Colorimetric and Resolution requirements of cameras

Alan Roberts

ADDENDUM 15: Menu settings for

Panasonic DVCPro100 (AJ-HDX400-MC)

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Assessment was made on a preproduction sample of the AJ-HDX400 (no serial number), a 1080-line fixed frame-rate HDTV cam-corder. It is very similar in form and function to the SDX900, sharing many features and having a very similar menu set. For this assessment, no manual was available. Production models may well differ in detail.

The camera is switchable between interlace (50i) and progressive (25psf) modes and thus can generate a "film look" in the camera . It has specific "film-look" gamma curves that incorporate many of the contrast handling features of earlier cameras, making it a great deal easier to set up. The camera has 3 2/3" ccds and records using conventional DVPro tape at 100Mb/s.

The camera is significantly smaller and lighter than the familiar Beta camcorder and is useful mostly for portable, single-camera work. It has many internal menus for setting the performance, such that it can then be used without external controls. It is not well suited to multi-camera operation.

In this setup, the gamma correction and knee are adjusted to capture about 2.5 stops of overload, and 1 stop of underexposure, to mimic film performance.

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ADDENDUM 15: Menu settings for

Panasonic DVCPro (AJ-HDX400-MC)

Many menu items have little or no effect on the image. Those that do so are highlighted. The full menus are given for completeness. Where two values are given {f} denotes film use, {v} video. The film mode uses the "Filmlike2" gamma curve, which very closely resembles the best that can be done with a conventional gamma curve and knee, but with a nice smooth join, there seems no point in ignoring this curve sinc Panasonic have clearly put much effort into its design, and it works well. The manual knee controls have no effect in this mode. Both modes can cope with about 2.5 stops of overexposure; the video mode (with optimal knee settings) copes a little better than does the built-in film mode but the difference is marginal. Total exposure range has been measured as at least 11 stops, perhaps 12 depending on noise and optical flare.

Line Mix mode appears to be the equivalent of EVS in other cameras. Switched on in 25p mode gives the same vertical resolution as 50i, thus minimising most interlace twitter artefacts.

The shutter can be set to 180 degrees for 25psf, independent of the shutter switch setting, thus it is much less likely to be accidentally switched off.

Digital Super Gain is implemented by reducing the frame rate. This gives "free" gain without noise, provided the lowered frame rate is acceptable. In this prototype, the facility was available only in 50i mode, but the output was obviously progressive. This may be a software fault.

The viewfinder has a magnification facility, assignable to one of the User switches. Magnification cycles through the enabled settings in Operation/User Sw Gain.

SYSTEM MENUS

System mode

Item	*Range*	*Factory*	*description*	*BBC*
Camera Mode	50i,25p	50i	Interlace/proscan	25p{f} 50i{v}
P.Half Shut	On,Off	On	180deg shutter for proscan	

Option mode

Item	*Range*	*Factory*	*description*	*BBC*
P.Off GPS Data	Hold,Clear	Clear	Holds GPS data while power off	
Rec Tally	Red, Green, Char	On	Vf indicators	

Rec function

Item	*Range*	*Factory*	*description*	*BBC*
Interval Rec Mode	On,One shot,Off	Off	Single frame recording possible with YA903G card	
Rec Time	00s01f~59s24f	00s01f	Frames to record, min 2 sec without 903G	
Pause Time	01f~23h59m59s24f	04m59s24f	Interval between recordings	
Take Total Time	None~5day	None	Session duration	
Total Rec Time	00s01f~ over100m,None	Display only	=REC+PAUSE+TOTAL TAKE	
Auto Rec	Off,On	Off		
Start Delay	0sec~10sec	0sec	Delay to start full recording when in interval mode	
Pre Rec Mode	Off,0sec~15sec	7sec	Preroll time	
Retake Mode	On,Off	Off	Refer to manual	

Output sel

Item	*Range*	*Factory*	*description*	*BBC*

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Output Char	TC,Status,Menu	Menu	Characters on Video/Mon outputs	
VF Mode	EE/PB,PB	EE/PB	EE=camera at all times	
HDSDI P.Save	Off,On	Off	Trunrs off all output signals	
HDSDI Char	Off,On	Off	Puts characters on HDSDI output	
HDSDI Metadata	Off,On	Off	Puts vf struff on HDSDI	
Downcon P.Save	Off,On	Off	Puts characters on SD composite output	
Dpowncon Char	Off,On	Off	Puts vf stuff on SD composite output	

