
Commodore 64 Computer

Technical Manual

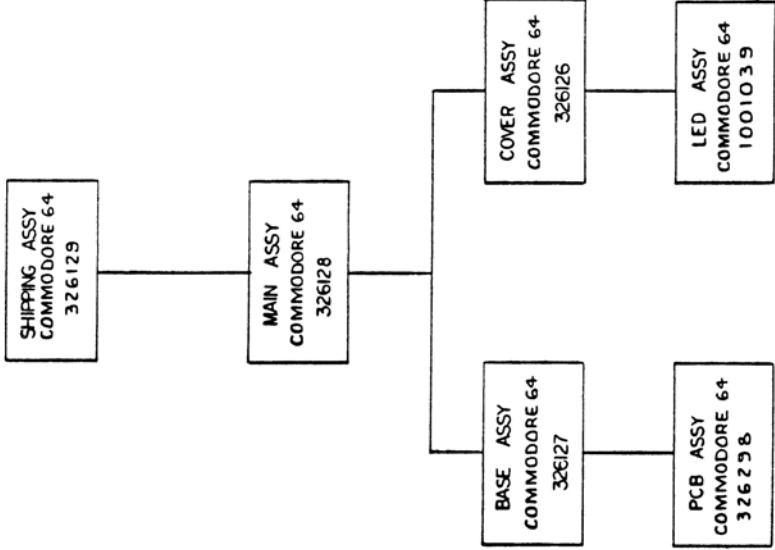
Model C-64



 **commodore**
COMPUTER

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REVISIONS		DATE	APPROVED
REV	DESCRIPTION		



DESIGNED BY	DATE	SCALE	SHEET	OF
COMMODORE			1	1
DRAWING TREE COMMODORE 64				
SIZE	D	326101	REV	

PART NO.		DESCRIPTION		TITLE: <u>COMMODORE 64 PCB ASSY</u>													
250407-04		US VERSION WITH TYPE B MODULATOR		<table border="1"> <tr> <th colspan="3">REVISIONS</th> </tr> <tr> <th>LTR ZONE</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> <tr> <td>A</td> <td>PRODUCTION RELEASE</td> <td>3/28/83</td> </tr> <tr> <td>B</td> <td>REVISED PER ECO 830140</td> <td></td> </tr> </table>		REVISIONS			LTR ZONE	DESCRIPTION	DATE	A	PRODUCTION RELEASE	3/28/83	B	REVISED PER ECO 830140	
REVISIONS																	
LTR ZONE	DESCRIPTION	DATE															
A	PRODUCTION RELEASE	3/28/83															
B	REVISED PER ECO 830140																
				APPROVED: <i>[Signature]</i>													
				DATE: 3/28/83													
				LTR ZONE: A													
				LTR ZONE: B													
				DATE: 2-15-83													
				DATE: Mar. 1st '83													
				DRAWN BY: K. T. M. No-													
				CHKD: Katsuyama													
				ENGR: <i>[Signature]</i>													
				APPR: <i>[Signature]</i>													
				DATE: Mar. 7, 83													
				DATE: 3-8-83													
				SIZE: B													
				SHEET: 1 OF 7													

1. SHEET 7 OF 7 SIZE C
 ASSY DWG
 NOTES-UNLESS OTHERWISE SPECIFIED:

QUANTITY REQD PER PART / DASH NO.	ITEM	PART NUMBER	DESCRIPTION	REF DES	QTY	NOTES
04	1	C 251138	SCHEMATIC DIAGRAM			REV A.
REF	2	C 250406	P.C BOARD			
REF	3					
REF	4	C 251137	C-64 ARTWORK			
	5					
	6					
	7	B 906107-01	I.C. 6510A	U7		2MHz TYP
	8	B 906108-01	6526	U1, U2		
	9	B 906109-01	6567	U19		JIS, NTSC
	10	B 906111-01	6569	U19		PAL
	11	B 906112-01	6581	U18		
	12	B 901453-01	2114 L-30	U6		
	13	B 901505-01	4164-2 (200NSEC)	U9,10,11,12		21,22,23,24
	14	B 901226-01	2364 A BASIC	U3		(2364 - 161)
	15	B 901227-02	2364 A KERNAL U.S. PAL	U4		(2364 - 182)
	16	B 901225-01	2332 B CHAR. U.S. PAL	U5		
	17	B 906145-02	2364 A KERNAL JIS	U4		
	18	B 906143-02	2332 B CHAR JIS	U5		
	19	B 901523-03	NE 556	U20		
	20	B 901502-01	4066	U16, U28		
	21	B 901521-57	74LS 257N	U13, U25		HITACHI, FAIRCHILD, MOTOROLA, MITSUBISHI, FUJITSU
	22	B 901521-29	74LS 373N	U26		
	23	B 901521-18	74LS 139N	U15		
	24	B 901521-68	74LS 629N	U31		
	25	B 901521-03	74LS 08N	U27		
	26	B 901521-58	74LS 258N	U14		HITACHI, FAIRCHILD, MOTOROLA, MITSUBISHI, FUJITSU
	27	B 901521-06	74LS 74AN	U29		
	28	B 901521-26	74LS 193N	U30		
	29	B 901522-06	7406	U8		
	30	B 906128-01	MC4044CP	U32		
	31	B 906114-01	I.C. 825100N / 7700	U17		JIS, NTSC
	32	B 906114-06	I.C. 93459	U17		PAL
	33					
	34					
	35					
	36					
	37					

