Chroma 8 I

Getting Started Guide

V1.0





Introduction

This document provides the basic information required to get the Chroma 81 interface set up and includes a step-by-step example on how to program a simple compilation of ZX81 programs into a ZXC4 ROM cartridge. It concludes by explaining how the appearance of programs can be enhanced through the use of colourisation and character definition files. This guide doesn't cover all the functionality available, but provides sufficient information to help put into context the full details available on the ZX81 pages at www.fruitcake.plus.com.

Chroma 81 Suitability

Chroma 81 is only suitable for use with a ZX81 fitted with any of the 3 editions of the BASIC ROM.

Pre-requisites and Precautions

The following important points will help ensure trouble free operations of Chroma 81.

• Use a higher rated power supply of 1A or more.

The ZX81 came with either a 0.7A or 1.2A power supply. The 0.7A power supply is borderline suitable for a ZX81 with Chroma 81 interface but not if a ZXC4 or other device is connected. Modern design higher current rated power supplies sold especially for use with the ZX81 can be found on ebay and direct from various online sellers of Sinclair spares.

• Clean the ZX81's expansion bus using isopropyl alcohol (isopropanol).

The ZX81's expansion bus contacts will oxidise over time and should be cleaned by rubbing with isopropyl alcohol using a cotton bud/swab before connecting Chroma 81, otherwise a poor electrical contact is likely to cause unreliable operation.

- Only connect / remove Chroma 81 and a ZXC4 ROM cartridge with the power off to the ZX81. Connecting or disconnecting with the power on seriously risks damaging the ZX81 and Chroma 81. Ideally also connect / disconnect all cables before powering on the ZX81 or TV.
- Be careful not the damage the ZX81's case when connecting / disconnecting Chroma 81. Chroma 81 will form a tight connection on the ZX80's expansion bus. Be careful how you hold the ZX81 to avoid damaging its case due to the force needed to connect / disconnect Chroma 81. Try to keep the interface as straight with the ZX81 as possible, wiggling it gently from side to side as necessary. After disconnecting Chroma 81, always check that its edge connector key has not become dislodged, which would result in damage is the interface is connected misaligned.
- Only use Chroma 81 with a ZX81. Chroma 81 is not suitable for use with a ZX80 or non-identical clone of the ZX81 due to difference in timing of the expansion bus signals, and damage could occur to the computer or Chroma 81 as a result.

Chroma 81 Facilities

The hardware facilities provided by Chroma 81 are identified below.



The majority of the hardware and software facilities provided by the Chroma 81 interface can be enabled/disabled via its configuration switches.

The permanently enabled facilities are:

- Joystick socket
- Sound via the TV speaker. Sound will be output whenever TV frames are not being produced, e.g. during saving to cassette. Turn down the volume on your TV if you do not wish to hear such sounds.
- ROM cartridge facilities whenever a ROM cartridge is plugged in.

The facilities that can be enabled / disabled via the configuration switches are:

- **Switch 1** Set this to ON to enable the 16K RAM pack.
- **Switch 2** Set this to ON to enable WRX high resolution graphic support for the 16K RAM pack (requires switch 1 to be ON also).
- **Switch 3** Set this to ON to enable 8K RAM between the ROM space and the 16K RAM space. This also enables support for CHR\$128 UDG mode.
- Switch 4 Set this to ON to enable Quicksilva Character Board UDG support.
- Switch 5 Set this to ON to enable the RS232 socket.
- **Switch 6** Set this to ON to enable colour support.

Using the Joystick Socket

The ZX81 never had a joystick connection standard that games supported, but the cursor keys were often used and so these are what the Chroma 81 joystick socket responds to.

Programming a ZXC4 ROM Cartridge

Chroma 81's ROM cartridge socket supports ROM cartridge designs conforming to the ZX Interface 2 standard devised by Sinclair Research for the ZX Spectrum. Suitable software is available to support the ZXC2, ZXC3 and ZXC4 ROM cartridge designs. These instructions only refer to the ZXC4 since it is the only design still in production. They describe the generation of a simple compilation but won't

cover all the setting options available (refer to www.fruitake.plus.com for details about all the available options).

