

Black (RISC OS)

ROM and Disc Structure Functional Specification

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History

24/10/94 MC Issue 1 prepared for AMR. Spreadsheet added as a text table to this Impression Style document.
 20/3/95 MC Updated for Registered Developer pack.

Product Overview

RISC OS Black includes developments by its project team of many parts of what was RISC OS 3.50, and incorporates some developments started outside Black, such as better JPEG support, PCMCIA support.

This document defines the contents of the RISC OS Black ROMs and accompanying discs. It is one of a family of functional specifications defining the software developments to be undertaken by the 'Black' project.

The RISC OS Black software deliverables are:

OS ROM	(Engineering status only - never to be audited or published) 2MB ROM image containing core OS. This ROM image will have the same overall contents as the existing RISC OS 3.5 ROMs fitted to the RISC PC, ie. contain no applications such as !Printers, !Configure, etc. The only objective in preparing this 2MB ROM set is to support hardware development, allowing them to perform tests, eg. in the environment chamber, without bulky 4MB EPROM carrier boards.
OS + Apps ROM	4MB ROM image containing the OS ROM image plus many applications and resources.
Rem. Apps. HD	Image of hard disc containing remaining non-ROM apps and resources.
Network setup discs	A set of 1.6MB ADFS format floppy discs containing software to be copied to a network fileserver to support booting and operation of network-only machines.

The Risc PC will have the OS and some apps in a 4MB ROM and provide remaining applications and resources on hard disc or network (initially copied from floppy discs).

Concepts And Definitions

RISC OS Black is being developed from the Medusa/RISC PC software. Many software components are therefore of the same size and location as they are in RISC OS 3.5. From the point of view of arranging the RISC OS Black software in ROM and on disc, the main differences are:

- * RISC OS Black ROM sets used for production will be 4MB only, whereas RISC OS 3.5 ROM sets are 2MB.
- * It is possible that some models may be supplied from time to time without a hard disc for network use only. A set of floppy discs will be supplied from which a network administrator will copy the non-ROM applications to a fileserver to support this
- * Several existing components will have grown in size to accommodate new Black developments, eg. the SpriteExtend module to implement JPEG support. More details about such developments and size targets are described in accompanying specifications.
- * Some new components developed by Black - eg. PCMCIA modules - or other projects - will be incorporated into RISC OS Black. Notable examples from other projects include Aquarius modules, CDFS with !CDPlayer and !PhotoView, Acorn Access modules.

4MB ROM Space Use

Fitting machines with 4MB ROMs rather than 2MB ROMs adds cost to the bill of materials. This extra cost was accepted in order to make 2MB RAM machines much more usable than they would have been with 2MB ROMs. This improved usability comes from more executable memory at run-time, not extra storage at off-time. The priorities for filling the

'extra' 2MB ROM are therefore to place code in ROM which will save the use of RAM as much as possible, especially in the critical case where a typical large application is being used to edit a substantial document, then print it out. It is therefore proposed to use most of the 'extra' ROM space for shared resources, which save RAM when any client application is running in RAM.

The main components filling the 'extra' 2MB in the 4MB ROMs are:

- * !Printers (with all associated modules)
- * !Alarm, !Chars, !Draw, !Edit, !Help, !Paint
- * Aquarius 'ToolBox' run time support modules
- * CDFS
- * PCMCIA support modules
- * Acorn Access modules
- * Full 'Internet' module replacing 'InternetA' module
- * Free space for future expansion

Some ROM space is left free for future expansion.

Product Organisation

The contents of the RISC OS Black software deliverables are specified in detail in the spreadsheet attached to this document as Appendix A.

The basis of this spreadsheet is to specify the location of software in terms of components which will be perceived by the user as single items. Thus, for example, most applications are listed as single software components, the myriad of individual files within them in general being lumped together as one component. The advantage of this approach is that it avoids making this specification too prescriptive for other RISC OS Black developments. For example, if to fix a bug during audit a 100 byte file has to be added to !Maestro, that is of no relevance to the level of design specified here.

Software work

Between RISC OS 3.5 and RISC OS Black, a number of software components are to be moved in total from disc (RAM) to ROM, as specified elsewhere in this document.

A few components will need some development to allow them to be put in ROM:

!Printers

!Printers will have to be modified, to save its configuration files to a directory 'Choices:Printers' on disc or net, together with any other changes necessary to make it execute from ROM. This must include the ability to place !Printers updates on disc/net so that updated software is loaded into RAM and used in preference to ROM components.

Note that in the case of client machines booted from net (ie. network-only machines) this means that only the IT coordinator will be able to 'Save choices' from !Printers.

To meet these requirements, the proposal is as follows:

- 1) Place the !Printers structure, excluding the printer modules/dumpers, in ROM via ResourceFS, at Resources:\$.Apps.!Printers ;
- 2) Place the printer modules/dumpers in ROM as standard modules ;
- 3) Merge the main BASIC !RunImage and the BASIC 'back ends' into one BASIC program (overlay of the back ends is inappropriate for running from ROM) ;

- 4) Execute !RunImage via a small !RunLink program (cf RISC OS 3.1 ROM apps), so that it really is run in ROM, not loaded into RAM ;
- 5) Use the directory <Choices\$Dir>.Printers for user configuration/updates.