DRWN BY: A. J. H. N.	DATE: 2-16-83	ENGR: J. O. D.	DATE: 3-9-83	SIZE: B	REV: B	SHT: 27
CHKD: J. S. J.	DATE: 3-1-83	APPR: J. S. J.	DATE: 3-9-83		250407	
TITLE: COMMODORE 64 PCB ASSY						

commodore
ADVANCED REFPO

QUANTITY REQD PER PART / DASH NO.	ITER	Q	PART NUMBER	DESCRIPTION	REF DES	ENGR	DATE	DATE	SIZE	REV	SHT	NOTES
0.4	38	B	251030-01	CAPACITOR 15PF ± 5% N3300	C.C.70)							PAL
	39	B	251078-14	20pf SL ± 5%	C36							Ⓐ : AXIAL
	40	B	251078-24	51pf SL ± 5%	C38							Ⓑ : RADIAL
	41	B	251078-51	360pf B ± 10%	C23							Ⓒ : TUBULAR
	42	B	251078-29	82pf SL ± 5%	C83, 86							
	43	B	251069-4	470pf B ± 10%	C10, 11							
	44	B	251069-8	1000pf B ± 10%	C37							
	45	B	251069-11	1800pf B ± 10%	C48, 93							
	46	B	900016-01	0.47µf 50V ± 20%	C85							
	47	B	900100-01	10µf 25VELECT ± 30%	C8, C12-15, 17							24, 34, 57, 62, 65, 94, 102 SEE ITEM 154
	48	B	900100-40	100µf 16V	C91							
	49	B	900101-34	470µf 50V	C88, 90							
	50	B	900101-33	2200µf 16V	C19							
	51	B	900150-11	0.22µf 100V ± 20%	C20, C21							
	52	B	251030-02	16pf ± 5% N2200	(C70)							JIS, NTSC
	53	B	251078-35	220pf B ± 10%	C203							SUITABLE FOR 6569 REV1 (U19)
	54	B	251079-16	10µf 25V ELECT SMALL	± 20%							
	55											
	56											
	57											
	58	B	901151-17	COIL 2.2µh	L2							
	59	B	325570-01	COIL INDUCTOR 1.2µh	L5							
	60	B	325559-02	ASSY LINE FILTER	L4							
	61											
	62											
	63											
	64	B	251081	CRYSTAL 14.31818 MHZ	Y1							NTSC, JIS
	65	B	251082	CRYSTAL 17.73447 MHZ	Y1							PAL
	66											
	67											
	68											
	69	B	900750-01	DIODE POWER 1N4001	CR5, CR6							
	70	B	906103-02	ZENER 1N4371	CR1							2.7 V
	71	B	900941-01	ZENER 1N755	CR2							7.5 V
	72	C	251026	DIODE BRIDGE RECTIFIER	CR4							
	73											
	74											

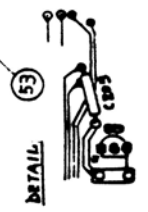
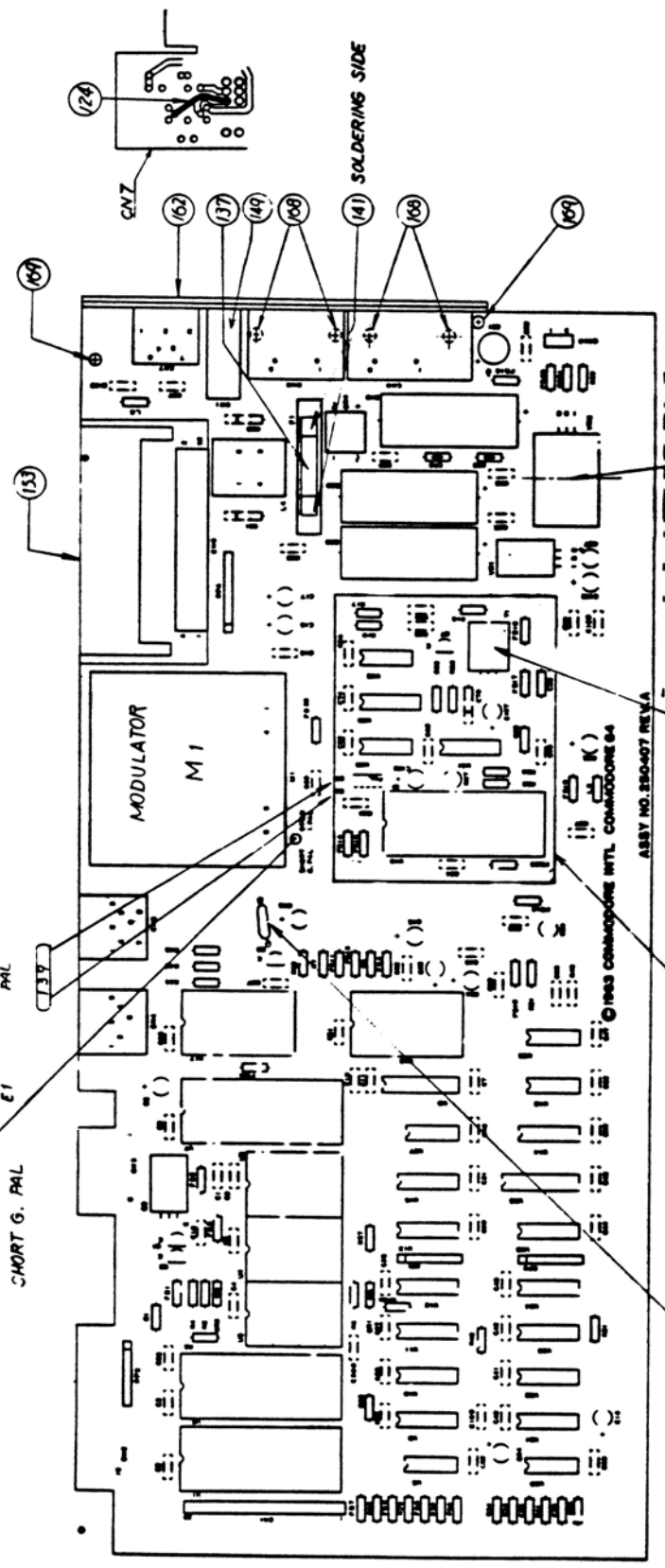
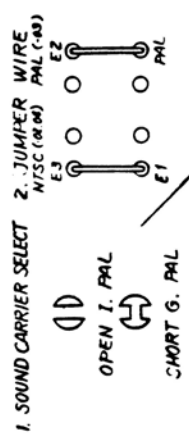
commodore TITLE: COMMODORE 64 PCB ASSY
 DATE: 2/16/83
 ENGR: [Signature]
 DATE: [Signature]
 SIZE: B
 REV: B
 SHT: 3/7
 250407