Programming the ZXC4 ROM cartridge requires the following:

- A Windows PC (any version of Windows is suitable).
- An RS232 socket on the PC (male 9-way D-type socket, typically provided by a USB adapter).
- An optional standard 9-way non-crossover male-to-female RS232 extension cable (only required if the USB adapter cable is not long enough to reach Chroma 81's RS232 socket).
- The *ZX ROM Cartridge Creator* software downloaded from www.fruitcake.plus.com and installed on the Windows PC.

The programming process involves the following aspects:

- Prepare a compilation of programs to be installed into the ZXC4 ROM cartridge.
- Download the compilation data to the ZX81 for programming into the ZXC4.
- Accessing the menu system once the compilation has been programmed into the ZXC4 to allow running of the programs it contains.

Preparing a Compilation

• Run the ZX ROM Cartridge Creator utility on the Windows PC.

File Edit Cartridge Help Spectrum • ZXC4 • • • New @ Open @ Save Add • * Remove @ Move Up @ Move Down ? Ascending • 2 Descending • 2 D	ZX ROM (Cartridge Creator - Ne	ew Compila	ation.zxc									-		X
Spectrum • ZXC4 • New <table-cell> Open 🗟 Save 🖾 Add • Kemove 🐔 Move Up 🐔 Move Down <table-cell-columns> Accending • 🛣 Descending • $Menov$ Duble Programmer Ocde 3.79K Free Space 4092.21K Program Data 0.00K Menu Code 0.00K Programmer Code 3.79K Free Space 4092.21K Program Type RAM Publisher Year Reference Size File Name</table-cell-columns></table-cell>	File Edit	Cartridge Help													
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Title ZX Compilation Cartridge Memory Type FLASH Include Chars No Include Programmer Yes Startup Type Auto Programs 0 Required Memory 4M (29F032B) Program Data 0.00K Menu Code 0.00K Programmer Code 3.79K Free Space 4092.21K Menu Entry Name Program Type RAM Publisher Year Reference Size File Name Image: Startup Type RAM Publisher Year Reference Size File Name Image: Startup Type RAM Publisher Year Reference Size File Name Image: Startup Type RAM Publisher Year Reference Size File Name Image: Startup Type RAM Publisher Year Reference Size File Name Image: Startup Type RAM Publisher Year Image: Startup Type File Name Image: Startup Type RAM Auto-Run Line Emulator Image: Startup Type Paging Paging Paging Paging Paging Paging Paging<	Cartridge D	etails													
Programs 0 Required Memory 4M [29F032B] Program Data 0.00K Menu Code 0.00K Programmer Code 3.79K Free Space 4092 21K Menu Entry Name Program Type RAM Publisher Year Reference Size Rile Name Image: State Stat	Title	ZX Compilation Cartridg	je		Memory	Туре	$\rm FLASH - \smallsetminus$	Include Chars	No	\sim In	clude Programmer	Yes v	Start-up Type	Auto	\sim
Menu Entry Name Program Type RAM Publisher Year Reference Size File Name Image: Size in the structure of the	Programs	0 Required M	Memory	4M [29F032B]	Program	n Data	0.00K	Menu Code	0.00	K P	rogrammer Code	3.79K	Free Space	4092.2	21K
Program Details Name Publisher Ref. Year Paging Padding		Menu Entry Name		Program Type	RAM		Publish	ner	Ye	ar	Reference	Size	File Nam	e	
Program Details Name Publisher Ref. Year Paging Padding															
Program Details Name Type RAM Auto-Run Line Emulator Vibileher Ref. Year Paging Locked In Menu Paging Padding															
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	File								Data		Menu	Paging	Padd	ing	

- Change the target computer from *Spectrum* to *ZX81*.
- Leave the target ROM cartridge as **ZXC4**.

	Ca	rtridge	Create
File Edit		Cartric	lge
ZX81	•	ZXC4	•)[
Cartridge D	leta	ils	

• Select the COM port number corresponding to the RS232 socket on the PC that is connected to Chroma 81's RS232 socket (this setting is only applicable if your PC has multiple RS232 sockets).



• Download the ZX81 programs to include in the ZXC4 compilation. For this example, the following games were downloaded from www.fruitcake.plus.com.

