48K 128K Spectrum +2 +3

SPECCIFAX
Picture Base
System

ROYBOT

ROYBOT SPECCIFAX PICTURE BASE SYSTEM

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The package is used like a word processing system but has a keyboard with 220 user definable characters or graphic symbols enabled via different keyboard shift options. The characters on any line can be any one of four sizes and any paper/ink colour combination: these options are implemented via easy to use menu selections. An edit option allows the characters, sizes and colours to be changed or lines to be deleted or moved. A reduced screen copy (via an Epson printer), representing a range of capablities is given below:

The predefined character set is normal characters, numbers and symbols; capital Gothic characters; sideways capital letters; lines and angles; artwork symbols.

A character designer is provided to redefine any character. It has facilities to set or reset any of the 64 dots that make a character, display/insert any reference character, rotate or invert paper/ink. Any number of different character sets can be produced to relate to a picture set.

A picture set is loaded via a user named index with 66 entries,
either one at a time for display or editing, or as a series with
a selected variable delay between displays. Alternatively, four
predefined lists can be produced to give variable delays and
display modes: the latter are scroll across, down or reveal from
the centre. The memory on a 48K system can hold 6 pictures and
128K sytems 6 in RAM and 29 in RAMDISC.

A random access mode is provided with facilities similar to
advanced database systems, where the least recently used picture
is overwritten if the memory is full and, on updating, memory
based pictures are changed besides those on disk or tape.

A further display mode is as a slide projector, with forwards or
backwards selection.

The main menu has options to type, edit, load, save, display
index, select picture display menu or a utilities menu.

The menus for editing, selecting colours and sizes and other pop
up messages appear on the half of the screen not being typed.
The screen edit menu has options to type or overtype (same
colour), repaint, line insert, delete or reinsert, change size
and display or edit keyboard characters.

The picture display menu allows selection of a series, (by first
and last from the index), creation, editing and running of a
random list (saved with the index), single screen random access
or slide projector mode. Once pictures are loaded into memory,
other display modes can be effected without reloading.

The utilities menu has options for creating different picture
base systems, particularly to overcome the limitations in using
tapes.

The software has been written in accordance with the ROYBOT
Internationally Convertible Standards, whereby a modifiable
BASIC driver is used, the first entries being menu titles and
messages which can changed to other languages. These are
followed by input/output statements which can be changed for
non-standard peripherals. For Spectrums with the facility, COPY
and COPY EXP can be selected to print screen dumps.

The software provides facilities to make copies for back-up or
for use with different picture sets. The purchase price licences
the purchaser to use the software on one computer at a time.
Multiple licences can be arranged at a discount.

SIZING INFORMATION

The software comprises a BASIC and a machine code program with a
combined size of 24K bytes. There is also an index file of 5K
bytes, which also contains the keyboard definition. Each picture
occupies 2K bytes. Thus a +3 disk can store all the software and
72 pictures and a microdrive cartridge the software and about 30
pictures. Around 3 pictures per minute can be obtained on tape.

COPYING THE SOFTWARE

On receiving the software, a copy should be made for normal use
and the original stored in a safe place. In line with the design
objectives of putting the the user's requirements first and easy
conversion to other disks or menus for non-English languages,
the software provides facilities for making copies. Please do
not abuse this user friendly facility for making illegal copies.
As a purchaser you are licensed to make copies for your own use
and on only one computer at a time.

1) Load the software as described below; a menu will appear;

2) press 0 for utilities; the utilities menu will be displayed;

3) press 8 (save software); a copyright notice is given;

4) remove the ROYBOT software from the drive and insert a tape,
pre-formatted disk or microdrive cartridge as appropriate; press
any key other than EDIT to save.

For disks or microdrives, the software will be saved
automatically. For tape, the normal "Press REC & PLAY" or "Start
tape" message will be given for each of the three parts to be
saved (speccifax, infcode and index; saving time 108, 35 and 30
seconds): for later convenient operation, the third part should
be saved on a separate tape.