ADVANCED REPRO

QUANTITY RECD PER PART / DASH NO.	8	PART NUMBER	DESCRIPTION	REF DES	REMARKS	NOTES
04	B	902265-05	POTENTIOMETER 500Ω	R27		
1	B	901550-37	RESISTOR 1/4 W 5% 680Ω	(R52)		NTSC, JIS
1	B	901550-113	" 910Ω	(R53)		NTSC, JIS
2	B	901550-84	" 1M	R41, 50		
1	B	901550-105	" 33Ω	R42		
1	B	901550-26	" 15k	R19		
1	B	901550-57	" 390Ω	R39		
1	B	901550-49	" 100Ω	R26		
10	B	901550-01	" 1K	R4, 6, 16		28-31, 36, 38, 100
2	B	901550-69	" 1.5K	R2, 51		
4	B	901550-02	" 3.3K	R1, 43-45		
2	B	901550-20	" 10K	R3, 7		
2	B	901550-22	" 47K	R33, 34		
1	B	901550-82	" 470K	R35		
2	B	901550-23	" 2.7K	R17, 37		
1	B	901550-30	" 560Ω	R5		
1	B	902410-06	PACK 3.3K, 10PIN	RP4		
1	B	902442-29	" 8PIN	RP3		
2	B	902422-03	PACK 33Ω 8PIN	RP1, RP2		
-	B	901550-14	RESISTOR 1/4 W 5% 330Ω	(R52)		PAL
-	B	901550-49	" 100Ω	(R53)		PAL
4	B	902693-01	TRANSISTOR 2SC1815	Q1, 2, 7, 8		
5	B	902694-01	TRANSISTOR 2SD880	Q3		
1	B	902653-01	TRANSISTOR TIP29B	Q3		SUBSTITUTE FOR ITEM 104
1	B	901527-01	VOLTAGE REGULATOR MC7812CT	VR1		
1	B	901527-02	VOLTAGE REGULATOR MC7805CT	VR2		

commodore TITLE: COMMODORE 64 PCB ASSY
 DRAWN BY: K. J. H. No. 123456789
 CHKD: J. B. No. 987654321
 DATE: 2-16-83
 ENGR: J. B. No. 123456789
 DATE: 3-1-83
 APPR: J. B. No. 987654321
 DATE: 3-1-83
 SIZE: B
 REV: B
 SHT: 47
 250407

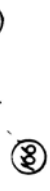
REVISIONS		DATE	APPROVED
LTH	ZONE		
DESCRIPTION			
SEE SHEET 1			



