

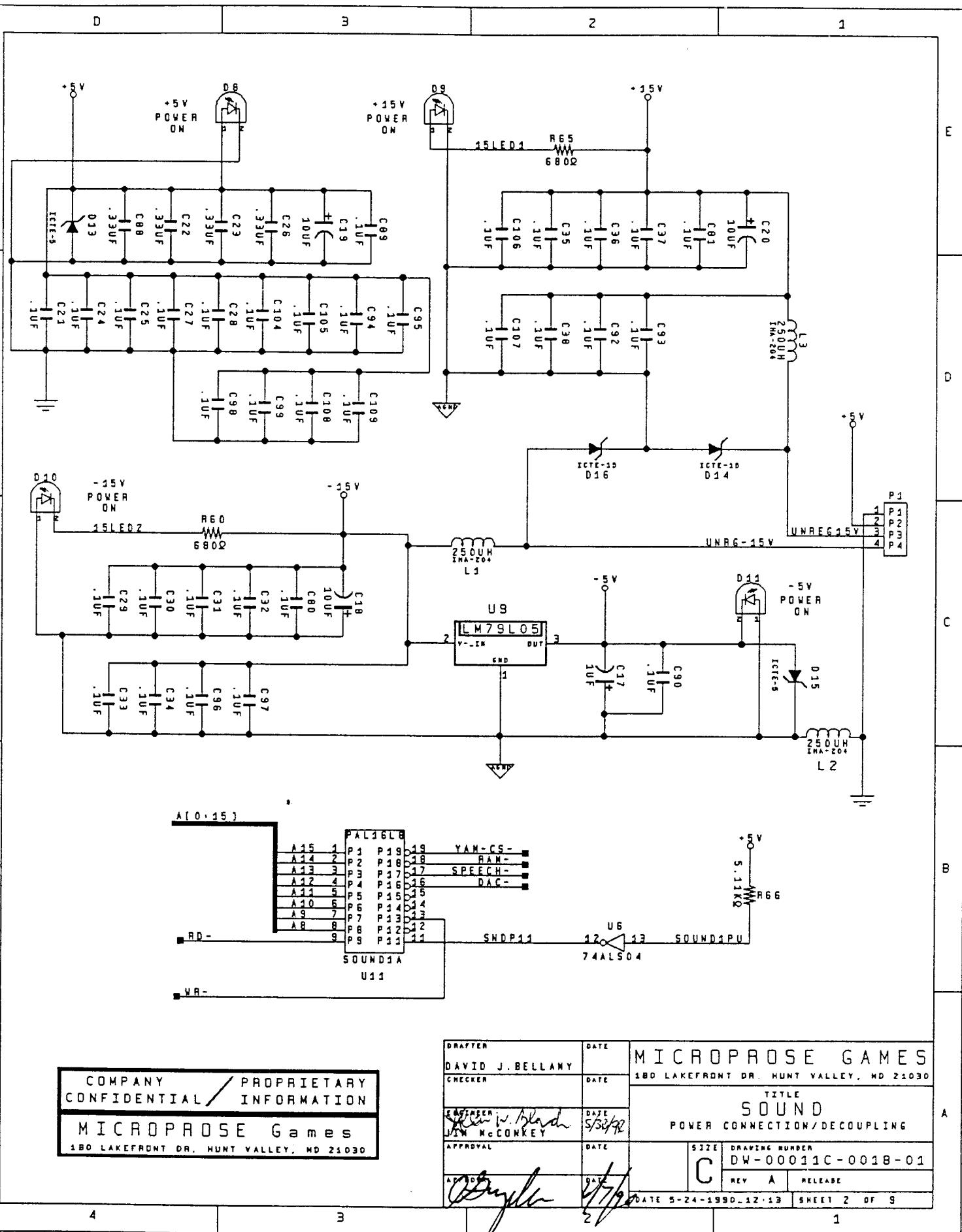
MICROPROSE GAMES

SOUND
PRINTED CIRCUIT
BOARD ASSEMBLY

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

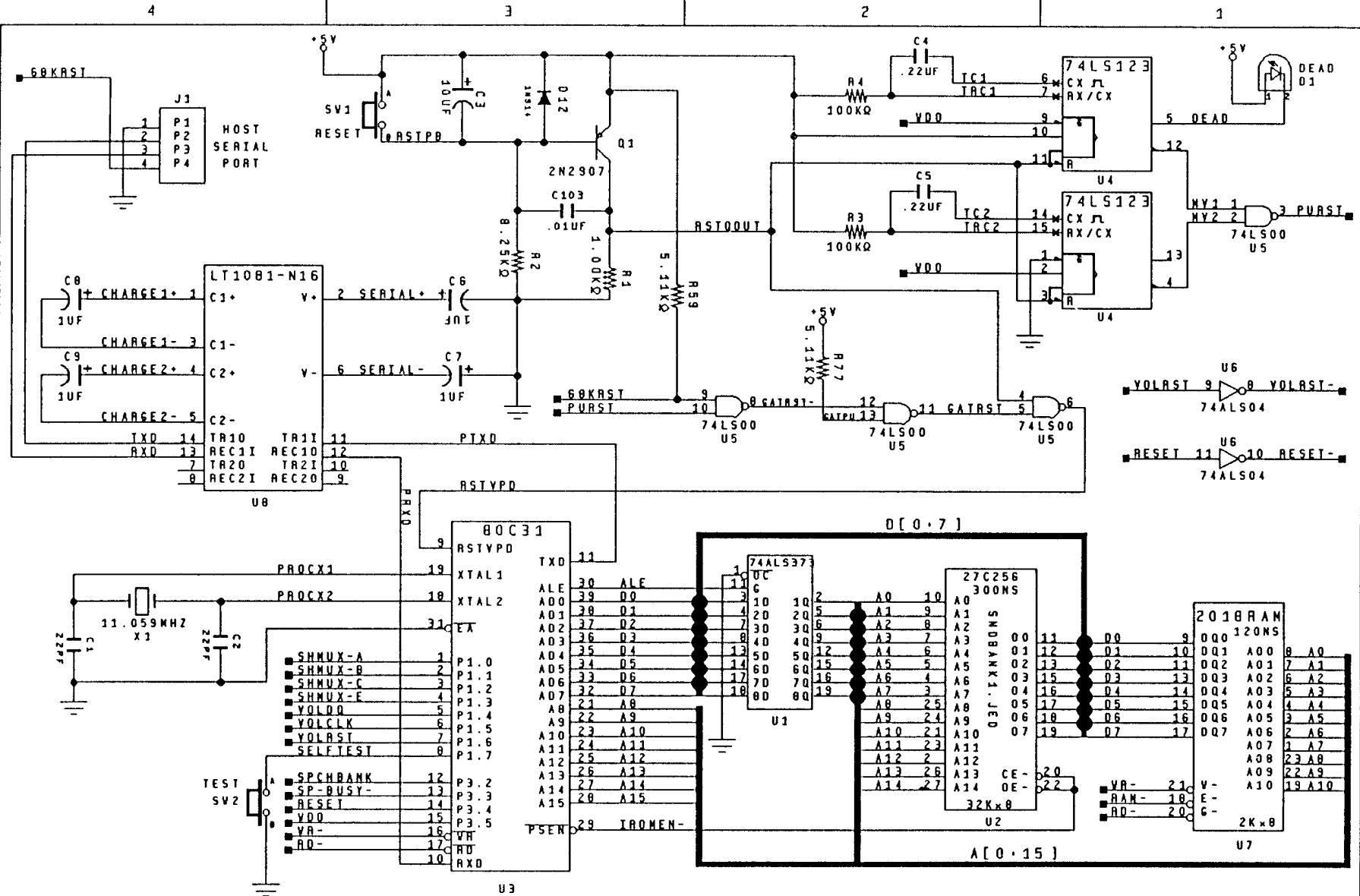
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES		
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
CHECKER	DATE			
ENCLADER Allen Black	DATE 5/30/90	TITLE SOUND		
ALLEN BLACK		PRINT CIRCUIT BOARD ASSEMBLY		
APPROVAL	DATE	SIZE C	DRAWING NUMBER DW-000011C-0018-01	
APPROVAL	DATE 5/30/90		REV A	RELEASE
DATE 5-30-1990 10-21			SHEET 1 OF 9	



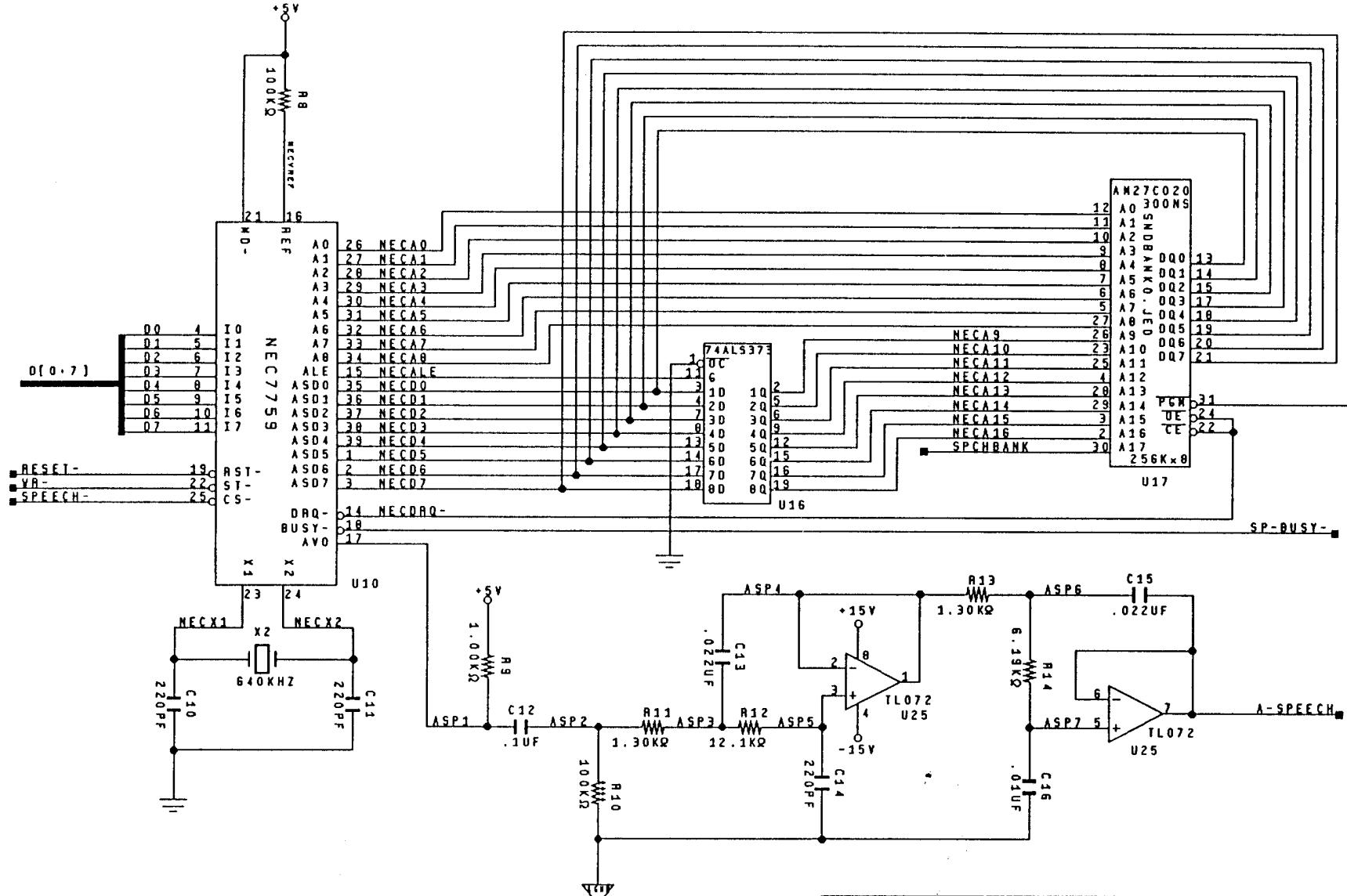
COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

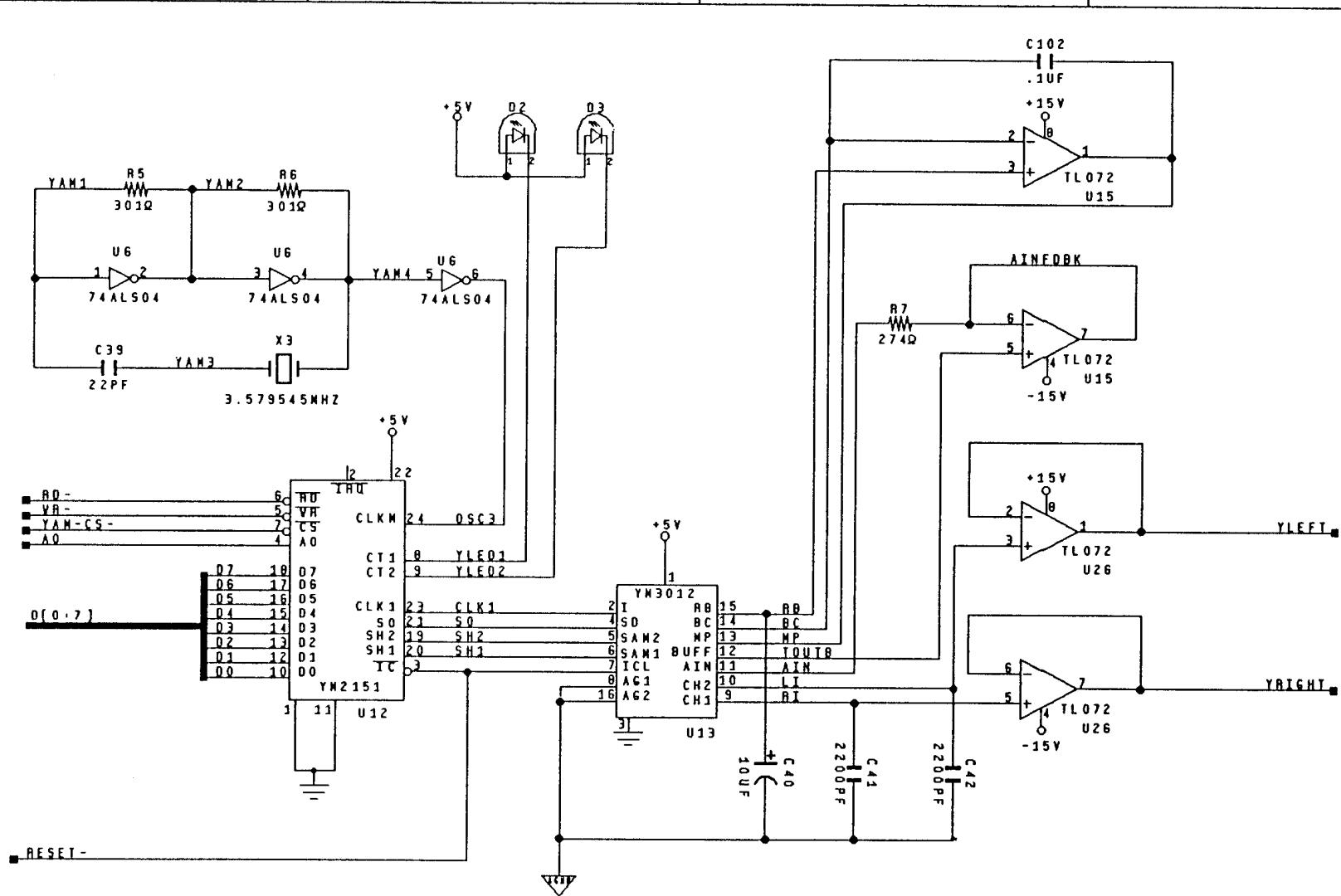
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030



COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE
DAVID J. BELLAMY	
CHECKER	DATE
GARY GREEN	5/30/90
ENGINEER	DATE
S. W. MASON	
APPROVAL	DATE
M. PROVO	
TITLE	
SOUND	
CPU, INSTRUCTION MEMORY, RESET AND RS232 COMMUNICATIONS	
SIZE	DRAWING NUMBER
C	DW-00011C-001B-01
REV A	RELEASE
DATE 5-30-1990-5-15 SHEET 3 OF 9	





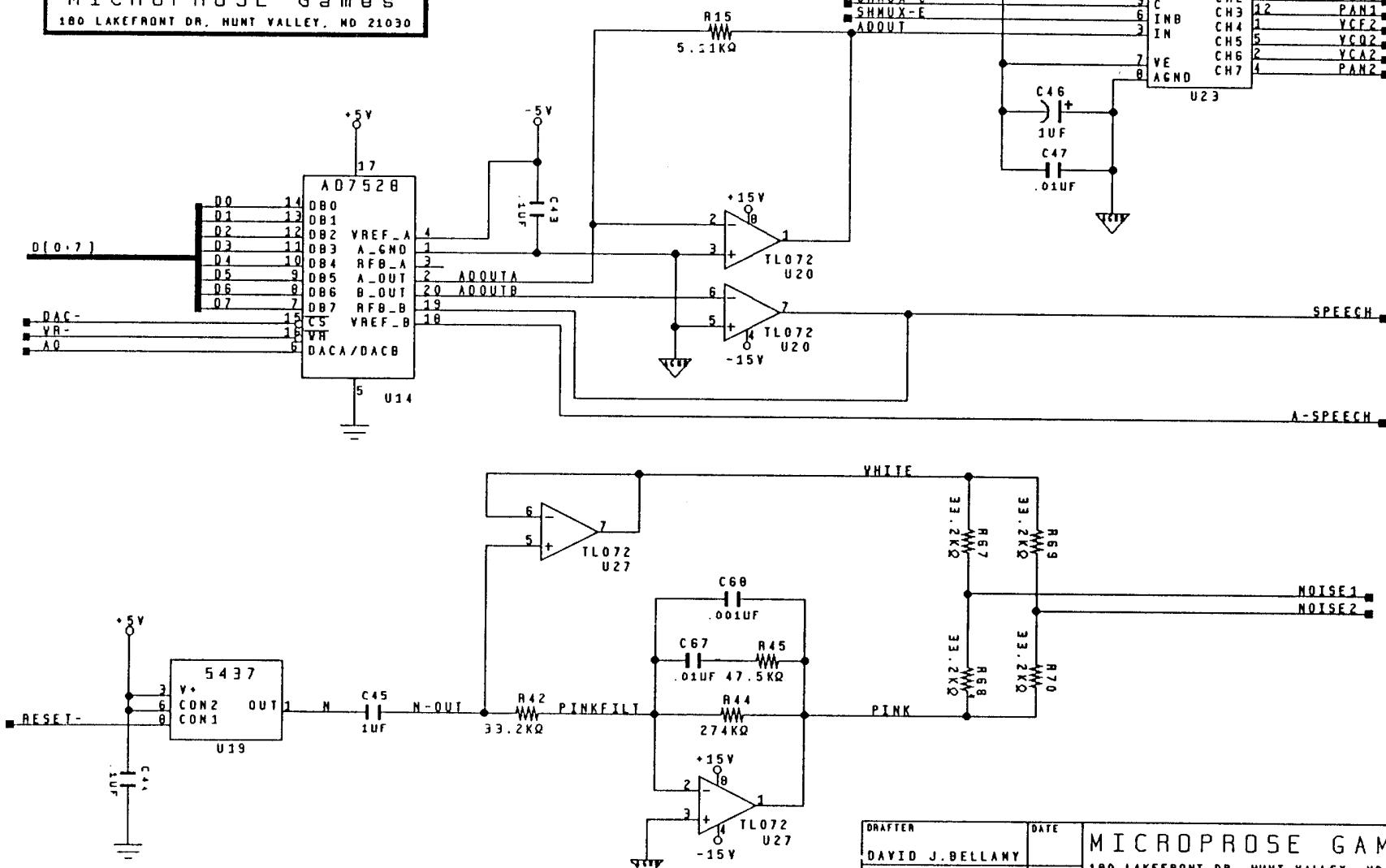
COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR., HUNT VALLEY, MD 21030

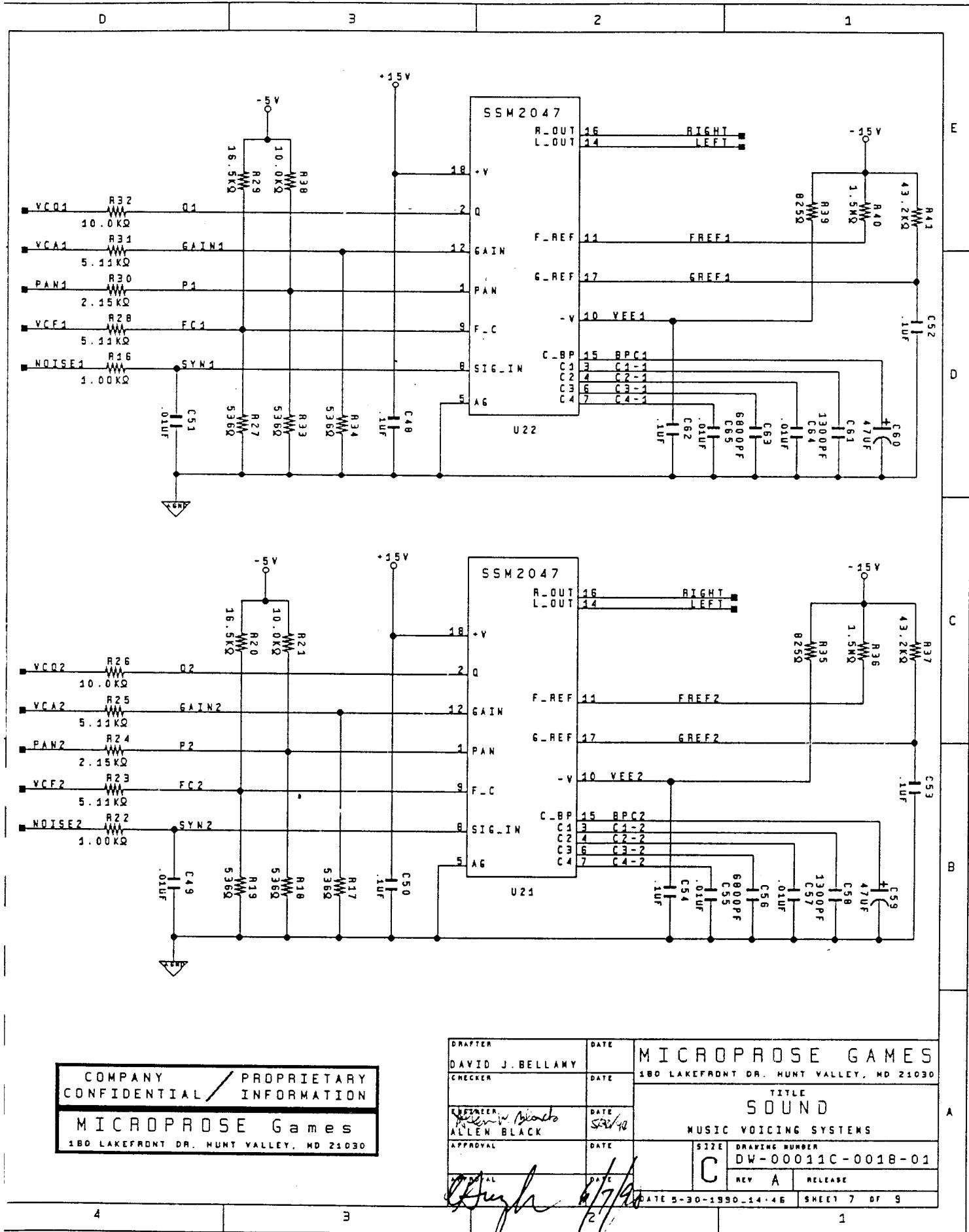
DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
CHECKER	DATE	TITLE SOUND STEREO MUSIC SYNTHESIZER		
ENGR/EEF <i>Ken W. Black</i> ALLEN BLACK	DATE <i>5/20/90</i>			
APPROVAL	DATE	SIZE <i>G</i>	DRAWING NUMBER DW-00011C-0018-01	REV A RELEASE
APPROVAL	DATE <i>5/20/90</i>	DATE 5-30-1990 9:51		SHEET 5 OF 9

COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE GAMES
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

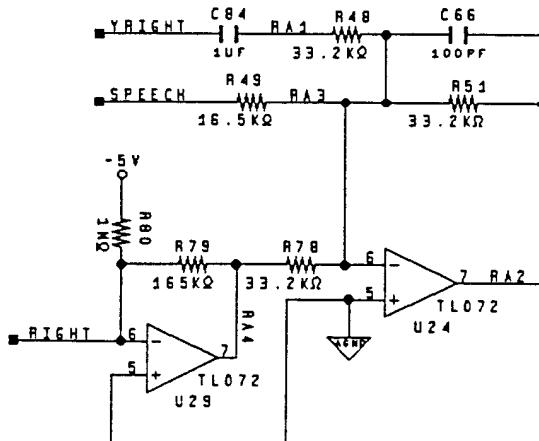


DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE	TITLE	
<i>Allen W. Black</i>	<i>5/31/90</i>	SOUND	
ALLEN BLACK		NOISE GENERATOR, A/D AND	
APPROVAL	DATE	SPECIAL EFFECTS S & H	
<i>John G. Taylor</i>	<i>6/7/90</i>	SIZE	DRAWING NUMBER
		C	DW-00011C-001B-01
REV	A	RELEASE	
DATE 5-30-1990-10-15		SHEET 6 OF 9	

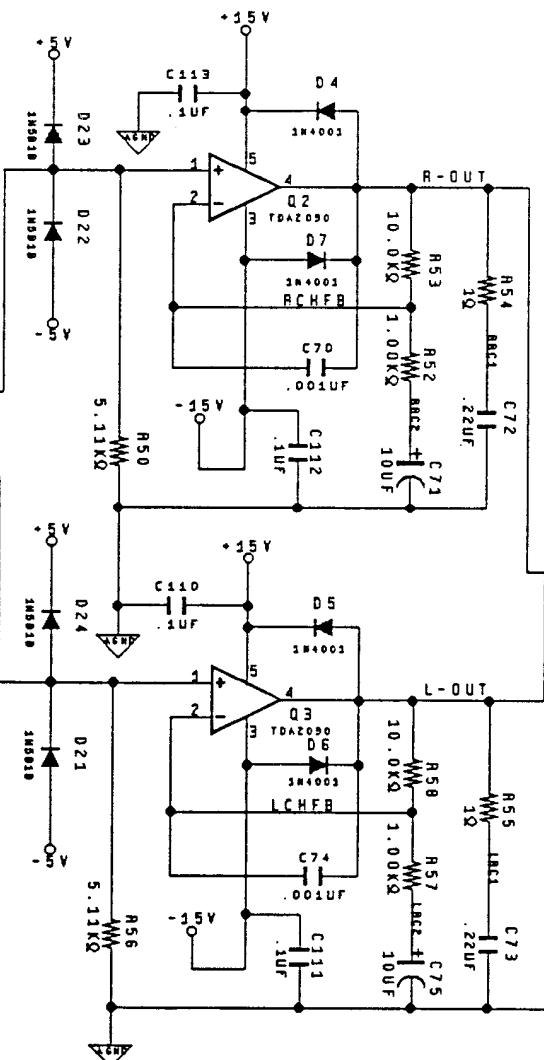
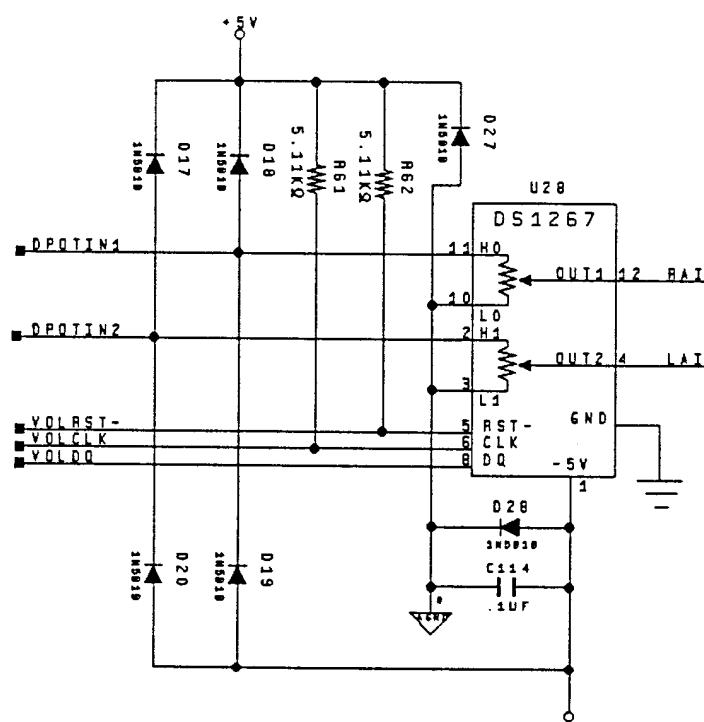
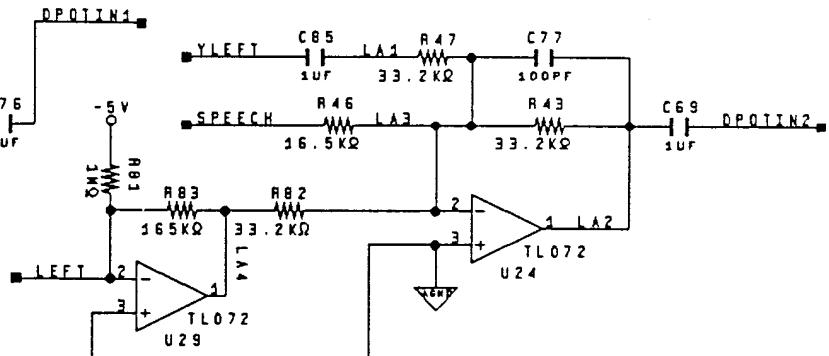


D E 1
3 2

RIGHT



LEFT

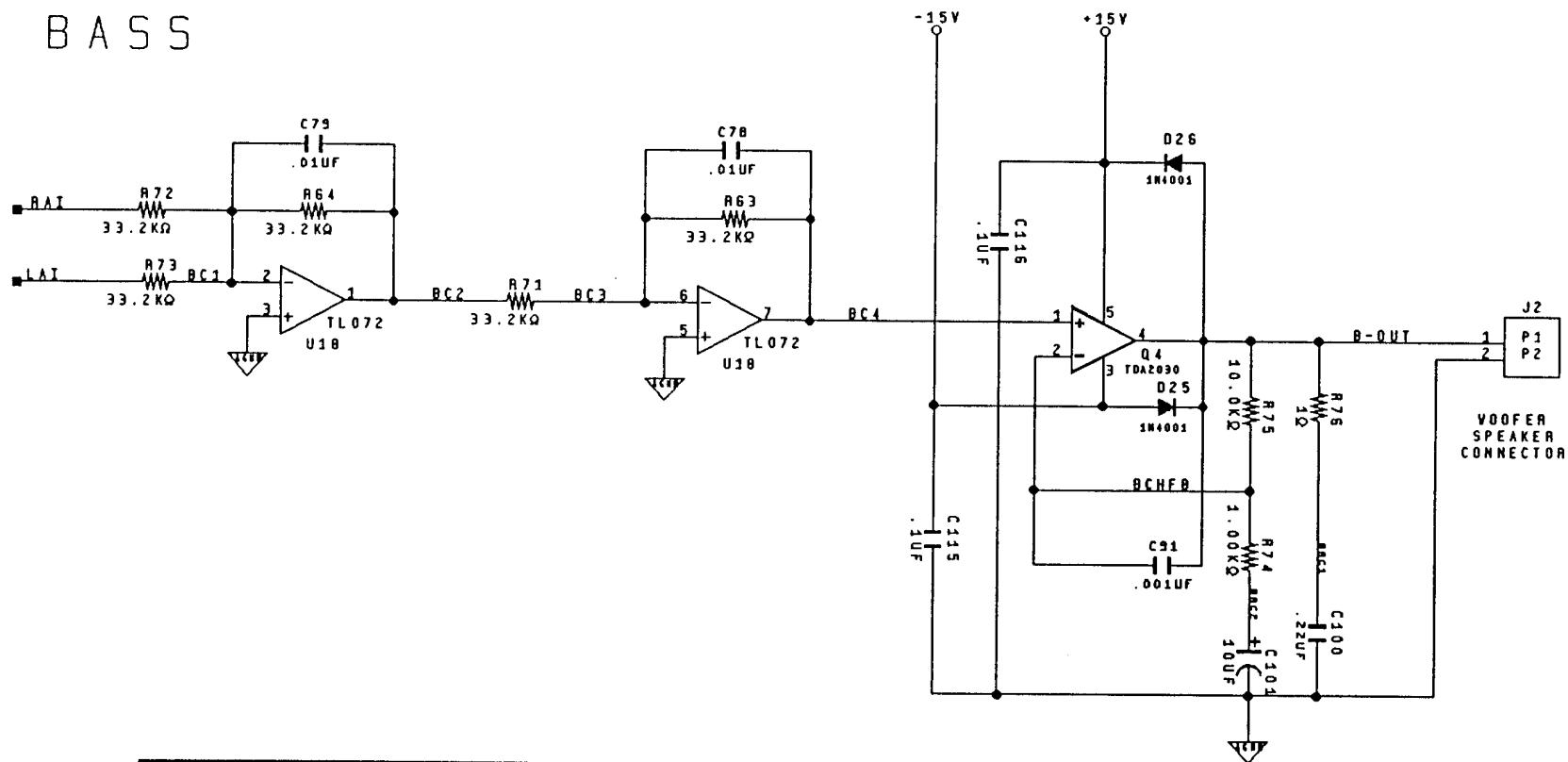


COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
Selma W. Bird	S/3/92		
APPROVAL	DATE	TITLE	
ALLEN BLACK		SOUND	
APPROVAL	DATE	LEFT AND RIGHT CHANNEL	
		OUTPUT AUDIO AMPLIFIERS	
		SIZE	DRAWING NUMBER
		C	DH-00011C-0018-01
		REV A	RELEASE
		DATE 5-30-1990-14-50 SHEET 8 OF 9	

Drafts 6/92

BASS



COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR., HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES		
CHECKER	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
ENGINEER <i>Allen W. Black</i> ALLEN BLACK	DATE <i>Setup</i>	TITLE SOUND BASS OUTPUT AUDIO AMPLIFIER		
APPROVAL	DATE	SIZE <i>C</i>	DRAWING NUMBER DW-00011C-0018-01	
VERIFIED <i>David J. Bellamy</i>	DATE <i>6/7/90</i>		REV <i>A</i>	RELEASE
DATE 5-30-1990-14-52			SHEET 9 OF 9	

MICROPROSE GAMES, 180 Lakefront Drive, Hunt Valley, Maryland 21030

PROJECT: SOUND BOARD DRWG NO: PL-00011A-00018-01 REV: C

DATE: Wed 1-Aug-1990

ITEM	QTY	VENDOR PART NUMBER REF. DES.	PART DESC	VALUE	MPG P/N
1	2	CCF-07 155J R40, R36	5PCMFRES	1.5MOHM	503-00005-155
2	1	CCF-50 2743F R44	1PCMFRES	274KOHM	503-00001-274
3	4	CCF-50 1003F R3, R4, R8, R10	1PCMFRES	100KOHM	503-00001-104
4	1	CCF-50 4752F R45	1PCMFRES	.47.5KOHM	503-00001-473
5	2	CCF-50 4322F R37, R41	1PCMFRES	43.2KOHM	503-00001-433
6	9	CCF-50 3322F [R73, R72, R71, R64, R63], R51, R48, R47, R43, R42, R78, R82, R68, R70	1PCMFRES	33.2KOHM	503-00001-333
7	4	CCF-50 1652F R20, R29, R46, R49	1PCMFRES	16.5KOHM	503-00001-163
8	1	CCF-50 1212F R12	1PCMFRES	12.1KOHM	503-00001-123
9	6	CCF-50 1002F R21, R26, R32, R38, R58, R53, [R75]	1PCMFRES	10.0KOHM	503-00001-103
10	1	CCF-50 8251F R2	1PCMFRES	8.25KOHM	503-00001-822
11	1	CCF-50 6191F R14	1PCMFRES	6.19KOHM	503-00001-612
12	12	CCF-50 5111F R62, R61, R56, R50, R23, R25, R31, R28, R15, R59, R66, R77	1PCMFRES	5.11KOHM	503-00001-512
13	2	CCF-50 2151F R24, R30	1PCMFRES	2.15KOHM	503-00001-212
14	2	CCF-50 1301F R13, R11	1PCMFRES	1.30KOHM	503-00001-132
15	6	CCF-50 1001F R1, R9, R16, R22, R52, R57, [R74]	1PCMFRES	1.00KOHM	503-00001-102
16	2	CCF-07 681G R60, R65	2PCMFRES	680 OHM	503-00002-681
17	6	CCF-50 5360F R34, R19, R18, R17, R33, R27	1PCMFRES	536 OHM	503-00001-541

ITEM	QTY	VENDOR PART NUMBER REF. DES.	PART DESC	VALUE	MPG P/N
18	2	CCF-50 3010F R6, R5	1PCMFRS	301 OHM	503-00001-301
19	1	CCF-50 2740F R7	1PCMFRS	274 OHM	503-00001-001
20	2	5053EM1R00J R55, R54, [R76]	5PCMFRS	1 OHM	503-00005-010
21					
22	2	513D108MC16DK4 C87, C86	RADTANTCAP	1000UF	410-00002-108
23	2	TAP476M020CRW C59, C60	RADTANT	.47UF	421-00020-476
24	7	173D106X0035X C3, C40, C71, C75, C18, C19, C20, [C101]	AXTANT	.10UF	422-00072-106
25	6	173D105X0035V C46, C17, C7, C6, C9, C8	AXTANTCAP	.1UF	422-00072-105
26	5	C340C105K5R5CA C85, C76, C69, C84, C45	RADCERCAP	.1UF	400-00281-105
27	4	C412C334M5U5CA C23, C22, C26, C88	AXCERCAP	.33UF	402-00382-334
28	36	C410C104M5U5CA C44, C43, C99, C98, C97, C96, C95, C94, C93, C92, C38, C37, C36, C35, C113 C34, C33, C32, C31, C30, C28, C27, C25, C24, C21, C29, C80, C81, C89, C90, C104, C105, C106, C107, C108, C109, [C114, C115, C116, C110, C111, C112]	AXCERCAP	.1UF	402-00382-104
29	4	C430C224J5R5CA C4, C5, C72, C73, [C100]	AXCERCAP	.22UF	402-00285-224
30	10	C412C104J5R5CA C83, C82, C48, C50, C53, C54, C52, C62, C12, C102	AXCERCAP	.1UF	402-00285-104
31	2	C410C223J5R5CA C15, C13	AXCERCAP	.022UF	402-00285-223
32	10	C410C103J5R5CA C51, C49, C55, C57, C64, C65, C67, C47, C16, C103, [C78, C79]	AXCERCAP	.01UF	402-00285-103
33	3	C410C102J1R5CA C68, C70, C74, [C91]	AXCERCAP	.001UF	402-00295-102
34	2	C410C222J1R5CA C42, C41	AXCERCAP	2200PF	402-00295-222
35	3	C410C221J1G5CA C10, C14, C11	AXCERCAP	220PF	402-00195-221

<u>ITEM</u>	<u>QTY</u>	<u>VENDOR PART NUMBER</u>	<u>PART DESC</u>	<u>VALUE</u>	<u>MPG P/N</u>
<u>REF. DES.</u>					
36	2	C410C101J1G5CA C66,C77	AXCERCAP	100PF	402-00195-101
37	3	C410C220J1G5CA C39,C2,C1	AXCERCAP	22PF	402-00195-220
38	2	SX268J C63,C56	POLYFILMCAP	6800PF	430-00002-682
39	2	SXM213H C61,C58	POLYFILMCAP	1300PF	430-00001-132
40	2	ICTE-15 D14,D16	ZENER	15V	300-00001-005
41	2	ICTE-5 D13,D15	ZENER	5V	300-00001-002
42	10	1N5818 D17,D18,D19,D20,D21,D22,D23,D24,D27,D28	SCHOTDIODE		302-00002-001
43	4	1N4001 D7,D6,D5,D4,[D25,D26]	DIODE,RECT		302-00001-001
44	1	1N914 D12	DIODE,SIGNAL		300-00002-003
45	7	HLMP3600 D8,D3,D2,D1,D9,D10,D11	LED	RED	305-00003-002
46	3	IHA-204 L1,L2,L3	INDUCTOR	250 UH	590-00001-001
47	1	NYP 111-20 X1	OSCILLATOR	11.06MHZ	290-00003-011
48	1	NYP035A-18 X3	SNDXTAL	3.58MHZ	290-00003-003
49	1	CSB640J X2	CERRESONATR	640KHZ	290-00005-640
50	1	15-24-4049 P1	4PINPWRCON	.200"	610-00300-004
51	2	22-23-2041 J1,J5	4PINMOLEX	.100"	610-00102-004
52	[0]	22-23-2021 [J2]	2PINMOLEX	.100"	610-00102-002
53	2	KSA1A211 SW2,SW1	PBSWITCH		625-00002-001

<u>ITEM</u>	<u>QTY</u>	<u>VENDOR PART NUMBER</u>	<u>PART DESC</u>	<u>VALUE</u>	<u>MPG P/N</u>
		<u>REF. DES.</u>			
54	1	2-644018-2 UX17	32PIN SOCKET	.600"	600-00003-632
55	1	ICO-628MTT UX2	28PIN SOCKET	.600"	600-00001-628
56	[0]	ICO-320MTT [UX11]	20PIN SOCKET	.300"	600-00001-320
57	[0]	2-641606-1 [UX3]	40PIN SOCKET	.600"	600-00003-640
58	2	7-0805G-5 TP1, TP2	TEST PIN		710-00001-001
59	2	7023BCLP	HEATSINK		790-00001-001
60	2	CLP201	CLIP, HEATSINK		790-00001-002
61	1	DS1267-50 U28	DUALDIGPOTS	50KOHM	282-01267-200
62	1	P80C31BH U3	MICROPROCESR	12MHZ	135-80C31-212
63	1	UPD7759CADPC U10	SPEECHGEN		282-07759-200
64	1	MM5437 U19	NOISEGENR		282-05437-200
65	1	YM2151 U12	MUSICSYNTH		282-02151-200
66	1	YM3012 U13	STEREODAC		282-03012-200
67	2	TDA2030V Q3, Q2, [Q4]	AUDIOAMP		282-02030-600
68	7	TL072ACP U24, U27, U20, U26, U15, U25, U29, [U18]	DUALOPAMP		282-00072-200
69	1	MC79L05ACZ U9	NEG5VREG		281-07905-001
70	1	TP2907 Q1	PNPTRANS		310-00001-001
71	1	PAL16L8-BCN U11	SOUND1A	15NS	120-00003-001
72	1	AM27C020-305DC U17	256Kx8EPROM SNDBANK0.JED	300NS	110-00003-001

<u>ITEM</u>	<u>QTY</u>	<u>VENDOR PART NUMBER</u>	<u>PART DESC</u>	<u>VALUE</u>	<u>MPG P/N</u>
		<u>REF. DES.</u>			
73	1	MCM2018AN45 U7	2Kx8SRAM	45NS	221-00004-245
74	1	D27C256-3 U2	32Kx8EPROM SNDBANK1.JED	300NS	110-00004-001
75	2	SSM-2047P U22,U21	MUSICVOICE		282-02047-200
76	1	SSM-2300P U23	8CHANS/HOLD		282-02300-200
77	1	AD7528JN U14	D/A CONVRTR		245-00003-200
78	1	LT1081CN U8	RS232DRV		235-00001-200
79	1	SN74ALS04BN U6	HEXINVERTRS		200-00004-200
80	1	SN74LS00N U5	QUAD2-IN'NAND'		202-00000-200
81	1	SN74LS123N U4	DUALONESHOT		202-00123-200
82	2	SN74ALS373N U16,U1	OCTDFLOPS		200-00373-200
83	2	CCF-07 105G R80,R81	2PCMFRES	1MOHM	503-00002-105
84	2	CCF-50 8250F R39,R35	1PCMFRES	8250HM	503-00001-831
85	2	CCF-50 1653F R79,R83	1PCMFRES	165KOHM	503-00001-174
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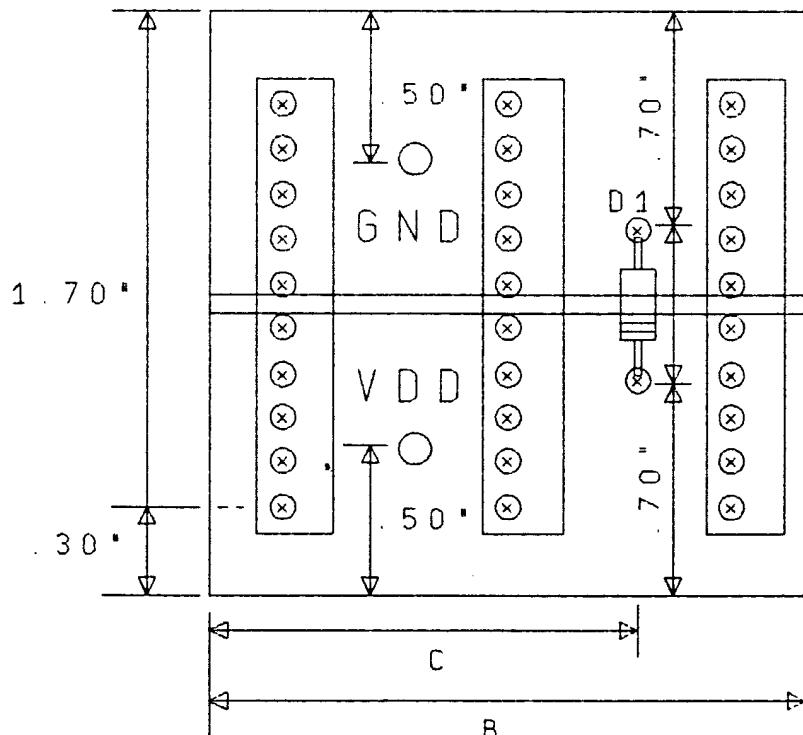
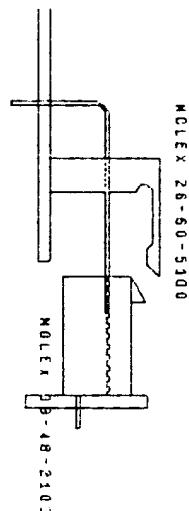
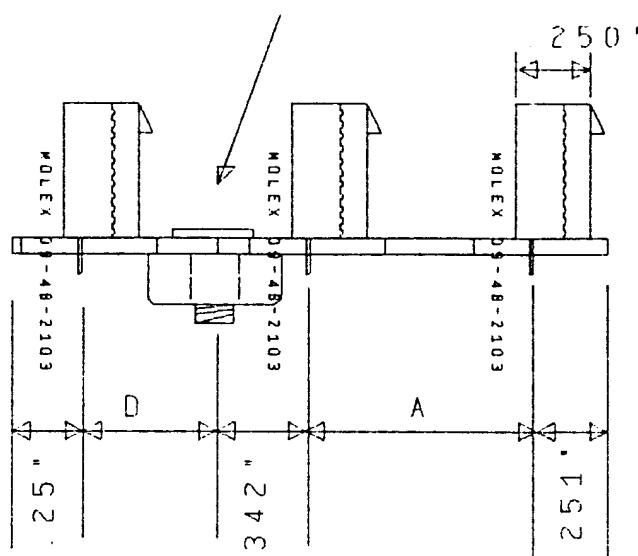
254

NOTES:

1. ITEMS WITH REFERENCE DESIGNATORS IN BRACKETS [] WILL NOT BE POPULATED FOR PRODUCTION.

#10 SCREW P E M.

P/N KFH-032-6



DIM.	REV -	REV A
A	.812"	.750"
B	.125"	.000"
C	.45"	.388"
D	.47"	.408"

DRILL KEY :

(X) .0625"

(O) .1875"

DRAFTER JG MCKIBBIN	DATE	MICROPROSE GAMES	
CHECKER	DATE	380 LAKEFRONT DRIVE HUNT VALLEY, MD 21030	
ENGINEER JG MCKIBBIN	DATE	TITLE	
APPROVAL	DATE	SIZE	DRAWING NUMBER
PWR .5	DATE	C	DW-00013A-0008-01
	DATE	SHEET OF	

MICROPROSE GAMES, 180 Lakefront Drive, Hunt Valley, Maryland 21030
PROJECT: POWER BACKPLANE DRWG NO: PL-00011A-0008-01 REV:

DATE: Tue 15-Jan-1991

ITEM	QTY	VENDOR	PART NUMBER	PART DESC	VALUE	MPG P/N
			REF. DES.			
1	3	09-48-2103	J1,J2,J3	1x10FEMCON	.156"	610-10301-010
2	2	KFH-032-6	ST1,ST2	PEM STUDS	#10-32	721-00520-410
3	2		N1,N2	HEXNUTS	#10-32	721-00010-010
4	2		W1,W2	LOCKWASHERS	#10	720-00002-010
5	1	ICTE-5	D1	DIODE	5VDC	300-00001-002

— 10 —

MICROPROSE Games

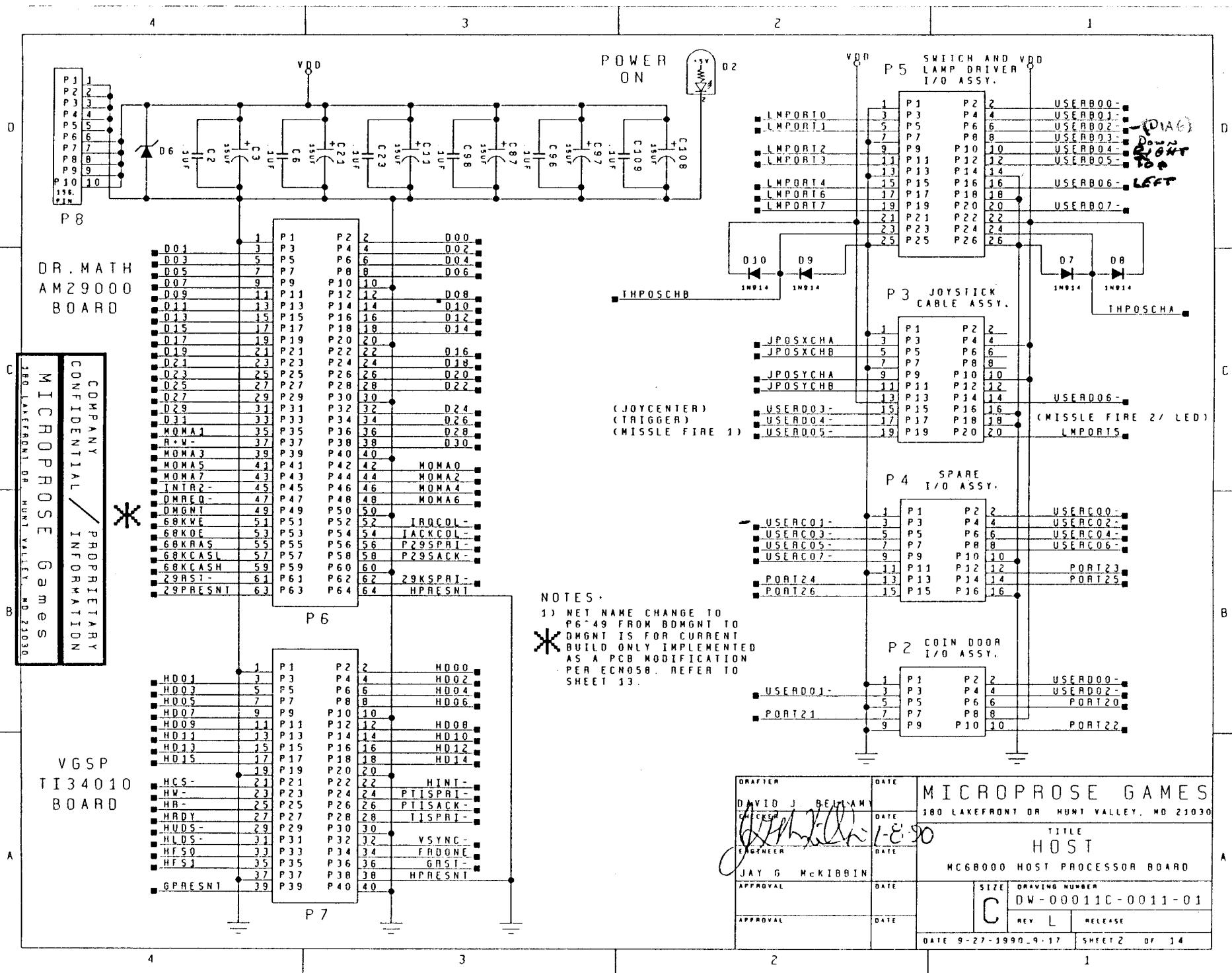
HOST PROCESSOR

PRINTED CIRCUIT BOARD ASSEMBLY

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES		
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
CHEKED	DATE			
<i>DKM/1-14-91</i>	1-14-91			
ENGINEER	DATE	TITLE		
JAY G. MCKIBBIN		HOST		
APPROVAL	DATE	HOST PROCESSOR PCB SCHEMATIC DRAWING		
		SIZE C	DRAWING NUMBER	
			DW-00011C-0011-01	
APPROVAL	DATE	REV P	RELEASE	
		DATE 1-14-1991-16-05		SHEET 1 OF 14



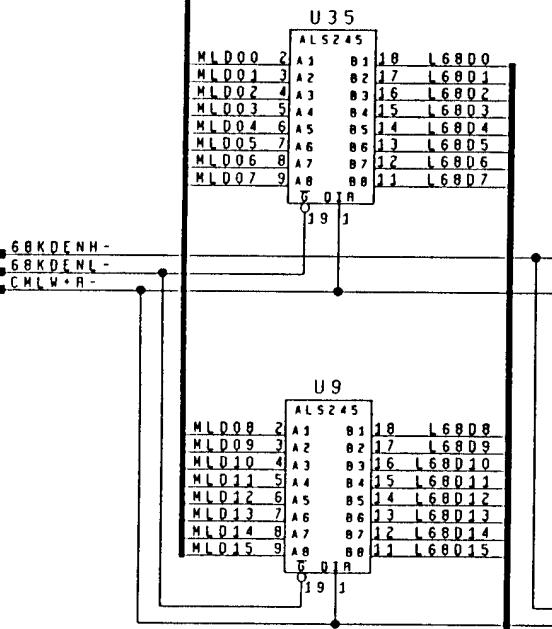
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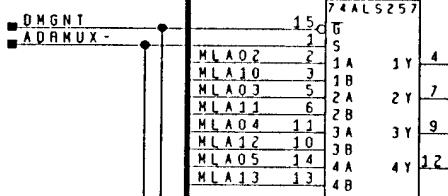
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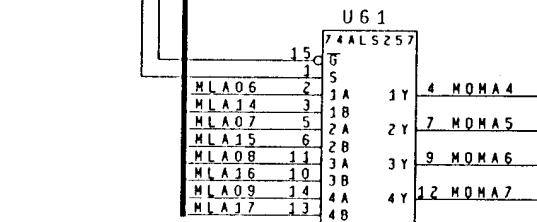
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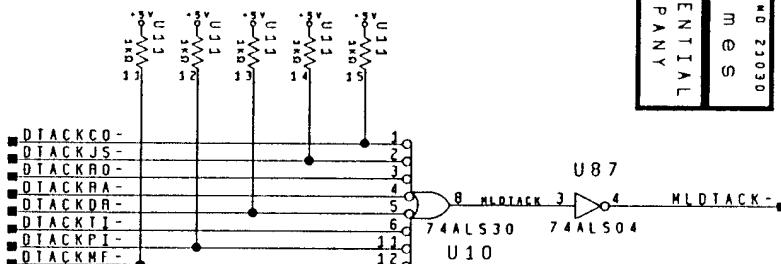
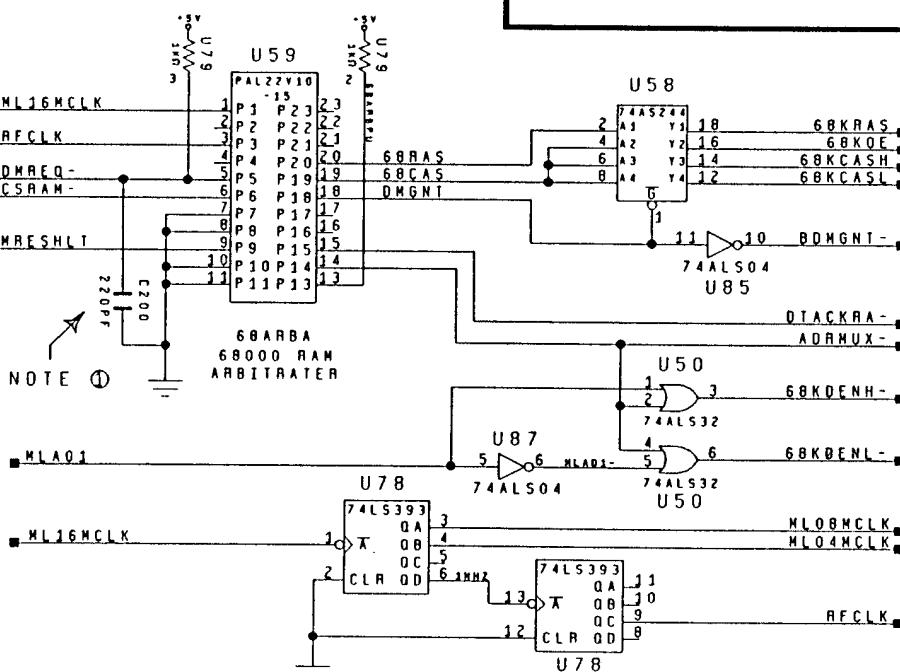
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M0MA[0-7]



180 LAKEFRONT DR. HUNT VALLEY, MD 21030
MICROPROSE GAMES
INFORMATION / CONFIDENTIAL
PROPRIETARY COMPANY



NOTE.