5) after copying press 0 to exit to the main menu.

LOADING THE SOFTWARE

Tape - LOAD "" or LOAD "speccifax". The tape loader option can
be used on the +2.

+3 Disk - Reset the computer, select the loader or +3 BASIC and
LOAD "disk".

Microdrive - Reset the computer (select 128 or 48 BASIC), type
RUN and press ENTER or LOAD *"m";1;"run".

CONVERSION FOR OTHER DRIVES OR DIFFERENT LANGUAGES

With the main menu loaded, press BREAK (CAPS SHIFT SPACE),
cursor down and ENTER. The following lines can be changed:

20 to 890, 910, 930, 950 for menus and messages. The normal
Spectrum user defined graphics characters can be used for
special characters. Note: the array dimensions are given in line
4690 and should not normally be changed.

900, 920, 940, 960 to save BASIC, load code, save code and erase
file. Line 960 should be just RETURN when a file can be
overwritten without erase.

970, 980, 990 for RAMDISC load, save and erase.

1000, 1010 for copying the screen to a printer.

WARNING: increasing the size of the program can lead to "Out of memory errors", particularly where microdrive like devices are used which require extra memory for loading etc.

After conversion, type RUN and save the software as above.

TYPING TEXT (MAIN MENU 1)

1) Press 1; a SIZE menu will appear;

2) press 1 to 4 for size; the BORDER colour menu will be displayed;

3) press 0 to 7 for colour or SPACE for existing border colour; the menu for PAPER colour is next;

4) press 0 to 7, or SPACE for last used paper and ink colours;

5) on the following INK menu, again select 0 to 7, noting the contrast;

6) the final colour menu choice is 0 to 3 for dark, bright, dark flashing or bright flashing;

Characters can now be typed in, the colour being inserted on pressing a key. The following can also be used:

* < > keys move the cursor without changing the colour;

* DELETE removes a character to the left of the cursor and its colour moving the remainder of the line to the left, including colours;

```
      MAIN  MENU
  0  Utilities
  1  Type page
  2  Edit page
  3  Load page
  4  Save page
  5  Display index
  6  128K Display
  7  48K Display
MENU SELECTION: Press number
```

```
  SELECT SIZE POP UP MENU
Characters on a line can be
any 1 of 4 different sizes

AABB  BBBB  CCDD
AABB  BBBB  CCDD

 1 ▪    2 ▬   3 ▐   4 ▪
MENU SELECTION  Press number
Press EDIT for main menu
     SPACE same size
```

```
 SELECT COLOUR POP UP MENU
Used for BORDER (first line),
         PAPER and INK.

A 4 choice menu is then given
for dark, bright or flashing.

Characters on a line can be
different colours.

Black   Blue   Red   Purple
0 ▪     1 ▪    2 ▪   3 ▪

Green   Cyan   Yellow  White
4 ▪     5 ▪    6 □    7 □
MENU SELECTION: Press number
SPACE same colour/attributes
```

* capital letters can be inserted using CAPS SHIFT or symbols with SYMBOL SHIFT; CAPS LOCK, EXTENDED and GRAPH enable other characters with C,E,G flashing on the screen; the lock modes are reset by pressing the keys again;

* as indicated in the message box, pressing INV VIDEO allows a new colour to be chosen via the same menus as before.

When the line is finished, press ENTER. The "Select Size" menu is given for the next line, followed by "Paper Colour", "Ink colour" and "Attributes". The same size as the previous line can be selected by ENTER and the last used colours also by ENTER.