3 C203, IT IS SUITABLE FOR 656P REV. 1.

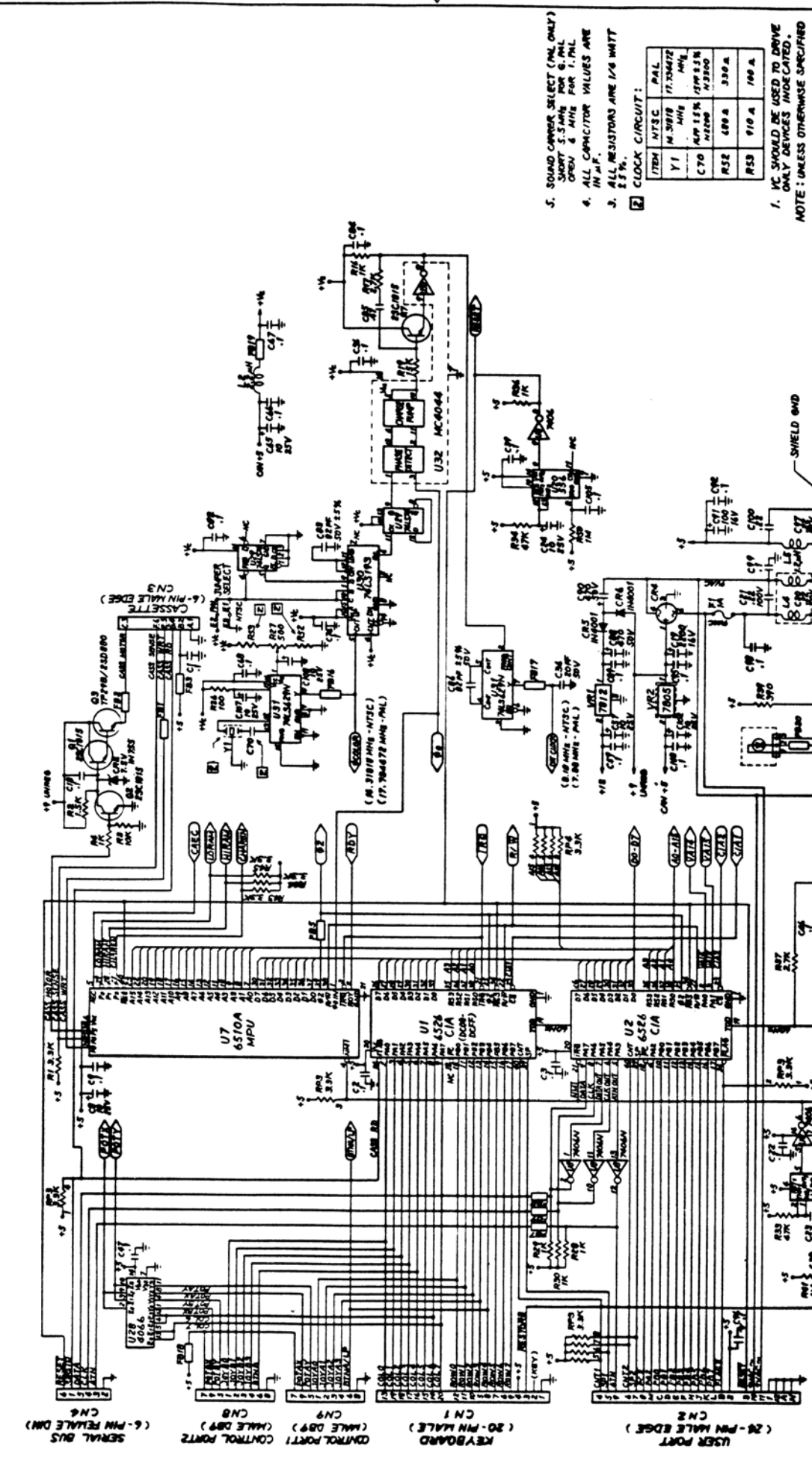


64 -02 AND -04
 65 -03 ONLY



DESIGNED BY	DATE	REV	REV
KIMIJIMA	2/24/78	1	B
CHKD BY	DATE	REV	REV
ASANO	3/19/78	2	B
APP'D BY	DATE	REV	REV
WANG	3/27/78	3	B
REVISED BY	DATE	REV	REV
WANG	7/18/78	4	B
WANG	7/18/78	5	B
WANG	7/18/78	6	B
WANG	7/18/78	7	B
WANG	7/18/78	8	B
WANG	7/18/78	9	B
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WANG	7/18/78	97	B
WANG	7/18/78	98	B
WANG	7/18/78	99	B
WANG	7/18/78	100	B

LTR	ZONE	SEE SHEET 1
REVISIONS		DATE APPROVED
DESCRIPTION		2/1/83 JRM/BJP



commodore
COMMODORE 64
SCHEMATIC DIAGRAM

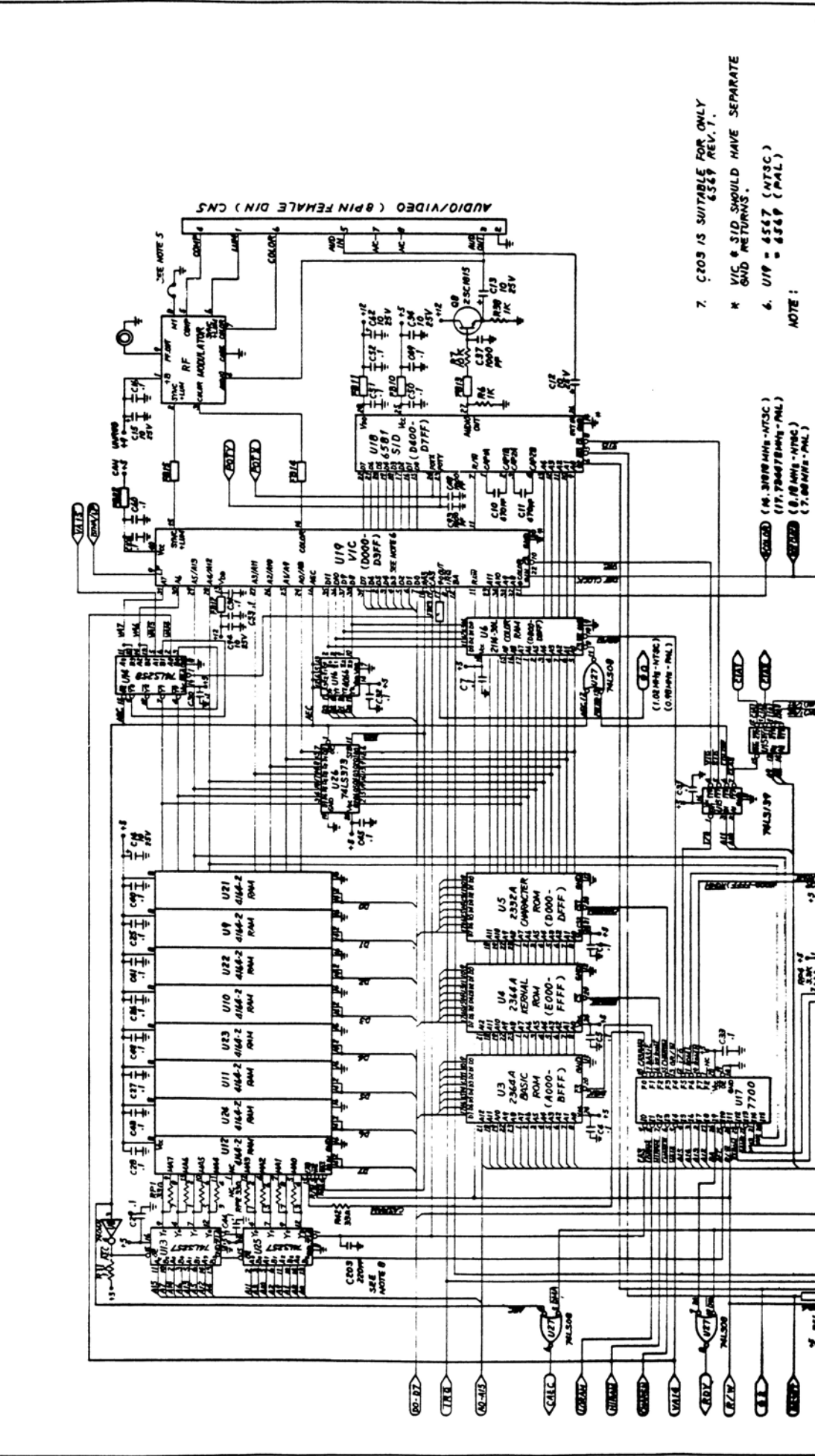
DATE: 1/1/83
 DRAWN BY: JRM/BJP
 CHECKED BY: JRM/BJP
 SCALE: NONE
 SHEET NO: 3 OF 3

