
RAM-COMM Expansion Board

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Interface Circuitry

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Input/Output Handling

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Expansion Board Schematic

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RAM - COMM Expansion Board

The expansion hardware provides additional memory and communication capabilities for the AT&T UNIX PC. The expansion hardware's EIA ports make it possible for the PC to communicate with another terminal or computer. Additional memory and EIA capabilities are available separately or in combination, as shown in the following list of expansion hardware options:

- o 0.5MB RAM Expansion Board (no EIA ports)
- o 2.0MB RAM Expansion Board (no EIA ports)
- o 0.5MB EIA/RAM Combo Board (two EIA ports)
- o 1.0MB EIA/RAM Combo Board (two EIA ports)
- o 1.5MB EIA/RAM Combo Board (two EIA ports)
- o Dual EIA Port Board (no RAM, two EIA ports)

The expansion hardware includes:

- o An interface connection P1 and associated circuitry
- o RAM memory
- o EIA connection circuitry (if an EIA or Combo board)

Interface Circuitry

All communications between the expansion board and the UNIX PC bus are through the expansion board interface connector P1.

Input/Output Handling

As a direct memory access (DMA) device, data transfer from the expansion board to the PC bus causes the 68010 to wait while data is transferred into RAM memory. Data transfer is considered a fast cycle (500 ns).

Expansion Hardware

There are three functions which the expansion board may be called upon to perform. Read to memory, read from memory and port to or from memory to the RS-232 interface.

Expansion Board Schematic

Sheet 2--Memory Access Control Circuitry:

This circuitry consists of address latch 1K, lower and upper data strobe control, consisting of demultiplexers 3H and 3J and OR gates 3B and parity interrupt, 2C and 2E.

Sheet 3--Memory Bus Management and Communications Circuitry:

The upper portion of sheet 3 of the schematic contains map address management circuitry consisting of multiplexers 4A, 4B, 4C, 4E, 4H, and 4J. The lower portion of sheet 3 contains the communication interface IC 11E, RS-232 line drivers 12J, 12K, and 12A, and RS-232 receivers 11A and 12B and port connectors J1 and J2.

Note

This circuitry is present only on the EIA/RAM Combo and EIA/RAM boards. The 0.5 and 2.0 RAM expansion boards do not contain interface circuitry or RS-232 ports.

Sheets 4, 5 and 6--Memory (RAM):

Memory circuitry consists of the X, Y, and Z bus, the read bus and read bus control 11H and 11C, and upper and lower parity generator ICs 5K through 10K.

Depending on the amount of RAM that is mounted physically on the expansion board, these locations may or may not be used.

Sheet 5--Expansion Bus Interface:

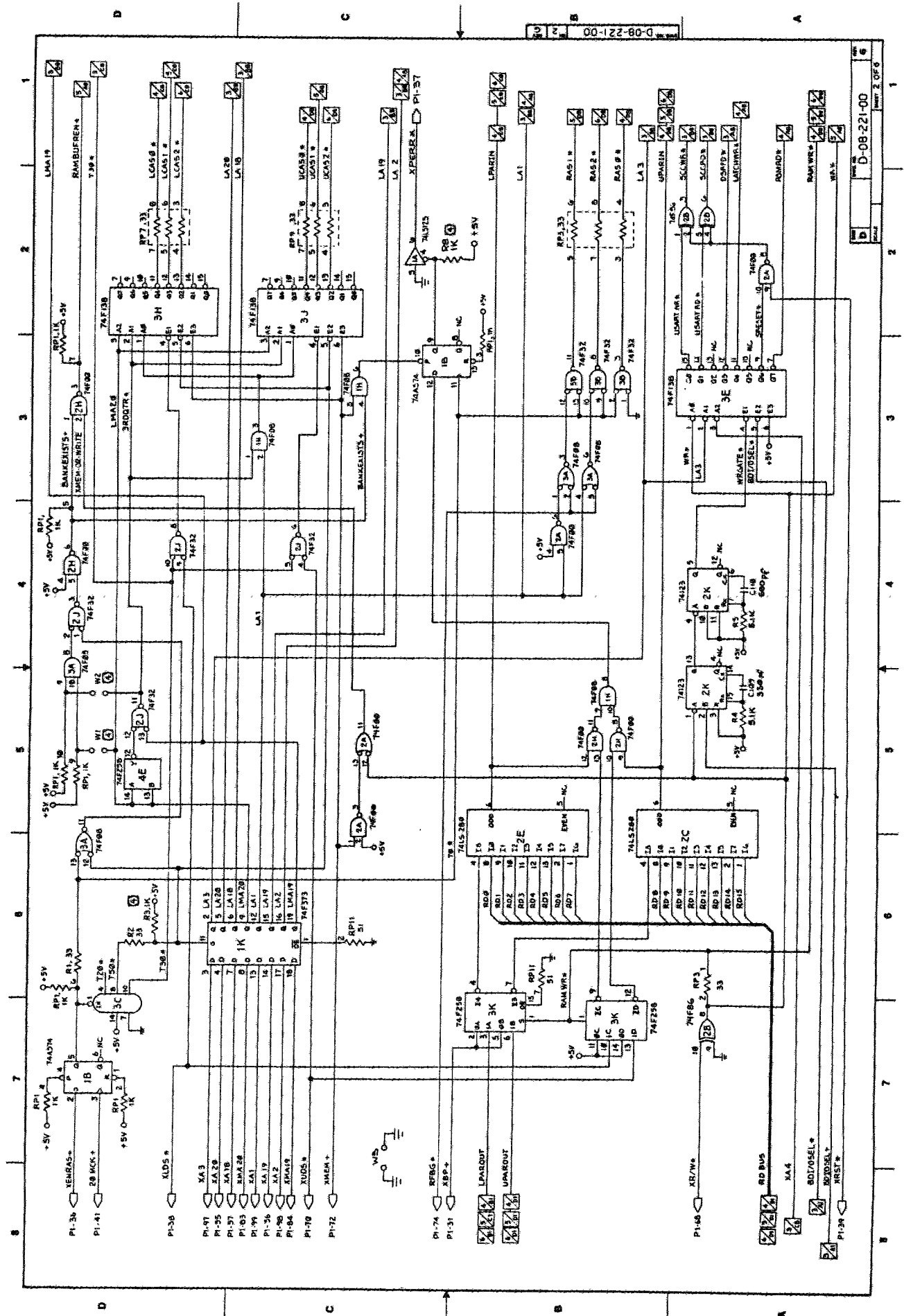
The lower portion of sheet 5 of the schematic also contains data transceivers 1C and 1E connected to the read bus and expansion bus connector P1 completing the expansion loop.