After the last line has been typed, the program returns to the main menu. Input can also be stopped by pressing EDIT when the "Select Size" menu appears.
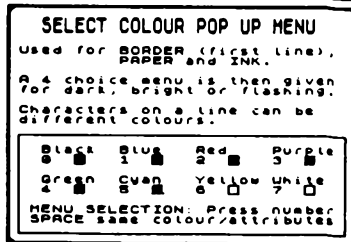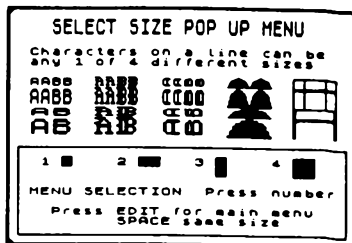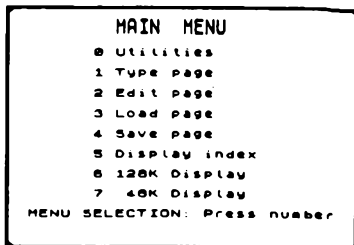
CANCELLING INPUT PAGE AND MENU SELECTION ERRORS

A page which has just been typed can be cancelled by reselecting
type page or most other menu options. An intermediate step
requires ENTER to be pressed or another key to save. If a wrong
selection has been made, select save then press EDIT to return
to the main menu.

EDIT PAGE (MAIN MENU 2)

Press 2 to edit the page which has
just been typed in. The page will be
displayed with the menu options at
the bottom of the screen.

On selecting overtype, type or paint
the cursor keys are used for moving
to the point to be changed.

```
┌─────────────────────────────────┐
│     EDIT POP UP MENU OPTIONS      │
│ Overtype, type or paint - use    │
│ the <>^v cursor keys to move     │
│ to any point on the screen.      │
│                                  │
│ Use new line or overtype/^v      │
│ keys to move the cursor to the   │
│ line to be inserted, deleted     │
│ or reinserted.                   │
│                                  │
│  1 Overtype      6 Reinsert      │
│  2 Type          7 Change Size   │
│  3 Paint         8 Keyboard      │
│  4 Delete Line   9 New Line      │
│  5 Insert Line   0 Exit          │
│ MENU SELECTION   Press number    │
└─────────────────────────────────┘
```

1 Overtype - allows characters to be overwritten with insert and
delete inactive. The colour is not changed.

2 Type - this is the same as used for input, except the last
chosen colour is inserted and cannot be changed. The main use is
for deleting or inserting to move part of a picture left or
right. On delete, the colour of the last column is not changed.

3 Paint - the paper and ink colours have to be selected as on
input: pressing space selects the colours used in column 1 of
the cursor line. Moving the cursor up, down or across does not
change existing colours. Painting down, up or backwards is
achieved by pressing space then a cursor key. Painting along a
line can be via space and cursor right or by simply pressing a
letter key: letters or symbols on the screen are not changed.
Different colours can be selected by pressing INV VIDEO.

After the above, ENTER returns to the edit menu.

4 Delete line - deletes the cursor line and saves it for
reinsertion. This can be used to move pictures up and down the
screen, one line at a time.

5 Insert line - this inserts a new line for entry in the same
way as initial input, the existing cursor line and those below
are moved down 1 or 2 lines, depending on the size chosen.

6 Reinsert - reinserts the last deleted line or last line where
the size has been changed, moving other lines down.

7 Change size - allows the size of characters on a line to be
changed via the size menu used on input.

8 Keyboard - displays the 221 defined keyboard characters and
provides access to the character designer (see later).

9 New line - moves the cursor down a line. An alternative for up
or down a line is by selecting overtype and using cursor keys.

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When editing is complete, 0 is pressed to exit. The complete
picture is then displayed. If a suitable printer is available, a
copy of the screen can be obtained by pressing c (for COPY) or e
(for COPY EXP on a +3). Pressing any other key returns to the
main menu.

ENTERING GRAPHICS AND SPECIAL CHARACTERS

In general, entering graphics is easier using the edit menu
option, often entered in black and white and painted later.
However, it is first necessary to initialise a picture and
colour for the first line: select 1 type page, size 1, press
space twice for previous border colour and existing paper/ink
colours (black and white), then press ENTER and EDIT for the
main menu, followed by 2 to edit. The graphics character set and
example pictures are given in the appendices.

