

Theory of Operations Manual

MODEL 9000

GRAPHIC DISPLAY SYSTEM

VOLUME II

RAMTEK CORPORATION • 583 NORTH MARY AVENUE • SUNNYVALE, CA 94086

PRINTED - AUGUST - 1977

NOTE  
THE INDEX OF  
DRAWINGS IS  
ON PAGE 13-9

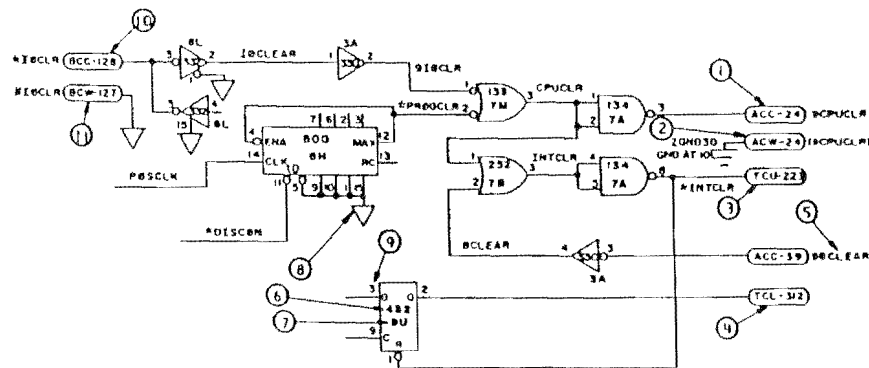
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Section 13.0 of Volume I is repeated here, in Volume II, as a guide to the user.

NOTE

Section 13.0 of Volume I is repeated here, in Volume II, as a guide to the user.



LEGEND:

- ① "A" connector component side, pin number.
- ② "A" connector non-component side, pin number.
- ③ Test connector upper, pin number.
- ④ Test connector lower, pin number.
- ⑤ Term name.
- ⑥ Device type number, refer to Table 13-1.
- ⑦ Device location, refer to Figure 13-2.
- ⑧ Signal ground.
- ⑨ Pin number on device.
- ⑩ "B" connector component side, pin number.
- ⑪ "B" connector non-component side, pin number.

FIGURE 13-1 SCHEMATIC NOTES

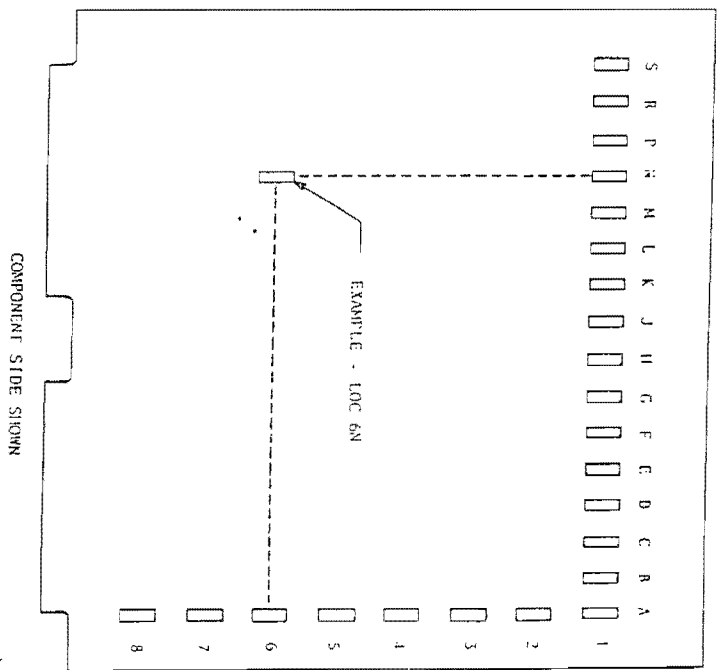


FIGURE 13-2 TYPICAL DEVICE LOCATION DESIGNATOR

TABLE 13-1 NUMERICAL LISTING OF IC TYPES

REFERENCE	RAMTEK PART NO.	DESCRIPTION	MFR.	MFR. PART NO.
001	1301001	IC: Dual 2 input AND gate open collector driver	01295	SN75451B
002	1301002	IC: Quad 2 input AND gate	01295	SN7408N
024	1301024	IC: Dual 4 input AND gate	01295	SN74H21N
030	1301030	IC: Quad 2 input AND gate	01295	SN74S08N
031	1301031	IC: Quad 2 input AND gate	01295	SN74LS08N
032	1301032	IC: Dual 4 input AND gate	01295	SN74S21N
033	1301033	IC: Dual 4 input AND gate	01295	SN74LS21N
034	1301034	IC: Quad 2 input AND gate open collector	01295	SN74LS09N
100	1301100	IC: Quad 2 input NAND gate open collector	01295	SN7401N
101	1301101	IC: Quad 2 input NAND gate driver	01295	SN7437N
102	1301102	IC: Quad 2 input NAND gate	01295	SN7400N
103	1301103	IC: Triple 3 input NAND gate	01295	SN7412N
104	1301104	IC: Dual 4 input NAND gate	01295	SN7420N
105	1301105	IC: Quad 2 input NAND gate driver (open collector)	01295	SN7438N
106	1301106	IC: Quad 2 input NAND gate driver	01295	SN7439N
107	1301107	IC: Dual peripheral positive NAND gate driver (open collector)	01295	SN75452B
108	1301108	IC: 8 input NAND gate	01295	SN7430N
112	1301112	IC: Quad 2 input NAND gate open collector	01295	SN7403N
132	1301132	IC: Quad 2 input NAND gate	01295	SN74S00N
133	1301133	IC: Quad 2 input NAND gate	01295	SN74LS00N
134	1301134	IC: Quad 2 input NAND gate driver	01295	SN74S37N
135	1301135	IC: Dual 4 input NAND gate	01295	SN74S20N
136	1301136	IC: Dual 4 input NAND gate	01295	SN74LS20N
137	1301137	IC: 12 input NAND gate with tristate control	01295	SN74S154N
138	1301138	IC: Dual 2 input 50 ohm NAND gate driver	01295	SN74S140N
139	1301139	IC: Triple 3 input NAND gate	01295	SN74H10N
140	1301140	IC: Quad 2 input NAND gate	01295	SN74H00N
141	1301141	IC: Dual 4 input NAND gate	01295	SN74H20N
142	1301142	IC: Quad 2 input NAND Schmitt triggers	01295	SN74LS132N
143	1301143	IC: Quad 2 input NAND (open collector)	01295	SN74LS03N
200	1301200	IC: Dual 2 input OR gate peripheral driver	01295	SN75453B
231	1301231	IC: Quad 2 input OR gate	01295	SN74S32N
232	1301232	IC: Quad 2 input OR gate	01295	SN74LS32N
300	1301300	IC: Hex inverter	01295	SN7404N
301	1301301	IC: Hex inverter	01295	SN74L04N
302	1301302	IC: Quad 2 input NOR gate	01295	SN7402N
303	1301303	IC: Triple 3 input NOR gate	01295	SN7427N
304	1301304	IC: Quad MOS clock driver	32293	HM5003
305	1301305	IC: Differential line receiver	01295	SN75182N
306	1301306	IC: TTL to ECL translator	01295	SN10124N
307	1301307	IC: ECL to TTL translator	01295	SN10125N
308	1301308	IC: Differential line receiver	01295	SN75107N
309	1301309	IC: Differential line driver	01295	SN75183N

TABLE 13-1 NUMERICAL LISTING OF IC TYPES (CONT'D)

REFERENCE	RAMTEK PART NO.	DESCRIPTION	REF.	REF. PART NO.
310	1301310	IC: Hex inverter open collector	01295	SN7405N
311	1301311	IC: Hex inverting Schmitt trigger	01295	SN7414N
312	1301312	IC: Dual line driver	18324	8T13
313	1301313	IC: Differential line driver	01295	SN75110N
314	1301314	IC: Hex inverter open collector driver	01295	SN7406N
315	1301315	IC: Hex inverter open collector, high voltage	01295	SN7416N
316	1301316	IC: Hex inverter	01295	SN7400N
317	1301317	IC: Dual 2 input NOR gate peripheral driver	01295	SN75454B
318	1301318	IC: Video operational amplifier/driver	27014	LJ10002C
319	1301319	IC: MOS clock driver TO-8 package	27014	M10026CG
320	1301320	IC: Dual differential line driver	18324	DM8430
321	1301321	IC: Voltage follower 14 pin DIP	27014	LM1100
322	1301322	IC: Dual line driver	01295	SN75150N
323	1301323	IC: Operational amplifier	27014	LM301N
324	1301324	IC: Voltage regulator	27014	LM305N
325	1301325	IC: 5 volt regulator	27014	LM309N
326	1301326	IC: Voltage follower	27014	LM310N
327	1301327	IC: Audio power amplifier	27014	LM380N
328	1301328	IC: Quad amplifier	27014	LM3900N
329	1301329	IC: 5 volt regulator TO-9 package	27104	LM309H
330	1301330	IC: Hex inverter	01295	SN74LS04N
331	1301331	IC: Hex inverter	01295	SN74S04N
332	1301332	IC: Tristate line driver/receiver	18324	8T26
333	1301333	IC: Quad 2 input NOR gate	01295	SN74LS02N
334	1301334	IC: Quad 2 input NOR gate	01295	SN74LS02N
335	1301335	IC: Triple 3 input NOR gate	01295	SN74S27N
336	1301336	IC: Triple 3 input NOR gate	01295	SN74LS27N
337	1301337	IC: Dual 5 input NOR gate	01295	SN74S26N
338	1301338	IC: RS232 line driver	01295	SN75188N
339	1301339	IC: RS232 line receiver	01295	SN75189N
340	1301340	IC: High speed hex inverter	18324	8H90A
341	1301341	IC: Noninverting hex buffer, high voltage (open collector)	01295	SN7417N
342	1301342	IC: Quad comparator	18324	LM139N
343	1301343	IC: Precision operational amplifier	27014	LM50
350	1301350	IC: Dual MOS clock driver	27014	DS0026CN
365	1301365	IC: Hex non-inverting bus drivers (tri-state)	01295	SN74LS65N
366	1301366	IC: Hex inverting bus drivers (tri-state)	01295	SN74LS66N
367	1301367	IC: Hex non-inverting bus drivers (tri-state)	01295	SN74LS67N
368	1301368	IC: Hex inverting bus drivers (tri-state)	01295	SN74LS68N
369	1301369	IC: Hex non-inverting bus drivers (tri-state)	01295	SN74LS69N
400	1301400	IC: Quad 80 bit shift register	34609	3409
401	1301401	IC: 256 x 1 bipolar RAM	01295	SN74S209N

TABLE 13-1 NUMERICAL LISTING OF IC TYPES (CONT'D)

REFERENCE	RAMTEK PART NO.	DESCRIPTION	MFR.	MFR. PART NO.
402	1301402	IC: Quad 256 bit MOS shift register	34335	2802DC
403	1301403	IC: 1k x 1 bit shift register	32293	7722
404	1301404	IC: Dual one shot	01295	SN74123N
405	1301405	IC: 4 bit latch	07263	9314
406	1301406	IC: 16 x 4 bit bipolar RAM	01295	SN7489N
407	1301407	IC: Dual 480 bit shift register	31471	51685
408	1301408	IC: 8 bit parallel in-serial out shift register	01295	SN74164N
409	1301409	IC: 8 bit serial in-parallel out shift register	01295	SN74166N
410	1301410	IC: Hex D flip-flop	01295	SN74174N
411	1301411	IC: 4 bit left-right shift register	01295	SN74194N
412	1301412	IC: 256 x 1 MOS RAM	18324	2501
413	1301413	IC: 1024 bit MOS shift register	18324	2525
414	1301414	IC: 1024 x 1 bit MOS dynamic RAM	50361	1M5260
415	1301415	IC: 256 bit bipolar RAM	32293	T5523
416	1301416	IC: 1024 bit dynamic shift register	18324	2512
417	1301417	IC: 4 bit shift register with JK inputs	01295	SN74195N
418	1301418	IC: Dual one shot	07263	9602
419	1301419	IC: Dual D flip-flop	01295	SN74174N
424	1301424	IC: 64 x 4 RAM	01295	SN745189N
426	1301426	IC: 256 x 4 static RAM	34335	AM9112C
430	1301430	IC: Dual JK flip-flop	01295	SN745112N
431	1301431	IC: Hex D flip-flop	01295	SN745174N
432	1301432	IC: Hex D flip-flop	01295	SN74LS174N
433	1301433	IC: Left-right shift register	01295	SN74LS194N
434	1301434	IC: Dual D flip-flop	01295	SN74524N
435	1301435	IC: Dual JK flip-flop	01295	SN74LS109N
436	1301436	IC: Left-right shift register	01295	SN745194N
437	1301437	IC: Dual JK flip-flop	01295	SN74LS174N
438	1301438	IC: 8 bit serial in-parallel out shift	01295	SN74LS166N
439	1301439	IC: Dual JK flip-flop	01295	SN745109N
440	1301440	IC: 4 bit D-type register (tri-state)	01295	SN74173N
441	1301441	IC: 1k x 1 static RAM	32293	1M55518CJE
442	1301442	IC: 256 x 1 RAM	34335	AM271500PC
443	1301443	IC: 1k x 1 RAM	07263	93425AXC
444	1301444	IC: 8 bit D-type latch	01295	SN745374
445	1301445	IC: 4 bit register file	01295	SN74170N
446	1301446	IC: 256 x 4 static RAM	34335	AM9112
447	1301447	IC: 256 x 4 bi-polar RAM (separate I/O)	07263	95L422
448	1301448	IC: Dual JK flip-flop	01295	SN74LS107N
449	1301449	IC: Mono stable multivibrator	01295	SN74LS123N
450	1301450	IC: 4k x 1 dynamic RAM	07263	40965DC
451	1301451	IC: Dual D type flip-flop	01295	SN74LS74N
452	1301452	IC: 256 x 4 static RAM	34649	8111-2
453	1301453	IC: 1k x 1 static RAM	34335	AM9102EPC
454	1301454	IC: 8 bit SI-PO shift register	01295	SN74LS164N
500	1301500	IC: 4 bit up-down counter	01295	SN74191N

TABLE 13-1 NUMERICAL LISTING OF IC TYPES (CONT'D)

REFERENCE	RAMTEX PART NO.	DESCRIPTION	MFR.	MFR. PART NO.
501	1301501	IC: 4 bit adder	01295	SN74283N
502	1301502	IC: 9 line to BCD encoder	01295	SN74147N
503	1301503	IC: Quad 2 input multiplexer with storage	01295	SN74298N
504	1301504	IC: UART	52840	TR1602A
505	1301505	IC: 4 to 10 line decoder	01295	SN7442N
506	1301506	IC: 4 bit binary up-down counter	01295	SN74LS193N
507	1301507	IC: 2 section - 4 input selector	01295	SN74LS153N
508	1301508	IC: 4 bit binary adder (not recommended for use dur to pwr. gnd arrangement)	01295	SN7483N
509	1301509	IC: 4 bit up-down binary counter	01295	SN74193N
510	1301510	IC: 4 bit up-down BCD counter	01295	SN74192N
511	1301511	IC: BCD to 7 segment decoder/driver	01295	SN7447N
513	1301513	IC: BCD counter	07263	93L16
514	1301514	IC: 8 to 1 line selector	01295	SN74151N
515	1301515	IC: 2 section - 4 input selector	01295	SN74153N
516	1301516	IC: Quad 2-line-to-1-line selector	01295	SN74157N
517	1301517	IC: 4 bit binary counter	07263	9316
518	1301518	IC: 4 bit comparator	01295	SN7485N
519	1301519	IC: Quad 2 input exclusive OR gate	01295	SN7486N
520	1301520	IC: 4 AND/NOR gate	01295	SN74H55N
521	1301521	IC: Keyboard encoder ROM	11711	AY-5-3600-XXX
522	1301522	IC: Baud rate clock generator, MOS	27014	HM5307AA/N
523	1301523	IC: Dual voltage controlled oscillators	01295	SN74LS124N
524	1301524	IC: Phase frequency detector	04713	MC0444P
525	1301525	IC: Timer	18324	NE555Y
526	1301526	IC: Timer	18324	NE556A
527	1301527	IC: Timer	18324	NE565A
528	1301528	IC: 4 bit binary counter	01295	SN74LS91N
529	1301529	IC: Look ahead carry generator	01295	SN74S182N
530	1301530	IC: 4 bit comparator	01295	SN7485N
531	1301531	IC: Quad exclusive OR gate	01295	SN74S86N
532	1301532	IC: 3 to 8 decoder/demultiplexer	01295	SN74S138N
533	1301533	IC: 8 input selector	01295	SN74S15N
534	1301534	IC: 2 section - 4 input selector	01295	SN74S153N
535	1301535	IC: 4 section - 2 input selector	01295	SN74S157N
536	1301536	IC: 4 bit binary counter	01295	SN74S161N
537	1301537	IC: 3 to 8 decoder/demultiplexer	01295	SN74138N
538	1301538	IC: 5 x 7 font ASCII character generator	18321	2513N/CM2110
539	1301539	IC: 4 section - 2 input selector	01295	SN74S158N
540	1301540	IC: 4 AND NOR gate	01295	SN74S64N
541	1301541	IC: Dual 2 AND/NOR gate	01295	SN74LS51N
542	1301542	IC: Arithmetic logic unit/function generator	01295	SN74S181N
543	1301543	IC: Synchronous 4 bit up-down counter	01295	SN74S169N
544	1301544	IC: 8 input selector	01295	SN74LS151N
545	1301545	IC: 4 section - 2 input selector	01295	SN74LS157N
546	1301546	IC: 4 section - 2 input selector	01295	SN74LS153N
547	1301548	IC: 4 bit binary counter	01295	SN74LS161N



TABLE 13-1 NUMERICAL LISTING OF IC TYPES (CONT'D)

REFERENCE	RAMTEK PART NO.	DESCRIPTION	MFR.	MFR. PART NO.
548	1301548	IC: Quad 2 input multiplexer with D storage	01295	SN74LS298N
549	1301549	IC: 3-to-8 decoder/demultiplexer	01295	SN74LS138N
550	1301550	IC: Decode counter	18324	N7490
551	1301551	IC: BCD to 7 segment decoder/driver	01295	SN7448N
552	1301552	IC: Synchronous up/down decode counter	01295	SN74S168N
554	1301554	IC: Synchronous up/down binary counter	01295	SN74S169N
555	1301555	IC: Arithmetic logic unit	01295	SN74181N
556	1301556	IC: 1 of 16 decoder/demultiplexer	01295	SN74150N
558	1301558	IC: Synchronous 4 bit binary counter	01295	SN74163N
559	1301559	IC: Synchronous 4 bit decode counter	01295	SN74160N
560	1301560	IC: Quad 2 to 1 selector/multiplexer	01295	SN74S257N
561	1301561	IC: Dual 4 to 1 selector/multiplexer (open collector)	01295	SN74S253N
562	1301562	IC: Dual 2 to 4 decoder/demultiplexer	01295	SN74S139
536	1301563	IC: 8 bit I/O port	34649	8212
564	1301564	IC: Priority encoder	01295	SN74148N
565	1301565	IC: Programmable communication interface (USART)	34649	8251
566	1301566	IC: Programmable bit rate generator	07263	F4702
600	1301600	IC: 8080 microprocessor (325 ns cycle time)	34335	9080A-1
602	1301602	IC: 8080 microprocessor (480 ns cycle time)	34335	8080A
603	1301603	IC: Z80 microprocessor (250 ns cycle time)		HK3880-44
608	1301608	IC: Bit slice bi-polar microprocessor	34335	AM2901
609	1301609	IC: Microprocessor sequencer	34335	AM2909
700	1301700	IC: ECL JK flip-flop	04713	MC10231P

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Large Distribution Panel Assembly .....	502769
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Small Distribution Panel Assembly .....	502635
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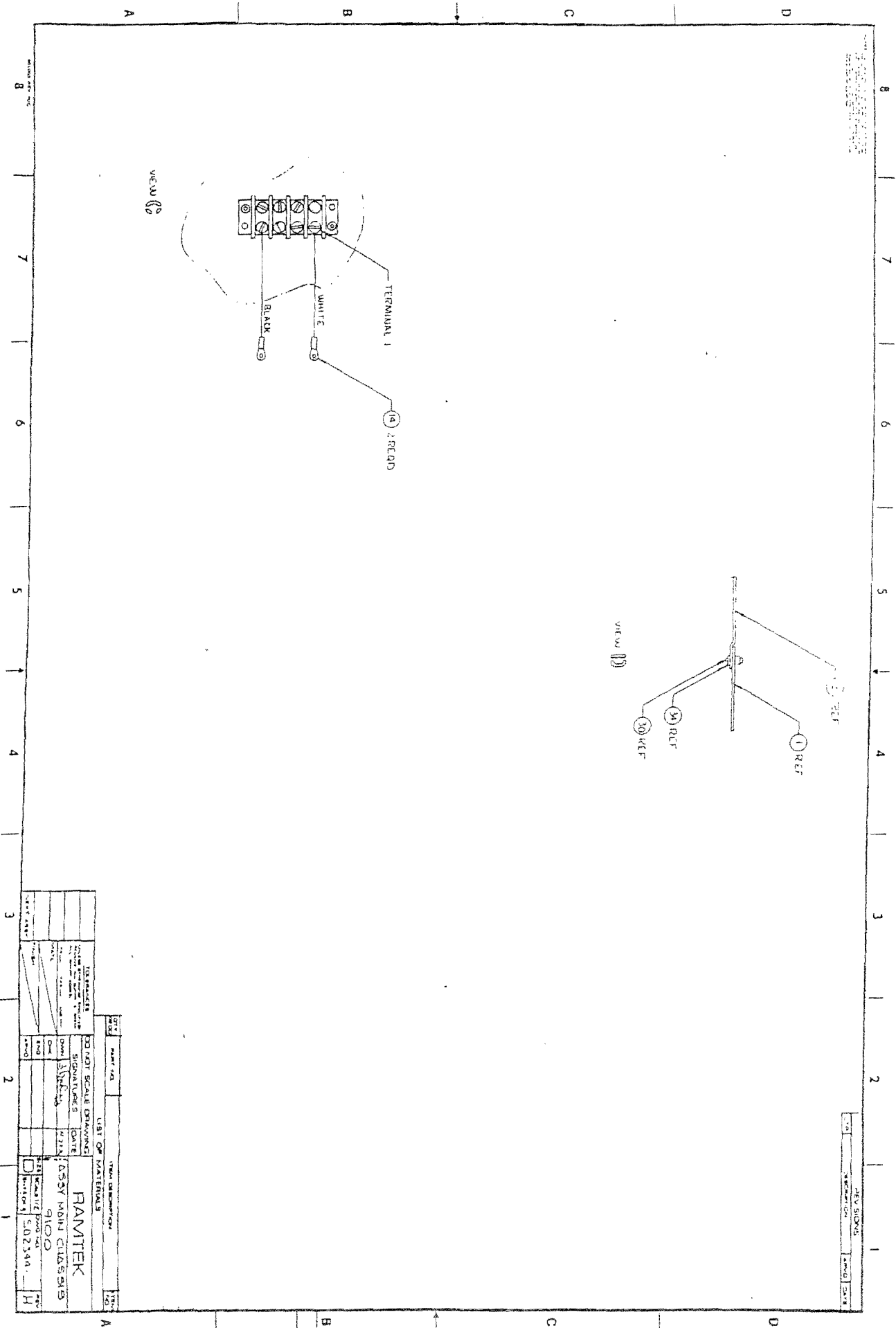








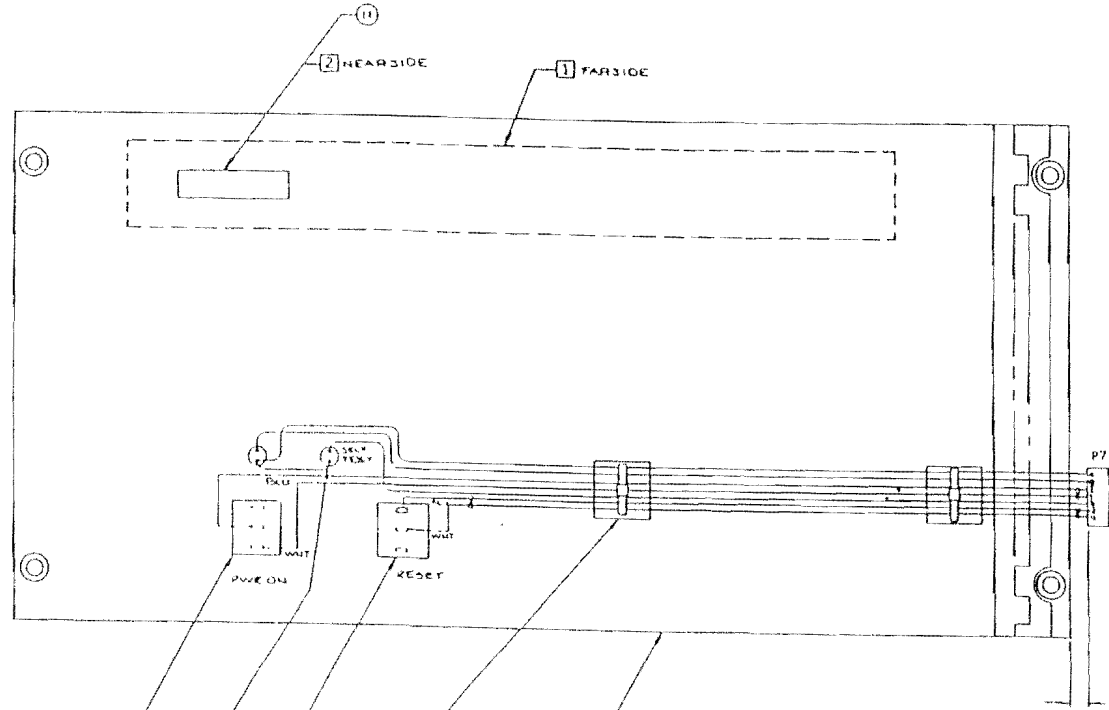
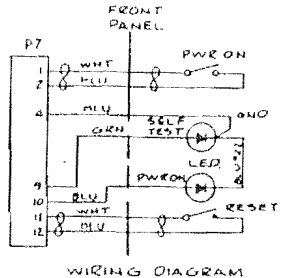




LIST OF MATERIALS  
 RAMTEK  
 ASSY MAIN CLASS B  
 9100  
 50259A

A B C D  
 1 2 3 4 5 6 7 8  
 1 2 3 4 5 6 7 8

REVISIONS			
NO.	DESCRIPTION	APPROV.	DATE
A	PROG ASSE PER ECO 507501		
B	REVISED PER ECO 506844		
C	REVISED PER ECO 507501		
D	REVISED PER ECO 507555		1/18/77



- NOTES:
- 1 CENTRALLY LOCATE ABOVE FEATURE LINES AND VERTICALLY AS SHOWN.
  - 2 PART NUMBER AND REVISION LABEL AS SHOWN.

SEE SEPARATE L/M

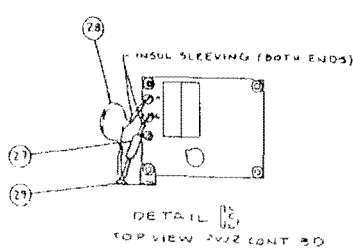
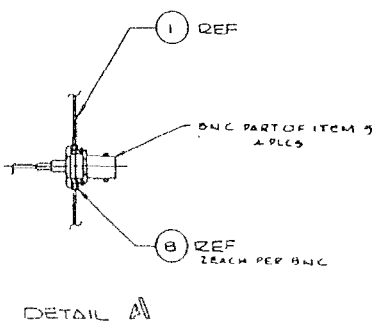
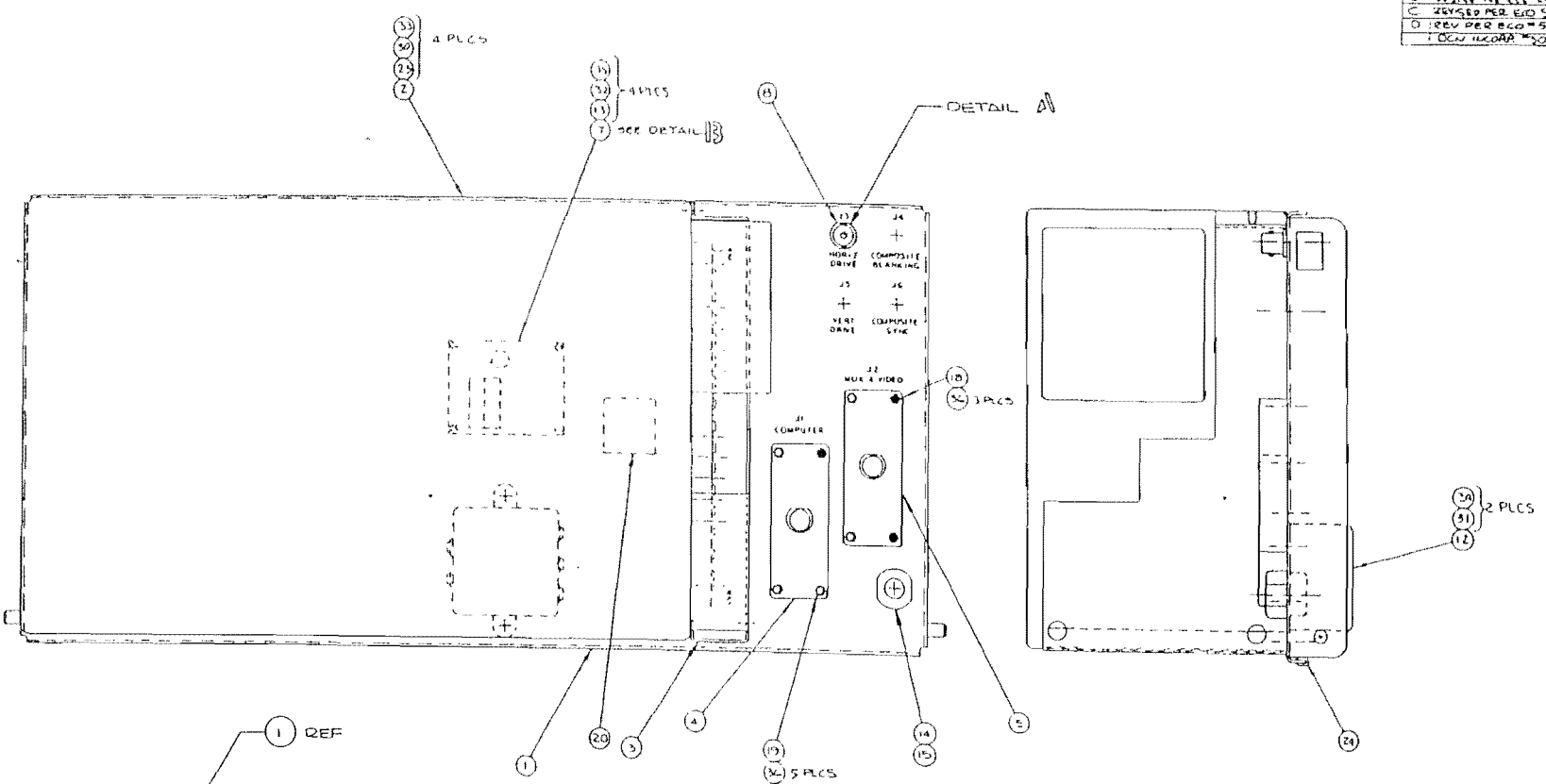
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TOLERANCES			
DO NOT SCALE DRAWING			
SIGNATURES		DATE	
DESIGNED BY	DATE	1/18/77	
DRAWN BY	DATE		
CHECKED BY	DATE		
DATE	1/18/77		
PART SCALE		UNIT SCALE	
NEXT ASSY		502318 D	

RAMTEK

ASSY FRONT

PANEL - 9100/9200

REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	PROD RISE FIX (CO #5-11-61)	5-11-61	...
2	REVISED PER EIO (5-11-61)	5-11-61	...
3	REVISED PER EIO (5-11-61)	5-11-61	...
4	REV PER EIO #507720112	12-476	...
5	CON HAZOP #500	1-ET	...



SEE SEPARATE L/M

QTY	UNIT	PART NO	ITEM DESCRIPTION	REF
LIST OF MATERIALS				
RAMTEK				
ASSY BEAR PANEL 9100				
SCALE: 1:1				
PART NO: 502312				

TOLERANCES	UNLESS OTHERWISE SPECIFIED
FINISH	...
...	...

SIGNATURES	DATE
...	...
...	...



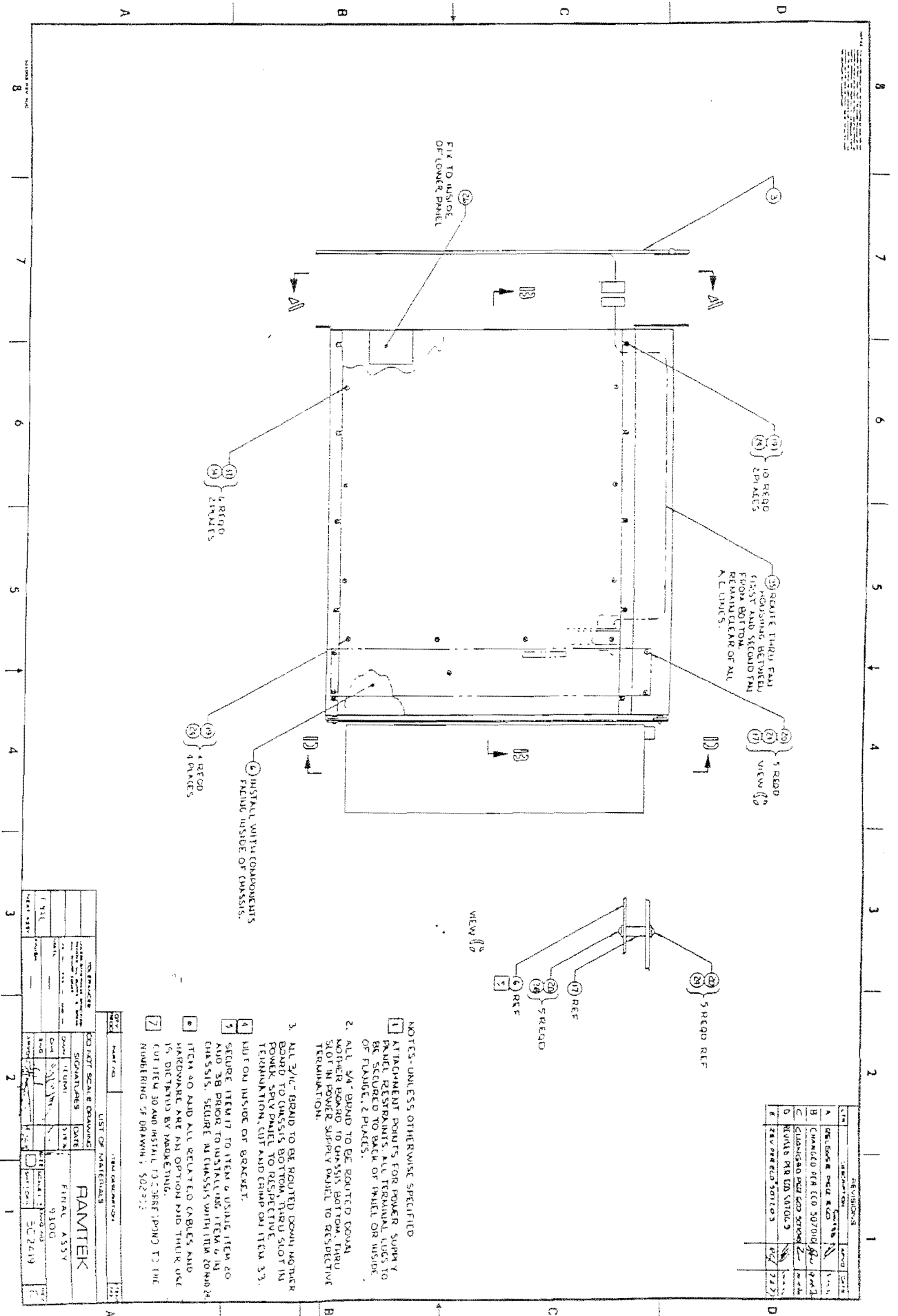
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A01	OFFRACE BOARD		
A02	(MAY BE UNREQUIRRED)		
A03	COURTROL BOARD	502456	1
A04	MEMBERY EXPANSION BOARD	502240	
A05	SERIAL LINK BOARD NO 1	502541	
A06	SERIAL LINK BOARD NO 2	502241	
A07	VIDEO BOARD NO. 1		1
A08	VIDEO BOARD NO. 2		1
A09	MEMORY BOARD	502332	
A10	MEMORY BOARD	502332	
A11	MEMORY BOARD	502332	
A12	MEMORY BOARD	502332	

NOTES: UNLESS OTHERWISE SPECIFIED:  
 1 PART NUMBER TO BE DETERMINED BY APPROVATION  
 OF UNIT.

UNIT		LIST OF MATERIALS		ITEM DESCRIPTION	
UNIT	PART NO.	QTY	UNIT	QTY	UNIT
BOARD SCALE DRAWINGS SIGNATURES DATE <b>FAMTEK</b> BOARD LABORING DIVISION 9100/9100 502315 A					

SCALE AND UNIT  
 8 7 6 5 4 3 2 1



REV	DESCRIPTION	DATE	BY	CHKD
1	REVISED			
2				
3				
4				
5				

REV	DESCRIPTION	DATE	BY	CHKD
1	REVISED			
2				
3				
4				
5				

- NOTES--UNLESS OTHERWISE SPECIFIED
- ATTACHMENT POINTS FOR POWER SUPPLY PANEL RESTRAINTS. ALL TERMINAL LUGS TO BE SECURED TO BACK OF PANEL OR INSIDE OF FLANGE, 2 PAGES.
  - ALL "A" BOARD TO BE ROUTED DOWN ANOTHER BOARD TO CHASSIS BOTTOM, THRU SLOT IN POWER SUPPLY PANEL TO RESPECTIVE TERMINATION. CUT AND CRIMP ON ITEM 33.
  - ALL "A" BOARD TO BE ROUTED DOWN ANOTHER BOARD TO CHASSIS BOTTOM, THRU SLOT IN POWER SUPPLY PANEL TO RESPECTIVE TERMINATION.

10 REGRD  
(18) 2 PAGES  
39 ROUTE THRU PAIR  
CUTTING RE-CONDUCT PAIR  
REMAINING CLEAR OF ALL  
A.C. UNITS.

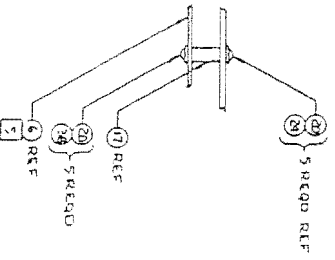
4 REGRD  
(14) 2 PAGES

5 REGRD  
(19) 4 PAGES

6 INSTALL WITH COMPONENT'S  
FRINGE INSIDE OF CHASSIS.

39 FIX TO INSIDE  
OF LOWER PANEL

VIEW 10

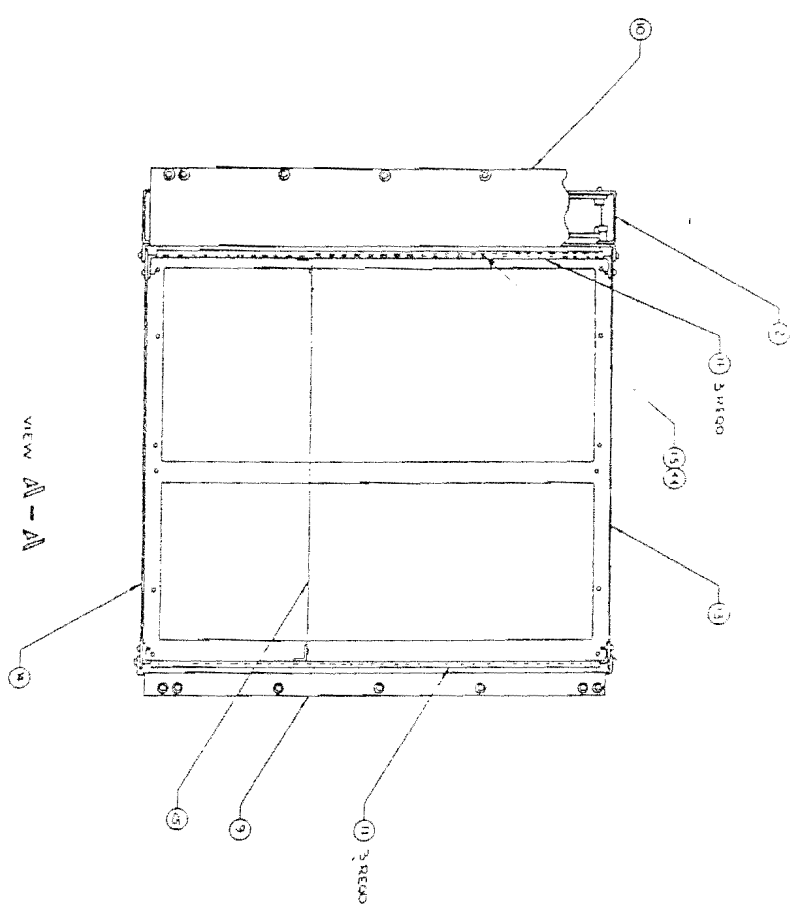


DATE: 10/1/58  
DRAWN BY: J. J. ...  
CHECKED BY: ...

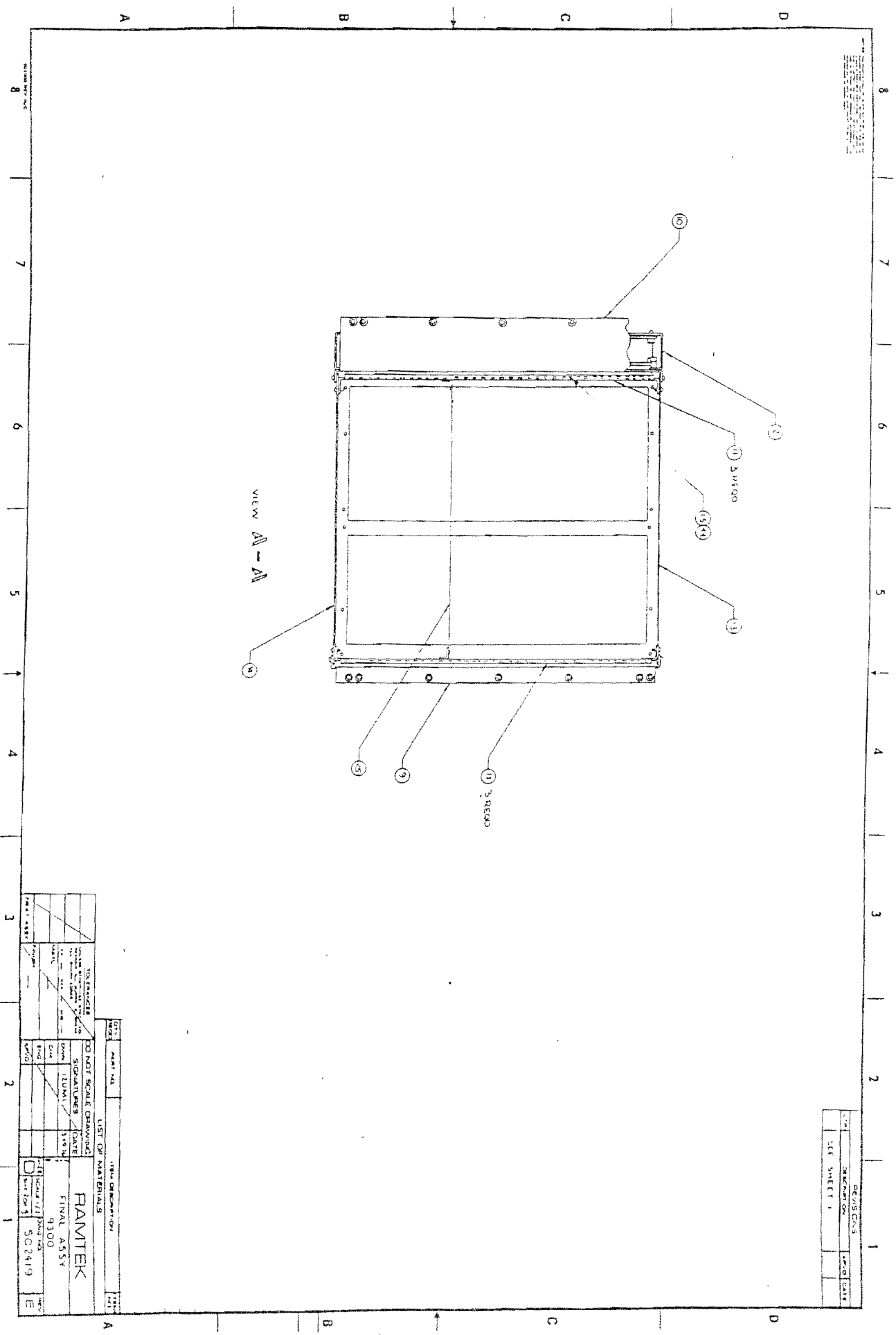
PANTEK  
FINAL ASSY  
9300  
SC 2619

REVISIONS

REVISED BY DATE



VIEW A-A



DATE		DRAWN BY		CHECKED BY	
MATERIALS		SIGNATURES		DATE	
RANITEK		FINAL ASSY		9300	
SCHEMATIC		REVISED		SC02419	

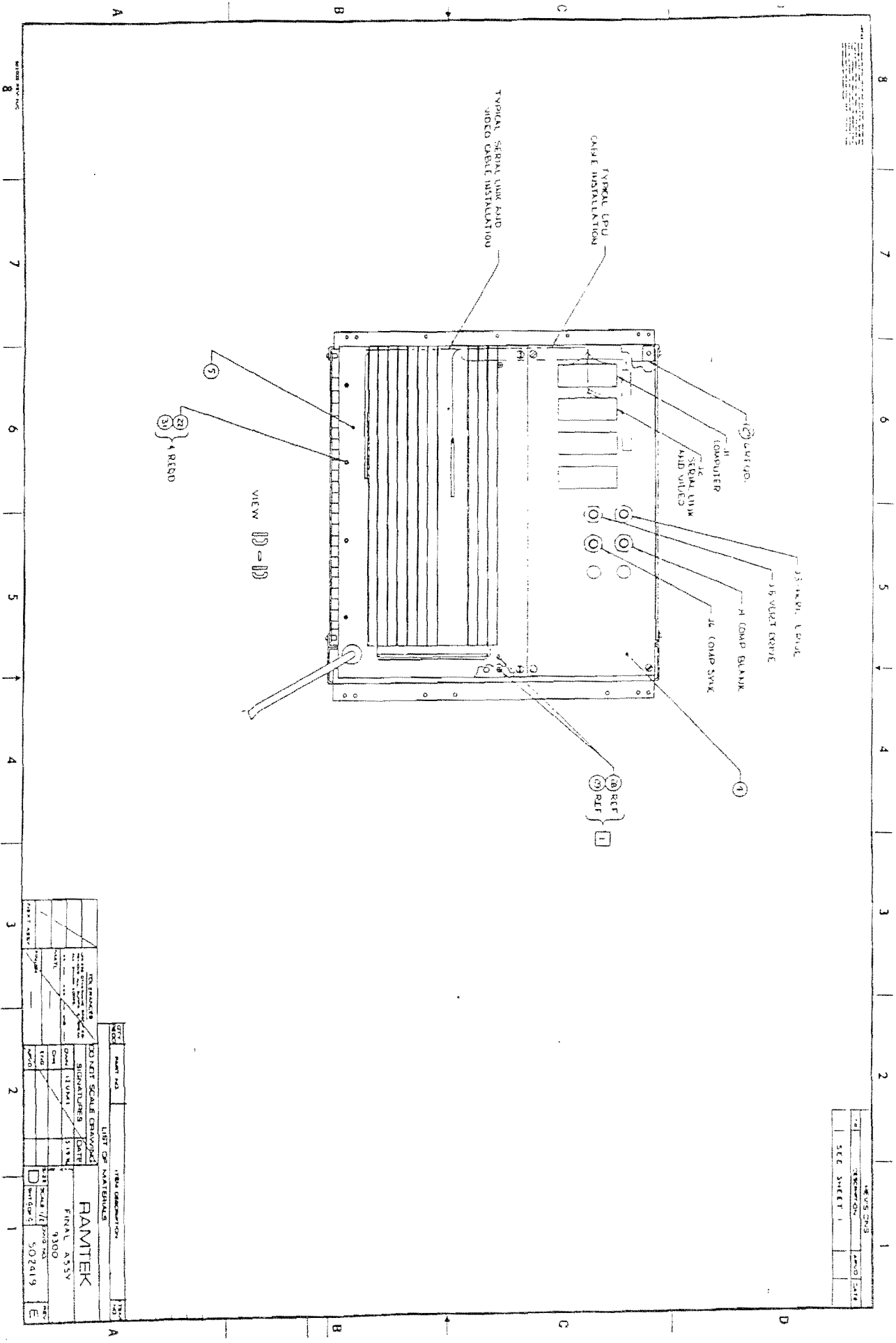
1185 DIRECTION

DO NOT SCALE DRAWING

1





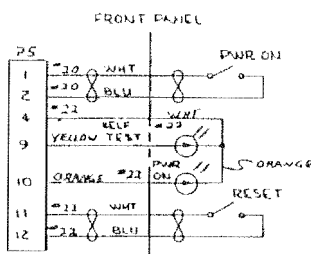


REV	DATE	BY	CHKD	APP'D
1				

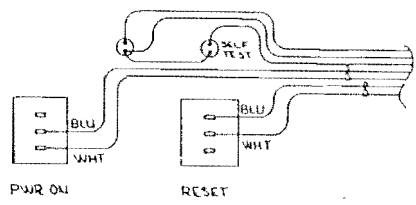
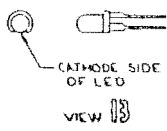
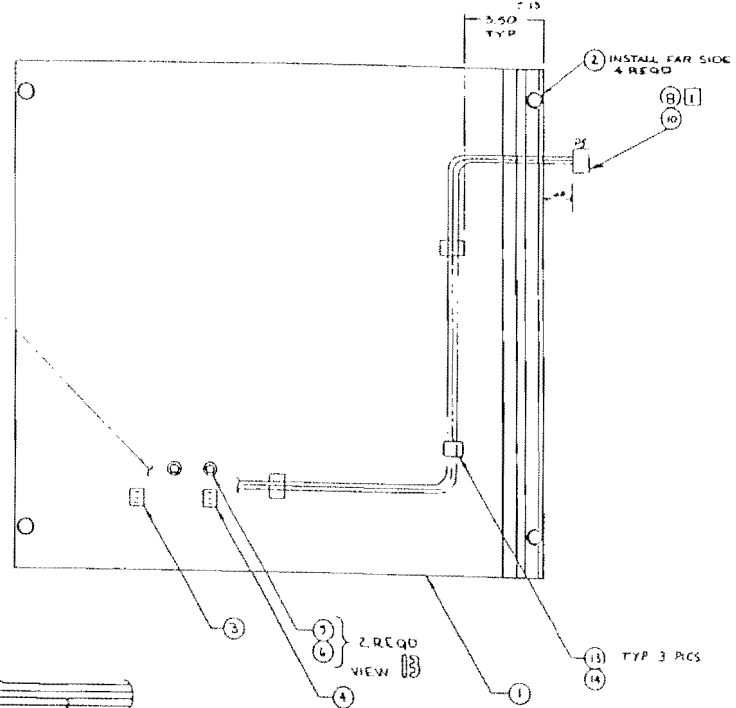
DRAWING TITLE		DRAWING NO.		DATE	
30 NET SCALE DRAWING		RANTEK		FINAL ASSY	
DRAWN BY		CHECKED BY		DATE	
SIGNATURES		SIGNATURES		DATE	
DATE		DATE		DATE	
11/17/68		5/24/69		5/24/69	
RANTEK		RANTEK		RANTEK	
502419		502419		502419	

8 7 6 5 4 3 2 1

REVISIONS			
ITEM	DESCRIPTION	APPROV	DATE
A	20 LEMMA "PWR ON" LED		7/1/77
B	REV PER ELD - 507077		7/1/77
C	REV PER ELD - 507247		7/1/77
D	REV PER ELD - 507286		7/1/77



WIRING DIAGRAM



NOTE:  
IDENTIFY CONN WITH CONN DESIGNATION AS SHOWN.