I.C. DEVICE CHART

I.C. TYPE	REFERENCE DESIGNATIONS	+5V	GROUND	UNUSED OUTPUTS
74F00	2A, 2H	14	7	
74F08	3A, 1A	14	7	
74F12	3B, 2J	14	7	
74F16	3C, 2K, 3J	14	7	
74F20	3E, 2M, 3L	16	8	
74F24	3G, 2N	16	8	
74F28	3I, 2O	16	8	
74F32	3K, 2P	16	8	
74F36	3M, 2Q	16	8	
74F40	3O, 2R	16	8	
74F44	3Q, 2S	16	8	
74F48	3R, 2T	16	8	
74F52	3S, 2U	16	8	
74F56	3T, 2V	16	8	
74F60	3U, 2W	16	8	
74F64	3V, 2X	16	8	
74F68	3W, 2Y	16	8	
74F72	3X, 2Z	16	8	
74F76	3Y, 2AA	16	8	
74F80	3Z, 2AB	16	8	
74F84	3AA, 2AC	16	8	
74F88	3AB, 2AD	16	8	
74F92	3AC, 2AE	16	8	
74F96	3AD, 2AF	16	8	
74F100	3AE, 2AG	16	8	
74F104	3AF, 2AH	16	8	
74F108	3AG, 2AI	16	8	
74F112	3AH, 2AJ	16	8	
74F116	3AI, 2AK	16	8	
74F120	3AJ, 2AL	16	8	
74F124	3AK, 2AM	16	8	
74F128	3AL, 2AN	16	8	
74F132	3AM, 2AO	16	8	
74F136	3AN, 2AP	16	8	
74F140	3AO, 2AQ	16	8	
74F144	3AP, 2AR	16	8	
74F148	3AQ, 2AS	16	8	
74F152	3AR, 2AT	16	8	
74F156	3AS, 2AU	16	8	
74F160	3AT, 2AV	16	8	
74F164	3AU, 2AW	16	8	
74F168	3AV, 2AX	16	8	
74F172	3AW, 2AY	16	8	
74F176	3AX, 2AZ	16	8	
74F180	3AY, 2BA	16	8	
74F184	3AZ, 2BB	16	8	
74F188	3BA, 2BC	16	8	
74F192	3BB, 2BD	16	8	
74F196	3BC, 2BE	16	8	
74F200	3BD, 2BF	16	8	
74F204	3BE, 2BG	16	8	
74F208	3BF, 2BH	16	8	
74F212	3BG, 2BI	16	8	
74F216	3BH, 2BJ	16	8	
74F220	3BI, 2BK	16	8	
74F224	3BJ, 2BL	16	8	
74F228	3BK, 2BM	16	8	
74F232	3BL, 2BN	16	8	
74F236	3BM, 2BO	16	8	
74F240	3BN, 2BP	16	8	
74F244	3BO, 2BQ	16	8	
74F248	3BP, 2BR	16	8	
74F252	3BQ, 2BS	16	8	
74F256	3BR, 2BT	16	8	
74F260	3BS, 2BU	16	8	
74F264	3BT, 2BV	16	8	
74F268	3BU, 2BW	16	8	
74F272	3BV, 2BX	16	8	
74F276	3BW, 2BY	16	8	
74F280	3BX, 2BZ	16	8	
74F284	3BY, 2CA	16	8	
74F288	3BZ, 2CB	16	8	
74F292	3CA, 2CC	16	8	
74F296	3CB, 2CD	16	8	
74F300	3CC, 2CE	16	8	
74F304	3CD, 2CF	16	8	
74F308	3CE, 2CG	16	8	
74F312	3CF, 2CH	16	8	
74F316	3CG, 2CI	16	8	
74F320	3CH, 2CJ	16	8	
74F324	3CI, 2CK	16	8	
74F328	3CJ, 2CL	16	8	
74F332	3CK, 2CM	16	8	
74F336	3CL, 2CN	16	8	
74F340	3CM, 2CO	16	8	
74F344	3CN, 2CP	16	8	
74F348	3CO, 2CQ	16	8	
74F352	3CP, 2CR	16	8	
74F356	3CQ, 2CS	16	8	
74F360	3CR, 2CT	16	8	
74F364	3CS, 2CU	16	8	
74F368	3CT, 2CV	16	8	
74F372	3CU, 2CW	16	8	
74F376	3CV, 2CX	16	8	
74F380	3CW, 2CY	16	8	
74F384	3CX, 2CZ	16	8	
74F388	3CY, 2CA	16	8	
74F392	3CZ, 2CB	16	8	
74F396	3CA, 2CC	16	8	
74F400	3CB, 2CD	16	8	
74F404	3CC, 2CE	16	8	
74F408	3CD, 2CF	16	8	
74F412	3CE, 2CG	16	8	
74F416	3CF, 2CH	16	8	
