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# ORIC AT

## THE ORIC ATMOS 48K

The new computer that takes a remarkable step forward in home computer technology. Which is hardly surprising when you consider it's a development of the Oric-1, the UK computer that was voted 'Best of the Year' in France.

The original best-selling Oric-1 (150,000 already sold) has been completely re-styled, and refined to include a number of important advances.

### USABLE MEMORY

Believe it or not, computers often suffer from amnesia.

99% start off with large enough memories, but operating functions like text, colour, sound and more particularly high resolution graphics, take large bytes out of them. Leaving very little 'usable' memory for programming and games.

Not so the new Oric Atmos 48K.

This is the one home computer that takes these normal working functions in its stride.

Unlike other home computers it uses the highly sophisticated serial attribute handling method used by Viewdata and Teletext. So these attributes are stored on the screen alongside the data, instead of taking up storage space in the memory.

Thus the Oric Atmos never offers less than a healthy 37K of usable memory - even when the new colour printer and disc drive unit are attached. (Technical buffs see details overleaf).

So it rivals the performance of the supposedly larger, more expensive Commodore 64K, which loses 26K of its "elephantine" memory in high resolution graphics.

It beats its immediate competitors like the Sinclair Spectrum, Dragon 32K, Vic 20 and Atari 600.

It beats the Lynx 48K, which costs over a third more yet loses 34K.

It even beats the Acorn Electron and the BBC Micro which costs more than twice as much, yet loses 23K in high resolution graphics.

And while this may surprise you, it's totally in keeping with a company recognised in the computer industry for performance and innovation.

### COLOURS

The Atmos offers 8 for graphics and text and 8 background colours. You can also 'paint over' the graphics area and mix text freely with colours and shapes. Areas can be filled with combinations of the 8 colours to effectively produce a multitude of shades and colours.



# M O S 4 8 K



## SOUND

Most other computers don't have speakers and rely on a television set to produce the sound. The Atmos gives you a powerful loudspeaker and internal amplifier – which can be connected to your hi-fi system to produce sound quality on a par with the £400 BBC Micro. The Atmos measures up to the most sophisticated machines, and is even able to synthesize the sound of musical instruments.

## KEYBOARD

One important advance on the original Oric is the professional keyboard. The Atmos now gives you a full response 'typewriter' style keyboard. The keyboard layout is standard and so it's easy to use.

## LANGUAGE

The Oric uses an extended version of Microsoft BASIC. This is now generally recognised as the best and simplest computer language.

## DESIGN

The new Oric Atmos includes many special features.

- The Atmos has ports where you can immediately 'plug-in' a wide range of additional peripherals to give you a comprehensive and professional system.
- The Atmos provides a text mode of 28 rows by 40 columns. The sharpness of the graphics is provided by a resolution of 200 points by 240 points. You will also be able to link up to the Prestel/Viewdata system with a suitable modem.
- Unlike most others, the Atmos is compatible with most domestic cassette players.
- The Atmos has a device called a 'warm reset control', which ensures that you can immediately start again if you make an operational mistake – *without* entirely losing your program. Many other computers don't give you this facility.
- The Atmos comes complete with all the leads you need, saving you the frustration of shopping around again, before you can begin using your computer.
- You may want to extend the facilities of your Atmos. No problem! The Four Colour Printer and Micro Disc system simply plug-in, and can be used immediately. Each unit is designed in the same colours, and are illustrated and described on the following pages. There is also a full range of software, giving you a choice of games, educational and business programs.

## ORIC FOUR COLOUR PRINTER

Your Atmos will soon become invaluable in producing information and details which you will want to keep in a printed format rather than viewing it constantly on a TV monitor. It's both simple and inexpensive to add an Oric Colour Printer to your system.

The Oric Four Colour Printer is compact and styled to integrate perfectly with the new Oric Atmos.

Precision engineering has produced a machine that will give you an excellent hard print-out in four colours on plain paper. So you don't need to buy the expensive heat-sensitive paper required by many other printers.

The printer produces a high quality print-out and will print 40 or 80 columns at 12 characters per second.

The printer uses rolling ballpoint dispensers to print red, green, blue and black.

Like the plain paper – the coloured pens are also inexpensive and easy to change. You'll find them available at most computer retailers.