1) PCB MODIFICATION. ADD C200 BETWEEN U59~5 AND U59~12 ON BOTTOM OF PCB.

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. REILLY JR.		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
JAY G. MCKIBBIN	1-10-90		
EDIFIER	DATE	TITLE	
JAY G. MCKIBBIN		HOST	
APPROVAL	DATE	68000 PROGRAM RAM BUFFERS	
		AND CONTROL LOGIC	
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-000011C-0011-01
APPROVAL	DATE	REV	RELEASE
		0	
DATE 10-1-1990-10-29 SHEET 4 OF 14			

4

3

2

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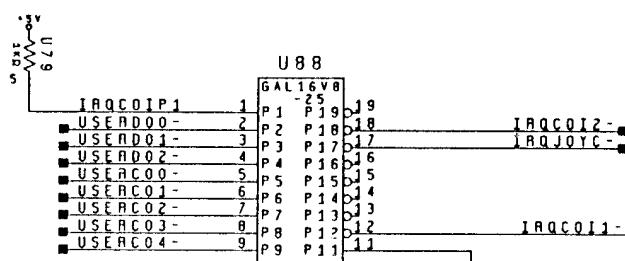
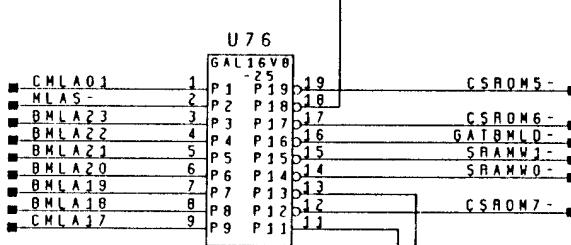
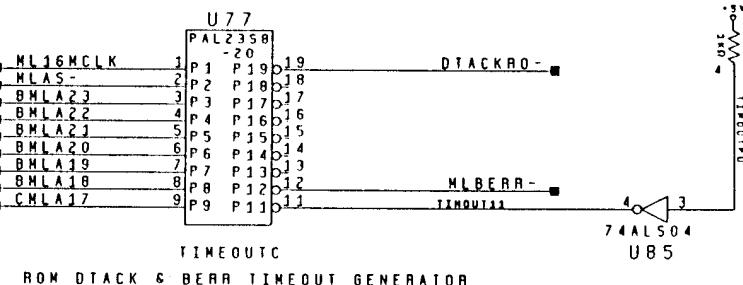
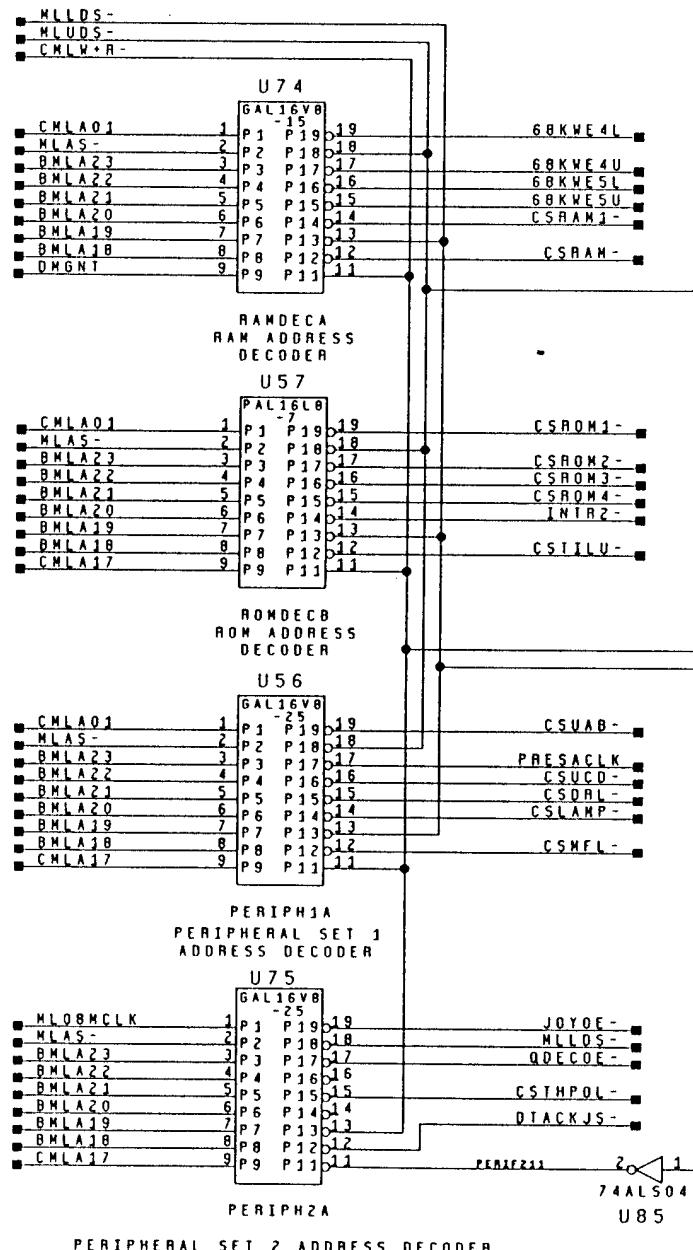
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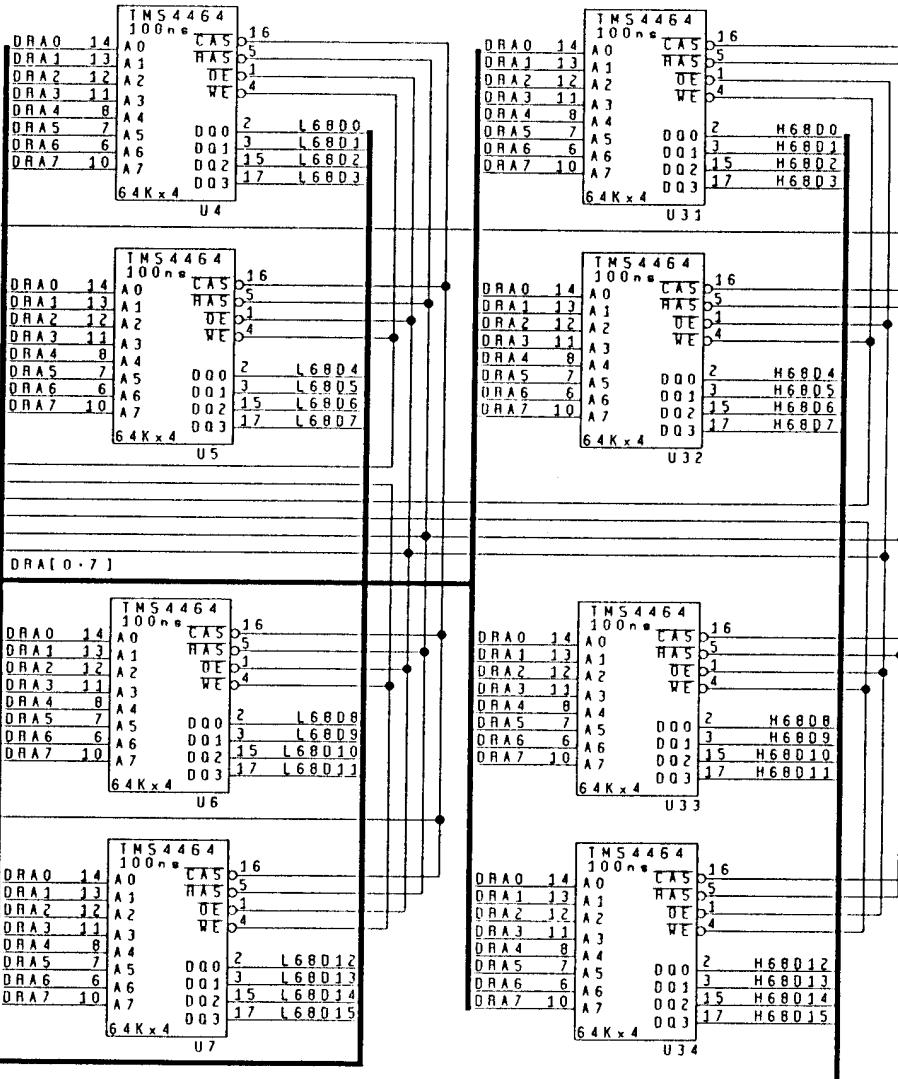
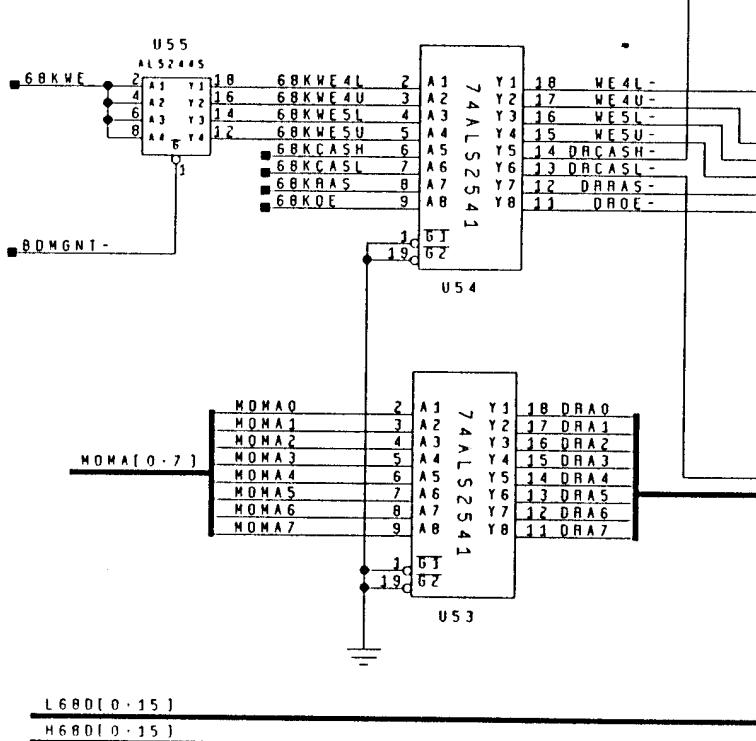


DRAFTER	DATE
DAVID J. BELLAMY	1-14-91
CHECKER	DATE
V. R. K.	1-14-91
ENGINEER	DATE
JAY G. MCKIBBIN	1-14-91
APPROVAL	DATE
MICROPROSE GAMES	
180 LAKEFRONT DR HUNT VALLEY, MD 21030	
TITLE	
HOST	
ADDRESS DECODING/ COIN INTERRUPT	
SIZE	DRAWING NUMBER
C	DW-00011C-0011-01
REV	P
RELEASE	
DATE 10-25-1990 14-42 SHEET 5 OF 14	

COMPANY PROPRIETARY
CONFIDENTIAL INFORMATION
MICROPROSE GAMES
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030



DRAFTER DAVID J. BEHN CHECKED DATE 9-26-90	DATE	MICROPROSE GAMES	
ENGINEER MICHAEL WILLIAMS APPROVAL DATE	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL DATE	DATE	TITLE HOST	
SIZE C		DRAWING NUMBER DW-00011C-0011-01	
APPROVAL DATE		REV K	RELEASE
		DATE 5-7-1990, 12-42 SHEET 6 OF 14	

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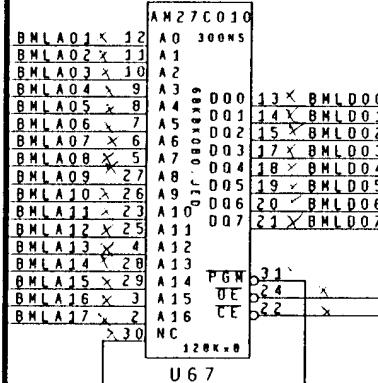
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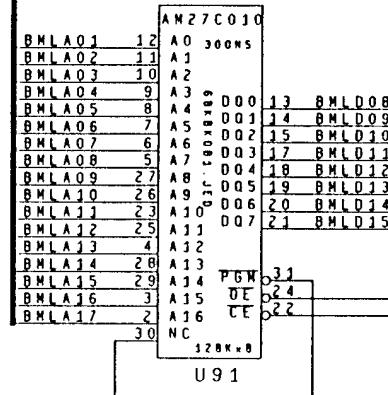
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MICROPROSE Games
 COMPANY PROPRIETARY INFORMATION
 CONFIDENTIAL / INFORMATION
 180 LAKEFRONT DR. HUNT VALLEY, MD 21030



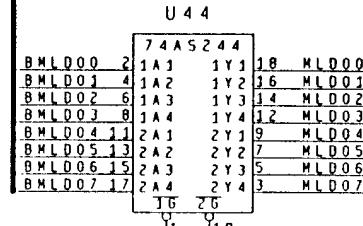
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- CSROM2-
- CSROM3-



BMLW-R-

BMLD[00-15]

MLD[00-15]



GATEMLD-

NOTE:
 U67, U68, U69, U91, U92, U93 INSTALLED
 IN SOCKET (MFG P/N 600-00002-632)

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BEILBY	9-26-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKED	DATE	TITLE	
JAY G. MCKIBBIN	9-26-90	HOST	
ENGINEER	DATE	64K INSTRUCTION EPROM	
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-00011C-0011-01
APPROVAL	DATE	REV	N RELEASE
DATE 9-17-1990-17-32		SHEET 7 OF 14	

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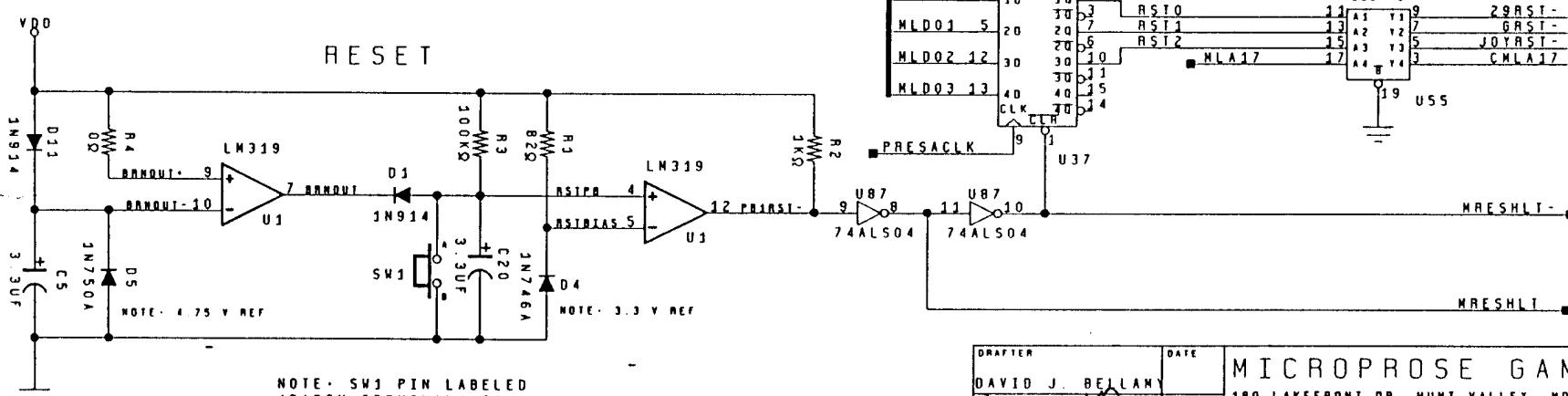
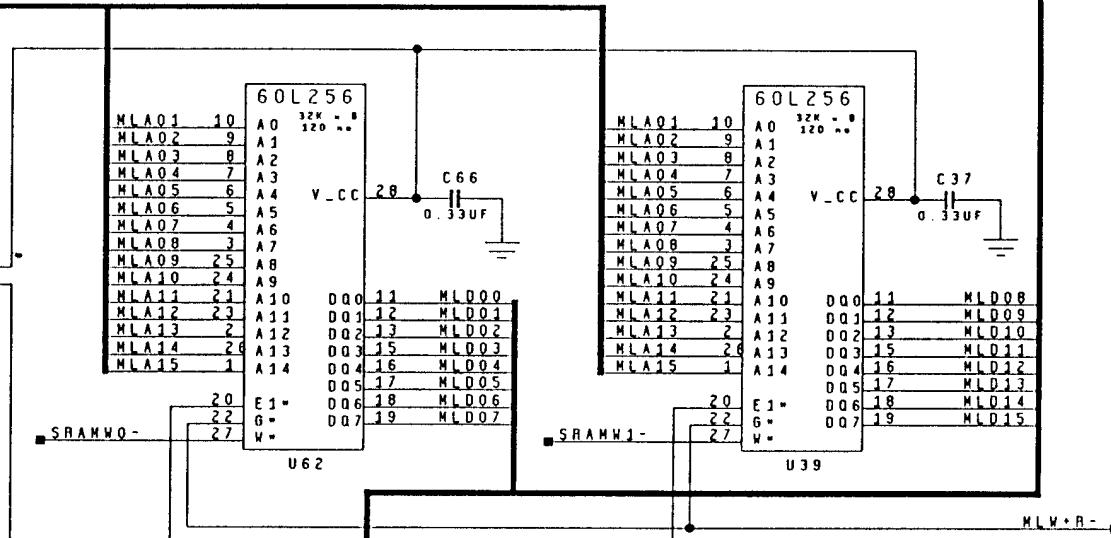
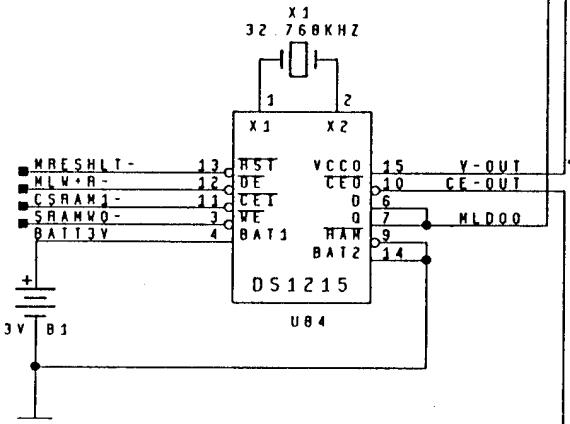
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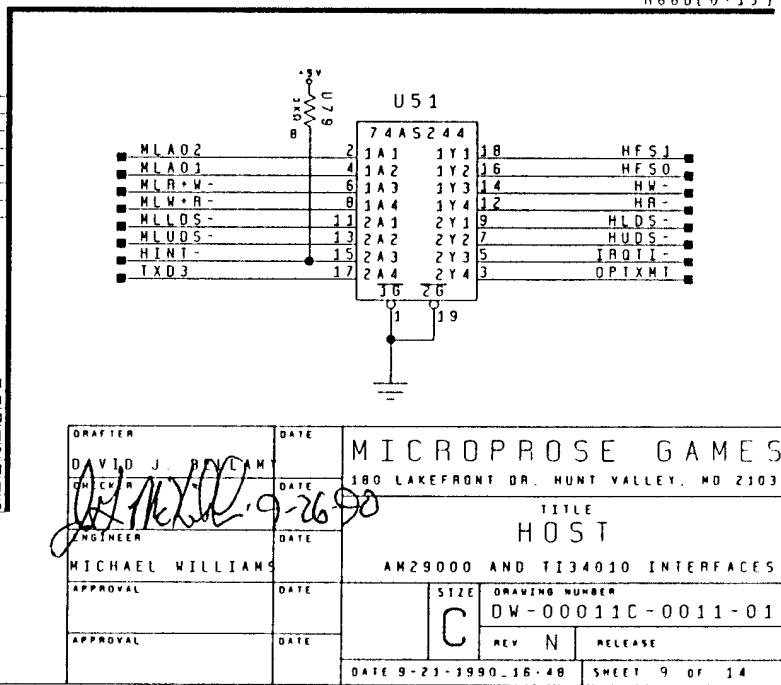
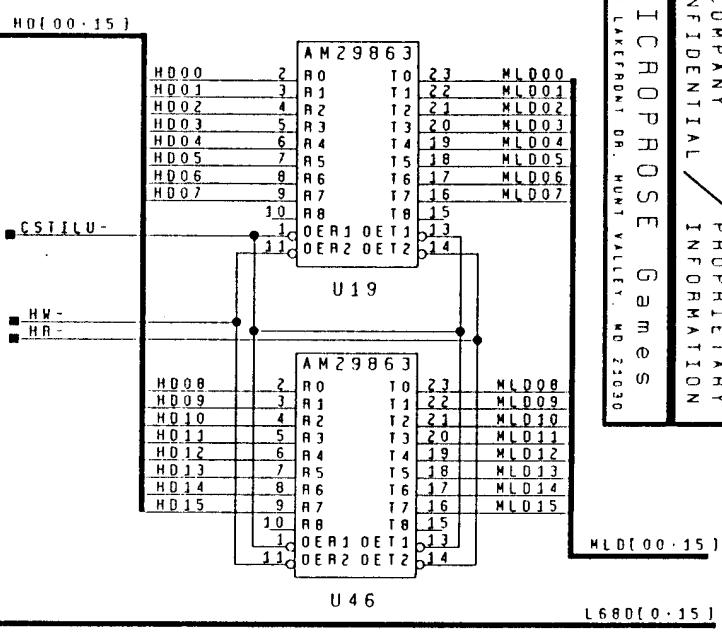
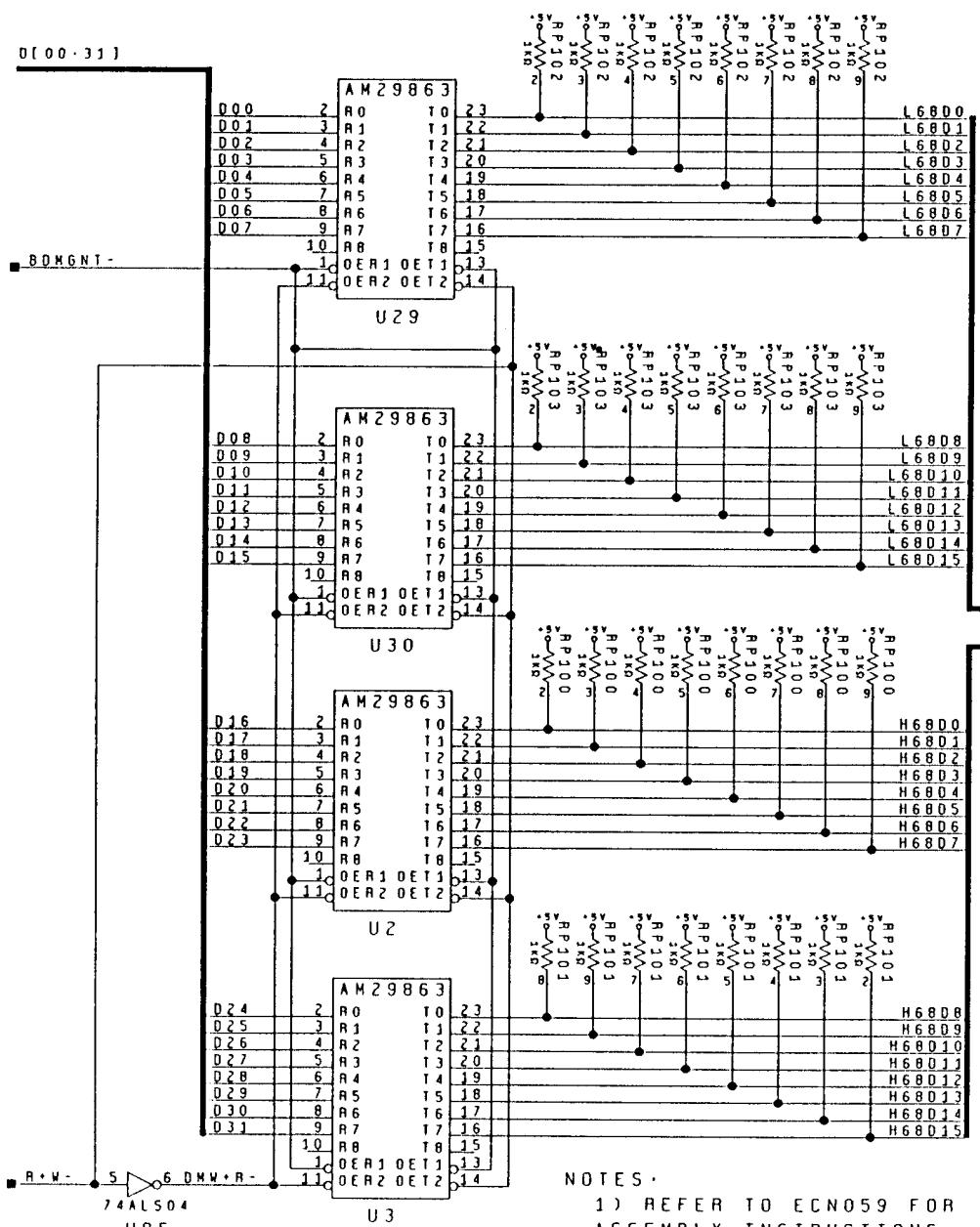
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MLA[03-15]



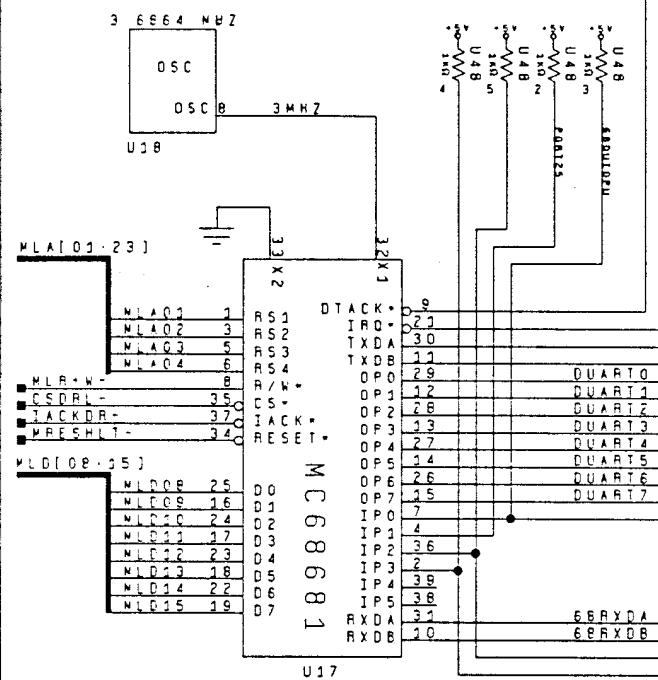
COMPANY CONFIDENTIAL / PROPRIETARY INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030



COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
380 LAKEFRONT DR. HUNT VALLEY, MD 21030



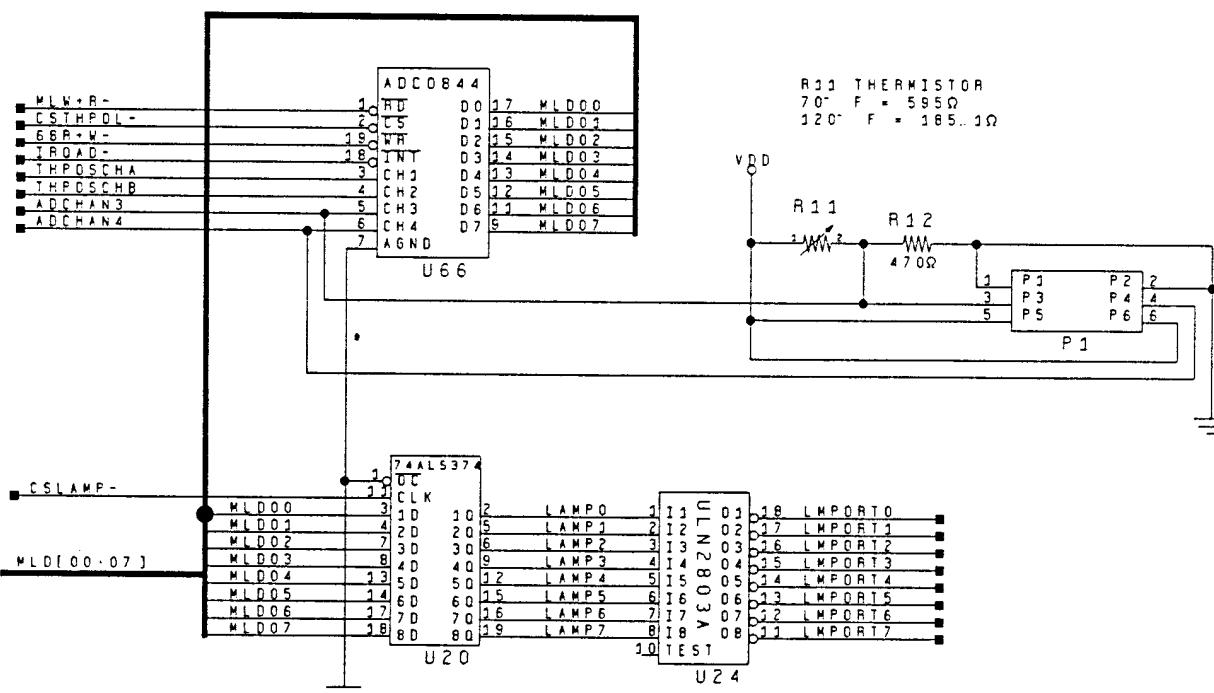
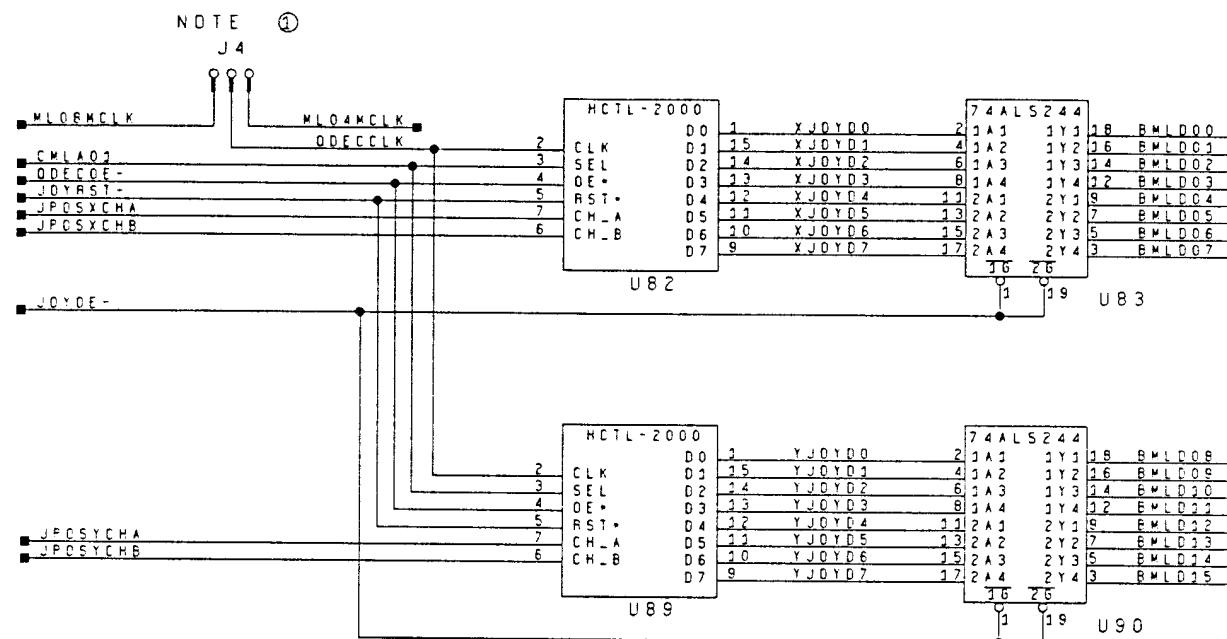
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NOTE:

- NOTE
1) REF ECN059. INSTALL
WIRE STAPLE BETWEEN
J4-2 AND J4-3.

COMPANY / PROPRIETARY
CONFIDENTIAL INFORMATION

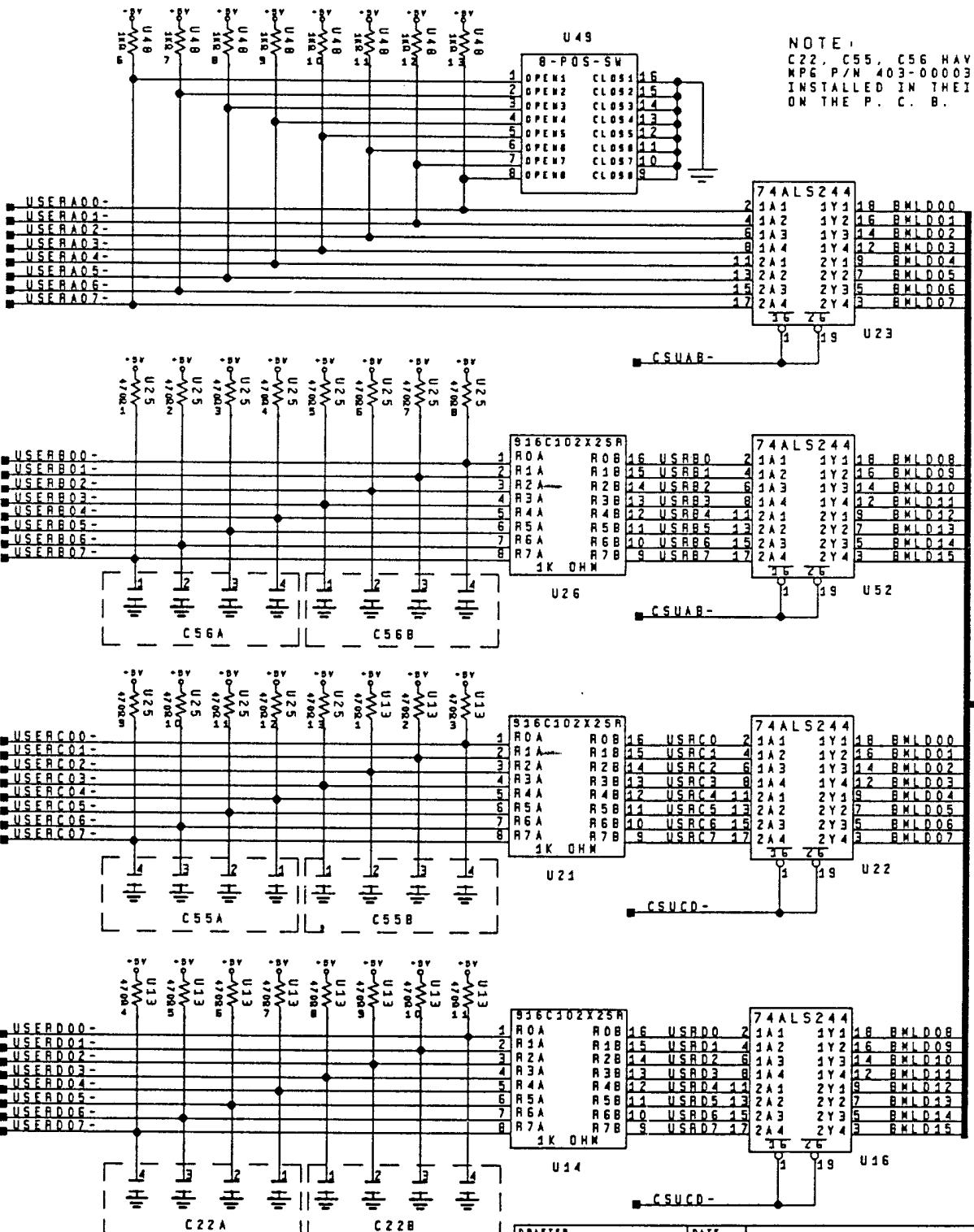
DRAFTER <i>David J. Belan</i>	DATE 9-25-90	MICROPROSE GAMES 380 LAKEFRONT DR HUNT VALLEY, MD 21030		
CHECKER <i>John W. D.</i>	DATE 9-25-90	TITLE HOST		
ENGINEER <i>Michael Williams</i>	DATE	10 INTERFACE AND LAMP DRIVERS		
APPROVAL	DATE	SIZE C	DRAWING NUMBER DW-00011C-0011-01	
APPROVAL	DATE		REV N	RELEASE
DATE 9-21-1990 17-18			SHEET 13 OF 24	

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DRAFTER

DAVID J. BELLAMY

5/1/00

DATE

MICROPROSE GAMES

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DESIGNER

MICHAEL WILLIAMS

5/1/00

DATE

TITLE

HOST

USER SWITCH INPUT INTERFACE

ENGINEER

DATE

APPROVAL

DATE

SIZE

C

DRAWING NUMBER

DW-00011C-0011-01

REV H

RELEASE

DATE 5-1-1990-13-30

SHEET 12 OF 14

COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

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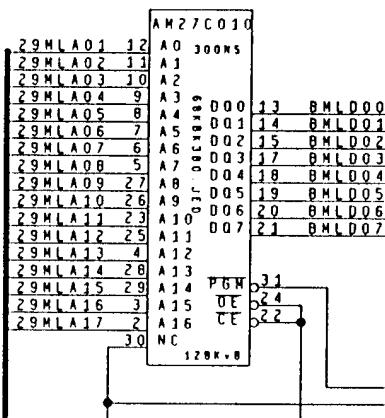
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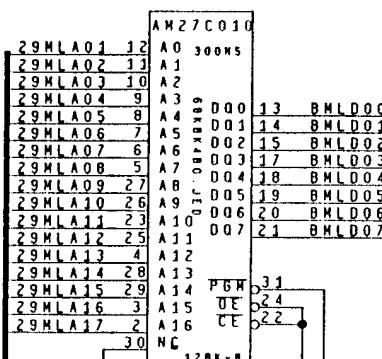
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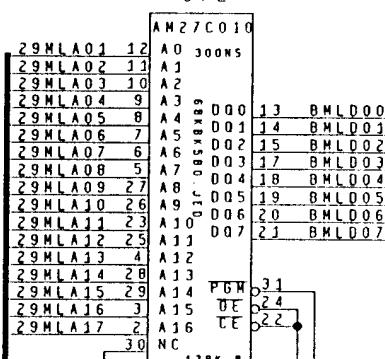
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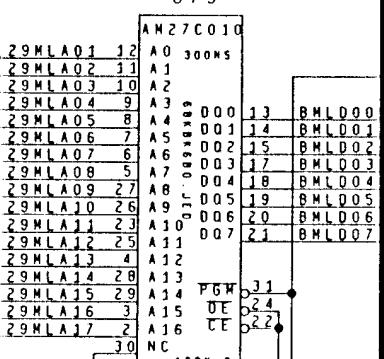
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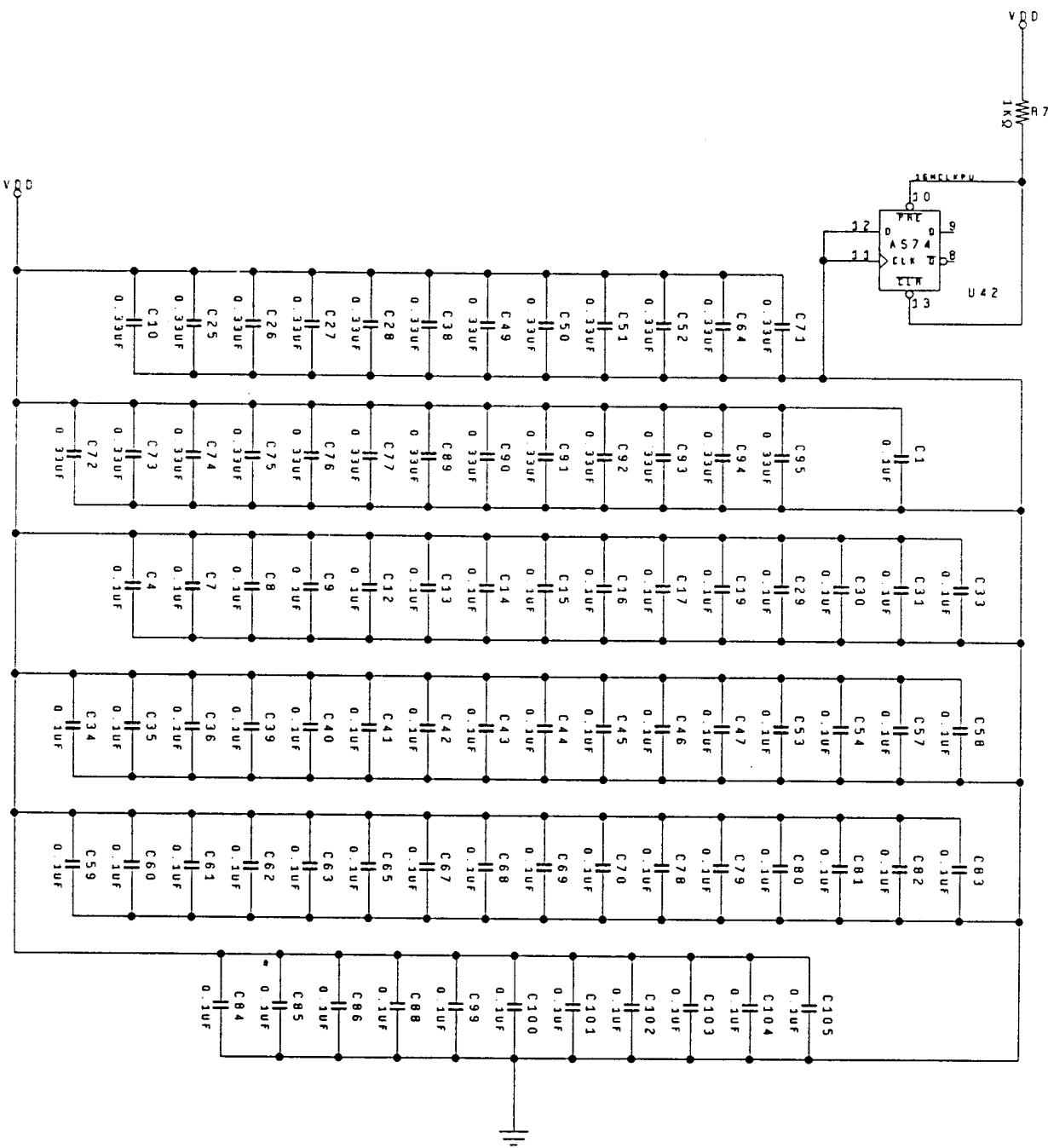
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U73



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COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER <i>DAVID J. BELLEVILLE</i>	DATE <i>1-14-91</i>	MICROPROSE GAMES	
DESIGNER <i>JAY G. MCKIBBIN</i>	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER <i>JAY G. MCKIBBIN</i>	DATE	TITLE HOST	
APPROVAL <i>JAY G. MCKIBBIN</i>	DATE	POWER DECOUPLING	
APPROVAL <i>JAY G. MCKIBBIN</i>	DATE	DRAWING NUMBER DW-00011C-0011-01	
		REV D	RELEASE
		DATE 3-22-1990-17-18 SHEET 14 OF 34	

BILL OF MATERIALS
HOST PROCESSOR P.C.B.
ASSEMBLY : A10-00001-001

COMPANY CONFIDENTIAL /
PROPRIETARY INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES		
CHECKER <i>Wm. S. C.</i>	DATE 1-14-91	180 LAKEFRONT DRIVE, HUNT VALLEY, MD 21030		
ENGINEER JAY G. MCKIBBIN	DATE	TITLE	DWG NO	REV
APPROVAL	DATE	BILL OF MATERIALS		
APPROVAL	DATE	HOST PROC. P.C.B. A10-00001-001		
			DATE 1-14-1991-11-29	A
			SHEET 1 OF 7	

MICROPROSE GAMES, 180 Lakefront Drive, Hunt Valley, Maryland 21030
 PROJECT NAME: HOST PROCESSOR DRWG. NO.: PL-00011A-0011-01 REV: T

DATE: Wed 5-Oct-1990

ITEM QTY PART NUMBER PART DESCRIPT VALUE MPG P/N

		<u>REF. DES.</u>			
1	2	914C471X2PE U13, U25	PULRESPAK	4700OHM	501-00022-471
2	1	90B08S U49	8POS DIPSW		625-00001-208
3	3	916C102X2SR U14, U21, U26	ISORESPAK	1K	501-00031-102
4	6	929CZ5U104Z050B C22A, C22B, C55A, C55B, C56A, C56B	DIPCAPX4	.1 UF	403-00003-104
5	1	SN74ALS374N U20	OCTALDFLOPS		200-00374-200
6	7	SN74ALS244AN U16, U22, U23, U52, U55, U83, U90	OCTBUFFR		200-00244-200
7	1	ADC0844CCN U66	A/DCONVERTR		246-00001-200
8	2	HCTL-2000 U82, U89	QUADDECODER		246-00002-200
9	2	ULN2803A U24, U27	LAMPDRIVER		279-00001-200
10	67	C410C104M5U5CA C4, C1, C33, C7, C8, C14, C13, C12, C9, C31, C30, C29, C19, C17, C15, C16, C45, C44, C46, C47, C53, C54, C57, C58, C40, C41, C42, C43, C39, C36, C34, C35, C70, C69, C78, C79, C80, C81, C82, C83, C63, C65, C67, C68, C62, C61, C59, C60, C85, C84, C86, C88, C102, C101, C100, C99, C105, C103, C104, C107, C106, C109, C96, C98, C23, C6, C2	AXCERCAP	0.1UF	402-00382-104
11	[0]	68001-503 [J4]	3PINJUMPR	.100"	610-00002-003
12	0	92915-R-HS-1 J5	FIBROPTRCV		240-00004-001
13	0	92915-T-DD J6	FIBROPTXMT		240-00005-001
14	1	X0-53B-3.6864 U18	DIPOSCILATR	3.6864M	290-00002-003
15	*	MC68681-P U17	DUART		240-00003-200
16	1	LT1081CN U28	RS232DRV		235-00001-200

ITEM QTY	PART NUMBER REF. DES.	PART DESCRIPT	VALUE	MPG P/N
17	4 173D105X0035V C18,C24,C32,C48	AXTANTCAP	1UF	422-00072-105
18 D*	1 MC68901-P U60	MFPERIPHERL		130-68901-204
19	8 AM29C863PC U2,U3,U19,U29,U30,U46,U64,U81	9BIBUSDRV		235-00005-200
20	2 22-05-7048 J1,J2	MOLEX4PIN	.100"	610-00601-004
21	5 1N914 D1,D7,D8,D9,D10,D11	DIODE		300-00002-003
22	5 CCF-07 102G R2,R7,R8,R9,R10	2%MFRES	1K	503-00002-102
23	2 173D335X0020V C5,C20	AXTANTCAP	3.3UF	422-00062-335
24	1 SA101A221JAA C200	AXCERCAP	220PF	402-00195-221
25	1 CCF-07 104G R3	2%MFRES	100K	503-00002-104
26	1 1N746A D4	ZENER		301-00002-033
27	1 WX-32.768KHZ X1	CRYSTAL	32KHZ	290-00004-32K
28	1 KSA1A211 SW1	PBSWITCH		625-00002-001
29	1 LM319N U1	VOLTCOMPAR	14DIP	280-00003-200
30	1 DS1215 U84	R/TCLK		291-01215-200
31	27 C412C334M5U5CA C52,C51,C50,C49,C38,C28,C27,C26,C25,C10,C91,C90,C72,C73, C74,C75,C89,C77,C76,C95,C94,C93,C92,C64,C71,C37,C66	AXCERCAP	0.33UF	402-00382-334
32	1 15-51-04-410-000 B1	LITHBATT	3VOLT	390-00001-001
33 *	2 MCM60L256AP12 U39,U62	32Kx8SRAM	120NS	221-00003-212
34	1 SN74ALS175N U37	QUADDFLOPS		200-00175-200

<u>ITEM QTY</u>	<u>PART NUMBER REF. DES.</u>	<u>PART DESCRIPT</u>	<u>VALUE</u>	<u>MPG P/N</u>
35				
36	2 SN74ALS2541N U53, U54	OCTINVDRVR		200-02541-200
37	* 8 TMS4464-10NL U4, U5, U6, U7, U31, U32, U33, U34	64Kx4DRAM	100NS	220-00001-210
38 A	1 AMPAL23S8-20PC U77	TIMEOUTC	25NS	<u>120-00001-206</u>
39 A	1 GAL16V8A-25P U75	PERIPH2A	25NS	120-00001-005
40 A	1 GAL16V8A-25P U15	VPA_GENA	25NS	120-00001-000
41 A	1 GAL16V8A-25P U74	RAMDECA	15NS	120-00001-002
42 B	1 GAL22V10-15P U59	68ARBA	15NS	120-00001-001
43	1 1N750A D5	ZENER		301-00002-047
44	1 SN74LS393N U78	QUADCOUNTR		202-00393-200
45	1 SN74ALS30AN U10	8INNAND		200-00030-200
46	1 SN74ALS32N U50	QUAD2INOR		200-00032-200
47	2 SN74ALS257N U38, U61	2:1MUX		200-00257-200
48	4 SN74ALS245AN U8, U9, U35, U36	OCTBIDBUFR		200-00245-200
49	1 SN74LS148N U12	8:3ENCODER		202-00148-200
50	1 SN74ALS138N U47	3:8DEMUX		200-00138-200
51	1 68001-502 J3	2PINJUMP	.100"	610-00002-002
52	1 X0-43D-32 U43	DIPOSCILATR	32MHZ	290-00001-032
53	1 SN74AS74N U42	DUALDFLOPS		201-00074-200

<u>ITEM QTY</u>	<u>PART NUMBER</u>	<u>PART DESCRIPT</u>	<u>VALUE</u>	<u>MPG P/N</u>
	<u>REF. DES.</u>			
54	7 SN74AS244N U44,U45,U51,U58,U63,U65,U80	OCTBUFFR		201-00244-200
55	1 SN74AS1004AN U41	HEXINERTR		201-01004-200
56	1 SN74ALS11AN U86	TRI3INAND		200-00011-200
57	2 SN74ALS04BN U85,U87	HEXINVERTR		200-00004-200
58	1 CCF-07 180G R6	2%MFRES	180OHM	503-00002-180
59	3 916C102X2PE U11,U48,U79	PULLRESPAK	1KOHM	501-00032-102
60 E*	1 MC68000-P12F U40	MICROPROCESR	16MHZ	135-68000-216
61	2 HLMP3600 D2,D3	LEDW/RES	RED	305-00003-002
62	6 173D156X0015W C3,C11,C21,C87,C97,C108	AXTANTCAP	15UF	422-00052-156
63	1 ICTE-5 D6	ZENER	5V	300-00001-002
64	1 71922-016 P4	2x8HEADER	.100"	610-00800-016
65	1 71922-020 P3	2x10HEADER	.100"	610-00800-020
66	1 71922-026 P5	2x13HEADER	.100"	610-00800-026
67	1 26-60-5100 P8	MOLEX10PIN	.156"	610-00601-010
68	1 71922-140 P7	2x20HEADER	.100"	610-00900-040
69	1 533249-1 P6	2x32HEADER	.100"	6 - -064
70				
71 A	1 GAL16V8A-25P U76	SPARMEMA	25NS	120-00001-007

<u>ITEM</u>	<u>QTY</u>	<u>PART NUMBER</u>	<u>PART DESCRIPT</u>	<u>VALUE</u>	<u>MPG P/N</u>
		<u>REF. DES.</u>			
72	A 1	GAL16V8A-25P U56	PERIPH1A	25NS	120-00001-004
73	A 1	TIBPAL16L8-7CN U57	ROMDECB	7.5NS	120-00001-103
74	A 1	GAL16V8A-25P U88	IRQCOINA	25NS	120-00001-008
75	1	71922-006 P1	2x3HEADER	.100"	610-00800-006
76	1	71922-010 P2	2x5HEADER	.100"	610-00800-010
77	1	68786-102 J3	SHUNT		715-00001-001
78	[0]	SRS8-12-01	SPACER	.75 "	700-00001-003
79	5	7-0805G-5 TP1,TP2,TP3,TP4,TP5	TEST PIN		710-00001-001
80	1	7-22870-5 TP6	TEST PIN		710-00001-002
81	C* 1	AM27C010-305DC U67	128Kx8EPROM 68KBK0B0.001	300NS	110-00001-100
82	C* 1	AM27C010-305DC U91	128Kx8EPROM 68KBK0B1.001	300NS	110-00001-101
83	C* 1	AM27C010-305DC U68	128Kx8EPROM 68KBK1B0.001	300NS	110-00001-102
84	C* 1	AM27C010-305DC U92	128Kx8EPROM 68KBK1B1.001	300NS	110-00001-103
85	C* 1	AM27C010-305DC U69	128Kx8EPROM 68KBK2B0	300NS	110-00001-004
86	C* 1	AM27C010-305DC U93	128Kx8EPROM 68KBK2B1	300NS	110-00001-005
87	C* 1	AM27C010-305DC U70	128Kx8EPROM 68KBK3B0	300NS	110-00001-006
88	C* 1	AM27C010-305DC U94	128Kx8EPROM 68KBK3B1	300NS	110-00001-007
89	C* 1	AM27C010-305DC U71	128Kx8EPROM 68KBK4B0	300NS	110-00001-008
90	C* 1	AM27C010-305DC U95	128Kx8EPROM 68KBK4B1	300NS	110-00001-009

<u>ITEM</u>	<u>QTY</u>	<u>PART NUMBER</u> <u>REF. DES.</u>	<u>PART DESCRIPT</u>	<u>VALUE</u>	<u>MPG P/N</u>
91	C*	[0] AM27C010-305DC [U72]	128Kx8EPROM 68KBK5B0	300NS	110-00001-010
92	C*	[0] AM27C010-305DC [U96]	128Kx8EPROM 68KBK5B1	300NS	110-00001-011
93	C*	[0] AM27C010-305DC [U73]	128Kx8EPROM 68KBK6B0	300NS	110-00001-012
94	C*	[0] AM27C010-305DC [U97]	128Kx8EPROM 68KBK6B1	300NS	110-00001-013
95	A	2 ICO-320MTT UX77, UX88 [UX15, UX56, UX57, UX74, UX75, UX76]	SOCKET		600-00001-320
96	B	[0] ICO-324MTT [UX59]	SOCKET		600-00001-324
97	C	10 2-644018-2 UX67, UX68, UX69, UX70, UX71, UX91, UX92, UX93, UX94, UX95, [UX72, UX73, UX96, UX97]	SOCKET		600-00002-632
98	D	[0] 1848-AG111D [UX60]	SOCKET		600-00001-648
99	E	1 110-91-964-41-001 UX40	SOCKET		600-00001-964
100		1 RL2003-289-95-D1 R11	TEMPSENSOR	5000OHM	508-00001-501
101		1 CCF-07 471G R12	2PCMFRES	4700OHM	503-00002-471
102		1 CCF-07 820G R1	2PCMFRES	82 OHM	503-00002-820
103		1 FRJ-50 R4	JUMPRES	0 OHM	503-00001-000
104		4 CSC09A01102G RP100, RP101, RP102, RP103	8RESSIPPAK	1 KOHM	501-10008-102

		270			

NOTES:

- (1) PARTS REQUIRING 0.33UF DECOUPLING CAPS ARE MARKED (*) IN BETWEEN ITEM NO. AND QTY. COLUMNS.
- (2) PARTS REQUIRING SOCKETS ARE MARKED WITH A LETTER TO CORRESPOND WITH SOCKETS WITH THE SAME LETTER.
- (3) PARTS WITH REFERENCE DESIGNATORS IN BRACKETS [] ARE WILL NOT BE POPULATED DURING PRODUCTION.