Windows 10 (C:) > ZX81_Games										
Name	Date modified	Туре	Size							
3DMonsterMaze_Colour.p	26/07/2020 15:38	P File	14 KB							
Against_The_Elements (Paul Farrow 2016) [V1-02].p	17/03/2022 22:46	P File	12 KB							
AstralConvoy(VortexSoftware).p	19/04/2017 19:30	P File	9 KB							
Celebration (Paul Farrow 2016) [V1-01].p	28/03/2022 23:06	P File	10 KB							
High Resolution Invaders (Odyssey Computing).p	17/03/2017 16:22	P File	8 KB							
Mazogs_Colour.p	03/06/2017 23:42	P File	9 KB							
🛲 Murgatroyds Revenge (Collins Computing).p	18/04/2017 17:08	P File	13 KB							
🔜 War Web (Pooter Games).p	17/04/2017 17:30	P File	6 KB							
ZX80 8K ROM Kong (Lightning Software, 2010).p	31/08/2019 14:41	P File	13 KB							
🔜 ZX80 8K ROM Pacman (Lightning Software, 2010).p	08/06/2020 00:15	P File	7 KB							

Note that supported ZX81 programs will have file extension .p or .p81. Two ZX80 games are included here which target the 8K ROM, i.e. the ZX81 ROM, and so will also run on the ZX81.

 Open Windows File Explorer on the PC and browse to the folder containing the ZX81 games. Drag and drop the files into the main area of the ZX ROM Cartridge Creator utility. The file names will be used to set the default menu entry names, truncating them as necessary so that they will fit the ZX81's 32 column display.

ZX ROM	Cartridge Creator - New Compi	lation.zxc*							-	
File Edi	t Cartridge Help									
7701	- 7YC4 - D New P# On	en 🛄 Save 🔤 Ar	u - × 1	Remove 🌆 Mo	e Un		ding - Z Descen	ling -	Create Send C	0M1 -
LAGI	· 2x04 ·] [] New [] op	an Magaza			eop Elmover	Z* Asce	iding · At Descen	ing · It	Create gy Sena Ct	
Cartridge [Details									
Title	ZX COMPILATION CARTRIDGE		Memory	Type FLASH	Include Chars	No \sim	Include Programmer	Yes	✓ Start-up Type A	uto 🗸 🗸
Programs	10 Required Memory	4M [29F032B]	Program	Data 94.13K	Menu Code	1.77K	Programmer Code	3.05	K Free Space	3997.05K
	Menu Entry Name	Program Type	RAM	Pu	ublisher	Year	Reference	Size	File Name	
3DMONS1	TERMAZE_COLOUR	ZX81 Program	16K					12.60K	3DMONSTERMAZE_CC	DLOUR.P
AGAINST_	THE_ELEMENTS (PAUL FARRO	ZX81 Program	16K					11.57K	AGAINST_THE_ELEME	ENTS (PAUL
ASTRALC	ONVOY(VORTEXSOFTWARE)	ZX81 Program	16K					7.48K	ASTRALCONVOY(VOR	TEXSOFTW
CELEBRA	TION (PAUL FARROW 2016) [ZX81 Program	16K					9.77K	CELEBRATION (PAUL F	FARROW 20
HIGH RES	SOLUTION INVADERS (ODYSSE	ZX81 Program	16K					7.27K	HIGH RESOLUTION IN	VADERS (OI
MAZOGS_	COLOUR	ZX81 Program	16K					8.60K	MAZOGS_COLOUR.P	
MURGATE	ROYDS REVENGE (COLLINS C	ZX81 Program	16K					11.88K	MURGATROYDS REVE	NGE (COLL
WAR WE	B (POOTER GAMES)	ZX81 Program	16K					5.33K	WAR WEB (POOTER G	iAMES).P
ZX80 8K F	ROM KONG (LIGHTNING SOFT	ZX81 Program	16K					12.81K	ZX80 8K ROM KONG (L	IGHTNING :
ZX80 8K F	ROM PACMAN (LIGHTNING SO	ZX81 Program	16K					6.83K	ZX80 8K ROM PACMAN	I (LIGHTNIN
¢										>
Program D	letails									
Name	ZX80 8K ROM PACMAN (LIGHTI	NING SO	Туре	ZX81 Program	RAM 16K	✓ Auto-Run L	ine 10 V	Pag	ing 0.06K Menu	0.05K
Publisher			Ref.		Year	✓ Paging Loc	ked ZXC ~	Pad	Iding 0.00K Data	6.72K
File	3\ZX80 8K ROM Pacman (Lightni	ng Software, 2010).p	Chars				× Colour			X

