Revision Date: June 2024

Production Switchers

Feature Comparison

CARBONITE BLACK SOLO | GRAPHITE | CARBONITE UltrA | CARBONITE UltrA 60 | Ultrix CARBONITE

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ROSS

PHYSICAL

ROSS	CARBONITE BLACK SOLO				GRAPHITE			CARBONITE Ultra	CARBONITE Ultra 60	Ultrix CARBONITE		
	SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA	CARBONITE ULTRA 60	FR2	FR5	FR12
Separate Rack Frame & Panel	✗	✓	✗	✓	✓	✓	N/A	✓	✓	✓	✓	✓
Rack Frame Height (RU)	✗	1	✗	1	4	14.63" (371.5 mm)	N/A	1	3	2	5	12
Rack Frame Width	16.20" (411.50 mm)	18.98" (482.10 mm)	16.20" (411.50 mm)	18.98" (482.10 mm)	16.00" (430.00 mm)	17.09" (434.00 mm)	N/A	18.98" (482.10 mm)	17.50" (444.5 mm)	17.50" (444.5 mm)	17.50" (444.5 mm)	17.50" (444.5 mm)
Rack Frame Depth	10.60" (255.50 mm)	10.00" (254.00 mm)	10.60" (255.50 mm)	10.00" (254.00 mm)	23.30" (592.00 mm)	9.05" (230.00 mm)	N/A	10.00" (254.00 mm)	17.50" (444.5 mm)	7.90" (200.66 mm)	7.90" (200.66 mm)	15.91" (404.11 mm)
Rack Frame Weight	10.00 lbs. (4.54 kg.)	8.00 lbs. (3.63 kg.)	11.00 lbs. (4.99 kg.)	9.00 lbs. (4.08 kg.)	62.00 lbs. (28.12 kg.)	42.00 lbs. (19.05 kg.)	N/A	13.00 lbs. (5.90 kg.)	47.00 lbs. (21.31 kg.)	12.00 lbs. (frame only) (5.44 kg.) Blade (approx.) 3 lbs. (1.36 kg.) Ultripower: 10.6 lbs. (4.83 kg.)	14.00 lbs. (frame only) (6.35 kg.) Blade (approx.) 3 lbs. (1.36 kg.) Ultripower: 10.6 lbs. (4.83 kg.)	76.00 lbs. (frame only) (34.47 kg.) Blade (approx.) 3 lbs. (1.36 kg.) Ultripower: 10.6 lbs. (4.83 kg.)
Maximum SDPE Blades per Chassis	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	4	16
Power Consumption	57W 4.75A 12VDC	66W 5.50A 12VDC	45W 3.75A 12VDC	48W 4.00A 12VDC	520W 4.70A 120V	185W 1.5A 120V	N/A	114W 7.6A 15VDC	800W 12VDC (maximum)	See Note		
Input Power	100 - 120 V, 220 - 240V, 47 - 63 Hz. 1.6 A						N/A	100 - 120 V, 220 - 240V, 47 - 63 Hz. 1.6 A		See Note		

Note: Power requirements and consumption dependent on I/O and SDPE blade complement

LEGEND: ✓ = Supported ✗ = Unsupported

Specifications subject to change without notice

PORTS

ROSS	CARBONITE BLACK SOLO				GRAPHITE			CARBONITE Ultra	CARBONITE Ultra 60	Ultrix CARBONITE		
	SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA	CARBONITE ULTRA 60	FR2	FR5	FR12
Ethernet Port (Frame)	1	1	1	1	2 (1 Carbonite, 1 Windows)	2 (1 Carbonite, 1 Windows)	N/A	1	1	Blades & Chassis	Blades & Chassis	Blades & Chassis
Tally	16	16	16	16	16 [1]	16 [1]	N/A	24	24	24 per SDPE blade	24 per SDPE blade	24 per SDPE blade
GPI/O	24	24	24	24	24 [1]	24 [1]	N/A	24	24	24 per SDPE blade	24 per SDPE blade	24 per SDPE blade
Serial Ports (Frame)	1	1	1	1	✗	✗	N/A	✗	✗	1	1	1
LTC Input	✗	✗	✗	✗	✓	✓	N/A	✓	✓	1	1	1
AES Input	✗	✗	✗	✗	✓ [1]	✓ [1]	N/A	✗	✗	✗	✗	✗
AES Output	✓	✓	✓	✓	✓	✓	N/A	✓	✗	2	2	2
Reference Input	1	1	1	1	1	1	N/A	1	1	1 [3]	2 [3]	2 [3]
Reference Loop	✗	✗	✗	✗	✗	✗	N/A	1 [2]	1 [2]	1 [3]	2 [3]	2 [3]
Independent Reference Output	✗	✗	✗	✗	✗	✗	N/A	1	1	✗	✗	✗

[1] On Audio Breakout Module
[2] Using Reference Output.
[3] On Ultrix frame.