MICROPROSE Games

DR. MATH P.C.B. ASSEMBLY

COMPANY / PROPRIETARY
CONFIDENTIAL INFORMATION

DRAFTER DAVID J. BELLAMY	DATE <i>Paul J. Bellamy 11-8-90</i>	MICROPROSE GAMES 180 LAKEFRONT DR., HUNT VALLEY, MD 21030		
CHEKER <i>Paul J. Bellamy</i>	DATE	TITLE DR. MATH DR. MATH PCB ASSEMBLY		
ENGINEER PAUL T. KUHN	DATE	SIZE <i>C</i>	DRAWING NUMBER DW-00011C-0012-01	
APPROVAL	DATE		REV <i>M</i>	RELEASE
APPROVAL	DATE	DATE 11-8-1990 10:54		SHEET 3 OF 28

M68000
BOARD

CSD001	1	P1	2	CSD000
CSD002	5	P3	4	CSD002
CSD005	7	P5	6	CSD004
CSD007	9	P7	8	CSD006
CSD009	11	P9	10	CSD008
CSD011	13	P11	12	CSD010
CSD013	15	P13	14	CSD012
CSD015	17	P15	16	CSD014
CSD017	19	P17	18	CSD016
CSD019	21	P19	20	CSD018
CSD021	23	P21	22	CSD020
CSD023	25	P23	24	CSD022
CSD025	27	P25	26	CSD024
CSD027	29	P27	28	CSD026
CSD029	31	P29	30	CSD028
CSD031	33	P31	32	CSD030
MONA1	35	P33	34	CSD032
68KRA+V-	37	P35	36	CSD034
MONA3	39	P37	38	CSD036
MONA5	41	P39	40	CSD038
MONA7	43	P41	42	MONA0
INTR2-	45	P43	44	MONA2
DRB6D-	47	P45	46	MONA4
ROMGNT	49	P47	48	MONA6
68KVE	51	P49	50	68COL-
68KOE	53	P51	52	IACCOL-
68KASL	55	P53	54	P29SPR1-
68KCASH	57	P55	56	P29SACK-
HP2DMRS-	61	P57	58	68KSPRT-
29PRESNT	63	P61	62	
		P63	64	

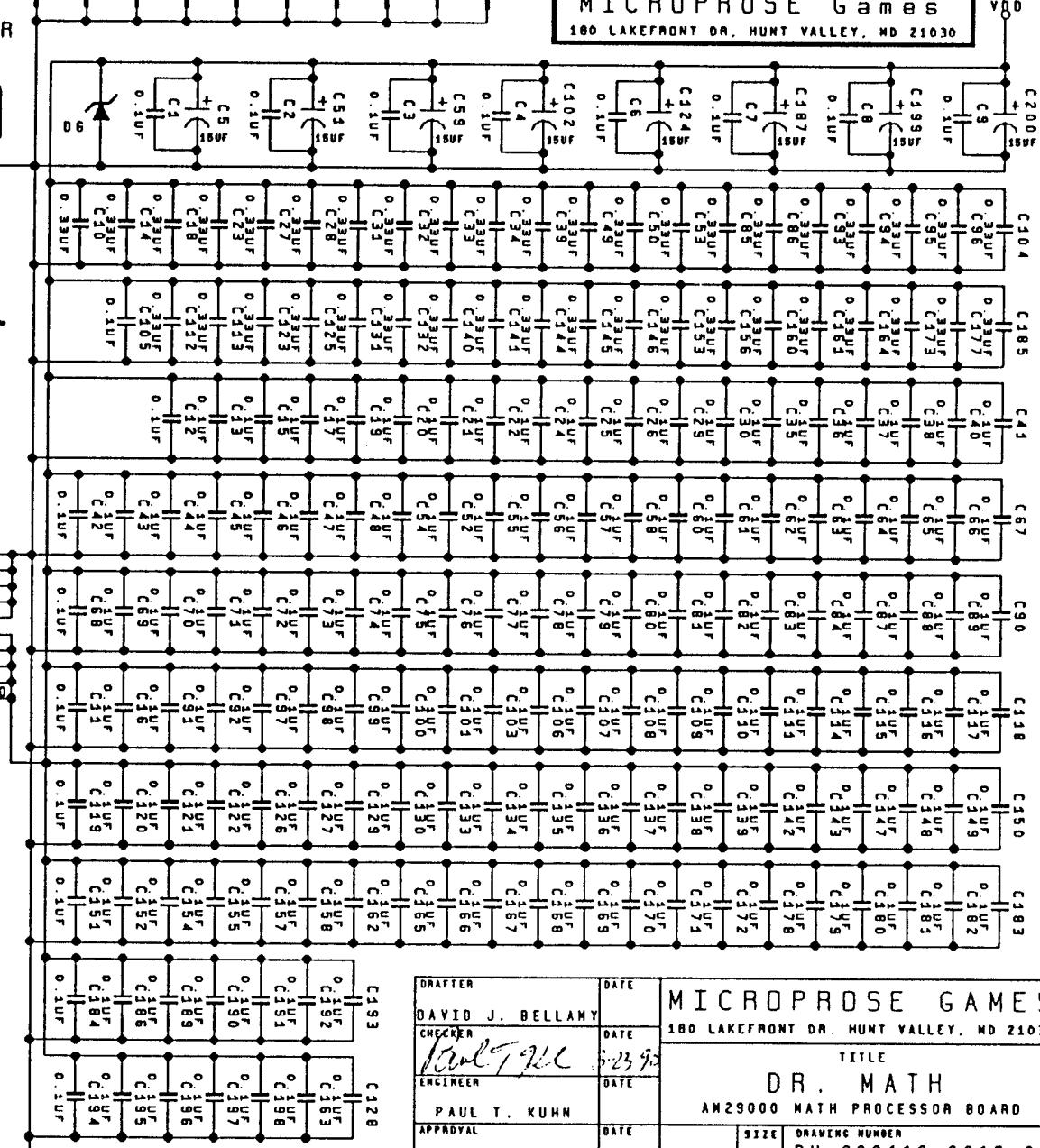
T134010
BOARD

CSD001	1	P1	2	CSD000
CSD003	5	P3	4	CSD002
CSD005	7	P5	6	CSD004
CSD007	9	P7	8	CSD006
CSD009	11	P9	10	CSD008
CSD011	13	P11	12	CSD10
CSD013	15	P13	14	CSD12
CSD015	17	P15	16	CSD14
CSD017	19	P17	18	CSD16
CSD019	21	P19	20	CSD18
CSD021	23	P21	22	CSD20
CSD023	25	P23	24	CSD22
CSD025	27	P25	26	CSD24
CSD027	29	P27	28	CSD26
CSD029	31	P29	30	CSD28
CSD031	33	P31	32	CSD30
FIFOVR-	35	P33	34	CLDEN-
FFULL-	37	P35	36	CLDIR
	39	P37	38	
		P39	40	

POWER
ON

D3

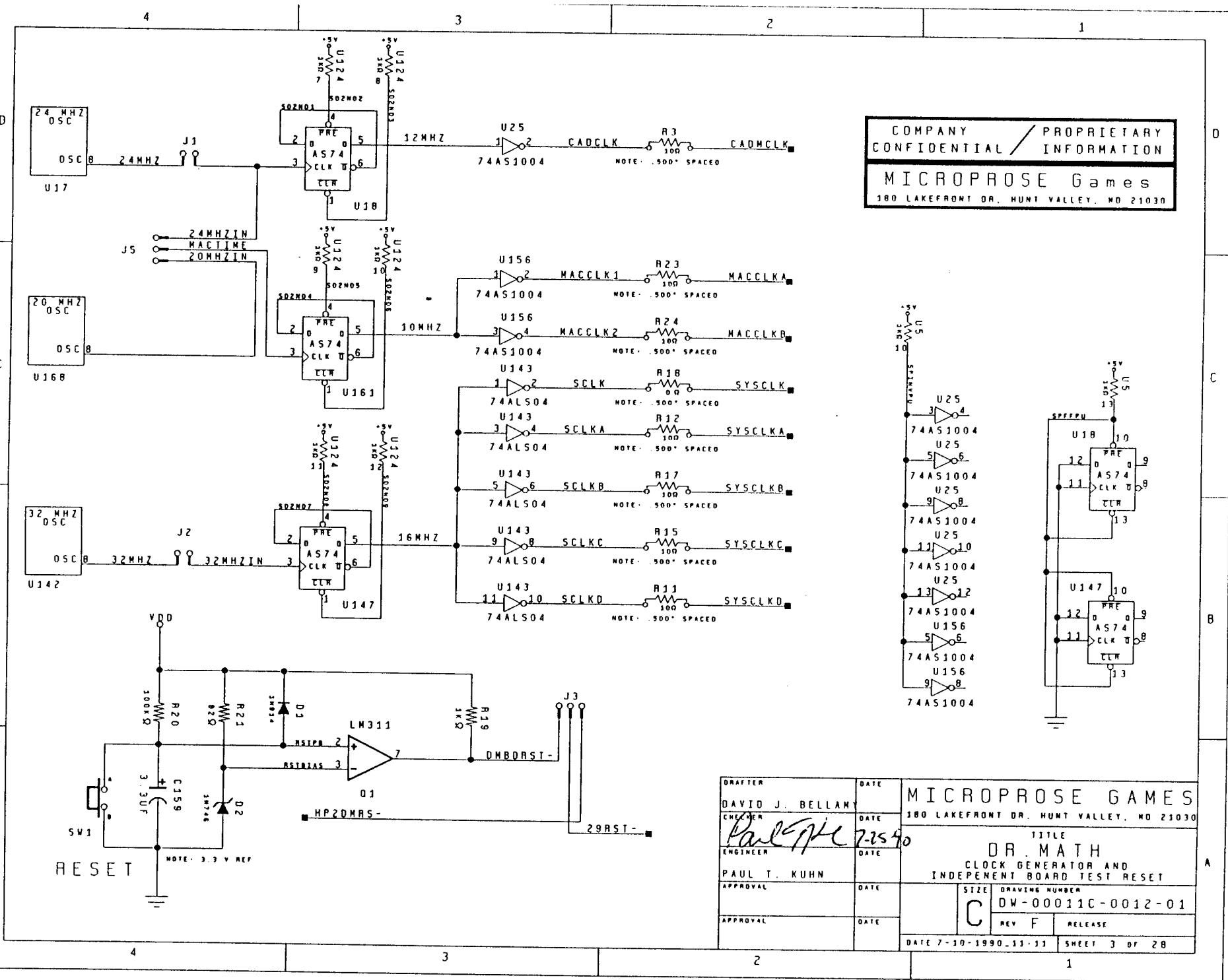
TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10

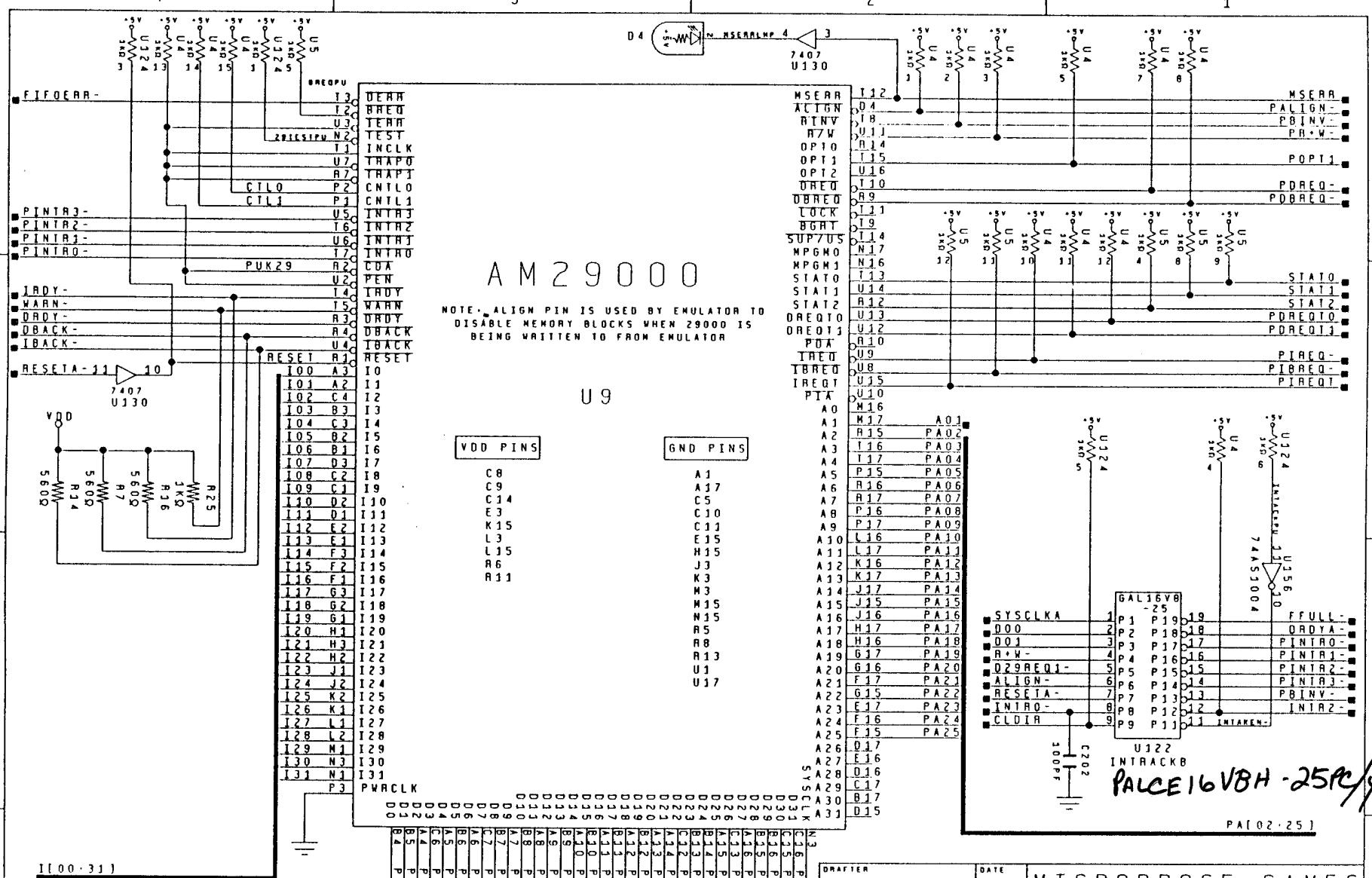


COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
160 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE
DAVID J. BELLAMY	
CHECKER	DATE
<i>Bell 7/92</i>	6-23-92
ENGINEER	DATE
PAUL T. KUHN	
APPROVAL	DATE
<i>Paul T. Kuhn</i>	
ROUTER	DATE
SIZE DRAWING NUMBER	
C DW-00011C-0012-01	
REV C	RELEASE
DATE 3-21-1990-20-40 SHEET 2 OF 28	





COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR, HUNT VALLEY, MD 21030

4

3

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PD[00 - 31]

D[00 - 31]

D

U130
7407
PDBREQ - 9 8 DREQLMP 2



D5

U59

SYSCLK0	1	-15
A22	2	P23
A23	3	P22
A24	4	P21
A25	5	P20
D29RQ0A	6	P19
BR+W-	7	P18
DBREQD0D	8	P17
A21	9	P16
ALIGN-	10	P15
PBJINV-	11	P14
	12	P13

CLFIFOA

FFULL -

U19
74AS1004
PDRQ - 5 6 PDRQ

U20

029RQ0A -

74ALS1010

U19
74AS1004
PDRQ1 - 9 8 PDRQ1 -

U20

D29REQ1 -

74ALS1010

U19
74AS1004
PDRQ10 - 11 10 PDRQ10 -

U20

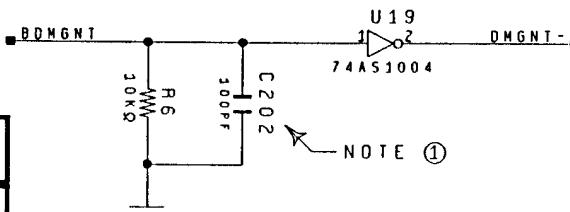
D29REQ0 -

74ALS1010

NOTE .

- 1) PCB MODIFICATION . C202 ADDED
BETWEEN U19^1 AND U18^7 .

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MICROPROSE Games 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	



3

U43

P000	18	74AS245	81	A1	2	D00
P001	17	82	A2	3	D001	
P002	16	83	A3	4	D002	
P003	15	84	A4	5	D003	
P004	14	85	A5	6	D004	
P005	13	86	A6	7	D005	
P006	12	87	A7	8	D006	
P007	11	88	A8	9	D007	

U52

P008	18	74AS245	81	A1	2	D008
P009	17	82	A2	3	D009	
P010	16	83	A3	4	D010	
P011	15	84	A4	5	D011	
P012	14	85	A5	6	D012	
P013	13	86	A6	7	D013	
P014	12	87	A7	8	D014	
P015	11	88	A8	9	D015	

U53

P16	18	74AS245	81	A1	2	D16
P17	17	82	A2	3	D17	
P18	16	83	A3	4	D18	
P19	15	84	A4	5	D19	
P20	14	85	A5	6	D20	
P21	13	86	A6	7	D21	
P22	12	87	A7	8	D22	
P23	11	88	A8	9	D23	

U44

P24	18	74AS245	81	A1	2	D24
P25	17	82	A2	3	D25	
P26	16	83	A3	4	D26	
P27	15	84	A4	5	D27	
P28	14	85	A5	6	D28	
P29	13	86	A6	7	D29	
P30	12	87	A7	8	D30	
P31	11	88	A8	9	D31	

U31

PA24	2	74AS244	1A1	Y1	18	A24
PA25	4	1A2	Y2	16	A25	
PA02	6	1A3	Y3	14	A02	
PA03	8	1A4	Y4	12	A03	
PA04	10	2A1	Y1	9	A04	
PA05	12	2A2	Y2	7	A05	
PA06	14	2A3	Y3	5	A06	
PA07	17	2A4	Y4	3	A07	

U45

PA08	2	74AS244	1A1	Y1	18	A08
PA09	4	1A2	Y2	16	A09	
PA10	6	1A3	Y3	14	A10	
PA11	8	1A4	Y4	12	A11	
PA12	10	2A1	Y1	9	A12	
PA13	12	2A2	Y2	7	A13	
PA14	14	2A3	Y3	5	A14	
PA15	17	2A4	Y4	3	A15	

U54

PA16	2	74AS244	1A1	Y1	18	A16
PA17	4	1A2	Y2	16	A17	
PA18	6	1A3	Y3	14	A18	
PA19	8	1A4	Y4	12	A19	
PA20	10	2A1	Y1	9	A20	
PA21	12	2A2	Y2	7	A21	
PA22	14	2A3	Y3	5	A22	
PA23	17	2A4	Y4	3	A23	

U36

68RAS	2	74AS244	1A1	Y1	18	68RAS
68CASL	4	1A2	Y2	16	68CASL	
68CASH	6	1A3	Y3	14	68CASH	
W+R-	8	1A4	Y4	12	68KOE	
BR+W-	10	2A1	Y1	9	BDW+R-	
PR+W-	12	2A2	Y2	7	68KWE	
BR+W-	14	2A3	Y3	5	68KRW-	
PR+W-	15	2A4	Y4	3	BDW+W-	

U56

PALIGN-	2	74AS244	1A1	Y1	18	ALIGN-
ULCDEN-	4	1A2	Y2	16	ULCDEN-	
PR+W-	6	1A3	Y3	14	PR+W-	
PR+W-	8	1A4	Y4	12	BR+W-	
PIREQ-	10	2A1	Y1	9	IREQ-	
DRAMAW-	12	2A2	Y2	7	DRAMAW-	
UFIFOWR-	14	2A3	Y3	5	FIFOWR-	
PIREQT	17	2A4	Y4	3	IREQT	

DRAFTER
DAVID J. BELLAMYCHECKER
Karl G. Bellamy 11-796ENGINEER
PAUL T. KUHNAPPROVAL
DATEAPPROVAL
DATE

DATE

DATE

DATE

DATE

DATE

MICROPROSE GAMES
180 LAKEFRONT DR. HUNT VALLEY, MD 21030TITLE
DR. MATH

AM29000 PROCESSOR BUFFERS

SIZE C DRAWING NUMBER
DW-00011C-0012-01

REV L RELEASE

DATE 11-7-1990 11-52 SHEET 5 OF 28

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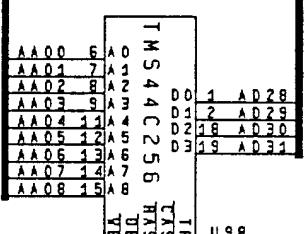
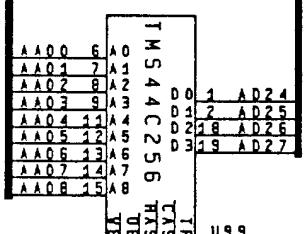
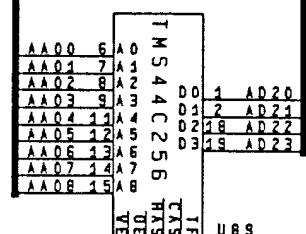
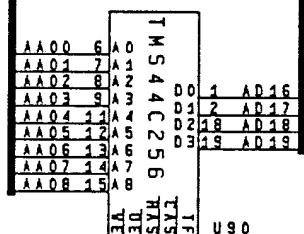
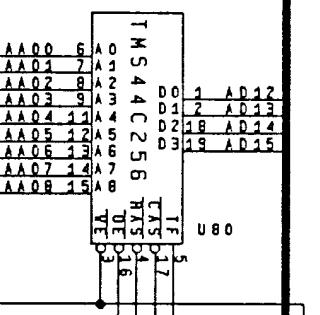
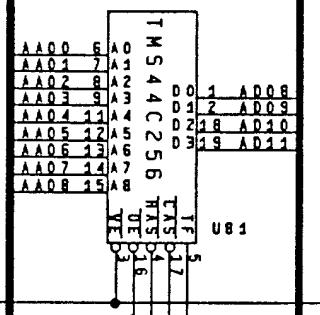
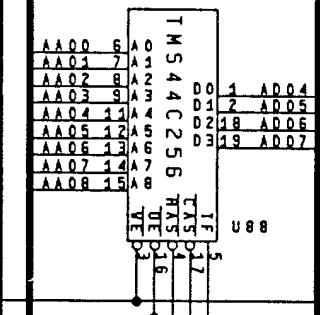
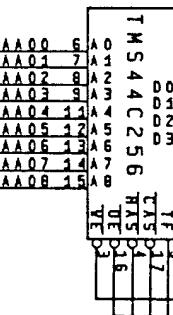
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AA[00-08]

AD[00-31]



DRAMAW-

29ENWA-

29RASA-

29CASA-

AD[00-31]

D[00-31]

74AS244	
AD00	2 1A1 1Y1 18 000
AD01	4 1A2 1Y2 16 001
AD02	6 1A3 1Y3 14 002
AD03	8 1A4 1Y4 12 003
AD04	10 1A5 2Y1 9 004
AD05	12 1A6 2Y2 7 005
AD06	14 1A7 2Y3 5 006
AD07	16 1A8 2Y4 3 007

74AS244	
AD08	2 1A1 1Y1 18 008
AD09	4 1A2 1Y2 16 009
AD10	6 1A3 1Y3 14 010
AD11	8 1A4 1Y4 12 011
AD12	10 1A5 2Y1 9 012
AD13	12 1A6 2Y2 7 013
AD14	14 1A7 2Y3 5 014
AD15	16 1A8 2Y4 3 015

74AS244	
AD16	2 1A1 1Y1 18 016
AD17	4 1A2 1Y2 16 017
AD18	6 1A3 1Y3 14 018
AD19	8 1A4 1Y4 12 019
AD20	10 1A5 2Y1 9 020
AD21	12 1A6 2Y2 7 021
AD22	14 1A7 2Y3 5 022
AD23	16 1A8 2Y4 3 023

74AS244	
AD24	2 1A1 1Y1 18 024
AD25	4 1A2 1Y2 16 025
AD26	6 1A3 1Y3 14 026
AD27	8 1A4 1Y4 12 027
AD28	10 1A5 2A1 2Y1 9 028
AD29	12 1A6 2A2 2Y2 7 029
AD30	14 1A7 2A3 2Y3 5 030
AD31	16 1A8 2A4 2Y4 3 031

ENRAMAD-

U73

U65

U50

U41

ENRAMAD-

ENRAMAI-

U29

U23

U15

U7

ENRAMAI-

74AS244

74AS244

74AS244

74AS244

AD00 2 1A1 1Y1 18 100

AD08 2 1A1 1Y1 18 108

AD16 2 1A1 1Y1 18 116

AD24 2 1A1 1Y1 18 124

AD01 4 1A2 1Y2 16 101

AD09 4 1A2 1Y2 16 109

AD17 4 1A2 1Y2 16 117

AD25 4 1A2 1Y2 16 125

AD02 6 1A3 1Y3 14 102

AD10 6 1A3 1Y3 14 110

AD18 6 1A3 1Y3 14 118

AD26 6 1A3 1Y3 14 126

AD03 8 1A4 1Y4 12 103

AD11 8 1A4 1Y4 12 111

AD19 8 1A4 1Y4 12 119

AD27 8 1A4 1Y4 12 127

AD04 10 1A5 2Y1 9 104

AD12 10 1A5 2Y1 9 112

AD20 10 1A5 2Y1 9 120

AD28 10 1A5 2Y1 9 128

AD05 12 1A6 2Y2 7 105

AD13 12 1A6 2Y2 7 113

AD21 12 1A6 2Y2 7 121

AD29 12 1A6 2Y2 7 129

AD06 14 1A7 2Y3 5 106

AD14 14 1A7 2Y3 5 114

AD22 14 1A7 2Y3 5 122

AD30 14 1A7 2Y3 5 130

AD07 16 1A8 2Y4 3 107

AD15 16 1A8 2Y4 3 115

AD23 16 1A8 2Y4 3 123

AD31 16 1A8 2Y4 3 131

COMPANY / PROPRIETARY INFORMATION
CONFIDENTIAL / INFORMATIONMICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

drafter	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
checker	DATE	TITLE	
Paul, gke	3-23-90	DR. MATH	
engineer	DATE	'A' BANK - 256K X 32 DRAM ARRAY	
PAUL T. KUHN		SIZE	
approver	DATE	C	DRAWING NUMBER
		C	DW-00011C-0012-01
APPROVED	DATE	REV C	RELEASE
DATE 3-21-1990 0:45		SHEET 6 OF 28	

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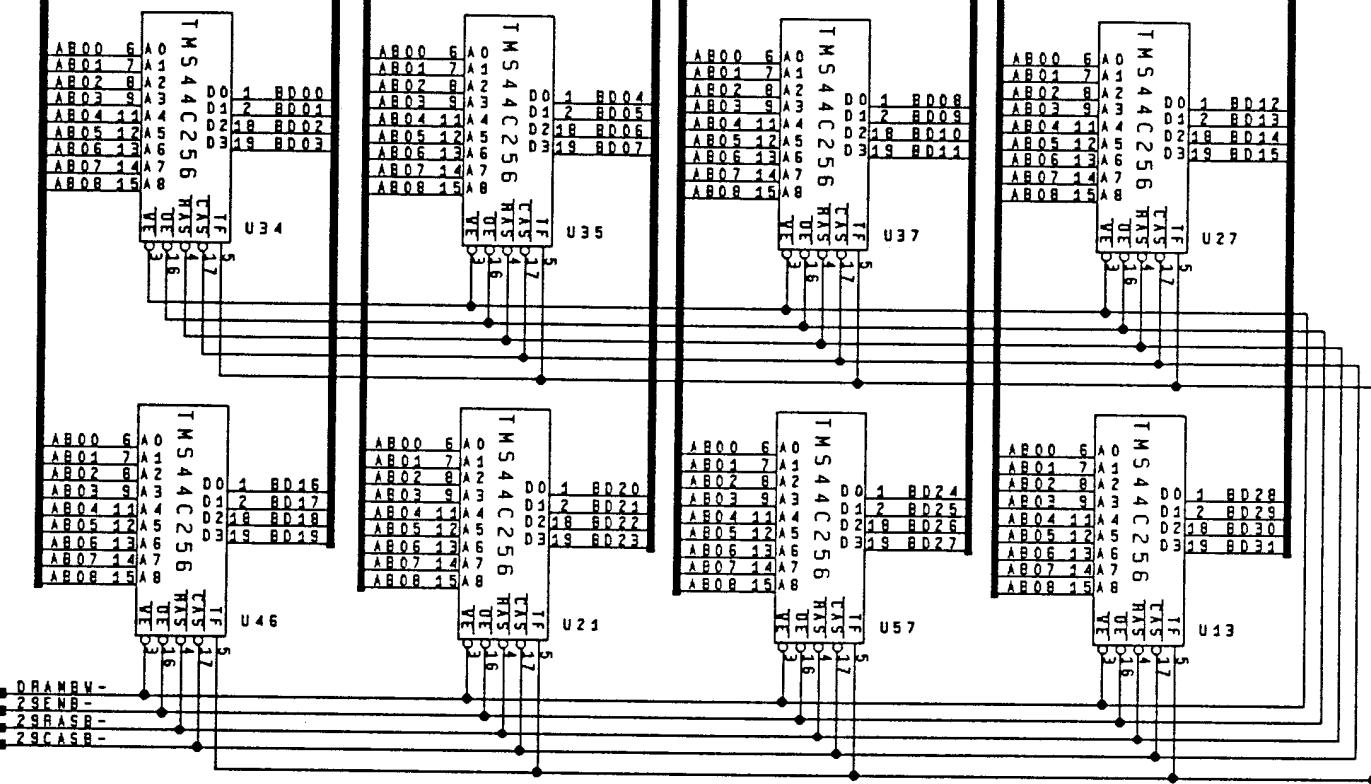
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BD[00-31]



BD[00-31]

D[00-31]

ENHARMED-

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BD01 4 1A2 1Y2 16 001	BD09 4 1A2 1Y2 16 009	BD17 4 1A2 1Y2 16 D17	BD25 4 1A2 1Y2 16 D25
BD02 6 1A3 1Y3 14 002	BD10 6 1A3 1Y3 14 D10	BD18 6 1A3 1Y3 14 D18	BD26 6 1A3 1Y3 14 D26
BD03 8 1A4 1Y4 12 003	BD11 8 1A4 1Y4 12 D11	BD19 8 1A4 1Y4 12 D19	BD27 8 1A4 1Y4 12 D27
BD04 11 2A1 2Y1 9 004	BD12 11 2A1 2Y1 9 D12	BD20 11 2A1 2Y1 9 D20	BD28 11 2A1 2Y1 9 D28
BD05 13 2A2 2Y2 7 005	BD13 13 2A2 2Y2 7 D13	BD21 13 2A2 2Y2 7 D21	BD29 13 2A2 2Y2 7 D29
BD06 15 2A3 2Y3 5 006	BD14 15 2A3 2Y3 5 D14	BD22 15 2A3 2Y3 5 D22	BD30 15 2A3 2Y3 5 D30
BD07 17 2A4 2Y4 3 007	BD15 17 2A4 2Y4 3 D15	BD23 17 2A4 2Y4 3 D23	BD31 17 2A4 2Y4 3 D31

BD[00-31]

I[00-31]

ENHARMED-

74AS244 BD00 2 1A1 1Y1 18 100	74AS244 BD08 2 1A1 1Y1 18 I08	74AS244 BD16 2 1A1 1Y1 18 I16	74AS244 BD24 2 1A1 1Y1 18 I24
BD01 4 1A2 1Y2 16 I01	BD09 4 1A2 1Y2 16 I09	BD17 4 1A2 1Y2 16 I17	BD25 4 1A2 1Y2 16 I25
BD02 6 1A3 1Y3 14 I02	BD10 6 1A3 1Y3 14 I10	BD18 6 1A3 1Y3 14 I18	BD26 6 1A3 1Y3 14 I26
BD03 8 1A4 1Y4 12 I03	BD11 8 1A4 1Y4 12 I11	BD19 8 1A4 1Y4 12 I19	BD27 8 1A4 1Y4 12 I27
BD04 11 2A1 2Y1 9 I04	BD12 11 2A1 2Y1 9 I12	BD20 11 2A1 2Y1 9 I20	BD28 11 2A1 2Y1 9 I28
BD05 13 2A2 2Y2 7 I05	BD13 13 2A2 2Y2 7 I13	BD21 13 2A2 2Y2 7 I21	BD29 13 2A2 2Y2 7 I29
BD06 15 2A3 2Y3 5 I06	BD14 15 2A3 2Y3 5 I14	BD22 15 2A3 2Y3 5 I22	BD30 15 2A3 2Y3 5 I30
BD07 17 2A4 2Y4 3 I07	BD15 17 2A4 2Y4 3 I15	BD23 17 2A4 2Y4 3 I23	BD31 17 2A4 2Y4 3 I31

COMPANY
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INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE 3-23-94	MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER <i>Paul T. Kuhn</i>	DATE	TITLE DR. MATH	
ENGINEER PAUL T. KUHN	DATE	'B' BANK - 256K X 32 DRAW ARRAY	
APPROVAL <i>Paul T. Kuhn</i>	DATE	SIZE C	DRAWING NUMBER DW-00011C-0012-01
RELEASE <i>Paul T. Kuhn</i>	DATE 3-21-1990-0-47	REV C	RELEASE
DATE 3-21-1990-0-47		SHEET 7 OF 28	

D[00-31]

- BDR+W-
- BDEN-
- BDW+R-
- Z9RAS
- Z9CASA
- Z9CASB

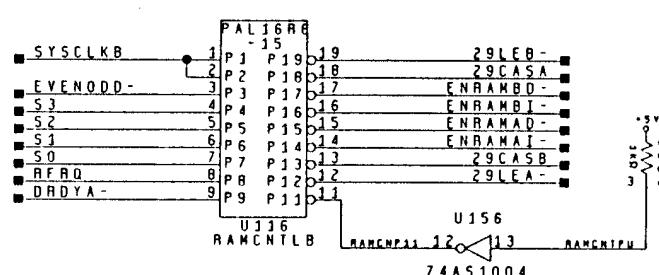
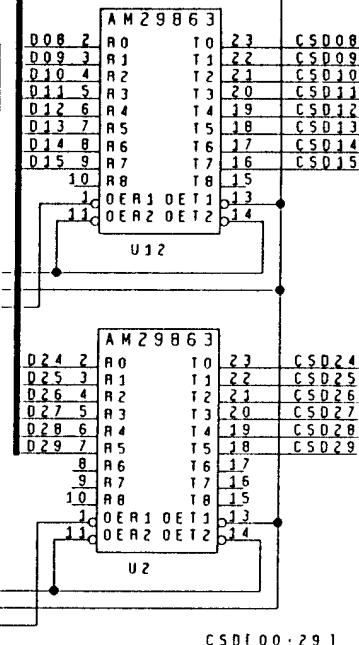
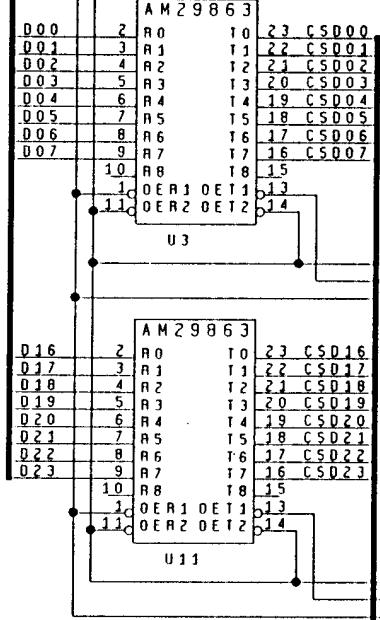
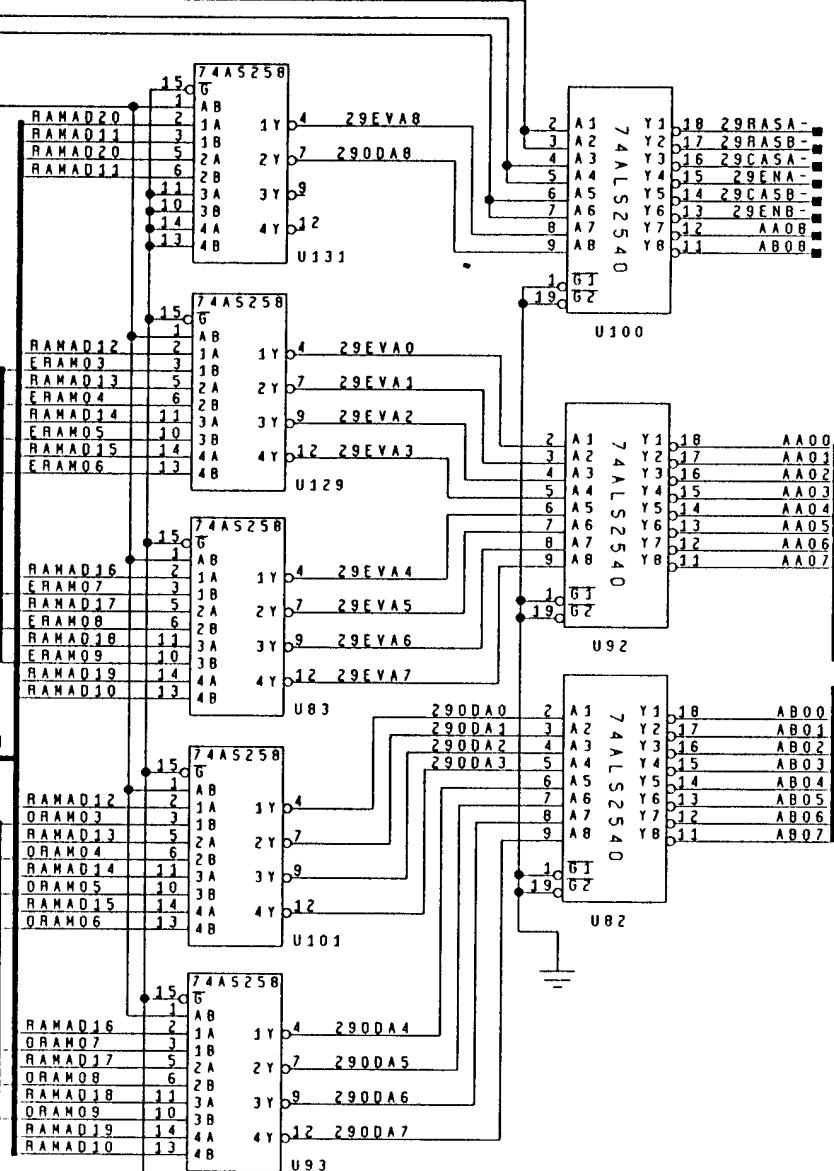
- ADRMUX

COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

ERAM[03-09]

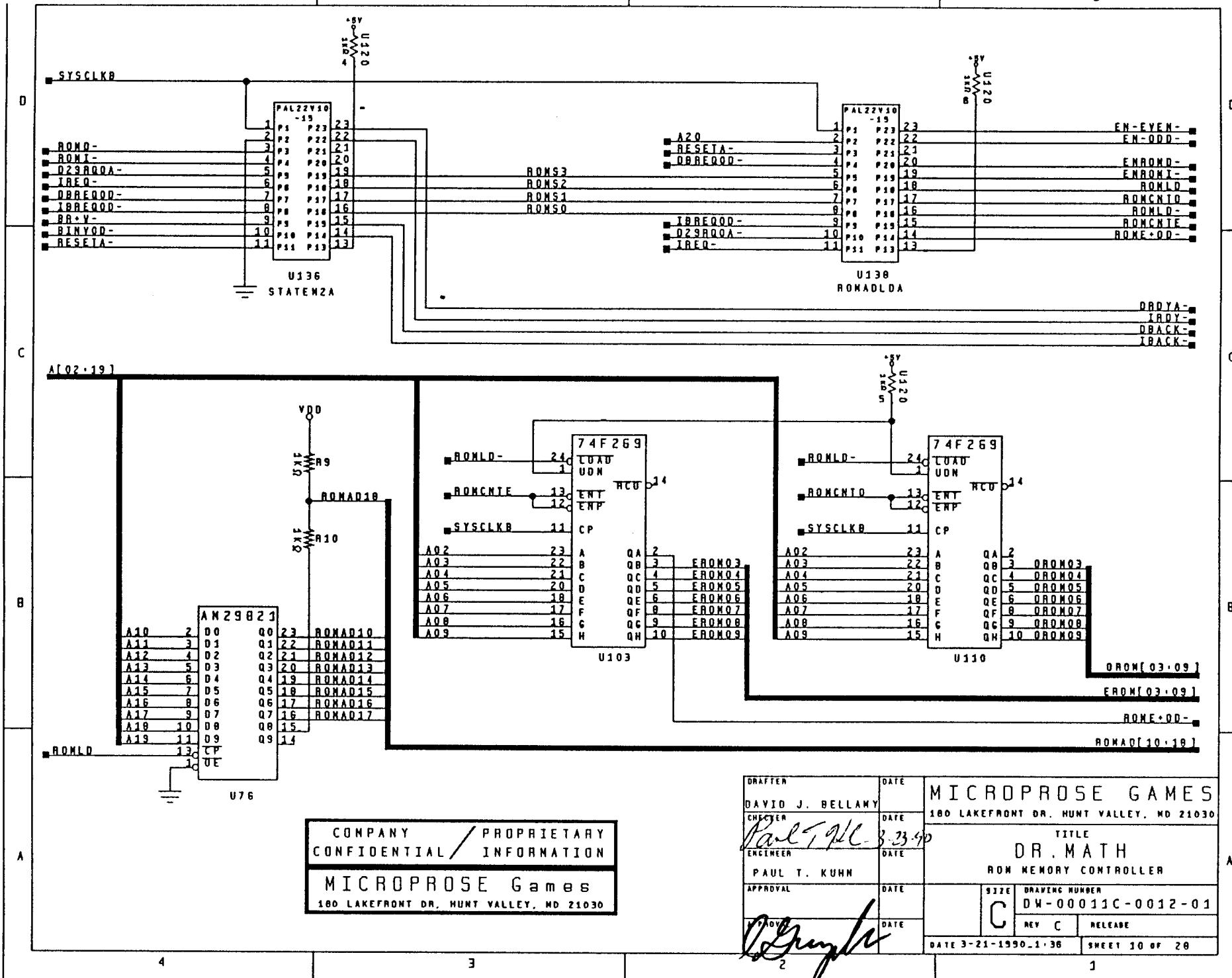
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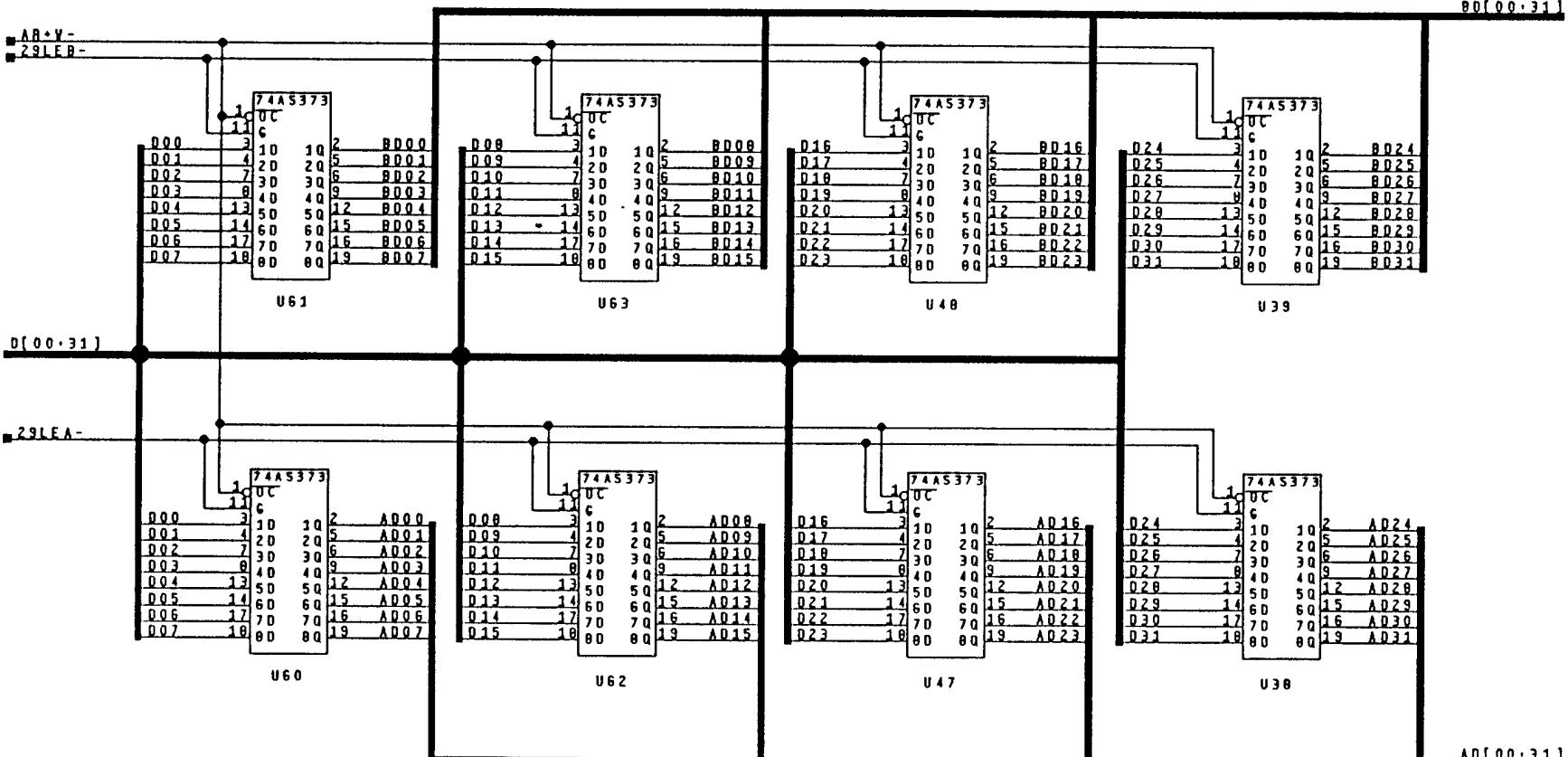
ORAM[03-09]



DRAFTER		DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		8-15-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHIEF ENGR		DATE		
PAUL T. KUHN		DATE		
APPROVAL		DATE	SIZE	DRAWING NUMBER
			C	DW-00011C-0012-01
APPROVAL		DATE	REV H	RELEASE
			DATE 8-15-1990-11-21 SHEET 9 OF 28	

TITLE
DR. MATH
ADDR MUX & WRITE LATCHES
AND DATA BUFFERS





COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER: DAVID J. BELLAMY DATE: 180 LAKEFRONT DR. HUNT VALLEY, MD 21030
Paul T. Kuhn 3-23-90 TITLE: DR. MATH
 CHECKER: DATE: ENGINEER: DATE:
 PAUL T. KUHN APPROVAL: DATE: SIZE: DRAWING NUMBER:
 REV: C RELEASE: DATE: 3-21-1990-1-37 SHEET 11 OF 28

ROMD[00-31]

D

D

U30

74AS244							
ROMD00	2	1A1	1Y1	18	I00		
ROMD01	4	1A2	1Y2	16	I01		
ROMD02	6	1A3	1Y3	14	I02		
ROMD03	8	1A4	1Y4	12	I03		
ROMD04	10	2A1	2Y1	9	I04		
ROMD05	12	2A2	2Y2	7	I05		
ROMD06	14	2A3	2Y3	5	I06		
ROMD07	16	2A4	2Y4	3	I07		
		TG	ZG				
		1	19				

U16

74AS244							
ROMD16	2	1A1	1Y1	18	I16		
ROMD17	4	1A2	1Y2	16	I17		
ROMD18	6	1A3	1Y3	14	I18		
ROMD19	8	1A4	1Y4	12	I19		
ROMD20	10	2A1	2Y1	9	I20		
ROMD21	12	2A2	2Y2	7	I21		
ROMD22	14	2A3	2Y3	5	I22		
ROMD23	16	2A4	2Y4	3	I23		
		TG	ZG				
		1	19				

U74

74AS244							
ROMD00	2	1A1	1Y1	18	D00		
ROMD01	4	1A2	1Y2	16	D01		
ROMD02	6	1A3	1Y3	14	D02		
ROMD03	8	1A4	1Y4	12	D03		
ROMD04	10	2A1	2Y1	9	D04		
ROMD05	12	2A2	2Y2	7	D05		
ROMD06	14	2A3	2Y3	5	D06		
ROMD07	16	2A4	2Y4	3	D07		
		TG	ZG				
		1	19				

U51

74AS244							
ROMD16	2	1A1	1Y1	18	D16		
ROMD17	4	1A2	1Y2	16	D17		
ROMD18	6	1A3	1Y3	14	D18		
ROMD19	8	1A4	1Y4	12	D19		
ROMD20	10	2A1	2Y1	9	D20		
ROMD21	12	2A2	2Y2	7	D21		
ROMD22	14	2A3	2Y3	5	D22		
ROMD23	16	2A4	2Y4	3	D23		
		TG	ZG				
		1	19				

U24

74AS244							
ROMD08	2	1A1	1Y1	18	I08		
ROMD09	4	1A2	1Y2	16	I09		
ROMD10	6	1A3	1Y3	14	I10		
ROMD11	8	1A4	1Y4	12	I11		
ROMD12	10	2A1	2Y1	9	I12		
ROMD13	12	2A2	2Y2	7	I13		
ROMD14	14	2A3	2Y3	5	I14		
ROMD15	16	2A4	2Y4	3	I15		
		TG	ZG				
		1	19				

U8

74AS244							
ROMD24	2	1A1	1Y1	18	I24		
ROMD25	4	1A2	1Y2	16	I25		
ROMD26	6	1A3	1Y3	14	I26		
ROMD27	8	1A4	1Y4	12	I27		
ROMD28	10	2A1	2Y1	9	I28		
ROMD29	12	2A2	2Y2	7	I29		
ROMD30	14	2A3	2Y3	5	I30		
ROMD31	16	2A4	2Y4	3	I31		
		TG	ZG				
		1	19				

U66

74AS244							
ROMD08	2	1A1	1Y1	18	D08		
ROMD09	4	1A2	1Y2	16	D09		
ROMD10	6	1A3	1Y3	14	D10		
ROMD11	8	1A4	1Y4	12	D11		
ROMD12	10	2A1	2Y1	9	D12		
ROMD13	12	2A2	2Y2	7	D13		
ROMD14	14	2A3	2Y3	5	D14		
ROMD15	16	2A4	2Y4	3	D15		
		TG	ZG				
		1	19				

U42

74AS244							
ROMD24	2	1A1	1Y1	18	D24		
ROMD25	4	1A2	1Y2	16	D25		
ROMD26	6	1A3	1Y3	14	D26		
ROMD27	8	1A4	1Y4	12	D27		
ROMD28	10	2A1	2Y1	9	D28		
ROMD29	12	2A2	2Y2	7	D29		
ROMD30	14	2A3	2Y3	5	D30		
ROMD31	16	2A4	2Y4	3	D31		
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		1	19				

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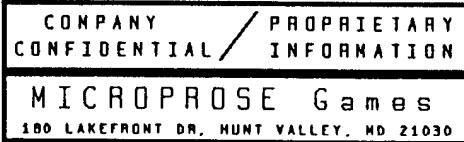
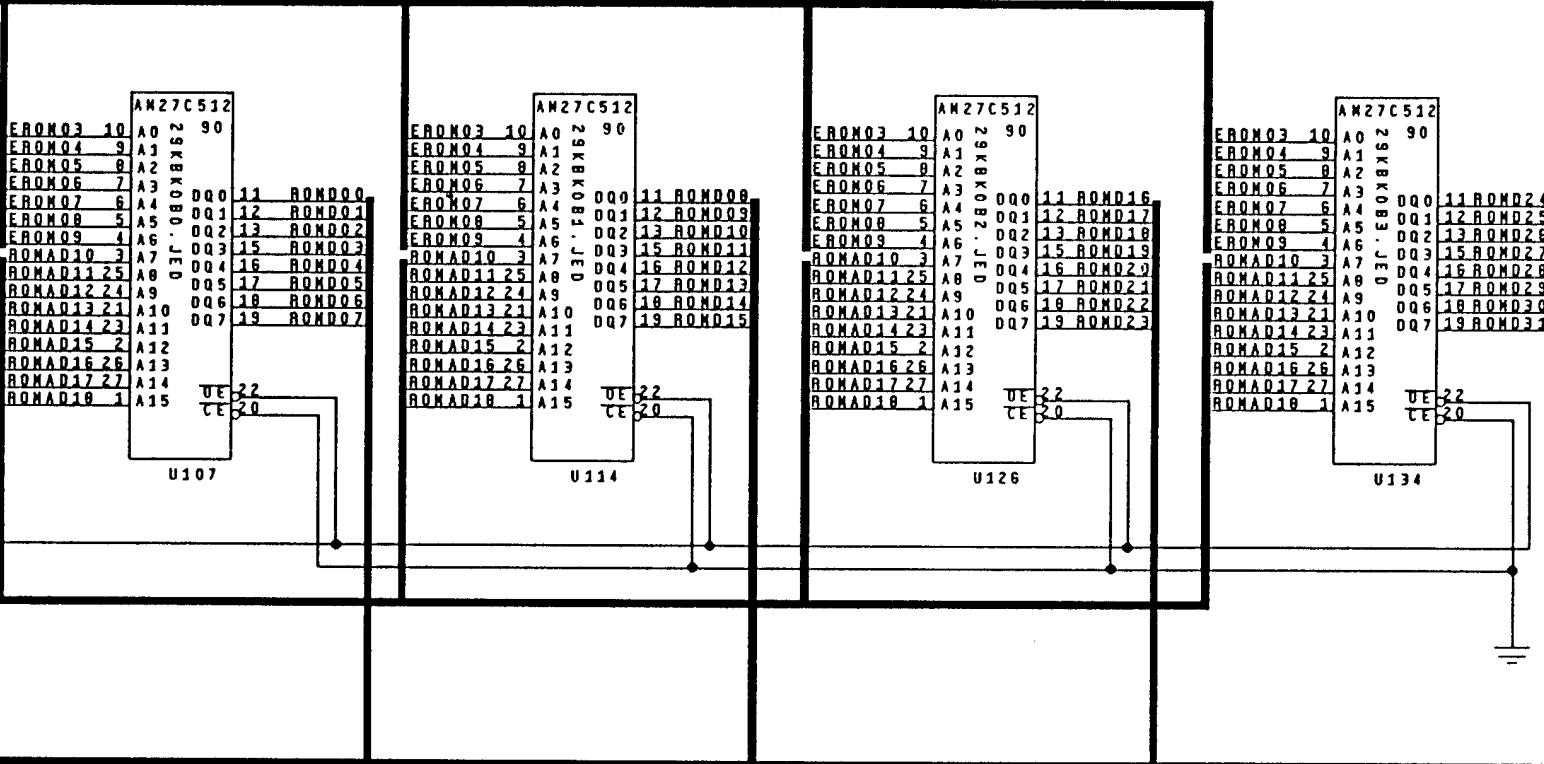
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COMPANY
CONFIDENTIAL / PROPRIETARY INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY DATE
 CHECKER *Paul T. Kuhn* 3-23-90 TITLE
 ENGINEER PAUL T. KUHN 29K
 APPROVAL *John* DATE SIZE DRAWING NUMBER
 DATE *John* C DW-00011C-0012-01
 RELEASER *John* RELEASE
 DATE 3-21-1990-1-37 SHEET 12 OF 28

Grayson

EROM[03-09]



DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHEKER	DATE		
<i>Paul T. Kuhn</i>	3-23-90		
ENGINEER	DATE	TITLE	
PAUL T. KUHN		DR. MATH	
APPROVAL	DATE	EVEN INSTRUCTION EPROM	
<i>David J. Bellamy</i>		SIZE	DRAWING NUMBER
		C	DW-00011C-0012-01
		REV C	RELEASE
DATE 3-23-1990 1-139		SHEET 13 OF 28	

0 ROM[03-09]

AN27C512		
OROM03	10	A0 2 90
OROM04	9	A1 S
OROM05	8	A2 B
OROM06	7	A3 X
OROM07	6	A4 D Q0
OROM08	5	A5 B Q1
OROM09	4	A6 C Q2
ROMAD10	3	A7 E Q4
ROMAD11	25	A8 F Q4
ROMAD12	24	A9 G Q5
ROMAD13	21	A10 H Q6
ROMAD14	23	A11 I Q7
ROMAD15	2	A12 J
ROMAD16	26	A13 K
ROMAD17	27	A14 L
ROMAD18	1	A15 M
		UE 22 CE 30

U108

AN27C512		
OROM03	10	A0 2 90
OROM04	9	A1 S
OROM05	8	A2 B
OROM06	7	A3 X
OROM07	6	A4 B Q0
OROM08	5	A5 C Q1
OROM09	4	A6 D Q2
ROMAD10	3	A7 E Q3
ROMAD11	25	A8 F Q4
ROMAD12	24	A9 G Q5
ROMAD13	21	A10 H Q6
ROMAD14	23	A11 I Q7
ROMAD15	2	A12 J
ROMAD16	26	A13 K
ROMAD17	27	A14 L
ROMAD18	1	A15 M
		UE 22 CE 30

U115

AN27C512		
OROM03	10	A0 2 90
OROM04	9	A1 S
OROM05	8	A2 B
OROM06	7	A3 X
OROM07	6	A4 B Q0
OROM08	5	A5 C Q1
OROM09	4	A6 D Q2
ROMAD10	3	A7 E Q3
ROMAD11	25	A8 F Q4
ROMAD12	24	A9 G Q5
ROMAD13	21	A10 H Q6
ROMAD14	23	A11 I Q7
ROMAD15	2	A12 J
ROMAD16	26	A13 K
ROMAD17	27	A14 L
ROMAD18	1	A15 M
		UE 22 CE 30

U127

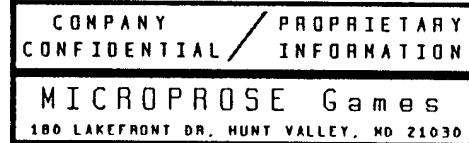
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OROM04	9	A1 S
OROM05	8	A2 B
OROM06	7	A3 X
OROM07	6	A4 B Q0
OROM08	5	A5 C Q1
OROM09	4	A6 D Q2
ROMAD10	3	A7 E Q3
ROMAD11	25	A8 F Q4
ROMAD12	24	A9 G Q5
ROMAD13	21	A10 H Q6
ROMAD14	23	A11 I Q7
ROMAD15	2	A12 J
ROMAD16	26	A13 K
ROMAD17	27	A14 L
ROMAD18	1	A15 M
		UE 22 CE 30