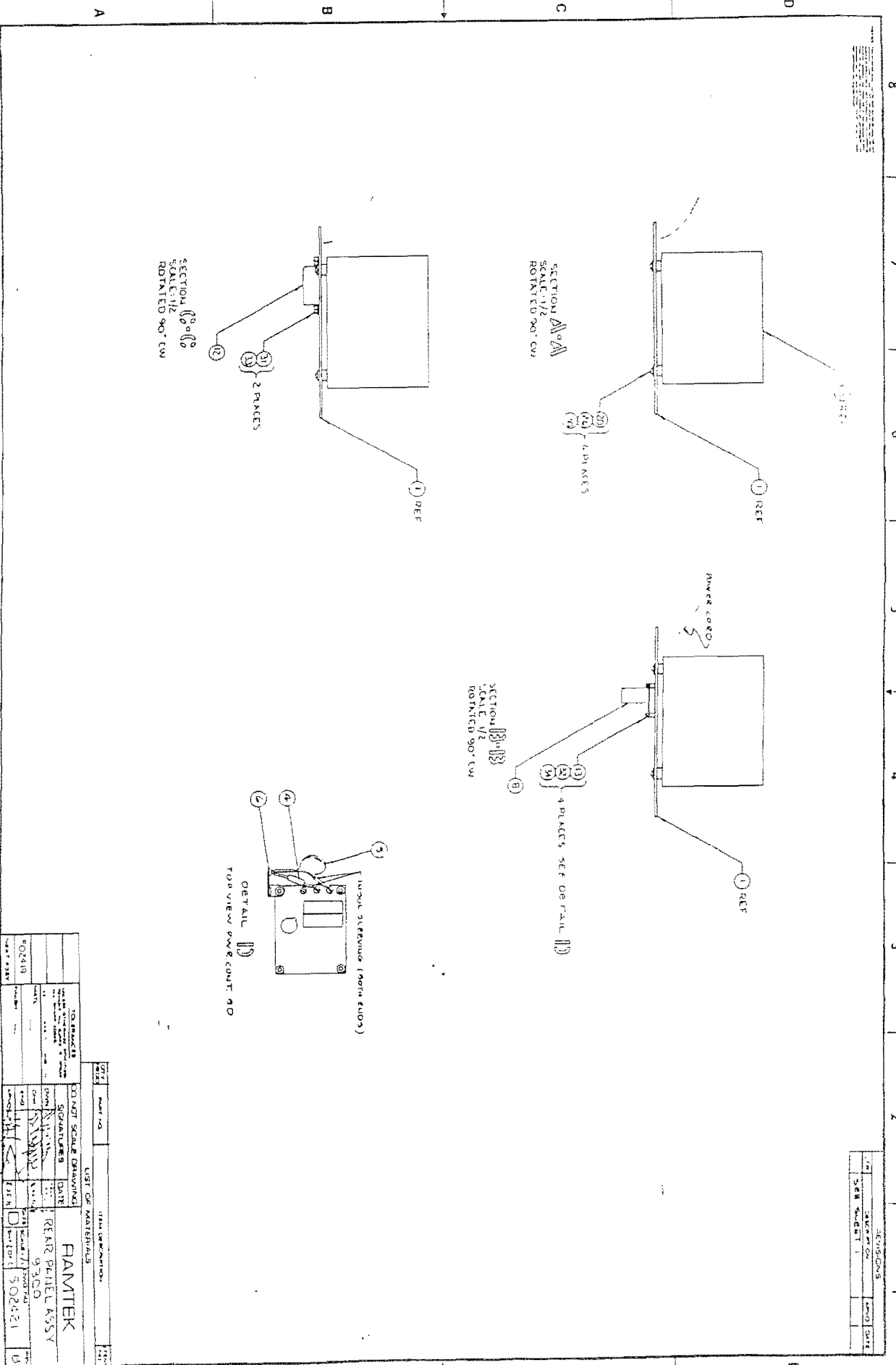
SEE SEPARATE LM

ITEM	PART NO.	ITEM DESCRIPTION	QTY REQD
LIST OF MATERIALS			
FRAMTEK			
FRONT PANEL ASSY			
300			
502419			
NEXT ASSY			
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED		SIGNATURES	
PARENT DIMENSIONS		DATE	
DATE		DATE	
DRAWN		DATE	
ENGR		DATE	
CHECKED		DATE	
APPROVED		DATE	
SCALE 1/16		PART NO.	
502419		502422	

8 7 6 5 4 3 2 1



REV	DESCRIPTION	DATE
1	ISSUED FOR	
2	REVISED	



DATE	REV	DESCRIPTION

ITEM	QTY	DESCRIPTION

DATE	REV	DESCRIPTION

REVISED DATE: 8

REVISED DATE: 7

REVISED DATE: 6

REVISED DATE: 5

REVISED DATE: 4

REVISED DATE: 3

REVISED DATE: 2

REVISED DATE: 1

REVISED DATE: 1

REVISED DATE: 1

REVISED DATE: 1

REVISED DATE: 1

REVISED DATE: 1

REVISED DATE: 1

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REVISED DATE: 1

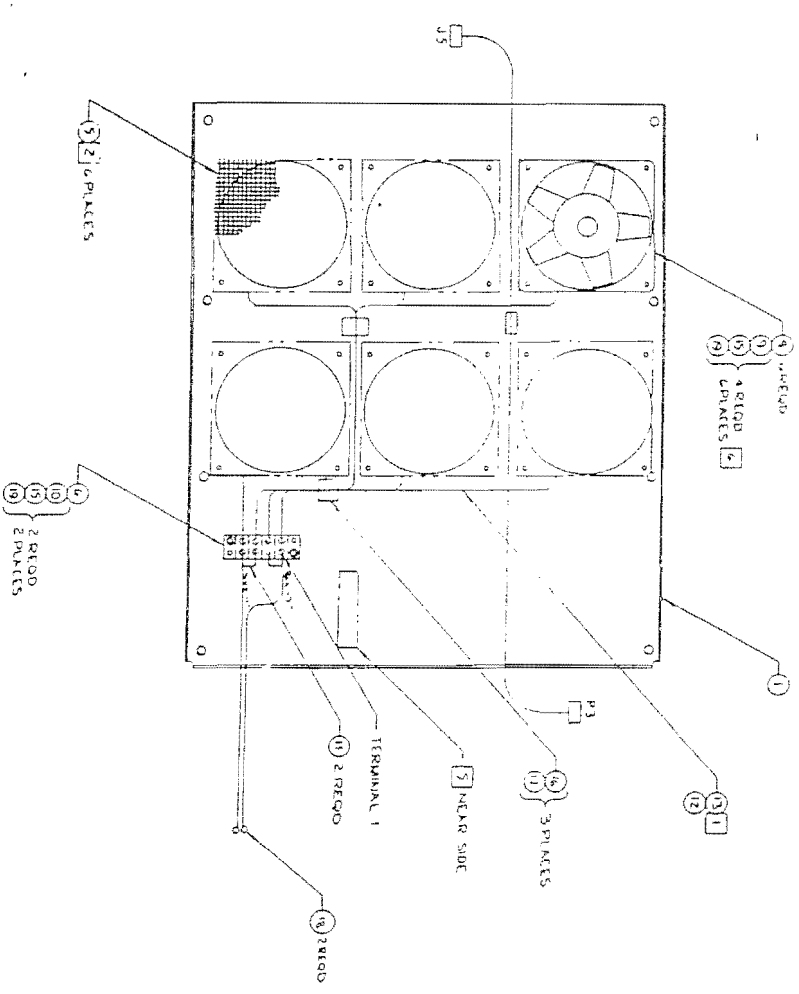
REVISED DATE: 1

REVISED DATE: 1

REVISED DATE: 1

REVISIONS

NO.	DESCRIPTION	DATE	BY
A	RELEASE PER ECOSYSTEM		
B	REV PER ECO 50200M		



- NOTES: UNLESS OTHERWISE SPECIFIED:
- 1 TWISTED PAIR FOR EACH FAN. TERMINATE AT TERMINAL BLOCK USING ITEM 14.
  - 2 LOCATE BETWEEN FAN HOUSING AND FAN.
  - 3 USE THREE REMAINING TIE WRAPS TO BUNDLE WIRES. LOCATION OPTIONAL.
  - 4 REF WIRING DIAGRAM 7024150.
  - 5 MARK WITH ASSEMBLY NUMBER AND REV LEVEL TO WHICH MANUFACTURED USING DYMO LABEL APPROX WHERE SHOWN.
  - 6 AIR FLOW IN.

SEE SEPARATE LIA

REV	DATE	BY	APP	DESCRIPTION
1				INITIAL SCALE DRAWING
2				SIQWATER DATE
3				FAN HOUSING ASSEMBLY
4				97300
5				502691

RAMTEK

8

7

6

5

4

3

2

1

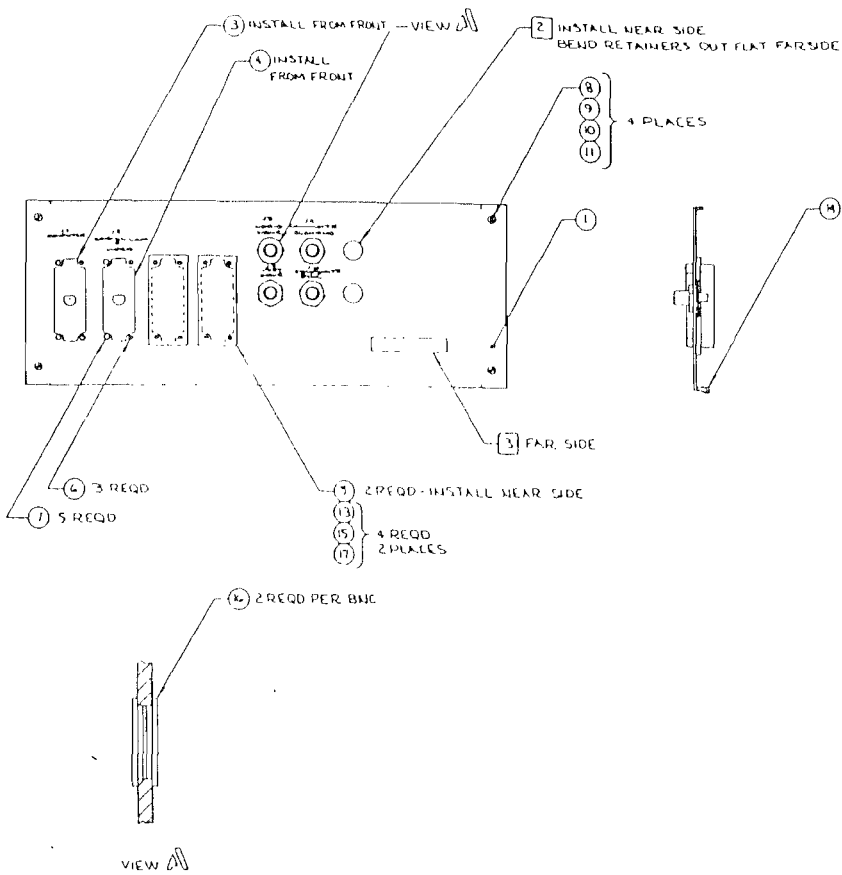
REVISIONS			
LT#	DESCRIPTION	APPROV	DATE
0	RELEASE PER 10144		11/11/71

D

C

B

A



- NOTES - UNLESS OTHERWISE SPECIFIED:
1. ALL BNC CONNECTORS INSTALL FROM BACK OF PANEL.
  2. PLUG ALL UNUSED BNC HOLES WITH ITEM 12.
  3. MARK WITH ASSEMBLY NUMBER AND REV LEVEL TO WHICH MANUFACTURED USING DYMCO LABEL APPROX WHERE SHOWN.

SEE SEPARATE LM

QTY	PART NO.	ITEM DESCRIPTION	ITEM NO.
LIST OF MATERIALS			
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED		SIGNATURES	DATE
FRACTIONAL DIMENSIONS TO NEAREST 100 THS UNLESS OTHERWISE SPECIFIED			
DECIMAL DIMENSIONS TO NEAREST 10 THS UNLESS OTHERWISE SPECIFIED			
HOLE DIMENSIONS TO NEAREST 10 THS UNLESS OTHERWISE SPECIFIED			
502419			
NEXT ASSY		SCALE: 1/1	DATE: 11/11/71
		APPROV: [Signature]	DATE: 11/11/71
		REV: 1	DATE: 11/11/71
		REV: 2	DATE: 11/11/71
		REV: 3	DATE: 11/11/71
		REV: 4	DATE: 11/11/71
		REV: 5	DATE: 11/11/71
		REV: 6	DATE: 11/11/71
		REV: 7	DATE: 11/11/71
		REV: 8	DATE: 11/11/71
		REV: 9	DATE: 11/11/71
		REV: 10	DATE: 11/11/71
		REV: 11	DATE: 11/11/71
		REV: 12	DATE: 11/11/71
		REV: 13	DATE: 11/11/71
		REV: 14	DATE: 11/11/71
		REV: 15	DATE: 11/11/71
		REV: 16	DATE: 11/11/71
		REV: 17	DATE: 11/11/71
		REV: 18	DATE: 11/11/71
		REV: 19	DATE: 11/11/71
		REV: 20	DATE: 11/11/71
		REV: 21	DATE: 11/11/71
		REV: 22	DATE: 11/11/71
		REV: 23	DATE: 11/11/71
		REV: 24	DATE: 11/11/71
		REV: 25	DATE: 11/11/71
		REV: 26	DATE: 11/11/71
		REV: 27	DATE: 11/11/71
		REV: 28	DATE: 11/11/71
		REV: 29	DATE: 11/11/71
		REV: 30	DATE: 11/11/71
		REV: 31	DATE: 11/11/71
		REV: 32	DATE: 11/11/71
		REV: 33	DATE: 11/11/71
		REV: 34	DATE: 11/11/71
		REV: 35	DATE: 11/11/71
		REV: 36	DATE: 11/11/71
		REV: 37	DATE: 11/11/71
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		REV: 41	DATE: 11/11/71
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		REV: 95	DATE: 11/11/71
		REV: 96	DATE: 11/11/71
		REV: 97	DATE: 11/11/71
		REV: 98	DATE: 11/11/71
		REV: 99	DATE: 11/11/71
		REV: 100	DATE: 11/11/71

502419 REV A/C

8

7

6

5

4

3

2

1







REVISIONS	
NO.	DATE
1	11/15/88
2	11/15/88
3	11/15/88
4	11/15/88

A01	INTERFACE BOARD	
A02	(PART OF UNIT W/BOARD C)	1
A03		
A04	COPYING BOARD 5020520	
A05	MEMORY (FRANVIVOU BOARD 502440	
A06	SERIAL LINK BOARD NO 1 502640	
A07	SERIAL LINK BOARD NO 2 502640	
A08	NOT SHIP OPTION	1
A09		
A10	FUTURE PC OPTION	
A11	FUTURE PC OPTION	
A12	FUTURE PC OPTION	
A13	VIDEO BOARD NO 1	1
A14	VIDEO BOARD NO 2	1
A15	VIDEO BOARD NO 3	1
A16	VIDEO BOARD NO 4	1
A17	MULTIMEDIA VIDEO	
A18	MEMORY 502332	
A19	MEMORY 502332	
A20	MEMORY 502332	
A21	MEMORY 502332	
A22	MEMORY 502332	
A23	MEMORY 502332	
A24	MEMORY 502332	

NOTES-UNLESS OTHERWISE SPECIFIED:  
 PART NUMBER TO BE DETERMINED BY APPLICATION OF UNIT.

LIST OF MATERIALS		ITEM DESCRIPTION		QTY	UNIT
REV	REV	REV	REV		
1	1	1	1		
2	2	2	2		
3	3	3	3		
4	4	4	4		
5	5	5	5		
6	6	6	6		
7	7	7	7		
8	8	8	8		

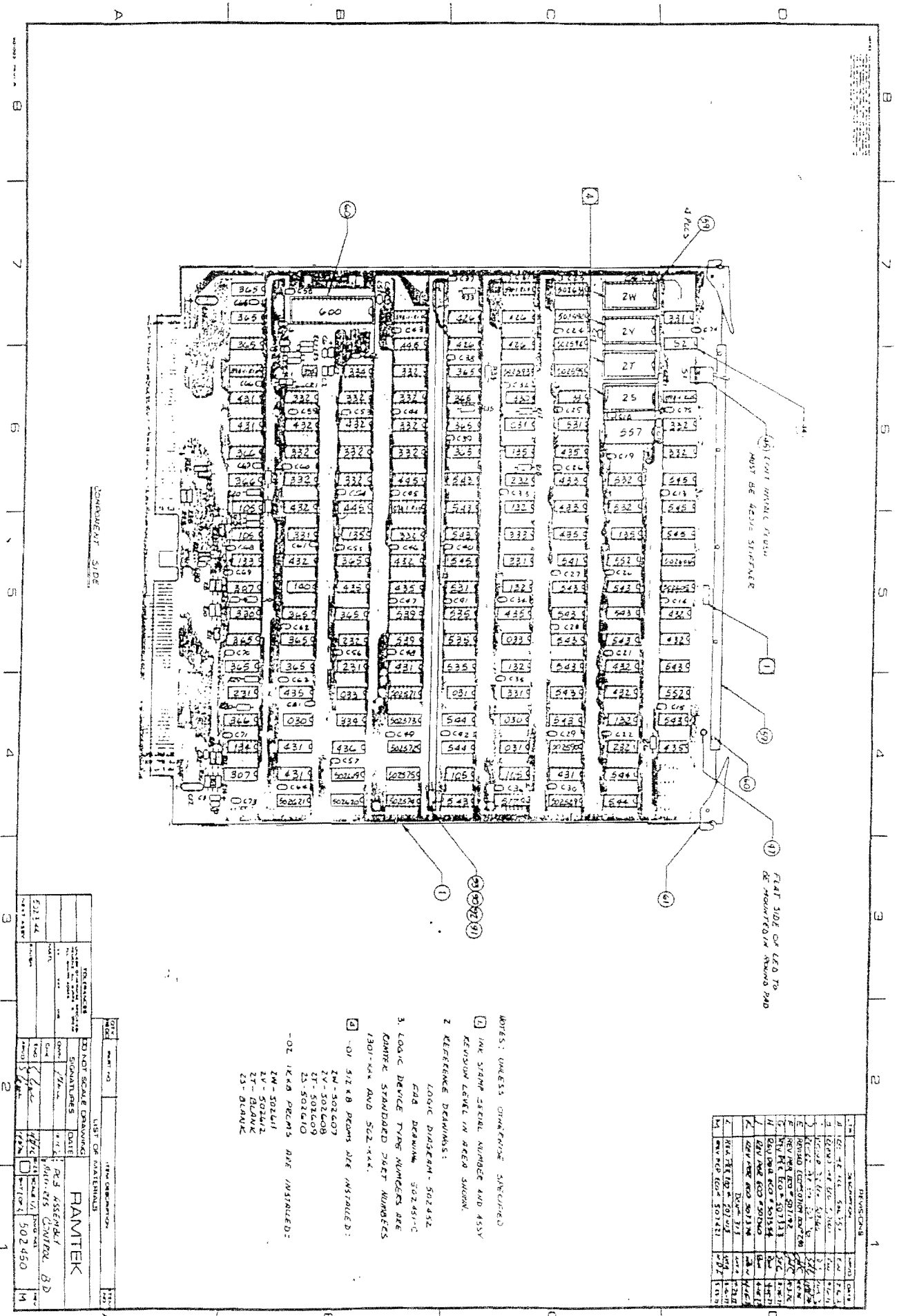
REVISIONS		ITEM DESCRIPTION		QTY	UNIT
REV	REV	REV	REV		
1	1	1	1		
2	2	2	2		
3	3	3	3		
4	4	4	4		
5	5	5	5		
6	6	6	6		
7	7	7	7		
8	8	8	8		

DO NOT SCALE DRAWING  
 SIGNATURES DATE  
 BOARD LAYOUT DESIGN  
 9:00  
 502803  
 A

SYSTEM ASSEMBLIES

502450 2 sheets  
502451 18 sheets  
502446 3 sheets  
502448 11 sheets  
503045 4 sheets  
503046 17 sheets  
502332 1 sheet  
502331 10 sheets  
502335 3 sheets  
502334 7 sheets  
502346 1 sheet  
502438 1 sheet





CONCRETE SIDE

(A) CONTINUAL TESTS MUST BE DONE WEEKLY

FLAT SIDE OF LED TO BE MOUNTED IN ROOMS

REVISIONS	
1	REVISED FOR 502450
2	REVISED FOR 502450
3	REVISED FOR 502450
4	REVISED FOR 502450
5	REVISED FOR 502450
6	REVISED FOR 502450
7	REVISED FOR 502450

NO.	DATE	BY	DESCRIPTION
1	10/1/78	JAC	ISSUED FOR CONSTRUCTION
2	10/1/78	JAC	REVISED FOR 502450
3	10/1/78	JAC	REVISED FOR 502450
4	10/1/78	JAC	REVISED FOR 502450
5	10/1/78	JAC	REVISED FOR 502450
6	10/1/78	JAC	REVISED FOR 502450
7	10/1/78	JAC	REVISED FOR 502450

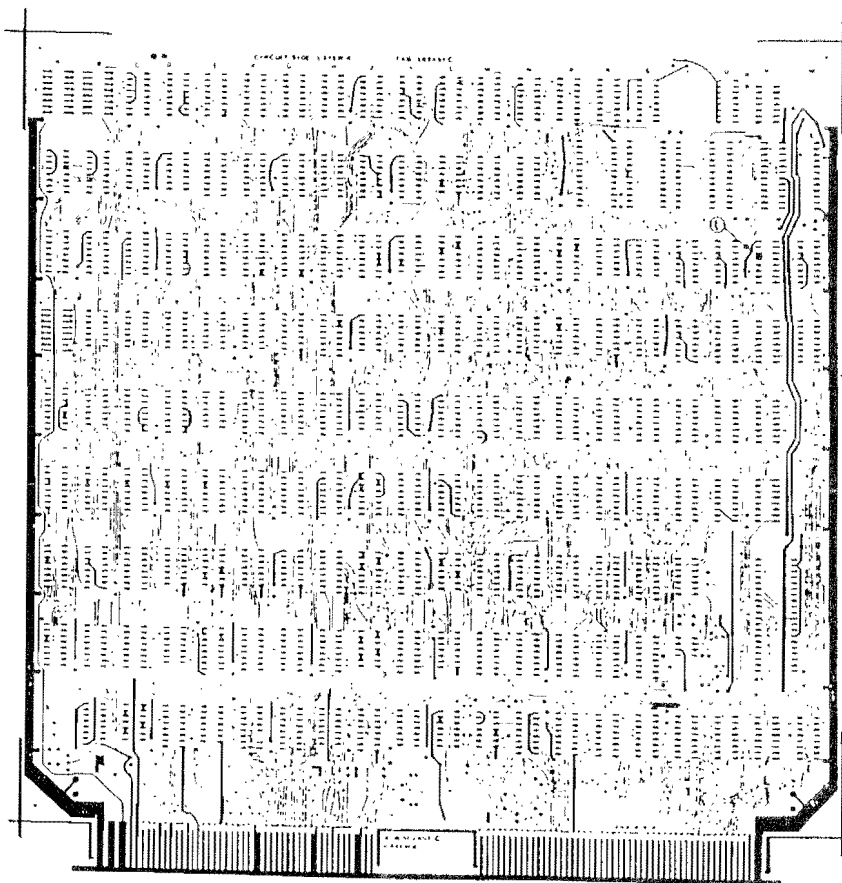
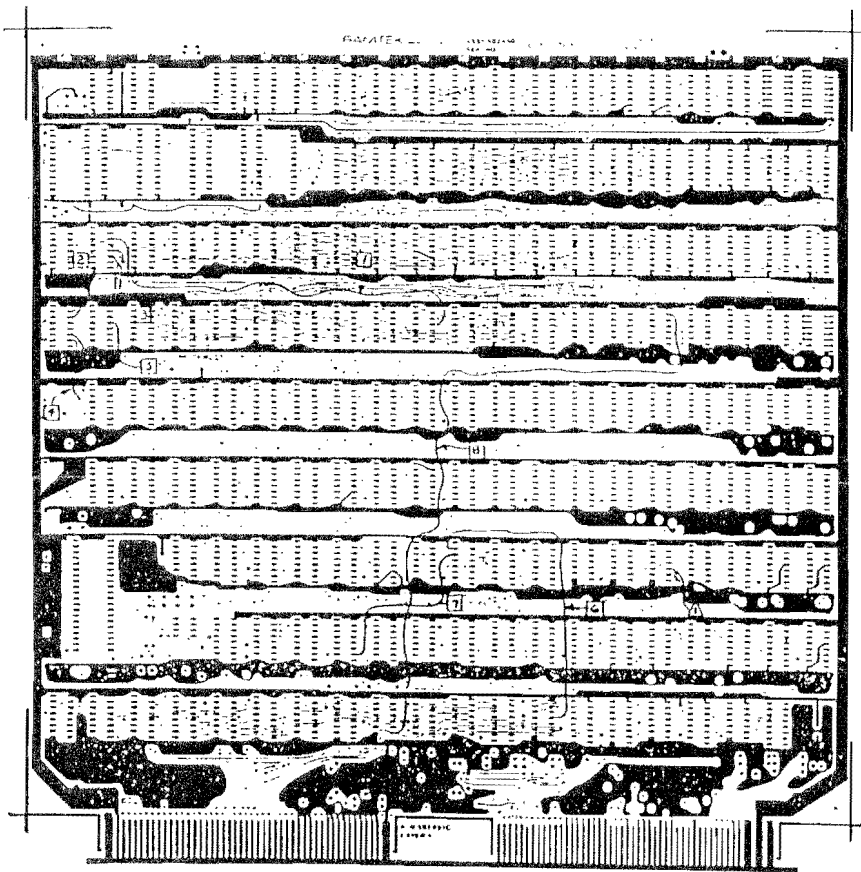
  

SIGNATURES	
DESIGNED BY	JAC
CHECKED BY	JAC
DATE	10/1/78

PROJECT INFORMATION	
PROJECT NO.	502450
PROJECT NAME	RAMTEK
CLIENT	RAMTEK
DATE	10/1/78
SCALE	AS SHOWN
DRAWN BY	JAC
CHECKED BY	JAC
DATE	10/1/78

- NOTES: UNLESS OTHERWISE SPECIFIED:
- 1. THE STAMP SERIAL NUMBER AND ASSY NUMBER LEVEL IN REED SHOWN.
  - 2. REFERENCE DRAWINGS:
    - LOGIC DIAGRAM - 502452
    - CGA DRAWING - 502451-C
  - 3. LOGIC DEVICE TYPE NUMBERS ARE CAMMCK STANDARD PART NUMBERS 1301-KXX AND 502-KXX.
  - 4. -01 512KB MEMORY ARE INSTALLED:
    - 1M - 502L07
    - 2V - 502L08
    - 3T - 502L09
    - 4S - 502L10
  - 02 12KB MEMORY ARE INSTALLED:
    - 1M - 502L11
    - 2V - 502L12
    - 3T - 502L13
    - 4S - 502L14



- REV. G**
1. MAKE A TRACE CUT TO DELETE THE FOLLOWING WIRE:
    - ① 3V-13 to 3V-14
  2. ADD THE FOLLOWING WIRES:
    - ① 3V-14 to FEEDTHRU
    - ② 3V-12 to 4W-15
    - ③ 3V-11 to 4W-14
    - ④ 4W-10 to FEEDTHRU
    - ⑤ 4W-11 to 4V-13

NOTE THAT THESE CHANGES APPLY TO ALL CURRENT ARTWORK: A, B, & C

**REV. H** NO ADDS OR DELETES REQUIRED. JUST ADDS STIFFENER.

**REV. J** ADD CAPACITOR (47 pF) AS SHOWN BY SOLDERING ONE LEAD OF THE CAP TO A 1-KOHM RESISTOR AT FEEDTHRU AS SHOWN, AND THE OTHER END TO THE GROUND PLANE. (DELETED BY REV. "L")

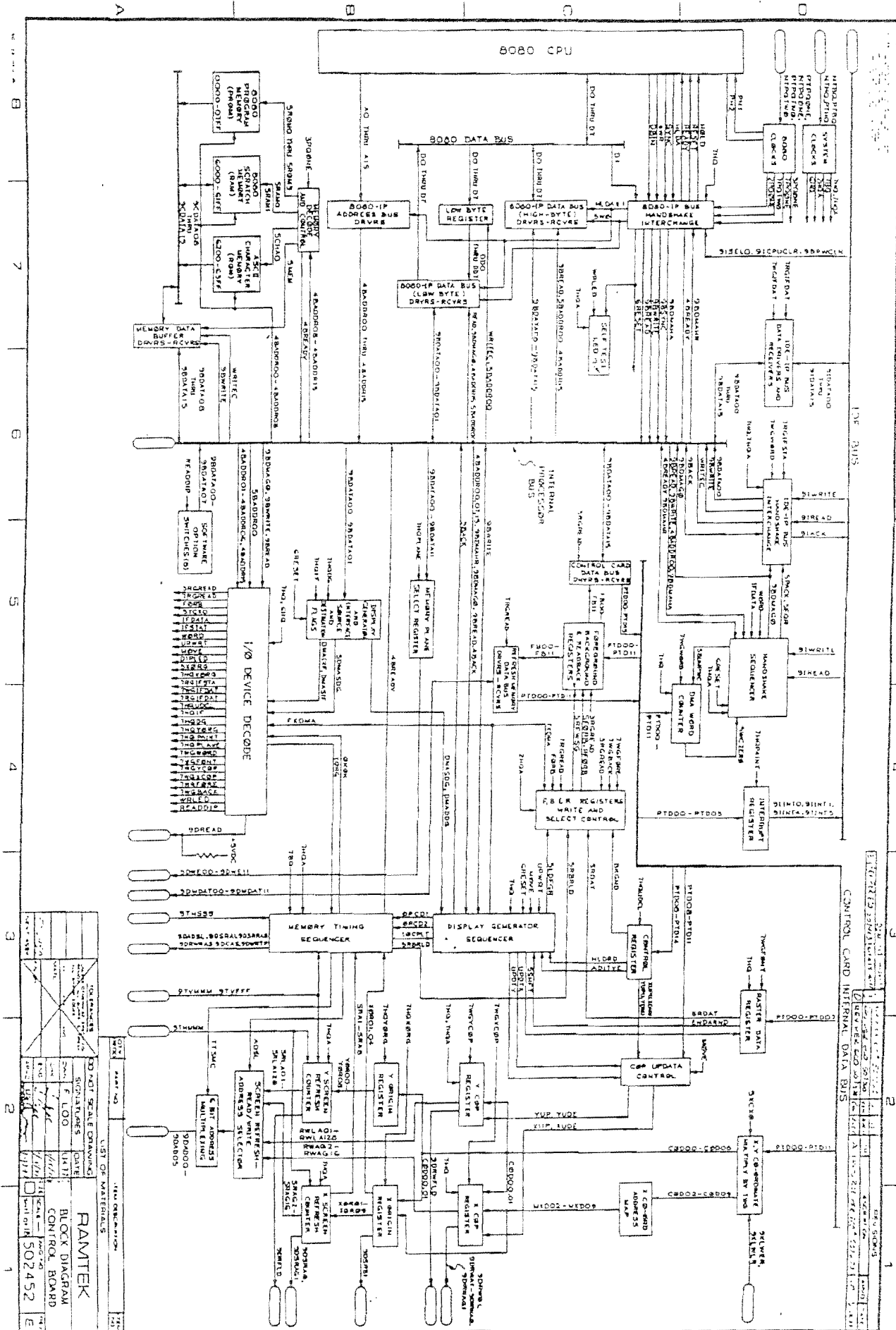
**REV. K**

- ① ADD WIRE FROM 9H-11 to 7K-02.
- ② ADD WIRE FROM 7K-03 to 8H-10.

- REV. L**
- ⚠ CUT I.C. PINS 7E-09 & 7E-10 FREE FROM THE PCB AND BEND UP. CONNECT BENT-UP PINS 7E-09 & 7E-10 TOGETHER WITH A WIRE. CONNECT BENT-UP PIN 7E-10 TO 4E-12.
  - ⑧ ADD WIRE 4E-13 TO 9H-08.
  - ⚠ DELETE 47-pF CAPACITOR INSTALLED OR REV. "J".

ALL JUMPERS SUPERCEDED BY REV. "E" ARTWORK--5/23/77

SIGNATURES		DATE	RAMTEK	
DESIGN	ENGR	1977	PCB ASSEMBLY	
ENG			MULTI-PES COMBINE 80	
APPD			SCALE 1:1	502450
			DATE	M



CONTROL CARD INTERNAL DATA BUS

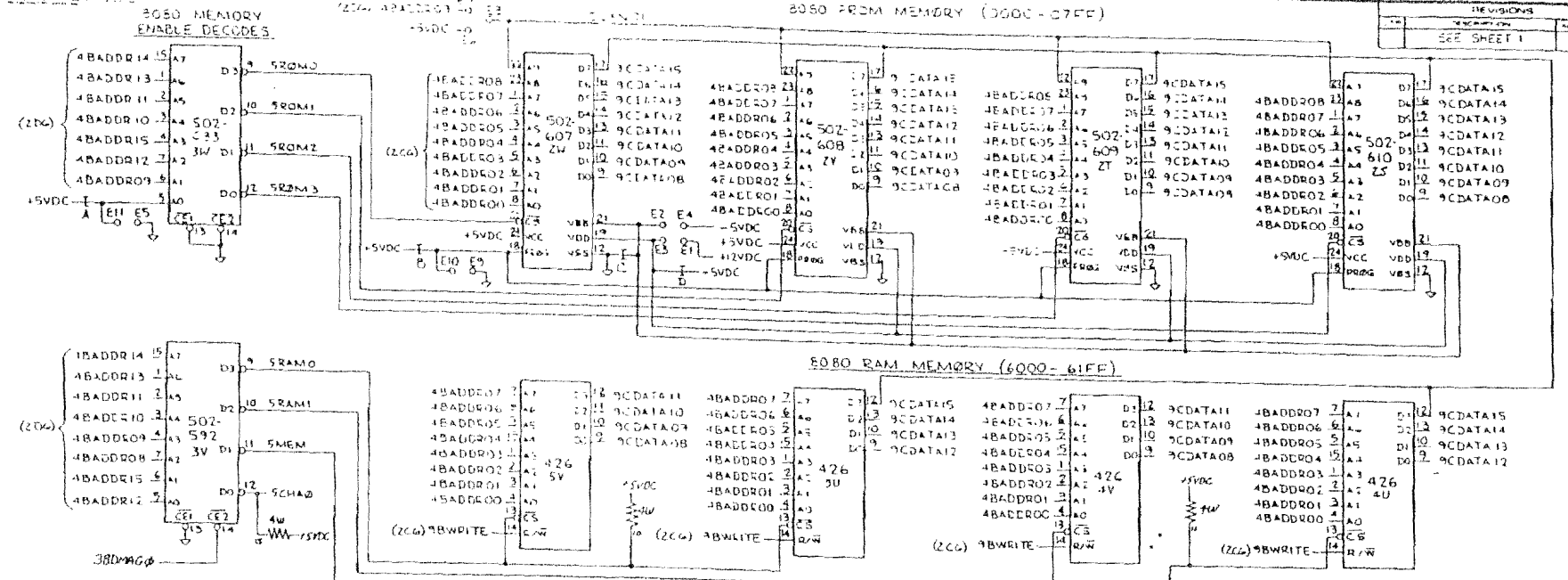
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

RAMTEK  
BLOCK DIAGRAM  
CONTROL BOARD  
S02452

RAMTEK  
BLOCK DIAGRAM  
CONTROL BOARD  
S02452

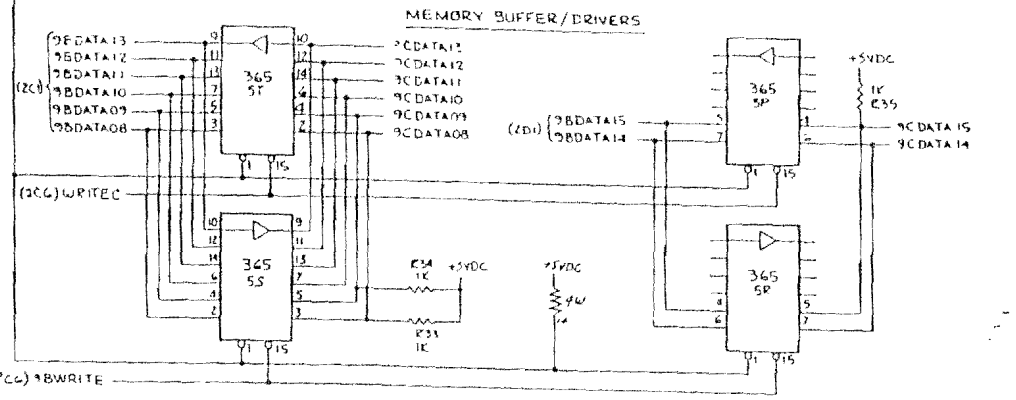


8 7 6 5 4 3 2 1

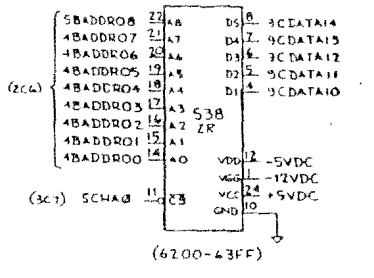


THIS TABLE DESCRIBES BOARD MODIFICATIONS THAT ARE REQUIRED TO USE VARIOUS TYPES OF ROM MEMORIES.

MFG.	PART NO.	TRACE CUTS	JUMPS	SIZE
INTERSID	1M5605 1M5625	NONE	NONE	512X8
FAIRCHILD	73430 73440	NONE	NONE	512X8
INTEL	3604 3604-4	NONE	E6 TO E8	512X8
INTEL	3624 3624-4	NONE	E6 TO E8	512X8
INTEL	2708	A,B,C, AND D	E5 TO E11 E7 TO E8 E3 TO E11 E2 TO E4	1K X 8



CHARACTER GENERATOR ROM 6000's CHAR ACCESS TIME



THE 8080'S FROM, RAM AND CHARACTER ROM MEMORIES ARE ALL BUSSED TOGETHER AND THEN DRIVEN OR RECEIVED ON THE HIGH BYTE OF THE 17 DATA BUS THROUGH A SET OF DRIVERS AND RECEIVERS.

REV	REVISED	PART NO	ITEM DESCRIPTION	REV
LIST OF MATERIALS				
RAMTEK				
LOGIC DIAGRAM - CONTROL BOARD				
DATE: 302454				

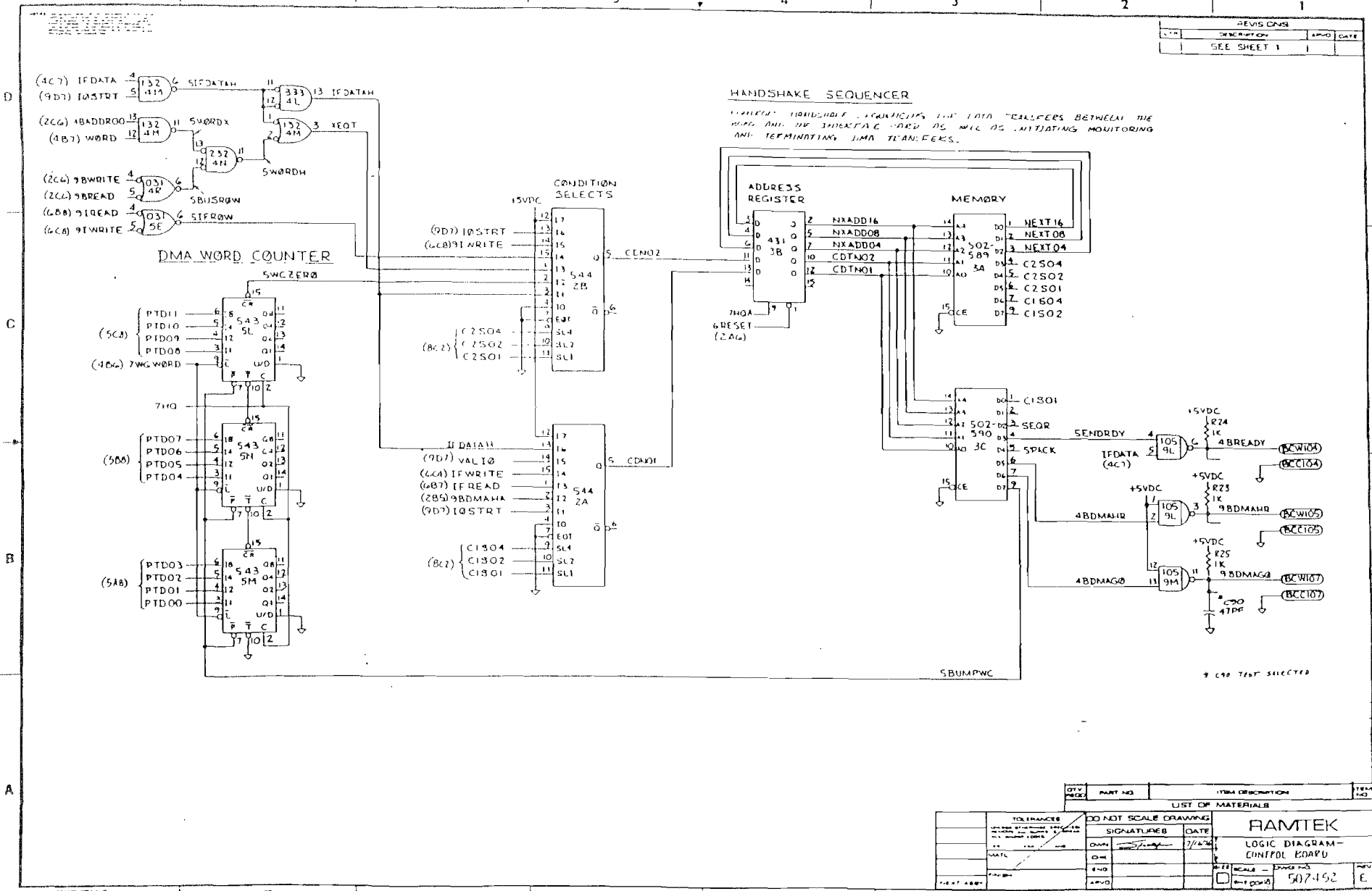
8 7 6 5 4 3 2 1







REVISIONS			
REV	DESCRIPTION	APPRO	DATE
1	SEE SHEET 1		



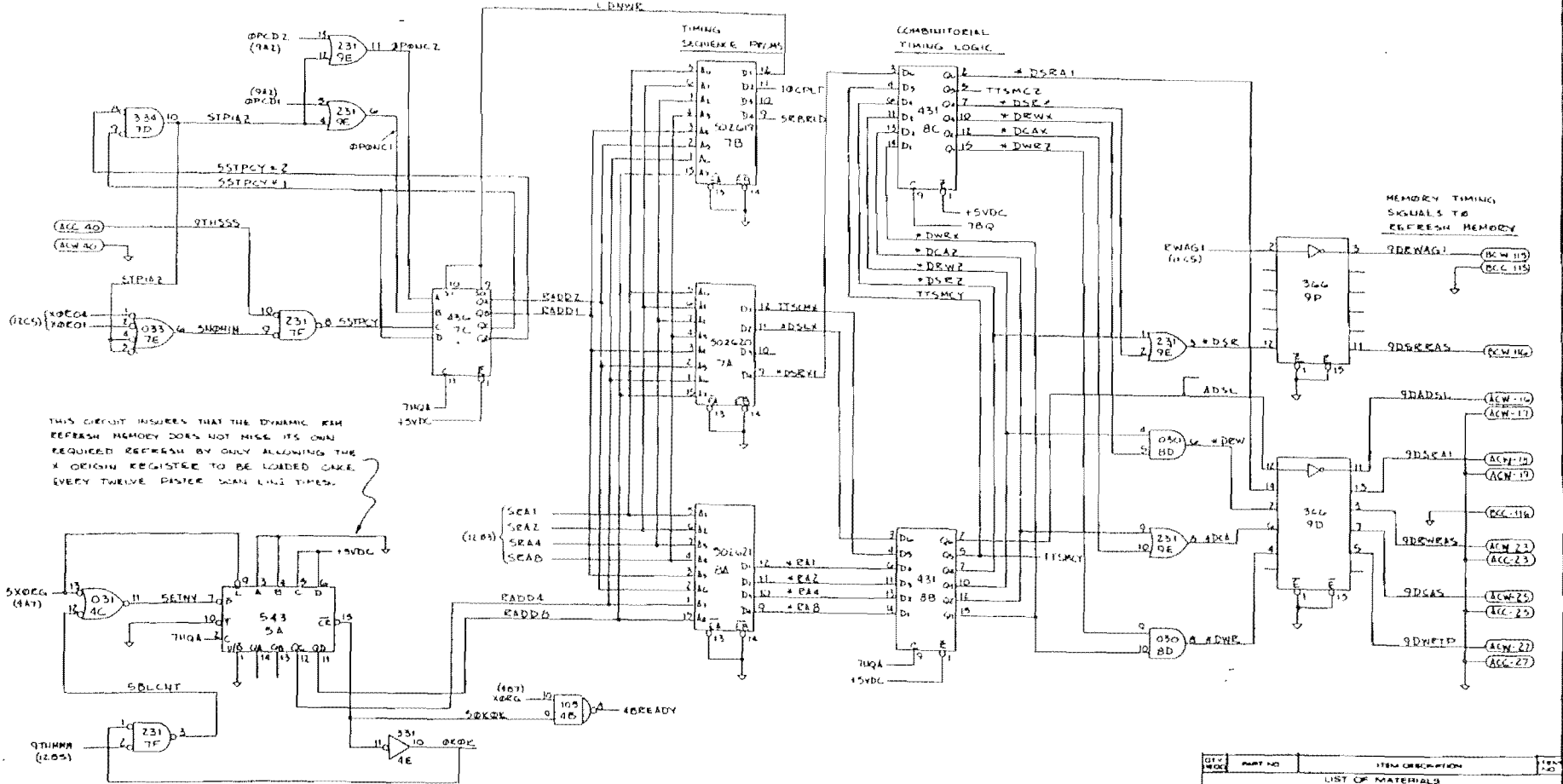
QTY	PART NO.	ITEM DESCRIPTION	TRM NO.
LIST OF MATERIALS			
RAMTEK			
LOGIC DIAGRAM - CONTROL BOARD			
SCALE - 500% NS			
REV 507-152 E			

502548



### REFRESH MEMORY TIMING GENERATOR

TIMING SEQUENCE CONTROL BASED UPON THE SIGNALS FROM THE DISPLAY GENERATOR SEQUENCER AND THE CURRENT TIME IN THE MASTER SCAN LINE THE CORRECT TIMING SEQUENCE IS SELECTED.



THIS CIRCUIT INSURES THAT THE DYNAMIC RAM REFRESH MEMORY DOES NOT MISS ITS OWN REQUIRED REFRESH BY ONLY ALLOWING THE X ORIGIN REGISTER TO BE LOADED ONCE EVERY TWELVE MASTER SCAN LINE TIMES.

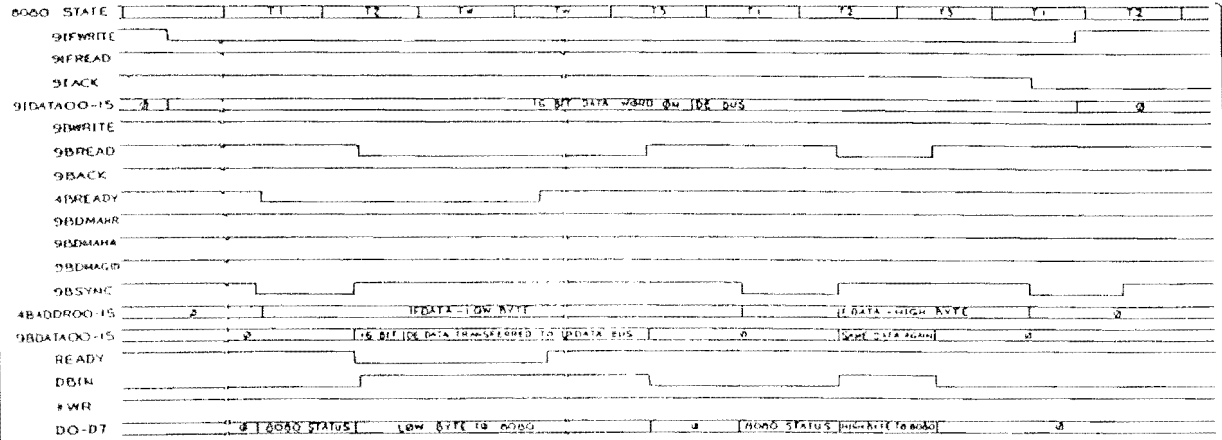
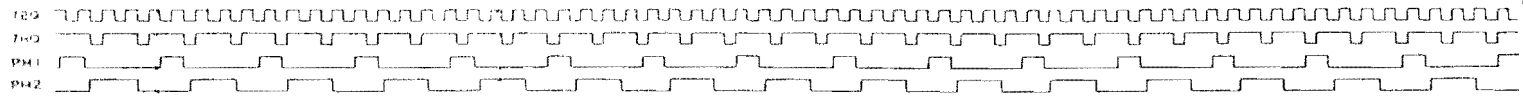
QTY	PART NO.	ITEM DESCRIPTION	REV.
		LIST OF MATERIALS	
		<b>RAMTEK</b>	
		LOGIC DIAGRAM	
		CONTROL BOARD	
		SCALE - DIM. NO.	
		UNPROV. 502452	



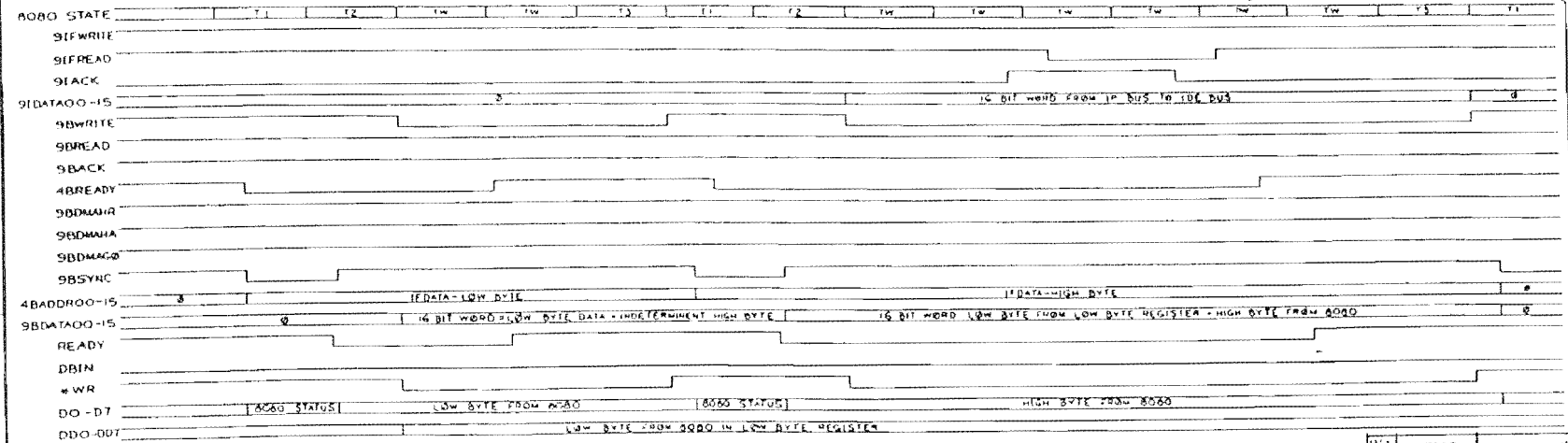
8 7 6 5 4 3 2 1

HANDSHAKE TIMING  
THE 8080 MICROPROCESSOR COMMUNICATING WITH THE INTERFACE

REVISIONS		
NO.	DESCRIPTION	DATE
1	SEE SHEET 1	



EXAMPLE OF TIMING WHEN THE 8080 IS READING A 16 BIT WORD FROM THE INTERFACE. IN PARTICULAR, A ONE WORD INSTRUCTION OR THE FIRST WORD OF A MULTI-WORD INSTRUCTION. THE WORD IS READ ONE BYTE AT A TIME, LOW BYTE FIRST, THEN THE HIGH BYTE.



EXAMPLE OF TIMING WHEN THE 8080 IS WRITING A 16 BIT WORD TO THE INTERFACE. IN PARTICULAR, A DATA WORD TRANSFER REQUIRED BY SOME PREVIOUSLY RECEIVED INSTRUCTION WORD. THE WORD IS WRITTEN ONE BYTE AT A TIME, LOW BYTE FIRST INTO A HOLDING REGISTER, THEN THE HIGH BYTE.

