Commodore

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Technical Support

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Amigas and Monitors

Engineering Change Request

Document distributed August 31, 1993

Contents

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Commodore

ENGINEERING CHANGE REQUEST (SHEET 1)

ECR NO.	DATE	SHEET
WC3280	8-12-93	1 OF 16

REASON FOR CHANGE

Documentation required for video dongle parts, both original 390682-01 and new 390682-03 sync generating version, BIS includes revisions of existing drawings and new drawings

AFFECTED PRODUCTS	TYPE OF CHANGE
AMIGAs + MONITORS	☑ REGULAR ☐ EMERGENCY ☐ DOC. MAINTENANCE

DRAWINGS TO BE REVISED OR DRAWN

DRAWING NO.	TITLE	REVISION FROM	REVISION TO (NEW)
353410	HOUSING TOP, VIDEO ADAPTOR	A	B
353411	HOUSING BOTTOM, VIDEO ADAPTOR	A	B
390682	MAIN ASS'Y, VIDEO DONGLE	New	1
365380	PCB ASS'Y, VIDEO DONGLES (SYNC + BUFFER)	New	1
365377	SCHEMATIC CCT. DWGS. VIDEO DONGLE	New	A
365378	PCB ARTWORK, VIDEO DONGE (SYNC VERS.)	New	A
~~365379~~	~~FUNCTIONAL SPEC, VIDEO DONGLE~~		
365381	FUNCTIONAL SPEC, VIDEO DONGLE (SYNC)	New	A

DESCRIPTION OF CHANGE

*Revise existing drawings 353410 and 353411 to show casework (top + bottom). Release new drawings 390682, etc., to complete required documentation

*-changes not shown in this ECR. ECO will reflect changes

DISTRIBUTION INFO	APVL	LOCATION	REVIEW AUTHORIZATION APP	SIGNATURE	HOLD	REJ.	DATE
	✓	W.C. ENG.	✓	G. Bell			8-12-93
		W.C. SAF.					
✓		BSW ENG.					
		BSW SAF.					
		HK					
✓		PHILIPPINES					

ORIGINATOR (PRINT): J. SHANNON

DEPT. MANAGER: B. BAILEY

IMPLEMENTATION

RUNNING CHANGE	NEW PRODUCTION	W.I.P.	F.G. STOCK	IN FIELD
✓				

REMARKS

REASON FOR HOLD/REJECTION

ENGINEERING APPROVED

DISPOSITION OF OLD REVISION PARTS

SCRAP	REWORK	USE AS IS	RTV	

D.C AUTH./PREPARED ECO

SIG: DATE:

ECO #

1009 REV 2

ORIGINAL

APPLICATION		REVISION			
NEXTASSEMBLY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	A4000, A4000T	A	SPECIFICATION RELEASEPER ECO 930___	8-3-93	BCB
	1942 monitor		ECO 3280	8/12/93	

1.0 DESCRIPTION

Two schematic circuit drawings for 23-pin to 15-pin video "dongle" adaptors are included in this document:

365377-01	video buffering with sync generation (e.g., for compatibility with NEWTEK's "Video Toaster" or other gen-locking devices)
365377-02	simple video buffering

Commodore P/N	Status	Commodore P/N	Status		
365377-01	Active				
365377-02	Active				