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SUPPORTED VIDEO STANDARDS

		CARBONITE BLACK SOLO				GRAPHITE			CARBONITE UltrA	CARBONITE UltrA 60	Ultrix CARBONITE		
		SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA	CARBONITE ULTRA 60	FR2	FR5	FR12
										NOTE: Support for SD formats available 2025			
SD	480i / 59.94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
	576i / 50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
HD 720p	720p / 50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	720p / 59.94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HD pSF	1080 pSF / 23.98	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1080 pSF / 24	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓
	1080 pSF / 25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1080 pSF / 29.97	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1080 pSF / 30	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓
HD 1080i	1080i / 25	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	1080i / 29.97	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	1080i / 30	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	1080i / 50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1080i / 59.94	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HD 1080p	1080p / 23.98	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓
	1080p / 24	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓
	1080p / 25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1080p / 29.97	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1080p / 30	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓
	1080p / 50 (Level A)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1080p / 59.94 (Level A)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1080p / 60	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
UHD 2160p	2160p / 23.98	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	2160p / 24	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	2160p / 25	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	2160p / 29.97	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	2160p / 30	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	2160p / 50	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	2160p / 59.94	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	2160p / 60	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	Single-Link 12G	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	Quad-Link 2SI, 3G Level A	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓

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	SDI INPUTS & OUTPUTS										SDPE SDI / IP INPUTS & OUTPUTS		
	CARBONITE BLACK SOLO				GRAPHITE			CARBONITE UltrA		CARBONITE UltrA 60	Ultrix CARBONITE		
	SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA		CARBONITE ULTRA 60	FR2	FR5	FR12
										NOTE: Support for SD formats available 2025			
	SD / HD	SD / HD	SD / HD	SD / HD	SD / HD	SD / HD	SD / HD	SD / HD	UHD	HD / UHD	HD / UHD	HD / UHD	HD / UHD
Inputs	6	6	12	12	4, 8 or 12	4, 8 or 12	✗	24	18	Up to 60	22 [1]	22 [1]	22 [1]
Outputs	5	5	5	5	6	6	✗	14	12	Up to 25	22 [1]	22 [1]	22 [1]
NDI Inputs/Outputs	✗	✗	✗	✗	✗	✗	6, 12, or 18	✗	✗	✗	✗	✗	✗

[1] Up to eighteen (18) SDI or IP Carbonite inputs/outputs from/to the Ultrix router + four (4) SDPE direct SDI inputs & outputs

Note: Each SDPE blade = one (1) Carbonite switcher

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	Ultrix					
	SDI INPUTS & OUTPUTS			IP INPUTS & OUTPUTS		
	FR2[1]	FR5[1]	FR12[1]	FR2[2]	FR5	FR12
	HD / UHD	HD / UHD	HD / UHD	HD / UHD	HD /UHD	HD / UHD
Inputs / Outputs	1 SDPE + 3 HDX-IO	1 SDPE + 8 HDX-IO	1 SDPE + 15 HDX-IO	1 SDPE + 2 IPX-IO	1 SDPE + 8 IPX-IO	1 SDPE + 15 IPX-IO
	58 x 58	146 x 146	274 x 274	32 x 32	128 x 128	240 x 240
	2 SDPE + 2 HDX-IO	2 SDPE + 7 HDX-IO	2 SDPE + 14 HDX-IO	2 SDPE + 1 IPX-IO	2 SDPE + 7 IPX-IO	2 SDPE + 14 IPX-IO
	44 x 44	128 x 128	256 x 256	16 x 16	112 x 112	224 x 224
		3 SDPE + 6 HDX-IO	3 SDPE + 13 HDX-IO		3 SDPE + 6 IPX-IO	3 SDPE + 13 IPX-IO
		110 x 110	238 x 238		96 x 96	208 x 208
		4 SDPE + 5 HDX-IO	4 SDPE + 12 HDX-IO		4 SDPE + 5 IPX-IO	4 SDPE + 12 IPX-IO
		92 x 92	220 x 220		80 x 80	192 + 192
			5 SDPE + 11 HDX-IO			5 SDPE + 11 IPX-IO
			202 x 202			176 x 176
			6 SDPE + 10 HDX-IO			6 SDPE + 10 IPX-IO
			184 x 184			160 x 160
			7 SDPE + 9 HDX-IO			7 SDPE + 9 IPX-IO
			166 x 166			144 x 144
			8 SDPE + 8 HDX-IO			8 SDPE + 8 IPX-IO
			148 x 148			128 x 128
			9 SDPE + 7 HDX-IO			9 SDPE + 7 IPX-IO
			130 x 130			112 x 112
			10 SDPE + 6 HDX-IO			10 SDPE + 6 IPX-IO
			112 x 112			96 x 96
			11 SDPE + 5 HDX-IO			11 SDPE + 5 IPX-IO
			94 x 94			80 x 80
			12 SDPE + 4 HDX-IO			12 SDPE + 4 IPX-IO
			76 x 76			64 x 64
			13 SDPE + 3 HDX-IO			13 SDPE + 3 IPX-IO
			58 x 58			48 x 48
			14 SDPE + 2 HDX-IO			14 SDPE + 2 IPX-IO
			40 x 40			32 x 32
			15 SDPE + 1 HDX-IO			15 SDPE + 1 IPX-IO
			22 x 22			16 x 16