Genlock

Item	*Range*	*Factory*	*description*	*BBC*
Genlock	Auto	Auto	Genlock source, no control	
GL.Phase	HDSDI,Downc on	HDSDI	Horizontal timing	
H.Phase Coarse	-55~55	0		
H.Phase Fine	-100~100	0		

PAINT MENUS

ROP remote operating panel, mimics ECU. Not available if ECU is plugged in

Item	*Range*	*Factory*	*description*	*BBC*
Master Ped	-200~200	18	Master lift	0
Master Dtl	-31~31	0		0
Master Gamma	0.35~0.75	0.45	In 0.1 steps, stored in gain switch	0. 45
Knee Point	70~107%	85%		
Knee Slope	0~99	50		
R Gain	-200~200	0		0
G Gain	-200~200	0		0
B Gain	-200~200	0		0
R Pedestal	-200~200	0		0
G Pedestal	-200~200	0		0
B Pedestal	-200~200	0		0

Matrix (User preset) A,B

Item	*Range*	*Factory*	*description*	*BBC*
Matrix Table	A,B	A	Two user tweakable matrices	
Matrix R-G	-31~31	0	Settings for matrix A	+07{f} 0{v}
Matrix R-B	-31~31	0		+17{f} 0{v}
Matrix G-R	-31~31	0		+07{f} 0{v}
Matrix G-B	-31~31	0		-6{f} 0{v}
Matrix B-R	-31~31	0		-6{f} 0{v}
Matrix B-G	-31~31	0		0
Matrix R-G	-31~31	0	Settings for matrix B,	+9{f} 0{v}
Matrix R-B	-31~31	0	Not used in this setup	+7{f} 0{v}
Matrix G-R	-31~31	0		+16{f} 0{v}
Matrix G-B	-31~31	0		+12{f} 0{v}
Matrix B-R	-31~31	0		0
Matrix B-G	-31~31	0		0
L Matrix Table	Off,A,B	A	Select matrix in Low	
M Matrix Table	Off,A,B	A	Mid	
H Matrix Table	Off,A,B	A	High gain setting	

Color Correction rather dangerous territory

Item	*Range*	*Factory*	*description*	*BBC*
R (Sat/Phase)	-63~63	0	Adjusts colour in 45 degree segments, tweaks saturation and hue.	-10+08{f} –20+08{v}
R-Mg (Sat/Phase)	-63~63	0		-05-25
Mg (Sat/Phase)	-63~63	0		+35+00
Mg-B (Sat/Phase)	-63~63	0		+00+00
B (Sat/Phase)	-63~63	0		-30+13
B-Cy (Sat/Phase)	-63~63	0		+00+00
Cy (Sat/Phase)	-63~63	0		+15–04
Cy-G (Sat/Phase)	-63~63	0		+00+00
G (Sat/Phase)	-63~63	0		+13–10
G-Yl (Sat/Phase)	-63~63	0		+00+00
Yl (Sat/Phase)	-63~63	0		+26+30{f} –27-29{v}
Yl-R (Sat/Phase)	-63~63	0		+00+00

Low Setting Low Level Gain switch position

Item	*Range*	*Factory*	*description*	*BBC*

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Master Gain	-3~30dB	0	dB settings, 3dB steps	0
H Dtl Level	0~63	28		0 {f} 20{v}
V Dtl Level	0~31	12		0 {f} 14{v}
Dtl Coring	0~15	2		2
H Dtl Freq	0~31	18		31
Level Dep	0~5	3	Low luma zone, no correction	1
Gamma	0.35~0.75	0.45	0.01 steps	0.45
Black Str	-3~OFF~+3	OFF	No other controls	2
Matrix Table	A/B/OFF	A	User preset matrices	A{f} OFF{v}
Col. Corr.	ON,OFF	OFF	12 segment adjust, see above	ON