NO.	DESCRIPTION	DATE
1	SEE SHEET 1	

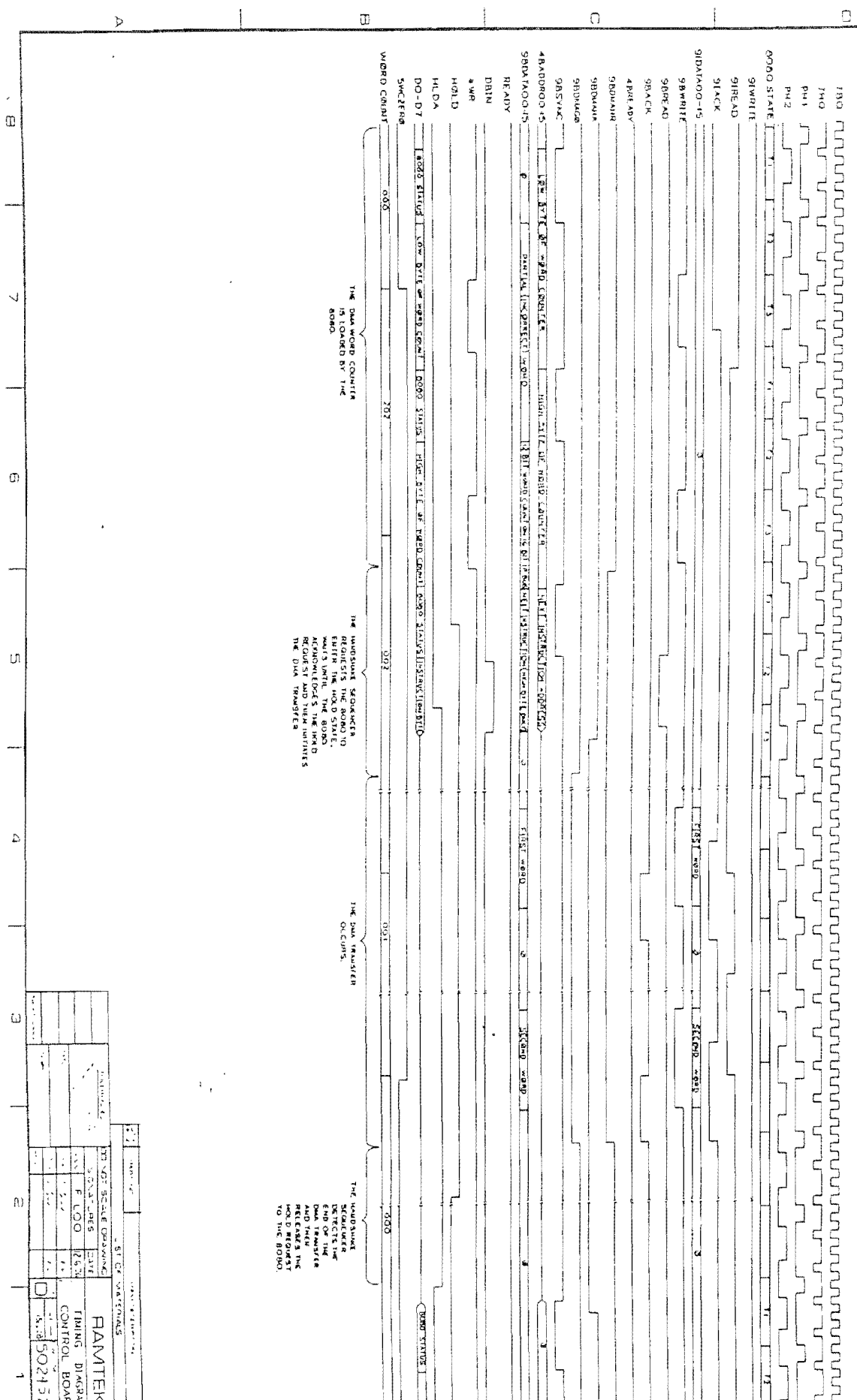
POLYMERILES		DO NOT SCALE DRAWING	
SIGNATURES		DATE	
DATE	DATE	DATE	DATE
DATE	DATE	DATE	DATE
LIST OF MATERIALS			
RAMTEK			
TIMING DIAGRAM			
CONTROL BOARD			
DATE	DATE	DATE	DATE
DATE	DATE	DATE	DATE
502452			

8 7 6 5 4 3 2 1

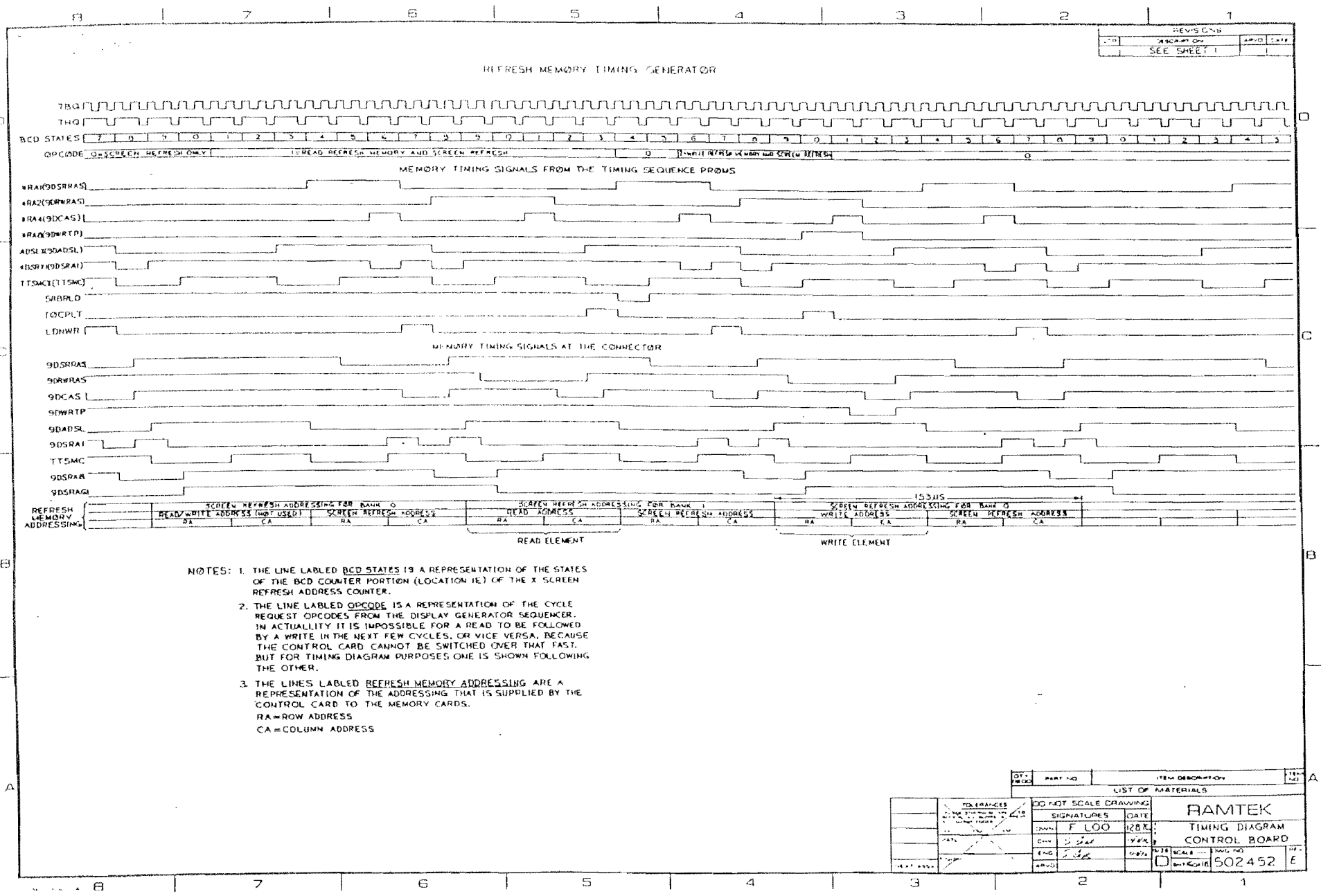




TWO WORD DATA TRANSFER WITH THE INTERFACE AS THE DESTINATION

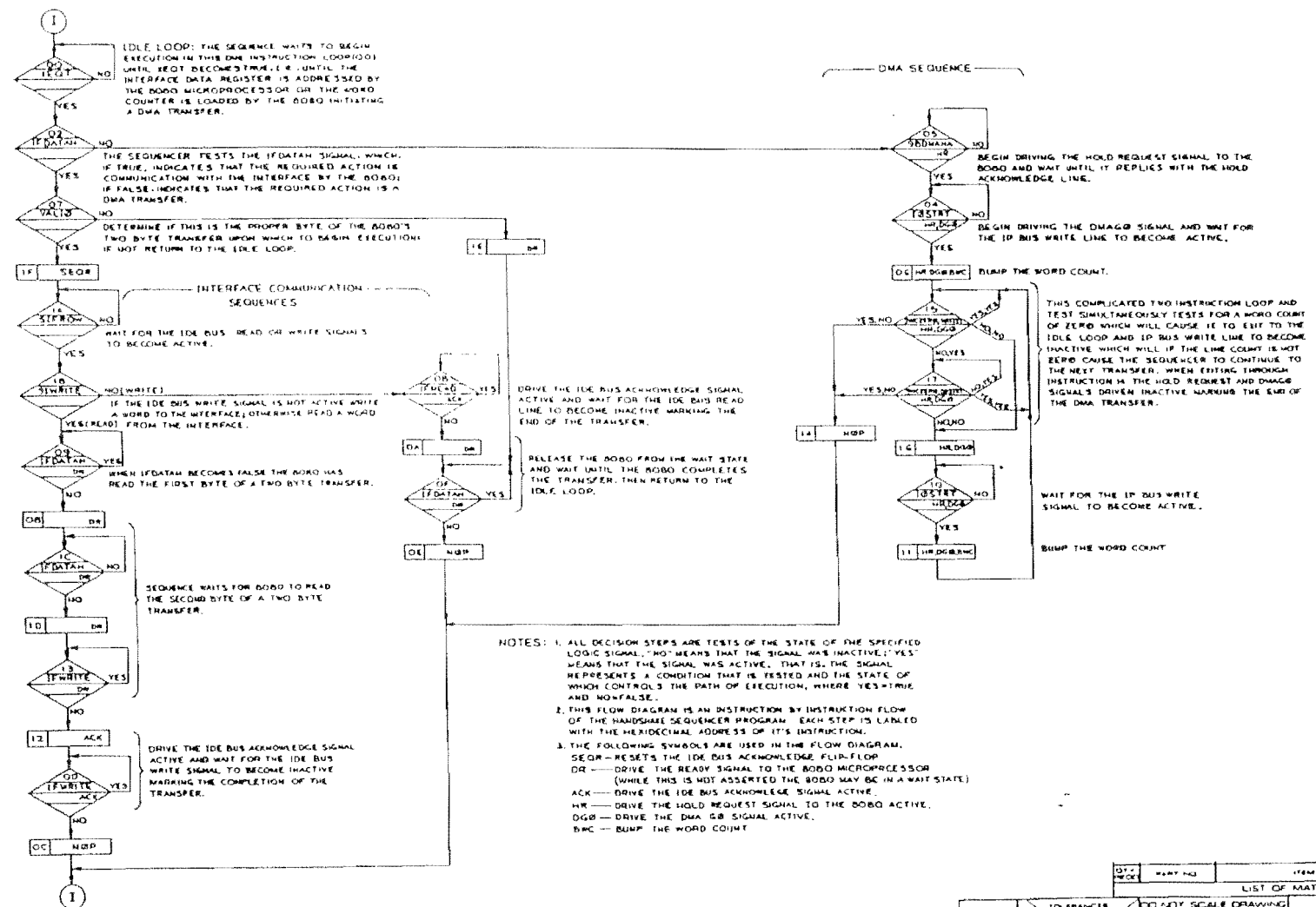


FAMATEK		TIMING DIAGRAM CONTROL BOARD	
DATE	REV	502452	1
DESIGNED BY	DATE	502452	1
CHECKED BY	DATE		
APPROVED BY	DATE		



REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	SEE SHEET 1		

HANDSHAKE SEQUENCER



DATE	REV. NO.	ITEM DESCRIPTION	REV. NO.															
		LIST OF MATERIALS																
DRAWN BY		DATE																
CHECKED BY		DATE																
MATERIALS		DATE																
APPROVED BY		DATE																
<table border="1"> <tr> <td>SCALE</td> <td>DRAWING</td> <td>DATE</td> </tr> <tr> <td></td> <td>F L O O</td> <td>12/10/74</td> </tr> <tr> <td></td> <td>C =</td> <td>1/24/75</td> </tr> <tr> <td></td> <td>R =</td> <td>2/12/75</td> </tr> <tr> <td></td> <td>APPROV</td> <td></td> </tr> </table>				SCALE	DRAWING	DATE		F L O O	12/10/74		C =	1/24/75		R =	2/12/75		APPROV	
SCALE	DRAWING	DATE																
	F L O O	12/10/74																
	C =	1/24/75																
	R =	2/12/75																
	APPROV																	
<b>RAMTEK</b> FLOW DIAGRAM CONTROL BOARD			PART NO. <b>502452</b>															

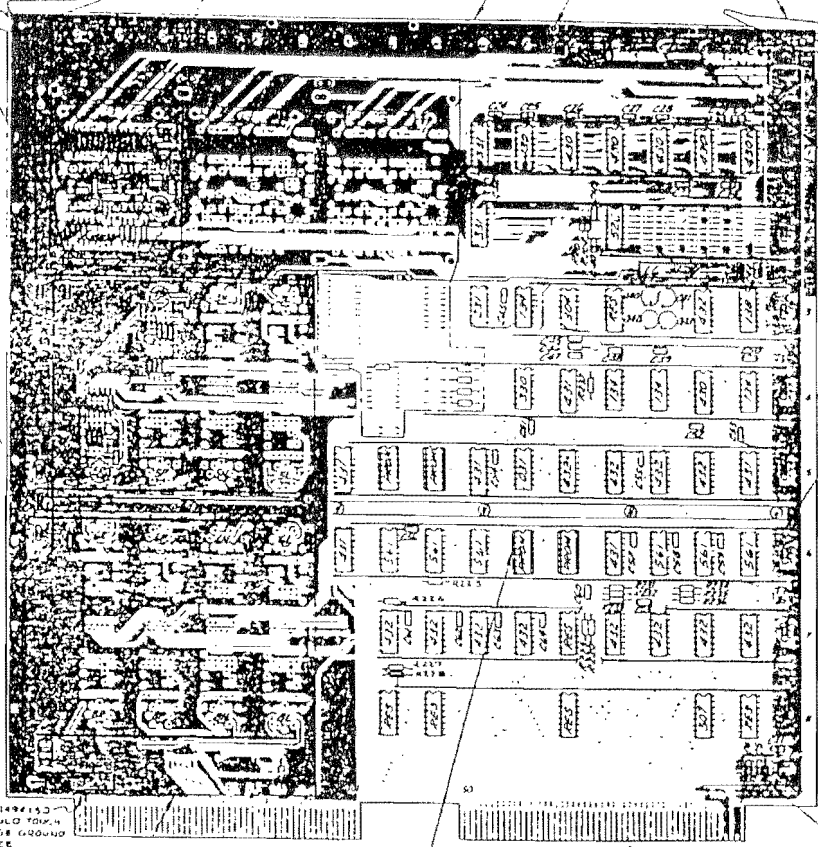
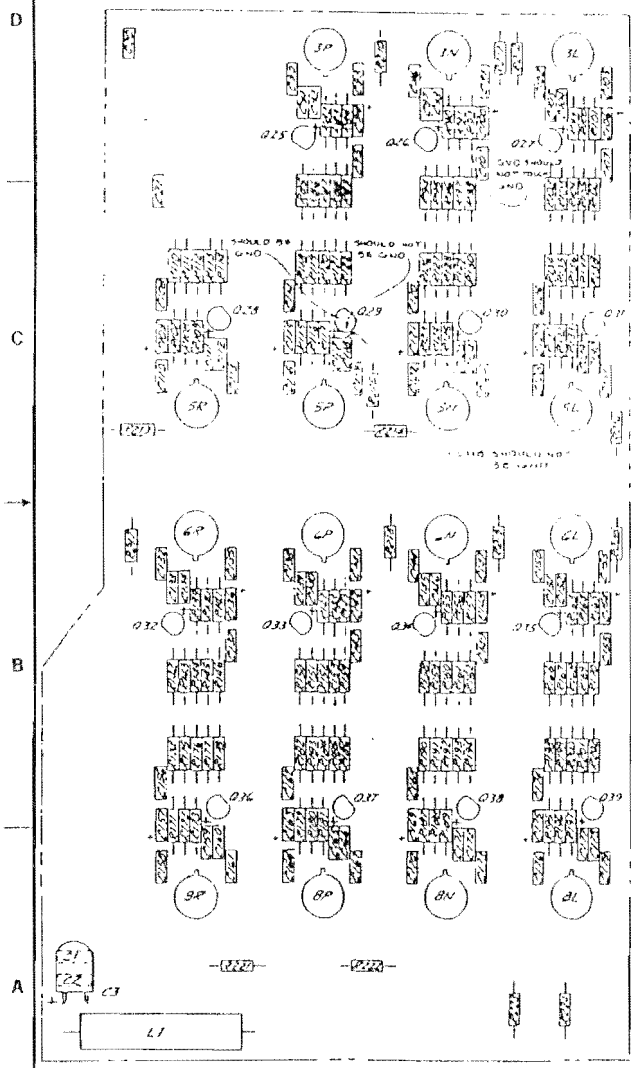


8 7 6 5 4 3 2 1

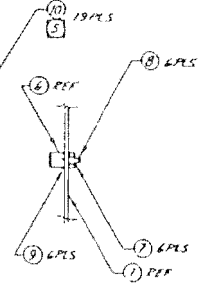
REVISIONS			
NO.	DESCRIPTION	APPROV.	DATE
A	ISSUANCE FOR 502446	JRS	9/26
F	REV PER ECO # 507162	JRS	12-76
G	REV PER ECO # 507170	JRS	12-76
D	REV PER ECO # 507174	JRS	12-76
E	REV PER ECO # 507233	JRS	1-9-77
B	REV PER ECO # 507243	JRS	12-77
C	REV PER ECO # 507302	JRS	12-77
H	REV PER ECO # 507437	JRS	12-77
J	REV PER ECO # 0015	JRS	1-8-77

V151-1  
SCALE 1:1

V151-1  
SCALE 1:1  
(SEE SHEET 2)



THIS GND TRACE SHOULD END HERE



SEE SHEET 2 FOR NOTES

SEE SHEET 2 FOR NOTES

TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	PERIODIC DIMENSIONS	SIGNATURES	DATE
FRAMES	...	...	...
...	...	...	...
...	...	...	...
...	...	...	...

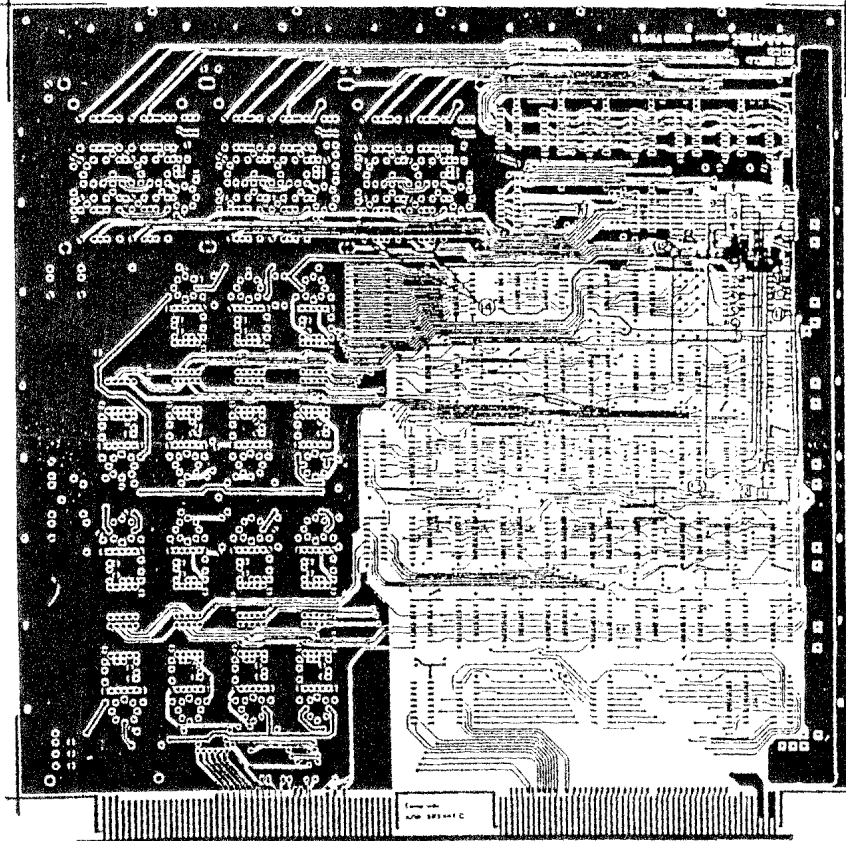
  

QTY	PART NO	ITEM DESCRIPTION	PART NO
LIST OF MATERIALS			
<b>RAMTEK</b>			
ASSEMBLY DRAWING			
VIDEO TYPE 1			
SCALE 1:1			
502446			

501001 REV. AUC

8 7 6 5 4 3 2 1

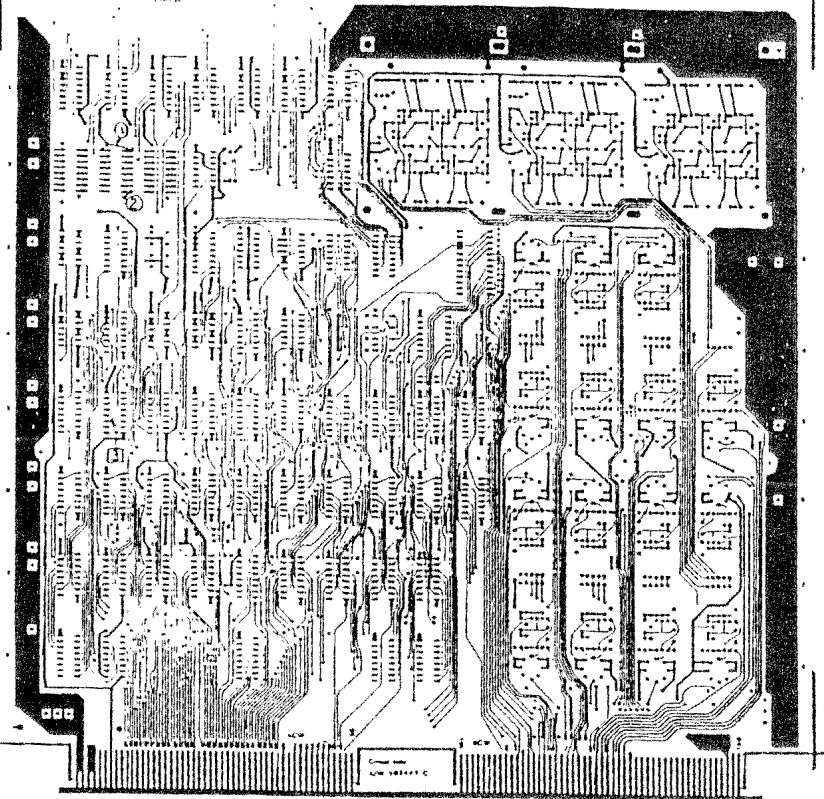
502446



△ INSTALL A 74S174 AT 2B.

DELETES

- 1 CUT TRACE AT 5B-15, 5B-12, 5B-10, & 5B-7 (comp side).
- 2 CUT TRACE AT 5B-9 AS SHOWN. (comp side).
- 3 CUT TRACE AT 5B-10 (CENT SIDE).



ADDS

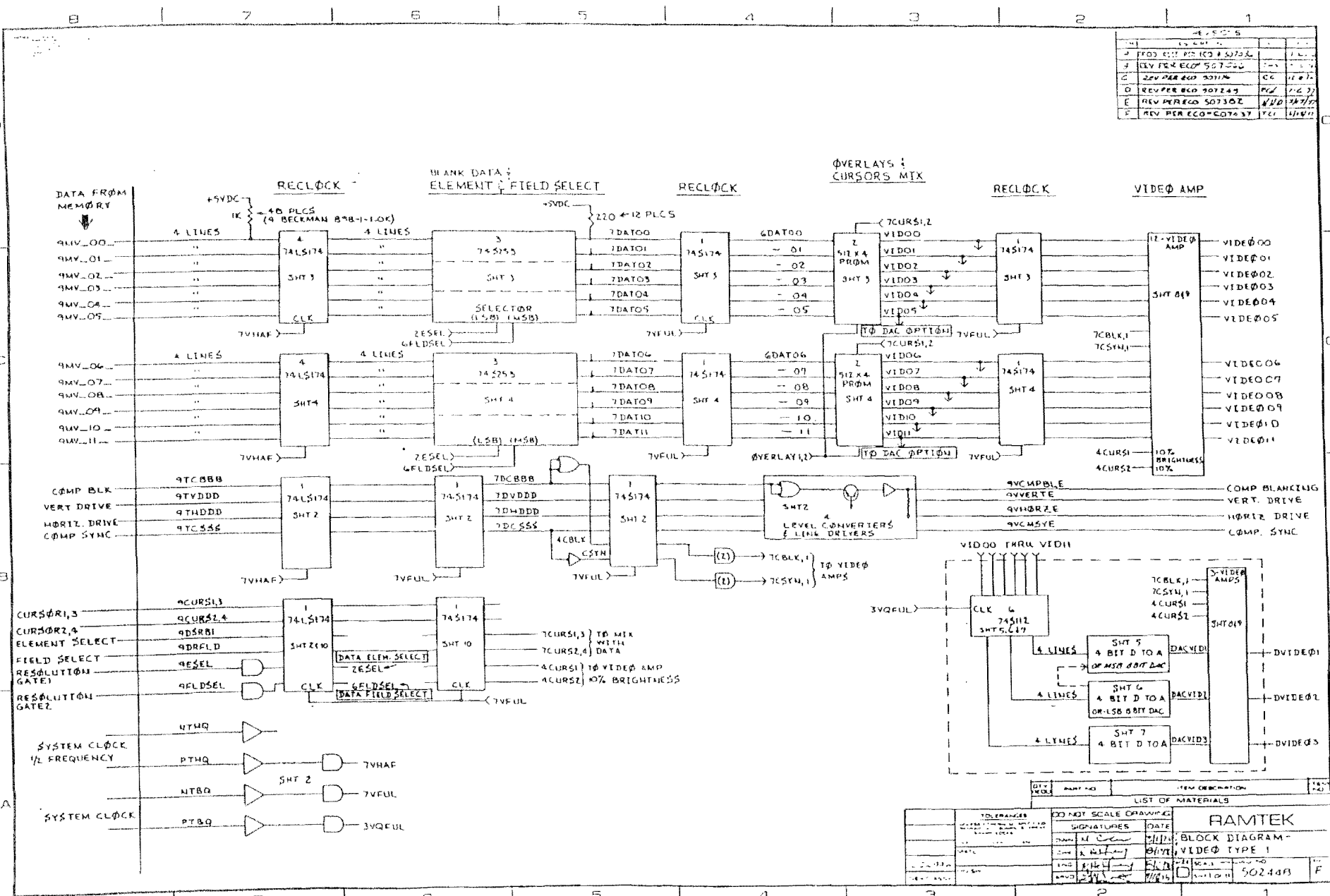
- 1 2B-1 TO 2B-16 THE FEED THRU SHOWN (CMT SIDE)
- 2 2B-8 TO FEEDTHRU SHOWN. (CMT SIDE)
- 3 2B-14 TO 5B-15 (comp side)
- 4 2B-13 TO 5B-12 (comp side)
- 5 2B-11 TO 5B-10 (comp side)
- 6 2B-6 TO 5B-9 (comp side)
- 7 2B-7 TO 5A-6 (comp side)
- 8 2B-10 TO 4E-5 (comp side) - NOT SHOWN
- 9 2B-10 TO 5A-11 (comp side)
- 10 2B-12 TO 5A-13 (comp side)
- 11 2B-15 TO 5A-14 (comp side)
- 12 2B-9 TO 4C-6 (comp side)
- 13 5A-9 TO 5D-9 (comp side)

Rev "3"

- 14 ADD WIRES AS SHOWN (ADDING GND WIRE)

DO NOT SCALE DRAWING		RAMTEK	
SIGNATURES	DATE		
J. P. [Signature]	9-18-77	ASSY DWG	
C. [Signature]	9-18-77	VIDEO TYPE 1	
J. P. [Signature]	9-18-77	SCALE	1:1
		DRAWING NO.	502446
		REV	J

REV	DATE	BY	DESCRIPTION
1	12/1/77	...	...
2	12/1/77	...	...
3	12/1/77	...	...
4	12/1/77	...	...
5	12/1/77	...	...
6	12/1/77	...	...
7	12/1/77	...	...

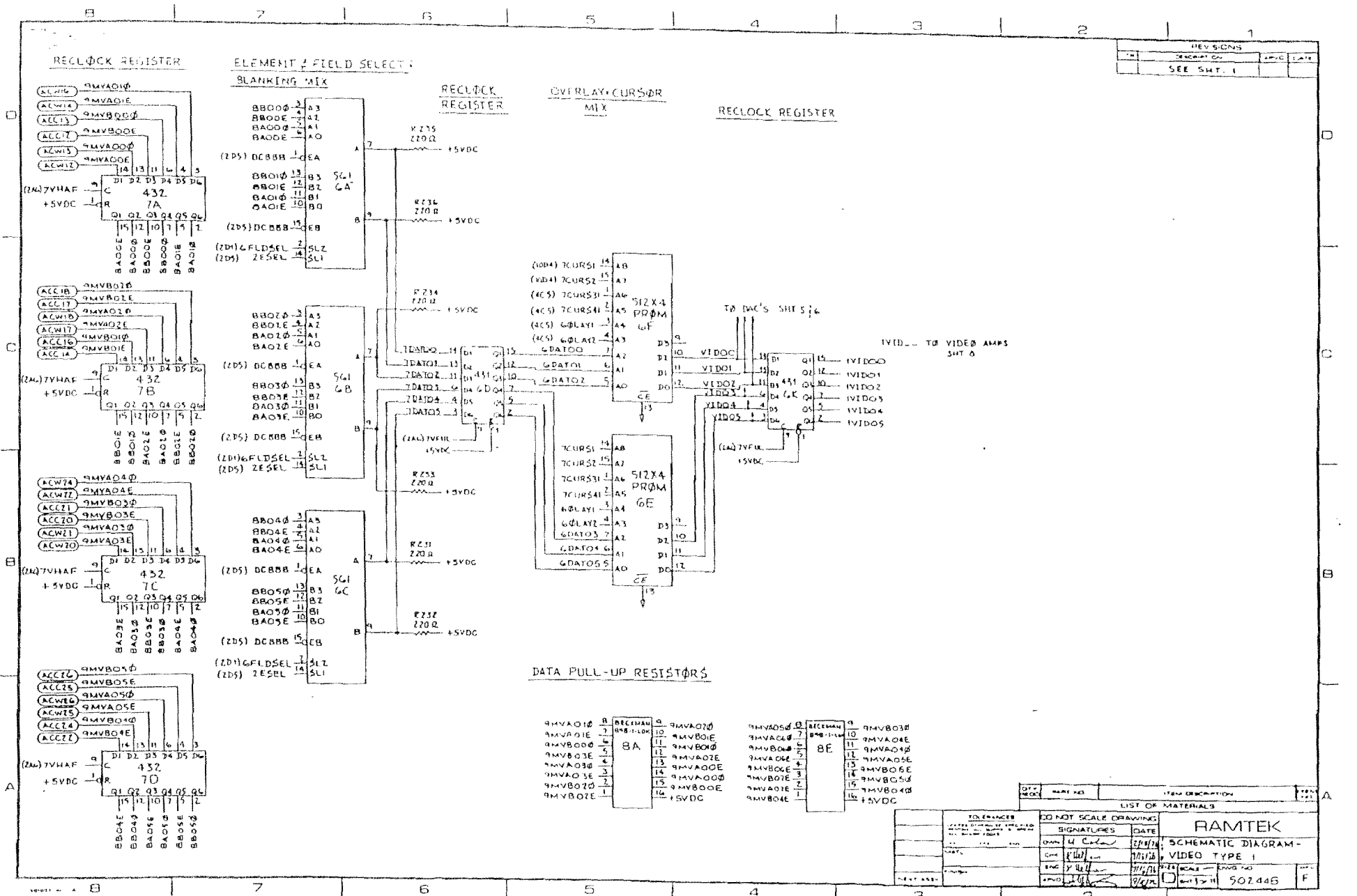


TOLERANCES		DO NOT SCALE DRAWING		SIGNATURES		DATE	
...	...	...	...	...	...	...	...
LIST OF MATERIALS				RAMTEK			
BLOCK DIAGRAM - VIDEO TYPE 1				50244B			





REV. NO.		



DATA PULL-UP RESISTORS

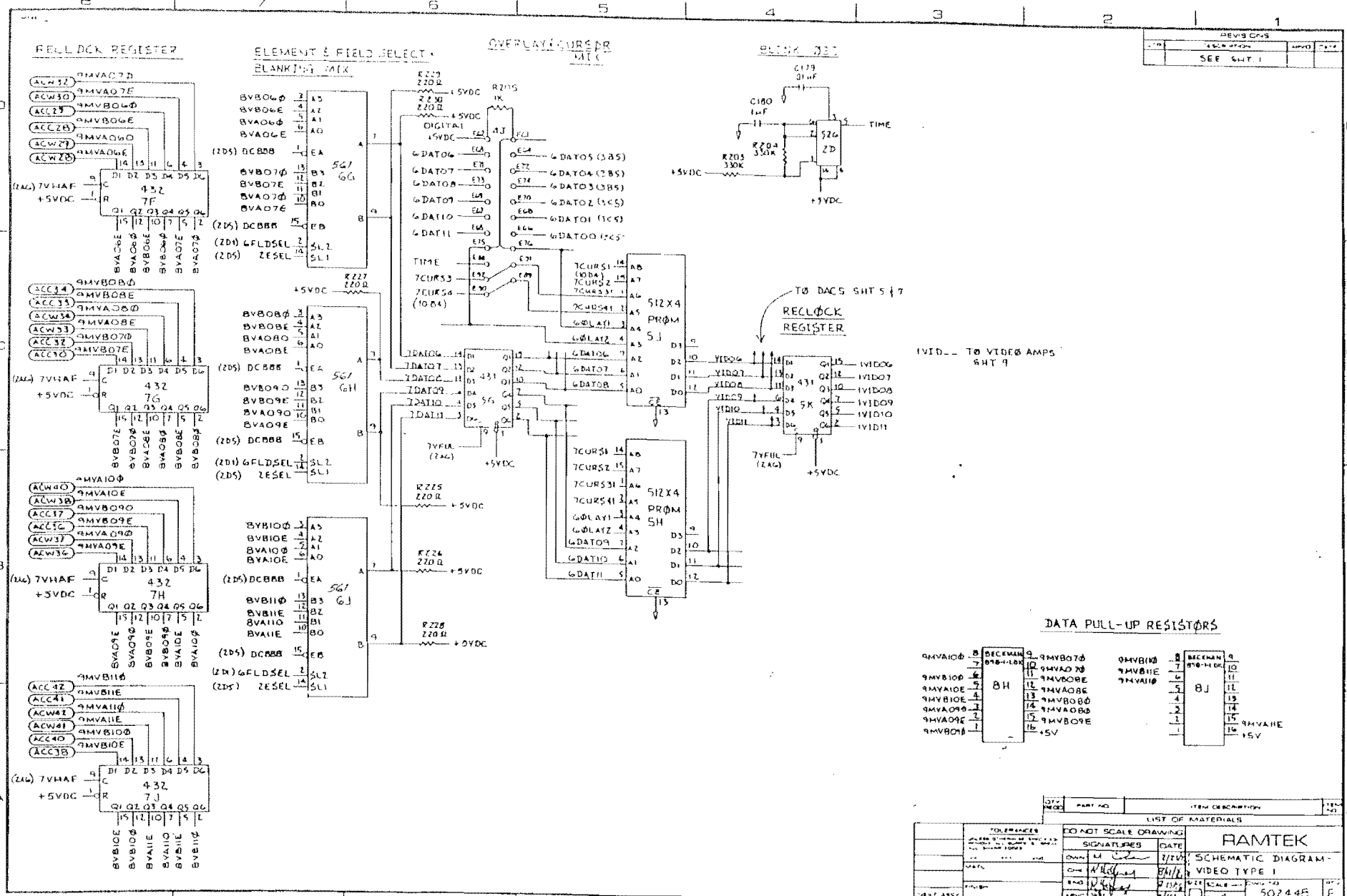
9MVA010	8	9MVA070	9	9MVA030	9	9MVA030	9
9MVA011	7	9MVA071	8	9MVA031	8	9MVA031	8
9MVA012	6	9MVA072	7	9MVA032	7	9MVA032	7
9MVA013	5	9MVA073	6	9MVA033	6	9MVA033	6
9MVA014	4	9MVA074	5	9MVA034	5	9MVA034	5
9MVA015	3	9MVA075	4	9MVA035	4	9MVA035	4
9MVA016	2	9MVA076	3	9MVA036	3	9MVA036	3
9MVA017	1	9MVA077	2	9MVA037	2	9MVA037	2
9MVA018	0	9MVA078	1	9MVA038	1	9MVA038	1

LIST OF MATERIALS			

DO NOT SCALE DRAWING	


RAMTEK  
SCHEMATIC DIAGRAM -  
VIDEO TYPE 1  
502445

REV'S	CHG'S	DATE	BY
1	1	7/1/74	...

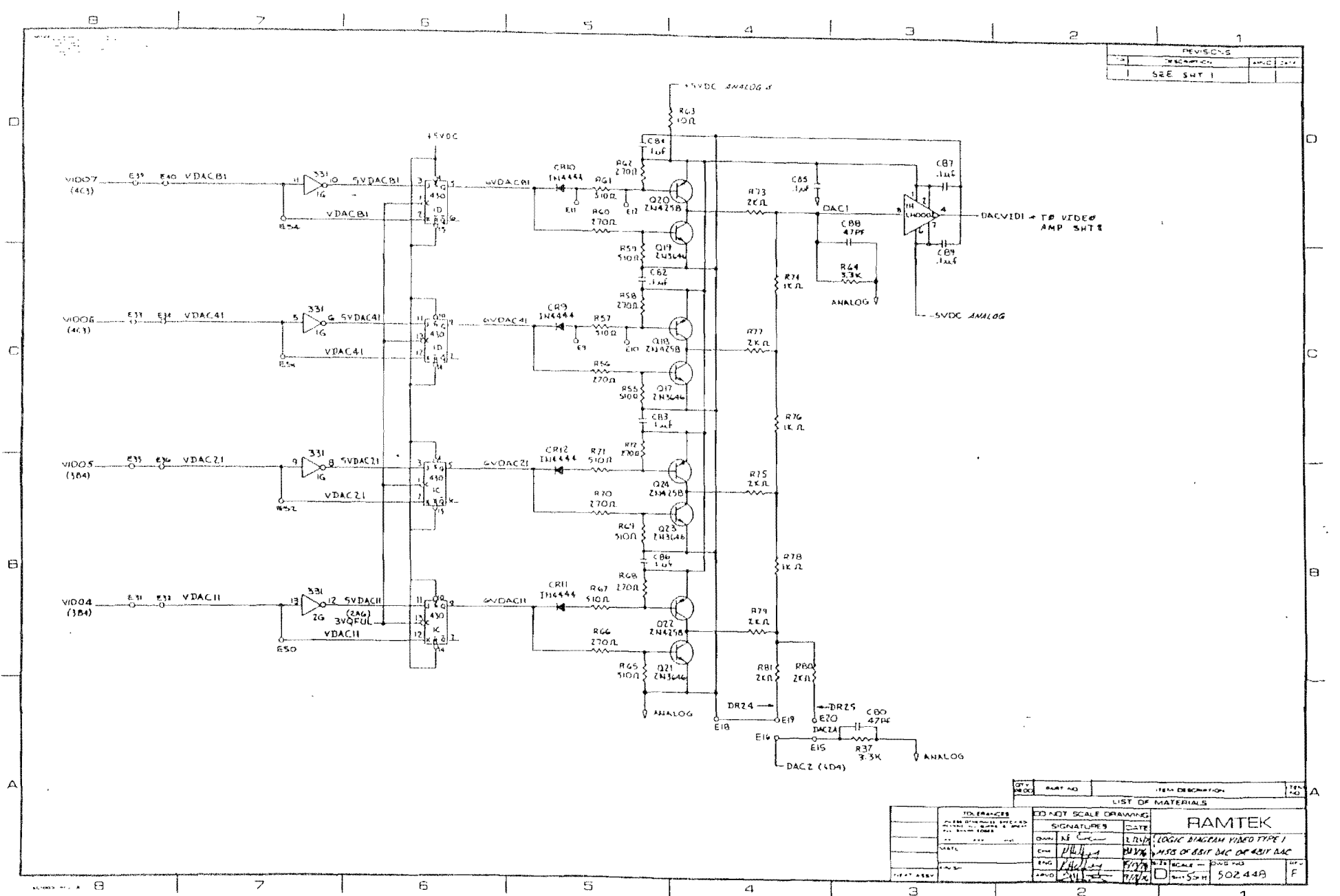


RESISTOR VALUE	RESISTOR VALUE	RESISTOR VALUE	RESISTOR VALUE
9MVA100	88K	9MVB070	88K
9MVB100	88K	9MVA070	88K
9MVA100	88K	9MVB070	88K
9MVB100	88K	9MVA070	88K
9MVA100	88K	9MVB070	88K
9MVB100	88K	9MVA070	88K
9MVA100	88K	9MVB070	88K
9MVB100	88K	9MVA070	88K
9MVA100	88K	9MVB070	88K
9MVB100	88K	9MVA070	88K

ITEM NO.	DESCRIPTION	QTY	UNIT
1	...	...	...
2	...	...	...
3	...	...	...
4	...	...	...
5	...	...	...
6	...	...	...
7	...	...	...
8	...	...	...
9	...	...	...
10	...	...	...
11	...	...	...
12	...	...	...
13	...	...	...
14	...	...	...
15	...	...	...
16	...	...	...

TOLERANCES		DO NOT SCALE DRAWING	
...	...	SIGNATURES	DATE
...	...	...	...
...	...	...	...
...	...	...	...
...	...	...	...
...	...	...	...

REVISIONS		
NO.	DESCRIPTION	DATE
1	SEE SHY 1	

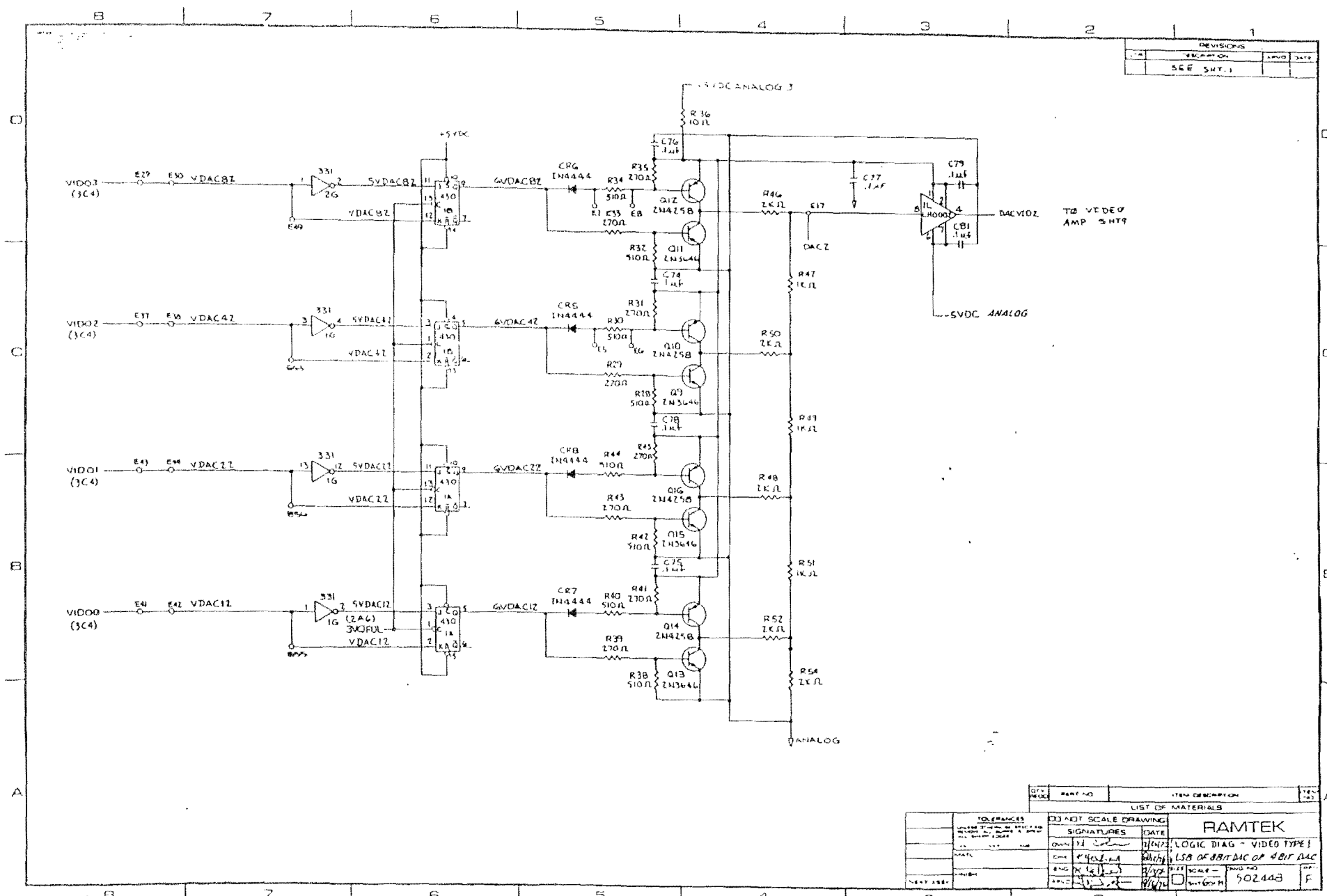


QTY	PART NO.	ITEM DESCRIPTION	ITEM NO.
LIST OF MATERIALS			
RAMTEK			
LOGIC DIAGRAM VIDEO TYPE 1			
PARTS OF 8BIT DAC OR 4BIT DAC			
SCALE		DRAWING NO.	
1:1		502 449	

TOLERANCES	
RESISTORS	±1%
CAPACITORS	±5%
INDUCTORS	±10%
TRANSISTORS	±5%
DIODES	±5%
IC'S	±5%
OPTICALLY COATED	±5%
OTHER	±5%

DO NOT SCALE DRAWING	
SIGNATURE	DATE
DESIGNED BY	2/7/74
CHKD BY	
ENG	
APP'D	

REVISIONS		
NO.	DESCRIPTION	DATE
1	SC4 SHT 1	

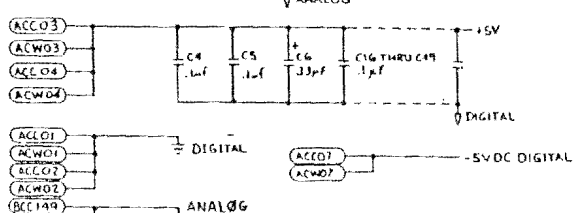
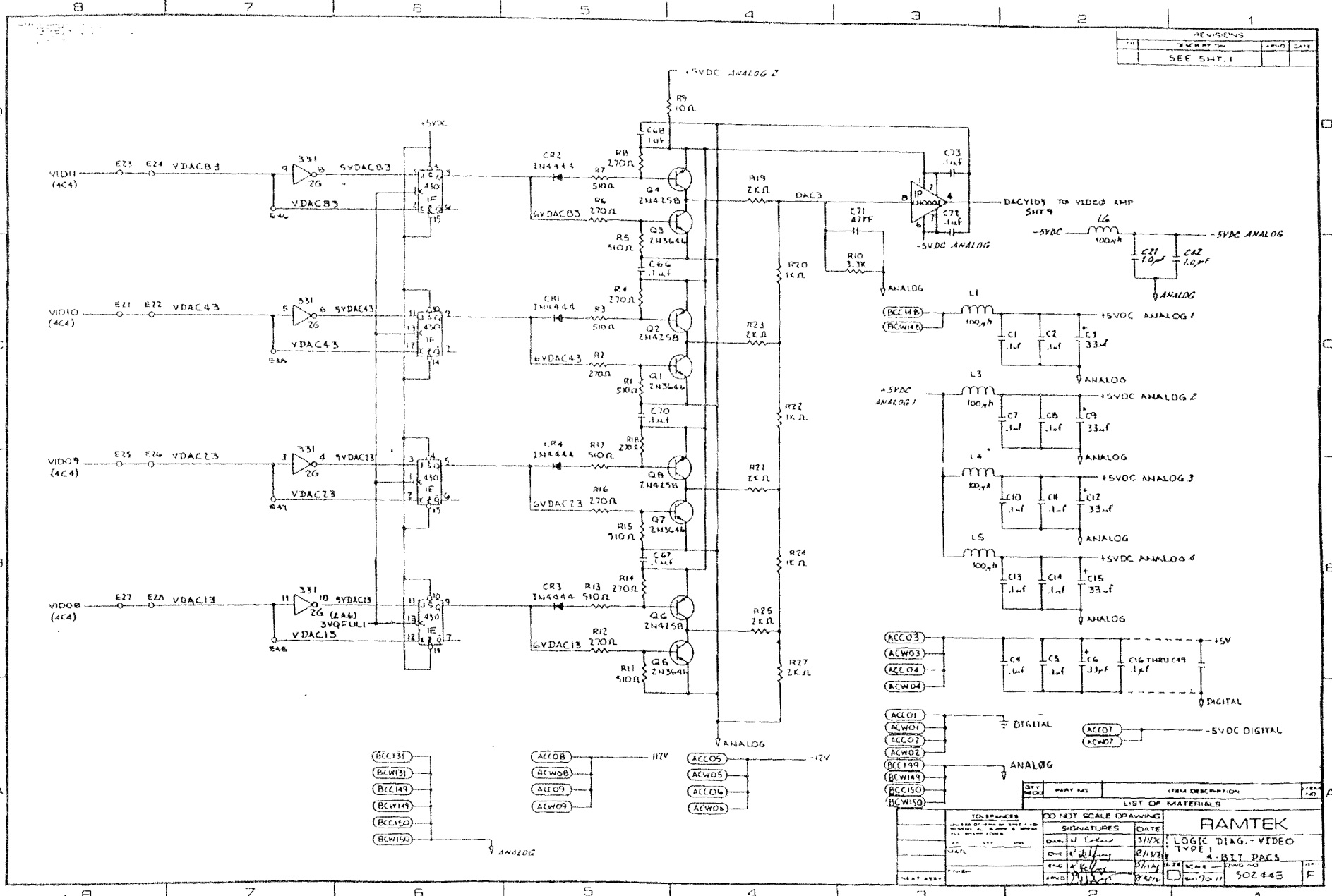


QTY	PART NO	ITEM DESCRIPTION	REV
LIST OF MATERIALS			

TOLERANCES		DIP NOT SCALE DRAWING	
VALUE	UNIT	SIGNATURES	DATE
±0.1%		OWN	11/2/72
±0.5%		CHK	11/2/72
±1%		ENG	11/2/72
±2%		APP	11/2/72

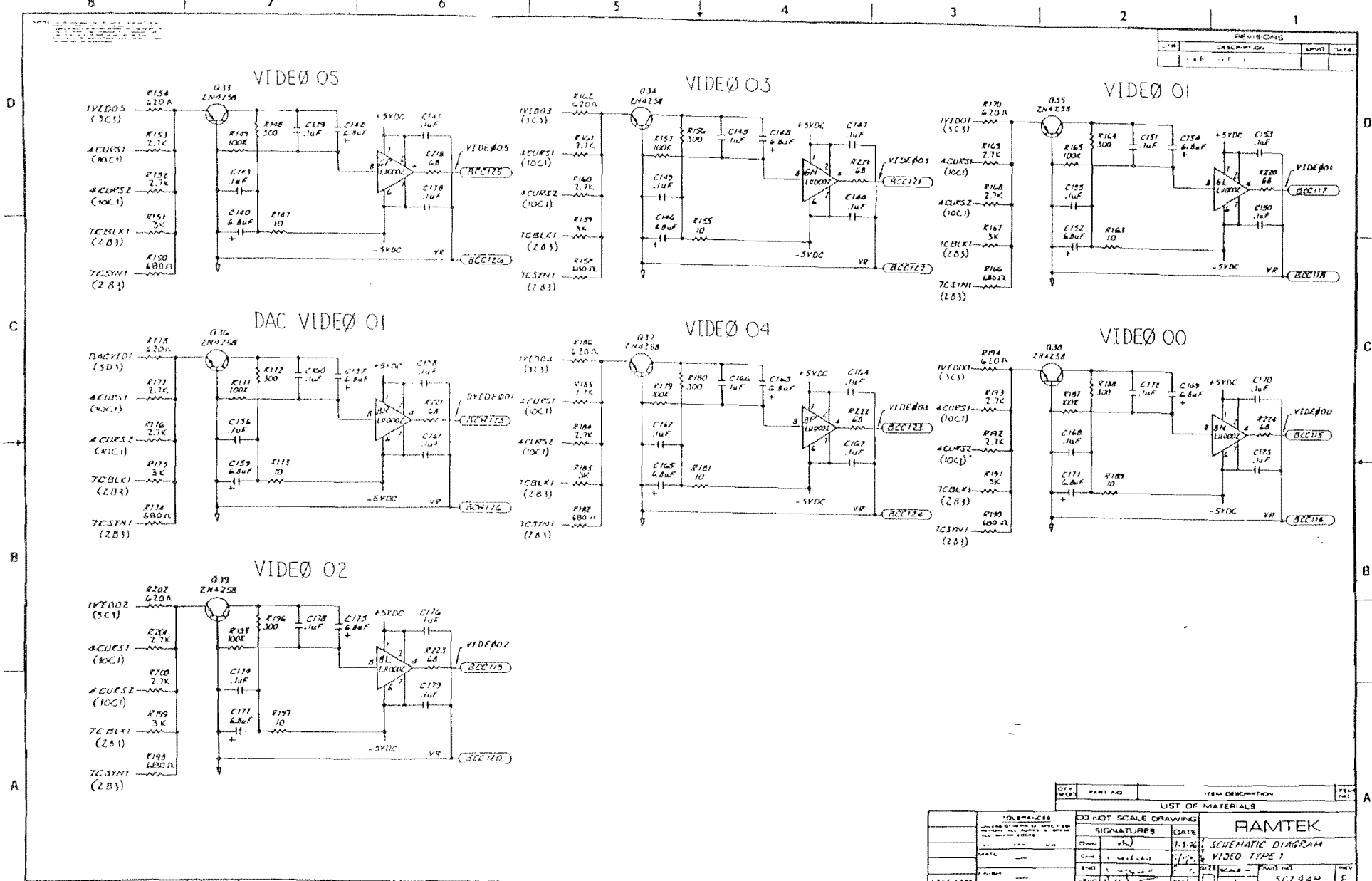
**RAMTEK**  
 LOGIC DIAG - VIDEO TYPE I  
 LSB OF 8 BIT DAC OF 4 BIT DAC  
 SCALE = 100000  
 902448 F

REVISIONS			
NO.	DESCRIPTION	APP'D	DATE
1	SEE SHT. 1		



LIST OF MATERIALS			
QTY	PART NO.	ITEM DESCRIPTION	REV.
		RAMTEK	
		LOGIC DIAG. - VIDEO	
		TYPE 1	
		4-BIT DACS	
		50244B	F

REVISIONS			
NO.	DESCRIPTION	APPROV.	DATE
1	...	...	...