The !Printers code then refers to two system variables to read/write files at the correct places:

Printers\$Path will normally be set to scan Choices:Printers followed by Resources:\$.Apps.!Printers. This can only be used for reads, and will ensure that user configuration/updates take precedence.

Choices\$Write will be referenced such that writes are made to the directory <Choices\$Write>.Printers. User configuration settings of !Printers (eg. new paper sizes) will create the appropriate files in <Choices\$Write>.Printers automatically.

To update parts of !Printers, the user can create subdirectories Modules, Palettes, PDumpers, ps, etc. in <Choices\$Dir>.Printers as necessary and place updates there. If !RunImage itself is to be updated, then this can be placed in <Choices\$Dir>.Printers.

The main risk of this change to !Printers is finding all the file read/writes and ensuring they use the appropriate paths. Testing will need to ensure that configuration and updates work properly.

(MJS 19-10-94)

!Alarm

!Alarm will have to be modified to save its Alarm files (by default) to a directory 'Choices:Alarm' on disc or net.

Messages

Messages module messages will be extended to include those for, among other things, PCMCIA and CDFS messages - removing the need for the PCMCIAResources and CDFSRes modules.

Internationalisation

The internationalisation of CDFS, Internet, and Acorn Access modules (ShareFS, Freeway, EconetA) will be checked and completed as appropriate.

Patches

The same application patches (in the Utilities.Patches directory) will be provided with RISC OS Black as RISC OS 3.5. The installation obey files and applications will be checked to ensure they will continue to work with RISC OS Black - eg. locating Choices: within !Boot in a way which will work for network-only machines.

User Interface

Apps Icon Viewer

The Apps icon viewer will display both the applications stored in ROM AND those stored in the directory 'Apps' next to the boot application (on hard disc machines, \$.Apps). On standard machines this will be the same set of applications as RISC OS 3.5, plus !Printers (which was in \$.Printing on 3.5, and will be in the 4MB Black ROMs). The viewer will not distinguish between ROM and disc applications.

Hard Disc Directory Structure

Machines fitted with Black and hard discs will have a directory structure largely unchanged from RISC OS 3.5. The only changes will be removals of files to ROM, a few extra choices directories, as described above, and detailed changes described in other Black functional specifications such as 'Black Support For Network-Only Machine Functional Specification', 1303,017/FS.

'Network setup discs' (Floppy) Structure

The 'Network setup discs' are a set of 7 1.6MB floppy discs, containing the items classified as 'D' or 'E' in the Location column of the spreadsheet in Appendix A.

The disc contents are:

Disc	Label Title	Contents
1	Apps & Diversions	Apps and Diversions directories, with contents
2	Printing & Utilities	Printing and Utilities directories, with contents
3	Sound & Tutorials	Sound and Tutorials directories, with contents
4	Network Setup Disc 1	!ARMovie, !MchConfig, both in root directory
5	Network Setup Disc 2	!ArmBoot, with !ARMovie removed, in root directory
6	Network Setup Disc 3	!ShareBoot, with !ARMovie removed, in root directory
7	Emergency Boot Disc	!Boot, cut down version (see 1303,017/FS), in root directory

External Dependencies

Some of the components to be included in RISC OS Black are produced by other projects or companies.