U135

-EN-000-

ROMAD[10-18]

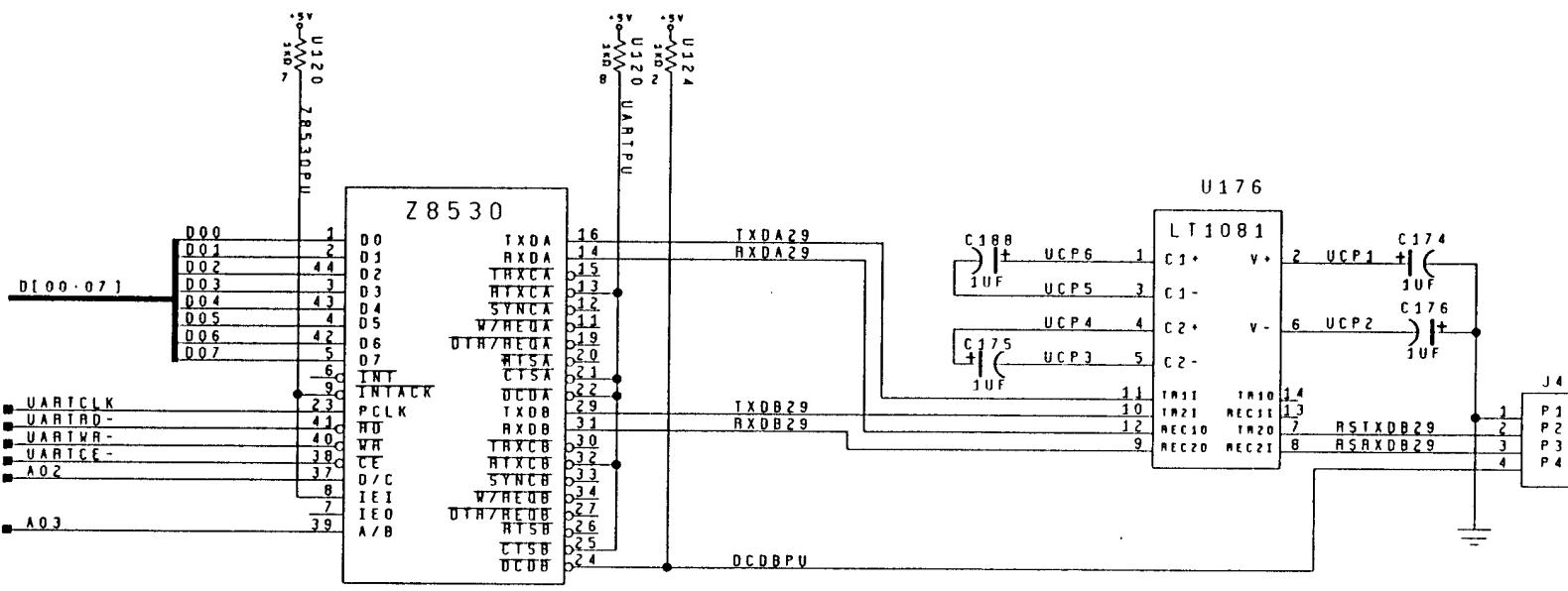
ROMD[00-31]



DRAFTER <i>David J. Bellamy</i>	DATE
CHECKER <i>Paul T. Kuhn</i>	DATE 3-23-90
ENGINEER <i>Paul T. Kuhn</i>	DATE
APPROVAL <i>John G. Grayson</i>	DATE
MICROPROSE GAMES 180 LAKEFRONT DR, HUNT VALLEY, MD 21030	
TITLE DR. MATH	
000 INSTRUCTION EPROM	
SIZE C	DRAWING NUMBER DW-00011C-0012-01
REV C	RELEASE
DATE 3-21-1990 1:39 SHEET 14 OF 28	

D

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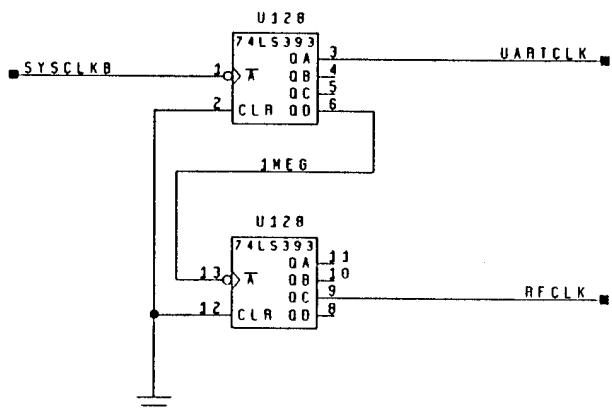


C

C

B

B



A

A

COMPANY PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
<i>David J. Bellamy</i>	7-25-90		
CHECKER	DATE	TITLE	
		DR. MATH	
ENGINEER	DATE	AM29000 UART	
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-00011C-0012-01
APPROVAL	DATE	REV F	RELEASE
		DATE 7-6-1990 9-53 SHEET 15 OF 28	

RNY[00-31]

X[00-31]

U12	PX0
U9	PX1
R6	PX2
U1	PX3
X00	U15
X01	X0
X02	T15
X03	X1
X04	R14
X05	X2
X06	T14
X07	X3
X08	U14
X09	X4
X10	T13
X11	X5
X12	U13
X13	X6
X14	R13
X15	X7
X16	T12
X17	X8
X18	R12
X19	X9
X20	T11
X21	X10
X22	U10
X23	X11
X24	T11
X25	X12
X26	U11
X27	X13
X28	T10
X29	X14
X30	U10
X31	X15

A M 2 9 C 3 2 3

U 1 4 9

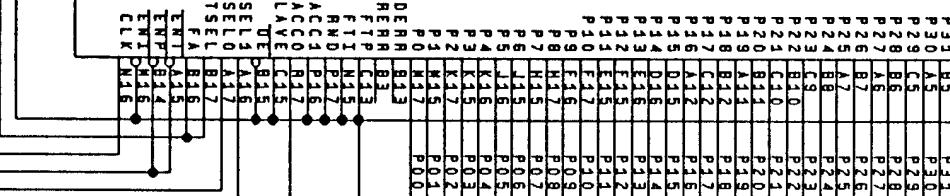
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 [NC PINS] A3,A9,A14,B2,B9,C3,C4,C14,D4,D17

■ENXA-
■ENXB-
■XSEL-
■HIMAC

ENXA
ENXB
XSEL
HIMAC

TCX

FTX



■MACLKA
■ENPI-
■NRML-

U119
74AS1004

■ACTL

COMPANY CONFIDENTIAL	/ PROPRIETARY INFORMATION
MICROPROSE Games 180 LAKEFRONT DR, HUNT VALLEY, MD 21030	

PY0	M2
PY1	J2
PY2	E2
PY3	A1
Y0	R2
Y1	P3
Y2	P2
Y3	P1
Y4	M2
Y5	M1
Y6	M3
Y7	M1
Y8	M3
Y9	L2
Y10	K1
Y11	L1
Y12	K2
Y13	K3
Y14	J3
Y15	J1
Y16	H2
Y17	H3
Y18	G2
Y19	H1
Y20	G1
Y21	F2
Y22	F3
Y23	F1
Y24	E1
Y25	E3
Y26	D1
Y27	D2
Y28	D3
Y29	C2
Y30	C1
Y31	B1

ENYA-	ENYB-
ENYB	ENYB
YSEL	YSEL
TCY	TCY
FTY	FTY

ENYA-
ENYB-
YSEL
TCY
FTY

P[00-31]

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR, HUNT VALLEY, MD 21030	
<i>David J. Bellamy</i>	3-23-93	TITLE	
CHECKER	DATE	DR. MATH	
PAUL T. KUHN		MULTIPLY ACCUMULATOR	
ENGINEER	DATE		
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-00011C-0012-01
REVISION	DATE	REV	C
			RELEASE
DATE 3-21-1990-1-40		SHEET 16 OF 28	

Bo Grayson

P[00:31]

 MACCLKB
 RESETC-
 MACCLKA

RNY[00:31]

D

	RNY00	2	D0	Q0	23	X00
	RNY01	3	D1	Q1	22	X01
	RNY02	4	D2	Q2	21	X02
	RNY03	5	D3	Q3	20	X03
	RNY04	6	D4	Q4	19	X04
	RNY05	7	D5	Q5	18	X05
	RNY06	8	D6	Q6	17	X06
	RNY07	9	D7	Q7	16	X07
		10	D8	Q8	15	
		11	CP			
		12	EN			
		13	CLR			
		14	UE			

AM29823

U169

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	RNY15	3	D1	Q1	22	X15
	RNY16	4	D2	Q2	21	X16
	RNY17	5	D3	Q3	20	X17
	RNY18	6	D4	Q4	19	X18
	RNY19	7	D5	Q5	18	X19
	RNY20	8	D6	Q6	17	X20
	RNY21	9	D7	Q7	16	X21
	RNY22	10	D8	Q8	15	X22
		11	CP			
		12	EN			
		13	CLR			
		14	UE			

AM29823

U172

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	P01	3	1A2	1Y2	16	RNY01
	P02	4	1A3	1Y3	14	RNY02
	P03	5	1A4	1Y4	12	RNY03
	P04	6	2A1	2Y1	9	RNY04
	P05	7	2A2	2Y2	7	RNY05
	P06	8	2A3	2Y3	5	RNY06
	P07	9	2A4	2Y4	3	RNY07
		10	26			
		11				
		12				
		13				
		14				
		15				
		16				
		17				
		18				
		19				

U151

U145

	P08	2	1A1	1Y1	18	RNY08
	P09	3	1A2	1Y2	16	RNY09
	P10	4	1A3	1Y3	14	RNY10
	P11	5	1A4	1Y4	12	RNY11
	P12	6	2A1	2Y1	9	RNY12
	P13	7	2A2	2Y2	7	RNY13
	P14	8	2A3	2Y3	5	RNY14
	P15	9	2A4	2Y4	3	RNY15
		10	26			
		11				
		12				
		13				
		14				
		15				
		16				
		17				
		18				
		19				

U144

U144

	P16	2	1A1	1Y1	18	RNY16
	P17	3	1A2	1Y2	16	RNY17
	P18	4	1A3	1Y3	14	RNY18
	P19	5	1A4	1Y4	12	RNY19
	P20	6	2A1	2Y1	9	RNY20
	P21	7	2A2	2Y2	7	RNY21
	P22	8	2A3	2Y3	5	RNY22
	P23	9	2A4	2Y4	3	RNY23
		10	26			
		11				
		12				
		13				
		14				
		15				
		16				
		17				
		18				
		19				

	P24	2	1A1	1Y1	18	RNY24
	P25	3	1A2	1Y2	16	RNY25
	P26	4	1A3	1Y3	14	RNY26
	P27	5	1A4	1Y4	12	RNY27
	P28	6	2A1	2Y1	9	RNY28
	P29	7	2A2	2Y2	7	RNY29
	P30	8	2A3	2Y3	5	RNY30
	P31	9	2A4	2Y4	3	RNY31
		10	26			
		11				
		12				
		13				
		14				
		15				
		16				
		17				
		18				
		19				

X[00:31]

RNY[00:31]

COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE	TITLE	
<i>Bob Bellamy</i>	3-23-90	DR. MATH	
ENGINEER	DATE	MAC AND SRAM BUFFERS	
PAUL T. KUHN		DRAWING NUMBER	
APPROVAL	DATE	DW-00011C-0012-01	
<i>O. Breyer</i>		C	REV C
APPROVAL	DATE	RELEASE	
		DATE 3-21-1990.1-41 SHEET 17 OF 28	

MACCLKB
 MACCLKA
 NRML-
 RESETC-
 MULDEN-
 P[00-31]

RNY[00-31]

		AM29827		
P14	2	00	Y0	23 RNY00
P15	3	01	Y1	22 RNY01
P16	4	02	Y2	21 RNY02
P17	5	03	Y3	20 RNY03
P18	6	04	Y4	19 RNY04
P19	7	05	Y5	18 RNY05
P20	8	06	Y6	17 RNY06
P21	9	07	Y7	16 RNY07
P22	10	08	Y8	15 RNY08
	11	09	Y9	14
	12	UE1		
	13	UE2		

U157

		AM29823		
P00	2	00	Q0	23 RNY10
P01	3	01	Q1	22 RNY19
P02	4	02	Q2	21 RNY20
P03	5	03	Q3	20 RNY21
P04	6	04	Q4	19 RNY22
P05	7	05	Q5	18 RNY23
P06	8	06	Q6	17 RNY24
P07	9	07	Q7	16 RNY25
	10	08	Q8	15
	11	CP		
	12	EN		
	13	CLR		
	14	UE		

U146

		AM29827		
P23	2	00	Y0	23 RNY09
P24	3	01	Y1	22 RNY10
P25	4	02	Y2	21 RNY11
P26	5	03	Y3	20 RNY12
P27	6	04	Y4	19 RNY13
P28	7	05	Y5	18 RNY14
P29	8	06	Y6	17 RNY15
P30	9	07	Y7	16 RNY16
P31	10	08	Y8	15 RNY17
	11	09	Y9	14
	12	UE1		
	13	UE2		

U155

		AM29823		
P08	2	00	Q0	23 RNY26
P09	3	01	Q1	22 RNY27
P10	4	02	Q2	21 RNY28
P11	5	03	Q3	20 RNY29
P12	6	04	Q4	19 RNY30
P13	7	05	Q5	18 RNY31
	8	06	Q6	17
	9	07	Q7	16
	10	08	Q8	15
	11	CP		
	12	EN		
	13	CLR		
	14	UE		

U137

COMPANY CONFIDENTIAL	/ PROPRIETARY INFORMATION
MICROPROSE Games 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE	TITLE	
<i>Janet Gil</i>	3-23-90	DR. MATH	
ENGINEER	DATE	DOT PRODUCT NORMALIZATION	
PAUL T. KUHN			
APPROVAL	DATE	SIZE	DRAWING NUMBER
<i>Bobay</i>		C	0W-00011C-0012-01
PROVAC	DATE	REV C	RELEASE
		DATE 3-21-1990-20-37 SHEET 18 OF 28	

VDD

D

D

AM27C010	
YPA00_12	A0 ~ 150
YPA01_13	A1 ~ 150
YPA02_10	A2 ~ 150
YPA03_9	A3 ~ 150
YPA04_8	A4 ~ 150
YPA05_7	A5 ~ 150
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YPA07_5	A7 ~ 150
YPA08_27	A8 ~ 150
YPA09_26	A9 ~ 150
YPA10_23	A10 ~ 150
YPA11_25	A11 ~ 150
YPA12_4	A12 ~ 150
YPA13_28	A13 ~ 150
YPA14_29	A14 ~ 150
YPA15_3	A15 ~ 150
YPA16_2	A16 ~ 150
30 NC	

U153

R22

AM27C010	
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YPA01_13	A1 ~ 150
YPA02_10	A2 ~ 150
YPA03_9	A3 ~ 150
YPA04_8	A4 ~ 150
YPA05_7	A5 ~ 150
YPA06_6	A6 ~ 150
YPA07_5	A7 ~ 150
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YPA10_23	A10 ~ 150
YPA11_25	A11 ~ 150
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YPA13_28	A13 ~ 150
YPA14_29	A14 ~ 150
YPA15_3	A15 ~ 150
YPA16_2	A16 ~ 150
30 NC	

U154

AM27C010	
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YPA01_13	A1 ~ 150
YPA02_10	A2 ~ 150
YPA03_9	A3 ~ 150
YPA04_8	A4 ~ 150
YPA05_7	A5 ~ 150
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YPA08_27	A8 ~ 150
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YPA11_25	A11 ~ 150
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YPA13_28	A13 ~ 150
YPA14_29	A14 ~ 150
YPA15_3	A15 ~ 150
YPA16_2	A16 ~ 150
30 NC	

U167

AM27C010	
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YPA01_13	A1 ~ 150
YPA02_10	A2 ~ 150
YPA03_9	A3 ~ 150
YPA04_8	A4 ~ 150
YPA05_7	A5 ~ 150
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YPA11_25	A11 ~ 150
YPA12_4	A12 ~ 150
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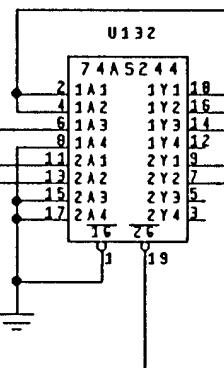
U160

74AS1004
U119

X[00 - 31]

MINSTR4

YPA17



4

COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

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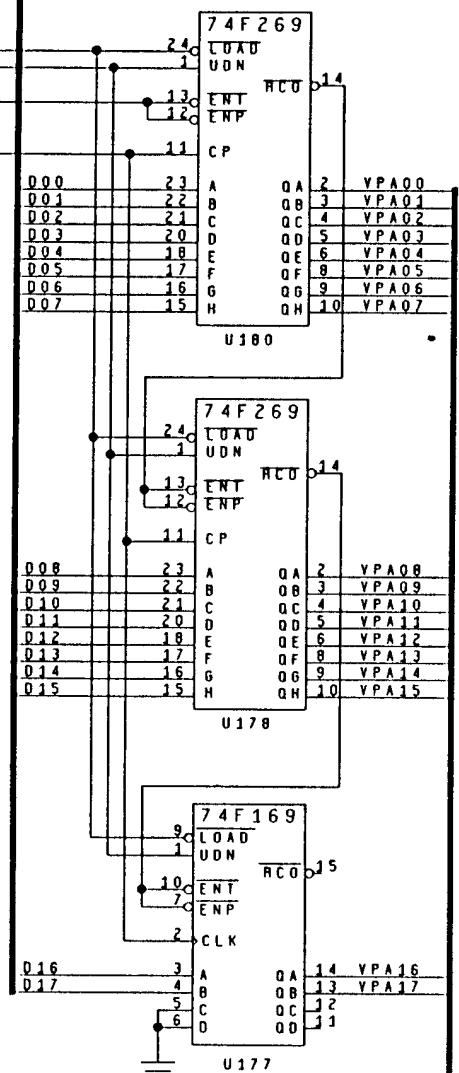
DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE	TITLE	
<i>[Signature]</i>	3-23-90	DR. MATH	
ENGINEER	DATE	MAC OBJECT DATA EEPROM	
PAUL T. KUHN		APPROVAL	
APPROVAL	DATE	SIZE	DRAWING NUMBER
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RELEASE		NEY C	
		DATE 3-21-1990 1:42 SHEET 19 OF 28	

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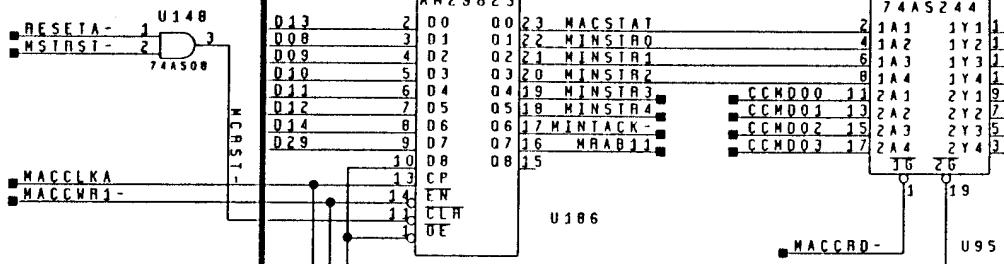
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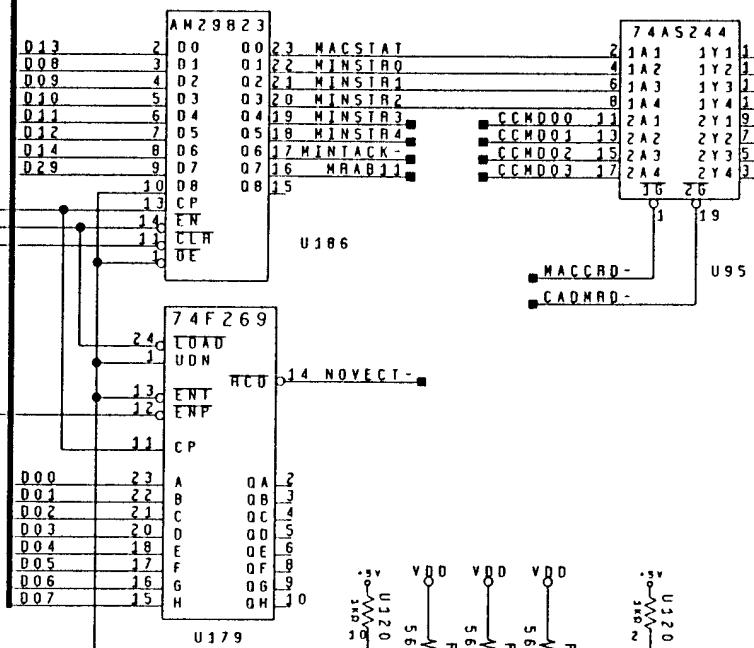
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■ VPAUDN
■ VPACEN-
■ MACCLKA



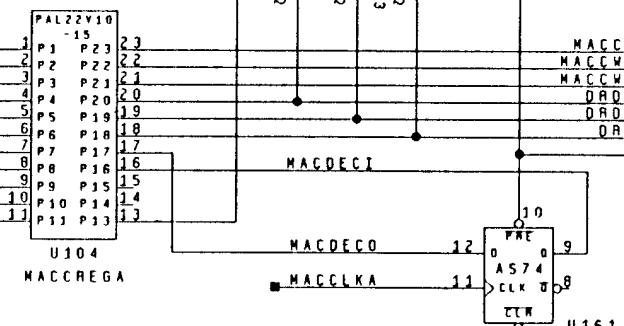
VPA[00-17]



DECVEC-



SYSCLKC
■ A02
■ A21
■ A22
■ A23
■ A24
■ A25
■ D29REQ0-
■ ALIGN-
■ R+H-
■ PBINV-



DRAFTER	DATE	MICROPROSE GAMES		
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
CHECKER	DATE			
PAUL T. KUHN	7-25-90			
ENGINEER	DATE			
APPROVAL	DATE	SIZE	DRAWING NUMBER	
		C	DW-00011C-0012-01	
APPROVAL	DATE	REV F	RELEASE	
		DATE 7-6-1990-10-31 SHEET 20 OF 28		

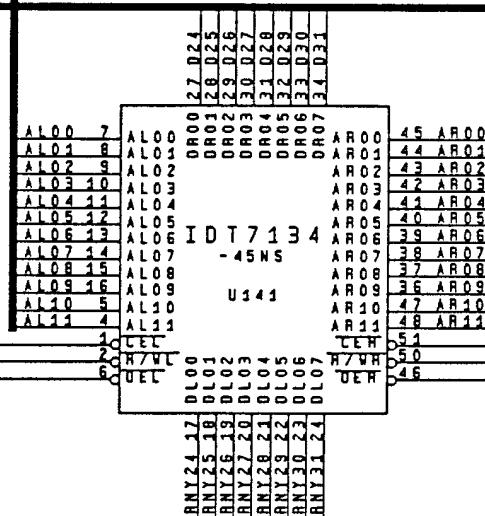
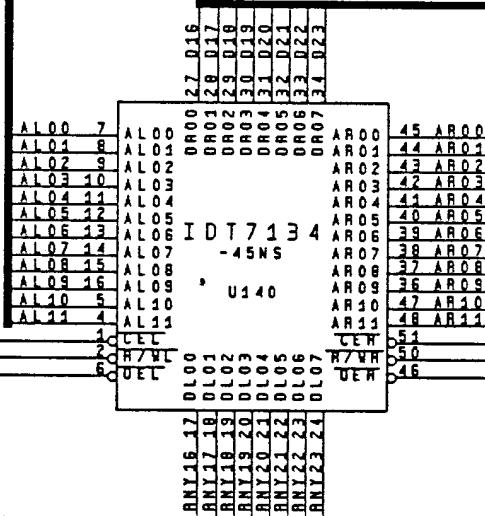
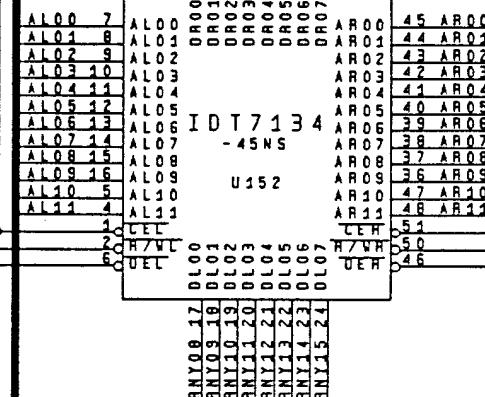
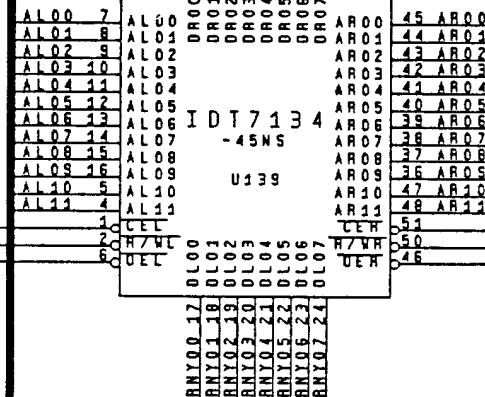
COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

AL[00..11]

CER-
R+VR-
V+R-
DEL-
R+VL-
CEL-

D[00..31]



RNY[00..31]

AR[00..15]

COMPANY
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INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

BRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHEESEMAN	DATE	TITLE	
<i>Bob T. Kie</i>	3-26-90	DR. MATH	
ENGINEER	DATE	MAC DUAL PORT SRAM ARRAY	
PAUL T. KUHN		SIZE	DRAWING NUMBER
APPROVAL	DATE	C	DW-00011C-0012-01
INITIAL	DATE	REV C	RELEASE
		DATE 3-21-1990-1-45 SHEET 21 OF 28	

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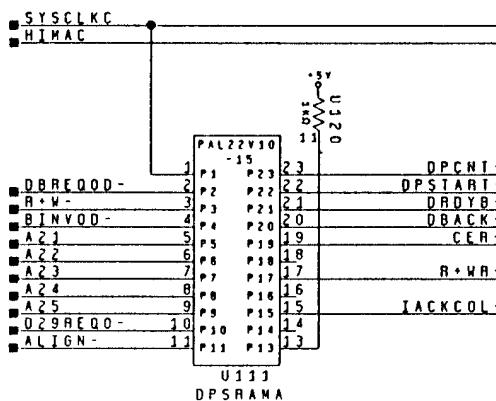
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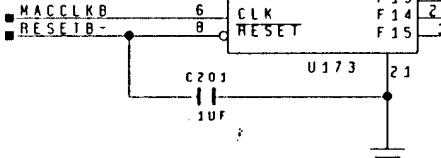
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A[00-31]



EPS 448	
I0	13 XSEL
I1	14 YSEL
I2	15 ENPT-
I3	16 ACIL
I4	17 NRML-
I5	18 MULOE-
I6	19 MULOEU-
I7	20 MRAZ-
F00	22 DECVEC-
F01	23 MSTRST-
F02	24 INTRO-
F03	
F04	
F05	
F06	
F07	
F08	
F09	
F10	
F11	
F12	
F13	
F14	
F15	

MAC JD1



EPS 448

EPS 448	
I0	13 ENXA-
I1	14 ENXB-
I2	15 ENYA-
I3	16 ENYB-
I4	17 VPACEN-
I5	18 VPAUDN
I6	19 MRAQNT-
I7	20 MRAQUD
F00	21 MWAQNT-
F01	22 MWAQUD
F02	23 MWAQUD
F03	24 R+WL-
F04	25 CEL-
F05	26 OEL-
F06	27 ASELO
F07	28 ASELI
F08	
F09	
F10	
F11	
F12	
F13	
F14	
F15	

MAC JD2



AR[00-11]



DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
<i>Ron J. Kuhn</i>	11-8-90	TITLE	
CHEWER	DATE	DR. MATH	
PAUL T. KUHN		DUAL PORT SRAM AND MAC CONTROL	
ENGINEER	DATE	SIZE	DRAWING NUMBER
APPROVAL	DATE		
APPROVAL	DATE	C	DW-00011C-0012-01
		REV M	RELEASE
		DATE 11-8-1990-10-48 SHEET 22 OF 28	

MRAA[00-11]

MVA[00-11]

YPA[00-11]

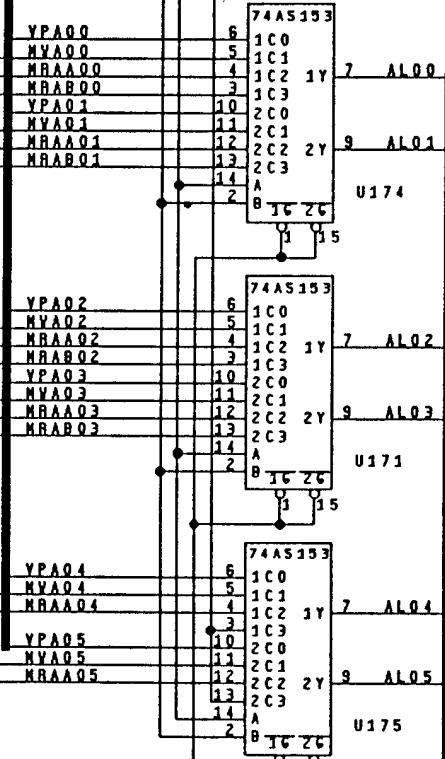
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■ ASE1

■ ASE0

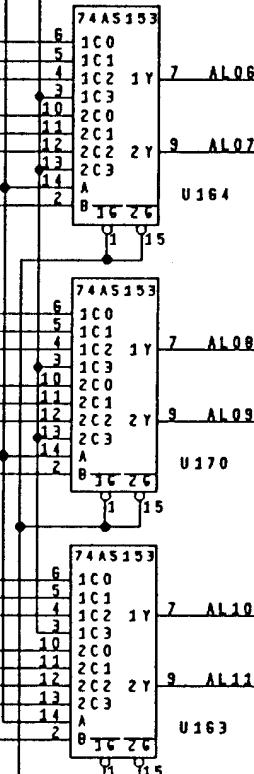
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COMPANY PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030



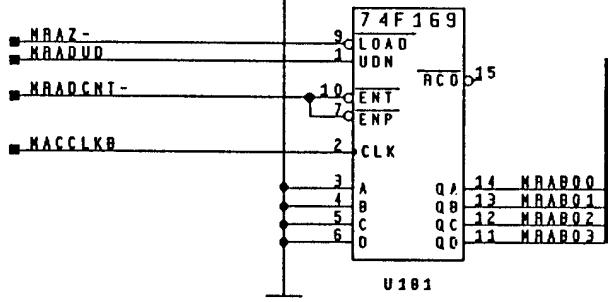
■ MRAB11

+5V
GND
EN
S
D



AL[00-11]

MRAB[00-03]



David J. Bellamy 6-337

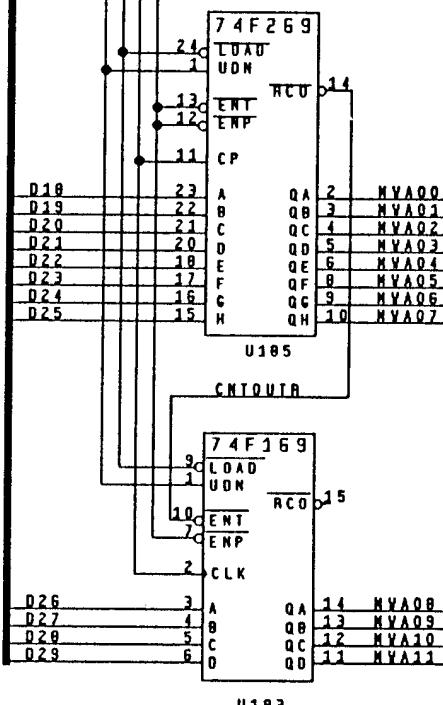
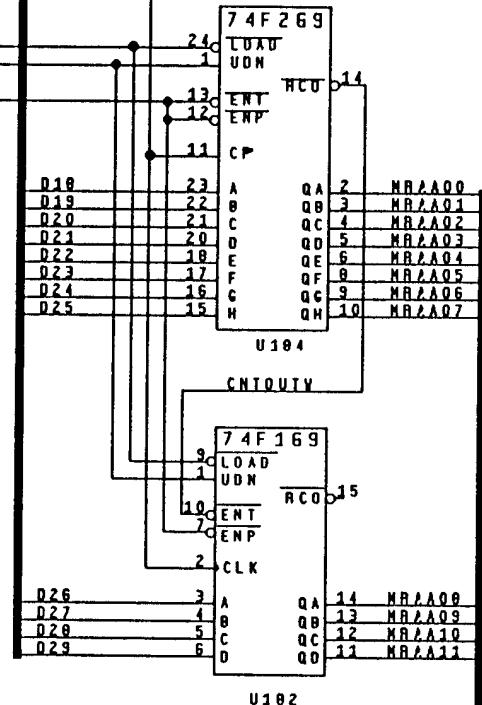
DRAFTER	DATE	MICROPROSE GAMES	
CHEKER	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER	DATE	TITLE	
PAUL T. KUHN	DATE	DR. MATH	
APPROVAL	DATE	MAC SRAM ADDRESS MUXES	
OWNER	DATE	SIZE	DRAWING NUMBER
		C	DW-00011C-0012-01
		REV C	RELEASE
		DATE 3-21-1990 1-47 SHEET 23 OF 28	

Paul T. Kuhn

MVADCNT-
MACCLKB
MACCYR0-
MVADUD

D[00-31]

MACCVB1-
MRADUD
MRADCNY-

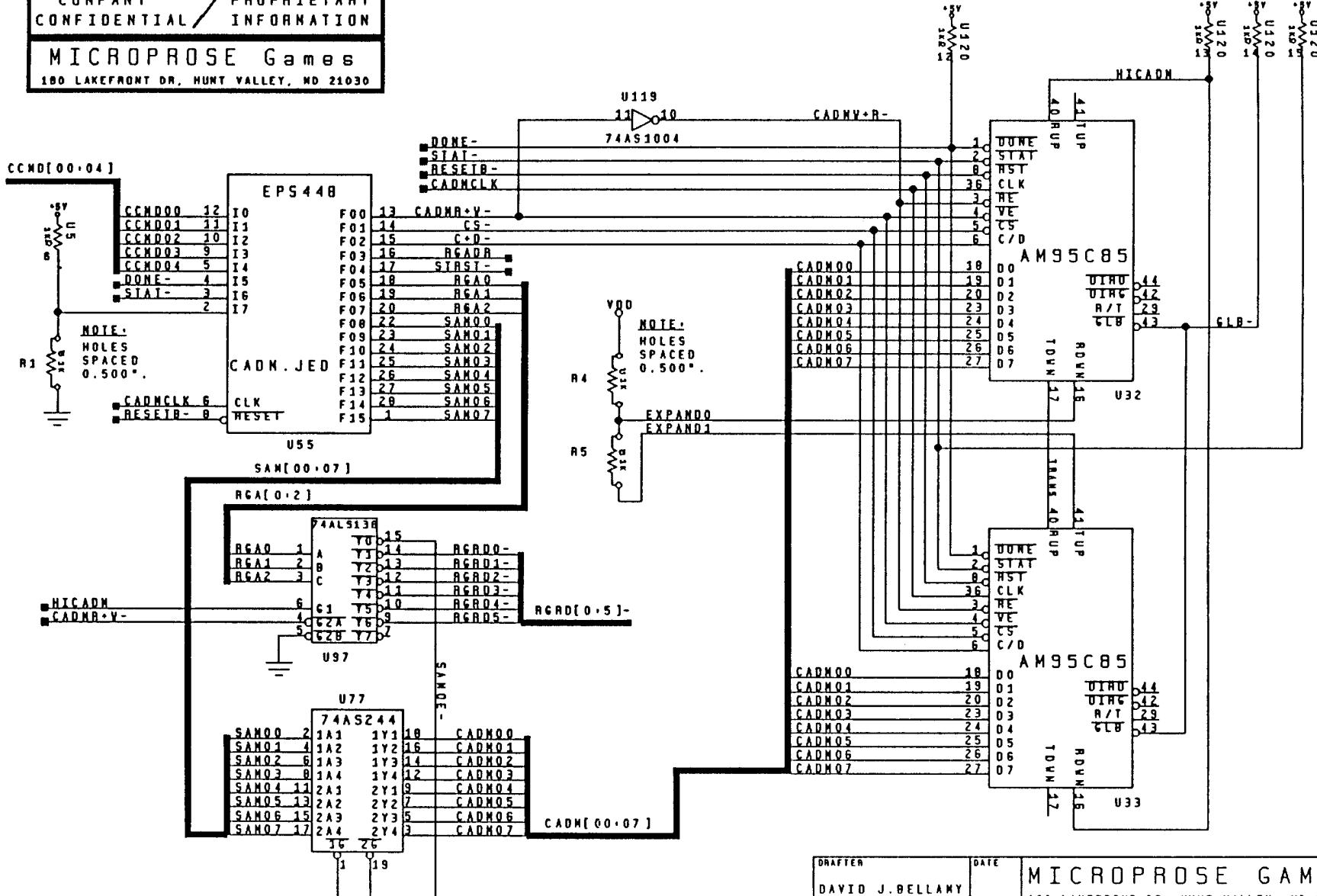


MVA[00-11]
MRAA[00-11]

COMPANY PROPRIETARY
CONFIDENTIAL INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
Paul T. Kuhn	3-23-90		
ENGINEER	DATE	TITLE	
PAUL T. KUHN		DR. MATH	
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-000311C-0012-03
APPROVAL	DATE	REV C	RELEASE
		DATE 3-21-1990-1-48 SHEET 24 OF 28	

COMPANY / PROPRIETARY
CONFIDENTIAL INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030



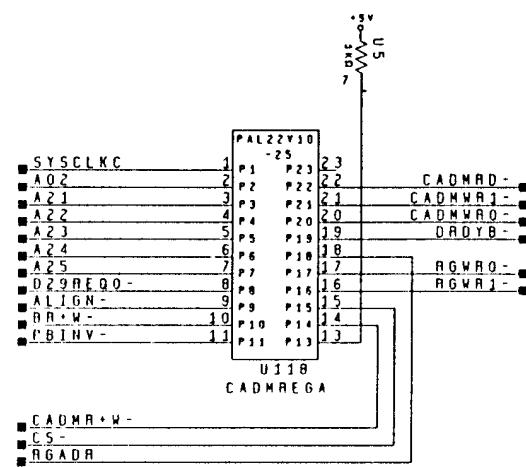
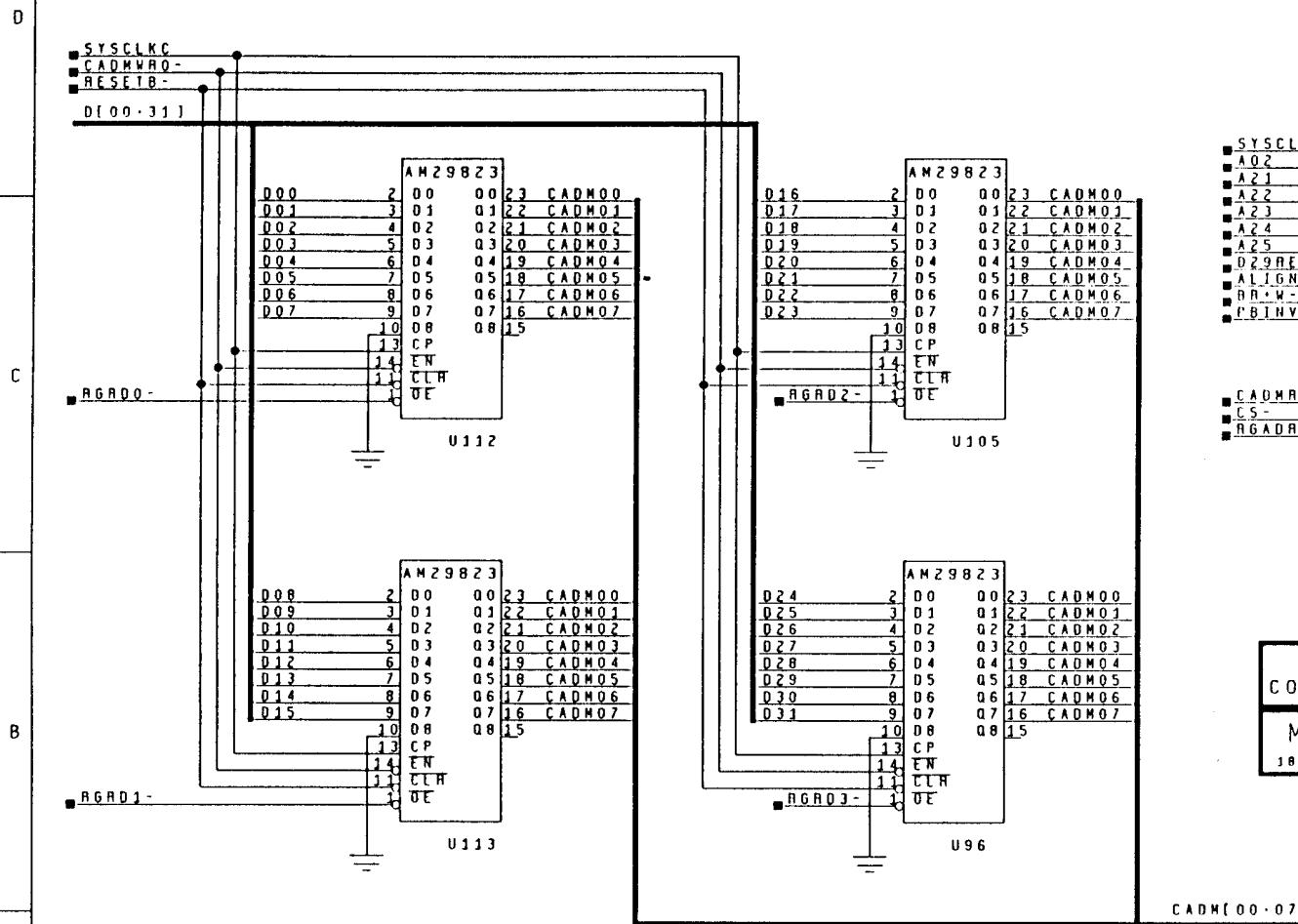
DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHEKED	DATE	TITLE	
<i>Paul, Bell</i>	3-23-90	DR. MATH	
ENGINEER	DATE	CADM AND CADW CONTROL	
PAUL T. KUHN		SIZE DRAWING NUMBER	
APPROVAL	DATE	C	DW-00011C-0012-01
APPROVED	DATE	REV C	RELEASE
		DATE 3-21-1990 1-49 SHEET 25 OF 28	

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COMPANY PROPRIETARY
CONFIDENTIAL INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

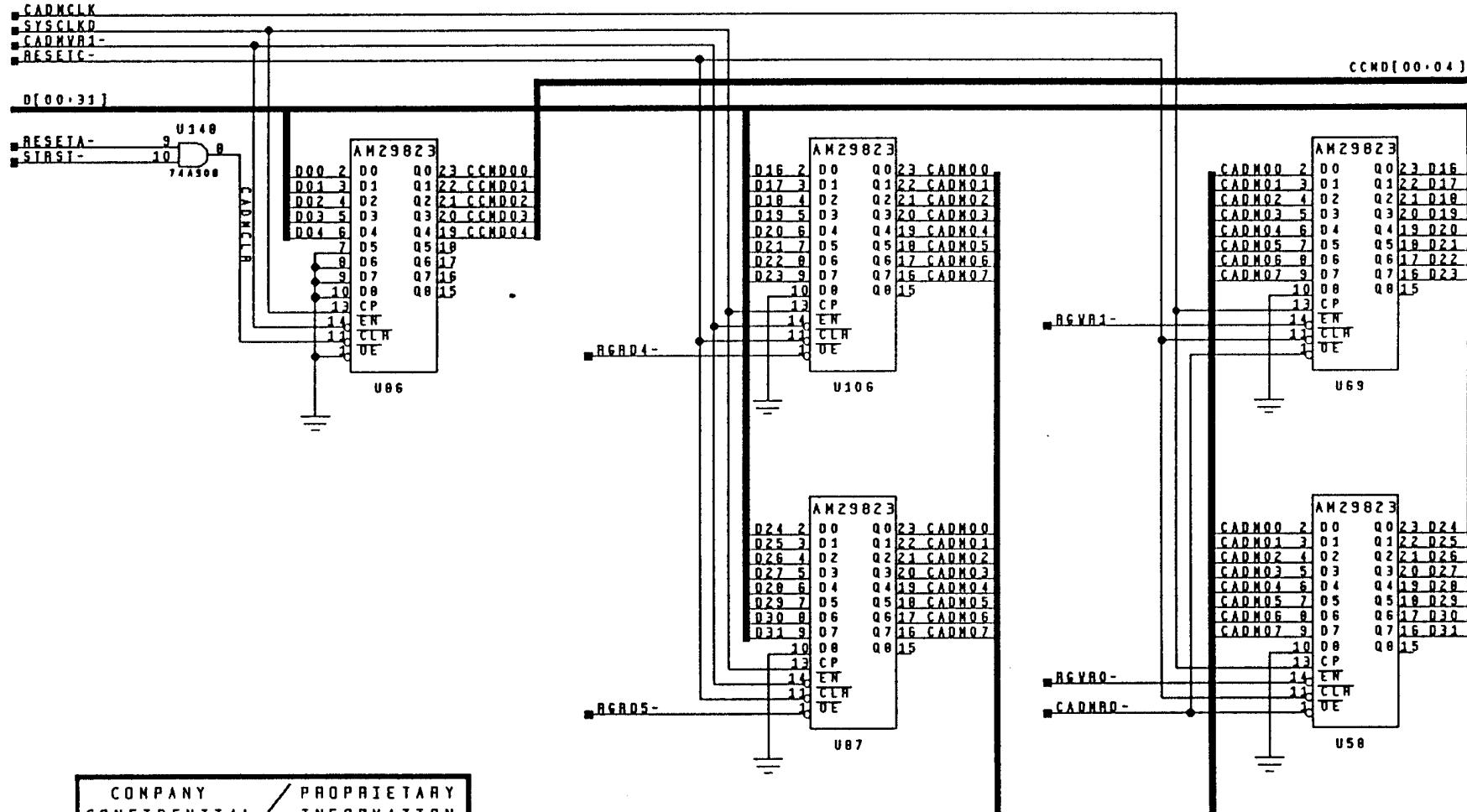
DRAFTER	DATE	MICROPROSE GAMES	
PAUL T. KUHN		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
<i>Paul T. Kuhn</i>	7-25-90		
ENGINEER	DATE	TITLE	
PAUL T. KUHN		DR. MATH	
APPROVAL	DATE	CADM DATA REGISTERS	
		SIZE	DRAWING NUMBER
		C	DW-00011C-0012-01
APPROVAL	DATE	REV F	RELEASE
DATE 7-6-1990, 10:44		SHEET 26 OF 28	

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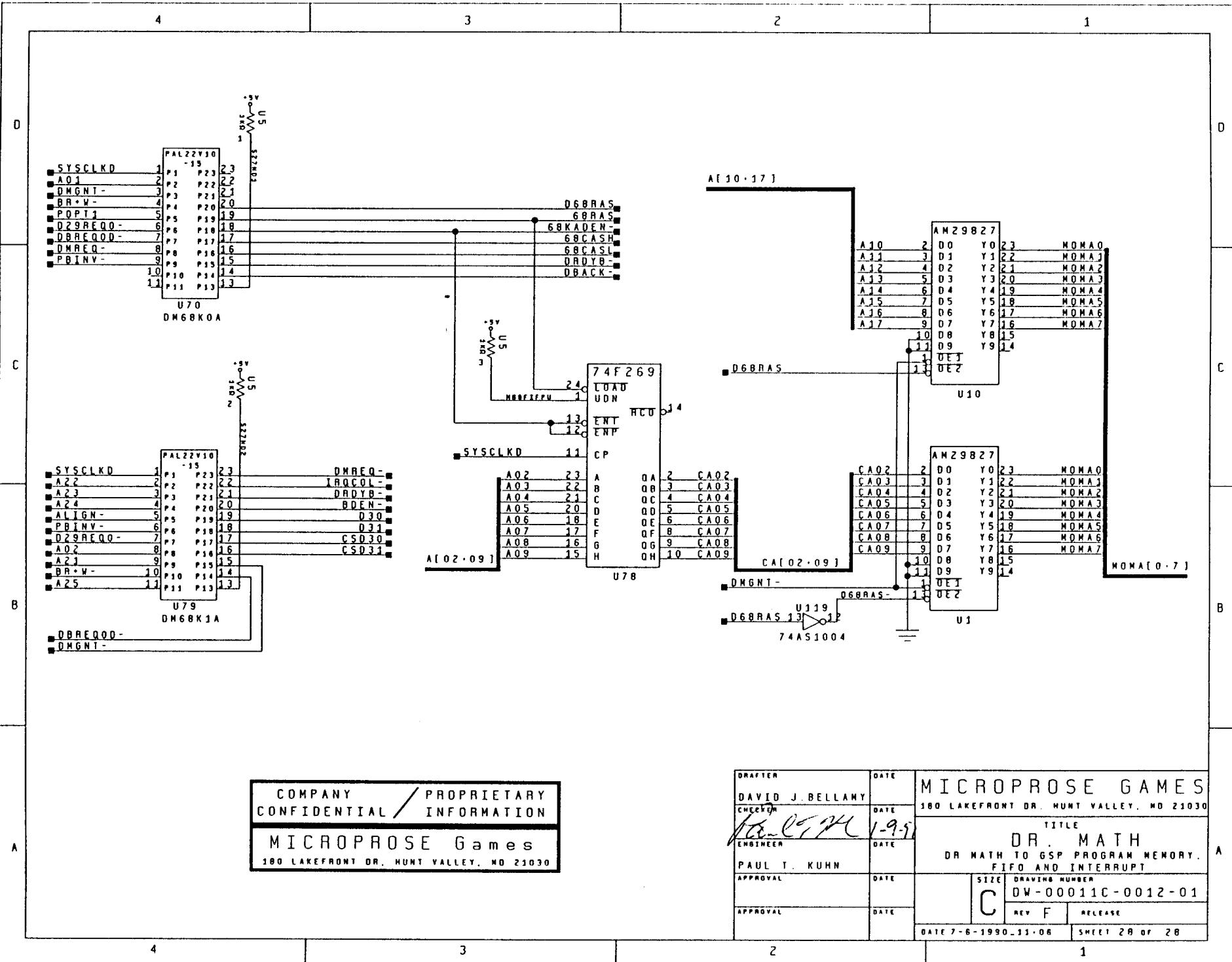


COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES		
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
<i>Pete Bellamy</i>	3-23-90			
CHIEF ENGINEER	DATE	TITLE		
PAUL T. KUHN		DR. MATH		
ENGINEER	DATE	CADM DATA REGISTERS		
APPROVAL	DATE	SIZE	DRAWING NUMBER	
<i>Paul Kuhn</i>		C	DW-00011C-0012-01	
REVISION	DATE	REV	C	RELEASE
DATE 3-23-1990-1-30		SHEET 27 OF 28		

Paul Kuhn



A

B

BILL OF MATERIALS

D R . M A T H P . C . B .