QTY	PART NO	NEW DESCRIPTION	REV
...	...	...	...

LIST OF MATERIALS			
TOLERANCES	UNLESS OTHERWISE SPECIFIED	RESISTORS	CAPACITORS
...	...	...	...

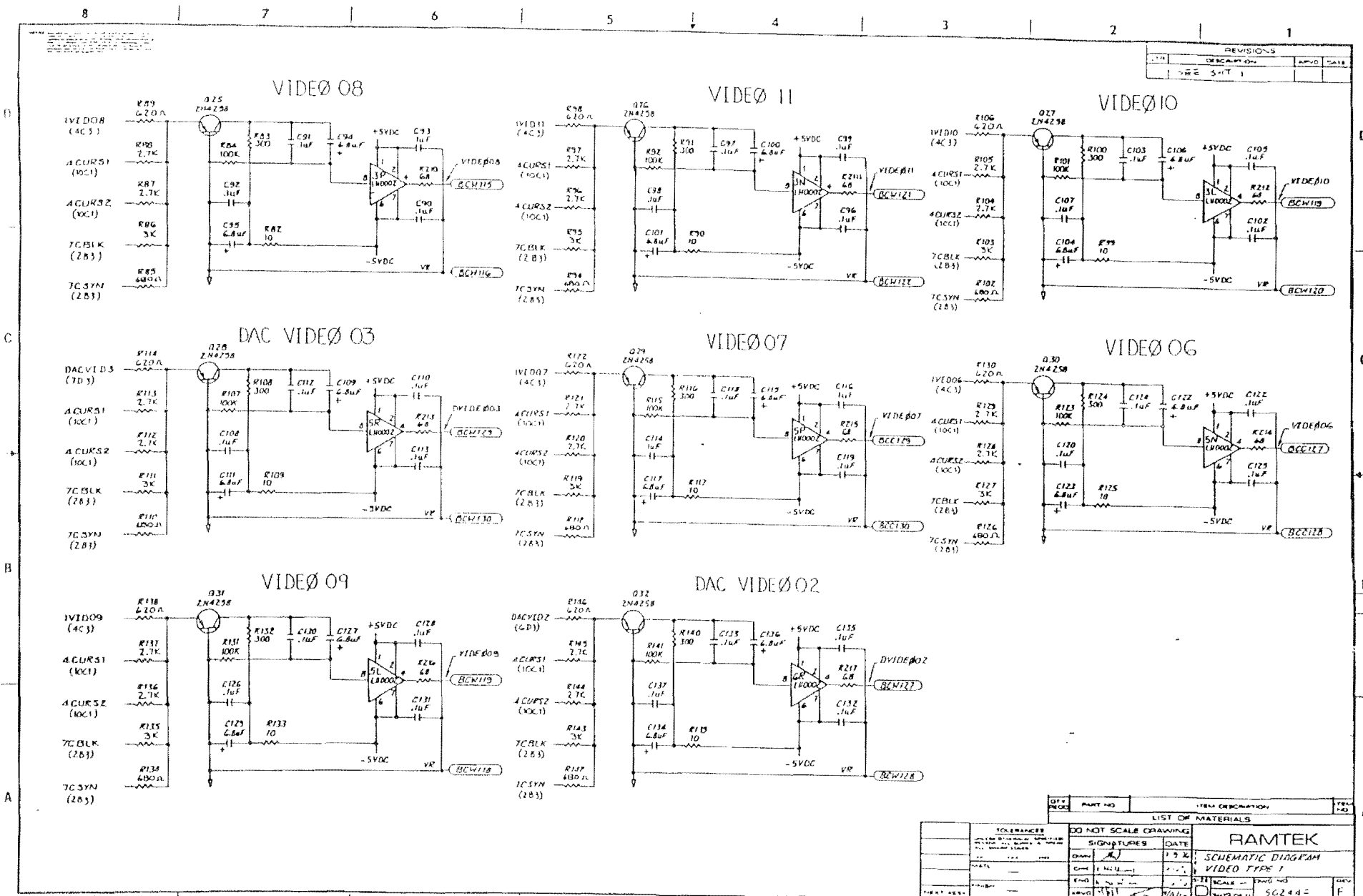
  

DO NOT SCALE DRAWING		DATE	
SIGNATURES	DATE	1.5.82	...

SCHEMATIC DIAGRAM		VIDEO TYPE 1	
SCALE = 5000:1	REV	502 442	F

REVISIONS		
NO.	DESCRIPTION	APPRO. DATE
1	ISSUE SHEET	



LIST OF MATERIALS			
QTY	PART NO.	ITEM DESCRIPTION	REV. NO.

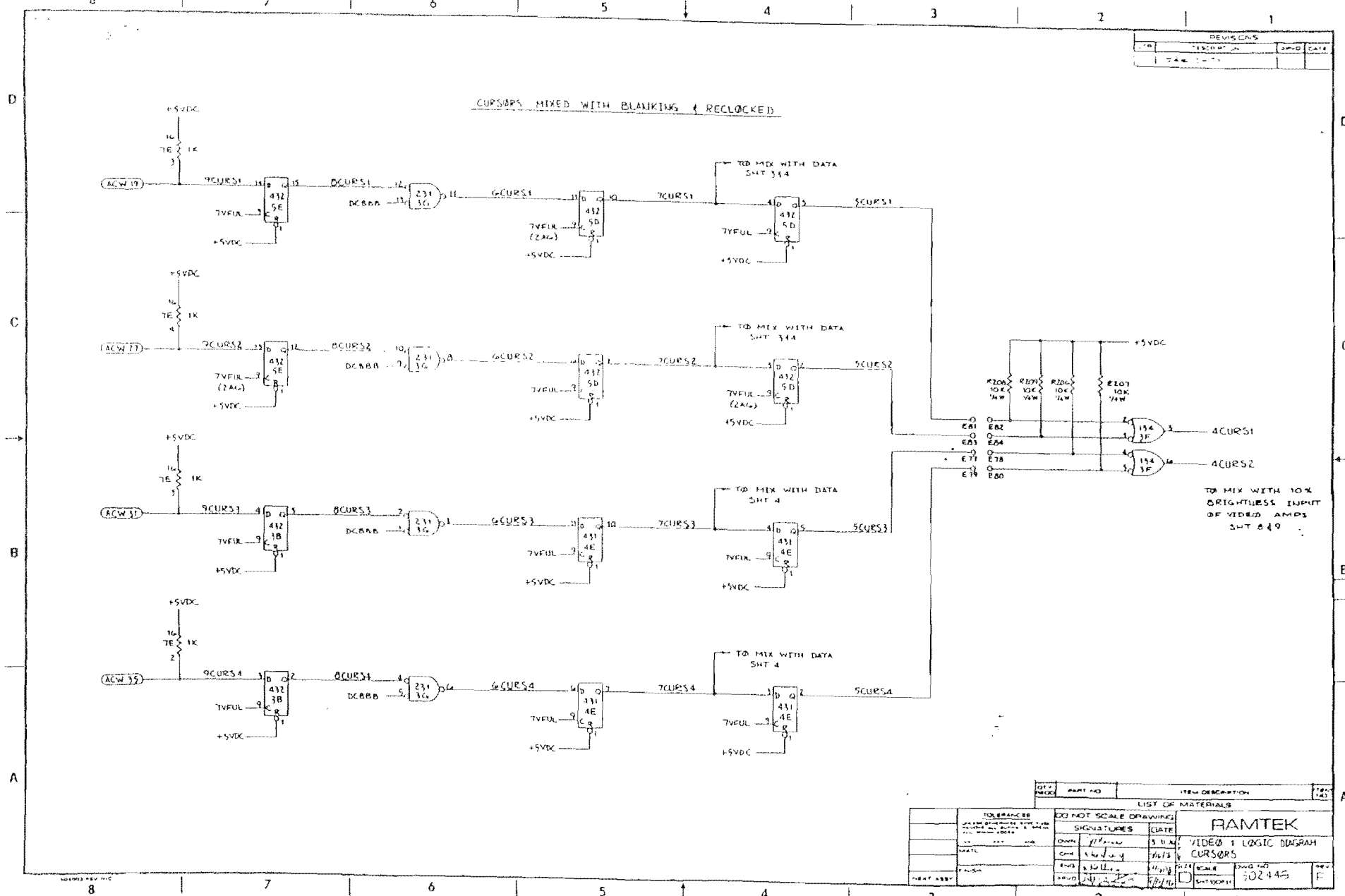
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
RESISTORS	RESISTORS		
CAPACITORS	CAPACITORS		
WELDS	WELDS		
ANGLES	ANGLES		
SPACINGS	SPACINGS		
DRILL SIZES	DRILL SIZES		

<b>RAMTEK</b>	
SCHEMATIC DIAGRAM	
VIDEO TYPE 1	
SCALE: 1/8" = 1"	REV. NO. 56244
DATE: 1/1/71	BY: [Signature]

REVISIONS		DATE
1	INITIALS	
2		

CURSORS MIXED WITH BLANKING & RELOCKED



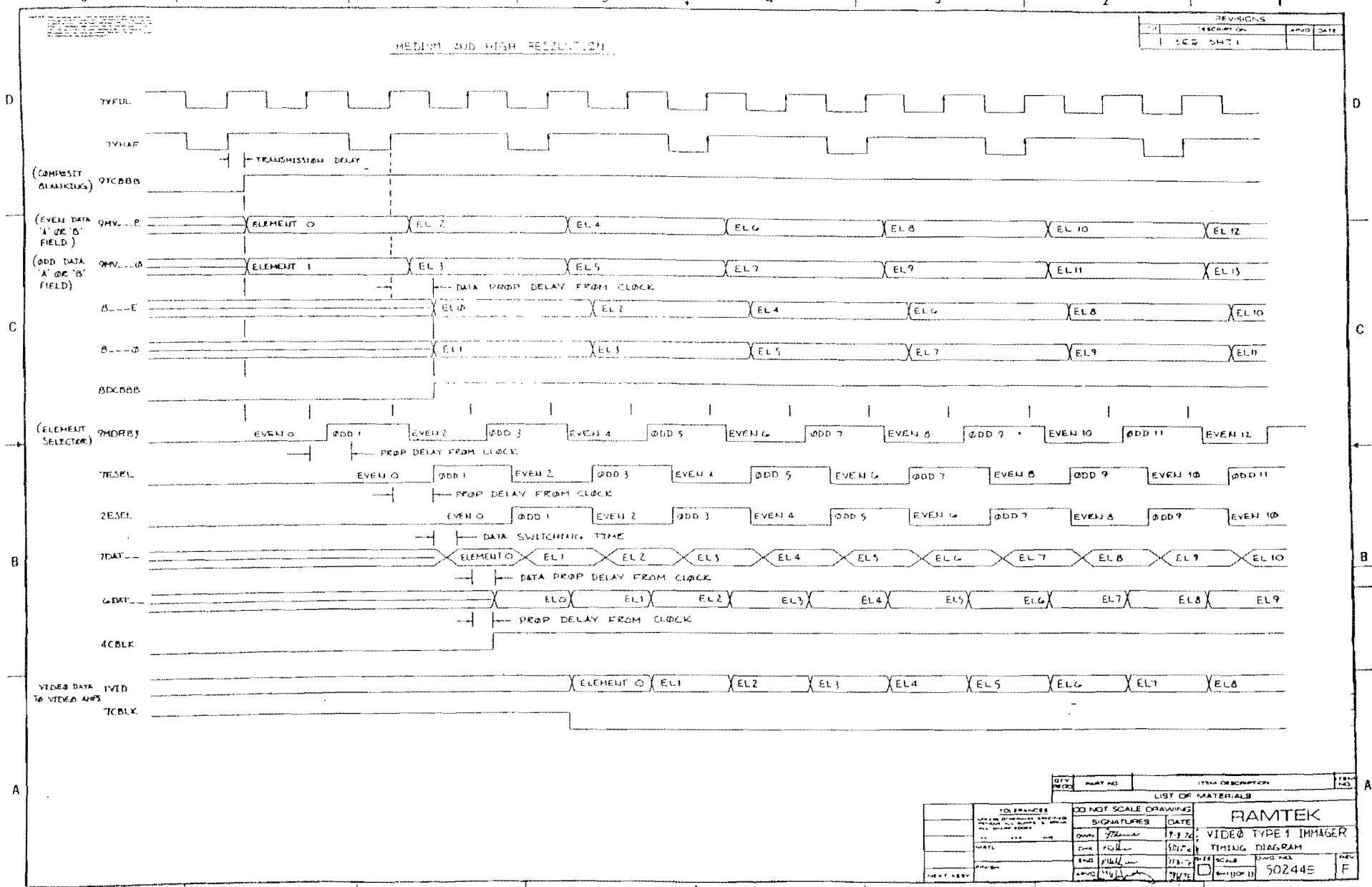
QTY	PART NO	ITEM DESCRIPTION	REV
		LIST OF MATERIALS	
		RAMTEK	
		VIDEO 1 LOGIC DIAGRAM	
		CURSORS	
		REV NO	302445
		SHEET NO	F

TOLERANCES	DO NOT SCALE DRAWINGS
UNLESS OTHERWISE SPECIFIED	SIGNATURES
ALL DIMENSIONS ARE IN INCHES	DATE
FRACTIONS SHALL BE SHOWN AS DECIMALS	CHKD
	DATE
	APPD
	DATE

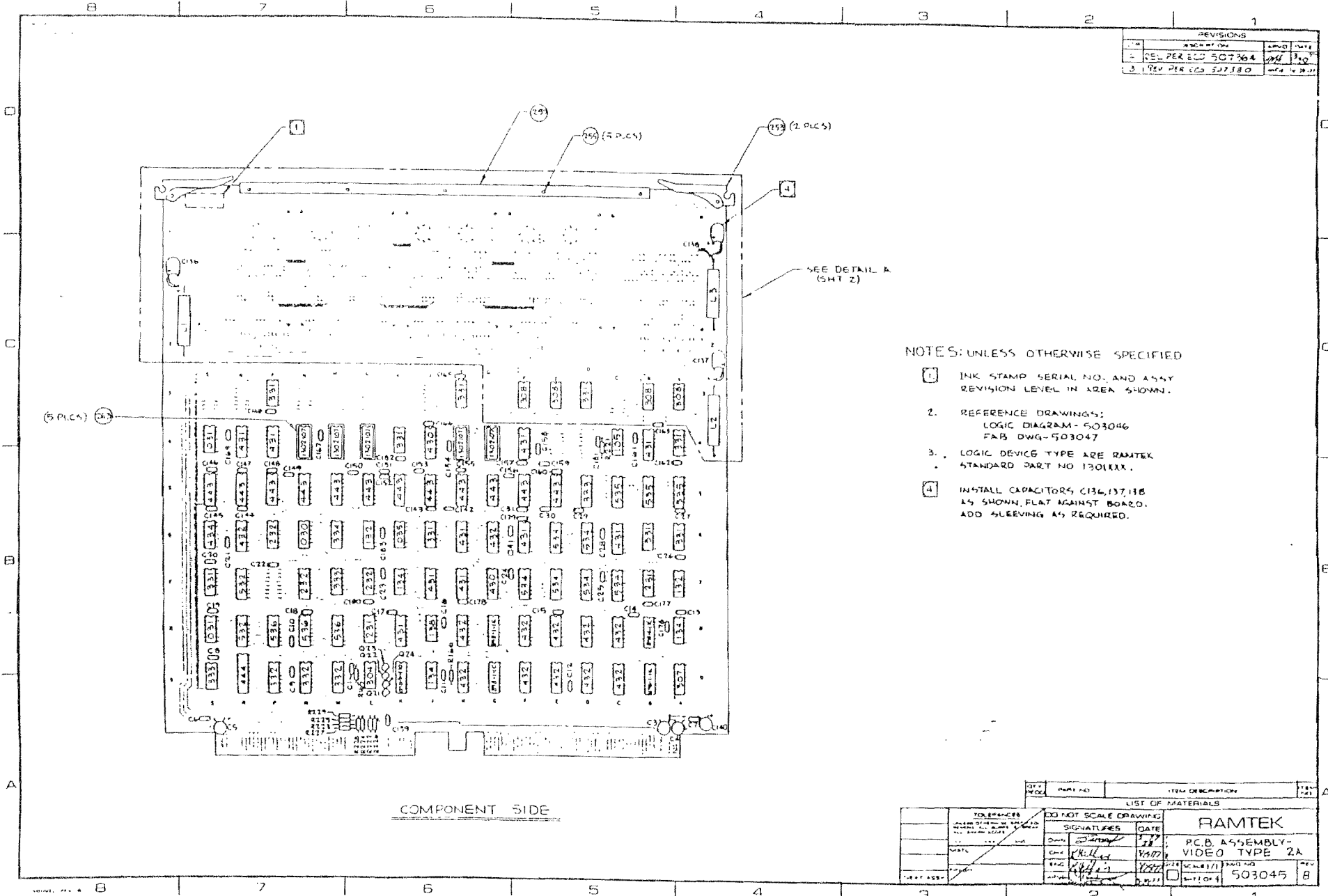


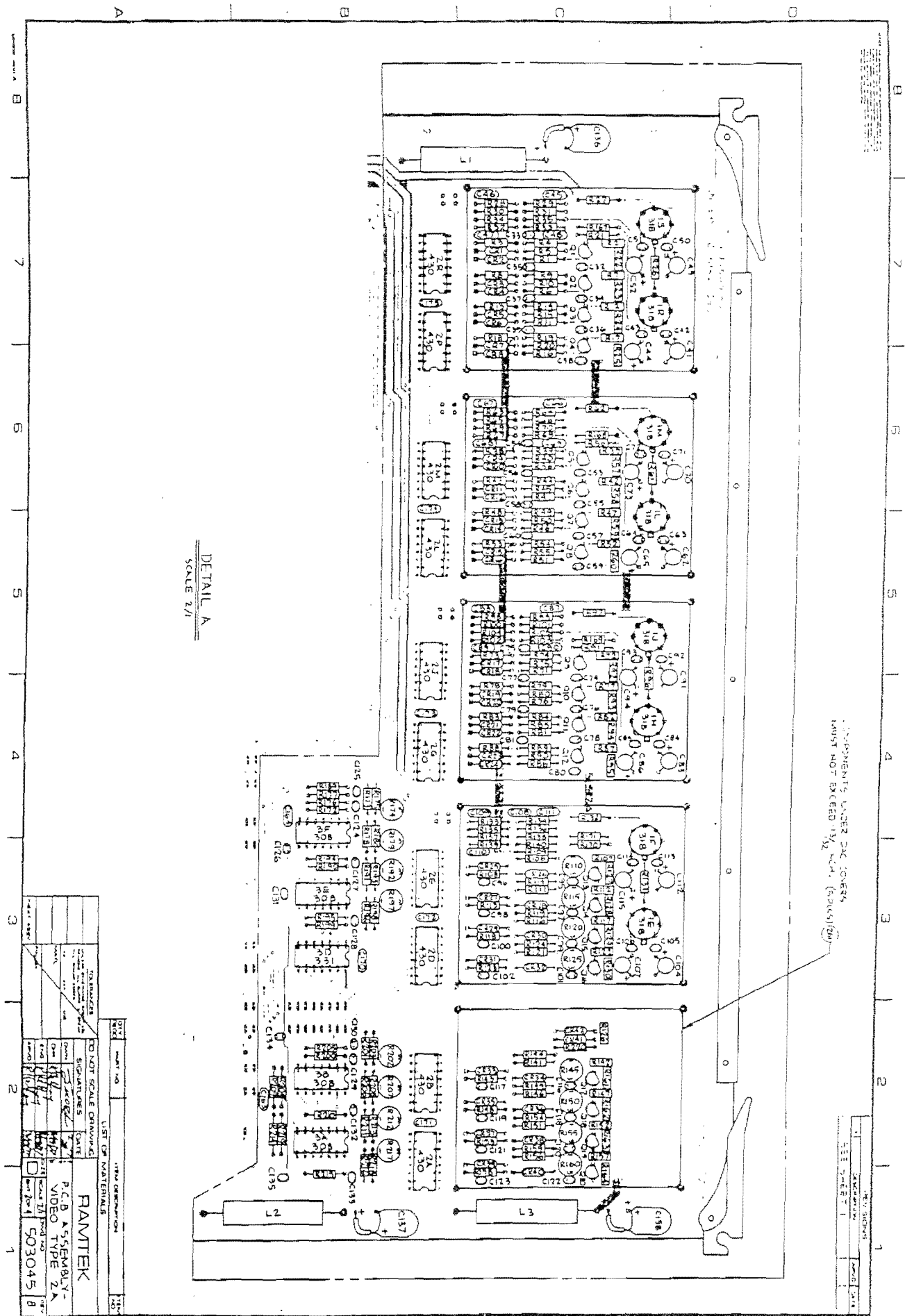
MEDIUM AND HIGH RESOLUTION

REVISIONS	
NO.	DESCRIPTION
1	SEE DWT 1



REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	REL PER ECO 507364	1/10	JH
2	REV PER ECO 507380	1/10	JH





DETAIL A  
SCALE 2/1

LIST OF MATERIALS		PART DESCRIPTION	
QTY	PART NO.	QTY	PART NO.
1	318	1	318
1	319	1	319
1	320	1	320
1	321	1	321
1	322	1	322
1	323	1	323
1	324	1	324
1	325	1	325
1	326	1	326
1	327	1	327
1	328	1	328
1	329	1	329
1	330	1	330
1	331	1	331
1	332	1	332
1	333	1	333
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1	335	1	335
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1	393	1	393
1	394	1	394
1	395	1	395
1	396	1	396
1	397	1	397
1	398	1	398
1	399	1	399
1	400	1	400

DO NOT SCALE DRAWING

SIGNATURES DATE

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

DATE: [Date]

VIDEO TYPE: VHS

503045 B

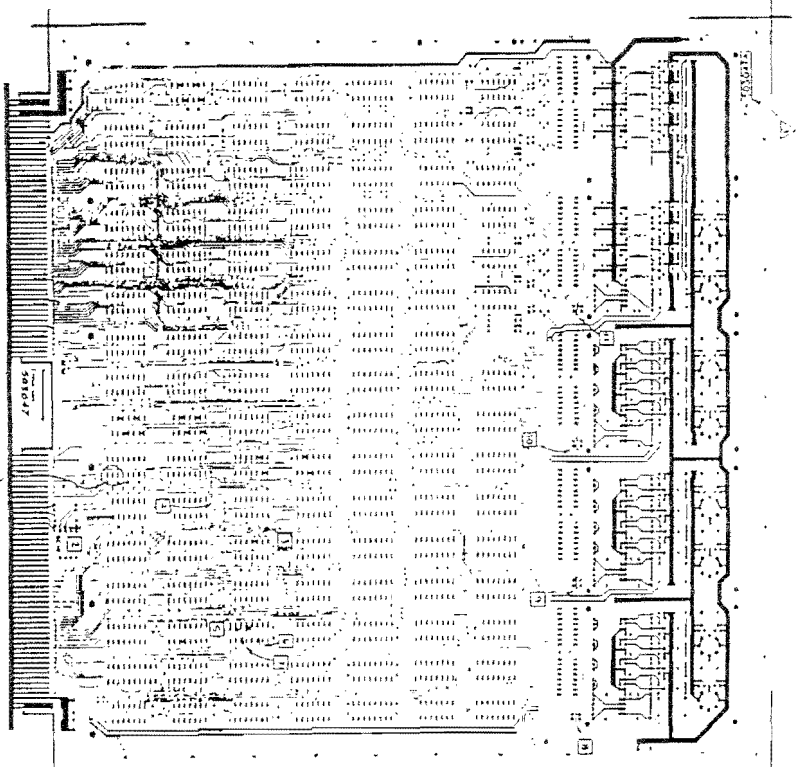
RAMTEK

P.C.B. ASSEMBLY

VIDEO TYPE VHS

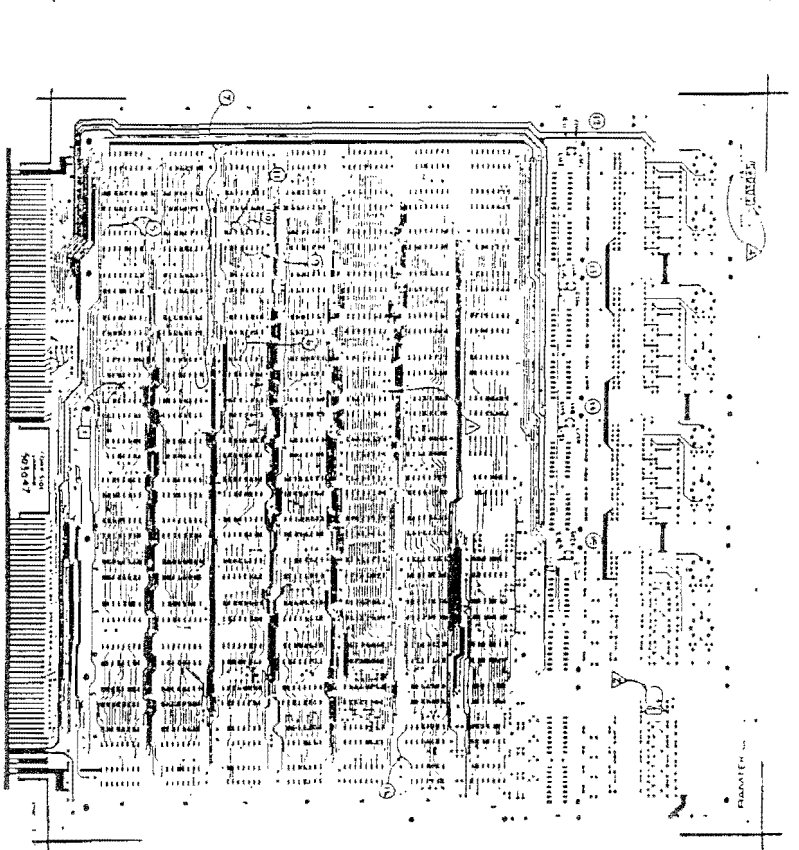
503045 B





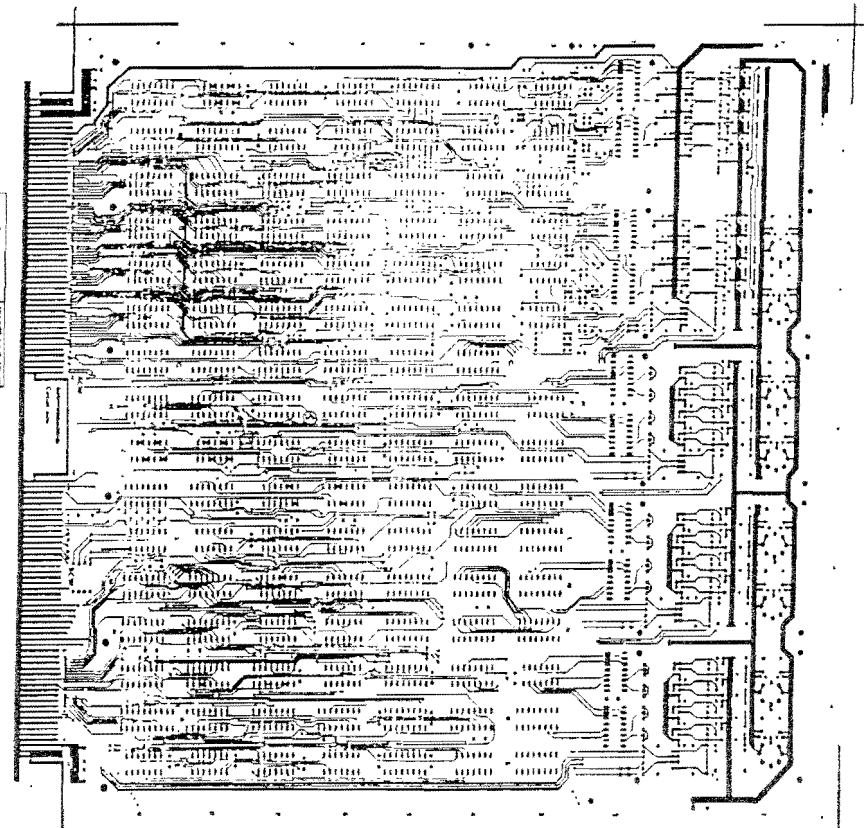
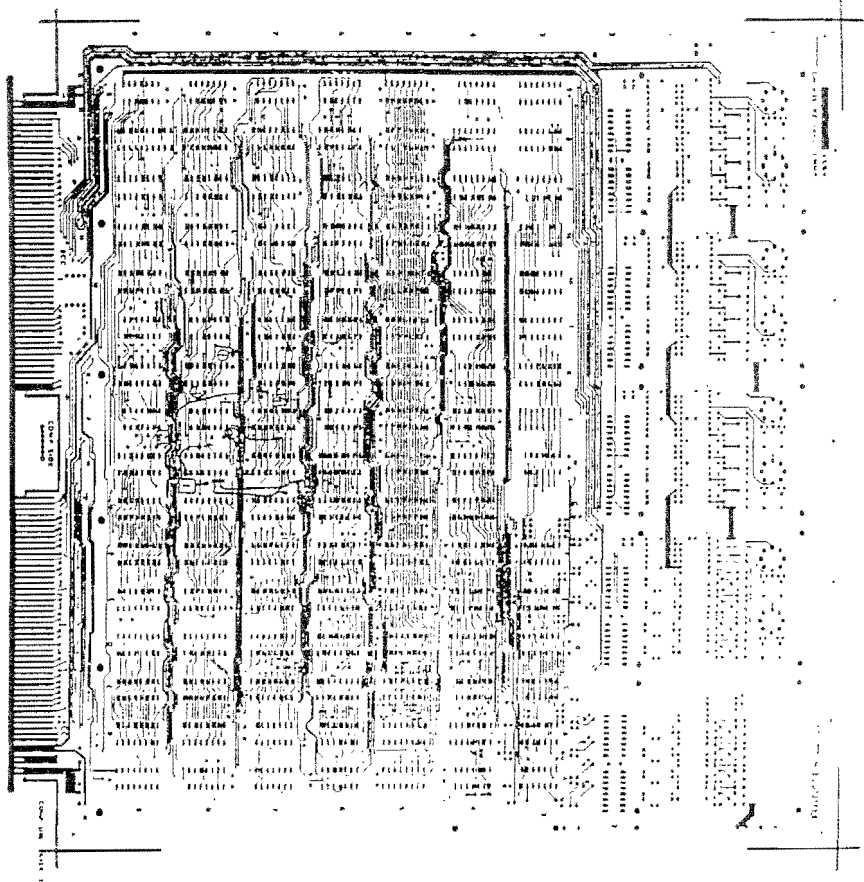
- NOTES**
- △ CARPETING ESTIMATED AS TO COST TO BE TAKEN ABOVE TO REMOVE A VIBRANT RESONANCE OF THE SMALL SECTION 22 2200-2300
  - △ X-20 STAIR BALANCE AS TO STAIRWAY AS SHOWN
  - △ PLACE A PAIR OF STAIRS IN SECTION 22 2200-2300
  - △ PAIR A PAIR OF STAIRS IN SECTION 22 2200-2300

- DETAILS**
- 1 CUT TACK AT 20-4
  - 2 CUT TACKS AT 20-4
  - 3 CUT TACKS AT 20-4
  - 4 CUT TACKS AT 20-4
  - 5 CUT TACKS AT 20-4
  - 6 CUT TACKS AT 20-4
  - 7 CUT TACKS AT 20-4
  - 8 CUT TACKS AT 20-4
  - 9 CUT TACKS AT 20-4



- ADD'L**
- 1 20-4 TO 20-5
  - 2 20-4 TO 20-5
  - 3 20-4 TO 20-5
  - 4 20-4 TO 20-5
  - 5 20-4 TO 20-5
  - 6 20-4 TO 20-5
  - 7 20-4 TO 20-5
  - 8 20-4 TO 20-5
  - 9 20-4 TO 20-5

1	RAMTEK
2	503045
3	3

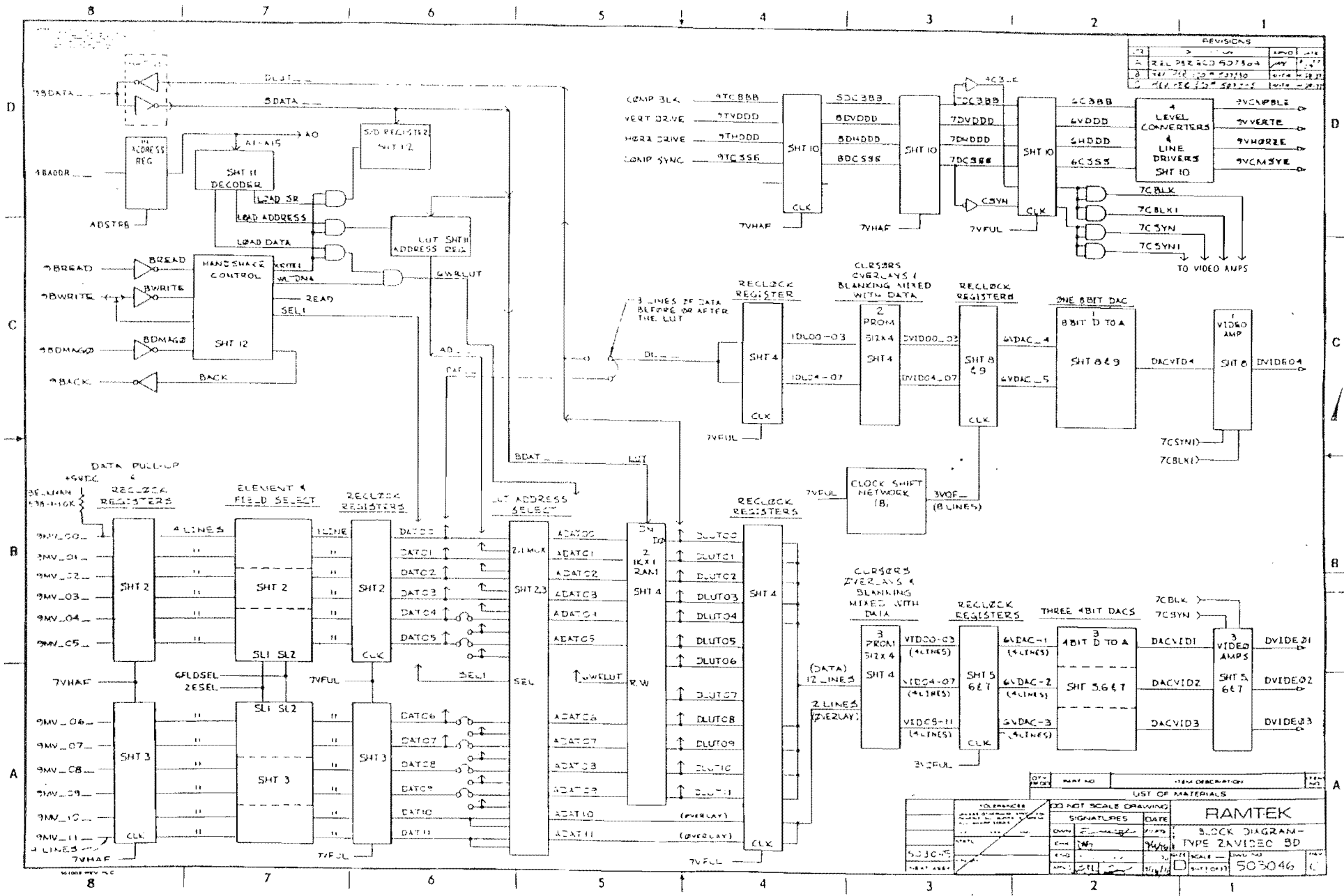


- DELETES
- 1 CUT TRACE AT 8H-3, 8H-15, 4 8H-14 (COMP SIDE)
  - 2 LIFT IC PIN 9 AT 5H AWAY FROM CKT PAD (COMP SIDE)
  - 3 CUT TRACE AT 8H-2 (CMT STICK)
  - 4 CUT TRACE AT 7K-8 (COMP STICK)

- ADD'S
- 1 7H-3 TR FEEDBACK SHOWN (COMP SIDE)
  - 2 7H-2 TR FEEDBACK SHOWN (COMP SIDE)
  - 3 7H-14 TR FEEDBACK SHOWN (COMP SIDE)
  - 4 7K-8 TR IC PIN 9 AT 8H-8E SIDE. Pin 9 BACKSHOT TOUCH THE PAD. (COMP SIDE)
  - 5 7H-3 TR 7T-4

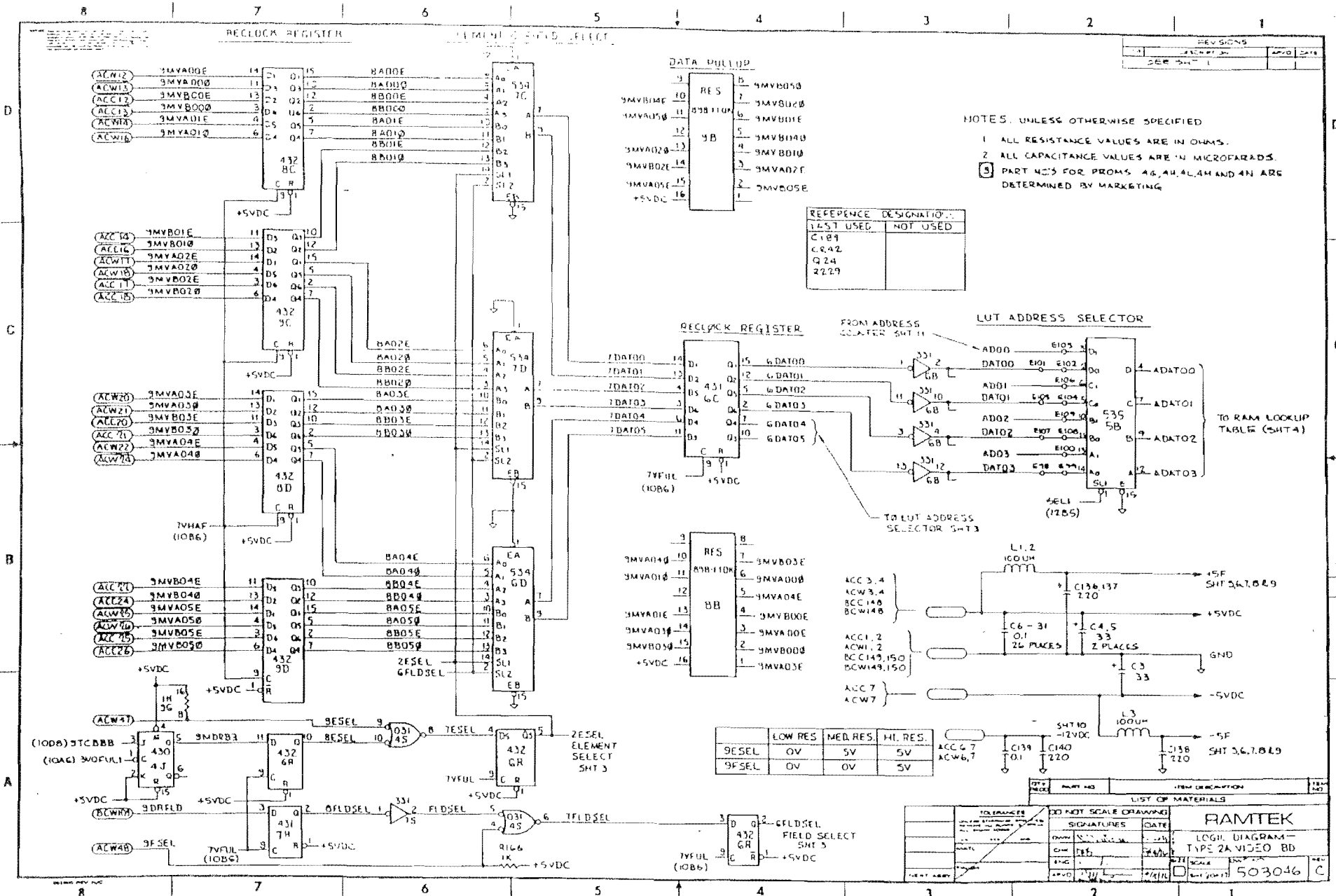
DO NOT SCALE DRAWING		RAMTEK	
SIGNATURES	DATE	PC B ASSY	
Checked by: J. L. Hall	11/11/78	UTREO TYPE 2A	
Drawn by: J. L. Hall	11/11/78	503095	
Scale: 1:1	Sheet: 3		B

ECO # 503095  
ALL 8-78



REVISIONS	
1	REVISED 907804
2	REVISED 907810
3	REVISED 907810
4	REVISED 907810

ITEM NO.		ITEM OPERATION		ITEM DATE	
LIST OF MATERIALS					
<b>RAMTEK</b>					
BLOCK DIAGRAM - TYPE 2AVIDEO 3D					
SCALE: 1/8" = 1" (VERTICAL)					
503046					



REVISIONS	
REV. NO.	DATE
1	SEP 54

- NOTES: UNLESS OTHERWISE SPECIFIED
- 1 ALL RESISTANCE VALUES ARE IN OHMS.
  - 2 ALL CAPACITANCE VALUES ARE IN MICROFARADS.
  - 3 PART NOS FOR PROMS 46,44,44A AND 4N ARE DETERMINED BY MARKETING

REFERENCE DESIGNATION	
USED	NOT USED
1A57	
C189	
C942	
Q24	
Q229	

	LOW RES	MED. RES.	HI. RES.
BESEL	OV	5V	5V
FLDSEL	OV	OV	5V

QTY	PART NO.	ITEM DESCRIPTION	REV.
		LIST OF MATERIALS	
		DO NOT SCALE DRAWING	
		SIGNATURES	DATE
		CHKD BY	DATE
		ENG. BY	DATE
		APPROV. BY	DATE

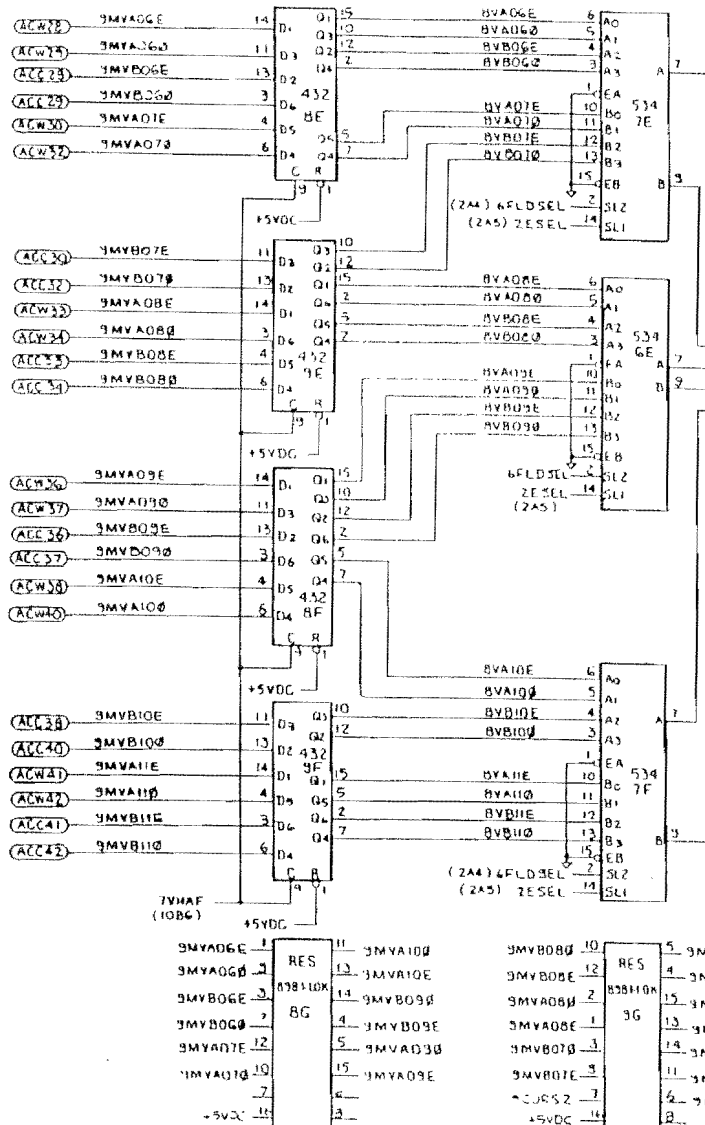
RAMTEK  
LOGN. DIAGRAM -  
TYPE 2A VIDEO BB  
503046



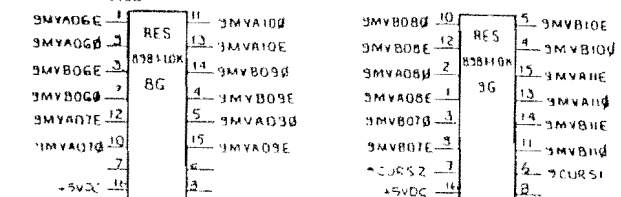
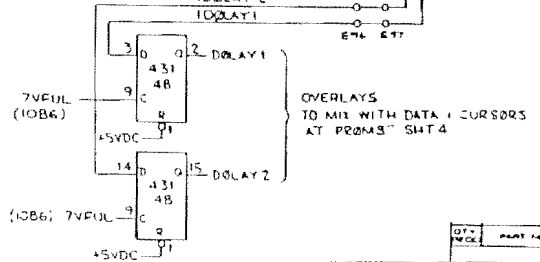
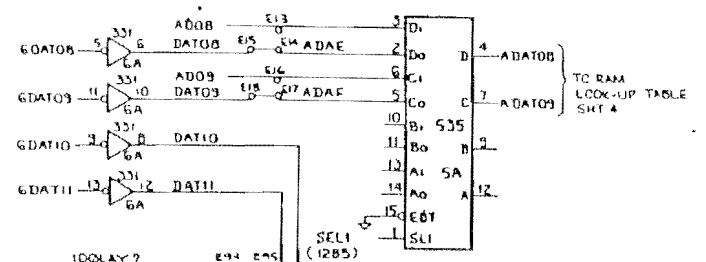
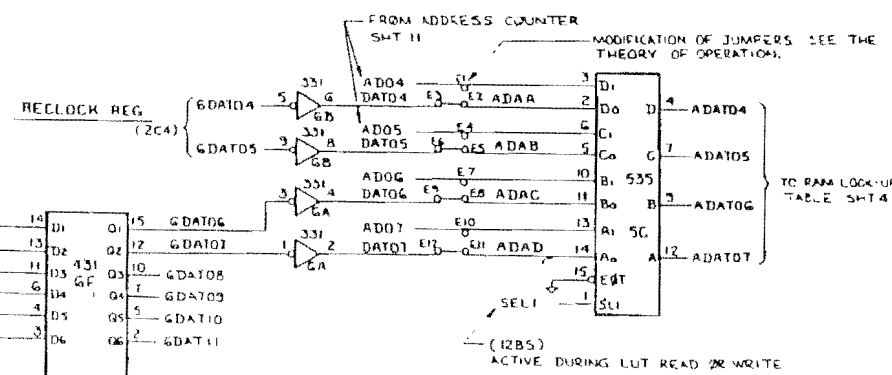
8 7 6 5 4 3 2 1