[1] Assumes all available slots, Aux Ports, and dedicated SDPE inputs & outputs are populated

[2] FR2 frame includes one fixed SDI I/O board for up to eighteen (18) additonal SDI inputs & outputs

Note: Mixed I/O board complement will result in different matrix sizes. Contact Ross Video for more details.

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FRAME FEATURES (SD / HD)

	CARBONITE BLACK SOLO				GRAPHITE			CARBONITE UltrA	CARBONITE UltrA 60	Ultrix CARBONITE		
	SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA	CARBONITE ULTRA 60	FR2	FR5	FR12
									NOTE: Support for SD formats available 2025			
ME Banks	1	1	1	1	1 or 2	1 or 2	3	1, 2 or 3 (4-Keyer Mode) 2 (6-Keyer Mode) [1]	3	1, 2 or 3 per SDPE Blade	1, 2 or 3 per SDPE Blade	1, 2 or 3 per SDPE Blade
MiniME Banks	2 (Gen 1) [2]	2 (Gen 1) [2]	2 (Gen 1) [2]	2 (Gen 1) [2]	4 (Gen 1) [2]	4 (Gen 1) [2]	✗	4 (Gen 2) [3]	4 (Gen 2) [3]	4 (Gen 2) [3] per SDPE Blade (1 or 2 ME modes only) [4]	4 (Gen 2) [3] per SDPE Blade (1 or 2 ME modes only) [4]	4 (Gen 2) [3] per SDPE Blade (1 or 2 ME modes only) [4]
Keyers per ME	5 (4 Full + 1 Transition Keyer)	5 (4 Full + 1 Transition Keyer)	5 (4 Full + 1 Transition Keyer)	5 (4 Full + 1 Transition Keyer)	5 (4 Full + 1 Transition Keyer)	5 (4 Full + 1 Transition Keyer)	6 (Full Keyers)	5 (4 Full + 1 Transition Keyer (4-Keyer Mode) 7 (6 Full + 1 Transition Keyer (6-Keyer Mode) [1]	7 (6 Full + 1 Transition Keyer)	7 (6 Full + 1 Transition Keyer)	7 (6 Full + 1 Transition Keyer)	7 (6 Full + 1 Transition Keyer)
Keyers per MiniME	2	2	2	2	2	2	✗	2	2	2 (1 or 2 ME modes only) [4]	2 (1 or 2 ME modes only) [4]	2 (1 or 2 ME modes only) [4]
2D DVEs	2	2	2	2	4	4	See note [5]	8	12	12	12	12
DVE Border Y-Perspective	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
UltraChrome Chroma Keyers	1	1	1	1	2	2	✗	4	4	4	4	4
UltraScene Advanced Compositing Engine	✗	✗	✗	✗	✗	✗	✗	4 pairs	4 pairs	4 pairs	4 pairs	4 pairs
Sequencer	✗	✗	✗	✗	✗	✗	✗	5	5	5	5	5
Portrait Rotation Mode	✗	✗	✗	✗	✗	✗	✗	3 Outputs	✗	✗	✗	✗
Input FSFC	6	6	6	6	6	6	✗	Up to 24	Up to 60	Up to 22	Up to 22	Up to 22
Input Colour Correctors/ Proc Amps	✗	✗	✗	✗	✗	✗	✗	Up to 24	Up to 60	Up to 22	Up to 22	Up to 22
Input SDR <> HDR Conversion	✗	✗	✗	✗	✗	✗	✗	Up to 24	Up to 60	Up to 22	Up to 22	Up to 22
Input Rec 709 <> Rec 2020 Conversion	✗	✗	✗	✗	✗	✗	✗	Up to 24	Up to 60	Up to 22	Up to 22	Up to 22
Output FC	✗	✗	✗	✗	✗	✗	✗	Up to 10	Up to 10	UltriProc	UltriProc	UltriProc
Output SDR <> HDR Conversion	✗	✗	✗	✗	✗	✗	✗	Up to 10	Up to 20	UltriProc	UltriProc	UltriProc
Output Rec 709 <> Rec 2020 Conversion	✗	✗	✗	✗	✗	✗	✗	Up to 10	Up to 20	UltriProc-3DLUT	UltriProc-3DLUT	UltriProc-3DLUT
I/O MultiViewers	✗	✗	✗	✗	✗	✗	✗	Up to 2	Up to 5	Ultriscape	Ultriscape	Ultriscape
Production MultiViewers	1	1	1	1	2	2	1	Up to 2	2	2	2	2
MultiViewer Timers	✗	✗	✗	✗	✗	✗	✗	5	10	Ultriscape	Ultriscape	Ultriscape
Global MediaStores	4 x video or 2 x video/key	4 x video or 2 x video/key	4 x video or 2 x video/key	4 x video or 2 x video/key	4 x video or 2 x video/key	4 x video or 2 x video/key	✗	4 x video or video/key	8 x video or video/key	4 x video or video/key	4 x video or video/key	4 x video or video/key
Audio MediaStore	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2	✗	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2
MediaStore RAM Capacity	8GB (Shared)	8GB (Shared)	8GB (Shared)	8GB (Shared)	2GB (Shared)	2GB (Shared)	N/A	8GB (Shared)	12GB (Shared)	8GB (Shared)	8GB (Shared)	8GB (Shared)
USB Media Player	✓ [6]	✓ [6]	✓ [6]	✓ [6]	✗	✗	✗	✓ [6]	✗	✓ [6]	✓ [6]	✓ [6]
Internal SSD Capacity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1TB (800GB User-accessible)	N/A	N/A	N/A