In order to become aware of the range of characters and symbols,
it is a useful exercise to type each of the 36 keys (1 to m)
with the following:

    no shift   numbers and lower case letters
    CAPS LOCK   numbers and capital letters
    SYMB SHIFT   normal shift characters except
                                  <= etc. on older Spectrums
    GRAPH   graphics symbols
    EXTENDED   sideways numbers and capitals
    EXTENDED + CAPS LOCK   Gothic capitals
    EXTENDED + SYMB SHIFT   more graphics symbols
    EXT + CAPS LOCK + SYMB SHIFT a few more graphics symbols

Note that, as CAPS LOCK, EXTENDED and GRAPH keys are pressed, C,
E and G flash on the edge of the message box to show the shift
mode. GRAPH overrides the other options.

SAVING A PICTURE (MAIN MENU 4)

1) Press 4; the index is displayed,
the format being shown on the right;

2) select the required page number,
using the cursor keys; press ENTER;

3) the next options govern whether
the picture and the index are saved,
or just the picture. The latter mode
is provided for tapes where a number
of pictures can be typed and saved. Later, the index can be
saved on a different tape.

4) the final action is to type the name when prompted and ENTER.

5) the save then starts. For tape, the usual "Start tape" or
"PRESS REC" message will be given for each save. On saving, the
index entry is changed to have a bright white background. After
saving the program returns to the main menu.
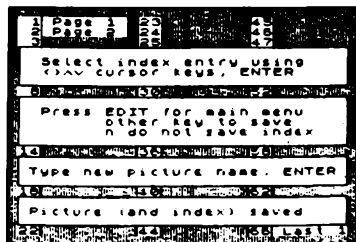
LOADING A PICTURE (MAIN MENU 3)

1) Press 4; the index will be displayed (see SAVING A PICTURE);

2) select the required number, using the cursor keys; press
ENTER to load or EDIT to cancel;

3) the page will be loaded, a message appearing on the screen,
e.g. LOAD info.p1, to show which page is required;

4) the picture will be diplayed then pressing any key returns to
the main menu.

Loading of a picture which is not in the index is carried out
via the utilities menu.

DISPLAY INDEX (MAIN MENU 5)

Selecting 5 on the main menu displays the index. Then any key
can be pressed to return to the menu. The index has 66 entries
(see SAVING A PICTURE). Pictures which have apparently been
saved successfully have a bright white background.

48K AND 128K DISPLAY (MAIN MENU 6/7)

Press 6 for 128K Display and 7 for
48K Display. The DISPLAY MENU shown
on the right appears. Both options
can be used on 128K systems. If 128K
is selected on 48K systems a program
stop will occur with a "Nonsense in
BASIC" message: type RUN to restart
the program.

```
┌─────────────────────────────┐
│   128K/48K  DISPLAY MENU     │
│                             │
│     0 Exit                  │
│     1 Select series         │
│     2 Random access         │
│     3 Edit list             │
│     4 Run list              │
│     5 Slide show            │
│                             │
│ MENU SELECTION  Press number │
└─────────────────────────────┘
```
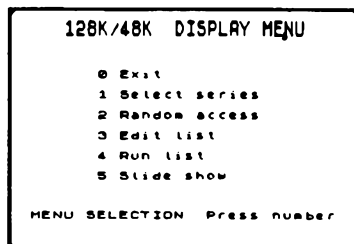
SELECT SERIES (DISPLAY OPTION 1)

1) Press 1; the index will be displayed;

2) select the first required picture and press ENTER;

3) select the last required picture and press ENTER;

No matter what range of entries are selected, a maximum of 6
pages will be read in 48K mode and 29 in 128K mode (the limit on
Spectrum +3): gaps in the index are ignored.