ASSEMBLY : A 10 - 00002 - 001

COMPANY CONFIDENTIAL /
PROPRIETARY INFORMATION

MICROPROSE Games
LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES		
CHECKER <i>Park T. 9/1</i>	DATE 1-14-91	180 LAKEFRONT DRIVE, HUNT VALLEY, MD 21030		
ENGINEER PAUL T. KUHN	DATE	TITLE BILL OF MATERIALS	DWG NO PL-00011A-0012-01	REV R
APPROVAL	DATE	DR. MATH P.C.B. A 10-00002-001	DATE 1-14-1991-9-45	
APPROVAL	DATE	SHEET 1 OF 7		A

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MICROPROSE games, 180 Lakefront Drive, Hunt Valley, Maryland, 21030					
PROJECT: DR. MATH PCB			DRWG NO: PL-0011A-0012-01		REV: R
DATE: Mon 14-Jan-1991					
ITEM	QTY	VENDOR PART NUMBER	PART DESCRIPT	VALUE	MPG P/N
		REF. DES.			
1	B 1	GAL22V10-15P U79	DM68K1A	15NS	120-00001-009
2	B 1	GAL22V10-15P U70	DM68K0A	15NS	120-00001-010
3	B [0]	GAL22V10-25P [U118]	CADMREGA	25NS	120-00001-011
4	[0]	SN74ALS138N [U97]	3:8DEMUX		200-00138-200
5	1	68001-502 [J1],J2	2PINJUMPER	.100"	610-00002-002
6	* [0]	AM95C85-12JC [U32,U33]	SMT CADM		130-95C85-412
7	6	SN74AS153N U175,U174,U163,U164,U171,U170	4:1DATAMUX		201-00153-200
8	B 1	GAL22V10-15P U111	DPSRAMA	15NS	120-00001-014
9	C* [0]	EPS448-3P [U55]	CADM SAM	20MHZ	115-00001-003
10	* 4	IDT7134-S45J U139,U140,U141,U152	4Kx8DPRAM SMT	45NS	222-00003-445
11	5	F74F169PC U125,U177,U181,U182,U183	4BITU/DCNTR		203-00169-200
12	1	SN74ALS04BN U143	HEXINVERTR		200-00004-200
13	1	SN74AS08N U148	QUAD2INAND		201-00008-200
14	B 1	GAL22V10-15P U104	MACCREGA	15NS	120-00001-015
15	E* 1	AM27C010-155DC U153	128Kx8EPROM 29KBK2B0	150NS	110-00001-014
16	E* 1	AM27C010-155DC U154	128Kx8EPROM 29KBK2B1	150NS	110-00001-015
17	E* 1	AM27C010-155DC U167	128Kx8EPROM 29KBK3B0	150NS	110-00001-016
18	E* 1	AM27C010-155DC U160	128Kx8EPROM 29KBK3B1	150NS	110-00001-017

<u>ITEM QTY</u>	<u>PART NUMBER REF. DES.</u>	<u>PART DESCRIPT</u>	<u>VALUE</u>	<u>MPG P/N</u>
19 4	AM29C827APC U1,U10,U155,U157	10BITBUFFER		235-00006-200
20 7	AM29C823ASC [U58,U69,U86,U87,U96,U105,U106,U112,U113],U137,U162, U165,U169,U172,U186,U146	SMT9BITBUSREG		235-00004-100
21 F* 1	AM29C323GC U149	MAC IC	10MHZ	130-00323-510
22 4	173D105X0035V C174,C175,C176,C188	AXTANTCAP	1UF	422-00072-105
23 1	LT1081-CN U176	RS232DRV		235-00001-200
24 1	SN74LS393N U128	DUAL4BITCNTR		202-00393-200
25 1	22-05-7048 J4	4PINMOLEX	.100"	610-00601-004
26 B 1	GAL22V10-25P U121	UARTCTLA	25NS	120-00001-021
27 1	Z85C30-10JC U159	SMT UART		240-00001-400
28 D* 1	AM27C256-95DC U135	32Kx8EPROM 29KBK1B3.001	90NS	110-00001-118
29 D* 1	AM27C256-95DC U115	32Kx8EPROM 29KBK1B1.001	90NS	110-00001-119
30 D* 1	AM27C256-95DC U108	32Kx8EPROM 29KBK1B0.001	90NS	110-00001-120
31 D* 1	AM27C256-95DC U127	32Kx8EPROM 29KBK1B2.001	90NS	110-00001-121
32 D* 1	AM27C256-95DC U134	32Kx8EPROM 29KBK0B3.001	90NS	110-00001-122
33 D* 1	AM27C256-95DC U114	32Kx8EPROM 29KBK0B1.001	90NS	110-00001-123
34 D* 1	AM27C256-95DC U107	32Kx8EPROM 29KBK0B0.001	90NS	110-00001-124
35 D* 1	AM27C256-95DC U126	32Kx8EPROM 29KBK0B2.001	90NS	110-00001-125
36 8	SN74AS373DW U38,U39,U47,U48,U60,U61,U62,U63	SMT OCTD-LATCHES		201-00373-100

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIPT	VALUE	MPG P/N
37	B 1	GAL22V10-15P U138	ROMADLDA	15NS	120-00001-016
38	B 1	GAL22V10-15P U136	STATEM2A	15NS	120-00001-017
39	4	AM29C863APC U2,U3,U11,U12	9BIBUSDRV		235-00005-200
40	3	SN74ALS2540N U82,U92,U100	OCTINVDRV		200-02540-200
41	A 1	GAL16V8A-15P U116	RAMCNTLB	15NS	120-00001-123
42	5	SN74AS258N U83,U93,U101,U129,U131	QUAD2:1MUX		201-00258-200
43	2	AM29C821APC U75,U76	10BITREGISTER		235-00003-200
44	1	SN74AS175N U84	QUADDFLOPS		201-00175-200
45	11	74F269SC U68,U78,U85,U103,U110,U133,U178,U179,U180,U184,U185	SMTDECADEU/DCNTR		203-00269-100
46	B 1	GAL22V10-15P U109	RAMADLDA	15NS	120-00001-018
47	B 1	GAL22V10-15P U102	STATEMB	15NS	120-00001-119
48	A 1	GAL16V8A-15P U67	29DECODA	15NS	120-00001-024
49	* 16	TMS44C256-12NL U13,U21,U27,U34,U35,U37,U46,U57,U80,U81,U88,U89,U90,U91,U98,U99	256Kx4DRAM	120NS	220-00002-212
50	4	SN74AS245DW U43,U44,U52,U53	SMTOCTBIBUFFER		201-00245-100
51	1	SA101A221JAA C203	AXCERCAP	220PF	402-00195-221
52	1	SN74ALS1010N U20	TRI3INNAND		200-01010-200
53	35	SN74AS244DW U6,U7,U8,U14,U15,U16,U22,U23,U24,U28,U29,U30,U31,U36, U40,U41,U42,U45,U49,U50,U51,U54,U56,U64,U65,U66,U72,U73, U74,U95,U132,U144,U145,U150,U151,[U77]	SMTOCTBUFFERS		201-00244-100

<u>ITEM QTY</u>	<u>PART NUMBER REF. DES.</u>	<u>PART DESCRIPT</u>	<u>VALUE</u>	<u>MPG P/N</u>
54 B 1	GAL22V10-15P U59	CLFIFOA	15NS	120-00001-020
55 F* 1	AM29000-16GC U9	MICROPROCESOR	16MHZ	135-29000-516
56				
57 1	SN7407N U130	HEXOCDRIVERS		206-00007-200
58 A 1	GAL16V8A-25P U122	INTRACKB	25NS	120-00001-026
59				
60				
61 6	CCF-07 561G R2,R7,R8,R13,R14,R16	2%MFRES	5600HM	503-00002-561
62 2	SN74AS74N [U18],U147,U161	DUALDFLOPS		201-00074-200
63 [0]	X0-43D-24 [U17]	OSCILLATOR	24MHZ	290-00001-024
64 4	836C102X2PE U4,U5,U120,U124	SMTPULRESPAK	1KOHM	502-00001-102
65 6	CCF-07 100G [R3],R11,R12,R15,R17,R23,R24	2%MFRES	100HM	503-00002-100
66 1	68001-503 [J3],J5	3PINJUMPER	.100"	610-00002-003
67 4	CCF-07 102G [R1,R4,R5],R9,R10,R19,R25	2%MFRES	1KOHM	503-00002-102
68 2	CCF-07 103G R6 ,R22	2%MFRES	10KOHM	503-00002-103
69 1	CCF-07 104G R20	2%MFRES	100KOHM	503-00002-104
70 1	1N914 D1	DIODE		300-00002-003
71 1	1N746A D2	ZENER	3 .3V	301-00002-033
72 1	LM311N Q1	VOLTCOMPAR		280-00002-200

<u>ITEM</u>	<u>QTY</u>	<u>PART NUMBER</u>	<u>PART DESCRIPT</u>	<u>VALUE</u>	<u>MPG P/N</u>
		<u>REF. DES.</u>			
73	1	KSA1A211 SW1	PBSWITCH		625-00002-001
74	1	173D335X0020V C159	AXTANTCAP	3.3UF	422-00062-335
75	1	XO-43D-20 U168	OSCILLATOR	20MHZ	290-00001-020
76	1	XO-43D-32 U142	OSCILLATOR	32MHZ	290-00001-032
77	3	SN74AS1C04AN [U25], U19, U119, U156	HEXINVDRIVRS		201-01004-200
78	3	HLMP3600 D3, D4, D5	LED	RED	305-00003-002
79	1	ICTE-5 D6	ZENER		300-00001-002
80	10	7-0805G-5 TP5, TP4, TP3, TP2, TP1, TP6, TP7, TP8, TP9, TP10	TESTPIN		710-00001-001
81	1	26-64-5100 09-52-3101 P3	MOLEX10PIN MOLEX10PIN	.156" .156"	610-00601-010 610-10600-010
82	8	TAJC156M010R C5, C51, C59, C102, C124, C187, C199, C200	SMTTANTCAP	15UF	420-00002-156
83	41	11C1210Z5U334M050NT C112, C113, C185, C104, C177, C173, C164, C161, C160, C156, C153, C146, C145, C144, C141, C140, C132, C131, C125, C123, C96, C95, C94, C93, C86, C85, C53, C49, C39, C34, C33, C31, C27, C23, C18, C14, C10, C105, C28, C32, C50	SMTCERCAP	0.33UF	401-02000-334
84	146	11C1206Z5U104M050NT C11, C16, C193, C128, C183, C150, C118, C90, C67, C9, C8, C7, C6, C4, C3, C2, C1, C41, C12, C13, C15, C194, C195, C196, C197, C198, C163, C184, C186, C189, C190, C191, C192, C99, C89, C88, C87, C84, C83, C82, C81, C80, C182, C181, C180, C179, C178, C172, C171, C170, C169, C168, C167, C166, C165, C162, C158, C157, C155, C154, C152, C151, C149, C148, C147, C143, C142, C138, C137, C136, C135, C134, C133, C130, C129, C127, C126, C122, C121, C120, C119, C117, C116, C115, C114, C111, C110, C109, C108, C107, C106, C103, C101, C98, C97, C92, C91, C79, C78, C77, C76, C75, C74, C72, C71, C70, C69, C68, C66, C65, C64, C63, C62, C61, C60, C58, C57, C56, C55, C52, C54, C48, C47, C46, C45, C44, C43, C42, C40, C38, C37, C36, C35, C30, C29, C26, C25, C24, C22, C21, C20, C19, C17, C73, C139, C100	SMTCERCAP	0.1UF	401-01000-104
85	1	92984-2-01-20-30 P2	2x20HEADER	.100"	610-10100-040

<u>ITEM</u>	<u>QTY</u>	<u>PART NUMBER</u> <u>REF. DES.</u>	<u>PART DESCRIPT</u>	<u>VALUE</u>	<u>MPG</u>	<u>P/N</u>
86	1	92984-2-01-32-30 P1	2x32HEADER	.100"		610-10100-064
87 A	[0]	ICO-320-MTT [UX67,UX116,UX117,UX122]	.3x20PIN SOCKET			600-00001-320
88 B	[0]	ICO-324-MTT [UX59,UX70,UX79,UX102,UX104,UX109,UX111,UX118,UX121, UX136,UX138]	.3x24PIN SOCKET			600-00001-324
89 C	[0]	110-13-328-41-001 [UX55,UX166,UX173]	.3x28PIN SOCKET			600-00001-328
90 D	8	ICO-628-MTT UX107,UX108,UX114,UX115,UX126,UX127,UX134,UX135	.6x28PIN SOCKET			600-00001-628
91 E	4	2-644018-2 UX153,UX154,UX160,UX167	.6x32PIN SOCKET			600-00003-632
92 F	1	CPAS-169-ZSTT UX9,[UX149]	169PINPGASOCKET			601-00002-169
93	[0]	SRS8-12-01	SPACER	.750"		700-00001-003
94	2	68786-102	SHUNT			715-00001-001
95	1	CCF-07 820G R21	2PCMFRS	820HM		503-00002-820
96	1	FRJ-50 R18	JUMPRES	00HM		503-00001-000
96	1	C410C104M5U5CA C201	AXCERCAP	.1UF		402-00382-104
97 C*	1	EPS448-3P U166	MAC.2 SAM	20MHZ		115-00001-002
98 C*	1	EPS448-3P U173	MAC.1 SAM	20MHZ		115-00001-001
99	1	C410C101J1R5CA C202	AXCERCAP	100PF		402-00195-101

		425				

NOTES:

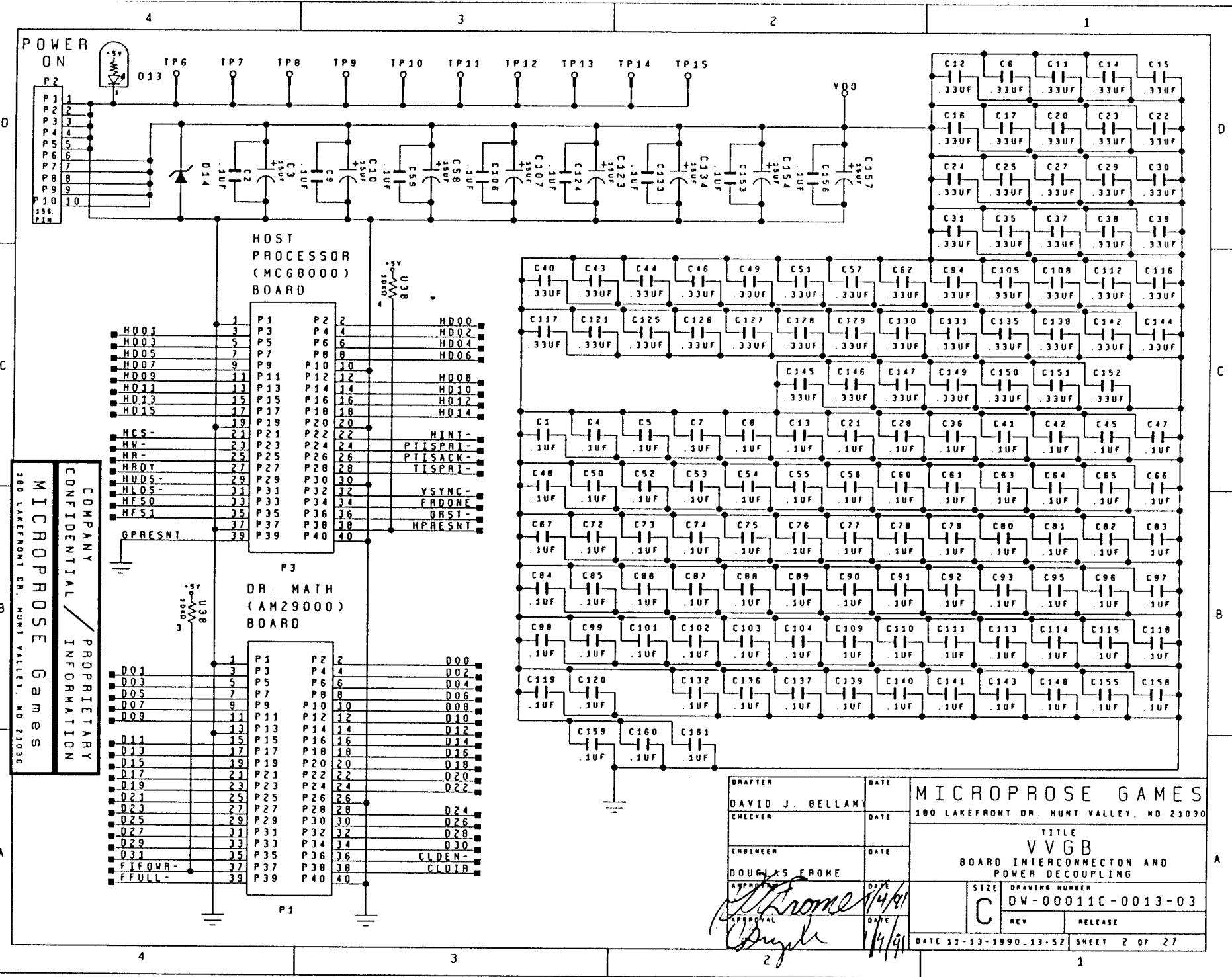
1. PARTS REQUIRING 0.33UF DECOUPLING CAPACITORS ARE DESIGNATED WITH AN ASTERISK (*) BETWEEN ITEM AND QTY COLUMNS.
2. PARTS REQUIRING SOCKETS ARE MARKED WITH A LETTER CORRESPONDING TO THE SOCKETS (SOCKETS ARE ITEMS 87 - 92).
3. PARTS WITH REFERENCE DESIGNATORS IN BRACKETS [] WILL NOT BE POPULATED DURING PRODUCTION.

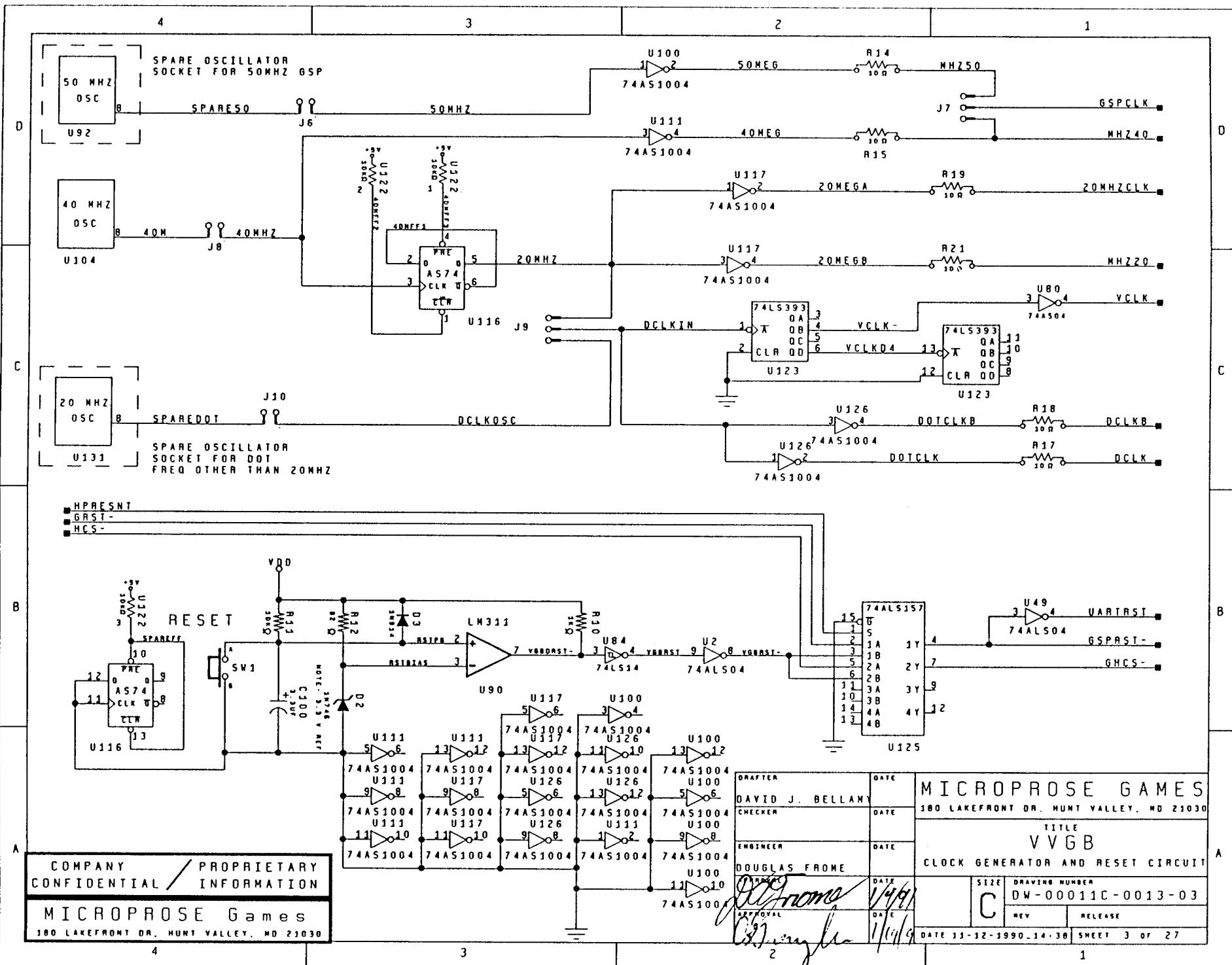
MICROPROSE GAMES

VIDEO GRAPHICS
PRINTED CIRCUIT
BOARD ASSEMBLY
(with VCLIPPERS)

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

DRAFTER	DATE	MICROPROSE GAMES		
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
CHECKER	DATE			
ENGINEER	DATE			
DOUGLAS FROOME		TITLE V V G B		
APPRENTICE	DATE	PRINT CIRCUIT BOARD ASSEMBLY		
<i>D. Froome</i>	1/4/91	SIZE	DRAWING NUMBER	
APPROVAL	DATE	C	REV A	RELEASE
<i>E. Doyle</i>	1/15/91	DATE 13-28-1990-13-08		SHEET 1 OF 27
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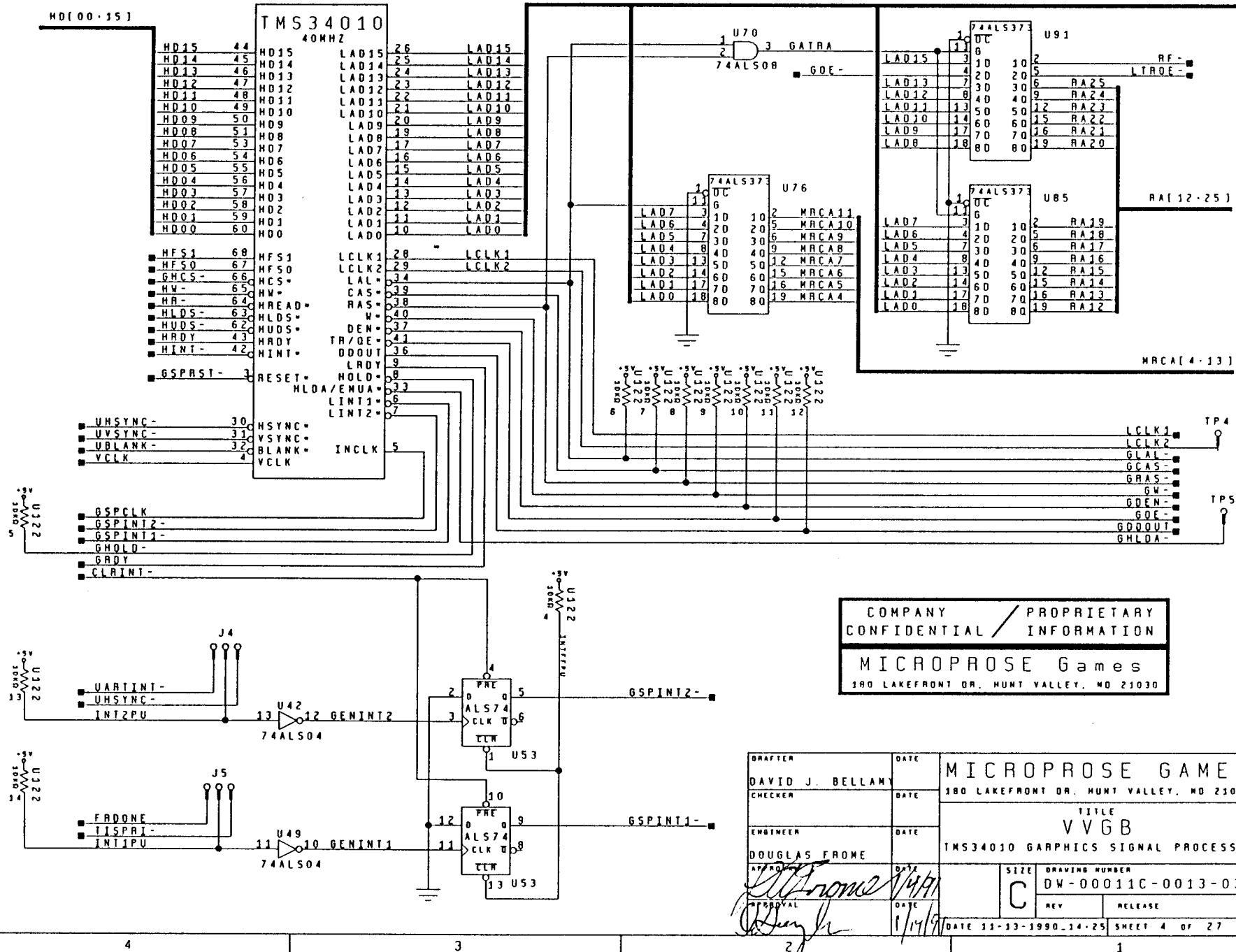
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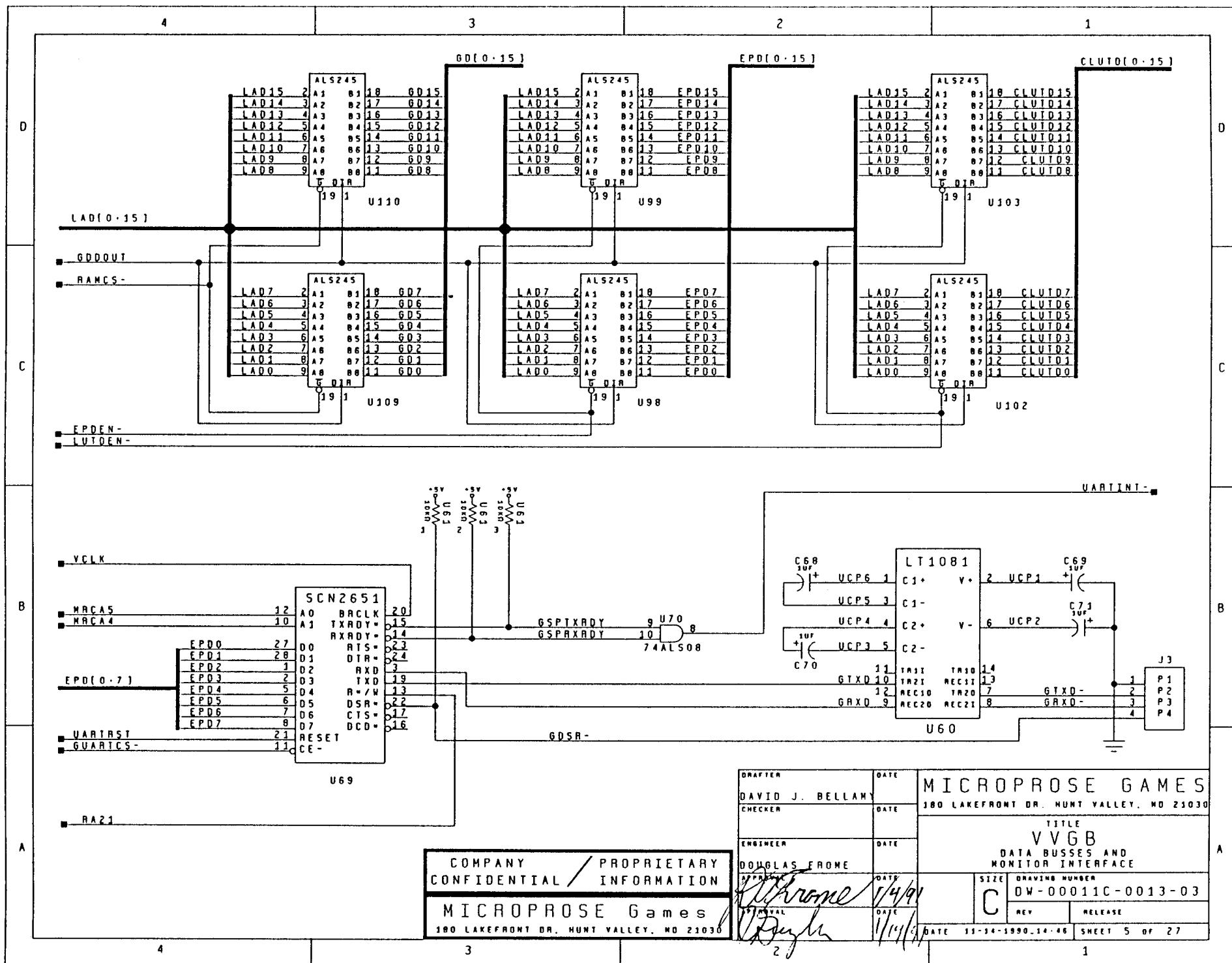


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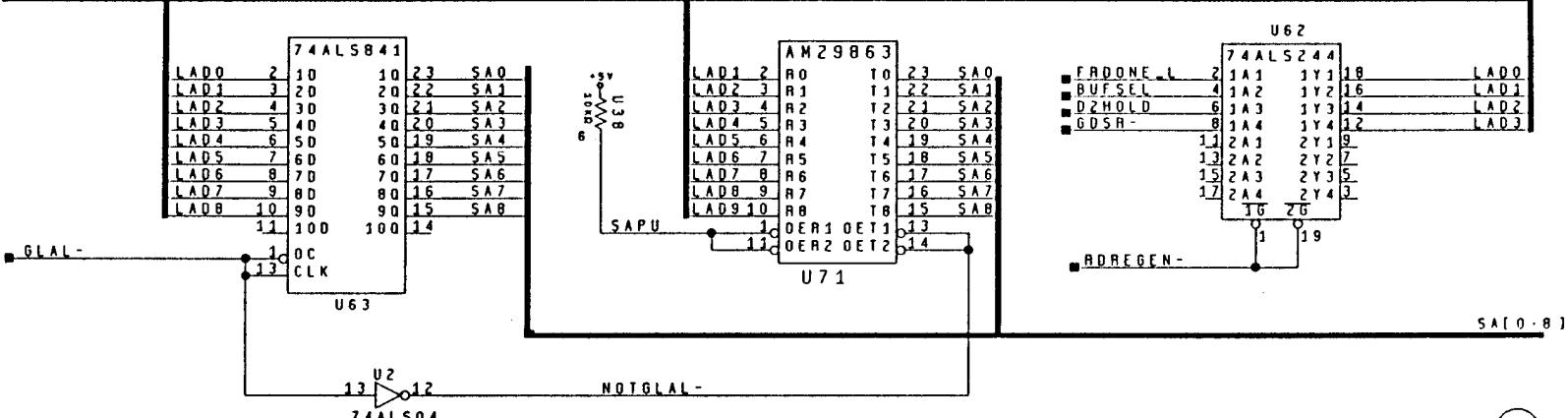
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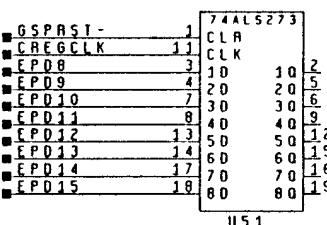
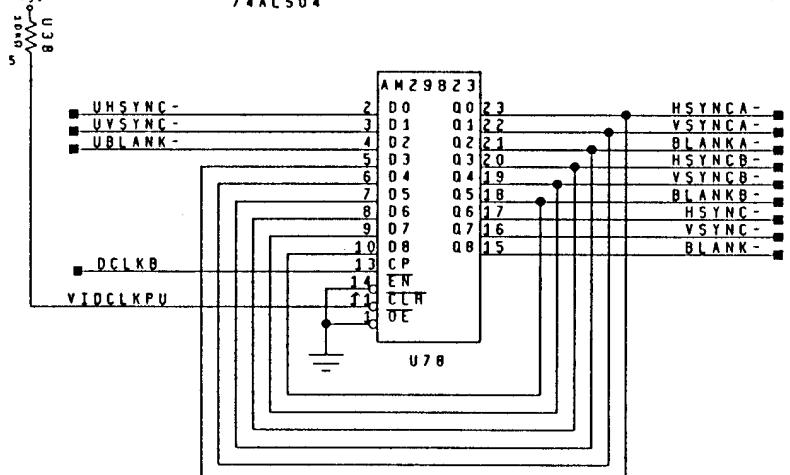
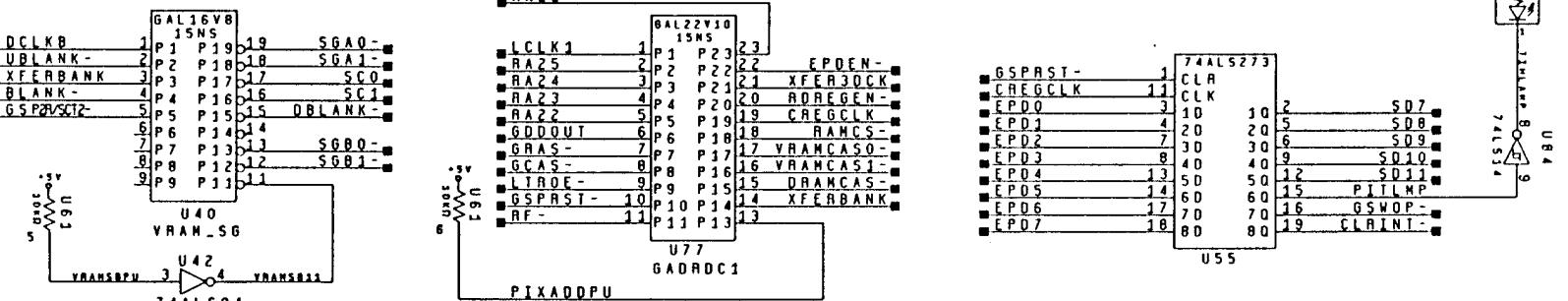
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SA[0..8]

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COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
DOUGLAS FROOME			
APPROVAL	DATE	SIZE	DRAWING NUMBER
DOUGLAS FROOME	1/4/91	C	DW-00011C-0013-03
INITIALS	DATE	KEY	RELEASE
DOUGLAS FROOME	1/4/91		
DATE 31-13-1990_15-01 SHEET 7 OF 27			

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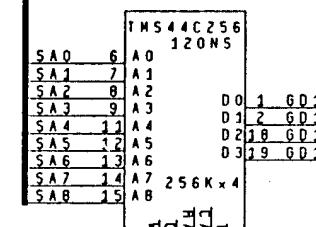
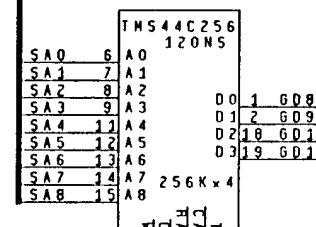
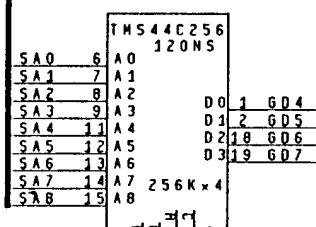
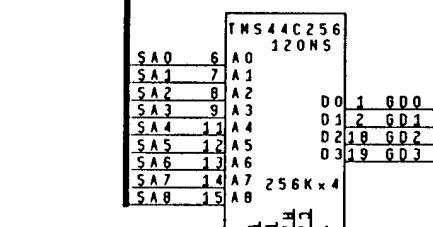
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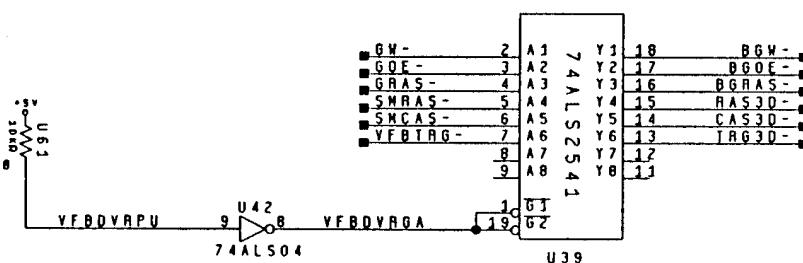
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SA[0..8]

G0[0..15]



- BGW-
- BGOE-
- BGRAS-
- DRAMCAS-



COMPANY
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INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE	TITLE	
		VVGB	
ENGINEER	DATE	GSP DRAM BANK	
DOUGLAS FROME		SIZE	DRAWING NUMBER
<i>Fromez</i>	1/1/91	C	DW-00011C-0013-03
APPROVAL	DATE	REV	RELEASE
<i>Fromez</i>	1/1/91		
DATE 11-13-1990-15-03 SHEET 8 OF 27			

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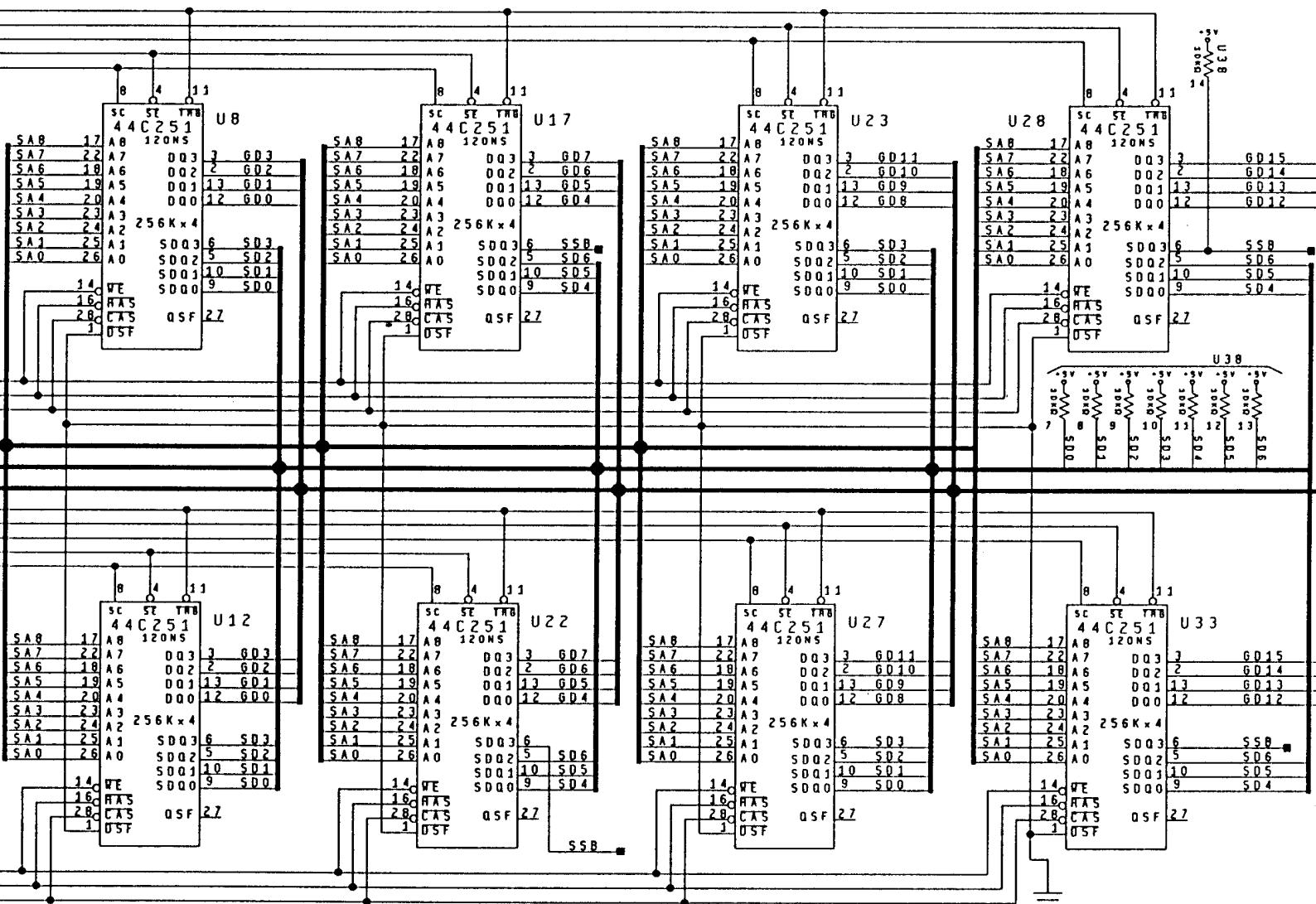
B

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A

A

■ BGOF-
 ■ SGA1-
 ■ SC1
 ■ SGA0-
 ■ SCO



COMPANY / PROPRIETARY
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MICROPROSE Games
 180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
DOUGLAS FRONE			
APPROVAL	DATE	SIZE	DRAWING NUMBER
<i>D. Frone 1/14/91</i>		C	DW-00011C-0013-03
REVAL	DATE	REV	RELEASE
<i>D. Frone 1/14/91</i>			
DATE 11-13-1990-15-04		SHEET 9 OF 27	

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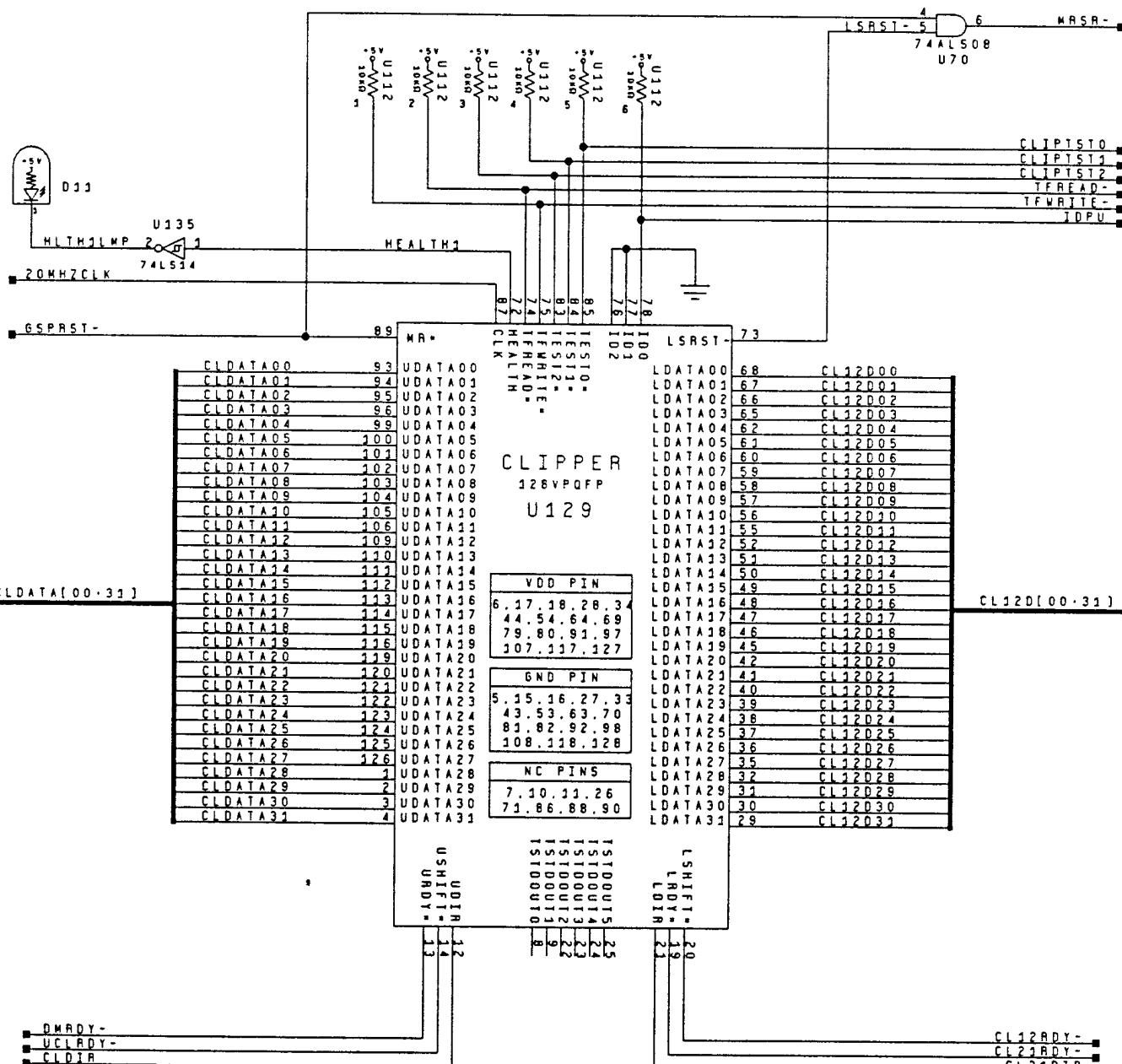
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E



COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

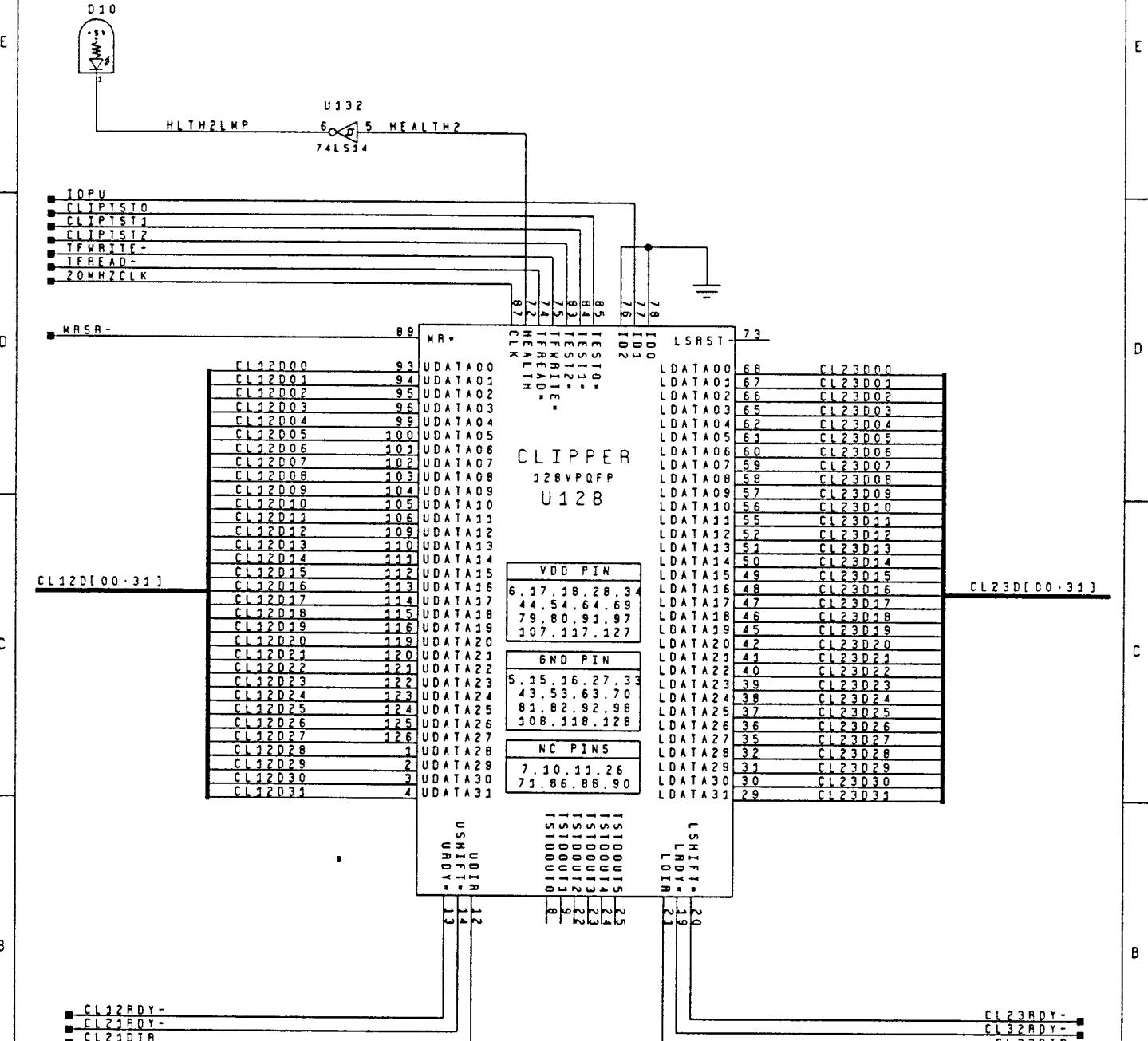
DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
Douglas E. Bone		TITLE	
APPROVED	DATE	VVGB	
INITIALS	DATE	CLIPPER ASIC 3	
		SIZE	DRAWING NUMBER
		C	DW-00011C-0013-03
REV	RELEASE		
DATE 11-25-1990 12-09 SHEET 30 OF 27			

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COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
380 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		380 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
DOUGLAS FROOME		TITLE VVGB CLIPPER ASIC 2	
APPROVAL	DATE	SIZE	DRAWING NUMBER
D. F. Froome	1/14/91	Z = d	DW-00011C-0013-03
APPROVAL	DATE	REV	RELEASE
J. Bellamy	1/14/91		
DATE 12-17-1990.9-10		SHEET 11 OF 27	

D

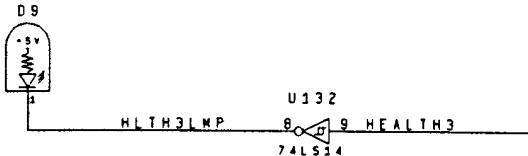
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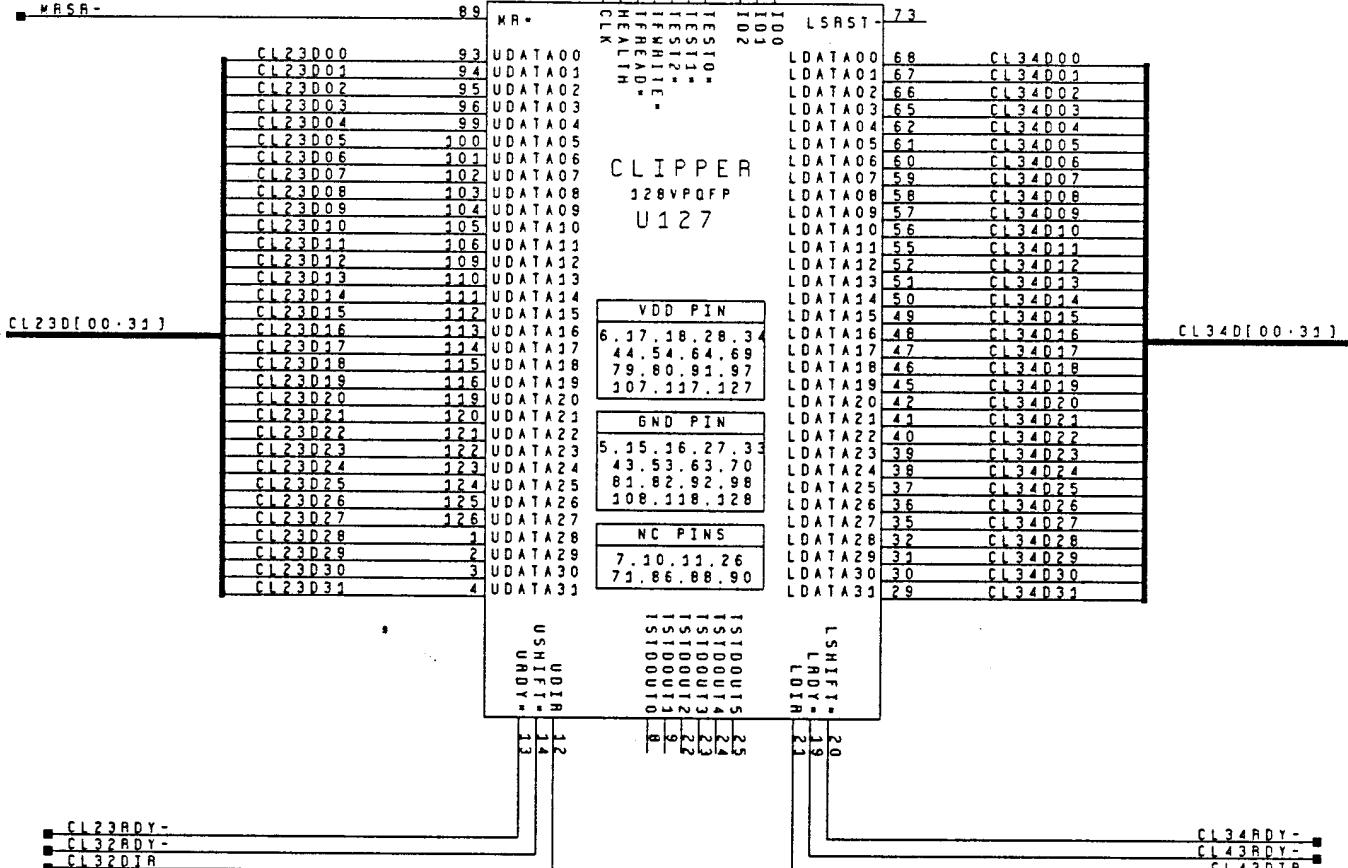
E

E



- TOPU
- CLIPST0
- CLIPST1
- CLIPST2
- TFWRITE-
- TFREAD-
- 20MHZCLK

MRSF -



COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
DOUGLAS FROOME		TITLE	
FROOME		VVGB	
APPROVAL	DATE	CLIPPER ASIC 3	
		VS Y MAX	
		SIZE	
		DRAWING NUMBER	
		C DW-00011C-0013-03	
		REV	RELEASE
		DATE 12-17-1990 9:33 SHEET 32 OF 27	

Froome *1/4/91*

E

E



U132
HLTH4LMP 10 11 HEALTH4
74LS14

IDPU
CLIPST0
CLIPST1
CLIPST2
TFWRITE-
TFREAD-
20MHzCLK

MRSR-

B9 MR* CLK LSR51 73

CLIPPER

U118

CL34D[00-31]

	UDATA00	UDATA01	UDATA02	UDATA03	UDATA04	UDATA05	UDATA06	UDATA07	UDATA08	UDATA09	UDATA10	UDATA11	UDATA12	UDATA13	UDATA14	UDATA15	UDATA16	UDATA17	UDATA18	UDATA19	UDATA20	UDATA21	UDATA22	UDATA23	UDATA24	UDATA25	UDATA26	UDATA27	UDATA28	UDATA29	UDATA30	UDATA31
CL34000	93																															
CL34001	94																															
CL34002	95																															
CL34003	96																															
CL34004	99																															
CL34005	100																															
CL34006	101																															
CL34007	102																															
CL34008	103																															
CL34009	104																															
CL34010	105																															
CL34011	106																															
CL34012	109																															
CL34013	110																															
CL34014	111																															
CL34015	112																															
CL34016	113																															
CL34017	114																															
CL34018	115																															
CL34019	116																															
CL34020	118																															
CL34021	120																															
CL34022	121																															
CL34023	122																															
CL34024	123																															
CL34025	124																															
CL34026	125																															
CL34027	126																															
CL34028	1																															
CL34029	2																															
CL34030	3																															
CL34031	4																															

USDIRA
UDIRY
UDIRY

LSHIFT
LSHIFT
LDIRY
LDIRY
LDIRY

CL34RDY-
CL43RDY-
CL43DIR

CL45RDY-
CLS4RDY-
CLS4DIR

COMPANY / PROPRIETARY INFORMATION
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		380 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
DOUGLAS FROOME			
APPROVAL	DATE	TITLE	
		VVGB	
		CLIPPER ASIC 4	
		X X MIN	
		SIZE	DRAWING NUMBER
		C	DW-00011C-0013-03
APPROVAL	DATE	REV	RELEASE
J. Froome	1/14/91		
		DATE 12-17-1990.9-31 SHEET 13 OF 27	

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U132
HLTH5LMP 12 13 HEALTH5
74LS14

TOPU
CLIPPTST0
CLIPPTST1
CLIPPTST2
TFWRITE-
TFREAD-
20MHzCLK

MRSR-

B9

MR*

CLK

LSRST

73

CLIPPER
32BVQFP
U119

CL45D[00-31]

CL45D00	93	UDATA00
CL45D01	94	UDATA01
CL45D02	95	UDATA02
CL45D03	96	UDATA03
CL45D04	99	UDATA04
CL45D05	100	UDATA05
CL45D06	101	UDATA06
CL45D07	102	UDATA07
CL45D08	103	UDATA08
CL45D09	104	UDATA09
CL45D10	105	UDATA10
CL45D11	106	UDATA11
CL45D12	109	UDATA12
CL45D13	110	UDATA13
CL45D14	111	UDATA14
CL45D15	112	UDATA15
CL45D16	113	UDATA16
CL45D17	114	UDATA17
CL45D18	115	UDATA18
CL45D19	116	UDATA19
CL45D20	119	UDATA20
CL45D21	120	UDATA21
CL45D22	121	UDATA22
CL45D23	122	UDATA23
CL45D24	123	UDATA24
CL45D25	124	UDATA25
CL45D26	125	UDATA26
CL45D27	126	UDATA27
CL45D28	1	UDATA28
CL45D29	2	UDATA29
CL45D30	3	UDATA30
CL45D31	4	UDATA31

VDD PIN
6, 17, 18, 28, 34
44, 54, 64, 69
79, 80, 91, 97
107, 117, 127

GND PIN
5, 15, 16, 27, 33
43, 53, 63, 70
81, 82, 92, 98
108, 118, 128

NC PINS
7, 10, 11, 26
71, 86, 88, 90

LSHIFT-
RDY-
LOIA

UDIAR
UDIY-
UDRY-
UDRA

15100014
15100013
15100012
15100011
15100010
15100009
15100008

CL56D[00-31]

CL45RDY-
CL54RDY-
CL54DIR

CL56RDY-
CL65RDY-
CL65DIR

COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
380 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES	
CHECKER	DATE	380 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER DOUGLAS FROKE	DATE	TITLE VVGB CLIPPER ASIC 5 X X X X X	
APPROV. J. Home 10/1/91	DATE	SIZE C	DRAWING NUMBER DW-00011C-0013-03
INITIALS J. Home 10/1/91	DATE	REV C	RELEASE
		DATE 12-17-1990-9-32 SHEET 14 OF 27	

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U132
HLTH6LMP 4 3 HEALTH6
74LS14

IDPU
CLIPTS0
CLIPTS1
CLIPTS2
TFWRITE-
TFREAD-
20MHzCLK

MASR-

	BS	MR*	LSRST	7.3
CL56D00	9.3	UDATA00	L DATA00	6.8 D1DATA00
CL56D01	9.4	UDATA01	L DATA01	6.7 D1DATA01
CL56D02	9.5	UDATA02	L DATA02	6.6 D1DATA02
CL56D03	9.6	UDATA03	L DATA03	6.5 D1DATA03
CL56D04	9.9	UDATA04	L DATA04	6.2 D1DATA04
CL56D05	10.0	UDATA05	L DATA05	6.1 D1DATA05
CL56D06	10.1	UDATA06	L DATA06	6.0 D1DATA06
CL56D07	10.2	UDATA07	L DATA07	5.9 D1DATA07
CL56D08	10.3	UDATA08	L DATA08	5.8 D1DATA08
CL56D09	10.4	UDATA09	L DATA09	5.7 D1DATA09
CL56D10	10.5	UDATA10	L DATA10	5.6 D1DATA10
CL56D11	10.6	UDATA11	L DATA11	5.5 D1DATA11
CL56D12	10.9	UDATA12	L DATA12	5.2 D1DATA12
CL56D13	11.0	UDATA13	L DATA13	5.1 D1DATA13
CL56D14	11.1	UDATA14	L DATA14	5.0 D1DATA14
CL56D15	11.2	UDATA15	L DATA15	4.9 D1DATA15
CL56D16	11.3	UDATA16	L DATA16	4.8 D1DATA16
CL56D17	11.4	UDATA17	L DATA17	4.7 D1DATA17
CL56D18	11.5	UDATA18	L DATA18	4.6 D1DATA18
CL56D19	11.6	UDATA19	L DATA19	4.5 D1DATA19
CL56D20	11.9	UDATA20	L DATA20	4.2 D1DATA20
CL56D21	12.0	UDATA21	L DATA21	4.1 D1DATA21
CL56D22	12.1	UDATA22	L DATA22	4.0 D1DATA22
CL56D23	12.2	UDATA23	L DATA23	3.9 D1DATA23
CL56D24	12.3	UDATA24	L DATA24	3.8 D1DATA24
CL56D25	12.4	UDATA25	L DATA25	3.7 D1DATA25
CL56D26	12.5	UDATA26	L DATA26	3.6 D1DATA26
CL56D27	12.6	UDATA27	L DATA27	3.5 D1DATA27
CL56D28	1	UDATA28	L DATA28	3.2 D1DATA28
CL56D29	2	UDATA29	L DATA29	3.1 D1DATA29
CL56D30	3	UDATA30	L DATA30	3.0 D1DATA30
CL56D31	4	UDATA31	L DATA31	2.9 D1DATA31

CL56D[00-31]

CLIPPER
128VQFP
U120

VDD PIN
6.17.18.28.34

44.54.64.69

79.80.91.97

107.117.127

GND PIN
5.15.16.27.33

43.53.63.70

81.82.92.98

108.118.128

NC PINS
7.10.11.26

71.86.88.90

1510000115
1510000114
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1510000110
1510000109
1510000108

CL56RDY-
CL65RDY-
CL65DIR

D1RDY-
LC1RDY-
D1DTR

COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DATE MICROPLOSE GAMES
DAVID J. BELLAMY 180 LAKEFRONT DR. HUNT VALLEY, MD 21030
CHECKER DATE TITLE
ENGINEER DATE VVGB
DOUGLAS FROOME CLIPPER ASIC 6
APPROVAL DATE Y ≥ MIN
DATE DW-00011C-0013-03
REV RELEASE
DATE 12-17-1990-9-13 SHEET 15 OF 27
C

D

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D1HLAMP U132 D1HEALTH
74LS34

MHZ20
MRSR-

D1DATA[00-31]

D1DATA00 124
D1DATA01 125
D1DATA02 126
D1DATA03 127
D1DATA04 3
D1DATA05 4
D1DATA06 5
D1DATA07 6
D1DATA08 7
D1DATA09 8
D1DATA10 9
D1DATA11 10
D1DATA12 11
D1DATA13 12
D1DATA14 13
D1DATA15 14
D1DATA16 15
D1DATA17 16
D1DATA18 17
D1DATA19 18
D1DATA20 19
D1DATA21 20
D1DATA22 21
D1DATA23 22
D1DATA24 23
D1DATA25 24
D1DATA26 25
D1DATA27 26
D1DATA28 27
D1DATA29 28
D1DATA30 29
D1DATA31 30

UDATA00 124
UDATA01 125
UDATA02 126
UDATA03 127
UDATA04 3
UDATA05 4
UDATA06 5
UDATA07 6
UDATA08 7
UDATA09 8
UDATA10 9
UDATA11 10
UDATA12 11
UDATA13 12
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UDATA31 30