USED ON: C-64

UNLESS OTHERWISE SPECIFIED:
 UNITS: INCHES
 DIMENSIONS: SEE DRAWING
 MATERIAL: SEE DRAWING
 FINISH: SEE DRAWING

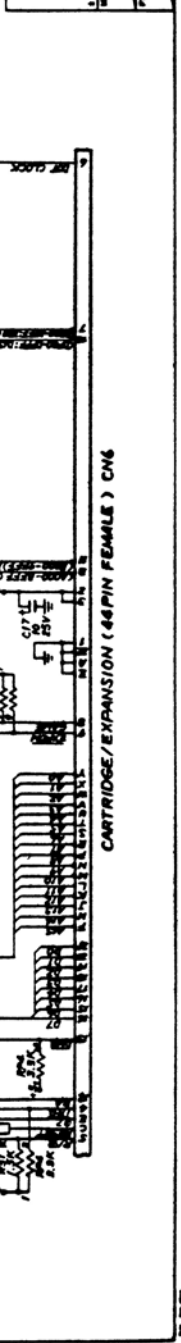
1. VC SHOULD BE USED TO DRIVE ONLY DEVICES INDICATED. NOTE: UNLESS OTHERWISE SPECIFIED
 2. CLOCK CIRCUIT:
- | ITEM | NTSC | PAL |
|------|---------|----------|
| Y1 | M.3019 | 17.70472 |
| C70 | M.P.15K | 17P.025N |
| R52 | 400 A | 330 A |
| R53 | 910 A | 100 A |
3. ALL RESISTORS ARE 1/4 WATT 5%.
 4. ALL CAPACITOR VALUES ARE IN μ F.
 5. SOUND CHIP SELECT (PAL ONLY) SHORT 5.5MHZ FOR 6.1MHZ OR 5V FOR 1.1MHZ.

REVISIONS		DATE	APPROVED
LTR	ZONE	7/10/77	T. HIGGINS
DESCRIPTION		PRODUCTION RELEASE	



COMMODORE		DATE	REV
COMMODORE 64		7/10/77	A
SCHEMATIC DIAGRAM		C 251138	
SCALE NONE		SHEET 1 OF 2	

7. C203 IS SUITABLE FOR ONLY 6569 REV. 1.
 * VIC & SID SHOULD HAVE SEPARATE GND RETURNS.
 6. U19 = 6567 (NTSC)
 U19 = 6569 (PAL)



COMMODORE 64 PCB ASSY

DWG No 326298

TITLE:

REVISIONS

LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		PRODUCTION RELEASE	7/4/82	[Signature]
B		REVISED PER ECO 4256-2	9-2-82	[Signature]
C		REVISED PER ECO 10030	9-2-82	[Signature]
D		REVISED PER ECO 2803	7/1/83	[Signature]
E		REV. PER ECO 2893	7/1/83	[Signature]
F		REV. PER ECO 2898	7/1/83	[Signature]
G		REV. PER ECO 2910	7/1/83	[Signature]
H		REV. PER ECO 2911	7/1/83	[Signature]
J		REV. PER ECO 2964	7/1/83	[Signature]
K		REV. PER ECO 2976	7/1/83	[Signature]
L		REV PER ECO 2996	7/1/83	[Signature]
M		REVISED PER ECO 830104	3/7/84	[Signature]
N		REVISED PER ECO 830116	3/11/83	[Signature]

326298

[3] REFER TO ECO NO. 2896 REWORK INSTRUCTION AND TROUBLESHOOTING GUIDE.

[2] 901505-02, 150NS DYNAMIC RAMS ARE TO BE USED IN CONJUNCTION WITH R4, 6567 VIC CHIPS. DO NOT MIX -01 WITH -02 RAMS ON SAME BOARD.

1. SHEET 7 OF 7 SIZE D

ASSY DWG

NOTES-UNLESS OTHERWISE SPECIFIED:

PART NO.	DESCRIPTION
326298-01	US VERSION

commodore	DRAWN BY <i>S. Camanga</i>	DATE <i>8/1/82</i>	ENGR APPR. <i>[Signature]</i>	SIZE B	SHEET 1 OF 7
	CHKD <i>[Signature]</i>				

QUANTITY REQ PER PART / DASH NO.

ITEM	QTY	PART NUMBER	DESCRIPTION	REF DES	RENO	NOTES
1		326106	SCHEMATIC DIAGRAM	REV F		
2		326294	P.C.B. ARTWORK	REV D		
3		326296	PC B SOLDER MASK	REV D		
4		326297	P.C.B. SILKSCREEN	REV D		
5		326295-01	P.C.B. FABRICATION BOARD			
6						
7						
8		901521-68	I.C. 74LS629N	U31		
9		906128-01	MC4044 GP	U32		
10		906107-01	6510A	U7		
11		906108-01	6526A	U1,U2		
12		906109-01	6567	U19		
13		906112-01	6581	U18		
14		901226-01	2364A BASIC U.S.	U3		
15		901227-02	2364A KERNAL	U4		
16		901225-01	2332A CHAR U.S.	U5		
17		906114-02	82S100N	U17		
18		901523-03	NE556	U20		
19		901502-01	4066	U16,U28		
20		901453-01	2114L-30	U6		
21		901521-57	74LS257N	U13,U25		
22		901521-29	74LS373N	U26		
23		901521-18	74LS139N	U15		
24		901505-01	4164-2 (200NS)	U9,10,11,12 U21,22,23,24	2	
25		901522-06	7406	U8		
26		901521-03	74LS08N	U27		
27		901521-58	74LS258N	U14		
28		906144-01	2364A BASIC JPN	U3		
29		906145-01	2364A KERNAL JPN	U4		
30		906143-01	2332A CHAR JPN	U5		
31		906141-01	2364A BASIC PAL	U3		
32		901337-01	FPLA 93459PG	U17		
33		906140-01	2332A CHAR PAL	U5		
34		906111-01	6569 PAL	U19		
35		901521-06	74LS74 AN	U29		
36		901521-26	I.C. 74LS193N	U30		

DATE: 6/8/82
 ENGR: []
 APPR: []
 SIZE: B
 REV: N
 SHT: 27
 326298

commodore
 TITLE: COMMODORE 64 PCB ASSY

QUANTITY REQD. PER PART / DASH NO.

