDDD

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
B1BBBBBBBBBBBBBBBBBBBBBBBBBBBB
B2BBBBBBBBBBBBBBBBBBBBBBBBBBBB
B3BBBBBBBBBBBBBBBBBBBBBBBBBBBB

Dear Sirs.

OUTSTANDING ACCOUNT £ CCCCCCCCCCCC

We refer to the above account. which appears to have escaped your notice.

As our terms for payment are STRICTLY NET 30 DAY SETTLEMENT. we would appreciate your immediate attention to this matter. letting us have your remittance by return of post.

Yours faithfully.

Martin J. Wright
ACCOUNTANT.

```
 1  DOCUMENT MAIN TEXT
 2
 3  The document main text reflects the overall layout of the  document
 4  It contains the text that will be printed both at the start and the
 5  end of the document and also includes a representation of the
 6  transaction data in the position in which it is to be printed.
 7  Except for the transaction data which is to be repeated, the main
 8  text is only printed once on each document.
 9
10  BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB          Date      IIIIIIII
11  C1CCCCCCCCCCCCCCCCCCCCCCCCCCCCC
12  C2CCCCCCCCCCCCCCCCCCCCCCCCCCCCC          Account   AAAAAA
13  C3CCCCCCCCCCCCCCCCCCCCCCCCCCCCC          Page      1
14
15
16  --------------------------------------------------------------------
17   DATE          REFERENCE          TYPE                 AMOUNT
18  --------------------------------------------------------------------
19
20  DDDDDDDD        EEEEEE             G            FFFFFFFFFFFF
    DDDDDDDD        EEEEEE             G            FFFFFFFFFFFF
    DDDDDDDD        EEEEEE             G            FFFFFFFFFFFF
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    DDDDDDDD        EEEEEE             G            FFFFFFFFFFFF
    DDDDDDDD        EEEEEE             G            FFFFFFFFFFFF

    (The following text is an example of a data footer)
    Further transactions will be continued on the next page:-


    This is a page footer and contains standard text to be printed at
    the bottom of every page to be continued.
```

system date to be printed here

Main text to transaction line
(1st part of main text)

account number, name and address
from master file record to print here

date, reference, type and amount
from transaction records to print here

Repetition is defined as being
from main text line 20
to main text line 20.

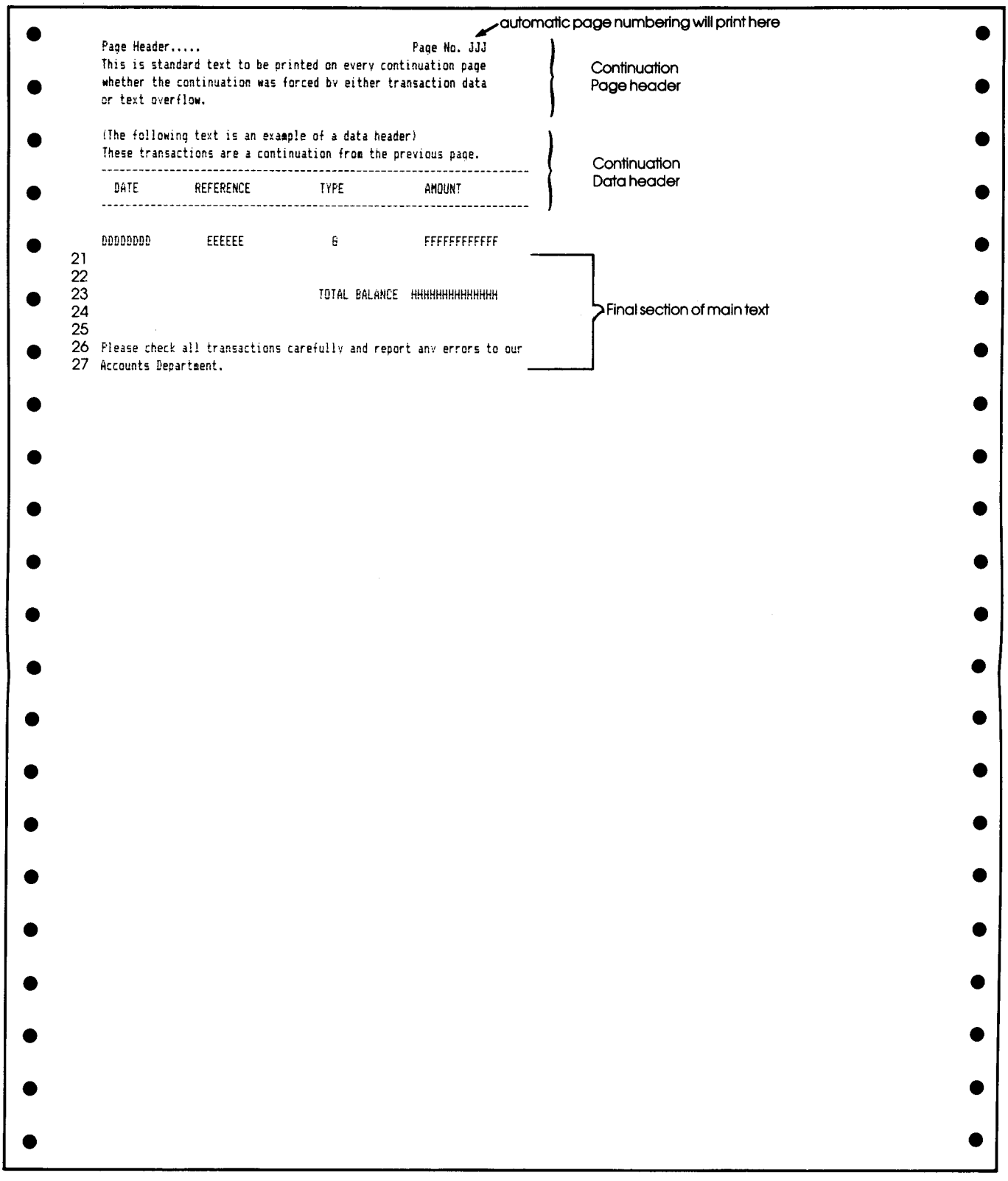
That is, for every transaction printed in this document the format specified by line 20 will be used.

If lines 19-20 had been specified for repetition then the result would be double spaced transactions.
(line 19 is a blank line).

The number of transactions printed on each page is limited by the page size and the number of lines required for any headers and footers or main text.

Data footers are printed when the data is overflowing to the next page.

Page footers are printed when either data or text is overflowing.


automatic page numbering will print here
Page Header.....
Page No. JJJ
This is standard text to be printed on every continuation page
whether the continuation was forced by either transaction data
or text overflow.
Continuation
Page header
(The following text is an example of a data header)
These transactions are a continuation from the previous page.
DATE
REFERENCE
TYPE
AMOUNT
Continuation
Data header
DDDDDDDD
EEEEEE
G
FFFFFFFFFFFF
TOTAL BALANCE HHHHHHHHHHHHHH
Final section of main text
Please check all transactions carefully and report any errors to our
Accounts Department.

COMPACT **FINAL STATEMENT**

Compact Distributors Limited,
Cape House, Cape Place,
Dorking, Surrey.

BBBBBBBBBBBBBBBBBBBBBBBBBBBBBB Account No. AAAAAA
C1CCCCCCCCCCCCCCCCCCCCCCCCCCCC
C2CCCCCCCCCCCCCCCCCCCCCCCCCCCC Date NNNNNNNN
C3CCCCCCCCCCCCCCCCCCCCCCCCCCCC Page No. 1

The following invoices remain unpaid after 60 days. We would appreciate your prompt attention.

DATE	REFERENCE	TYPE	AMOUNT
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK
IIIIIIII	JJJJJJ	L	KKKKKKKKKKKK

Balance c/f MMMMMMMMMMMMMM

60 DAY STATEMENT Page 000

DATE	REFERENCE	TYPE	AMOUNT
IIIIIIII	JJJJJJ	L	KKKKKKKKKKK
		Balance	MMMMMMMMMMMMM

COMPACT

FINAL STATEMENT

Compact Distributors Limited,
Cape House, Cape Place,
Dorking, Surrey.

KNIGHT & STRIPP
UNIT C1
TAMIAN WAY
HOUNSLOW

Account No. 1016

Date 25/01/84
Page No. 1

The following invoices remain unpaid after 60 days. We would appreciate your prompt attention.

DATE	REFERENCE	TYPE	AMOUNT
30/10/83	4587	1	1150.00
11/11/83	5899	1	575.58
10/10/83	5691	1	306.32
30/10/83	CN405	4	-125.00
16/10/83	3214	1	72.75
17/10/83	588	1	59.50
18/10/83	2563	1	245.10
21/10/83	1254	1	56.00
21/10/83	JNL10	2	15.00
22/10/83	JNL15	2	23.01
27/10/83	25412	1	1150.00
		Balance	3528.26

NUCLEUS DEFINITION

USER GUIDE

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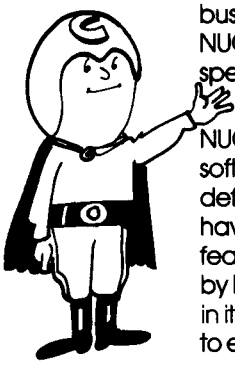
INDEX

INTRODUCTION



COMPACT's NUCLEUS System Generator has been developed with the advantage of many years of experience gained in the supply of business applications for small to medium size micro computers. NUCLEUS is a program and report generator which addresses the special needs of accounting and commercial software in the areas of input validation, data retrieval and reporting flexibility.

NUCLEUS as a tool is capable of taking the routine drudgery out of software development for quite sophisticated applications. Having defined the system, the generated programs (in interpretive Basic) have no further need for the generator. Where very specialised features are required and these are not capable of being handled by NUCLEUS, the generated code can be listed, edited and "SAVED" in its amended form. Full documentation is provided by the system to enable modifications to be carried out easily. NUCLEUS also provides links to standard COMPACT accounting systems which give end users the ability to generate special "one off" reports using data held in the accounting files.

SYSTEMS OVERVIEW

NUCLEUS is a series of programs which will enable a user without programming knowledge to develop a simple system. Within the system, facilities are provided for three levels of menu – firstly at a company level, secondly at a system level and finally the menu provides selectors for each program within the system. The operator has full control of the system and program descriptions appearing on the menus.

All of the software generated using NUCLEUS makes use of sophisticated index sequential file handling software giving users of the generated software instant access to data in whatever order is required.

As well as generating completely new stand alone applications using NUCLEUS it is possible to link new applications to COMPACT's standard accounting packages. It is important to appreciate that it is not possible to modify file structures or input programs within the standard packages using NUCLEUS but, it is certainly possible to generate supplementary reports and files where additional information or analysis is required.

DETAILS OF THE SYSTEM

The following broad selections are available within the system:–

1. Create NUCLEUS Parameter File

This program will only be used when setting up software for the first time. It will also need to be used if the generated software extends over a number of floppy diskettes. The NUCLEUS parameter file maintains a directory of all the systems that have been generated and stores details of the file definitions. The system will check that the parameter file exists and if any attempt is made to duplicate the file the operator will be warned.

2. Create a System Definition

This option enables the user to define and describe the system for insertion in the parameter file as well as in the system menu. Each system defined is given a unique two character alpha prefix which will identify all subsequent programs and data files which are generated under this selector.

3. Create File Definition

The file definition option enables the user to describe the file to be used for data storage and to identify each of the elements of the record to be held within this file. As well as naming the file the user is able to indicate the field names for each of the data fields to be held within the file.

4. Create File Linkage

The file linkage routine enables two files to be used in conjunction with one another so that common data can be used in the processing of information. The concept of file linkage will be explained in greater detail later in the manual but, it enables a number of simple files to be linked together to create a complex data base.

5. Print File Definitions

Printing of file definitions provides comprehensive documentation for those users who may wish to modify or enhance the generated software. For hardcopy documentation purposes it is possible to print full details of files created within the system. In addition to details input during the creation routine, details derived under software control such as the BASIC variable names and the position of the fields within the records are also printed.

6. Create Update Program

Having created the file definitions this option then enables update programs to be generated so that data may be entered to the files. The update program generated can be for all the fields contained within the file, or if a special situation exists an update routine can be generated to handle only one or two fields. The update program generation takes into account any file linkages which may exist.

ADMINISTRATION HINTS

NUCLEUS has been designed to remove some of the drudgery from developing simple application software as well as speed up the production of bug-free, efficient program code. NUCLEUS does not remove the necessity for any proposed application to be carefully planned in advance. It is very difficult in a document of this type to cover all possible uses for NUCLEUS. Some of the following suggestions may assist in the use of NUCLEUS when generating new systems.

SYSTEM SPECIFICATION

Throughout the manual an example of a Personnel System has been used to illustrate the features of NUCLEUS. Before the example was created using NUCLEUS a considerable amount of planning and preparation was carried out.

Although it may appear to be the wrong way to start to design a system, it is often easier to consider the reports required from the system and the information which these reports are to contain. By analysing the reports from the system carefully, most of the essential information to be stored will become obvious. When tackling the system design in this way, it is important to consider all reports, particularly those reports that are run infrequently and may be overlooked in the design stage.

It may be that there are no reports in existence, if the system is being converted from manual records or cards. These documents will also be extremely helpful to identify the type of information that has to be processed. It is always helpful to take a random sample of any manual records to see if any unusual pieces of information are required to be processed by the system.

Once the scope of the data to be stored within the system has been established it is then necessary to carefully plan the format and the order in which this information is to be stored. The method of accessing any data held on the file is the most essential part of the whole system. This method of access will provide the key to the file so that information can be retrieved, updated and printed in whatever order is required. In the Personnel System example, most employees would be given an employee number or clock number on joining an organisation.

Although most reports would not be required in clock number order it provides a unique reference number for each employee within the system. (A unique clock number reference overcomes the complication of having to identify two employees who both have Smith as a surname). Although reports may be required to be printed in employee name or in department order at a later stage, the unique clock number or employee reference number is essential to the system and should be the first field within any record.

The employee's name is obviously an important part of the system and it will often be that the reports are required in alphabetical order. To avoid the problem of sorting names into alphabetical order where initials appear before the surname, the example has provided two fields:– one for the employee surname and a second smaller field containing the initials. It may be that the system will require an employee's whole christian name to be entered but the same philosophy can be adopted. Where a report is required with the employee's initials appearing before the surname, this can still be achieved using features within the report generation software.