Appendix A: RISC OS Black Structure Spreadsheet

RISC OS Black Structure Spreadsheet		Issue C					
Components changed: *** = major devlpmnt. ** = minor devlpmnt. * = bugfix/any update							
Objects in RISC OS 3.5 ROM	3.50 Module Size	Black Module Size (est.)	Location	2MB ROM Spac	4MB ROM Space	HD Space	Net FD Space
Module Title							
UtilityModule ***	166660	173828	A (2MB & 4MB ROMs)	173828	173828	0	0
Podule *	7236	7236	A (2MB & 4MB ROMs)	7236	7236	0	0
FileSwitch *	51448	51548	A (2MB & 4MB ROMs)	51548	51548	0	0
ResourceFS	3148	3148	A (2MB & 4MB ROMs)	3148	3148	0	0
Messages ***	485148	497436	A (2MB & 4MB ROMs)	497436	497436	0	0
MessageTrans *	3572	3572	A (2MB & 4MB ROMs)	3572	3572	0	0
TerritoryManager *	6904	6904	A (2MB & 4MB ROMs)	6904	6904	0	0
UK	6480	6480	A (2MB & 4MB ROMs)	6480	6480	0	0
WindowManager *	81460	81560	A (2MB & 4MB ROMs)	81560	81560	0	0
Desktop **	2984	8104	A (2MB & 4MB ROMs)	8104	8104	0	0
Keyboard (replaced by PS2Driver)	1628	0	A (2MB & 4MB ROMs)	0	0	0	0
Mouse *	880	880	A (2MB & 4MB ROMs)	880	880	0	0
TaskManager *	14220	14220	A (2MB & 4MB ROMs)	14220	14220	0	0
ADFSFiler **	15964	16064	A (2MB & 4MB ROMs)	16064	16064	0	0
ARM	904	904	A (2MB & 4MB ROMs)	904	904	0	0
BASIC *	52624	52624	A (2MB & 4MB ROMs)	52624	52624	0	0
BASICTrans	3396	3396	A (2MB & 4MB ROMs)	3396	3396	0	0
BufferManager	4220	4220	A (2MB & 4MB ROMs)	4220	4220	0	0
ColourTrans *	16380	16380	A (2MB & 4MB ROMs)	16380	16380	0	0
Debugger	8820	8820	A (2MB & 4MB ROMs)	8820	8820	0	0
DeviceFS	8088	8088	A (2MB & 4MB ROMs)	8088	8088	0	0
DMAManager *	5812	5812	A (2MB & 4MB ROMs)	5812	5812	0	0
DragASprite *	4280	4380	A (2MB & 4MB ROMs)	4380	4380	0	0
Draw *	10100	10100	A (2MB & 4MB ROMs)	10100	10100	0	0
BHCEconet	2176	2176	A (2MB & 4MB ROMs)	2176	2176	0	0
FileCore ***	63712	69856	A (2MB & 4MB ROMs)	69856	69856	0	0
ADFS ***	29188	32260	A (2MB & 4MB ROMs)	32260	32260	0	0
KamFS	1684	1684	A (2MB & 4MB ROMs)	1684	1684	0	0
Filer **	29752	29852	A (2MB & 4MB ROMs)	29852	29852	0	0
FilerSWIs	752	752	A (2MB & 4MB ROMs)	752	752	0	0
FSLock	4912	4912	A (2MB & 4MB ROMs)	4912	4912	0	0
FontManager *	59496	59696	A (2MB & 4MB ROMs)	59696	59696	0	0
FPEmulator	30008	30008	A (2MB & 4MB ROMs)	30008	30008	0	0
Free	5112	5112	A (2MB & 4MB ROMs)	5112	5112	0	0
GameModes	88	88	A (2MB & 4MB ROMs)	88	88	0	0
Hourglass *	2152	2252	A (2MB & 4MB ROMs)	2252	2252	0	0
HC	1068	1068	A (2MB & 4MB ROMs)	1068	1068	0	0
International	13080	13080	A (2MB & 4MB ROMs)	13080	13080	0	0
IRQUtils	84	84	A (2MB & 4MB ROMs)	84	84	0	0
DisplayManager **	7228	7328	A (2MB & 4MB ROMs)	7328	7328	0	0

NetFS *	25844	26044	A (2MB & 4MB ROMs)	26044	26044	0	0
NetFiler	8292	8292	A (2MB & 4MB ROMs)	8292	8292	0	0
NetPrint *	8008	8008	A (2MB & 4MB ROMs)	8008	8008	0	0
NetStatus	804	804	A (2MB & 4MB ROMs)	804	804	0	0
NetUtils	84	84	A (2MB & 4MB ROMs)	84	84	0	0
Obeys	2168	2168	A (2MB & 4MB ROMs)	2168	2168	0	0
ParallelDeviceDriver *	3896	4196	A (2MB & 4MB ROMs)	4196	4196	0	0
InternationalKeyboard	5112	5112	A (2MB & 4MB ROMs)	5112	5112	0	0
Pinboard *	17388	17388	A (2MB & 4MB ROMs)	17388	17388	0	0
PipeFS	4324	4324	A (2MB & 4MB ROMs)	4324	4324	0	0
RAMFSFiler	2428	2428	A (2MB & 4MB ROMs)	2428	2428	0	0
ResourceFiler	1844	1844	A (2MB & 4MB ROMs)	1844	1844	0	0
ROMFonts	250004	250004	A (2MB & 4MB ROMs)	250004	250004	0	0
RTCAAdjust	1832	1832	A (2MB & 4MB ROMs)	1832	1832	0	0
ScreenBlanker	2024	2024	A (2MB & 4MB ROMs)	2024	2024	0	0
SerialDeviceDriver *	6184	6184	A (2MB & 4MB ROMs)	6184	6184	0	0
SerialDeviceSupport	1704	1704	A (2MB & 4MB ROMs)	1704	1704	0	0
SerialMouse *	1452	1452	A (2MB & 4MB ROMs)	1452	1452	0	0
ShellCLI	1416	1416	A (2MB & 4MB ROMs)	1416	1416	0	0
SoundDMA ***	2496	5500	A (2MB & 4MB ROMs)	5500	5500	0	0
SoundChannels	5180	5180	A (2MB & 4MB ROMs)	5180	5180	0	0
SoundScheduler *	2040	2140	A (2MB & 4MB ROMs)	2140	2140	0	0
SpriteExtend ***	18768	76800	A (2MB & 4MB ROMs)	76800	76800	0	0
SpriteUtils	1496	1496	A (2MB & 4MB ROMs)	1496	1496	0	0
Squash *	7076	7076	A (2MB & 4MB ROMs)	7076	7076	0	0
SuperSample	2324	2324	A (2MB & 4MB ROMs)	2324	2324	0	0
SystemDevices	3428	3428	A (2MB & 4MB ROMs)	3428	3428	0	0
TaskWindow *	9612	9712	A (2MB & 4MB ROMs)	9712	9712	0	0
WindowUtils	88	88	A (2MB & 4MB ROMs)	88	88	0	0
FilterManager *	1876	1976	A (2MB & 4MB ROMs)	1976	1976	0	0
WaveSynth	2716	2716	A (2MB & 4MB ROMs)	2716	2716	0	0
StringLib	2696	2696	A (2MB & 4MB ROMs)	2696	2696	0	0
Perension	2936	2936	A (2MB & 4MB ROMs)	2936	2936	0	0
SharedCLibrary **	184364	188460	A (2MB & 4MB ROMs)	188460	188460	0	0
Filer_Action **	27512	28536	A (2MB & 4MB ROMs)	28536	28536	0	0
DOSFS ***	43704	44728	A (2MB & 4MB ROMs)	44728	44728	0	0
InternetA (replaced with Internet)	54676	0	A (2MB & 4MB ROMs)	0	0	0	0
Net *	31060	31260	A (2MB & 4MB ROMs)	31260	31260	0	0
BootNet **	1020	1020	A (2MB & 4MB ROMs)	1020	1020	0	0
ColourPicker ***	76568	85784	B (4MB ROMs only)	0	85784	0	0
ScreenModes *	9064	9064	A (2MB & 4MB ROMs)	9064	9064	0	0