4) select paging mode down, across or opening up from the centre
of the screen by pressing a, b or c (see prompt);

5) select the delay between displays by pressing 0 to 9, for
minimum period, 10, 20, 30 to 90 seconds (see prompt);

6) confirm the displayed modes by pressing any key other than
EDIT to load the pages. EDIT causes a return to the main menu.

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As on all loading, the page number required is displayed e.g. LOAD info.p1: this helps when pictures are on different tapes.

After loading, each picture will be displayed in turn. To stop, hold down the EDIT key to return to the main menu. If the edit or save page options are chosen, the last displayed picture will be available for editing or saving.

Reselection of the display menu allows the same series to be displayed by pressing ENTER, when indicated on the screen, or EDIT to select and read a different series. The same pictures can also be reselected via the Random Access or Slide Show menu options.

RANDOM ACCESS (DISPLAY OPTION 2)

1) Press 2; the index will be displayed;

2) if a previous series has not been loaded, select first and last as for the series. The pictures will be loaded and the index will be displayed again;

2) select the required picture;

The software maintains a list of pictures in memory. When one is selected from the index, it is placed at the top of the list. If it is in memory, it is displayed straight away: if not, it is read in and overwrites the least used picture, at the bottom of the list, if the memory is full (6 pages 48K, 29 pages 128K).

The picture is displayed until any key is pressed: the index is then displayed for the next selection. Pressing EDIT returns to the main menu. The picture can be edited or saved.

The same pictures can be reselected again for Random Access, Slide Show or Series. For the latter, the pictures are displayed across the screen with a delay of 10 seconds when they have been loaded via Random Access.

INPUT OR EDIT LIST (DISPLAY OPTION 3)

1) Press 3; a message will appear requesting selection of one of the four available lists;

2) press 1 to 4 for the list;

3) if the list exists, an entry will be displayed, showing the page number, paging mode and delay between displays (see SERIES 4 and 5). ENTER selects the next entry and EDIT as below;

4) for a new entry or one to be edited, the picture is selected from the index, then display mode and delay selected, as for SERIES. Step 3 is then repeated.

Up to 33 entries can be included in the list and picture selections can be repeated, if required.

Note that there is no delete option but, if a picture is to be omitted, the one for the previous entry should be selected with page across and delay 0.

When the last required entry has been completed, press the e key to end (see prompt). An option is the given to save the index, which contains the lists, by pressing any key except n. The edit can be repeated if the saving step is missed.

RUN LIST (DISPLAY OPTION 4)

Press 4; then, when prompted, select one of the four lists which has been defined. The pictures will be loaded and displayed in turn, according to the defined mode and delay.

To end, hold down the EDIT key. If the list is reselected and another list or series has not been loaded, the pictures can be re-displayed without loading.

SLIDE SHOW (DISPLAY OPTION 5)

Slide show can be used with any loaded series or list. If no pictures are loaded, the run list options are given.

A picture will be displayed until a key is pressed. EDIT returns to the main menu, cursor up selects the previous picture and other keys select the next picture.

SAVING OR LOADING PROBLEMS

Tape loading or saving can be stopped by pressing BREAK. After this, or other stoppages, the program can be restarted by entering RUN, preceded by cursor down and ENTER on 128K systems.

If, for some reason, a failure occurred on saving a picture, an entry may appear in the index. When this is selected for reading a disk or microdrive, the program will stop with an error message. The program can be restarted, as above, and the index entry erased via the Utilities menu.

There are certain difficulties in designing software to run on all types of Spectrums which may make operation seem rather illogical:

a) the method of loading via the index is to prevent a wrong name from being entered, which could cause the program to stop. To ensure that the program works successfully with microdrives, saving an existing entry executes ERASE before SAVE, whereas only SAVE is used for a new index entry. Saving existing files without erase can be via the Utilities.

b) with +3 disks, a file can be overwritten with an automatic back-up copy being produced, so it is better not to use ERASE. However, back-up copies reduce available space.