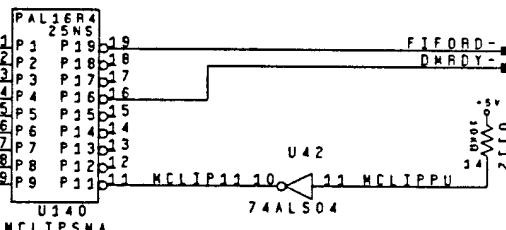
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55.64.65.76.88	
95.107.114.128	
GND PINS -	2
12.22.32.33.37	
50.54.66.75.87	
96.97.108.113	

FLD23	57
FLD22	58
FLD21	59
FLD20	60
FLD19	61
FLD18	62
FLD17	63
FLD16	67
FLD15	68
FLD14	69
FLD13	70
FLD12	71
FLD11	72
FLD10	73
FLD9	74
FLD8	77
FLD7	78
FLD6	79
FLD5	80
FLD4	81
FLD3	82
FLD2	83
FLD1	84
FLD0	87
FLRD-	104
FLWR-	105
FLWR-	103
FLRDY1	FLRDY1
FLDONE1	FLDONE1
DPSEL	DPSEL
FLA8	91 D1A08
FLA7	92 D1A07
FLA6	93 D1A06
FLA5	94 D1A05
FLA4	98 D1A04
FLA3	99 D1A03
FLA2	100 D1A02
FLA1	101 D1A01
FLA0	102 D1A00

D1DIR
D1BDY-
LCLRDY-
FLSILENT

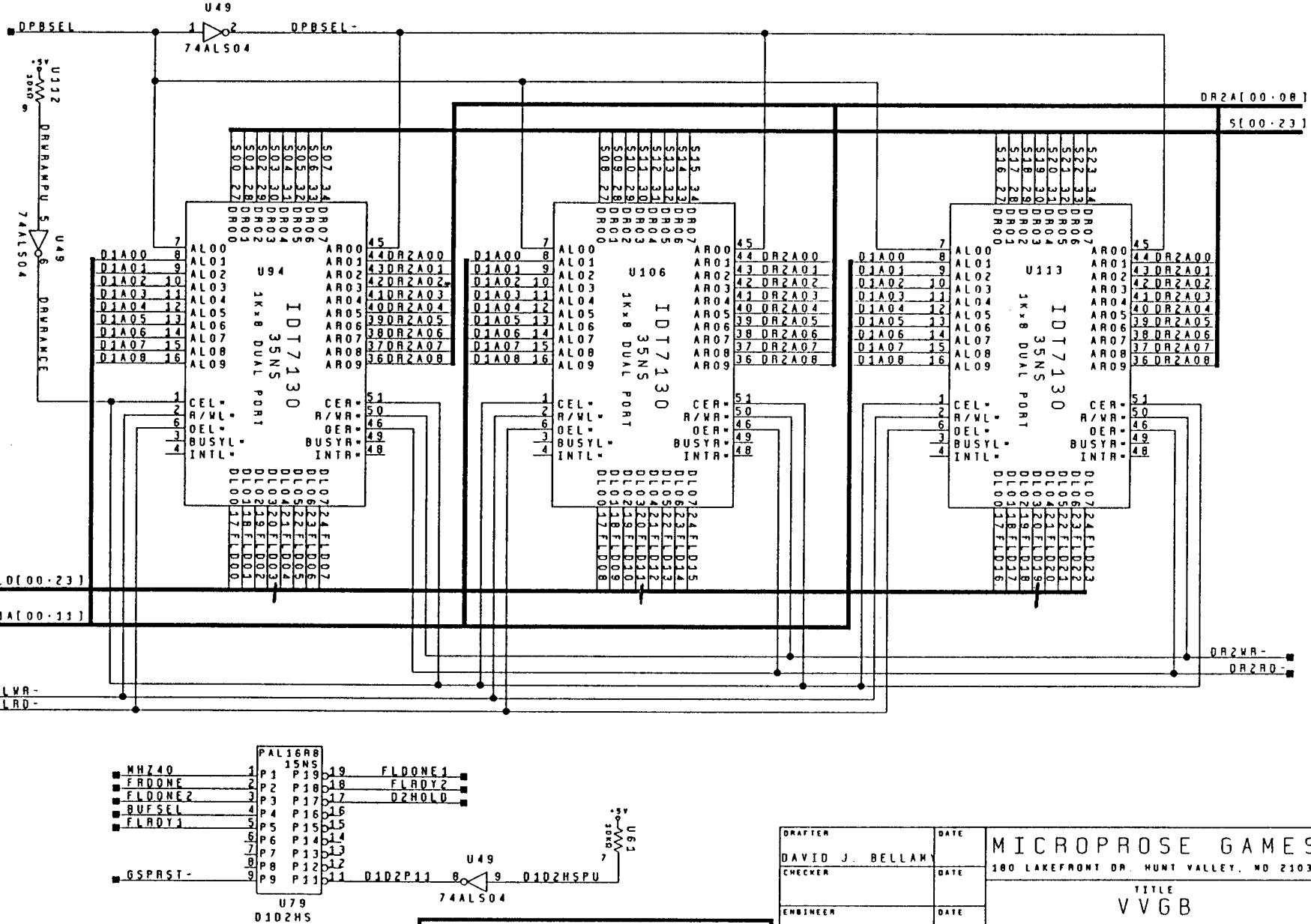
MHZ20
UCLRDY-
CLDIR-
FEMPTY-
CLDEN-



COMPANY PROPRIETARY
CONFIDENTIAL INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES		
CHECKER	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
ENGINEER DOUGLAS FEROME	DATE	TITLE VVGB		
APPROVAL Ferome	DATE 1991	SIZE C	DRAWING NUMBER DW-00011C-0013-03	
REV	RELEASE			
DATE 12-17-1990-10-05 SHEET 16 OF 27				



COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
DOUGLAS FROME			
APPROV.	DATE		
U61	SIZE	DRAWING NUMBER	
74ALS04	C	DW-00011C-0013-03	
U49	REV	RELEASE	
U79	DATE 12-17-1990-10-05 SHEET 17 OF 27		

D

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E

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MHZ40
MRSR-

F1SILENT 57 SILENT
FLDONE2 156 DONE-
FLRDY2 55 RDY-
DR2WR- 37 FLW-

DR2RD- 3 FLOE-

DR2A[00-0B] 38 FLA9
DR2A08 43 FLA8
DR2A07 44 FLA7
DR2A06 45 FLA6
DR2A05 46 FLA5
DR2A04 47 FLA4
DR2A03 36 FLA3
DR2A02 49 FLA2
DR2A01 52 FLA1
DR2A00 53 FLA0
S23 34 S23
S22 32 S22
S21 31 S21
S20 30 S20
S19 29 S19
S18 35 S18
S17 25 S17
S16 24 S16
S15 23 S15
S14 22 S14
S13 21 S13
S12 20 S12
S11 19 S11
S10 18 S10
S09 17 S9
S08 16 S8
S07 7 S7
S06 12 S6
S05 11 S5
S04 10 S4
S03 9 S3
S02 6 S2
S01 5 S1
S00 4 S0

MPGDRAW2 ASIC

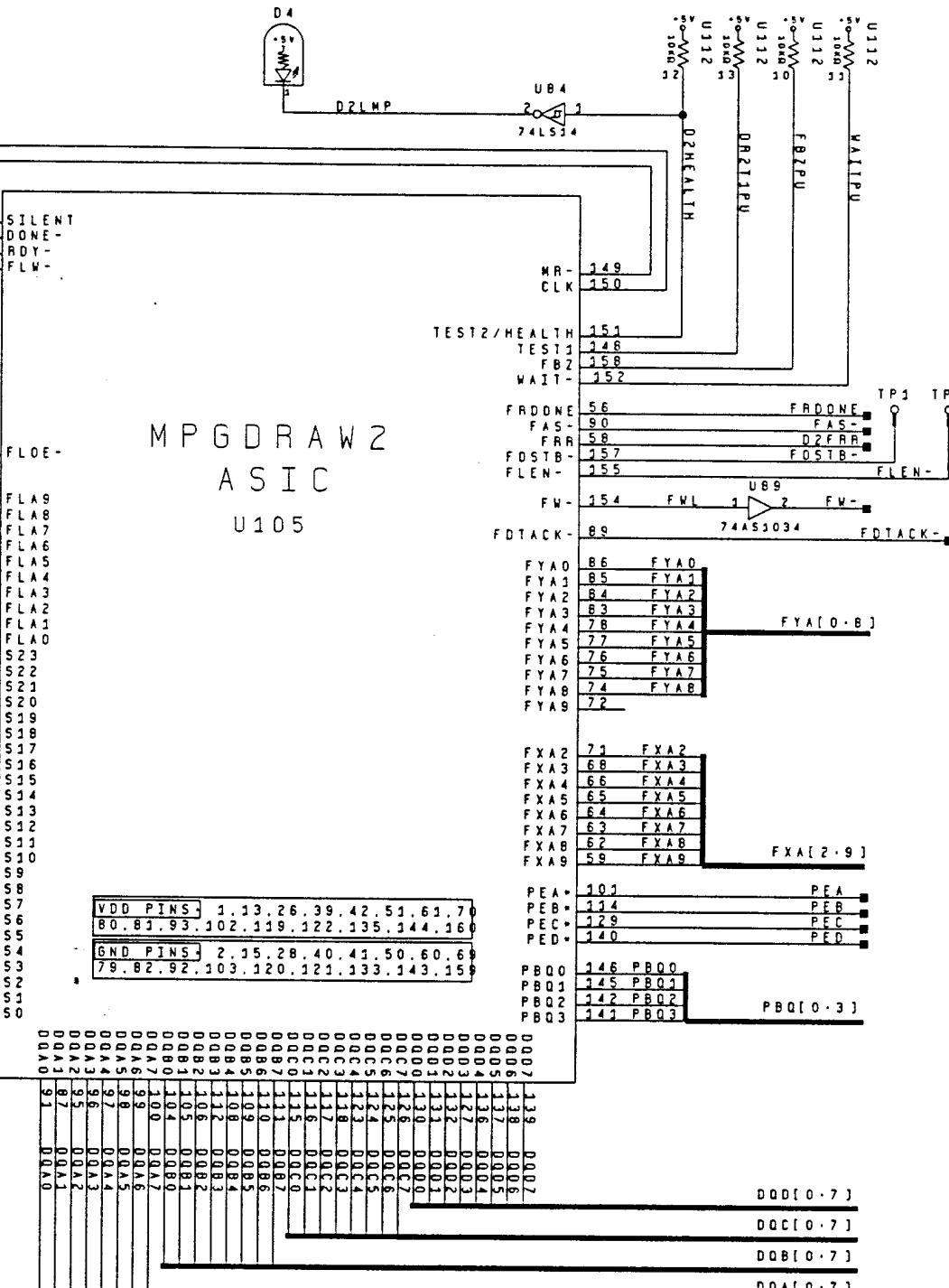
U105

VDD PINS 1, 13, 26, 39, 42, 51, 61, 70

80, 83, 93, 102, 119, 122, 135, 144, 160

GND PINS 2, 15, 28, 40, 41, 50, 60, 69

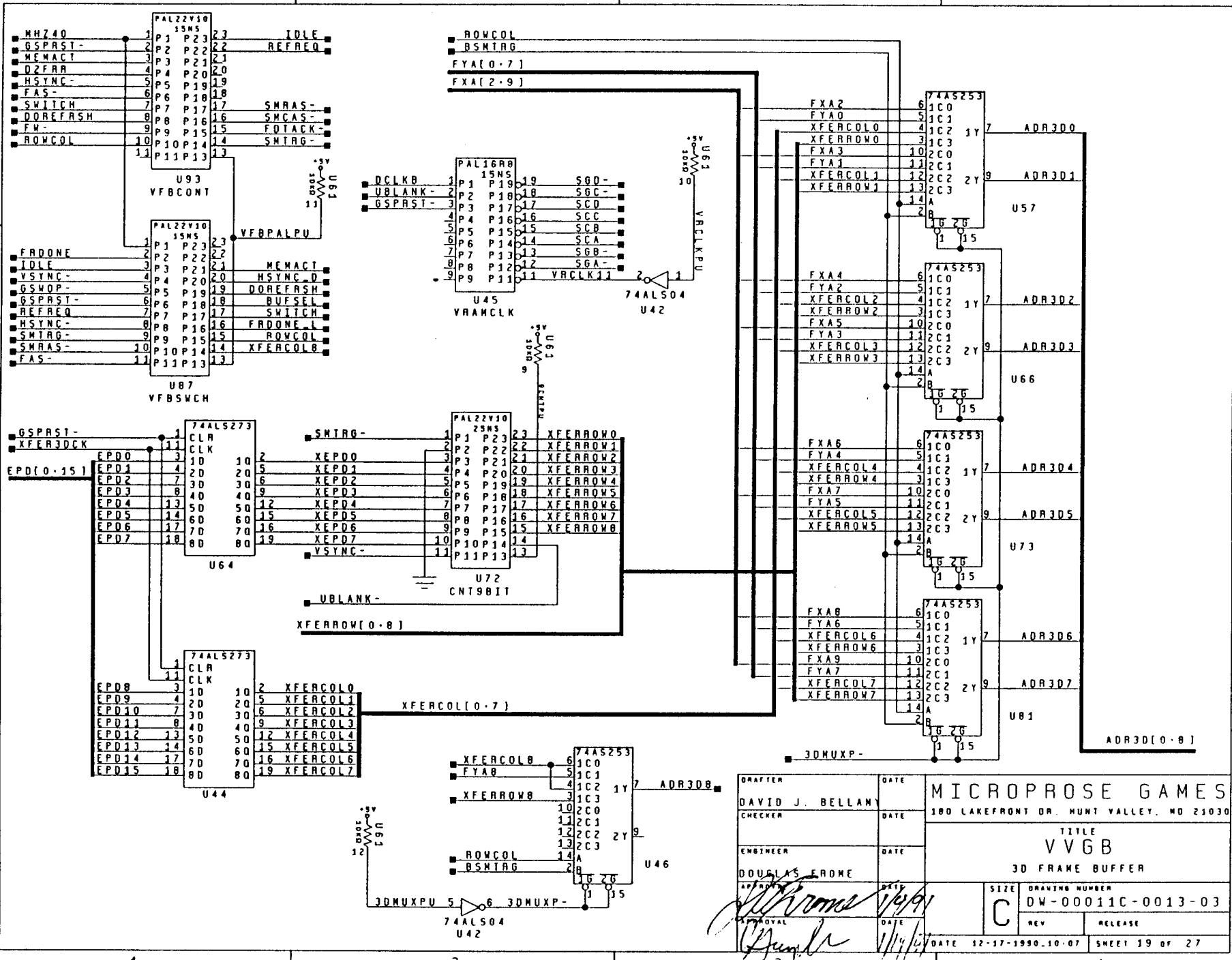
79, 82, 92, 103, 120, 121, 133, 143, 159



COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES	
CHECKER	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER	DATE	TITLE	
DOUGLAS FROME	DATE	VVGB	
APPROVED <i>Frome 12/14/91</i>	DATE	DRAWING NUMBER	
STAMPED <i>Frome 12/14/91</i>	DATE	C	DW-00011C-0013-03
		REV	RELEASE
		DATE 12-17-1990 10-06 SHEET 18 OF 27	



MICROPROSE GAMES
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

TITLE
VVGB

3D FRAME BUFFER

DRAFTER	DATE	SIZE	DRAWING NUMBER
DAVID J. BELLAMY			
CHECKER	DATE		DW-00011C-0013-03
ENGINEER	DATE		REV
DOUGLAS EROME			
APPROVAL	DATE		RELEASE
J. Erome	1991		
DATE	12-17-1990	10-07	SHEET 19 OF 27

4 3 2 1

4 3 2 1

DQ[0-7]

DOB[0-7]

DOA[0-7]

U83							
DQA0	2	1A1	1Y1	18	BDOA0		
DQA1	4	1A2	1Y2	16	BDOA1		
DQA2	6	1A3	1Y3	14	BDOA2		
DQA3	8	1A4	1Y4	12	BDOA3		
DQA4	10	2A1	2Y1	9	BDOA4		
DQA5	12	2A2	2Y2	7	BDOA5		
DQA6	14	2A3	2Y3	5	BDOA6		
DQA7	16	2A4	2Y4	3	BDOA7		
	16	ZG					
	1		19				

U75							
DQB0	2	1A1	1Y1	18	BDOB0		
DQB1	4	1A2	1Y2	16	BDOB1		
DQB2	6	1A3	1Y3	14	BDOB2		
DQB3	8	1A4	1Y4	12	BDOB3		
DQB4	10	2A1	2Y1	9	BDOB4		
DQB5	12	2A2	2Y2	7	BDOB5		
DQB6	14	2A3	2Y3	5	BDOB6		
DQB7	16	2A4	2Y4	3	BDOB7		
	16	ZG					
	1		19				

U68							
DOC0	2	1A1	1Y1	18	BDOC0		
DOC1	4	1A2	1Y2	16	BDOC1		
DOC2	6	1A3	1Y3	14	BDOC2		
DOC3	8	1A4	1Y4	12	BDOC3		
DOC4	10	2A1	2Y1	9	BDOC4		
DOC5	12	2A2	2Y2	7	BDOC5		
DOC6	14	2A3	2Y3	5	BDOC6		
DOC7	16	2A4	2Y4	3	BDOC7		
	16	ZG					
	1		19				

B00C[0-7]

B00B[0-7]

B00A[0-7]

PBQ[0-3]

DOQ[0-7]

U59							
DQD0	2	1A1	1Y1	18	BQD00		
DQD1	4	1A2	1Y2	16	BQD01		
DQD2	6	1A3	1Y3	14	BQD02		
DQD3	8	1A4	1Y4	12	BQD03		
DQD4	10	2A1	2Y1	9	BQD04		
DQD5	12	2A2	2Y2	7	BQD05		
DQD6	14	2A3	2Y3	5	BQD06		
DQD7	16	2A4	2Y4	3	BQD07		
	16	ZG					
	1		19				

U47							
BQ00	2	1A1	1Y1	18	PBQ0		
BQ01	4	1A2	1Y2	16	PBQ1		
BQ02	6	1A3	1Y3	14	PBQ2		
BQ03	8	1A4	1Y4	12	PBQ3		
BQ04	10	2A1	2Y1	9	PBQ4		
BQ05	12	2A2	2Y2	7	PBQ5		
BQ06	14	2A3	2Y3	5	PBQ6		
BQ07	16	2A4	2Y4	3	PBQ7		
	16	ZG					
	1		19				

B00[0-3]

B00D[0-7]

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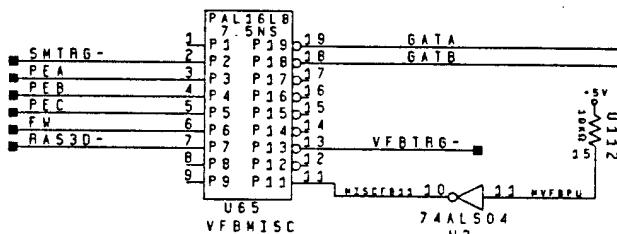
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 CHECKER: _____ DATE: _____
 ENGINEER: DOUGLAS FROOME DATE: _____
 APPROVED: _____ DATE: _____
 APPROVAL: _____ DATE: _____
 SIZE: C DRAWING NUMBER: DW-00011C-0013-03
 REV: _____ RELEASE: _____
 DATE 12-17-1990-10-07 SHEET 20 OF 27

VVGB
3D FRAME DATA BUS BUFFERS

E

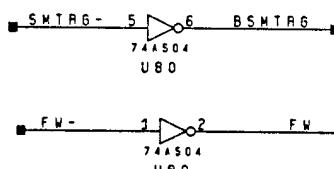
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 BDDB[0-7]
 BDCC[0-7]
 BDOD[0-7]



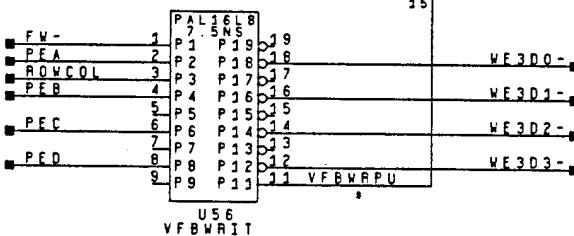
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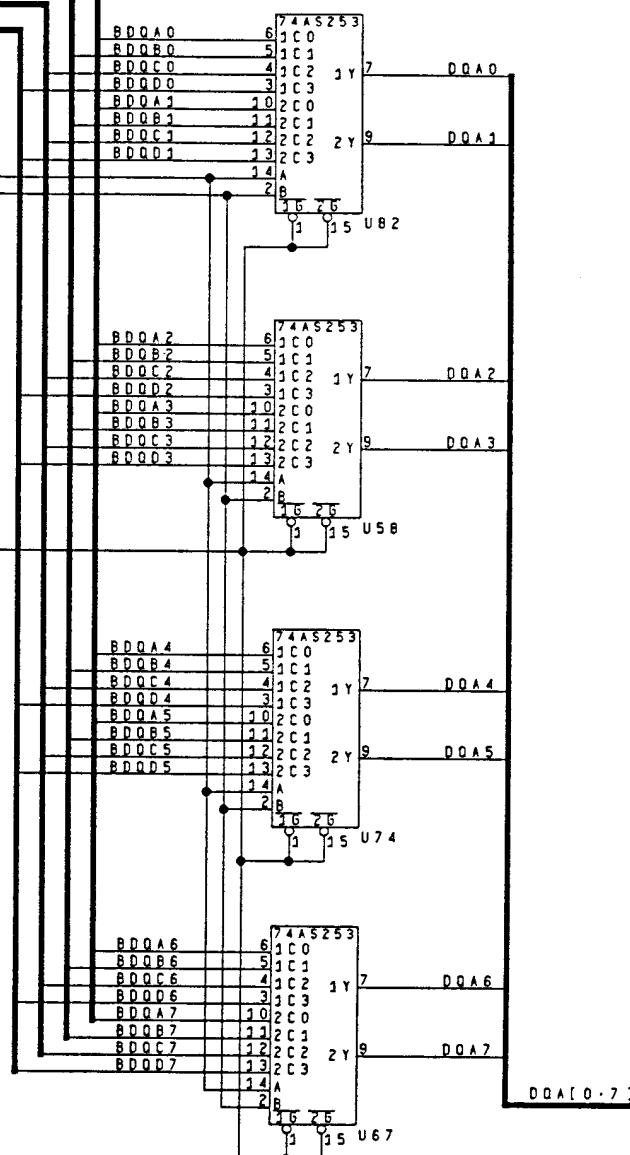
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C



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B



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DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
DOUGLAS FROOME		TITLE	
APPROVAL	DATE	VVGB	
APPROVAL	DATE	VIDEO FRAME BUFFER READBACK	
		SIZE	DRAWING NUMBER
		C	DW-00011C-0013-03
		REV	RELEASE
		DATE 12-17-1990, 10-09 SHEET 21 OF 27	

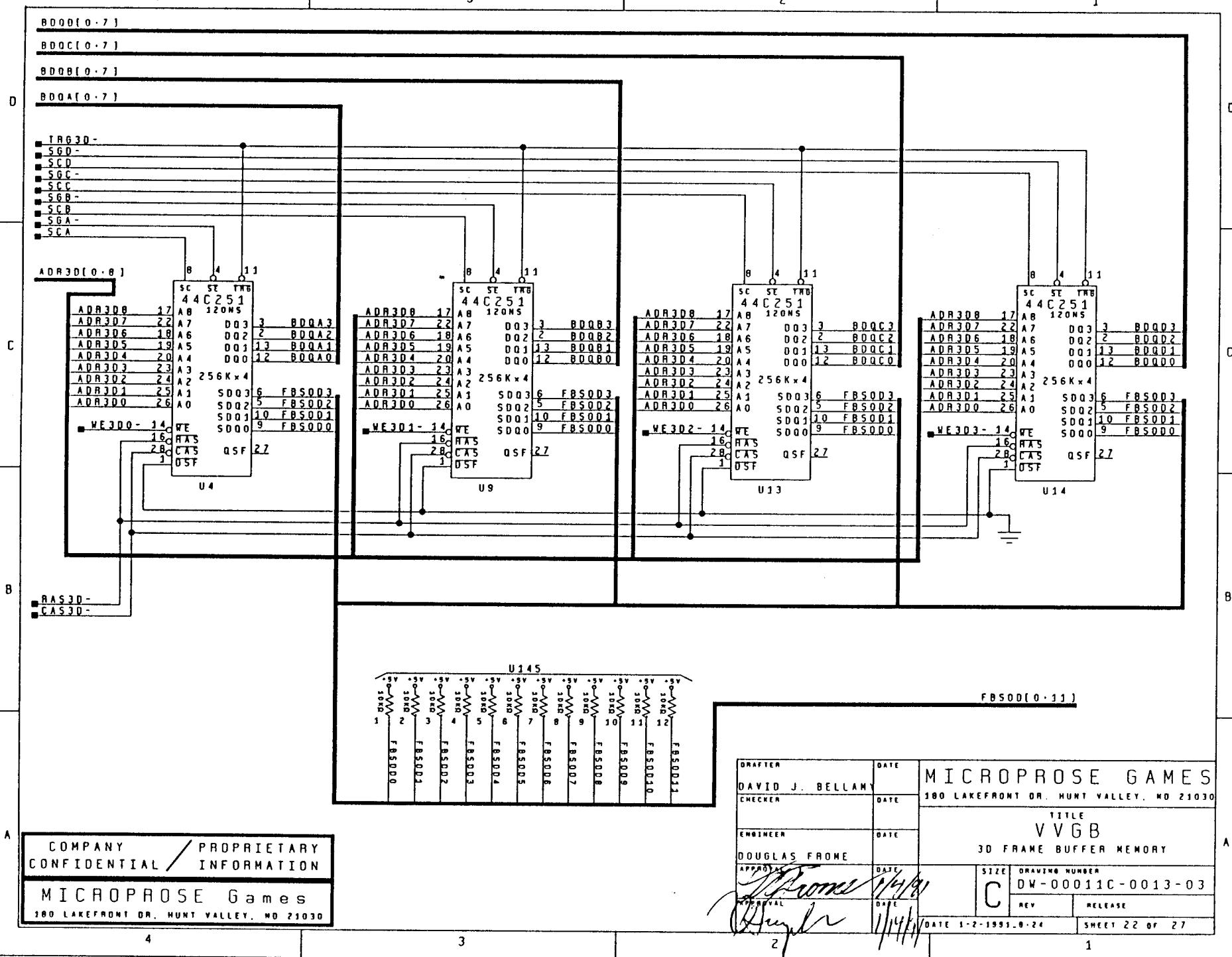
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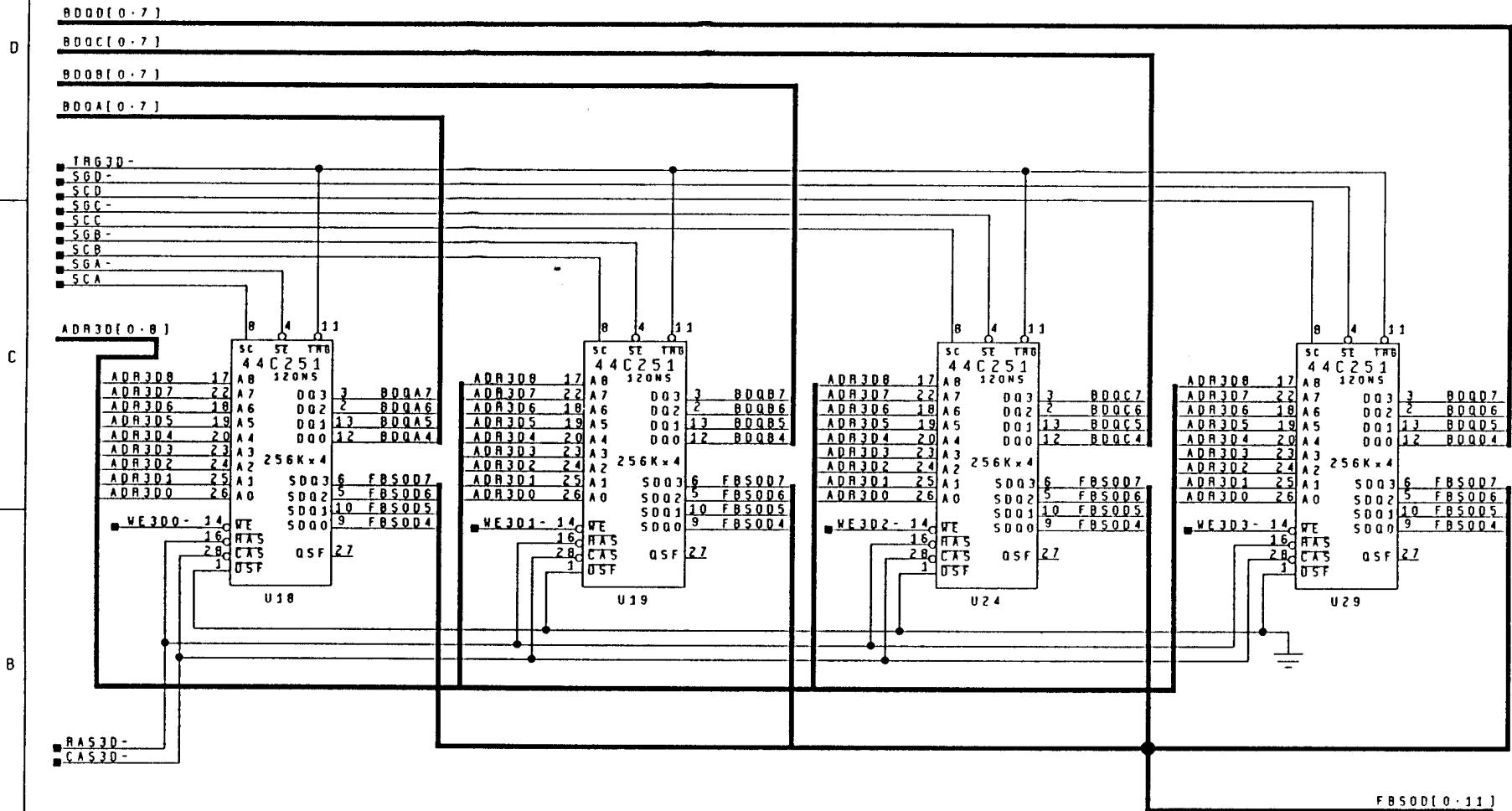
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180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE	TITLE	
		VVGB	
ENGINEER	DATE	3D FRAME BUFFER MEMORY	
DOUGLAS FROME		SIZE	DRAWING NUMBER
APPROVAL	DATE	C	DW-00011C-0013-03
INITIAL	DATE	REV	RELEASE
J. Frome 1/4/91		DATE 1-2-1991-8-33 SHEET 23 OF 27	

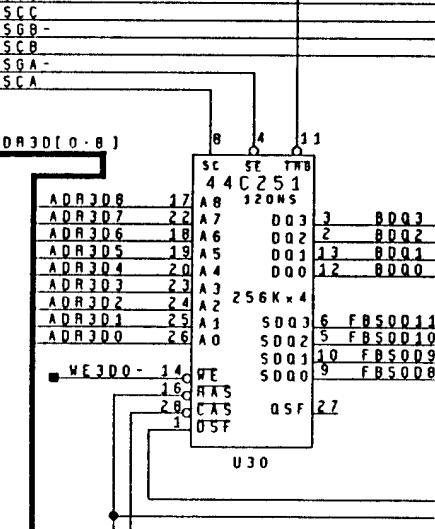
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B00[0 - 3]

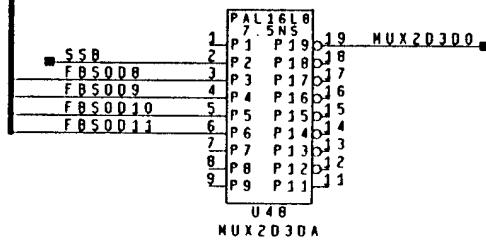
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- SGD -
- SCD -
- SGC -
- SCC -
- SGB -
- SCB -
- SGA -
- SCA -

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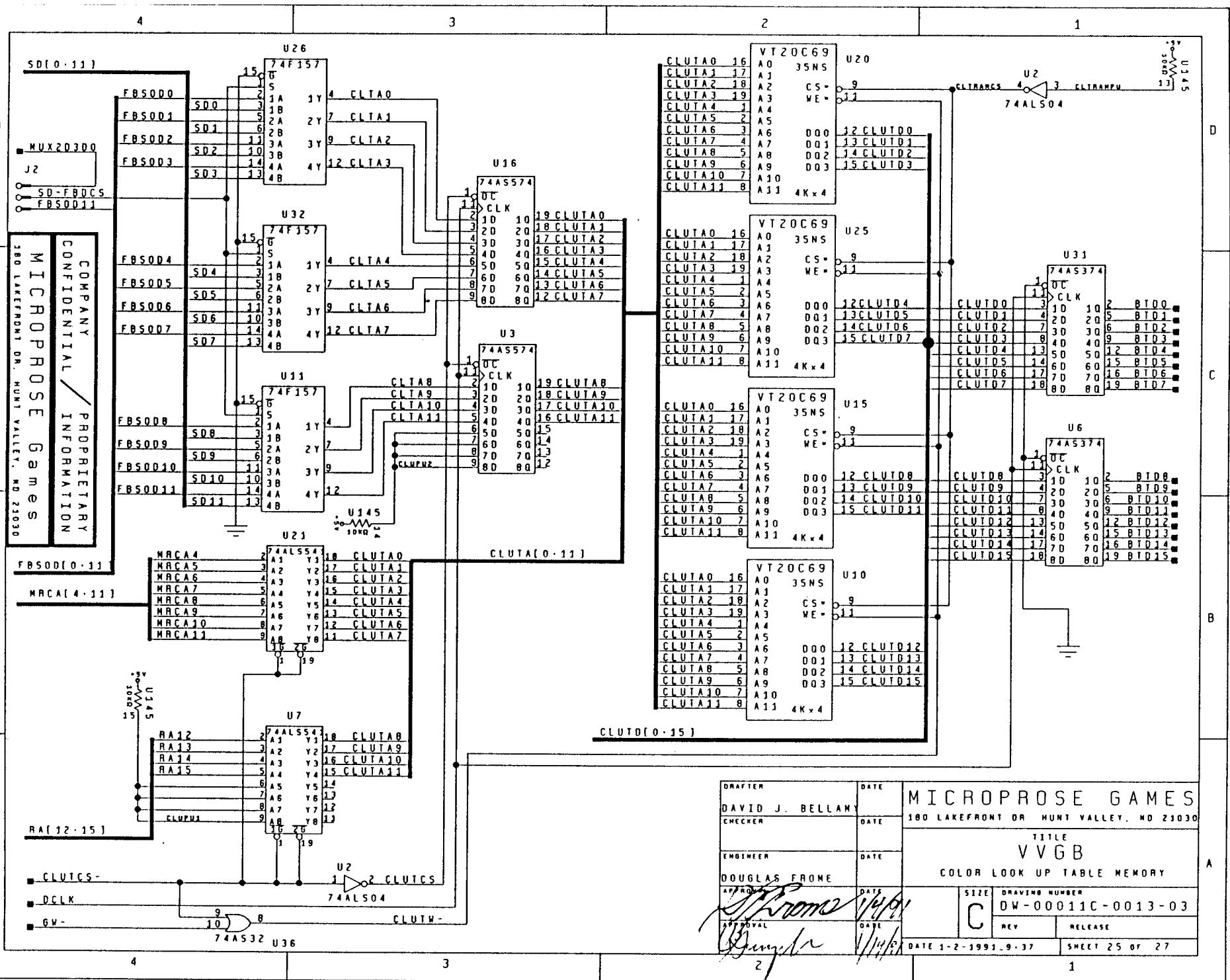


FB500[0 - 11]



DRAFTER		DATE	MICROPROSE GAMES	
CHECKER		DATE	TITLE	
ENGINEER		DATE	3D FRAME BUFFER MEMORY	
APPROVAL		DATE	SIZE	DRAWING NUMBER
REV		RELEASE	DATE 11-13-1990-17-49 SHEET 24 OF 27	

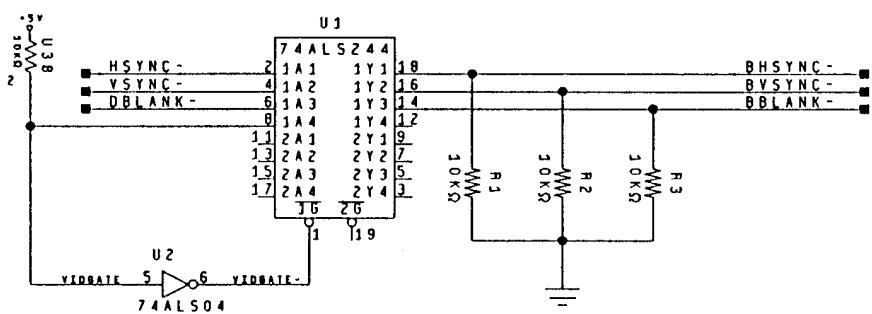
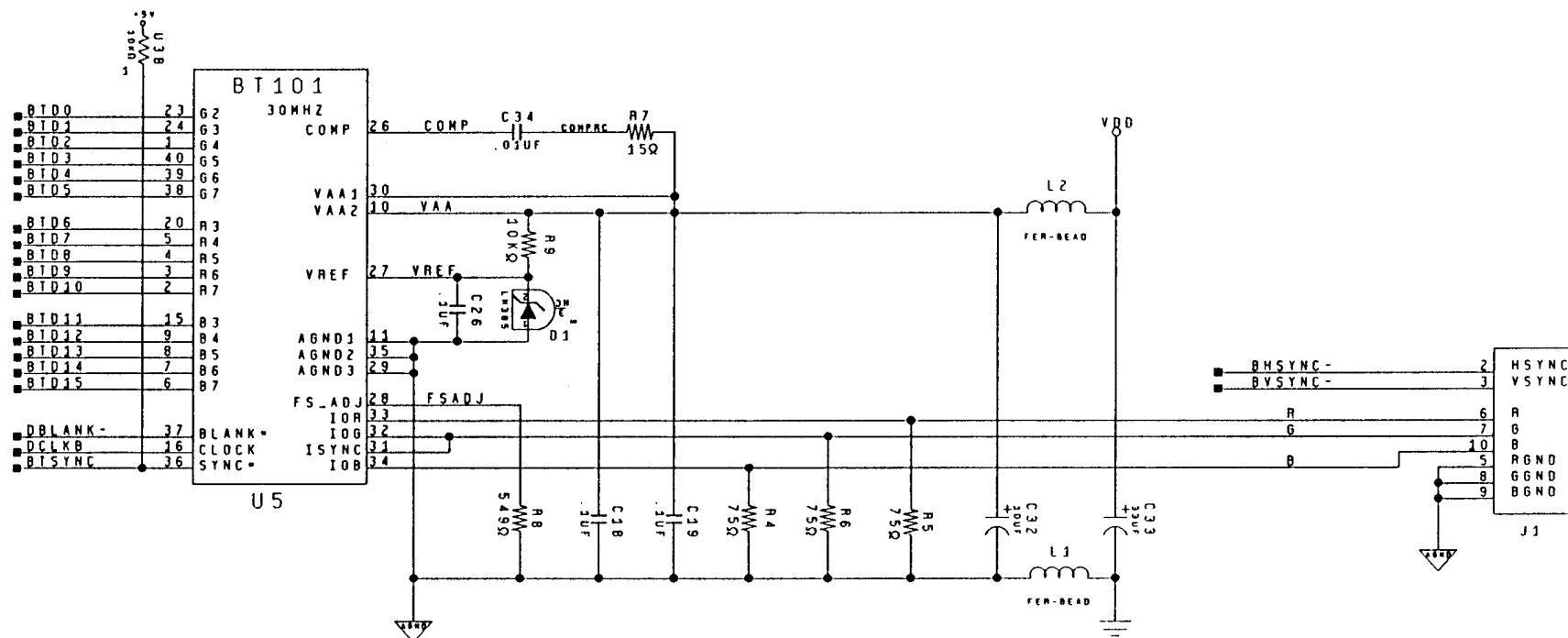
Frome 1/4/91
Bellamy 1/4/91



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180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE		
ENGINEER	DATE		
DOUGLAS FROME			
APPROVAL	DATE	SIZE	DRAWING NUMBER
DOUGLAS FROME	3/4/91	C	DW-00011C-0013-03
APPROVAL	DATE	REV	A RELEASE
DOUGLAS FROME	3/14/91		
DATE 1-2-1991-9-38		SHEET 26 OF 27	

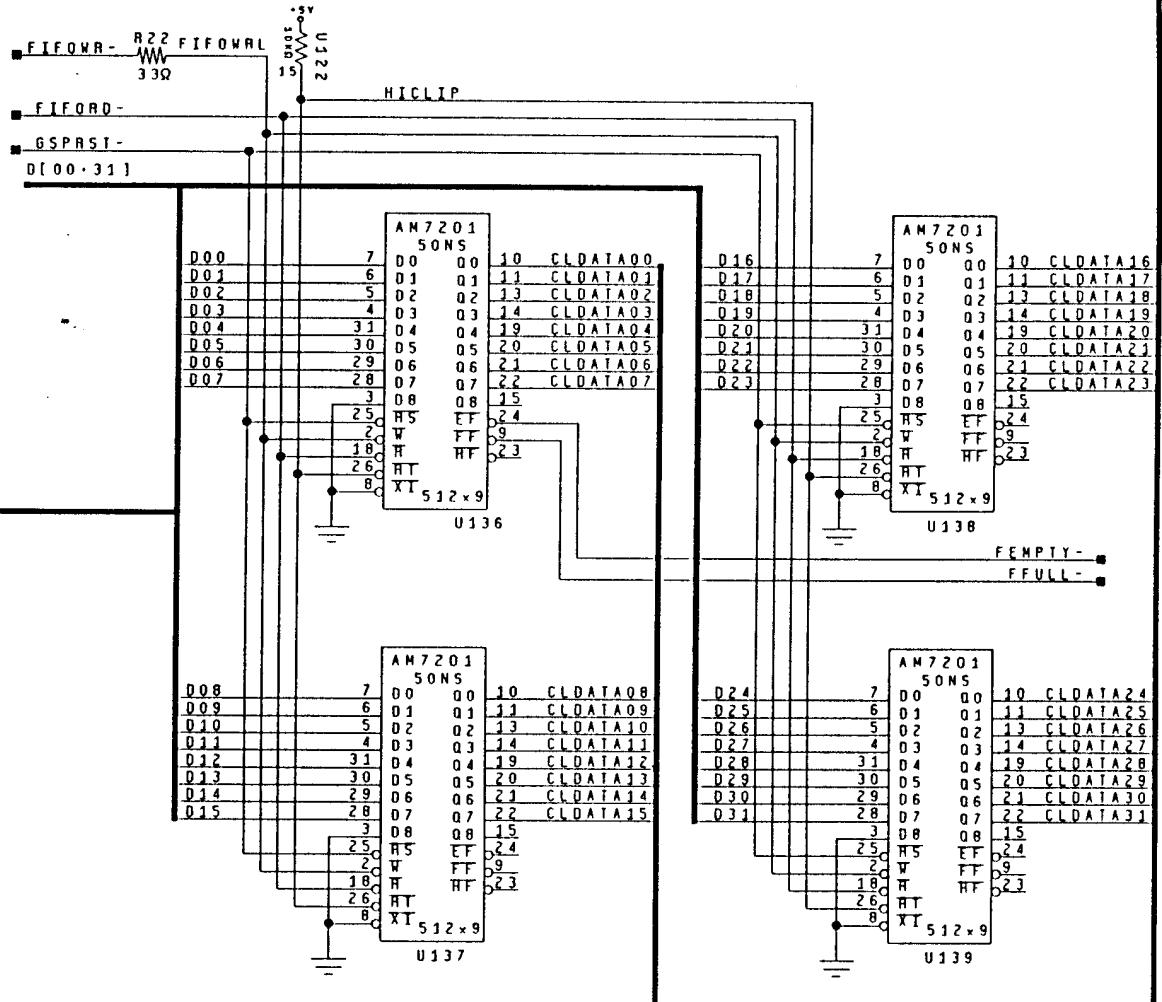
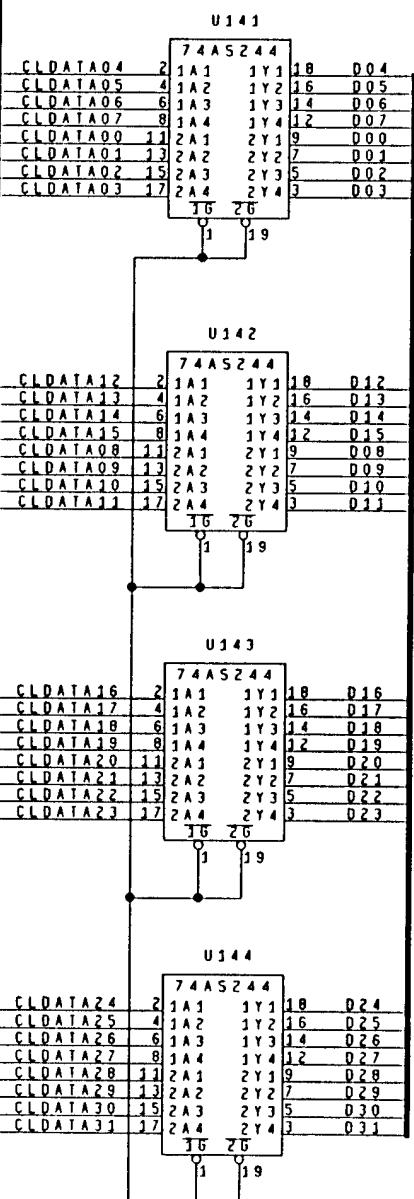
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CLDATA[00-31]



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DRAFTER DATE MICROPORSE GAMES
DAVID J. BELLAMY
CHECKER DATE 180 LAKEFRONT DR. HUNT VALLEY, MD 21030
ENGINEER DATE TITLE
DOUGLAS FROME VVGB
APPROVAL DATE OR MATH TO CLIPPER FIFO MEMORY
Fromez 1/14/91 SIZE DRAWING NUMBER
APPROVAL DATE DW-00011C-0013-03
Fromez 1/14/91 REV RELEASE
APPROVAL DATE DATE 1-2-1991-9-53 SHEET 27 OF 27
Fromez 1/14/91

BILL OF MATERIALS
VIDEO GRAPHICS P.C.B.
ASSEMBLY: A10-00003-003

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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES		
CHECKER	DATE	180 LAKEFRONT DRIVE, HUNT VALLEY, MD 21030		
ENGINEER DOUGLAS FROME	DATE	TITLE BILL OF MATERIALS VIDEO GRAPHICS P.C.B. WITH VLSI CLIPPERS A 10-00003-003	DWG NO PL-00011A-0013-03	REV B
APPROVAL <i>Frone 1/15/91</i>	DATE	DATE 1-15-1991-14-17		
APPROVAL	DATE	SHEET 1 OF 8	A	

MICROPROSE GAMES, 180 Lakefront Drive, Hunt Valley, Maryland 21030
 PROJECT: Video Graphics PCB DRWG NO: PL-00011A-0013-003 REV:B
 DATE: Wed 19-Dec-1990

ITEM	QTY	VENDOR	PART NUMBER REF. DES.	PART DESC	VALUE	MPG P/N
1	*	4	AM7201-50JC U136,U137,U138,U139	512x9FIFO	50NS	222-00004-450
2		1	71922-010 J1	2X5HEADER	.100"	610-00800-010
3		3	11C1210X7R104K050NT C18,C19,C26	SMTCERCAP	0.1UF	401-02002-104
4		1	LM385BZ-1.2 D1	ZENER	1.2V	301-00001-012
5		1	11C1210X7R103K050NT C34	SMTCERCAP	0.01UF	401-02002-103
6		1	293D336X9016D2T C33	SMTTANTCAP	33UF	420-00163-336
7		1	BT101KC30 U5	VIDEODAC	30MHZ	245-00001-230
8		2	2743019446 L2,L1	FERRITEBD	75 OHM	595-00001-100
9		1	293D106X9016C2T C32	SMTTANTCAP	10UF	420-00162-106
10		1	CCF-50 15R0F R7	1%MFRES	15 OHM	503-00001-150
11		1	CCF-50 5490F R8	1%MFRES	549 OHM	503-00001-551
12		3	CCF-50 75R0F R6,R5,R4	1%MFRES	75 OHM	503-00001-750
13		4	CCF-50 1002F R9,R3,R2,R1	1%MFRES	10KOHM	503-00001-103
14		2	SN74ALS541N U7,U21	OCTDRVRS		200-00541-200
15		3	MC74F157AN U11,U26,U32	QUAD2:1MUX		203-00157-200
16		1	GAL16V8-15LP U65	VFBMISCA	15 NS	120-00002-010
17		2	SN74AS374N U6,U31	OCTREGISTER		201-00374-200

ITEM	QTY	VENDOR PART NUMBER REF. DES.	PART DESC	VALUE	MPG P/N
18	2	SN74AS574N U3 , U16	OCTREGISTER		201-00574-200
19	*	4 VT20C69-35PC U10 , U15 , U20 , U25	4Kx4SRAM	35NS	221-00002-235
20					
21	1	AmPAL16L8-7CN U56	VFBWRITC	7.5 NS	120-00002-211
22	1	SN74AS32N U36	HEX2-IN'OR'		201-00032-200
23	9	SN74AS244DW U47 , U59 , U68 , U75 , U83 , U141 , U143 , U144 , U142	SMTOCTBUFFERS		201-00244-100
24	1	GAL16V8-15LP U45	VRAMCLKA	15NS	120-00002-001
25	1	GAL22V10-15LP U93	VFBCONTA	15NS	120-00002-002
26	1	GAL22V10-15LP U87	VFBSWCHA	15NS	120-00002-003
27	9	SN74AS253DW U46 , U57 , U58 , U67 , U66 , U73 , U74 , U81 , U82	SMTDUAL4:1MUX		201-00253-100
28	1	GAL22V10-25LP U72	CNT9BITA	25NS	120-00002-004
29	*	1 MPGDRAW2 U105	DRAW2ASIC	40MHZ	100-TB001-340
30	1	SN74AS1034AN U89	HEXDIVER		201-01034-200
31	*	3 IDT7130SA-35J U94 , U106 , U113	1Kx8DPSRAM	35NS	222-00002-435
32	1	GAL16V8-15LP U79	D1D2HSA	15NS	120-00002-005
33	1	GAL16V8-25LP U140	MCLIPSMA	25NS	120-00002-006
34	*	1 MPGDRAW1 U107	DRAW1ASIC	20MHZ	100-PK001-320
35	*	6 MPGCLIPPER U118 , U119 , U120 , U127 , U128 , U129	CLIPPERASIC	20MHZ	100-MW001-320

<u>ITEM</u>	<u>QTY</u>	<u>VENDOR PART NUMBER</u>	<u>PART DESC</u>	<u>VALUE</u>	<u>MPG P/N</u>
<u>REF. DES.</u>					
36	*	20 HM534251ZP-12 U4, U8, U9, U12, U13, U14, U17, U18, U19, U22, U23, U25, U27, U28, U29, U30, U33, U34, U35, U41	256Kx4VRAM	120NS	222-00006-612
37	1	SN74ALS2541N U39	OCTDRVRW/SERRES		200-02541-200
38	*	4 TMS44C256-12N U37, U43, U50, U54	256Kx4DRAM	120NS	220-00002-212
39	1	AM29C863PC U71	9BITXCVR		235-00005-200
40	2	SN74ALS244ADW U1, U62	SMT OCTBUFFERS		200-00244-100
41	1	AM29C823ASC U78	SMT 9BITLATCH		235-00004-100
42	1	GAL16V8-15LP U40	VRAM_SGA	15NS	120-00002-007
43	4	SN74ALS273N U44, U51, U55, U64	OCTREGISTERS		200-00273-200
44	1	GAL22V10-15LP U77	GADRDC1A	15NS	120-00002-008
45	1	AM29841APC U63	10BITLATCHES		235-00008-100
46	1	GAL22V10-25LP U86	GADRDC0A	25NS	120-00002-009
47					
48	1	LT1081-CN U60	RS232DRV		235-00001-200
49	1	22-05-7048 J3	MOLEX4PIN	.100"	610-00601-004
50	4	293D105X0016A2T C68, C69, C70, C71	SMT TANTCAP	1UF	420-00060-105
51					
52	*	1 SCN2651CC1N28 U69	UART		240-00002-200
53	6	SN74ALS245ADW U98, U99, U102, U103, U109, U110	SMT OCTXCVR		200-00245-100

<u>ITEM</u>	<u>QTY</u>	<u>VENDOR PART NUMBER</u>	<u>PART DESC</u>	<u>VALUE</u>	<u>MPG P/N</u>
		<u>REF. DES.</u>			
54	D*	1 TMS34010FNL-40 U115	68PLCCGSP	40MHZ	135-34010-440
55		1 SN74ALS74N U53	DUAL DFLOPS		200-00074-200
56		1 SN74ALS08N U70	HEX2-IN'AND'		200-00008-200
57		3 SN74ALS373N U76, U85, U91	OCTLATCHES		200-00373-200
58		1 68001-502 J8, [J6, J10]	2PINJUMPER	.100"	610-00002-002
59	0	68001-503 [J2, J4, J5, J7, J9]	3PINJUMPER	.100"	610-00002-003
60		1 SN74AS04N U80	HEXINVERTER		201-00004-200
61		1 SN74LS393N U123	DUAL4BITBICNTR		202-00393-200
62		1 SN74AS74N U116	DUALDFLOPS		201-00074-200
63	6	CCF-07 100G R14, R15, R17, R18, R19, R21	2%MFRESISTOR	10 OHM	503-00002-100
64	1	X0-43D-40 U104	OSCILLATOR	40MHZ	290-00001-040
65	1	1N746A D2	ZENER	3.3V	301-00002-033
66	1	KSA1A211 SW1	PBSWITCH		625-00002-001
67	1	CCF-07 102G R10	2%MFRESISTOR	1KOHM	503-00002-102
68	1	CCF-07 820G R12	2%MFRESISTOR	82 OHM	503-00002-820
69	4	CCF-07 103G R11, R13, R16, R20	2%MFRESISTOR	10KOHM	503-00002-103
70	1	1N914 D3	DIODE		300-00002-003
71	1	LM311N U90	VOLTCOMP		280-00002-200

<u>ITEM</u>	<u>QTY</u>	<u>VENDOR PART NUMBER</u>	<u>PART DESC</u>	<u>VALUE</u>	<u>MPG P/N</u>
		<u>REF. DES.</u>			
72	1	173D335X0020V C100	AXTANTCAP	3 .3UF	422-00062-335
73	3	SN74LS14N U84 , U132 , U135	HEXSTINVERT		202-00014-200
74	3	SN74ALS04BN U2 , U42 , U49	HEXINVERTERS		200-00004-200
75	1	SN74ALS157N U125	QUAD2:1MUX		200-00157-200
76	0	XO-43D-50 U92	OSCILLATOR	50MHZ	290-00001-050
77	0	XO-43B-20 U131	OSCILLATOR	20MHZ	290-00001-020
78	4	SN74AS1004AN U100 , U111 , U117 , U126	HEXINVDRVRS		201-01004-200
79	14	7-0805G-5 TP2 , TP1 , TP5 , TP4 , TP15 , TP14 , TP13 , TP12 , TP11 , TP10 , TP9 , TP8 , TP7 , TP6	TESTPIN		710-00001-001
80	5	836C103X2PE U38 , U61 , U112 , U122 , U145	SMTPULRESPAK	10KOHM	502-00001-103
81	1	ICTE-5 D14	ZENER	5 .0V	300-00001-002
82	1	26-60-5100 0 09-52-3102 P2	MOLEX10PIN	.156"	610-00601-010 610-10600-010
83	8	TAJC156M010CR C3 , C10 , C58 , C107 , C123 , C134 , C154 , C157	SMTTANTCAP	15UF	420-00002-156
84	88	11C1206Z5U104M050NT	SMTCERCAP	0 .1UF	401-01000-104
		C1 , C2 , C4 , C5 , C7 , C9 , C13 , C21 , C28 , C36 , C41 , C42 , C45 , C47 , C48 , C50 , C52 , C53 , C54 , C55 , C56 , C59 , C60 , C61 , C63 , C64 , C65 , C66 , C67 , C72 , C73 , C74 , C75 , C76 , C77 , C78 , C79 , C80 , C81 , C82 , C83 , C84 , C85 , C86 , C87 , C88 , C89 , C90 , C91 , C92 , C93 , C95 , C96 , C97 , C98 , C99 , C101 , C102 , C103 , C104 , C106 , C109 , C110 , C111 , C113 , C114 , C115 , C118 , C119 , C120 , C124 , C132 , C133 , C136 , C137 , C139 , C140 , C141 , C143 , C148 , C153 , C155 , C156 , C158 , C159 , C160 , C161			
85	10	HLMP3600 D4 , D5 , D6 , D7 , D8 , D9 , D10 , D11 , D12 , D13	LED	RED	305-00003-002
86	1	71922-140 P3	2x20RACONNECTR	.100"	610-00900-040

ITEM	QTY	VENDOR PART NUMBER REF. DES.	PART DESC	VALUE	MPG P/N
87	53	11C1206Z5U334M050NT	SMT CER CAP C6, C11, C12, C14, C15, C16, C17, C20, C22, C23, C24, C25, C27, C29, C30, C31, C35, C37, C38, C39, C40, C43, C44, C46, C49, C51, C57, C62, C94, C105, C108, C112, C116, C117, C121, C125, C126, C127, C128, C129, C130, C131, C135, C138, C142, C144, C145, C146, C147, C149, C150, C151, C152	0.33UF	401-02000-334
88 A*	1	AM27C010-155DC U101	128Kx8EPROM VGBK0BY0.001	150NS	110-00002-101
89 A*	1	AM27C010-155DC U108	128Kx8EPROM VGBK0BY1.001	150NS	110-00002-102
90 A*	1	AM27C010-155DC U114	128Kx8EPROM VGBK1BY0.001	150NS	110-00002-103
91 A*	1	AM27C010-155DC U97	128Kx8EPROM VGBK1BY1.001	150NS	110-00002-104
92 A*	1	AM27C010-305DC U124	128Kx8EPROM VGBK2BY0.001	300NS	110-00002-105
93 A*	1	AM27C010-305DC U121	128Kx8EPROM VGBK2BY1.001	300NS	110-00002-106
94 A*	1	AM27C010-305DC U130	128Kx8EPROM VGBK3BY0.001	300NS	110-00002-107
95 A*	1	AM27C010-305DC U133	128Kx8EPROM VGBK3BY1.001	300NS	110-00002-108
96 A	0	2-644018-2 [UX97, UX101, UX108, UX114, UX121, UX124, UX130, UX133]	32PIN SOCKET	.600"	600-00003-632
97 B	0	ICO-324MTT [UX72, UX77, UX86, UX87, UX93]	24PIN SOCKET	.300"	600-00001-324
98 C	5	ICO-320MTT UX40, UX45, UX65, UX79, UX140	20PIN SOCKET	.300"	600-00001-320
99 D	1	PLCC-68-P-T UX115	68PLCC SOCKET		602-00001-068
100	1	68686-102 FOR J8	SHUNT		715-00001-001
101	0	SRS8-12-01	SPACER	.750"	700-00001-031

<u>ITEM</u>	<u>QTY</u>	<u>VENDOR PART NUMBER</u>	<u>PART DESC</u>	<u>VALUE</u>	<u>MPG P/N</u>
<u>REF. DES.</u>					
102	1	ZS5-120-02-L-D-615 P1	2x20CONNECTOR	.100"	610-00004-040
103	1	CCF-07 330G R22	2%MFRESISTOR	33 OHM	503-00002-330
104 ** 0		AmPAL16L8-7CN U49	MUX2D3DA	7.5NS	120-00002-012

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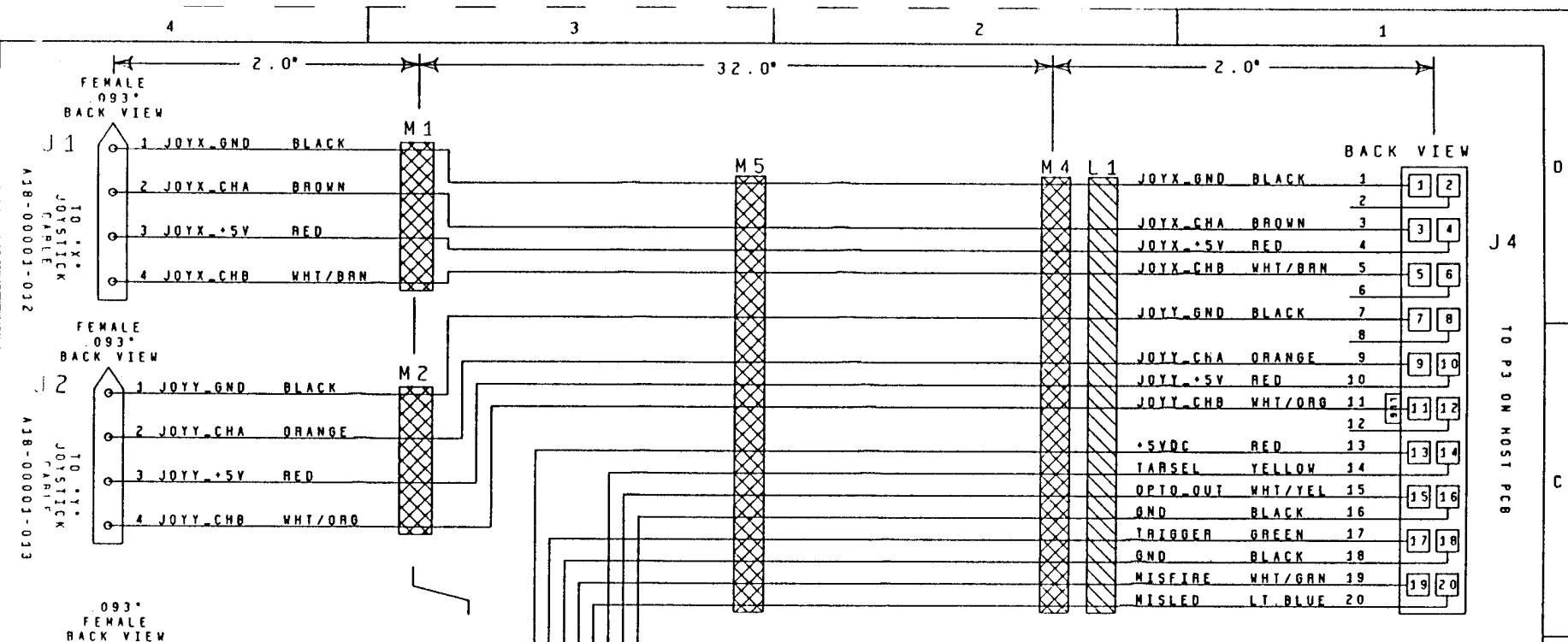
NOTES:

1. PARTS REQUIRING 0.33UF DECOUPLING CAPACITORS ARE DESIGNATED WITH AN ASTERISK (*) BETWEEN THE ITEM AND QTY COLUMNS.
2. PARTS REQUIRING SOCKETS ARE MARKED WITH A LETTER CORRESPONDING TO THE SOCKETS (SOCKETS ARE ITEMS 96 - 99).
3. ALL PARTS WITH A DOUBL ASTERISK (**) NEXT TO ITEM NUMBER ARE NOT POPULATED FOR THE CURRENT BUILD.