[1] 6-Keyer Mode requires CUF-ADD-ME3 License. Contact Ross Video for more details

[2] Gen 1 MiniME Banks provide one (1) DVE Keyer and one (1) full-function keyer

[3] Gen 2 MiniME Banks provide two (2) full-function keyers

[4] MiniMEs not available in 3 ME mode

[5] Dependent on available XPression resources

[6] Supported for certain resolutions, frame rates, and file formats only. Contact Ross Video for specifications

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FRAME FEATURES (SD / HD)

ROSS	CARBONITE BLACK SOLO				GRAPHITE			CARBONITE UltrA	CARBONITE UltrA 60	Ultrix CARBONITE		
	SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA	CARBONITE ULTRA 60	FR2	FR5	FR12
									NOTE: Support for SD formats available 2025			
Audio Mixer	✗	✗	✗	✗	✓	✓	✓	✓	✓	Ultrimix	Ultrimix	Ultrimix
Audio Aux Mix Reentry	✗	✗	✗	✗	✓	✓	✗	✓	✗	✗	✗	✗
Multiple AFV Source Triggers	✗	✗	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗
Memory/Custom Control Export	✗	✗	✗	✗	✓[1]	✓[1]	✗	✓[1]	✓[1]	✓[1]	✓[1]	✓[1]
Dual GPI Events	✗	✗	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓
Frame Simulator (DashBoard)	✗	✗	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓
Ross Platform Manager (RPM) Support	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
XPression LivcCG	✓	✓	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓
XPression Prime	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✗	✗

[1] Export function supported for Graphite, Carbonite Ultra, Carbonite Ultra 60, and Ultrix Carbonite only

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FRAME FEATURES (UHD)