The naming convention used for the pictures, e.g. info.p1,
info.p12, is to save space as only one info.BAK back-up copy
will be produced, that is for the last saved picture. An
index.BAK is generated.

c) RAMDISCS on the +2 and +3 work in different ways. On the
former, files must be erased before saving but they can be
overwritten on the +3. If the memory is required for different
files, existing ones need to be erased in both cases. The
software arranges for this to be done if a second set of pages
is loaded but, occasionally, with drive errors or misoperation,
things can go wrong and cause the program to stop. It might be
necessary to erase RAMDISC files manually to avoid having to
reload the software - +2 use CAT !, note the names, then ERASE !
"name", or +3 just ERASE "m:".

d) it is difficult to produce a foolproof filing system for use
with tapes, particularly where updating is involved. Two ways of
operation are suggested to avoid problems. The first method is
to load a page to be changed and the last one on a tape via
Random Access: after editing, save the page with a new number at
the end of the tape, then erase the old entry from the index
using the Utilities. The second method is to use a number of
tapes with a small number of pictures on each tape (6 on 48K
Spectrums): load as a Series and, after editing, save all via
the Utilities. Using Random Access changes the order in which
pages are saved, that is the most frequently used pages first:
to avoid this, use Slide Show for displaying pictures or save
each page individually via Save Page.

Failures are bound to occur. If a complex new character set or
picture has been defined, it is advisable to make a second copy.

UTILITIES (MAIN MENU 0)

Pressing 0 on the main menu switches to the utilities menu. This
has various facilities for producing varieties of picture base
systems. The following options are available:

0 Exit returns to the main menu.

1 Load Page; this is used in loading
a picture that is not in the index,
the number being requested. The page
can be saved via the main menu.

2 Load Index, simply loads the index

3 Blank Index, deletes index entries
and defined lists.

4 Save Index; simply saves the index
without erase on disk or microdrive
program versions. If an index needs
erasing, it can be arranged via the
Save Page or Edit List options.

```
UTILITIES MENU
0 Exit
1 Load page
2 Load index
3 Blank index
4 Save index
5 Erase
6 Save 128K
7 Save 48K
8 Save software
MENU SELECTION: Press number
```

5 Erase; this first displays the index and the appropriate entry
is selected in the usual way. Four options are then given: 1
erase a file from disk or microdrive; 2 delete an entry from the
index; 3 both erase file and delete from index; 0 cancel. The
index is not saved (see Save Index).

6 Save 128K and 7 Save 48K; these save pages that have been
loaded as a series or via the random access option. Again, no
erase is involved. These options do not save pictures loaded as
lists, as the same picture may be included more than once, which
would lead to stoppages with certain drives.

8 Save Software - see page 3.

An example of using the above is creating a new empty picture
base by selecting Blank Index then Save Software.

A second example is creating a picture base with some of the
pages from the existing one: load the required pictures via
Random Access; save via Utilities option 6 or 7; delete unwanted
index entries then save the index. For tapes load a Series and
save pages in the same way or as separate pages.

COPYING SCREENS TO A PRINTER

Screen dumps can be obtained when the full screen display is
given after editing, or on a random access display.

The c key is pressed to execute the Spectrum COPY command. When
a suitable printer is connected, 22 lines will be copied i.e.
not the last 2 lines. For the +3, e can be pressed for COPY EXP
to produce a full screen shaded copy (see +3 manual page 174).

SAVING SCREENS AS CODE

This facility is not incorporated but the program can be
modified to do it. The COPY command is executed via line 1000
and this can be modified. For disks and microdrives all that is
necessary is to insert SAVE "screen" SCREEN$ or SAVE
*"m";1;"screen" SCREEN$, followed by RETURN.