Having established the method of identifying records within the file, it is now possible to add in any order, details which are required for storage. It should be noted that it is not possible to have a record longer than 251 characters of information. When designing the system, this figure should be borne in mind although if any records are attempted to be created with data input longer than 251 characters, the operator will be warned.

Most micro computers are not capable of supporting unlimited storage of data. It is therefore important to consider economising the way in which data is stored in the files. An example of this economy is shown in the way department numbers are used. If a large file of employees is to be created, each with a department description of 25 characters, then it will provide considerable savings in storage if the departments are coded and the department description stored only once. It is only possible to use this method when a number of common variables exist which are used by all records within the system. In the department description example, there may only be a small number of departments, but these can be stored in a separate file against a code number. Within each of the employee records the department description can be reduced to a two digit department code. For reporting purposes etc. the department code can be matched up with the description held on a separate file.

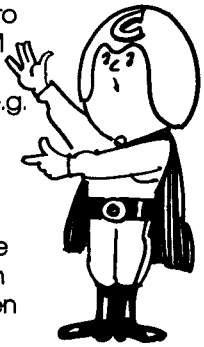
This method of economising on storage space is used in a number of the COMPACT standard packages. Because of the linkage facility available within NUCLEUS it is possible to link a file holding descriptions with the code held in another file. This particular feature will be explained in more detail when file linkages are discussed.

TEST SYSTEMS

Because it is relatively quick to generate programs using NUCLEUS, a method of building up some confidence with the software is to undertake some very simple test systems. Considerable experience and insight will be gained by designing a simple system (or if nothing comes to mind, following the example in the manual) and seeing what results are achieved when the system is generated. Input routines can also be generated and having created data within the files, alternative report routines can be selected and tested. If mistakes are made in the early use of NUCLEUS then it is a relatively simple matter to go back and re-enter the system details.

Throughout the manual in following the example of the Personnel System, attention will be drawn to system design features which may help in the subsequent design of new systems. It is also important to look at other applications and other systems to gain a cross section of analysts thinking when developing software. Good systems design analysis cannot be learnt easily from text books; it usually comes from experience in working with systems and applications.

START OF DAY PROCEDURES



After copying the software, insert the manufacturer's system disk into drive A and follow the manufacturer's instructions to load the CP/M or MS-DOS operating system. If this has been carried out correctly then the CP/M or MS-DOS prompt should appear on the screen (e.g. A>, A:). The CP/M or MS-DOS prompt must be displayed on the screen before the COMPACT software can be run.

Having loaded the CP/M or MS-DOS prompt correctly, insert the COMPACT 'Start of Day' disk into drive A. All that is required is to type 'COMPACT' (or 'SUBMIT COMPACT' in the case of CP/M-86 users) in lower or upper case and depress the Enter key. If the entry has been carried out correctly, the screen will reflect the following:

E.g. 'A>COMPACT' (upper or
'A>submit compact' (CP/M-86 users) lower case).

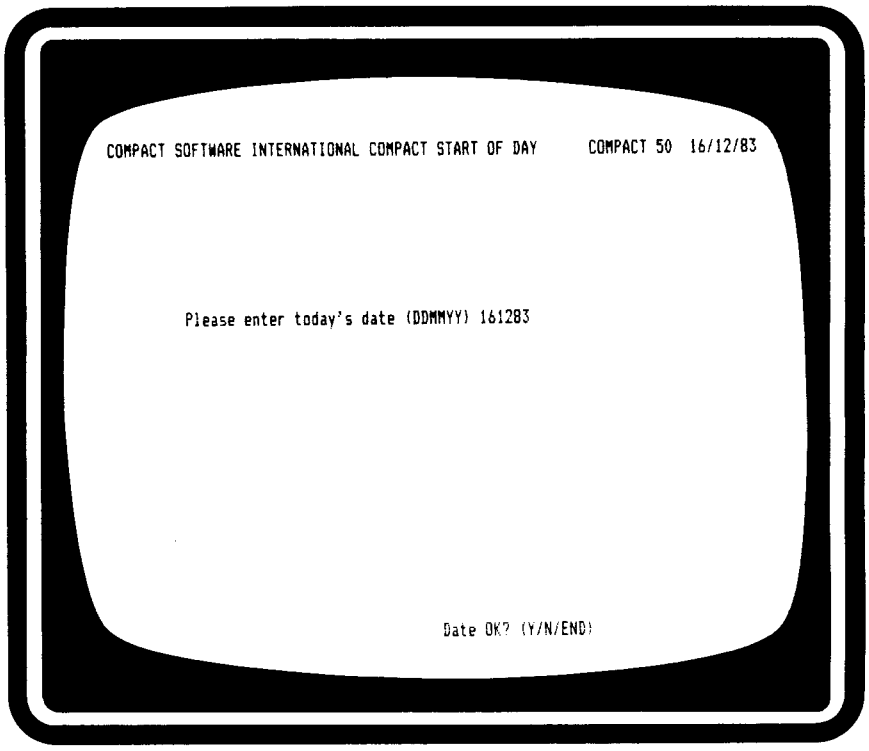
After depressing the Enter key the system will load all the necessary software.

The next entry required by the operator will be to enter today's date. This is required in the format Day Day Month Month Year Year. If a date of 8th September, 1983 is required it will be entered as 080983. No punctuation or spaces should be left.

After the date has been entered correctly, the operator will then be asked to put the program disk into drive A, and the data files into drive B.

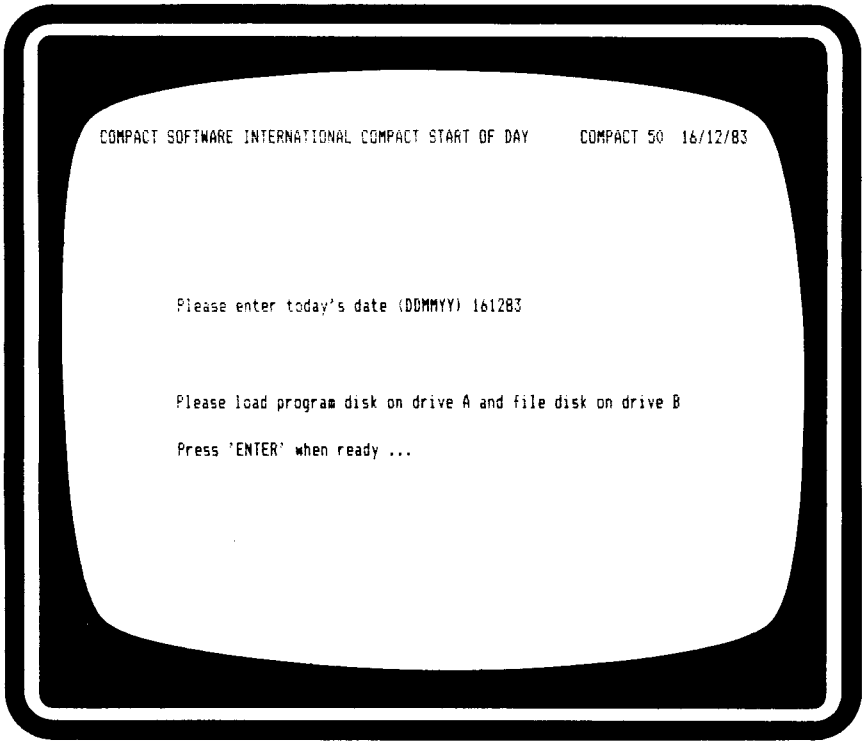
If the software is being used for the first time, then the program disk should be loaded into drive A and a blank formatted disk into drive B.

Where a hard disk system is in use, program files and data files may be mixed on the same logical unit.



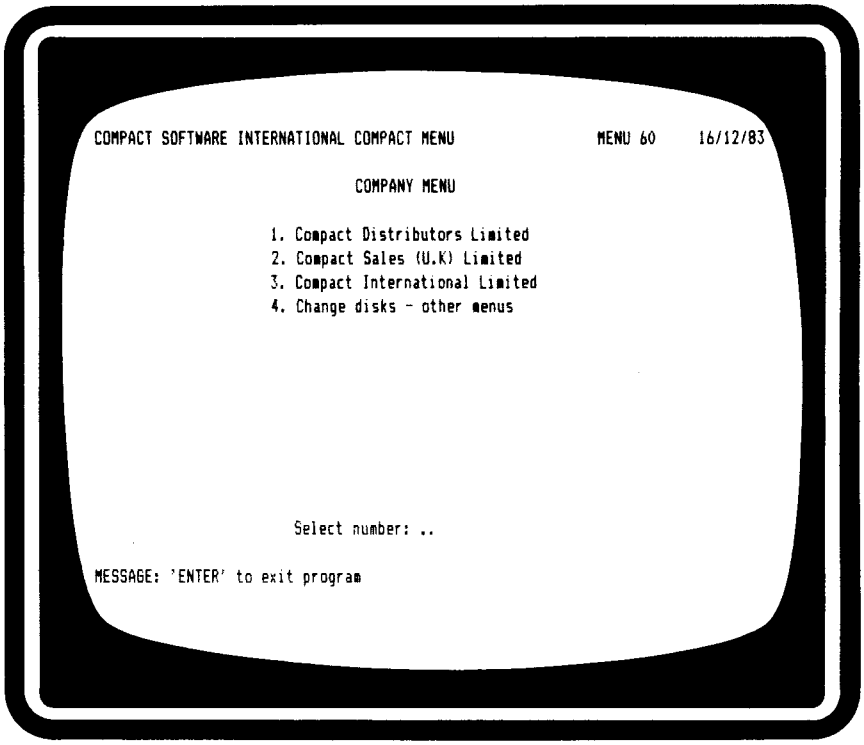
SCREEN 1

Having loaded the Start of Day disk into drive A and typed COMPACT or SUBMIT COMPACT in lower or upper case, the operator will then be asked for today's date. This routine need only be run at the start of each day or when the machine is turned on.



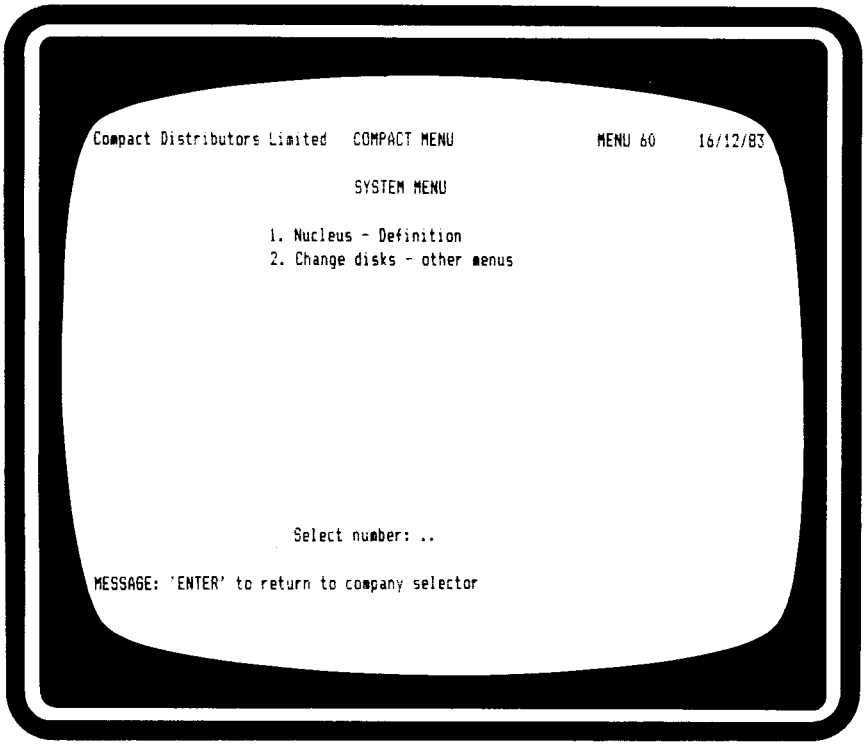
SCREEN 2

Depending on the system to be run, the Program Disk is loaded into drive A and the Data Disk into drive B. If a new system is being set up then a blank formatted disk should be used in drive B.



SCREEN 3

Programs are selected via a MENU. The first level of Menu selection enables multi-company systems to be handled. Maintenance routines exist to add new companies to the system. On selecting the company, only files relating to the company can be accessed.



SCREEN 4

The second level of menu available is the System Menu. Selection of one of these options will display a more detailed list of the actual programs available within the system.

DETAILED SYSTEM NOTES

Following are detailed system notes for each program within the system along with an explanation of information held within the files maintained by the system. The notes follow the same sequence as the options given in the program menu shown in Screen 5.

Create NUCLEUS Parameter File (Option 1)

This program creates the parameter file which is used by the software to control the systems generated. Where a new system is being created a new parameter file will be required to hold details of the files and system description.