74F420	3CG, 2CI	16	8	
74F424	3CH, 2CJ	16	8	
74F428	3CI, 2CK	16	8	
74F432	3CJ, 2CL	16	8	
74F436	3CK, 2CM	16	8	
74F440	3CL, 2CN	16	8	
74F444	3CM, 2CO	16	8	
74F448	3CN, 2CP	16	8	
74F452	3CO, 2CQ	16	8	
74F456	3CP, 2CR	16	8	
74F460	3CQ, 2CS	16	8	
74F464	3CR, 2CT	16	8	
74F468	3CS, 2CU	16	8	
74F472	3CT, 2CV	16	8	
74F476	3CU, 2CW	16	8	
74F480	3CV, 2CX	16	8	
74F484	3CW, 2CY	16	8	
74F488	3CX, 2CZ	16	8	
74F492	3CY, 2CA	16	8	
74F496	3CZ, 2CB	16	8	
74F500	3CA, 2CC	16	8	
74F504	3CB, 2CD	16	8	
74F508	3CC, 2CE	16	8	
74F512	3CD, 2CF	16	8	
74F516	3CE, 2CG	16	8	
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74F524	3CG, 2CI	16	8	
74F528	3CH, 2CJ	16	8	
74F532	3CI, 2CK	16	8	
74F536	3CJ, 2CL	16	8	
74F540	3CK, 2CM	16	8	
74F544	3CL, 2CN	16	8	
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74F552	3CN, 2CP	16	8	
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74F596	3CY, 2CA	16	8	
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74F608	3CB, 2CD	16	8	
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74F616	3CD, 2CF	16	8	
74F620	3CE, 2CG	16	8	
74F624	3CF, 2CH	16	8	
74F628	3CG, 2CI	16	8	
74F632	3CH, 2CJ	16	8	
74F636	3CI, 2CK	16	8	
74F640	3CJ, 2CL	16	8	
74F644	3CK, 2CM	16	8	
74F648	3CL, 2CN	16	8	
74F652	3CM, 2CO	16	8	
74F656	3CN, 2CP	16	8	
74F660	3CO, 2CQ	16	8	
74F664	3CP, 2CR	16	8	
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74F676	3CS, 2CU	16	8	
74F680	3CT, 2CV	16	8	
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74F708	3CA, 2CC	16	8	
74F712	3CB, 2CD	16	8	
74F716	3CC, 2CE	16	8	
74F720	3CD, 2CF	16	8	
74F724	3CE, 2CG	16	8	
74F728	3CF, 2CH	16	8	
74F732	3CG, 2CI	16	8	
74F736	3CH, 2CJ	16	8	
74F740	3CI, 2CK	16	8	
74F744	3CJ, 2CL	16	8	
74F748	3CK, 2CM	16	8	
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74F756	3CM, 2CO	16	8	
74F760	3CN, 2CP	16	8	
74F764	3CO, 2CQ	16	8	
74F768	3CP, 2CR	16	8	
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74F808	3CZ, 2CB	16	8	
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74F856	3CL, 2CN	16	8	
74F860	3CM, 2CO	16	8	
74F864	3CN, 2CP	16	8	
74F868	3CO, 2CQ	16	8	
74F872	3CP, 2CR	16	8	
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74F952	3CJ, 2CL	16	8	
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74F984	3CR, 2CT	16	8	
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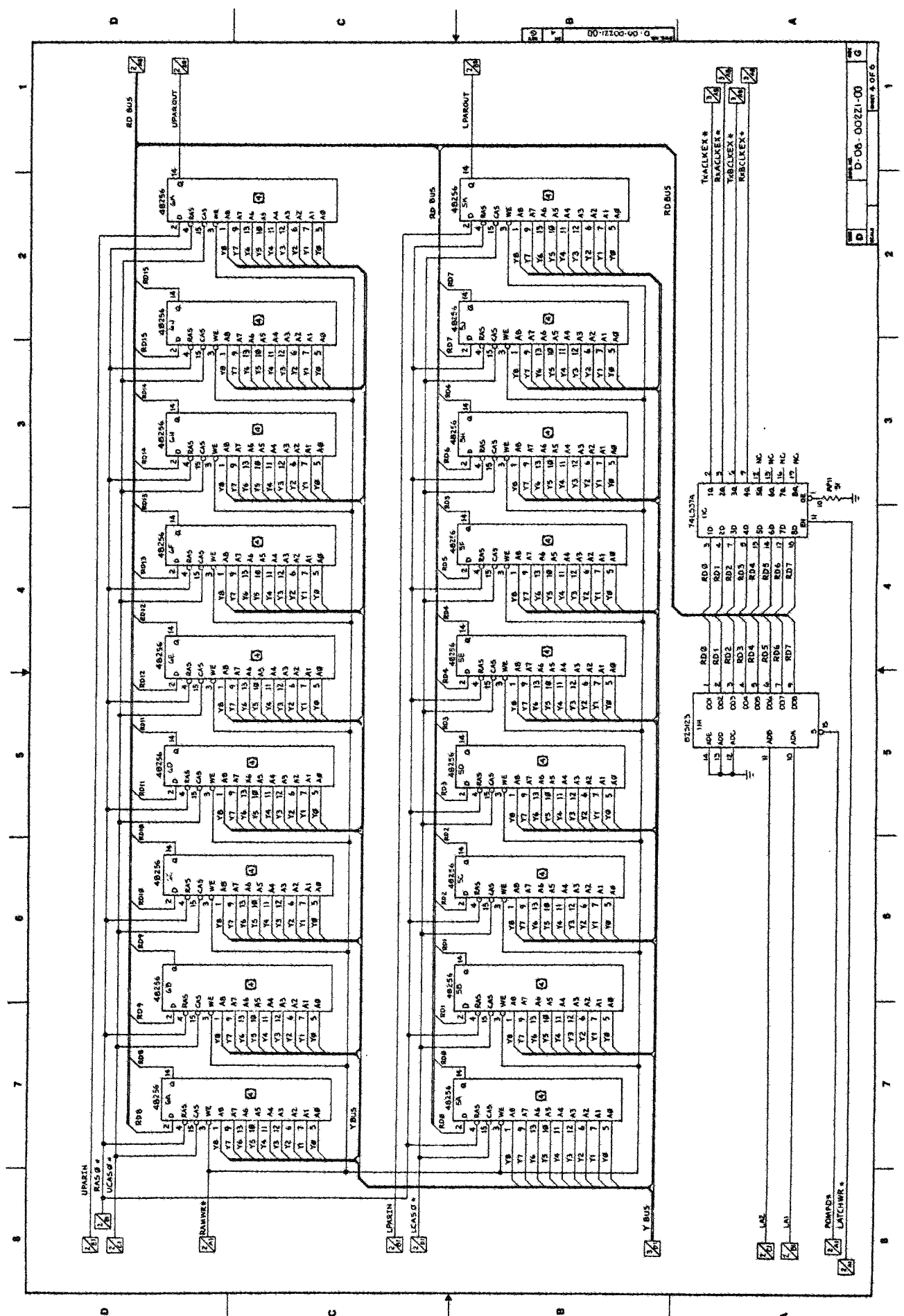
REVISIONS

