AJA Video R20AD 10 Bit Universal Decoder *(Preliminary)*

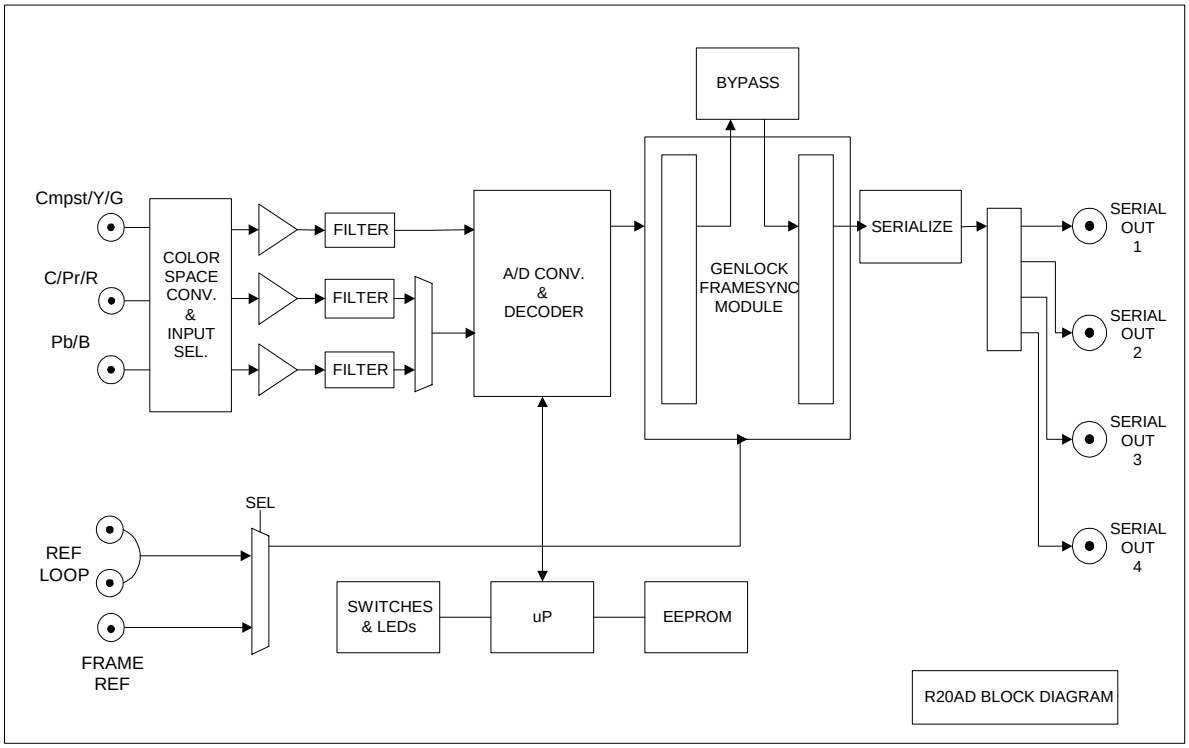
Introduction

The AJA Video R20AD Decoder produces excellent quality, serial digital component video from NTSC and PAL sources. The R20AD is a 10.3" X 3.1" card, designed to plug into The AJA Video FR1 1 RU frame and the AJA Video FR2 2 RU frame. The R20AD accommodates the AJA Video FSG framesync/genlock module option, to allow Genlocking to a external reference, adjustment of output timing, and decoding of non-timebase corrected sources.

Features

- Excellent quality 10 bit adaptive comb filter decoding
- Component (YPbPr, Betacam), PAL and NTSC Composite and Y/C (S Video) inputs
- Four serial outputs (SMPTE 259M)
- Automatic NTSC/PAL selection
- Configurable pedestal and narrow/wide H/V blanking
- +/- 0.2db to 5 MHz frequency response, 2x oversampling
- Frame Sync/Genlock option with external reference inputs and full timing adjustment
- Plug compatible with several other manufacturers' video frames

BLOCK DIAGRAM



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User Controls and Indicators

The user interface for the R20D includes a 16 position hex rotary switch, a momentary action up/down toggle switch, and 6 LEDs. The rotary switch selects a function or setting to be controlled by the toggle switch. The BANK LED allows two banks of functions to be accessed. The LEDs are numbered 1-6 from top to bottom or left to right. The LEDs are labeled as follows:

LED	*FUNCTION*
1	BANK (OFF = Bank 0, ON = Bank 1)
2	525
3	AUTO (auto 525/625 select)
4	625
5	VID (video detected at input)
6	CONFIRM (for signaling memory load, errors, etc)