Having selected the option to create a parameter file the system gives the following prompt:

'Do you want to create Nucleus parameter file ? (Y/N/END)'

If the response to this prompt is 'Y' then the following message is given:–

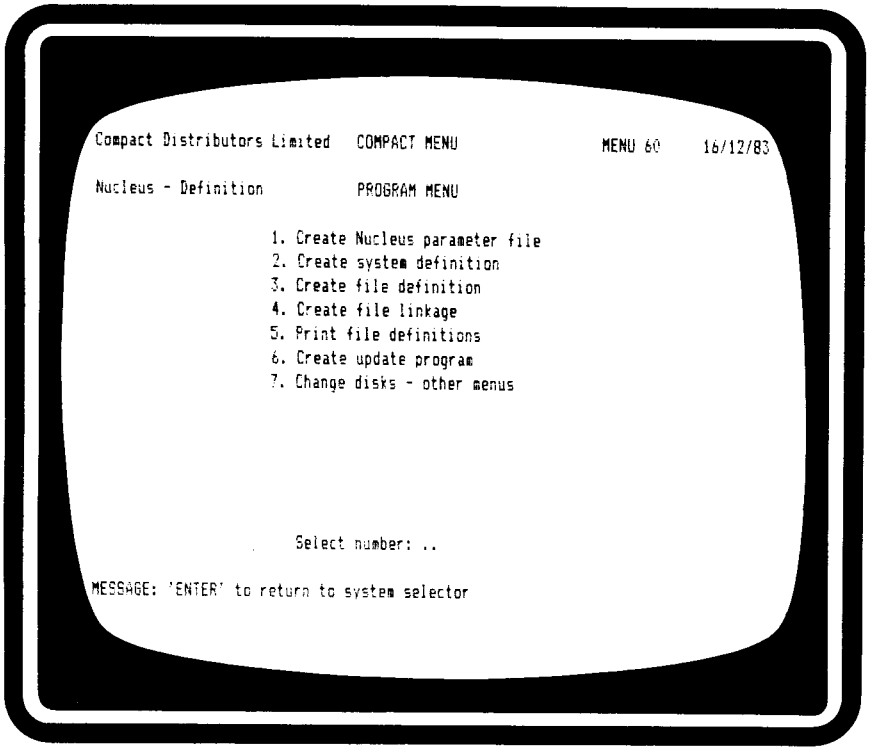
'Mount Nucleus parameter file disk on drive B ('CAN' to cancel)'

By creating a parameter file on a separate disk it simplifies the matter of generating a stand alone system. It will now be possible to write all of the software generated using NUCLEUS to the disk held on drive B. (See Screen 6)

If the NUCLEUS parameter file has been successfully created on drive B the following message will be displayed on the screen:–

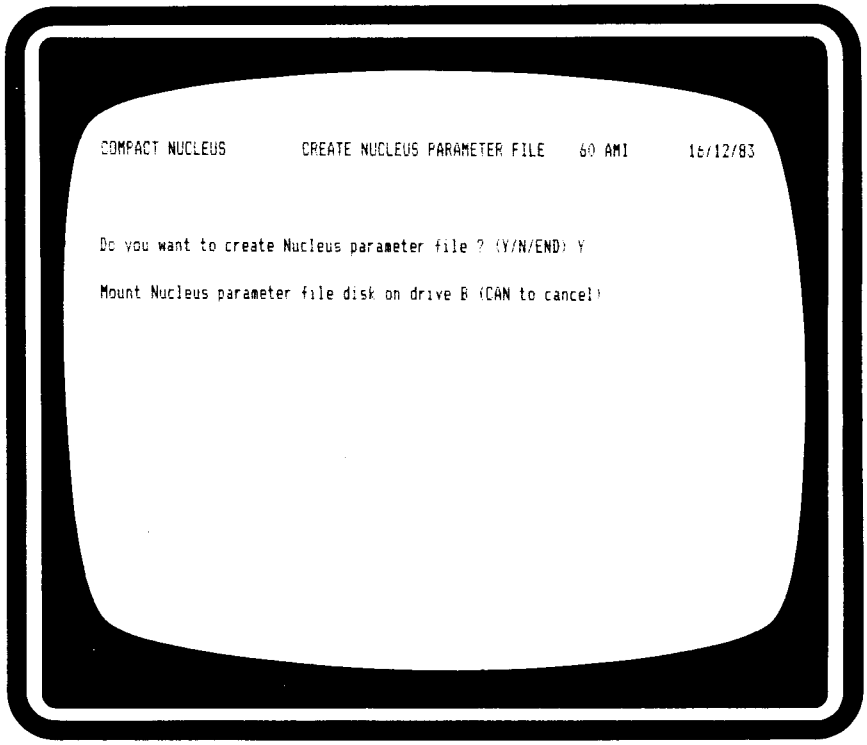
'Nucleus parameter file successfully created'

Under no circumstances should the parameter disk be used if this message is not displayed. For all future use of the NUCLEUS system for either generating input programs or report programs it will be necessary to use the parameter file that has just been created.



SCREEN 5

This screen displays the programs available within the NUCLEUS Definition System. Where a new system is being created, it is important that option 1 is run before any attempt is made to run the other options.



SCREEN 6

After selecting option 1, the above screen will be displayed giving the option of continuing with the parameter file creation and showing the drive on which the parameter file disk should be mounted.

Create System Definition (Option 2)

When creating a system definition, it will be necessary to enter a general name by which the system will be known. This system name will then be inserted in the next available space in the system menu for use when selecting the system.

The system name is a maximum of 20 alphanumeric characters. So that all files and programs generated under this system can be easily identified, it is also necessary to enter a 2 character prefix to be used in conjunction with the name.

The system used as an example throughout the manual is that of a Personnel System. The system name is entered, 'Personnel System', and in order that the files can easily be associated with the system name, a possible prefix would be 'PE'. The system checks that the prefix selected has not already been used elsewhere in the system.

Having identified the new system, the name is then inserted in the next available space on the system menu and the prefix and name inserted in the NUCLEUS parameter file. NUCLEUS automatically numbers the systems generated, with the systems numbered 1-19 having been reserved for COMPACT standard packages. The first 'user defined' system number available is '20'. The allocation of these system numbers is carried out automatically by the software.

Having entered the system name and system prefix the following prompt is displayed:–

'Details OK ? (Y/N/CAN)'

If the details entered are correct then select 'Y'. If 'N' is selected then it is possible to step through the system name and system prefix and make any alterations which may be necessary. By selecting 'CAN' the entry is ignored and the system returns to the menu.

The prompt is then displayed on the screen:–

'Mount Personnel System program disk on drive B'

Where a floppy disk based system is in operation and diskettes are of sufficient capacity, it is possible to store the NUCLEUS parameter details on the same disk as the generated program. Where space is likely to cause a problem, it is possible to have the NUCLEUS parameter details and the generated programs on separate diskettes.

Depress Enter key for the system name to be written to the diskette in drive B. (See Screen 7).

Where a new system is being created and no standard menus exist, the following message will be displayed on the screen:–

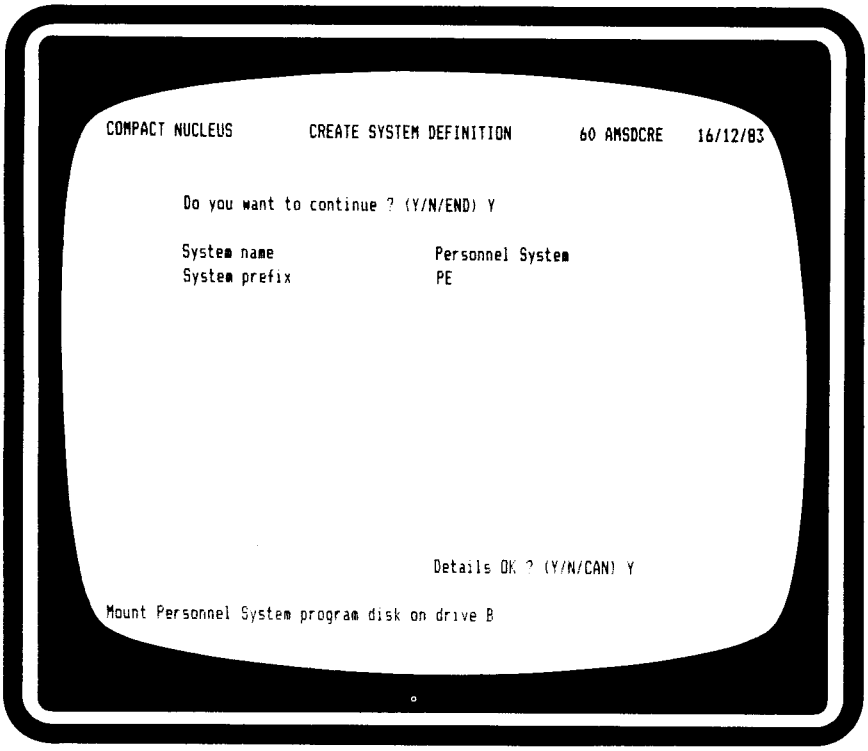
'NO COMPANY MENU EXISTS ON DRIVE B
Please change disk or press 'C' to create menu'

If a new menu is required enter the letter 'C', depress the Enter key and a new menu will be created. If a menu already exists on another diskette, change the diskette before depressing the Enter key.

After the new menus have been successfully created and the system name written to the file the following message will be displayed:

'Mount Nucleus parameter file disk on drive B'

The system will then return to the program menu.



SCREEN 7

Screen 7 shows a screen format for creating a new system. A new system has been described as 'Personnel System' and this will now be inserted in the next available space on the system menu. The system prefix can also be defined by the user so that all the files created under this system and any programs generated, will be prefixed 'PE'.

All generated systems will be given a number for selection purposes. System numbers 1-19 are reserved for standard packages; the first user generated system will be given a system number of 20.

Create File Definition (Option 3)

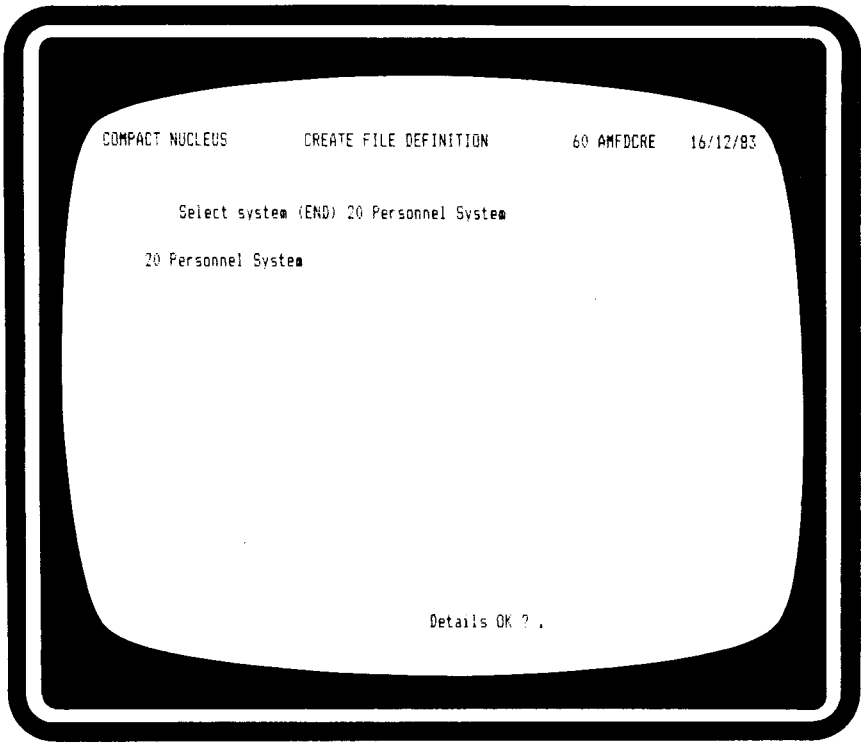
Having defined the system, it is now possible to create files within this system. Having selected option 3, the screen will display all system numbers, along with the system name of those systems held on the NUCLEUS parameter file. In the case of a new system being generated the first number displayed on the screen will be 20 plus the description entered in option no. 2. Where more than one system has been created it is possible to select the system for which the files are to be generated. (See Screen 8)

Select the system number (2 digit number) and depress the Enter key.

Having selected the system for which the files are to be generated, it is then necessary to enter a general name for the file. The file name is 20 alphanumeric characters long and this should give some indication of the purpose for which the file will be used. An example of a file that would be created within the Personnel System is the personnel master file.

The master file will contain the static information for each personnel record maintained by the system – examples of this type of information are name, address, telephone number, next of kin, etc. The personnel number will provide the key to this record (or the method of accessing the record) and each record will have a unique key i.e. it will not be possible to have two personnel records on the file that have the same personnel number.

Having named the file, it is then necessary to indicate whether the file is a master file or transaction file. The master file classification (M) is used for those files where each record in the file is accessed by a unique key. Examples of this type of file are a Sales Ledger master file (a separate sales account for each Sales Ledger account number) or Nominal Ledger master file (separate Nominal Ledger account details for each Nominal account number). The transaction file classification (T) is used where a number of records each with the same key may be held within the same file. An example of this type of file is the Sales Ledger open item file where a number of invoices, credit notes and cash postings may exist for the same customer. Each of the transactions for the same customer will have a common key.



SCREEN 8

Where more than one system has been created it is possible to select the system for which the files are to be created.

It is necessary to specify either 'M' or 'T' depending on the type of file being defined. Having entered these details, the following prompt is displayed:–

'Details OK ?'

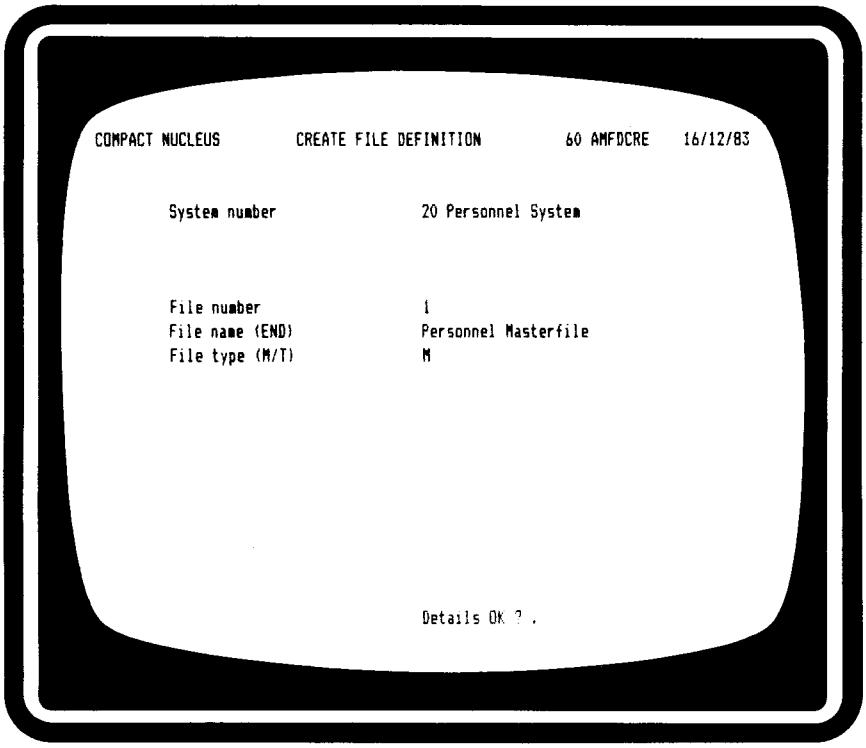
If the name and classification of the file have been entered correctly, then enter 'Y' but if any errors have been made, enter 'N' and it is possible to step through the details and make any modifications necessary. (See Screen 9).