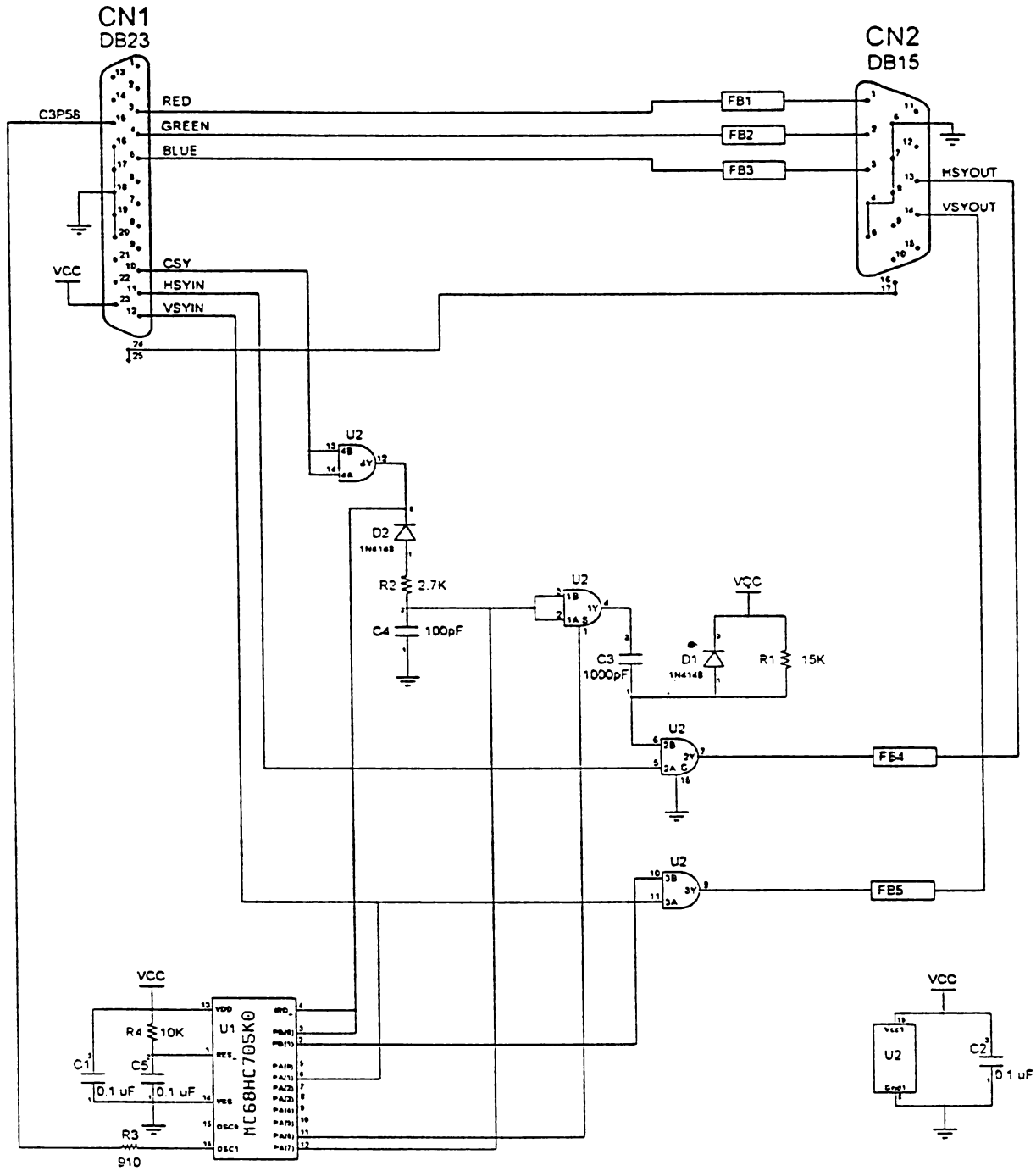
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS.
TOLERANCES:
ANGLES +/- 1 DEGREE
2 PLACE DECIMALS +/- 0.5
3 PLACE DECIMALS +/- 0.25

DRAWN D. Shannon	DATE 4JUN93
SYSTEM ENGR. G. Berlin	DATE
TEST ENGR.	DATE
COMPONENTS ENGR. D. Shannon	DATE 4JUN93