- The *Title* field within the Cartridge Details area will be used as the heading for the menu that will appear when the compilation is run on the ZX81. It can be edited as desired, e.g. ZX81 GAMES.
- Leave the *Include Programmer* field set to *Yes*. This will keep a copy of the ZXC4 Programmer utility in the cartridge to allow it to be quickly accessed for subsequent re-programming of the ZXC4, otherwise it will be necessary to load it in from a backup made to cassette.
- Click on each game entry in turn and edit the *Name* field to tidy up any truncated text. The *Name* field will be used for the descriptions shown in the menu when the compilation is run on the ZX81.

For each game entry, optionally fill in the *Publisher*, *Ref* and *Year* fields. These will appear at the bottom of the screen on the ZX81 when the menu is browsed through and simply provide more information to identify each program. Any text displayable by the ZX81 may be set for the *Publisher* and *Ref* fields, with the latter useful for indicating a product code, or version number, author, etc. Select or type in the year of release of the game into the *Year* field. Any of the fields can be left blank if desired.

ZX ROM	Cartridge Creator - New Comp	pilation.zxc*								-	
<u>F</u> ile <u>E</u> dit	C <u>a</u> rtridge <u>H</u> elp										
ZX81	• ZXC4 • 🗋 New 🚔 Op	pen 🛃 Save 🏼 🍟 Ad	d - 🗙	Remov	re 1 Movel	Jp 📲 Move Do	wn 🔤 🛔 Ascen	iding 👻 🕌 Descend	ling 🗸 🛓	🗄 Create 🛛 🔒 Send	COM1 -
Cartridge D	letails										
Title	ZX81 GAMES		Memory	/ Туре	$FLASH^- \sim$	Include Chars	No	Include Programmer	Yes	✓ Start-up Type	Auto 💎
Programs	10 Required Memory	4M [29F032B]	Program	n Data	94.31K	Menu Code	1.73K	Programmer Code	3.05	K Free Space	3996.92K
	Menu Entry Name	Program Type	RAM		Publis	her	Year	Reference	Size	File Nam	e
3D MONST	FER MAZE (COLOUR)	ZX81 Program	16K	NEW	GENERATION	SOFTWARE / PF	1982		12.64K	3DMONSTERMAZE	_COLOUR.P
AGAINST	THE_ELEMENTS	ZX81 Program	16K	LIGHT	INING SOFTW	ARE	2016	V1.02	11.59K	AGAINST_THE_ELE	EMENTS (PAUL F
ASTRAL C	ONVOY	ZX81 Program	16K	VORT	EX SOFTWAR	E	1983		7.48K	ASTRALCONVOY(V	ORTEXSOFTWA
CELEBRAT	FION	ZX81 Program	16K	PAUL	FARROW		2016	V1.01	9.77K	CELEBRATION (PA	JL FARROW 201
HIGH RES	OLUTION INVADERS	ZX81 Program	16K	ODYS	SEY COMPUT	ING	1983		7.28K	HIGH RESOLUTION	I INVADERS (OD
MAZOGS (COLOUR)	ZX81 Program	16K	BUG-I	BYTE SOFTWA	RE / PF	2017		8.63K	MAZOGS_COLOUR	.P
MURGATE	OYDS REVENGE	ZX81 Program	16K	COLL	INS COMPUTIN	١G	1982		11.89K	MURGATROYDS R	EVENGE (COLLI
WAR WEE	1	ZX81 Program	16K	POOT	ER GAMES		1986		5.34K	WAR WEB (POOTE	R GAMES).P
ZX80 8K R	OM KONG	ZX81 Program	16K	LIGHT	INING SOFTW	ARE	2016	V1.03	12.83K	ZX80 8K ROM KON	g (lightning s
ZX80 8K R	OM PACMAN	ZX81 Program	16K	LIGH	INING SOFTW	ARE	2010	V1.04	6.85K	ZX80 8K ROM PACI	MAN (LIGHTNING
<											>
Program De	etails										
Name	ZX80 8K ROM PACMAN		Туре	ZX81	Program	RAM 16K ~	Auto-Run Li	ne 10 ~	Pagi	ing 0.06K M	enu 0.07K
Publisher	LIGHTNING SOFTWARE		Ref.	1	/1.04	Year 2010 🗸	Paging Lock	ked ZXC ~	Pade	ding 0.00K Da	ata 6.72K
File	3\ZX80 8K ROM Pacman (Lightr	ning Software, 2010).p	Chars					X Colour			X