The files created under this option are automatically numbered consecutively by the software. The system will generate file names for use by the software and this file name will incorporate the System Prefix and the file number generated by the software.

FIELD DEFINITION

Having described the system and the file required, it is now possible to define each field within the record to be held within the file.

When defining fields within a record, the system will control the space used and warn if the space available has been exceeded. The maximum record length capable of being generated within a file is 251 bytes. If this number is exceeded during the file definition routine then an error message is displayed on the screen.



SCREEN 9

This screen shows the creation of a personnel master file within the Personnel System. The system provides for a general name of the file to be entered by the operator up to a maximum of 30 characters. The system will then generate an automatic file name which will be used by the BASIC generated programs. Using the classification already outlined, this file has been designated a master file (M).

The following details are required for each field:–

1. Field Number **2N**

A two digit field number sequentially generated under systems control for each field specified within the record.

2. Field Name **20A/N**

A general name of 20 alphanumeric characters to describe the field. This name will be used for identifying fields within the input program and report generation routine.

3. Field Type **1A/N**

A single character field with the following values:–

A = An alphanumeric field

N = A numeric field

D = A date field in the format of either DDMMYY or MMDDYY.

The date format will depend on the parameter setting within the system parameter file.

R = A reverse input field to cater for the special requirements of character input for Arabic script.

Other special facilities exist within this section of the system for COMPACT defined systems. These facilities would be used for setting up file definitions for standard packages but will not be available to users for user defined systems.

4. Number of Characters **2N**

This field is set to the number of characters per line, where an alphabetic field (type A) has been selected in point 3 (above).

5.Number of Lines **1N**

For such fields as an address, it is possible to specify the number of lines of address required rather than have to specify each line as a separate field. Where a name and address of four lines is required each of 30 characters long, it will be possible to specify this as 30 characters for field no. 4 and 4 lines for field no. 5. Where the alpha characters are to be printed on one line no input is necessary. The system automatically assumes a single line when no entry has been made.

(Note: Points 4 and 5 are only accessed if the field type equals type 'A')

Where the field type is set to a value other than 'A' then the following details are required.

6.Number of Digits Before Point **2N**

A two digit numeric field indicating the number of digits to be stored before the decimal point.

7.Number of Digits After Point **1N**

A single digit numeric field to indicate the number of digits to be stored after the decimal point.

Where the field is to be restricted to whole numbers only, the 'Digits After Point' should be set to zero.

The sum of 'Digits Before Point' and 'Digits After Point' should not exceed fourteen.

8.Allow Negative Values? **1A/N**

A single character indicator with the following values:–

Y = Allow negative values
N = Do not allow negative values

9.Minimum Value **8N**

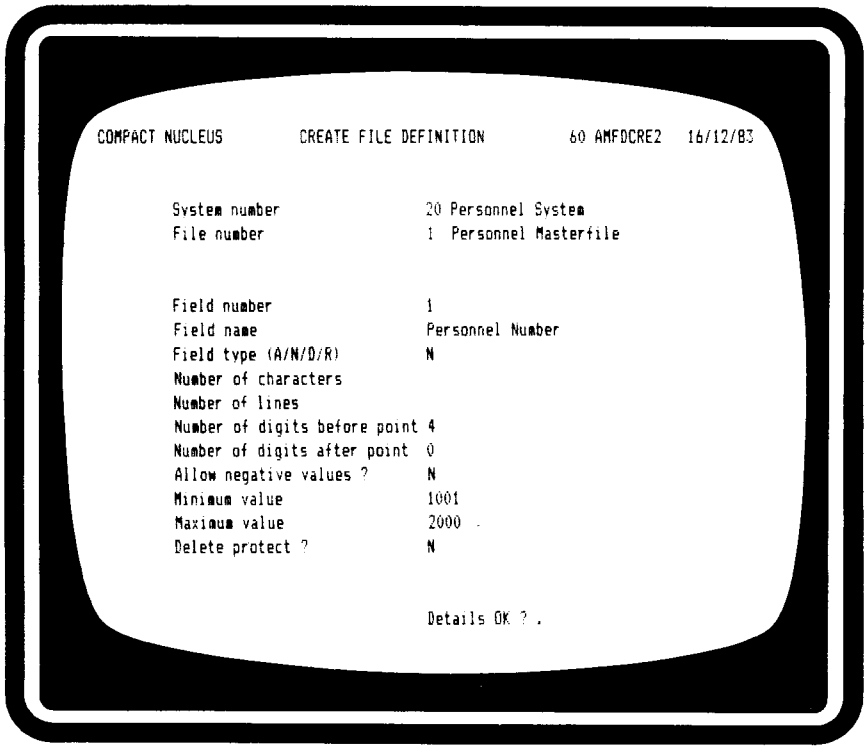
10.Maximum Value **8N**

Fields 9 and 10 provide two eight digit numeric fields for controlling the upper and lower limits of the values held in the fields. This facility is only available for numeric fields.

11.Delete Protect? **1A/N**

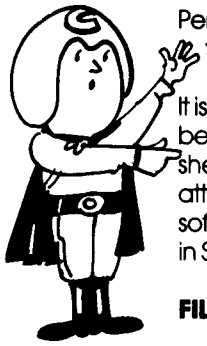
A single character field with the following values:–

Y = If field has a value stored then deletion is not possible.
(blank) = No deletion protection.



SCREEN 10

The example above shows the specification of the first field within the record. It is important that when specifying the field that the first field in the record is used as a principal key. In the example shown, account numbers entered to the system would be checked to ensure that they fall between the maximum and the minimum values of 1001 and 2000.

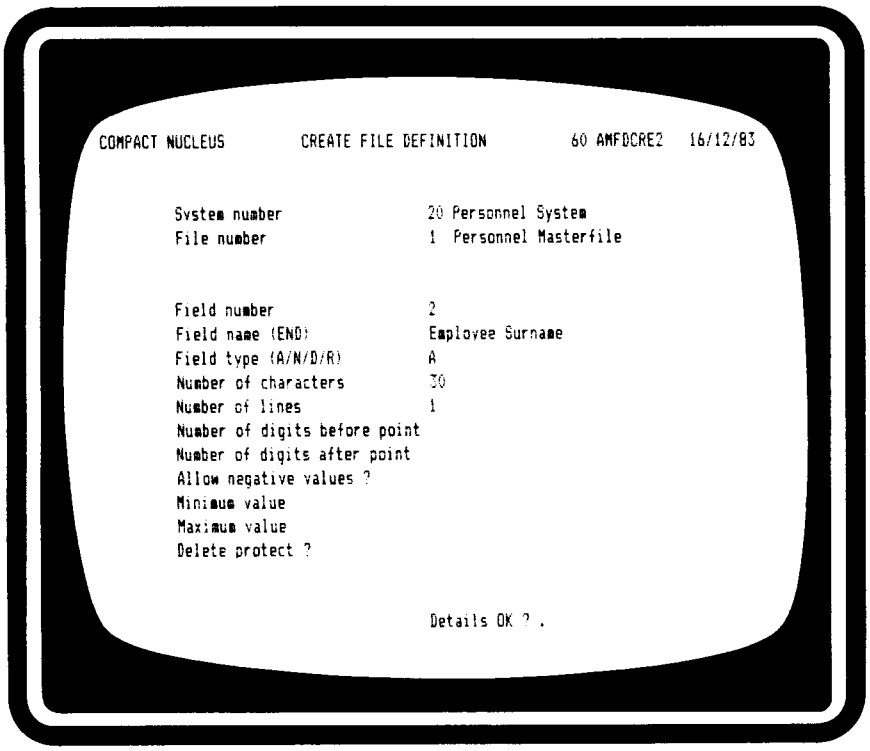


Using the parameters described above it is now possible to define each of the fields within the file. Continuing with the example of the Personnel System the attached summary outlines the fields required for each file and the parameters for each field.

It is essential that the file structures to be created by the system have been planned well in advance of using the NUCLEUS system. A work sheet should be prepared specifying type of field and the field attributes required by the system before commencing to use the software. A number of examples of fields being created are shown in Screens 10, 11, 12, 13 and 14.

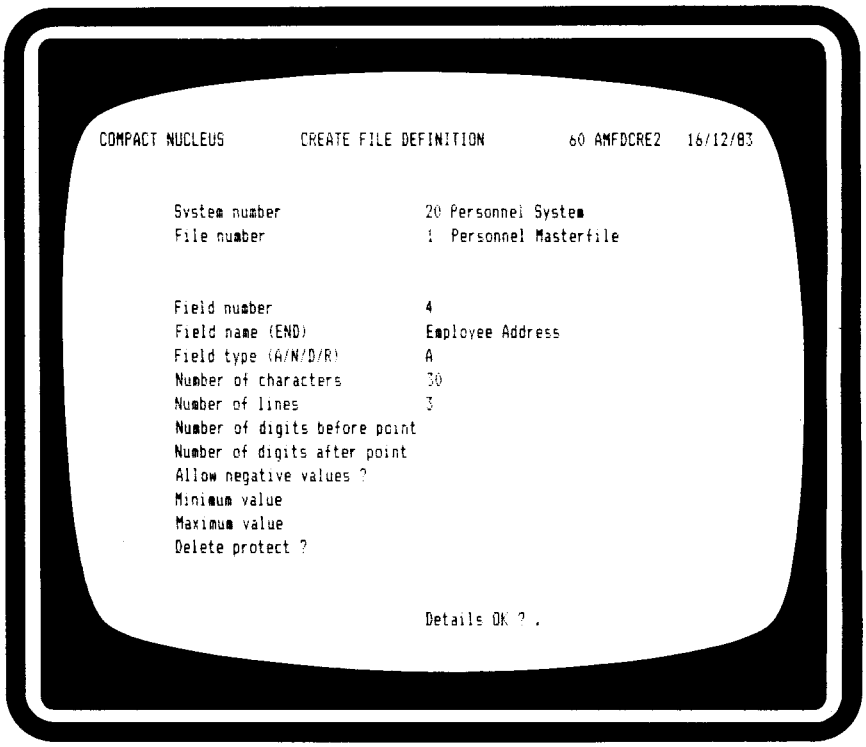
FILE KEYS

Having completed the specification for all fields within the file it is then necessary to specify the key of the file. The key is merely the order or index by which the data may be retrieved from the files. If the concept of file keys is not clear then please study the general notes on file handling included within this manual.



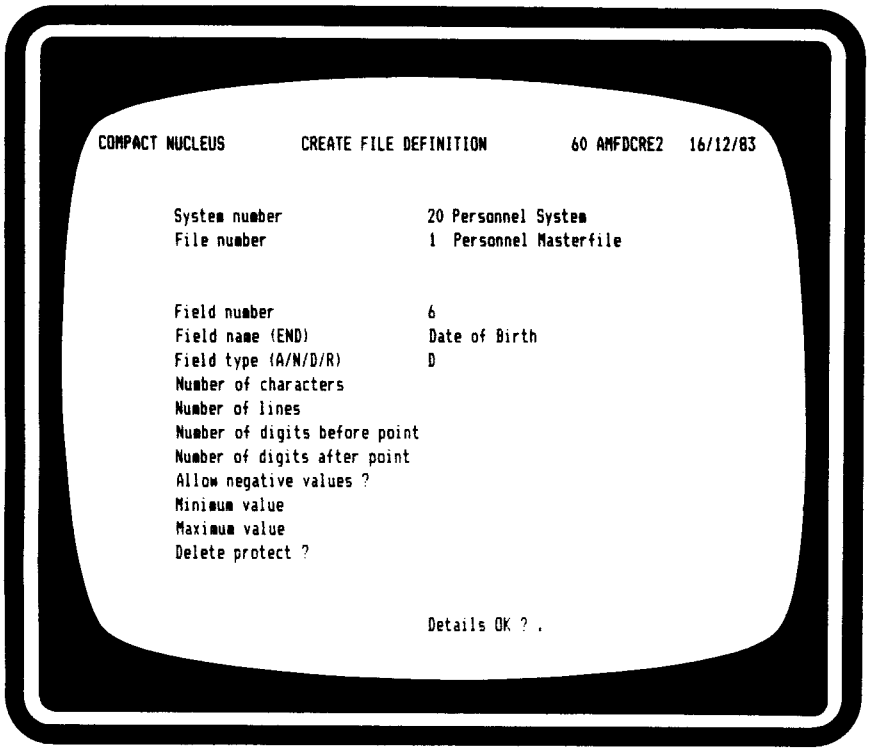
SCREEN 11

This screen shows the specification of the employee surname. The surname has been placed in a separate field to the initials so that the four characters of the name can be used for sorting into alphabetical order. Only those questions relating to alphabetic fields need be answered.



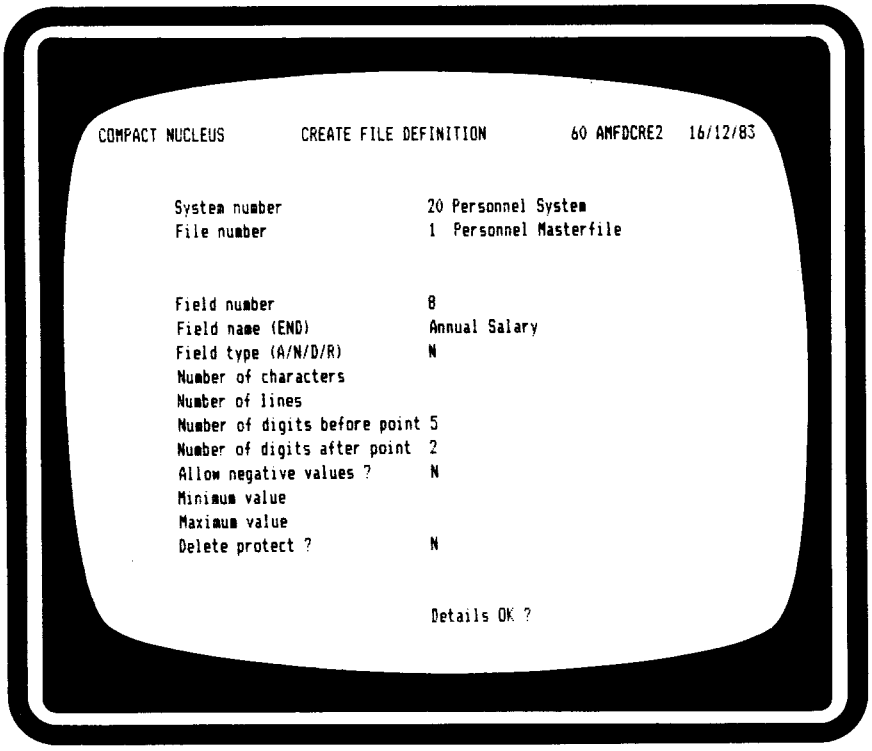
SCREEN 12

This example is also an alphabetical field which shows the facility of being able to specify the three lines of address each of 30 characters long.