Mid Setting Mid Level Gain switch position

Item	*Range*	*Factory*	*description*	*BBC*
Master Gain	-3~30dB	6	dB settings, 3dB steps	6
H Dtl Lev	0~63	20		0 {f} 20{v}
V Dtl Lev	0~63	10		0 {f} 14{v}
Dtl Coring	0~15	3		2
H Dtl Freq	0~31	18		31
Level Dep	0~5	1	Low luma zone, no correction	2
Gamma	0.35~0.75	0.45	0.01 steps	0.45
Black Str	-3~OFF~+3	OFF		1
Matrix Table	A/B/OFF	A	User preset matrices	A{f} OFF{v}
Col. Corr.	ON,OFF	OFF	12 segment adjust, see above	ON

High Setting High Level Gain switch position

Item	*Range*	*Factory*	*description*	*BBC*
Master Gain	-3~30dB	12	dB settings, 3dB steps	12
H Dtl Lev	0~63	10		0 {f} 20{v}
V Dtl Lev	0~63	10		0 {f} 14{v}
Dtl Coring	0~15	8		8
H Dtl Freq	0~31	18		31
Level Dep	0~5	3	Low-luma zone, no correction	4
Gamma	0.35~0.75	0.55	0.01 steps	0.55
Black Str	-3~OFF~+3	OFF		OFF
Matrix Table	A/B/OFF	A	User preset matrices	A{f} OFF{v}
Col. Corr.	ON,OFF	OFF	12 segment adjust, see above	ON

Additional Dtl Detail, extra controls

Item	*Range*	*Factory*	*description*	*BBC*
Knee Apa Lvl	OFF,1~5	3	Correction in knee compressed zone	3
Dtl Gain +	-31~31	0	correction, +ve going edges	0
Dtl Gain -	-31~31	8	correction, -ve going edges	8
Dtl Clip	0~63	0	Clip level of detail correction	47

Skin Tone Dtl

Item	*Range*	*Factory*	*description*	*BBC*
Skin Tone Dtl	ON,OFF	OFF		OFF
Skin Tone Zebra	ON,OFF	OFF	VF level has external control	OFF
Skin Dtl Coring	0~7	5		5
Y Max	0~255	190	Max luma level for boost	190
Y Min	0~255	10	Min luma level for boost	10
I Center	0~255	30	I axis mean level for boost	30
I Width	0~255	35	I axis min level for boost	35
Q Width	0~255	10	Q axis max level for boost	10
Q Phase	0~255	0	Q axis min level for boost	0

Cam Main Menu 1, Knee Level

Item	*Range*	*Factory*	*description*	*BBC*
Master Ped	-200~200	18	Duplicate entry for pedestal	0
Manual Knee	ON,OFF	ON	Valid only if AUTO is off	ON
Knee Point	80%~107%	93%	Manual break point	0 {f} 85{v}
Knee Slope	0~99	85	Gain in knee zone, about 1.5 stops overload	0 {f} 68 {v}
White Clip	ON,OFF	ON		ON
White Clip Lvl	90%~109%	109%		109%
A. Knee Point	80%~107%	93%	Auto knee point	85%
A Knee Level	100~109	107		105
A.Knee Response	1~4	1	Auto knee response speed	4

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Gamma Differential, colour tweaking

Item	*Range*	*Factory*	*description*	*BBC*
Master Gamma	0.35~0.75	0.45		0.45
R Gamma	-15~15	0	Set R away from Master	0
B Gamma	-15~15	0	Set B away from Master	0
Gamma Mode Sel	Std,Film1,Film2	Std	Film-type gammas, 2 is steeper than 1, Filmlike2 turns off man knee	Film2 {f} Std {v}

Flare

Item	*Range*	*Factory*	*description*	*BBC*
R.Flare	0~100		Set depending on lens, this is typical of powered zoom lenses	0
G.Flare	0~100			0
B.Flare	0~100			0

Camera Settings

Item	*Range*	*Factory*	*description*	*BBC*
Detail	On,Off	On		Off {f} On {v}
High Color	On,Off	Off	Hue/Saturation **attenuation** at high levels	Off
Gamma	On,Off	On		On
Test Saw	On,Off	Off		
Flare	On,Off	On		
H-F Compe	On,Off	On	Wide-band detail enhancement	On