Commodore
1200 WILSON DRIVE
WEST CHESTER, PA. 19380
(215) 431-9100

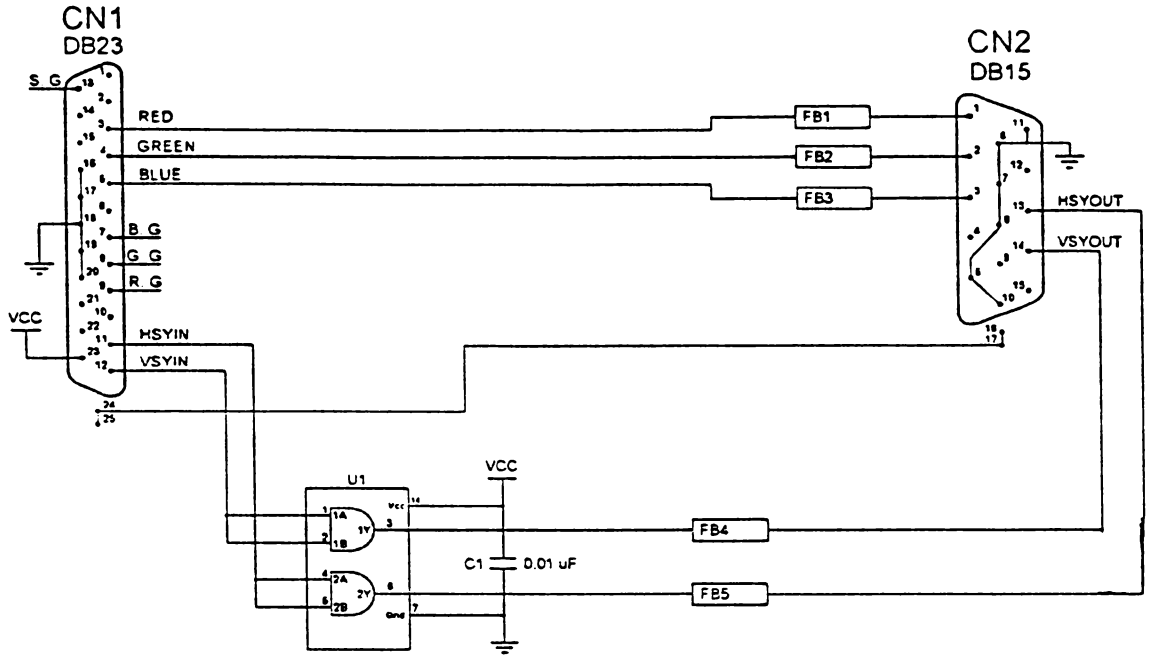
TITLE:
Schematic circuit drawings, Video "dongle" (Sync & buffer versions)

SIZE	DRAWING NUMBER
A	365377
SCALE	SHEET 1 of 3



SCHEMATIC CIRCUIT DRAWING 365377-01

Commodore		TITLE: Schematic circuit drawings, Video "dongle" (Sync & buffer versions)		
SIZE: A	DRAWING NUMBER: 365377	REV: A	SCALE:	SHEET 2 of 3



SCHEMATIC CIRCUIT DRAWING 365377-02

Commodore		TITLE: Schematic circuit drawings, Video "dongle" (Sync & buffer versions)		
SIZE: A	DRAWING NUMBER: 365377	REV: A	SCALE:	SHEET 3 of 3

APPLICATION		REVISION			
NEXTASSEMBLY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	A4000, A4000T	A	SPECIFICATION RELEASEPER ECO 930___	8-3-93	JCB
	1942 monitor		IEC3280	R1/2/93	

1.0 DESCRIPTION

Eight PCB artwork drawings for the 390682-03 23-pin to 15-pin video sync-generating "dongle" adaptor are included in this document:

COMPONENT SIDE	REV.0
SOLDER SIDE	REV.0
SILKSCREEN TOP	REV.0
SILKSCREEN BOTTOM	REV.0
DRILL LEGEND	REV.0
SOLDER MASK TOP	REV.0
SOLDER MASK BOTTOM	REV.0
SOLDER PASTE STENCIL	REV.0

Commodore P/N	Status	Commodore P/N	Status		
365378-01	Active				

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS.
TOLERANCES:
ANGLES +/- 1 DEGREE
2 PLACE DECIMALS +/- 0.5
3 PLACE DECIMALS +/- 0.25