REV	DESCRIPTION	DATE
1	SEE PART 1	

RELOCK REGISTER ELEMENT FIELD SELECT



LUT ADDRESS SELECT



QTY	PART NO	ITEM DESCRIPTION	REV

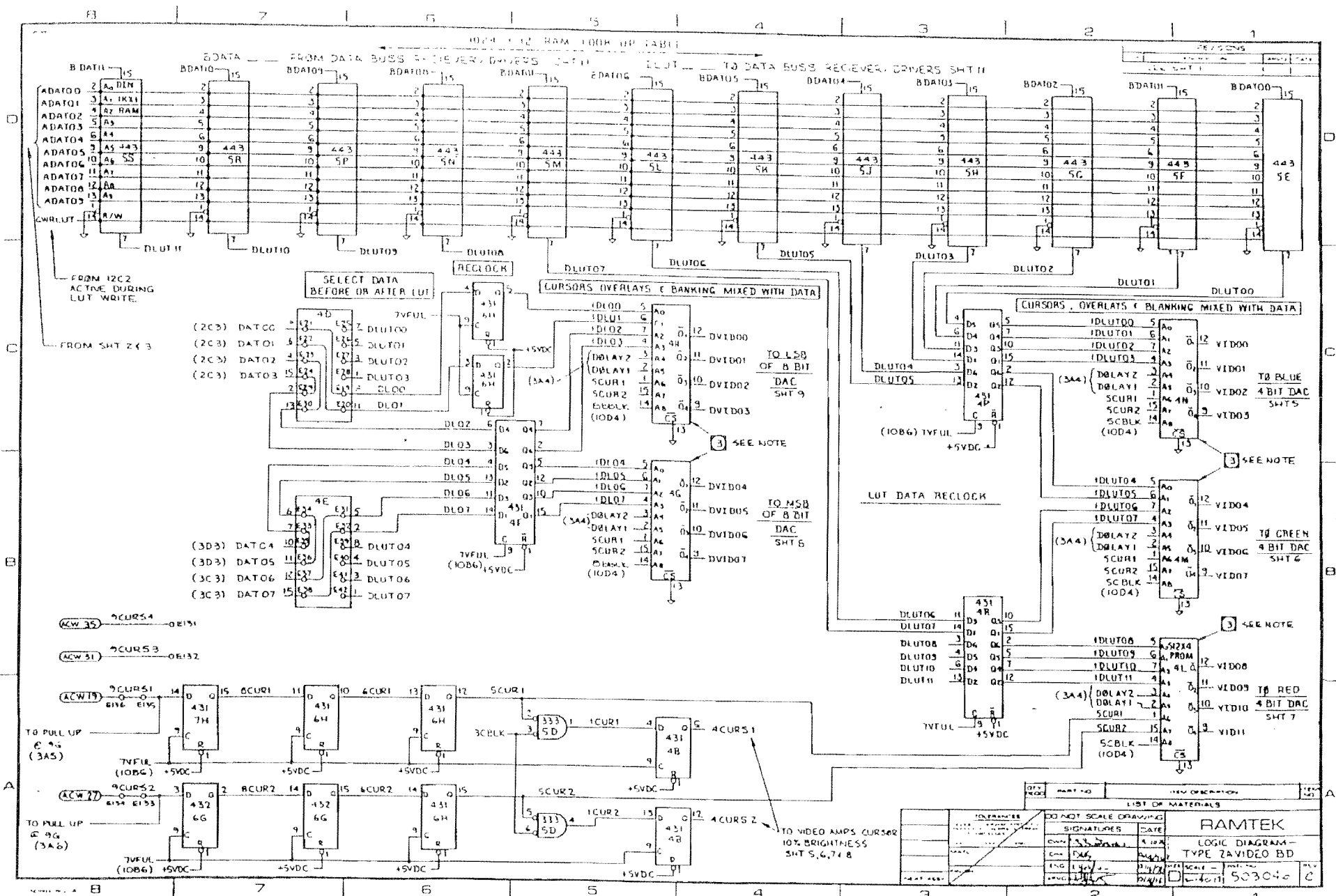
LIST OF MATERIALS

DESIGNED BY	DATE	DO NOT SCALE DRAWING
CHECKED BY	DATE	SIGNATURES
APPROVED BY	DATE	DATE

RAMTEK  
LOGIC DIAGRAM -  
TYPE 2A VIDEO BD

503046

8 7 6 5 4 3 2 1



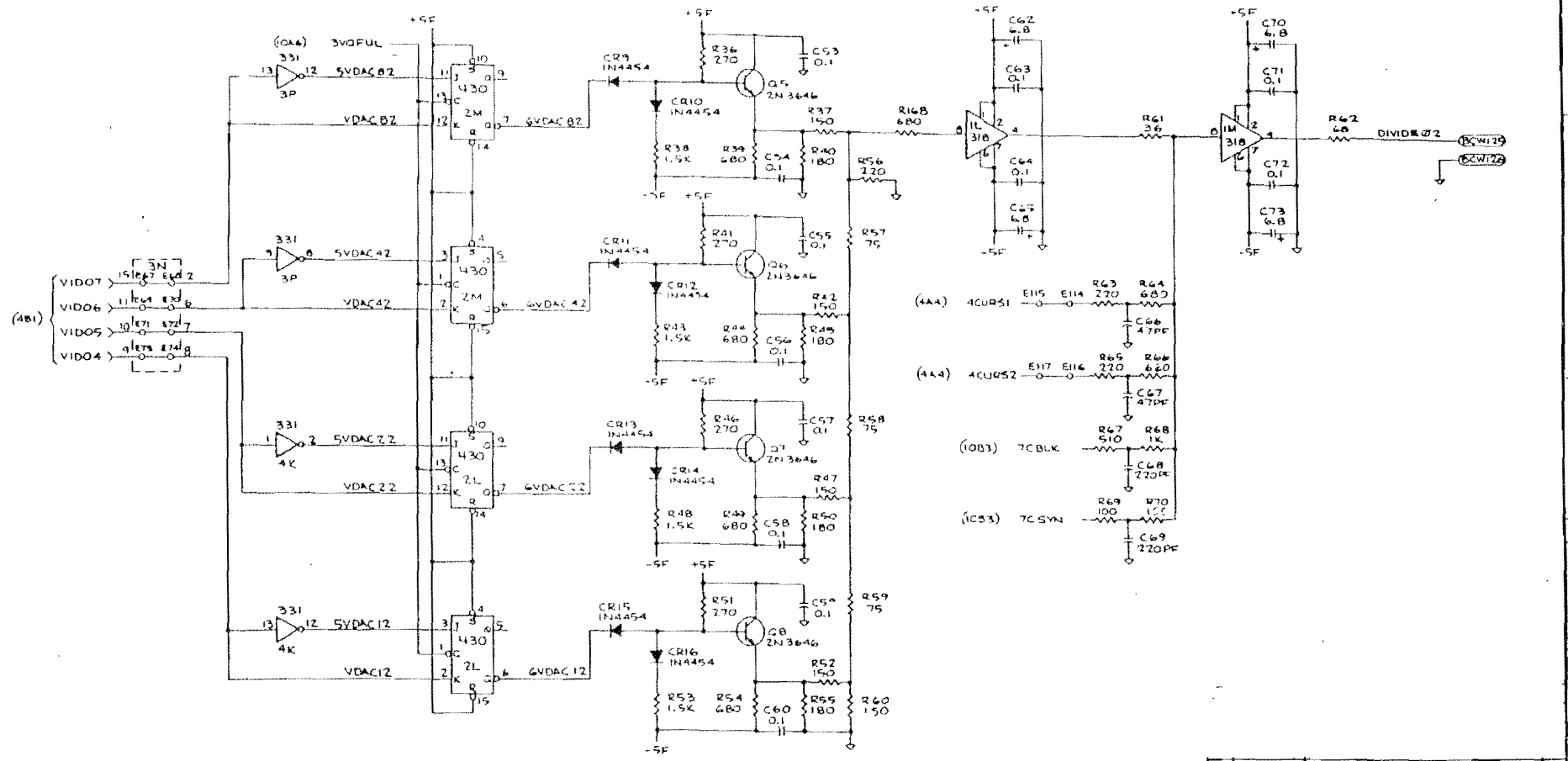
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2	74LS04	1	IC
3	74LS10	1	IC
4	74LS125	1	IC
5	74LS244	1	IC
6	74LS253	1	IC
7	74LS273	1	IC
8	74LS373	1	IC
9	74LS595	1	IC
10	74LS90	1	IC
11	74LS93	1	IC
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48	74LS131	1	IC
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283	74LS366	1	IC
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REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	SEE SHEET 1		

GREEN 4BIT DAC & VIDEO AMP

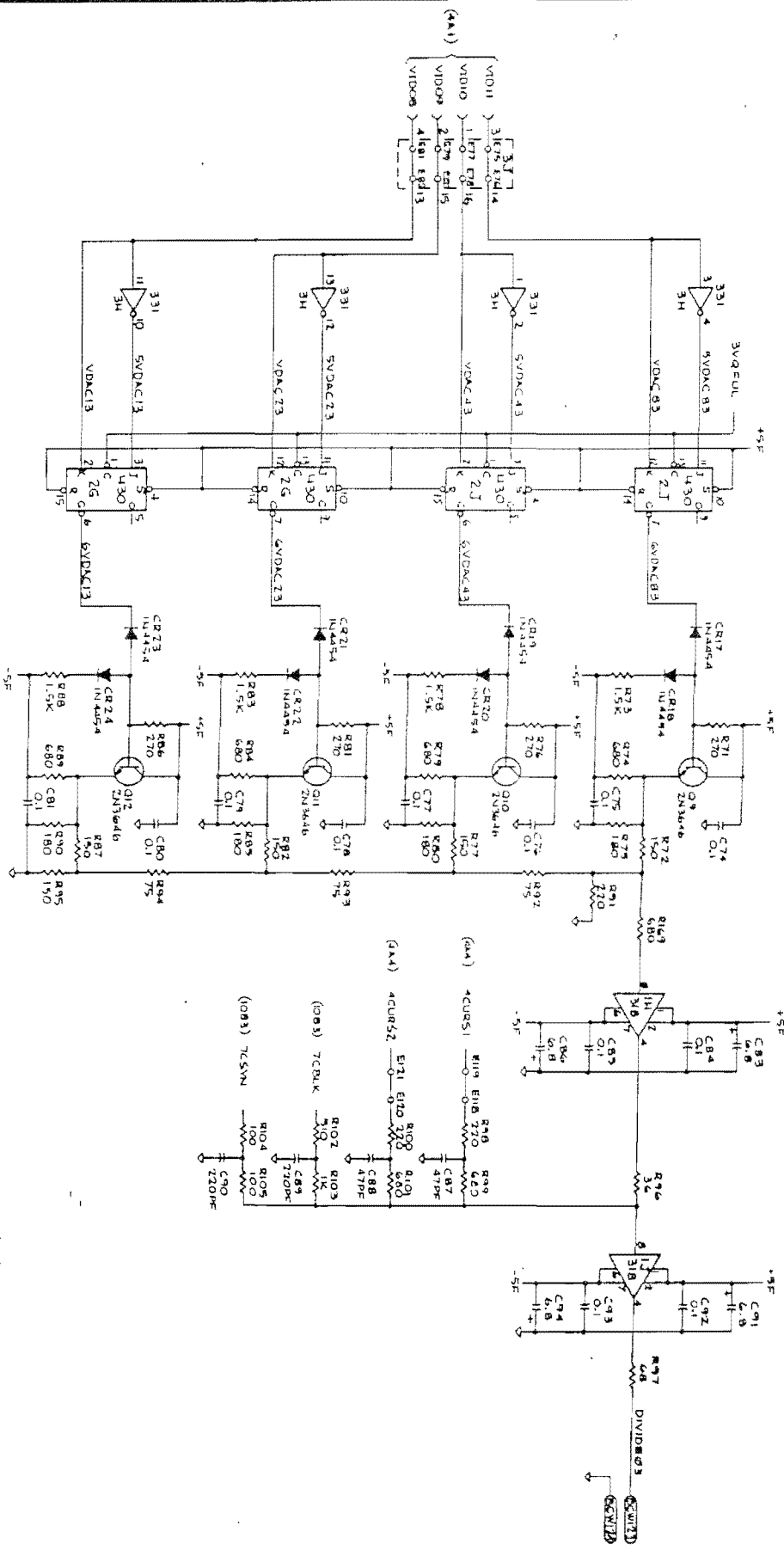


QTY	PART NO.	ITEM DESCRIPTION	ITEM NO.
LIST OF MATERIALS			
(4A4)	4CUG51	E115 E114	R63 220 R64 680
(4A4)	4CUG52	E117 E116	R65 220 R66 620
(10B3)	7CBLK		R67 510 R68 1K
(10C3)	7CSYN		R69 100 R70 150
			C66 47PF C67 47PF C68 220PF C69 220PF

TOLERANCES		DO NOT SCALE DRAWING	
RESISTORS	CAPACITORS	SIGNATURE	DATE
±1%	±5%	DWH	1/11/67
±2%	±10%	WHL	1/11/67
±5%	±20%		
±10%	±50%		
±20%	±100%		

RAMTEK  
 LOGIC DIAGRAM-  
 TYPE 2AVIDEO 80  
 SCALE - 100%  
 503046 C

RED 4BIT DAC & VIDEO AMP



LIST OF MATERIALS		PART DESCRIPTION	
QTY	PART NO.	QTY	PART DESCRIPTION
1	331	1	OP-AMP
1	318	1	OP-AMP
1	CR20	1	DIODE
1	CR21	1	DIODE
1	CR22	1	DIODE
1	CR23	1	DIODE
1	CR24	1	DIODE
1	CR25	1	DIODE
1	CR26	1	DIODE
1	CR27	1	DIODE
1	CR28	1	DIODE
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1	CR95	1	DIODE

TO ORDER: 503046

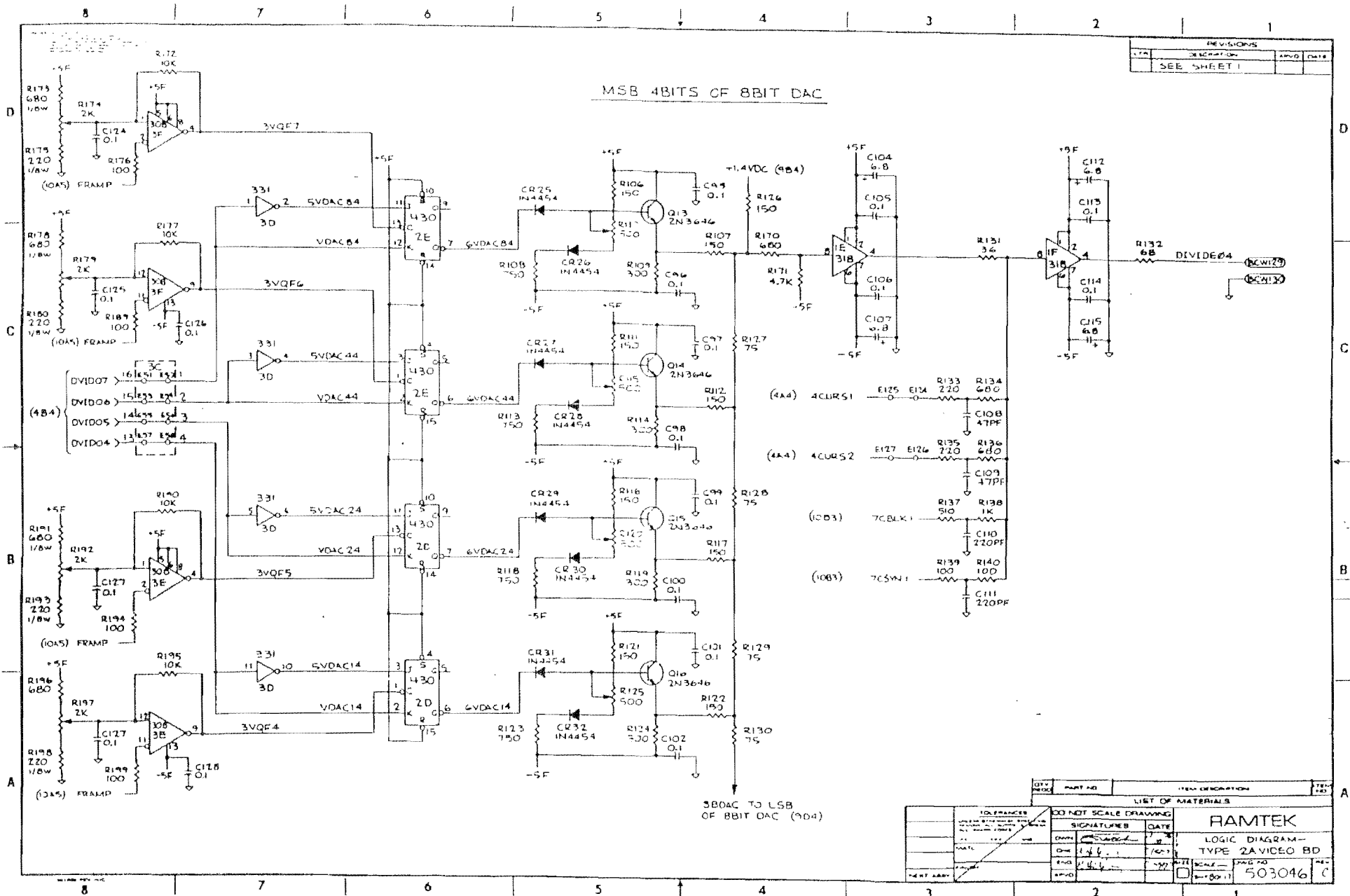
LOGIC DIAGRAM TYPE 2A VIDEO BD

DATE: 10/1/71

BY: [Signature]

REV: 1

303046



REVISIONS		
NO.	DESCRIPTION	DATE
1	SEE SHEET 1	

QTY	PART NO	ITEM DESCRIPTION	TEST NO

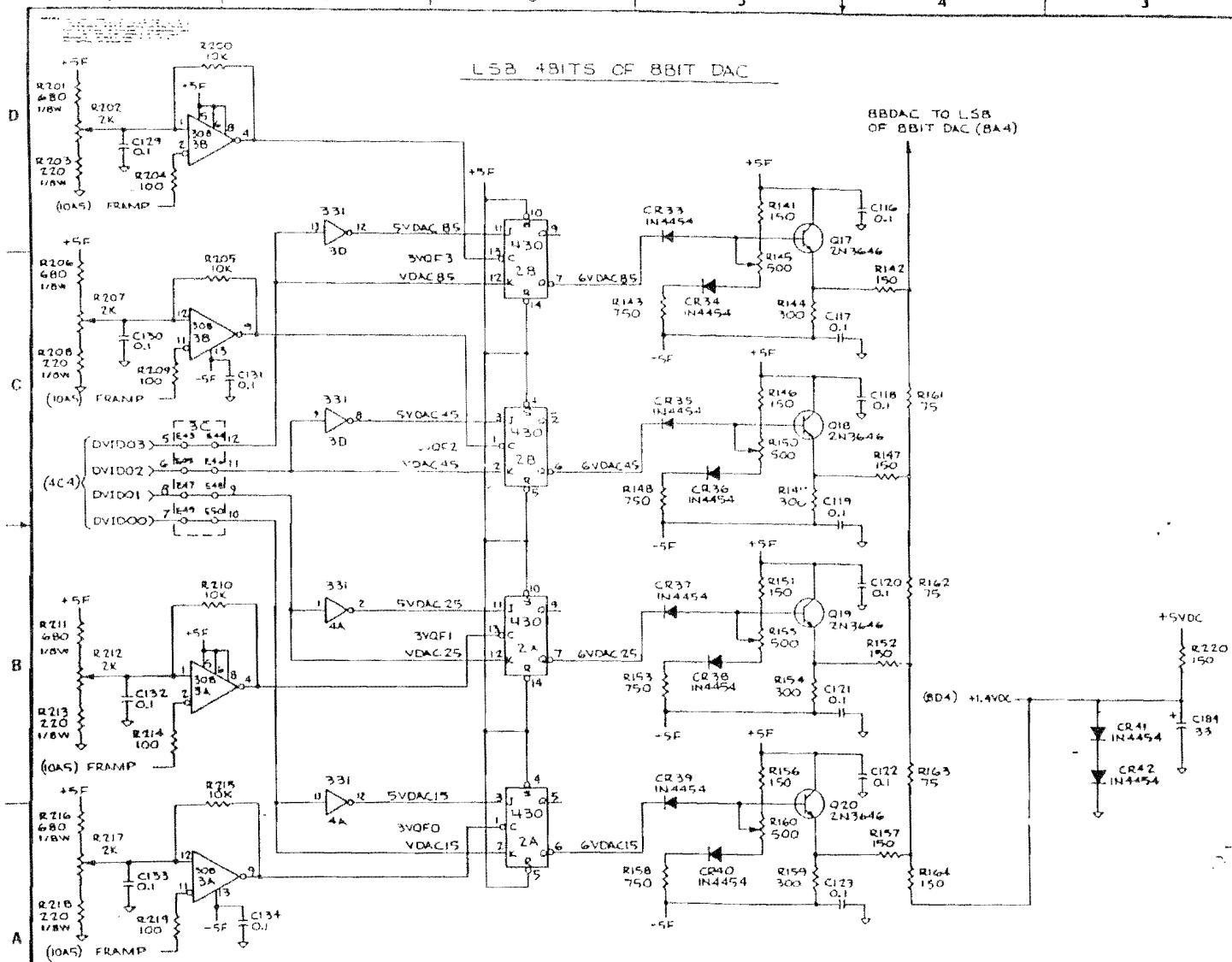
  

DO NOT SCALE DRAWING		LIST OF MATERIALS	
SIGNATURE	DATE	RAMTEK	
		LOGIC DIAGRAM -	
		TYPE 2AVIC0 BD	
		SCALE	DWG NO
		1:1	503046

REVISIONS			
CR	DESCRIPTION	APPRO	DATE
SEE SHEET 1			

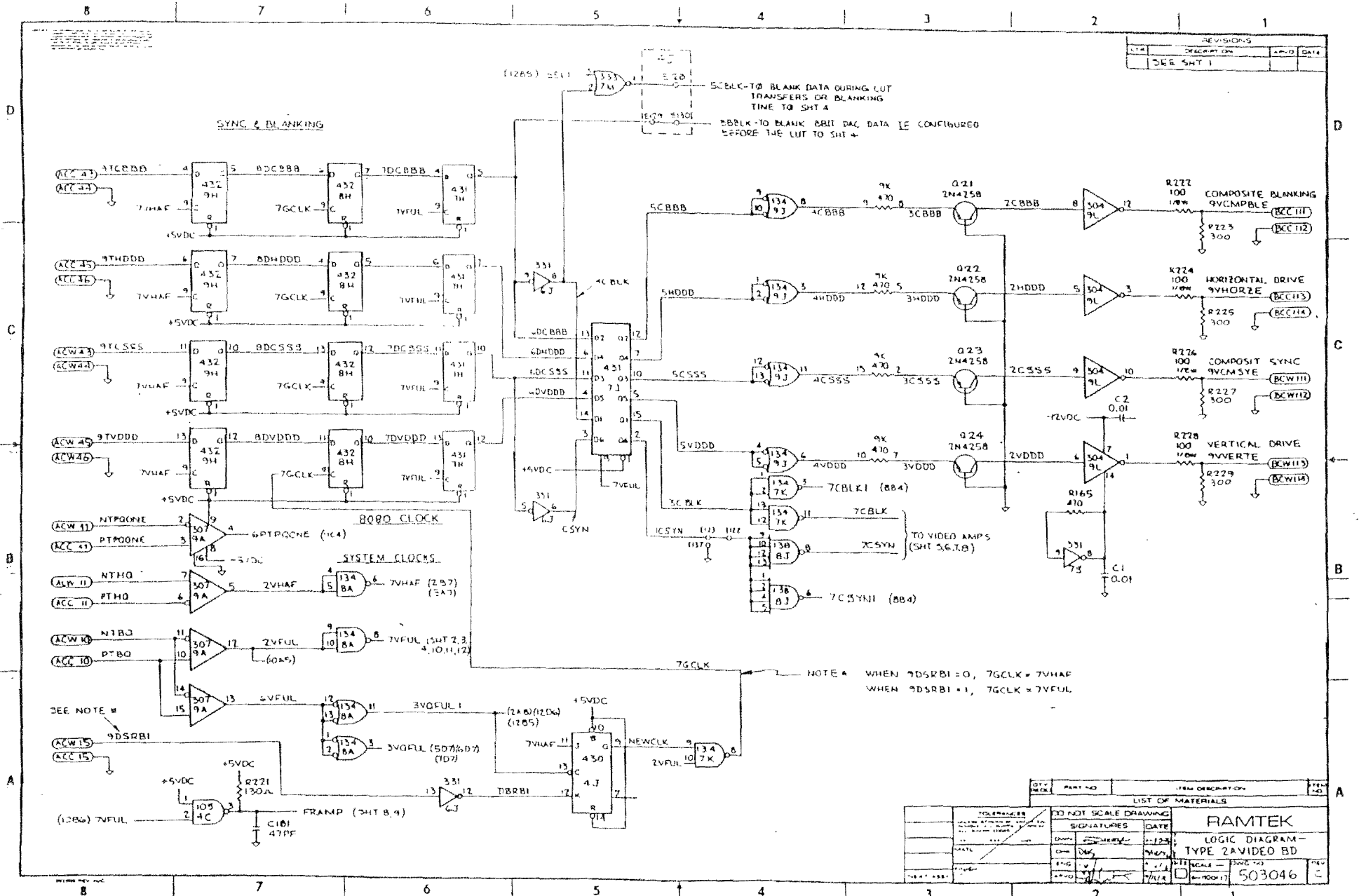
LSB 4BITS OF 8BIT DAC

8BDAC TO LSB OF 8BIT DAC (8A4)



QTY	PART NO	ITEM DESCRIPTION	REV
LIST OF MATERIALS			
TOLERANCES		DO NOT SCALE DRAWING	
RES	±1%	SIGNATURE	DATE
CAP	±5%	CHK	3/2/72
WIRE	±0.005"	ENG	1/25/72
MEAS	±0.001"	APPD	
RAMTEK		LOGIC DIAGRAM--	
TYPE 2A VIDEO DD		PART NO	
		503046	
		REV	
		0	

REVISIONS		
NO.	DESCRIPTION	DATE
1	SEE SHT 1	



REV.	PART NO.	ITEM DESCRIPTION	QTY.

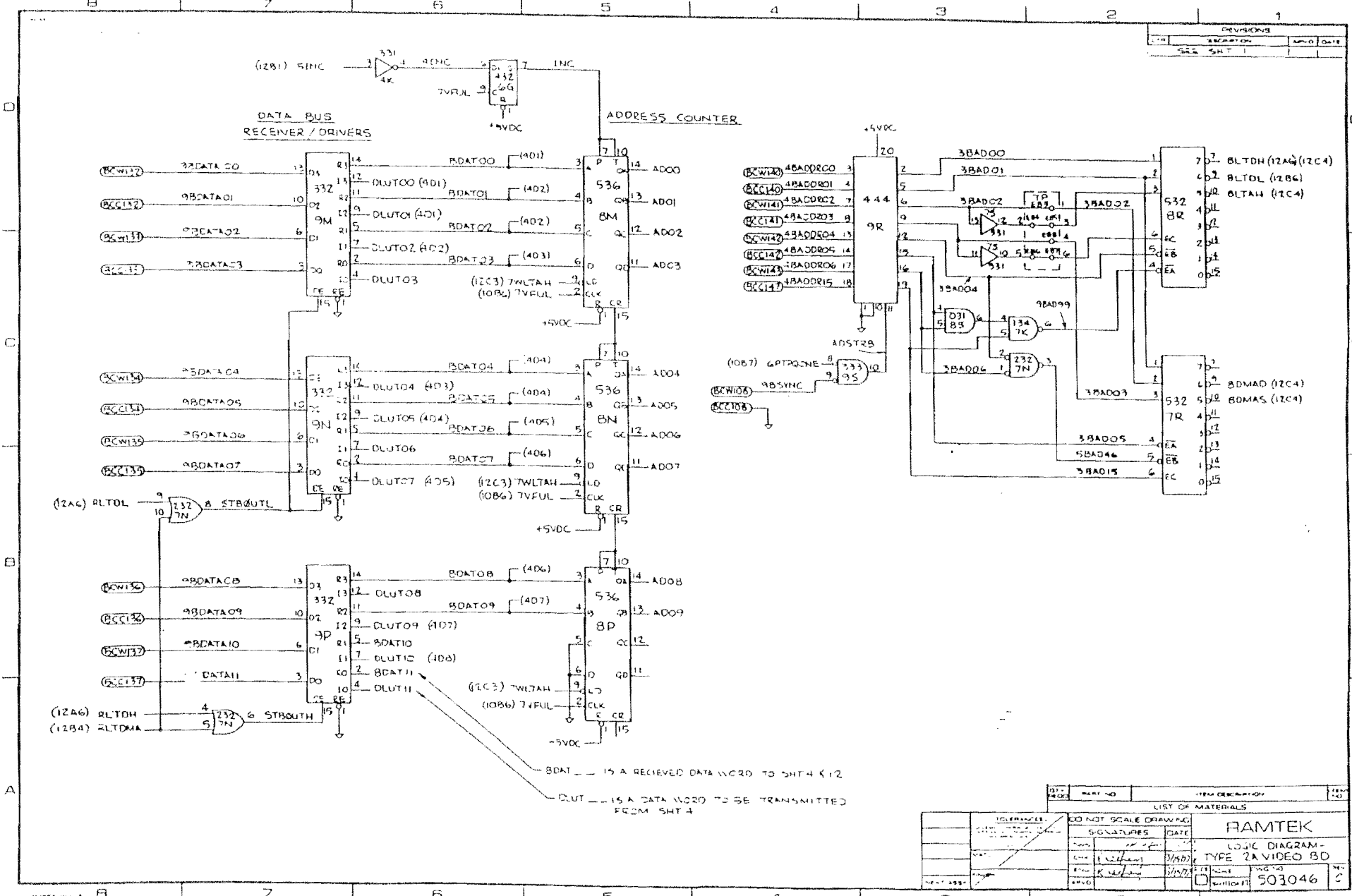
  

TOLERANCES		DO NOT SCALE DRAWING	
UNLESS SPECIFIED	UNLESS SPECIFIED	SIGNATURES	DATE
RESISTORS	±1%	DESIGNED BY	11-15-78
CAPACITORS	±5%	CHECKED BY	
MEASUREMENTS	±0.1%	DATE	
ANGLE	±0.1°	SCALE	3000:1
DRILLING	±0.005"	REV.	1
WELDING	±0.005"	APPROVED BY	
FINISH	±0.005"	DATE	

LIST OF MATERIALS	
RAMTEK	LOGIC DIAGRAM -
	TYPE 2A VIDEO BD
	SCALE - 3000:1
	REV. 1
	REV. NO. 503046

REVISIONS		
NO.	DESCRIPTION	APP'D DATE
1	322 SMT 1	



REV.	PART NO.	ITEM DESCRIPTION	REV.
		LIST OF MATERIALS	

DESIGNED BY	DO NOT SCALE DRAWING	SIGNATURES	DATE

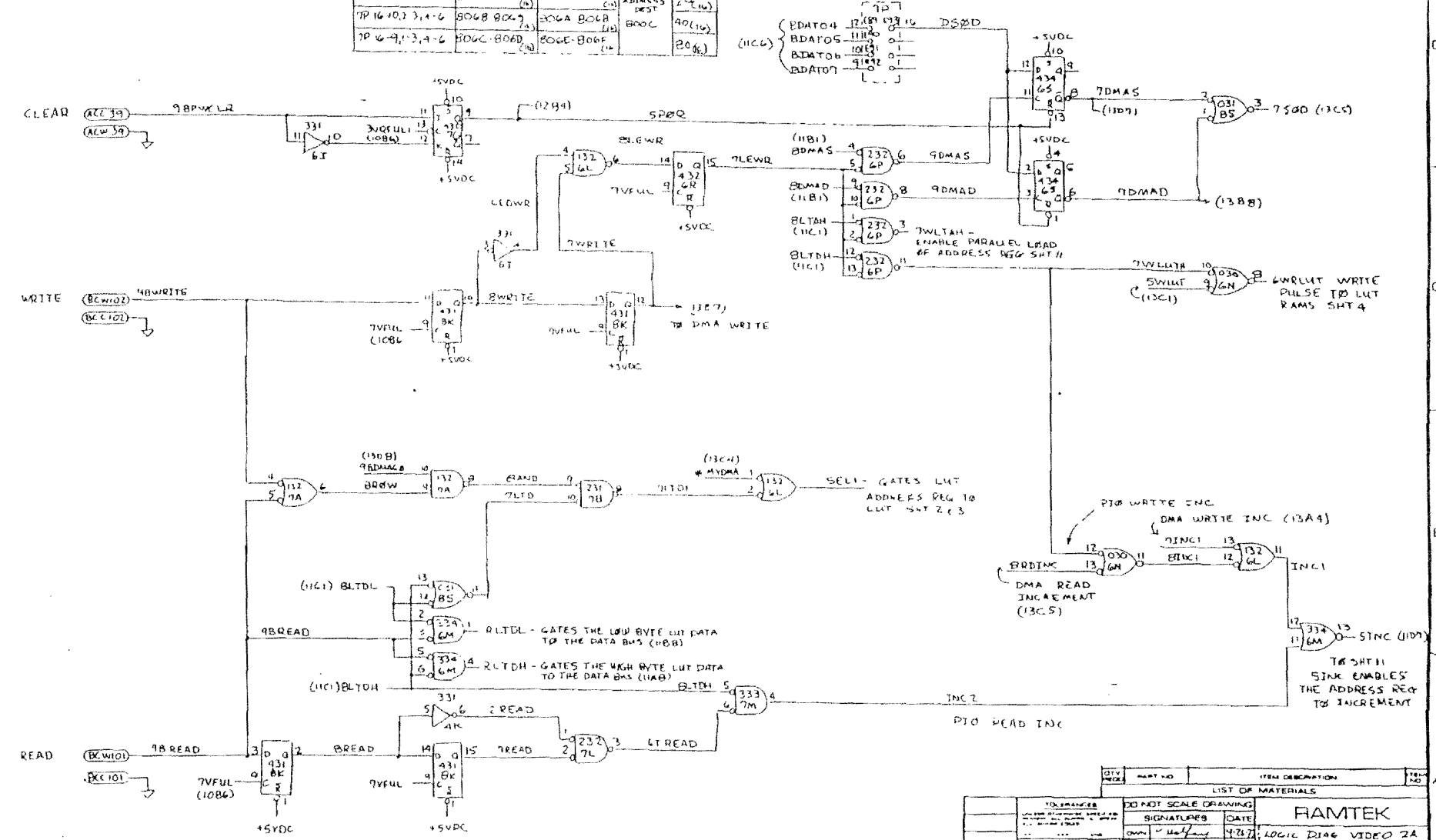
  

RAMTEK	
LOGIC DIAGRAM - TYPE 2A VIDEO 80	
REV. 1	503046



NUMBER	CONFIGURATION	LUT ADDRESS	LUT DATA	SD ADDRESS	DATA
1P 16-11, 2, 3, 5-6	8060-8067 (16)	8062-8067	ADDRESS SOMA	16	16
2P 16-11, 1, 3, 5-6	8064-8067 (4)	8064-8067	SDA ADDRESS DEST	20	16
3P 16-10, 2, 3, 4-6	8068-8067 (8)	8068-8067	800C	40	16
4P 16-9, 1, 2, 4-6	806C-806D (2)	806E-806F		80	16

HAND SHAKE CONTROL LOGIC FOR PIO



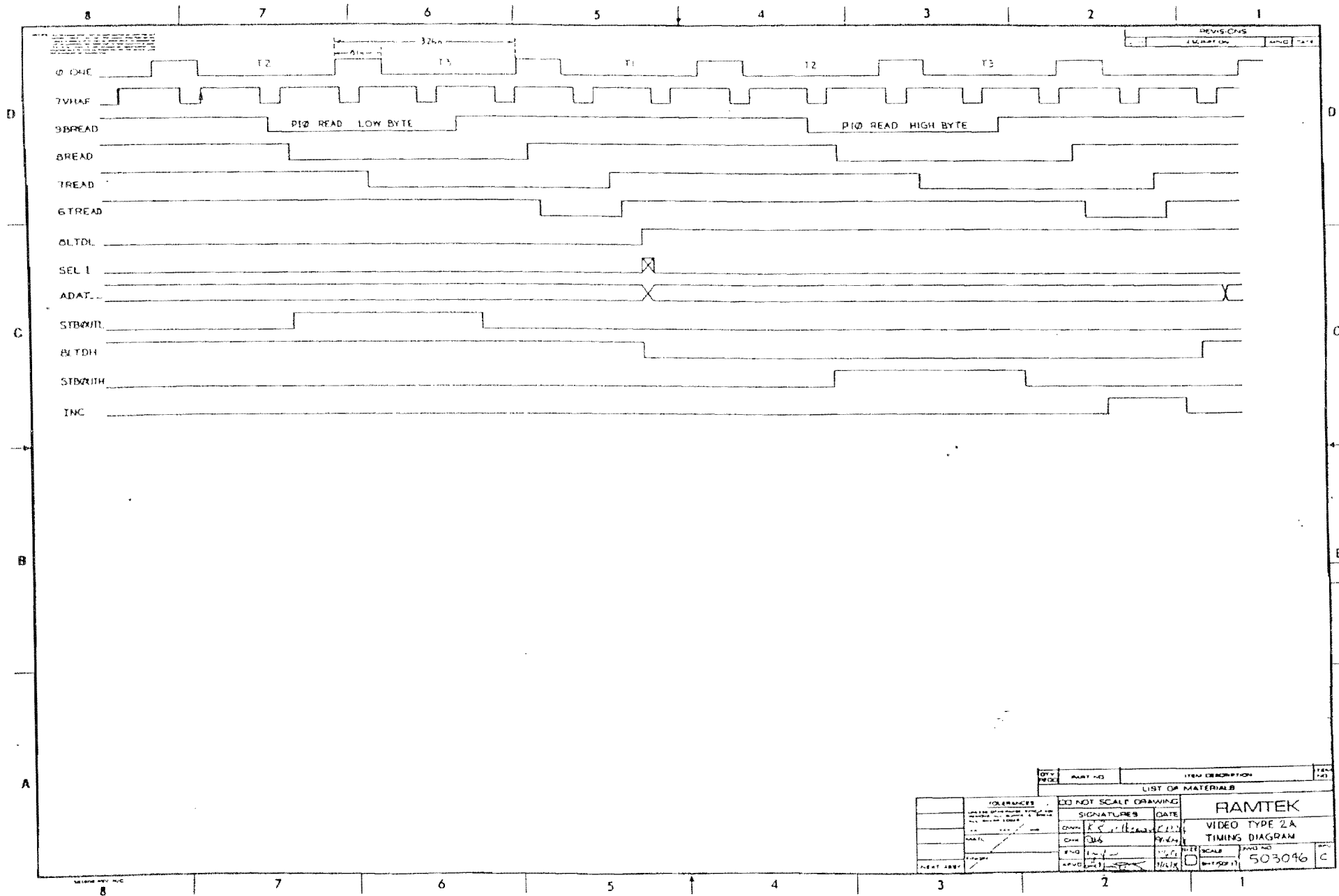
REV	REVISIONS	DATE
1	INITIAL	

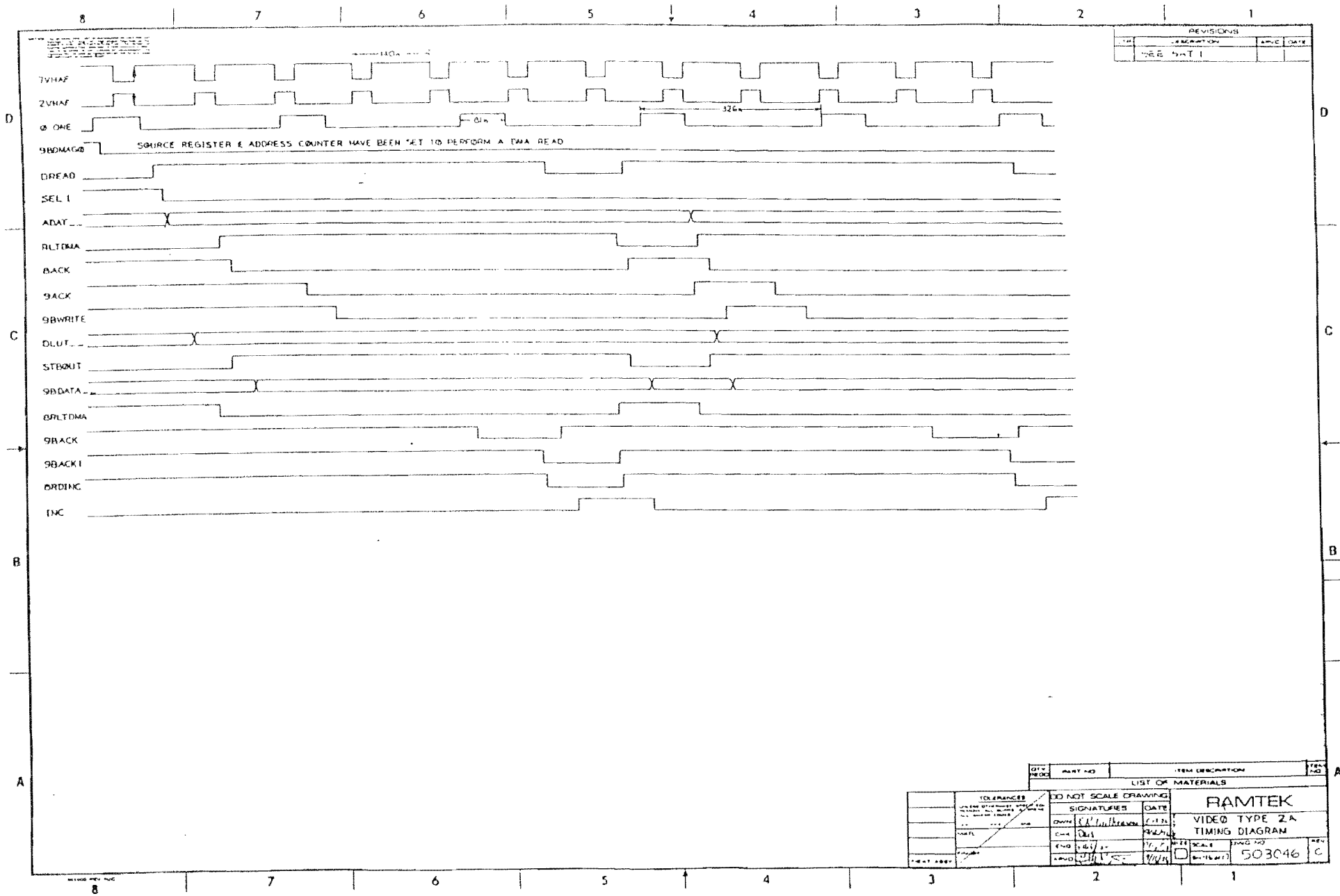
QTY		PART NO		ITEM DESCRIPTION		REV
LIST OF MATERIALS						

RAMTEK  
 LOGIC DIAG VIDEO 2A  
 PIO RC/D/WR/ITE  
 SCALE 5030x6









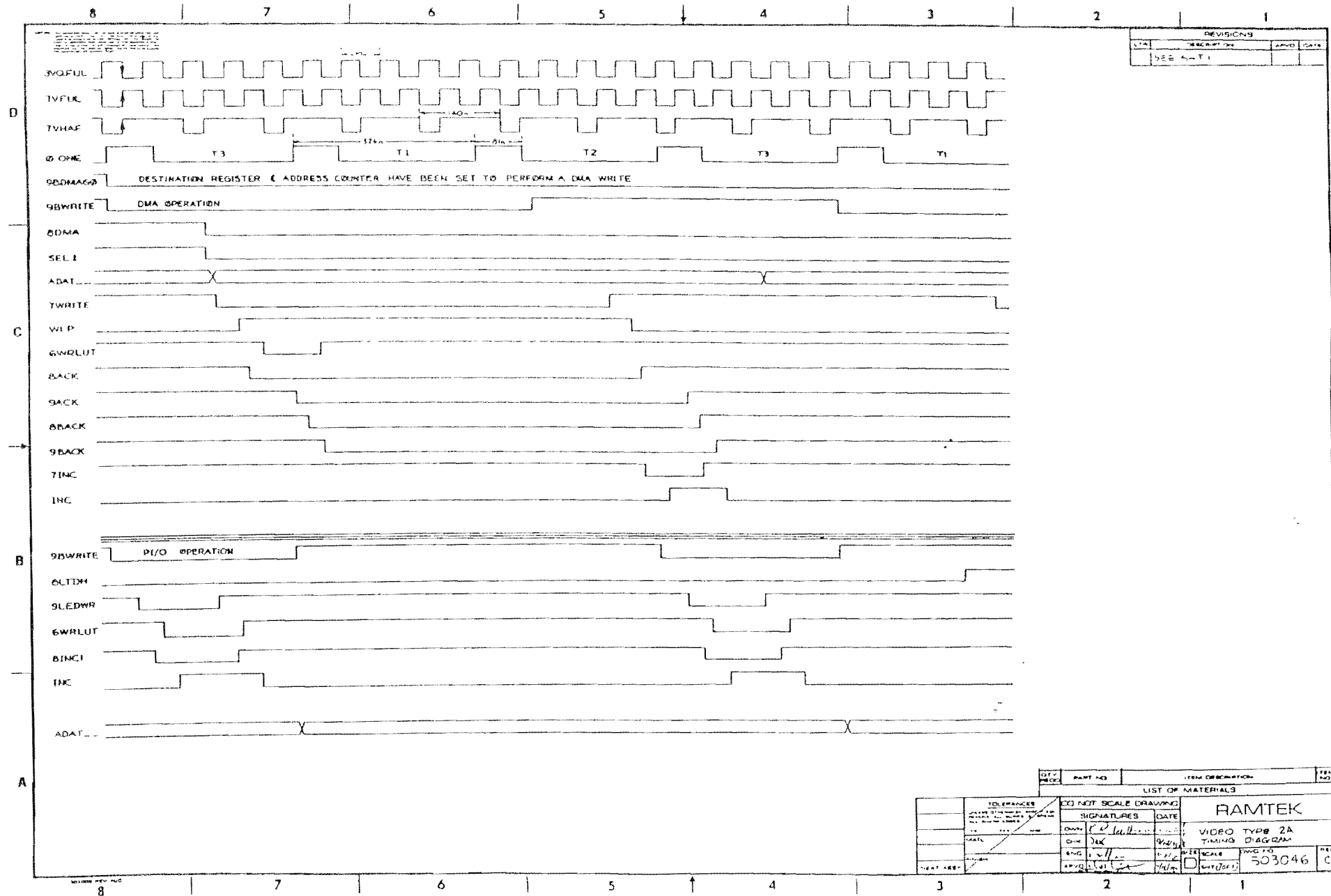
REVISIONS		
NO.	DESCRIPTION	DATE
1	SEE PART 1	

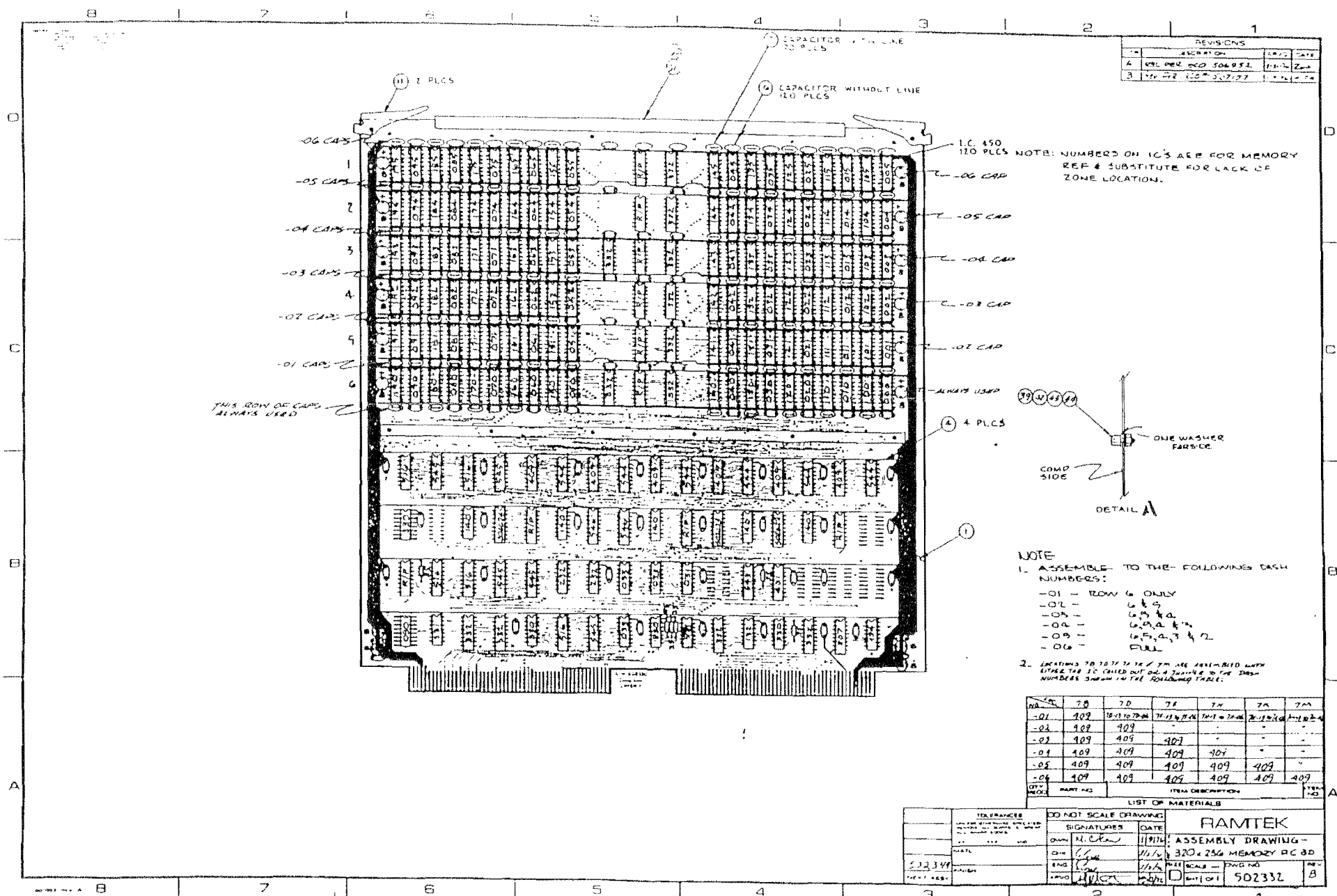
SOURCE REGISTER & ADDRESS COUNTER HAVE BEEN SET TO PERFORM A DMA READ

QTY	PART NO	ITEM DESCRIPTION	REV

LIST OF MATERIALS			
<b>RAMTEK</b>			
VIDEO TYPE 2A TIMING DIAGRAM			
SCALE	503046	REV	C

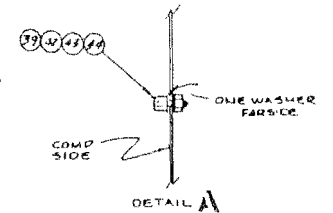
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
...	...	OWN	...
...	...	CHK	...
...	...	ENG	...
...	...	APP	...





REVISIONS			
NO.	DESCRIPTION	REVISED	DATE
4	BY L. OVER RCD 504982	11-17-72	Z
3	BY M. R. 602 507797	11-17-72	Z

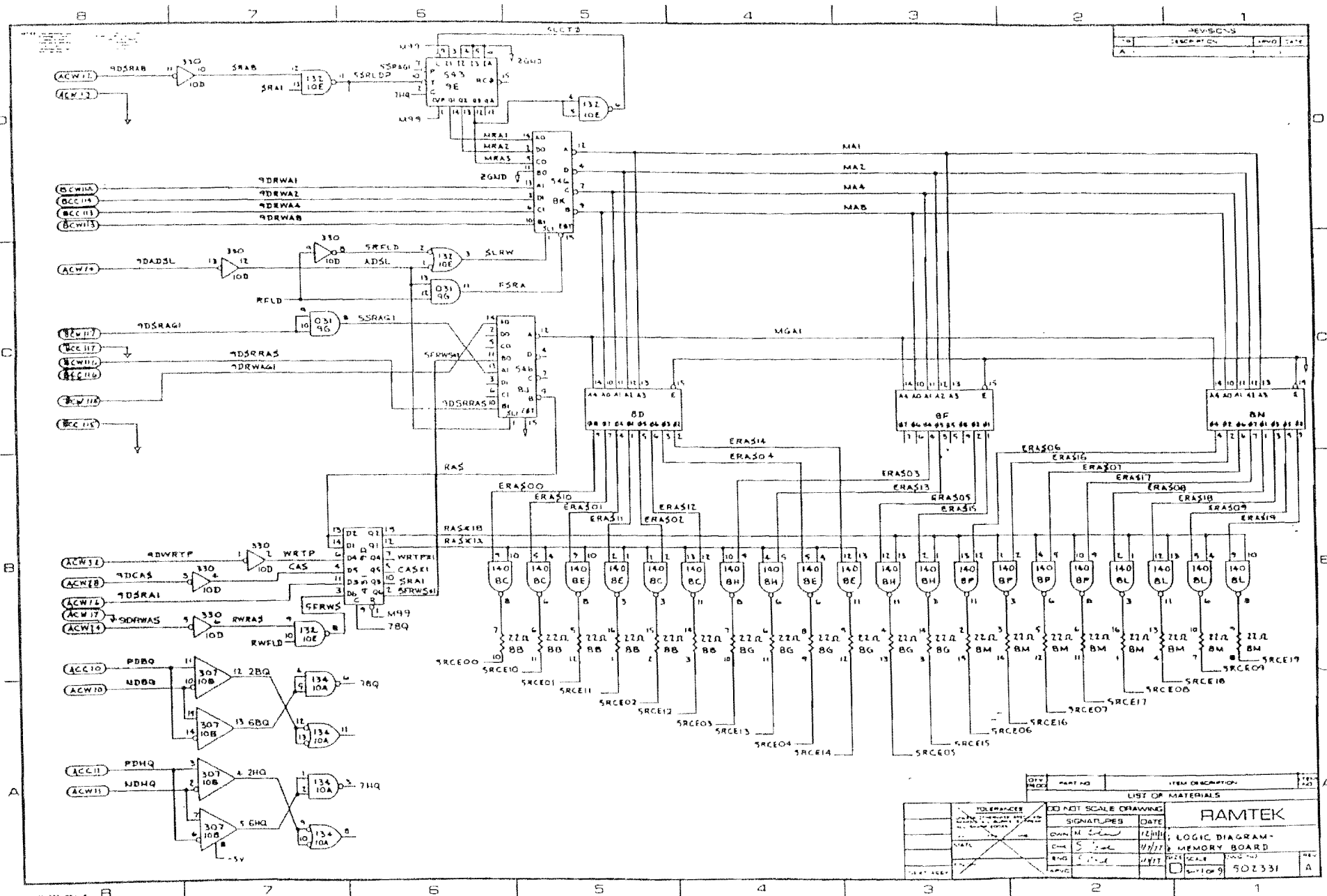
NOTE: NUMBERS ON IC'S ARE FOR MEMORY REF & SUBSTITUTE FOR LACK OF ZONE LOCATION.