ROSS	CARBONITE BLACK SOLO				GRAPHITE			CARBONITE UltrA	CARBONITE UltrA 60	Ultrix CARBONITE		
	SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA	CARBONITE ULTRA 60	FR2	FR5	FR12
ME Banks	✗	✗	✗	✗	✗	✗	✗	1 or 2	Up to 3	1 or 2 per SDPE Blade	1 or 2 per SDPE Blade	1 or 2 per SDPE Blade
MiniME Banks	✗	✗	✗	✗	✗	✗	✗	2 (Gen 2) [1]	2 (Gen 2) [1]	2 (Gen 2) [1] per SDPE Blade	2 (Gen 2) [1] per SDPE Blade	2 (Gen 2) [1] per SDPE Blade
Keyers per ME	✗	✗	✗	✗	✗	✗	✗	5 (4 Full + 1 Transition Keyer)	5 (4 Full + 1 Transition Keyer)	7 (6 Full + 1 Transition Keyer)	7 (6 Full + 1 Transition Keyer)	7 (6 Keyers + 1 Transition Keyer)
Keyers per MiniME	✗	✗	✗	✗	✗	✗	✗	2	2	2	2	2
2D DVEs	✗	✗	✗	✗	✗	✗	✗	4	6	6	6	6
DVE Border Y-Perspective	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
UltraChrome Chroma Keyers	✗	✗	✗	✗	✗	✗	✗	2	2	2	2	2
UltraScene Advanced Compositing Engine	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Sequencer	✗	✗	✗	✗	✗	✗	✗	5	5	5	5	5
Portrait Rotation Mode	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Input FSFC	✗	✗	✗	✗	✗	✗	✗	Up to 7	Up to 40	Up to 4	Up to 4	Up to 4
Input Colour Correctors/ Proc Amps	✗	✗	✗	✗	✗	✗	✗	Up to 8	Up to 20	Up to 4	Up to 4	Up to 4
Input SDR <> HDR Conversion	✗	✗	✗	✗	✗	✗	✗	Up to 8	Up to 20	Up to 4	Up to 4	Up to 4
Input Rec 709 <> Rec 2020 Conversion	✗	✗	✗	✗	✗	✗	✗	Up to 8	Up to 20	Up to 4	Up to 4	Up to 4

[1] Gen 2 MiniME Banks provide two (2) full-function keyers

LEGEND: ✓ = Supported ✗ = Unsupported

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FRAME FEATURES (UHD)

	CARBONITE BLACK SOLO				GRAPHITE			CARBONITE UltrA	CARBONITE UltrA 60	Ultrix CARBONITE		
	SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA	CARBONITE ULTRA 60	FR2	FR5	FR12
Output FC	✗	✗	✗	✗	✗	✗	✗	Up to 4	Up to 20	UltriProc	UltriProc	UltriProc
Output SDR <> HDR Conversion	✗	✗	✗	✗	✗	✗	✗	Up to 4	Up to 20	UltriProc	UltriProc	UltriProc
Output Rec 709 <> Rec 2020 Conversion	✗	✗	✗	✗	✗	✗	✗	Up to 4	Up to 20	UltriProc-3DLUT	UltriProc-3DLUT	UltriProc-3DLUT
I/O MultiViewers	✗	✗	✗	✗	✗	✗	✗	Up to 1	Up to 5	Ultriscape	Ultriscape	Ultriscape
Production MultiViewers	✗	✗	✗	✗	✗	✗	✗	1	1	1	1	1
MultiViewer Timers	✗	✗	✗	✗	✗	✗	✗	5	10	Ultriscape	Ultriscape	Ultriscape
MediaStores	✗	✗	✗	✗	✗	✗	✗	2 x video or video/key	8 x video or video/key	4 x video or video/key	4 x video or video/key	4 x video or video/key
Audio MediaStore	✗	✗	✗	✗	✗	✗	✗	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2	MediaStore 1 & 2
MediaStore RAM Capacity	8GB (Shared)	8GB (Shared)	8GB (Shared)	8GB (Shared)	2GB (Shared)	2GB (Shared)	N/A	8GB (Shared)	12GB (Shared)	8GB (Shared)	8GB (Shared)	8GB (Shared)
USB Media Player	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Internal SSD Capacity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1TB (800GB User-accessible)	N/A	N/A	N/A
Audio Mixer	✗	✗	✗	✗	✗	✗	✗	✓	✓	Ultrimix	Ultrimix	Ultrimix
Audio Aux Mix Re-Entry	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗
Multiple AFV Source Triggers	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗
Memory/Custom Control Export	✗	✗	✗	✗	✗	✗	✗	✓[1]	✓[1]	✓[1]	✓[1]	✓[1]
Dual GPI Events	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
Frame Simulator (DashBoard)	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
Ross Platform Manager (RPM) Support	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
XPression LivcCG	✓	✓	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓
XPression Prime	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✗	✗

[1] Export function supported for Graphite, Carbonite Ultra, Carbonite Ultra 60, and Ultrix Carbonite only

LEGEND: ✓ = Supported ✗ = Unsupported

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SUPPORTED PROTOCOLS

ROSS	CARBONITE BLACK SOLO				GRAPHITE			CARBONITE UltrA	CARBONITE UltrA 60	Ultrix CARBONITE		
	SOLO	CBF 109	SOLO 13	CBF 113	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC	CARBONITE ULTRA	CARBONITE ULTRA 60	FR2	FR5	FR12
INBOUND												
RossTalk	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
OverDrive / Caprica	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TSL 3.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TSL 5.0	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
GVG 100/110	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
GVG 200, 4000	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
OUTBOUND												
AMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RossTalk	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TSL 3.1	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
TSL 5.0	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
Ross CamBot	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Visca (Serial)	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
Canon BU series	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
PBUS II	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
VDCP	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