The Oric Printer has a built-in power supply and comes complete with its own lead, which will plug directly into your Atmos computer (or any other computer with a centronics interface). It can be used equally well – with either the 48K or the smaller 16K Atmos.



4 C O L O U R

M I C R O



P R I N T E R



D I S C

## THE ORIC MICRO DISC

Where does the Oric Micro Disc score over the normal audio cassette tape?

Quite simply it stores much more information (programs, games etc.) and you can locate each section in a fraction of the time.

The Micro Disc uses the small 3" format discs (probably the most reliable floppy disc medium). These are convenient to use and easy to store. Each disc is permanently housed in a protective discette (envelope). This means that the discs are never handled directly, which makes them ideal in schools and for carrying in briefcases and shirtpockets.

The discette is automatically loaded into the main unit within seconds. This medium of recording and storing programs is therefore ultra reliable.

The 3" disc can carry an enormous amount of information and has the same capacity of the larger, more costly 5 1/4" floppy disc. The unit is 'user friendly', which means your Atmos computer will instruct the Micro Disc to locate any part of an individual disc - fast.

The Oric Micro Disc will add an extra, powerful dimension to your Atmos computer - radically extending its performance.

A wide choice of advanced Oric software is available on this 3" micro disc format - and more is becoming available week by week.

## TECHNICAL SPECIFICATIONS

Oric offer 16K and 48K Atmos models, both featuring 'typewriter' style keyboards and we've included detailed specifications of the computer's capabilities for you below.

You can connect the MicroDisc and Four Colour Printer to the Atmos to create a professional computer system. If you'd like to know the full details of the Atmos and the Oric peripherals—read on...



### ATMOS SPECIFICATIONS

#### CPU/Memory

6502A MicroProcessor with 16K ROM containing BASIC interpreter and operating system. RAM uses state of the art dynamic memories for high board density and low power dissipation. 16K Byte or optionally 48K Byte. 48K model contains 64K of RAM with 16K overlaid by ROM. External control signal allows the use of full 64K RAM or may be used to externally increase ROM.

#### Keyboard

57 moving keys with tactile feedback. Full upper and lower case with correctly positioned space bar. Full typewriter pitch. Key layout is standard computer type with ESC, CTRL, RETURN and additional cursor control keys. All keys have auto repeat.

#### Display

Will drive a PAL UHF colour or black and white television receiver. Approximately Channel 36. RGB output also provided on DIN socket with 270° configuration.

#### Screen—Character Mode (Memory Mapped)

28 lines of 40 characters producing display very similar to Teletext. Character set is standard ASCII which is enhanced by the addition of 80 user definable characters. ASCII characters may also be re-defined as these are down loaded into RAM on power-up. Serial attributes are used to control display features, as in Teletext, and take up one character position. All remaining characters on that line are affected by the serial attribute until either the line ends or another serial attribute. Display features are:—

- Select background colour (paper) from one of eight.
- Select foreground colour (ink) from one of eight.
- Flash characters on and off approximately twice a second.
- Produce double height characters (even line top, odd line bottom).

e. Switch over to user definable character set. This feature is used to produce Teletext style colour graphics which does not require any additional RAM to operate.

Available colours are Black, Blue, Red, Magenta, Green, Cyan, Yellow and White. Each character position also has a parallel attribute, which may be operated on a character by character basis, to produce video inversion. The display has a fixed black border.

#### Screen—Graphics Mode (Memory Mapped)

200 pixels vertically by 240 pixels horizontally plus 3 lines of 40 characters (same as character mode) at the bottom of the screen to display system information and to act as a window on the user program while still viewing the graphics display. Can also be used to input direct commands for graphics and see effect instantly without having to switch modes. Graphics display operates with serial attributes in the same way as characters except that the display is now considered as 200 lines by 40 graphics cells. Each graphic cell is therefore very flexible by having 8 foreground and 8 background colours and flashing patterns. The video invert parallel attribute is also useable in this mode. ASCII characters may be 'painted over' the graphics area thus enabling the free mixing of graphics and text.