Total	2048356						
Spare	48796						

Objects On RISC OS 3.5 Disc

Application, Directory Or File	3.50 File Bytes	Black Bytes (est.)					
!Boot (excluding following contents) ***	30979	30979	C (Hard disc only)	0	0	30979	0
!Boot.Resources.!ARMovie.MovingLine.Byuv11	131072	131072	C (Hard disc only)	0	0	131072	0
!Boot.Resources.!ARMovie (except above file) **	1317065	1306825	C (Hard disc only)	0	0	1306825	0
!Boot.Resources.!Configure ***	201599	206719	C (Hard disc only)	0	0	206719	0
!Boot.Resources.!Fonts (application)	5408	5408	C (Hard disc only)	0	0	5408	0
!Boot.Resources.!Fonts.NewHall	134324	134324	C (Hard disc only)	0	0	134324	0
!Boot.Resources.!Fonts.Sassoon	65405	65405	C (Hard disc only)	0	0	65405	0
!Boot.Resources.!Fonts.Selwyn	45879	45879	C (Hard disc only)	0	0	45879	0
!Boot.Resources.!Fonts.Sidney	35377	35377	C (Hard disc only)	0	0	35377	0
!Boot.Resources.!Fonts.System	55756	55756	C (Hard disc only)	0	0	55756	0
!Boot.Resources.!Scrap **	11989	13231	C (Hard disc only)	0	0	13231	0
!Boot.Resources.!System ***	171592	172092	C (Hard disc only)	0	0	172092	0
!Boot.Resources.Configure.2DTools	11500	11500	C (Hard disc only)	0	0	11500	0
!Boot.Resources.Configure.CtrMonitor *	5608	5608	C (Hard disc only)	0	0	5608	0
!Boot.Resources.Configure.FontChange	137	137	C (Hard disc only)	0	0	137	0
!Boot.Resources.Configure.Monitors	22759	22759	C (Hard disc only)	0	0	22759	0
!Boot.Resources.Configure.Textures	177340	177340	C (Hard disc only)	0	0	177340	0
!Boot.Utils (excluding VProtect)	1340	1340	C (Hard disc only)	0	0	1340	0
!Boot.Utils.VProtect	7652	7652	C (Hard disc only)	0	0	7652	0
Apps.!Alarm **	77970	78785	B (4MB ROMs only)	0	78785	0	0
Apps.!ARPlayer ***	100233	100233	D (Hard and floppy discs)	0	0	100233	100233
Apps.!Clars *	5109	5209	B (4MB ROMs only)	0	5209	0	0
Apps.!CloseUp **	9971	13043	D (Hard and floppy discs)	0	0	13043	13043
Apps.!Draw (unsqueezed) ***	250125	270605	B (4MB ROMs only)	0	270605	0	0