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RAVE AUDIO FEATURES / XPRESSION GRAPHITE FEATURES

ROSS	RAVE			XPression Graphite					XPression Clips	
	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC		PRIME	STUDIO SINGLE	STUDIO DUAL	STUDIO FLEX		ALL MODELS
Stereo Faders	48	48	8, 12, or 18	Scene/Template Designer	✓	✓	✓	✓	Dedicated Playback Server Channels	2
Fader Volume	-∞db to + 20db	-∞db to + 20db	-∞db to + 20db	Playout Sequencer	✓	✓	✓	✓	Dedicated Ingest Server Channels	1
Pre/Post-Fade Meters	✓	✓	✓	2D/3D Fonts	✓	✓	✓	✓	Crash Record	✓
Pre/Post-Fade Peak Indicators	✓	✓	✓	Arabic, Asian & Scripted Font Support	✓	✓	✓	✓	Still Video Input Grabber	✓
Per Channel Mute, Solo, & Pre-Fade Listen (PFL)	✓	✓	✓	3D Primitives	✓	✓	✓	✓	Single-Channel Transitions	✓
Per Channel Mute, Solo, & PFL Clear	✓	✓	✓	3D Model Support	✗	✓	✓	✓	Clip Trimming	✓
Per Channel Balance Controls (Stereo Inputs)	✓	✓	✓	Template Video Clip Support	✓	✓	✓	✓	Subclipping	✓
Per Channel Pan Controls (Mono Inputs)	✓	✓	✓	Project Video Format Conversion	✓	✓	✓	✓	Clip Database Management	✓
Per Channel Audio Follow Video mode (AFV)	✓	✓	✓	Animation Timeline	✓	✓	✓	✓	Preview/Program Operation	✓
Multiple AFV Triggers per Channel	✓	✓	✓	Graphical Keyframe Editor	✓	✓	✓	✓	AMP Control	✓
Aux Mixers	12	12	2, 4, or 6	Continuous Animations	✓	✓	✓	✓		
Audio Aux Mix Reentry	✓	✓	✓	Stagger Animations	✓	✓	✓	✓		

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RAVE AUDIO FEATURES

RAVE

	GRAPHITE	GRAPHITE PPC	GRAPHITE CPC
Per-Channel EQ & Clip Indicators	✓	✓	✓
Per Channel EQ Control	4-band (high-shelf, dual midrange, low-shelf)	4-band (high-shelf, dual midrange, low-shelf)	4-band (high-shelf, dual midrange, low-shelf)
Per Channel Compression/Limiting (Assignable pre- or post-EQ)	Variable Threshold, Compression, Attack, Release & Makeup	Variable Threshold, Compression, Attack, Release & Makeup	Variable Threshold, Compression, Attack, Release & Makeup
Per Channel Noise Gate Controls	Variable Threshold, Depth, Reduction, Attack, Hold & Release	Variable Threshold, Depth, Reduction, Attack, Hold & Release	Variable Threshold, Depth, Reduction, Attack, Hold & Release
Per Channel Ducking Controls	Variable Threshold, Depth, Mix Reduction, Attack, Hold & Release	Variable Threshold, Depth, Mix Reduction, Attack, Hold & Release	Variable Threshold, Depth, Mix Reduction, Attack, Hold & Release
Per Channel Talkback Controls	Variable Threshold, Depth, Mix Reduction, Attack, Hold & Release	Variable Threshold, Depth, Mix Reduction, Attack, Hold & Release	Variable Threshold, Depth, Mix Reduction, Attack, Hold & Release
Mono Mode	Duplication of Mono channel (L or R) to create L-L / R-R channel pair	Duplication of Mono channel (L or R) to create L-L / R-R channel pair	Duplication of Mono channel (L or R) to create L-L / R-R channel pair
Maximum Embedded Audio Input Channels	16 per SDI Input	16 per SDI Input	16 per SDI Input
Maximum Embedded Audio Output Channels	16 per SDI Output	16 per SDI Output	16 per SDI Output
16-Channel Sample Rate Converters	Available on SDI inputs 1 - 6	Available on SDI inputs 1 - 6	✗
DashBoard Control	✓	✓	✓
External MIDI Control	Behringer X-Touch Mini, Compact or compatible	Behringer X-Touch Mini, Compact or compatible	✗

Note: RAVE Audio optional for Graphite, Carbonite Ultra, and Carbonite Ultra 60 only.