SCREEN 13

The above screen shows the special conditions for specifying a date field. Where a field type is 'D' i.e. date, all of the necessary checks are automatically included to ensure that the date is valid. (i.e. 31st June would be rejected)



SCREEN 14

This example is a numeric field which shows the facility of being able to specify the number of digits before and after the decimal point.

Using the Personnel System as an example, it may be necessary to produce a list of all personnel held within the system in the following ways:–

1. A listing by personnel number

2. A listing of all personnel in alphabetical order

3. A list of all personnel in departmental order

Each of these listings will require a separate key or index to be established. In theory it is possible to have each field in the file defined as a key, but this takes up a considerable amount of storage space and is very slow when adding new records to the file.

It is important to note that the system distinguishes between the main key to the file and other keys which may be needed for reporting purposes. The main key to the file must always be the first field in the record. This field will be used for all subsequent update programs as the entry point. Other keys which are defined in this section will be used for reporting purposes only.

The following details are required for each key which is specified within the system:–

1. Key Number **2N**

Sequential number generated under system control for each new key defined.

2. Main Key Name **20A/N**

A twenty alphanumeric field to describe the key being specified. This name will be used later in the system as a run time option for the user to select the order in which the reports are required to be printed.

3. Select Field **2N**

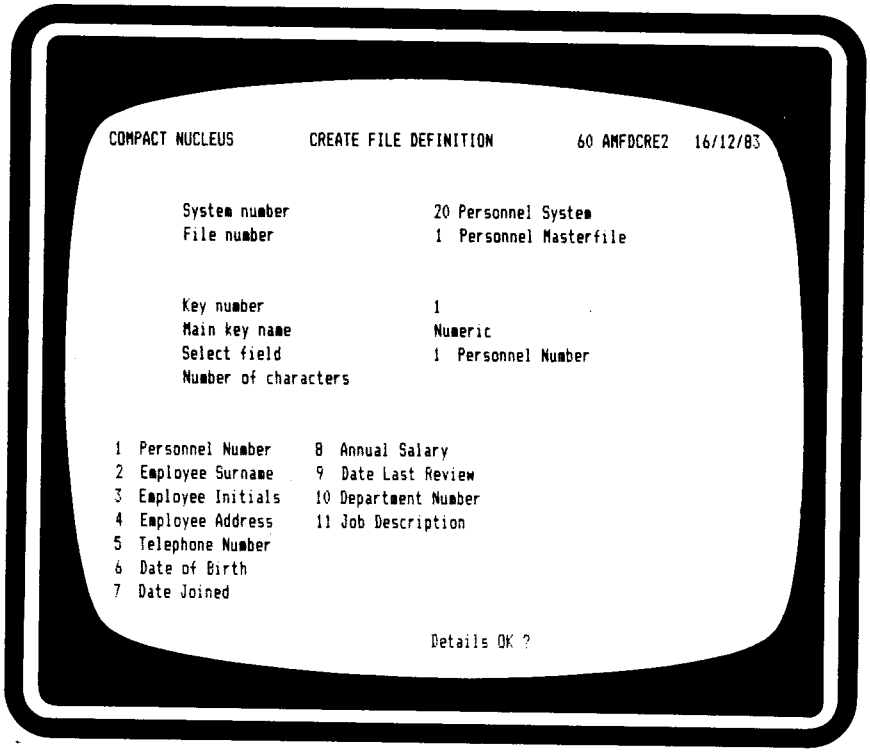
When specifying a key, the system displays all fields that have been defined along with the field number. The first key or principal key of the file must always be the first field within the file.

This field would normally be an account number or in the case of the example currently being used a personnel number. This key will provide the normal method of accessing the file for data entry or for reporting purposes. If more than one key is required to the file then the selection process is repeated.

4. How Many Characters **2N**

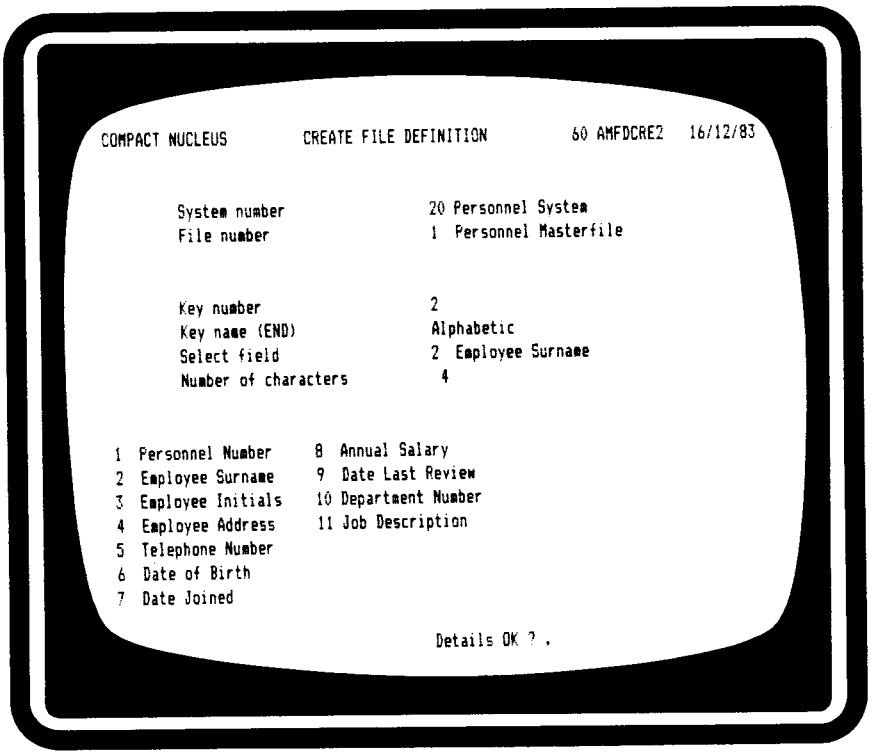
A two digit field used to select the number of characters from the field required for the key. If for example the report is required in alphabetical order then the surname will form the basis of the alphabetical key. However, it would be wasteful and extremely time consuming to use the whole of the 30 character surname field as the key. An alphabetical listing could be satisfactorily achieved by restricting the key to the first four or five characters of the name. By reducing the size of the key in this way, a considerable storage saving and improvement in speed can be achieved. For alphabetical keys there is a maximum limit of 26 characters. The system will not allow this key length to be exceeded.

In the case of numeric fields it is not necessary to specify the number of characters required for the key. 'How Many Characters?' will only have to be answered for alphabetic fields. When responding to this question the system will automatically display the maximum key length (i.e. 26 characters) and it is up to the operator to override this figure with the size of the key required. (See Screens 15 and 16).



SCREEN 15

Having specified all of the fields within the file, it is now possible to select the keys for the file to determine the order in which data entered to the system will be held on file. It is important that the first field within the file is used as the principal key. The example shows the personnel number being selected as the principal key.



SCREEN 16

If data in the file is required in an alternative order it is possible to select additional keys. This example shows the employee surname being selected so that data can be held in alphabetical order. Although the surname is 30 characters long, only the first four characters of the name have been selected. The maximum length for an alphabetic key is 26 characters.

Having defined the keys of the file the definition process is now complete. By typing 'END' opposite the key name the system will return to the screen ready for defining a new file. If additional files are required by the system being generated then these may now be defined. If no further files are required by the system then type 'END'.

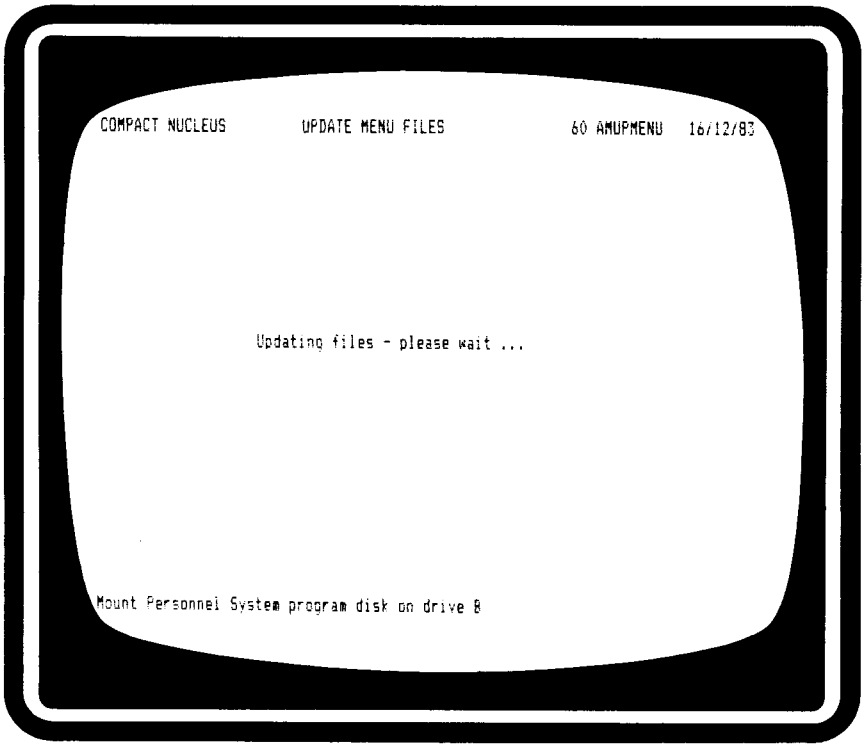
On completion of all file definitions NUCLEUS then generates a file creation program. Two messages will be displayed on the screen:

'Program definition is complete ...
Is this to be a permanent or temporary program ? (P/T/CAN) P'
PROGRAM DESCRIPTION FILE CREATION'

NUCLEUS will create a program that will enable the user of a new system to set up the necessary file storage areas on the disk without reference to any technical details. The file creation program is inserted on the next available space within the menu and before the new system is run the file creation program should be called.

After the file creation program has been generated, the operator is asked to load the program disk on drive B so that the program can be copied to this disk. It is possible to store the file creation program along with the NUCLEUS parameters already created. (See Screen 7).

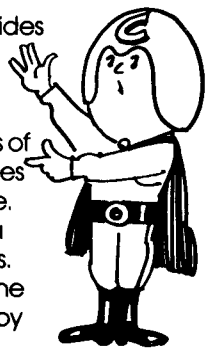
If any disks have been changed, the operator will be prompted to return the Nucleus parameter file disk to drive B and by depressing the Enter key the system will return to the main program menu.



SCREEN 17

After the file creation program has been generated, the operator is asked to load the program disk on drive B so that the program can be copied to this disk. It is possible to store the file creation program along with the NUCLEUS parameters already created.

Create File Linkage (Option 4)



The concept of being able to link files together for the purposes of data input or validation may be difficult to grasp initially but if provides an important feature of the NUCLEUS system and should be experimented with prior to undertaking final systems generation.

In certain situations when designing the overall system, for reasons of diskette space it may be desirable to code certain repetitive pieces of data and store the explanation of these codes in a separate file. Within the Personnel System example currently being used, such a procedure was used for the treatment of department descriptions. Within the Personnel System a separate file was created holding the description of each of the departments that would be accessed by the software. Each department description was 30 characters in length and was identified by a 2 digit numeric code. In the employee master file provision was made to store a 2 digit department number rather than store the full description. It is relatively simple to prove arithmetically that if 100 employees are stored on file a considerable amount of additional space would be needed if a 30 character description is stored in each personnel record describing the department.

If a personnel master file record within the system is created at the time the department code is entered, it is desirable to check the department code keyed is valid by displaying the description of the department code held on the department file at the time of entry.

By creating file linkages between the files maintained within the system it is possible to carry out such validation at the time of input. File linkages also pay an important part in providing descriptive detail when using the report section of NUCLEUS.

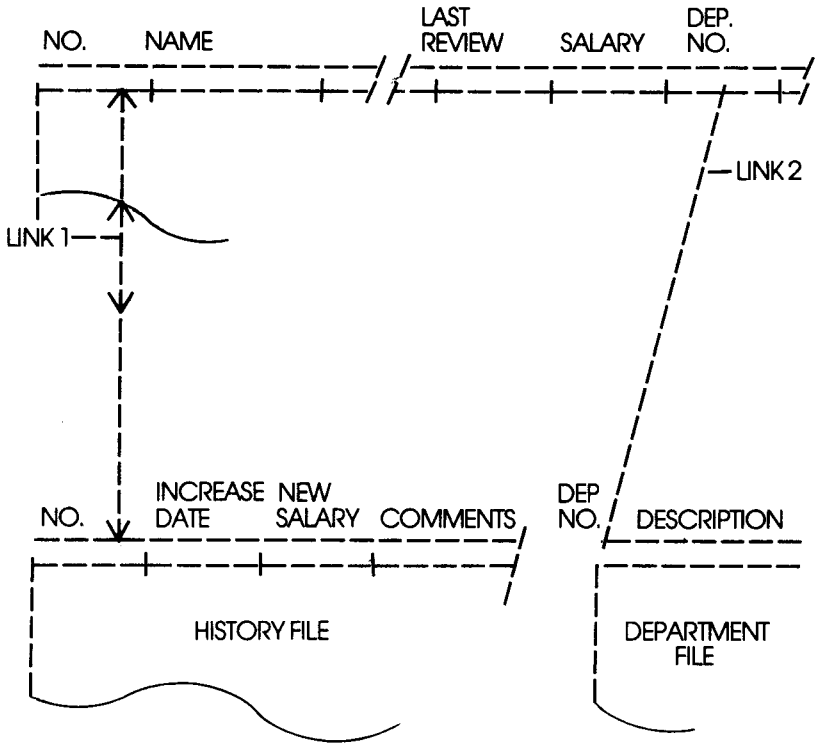
If the concept of file linkage still remains unclear then one or two simple examples should be created on a test diskette so that the results of linking files can be observed first hand.