- NOTE
- ASSEMBLE TO THE FOLLOWING PART NUMBERS:
    - 01 - ROW 6 ONLY
    - 02 - 6 & 9
    - 03 - 6, 9 & 4
    - 04 - 6, 9, 4 & 2
    - 05 - 6, 9, 4, 2 & 2
    - 06 - FULL
  - LOCATIONS 70 707 71 72 & 73 ARE ASSEMBLED WITH EITHER THE IC CALLED OUT OR A SUBSTITUTE TO THE PART NUMBER SHOWN IN THE FOLLOWING TABLE:

REV	70	70	71	72	73	73
-01	402	402	402	402	402	402
-02	402	402	-	-	-	-
-03	402	402	402	-	-	-
-04	402	402	402	402	-	-
-05	402	402	402	402	402	-
-06	402	402	402	402	402	402

TOLERANCES		DO NOT SCALE DRAWING		LIST OF MATERIALS	
UNLESS OTHERWISE SPECIFIED	ALL DIMENSIONS ARE TO BE TAKEN FROM THE CENTER OF THE PART	SIGNATURES	DATE	FRAMTEK	
DATE	BY	OWN	11/17/72	ASSEMBLY DRAWING -	
522332	11/17/72	CHK	11/17/72	320 x 256 MEMORY PC 80	
REV	BY	ENG	11/17/72	PART NO. - 502332	
REV	BY	APP	11/17/72	REV. - 8	



REVISIONS		
NO	DESCRIPTION	DATE
1		

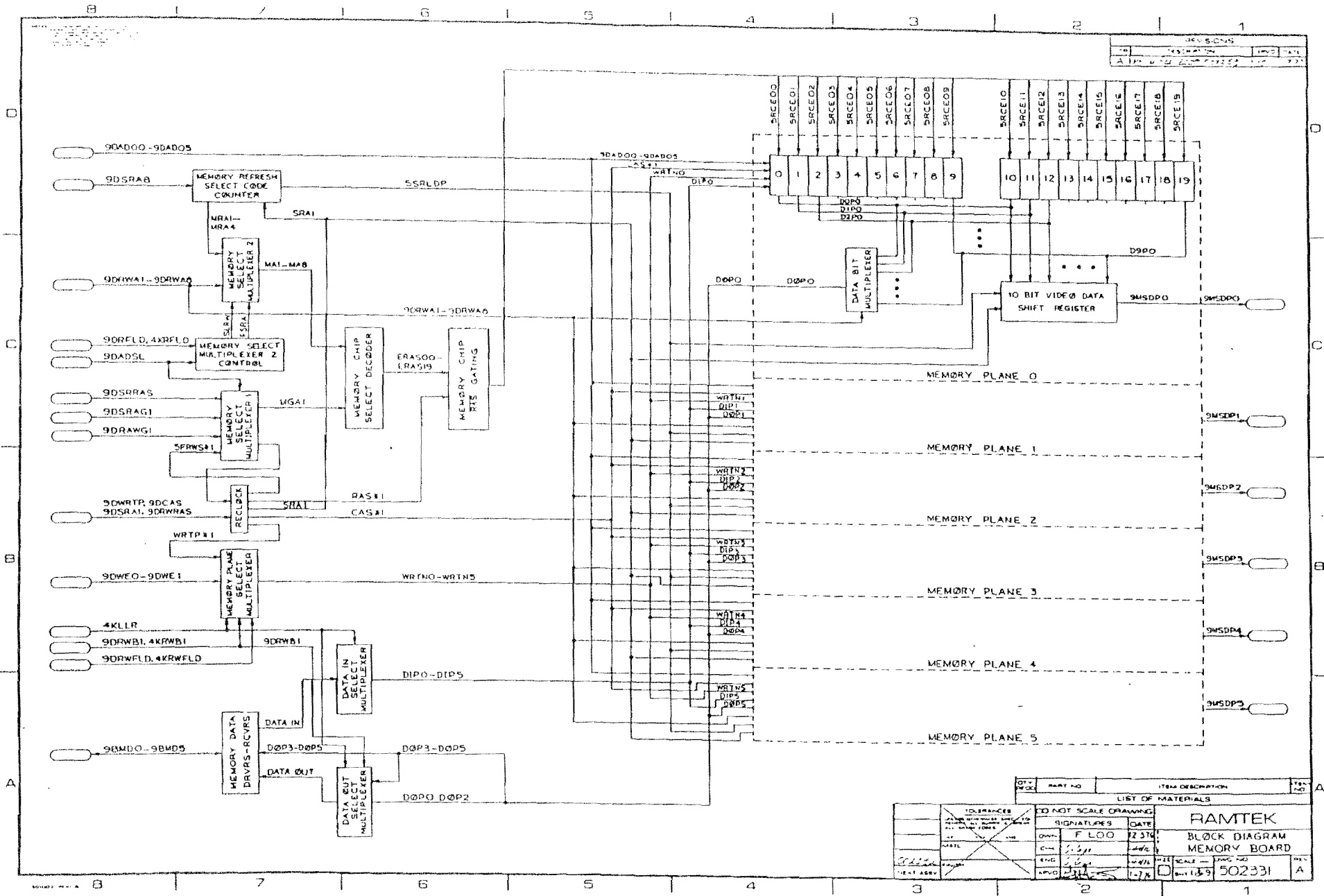
QTY	PART NO	ITEM DESCRIPTION
		LIST OF MATERIALS

TOLERANCES	DO NOT SCALE DRAWING
SIGNATURES	DATE
DATE	DATE
ENG	DATE
DATE	DATE

RAMTEK  
 LOGIC DIAGRAM -  
 MEMORY BOARD  
 502331



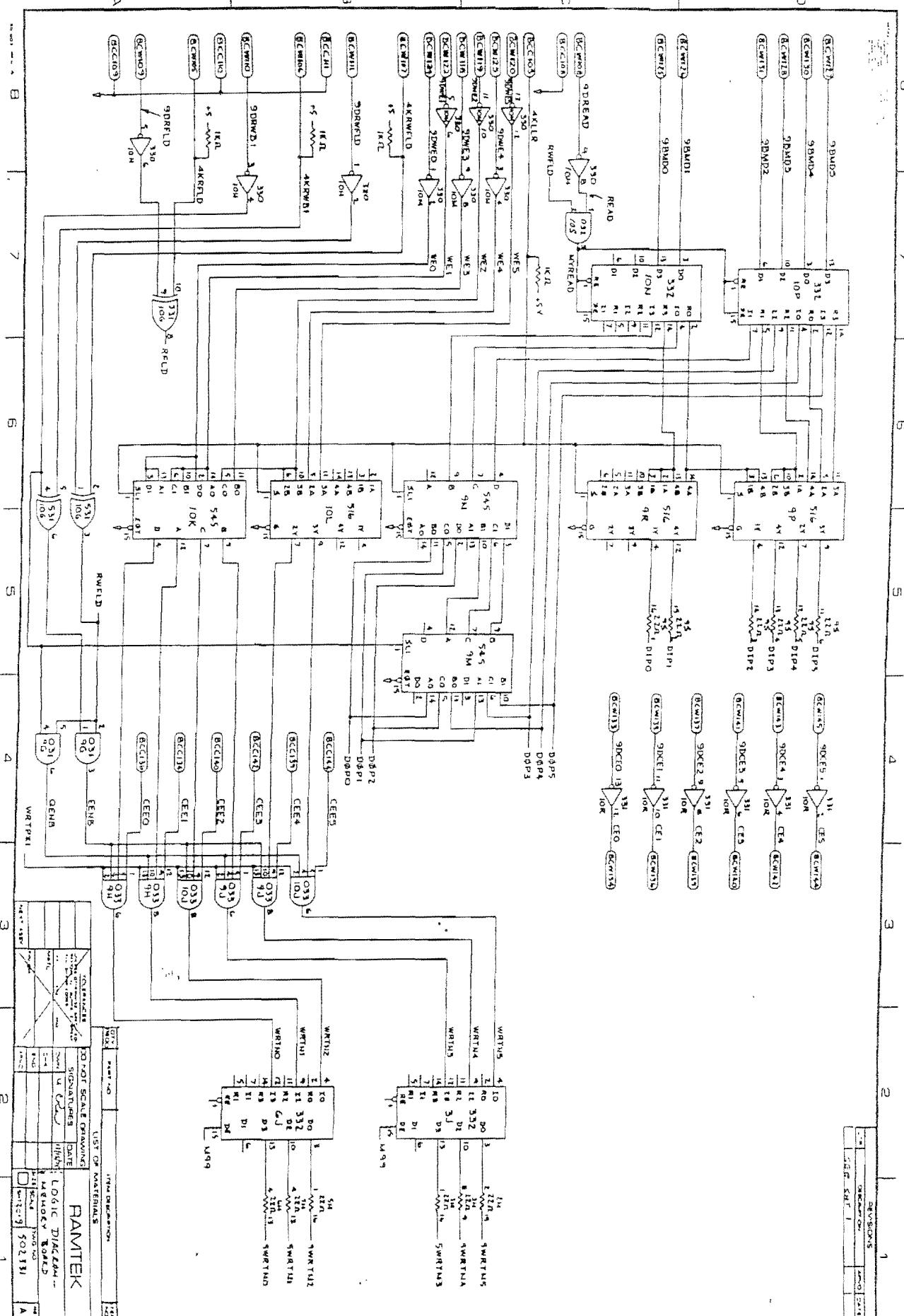


QTY	PART NO	ITEM DESCRIPTION	REV
LIST OF MATERIALS			
RAMTEK			
BLOCK DIAGRAM			
MEMORY BOARD			
SIGNATURES		DATE	
DESIGNED BY	CHKD BY	22 3/74	
ENG	APPD	1-74	
SCALE		1:1	
PART NO		502331	

TOLERANCES  
 DIMENSIONS  
 FINISHES  
 MATERIALS  
 WEIGHTS  
 PARTS LIST

DID NOT SCALE DRAWING  
 SIGNATURES  
 DATE  
 22 3/74

SCALE  
 1:1  
 PART NO  
 502331

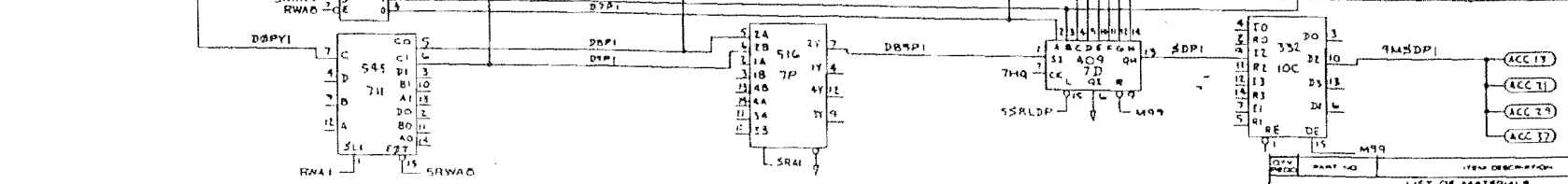
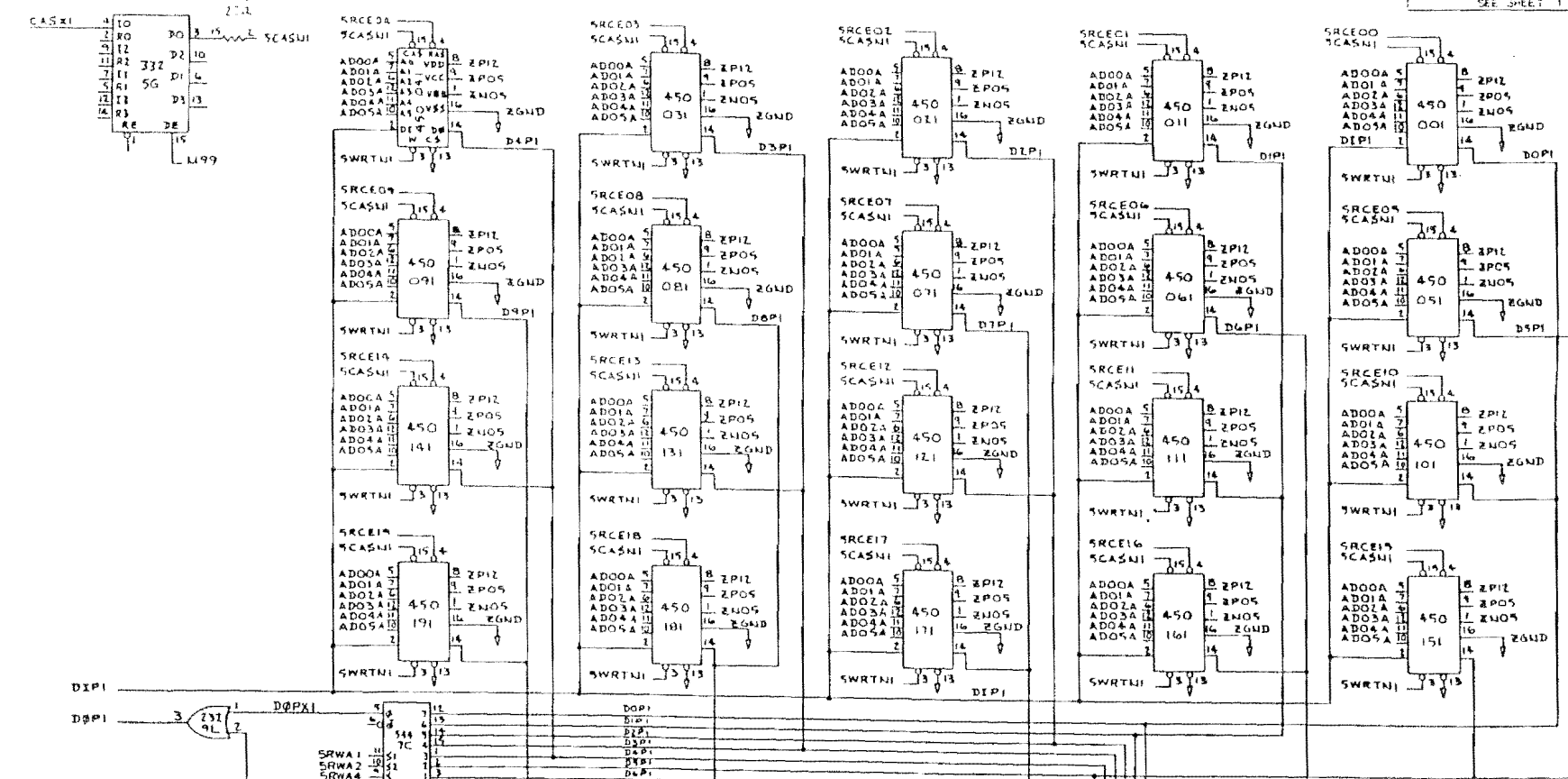


1 2 3 4 5 6 7 8

A B C D



REVISIONS		
NO.	DESCRIPTION	DATE
1	OFF SHEET 1	



LIST OF MATERIALS			
ITEM NO.	ITEM DESCRIPTION	QTY	UNIT
ACC 17			
ACC 18			
ACC 19			
ACC 20			

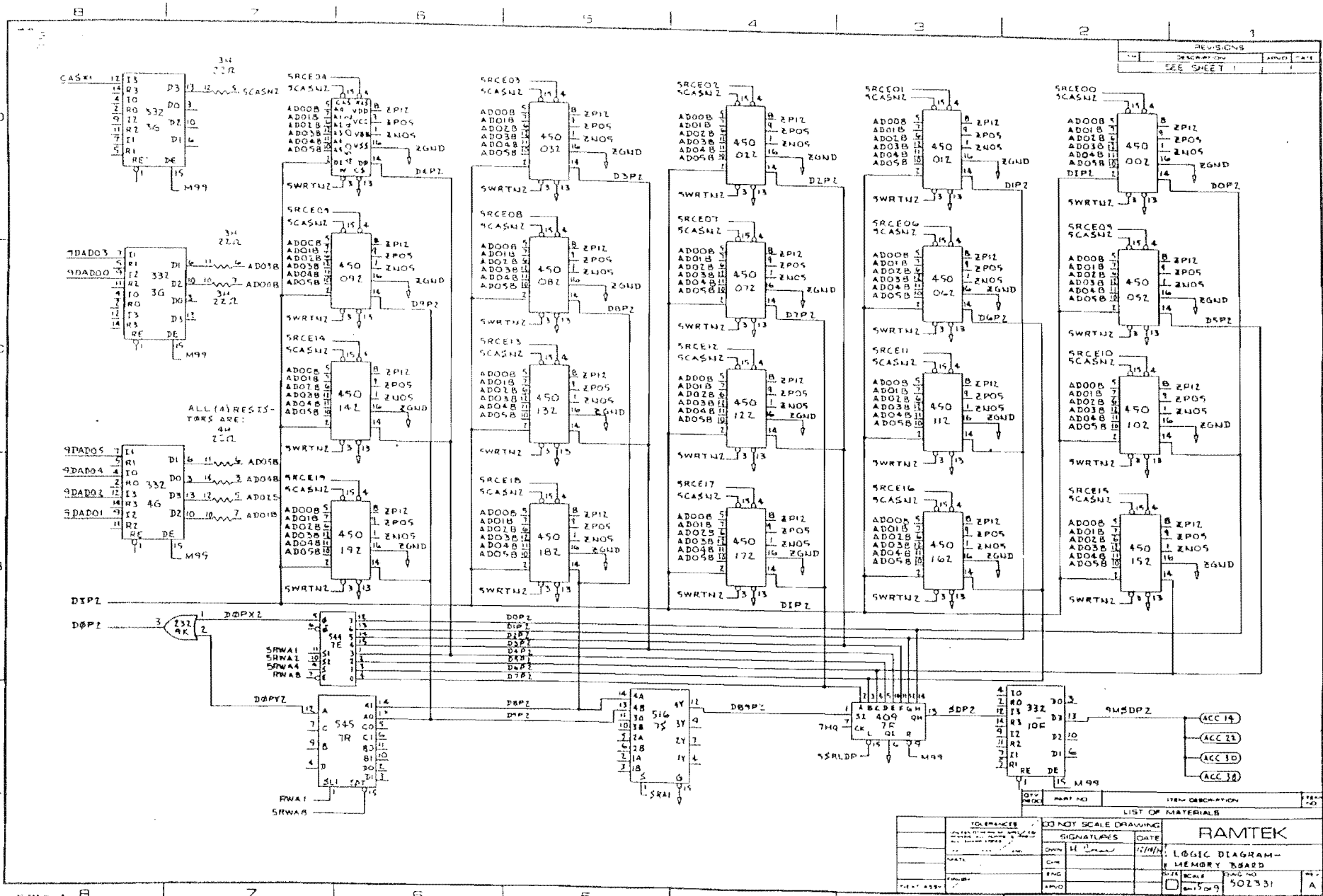
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	ALL DIMENSIONS ARE IN INCHES	SIGNATURES	DATE
			11/19/73

RAMTEK

LOGIC DIAGRAM - MEMORY BOARD

901331

REV. A

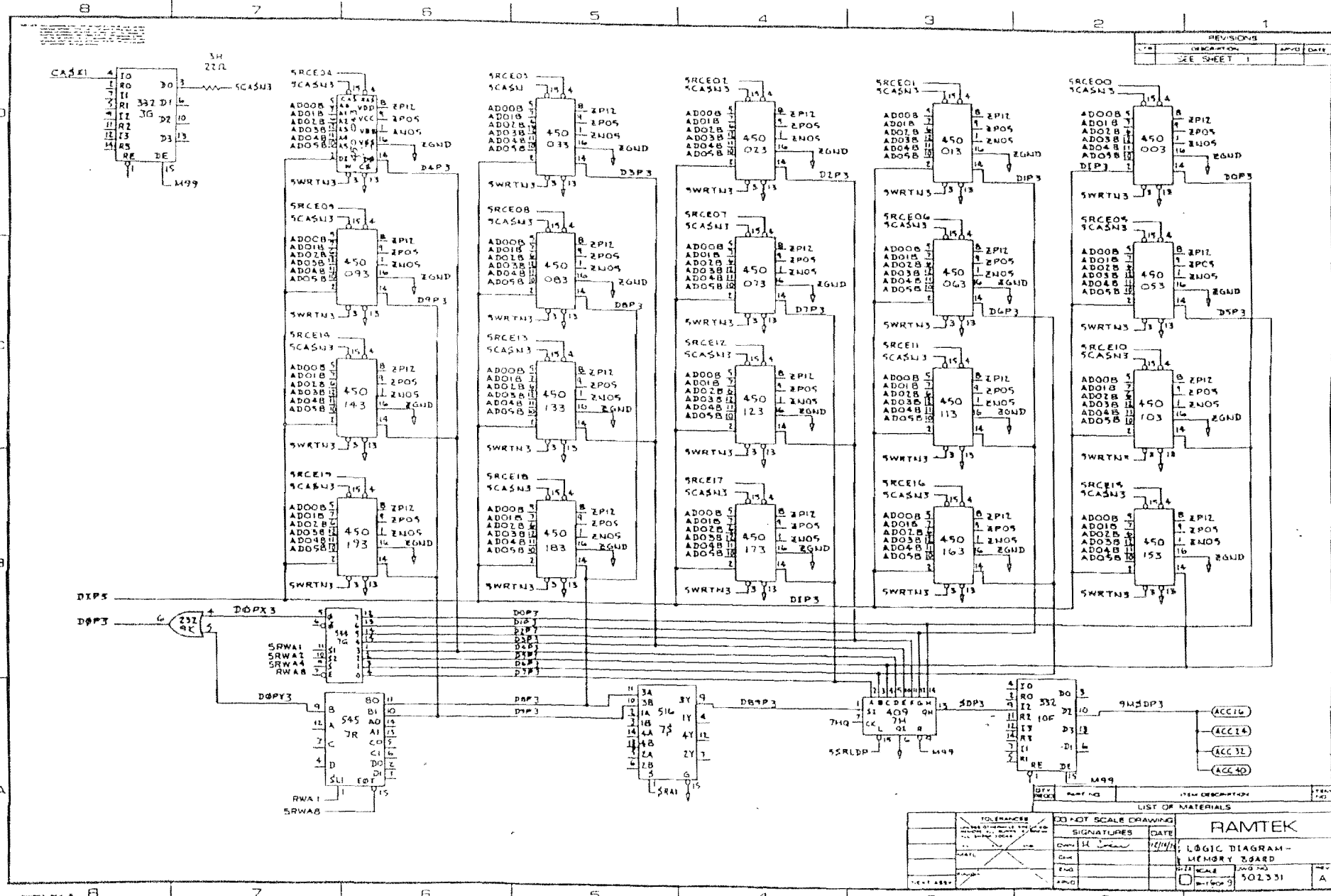


REVISIONS		APPD	DATE
1	REVISION		
SEE SHEET 1			

ALL (A) RESISTORS ARE:  
34 22K

QUANTITY		PART NO		ITEM DESCRIPTION		REV
LIST OF MATERIALS						
RAMTEK						
LOGIC DIAGRAM - MEMORY BOARD						
DATE: 11/11/71						
SCALE: 502531						

REVISIONS		
NO.	DESCRIPTION	APPROVED DATE
1	SEE SHEET 1	



LIST OF MATERIALS		
ITEM NO.	ITEM DESCRIPTION	QTY
1	...	...
2	...	...
3	...	...
4	...	...
5	...	...
6	...	...
7	...	...
8	...	...
9	...	...
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93	...	...
94	...	...
95	...	...
96	...	...
97	...	...
98	...	...
99	...	...
100	...	...

DO NOT SCALE DRAWING		SIGNATURES		DATE	
DESIGNED BY	CHKD BY	DATE	DATE	DATE	DATE
DRN	CHK	10/11/75			
ENG	CHK				
APP	CHK				
TEST	CHK				
REV	CHK				
DATE	CHK				

**RAMTEK**  
 LOGIC DIAGRAM -  
 LEADER 388B  
 PART NO. 302331  
 REV. A

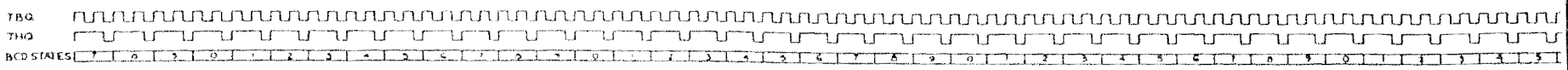




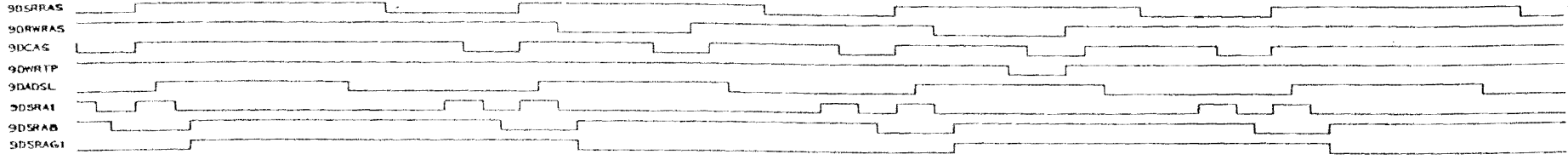


REV	DESCRIPTION	BY	DATE
1	SEE SHEET 1		

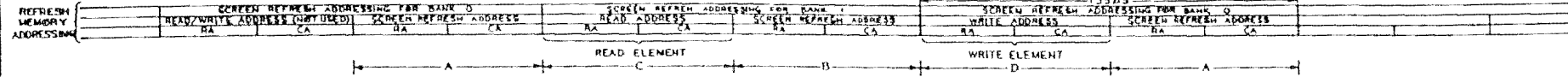
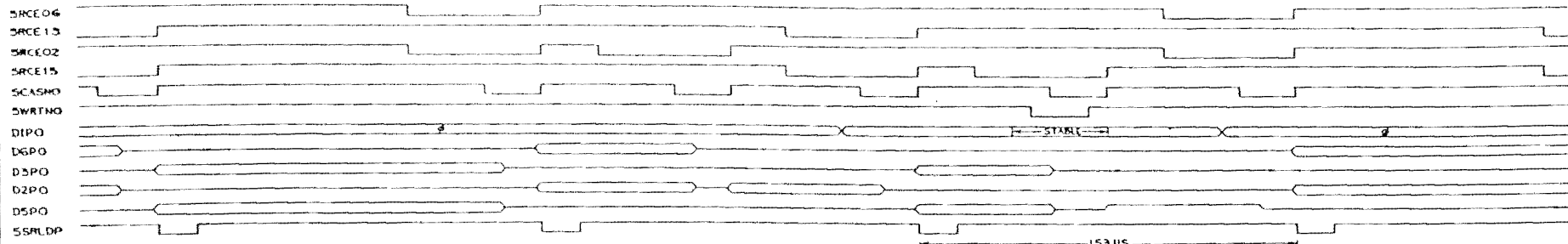
MEMORY TIMING



MEMORY TIMING SIGNALS AT THE CONNECTOR



MEMORY TIMING SIGNALS APPLIED TO REFRESH MEMORY



- NOTES: 1. TIMING SHOWN FOR PLANE 0 ONLY.
2. FOUR PAIRS OF SIGNALS ARE SHOWN:
- A. 5RCE06-D6PO
  - B. 5RCE13-D3PO
  - C. 5RCE02-D2PO
  - D. 5RCE15-D5PO
- EACH PAIR WERE SELECTED TO DEMONSTRATE THE FOLLOWING:
- A. SCREEN REFRESH ONLY IN BANK 0 IN RELATION TO BANK 1.
  - B. SCREEN REFRESH ONLY IN BANK 1 IN RELATION TO BANK 0.
  - C. THE CONTROL CARD READING AN ELEMENT.
  - D. THE CONTROL CARD WRITING AN ELEMENT.

QTY	WEEK	PART NO	ITEM DESCRIPTION	REV
LIST OF MATERIALS				

TOLERANCES		DO NOT SCALE DRAWING	
SIGNATURES	DATE	SIGNATURES	DATE
CHK	F L O O 12 4 2	CHK	11/26/61
END	1/6/62	END	11/26/61
REV		REV	

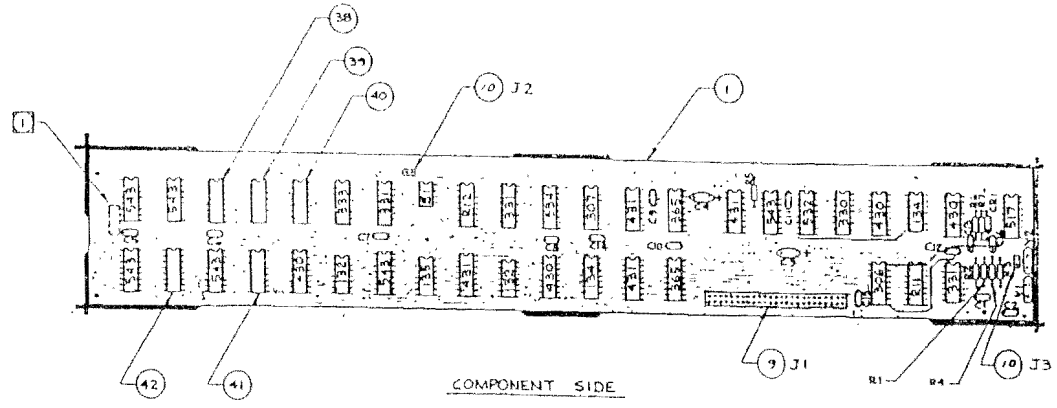
RAMTEK  
TIMING DIAGRAM  
MEMORY BOARD

SCALE = 1/10" = 1" = 10X  
502331

8 7 6 5 4 3 2 1

REVISIONS			
REV	DESCRIPTION	APPROV	DATE
A	RELEASED PER ECO 50684		
B	REVISED PER ECO 506909	CJI	1-1-74
C	REVISED PER ECO 506925	CJI	4/11/74
D	REVISED PER ECO 507059	DWY	05/27/74
E	REVISED PER ECO 507384	DWY	3-1-77

- NOTES: UNLESS OTHERWISE SPECIFIED
1. INK STAMP SERIAL NUMBER AND ASSY REVISION LEVEL IN AREA SHOWN.
  2. REFERENCE DRAWINGS - LOGIC DIAGRAM: 502 334 FABRICATION DWG: 502 333C
  3. LOGIC DEVICE TYPE NUMBERS ARE RAMTEK STANDARD PART NUMBERS 1301XXX.



COMPONENT SIDE  
 -01, -02, -03 SHOWN  
 -04

QTY	PART NO	ITEM DESCRIPTION	REV
LIST OF MATERIALS			
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
DATE	FINISH	DWY	8/23/74
SCALE: 1:1	DWG NO	ENG	502335
BY: J	REV	APPROV	BY: J
			502335 E

8 7 6 5 4 3 2 1

REVISIONS	
DATE	APPRO. DATE

THIS CUT AND PATCH DRAWING APPLIES TO REVISION 'A' ARTWORK BOARDS ONLY

**REVISION 'B'**

REVISION 'B' IS FUNCTIONALLY EQUIVALENT TO REVISION 'C'

CUT P.C. TRACES AS INDICATED TO DELETE THE FOLLOWING CONNECTIONS:

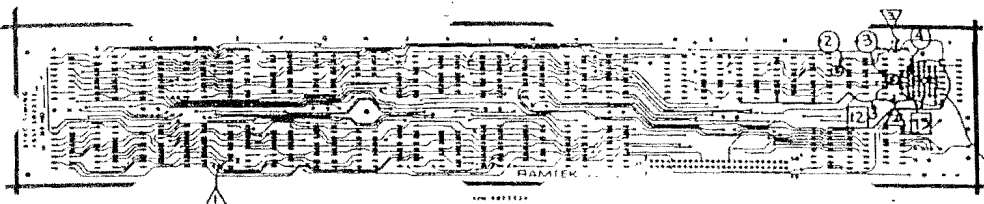
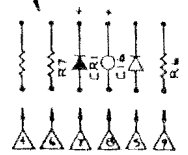
- ① IX-07 TO FEED THRU
- ② IV-14 TO IV-03
- ③ IX-10 TO FEED THRU
- ④ IX-12 TO COMPONENT

ADD THE INDICATED WIRES TO MAKE THE FOLLOWING CONNECTIONS:

- ① IX-09 TO FEED THRU
- ② IX-15 TO IV-16
- ③ COMPONENT TO COMPONENT
- ④ IX-01 TO COMPONENT
- ⑤ TIE TOGETHER IX-03, IX-04, IX-05, IX-06
- ⑥ IX-07 TO FEED THRU
- ⑦ IX-13 TO IX-13
- ⑧ IX-12 TO FEED THRU
- ⑨ IX-02 TO ZP-14
- ⑩ IX-11 TO ZF-05
- ⑪ IX-10 TO ZF-07
- ⑫ TIE TOGETHER IW-07 TO BENT I.C. PIN AT IX AND TO IX-06
- ⑬ BENT PIN AT IX TO COMPONENT HOLE

MAKE COMPONENT ADDS AND DELETES AND ADDITIONAL CHANGES AS NOTED:

- ⚠ CUT PIN 7 OF THE I.C. AT LOCATION ZF. DO NOT CUT THE TRACE.
- ⚠ REMOVE THE I.C. AT LOCATION IX. INSTALL I.C. 1301511 (SN74141) AT LOCATION IX. THIS REQUIRES BENDING PINS 8 AND 9 OF THE I.C. AS INDICATED.
- ⚠ REMOVE RESISTOR
- ⚠ REMOVE RESISTOR
- ⚠ REMOVE DIODE
- ⚠ REPLACE EXISTING COMPONENT WITH 10K, 1/4 W, 5% RESISTOR, R7 (3109103)
- ⚠ REPLACE EXISTING COMPONENT WITH 1N454 DIODE, CR1 (3202201) NOTE POLARITY
- ⚠ REPLACE EXISTING COMPONENT WITH 6.8 μF, 15V, 20% CAPACITOR, C16 (6706685) NOTE POLARITY
- ⚠ REPLACE EXISTING COMPONENT WITH 220 Ω, 1/4 W, 5% RESISTOR, R6 (3109221)



**REVISION 'C'**

REVISION 'C' IS FUNCTIONALLY EQUIVALENT TO REVISION 'B' ABOVE

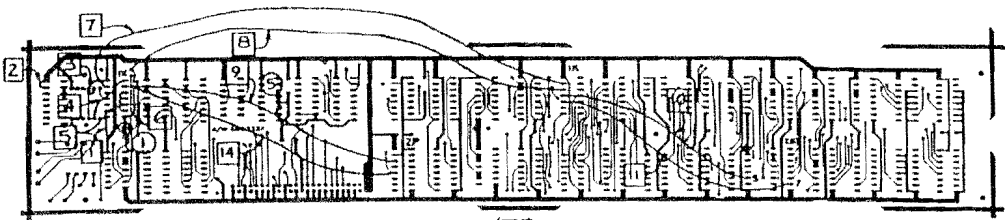
REMOVE THE INDICATED WIRE TO DELETE THE FOLLOWING CONNECTION

- ⑤ IX-02 TO ZP-14

**REVISION 'D'**

ADD THE INDICATED WIRES TO MAKE THE FOLLOWING CONNECTION

- ⑭ IX-02 TO ZP-12



QTY	PART NO.	ITEM DESCRIPTION	REV. NO.
LIST OF MATERIALS			

TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	USE	SIGNATURES	DATE
		DRAWN <i>Carl J. Blank</i>	10/17/74
		CHEK <i>Carl J. Blank</i>	10/17/74
		ENG <i>Carl J. Blank</i>	10/17/74
		APPRO <i>S. Conzel</i>	11/17/74

RAMTEK

P.C. ASSEMBLY-01-021-03  
MULTI-RESOLUTION 51K TIMING

SCALE / PART NO. 502335 E

THIS CUT AND FROM BOARD APPROX TO SECTION 'C' APPROX ONLY.

SECTION 'D'

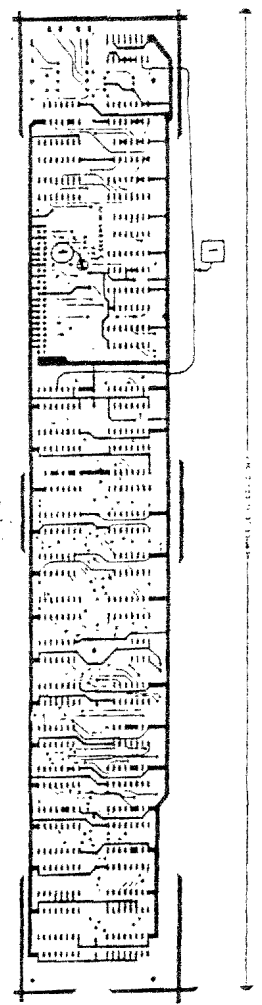
SECTION 'D'

FOR 10 TUBS AT  
 BOARD TO BE  
 THE FOURTH  
 COMPARTMENT

ADD THE TUBS  
 TO BE THE  
 FOURTH COMPARTMENT

1 14-02 TO 12-14

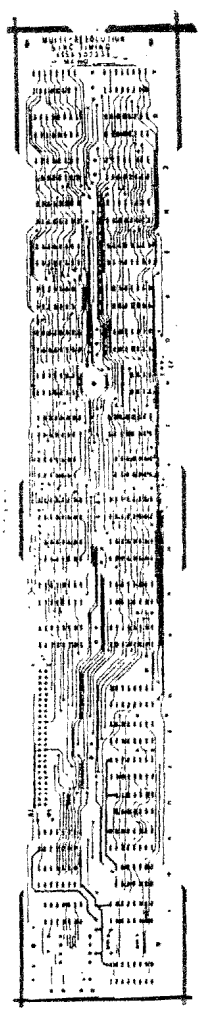
1 14-02 TO 12-14



SECTION 'D'

SECTION 'D'

SECTION 'D'



SECTION 'D'

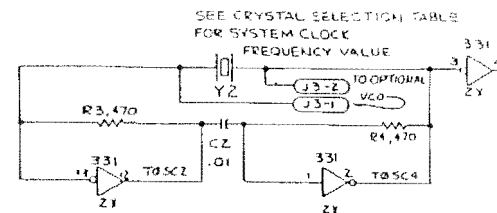
DRAWING SCALE DRAWING		DATE		REV	
NO.	DATE	BY	CHKD	NO.	DATE
1	11/11/54	J. J. BAKER		1	11/11/54
2				2	
3				3	
4				4	
5				5	
6				6	
7				7	
8				8	
9				9	
10				10	
11				11	
12				12	
13				13	
14				14	
15				15	
16				16	
17				17	
18				18	
19				19	
20				20	
21				21	
22				22	
23				23	
24				24	
25				25	
26				26	
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30				30	
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33				33	
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37				37	
38				38	
39				39	
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42				42	
43				43	
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45				45	
46				46	
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87				87	
88				88	
89				89	
90				90	
91				91	
92				92	
93				93	
94				94	
95				95	
96				96	
97				97	
98				98	
99				99	
100				100	

RAMTEK

502335



**XTAL**

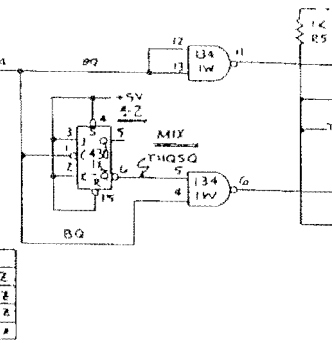


**CRYSTAL SELECTION TABLE**

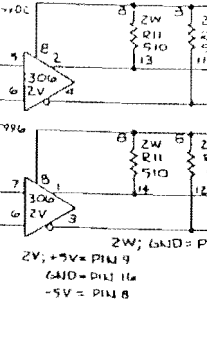
DASH NO	CRYSTAL FREQUENCY	FORMAT	VISABLE LINES
-01	12.273 MHz	BROADCAST	240/480 60HZ
-02	3.068 MHz	STANDARD	256/512 60HZ
-03	12.188 MHz	EUROPEAN	256/512 50HZ
-04	10.910 MHz	STANDARD 10MHz	256/512 50MHz

**SYSTEM CLOCK GENERATION**

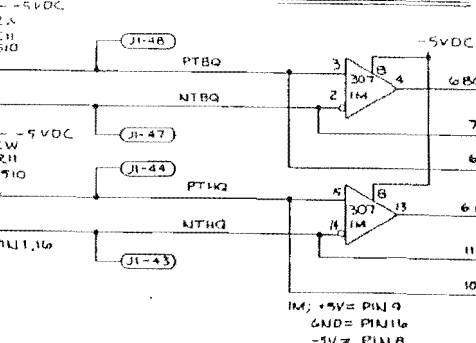
**SYSTEM CLOCK GENERATION**



**ECL DRIVERS**



**ECL RECEIVERS**

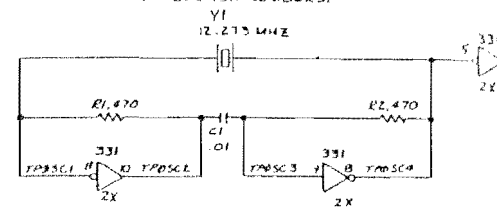


REVISIONS	DESCRIPTION	DATE
1	SEE SHEET ONE	

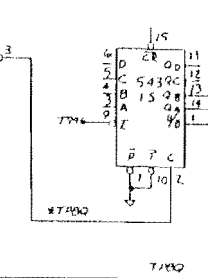
**PROCESSOR CLOCK GENERATION**

**XTAL**

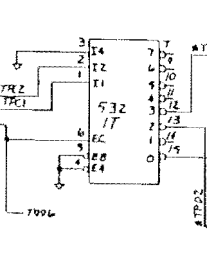
THE PROCESSOR CLOCK CRYSTAL FREQUENCY REMAINS THE SAME FOR ALL DASH NUMBERS.



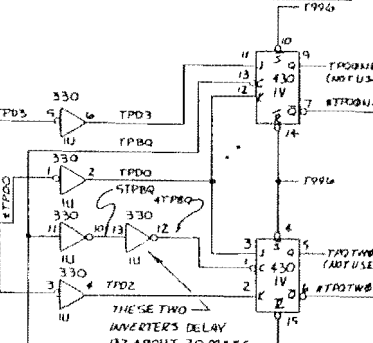
**4 BIT COUNTER**



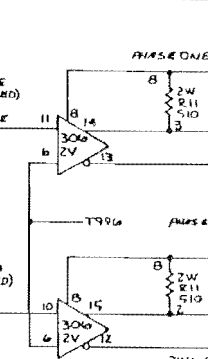
**1 OF 8 DECODE**



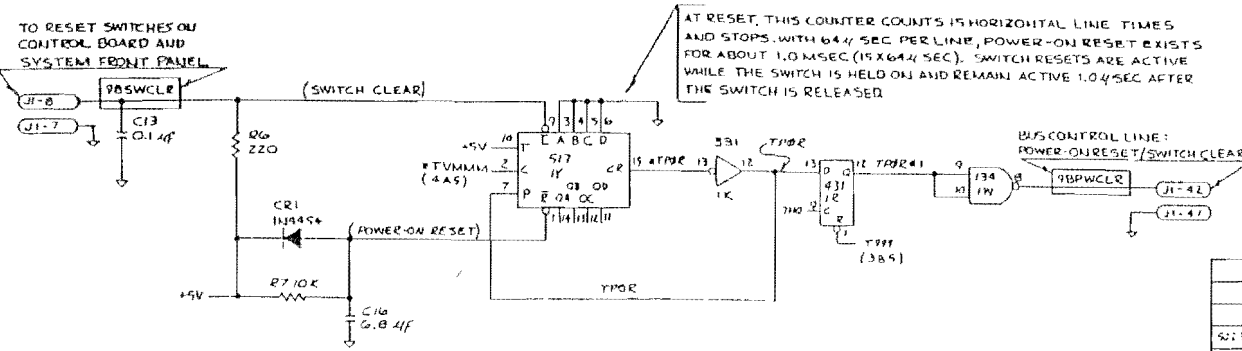
**JK PULSE SHAPER AND RECKLOCK**



**ECL DRIVERS**

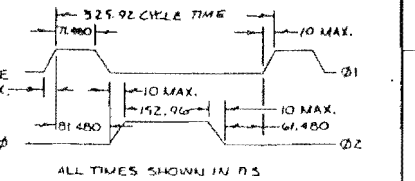


**POWER-ON RESET AND SWITCH CLEAR**



AT RESET, THIS COUNTER COUNTS 15 HORIZONTAL LINE TIMES AND STOPS. WITH 64.4 SEC PER LINE, POWER-ON RESET EXISTS FOR ABOUT 1.0 MSEC (15 X 64.4 SEC). SWITCH RESETS ARE ACTIVE WHILE THE SWITCH IS HELD ON AND REMAIN ACTIVE 1.04 SEC AFTER THE SWITCH IS RELEASED.

**8080A-1 CLOCKS**

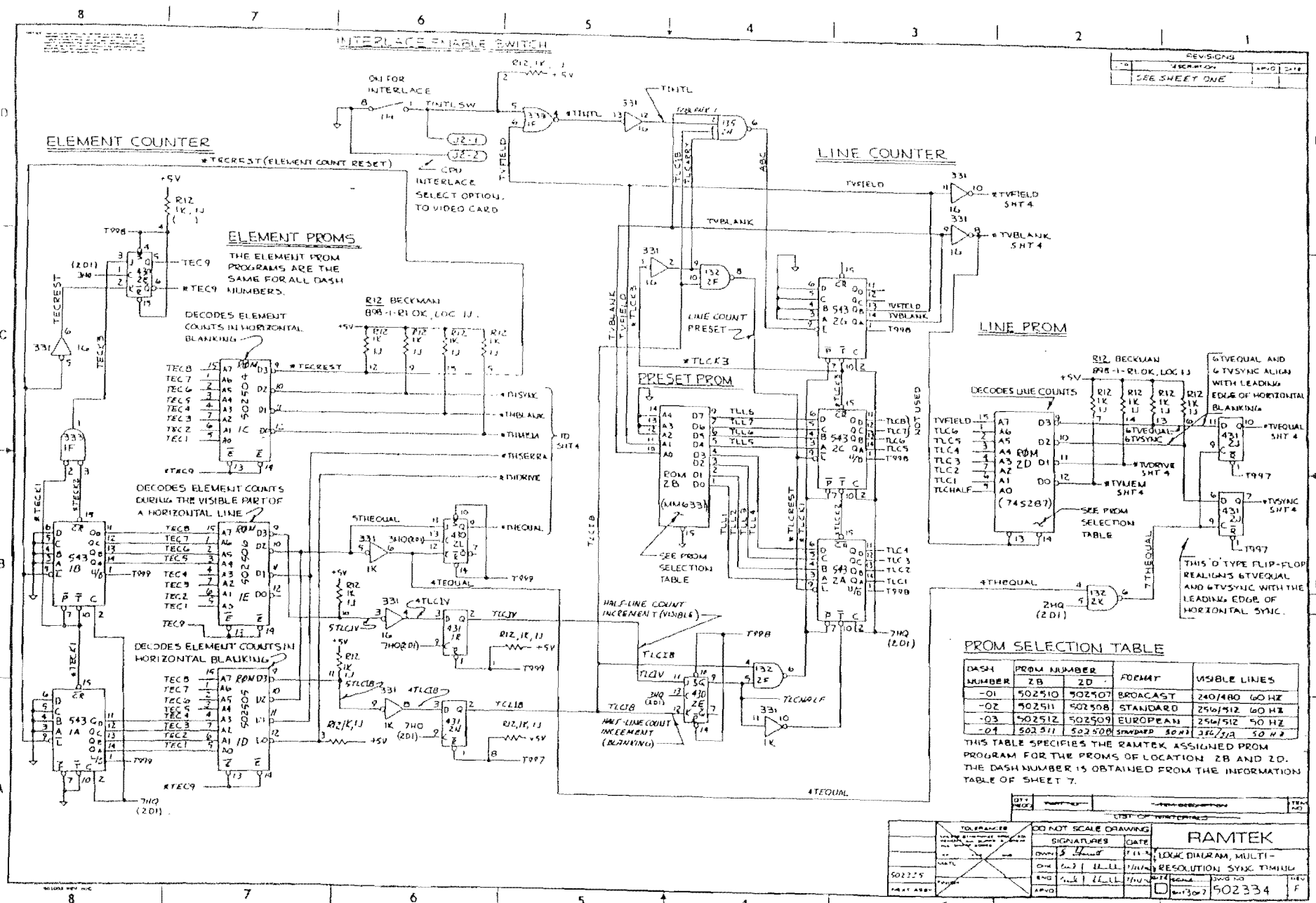


ALL TIMES SHOWN IN NS

TOLERANCES		DO NOT SCALE DRAWING	
RESISTORS	±1%	SIGNATURES	DATE
CAPACITORS	±5%	DATE	1/1/74
IC'S	±1%	CHKD	1/1/74
WELDS	±0.1mm	END	1/1/74
WIRE	±0.1mm	APP'D	1/1/74
SIZE	3:35	REV	1
NEXT ASSY		REV	1

**RAMTEK**  
LOGIC DIAGRAM, MULTI-RESOLUTION SYNC FUNCTIONS

602334



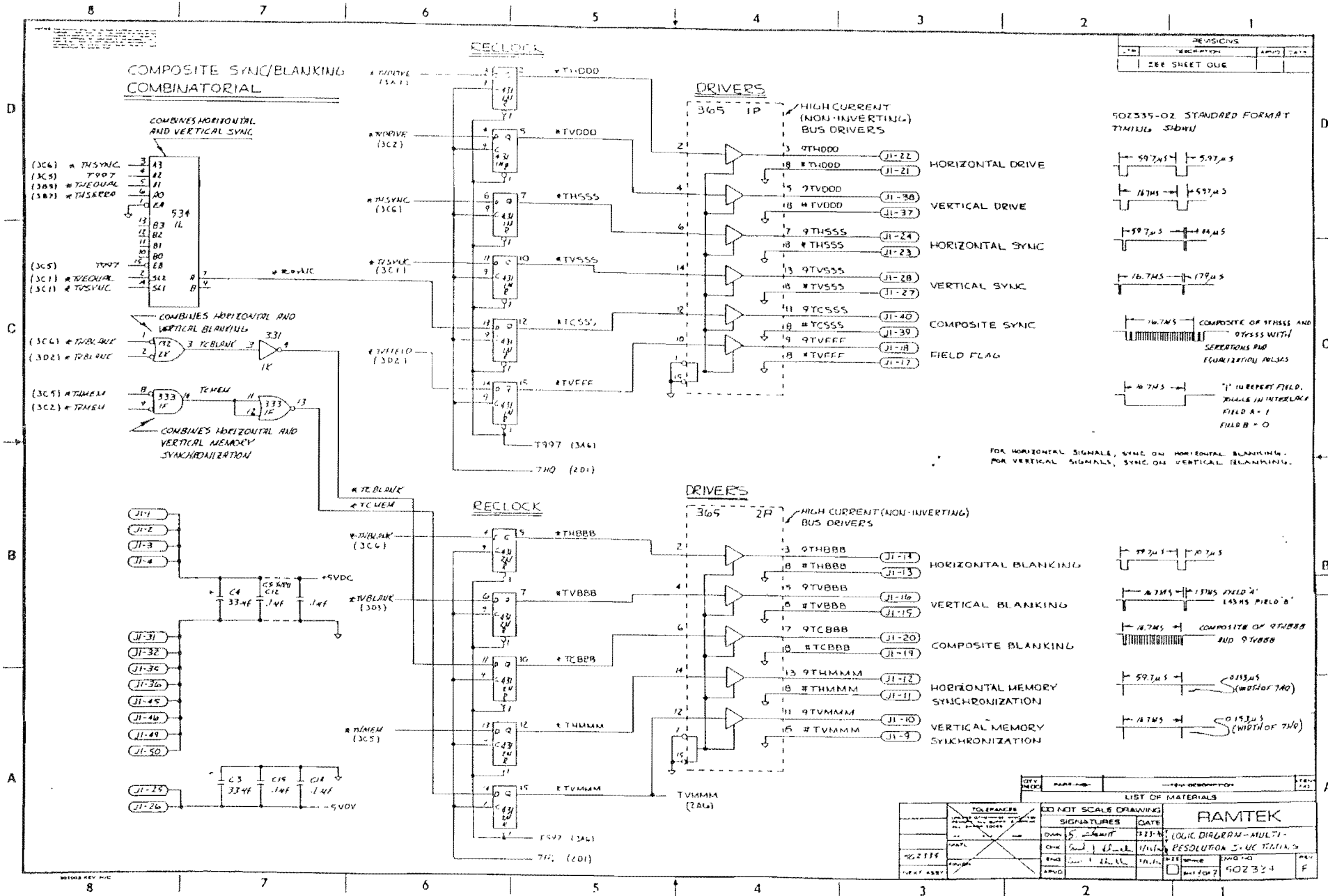
REVISIONS		DATE	BY
1	SEE SHEET ONE		

**PROM SELECTION TABLE**

DASH NUMBER	PROM NUMBER ZB	PROM NUMBER ZD	FORMAT	VISIBLE LINES
-01	502510	502507	BROADCAST	240/480 60 HZ
-02	502511	502508	STANDARD	256/512 60 HZ
-03	502512	502509	EUROPEAN	256/512 50 HZ
-04	502511	502508	STANDARD 30Hz	256/512 50 HZ

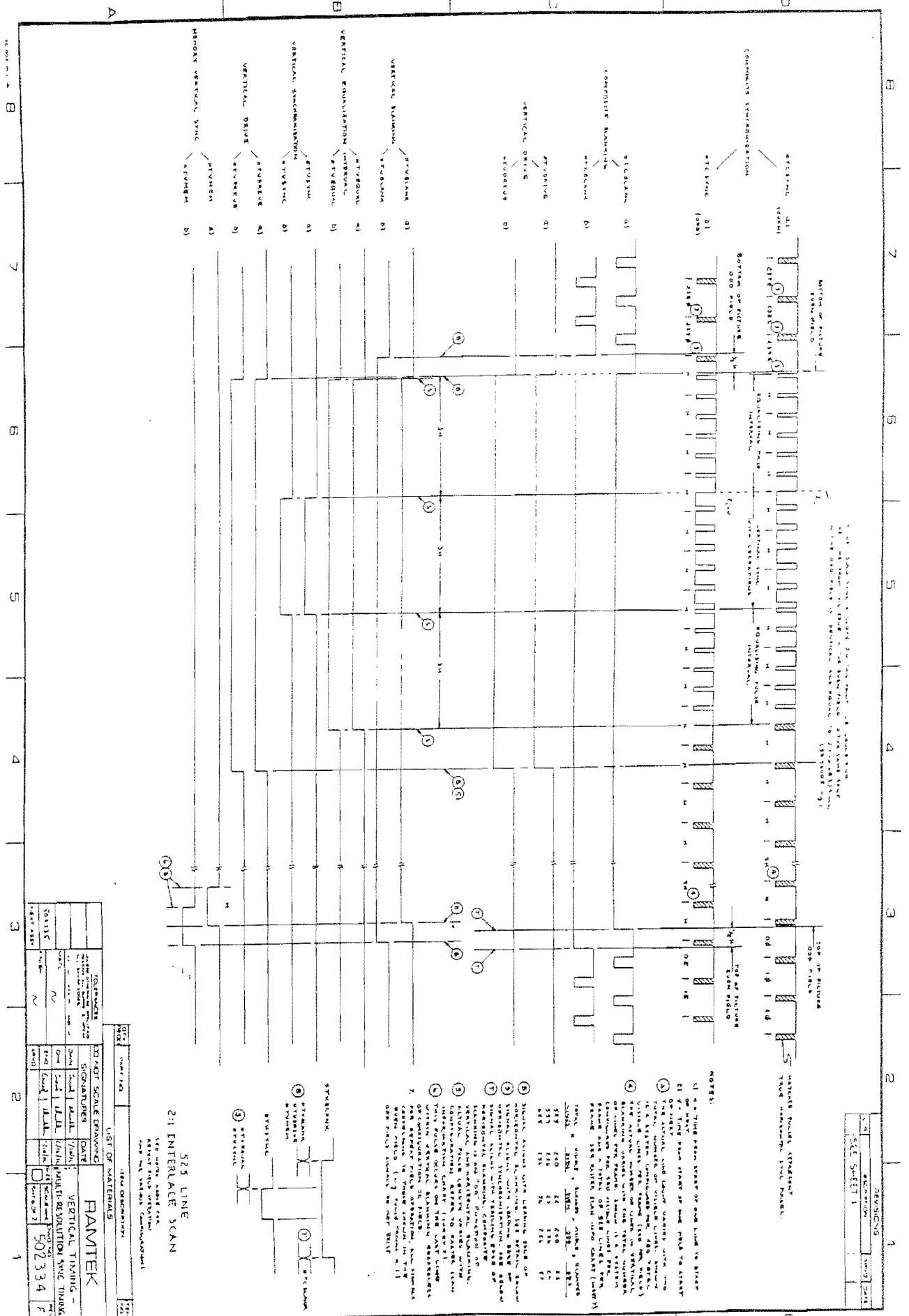
THIS TABLE SPECIFIES THE RAMTEK ASSIGNED PROM PROGRAM FOR THE PROMS OF LOCATION ZB AND ZD. THE DASH NUMBER IS OBTAINED FROM THE INFORMATION TABLE OF SHEET 7.