XPRESSION GRAPHITE FEATURES

XPression Graphite

	PRIME	STUDIO SINGLE	STUDIO DUAL	STUDIO FLEX
Transition Logic	✗	✓	✓	✓
Visual Logic	✓	✓	✓	✓
XPression Video Codec License	✓	✓	✓	✓
XPression Video Coder Application	✓	✓	✓	✓
.NET Based Scripting	✗	✓	✓	✓
.NET / COM Automation API	✗	✓	✓	✓
Virtual Cameras	✓	✓	✓	✓
Live Input Shader (Apply Live Video to Surfaces)	✓	✓	✓	✓
Render To AVI Output	✓	✓	✓	✓
Export Template to Image/Video File	✓	✓	✓	✓
Maximum Video Input Channels	1	1	2	4
Maximum Video Preview Channels	0	1	2	2
Virtual Preview Channels (up next & look-ahead)	2 Per Channel	2 Per Channel	2 Per Channel	2 Per Channel
Maximum Output Channels (fill + key)	1	1	2	4
Output Format Set by Switcher	✓	✓	✓	✓
Maximum Embedded Audio Channels	16	16	16	16
AES Audio	✓	✓	✓	✓
Video Bypass (Hardware Failure & Software Watchdog)	✓[1]	✓[1]	✓[1]	✓[1]
GPI Contact Closure	✓[1]	✓[1]	✓[1]	✓[1]
Keyboard/GPI Mapping	✓	✓	✓	✓
Custom Keyboard Support	✓	✓	✓	✓
Multi-Channel Editions Available	✓	✓	✓	✓
Advanced Workflow Tools Available	✓	✓	✓	✓

[1] Graphite & Graphite PPC only

LEGEND: ✓ = Supported ✗ = Unsupported

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FRAME / PANEL COMPATIBILITY (Current Panels)

ROSS

	DIMENSIONS*		CARBONITE	CARBONITE BLACK SOLO		GRAPHITE		CARBONITE BLACK	CARBONITE UltrA	CARBONITE UltrA 60	Ultrix CARBONITE
	WIDTH x HEIGHT		ALL MODELS	SOLO / SOLO 13	CBF 109 / CBF 113	GRAPHITE / GRAPHITE PPC	GARPHITE CPC	ALL MODELS	CARBONITE ULTRA	CARBONITE ULTRA 60	ALL MODELS
CB9	16.20 x 10.06 (in.) 411.48 x 255.52 (mm)		✓	✗	✓	✓	✓	✓[4]	✓	✓	✓
	WIDTH x HEIGHT										
	Non-Modular[1]	Modular[2]									
TD1C	17.50 x 12.91 (in.) 444.5 x 327.91 (mm)	17.94 x 12.78 (in.) 455.68 x 324.61 (mm)	✓[3]	✗	✗	✓	✓	✓[4]	✓	✓	✓
TD1	28.29 x 9.86 (in.) 718.57 x 250.44 (mm)	27.94 x 9.92 (in.) 709.68 x 251.97 (mm)	✓[3]	✗	✗	✓	✓	✓[4]	✓	✓	✓
TD2	28.33 x 15.77 (in.) 718.60 x 400.56 (mm)	27.94 x 15.76 (in.) 709.68 x 400.30 (mm)	✓[3]	✗	✗	✓	✓	✓[4]	✓	✓	✓
TD2S	41.04 x 15.77 (in.) 1042.42 x 400.56 (mm)	41.04 x 15.76 (in.) 1042.42 x 400.30 (mm)	✓[3]	✗	✗	✓	✓	✓[4]	✓	✓	✓
TD3S	41.00 x 21.23 (in.) 1041.40 x 539.42 (mm)	41.04 x 21.25 (in.) 1042.42 x 539.76 (mm)	✓[3]	✗	✗	✓	✓	✓[4]	✓	✓	✓
TD3		58.36 x 20.22 (in.) 1482.34 x 513.59 (mm)	✗	✗	✗	✓	✓	✗	✓	✓	✓
TDx3		58.36 x 20.22 (in.) 1482.34 x 513.59 (mm)	✗	✗	✗	✓	✓	✗	✓	✓	✓
TD4		58.36 x 25.37 (in.) 1482.34 x 644.40 (mm)	✗	✗	✗	✓	✓	✗	✓	✓	✓
TDx4		58.36 x 25.37 (in.) 1482.34 x 644.40 (mm)	✗	✗	✗	✓	✓	✗	✓	✓	✓

[1] Pre-Sept. 2023 [2] Post Sept. 2023 [3] Requires v. 15.6.4 software. Contact Ross Video for details.