DRAWN D. Shannon	DATE 4JUN93	
SYSTEM ENGR. G. Berlin	DATE	
TEST ENGR.	DATE	
COMPONENTS ENGR. D. Shannon	DATE 4JUN93	

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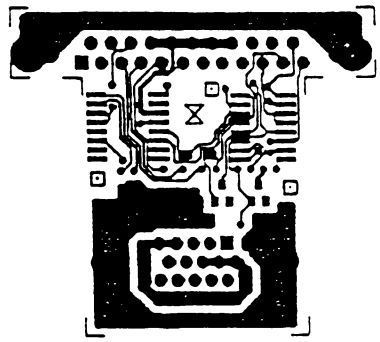
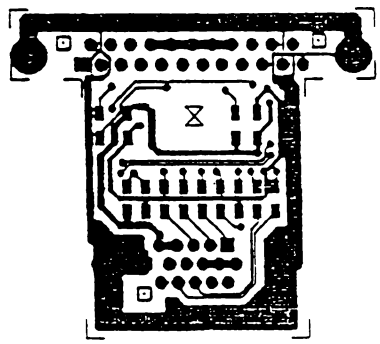
(215) 431-9100

TITLE:
PCB ARTWORK, Video "dongle" (Sync version)

SIZE	DRAWING NUMBER
A	365378
SCALE	SHEET 1 of 5



Commodore Wchest
Sync Dongle Bd.
Rev 0 (5-14-93)
COMPONENT SIDE

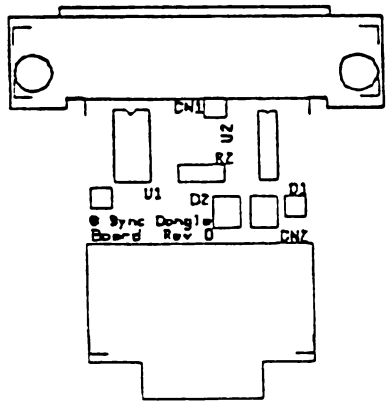


Commodore Wchest
Sync Dongle Bd.
Rev 0 (5-14-93)
SOLDER SIDE

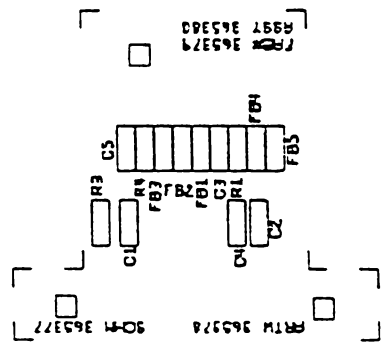
Commodore

TITLE: PCB ARTWORK, Video "dongle" (Sync version)