Control functions

The following tables describe the functions controlled by the user interface. To access a particular function, the hex rotary switch is set to the appropriate function, and the toggle switch is used to adjust the selected function. For on/off type functions, such as Setup/NoSetup selection, moving the switch to the UP/LEFT position sets the function and moving the switch DOWN/RIGHT clears the function. Multi-value functions such as INPUT MODE will rotate through the possible choices for the function. To control variables, such as framesync delay, the value of the function will be incremented or decremented each time the switch is momentarily moved either up, or down respectively. Holding the switch in either position will cause the function to begin automatically incrementing or decrementing, after a two second pause. With functions with more than two selections, the toggle switch cycles through the available selections.

BANK 0

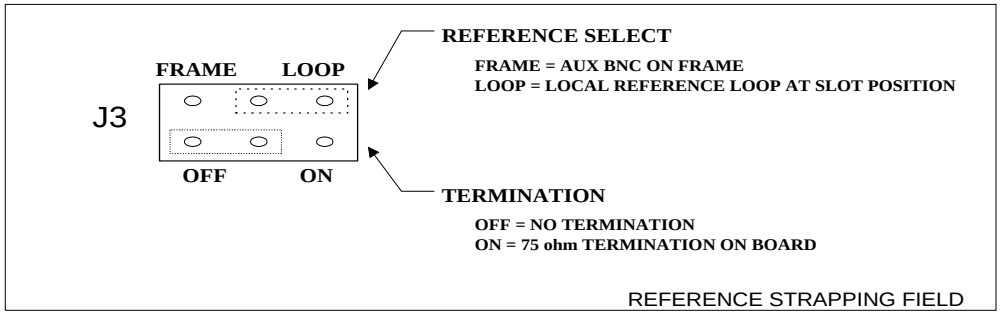
SELECTOR	*DESCRIPTION*	*FUNCTION*
0	BANK SEL	Toggle UP/LEFT to select BANK 1 Toggle DOWN/RIGHT to select BANK 0 (Default)
1	INPUT MODE	Toggle to cycle through the below selections Auto Select (Default) Currently this is the only selection.
2	VERTICAL BLANK	UP/LEFT = Blank Vertical Interval DOWN/RIGHT = Pass Vertical Interval (Default)
3	SETUP/PEDESTAL REMOVEL	UP/LEFT = No Pedestal on Input Video DOWN/RIGHT = Input Pedestal Present (Default) FUNCTIONS ONLY IN NTSC
4	COMPONENT/ COMPOSITE	UP/LEFT = Component Input DOWN/RIGHT = Composite Input (Default)
5	RGB/YPbPr/YC	UP/LEFT = YPbPr if Component selected above or YC if Composite selected above DOWN/RIGHT = RGB if Component selected above or Composite if Composite selected above
6	COMPONENT LEVELS	UP/LEFT = SMPTE/EBU-N10 Levels (Default) DOWN/RIGHT = Betacam 525/60 Levels
7	AGC	UP/LEFT = Automatic Gain Control ON DOWN/RIGHT = Automatic Gain Control OFF (Default)
8	CLEAR EEPROM and	Toggle either way to clear EEprom contents

	RESET	
9	RESET	Toggle either way to reset
A	COMB FILTER	UP/LEFT = Comb OFF DOWN/RIGHT = Comb ON
B	COMB TYPE	UP/LEFT = Adaptive 3 line Comb DOWN/RIGHT = Adaptive 4 line Comb (Default)
C	EDH	UP/LEFT = EDH OFF DOWN/RIGHT = EDH ON (Default)
D	TEST PATTERN	UP/LEFT = Pass Input (Normal Operation) (Default) DOWN/RIGHT = Output Internal Test Pattern
E	STORE/RECALL USER SETUP	Toggle UP/LEFT to Store Register Toggle DOWN/RIGHT to Recall Register
F	RESTORE DEFAULTS	Toggle UP/DOWN to Restore Default Settings