- For each game, it is recommended to leave the **RAM** field set to 16K unless there is a real necessity to change it lower, which will provide maximum program compatibility.
- Programs can be dragged and dropped to re-order them, with other facilities available from the menu toolbar to sort them by various criteria.
- Leave the *Auto-Run Line* field at its default for each program for now. This field allows programs that don't automatically run upon loading to be started from a specified line number. The facility works by changing the value of system variable NXTLIN, which controls the line to run after a program has loaded.

Downloading the Compilation to the ZX81 for Writing into the ZXC4

The compilation data is sent over to the ZX81 as a number of blocks of 8K or less. These instructions assume that all of Chroma 81's switches are initially set to OFF.

- Ensure the ZX81 is powered off.
- Set switch 1 of Chroma 81 to ON to enable the 16K RAM pack.
- Connect the PC's RS232 socket to Chroma 81's RS232 socket (use an extension cable if required).
- Plug the ZXC4 into Chroma 81's ROM cartridge socket.
- Set switch 5 of Chroma 81 to ON to enable the RS232 socket.
- Set switch 6 of Chroma 81 to ON to enable the colour support (since some of the game will be using colour).
- Power on the ZX81.

• The ZXC4 Programmer will automatically appear:



- Press NEWLINE to select **PROGRAM FROM CHROMA RS232**.
- The ZX81 will display that it wants to receive the first block of data.

ZXC4 PR	DGRAMI	1ER		
PROGRAM	FROM	CHROMA	R5232	
WANT BL	оск і			
(C)2015 WWW.FRU	PAUL ITCAK	FARROW E.PLUS.(, V1.06 COM	

• The ZX81's screen then changes to white with thin black lines across it, indicating that it is waiting to receive data.

1		
1		
1		
1		
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	-	
1		
1		

• On the ZX ROM Cartridge Creator, click the Send button.



• The ZX ROM Cartridge Creator will display a progress dialog showing details about the block currently being sent.

ZX ROM Cartridge	Creator - New Comp	ilation.zxc*							
File Edit Cartric	dae Help								
7/01 - 7/04	- D New 😪 On	on Covo de Ad	V	Permo	ra 🖅 Mava Ha 🛲 Mava Dr		ading - Z Dessand	dina = 14	tt Crosta III Sand COM1 -
2,01 • 2,004	• interv job	Au Save	u · ^	Remo		Z + ASCE	iding • At Descend	ung • 👘	Create Send COMI
Cartridge Details									
Title ZX81 GA	MES		Memor	у Туре	FLASH \checkmark Include Chars	No \vee	Include Programmer	Yes	V Start-up Type Auto
Programs 10	Required Memory	4M [29F032B]	Progra	m Data	94.31K Menu Code	1.73K	Programmer Code	3.05	K Free Space 3996.92K
Menu Er	ntry Name	Program Type	RAM		ZX ROM Cartridge Creator	Year	Reference	Size	File Name
3D MONSTER MAZE	(COLOUR)	ZX81 Program	16K	NEW	Disalis distant	1982		12.64K	3DMONSTERMAZE_COLOUR.P
AGAINST_THE_ELEN	MENTS	ZX81 Program	16K	LIGH	BIOCK: I OT 14	2016	V1.02	11.59K	AGAINST_THE_ELEMENTS (PAI
ASTRAL CONVOY		ZX81 Program	16K	VOR		1983		7.48K	ASTRALCONVOY(VORTEXSOFT
CELEBRATION		ZX81 Program	16K	PAUL	Byte: 0 of 8134	2016	V1.01	9.77K	CELEBRATION (PAUL FARROW
HIGH RESOLUTION	INVADERS	ZX81 Program	16K	ODYS		1983		7.28K	HIGH RESOLUTION INVADERS
MAZOGS (COLOUR)		ZX81 Program	16K	BUG-	Frame Length: 12	2017		8.63K	MAZOGS_COLOUR.P
MURGATROYDS RE	VENGE	ZX81 Program	16K	COLL	Bank: 0	1982		11.89K	MURGATROYDS REVENGE (CO
WAR WEB		ZX81 Program	16K	POOT	Start Address: 0	1986		5.34K	WAR WEB (POOTER GAMES).P
ZX80 8K ROM KONG		ZX81 Program	16K	LIGH	Block Length: 8122	2016	V1.03	12.83K	ZX80 8K ROM KONG (LIGHTNIN
ZX80 8K ROM PACM	AN	ZX81 Program	16K	LIGH	block Longin. 0122	2010	V1.04	6.85K	ZX80 8K ROM PACMAN (LIGHTN
					Cancel				
<									
Program Details									
Name ZX80 8K	ROM PACMAN		Туре	ZX8	Program RAM 16K	 Auto-Run L 	ine 10 V	Pag	ing 0.06K Menu 0.07K
Publisher LIGHTNI	NG SOFTWARE		Ref.		/1.04 Year 2010	Paging Loc	ked ZXC ~	Pad	ding 0.00K Data 6.72K
File 3\ZX80.8	K ROM Pacman (Lightn	ning Software, 2010).p	Chars				X Colour		