Apps.!Edit	162166	162166	B (4MB ROMs only)	0	162166	0	0
Apps.!Help *	16543	16543	B (4MB ROMs only)	0	16543	0	0
Apps.!Maestro *	86291	86291	D (Hard and floppy discs)	0	0	86291	86291
Apps.!Paint (un squeezed) ***	171763	182003	B (4MB ROMs only)	0	182003	0	0
Apps.!SciCalc *	65062	65262	D (Hard and floppy discs)	0	0	65262	65262
Apps.!Squash (squeezed) *	42302	42502	D (Hard and floppy discs)	0	0	42502	42502
Diversions.!Blocks *	27756	27756	D (Hard and floppy discs)	0	0	27756	27756
Diversions.!Clock	8963	8963	D (Hard and floppy discs)	0	0	8963	8963
Diversions.!Flasher *	22210	22210	D (Hard and floppy discs)	0	0	22210	22210
Diversions.!MemNow *	4529	4529	D (Hard and floppy discs)	0	0	4529	4529
Diversions.!Meteors	20531	20531	D (Hard and floppy discs)	0	0	20531	20531
Diversions.!MineHunt *	309038	309038	D (Hard and floppy discs)	0	0	309038	309038
Diversions.!Patience	36977	36977	D (Hard and floppy discs)	0	0	36977	36977
Diversions.!Pointer (dropped)	7820	0	D (Hard and floppy discs)	0	0	0	0
Diversions.!Puzzle	21985	21985	D (Hard and floppy discs)	0	0	21985	21985
Diversions.ArtWorks.!AWViewer *	205913	205913	D (Hard and floppy discs)	0	0	205913	205913
Diversions.ArtWorks (sample pictures)	534404	534404	D (Hard and floppy discs)	0	0	534404	534404
Diversions.!ReadMe	388	388	D (Hard and floppy discs)	0	0	388	388
Diversions.Tools.!ResetBoot **	13586	13586	D (Hard and floppy discs)	0	0	13586	13586
Diversions.Tools.!SaveCMOS	7833	7833	D (Hard and floppy discs)	0	0	7833	7833
Diversions.Tools.!ShowScrap	3854	3854	D (Hard and floppy discs)	0	0	3854	3854
Images.!SlideShow *	33540	33540	C (Hard disc only)	0	0	33540	0
Images.00-49.key00-24	86625	86625	C (Hard disc only)	0	0	86625	0
Images.00-49.key25-49	92138	92138	C (Hard disc only)	0	0	92138	0
Images.00-49.sa00	44780	44780	C (Hard disc only)	0	0	44780	0
Images.00-49.sa01	89508	89508	C (Hard disc only)	0	0	89508	0
Images.00-49.sa02	46246	46246	C (Hard disc only)	0	0	46246	0
Images.00-49.sa03	69952	69952	C (Hard disc only)	0	0	69952	0
Images.00-49.sa04	65748	65748	C (Hard disc only)	0	0	65748	0
Images.00-49.sa05	31818	31818	C (Hard disc only)	0	0	31818	0
Images.00-49.sa06	67844	67844	C (Hard disc only)	0	0	67844	0
Images.00-49.sa07	89223	89223	C (Hard disc only)	0	0	89223	0
Images.00-49.sa08	67579	67579	C (Hard disc only)	0	0	67579	0
Images.00-49.sa09	57105	57105	C (Hard disc only)	0	0	57105	0
Images.00-49.sa10	47411	47411	C (Hard disc only)	0	0	47411	0
Images.00-49.sa11	27619	27619	C (Hard disc only)	0	0	27619	0
Images.00-49.sa12	61716	61716	C (Hard disc only)	0	0	61716	0
Images.00-49.sa13	66520	66520	C (Hard disc only)	0	0	66520	0
Images.00-49.sa14	44286	44286	C (Hard disc only)	0	0	44286	0
Images.00-49.sa15	69488	69488	C (Hard disc only)	0	0	69488	0
Images.00-49.sa16	61318	61318	C (Hard disc only)	0	0	61318	0
Images.00-49.sa17	54604	54604	C (Hard disc only)	0	0	54604	0
Images.00-49.sa18	37120	37120	C (Hard disc only)	0	0	37120	0
Images.00-49.sa19	62871	62871	C (Hard disc only)	0	0	62871	0
Images.00-49.sa20	55331	55331	C (Hard disc only)	0	0	55331	0
Images.00-49.sa21	27317	27317	C (Hard disc only)	0	0	27317	0
Images.00-49.sa22	49302	49302	C (Hard disc only)	0	0	49302	0
Images.00-49.sa23	80160	80160	C (Hard disc only)	0	0	80160	0
Images.00-49.sa24	56668	56668	C (Hard disc only)	0	0	56668	0
Images.00-49.sa25	89720	89720	C (Hard disc only)	0	0	89720	0
Images.00-49.sa26	50625	50625	C (Hard disc only)	0	0	50625	0
Images.00-49.sa27	62351	62351	C (Hard disc only)	0	0	62351	0
Images.00-49.sa28	59379	59379	C (Hard disc only)	0	0	59379	0
Images.00-49.sa29	42695	42695	C (Hard disc only)	0	0	42695	0
Images.00-49.sa30	45617	45617	C (Hard disc only)	0	0	45617	0
Images.00-49.sa31	79591	79591	C (Hard disc only)	0	0	79591	0
Images.00-49.sa32	26486	26486	C (Hard disc only)	0	0	26486	0
Images.00-49.sa33	60091	60091	C (Hard disc only)	0	0	60091	0
Images.00-49.sa34	39050	39050	C (Hard disc only)	0	0	39050	0
Images.00-49.sa35	67455	67455	C (Hard disc only)	0	0	67455	0
Images.00-49.sa36	65122	65122	C (Hard disc only)	0	0	65122	0
Images.00-49.sa37	62436	62436	C (Hard disc only)	0	0	62436	0
Images.00-49.sa38	55771	55771	C (Hard disc only)	0	0	55771	0
Images.00-49.sa39	45606	45606	C (Hard disc only)	0	0	45606	0
Images.00-49.sa40	73132	73132	C (Hard disc only)	0	0	73132	0
Images.00-49.sa41	59924	59924	C (Hard disc only)	0	0	59924	0
Images.00-49.sa42	68908	68908	C (Hard disc only)	0	0	68908	0
Images.00-49.sa43	77360	77360	C (Hard disc only)	0	0	77360	0
Images.00-49.sa44	53158	53158	C (Hard disc only)	0	0	53158	0
Images.00-49.sa45	53105	53105	C (Hard disc only)	0	0	53105	0
Images.00-49.sa46	48811	48811	C (Hard disc only)	0	0	48811	0
Images.00-49.sa47	74140	74140	C (Hard disc only)	0	0	74140	0