BANK 1(Frame Sync Option Only)		
FUNCTION	*DESCRIPTION*	*DETAILS*
0	BANK SEL	Toggle UP/LEFT to select BANK 1 Toggle DOWN/RIGHT to select BANK 0 (Default)
1	SET DEFAULT DELAY	Toggle UP/LEFT or DOWN/RIGHT = Restores FSG to factory defaults
2	SET LINE DELAY	UP/LEFT = Increases Output Delay by lines DOWN/RIGHT = Decreases Output Delay by lines
3	SET PIXEL DELAY	UP/LEFT = Increases Output Delay by pixels DOWN/RIGHT = Decreases Output Delay by pixels
4	<reserved>	
5	<reserved>	
6	<reserved>	
7	<reserved>	
8	<reserved>	
9	<reserved>	
A	<reserved>	
B	<reserved>	
C	<reserved>	
D	<reserved>	
E	STORE/RECALL USER SETUP	Toggle UP/LEFT to Store Register Toggle DOWN/RIGHT to Recall Register
F	RESTORE DEFAULTS	Toggle UP/LEFT to Restore Default Settings

EXTERNAL REFERENCE INFORMATION

The R20D expects the External Reference to be NTSC or PAL Analog Color Black. The External Reference input can come from two different sources on the R20D. Each cell on the AJA VIDEO FR1 or FR2 frames has a looping input for reference or the reference can be taken from the "Frame reference input" AUX BNC on the back of the frame. If the looping reference were used then the Reference termination would normally be set to OFF. If the Frame reference is used then one (and only one) of the boards in the frame should have the termination set to ON.



INSTRUCTIONS FOR OUTPUT TIMING ADJUSTMENT (With FRAMESYNC/GENLOCK OPTION)

The R20D has two levels of output timing adjustment: advance or delay by lines, and advance or delay by pixels (with ¼ pixel resolution). There are two modes of timing adjustment: Genlock and Delay, If the board detects an external reference, it will be in Genlock mode. If there is no external reference detected, the board will be in Delay mode. In Genlock mode, the R20D output will be genlocked to the external reference. The board can be set to Delay mode without removing the external reference by lifting the "REFERENCE SELECT" jumper J3.

GENLOCK MODE:

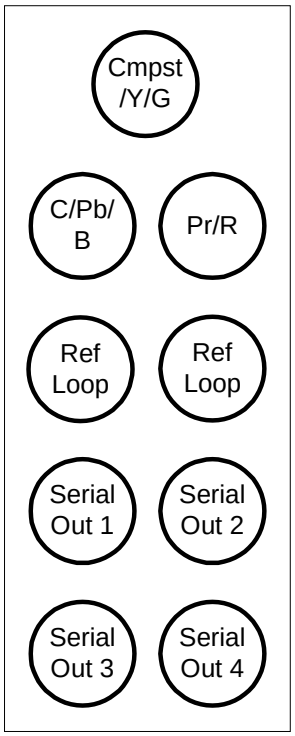
1) Perform function 1 in Bank 1 "SET DEFAULT DELAY". This will bring the output timing close to the reference's timing.
2) Perform function 3 in Bank 1 "SET PIXEL DELAY". This will allow adjustment to within ¼ pixel of reference.

DELAY MODE:

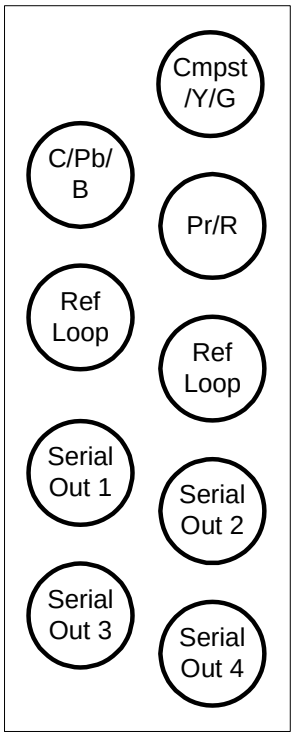
1) Perform function 1 in Bank 1 "SET DEFAULT DELAY". This will make the total delay through the R20D to about 1 frame.
2) Perform function 2 in Bank 1 "SET LINE DELAY". This will allow advancing and delaying of the output timing in Line increments.

3) Perform function 3 in Bank 1 “SET PIXEL DELAY”. This will allow advancing and delaying of the output timing in Pixel increments. NOTE: In “SET PIXEL DELAY” the first four increments are ¼ pixel steps.

R20AD Rear Panel Layout for FR1 Frame



R20AD Rear Panel Layout for FR2 Frame



Specifications (without framesync option)

Input:

Format:	Component (YPbPr, Betacam), PAL and NTSC Composite and Y/C (S Video)
Level:	1Vp-p

Output:

Format:	SMPTE 259 Serial Digital Component
Number of outputs:	4

Power Consumption (W/O frame sync)

+6.3V	5.7W
-6.3V	0.5 W