REV	DATE	DESCRIPTION
1	11/15/68	ISSUED
2	12/10/68	REVISED PER C.D. # 5100
3	1/10/69	REVISED PER C.D. # 5101
4	2/10/69	REVISED PER C.D. # 5102
5	3/10/69	REVISED PER C.D. # 5103
6	4/10/69	REVISED PER C.D. # 5104
7	5/10/69	REVISED PER C.D. # 5105
8	6/10/69	REVISED PER C.D. # 5106
9	7/10/69	REVISED PER C.D. # 5107
10	8/10/69	REVISED PER C.D. # 5108
11	9/10/69	REVISED PER C.D. # 5109
12	10/10/69	REVISED PER C.D. # 5110
13	11/10/69	REVISED PER C.D. # 5111
14	12/10/69	REVISED PER C.D. # 5112
15	1/10/70	REVISED PER C.D. # 5113
16	2/10/70	REVISED PER C.D. # 5114
17	3/10/70	REVISED PER C.D. # 5115
18	4/10/70	REVISED PER C.D. # 5116
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20	6/10/70	REVISED PER C.D. # 5118
21	7/10/70	REVISED PER C.D. # 5119
22	8/10/70	REVISED PER C.D. # 5120
23	9/10/70	REVISED PER C.D. # 5121
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25	11/10/70	REVISED PER C.D. # 5123
26	12/10/70	REVISED PER C.D. # 5124
27	1/10/71	REVISED PER C.D. # 5125
28	2/10/71	REVISED PER C.D. # 5126
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 SHEET 2 OF 6