ITEM #	QTY	PART NUMBER	DESCRIPTION	REF DES	ONER	NOTES
237		900462-20	CAPACITOR, 20pf 50v	C36,C81		
138		900050-11	33pf "MICA±5%	C83		
139		900050-17	39pf "MICA±5%	C86		
240		900462-30	51pf "	C80,38,		
141		900462-54	510pf "	C79		
142		900462-41	150pf "	C73		
243		-45	220pf "	C72,78		
144		-50	360pf "	C23		
545		-53	470pf "	C49,52,53,		
146		900462-61	1000pf "	C37		
47				C		
48		900461-28	0.1µf	01-3,16		18,22,30-32,35,39,45-47,56,58,68,71,74,77
1249		900461-32	0.22µf	C82,84,87,		89,95,96,55,103,105, NON
250		900010-59	0.22µf 250v (CERAMIC	C25-28,		40-43, 50, 54, 59, 92
1551		900464-36	0.47µf 50v ±20%	C97, C100		
1452		900100-01	10µf 25v ELECT ±8%	C61,63,66,		67,85, 4, 5, 6, 7, 29, 33, 9, 51, 60, 44
153		900100-40	100µf 16v	C8, C12-15		17, 24, 34, 57, 62, 64, 65, 94, 102
254		900101-34	470µf 50v	C91		
155		900101-33	2200µf 16v	C88, 90		
156		900050-14	10pf 50v MICA±5%	C19		
257		900462-67	1800pf 50v	C70		
258		900150-11	CAPACITOR 0.22µf 100V ±20%	C48, 93		
59				C20, C21		
360		900020-01	CAPACITOR .1µf 50V ±20%	C98,99,101		
-61		251071-26	CAPACITOR 220pf SL ±10%	C107		USE FOR ONLY 6569 REV.1
S62		251078-39	CAPACITOR 470pf ±10%			SUB FOR ITEM 45
S63		251078-45	CAPACITOR 1800pf ±10%			SUB FOR ITEM 57
164		901152-01	COIL 1.2µh @ 2.2K	L5		
265		901151-17	COIL 2.2µh	L1,2		
166		901151-21	COIL 3.0µh	L3		
67				L4		
168		906127-01	ASSY LINE FILTER			
69						
170		900558-01	CRYSTAL 14.31818 MHZ	Y1		NTSC (X TAL FEED, NOT EE, GROUND)
-71		906106-01	CRYSTAL 17.73447	Y1		PAL
72						

TITLE: COMMODORE 64 PCB ASSY

DATE: 4/9/72

ENGR: [Signature]

DATE: []

SIZE: B

REV: A

SHT: 37

326298

QUANTITY	RECD. PER PART/ DASH NO.	8	PART NUMBER	DESCRIPTION	REF DES	QTY	NOTES
1		273	900750-01	DIODE, POWER IN4001	CR5,CR6		
1		174	906103-02	ZENER IN4371	CR1		2.7 V
1		175	900941-01	ZENER IN755	CR2		7.5 V
1		176	900850-16	SIGNAL IN914	CR3		
1		177	906129-01	DIODE, BRIDGE RECTIFIER	CR4		VARO YMOB
1		178					
1		179	902265-02	POTENTIOMETER 1K	R25		
1		180	902265-03	POTENTIOMETER 2K	R27		
2		181	901550-84	RESISTOR, 1/4W, 5%, 1M	R41,50		
1		182					
1		183	-30	560 Ω	R5		
1		184	-17	1.2K	R17		
1		185	-26	15K	R19		
2		186	-45	75 Ω	R26,R9		
2		187	-57	390 Ω	R39,R8		
1		188	-49	100 Ω	R14		
1		189	-01	1K	R46,13,16,23		
3		190	-69	1.5K	R2,22,51		
5		191	-02	3.3K	R143,45,24		
1		192	-19	4.7K	R21		
1		193	-04	6.8K	R20		
2		194	-20	10K	R3,R7		
2		195	-22	47K	R33,R34		
1		196	-82	470K	R35		
1		197	-100	180 Ω	R31		
1		198	-70	2K	R43		
1		199	-58	180 Ω	R37		
1		1100	-23	2.7K	R37		
2		1101	901550-75	RESISTOR 1/4W, 5% 120 Ω	R11,10		
2		1102	901550-45	RESISTOR 1/4W, 5% 75 Ω	R9, R24		
1		1103					
1		1104	901550-58	RESISTOR 1/4W, 5% 470 Ω	NONE		INPUT VIDEO LINE TO GND (SEE SILKSCREEN)
1		1105	902410-06	RESISTOR PACK 3.3K, 10 PIN	RP4		
1		1106	902442-29	RESISTOR PACK 3.3K, 8 PIN	RP3		BOURNS NO.4308R-101-332
2		1107	902422-03	RESISTOR PACK 33 Ω, 8 PIN	RP1, RP2		BOURNS NO.4308R-102-330
1		1108					

TITLE: COMMODORE 64 PCB ASSY
 DRAWN BY: S. Collins
 DATE: 1/14/82
 ENGR: []
 APPR: []
 SIZE: B
 DATE: []
 REV: IN 4
 SHT: 4
 326298