*Download dimension files (.pdf & .dxf) and Panel Cutouts at www.rossvideo.com

[4] Requires v. 15.0 or higher software. Contact Ross Video for details.

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FRAME / PANEL COMPATIBILITY (Legacy Panels)

	DIMENSIONS*	CARBONITE	CARBONITE BLACK SOLO		GRAPHITE		CARBONITE BLACK	CARBONITE UltrA	CARBONITE UltrA 60	Ultrix CARBONITE
	WIDTH x HEIGHT	ALL MODELS	SOLO / SOLO 13	CBF 109 / CBF 113	GRAPHITE / GRAPHITE PPC	GARPHITE CPC	ALL MODELS	CARBONITE ULTRA	CARBONITE ULTRA 60	ALL MODELS
A1S / A1SDD	41.00 x 16.00 (in.) 1041.40 x 406.40 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
A2M / A2MDD	48.00 x 16.00 (in.) 1219.20 x 406.40 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
A2X / A2XDD	54.50 x 16.00 (in.) 1384.30 x 406.40 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
A3M / A3MDD	48.00 x 21.50 (in.) 1219.20 x 546.10 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
A3 / A3DD	54.50 x 21.50 (in.) 1384.30 x 546.10 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
A4 / A4DD	61.50 x 27.50 (in.) 1562.10 x 698.50 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
C10 (CPS-1012)	15.85 x 10.77 (in.) 402.59 x 273.56 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✗	✗	✗
C1 (CPS-1016)	21.70 x 10.76 (in.) 551.18 x 273.30 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✗	✗	✗
C1A	24.70 x 12.49 (in.) 627.38 x 316.99 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✓ [1]	✓ [1]	✓ [1]
C1M	29.77 x 12.48 (in.) 756.16 x 316.99 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✓ [1]	✓ [1]	✓ [1]
C2	24.71 x 18.24 (in.) 627.63 x 463.30 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✓ [1]	✓ [1]	✓ [1]
C2M	29.77 x 18.23 (in.) 756.16 x 463.04 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✓ [1]	✓ [1]	✓ [1]
C2S	33.74 x 18.25 (in.) 857.00 x 463.55 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✓ [1]	✓ [1]	✓ [1]
C2X	39.48 x 18.25 (in.) 1002.70 x 463.55 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✓ [1]	✓ [1]	✓ [1]
C3S	33.74 x 24.13 (in.) 857.00 x 612.90 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✓ [1]	✓ [1]	✓ [1]
C3X	39.48 x 24.13 (in.) 1002.79 x 612.90 (mm)	✓	✗	✓ [1, 2]	✓ [1]	✗	✓	✓ [1]	✓ [1]	✓ [1]
CB1	23.42 x 10.72 (in.) 594.87 x 272.29 (mm)	✓	✗	✓	✓	✓	✓	✓	✓	✓
CB1S	32.51 x 10.72 (in.) 825.75 x 272.29 (mm)	✓	✗	✓	✓	✓	✓	✓	✓	✓
CB2	23.42 x 16.24 (in.) 594.87 x 412.50 (mm)	✓	✗	✓	✓	✓	✓	✓	✓	✓
CB2S	32.51 x 16.24 (in.) 825.75 x 412.50 (mm)	✓	✗	✓	✓	✓	✓	✓	✓	✓
CB3S	32.51 x 21.76 (in.) 825.75 x 552.70 (mm)	✓	✗	✓	✓	✓	✓	✓	✓	✓
CB3X	38.19 x 21.76 (in.) 970.02 x 552.70 (mm)	✓	✗	✓	✓	✓	✓	✓	✓	✓
V1	28.50 x 16.50 (in.) 723.90 x 419.10 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
V1M	35.00 x 16.50 (in.) 889.00 x 419.10 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
V2	34.00 x 16.50 (in.) 863.60 x 419.10 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
V2M	39.50 x 16.50 (in.) 1003.30 x 419.10 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
V2X	51.00 x 16.50 (in.) 1295.40 x 419.10 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
V3M	45.30 x 20.50 (in.) 1150.60 x 520.70 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
V3	51.00 x 20.50 (in.) 1295.40 x 520.70 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗
V4	55.50 x 26.00 (in.) 1409.70 x 660.40 (mm)	✗	✗	✗	✗	✗	✗	✗	✗	✗

*Download dimension files (.pdf & .dxf) and Panel Cutouts at www.rossvideo.com

[1] Requires CarboNet Serial - Ethernet Adaptor. Contact Ross Video for details.
[2] Requires v. 2.0 or higher software. Contact Ross Video for details.
[3] Requires v. 13.0 or higher software. Contact Ross Video for details.

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