VF

VF Displays

Item	*Range*	*Factory*	*description*	*BBC*
Disp Condition	Normal/Hold	Normal	Show switch status or not	Normal
Disp Mode	1,2,3	3	1=0ff,2=some,3=all	3
DS.GAIN DISP	GAIN,FR RATE	FRM RATE		
VF Out	Y,NAM,R,G,B	Y	What you see	Y
Zebra 1 detect	50%~110%	70%		65% {f} 70% {v}
Zebra 2 detect	50%~110%	85%		100%
Zebra 2	On,Off,Spot	Spot	SPOT works only if Zebra 2>1	Spot
Low Light Lvl	Off,20%~45%	35%	Warns at low light level	35%
ECU menu Disp	On,Off	Off	Shows menus when UCU is connected	Off
Marker/Char Lvl	50%~100%	50%	Marker/Character brightness	100%

VF Marker

Item	*Range*	*Factory*	*description*	*BBC*
Table	A,B	A	Switch between AB setups set below	
Centre Mark	Off,1~4	1	Cross size/type	
Safety Zone	Off,1,2	2	1=box, 2=corners	
Safety Area	80%~100%	90%		
Frame Sig	4:3,13:9,14:9,Vista	4:3	Vista is 16:8.65!	14:9
Mark	On,Off	OFF	Frame marker	OFF
Lvl	0~15	15	Picture level outside frame mark	15

User Box

Item	*Range*	*Factory*	*description*	*BBC*
User Box	On,Off	Off	Custom frame	
User Box Width	1~100	13		
User Box Height	1~144	13		
User Box H Pos	-50~+50	0		
User Box V Pos	-144~+144	0		

VF Indicator 1

Item	*Range*	*Factory*	*description*	*BBC*
Extender	ON,OFF	ON	Lens extender	On
Shutter	ON,OFF	ON	Shutter speed display	On
Filter	ON,OFF	ON	Filter position	On
White	ON,OFF	ON	Show AWB or Preset A/B	On
Gain	ON,OFF	ON		On
Iris	IRIS,S+IRIS,OFF	S+IRIS	Iris/Super Iris (?) display	S+Iris
Camera ID	ON,OFF	ON	Show camera ID with bars	On

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ID Position	UpperR,UpperL, LowerR,LowerL	UpperL		
Date/Time	On,Off	Off		Off
Zoom Lvl	On,Off	On	Focal length	ON
Color Temp	On,Off	On		ON
Camera Mode	On,Off	On,Off	Shape/Data rate indicator	Off

VF Indicator 2

Item	*Range*	*Factory*	*description*	*BBC*
Tape	On,Off	On	Lens extender	On
Battery	On,Off	On	Shutter speed display	On
Audio Lvl	On,Off	On	Filter position	On
TC	TCG,TCR, TCG/TCR,Off	Off		Off
VTR Warning	Always,Normal,Off	Normal		Normal
Save LED	Save&Tape,Save	On,Off		Save

Mode Check Ind

Item	*Range*	*Factory*	*description*	*BBC*
Status	On,Off	On		On
!LED	On,Off	On		On
Function	On,Off	On		On
Audio	On,Off	On		On
P.On Ind	On,Off	On		On

! LED VF warnings

Item	*Range*	*Factory*	*description*	*BBC*
Gain (0dB)	On,Off	On		On
Gain (-3dB)	On,Off	Off		Off
DS Gain	On,Off	On		On
Line Mix Gain	On,Off	On		Off
Shutter	On,Off	On		On
White Preset	On,Off	Off		Off
Extender	On,Off	On		On
Black Str	On,Off	Off		Off
Matrix	On,Off	Off		Off
Color Correct	On,Off	Off		Off
Filter	On,Off	Off		Off
ATW	On,Off	Off		Off
D.Zoom	On,Off	Off		Off