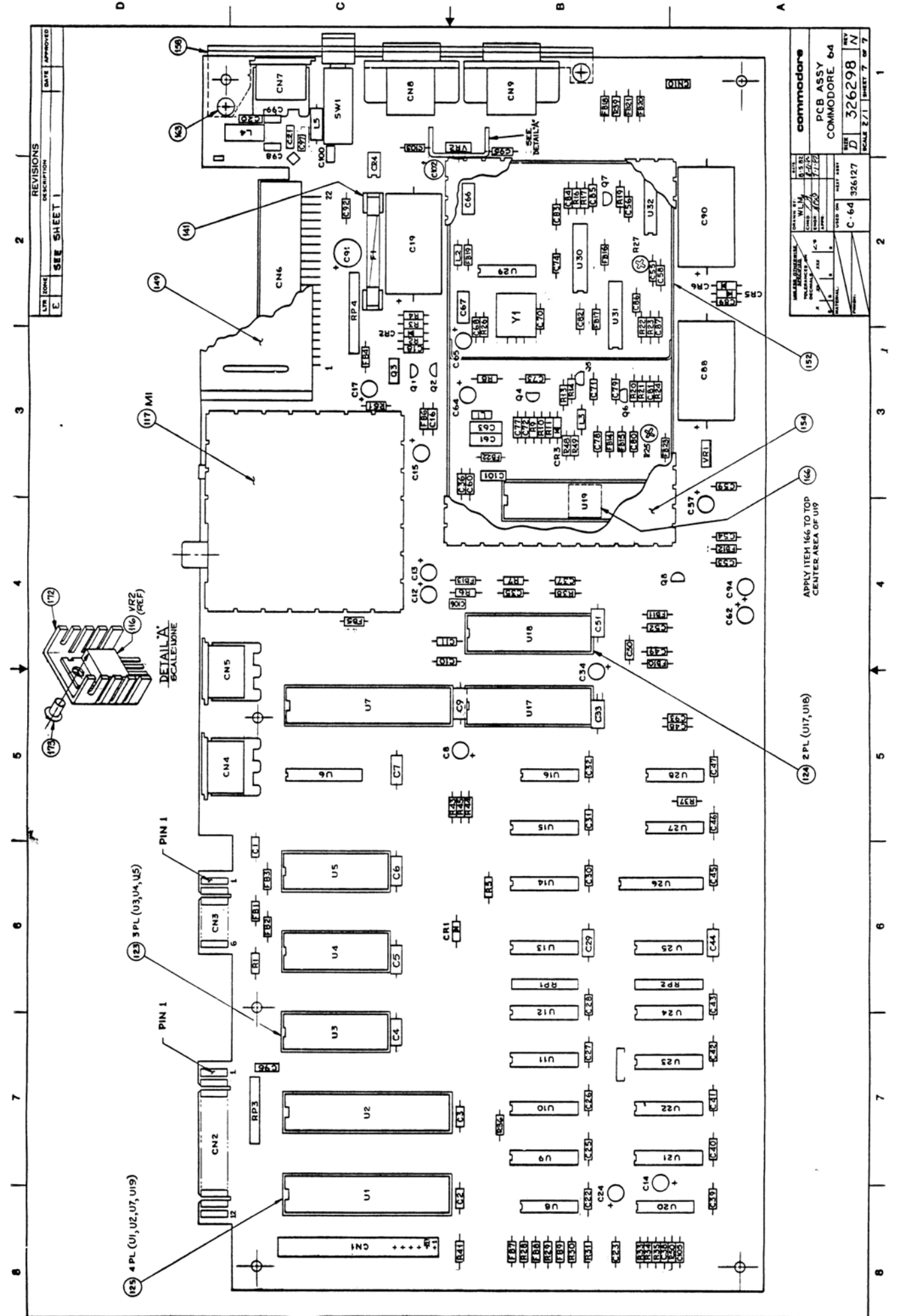
commodore

QUANTITY REQD PER PART / DASH NO.		QTY	PART NUMBER	DESCRIPTION	REF DES	QTY	NOTES
1	109	1	902652-01	TRANSISTOR 2N4401	Q1		
1	110	1	902658-01	TRANSISTOR 2N3904	Q2		
5	111	5	902686	PN2222	Q4,5,6,7,8		
1	112	1	902653-01	TRANSISTOR TIP29B	Q3		
	113						
	114						
1	115	1	901527-01	VOLTAGE REGULATOR MC7812CT	VR1		
1	116	1	901527-02	VOLTAGE REGULATOR MC7805CT	VR2		
1	117	1	326130-01	MODULATOR	M1		
1	118	1	326163-01	MODULATOR	M1		
1	119	1	326162-01	MODULATOR	M1		
	120						
	121						
1	122	1					
1	123	1	904150-04	SOCKET IC 24 PIN			USE ON: U3, U4, U5
2	124	2	904150-05	SOCKET IC 28 PIN			USE ON: U17, U18
2	125	2	904150-06	SOCKET IC 40 PIN			USE ON: U1, U2, U7, U19
	126						
	127						
2	128	2	906126-01	CONNECTOR, 9 PIN	CN8,9		
	129						
1	130	1	906100-02	CONNECTOR, 44 PIN CARD EDGE	GN6		532623-1 AMP (.200" ROW CTR)
1	131	1	903362-01	5 PIN DIN	GN5		
1	132	1	903361-01	6 PIN DIN	GN4		
1	133	1	903331-20	20 PIN POST HDR 0.1" CTR	CN1		
1	134	1	903332-03	3 PIN " "	CN10		
1	135	1	906130-01	CONNECTOR, 7 PIN DIN	CN7		
	136						
	137						
1	138	1	903556-18	FUSE 3AG 1.5AMP	F1		
1	139	1	T. B. A.	FUSE TIME LAG 1.25A	F1		SUB. ITEM 138
	140						
2	141	2	906102-01	CLIP, FUSE			
	142						
	143						
23	144	23	903025-01	FERRITE BEAD	FB1-23		
	145						