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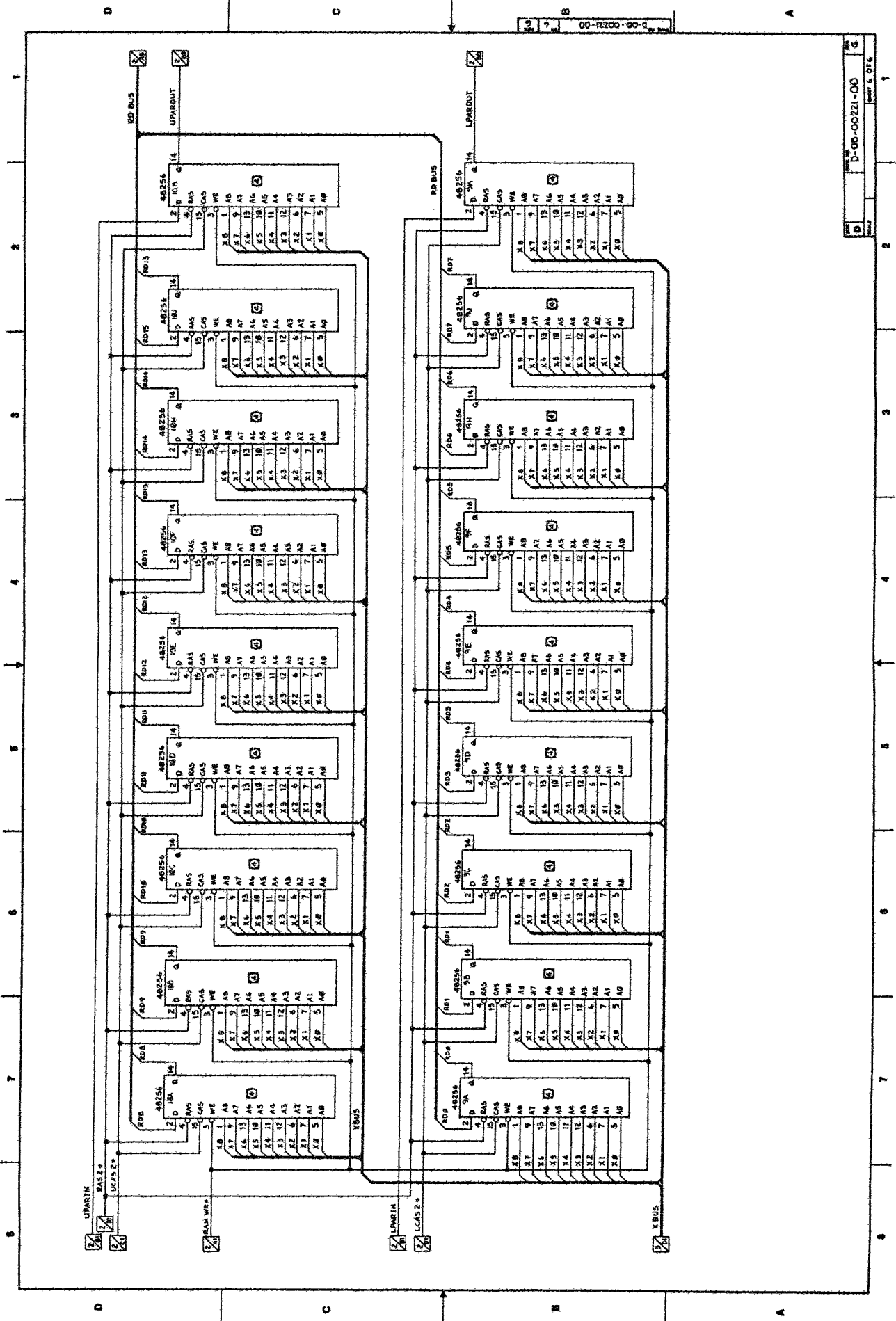


D-06-00221-00
REV. 1 OF 5

74LS27A

74LS237A

POWER3
LATCHWR*



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REV 5, DTG

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