• As the data is received, the ZX81 will display a pattern very reminiscent of that seen when saving to cassette. The exact pattern displayed varying based on the actual data being received.

• The ZX81 will display a confirmation message once it has received the block.



• The ZX81 will then indicate that it is about to program the block into the ZXC4.



• The ZX81's screen then changes to black with short thin white lines across it, indicating that it is writing the data into the ZXC4.

• The ZX81 confirms once the block has been programmed.



- The process then repeats for the remaining blocks.
- The ZX81 confirms once all blocks have been processed. The ZXC4 is now fully programmed.



- Press a key to reset the ZX81.
- The compilation menu will automatically appear:



- Games can now be selected from the menu and run. After selecting a game, the ROM cartridge will be locked and it will not be possible to re-invoke the ROM cartridge menu (or ZXC4 Programmer utility) until the ZX81 has been reset either using Chroma 81's reset button or by powering the ZX81 off and on again.
- The above process can be repeated whenever it desired to change the contents of the ZXC4.

Enhancing Games with Colour

Existing games can be enhanced using Chroma 81 by superimposing colour on top of every character without the need to change the actual games. Each character code can be assigned its own individual ink and paper colours for the 8 lines that make up the character through the use of colourisation definition files. Although it is possible to create your own colourisation definition files (as explained later), this introduction simply uses pre-prepared files.

• Download colourisation definition files from www.fruitcake.plus.com.

Windows 10 (C:) > ZX81_Games										
^	Name	Date modified	Туре	Size						
	ZX80_Kong.col	06/07/2025 21:59	COL File	43 KB						
	ZX80_Pacman.col	06/07/2025 21:59	COL File	22 KB						

• Highlight a program to assign a colourisation definition file to, then click the Browse button next to the *Colour* field and select the colourisation definition file to apply. Entries that have been assigned a colourisation definition file are displayed in red text within the ZX ROM Cartridge Creator.