The types of file linkage are capable within the system:–

1. The key of one file is linked to the key of another file.

2. The field of one file (which may or may not be a key) linked to the key of another file.

A simple chart has been included using the Personnel System example to indicate some of the types of linkages possible. This example shows graphically some of the following linkages:



Diagramatic representation of two types of file linkages.

LINK 1 – Key to key link

LINK 2 – Field to key link

Link 1

This linkage provides for the key of one file to be linked to the key of a second file. It is possible for this linkage to be established in both directions. By establishing this type of linkage it is possible to generate a transaction in the history file during an update routine. Because a linkage existed from the history file to the personnel master file it is possible to display details such as, employee name, last salary review date etc. from this file at the time of input. Where input is made to the history file and data displayed from the master file the linkage has to be specified in the following way:–

Primary file: Personnel history file
Secondary file: Personnel master file

Link 2

This type of linkage is where a field of one file (not necessarily a key) is linked to the key of a second file. The field in the primary file (Personnel master file) could be a data field but the field in the secondary file would have to be a key. The example will enable the department description to be displayed at the time of master file creation. It will be necessary to define the linkage in the following way:–

Primary file: Personnel master file
department number field)
Secondary file: Departmental file

Where a linkage between a field and a key is defined it is only necessary to specify the file name for the secondary details since the system will automatically select the principal key.

When creating the file linkages, the details for the primary file are input first and then details for the secondary file. On the screen will be displayed the system numbers and names for those NUCLEUS systems which are available for selection. Having selected the system required the files within this system are then shown on the screen. (See Screen 18).

Having selected the file for which the principal linkage is required, the fields and field numbers within this file are then displayed for selection. Having completed selection for the primary file details the screen is cleared and details are then requested for the secondary file.

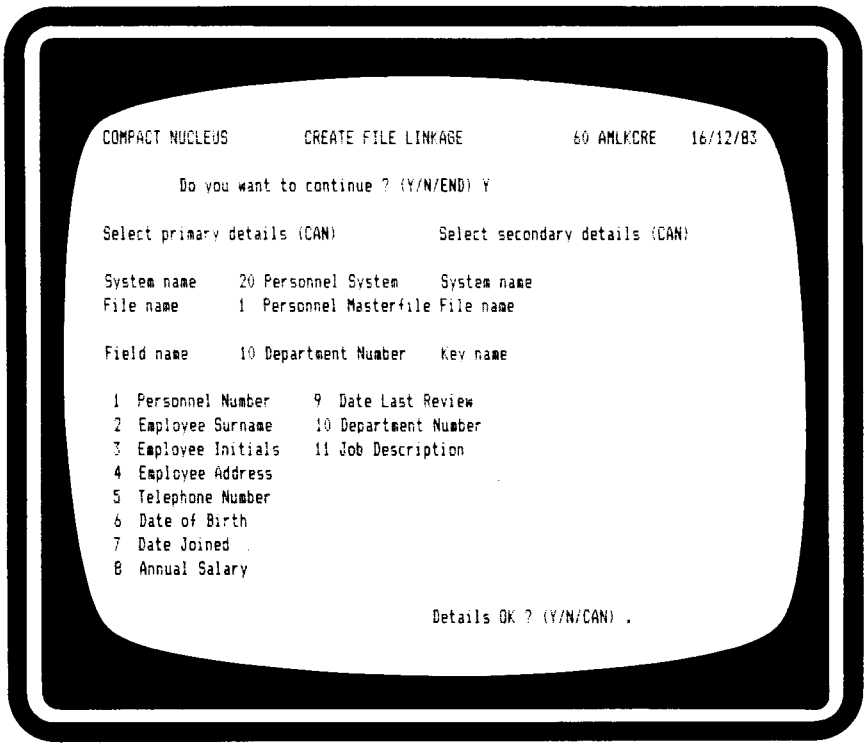
The same sequence is followed for specifying the secondary linkage as was done for the primary linkage. In the case of the secondary details, having selected the system and the file, any keys which exist on the secondary file are then displayed. In the case of the Personnel System only one key exists on the department file so no selection is possible. If however several keys had been created then the operator would be free to choose one of these keys.

Having completed the selection process, the following message is displayed on the screen:–

'File linkage definition is complete ...'

The operator is then asked 'Details OK? (Y/N/CAN)'

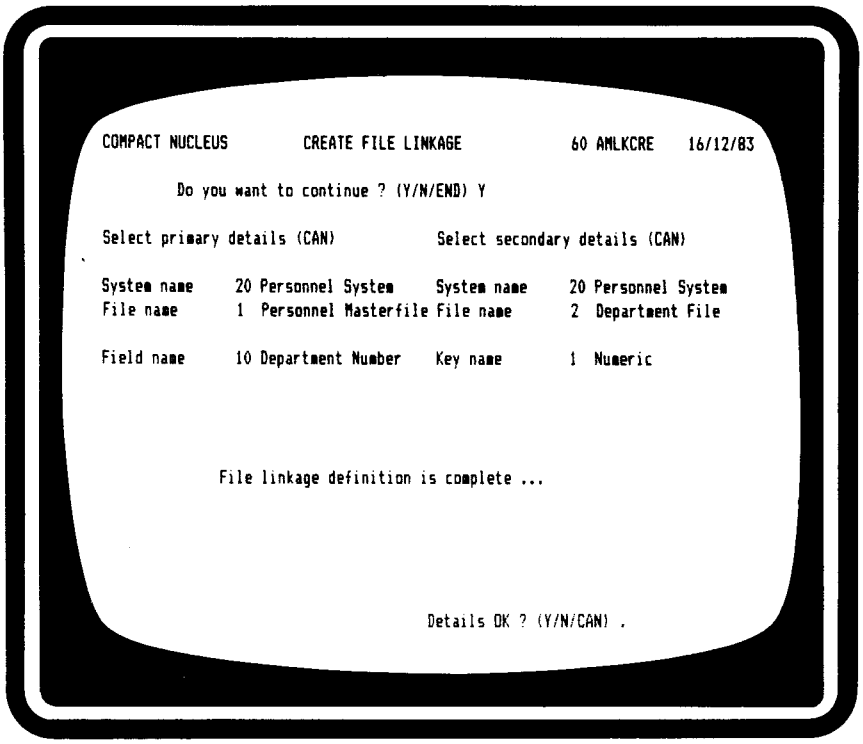
If the linkage details have been entered correctly, by responding 'Y' the linkage will be written to the parameter file and the system will return to the main menu. If 'N' is selected it is possible for the operator to re-enter details of the linkage and make any alterations that may be necessary. By using 'CAN' the details entered so far will be disregarded and no linkage update will take place and the operator will be returned to the main program menu. (See Screen 19).



SCREEN 18

Having defined all the fields within the file, it is possible then to link data in one field to information held in a secondary file. Choosing the personnel master file as the primary file it would be possible to link field number 10, department number, to a department description file.

Any linkages created within the system will be printed on the bottom of the file definition printout.



SCREEN 19

Having selected the primary file details for the linkage, it is now possible to select the secondary file details to complete the linkage. In this case field number 10, department number has been linked to the department description file.

Print File Definitions (Option 5)

The printing of file definitions not only provides a hard copy record of those details entered during the file creation routines, but it also provides other essential information that is necessary if programmers wish to undertake modifications or alterations to the generated code.

One of the important features of NUCLEUS is that the system generates interpretive BASIC code which may be listed and altered by a programmer and 'SAVED' again for subsequent use.

In addition to the details entered during option 3 and option 4 certain additional information is generated by the system.

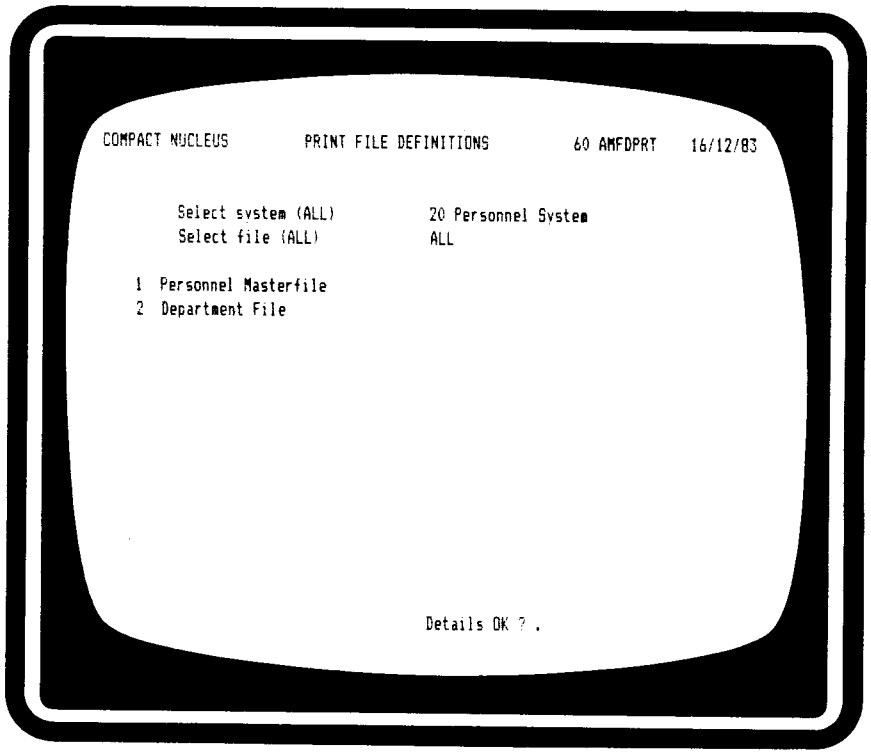
Each file added to the system is given a unique BASIC file name. This name is a combination of the system prefix code given in option 2 and a sequential file number generated by the system. For the first file created for the Personnel System the following BASIC file name is generated 'PEFILE01'. Within the Personnel System wherever this file is used, either for the storage of data or referred to in programs it will be known by this file name.

Apart from the details entered for each field, the system calculates the position of each field within the record (start byte number) so the precise position of each field within the record is known. The system also allocates a BASIC variable name by which each field within the file will be referred to during any generated programs.

The type of information supplied on the print of the file definitions will be adequate for those programmers wishing to maintain or modify the software. A hard copy print of all files created within the system should be printed and stored with any systems documentation which may have been prepared.

The file definition print program may be run as often as is required. (See Screen 20).

On selection of option 5 the operator has the opportunity of either printing all definitions within the system or selecting a single file definition for printing. On completion of the selection process the file definition(s) is printed. On completion of the print program the system returns to the main program menu.



SCREEN 20

Once all the files have been defined for the system, it is possible to print them out. The file definition print program can be run as often as required.

Create Update Program (Option 6)

Having now defined the system, the files within the system and the characteristics of each field that will be contained within the files, it is now possible to create an update program that will validate and store information within the system.

The first level of selection is at a systems level. The operator is asked to select the system for which the update routine is required. All systems 'on line' along with the system numbers are displayed on the screen prior to selection.

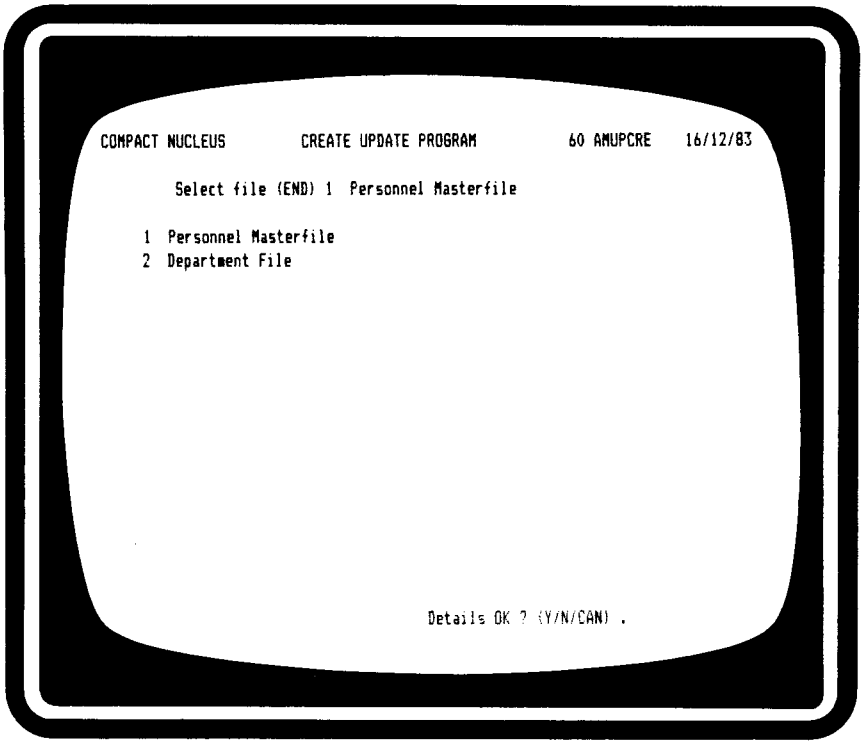
Having identified the correct system, all files held within the system are then displayed on the next screen. It is then necessary to select the file for which the update program is required. The file selected should be the principal file for the update as the system will take into account any linkages which may have already been established. (See Screen 21).

Having selected the file for which the update program is required, the field number along with the field names for each field contained within the file are displayed on the screen. Two methods exist for creating an update program:–

1. If every field within the file is to be updated then by selecting 'Y'option at the start of input will cause all fields to be automatically selected.

2. If 'N' is entered in response to the first screen prompt, then it will be necessary for the operator to select the fields for which update is required.

This distinction is made so that special update programs which may be needed from time to time can be created quickly. Using the Personnel example it may be necessary at the start of the tax year merely to update the annual salary field and the date of the last review. A special input program could be created with the name and address displayed, and only the 'annual salary' and 'last review date' fields need be input.



SCREEN 21

After selection of the correct system, all files held within the system are then displayed. It is then necessary to select the file for which the update program is required.

Beside the main key of the file is shown an '*' symbol. This indicates that this field is the principal key to the file and will automatically be included in any update program generated. It is not possible to generate an update program without this field being included. (See Screen 22).

It is now possible to select those fields which are to be updated by the input program. If the option for all fields to be updated is selected then an '*' will automatically be displayed beside each field. If the manual update is selected then it will be necessary for the operator to indicate 'Y or 'N' against each field.