#### Sound

Uses internal loudspeaker and amplifier and can also be connected to external Hi-Fi system via a DIN connector. A three channel sound synthesizer (The General Instrument 8912) as used in arcade games machines which can produce musical notes from sub-sonic to supersonic frequencies. Envelope of sound output is programmable and can be used to synthesize various musical instruments. Pseudo Random Noise generator (providing a hissing sound can be mixed into each channel). Provides interesting sound effects for video games.

#### Sound Commands

Three tones can be produced directly from the keyboard.

- A high beep when an alphanumeric key is pressed.
- A low beep when a special key is pressed (e.g. Delete, Carriage Return).
- A bell tone when the control G key is pressed.

The user can switch these sounds off as desired. There are four pre-programmed sound commands for use within programs. These are:—

- PING, produces a bell-like tone, is also used as control G tone.
- SHOOT, simulates a gunshot.
- EXPLODE, creates the sound of an explosion.
- ZAP, produces a space-invader 'laser' sound.

To facilitate the creation of other sounds there are three general purpose commands: SOUND, MUSIC and PLAY. SOUND has a range of 15Hz to 62kHz. MUSIC will play notes within a seven octave range. Up to 3 voices can be used at one time.

#### Cassette Interface

Connect via DIN socket. Uses Tangerine

format which has been field proven over 4 years and thousands of systems. Operates at super reliable 300 baud or reliable super fast 2400 baud. A tone leader allows tape recorders' automatic level control to stabilise before first recording filename and then dumping program/data with parity. At the end of recording several check sums are recorded which will be checked on loading to verify correct operation.

A Schmitt trigger circuit is used on the tape input to remove noise. The Tangerine format is so good it is the one other manufacturers are copying. All types of information may be saved such as programs, data, arrays, blocks of memory, screen displays. After saving, correct recording may be verified before deleting information in memory. Remote motor control of tape recorder is provided; essential for the loading and saving of data files.

Available commands are CLOAD, CSAVE (for programs and memory dumps) STORE, RECALL (for arrays). Both programs and arrays may have a filename up to 16 characters. Arrays may be string integer or real. Various command extensions can be used such as S for slow speed, V for verify (CLOAD and CSAVE only) AUTO for autorunning of programs, A and E for start and end of memory dumps.

#### Expansion Port and Micro Drive Interface

Full data, address and control information for the 6502A Micro Processor, for connection of add-ons. Can also be used for user designed hardware interfaces. Useful control lines allow RAM and ROM to be externally expanded (ideal for adding ROM cartridges).

#### Printer Port

Standard Centronics parallel interface allows connection of a multitude of different types of printer from very cheap thermal types to high speed matrix printers or wordprocessors quality daisywheel printers.

#### Reset

Machine resets to character mode on power up and clears program memory. A key on the base of the machine provides a warm start which will return to command mode (after a program crash or never ending loop) without destroying program or data.

#### Mathematical Operations and Functions

The standard +, -, ×, ÷ are available as are the functions, sine, cosine, tangent and arctan, exponential, log, absolute value, integer value, sign and square root. Full algebraic precedence is used to ensure that calculations are performed in the correct order. There are also functions to display the amount of free memory and the position of the cursor. PEEK and POKE allow direct access into memory.

The boolean operators of AND, OR and NOT are available as are relational operators: =, <, >, <> (not equal) <=, >=. Machine code subroutines may be called with the USR command. User defined functions are available using DEF-FN and program data may be manipulated using DATA, READ and RESTORE, ON GOSUB and ON GOTO allow programmed jumps to a choice of locations.

All mathematical functions are accurate to 9 digits with a range of between 2.93874 × 10<sup>-39</sup> to 1.70141 × 10<sup>38</sup>.

An immediate mode allows the computer to be used as a calculator.

String Operations and Functions

Strings may be up to 255 characters in length. There are a number of functions to manipulate strings: ASC, CHR\$, LEFT\$, LEN, MID\$, RIGHT\$, TAB, VAL. Strings may be concatenated (joined together) using +. Strings may be compared using, =, <, >, =, >, < >.

Variables

Variable names may be of any length, although only the first two characters are acted upon. They may consist of combinations of the letters A-Z and numbers 0-9. The following suffixes may be applied to variable names.

- \$ Indicates a string variable
- % Indicates an integer variable (-32768 to +32767).