OPERATION

Camera ID

Item	*Range*	*Factory*	*description*	*BBC*
ID1			Max 10 characters	
ID2				
ID3				

Shutter Speed

Item	*Range*	*Factory*	*description*	*BBC*
Syncrho Scan	On,Off	On	Speed set by buttons near filter wheel, can go down to 1/25.3sec	On
Position 1	On,Off	On	ON adds items to list of settings that can be cycled through using the little switch below the lens.	On
Position 2	On,Off	On		On
Position 3	On,Off	On		On
Position 4	On,Off	On		On
Position 5	On,Off	On		On
Position 6	On,Off	On		On

Shutter Select

Item	*Range*	*Factory*	*description*	*BBC*
Position 1	1/60,1/120, 1/250,1/500, 1/1000,1/2000	1/60		1/60
Position 2		1/120		1/120
Position 3		1/250		1/250
Position 4		1/500		1/500
Position 5		1/1000		1/1000
Position 6		1/2000		1/2000

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User SW

Item	*Range*	*Factory*	*description*	*BBC*
User Main Sw	Inh,S.Gain,DS,Gain,S.Iris,LineMix,	S.Gain	Allocate functions to switches	
User 1 Sw	I.Over,S.Blk,B.Str,AudioCh1,	D.Zoom		
User 2 Sw	AudioCh2,RecSw,Yget,RetSW,	DS.Gain		
	ATW,D.Zoom			

SW Mode

Item	*Range*	*Factory*	*description*	*BBC*
Ret Sw	RecCheck,CamRet	RecCheck		RecCheck
S.Blk Lvl	Off,-10,-20,-30	-10	Super black level	-10
Auto Knee Sw	On,Off	On		Off
Shd,Abb Sw Ctl	On,Off	On	Does black shading with black balance	On
Color Bars	SMPTE,Full,Split,Arib	Full	Arib=multiformat bars	Full
S.Gain Off	L/M/H,S.Gain	L/M/H	Which switch cancels Super Gain	L/M/H
DS.Gain Off	L/M/H,DS.Gain	DS.Gain	Which switch cancels Digital Super Gain	DS.Gain
D.Zoom Sel	Zoom,Focus	Zoom	Allows digital zoom as focus assistance	Zoom
D.Zoom x2	On,Off	On	V/f digital zoom, assign magnification to selected User switch	
D.Zoom x3	On,Off	On		
D.Zoom x4	On,Off	On		
ECU Data Save	On,Off	Off	ON saves ECU (ROP) settings when entered	Off

White Balance Mode

Item	*Range*	*Factory*	*description*	*BBC*
Filter Inh	On,Off	On	Allows separate balance data for filters	On
Shockless AWB	Off,Fast,Normal, Slow1,Slow2,Slow3	Normal	Response speed to white change	Normal
AWB Area	25%,50%,90%	25%	Central screen area	25%
AWB&ABB Offset	On,Off	Off	Resets Gain/Ped in ROP menu on balancing	Off
Color Temp Pre	3200K~5600K	3200K	AWB aim point	3200K
AWB A	Mem,Var	Mem	Var=AWB A aim point as set below	Mem
Color Temp A	3200K~5600K	3200K	AWB A Var aim point	3200K
AWB B	Mem,Var	Mem	Var=AWB B aim point as set below	Mem
Color Temp B	3200K~5600K	3200K	AWB B Var aim point	3200K
ATW Speed	Normal,Fast,Slow	Normal		Normal

User Sw Gain

Item	*Range*	*Factory*	*description*	*BBC*
S.Gain 30dB			Allows each Super Gain (analogue) gain setting to be included or excluded from the gain lists	
S.Gain 36dB				
S.Gain 42dB				
S.Gain 48dB				
DS.Gain 6dB (25P)			Digital Super Gain = Slow Shutter. Effectively free gain by lowering frame rate. Works only in 50i, not in 25p. This may not be true in production models	
DS.Gain 10dB (16P)				
DS.Gain 12dB (12P)				
DS.Gain 15dB (8P)				
DS.Gain 20dB (5P)				

Iris

Item	*Range*	*Factory*	*description*	*BBC*
A.Iris Level	0~100	35	Auto iris target level, luma	35
A.Iris Peak/Ave	0~100	40	Ratio, 0=ave'ge, 100=peak	40
A.Iris Mode	Norm1,Norm2,Centr	Norm1	1=full frame, 2=not top	Centr
S.Iris Level	0~100	80	Super Iris target level	80
Iris Gain	Cam,Lens	Cam	Where the control is	Cam
Irtis Gain Value	1~20	8		8