SAVE SCREEN$ with tape deletes the last two lines but the
following BASIC can be inserted: FOR i=16384 TO 23295: POKE
i+30616,PEEK i: NEXT i: SAVE "screen" CODE 47000,6912: RETURN -
then load via CLS: LOAD "" SCREEN$. The poking takes about 4
minutes. The memory used is that for a 48K Series: an existing
48K series or list must be reloaded after using the memory for
other purposes or the software will crash.

CHARACTER DESIGNER

The character designer is accessed via the main menu Edit Page
option. If a picture is not being created select Type Page, then
 size, SPACE twice for same colours, ENTER for new line, EDIT
for main menu, press 2 Edit Page, then 8 Keyboard.

With the keyboard displayed, select the character to be viewed
or edited: as usual, the CAPS, EXT and GRAPH lock mode will be
displayed on the edge of the message box. The enlarged character
will appear in the top editing box and a menu displayed.

1 Change; using cursor keys to move around the box; SPACE
inserts white, letter keys black. ENTER inserts the new
character in the keyboard memory, EDIT does not.

2 Ref Char; a cursor flashes in the
bottom box, where the next selected
character is displayed;

3 Use ref; transfers the reference
character into the editing box.

5 Invert; changes black to white and
white to black.

6 Rotate; rotates the character 90
degrees anti clockwise.

0 End; returns to keyboard display.
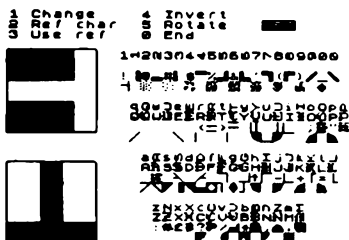
After each change, the program returns to the keyboard display,
where ENTER is pressed to end the session. A prompt is then
given to press any key to save the index or n to avoid the save.

For those who wish to use their own character designs for other
purposes, the character set is stored between addresses 63320
and 65367, with character code 33 starting at 63584, 34 at 63592
etc. The character codes are given in the appendices.

VIDEO RECORDING

Providing the particular Spectrum does not generate too much
interference, reasonable quality videos can be produced by
connecting the TV lead to the video aerial socket. The main
problem is that the video output channel is likely to be the
same as the Spectrum signal, causing distortion: the video
channel and associated TV channel can usually be changed.

DATABASE FORMS AND OPERATION

A blank form or table should be designed and saved then loaded
for each new entry. It is more appropriate to use different
colours for boxes or columns than lines, which can easily be
overwritten. Data entry should be via Edit Page and Overtype. To
create blank tables, use Type Page for headings and the first
line then, with Edit Page, delete the first line and use
reinsert to duplicate the lines.

On 128K systems, 6 pages can be loaded via 48K mode, then others
via 128K mode. The 6 in RAM will still be displayed if chosen
from the index but will not be overwritten.

KEYBOARD DEFINITION

N EN
C EC
S ES
G ESK

KEY SHIFT

N No shift

C CAPS

S SYMB

G GRAPH

E EXTENDED

K CAPS LOCK

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

CHARACTER CODES

KEY	N	EN	C	EC	S	ES	G	KES
1	49	177	..	...	33	161	129	...
2	50	178	..	...	64	162	130	...
3	51	179	..	...	35	163	131	...
4	52	180	..	...	36	165	132	...
5	53	181	..	...	37	165	133	...
6	54	182	..	...	36	166	134	...
7	55	183	..	...	39	167	135	...
8	56	184	..	...	40	168	136	...
9	57	185	..	...	41	169	137	...
0	48	176	..	...	95	223	128	...
Q	113	241	81	209	..	...	154	...
W	119	247	87	215	..	...	...	...
E	101	229	69	197	..	...	142	...
R	114	242	82	210	60	188	155	...
T	116	244	84	212	62	190	157	...
Y	121	249	89	217	..	91	...	219
U	117	245	85	213	..	93	158	221
I	105	233	73	201	..	...	146	...
O	111	239	79	207	59	187	152	...
P	112	240	80	208	34	162	153	...
A	97	225	65	193	..	126	138	254
S	115	243	83	211	..	124	156	252
D	100	228	68	196	..	92	141	220
F	102	230	70	198	..	123	143	251
G	103	231	71	199	94	125	144	253
H	104	232	72	200	45	222	145	...
J	106	234	74	202	45	173	147	...
K	107	235	75	203	43	171	148	...
L	108	236	76	204	61	169	149	...
Z	122	250	90	218	58	186	...	...
X	120	248	88	216	96	224	...	...
C	99	227	67	195	63	191	140	...
V	118	246	86	214	47	175	159	...
B	98	226	66	194	42	170	139	...
N	110	238	78	206	44	172	151	...
M	109	237	77	205	46	174	150	...