TOLERANCES		DO NOT SCALE DRAWING		SIGNATURES		DATE		RAMTEK	
RESISTORS	1%	DATE		DESIGNED BY		DATE		LOGIC DIAGRAM, MULTI-RESOLUTION SYNC TIMING	
CAPACITORS	5%	DATE		CHECKED BY		DATE		REV	
IC'S	1%	DATE		ENG		DATE		502334	F
WELDED POINTS	1%	DATE		APP'D		DATE		502334	F





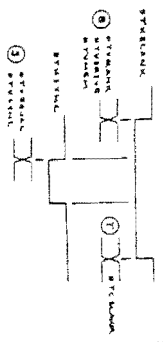




SEE DRAWING 525 LINE 2:1 INTERLEAVE SCAN FOR THE LOCATION OF THE SCANNING BEAMS AND THE POSITION OF THE SCANNING BEAMS IN THE SCANNING BEAM AREA. (SEE DRAWING 525 LINE 2:1 INTERLEAVE SCAN)

NOTES:

- 1) THE TIME FROM START OF ONE LINE TO START OF NEXT LINE IS 1/525 SEC.
- 2) THE TIME FROM START OF ONE LINE TO START OF NEXT LINE IS 1/525 SEC.
- 3) THE TIME FROM START OF ONE LINE TO START OF NEXT LINE IS 1/525 SEC.
- 4) THE TIME FROM START OF ONE LINE TO START OF NEXT LINE IS 1/525 SEC.
- 5) THE TIME FROM START OF ONE LINE TO START OF NEXT LINE IS 1/525 SEC.
- 6) THE TIME FROM START OF ONE LINE TO START OF NEXT LINE IS 1/525 SEC.
- 7) THE TIME FROM START OF ONE LINE TO START OF NEXT LINE IS 1/525 SEC.
- 8) THE TIME FROM START OF ONE LINE TO START OF NEXT LINE IS 1/525 SEC.



525 LINE  
2:1 INTERLEAVE SCAN

DRAWING		DATE		DATE	
NO.	REV.	NO.	REV.	NO.	REV.
1		1		1	

LIST OF MATERIALS

ITEM	DESCRIPTION	QTY	UNIT
1	525 LINE 2:1 INTERLEAVE SCAN	1	SET

30 X 40 FT SCALE DRAWING

SIGNATURES

NO.	NAME	DATE
1	502334	

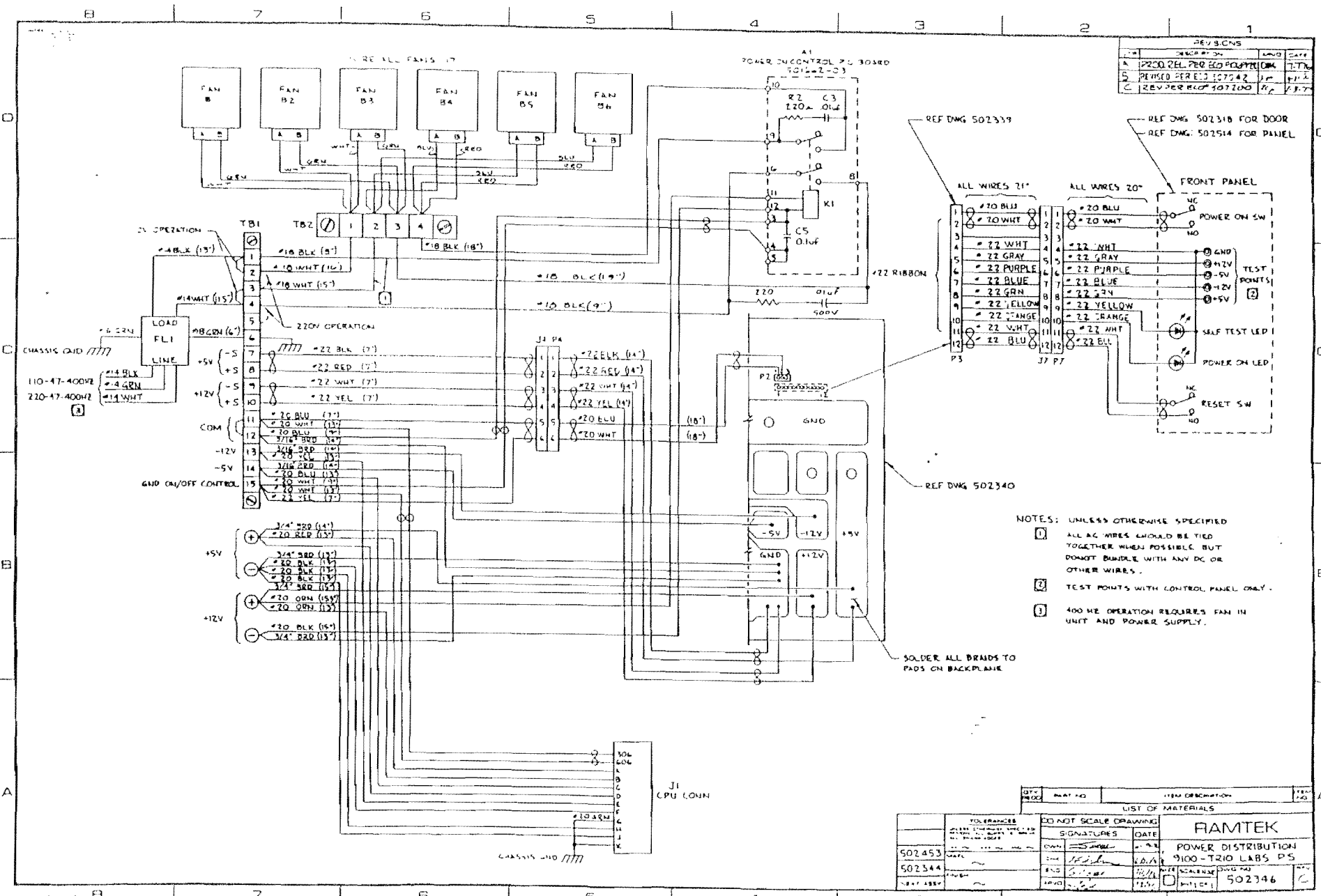
VERTICAL THINNING - MULTI-RESOLUTION AND THINNING

502334 F

NO.	DESCRIPTION	DATE
1	502334	



REV. 8.CNS			
REV.	DESCRIPTION	DATE	BY
A	2200 DEL PER ECO POLYMER	7-76	JM
B	REVISED PER ELD 502342		
C	REVISED PER ELD 502340		



- NOTES: UNLESS OTHERWISE SPECIFIED
- ① ALL AC WIRES SHOULD BE TIED TOGETHER WHEN POSSIBLE, BUT DON'T BUNDLE WITH ANY DC OR OTHER WIRES.
  - ② TEST POINTS WITH CONTROL PANEL ONLY.
  - ③ 400 MHz OPERATION REQUIRES FAN IN UNIT AND POWER SUPPLY.

REV.	DATE	BY	CHKD.	APP'D.	DESCRIPTION	REV.	DATE
502453							
502344							

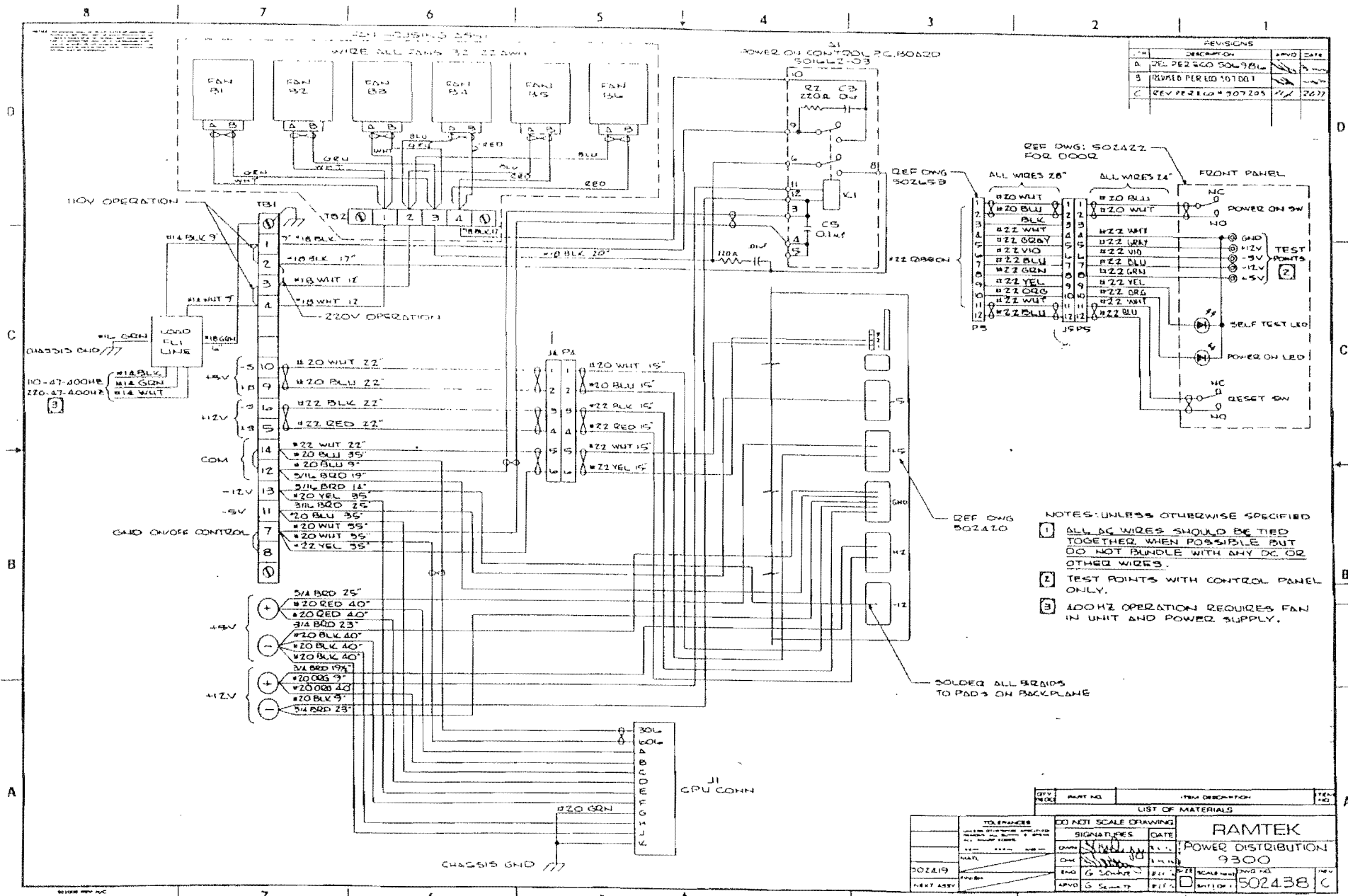
LIST OF MATERIALS			
QTY	PART NO	ITEM DESCRIPTION	REV.

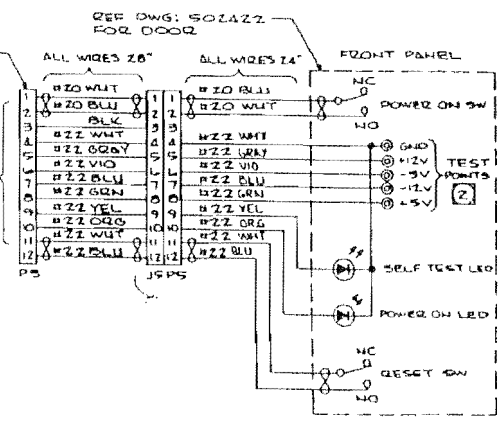
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
502453			
502344			

RAMTEK			
POWER DISTRIBUTION			
9100-TR10 LABS PS			
REV.	DATE	BY	CHKD.
502346			



REVISIONS		
REV	DESCRIPTION	APPROV DATE
A	DEL PER SCO 502438	
B	REVISED PER LEO 502401	
C	REV PER LEO 502405	11/20/77



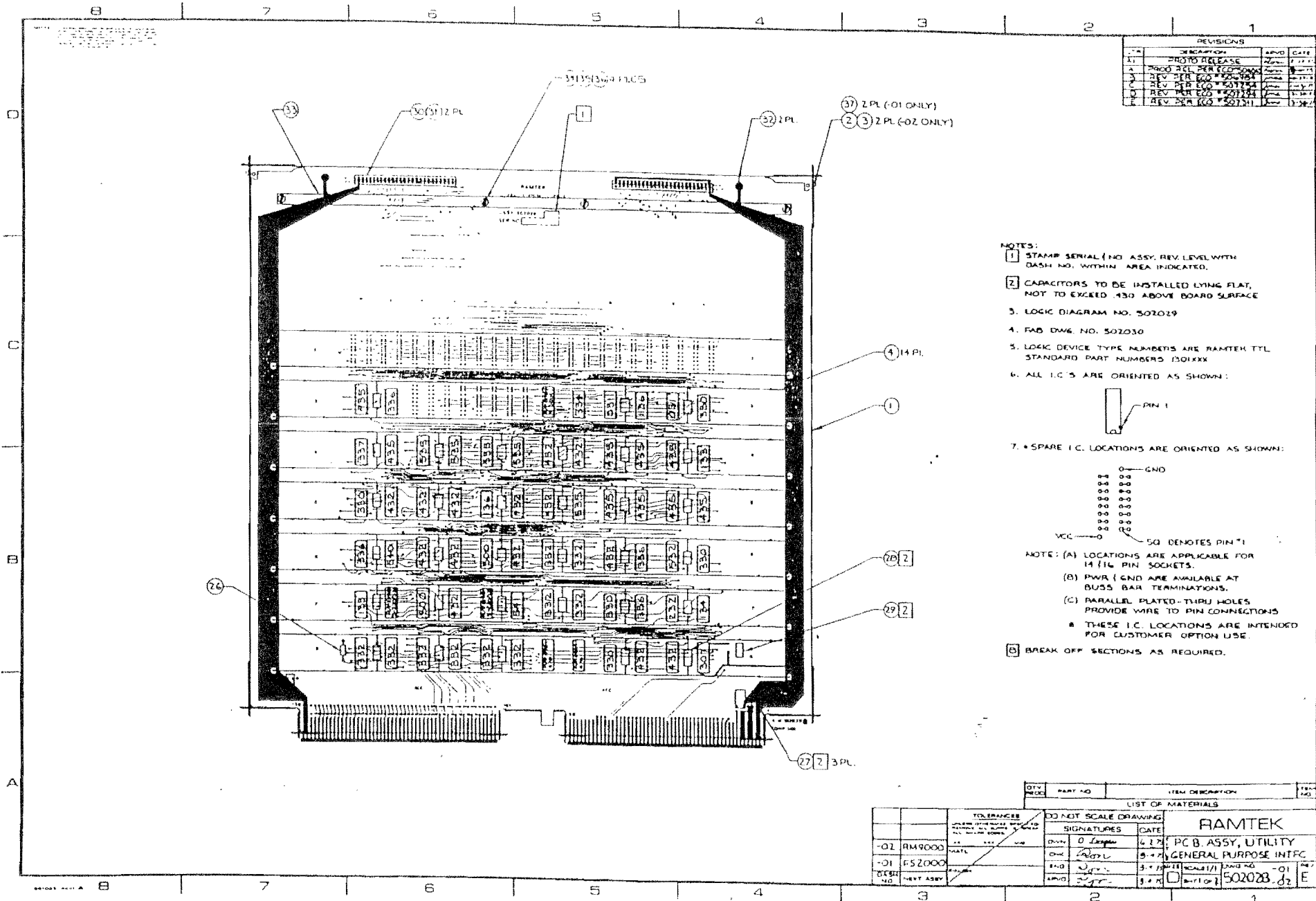
- NOTES: UNLESS OTHERWISE SPECIFIED
- 1 ALL AC WIRES SHOULD BE TIED TOGETHER WHEN POSSIBLE BUT DO NOT BUNDLE WITH ANY DC OR OTHER WIRES.
  - 2 TEST POINTS WITH CONTROL PANEL ONLY.
  - 3 400HZ OPERATION REQUIRES FAN IN UNIT AND POWER SUPPLY.

QTY	PART NO	PART DESCRIPTION	REV
LIST OF MATERIALS			
RAMTEK			
POWER DISTRIBUTION 9300			
SCALE: 1/8" = 1"			
DATE: 11/20/77			
DRAWN: G. SCHMIDT			
CHECKED: S. SCHMIDT			
APPROVED: S. SCHMIDT			
PART NO: 502438			

INTERFACE AND OPTIONAL ASSEMBLIES

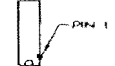
502028-	2 sheets
502029	7 sheets
502440	2 sheets
502442	6 sheets
502641	1 sheet
502643	16 sheets
502769	3 sheets
502635	1 sheet



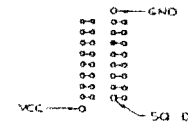


REVISIONS			
NO.	DESCRIPTION	APPROVED	DATE
1	PHOTO RELEASE		
2	REV PER ECO #502028		
3	REV PER ECO #502028		
4	REV PER ECO #502028		
5	REV PER ECO #502028		
6	REV PER ECO #502028		

- NOTES:
1. STAMP SERIAL (NO ASSY. REV. LEVEL WITH DASH NO. WITHIN AREA INDICATED).
  2. CAPACITORS TO BE INSTALLED LYING FLAT, NOT TO EXCEED .130 ABOVE BOARD SURFACE.
  3. LOGIC DIAGRAM NO. 502029
  4. FAB DWG. NO. 502030
  5. LOGIC DEVICE TYPE NUMBERS ARE RAMTEK TTL STANDARD PART NUMBERS 1301XXX
  6. ALL I.C.'S ARE ORIENTED AS SHOWN:



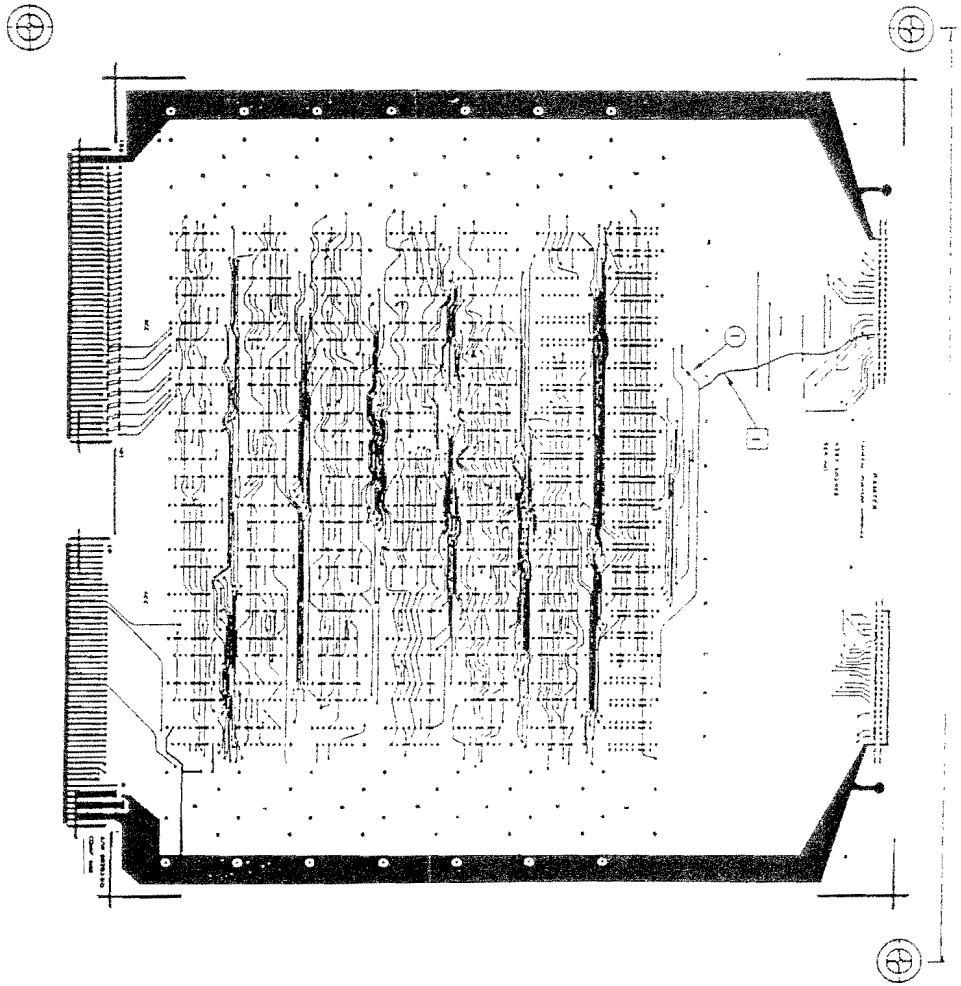
7. \* SPARE I.C. LOCATIONS ARE ORIENTED AS SHOWN:



- NOTE: (A) LOCATIONS ARE APPLICABLE FOR 14 (16) PIN SOCKETS.  
 (B) PWR (GND) ARE AVAILABLE AT BUSS BAR TERMINATIONS.  
 (C) PARALLEL PLATED-THRU HOLES PROVIDE WIRE TO PIN CONNECTIONS.  
 \* THESE I.C. LOCATIONS ARE INTENDED FOR CUSTOMER OPTION USE.  
 (D) BREAK OFF SECTIONS AS REQUIRED.

QTY	PART NO.	ITEM DESCRIPTION	TRC
		LIST OF MATERIALS	
		RAMTEK	
		PC B. ASSY, UTILITY GENERAL PURPOSE INTEFC	
		DATE: 5-17-77	
		BY: [Signature]	
		REV: 01	
		502028	





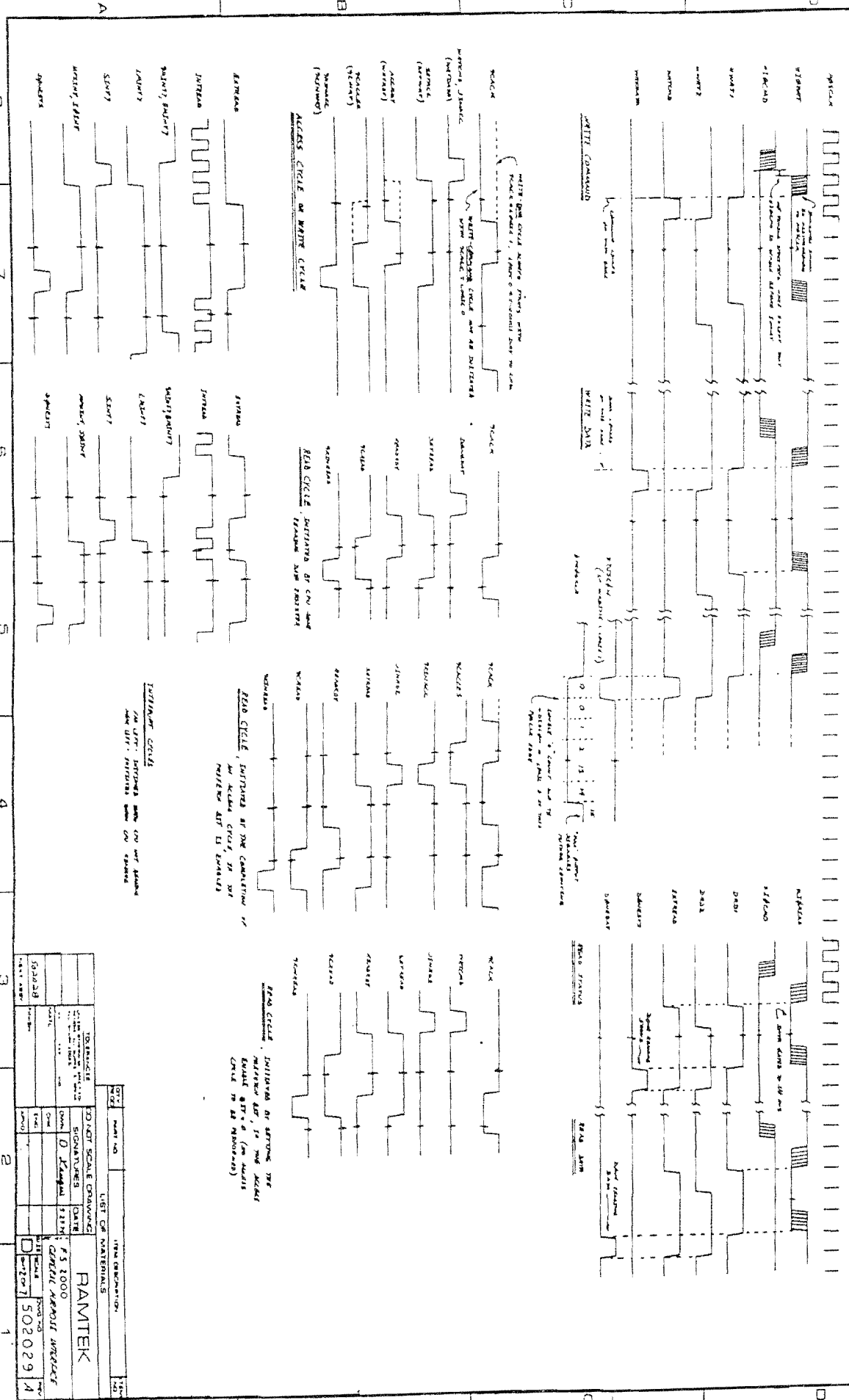
① CUT TRACE AS SHOWN

② ADD WIRE FROM TCU733 TO TRACE AS INDICATED.

DATE	REVISED
BY	DATE

DO NOT SCALE DRAWING	
SIGNATURES	DATE
DESIGNED BY	DATE
DRAWN BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
PAMTEK	
(CUT PATCH) UTILITY	
GENERAL BOARD INTERFACE	
REV	DATE
1	5020284
2	5020284





FORM 104-1 (Rev. 1-78)

UNIT NO. \_\_\_\_\_

DATE OF OPERATION \_\_\_\_\_

TESTER'S SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

TESTER'S NAME \_\_\_\_\_

TESTER'S TITLE \_\_\_\_\_

TESTER'S ORGANIZATION \_\_\_\_\_

TESTER'S ADDRESS \_\_\_\_\_

TESTER'S CITY \_\_\_\_\_

TESTER'S STATE \_\_\_\_\_

TESTER'S ZIP \_\_\_\_\_

TESTER'S PHONE \_\_\_\_\_

TESTER'S FAX \_\_\_\_\_

TESTER'S E-MAIL \_\_\_\_\_

TESTER'S SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

TESTER'S NAME \_\_\_\_\_

TESTER'S TITLE \_\_\_\_\_

TESTER'S ORGANIZATION \_\_\_\_\_

TESTER'S ADDRESS \_\_\_\_\_

TESTER'S CITY \_\_\_\_\_

TESTER'S STATE \_\_\_\_\_

TESTER'S ZIP \_\_\_\_\_

TESTER'S PHONE \_\_\_\_\_

TESTER'S FAX \_\_\_\_\_

TESTER'S E-MAIL \_\_\_\_\_

UNIT NO. \_\_\_\_\_

DATE OF OPERATION \_\_\_\_\_

TESTER'S SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

TESTER'S NAME \_\_\_\_\_

TESTER'S TITLE \_\_\_\_\_

TESTER'S ORGANIZATION \_\_\_\_\_

TESTER'S ADDRESS \_\_\_\_\_

TESTER'S CITY \_\_\_\_\_

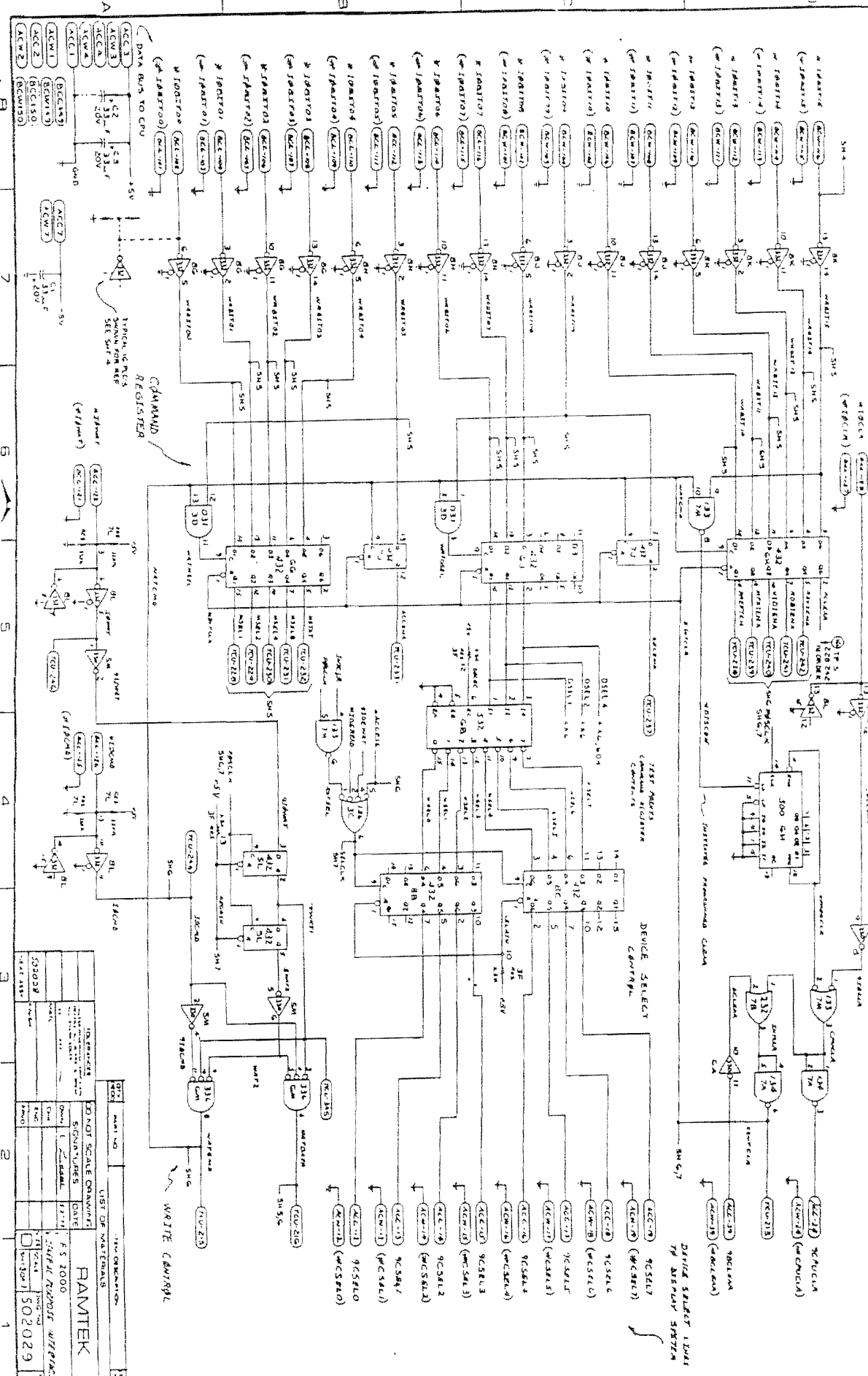
TESTER'S STATE \_\_\_\_\_

TESTER'S ZIP \_\_\_\_\_

TESTER'S PHONE \_\_\_\_\_

TESTER'S FAX \_\_\_\_\_

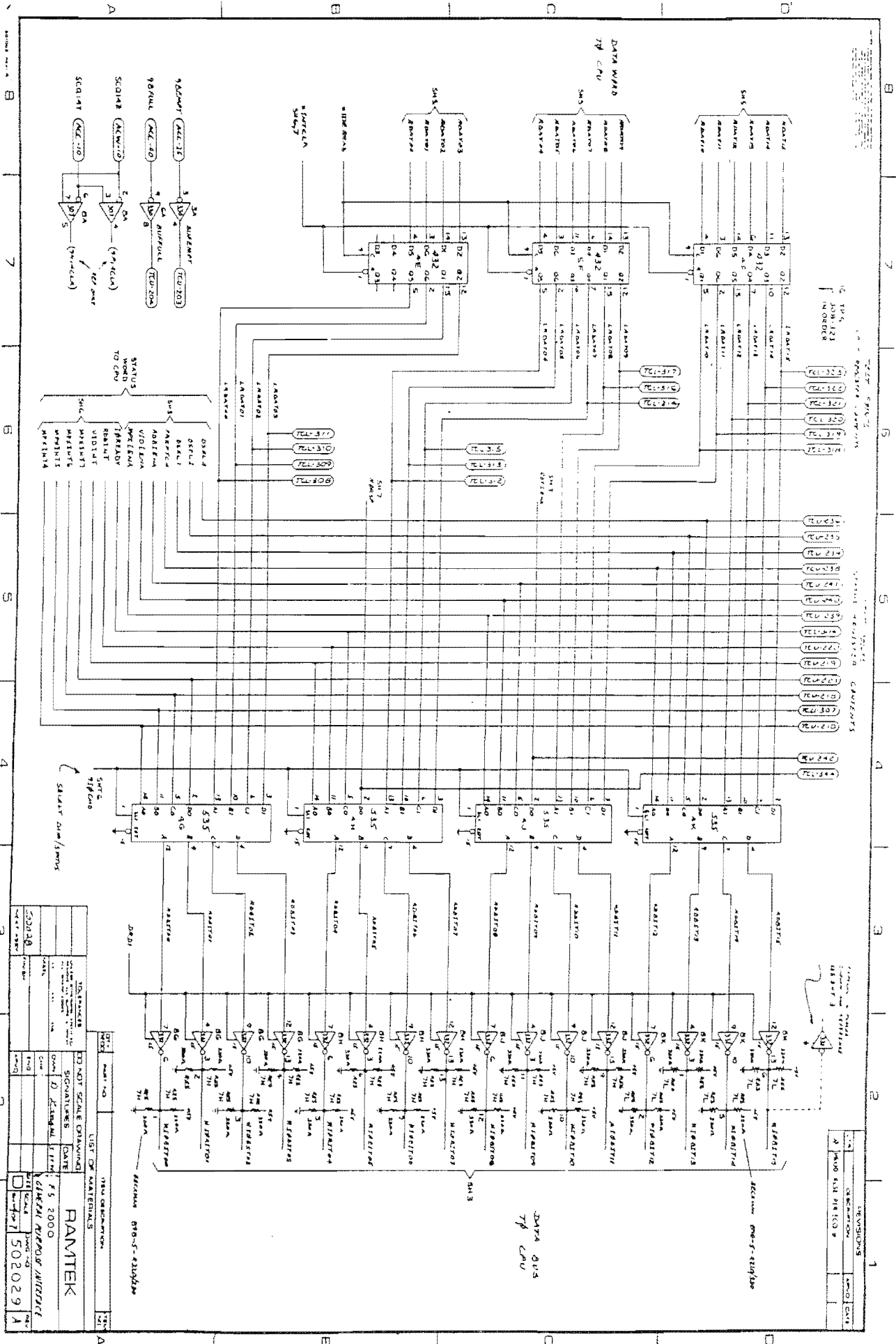
TESTER'S E-MAIL \_\_\_\_\_



DATA BUS TO CPU  
 COMMAND REGISTER  
 DEVICE SELECT  
 M180C1 (74181)  
 M180C2 (74181)  
 M180C3 (74181)  
 M180C4 (74181)  
 M180C5 (74180)  
 M180C6 (74182)  
 M180C7 (74183)  
 M180C8 (74181)  
 M180C9 (74181)  
 M180C10 (74181)  
 M180C11 (74181)  
 M180C12 (74181)  
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 M180C96 (74181)  
 M180C97 (74181)  
 M180C98 (74181)  
 M180C99 (74181)  
 M180C100 (74181)

NO.	DESCRIPTION	QTY.	UNIT
1	74181	100	IC
2	74180	1	IC
3	74182	1	IC
4	74183	1	IC
5	74184	1	IC
6	74185	1	IC
7	74186	1	IC
8	74187	1	IC
9	74188	1	IC
10	74189	1	IC
11	74190	1	IC
12	74191	1	IC
13	74192	1	IC
14	74193	1	IC
15	74194	1	IC
16	74195	1	IC
17	74196	1	IC
18	74197	1	IC
19	74198	1	IC
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32	74211	1	IC
33	74212	1	IC
34	74213	1	IC
35	74214	1	IC
36	74215	1	IC
37	74216	1	IC
38	74217	1	IC
39	74218	1	IC
40	74219	1	IC
41	74220	1	IC
42	74221	1	IC
43	74222	1	IC
44	74223	1	IC
45	74224	1	IC
46	74225	1	IC
47	74226	1	IC
48	74227	1	IC
49	74228	1	IC
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52	74231	1	IC
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95	74274	1	IC
96	74275	1	IC
97	74276	1	IC
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100	74279	1	IC

RANTEK  
 DATE: 5/5/2000  
 502029  
 A



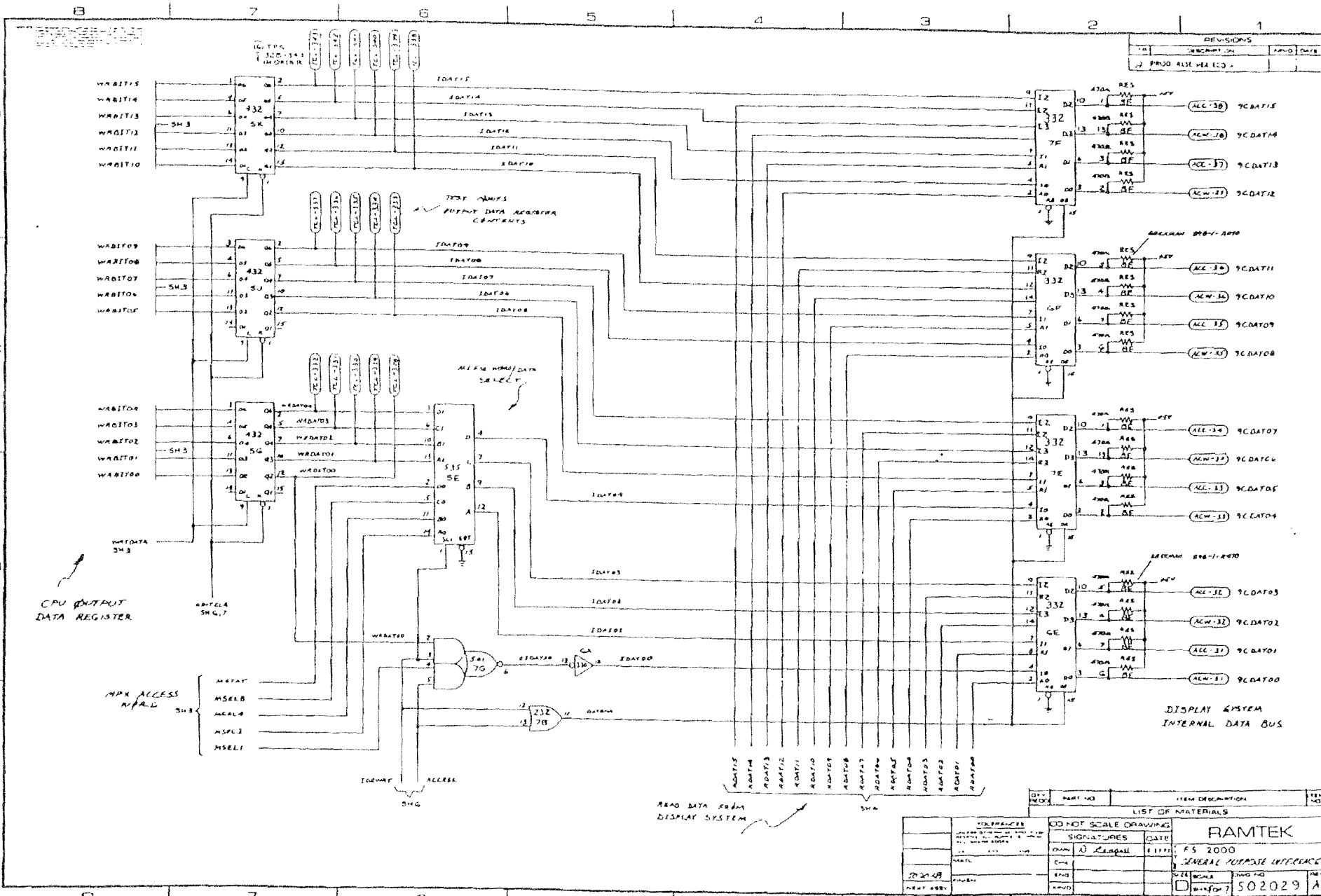
REVISIONS	
NO.	DATE
1	
2	
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8	

LIST OF MATERIALS	
ITEM NO.	DESCRIPTION
1	RELAY
2	RELAY
3	RELAY
4	RELAY
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97	RELAY
98	RELAY
99	RELAY
100	RELAY

DRAWING NO. 502029A  
 PROJECT: GENERAL PURPOSE INSTRUMENT  
 DATE: 11/15/55  
 DESIGNED BY: [Name]  
 CHECKED BY: [Name]  
 APPROVED BY: [Name]  
 TITLE: CONTROL SYSTEM

REVISIONS		
NO	DESCRIPTION	AMOUNT
1	PRIO ALL HEA LCO	



CPU OUTPUT DATA REGISTER

MPX ACCESS NPL#

ALL NEW MEMO DATA SELECT

READ DATA FROM DISPLAY SYSTEM

DISPLAY SYSTEM INTERNAL DATA BUS

QTY	PART NO	ITEM DESCRIPTION	REV
		LIST OF MATERIALS	

DO NOT SCALE DRAWING		DATE	
SIGNATURES	DATE	RAMTEK	
DESIGNER	DATE	F5 2000	
CHECKED	DATE	GENERAL PURPOSE INTERFACE	
APP'D	DATE	REV 1	
REVISED	DATE	REV 2	
REVISED	DATE	REV 3	
REVISED	DATE	REV 4	
REVISED	DATE	REV 5	
REVISED	DATE	REV 6	
REVISED	DATE	REV 7	
REVISED	DATE	REV 8	
REVISED	DATE	REV 9	
REVISED	DATE	REV 10	

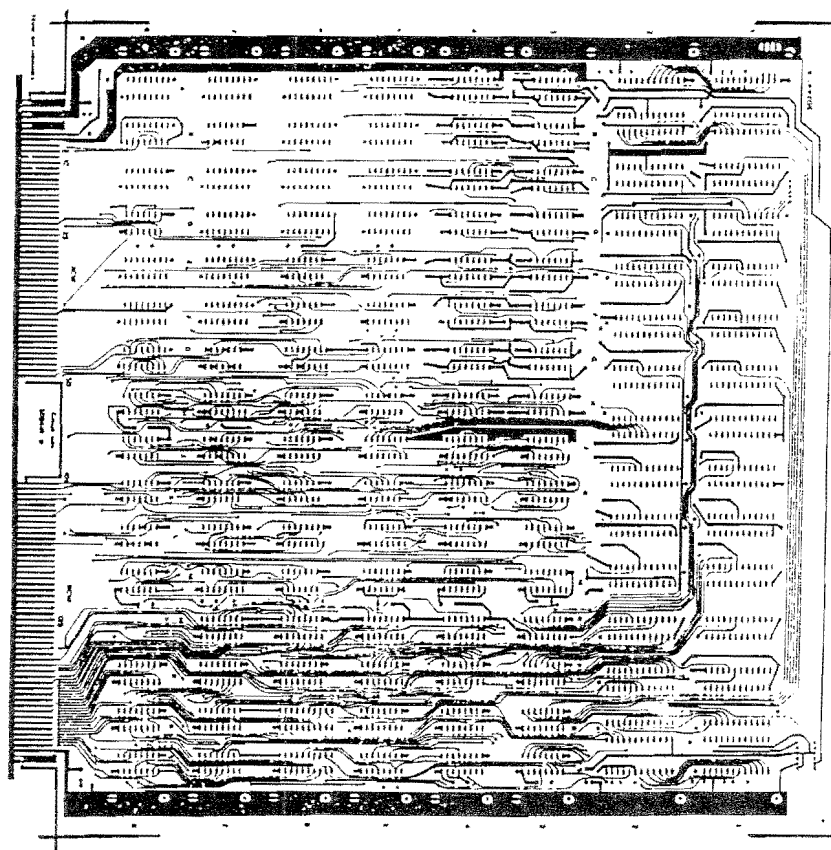
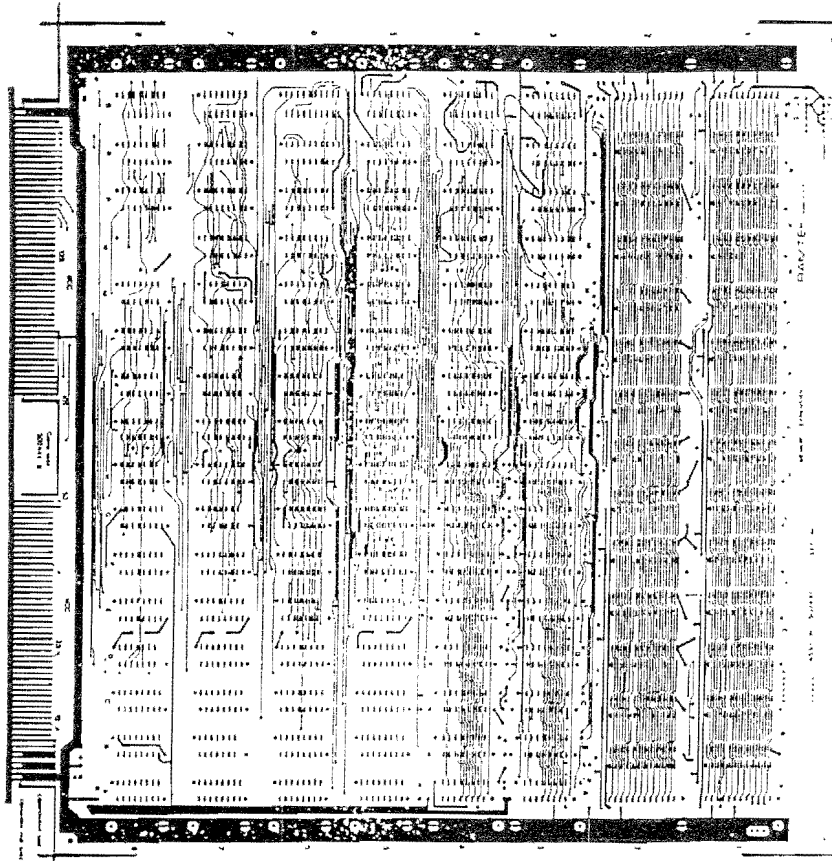