Where a field has been designated as a linked field (using option 4) it is necessary for the operator to indicate whether the linkage is to apply to the update program being generated. Where the system detects a linked field the following message is displayed on the screen:–

'Do you want to validate this field ?'

Although a linkage has been established it is possible to disregard the linked file for the purpose of creating data. If validation is not required then 'N' should be the response. If in the case of the Personnel System where the linkage exists between the department number on the master file and the department description held in the department file, it may be advisable to display the department description at the time of personnel master file creation. If such a facility is required within the update program then 'Y' should be entered by the operator. If validation is required then it is necessary for the operator to select those fields from the linked file which are required to be displayed at input time. (See Screen 23) It is possible to have more than one field displayed and as each field is selected an '*' is displayed beside the field. After all fields have been selected, by entering 'END' the system will return to the update program generation.

Having selected the fields to be used within the update program it is now possible to specify the screen format for the way in which these fields are to be displayed. Screen formatting can be done in two ways. Firstly, if the number of fields selected for update are small, then NUCLEUS will automatically position with a new line being allocated for each field. The operator may choose to accept this automatic formatting without alteration.

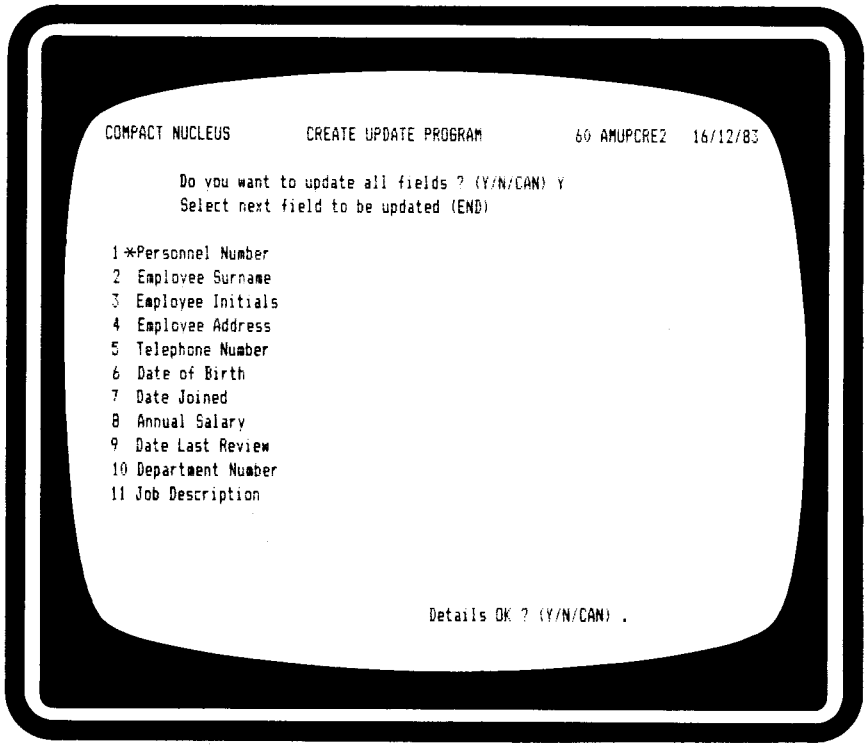
Screen 24 displays the fields that have been selected plus the length of the data stored within the field. It also shows the line number and column number on which the field will be displayed if no alteration is made.

Most micro computer screens are capable of displaying twenty five lines of information each of eighty characters long. The method of defining the position of the field is to specify the line number first (1-25) and the column number second (1-80).

If the automatic screen formatting is changed, then it is important to note that the first four lines of the screen have been reserved for special messages and essential data (i.e. company name and date etc.). The last five lines of the screen (lines 20-25) have also been reserved for special error messages and other instructions displayed by the system. It is important to bear in mind when formatting an input screen, that the values given for lines on which data is to be displayed must be selected between line 5 and line 20.

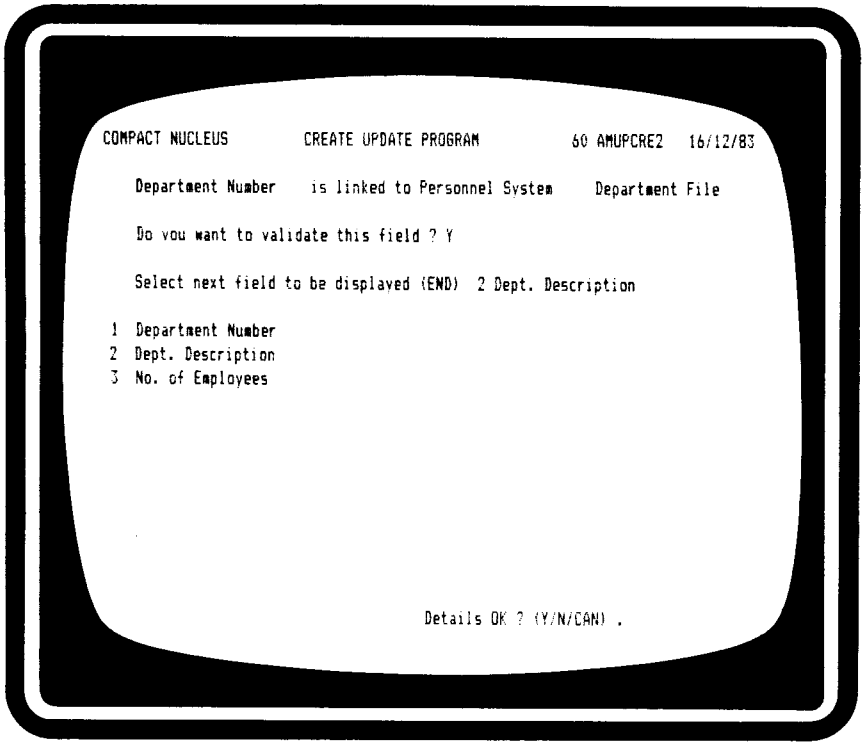
If the automatic formatting of the screen is unacceptable then by responding 'N' to the question 'Details OK? (Y/N)' the operator is then given the opportunity of amending the position at which the data is to be displayed.

When amending screen formats it is important that some preparation of the style of screen is done beforehand. Care should be taken that enough space is left for the headings to be displayed without overlapping data areas. NUCLEUS will check that headings and data areas are not overwritten, but it is important to plan the screen format in advance. Having made the necessary alterations to data headings, the line and column numbers for the headings and the data fields, it is then possible to have a test display of the screen that has just been displayed. If a test display is required, respond 'Y' and the fields that have been selected for update will be displayed in the positions specified. If the positions that have been chosen are not satisfactory, it is possible to return to the previous screen and make any alterations that may be necessary. This procedure may be repeated as often as required until the screen has been specified to the operator's satisfaction.



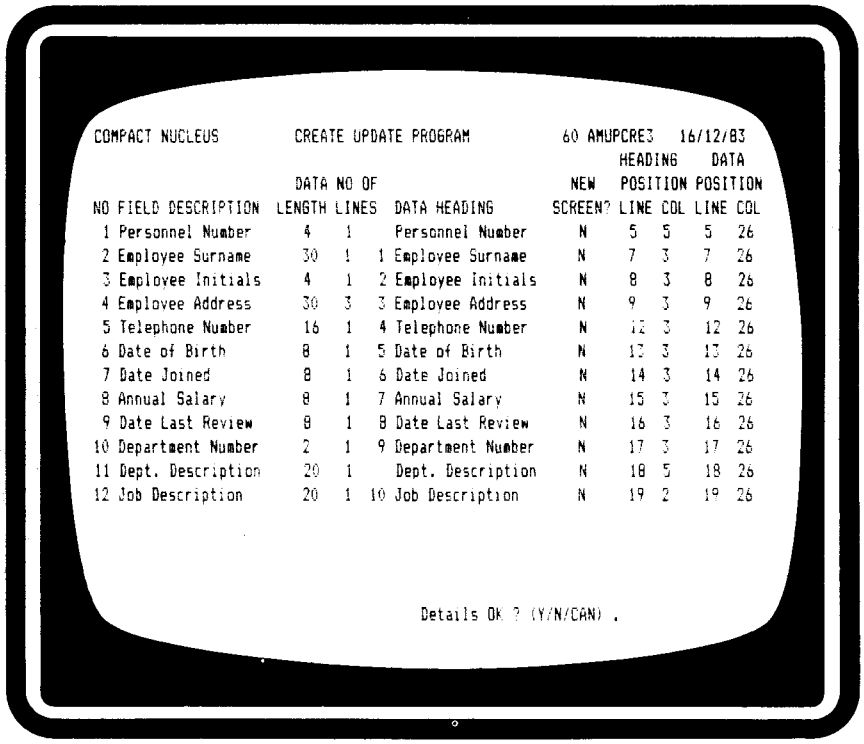
SCREEN 22

The '*' symbol beside the main key of the file, indicates that this field is the principal key to the file and will automatically be included in any update program generated. It is not possible to generate an update program without this field being included.



SCREEN 23

If a linked field is selected for update then details of the linkages shown on the screen give an opportunity for the operator to select any information which should be displayed from the linked file.



SCREEN 24

Screen 24 displays the fields that have been selected for update, plus the length of the data stored within the field. This screen also shows the line number and column number on which the field will be displayed if no alteration is made.

Where linkages exist within the file being updated, it is now possible to specify updating to take place in files other than the main file. In the Personnel System example, it may be helpful to maintain a total of the number of people in each department. This could be achieved by adding one to a department counter each time a personnel record is added to the personnel master file. Where transactions are being processed the value of the transaction could be added to a master file to maintain a running balance.

If the multiple file update facility is required, then the operator should respond 'Y' to the following question:–

'Do you want to update any information in linked files ? (Y/N/CAN)'

By responding 'N' to this question, the multi-file update facility will be ignored completely. By entering 'CAN' the system will return to the main menu.

Having selected the update option to linked files, screen 25 is displayed. On the top line of the screen a description of the linkage is given and the operator is asked:–

'Do you want to update this file?'

By responding 'Y' the operator is then able to indicate the fields in the linked file which are to be updated. On selection of the field to be updated, screen 26 is displayed. The top three lines of the screen describe the system, the file and the field name to which the secondary update will take place. It is then necessary for the operator to enter a simple equation which will specify the way in which the update is to be carried out. Where a simple counter is being maintained to establish the number of people in a department, the only equation necessary is +1. More complex mathematical equations can be entered and a list of the functions available is shown on the screen. A list of the fields available for inclusion in this equation is also displayed. It is possible to enter a single equation up to a maximum of 20 characters.

Having entered the equation, the system checks that the equation is capable of execution and then displays the following message:–

'Details OK ? (Y/N/CAN)'

If the equation is incorrect, by responding 'N' the operator may go back to the equation line and re-enter the detail. If by responding 'CAN' the program so far is disregarded and the system returns to the main menu. If the equation is correct, by responding 'Y' the operator is returned to the previous screen and asked if there are any further fields to be updated. It is possible to repeat this procedure for any other fields which are to be updated in the linked file. If no further update routines are required then respond 'END'.

After all fields have been selected for updating the screen displays the following prompt:–

'Details OK? (Y/N/CAN)'

If 'Y' is selected the program definition is complete and all that remains is for the following two details to be entered before the input program is generated. It will be necessary to respond to the following message:–

'Is this to be permanent or temporary program ? (P/T/CAN)'

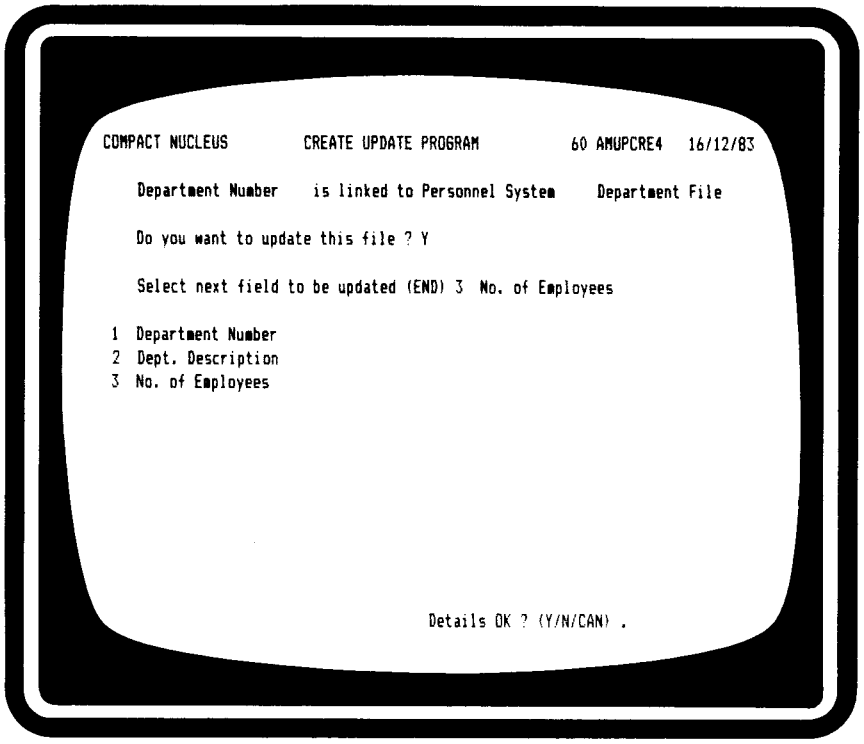
It is possible using NUCLEUS to generate a program which will be stored in memory for immediate use and then the details lost. If, however, the program is required for future use then it will be necessary to specify the program as a permanent one (P) and enter a description for the program so that this may be inserted on the menu. A program description of a maximum of 30 characters is provided.

Having specified the type of program and the program description for insertion on the menu, the system will then generate the necessary program for the update routine. (See Screen 27).

If the program definition details have been entered incorrectly then by responding 'N' it will be possible for the operator to step back through the details and make any alterations that may be necessary. The 'CAN' option will mean that any of the file update details that have been entered will be disregarded and the system will return to the main program menu.