Dec 19, 1990

F15 CABLE AND HARNESS LIST

Drawing No.	Assembly No.	Name
DW-00014C-0002	A18-00001-002	JOYSTICK CABLE
DW-00014C-0003	A18-00001-003	PANEL CONTROL HARNESS
DW-00014C-0004	A18-00001-004	COIN DOOR
DW-00014C-0005	A18-00001-005	THROTTLE/PANEL
DW-00014C-0006	A18-00001-006	RS-232 CABLE
DW-00014C-0007	A18-00001-007	HOST TO VGB
DW-00014C-0008	A18-00001-008	LEFT SPEAKER CABLE
DW-00014C-0009	A18-00001-009	THROTTLE HARNESS
DW-00014C-0010	A18-00001-010	JOYSTICK HARNESS
DW-00014C-0011	A18-00001-011	RIGHT SPEAKER CABLE
DW-00014C-0012	A18-00002-001	DC POWER HARNESS
DW-00014C-0013		NOT USED
DW-00014C-0014	A18-00003-002	INPUT A.C. HARNESS
DW-00014C-0015	A18-00003-003	A.C. TRAY TO CABINET TOP
DW-00014C-0016	A18-00003-004	100 VOLT TRANSFORMER CABLE
DW-00014C-0017	A18-00003-005	120 VOLT TRANSFORMER CABLE
DW-00014C-0018	A18-00003-006	240 VOLT TRANSFORMER CABLE
DW-00014C-0019	A18-00003-007	TRANSFORMER ASSEMBLY
DW-00014C-0020	A18-00003-008	BILL ACCEPTOR CABLE
DW-00014C-0021		NOT USED
DW-00014C-0022		NOT USED
DW-00014C-0023	A18-00001-013	X JOYSTICK
DW-00014C-0024	A18-00001-012	Y JOYSTICK
DW-00014C-0025	A18-00003-010	DISPLAY CABLE
DW-00014C-0026	A18-00003-013	LOWER SHROUD HARNESS
DW-00014C-0027	A18-00002-002	D.C. FAN EXTENSION CABLE
DW-00014C-0028	A18-00003-014	MARQUEE A.C. LIGHT CONNECTOR
DW-00014C-0029	A18-00003-015	FLORESCENT LIGHT 'Y' CABLE
DW-00014C-0030	A18-00003-016	UPPER SHROUD HARNESS



PART LIST			
REF ID	MFG.	PART NO.	PIN NO.
J1	MOLEX	03-09-1042	02-09-5142
J2	MOLEX	03-09-1042	02-09-5142
J3	MOLEX	03-09-1126	02-09-5142
J4	MOLEX	14-57-1201	
L1	FAIR-RITE	2643665702	

MARKERS

A	REF ID	MFG.	PART NO.	LINE 1	TEXT	LINE 2	TEXT SIZE
M1	BRADY	HCPS.9-5008W	X JOY		.125"		
M2	BRADY	HCPS.9-5008W	Y JOY		.125"		
M3	BRADY	HCPS.9-8336W	JOYSTICK	SWITCHES	.125"		
M4	BRADY	HCPS.9-1008W	HOST PCB	P3	.125"		
M5	BRADY	HCPS.9-1008W	HOST TO JOYSTICK	DW-00014C-0002-02	.125"		

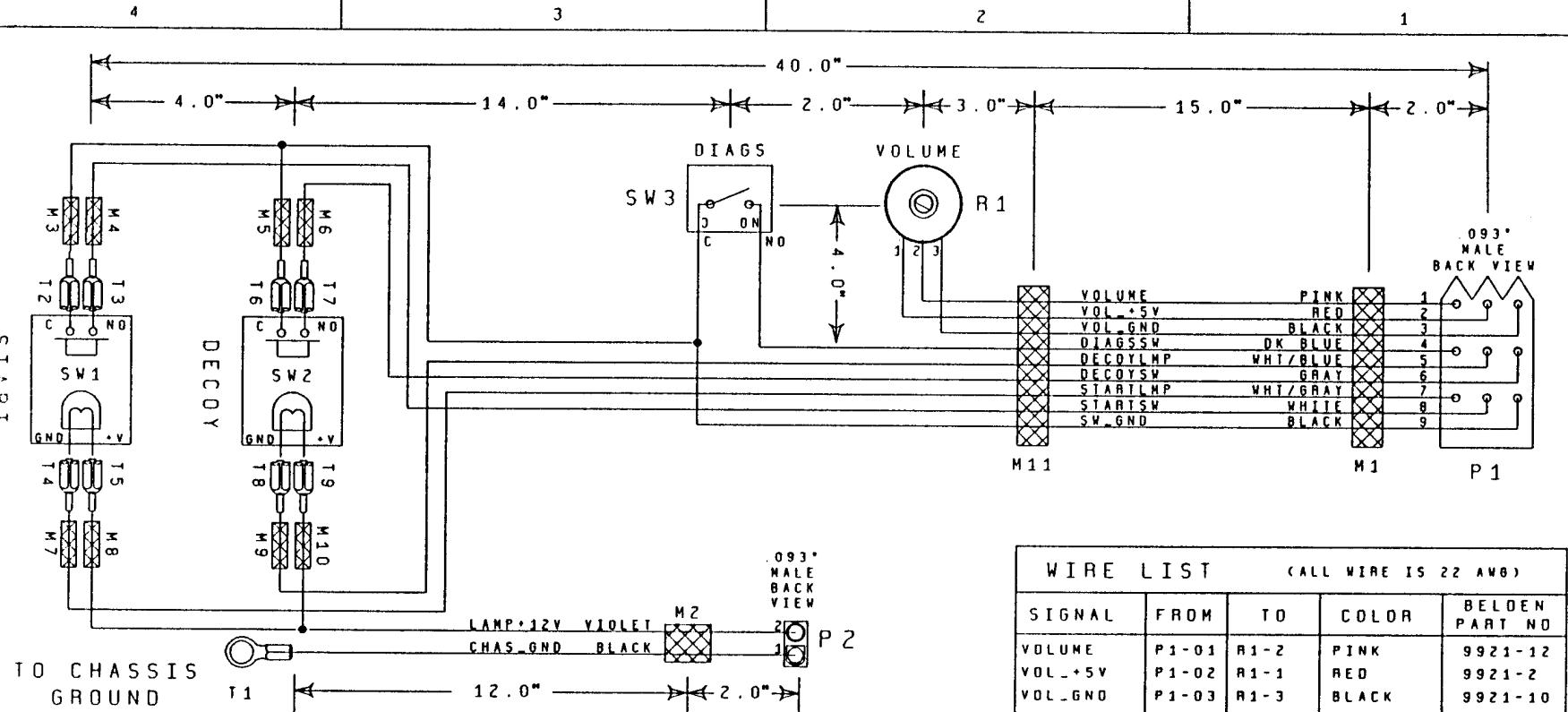
WIRE LIST (ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
JOYX_GND	J4-01	J1-01	BLACK	9921-10
JOYX_CHA	J4-03	J1-02	BROWN	9921-1
JOYX_+5V	J4-04	J1-03	RED	9921-2
JOYX_CHB	J4-05	J1-04	WHT/BRN	9921-19
JOYY_GND	J4-07	J2-01	BLACK	9921-10
JOYY_CHA	J4-09	J2-02	ORANGE	9921-3
JOYY_+5V	J4-10	J2-03	RED	9921-2
JOYY_CHB	J4-11	J2-04	WHT/ORG	9921-20
+5V	J4-13	J3-03, 08	RED	9921-2
TARG_SEL	J4-14	J3-06	YELLOW	9921-4
OPTO_OUT	J4-15	J3-09	WHT/YEL	9921-17
GND	J4-16	J3-10	BLACK	9921-10
TRIGGER	J4-17	J3-04	GREEN	9921-5
GND	J4-18	J3-01, 07	BLACK	9921-10
MISSILE	J4-19	J3-05	WHT/GRN	9921-16
MISSILE	J4-20	J3-02	LT BLUE	9921-6

MICROPROSE GAMES

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE
DAVID J. BEALITY	12-17-90
CHECKER	DATE
JOY G. MCKIBBIN	12-17-90
ENGR/EE	DATE
TITLE	
JOYSTICK CABLE	
HOST TO JOYSTICK	
APPROVAL	DATE
APPROVAL	DATE
APPROVAL	DATE
SIZE	DRAWING NUMBER
C	DW-00014C-0002
REV - 02	RELEASE CABLE 2
DATE 12-17-1990, 11-23 SHEET 1 OF 1	



NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) SW1 & SW2 ARE SHOWN FOR REFERENCE ONLY.
- 3) PLACE MARKERS M3 - M10 1" FROM PUSH-ON TERMINALS (T2 - T9).
- 4) TIE WRAP AT 4" INTERVALS.
- 5) MARKER M11 HAS TWO LINES OF TEXT
- 6) BREAKOUT DISTANCE FOR SW3 & R1 ARE THE SAME.
- 7) ASSEMBLED HARNESS IS MPG P/N A18-00001-003.

PARTS LIST

REF	DES	MFG	PART NO	PIN NO
P1		MOLEX	03-09-2092	02-09-6123
P2		MOLEX	19-09-2026	02-09-2118
T2 - T9		AMP	2-520184-4	
T1		AMP	2-520571-2	
R1		CLAROSTAT	RV4NAY5D502A	
SW1		SWITCHCRAFT	46202LR	

MARKER LIST

REF	DES	MFG	PART NO	TEXT SIZE	TEXT
M1		BRADY	HCPS.9-8336W	.125"	PANEL CONTROLS
M2		BRADY	HCPS.9-2508W	.125"	PWR SUPPLY
M3	M5	BRADY	HCPS.9-2508W	.125"	C
M4	M6	BRADY	HCPS.9-2508W	.125"	NO
M8	M10	BRADY	HCPS.9-2508W	.125"	12V
M7	M9	BRADY	HCPS.9-2508W	.125"	GND
M11		BRADY	HCPS1.9-8336W	.125"	(LINE 1) PANEL CONTROL HARNESS (LINE 2) DW-00014C-0003-02

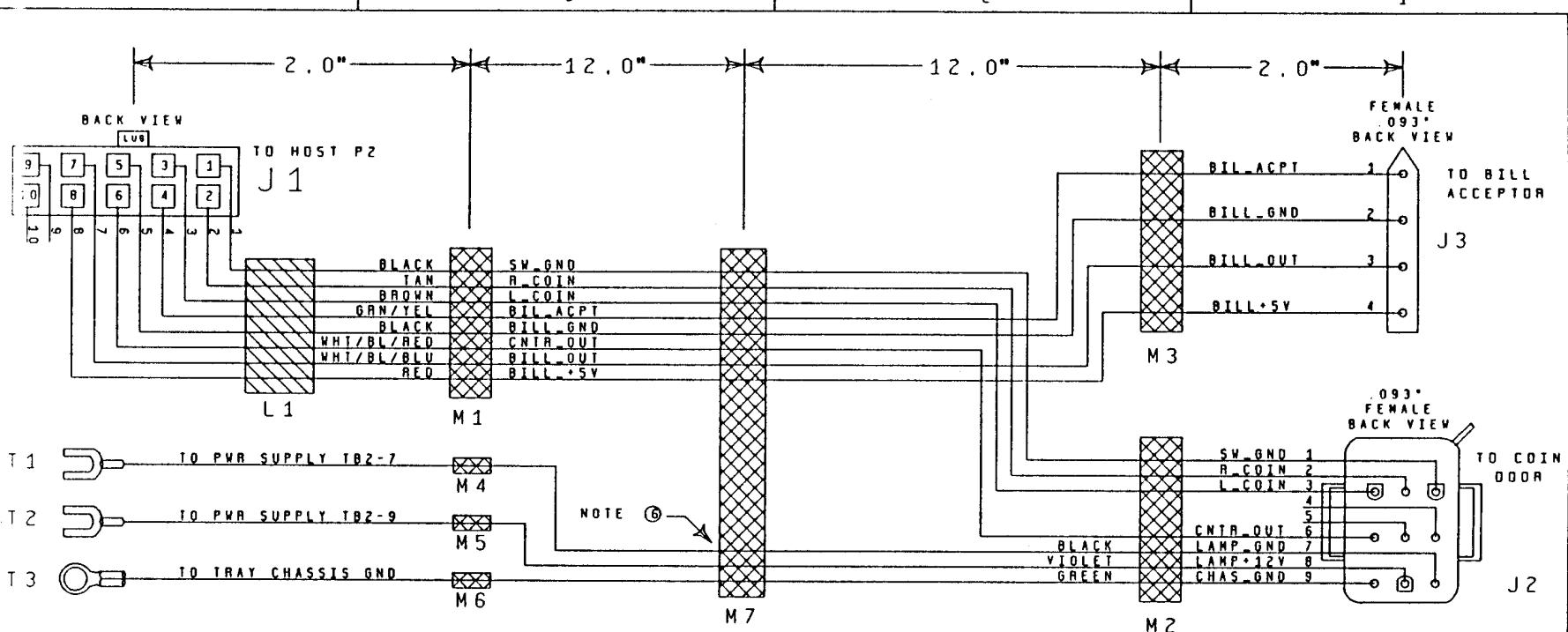
DRAFTER: DAVID J. BEATTY **DATE:** 12-12-90 **TITLE:** MICROPROSE GAMES
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

CHECKER: [Signature] **DATE:** **ENGINEER:** [Signature] **DATE:** **PANEL CONTROL HARNESS**

APPROVAL: [Signature] **DATE:** 12/14/90 **SIZE:** C **DRAWING NUMBER:** DW-00014C-0003

APPROVAL: [Signature] **DATE:** **REV.:** 02 **RELEASE:** CABLE .3

DATE: 12-13-1990-14-44 **SHEET:** 1 OF 1



NOTES :

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) PLACE MARKERS M4 - M6 ONE INCH FROM RING TERMINALS (T1 - T3).
- 3) TIE WRAP AT INTERVALS OF FOUR INCHES.
- 4) MARKER M7 HAS TWO LINES OF TEXT.
- 5) SECURE FERRITE BEAD (L1) TO CABLE WITH WIRE TIE.
- 6) BREAKOUT WIRES TO T1 - T3 AND TIE WRAP SEPERATELY FROM M7 TO POWER SUPPLY TERMINALS.
- 7) ASSEMBLED CABLE IS MPG P/N A18-00001-004.

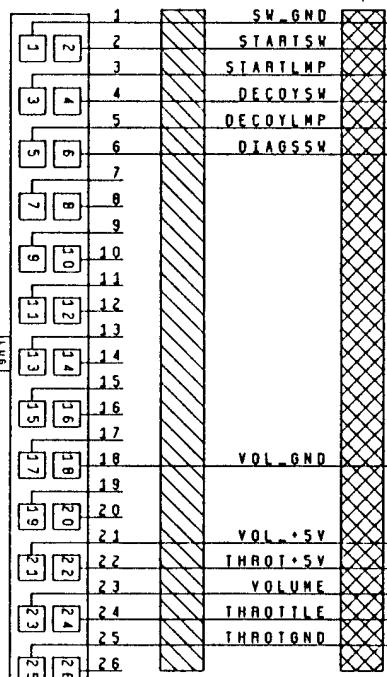
PARTS LIST			
REF DES	MFG	PART NO	PIN NO
J1	MOLEX	14-57-1101	
J2	AMP	1-480706-0	350851-1
J3	MOLEX	19-09-1046	02-09-1117
T1 - T3	MOLEX	AA-234-08X	
L1	FAIR-RITE	2643540002	

MARKER LIST

REF DES	MFG	PART NO	TEXT SIZE	TEXT
V1	BRADY	HCPS.9-1008W	.125"	HOST P2
V2	BRADY	HCPS.9-8336W	.125"	COIN DOOR
V3	BRADY	HCPS.9-5008W	.125"	BILL ACCEPTOR
V4	BRADY	HCPS.9-2508W	.125"	T82-7
V5	BRADY	HCPS.9-2508W	.125"	T82-9
V6	BRADY	HCPS.9-2508W	.125"	CHASSIS GND
V7	BRADY	HCPS1.9-1008W	.125"	(LINE 1) COIN DOOR CABLE (LINE 2) DW-00014C-0004-02

WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
SW_GND	J1-01	J2-1	BLACK	9921-10
R_COIN	J1-02	J2-2	TAN	9921-11
L_COIN	J1-03	J2-3	BROWN	9921-1
BILL_ACPT	J1-04	J3-1	GRN/YEL	9921-189
BILL_GND	J1-05	J3-1	BLACK	9921-10
CNTR_OUT	J1-06	J2-6	WHT/BL/RED	9921-23
BILL_OUT	J1-07	J3-3	WHT/BL/BLU	9921-26
BILL+5V	J1-08	J3-4	RED	9921-02
LAMP_GND	T1	J2-7	BLACK	9921-10
LAMP+12V	T2	J2-8	VIOLET	9921-7
CHAS_GND	T3	J2-9	GREEN	9921-5

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELKIN		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKED	DATE	12-02-90 TITLE	
JAY G. MCKIBBIN	DATE	COIN DOOR CABLE	
ENGINEER		APPROVAL DATE	
APPROVAL	DATE	SIZE	DRAWING NUMBER
APPROVAL	DATE	C	DW-00014C-0004
		REV - 02	RELEASE CABLE 4
		DATE 12-13-1990, 14-58 SHEET 4 OF 1	

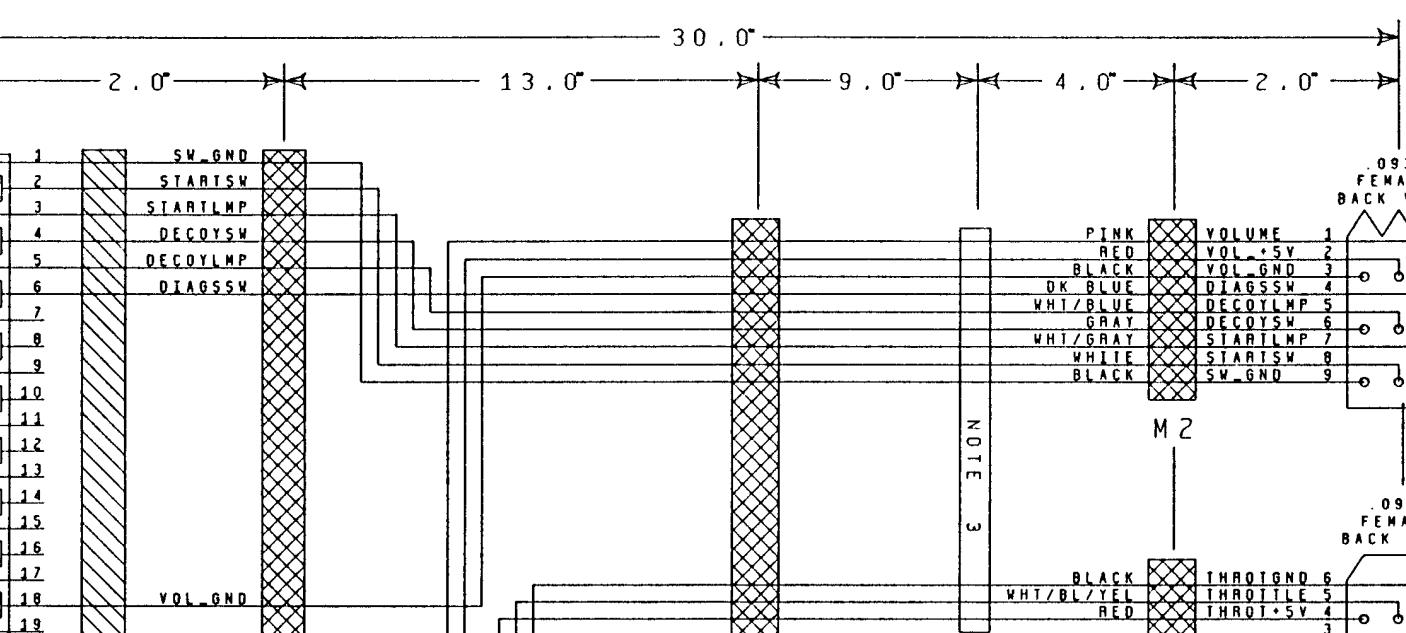


B

L 1

M 1

BACK VIEW



J 2
TO
FRONT
PANEL
HARNESS

D

D

J 1

HOST
15

C

C

B

B

A

4

3

2

1

30 . 0"

2 . 0"

13 . 0"

9 . 0"

4 . 0"

2 . 0"

M 2

M 3

MARKER LIST

REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-1008W	.125"	HOST PS
M2	BRADY	HCPS.9-8336W	.125"	FRONT PANEL
M3	BRADY	HCPS.9-5008W	.125"	THROTTLE
M4	BRADY	HCPS1.9-1008W	.125"	(CLINE 2DW-00014C-0005-02)

NOTES :

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) SECURE FERRITE BEAD L1 TO CABLE WITH WIRE TIE.
- 3) BREAKOUT WIRES TO J3 AS POSITION SHOWN.
- 4) TIE WRAP AT INTERVALS OF TWO INCHES.
- 5) MARKER M4 HAS TWO LINES OF TEXT.
- 6) ASSEMBLED HARNESS IS MPG P/N A18-00001-005.

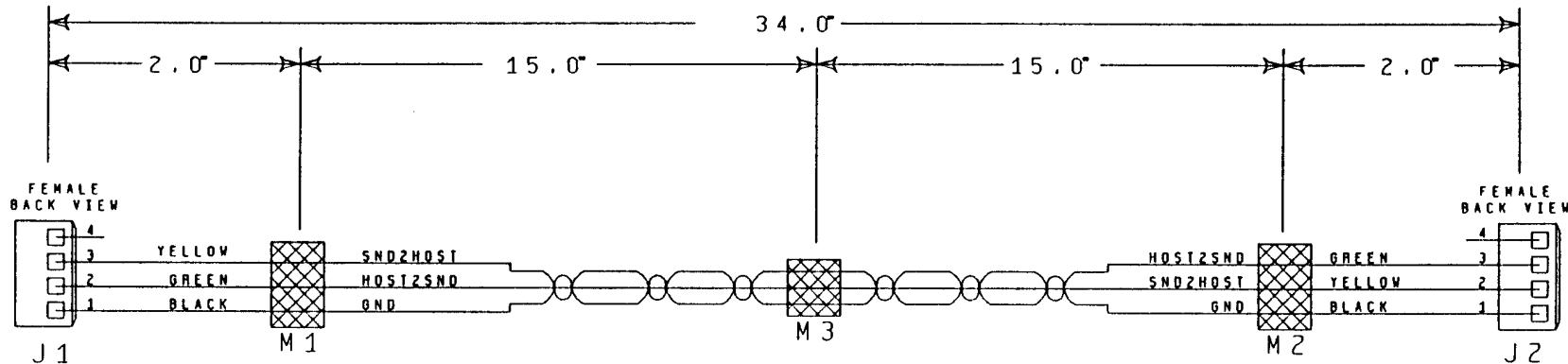
PARTS LIST

REF DES	MFG	PART NO	PIN NO
J1	MOLEX	14-57-3260	02-09-5142
J2	MOLEX	03-09-1094	02-09-5142
J3	MOLEX	03-09-1064	
L1	FAIR-RITE	2643665702	
DRAFTER	DAVID J. BELKNAY		
INSPECTOR			
ENGINEER			
APPROVAL	JAY G. MCKIBBIN		
APPROVAL			
APPROVAL			
APPROVAL			
SIZE	C	DRAWING NUMBER	DW-00014C-0005
REV	-02	RELEASE	CABLE 5
DATE	12/14/90	DATE	12-13-1990-15-40
SHEET	1	OF	1

WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
SW_GND	J1-01	J2-09	BLACK	9921-10
STARTSW	J1-02	J2-08	WHITE	9921-9
STARTLMP	J1-03	J2-07	WHT/GRAY	9921-21
DECOYSW	J1-04	J2-06	GRAY	9921-8
DECYLMP	J1-05	J2-05	WHT/BLUE	9921-18
DIAGSSW	J1-06	J2-04	OK BLUE	9921-13
VOL_GND	J1-18	J2-03	BLACK	9921-10
VOL_+5V	J1-21	J2-02	RED	9921-2
THROTL_+5V	J1-22	J3-04	RED	9921-2
VOLUME	J1-23	J2-01	PINK	9921-12
THROTTLE	J1-24	J3-05	WHT/BL/YEL	9921-25
THROTGND	J1-25	J3-06	BLACK	9921-10

A

A



WIRE LIST (ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
GND	J1-01	J2-01	BLACK	9921-10
HOST2SND	J1-02	J2-03	GREEN	9921-5
SND2HOST	J1-03	J2-02	YELLOW	9921-4

NOTES :

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M3 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2.
- 5) ASSEMBLED CABLE IS MPG P/N A18-00001-006.

PARTS LIST

REF DES	MFG	PART NO	PIN NO
J1	MOLEX	22-01-2041	08-50-0114
J2	MOLEX	22-01-2041	08-50-0114

MARKER LIST

REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-5008W	.125"	HOST J1
M2	BRADY	HCPS.9-5008W	.125"	SND BRD J1
M3	BRADY	HCPS1.9-5008W	.125"	LINE 3: RS-232 CABLE #1 LINE 2: DW-00014C-0006-02

DRAFTER: DAVID J. BERKANY DATE: 12-10-90

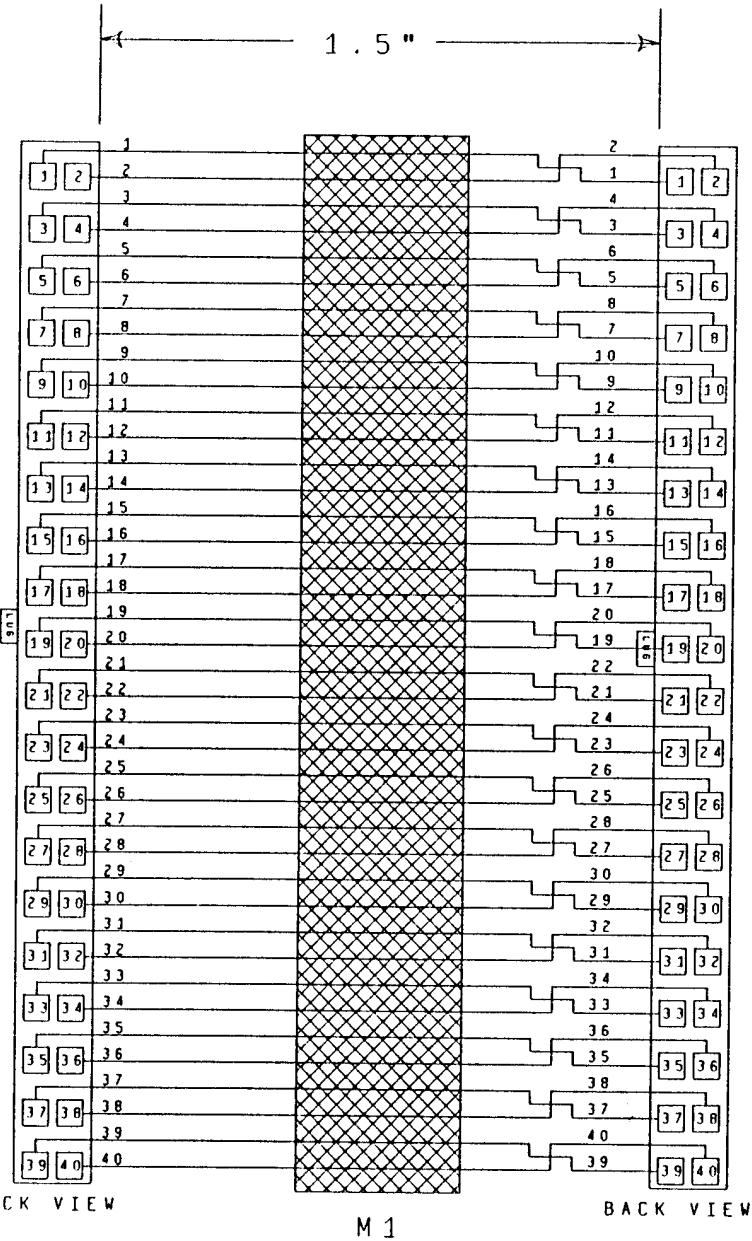
REVIEWER: JAY G. MCKIBBIN TITLE: RS-232 CABLE #1

APPROVAL: APPROVAL DATE: 12/14/90 SIZE: DRAWING NUMBER: DW-00014C-0006

APPROVAL DATE: RELEASE CABLE: 6

DATE: 12-15-1990-10-36 SHEET: 1 OF 3

A



MARKER LIST

REF DES	MFG	PART NO	TEXT SIZE	TEXT
M 1	BRADY	DAT-9-292	.125"	(LINE 1) HOST TO VGB (LINE 2) DW-00014C-0007-02

PARTS LIST

REF DES	MFG	PART NO	PIN NO
J 1	DUPONT	71602-040	
J 2	DUPONT	71602-040	
CABLE	3-M	3365/40	

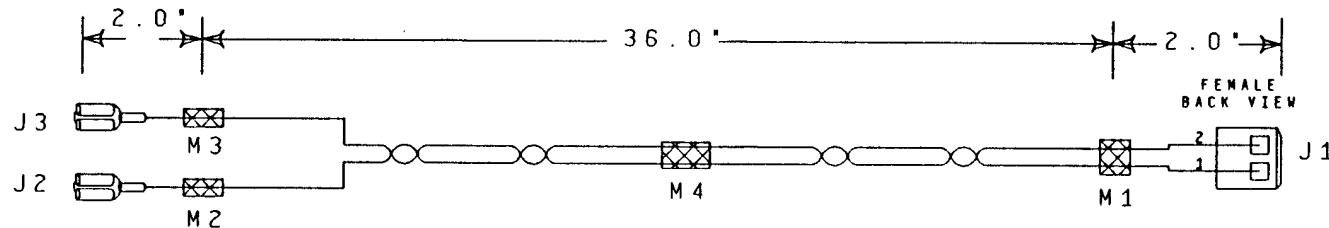
NOTES

- 1) ALL 28 AWG RIBBON CABLE SHALL MEET OR EXCEED UL2651.
- 2) MARKER M 1 HAS TWO LINES OF TEXT.
- 3) DISTANCE SPECIFIED BETWEEN J1 AND J2 IS MEASURED BETWEEN THE INSIDE EDGES OF J1 AND J2 AFTER ASSEMBLY.
- 4) ASSEMBLED CABLE IS MPG P/N A18-00001-007.

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE	TITLE	
		HOST TO VGB RIBBON CABLE A	
INSPECTOR	DATE		
JAY G. MCKIBBIN			
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-00014C-0007
RE-APPROVAL	DATE	REV - 02	RELEASE CABLE .7
		DATE 11-27-1990 17-29 SHEET 7 OF 1	

D

D



C

C

WIRE LIST (ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
L AUDIO	J1-01	J2	WHT/RED	9921-15
GND	J1-02	J3	BLACK	9921-10

B

B

PARTS LIST

REF DES	MFG	PART NO	PIN NO
J1	MOLEX	22-01-2021	08-50-0114
J2, J3	AMP	Z-520181-4	

A

A

MARKER LIST

REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	SOUND BD JS
M2	BRADY	HCPS.9-2508W	.125"	L SPKR +
M3	BRADY	HCPS.9-2508W	.125"	L SPKR -
M4	BRADY	HCPS1.9-3758W	.125"	(LINE 1) LEFT SPEAKER CABLE (LINE 2) DW-00014C-0008-02

NOTES:

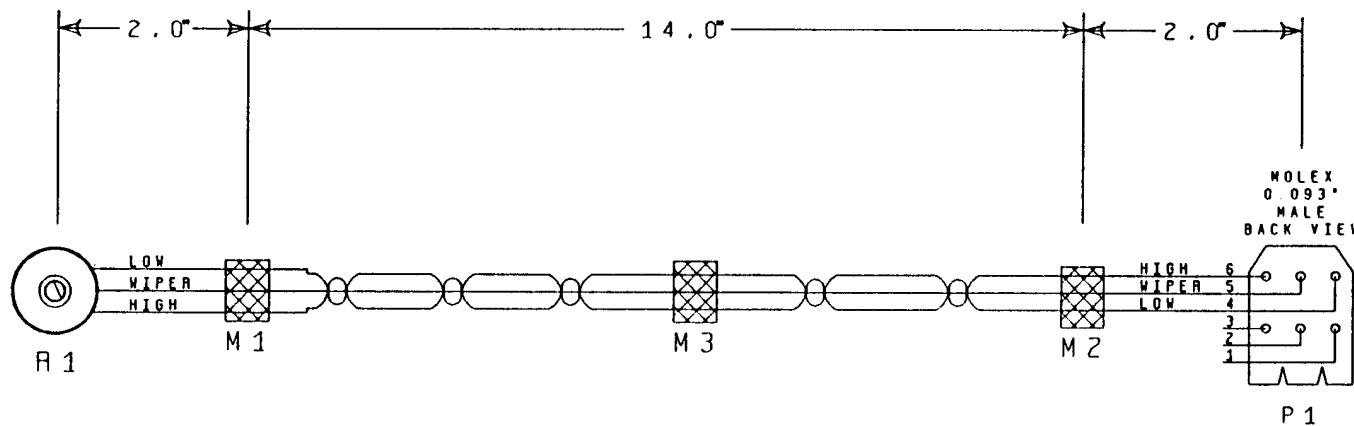
- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M4 HAS TWO LINES OF TEXT.
- 4) TWIST WIRE PAIR AND TIE WRAP AT 4° INTERVALS.
- 5) ASSEMBLED CABLE IS MPG P/N A18-00001-0008

DRAFTER	DATE
DAVID J. BELLMAN	12-10
CHECKED	DATE
	-70
ENCLOSURE	DATE
JAY G. MCKIBBIN	
APPROVAL	DATE
APPROVAL	DATE

MICROPROSE GAMES
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

TITLE
LEFT SPEAKER CABLE

SIZE	DRAWING NUMBER
C	DW-00014C-0008
REV - 02	RELEASE CABLE .8
DATE 12-31-1990.10-07 SHEET 1 OF 1	


WIRE LIST (ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
LOW	R1-01	P1-04	BLACK	9921-10
WIPER	R1-02	P1-05	WHITE	9921-9
HIGH	R1-03	P1-06	RED	9921-2

PARTS LIST

REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2064	
R1	CLAROSTAT	RV4NAYS0502A	02-09-2116

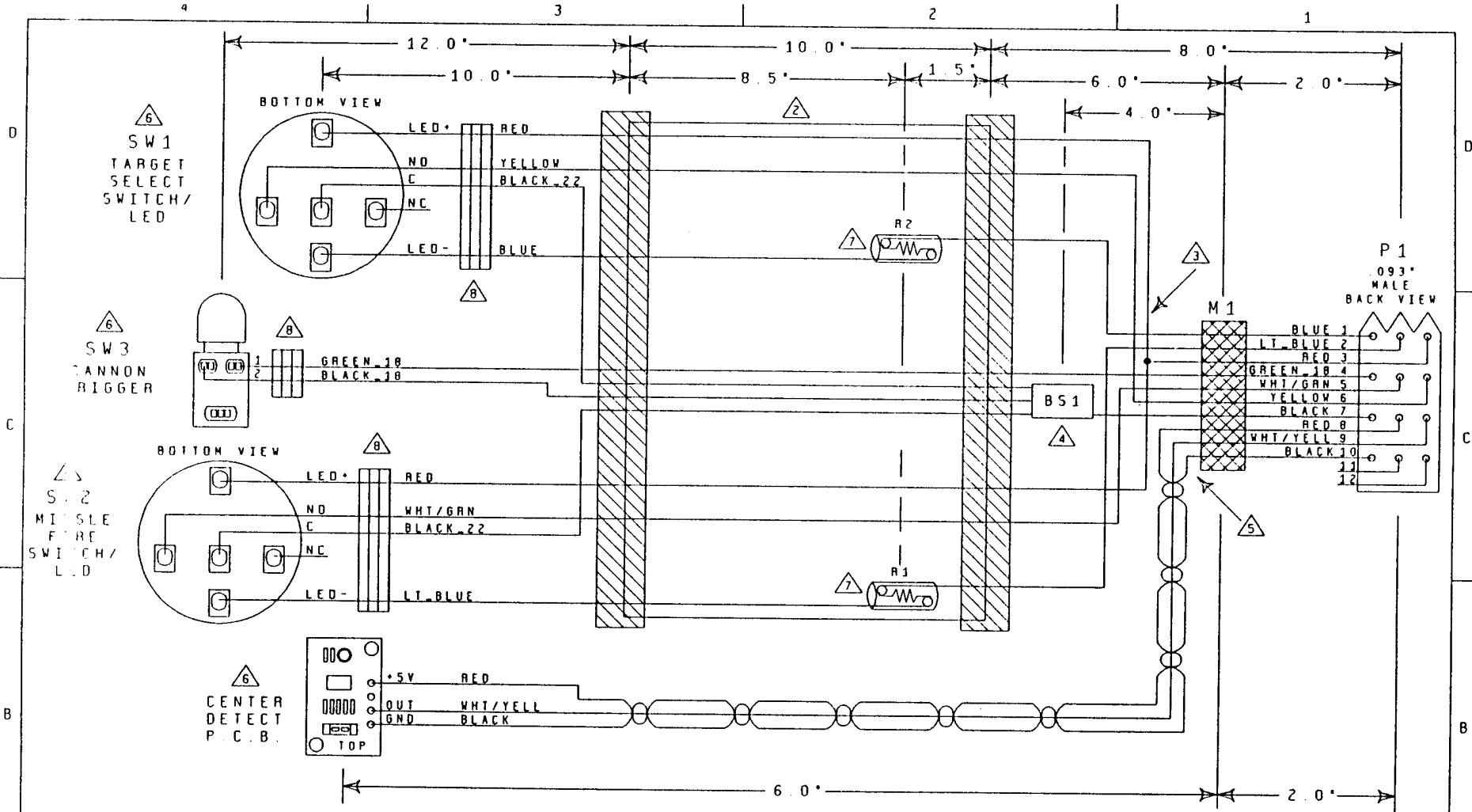
NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M3 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2.
- 5) ASSEMBLED HARNESS IS MPG P/N A18-00001-009.

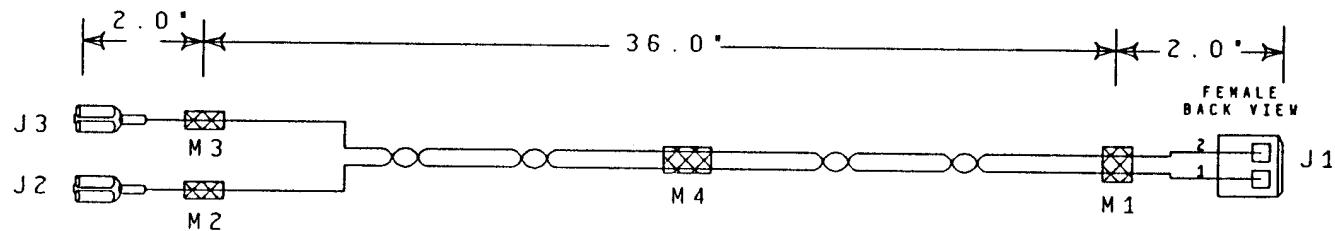
MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-5008W	.125"	THROTTLE
M2	BRADY	HCPS.9-5008W	.125"	THROTTLE 2 HOST
M3	BRADY	HCPS1.9-3758W	.125"	(LINE 1) THROTTLE HARNESS (LINE 2) DW-00014C-0009-02

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J BELKIN	12-12-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHIEF	DATE	TITLE	
JAY G. McKIBBIN	12-12-90	THROTTLE HARNESS	
ENGINEER	DATE	SIZE	DRAWING NUMBER
APPROVAL	DATE		
APPROVAL	DATE	C	DW-00014C-0009
			REV - 02
			RELEASE CABLE 13
			DATE 12-32-1990-15-21
			SHEET 1 OF 1



DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKED	DATE	TITLE	
JAY G. MCKIBBIN		JOYSTICK HARNESS	
SUPERVISOR	DATE		
APPROVAL	DATE	SIZE	DRAWING NUMBER
JAY G. MCKIBBIN	3/17/90	C	DW-00014C-0010
APPROVAL	DATE	REV - 02 RELEASE JOYS.2	
DATE 12-10-1990 17-55		SHEET 2 OF 2	



WIRE LIST (ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
R AUDIO	J1-01	J2	WHT/BLK	9921-14
GND	J1-02	J3	BLACK	9921-10

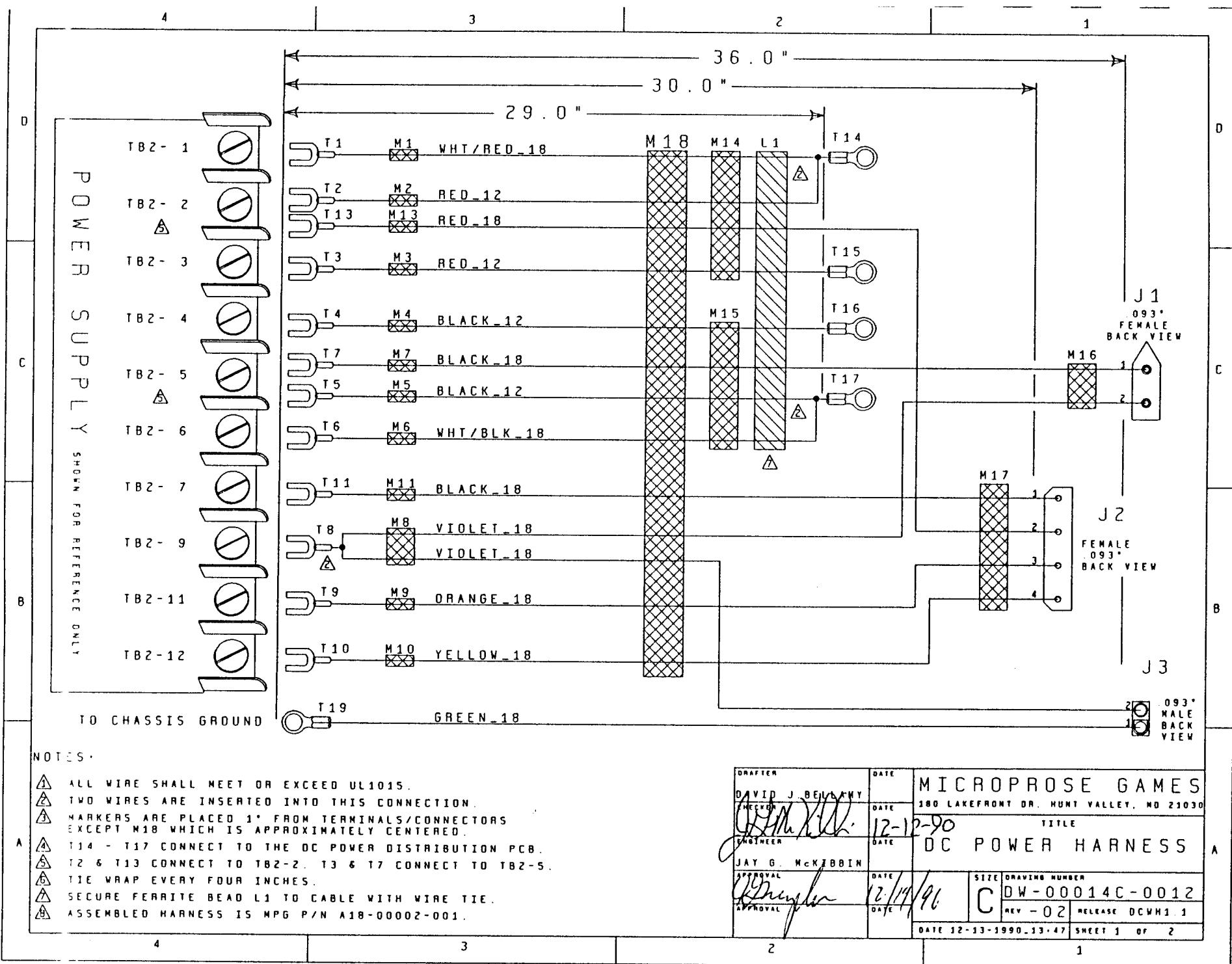
PARTS LIST			
REF DES	MFG	PART NO	PIN NO
J1	MOLEX	22-01-2021	08-50-0114
J2, J3	AMP	2-520181-4	

MARKER LIST				
REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	SOUND BO JS
M2	BRADY	HCPS.9-2508W	.125"	R SPKR +
M3	BRADY	HCPS.9-2508W	.125"	R SPKR -
M4	BRADY	HCPS1.9-3758W	.125"	(LINE 1) RIGHT SPEAKER CABLE (LINE 2) DW-00014C-0011-02

NOTES

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M4 HAS TWO LINES OF TEXT.
- 4) TWIST WIRE PAIR AND TIE WRAP AT 4" INTERVALS.
- 5) ASSEMBLED CABLE IS MPG P/N A18-00001-0011

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELKNAY	12-10-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKED	DATE	TITLE	
		RIGHT SPEAKER CABLE	
ENGINEER	DATE	A	
JAY G. MCKIBBIN		APPROVAL	
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-00014C-0011
APPROVAL	DATE	REV	RELEASE
		-02	CABLE.9
DATE 12-11-1990 10-12		SHEET 1 OF 1	



DRAFTER <i>[Signature]</i>	DATE 12-12-90	MICROPROSE GAMES	
REVIEWER <i>[Signature]</i>	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER <i>[Signature]</i>	DATE	TITLE DC POWER HARNESS	
JAY G. McKITTRICK <i>[Signature]</i>	APPROVAL <i>[Signature]</i>	DATE 12/19/96	SIZE C
	APPROVAL <i>[Signature]</i>	DATE	DRAWING NUMBER DW-00014C-0012
		REV - 02	RELEASE DCWH1.1
		DATE 12-13-1990-13-47 SHEET 1 OF 2	

WIRE LIST

SIGNAL	FROM	TO	COLOR	AWG	BELDEN PART NO
+SENSE	T1	T14	WHT/RED	18	8918-15
BKPLN_V1	T2	T14	RED	12	9912-2
BKPLN_V1	T3	T15	RED	12	9912-2
BKPLNRTN	T4	T16	BLACK	12	9912-10
BKPLNRTN	T5	T17	BLACK	12	9912-10
-SENSE	T6	T17	WHT/BLK	18	8918-14
FAN_RTN	T7	J1-1	BLACK	18	8918-10
FAN_V2	T8	J1-2	VIOLET	18	8918-7
PANEL_V2	T8	J3-2	VIOLET	18	8918-7
SND_V3	T9	J2-3	ORANGE	18	8918-3
SND_V4	T10	J2-4	YELLOW	18	8918-4
SND_RTN	T11	J2-1	BLACK	18	8918-10
SND_V1	T13	J2-2	RED	18	8918-2
CHAS_GND	T19	J3-1	GREEN	18	8918-5

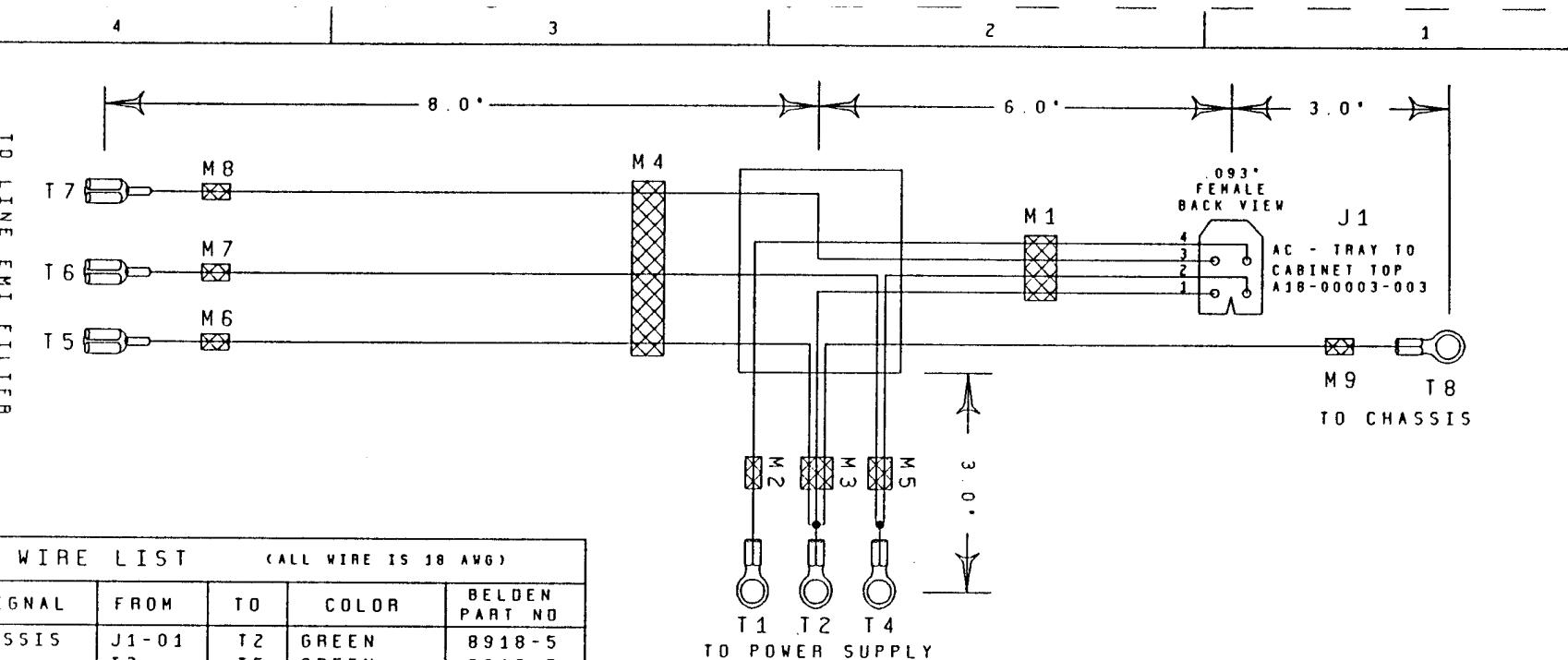
PARTS LIST

REFDES	MFG	PART NO	PIN NO
T1, T6, T7, T9, T10, T11, T13	MOLEX	AA-234-08X	
T2 - T5, T8	MOLEX	C-236-08X	
T14 - T17	MOLEX	D-656-10X	
T19	MOLEX	C-236-08X	
J1	MOLEX	03-06-1023	02-06-1101
J2	MOLEX	15-24-4048	02-08-1201
J3	MOLEX	19-09-1026	02-09-1117
L1	FAIR-RITE	2643164151	

MARKER LIST

REF DES	MFG	PART NO	TEXT SIZE	TEXT	
				LINE 1	LINE 2
M1	BRADY	HCPS.9-2508W	.125"	+SENSE	TB2-1
M2	BRADY	HCPS.9-3336W	.125"	V1	TB2-2
M3	BRADY	HCPS.9-3336W	.125"	V1	TB2-3
M4	BRADY	HCPS.9-3336W	.125"	RETURN	TB2-4
M5	BRADY	HCPS.9-2508W	.125"	RETURN	TB2-5
M6	BRADY	HCPS.9-3336W	.125"	-SENSE	TB2-6
M7	BRADY	HCPS.9-3336W	.125"	RETURN	TB2-5
M8	BRADY	HCPS.9-3336W	.125"	V2	TB2-9
M9	BRADY	HCPS.9-2508W	.125"	V3	TB2-11
M10	BRADY	HCPS.9-2508W	.125"	V4	TB2-12
M11	BRADY	HCPS.9-2508W	.125"	RETURN	TB2-7
M13	BRADY	HCPS.9-2508W	.125"	V1	TB2-2
M14	BRADY	HCPS.9-5008W	.125"	VDD	
M15	BRADY	HCPS.9-5008W	.125"	GND	
M16	BRADY	HCPS.9-3758W	.125"	FAN	
M17	BRADY	HCPS.9-5008W	.125"	SOUND BOARD	
M18	BRADY	HCPS1.9-1008W	.125"	DC POWER HARNESS	DW-00014C-0012-02

DRAFTER <i>DAVID J. BELLARY</i>	DATE 12/12/90	MICROPROSE GAMES	
ENGINEER <i>JAY G. MCKIBBIN</i>	DATE 12/12/90	380 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL <i>[Signature]</i>	DATE 12/12/90	TITLE DC POWER HARNESS	
INITIALS <i>[Initials]</i>	DATE 12/12/90	SIZE C	DRAWING NUMBER DW-00014C-0012
	DATE 12/12/90	REV. U/C	RELEASE DATE 12/13/90
			SHEET 2 OF 2



WIRE LIST (ALL WIRE IS 18 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
CHASSIS	J1-01	T2	GREEN	8918-5
	T2	T5	GREEN	8918-5
	T2	T8	GREEN	8918-5
COMMON	J1-02	T4	WHITE	8918-9
	T4	T6	WHITE	8918-9
U.S. SWLINE	J1-03	T7	WHT/BLK	8918-14
S.P. LINE	J1-04	T1	BLACK	8918-10

PARTS LIST

REFDES	MFG	PART NO	PIN NO
J1	MOLEX	03-09-1049	02-09-1117
1	MOLEX	AA-232-08X	RING TERM
2	MOLEX	C-236-08X	RING TERM
T4, T8	MOLEX	BB-223-08X	RING TERM
T5 - T7	MOLEX	AA-2201C	PUSH-ON

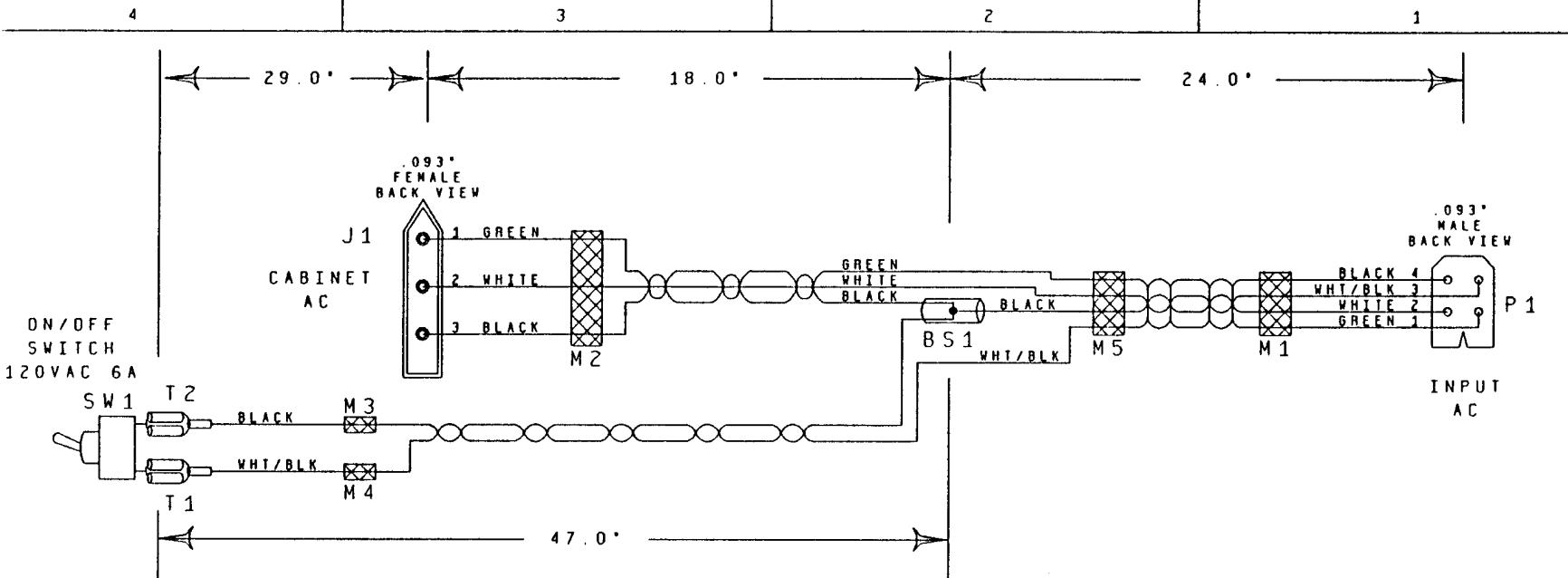
MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-6258W	.125"	INPUT AC
M2	BRADY	HCPS.9-2508W	.125"	TB1-1
M3	BRADY	HCPS.9-5008W	.125"	TB1-3
M4	BRADY	HCPS1.9-6258W	.125"	(LINE 1) INPUT AC HARNESS (LINE 2) DW-00014C-0014-02
M5	BRADY	HCPS.9-3758W	.125"	TB1-2
M6	BRADY	HCPS.9-2508W	.125"	GND
M7	BRADY	HCPS.9-2508W	.125"	COMM
M8	BRADY	HCPS.9-2508W	.125"	LINE
M9	BRADY	HCPS.9-2508W	.125"	GND

NOTES :

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M4 HAS TWO LINES OF TEXT.
- 4) TERMINAL T2 HAS 3 WIRES IN CRIMP.
- 5) TERMINAL T4 HAS 2 WIRES IN CRIMP.
- 6) BREAKOUT WIRES TO T1, T2 & T4. SECURE WITH TIE WRAP.
- 7) PLACE MARKERS M2 - M3 & M5 - M9 1" FROM TERMINALS.
- 8) ASSEMBLED HARNESS IS MPG P/N A18-00003-002.