SIZE A | DRAWING NUMBER 365378 | SCALE | SHEET 2 of 5

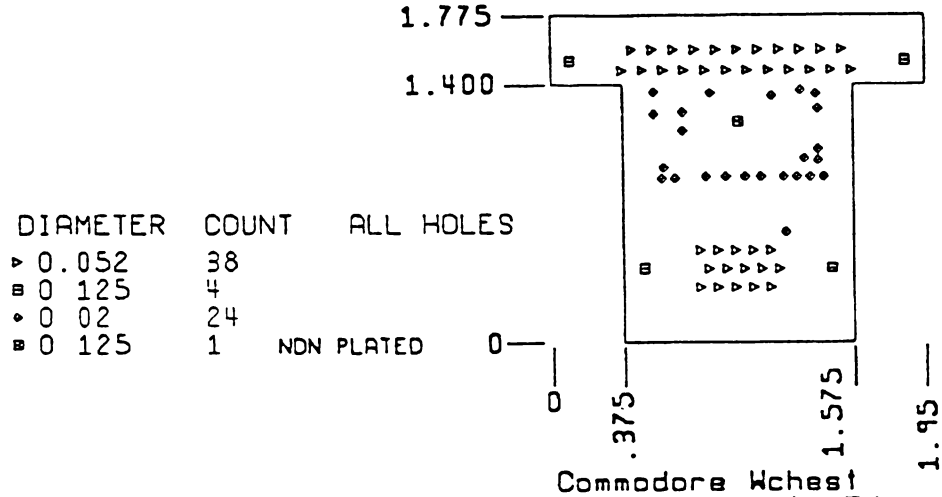


Commodore Wchest
Sync Dongle Bd.
Rev D (5-14-93)
SILKSCREEN TOP



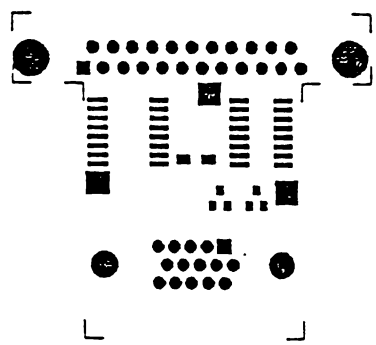
Commodore Wchest
Sync Dongle Bd.
Rev D (5-14-93)
SILKSCREEN BOTTOM

Commodore			TITLE: PCB ARTWORK, Video "dongle" (Sync version)	
SIZE: A	DRAWING NUMBER: 365378	REV: A	SCALE:	SHEET 3 of 5



DIAMETER	COUNT	ALL HOLES
▹ 0.052	38	
▫ 0 125	4	
• 0 02	24	
▫ 0 125	1	NON PLATED

Commodore Wchest
✿ Sync Dongle Bd.
Rev 0 (5-14-93)
DRILL LEGEND

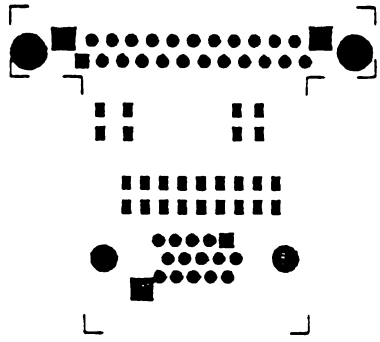


Commodore Wchest
✿ Sync Dongle Bd.
Rev 0 (5-14-93)
SOLDER MASK TOP

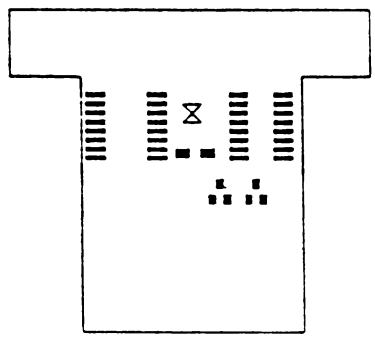
Commodore

TITLE: PCB ARTWORK, Video "dongle" (Sync version)

SIZE	DRAWING NUMBER	REV	SCALE	SHEET 4 of
A	365378	A		



Commodore Wchest
Œ Sync Dongle Bd.
Rev 0 (5-14-93)
SOLDER MASK BOTTOM



Commodore Wchest
Œ Sync Dongle Bd.
Rev 0 (5-14-93)
SOLDER PASTE STENCIL

Commodore

TITLE

PCB ARTWORK, Video "dongle"
(Sync version)

SIZE	DRAWING NUMBER	REV	SCALE	SHEET 5 of 5
A	365378	A		

APPLICATION		REVISION			
NEXT ASSEMBLY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	A4000	A	SPECIFICATION RELEASE	6-8-93	DCB
			(EC 3258)	11/11/93	

1.0 DESCRIPTION

This document describes the functional specifications for a video dongle. The video sync dongle is a device which connects the 23-pin video output on the Amiga to a standard 15-pin VGA connector. It is packaged identically to the current dongle shipped with the A4000 and high-end monitors. This new dongle provides sync processing which allows any monitor employing separate Hsync and Vsync processing to be driven from the host video output, even in the presence of a genlocking device.