FILE MENUS

Card Read/Write

Item	*Range*	*Factory*	*description*	*BBC*
R.Select	1~8	1	File number to read	1
Read			load from file	
W.Select	1~8	1	File number to write	1
Write			write to file	
Card Config			List titles on card	

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Title Read	load user data	
Title1-8	Title, max 8 characters	

Cam Card R/W Select

Item	*Range*	*Factory*	*description*	*BBC*
ID Read/Write	On,Off	Off	On=save cam ID to card	Off
User Menu Select R/W	On,Off	On		
System Menu R/W	On,Off	On		
Paint Menu level R/W	On,Off	On		
VF Menu R/W	On,Off	On	Load/save Menu items that are/aren't marked	
Operation Menu R/W	On,Off	On		
Mainte Menu R/W	On,Off	On		
VTR Menu R/W	On,Off	On		

Lens File

Item	*Range*	*Factory*	*description*	*BBC*
File No.	1~8	1	Lens file number	
Read			Read it	
Write			Write it	
Title1-8	ON,OFF		Max 8 characters	

Scene File

Item	*Range*	*Factory*	*description*	*BBC*
Read User Data.			Reads data from User area	
Scene Sel	1~4			
Read				
Write				
Reset				
Title1-3				
Title 4	Film Like		Max 8 characters	

Initialise

Item	*Range*	*Factory*	*description*	*BBC*
Read Factory Data			Factory reset all menu settings	
Write User Data			Save user setup (e.g. ROP values)	

MAINTENANCE MENUS

System Check

Item	*Range*	*Factory*	*description*	*BBC*
Color Check	On,Off	Off	Checks colour processing	Off

Diagnostic card/software versions, values for test camera on 14.11.2002

Item	*Range*	*Factory*	*description*	*BBC*
Camsoft (in)			Internal flash software version	
Camsoft (out)			External flash software version	
Cam Table			Table version	
Font Rom			Font version	
Pld(Char)			Programme software version	
Pld V Sel				
Pld(Mem)			Programme memory version	
Pld(TG)			CCD drive version	

Len Adj

Item	*Range*	*Factory*	*description*	*BBC*
F2.8 adj	On,Off	Off		
F16 adj	On,Off	Off		

Black Shading

Item	*Range*	*Factory*	*description*	*BBC*
Correct	On,Off	On		On
Detection (Dig)			This makes it happen	ON

White Shading

Item	*Range*	*Factory*	*description*	*BBC*
Correct	On,Off	On		On

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Detection (V Saw)	This makes it happen	

VTR MENUS

VTR Function

Item	*Range*	*Factory*	*description*	*BBC*
Humid Ope	On,Off	Off	=only Eject when humid	Off
Rec Start	All,Normal	Normal	=only in Power Save/Pause	Normal
Pause Timer	10,20,30,60	30	Pause before auto stop	30
ECU Rec Chk SW	R.Review,Retake	R.Review	What happens when pressing Rec Chk on Extension Control Unit	R.Reviewe

Battery/Tape

Choice of battery types

Item	*Range*	*Factory*	*description*	*BBC*
Battery Select	AJ-BP490,AU-BP402,HP-30A,Pro14,Trim14, Hytron50,Hytron100,Digital14,Digital13, Dionic,BP-H120,NP-L50,NP-L50D,Endura50, Endura80,BP-L60/90,NP-1B,TypeA,TypeB	PRO14		
Ext DC In Select	ACAdpt,AJ-BP490,AU-BP402,HP-30A,Pro14, Trim14,Hytron50,Hytron100,BP-H120,NP-L50, Endura50, Endura80,BP-L60/90,NP-1B, TypeA, TypeB	AC-ADPT	As for battery, plus external	AC-ADPT
Batt Near End Alarm	On,Off	Off	Warning bleep	Off
Batt Near End Cancel	On,Off	On	Mode switch cancels bleep	On
Batt End Alarm	On,Off	On	Warning bleep	On
Batt Remain Full	100%,70%	70%	Indicator level called "full"	70%
Tape Near End Alarm	On,Off	Of	Warning bleep	Off
Tape Near End Time	3min,2min	2min	Bleep time before end	2min
Tape End Alarm	On,Off	On	Warning bleep	On
Tape Remain	3min,5min	3min	Size of time pixel in LCD	3min