Images.00-49.a48	94528	94528	C (Hard disc only)	0	0	94528	0
Images.00-49.a49	69064	69064	C (Hard disc only)	0	0	69064	0
Images.50-99.Key50-74	88489	88489	C (Hard disc only)	0	0	88489	0
Images.50-99.Key75-99	107371	107371	C (Hard disc only)	0	0	107371	0
Image.50-99.a50	66830	66830	C (Hard disc only)	0	0	66830	0
Images.50-99.a51	48756	48756	C (Hard disc only)	0	0	48756	0
Images.50-99.a52	62137	62137	C (Hard disc only)	0	0	62137	0
Images.50-99.a53	43453	43453	C (Hard disc only)	0	0	43453	0
Images.50-99.a54	39154	39154	C (Hard disc only)	0	0	39154	0
Images.50-99.a55	65335	65335	C (Hard disc only)	0	0	65335	0
Images.50-99.a56	42057	42057	C (Hard disc only)	0	0	42057	0
Images.50-99.a57	41761	41761	C (Hard disc only)	0	0	41761	0
Images.50-99.a58	96455	96455	C (Hard disc only)	0	0	96455	0
Images.50-99.a59	55421	55421	C (Hard disc only)	0	0	55421	0
Images.50-99.a60	61020	61020	C (Hard disc only)	0	0	61020	0
Images.50-99.a61	79069	79069	C (Hard disc only)	0	0	79069	0
Images.50-99.a62	69196	69196	C (Hard disc only)	0	0	69196	0
Images.50-99.a63	57825	57825	C (Hard disc only)	0	0	57825	0
Images.50-99.a64	36683	36683	C (Hard disc only)	0	0	36683	0
Images.50-99.a65	73644	73644	C (Hard disc only)	0	0	73644	0
Images.50-99.a66	37076	37076	C (Hard disc only)	0	0	37076	0
Images.50-99.a67	67758	67758	C (Hard disc only)	0	0	67758	0
Images.50-99.a68	56869	56869	C (Hard disc only)	0	0	56869	0
Images.50-99.a69	37874	37874	C (Hard disc only)	0	0	37874	0
Images.50-99.a70	31782	31782	C (Hard disc only)	0	0	31782	0
Images.50-99.a71	80149	80149	C (Hard disc only)	0	0	80149	0
Images.50-99.a72	52141	52141	C (Hard disc only)	0	0	52141	0
Images.50-99.a73	102118	102118	C (Hard disc only)	0	0	102118	0
Images.50-99.a74	32211	32211	C (Hard disc only)	0	0	32211	0
Images.50-99.a75	53968	53968	C (Hard disc only)	0	0	53968	0
Images.50-99.a76	37685	37685	C (Hard disc only)	0	0	37685	0
Images.50-99.a77	80987	80987	C (Hard disc only)	0	0	80987	0
Images.50-99.a78	75607	75607	C (Hard disc only)	0	0	75607	0
Images.50-99.a79	48107	48107	C (Hard disc only)	0	0	48107	0
Images.50-99.a80	82237	82237	C (Hard disc only)	0	0	82237	0
Images.50-99.a81	96540	96540	C (Hard disc only)	0	0	96540	0
Images.50-99.a82	58868	58868	C (Hard disc only)	0	0	58868	0
Images.50-99.a83	52375	52375	C (Hard disc only)	0	0	52375	0
Images.50-99.a84	60375	60375	C (Hard disc only)	0	0	60375	0
Images.50-99.a85	72560	72560	C (Hard disc only)	0	0	72560	0
Images.50-99.a86	57515	57515	C (Hard disc only)	0	0	57515	0
Images.50-99.a87	78120	78120	C (Hard disc only)	0	0	78120	0
Images.50-99.a88	23986	23986	C (Hard disc only)	0	0	23986	0
Images.50-99.a89	67040	67040	C (Hard disc only)	0	0	67040	0
Images.50-99.a90	47627	47627	C (Hard disc only)	0	0	47627	0
Images.50-99.a91	79828	79828	C (Hard disc only)	0	0	79828	0
Images.50-99.a92	40042	40042	C (Hard disc only)	0	0	40042	0
Images.50-99.a93	54820	54820	C (Hard disc only)	0	0	54820	0
Images.50-99.a94	77150	77150	C (Hard disc only)	0	0	77150	0
Images.50-99.a95	92563	92563	C (Hard disc only)	0	0	92563	0
Images.50-99.a96	64049	64049	C (Hard disc only)	0	0	64049	0
Images.50-99.a97	39895	39895	C (Hard disc only)	0	0	39895	0
Images.50-99.a98	82019	82019	C (Hard disc only)	0	0	82019	0
Images.50-99.a99	51804	51804	C (Hard disc only)	0	0	51804	0
Images.Team.Picture ***	80097	80097	C (Hard disc only)	0	0	80097	0
Images.Team.ReadMe **	1510	1510	C (Hard disc only)	0	0	1510	0
Images.ReadMe	902	902	C (Hard disc only)	0	0	902	0
Printing.!FontPrint	19252	19252	D (Hard and floppy discs)	0	0	19252	19252
Printing.!PrintEdit *	72996	72996	D (Hard and floppy discs)	0	0	72996	72996
Printing.!Printers ***	423166	443646	B (4MB ROMs only)	0	443646	0	0
Printing.Printers.Acorn	1799	1799	D (Hard and floppy discs)	0	0	1799	1799
Printing.Printers.Apple	9722	9722	D (Hard and floppy discs)	0	0	9722	9722
Printing.Printers.Canon	12664	12664	D (Hard and floppy discs)	0	0	12664	12664
Printing.Printers.Citizen	12369	12369	D (Hard and floppy discs)	0	0	12369	12369
Printing.Printers.Epson	33306	33306	D (Hard and floppy discs)	0	0	33306	33306
Printing.Printers.Fujitsu	751	751	D (Hard and floppy discs)	0	0	751	751
Printing.Printers.HP	21579	21579	D (Hard and floppy discs)	0	0	21579	21579
Printing.Printers.IBM	6594	6594	D (Hard and floppy discs)	0	0	6594	6594
Printing.Printers.Integr x	4629	4629	D (Hard and floppy discs)	0	0	4629	4629
Printing.Printers.Linotype	1720	1720	D (Hard and floppy discs)	0	0	1720	1720
Printing.Printers.Manne-Tall	3765	3765	D (Hard and floppy discs)	0	0	3765	3765
Printing.Printers.NEC	3911	3911	D (Hard and floppy discs)	0	0	3911	3911