2.0 BACKGROUND

Genlocking devices, genlock or Toaster, use the Hsync and Vsync lines on the Amiga to provide non-standard syncing information to the Amiga. This has the effect of rendering Hsync and Vsync useless for normal monitor operation. In order to support monitors which require separate syncs, the genlocking must provide sync separation.

The Toaster is a genlocking device which does not (and cannot) provide this service. When used entirely within a 15 KHz domain, this is not a problem. Market demands are forcing NewTek to adopt 31 KHz for their user interface screens. The solution is to provide a means for connecting the host Amiga's 23-pin video port to a 31 KHz capable monitor. This requires that the sync processing be provided to recreate Hsync and Vsync from composite sync when the system is being genlocked, and that such sync processing provide pass-through service to the syncs when the system is not being genlocked.

Commodore P/N	Status	Commodore P/N	Status		
365381-01	Active				

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES (MILLIMETERS). TOLERANCES: ANGLES +/- 1 DEGREE 2 PLACE DECIMALS +/- 0.020 (0.5) 3 PLACE DECIMALS +/- 0.01 (0.25)	DRAWN joanne sugzdinis	DATE	**Commodore** 1200 WILSON DRIVE WEST CHESTER, PA. 19380 (215) 431-9100
	SYSTEM ENGR.	DATE	
	TEST ENGR.	DATE	
	COMPONENTS ENGR. D. Shannon	DATE	TITLE: FUNCTIONAL SPECIFICATION, VIDEO SYNCDONGLE
	CIRCUIT ENGR.	DATE	
			SIZE A / DRAWING NUMBER 365381
			SCALE / SHEET 1 of 3

3.0 THEORY OF OPERATION

The video sync dongle automatically selects either genlocked or normal mode of operation. The selection is based on the frequency of the vertical sync signal.

If vertical sync occurs faster than 45 Hz, then:

(a) the machine is not being genlocked,
(b) the horizontal frequency may be 15 KHz, 31 KHz, or other, therefore the Composite sync signal may be invalid,
(c) the dongle selects "normal" mode, Hsync and Vsync are passed through unmolested.

If vertical sync occurs slower than 45 Hz, then:

(a) the machine is being genlocked,
(b) composite sync is valid,
(c) the dongle selects "genlocked" mode, Hsync and Vsync are derived from Composite sync.

3.1 Normal Mode

The video sync dongle contains a 16-pin microprocessor U1, and a quad 2-input multiplexer U2. The microprocessor executes one of two hand-coded loops for each of the two modes. Note that the microprocessor clock is driven directly from the Amiga's 3.58 MHz output.

When the video sync dongle is in "normal" mode, the select pin U2 is driven low. This causes the Hsync and Vsync signals to be routed through the multiplexer directly to the 15-pin VGA connector. The microprocessor simply counts time between Vsyncs to determine if it should switch too "genlock" mode.

When the dongle is in "genlock" mode, operation is more complex. A major contributing factor to the complexity is that horizontal sync edges occur on both edges of the primary 3.58 MHz clock. The microprocessor, executing cycles 1.79 MHz, is incapable of driving the Hsync line directly. Therefore, some other signal processing means must be provided to generate a "correct" horizontal sync. The particular implementation of sync separation employed here is not ideal in the sense of being a straightforward design. It does have the advantages of being both inexpensive and physically small.

3.2 Genlocked Mode

In "genlock" mode, the select pin to the multiplexer is driven high, and the microprocessor executes a loop once per horizontal line synchronous with the video beam. The vertical sync output is created by simply copying the composite sync input to the vertical sync output at two places in the loop on each line. The two places in the loop are separated in time by about 1/2 of a line time. The reason for using two places instead of one is to facilitate proper operation in interlaced modes.