No Suffix Indicates a normal floating point variable.

Arrays may have up to 255 dimensions and may be integer, floating point or strings. Arrays are named as for variables (see above).

Dimensions

Height: 52mm                      Width: 280mm  
 Depth: 175mm                      Weight: 1.1Kg

BASIC Keywords

ABS	AND	ASC
ATN	CALL	CHAR
CHR\$	CIRCLE	CLEAR
CLOAD	CLS	CONT
COS	CSAVE	CURMOV
CURSET	DATA	DEEK
DEF	DIM	DOKE
DRAW	EDIT	END
EXP	EXPLODE	FALSE
FILL	FN	
FOR...TO...(STEP) NEXT	FRE	
GET	GOSUB	GOTO
GRAB	HEX\$	HIMEM
HIRES	IF...THEN...(ELSE)	
INK	INPUT	INT
KEY\$	LEFT\$	LEN
LET	LIST	LLIST
LN	LOG	LORES
LPRINT	MID\$	MUSIC
NEW	NOT	ON
OR	PAPER	PATTERN
PEEK	PI	PING
PLAY	PLOT	POINT
POKE	POP	POS
PRINT	PULL	RECALL
READ	RELEASE	REM
REPEAT	RESTORE	RETURN
RIGHTS\$	RND	RUN
SCRN	SGN	SHOOT
SIN	SOUND	SPC
SQR	STOP	STORE
STR\$	TAB	TAN
TEXT	TROFF	TRON
TRUE	USR	VAL
WAIT	ZAP	



**FOUR COLOUR  
 PRINTER SPECIFICATIONS**

Printer/Plotting system	- Ball Point Pen, 4 colour
Plotting speed: (horizontal)	- 52mm/sec (2.05ips)
(vertical)	- 73mm/sec (3.08ips)
Printer Speed	- 12 characters per second
Resolution	- 0.2mm/step (0.00787 inch)
Effective plotting range	- 96mm (3.804 inch) x axis, divided into 480 steps. (No limit in y direction)
Characters per line	- 80 or 40 text mode (determined by software in graphics mode)
Characters per line	- INT (480/n+1)*6 for 0=n=15
Accuracy: (repetition)	- 0.2mm max
(movement)	- 0.3mm max
(distance)	- 0.5% max (x-axis) 1% (y-axis)
Pen life	- 250 metres (825 feet)
Parallel interface	- 8-bit parallel Uses STROBE and ACKNOWLEDGE
Temperature: range	- 18.3 to 35°C (65 to 96°F)
storage	- -40 to 71°C (-40 to 160°F)
Humidity range	- 10% to 80% relative non-condensing
Power supply	- Switching power supply input 100-120 VAC 200-240 VAC
Dimensions	- 10¾" wide 6⅞" deep 2½" high



**MICRO DISC SPECIFICATIONS**

Formatted Capacity - 160K bytes per side

(double density as standard) No. of Tracks - 40 (80 available as option at a future date)

No. of Sectors - 16

Bytes per Sector - 256

Transfer Rate - 250K Bits/Sec

Supports up to 599 files per side, four drives single or double sided, 40 or 80 track. User definable configuration allows mixing of drive types including 5¼" (five and a quarter inch).

Extensive wild card facilities.

Copy allows merging of basic and machine code files.

Utilities

The utilities are as follows:

- |            |                                    |
|------------|------------------------------------|
| 1. Backup  | Copy a whole disc                  |
| 2. Copy    | Copy a file to another             |
| 3. Del     | Delete a file allowing wildcards   |
| 4. Dir     | Display directory listing          |
| 5. Drv     | Set the default drive number       |
| 6. Format  | Format and initialise a disc       |
| 7. Load    | Load a file (code data or basic)   |
| 8. Protect | Change protect status of file      |
| 9. Recall  | Recall a basic array from a file   |
| 10. Ren    | Rename a file                      |
| 11. Save   | Save a file (code, data, or basic) |
| 12. Store  | Store a basic array as a data file |
| 13. Sys    | Change system configuration.       |

Prices and data correct at time of going to press. Specifications on the above models may change without notice.



Coworth Park, London Road, Ascot, Berkshire SL5 7SE England  
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