ZX ROM	Cartridge Creator - New Compil	ation.zxc*							- 🗆 X
File Edit	t Cartridge Help								
7/01	- 7VC4 - D New 03 One	n Save 28 Ad	d - X	Remove 🖅 Move II	n Move Do		ding - Z Descent	lina - İt	Create A Send COM2 -
2701	• 2AC4 •]] New _ Ope	an 💽 Save 🔤 Au	u · ^	Kentove 📲 Move o	p - move bo	Z * Ascel	iung · At Descent	ing • 📲	Create Send COM2 +
Cartridge D)etails								
Title	ZX81 GAMES		Memory	r Type FLASH 🗸 🗸	Include Chars	No \sim	Include Programmer	Yes	✓ Start-up Type Auto ∨
Programs	10 Required Memory	4M [29F032B]	Program	n Data 94.86K	Menu Code	1.73K	Programmer Code	3.05	K Free Space 3996.37K
	Menu Entry Name	Program Type	RAM	Publish	her	Year	Reference	Size	File Name
3D MONST	TER MAZE (COLOUR)	ZX81 Program	16K	NEW GENERATION S	SOFTWARE / PF	1982		12.64K	3DMONSTERMAZE_COLOUR.P
AGAINST_	THE_ELEMENTS	ZX81 Program	16K	LIGHTNING SOFTWA	ARE	2016	V1.02	11.59K	AGAINST_THE_ELEMENTS (PAUL
ASTRAL C	ONVOY	ZX81 Program	16K	VORTEX SOFTWARE	-	1983		7.48K	ASTRALCONVOY(VORTEXSOFTW/
CELEBRAT	TION	ZX81 Program	16K	PAUL FARROW		2016	V1.01	9.77K	CELEBRATION (PAUL FARROW 20
HIGH RES	OLUTION INVADERS	ZX81 Program	16K	ODYSSEY COMPUTI	NG	1983		7.28K	HIGH RESOLUTION INVADERS (OI
MAZOGS ((COLOUR)	ZX81 Program	16K	BUG-BYTE SOFTWA	RE / PF	2017		8.63K	MAZOGS_COLOUR.P
MURGATE	ROYDS REVENGE	ZX81 Program	16K	COLLINS COMPUTIN	G	1982		11.89K	MURGATROYDS REVENGE (COLL
WAR WEB	3	ZX81 Program	16K	POOTER GAMES		1986		5.34K	WAR WEB (POOTER GAMES).P
ZX80 8K R	IOM KONG	ZX81 Program	16K	LIGHTNING SOFTWA	ARE	2016	V1.03	13.14K	ZX80 8K ROM KONG (LIGHTNING
ZX80 8K R	IOM PACMAN	ZX81 Program	16K	LIGHTNING SOFTWA	ARE	2010	V1.04	7.09K	ZX80 8K ROM PACMAN (LIGHTNIN
<									3
Program De	etails								
Name	ZX80 8K ROM PACMAN		Туре	ZX81 Program	RAM 16K ~	Auto-Run Li	ne 10 ~	Pag	ing 0.06K Menu 0.07K
Publisher	LIGHTNING SOFTWARE		Ref.	V1.04	Year 2010 ~	Paging Lock	ked ZXC ~	Pad	ding 0.00K Data 6.96K
File	3\ZX80 8K ROM Pacman (Lightnin	ng Software, 2010).p	Chars				Colour C:\ZX8	1_Games\	ZX80_Pacman.col

Send the compilation to the ZX81 and program it into the ZXC4 as before. Once programmed, reset the ZX81 and the compilation menu will appear. When a game with a colourisation definition file assigned to it is run, the option is given to apply the colours to the game or to run it in its original black and white form.



• Press C to set up the colourisation and the game run.



Enhancing Games with User Defined Graphics (UDGs)

Existing games can be enhanced using Chroma 81 by redefining the appearance of every character. Quicksilva and CHR\$128 UDG modes are supported. Each character code can be individually redefined through the use of character definition files. Although it is possible to create your own character definition files, this introduction simply uses pre-prepared files.

• Download character definition files from www.fruitcake.plus.com.

Windows 10 (C:) > ZX81_Games								
^	Name	Date modified	Туре	Size				
	VideoGameFont.chr	06/07/2025 22:09	CHR File	45 KB				

• Highlight a program to assign a character definition file to, then click the Browse button next to the *Chars* field and select the character definition file to apply. Entries that have been assigned a character definition file are displayed in blue text. An entry that has been assigned both a colourisation and a character definition file will be displayed in magenta text.