The Hsync output is routed from U2 in Pin 6. The circuit between U2 Pin 4 and U2 Pin 6 forms an edge detector. The time constant of C3 and R1 is selected so that the pulse length will be about the right size for a 15 KHz sync pulse. The goal of preceding circuitry is to make a low-going edge when we want Hsync output pulse to appear. U2 pins 2 and 3 can be forced to a specific state by the microprocessor. This provides a

means for the microprocessor to block the passage of serration pulses in the composite sync from pass through to the Hsync output, and also provides a means for the microprocessor to stretch the size of a short Hsync pulse (seen during vertical blanking) to sufficient length to allow C1 and R3 to operate.

During each horizontal line, the microprocessor drives U2 pins 2 and 3 high, and waits for Csync to be high. The microprocessor then releases U2 pins 2 and 3. When Csync falls, the edge is passed to the edge detector, and the microprocessor immediately drives U2 pins 2 and 3 low in order to stretch serration pulses. The microprocessor then waits approximately 1/4 of a line, samples Csync for Vsync, waits 1/2 line, samples Csync for Vsync again, and returns to the top of the loop waiting for Csync to be high.

The rationale behind the requirement of D1 is that the microprocessor cannot execute the code between the release of U2 pins 2 and 3 and the driving of U2 pins 2 and 3 low quickly enough. When composite sync falls,C4 is discharged quickly but is not recharged when Csync rises again. This allows the microprocessor time to clamp U2 pins 2 and 3 low.

Within the horizontal loop described above, code to count the number of lines between vertical syncs and for branching out of the loop is initiated. This code is all in one place, but is spread out so as to allow the real-time operations of vertical sampling to execute properly.

PART NUMBER	DESCRIPTION
390682-01	Main Assy, Video Dongle, 15 Pin to 23 Pin Adapter, Buffered Signals
390682-02	Main Assy, Video Dongle, 15 Pin to 23 Pin Adapter Inactive
390682-03	Main Assy, Video Dongle, 15 Pin to 23 Pin Adapter, Buffered Signals, Sync
	Sync Generation for Toaster Compatability

REVISIONS

ZN	LTR	DESCRIPTION	DATE	APPROVED
	A	Released per ECO 930...		
		UCS90	8/11/93	

1. SHEET 3 OF 3 SIZE
ASSY. DWG.
NOTES:

Commodore	TITLE: MAIN ASSEMBLY, VIDEO DONGLE	Drawn by D.V.B.	Drawing # 390682 Sheet 1 of 3

QUANTITY REQUIRED PER DASH #																						ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
																						ref		ref	1	365381-01	FUNCTIONAL SPECIFICATION	
																									2			
																						-		1	3	365380-02	PCB ASSY, VIDEO BUFFER DONGLE	
																						1		-	4	365380-01	PCB ASSY, VIDEO SYNC DONGLE	
																									5			
																									6			
																						1		1	7	353411-02	HOUSING, BOTTOM, PLASTIC	
																						-		1	8	353410-02	HOUSING, TOP, PLASTIC	
																						1		-	9	353410-04	HOUSING, TOP, PLASTIC	
																									10			
																									11			
																						2		2	12	390804-01	SCREW, JACK POST, #4-40	
																						1		1	13	906800-10	SCREW, PHL PAN HD M3 X 18	
																						1		1	14	905960-03	NUT, HEX M3	
																									15			
																						1		1	16	354502-12	PLASTIC BAG, 120mm X 97mm	
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Title	Drawn by	Drawing #	Rev
Commodore — MAIN ASSEMBLY, VIDEO DONGLE	D.V.B.	390682	A
		Sheet 2	of 3

PART NUMBER	DESCRIPTION
365380-01	PCB ASSEMBLY, VIDEO SYNC DONGLE (NEWTEK)
365380-02	PCB ASSEMBLY, VIDEO BUFFER DONGLE

ZN	LTR	DESCRIPTION	DATE	APPROVED
	A	Released per ECO 930		
		DC3280	5/11/93	

Commodore	TITLE: PCB ASSEMBLY, VIDEO DONGLES (SYNC & BUFFER)	Drawn by: D. Shannon	Drawing #: 365380
			Sheet 1 of 2

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