Printing, Printers, Panasonic	1492	1492	D (Hard and floppy discs)	0	0	1492	1492
Printing, Printers, PostScript	2357	2357	D (Hard and floppy discs)	0	0	2357	2357
Printing, Printers, PostScriptPP	2517	2357	D (Hard and floppy discs)	0	0	2517	2517
Printing, Printers, QMS	1346	1346	D (Hard and floppy discs)	0	0	1346	1346
Printing, Printers, Quinc	2041	2041	D (Hard and floppy discs)	0	0	2041	2041
Printing, Printers, Star	13969	13969	D (Hard and floppy discs)	0	0	13969	13969
Printing, Printers, TI	813	813	D (Hard and floppy discs)	0	0	813	813
Sound, 1812	1629060	1629060	C (Hard disc only)	0	0	1629060	0
Sound, BachFKVI	2235	2235	D (Hard and floppy discs)	0	0	2235	2235
Sound, Enigma	1885724	1885724	C (Hard disc only)	0	0	1885724	0
Sound, Fanfare	1297	1297	D (Hard and floppy discs)	0	0	1297	1297
Sound, Gigac	771	771	D (Hard and floppy discs)	0	0	771	771
Sound, HandMeal a	1661	1661	D (Hard and floppy discs)	0	0	1661	1661
Sound, HandMeal b	3257	3257	D (Hard and floppy discs)	0	0	3257	3257
Sound, ShostFl	2510	2510	D (Hard and floppy discs)	0	0	2510	2510
Tutorials, DrawTutor, Horae	112184	112184	D (Hard and floppy discs)	0	0	112184	112184
Tutorials, DrawTutor, LakeView	108440	108440	D (Hard and floppy discs)	0	0	108440	108440
Tutorials, DrawTutor, Map	275088	275088	D (Hard and floppy discs)	0	0	275088	275088
Tutorials, DrawTutor, MapText	936	936	D (Hard and floppy discs)	0	0	936	936
Tutorials, DrawTutor, Sign	472	472	D (Hard and floppy discs)	0	0	472	472
Tutorials, PaintTutor, Flower	3384	3384	D (Hard and floppy discs)	0	0	3384	3384
Tutorials, ReadMe	241	241	D (Hard and floppy discs)	0	0	241	241
Tutorials, WelcomeGde, DrawDemo	6384	6384	D (Hard and floppy discs)	0	0	6384	6384
Utilities, !ChangeFS1 ***	343691	381256	D (Hard and floppy discs)	0	0	381256	381256
Utilities, !HForm ***	26172	30268	D (Hard and floppy discs)	0	0	30268	30268
Utilities, !Products (dropped)	3804669	0	D (Hard and floppy discs)	0	0	0	0
Utilities, !TI ToFont *	78216	78216	D (Hard and floppy discs)	0	0	78216	78216
Utilities, Patches, !Patch	65216	65216	D (Hard and floppy discs)	0	0	65216	65216
Utilities, Patches, AdvancePch	201625	201625	D (Hard and floppy discs)	0	0	201625	201625
Utilities, Patches, ArcFS	47496	47496	D (Hard and floppy discs)	0	0	47496	47496
Utilities, Patches, DDE	65437	65437	D (Hard and floppy discs)	0	0	65437	65437
Utilities, Patches, PCEmPatch	171172	171172	D (Hard and floppy discs)	0	0	171172	171172
Utilities, Patches, SparkFS	63987	63987	D (Hard and floppy discs)	0	0	63987	63987
Video, Birds	3652376	3652376	C (Hard disc only)	0	0	3652376	0
Video, Birda2	3099942	3099942	C (Hard disc only)	0	0	3099942	0
Video, Launch	1864150	1864150	C (Hard disc only)	0	0	1864150	0
Video, Launch2	1930550	1930550	C (Hard disc only)	0	0	1930550	0
Video, LionFish	5984818	5984818	C (Hard disc only)	0	0	5984818	0
Video, LionFish2	3598406	3598406	C (Hard disc only)	0	0	3598406	0
Video, Rafts	3437554	3437554	C (Hard disc only)	0	0	3437554	0
Video, Rafts2	3126494	3126494	C (Hard disc only)	0	0	3126494	0
Video, ReadMe	2238	2238	C (Hard disc only)	0	0	2238	0
Total	47355586						