CODES

Range	Characters
32- 63	!"#$%&'()*+,-./0123456789:;<=>?
64- 95	@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑_
96-127	£abcdefghijklmnopqrstuvwxyz⌐□
128-159	◆┤▒░▓▒░▓⁄◥◣◢◤◸◹◿◺▲◤▮┗◀
160-191	▄ ▀▄┳▟ ⌐◣◥◤◢ graphics ┗▶
192-223	▃ABCDEFGHIJKLMNOPQRSTUVWXYZ▙▜▛
224-255	✱graphics ▌▚

	ES	A		ES	8		ES	4		ES	7
	ES	P	[	ES	3		Gr	S	]	ES	1
	ES	O		ES	6		ES	2		ES	5

	ES	H		Gr	I		ES	F		ES	T
[	Gr	R		Ge	D	]	Gr	T		ES	D
	ES	J		Gr	U		ES	G		ES	S
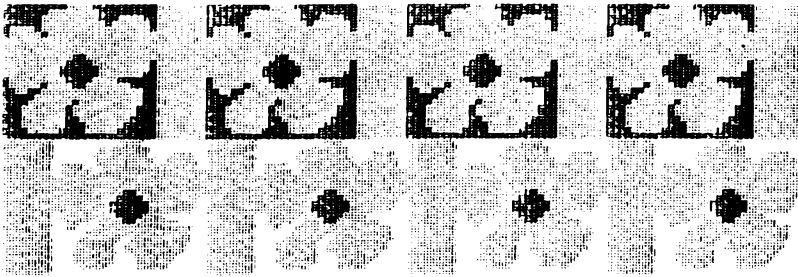
	ES	V		ES	B		ES	N
	ES	M		Gr	F		Gr	C
	Gr	V		Gr	B		Gr	N
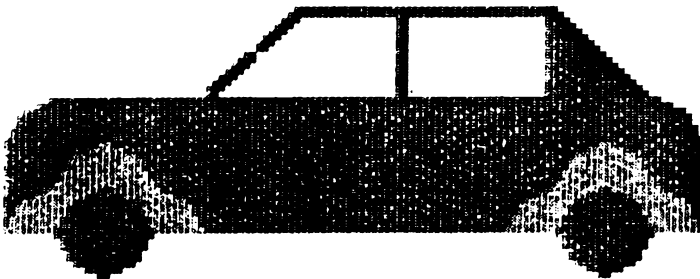
	Gr	O		Gr	P		ES	9
	Cl ES	Y		Cl ES	U		Gr	D

	ES	4		ES	7

ES EXTENDED & SYMB SHIFT, Gr GRAPH, Cl CAPS LOCK

ROYBOT ORIGINAL SOFTWARE

COMPLETE MACHINE CODE PACKAGE

*Assembler, Disassembler, Debugger, Tester,
Teach Yourself Machine Code Package. Example
programs for games screen operation and
copying tapes.*

SPECCIFAX PICTURE BASE SYSTEM

*Type pictures with 220 user definable
keyboard characters or graphic symbols in 4
sizes and any colour. Access pictures like a
database. Display as a slide projector,
random access or a repeating series.*

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copy cartridges, reorganise cartridges.*

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*Random access files, screen editor, sorting
and searching. Write your own software.*

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