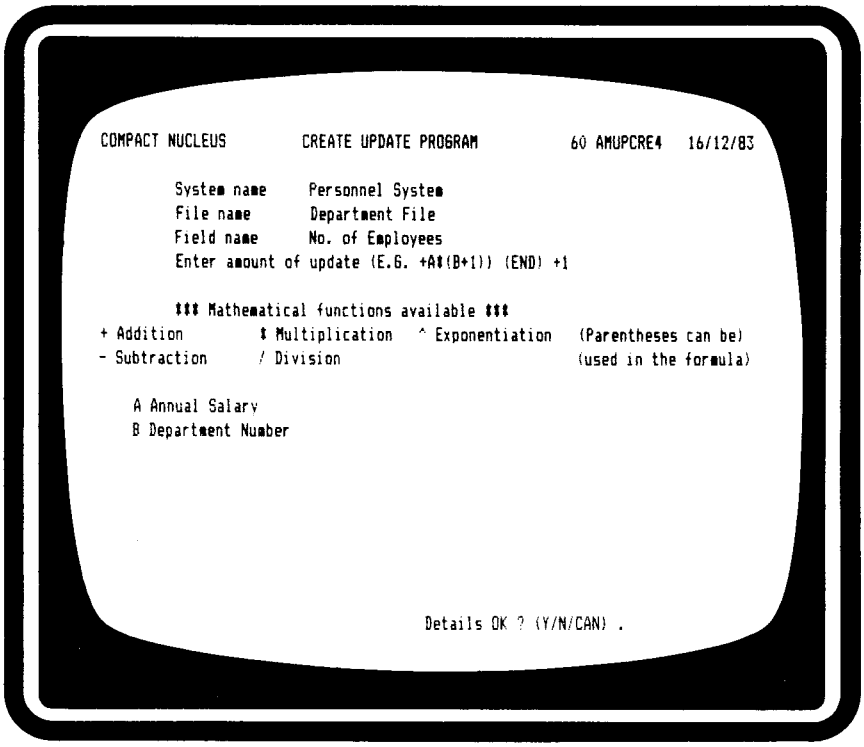
After the NUCLEUS generation of the update program has been completed the operator will be asked to mount the program disk on drive B. By depressing the Enter key the system will then copy the generated program to the program disk and insert the program description and selector on the next available space within the menu. Having completed this function the program disk held on drive B is then ready for use. When using the generated programs it will be necessary to load the program disk after first running the "Start of Day" program.

If any difficulties are experienced in running the generated programs please contact COMPACT Software Support Personnel.



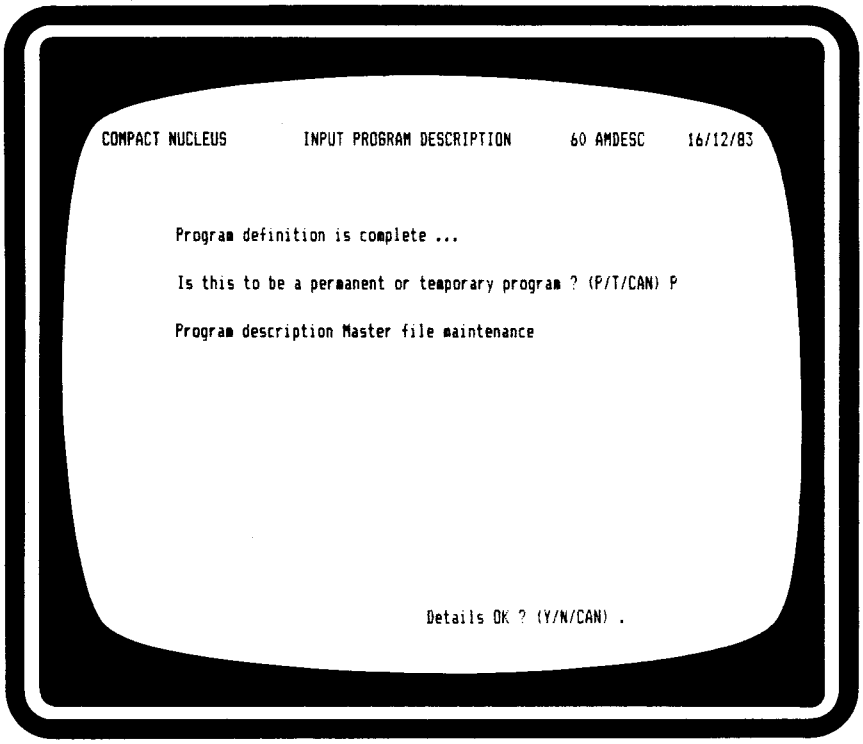
SCREEN 25

This screen is displayed after having selected the update option to linked files.



SCREEN 26

Having selected the field to be updated, screen 26 is displayed.



SCREEN 27

Having completed the details needed to create the input program the system requires that the program be given a description. This program description will then be inserted on the next available space on the menu. After the update program has been named, the update program is generated, linked to the menu selector and written to the program disk. Before the update program can be used it is necessary to run a file creation program which will have been generated during the file definition stage of the system and inserted on the menu. The file creation program will build blank files within the system ready to receive data from the input program.

GLOSSARY OF TERMS

ALPHA

This term usually applies to the abbreviation of "alphabetic". Where alpha input is required the system will only accept alphabetic characters from A-Z.

ALPHANUMERIC

Where this type of data is specified by the system it will be possible to enter the full alphabetic character set along with numbers (0-9) symbols and any other special characters which may be provided by the system.

AUDIT TRAIL

This term refers to the printed record supplied by the computer of those items which have been entered by the operator along with a full description of any calculation, updating or change to the original information which may have taken place. From audit trails provided by the system it should be possible to reconstruct exactly what has taken place during any input to the system.

BATCH

Batch can represent a group of documents or entries prepared in advance for entering to the system. The philosophy of batch processing is that the information is not added to the files and no update takes place until the operator has completed the input and is satisfied that the information entered is correct. Most batch options within the software enable the operator to change or delete the incorrect entries prior to any update of the system taking place.

BACKUP

This term will usually be used to refer to security copies of data files and programs. To simplify the recovery procedure in the event of mechanical or software failure, regular backup copies of all data must be taken by the operator. Instructions supplied by the hardware manufacturer explain how this procedure is carried out.

BOOLEAN

This is a system of algebraic expressions (named after the mathematician Boole) and allows the operator to determine relationships between variables held within the system. By use of Boolean algebra it is possible to produce selection criteria for the updating or the printing of records within the system. Using such a system of selection it would be possible, for example, to select from a group of records people whose ages were between 30 and 45 and who lived in a certain location.

C.P.U.

The C.P.U. or Central Processing Unit contains the main memory of the system along with the necessary circuits to execute the programs and control peripheral devices which may be attached to the system.

CURSOR

The Cursor is a prompt appearing on the screen (V.D.U.) which indicates to the operator where the next character will appear as it is input to the system. There are a number of different methods of identifying the cursor on the screen – some systems use an underline character and some use a small rectangle, approximately the size of a character. In some instances the cursor will pulsate or flash whereas in other systems no movement takes place at all.

DATA

Data is a general term for any information which has been entered to the system or can be used to refer to source documents or information being prepared to be entered to the system. Data may be in the format of alpha, alphanumeric or numeric information.

ENQUIRY

Certain options within the system will allow the operator to interrogate information held within the system. Often the system will offer two levels of enquiry, one where summary information is displayed or printed, the second which enables more detailed information to be provided.

ERROR MESSAGE

Error Messages provide prompts to the operator displayed on the screen to indicate that incorrect information has been entered or that a fault has occurred within the system. The error message will indicate what action has to be taken by the operator.

FIELD

The field is an area within a computer record which will have predetermined characteristics and be used to store information in a specified format. (See Supplementary Notes on File Handling).

FILE

A file is an area of storage on the disk or diskette which may be used to store computer programs or data entered to the system. Where a file is used to store data the data is normally organised in records within the file. (See Supplementary Notes on File Handling).

HASH TOTAL

A hash total is a predetermined value for a batch of information prepared for entry to the system and is used to establish the accuracy of the data which the operator has entered to the system. Where the predetermined hash total and the value generated by the system do not agree, provision is made to make the necessary adjustments before any update takes place.

INDEX

An index in computer terminology has the same concept as an index in a book.The index is the method of location within a file of a required record.

INITIALISE

Initialisation is the function carried out by the system to prepare files or storage areas ready for certain functions to be carried out. Initialisation could be carried out when the new system is created so that blank files are set up or it may occur at the start of batch processing where certain constants and standard values are loaded into the memory of the machine.

KEY

Key is the code used to identify a record within a file. The key may be numeric or alphanumeric. The number of keys will form the index to a file. It is possible to have more than one key for any record within the system. (See Supplementary Notes on File Handling).

MASTER FILE

The master file is a category of file where each of the records within the file has its own unique key. An example of a master file would be a file containing details of employees within a company where each employee's record has its own employee number.

NUMERIC

Data comprising of numbers only – the system will recognise numbers from zero to nine and these can be either positive or negative values.

OUTPUT

Output is usually used to refer to the product produced after some input has taken place to the system. Output can be in the form of printed hard copy record, the display of information on the screen, or information that has been processed and passed to another file or storage medium.

PARAMETER

The parameter is a constant value held by the system used from time to time in processing. An example of a parameter would be a company name where this information is entered to the system once and used throughout the system for headings of reports and displaying on the top line of the screen.

RECORD

A record is the basic element within a file and is usually made up of a number of fields. Records vary in length, the length of the record being controlled by the file structure. (See Supplementary Notes on File Handling).

TRANSACTION FILE

The transaction file is a special classification file where a number of records within the file may have the same key. An example of a transaction file would be where outstanding invoices were held by a customer, it would be possible to have a number of outstanding invoices for the same customer.

VALIDATION

Validation is the system of checking at the time of data entry to ensure that the information entered meets the requirements laid out by the program. Date validation for example would check that dates such as 31st June were not accepted by the system.

V.D.U.

The V.D.U. is the acronym for Visual Display Unit. The visual display unit would normally comprise of a screen containing 25 lines each of 80 characters long along with a keyboard for alphabetic and numeric data input.

SUPPLEMENTARY NOTES ON FILE HANDLING

Most of the standard software revolves around the maintenance and manipulation of data held within files. It is essential therefore that before any attempt is made to use the system that the basic concept of file handling is understood clearly. The following notes may be of some assistance.

The file is a storage unit maintained on a diskette or hard disk and is comprised of a number of records. Within any system the number of files used may be considerable so that each file is identified by a unique file name. The file name can be alpha or alphanumeric and will sometimes include punctuation. Some typical formats of file names used within the system could be:–

- SLMAST.DAT
- PEMENU.BAS
- PEPRG001.BAS

The files maintained by the system contain information or data in the form of records. Any file may contain an infinite number of records each with predefined attributes. These attributes or items within the record are referred to as fields. A field may be used to store a numeric value or a string or alphabetic characters.

To locate a record within a file the system uses a key to retrieve the record it needs. The key for each record is held within an index.

The file handling section of the operating system will maintain the index automatically, and the operator need only be aware of the fields which the system uses as keys.

A simple example would be a file containing the personnel records of all employees for a company. A method of identifying each employee would be to give them each a number. This would then become the main key to records contained within this file. It may however be necessary to have employees grouped by department. A second index could then be maintained of employees within department order.

FIELDS WITHIN A RECORD

FIELD 1	FIELD 2	FIELD 3	FIELD 4

The fields within a record would be determined by the system and could have values similar to the example given below:–

FIELD 1: Employee Number – four digits and the main key for the record

FIELD 2: Employee Name – thirty characters

FIELD 3: Employee Address- ninety characters

FIELD 4: Department Number – two digits

RECORD 1
RECORD 2
RECORD 3
RECORD etc.

A file is an area (on diskette or disk) defined within the system containing a number of records.

COMPACT NUCLEUS FILE DEFINITION

SYSTEM NUMBER 20 Personnel System
FILE NUMBER 2 Department File

BASIC FILE NAME PEFILE02
FILE TYPE Master
RECORD LENGTH 24
NUMBER OF RANKS 1
NUMBER OF RECORD TYPES 1
FILE PROTECTION None

FIELD NO.	DESCRIPTION	FIELD TYPE	NUMBER OF CHARACTERS	DIGITS BEFORE POINT	DIGITS AFTER POINT	ALLOW NEGATIVE VALUES	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF LINES	DELETE PROTECT	START BYTE	LTH	BASIC NAME
1	Department Number	Numeric		2	0	N	10	75			1	2	C2%
2	Dept. Description	Alphanumeric	20								3	20	C5$
3	No. of Employees	Numeric		3	0	N					23	2	C3%

KEY NO	KEY DESCRIPTION	NUMBER OF CHARACTERS	RANK NO.
1	Numeric	2	1

COMPACT NUCLEUS FILE DEFINITION

SYSTEM NUMBER 20 Personnel System
FILE NUMBER 1 Personnel Masterfile

BASIC FILE NAME PEFILE01
FILE TYPE Master
RECORD LENGTH 180
NUMBER OF RANKS 3
NUMBER OF RECORD TYPES 1
FILE PROTECTION None

FIELD NO.	DESCRIPTION	FIELD TYPE	NUMBER OF CHARACTERS	DIGITS BEFORE POINT	DIGITS AFTER POINT	ALLOW NEGATIVE VALUES	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF LINES	DELETE PROTECT	START BYTE	LTH	BASIC NAME
1	Personnel Number	Numeric		4	0	N	1001	2000			1	2	C0%
2	Employee Surname	Alphanumeric	30								3	30	C0$
3	Employee Initials	Alphanumeric	4								33	4	C1$
4	Employee Address	Alphanumeric	30						3		37	90	C2$
5	Telephone Number	Alphanumeric	16								127	16	C3$
6	Date of Birth	Date									143	4	C0!
7	Date Joined	Date									147	4	C1!
8	Annual Salary	Numeric		5	2	N					151	4	C2!
9	Date Last Review	Date									155	4	C3!
10	Department Number	Numeric		2	0	N	10	75			159	2	C1%
11	Job Description	Alphanumeric	20								161	20	C4$

KEY NO	KEY DESCRIPTION	NUMBER OF CHARACTERS	RANK NO.
1	Numeric	4	1
2	Alphabetic	4	2
3	Department	2	3

LINKAGE DETAILS

NO	FIELD NAME		SYSTEM NAME	FILE NAME	RECORD TYPE	KEY NAME
1	Department Number	is linked to	Personnel System	Department File		Numeric