TITLE: COMMODORE 64 PCB ASSY		DATE: 1/1/82	ENGR: [Signature]	DATE: []	SIZE: []	REV: R	QTY: 57
326298		APPR: []					

QUANTITY REQD PER PART / DASH NO.	8	DESCRIPTION	REF DES	NOTES
01	146	SWITCH ROCKER DPDT	SWI	
	147			
	148			
	149	CARTRIDGE GUIDE		
	150			
	151			
	152	SHIELD BOX		
	153			
	154	SHIELD CAP ASSY (WITH HEATSINK)		
	155			
	156			
	157			
	158	CONNECTOR PANEL		
	159	WIRE, INSULATED, 22AWG		3
	160			
	161			
	162			
	163	SCREW, #6 - 92 x .25 LG		
	164			
	165			
	166	HEAT SINK COMP'D THER. CONDUCTIVE		USE ON U19
	167	HEATSINK, FLAT		USED ON VR2
	168	RIVET		USED ON VR2
	169			
	170			
	171			
	172	HEATSINK, FLAT		USE ON VR2
	173	RIVET		USE ON VR2
	174			
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commodore	TITLE: COMMODORE 64 PCB ASSY	DRWN BY: S. Col	DATE: 6/5/77	ENGR: []	DATE: []	SIZE: []	REV: M	BMT: 67
		CHKD: []		APPR: []			326298	

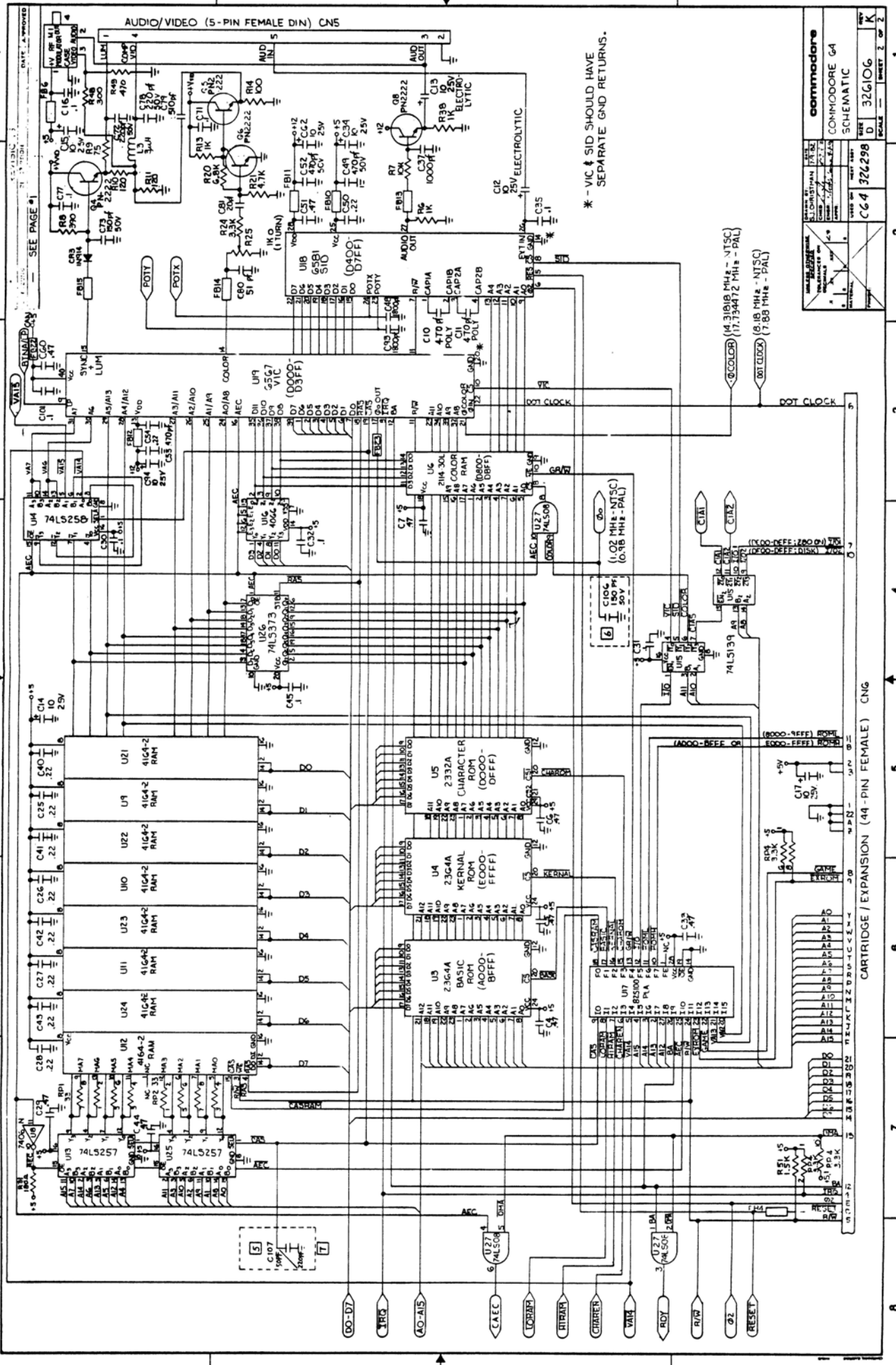


REVISIONS		DATE	APPROVED
1	ISSUE		
2	SEE SHEET 1		

DESIGNED BY	W.L.M.	DATE	7/72
CHECKED BY	J.P.	DATE	7/72
SCALE	2/1	SHEET	7 OF 7
UNIT	C-64	326127	
COMMODORE	PCB ASSY	COMMODORE	64
REV	D	326298	N

APPLY ITEM 166 TO TOP CENTER AREA OF U19

(129) 2 PL (U17, U18)



* - VIC & SID SHOULD HAVE SEPARATE GND RETURNS.

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SEE PAGE 1	SEE PAGE 1
REV. 1	REV. 1
REV. 2	REV. 2
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