ZX ROM	Cartridge Creator - New Comp	ilation.zxc*						-	• ×
ile <u>E</u> dit	C <u>a</u> rtridge <u>H</u> elp								
X81	🝷 ZXC4 🝷 🗋 New 🞯 Op	en 🛃 Save 🛛 🌌 A	dd 👻 🗙 Re	move 1 Move Up 📲 Move Do	own 🛛 🛃 Ascer	nding 👻 🏹 Descend	ling 👻 🛓	📩 Create 🛛 🔒 Send	COM2 -
Cartridge D	letails								
Tele	ZV01 CAMES		M	na Statuli Indula Chan		Include December	N.	Outur Tree	
litle	ZX81GAMES		Memory 1)	/pe FLASH V Include Chars	No 🗸	Include Programmer	Yes	 Start-up Type 	Auto ~
Programs	10 Required Memory	4M [29F032B]	Program D	ata 97.25K Menu Code	1.73K	Programmer Code	3.05	Free Space	3993.98K
	Menu Entry Name	Program Type	RAM	Publisher	Year	Reference	Size	File Name	e
3D MONST	FER MAZE (COLOUR)	ZX81 Program	16K N	EW GENERATION SOFTWARE / P	F 1982		12.64K	3DMONSTERMAZE	COLOUR.P
AGAINST_	THE_ELEMENTS	ZX81 Program	16K L	IGHTNING SOFTWARE	2016	V1.02	11.59K	AGAINST_THE_ELE	MENTS (PAUL
ASTRAL C	ONVOY	ZX81 Program	16K V	ORTEX SOFTWARE	1983		7.48K	ASTRALCONVOY(VC	ORTEXSOFTW/
CELEBRAT	FION	ZX81 Program	16K P	AUL FARROW	2016	V1.01	9.77K	CELEBRATION (PAU	IL FARROW 20
HIGH RES	OLUTION INVADERS	ZX81 Program	16K 0	DYSSEY COMPUTING	1983		7.28K	HIGH RESOLUTION	INVADERS (OD
MAZOGS (COLOUR)	ZX81 Program	16K B	UG-BYTE SOFTWARE / PF	2017		8.63K	MAZOGS_COLOUR.	P
NURGATE	OYDS REVENGE	ZX81 Program	16K C	OLLINS COMPUTING	1982		13.06K	MURGATROYDS RE	EVENGE (COLLI
NAR WEB	1	ZX81 Program	16K P	OOTER GAMES	1986		5.45K	WAR WEB (POOTER	R GAMES).P
ZX80 8K R	OM KONG	ZX81 Program	16K L	IGHTNING SOFTWARE	2016	V1.03	13.07K	ZX80 8K ROM KONG	i (LIGHTNING S
ZX80 8K R	OM PACMAN	ZX81 Program	16K L	IGHTNING SOFTWARE	2010	V1.04	8.26K	ZX80 8K ROM PACM	IAN (LIGHTNIN
1									>
Program De	etails								
Name	ZX80 8K ROM PACMAN		Туре	ZX81 Program RAM 16K	 Auto-Run L 	ine 10 $\scriptstyle \lor$	Pagi	ng 0.06K Me	nu 0.07K
Publisher	LIGHTNING SOFTWARE		Ref.	V1.04 Year 2010	Paging Loc	ked ZXC 🗸	Pade	ding 0.00K Da	ta 8.13K
File	3\ZX80 8K ROM Pacman (Lightn	ing Software, 2010).p	Chars C:	ZX81_Games\VideoGameFont.chr		Colour C:\ZX8	1_Games\	ZX80_Pacman.col	X

• Send the compilation to the ZX81 and program it into the ZXC4 as before. Once programmed, reset the ZX81 and the compilation menu will appear. When a game with a character definition file assigned to it is run, the option is given to apply the UDGs to the game or to display it using the standard Sinclair characters.



- Set switch 3 of Chroma 81 to ON to enable CHR\$128 UDG mode.
- Press C to select to apply the UDGs and the game runs.



Creating Colourisation and Character Definition Files

It is possible to create your own colourisation and character definition files using the *Chroma Program Enhancement Creator*. The utility and full details on its use can be found on the ZX81 pages at www.fruitcake.plus.com.

Chroma Program Enhancer	ment Creator						_		×
Character Code: 166 Init	Paper Paper Paper V V V V V V V V V V V V V V V		< = < < < < < < < <				- 2 - 2 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0		× ????????????????????????????????????
Invert Pixels Swap Character Definition Details Description:	Colours	K L M	l N O	Verse_A to	R S	" "	Sh	ow Cole	v Z ours ⊵
Colour Definition Details Description: Colourisation file (c Farrow	:)2015-2019 Pau	Il Farrow for Z	X80 Pacma	n 4K ROM	(c)2010 Pa	ul)	6	
Program Details File: File Name:									*
Reset Data		Output							
All Pixels	Colours	UDG Loader	Colour Loader	Program File	Format: QS	I Reg ✓ -	-	Create	