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELL / MY CHECKED	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER	DATE	TITLE	
JAY G. MCKIBBIN	DATE	INPUT AC HARNESS	
REVIEWED	DATE	SIZE	DRAWING NUMBER
APPROVED	DATE	C	DW-00014A-0014
		REV - 02	RELEASE ACVH1.1
		DATE 12-12-1990-13-1 SHEET 1 OF 3	



WIRE LIST (ALL WIRE IS 18 AWG)

SIGNAL	FROM	TO	COLOR	BELODEN PART NO
CH SSIS	P1-01	J1-01	GREEN	8918-5
COMMON	P1-02	J1-02	WHITE	8918-9
UN-LINE	P1-03	T1	WHT/BLK	8918-14
SW-LINE	P1-04	T2	BLACK	8918-10
	J1-03	T2	BLACK	8918-10

PARTS LIST

REF DES	MFG	PART NO	PIN NO
J1	MOLEX	03-09-1032	02-09-1117
P1	MOLEX	03-09-2049	02-09-2116
T1	MOLEX	AA-2201C	PUSH-ON
T2	MOLEX	BB-2206C	PUSH-ON
BS1	T. B. D.	T. B. D.	

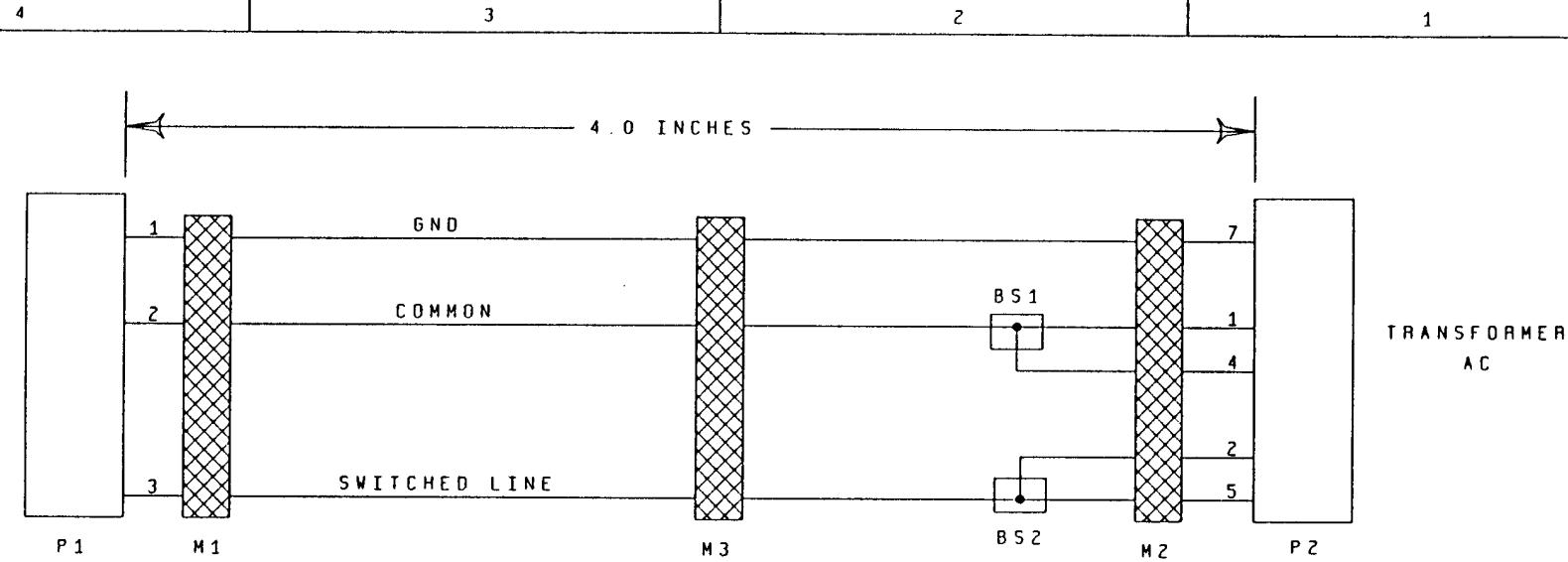
MARKER LIST

REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-6258W	.125"	INPUT AC
M2	BRADY	HCPS.9-5008W	.125"	CABINET AC
M3	BRADY	HCPS.9-3758W	.125"	SW LINE
M4	BRADY	HCPS1.9-6258W	.125"	(LINE 1) AC-TRAY TO TOP HARN (LINE 2) DW-00014C-0015-02
M5	BRADY	HCPS.9-2508W	.125"	UNSW LINE

NOTES

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M5 HAS TWO LINES OF TEXT.
- 4) BUTT SPLICER BS1 HAS 3 WIRES IN CRIMP.
- 5) TWIST WIRES FROM P1 TO J1 AND FROM BS1 TO TERMINALS.
- 6) BREAKOUT WIRES AT BS1. SECURE WITH TIE WRAP.
- 7) SW1 IS SHOWN FOR REFERENCE ONLY.
- 8) ASSEMBLED HARNESS IS MPG P/N A18-00003-003.

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAIR	12-13-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
REVIEWER	DATE	TITLE	
JAY G. McKITTRICK	12-13-90	AC - TRAY TO CABINET TOP	
ENGINEER	DATE	APPROVAL	
JAY G. McKITTRICK	12-13-90	SIZE	DRAWING NUMBER
APPROVAL	12-13-90	C	DW-00014A-0015
APPROVAL	12-13-90	REV - 02	RELEASE ACVH2.1
APPROVAL	12-13-90	DATE 12-13-1990 13-28 SHEET 1 OF 1	



PARTS LIST

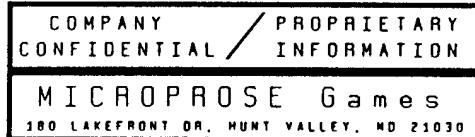
REFDES	DESCRIPTION	PART NO	PIN NO
P1	CONNECTOR, PLUG	MOLEX 03-09-2032	02-09-2116
P2	CONNECTOR, RECEPTICAL	MOLEX 03-09-1094	02-09-1117
BS1	16 AWG BUTT SPLICE	MOLEX C-246X	
BS2			

WIRE LIST

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
GROUND	P1-1	P2-7	GREEN	9918-5
COMMON	P1-2	BS1	WHITE/ORANGE	9918-20
COMMON	BS1	P2-1	WHITE/ORANGE	
COMMON	BS1	P2-4	WHITE/ORANGE	
SWITCHED LINE	P1-3	BS2	VIOLET	9918-7
SWITCHED LINE	BS2	P2-2	VIOLET	
SWITCHED LINE	BS2	P2-5	VIOLET	

MARKER LIST

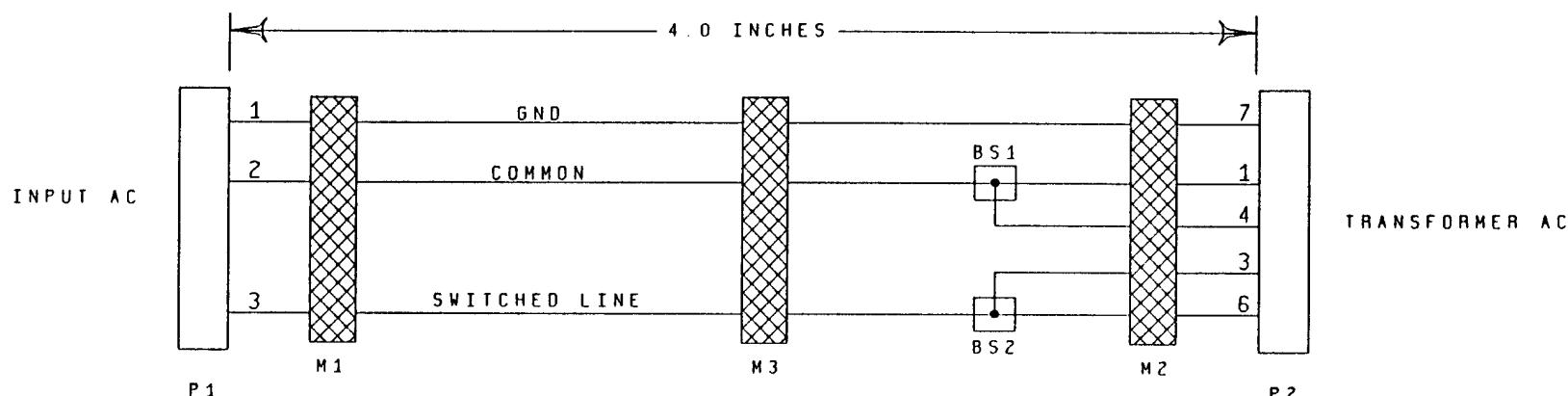
REFDES	TYPE SIZE	MFG	PART NO	TEXT	
				LINE 1	LINE 2
M1	.125"	BRADY	HCPS 9-8336W	100VAC	INPUT AC
M2	.125"	BRADY	HCPS 9-8336W	100VAC	XFORMER AC
M3	.125"	BRADY	HCPS 9-8336W	DW-00014A-0016-02	100VAC SELECT



drafter	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
checker	DATE	TITLE	
JAY G. MCKIBBIN	12-10-90	100V AC	
engineer	DATE	VOLTAGE SELECTION HARNESS	
JAY G. MCKIBBIN			
approval	DATE	SIZE	DRAWING NUMBER
JAY G. MCKIBBIN	12/13/90	C	DW-00014A-0016
APPROVAL	DATE	REV - 02	RELEASE ACWHS.1
		DATE 52-11-1990-10-31 SHEET 1 OF 1	

A NOTES: 1) ALL WIRE MUST MEET OR EXCEED UL1015.
2) LABEL MARKERS:

4 3 2 1



PARTS LIST

REFDES	DESCRIPTION	PART NO	PIN NO
P1	CONNECTOR, PLUG	MOLEX 03-09-2032	02-09-2116
P2	CONNECTOR, RECEPTICAL	MOLEX 03-09-1094	02-09-1117
BS1	16 AWG BUTT SPLICE	MOLEX C-246X	
BS2			

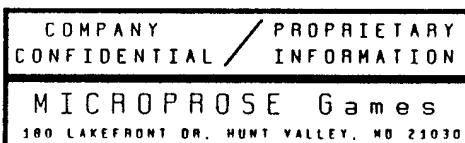
WIRE LIST

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
GROUND	P1-1	P2-7	GREEN	8918-5
COMMON	P1-2	BS1	WHITE	8918-9
COMMON	BS1	P2-1	WHITE	
COMMON	BS1	P2-4	WHITE	
SWITCHED LINE	P1-3	BS2	BLACK	8918-10
SWITCHED LINE	BS2	P2-3	BLACK	
SWITCHED LINE	BS2	P2-6	BLACK	

MARKER LIST

REFDES	TYPE SIZE	MFG	PART NO	TEXT	
				LINE 1	LINE 2
M1	.125"	BRADY	HCPS 9-8336W	120VAC	INPUT AC
M2	.125"	BRADY	HCPS 9-8336W	120VAC	XFORMER AC
M3	.125"	BRADY	HCPS 9-8336W	DW-00014A-0016-02	120VAC SELECT

NOTES: 1) ALL WIRE MUST MEET OR EXCEED UL1015.



DRAFTER	DAVID J BELANY	DATE	MICROPROSE GAMES	
CHECKED		DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER	JAY G. MCKIBBIN	DATE	TITLE 120VAC	
APPROVAL	JAY G. MCKIBBIN	DATE	VOLTAGE SELECTION HARNESS	
APPROVAL	12/12/90	SIZE	DRAWING NUMBER DW-00014A-0017	
APPROVAL	12/12/90	REV	02	RELEASE ACWH3.1
		DATE	12-12-1990-13-35 SHEET 1 OF 1	

4

3

2

1

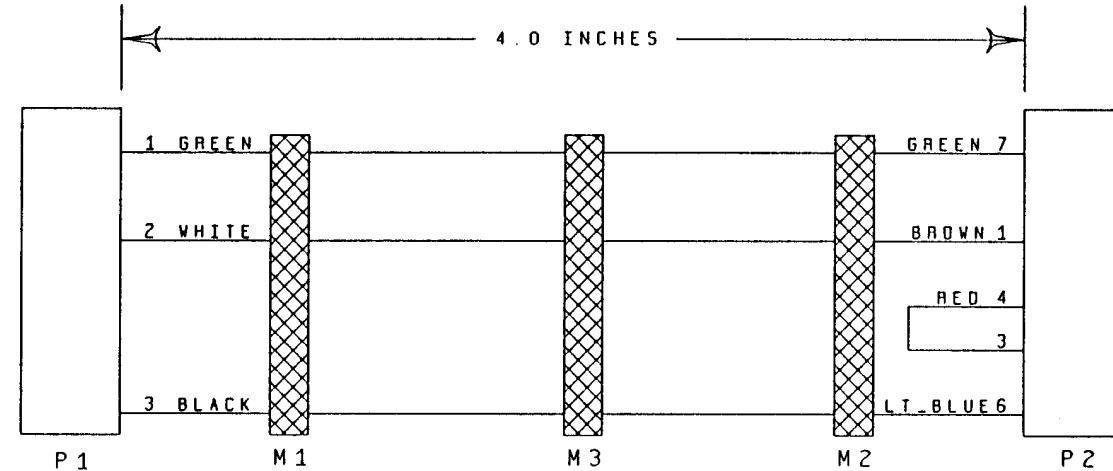
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INPUT
ACTRANSFORMER
AC

C

C



PARTS LIST

FEDFES	DESCRIPTION	PART NO	PIN NO
P1	CONNECTOR, PLUG	MOLEX 03-09-2032	02-09-2116
P2	CONNECTOR, RECEPTICAL	MOLEX 03-09-1094	02-09-1117

WIRE LIST

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
GROUND	P1-1	P2-7	GREEN	8918-5
COMMON	P1-2	P2-1	BROWN	8918-1
SWITCHED LINE	P1-3	P2-6	LT_BLUE	8918-6
SWITCHED LINE	P2-3	P2-4	RED	8918-2

MARKER LIST

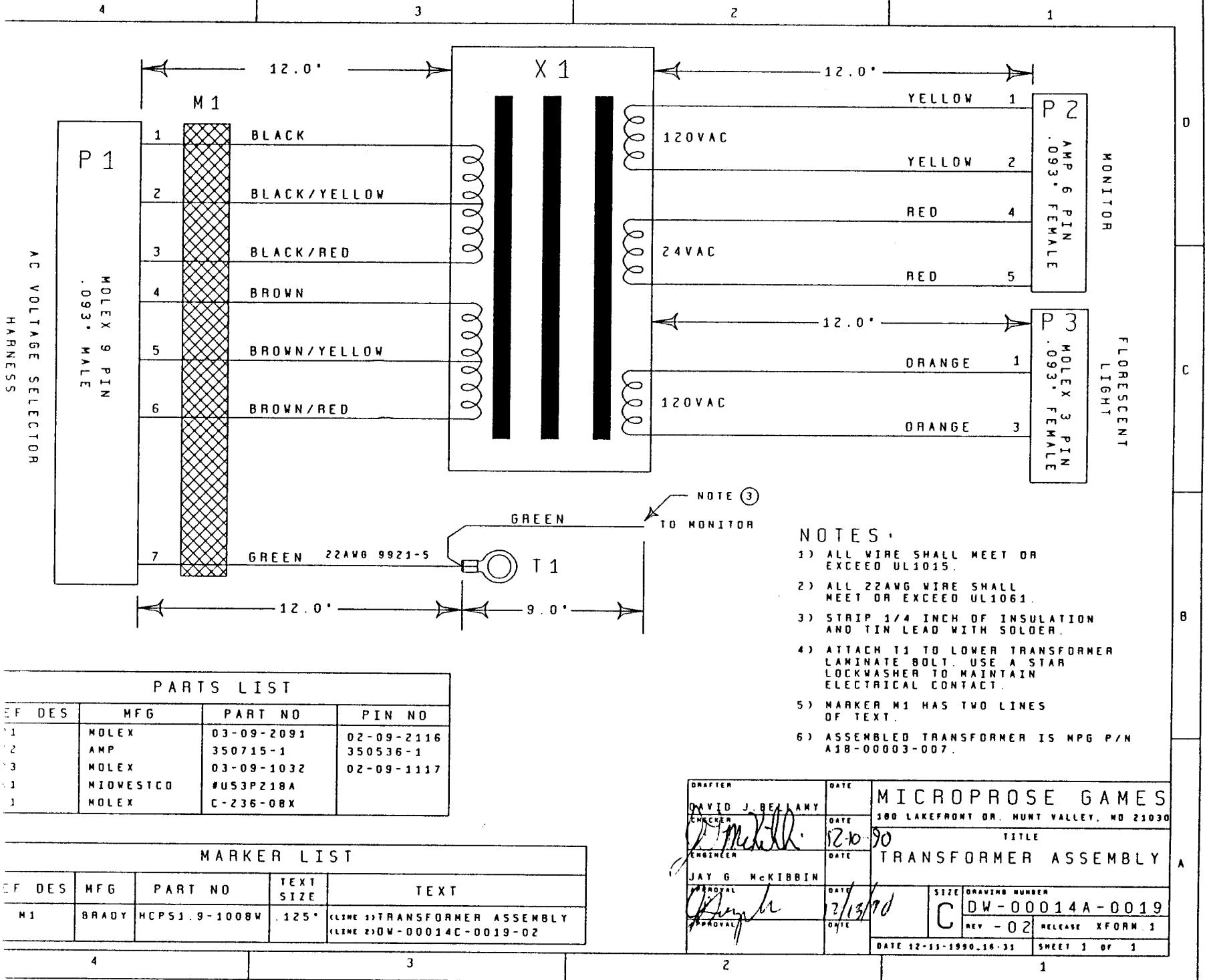
FEDFES	TYPE SIZE	MFG	PART NO	TEXT	
				LINE 1	LINE 2
M1	.125"	BRADY	HCPS 9-8336W	240VAC	INPUT AC
M2	.125"	BRADY	HCPS 9-8336W	240VAC	XFORMER AC
M3	.125"	BRADY	HCPS 9-8336W	DW-00014A-0016-02	240VAC SELECT

NOTES: 1). ALL WIRE MUST MEET OR EXCEED OF UL1015

2). LABEL MARKERS:

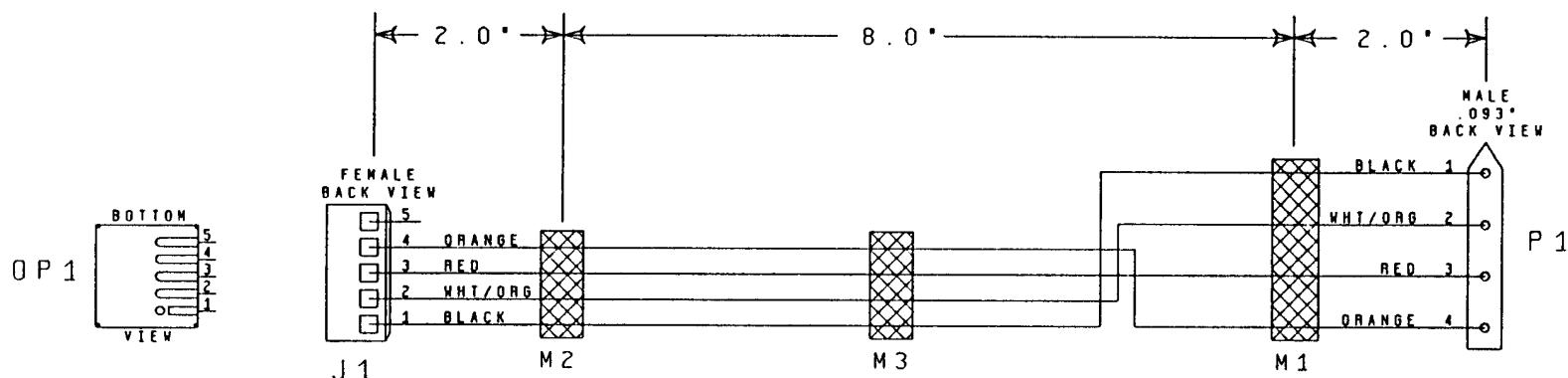
COMPANY
CONFIDENTIAL / PROPRIETARY
INFORMATIONMICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER <i>(Signature)</i>	DATE 12-18-90	MICROPROSE GAMES	
CHECKER <i>(Signature)</i>	DATE 12-18-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
TECHNICIAN <i>(Signature)</i>	DATE 12-18-90	TITLE 240 VAC	
JAY G. McKIBBIN <i>(Signature)</i>	APPROVAL DATE 12-18-90	SIZE C	VOLTAGE SELECTOR HARNESS DRAWING NUMBER DW-00014A-0018
	APPROVAL DATE 12-18-90	REV - 02	RELEASE ACMH4.1
		DATE 12-13-1990-14-12 SHEET 1 OF 1	



D

D



C

C

WIRES LIST (ALL WIRES IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELODEN PART NO
XJOY_GND	P1-01	J1-01	BLACK	9921-10
XJOY_CHA	P1-02	J1-02	ORANGE	9921-3
XJOY_+5V	P1-03	J1-03	RED	9921-2
XJOY_CHB	P1-04	J1-04	WHT/ORG	9921-20

B

B

PARTS LIST

REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2042	02-09-2118
J1	BERG	65039-032	
J1	MOLEX		02-09-2116
J1	BERG	KEY PLUG	65307-001

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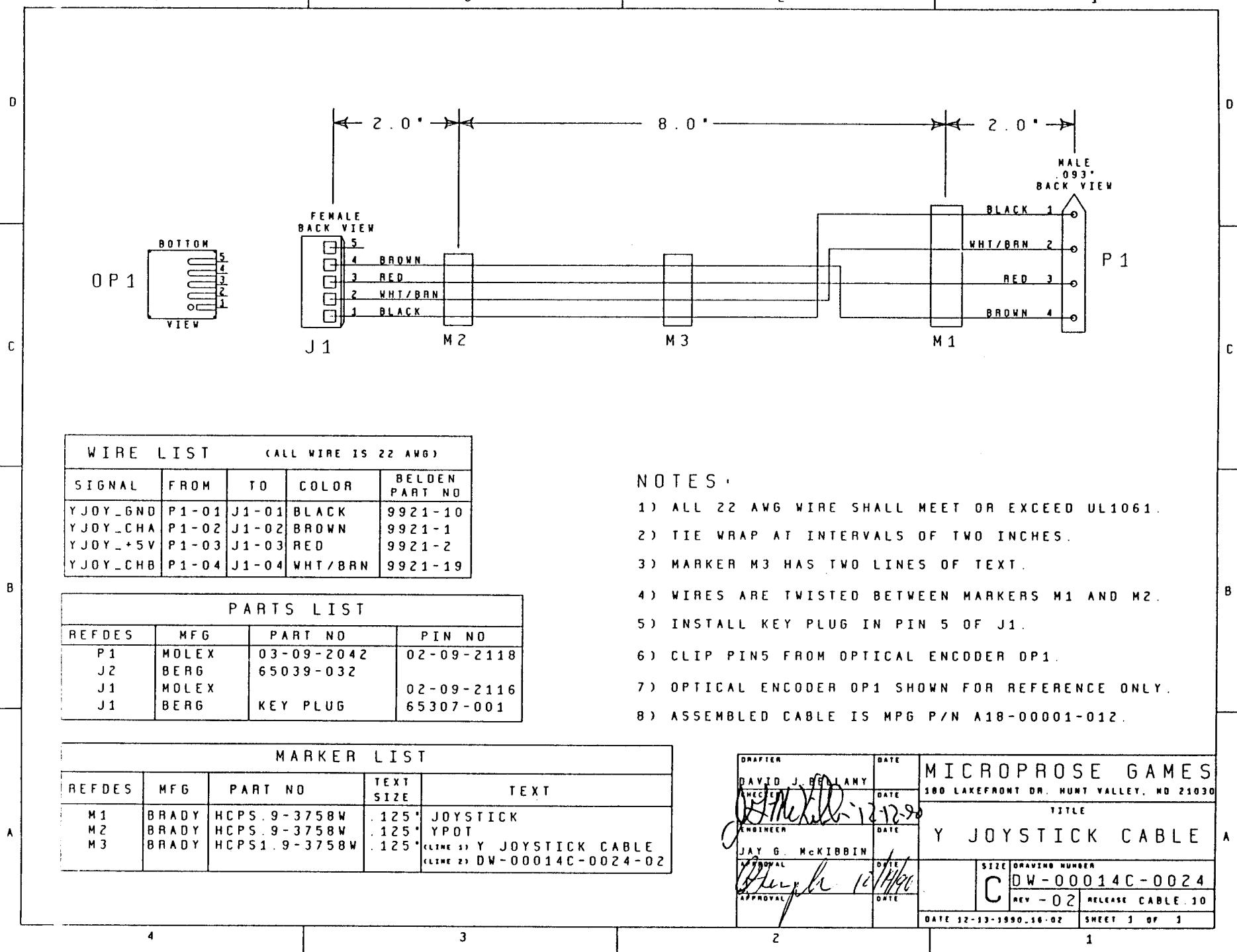
MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	JOYSTICK
M2	BRADY	HCPS.9-3758W	.125"	XPOD
M3	BRADY	HCPS1.9-3758W	.125"	CLINE :> X JOYSTICK CABLE CLINE :> DW-00014C-0023-02

NOTES:

- 1) ALL 22 AWG WIRES SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M3 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2.
- 5) INSTALL KEY PLUG IN PIN 5 OF J1.
- 6) CLIP PINS FROM OPTICAL ENCODER OP1.
- 7) OPTICAL ENCODER OP1 IS SHOWN FOR REFERENCE ONLY.
- 8) ASSEMBLED CABLE IS MPG P/N A18-00001-013.

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BENECKY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
REVIEWER	DATE	TITLE	
JAY G. Mc KIBBIN		X JOYSTICK CABLE	
ENGINEER	DATE	DRAWING NUMBER	
APPROVAL	DATE	C	DW-00014C-0023
APPROVAL	DATE	C	REV - 02 RELEASE CABLE 11
		DATE 12-13-1990-16-09 SHEET 1 OF 1	



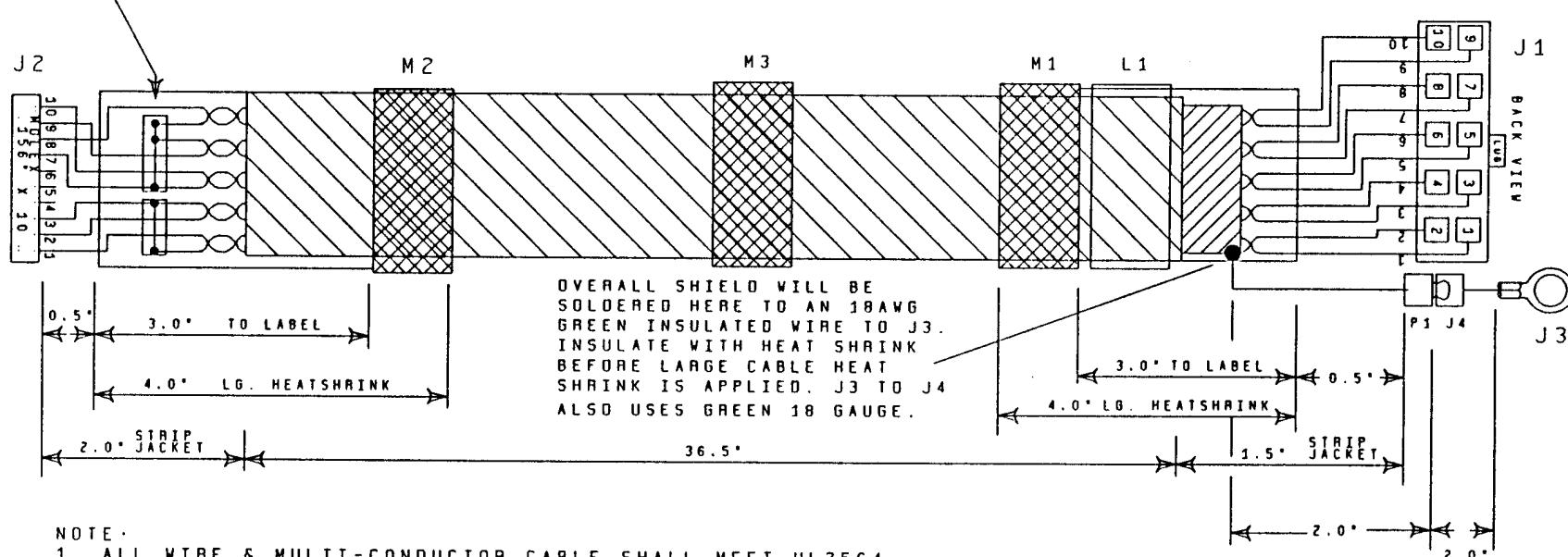
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SOLDER BLACK WIRES FROM ASSOCIATED TWISTED PAIR AS INDICATED. COVER WITH HEAT SHRINK AS SHOWN BEFORE LARGE CABLE HEAT SHRINK IS APPLIED.

WIRE LIST

SIGNAL	FROM	COLOR	TO	COLOR
DGND	J1-01	BLACK	J2-3	BLACK
H SYNC	J1-02	YELLOW	J2-1	YELLOW
V SYNC	J1-03	WHT/BLK	J2-2	WHT/BLK
DGND	J1-04	BLK/WHT	J2-3	WHT/BLK
AGND	J1-05	VIOLET	J2-7	
RED	J1-06	RED	J2-10	RED
GREEN	J1-07	GREEN	J2-9	GREEN
AGND	J1-08	ORANGE	J2-7	
AGND	J1-09	BROWN	J2-7	BROWN
BLUE	J1-10	BLUE	J2-8	BLUE

USE BELDEN CABLE. TRADE NO. 9505



NOTE:

- ALL WIRE & MULTI-CONDUCTOR CABLE SHALL MEET UL2564.
- CABLE WILL LOOP AROUND AND THRU L1.
- WIRES SOLDERED AND INSULATED WITH HEAT SHRINK.
- LABEL MARKERS.
- CABLE JACKET.
- OVERALL SHIELD.
- ASSEMBLED CABLE IS MPG P/N A18-00003-010.

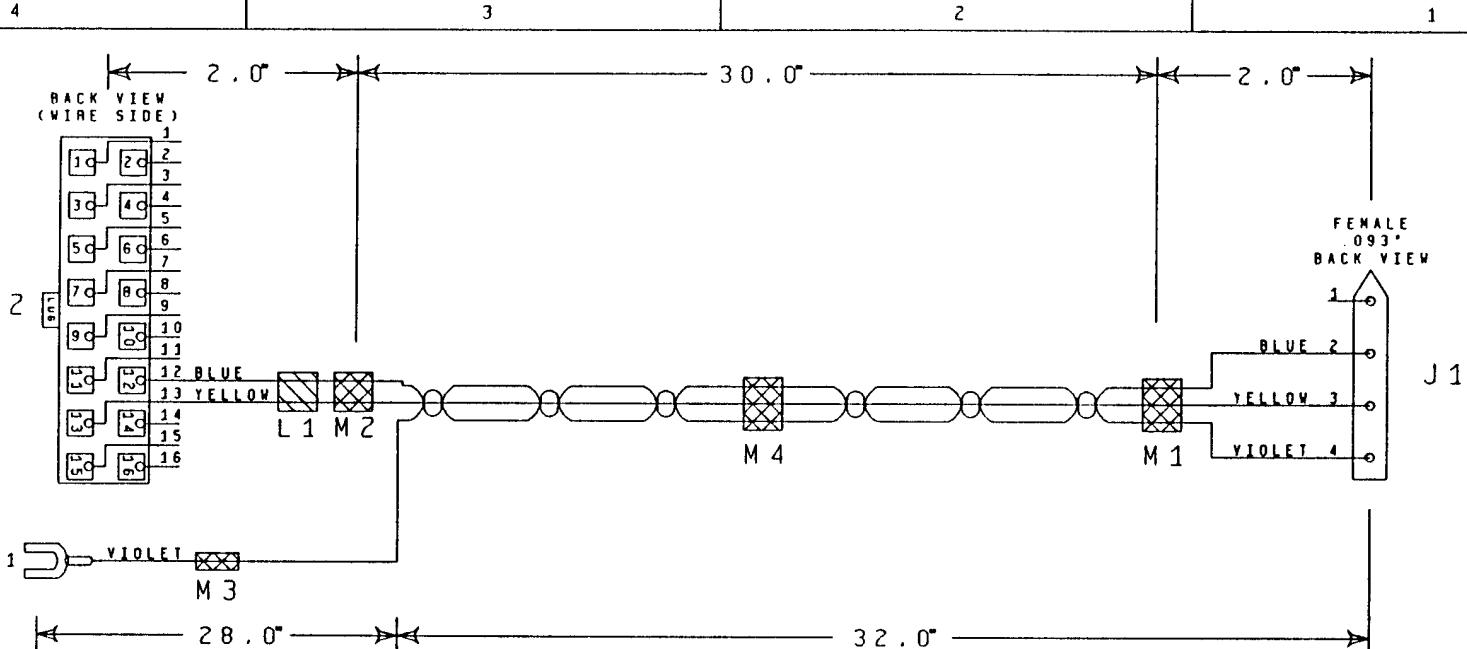
PART LISTS

REFDES	MFG.	PART NO.	PIN NO.
J1	DUPONT	65846-010	47389-000
J2	MOLEX	09-50-7101	08-55-0106
J3	MOLEX	C-236-08X	
J4	AMP	2-520183-2	
P1	AMP	2-520102-2	
L1	FAIR-RITE	2643802702	

MARKERS

REFDES	MFG.	PART NO.	SIZE	TEXT
				(LINE 2) DISPLAY CABLE
M1	BRADY	LAT-4-619-10	.125"	VGB J1
M2	BRADY	LAT-4-619-10	.125"	W-G MONITOR P200
M3	BRADY	LAT-6-619-10	.125"	(LINE 2) DW-00014C-0025-02

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BECKANY	12-18-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKED	DATE	TITLE	
JAY G. McKITTRICK	12-18-90	DISPLAY CABLE	
CHEESEMAN	DATE	MONCABLE	
JAY G. McKITTRICK	12-18-90	SIZE	DRAWING NUMBER
APPROVAL	DATE	C	DW-00014C-0025
RENOVAL	DATE	REV - 02	RELEASE
DATE	SHEET 1 OF 1		



WIRE LIST (ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
SH_YEL	J1-02	J2-12	DK BLUE	9921-13
SH_RED	J1-03	J2-13	YELLOW	9921-4
SH_12V	J1-04	T1	VIOLET	9921-7

PARTS LIST

REFDES	MFG	PART NO	PIN NO
J1	MOLEX	03-09-1042	02-09-5142
J2	MOLEX	14-57-1161	
L1	FAIR-RITE	2643164251	
T1	MOLEX	AA-234-08X	

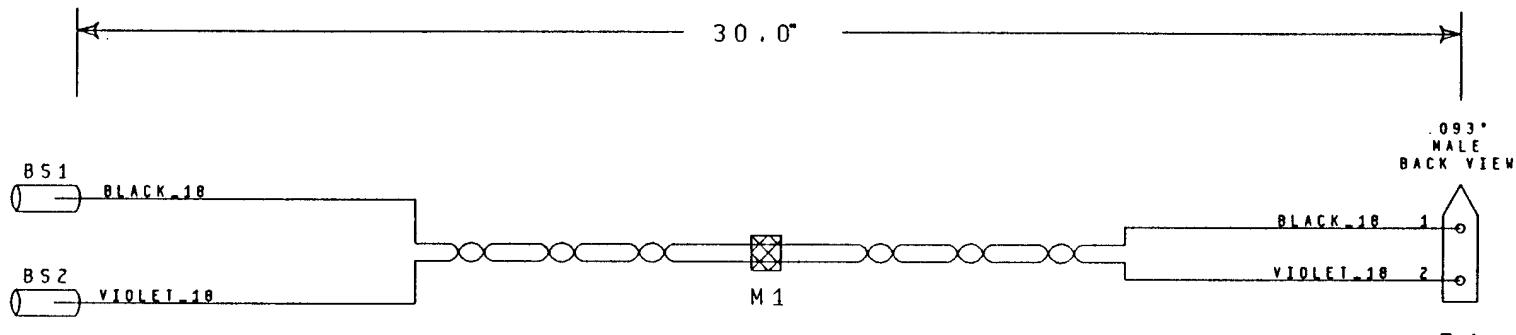
MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	HOST TO SHROUD
M2	BRADY	HCPS.9-3336W	.125"	HOST P4
M2	BRADY	HCPS.9-2508W	.125"	PWR SUP TBZ-9
M4	BRADY	HCPS1.9-3758W	.125"	(LINE 1) LOWER SHROUD HARNESS (LINE 2) DW-00014C-0026-02

NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF FOUR INCHES.
- 3) MARKER M4 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2.
- 5) PINS 1, 2, 15 & 16 OF J2 MUST BE POPULATED.
- 6) SECURE L1 WITH ELECTRICAL TAPE.
- 7) ASSEMBLED HARNESS IS MPG P/N A18-00003-013.

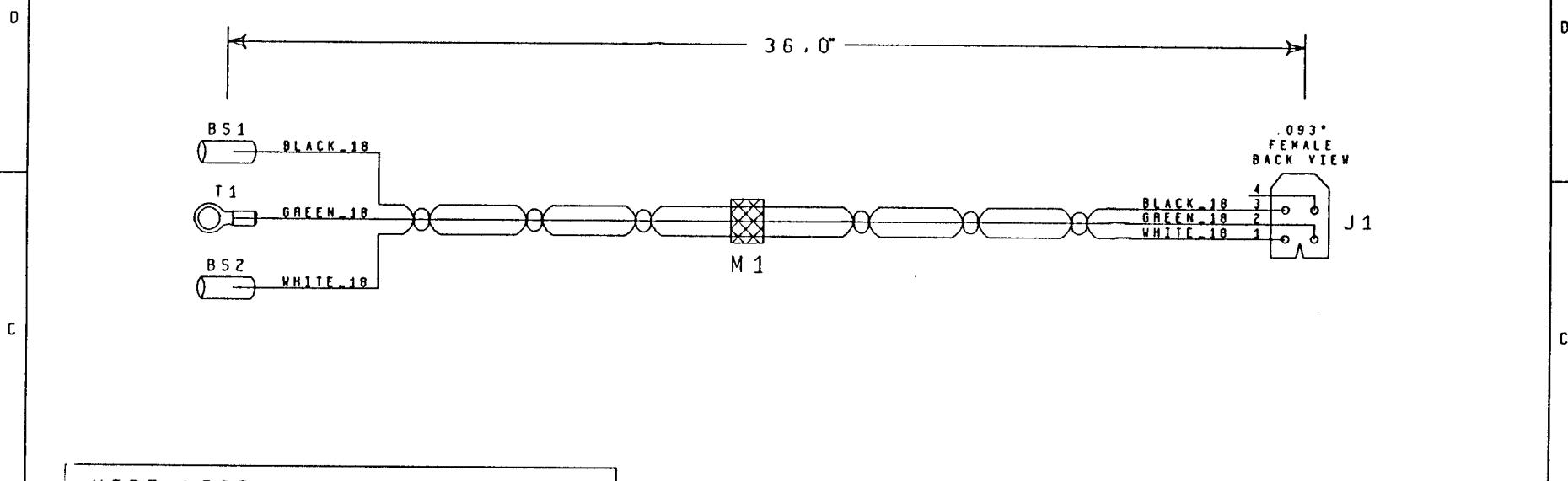
DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY	12-17-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKED	DATE	TITLE	
JAY G. Mc KIBBIN	12-17-90	LOWER SHROUD HARNESS	
ENGINEER	DATE	APPROVAL	
JAY G. Mc KIBBIN	12-17-90	DATE	SIZE
APPROVAL	12-17-90	12-17-90	DRAWING NUMBER
			DW-00014C-0026
APPROVAL	DATE	REV - 02	RELEASE CABLE .12
	12-13-1990-16-33		
		SHEET 1 OF 1	



NOTES:

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF FOUR INCHES.
- 3) MARKER M1 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED.
- 5) CRIMP ONE END ONLY OF BUTT SPLICES BS1 & BS2.

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLOWS	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER	DATE	TITLE	
JAY G. MCKIBBIN	DATE	DC FAN EXTENSION CABLE	
APPROVAL	DATE	SIZE	DRAWING NUMBER
J. Dugay	12/16/90	C	DW-00014A-0027
APPROVAL	DATE	REV	RELEASE CABLE .17
		02	
DATE 12-12-1990-14-38		SHEET 1 OF 1	


WIRE LIST (ALL WIRE IS 18 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
IEUTL	J1-01	BS2	WHITE	8918-10
CHASSIS	J1-02	T1	GREEN	8918-5
DOT	J1-03	BS1	BLACK	8918-9

NOTES :

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF FOUR INCHES.
- 3) MARKER M1 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED.
- 5) CRIMP ONLY ONE END OF BUTT SPLICES BS1 & BS2.
- 6) ASSEMBLED HARNESS IS MPG P/N A18-00003-014.

PARTS LIST

REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2049	02-09-2116
T1	MOLEX	C-236-08X	

MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS1.9-3758W	.125"	(LINE 1) AC-MARQUEE HARNESS (LINE 2) DW-00014C-0028-02

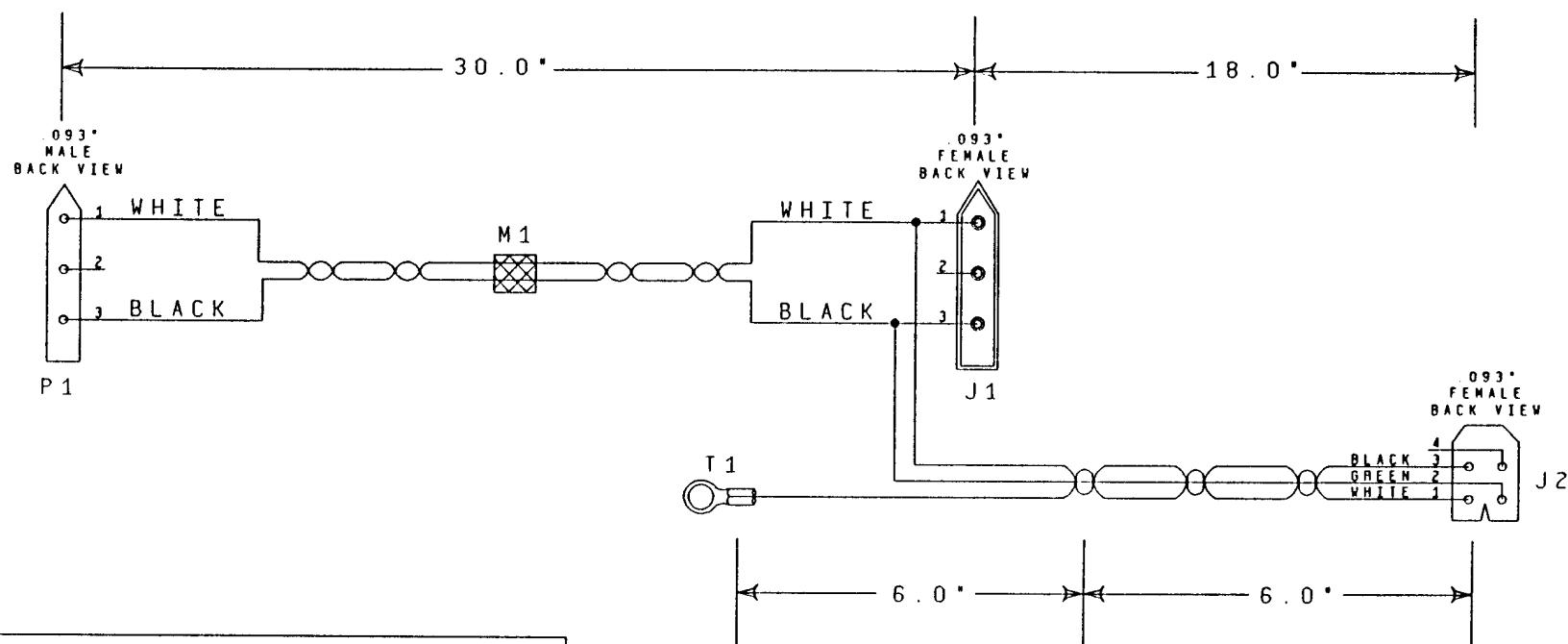
DRAFTER	DATE	MICROPROSE GAMES		
DAVID J. BELLAMY	12-12-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030		
REVISOR	DATE	TITLE		
JAY G. MCKIBBIN	12-12-90	AC - MARQUEE HARNESS		
APPROVAL	DATE	SIZE	DRAWING NUMBER	
O. Gray Jr.	12/14/90	C	DW-00014A-0028	
APPROVAL	DATE	REV	RELEASE CABLE	15
		02		
DATE 12-13-1990 14-25			SHEET 1 OF 1	

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WIRE LIST (ALL WIRE IS 18 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
X?PANCOM	P1-01	J1-01	WHITE	8918-9
X?PANHOT	P1-03	J1-03	BLACK	8918-10
P?MARCOM	J1-01	J2-01	WHITE	8918-9
P?MARHOT	J1-03	J2-03	BLACK	8918-10
CHASSIS	J2-02	T1	GREEN	8918-5

PARTS LIST

R/FDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2032	02-09-2116
J1	MOLEX	03-09-1032	02-09-1117
J2	MOLEX	03-09-1049	02-09-1117
T1	MOLEX	C-236-08X	RING TERM

MARKER LIST

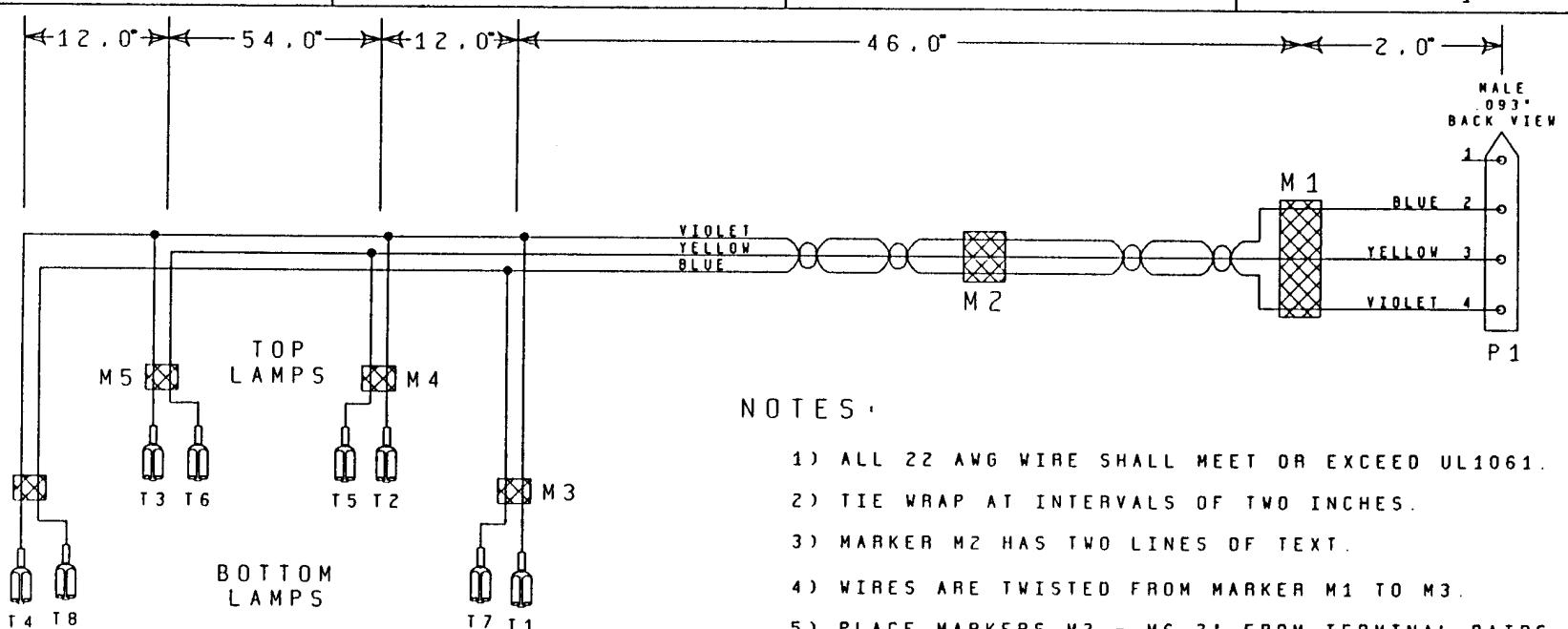
R/LFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS1.9-3758W	.125"	(LINE 1) FLUOR LITE Y CABLE (LINE 2) DW-00014C-0029-02

NOTES

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M1 HAS TWO LINES OF TEXT.
- 4) ASSEMBLED HARNESS IS MPG P/N A18-00003-015.

[Handwritten signatures and initials over the form]

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BEALAMY	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKED	DATE	TITLE	
JAY G. MCKIBBIN	DATE	FLORESCENT LIGHT	
ENGINEER	DATE	'Y' CABLE	
APPROVAL	DATE	SIZE	DRAWING NUMBER
JAY G. MCKIBBIN	12/13/90	C	DW-00014A-0029
APPROVAL	DATE	REV - 02	RELEASE
DATE 12-12-1990-16-56		SHEET 1 OF 1	



NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M2 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED FROM MARKER M1 TO M3.
- 5) PLACE MARKERS M3 - M6 2' FROM TERMINAL PAIRS.
- 6) TWO WIRES ARE CRIMPED IN T1 - T5 & T7.
- 7) ASSEMBLED HARNESS IS MPG P/N A18-00003-016.

PARTS LIST			
REFDES	MFG	PART NO	PIN NO
P1 1 - T8	MOLEX AMP	03-09-2042 2-520184-4	02-09-2118

EFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS .9-3758W	.125"	SHROUD LAMPS
M3	BRADY	HCPS .9-3758W	.125"	BOTTOM LAMP 1
M4	BRADY	HCPS .9-3758W	.125"	TOP LAMP 1
M5	BRADY	HCPS .9-3758W	.125"	TOP LAMP 2
M6	BRADY	HCPS .9-3758W	.125"	BOTTOM LAMP 2
M2	BRADY	HCPS1 .9-3758W	.125"	(LINE 1) UPPER SHROUD HARNESS (LINE 2) DW-00014C-0030-02

WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
SH_RED	P1-02	T7	DK BLUE	9921-13
	T7	T8	DK BLUE	9921-13
SH_YEL	P1-03	T5	YELLOW	9921-4
	T5	T6	YELLOW	9921-4
SH_12V	P1-04	T1	VIOLET	9921-7
	T1	T2	VIOLET	9921-7
	T2	T3	VIOLET	9921-7
	T3	T4	VIOLET	9921-7

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BROWN		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
INSTRUMENT	DATE	TITLE	
JAY G. MCKIBBIN		UPPER SHROUD HARNESS	
APPROVAL	DATE	SIZE	DRAWING NUMBER
DAVID J. BROWN	12/10/90	C	DW-00014C-0030
INSTRUMENT	DATE	REV	RELEASE CABLE .18
JAY G. MCKIBBIN		02	
DATE 12-11-1990 18-36		SHEET 1 OF 1	