Components New To Black (hence all ***)

Component	Black Bytes (est.)						
Aquarius toolbox modules (below):	256000	B (4MB ROMs only)	0	256000	0	0	
ColourDBox							
ColourMenu							
DCS_Quit							
FileInfo							
FontDbox							
FontMenu							
IconBar							
Menu							
PrintDbox							
ProgInfo							
SaveAs							
Scale							
Toolbox							
Window							
DragAnObj	1188	B (4MB ROMs only)	0	1188	0	0	
DrawFile	29696	B (4MB ROMs only)	0	29696	0	0	
CDFS	16384	B (4MB ROMs only)	0	16384	0	0	
CDFSDriver	5120	B (4MB ROMs only)	0	5120	0	0	
CDFSFiler	7168	B (4MB ROMs only)	0	7168	0	0	
ATAPI	5120	B (4MB ROMs only)	0	5120	0	0	
CDDrives, Chinon	2700	B (4MB ROMs only)	0	2700	0	0	
CDDrives, Hitachi	2700	B (4MB ROMs only)	0	2700	0	0	
CDDrives, Philips	3300	B (4MB ROMs only)	0	3300	0	0	
CDDrives, Sony	3800	B (4MB ROMs only)	0	3800	0	0	

CDDrive.s.Toshiba	2600	B (4MB ROMs only)	0	2600	0	0
Internet (full module)	81920	B (4MB ROMs only)	0	81920	0	0
MManager (module)	20480	B (4MB ROMs only)	0	20480	0	0
ShareFS	74752	B (4MB ROMs only)	0	74752	0	0
AccMsgs	22528	B (4MB ROMs only)	0	22528	0	0
Freeway	19456	B (4MB ROMs only)	0	19456	0	0
EconetA	15360	B (4MB ROMs only)	0	15360	0	0
PCMCIAManager	30720	B (4MB ROMs only)	0	30720	0	0
PCMCIAHWDriver	20480	B (4MB ROMs only)	0	20480	0	0
PCCardFS	15360	B (4MB ROMs only)	0	15360	0	0
PCCardFSFiler	15360	B (4MB ROMs only)	0	15360	0	0
Portable (module)	10240	B (4MB ROMs only)	0	10240	0	0
!BatMgr	12288	B (4MB ROMs only)	0	12288	0	0
PS2Driver	4096	A (2MB & 4MB ROMs)	4096	4096	0	0
Joytick	2048	A (2MB & 4MB ROMs)	2048	2048	0	0
PDumperE2	5120	B (4MB ROMs only)	0	5120	0	0
Printers.Canon.BJC4000	2400	D (Hard and floppy discs)	0	0	2400	2400
Printers.Acom.JP-360	1300	D (Hard and floppy discs)	0	0	1300	1300
Printers.HP.DJ560C	1300	D (Hard and floppy discs)	0	0	1300	1300
Printers.Epson.StylusCol	2400	D (Hard and floppy discs)	0	0	2400	2400
Monitors.Acorn.AKF70	6144	D (Hard and floppy discs)	0	0	6144	6144
Monitors.Acorn.AKF53	6144	D (Hard and floppy discs)	0	0	6144	6144
Utilities.!CDPlayer	61440	D (Hard and floppy discs)	0	0	61440	61440
Utilities.!PhotoView	114688	D (Hard and floppy discs)	0	0	114688	114688
!ArmBoot	2441272	E (Net floppies only)	0	0	0	2441272
!ShareBoot	2500252	E (Net floppies only)	0	0	0	2500252
!Boot (cut down application)	614400	E (Net floppies only)	0	0	0	614400
!MchConfig	49152	E (Net floppies only)	0	0	0	49152
BootCommands module	9216	B (4MB ROMs only)	0	9216	0	0
		Totals:	2024500	3958297	42673826	9179315
		Spare space:	72652	236007	Min. No. Floppies:6	