Battery Setting 1

Item	*Range*	*Factory*	*description*	*BBC*
AJ-BP490	Auto,Manual (11~15)	11.5		
AU-BP402		11.5		
HP-30A		12.0		
Pro14		13.8		
Trim14		13.6		
Hytron50		13.8		
Hytron100		13.1		
BP-H120		11.7		
NP-L50		13.1		
Endura50		12.9		
Endura80		13.6		
BP-L60/90		11.0		
NP-1B		11.4		

Battery Setting 2

Item	*Range*	*Factory*	*description*	*BBC*
Digital14	Auto,Manual (11~16)	13.8/13.4	Near end/End	
Digital13		12.7/12.2	Near end/End	
Dionic		13.9/13.3	Near end/End	
NP-L50D		13.1/12.2	Near end/End	
TypeA		15.0/13.5/11.9	Full/Near end/End	
TypeB		15.5/13.1/13.6	Full/Near end/End	

Mic/Audio 1

Item	*Range*	*Factory*	*description*	*BBC*
Front VR Ch1	Front/WLRear/All/Off	Off	Audio control, Ch1	Off
Front VR Ch2	Front/WLRear/All/Off	Off	Audio control, Ch2	Off
Mic Lowcut Ch1	Front/Rear/WL/Off	Off		Off
Mic Lowcut Ch2	Front/Rear/WL/Off	Off		Off
Mic Lowcut Ch3	Front/Rear/WL/Off	Off		Off
Mic Lowcut Ch4	Front/Rear/WL/Off	Off		Off
Limiter 1	On/Off	Off		Off
Limiter 2	On/Off	Off		Off

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Audio Level Ch3	On,Off	On		On
Audio Level Ch3	On,Off	On		On
Rec Ch3Ch4	Sw,Ch1/2	Sw	Source for Ch3/4 audio	Sw
Cue Rec Select	Ch1,Ch2,Ch3,Ch4,Ch1+2,Ch3+4	Ch1	Source for cue track	Vh1
Test Tone	Normal,Always,Off,ChSel	Normal	=tone with bars	Normal

Mic/Audio 2

Item	*Range*	*Factory*	*description*	*BBC*
Front Mic Power	On,Off	On	Phantom power	On
Rear Mic Power	On,Off	On	Phantom power	On
Audio Out	On,Off	On		On
Monitor Select	Stereo,Mix	Stereo		Stereo
Front Mic level	-40.-50dB	-40dB		
Rear Mic Ch1 Level	-40.-60dB	-60dB		
Rear Line In Level	0,+4dB	0dB		
Audio Out level	0,+4dB	0dB		
Headroom	18,20dB	18dB		
Wireless Warn	On,Off	Off	Warns when radio mic level is poor	

TC/UB

Item	*Range*	*Factory*	*description*	*BBC*
UB Mode	User,Date,Time, Ext,TCG,Frmrate,Regen	User	User bits data	User
VITC UB MODE	USER/EXT,DATE,TIME,TCG,FRM RATE,REGEN			
TCG Set Hold	On,Off	Off	Store TC when powered down	Off
First Rec TC	Regen,Preset	RegenN	How TC is started	Regen
P.Off LCD Display	On,Off	On	TC display when power OFF	On
TC Out	TCG,TCG/TCR	TCG		TCG

UMID Set/Info

Item	*Range*	*Factory*	*description*	*BBC*
Country				
Organization				
User				
Device Node		ID number		

VTR Diagnostic

Item	*Range*	*Factory*	*description*	*BBC*
Operation			Time in use	
Drum Running			Drum hours	
Threading			Number of tape loads	
Drum Running R			Since last reset	
Threading R			Since last reset	
VTR Syscon			System version number	
Servo			Servo version number	
Front			LCD version number	
Video FPGA			Video version number	

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