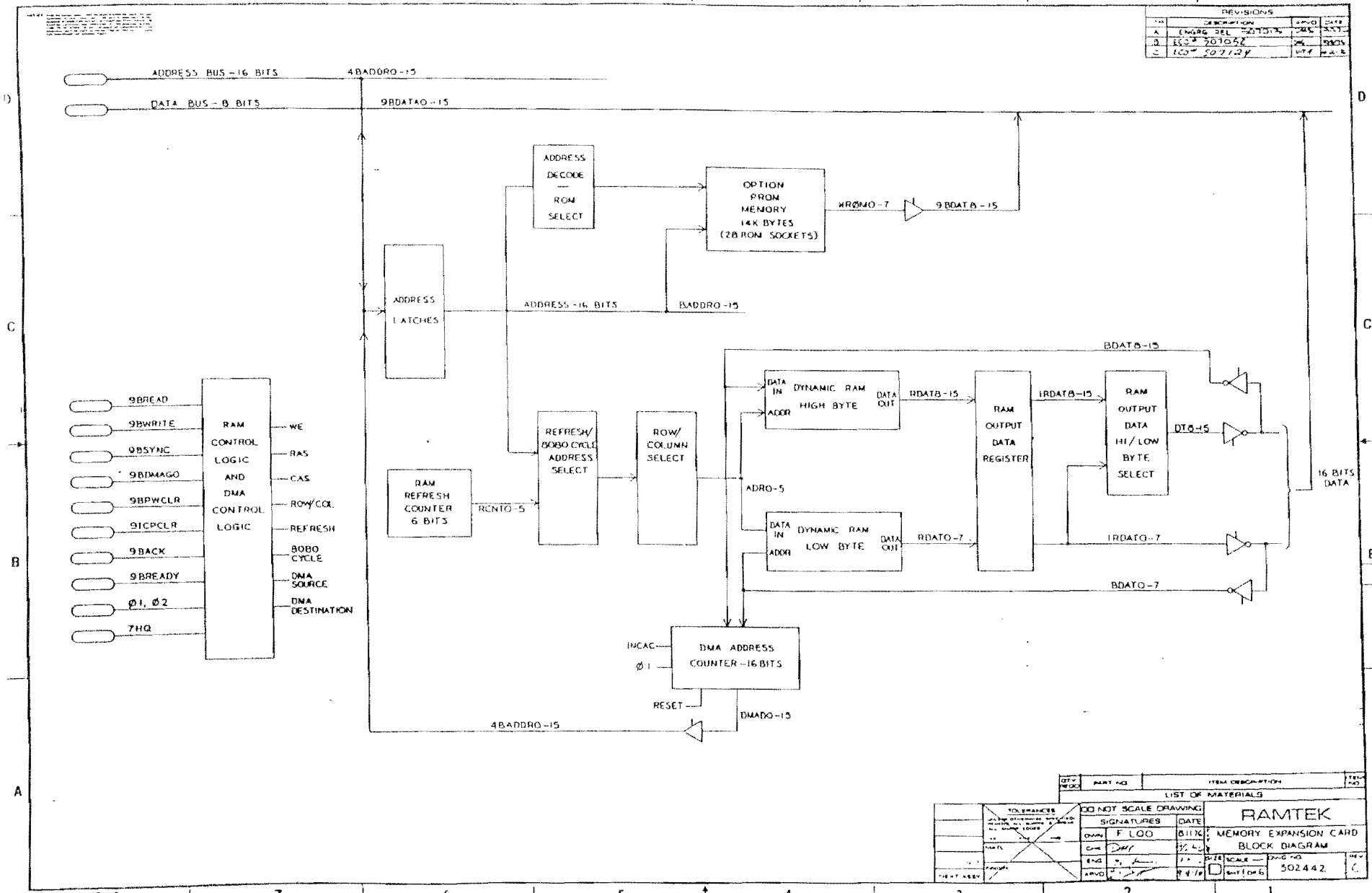


1 SHAPE PADS AT 3R-16L 13D-16 TO REV. B. 805 ONLY.



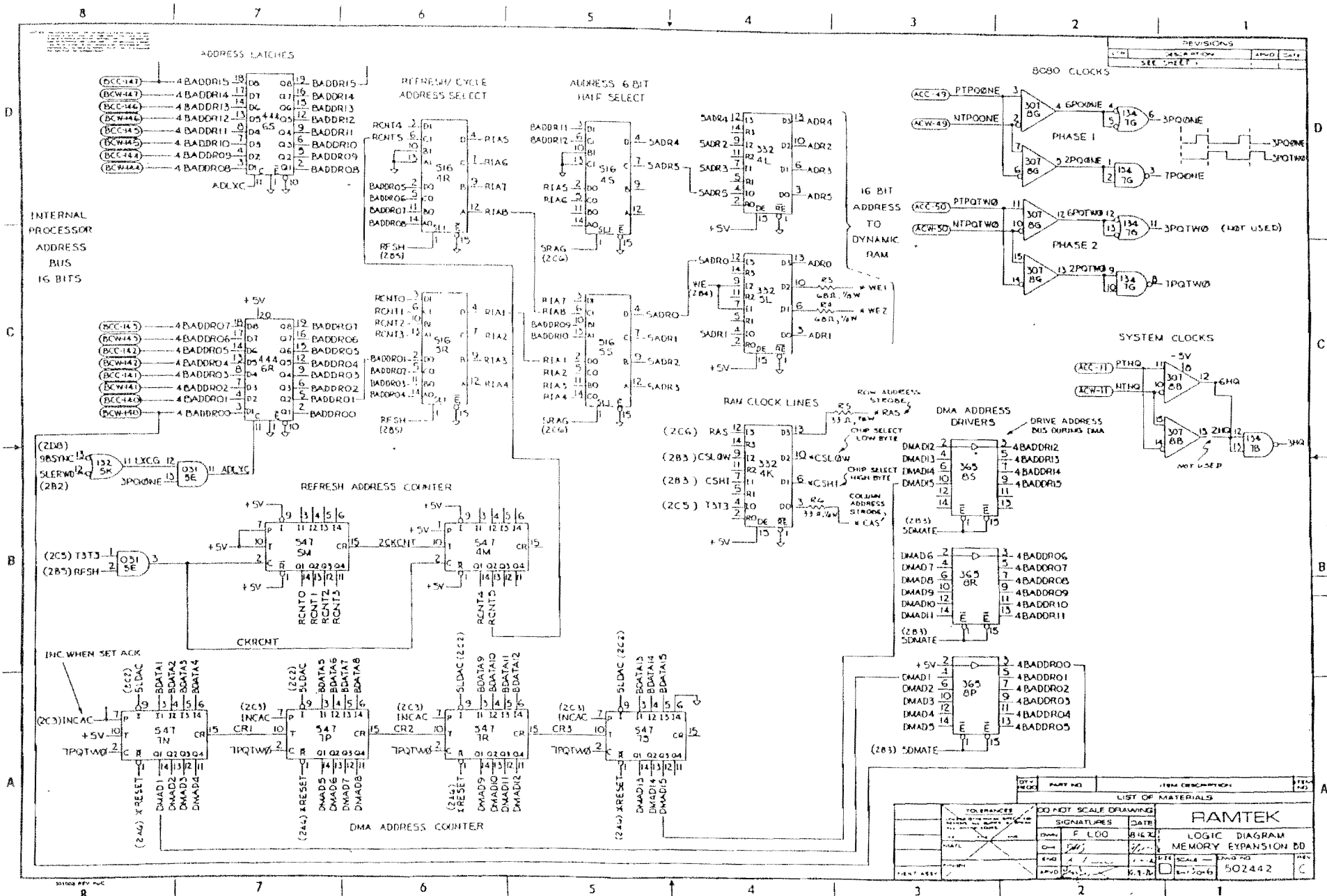
PLOT SCALE DRAWING		RAMTEK	
SIG. LABELS	DATE	ASSEMBLY	MEMORY EXPANSION
7	1/77		
8			
9			
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100			

REVISIONS			
REV	DESCRIPTION	APPROV	DATE
A	EMERG REL 2/20/74	MLC	2/20/74
B	ISS 2/20/74	MLC	2/20/74
C	ISS 2/27/74	MTY	2/27/74



QTY	PART NO.	ITEM DESCRIPTION	REV. NO.
LIST OF MATERIALS			
RAMTEK			
MEMORY EXPANSION CARD			
BLOCK DIAGRAM			
REV	DATE	BY	CHK
1	2/20/74	MLC	MLC
2	2/27/74	MTY	MLC
PART NO. 502442		REV. C	





REV	WORKS	PART NO.	ITEM DESCRIPTION	REV

TOLERANCES		DO NOT SCALE DRAWINGS	
UNLESS SPECIFIED	ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED	DATE	8/16/72
FRAM	DATE	SIGNATURES	
ENG	DATE	F. LOO	
CHK	DATE		
APP'D	DATE		

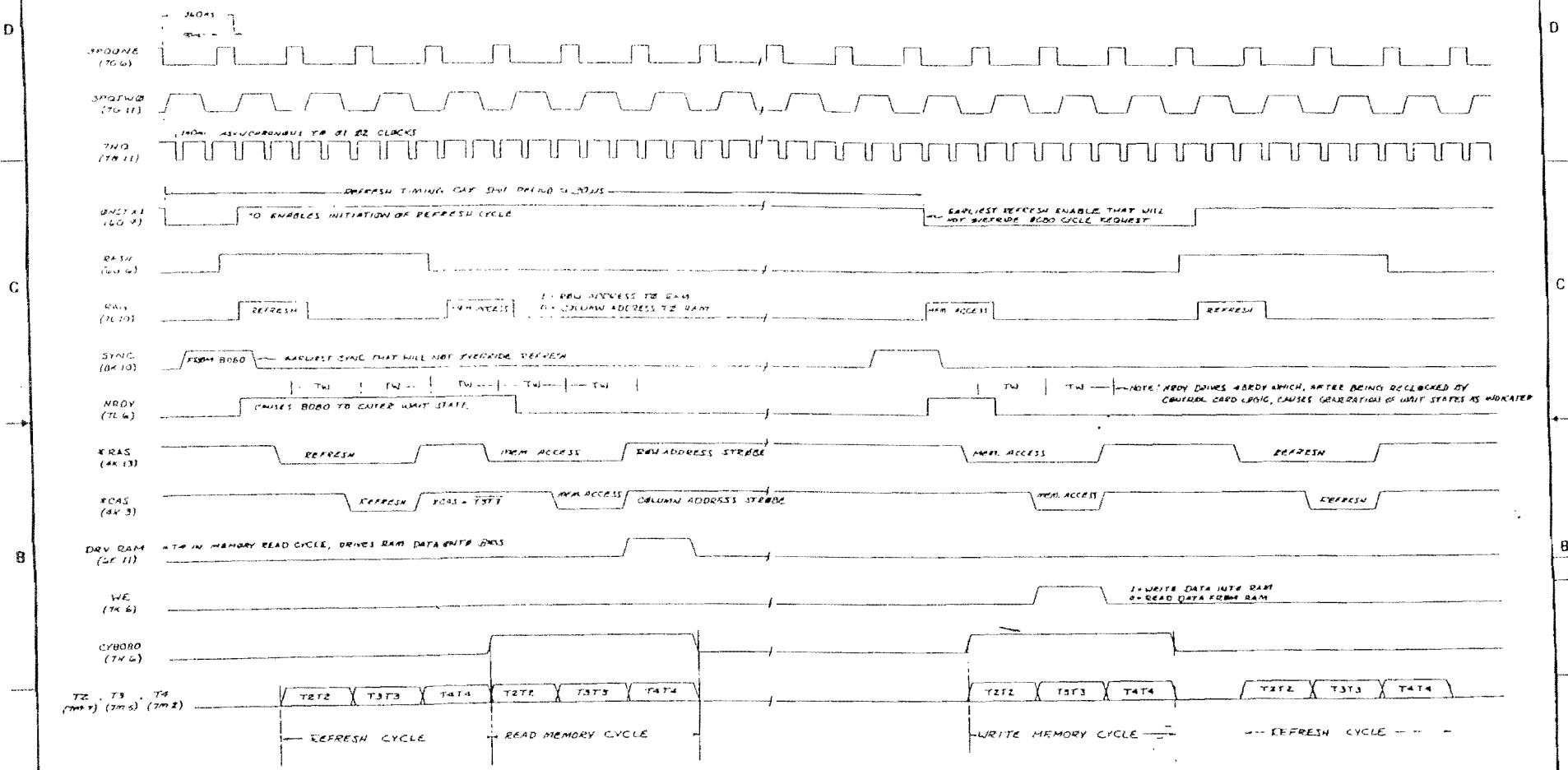
LIST OF MATERIALS			
QTY	PART NO.	ITEM DESCRIPTION	REV

<b>RAMTEK</b> LOGIC DIAGRAM MEMORY EXPANSION BD	
PART NO. 502442 REV. 1	DATE 8-1-72 BY F. LOO

REV. NO.		DESCRIPTION		DATE
1	1	1	1	1

MEMORY ACCESS / REFRESH TIMING



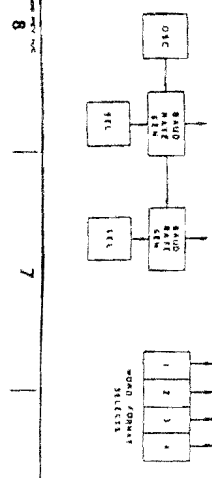
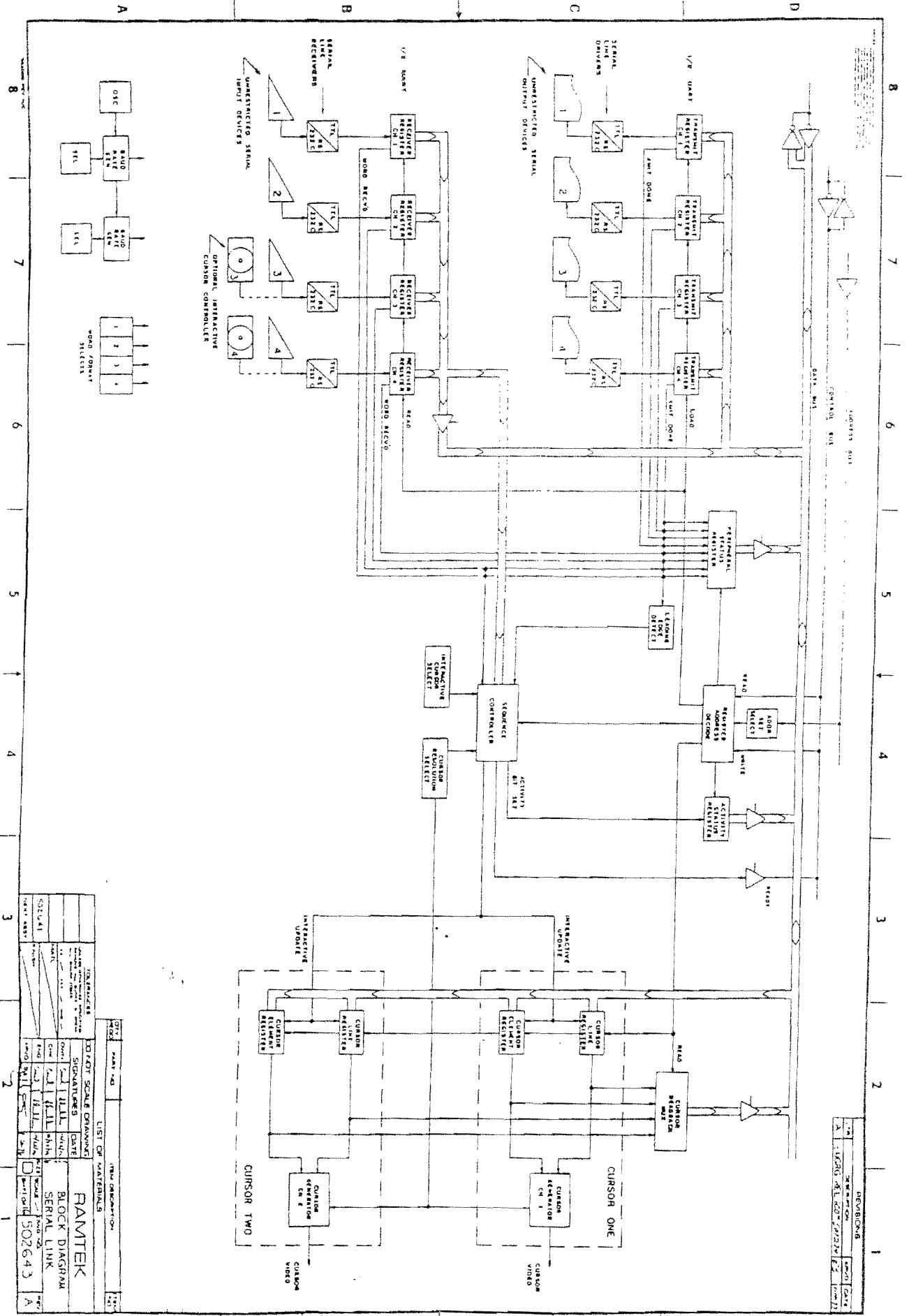
QTY	PART #	ITEM DESCRIPTION	UNIT
-----	--------	------------------	------

TOLERANCES		DO NOT SCALE DRAWING	
DATE	SIGNATURES	DATE	
CHK		DATE	
ENG		DATE	
APPV		DATE	

LIST OF MATERIALS

RAMTEK	
MEMORY OPTION CARD	
MEMORY ACCESS / REFRESH TIMING	
REV	502442





REVISIONS		DATE		BY	
1	ASSEMBLY	11/11/68	11/11/68	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...

REVISIONS		DATE		BY	
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...

REVISIONS		DATE		BY	
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...

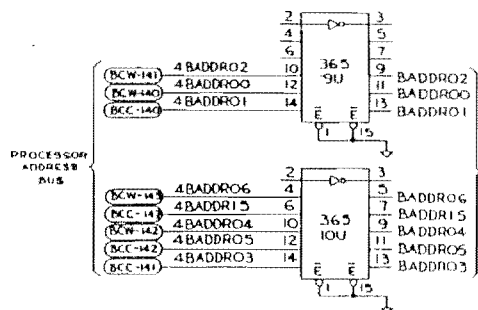
**RAMTEK**  
 BLOCK DIAGRAM  
 SERIAL LINK  
 502643  
 A



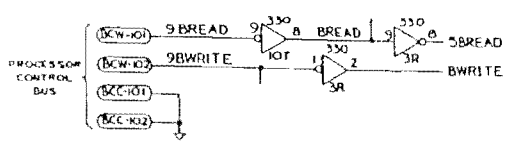
# PROCESSOR BUS BUFFERS

REVISIONS			
NO.	DESCRIPTION	AMVD	DATE
1	SEE SHEET 1		

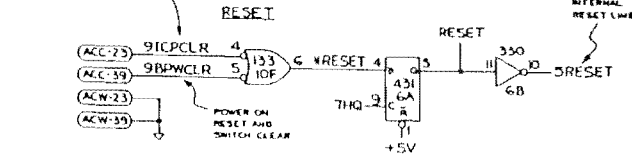
## ADDRESS BUS BUFFERS



## CONTROL BUS BUFFERS

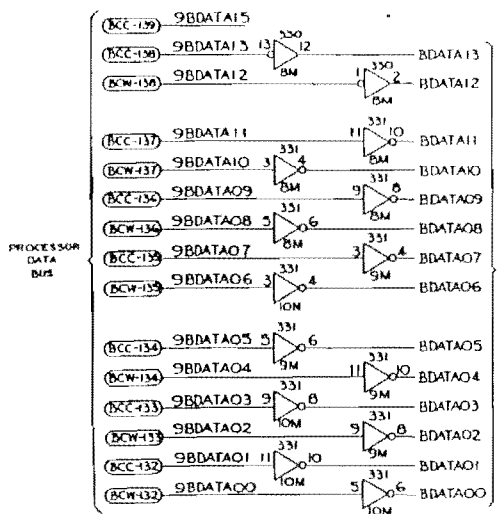


## INTERFACE COMPUTER CLEAR



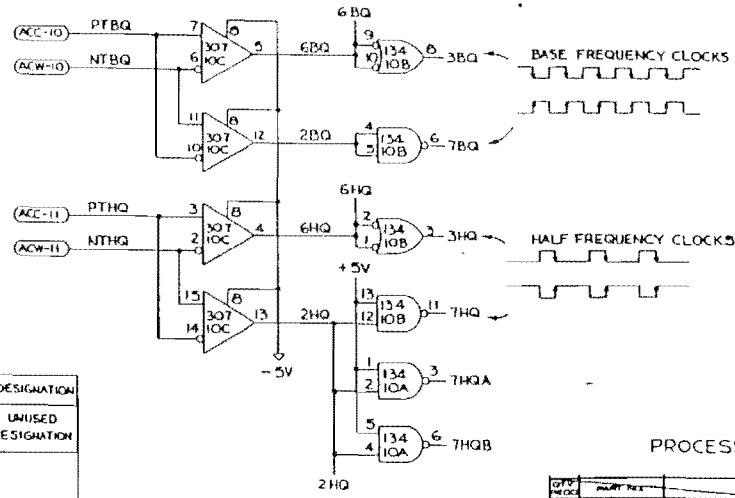
NOTES: UNLESS OTHERWISE SPECIFIED  
 1. ALL RESISTANCE VALUES ARE IN OHMS.  
 2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.

## DATA BUS BUFFERS



BUFFERED INTERNAL PROCESSOR DATA BUSES GOER TO EACH REGISTER OF THE SERIAL LINK CARD THAT CAN BE LOADED. EACH REGISTER THAT CAN BE READ BACK HAS ITS OWN BUS DRIVER TO DRIVE THE PROCESSOR DATA BUS DIRECTLY.

## SYSTEM CLOCKS



HIGHEST ONE USED	UNUSED DESIGNATION
R - RG	
C - CG	
Q - CQ	
L - CL	
CR - CR	
VR - VR	
E - E44	
Y - Y1	

## PROCESSOR BUS BUFFERS

QTY	PART NO.	ITEM DESCRIPTION	REV.

TOLERANCES		DO NOT SCALE DRAWING	
...	...	...	...

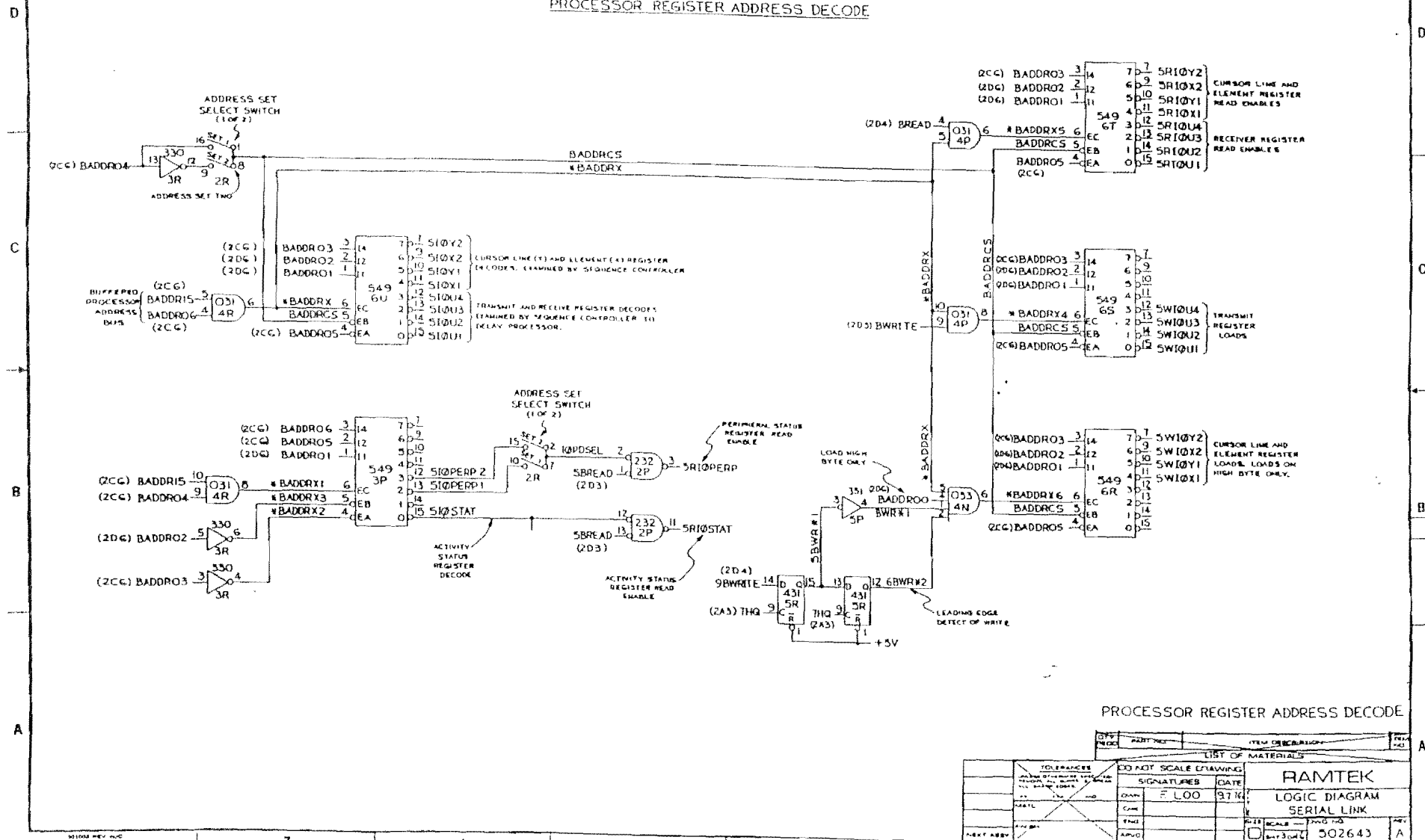
SIGNATURES	DATE
F. LOO	08 X

LIST OF MATERIALS	
RAMTEK	LOGIC DIAGRAM SERIAL LINK
SCALE	502643

REVISIONS			
NO.	DESCRIPTION	APPROV.	DATE
1	SEE SHEET 1		

PROCESSOR REGISTER ADDRESS DECODE



PROCESSOR REGISTER ADDRESS DECODE

LIST OF MATERIALS			
QTY	PART NO.	ITEM DESCRIPTION	REV.

TOLERANCES		DO NOT SCALE DRAWING	
UNLESS SPECIFIED	UNLESS SPECIFIED	SIGNATURES	DATE
FRACTIONS	FRACTIONS	F. LOO	97K
DECIMALS	DECIMALS		
ANGLES	ANGLES		
SPACES	SPACES		

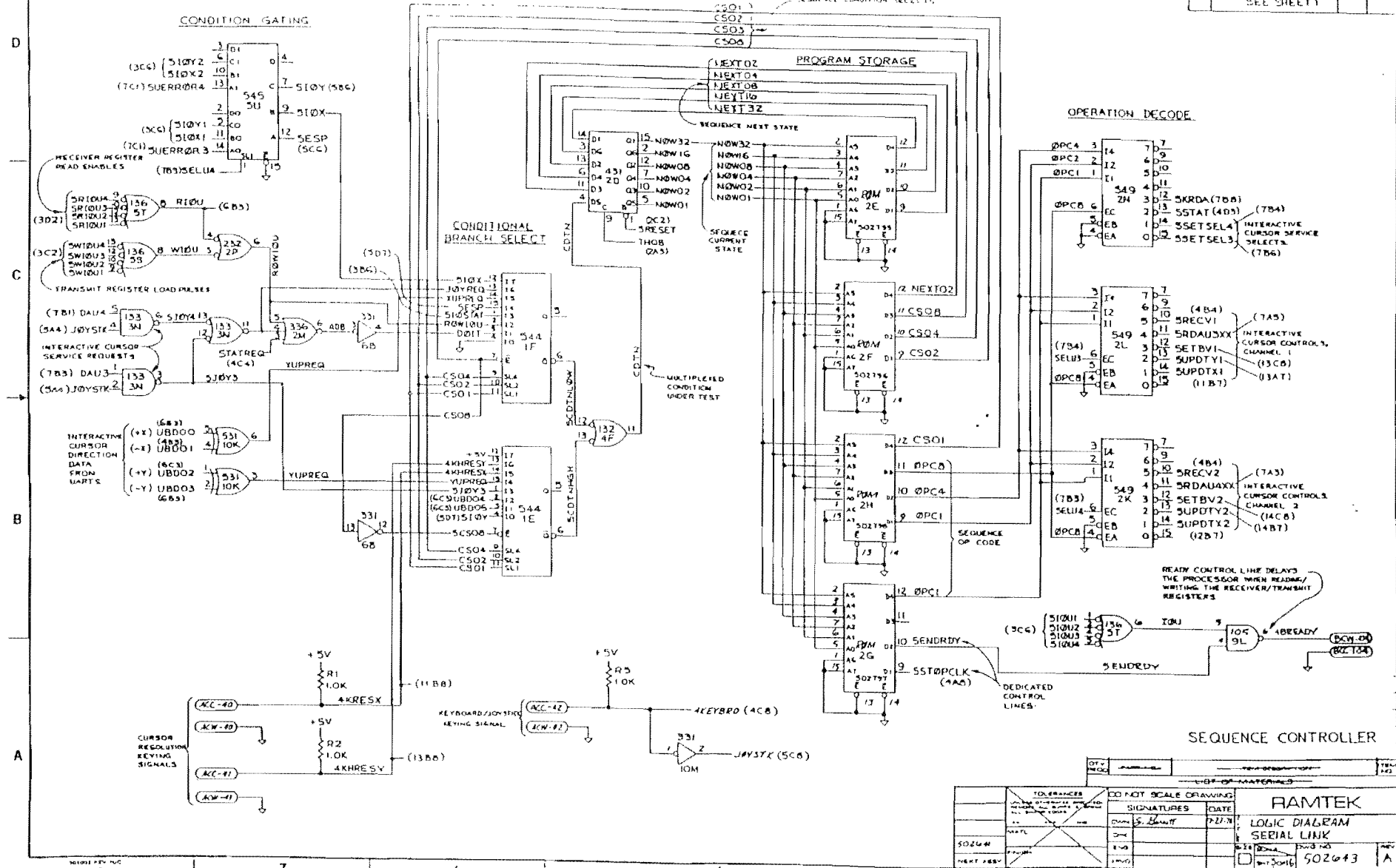
DRAWN BY: [ ]		CHECKED BY: [ ]	
DATE: [ ]		DATE: [ ]	
SCALE: 1:1		SCALE: 1:1	
REV: 3/04		REV: 3/04	
PART NO: 302643		PART NO: 302643	

74181 REV. 10/68



REVISIONS		
NO.	DESCRIPTION	DATE
1	SEE SHEET 1	

### SEQUENCE CONTROLLER



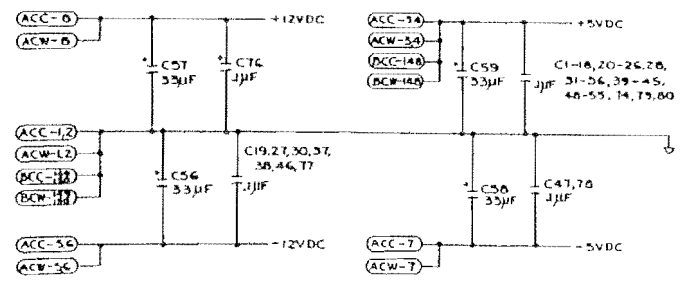
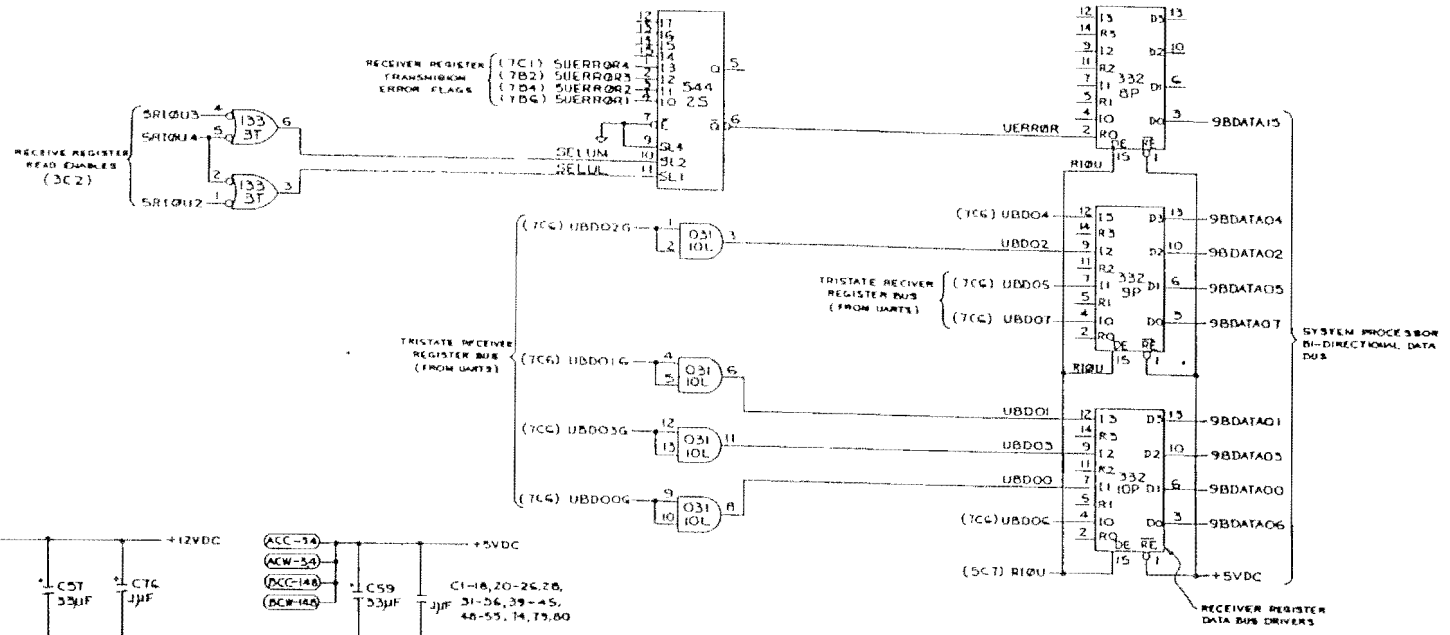
### SEQUENCE CONTROLLER

TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED	RESISTORS	SIGNATURES	DATE
±0.5%	±1%		9/27/78
±1%	±5%		
±5%	±10%		
±10%	±20%		
±20%	±50%		
±50%	±100%		

**RAMTEK**  
LOGIC DIAGRAM  
SERIAL LINK  
502643

REVISIONS			
NO.	DESCRIPTION	APP'D	DATE
1	SEE SHEET 1		

RECEIVER REGISTER BUS DRIVERS



RECEIVER REGISTER BUS DRIVERS

QTY	PART NO.	ITEM DESCRIPTION	REV.

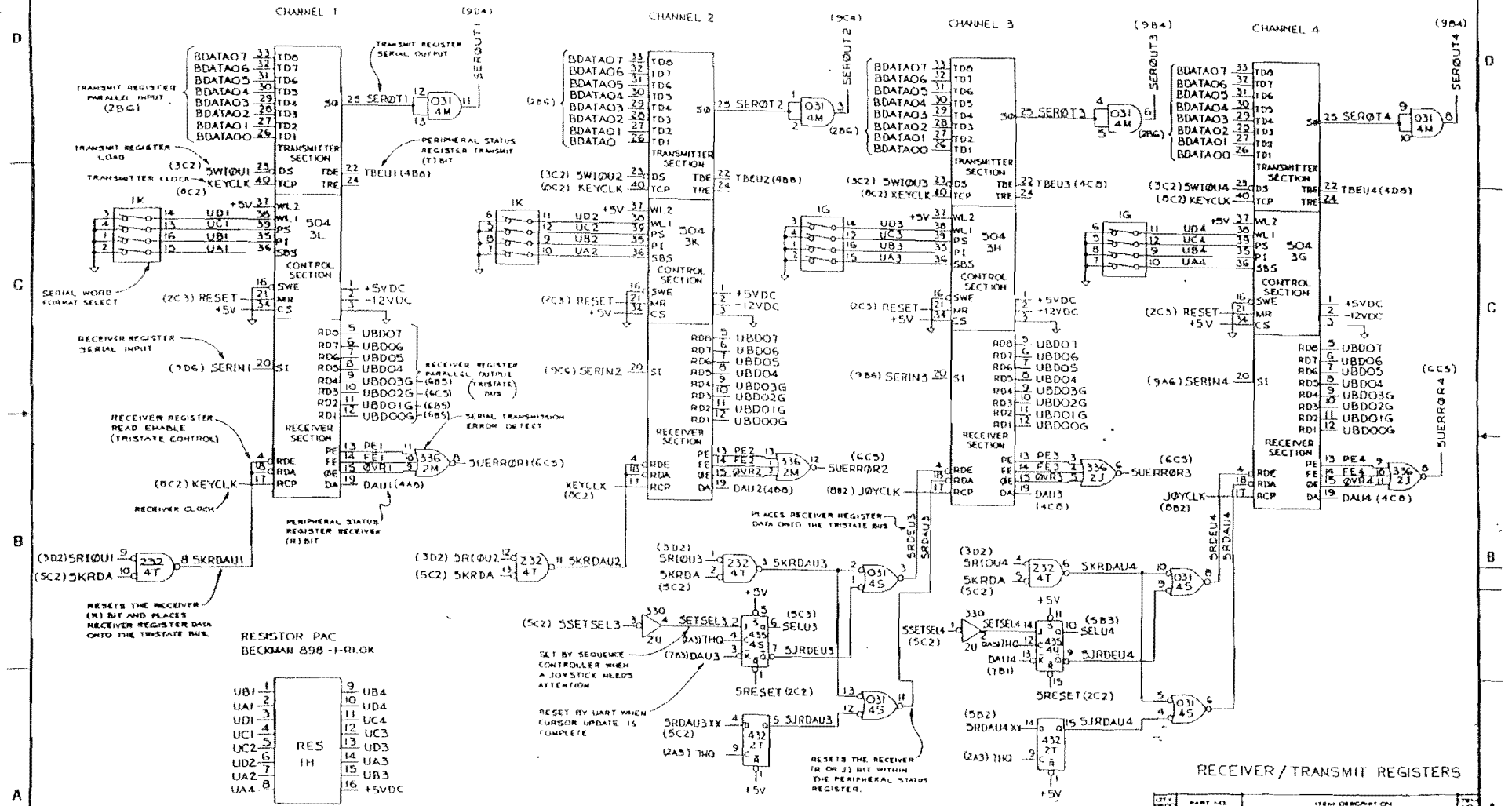
LIST OF MATERIALS			
DO NOT SCALE DRAWING	SIGNATURES	DATE	
CHK	F L O O	2/1/72	
END			
APP'D			

RAMTEK	
LOGIC DIAGRAM	
SERIAL LINK	
SCALE	70% NG
REV	502643

RECEIVER / TRANSMIT REGISTERS

REVISIONS			
REV.	DESCRIPTION	APP'D	DATE
1	SEE SHEET 1		



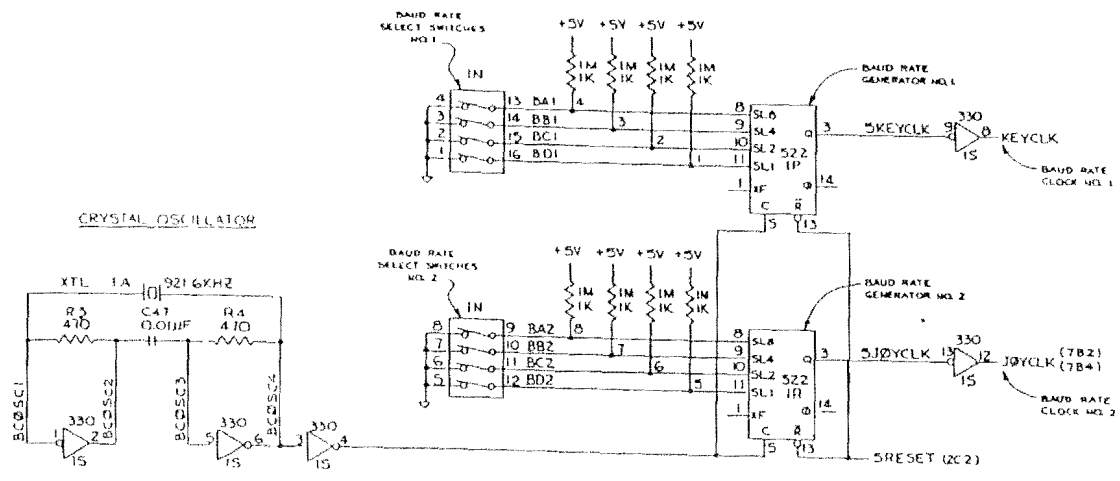
RECEIVER / TRANSMIT REGISTERS

REV.	PART NO.	ITEM DESCRIPTION	REV.
1		LIST OF MATERIALS	1

DESIGNER		DO NOT SCALE DRAWING	
DRAWN		SIGNATURES	
CHECKED		DATE	
APPROVED		F L O O 910X	
		RAMTEK	
		LOGIC DIAGRAM	
		SERIAL LINK	
		SCALE - 200% MAG	
		502643	

REVISIONS			
NO.	DESCRIPTION	APPROV.	DATE
1	SEE SHEET 1		

### BAUD RATE GENERATORS



### BAUD RATE GENERATORS

QTY	PART NO.	ITEM DESCRIPTION	TEST NO.																								
LIST OF MATERIALS																											
<table border="1"> <thead> <tr> <th colspan="2">TOLERANCES</th> <th colspan="2">DO NOT SCALE DRAWING</th> </tr> <tr> <th>UNLESS SPECIFIED</th> <th>USE</th> <th>DATE</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>...</td> <td>...</td> <td>F L O O</td> <td>9111</td> </tr> <tr> <td>...</td> <td>...</td> <td>OWN</td> <td></td> </tr> <tr> <td>...</td> <td>...</td> <td>AND</td> <td></td> </tr> <tr> <td>...</td> <td>...</td> <td>APRO</td> <td></td> </tr> </tbody> </table>				TOLERANCES		DO NOT SCALE DRAWING		UNLESS SPECIFIED	USE	DATE	DATE	...	...	F L O O	9111	...	...	OWN		...	...	AND		...	...	APRO	
TOLERANCES		DO NOT SCALE DRAWING																									
UNLESS SPECIFIED	USE	DATE	DATE																								
...	...	F L O O	9111																								
...	...	OWN																									
...	...	AND																									
...	...	APRO																									
SIGNATURES		DATE																									
DRAWN		DATE																									
CHECKED		DATE																									
APPROVED		DATE																									
NEXT ASSY		DATE																									
SCALE		PART NO.																									
SCALE - 1:1		502643																									
REV. DATE		REV. DATE																									
REV. DATE		REV. DATE																									

**RAMTEK**

LOGIC DIAGRAM

SERIAL LINK

502643

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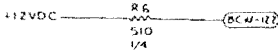
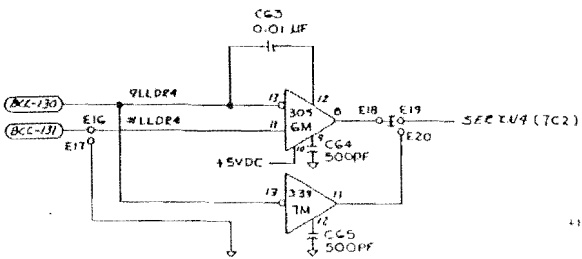
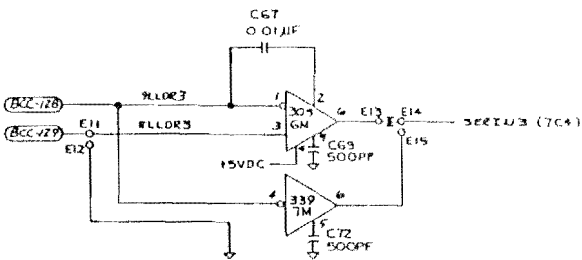
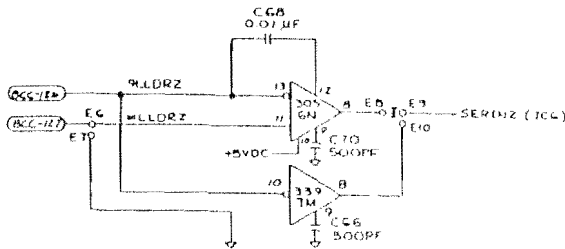
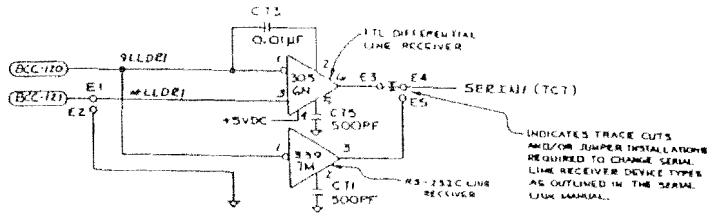
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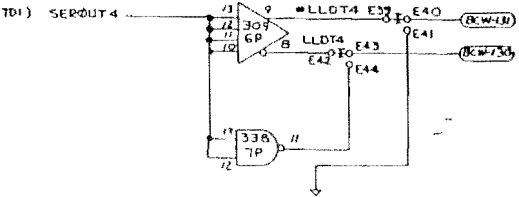
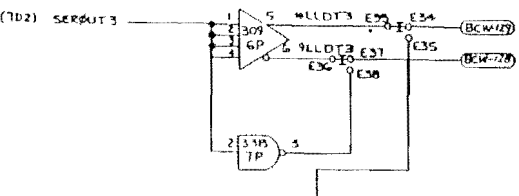
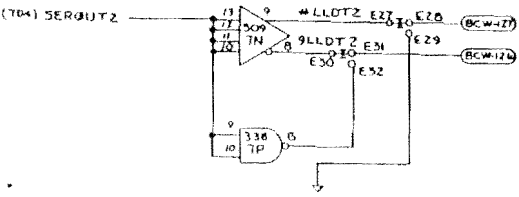
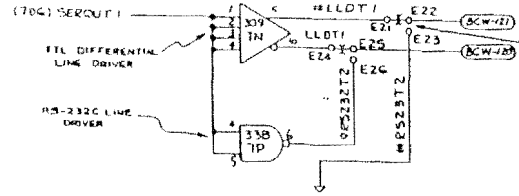
2

1

SERIAL LINE RECEIVERS



SERIAL LINE DRIVERS



INDICATES TRACE CUTS AND/OR JUMPER INSTALLATIONS REQUIRED TO CHANGE SERIAL LINE DRIVER DEVICE TYPES AS OBTAINED IN THE SERIAL LINK MANUAL.

REVISIONS		
NO.	DESCRIPTION	DATE
1	SEE SHEET ONE	

SERIAL LINE DRIVERS/RECEIVERS

DRAWN BY		CHECKED BY		APPROVED BY	
DO NOT SCALE DRAWING					
SIGNATURES		DATE			
DATE		PROJECT NO.			
PART NO.		REV.			
NEXT REV.		REV. NO.			

RAMTEK  
LOGIC DIAGRAM  
SERIAL LINK  
502643

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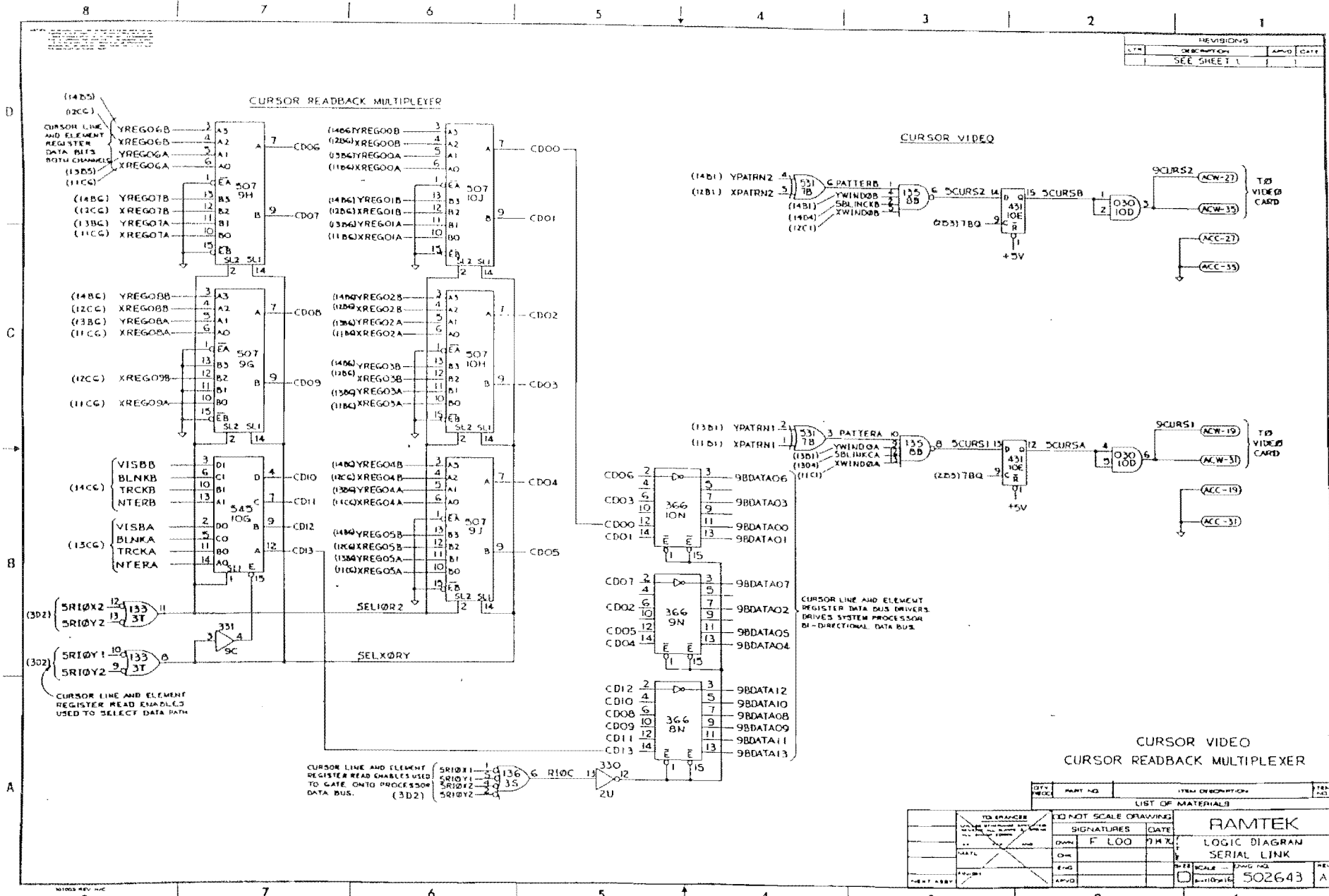
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2

1



REVISIONS		
NO.	DESCRIPTION	DATE
1	SEE SHEET 1	

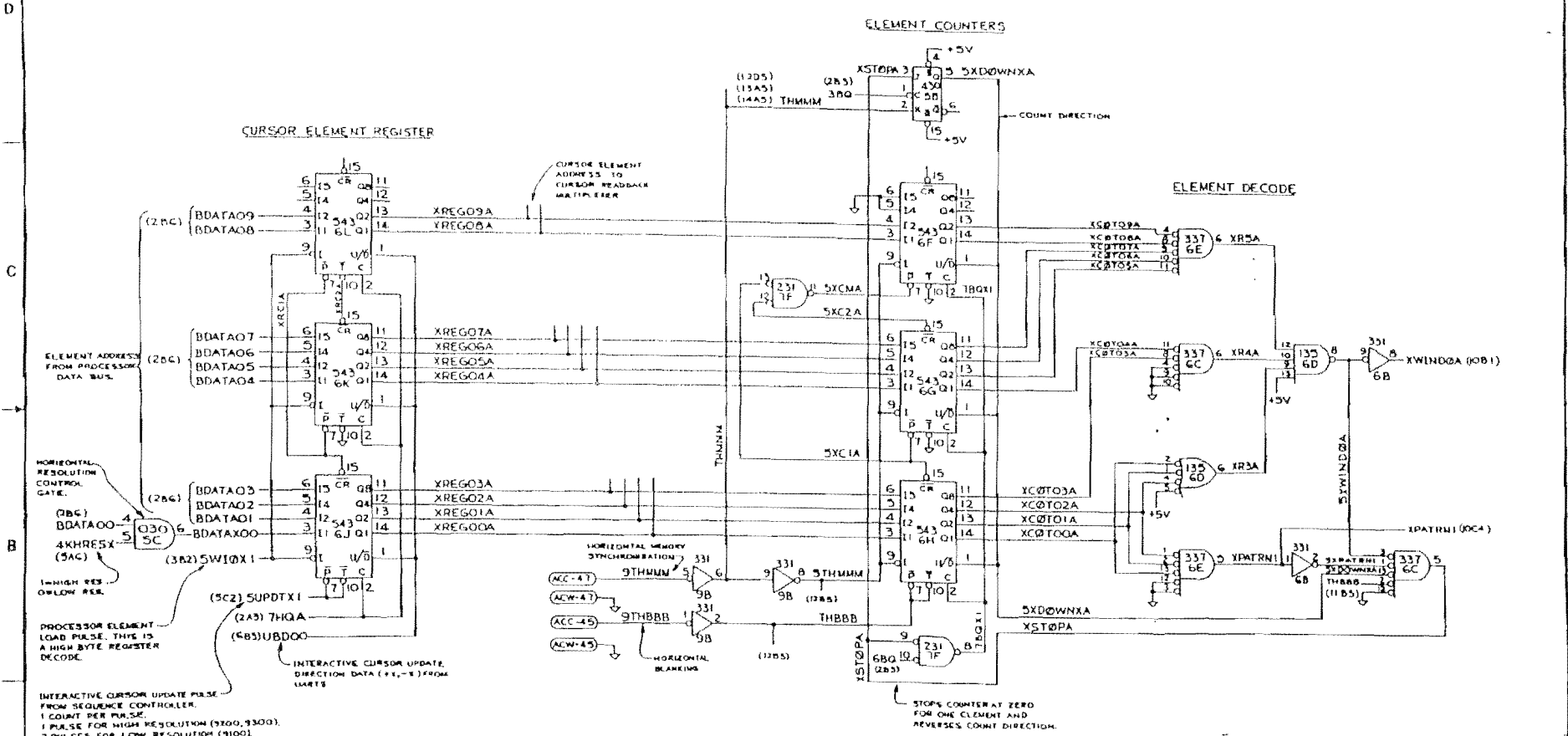


CURSOR VIDEO  
CURSOR READBACK MULTIPLEXER

DATE	PART NO.	ITEM DESCRIPTION	REV.
		LIST OF MATERIALS	
DO NOT SCALE DRAWING			
SIGNATURES		DATE	
DRWN	F LOO	THX	
CHK			
ENG			
TEST			
NEXT ASSY			
SCALE - PART NO.			REV.
502643			A

# CURSOR ELEMENT REGISTER — CHANNEL ONE

REVISIONS		
NO.	DESCRIPTION	APPROV. DATE
1	SEE SHEET 1	



1. HIGH RES. OVLW RES.  
2. PULSES FOR LOW RESOLUTION (91001)  
1. PULSE FOR HIGH RESOLUTION (9100, 9300).  
1. COUNT PER PULSE.  
1. FROM SEQUENCE CONTROLLER.

INTERACTIVE CURSOR UPDATE, DIRECTION DATA (+1, -1) FROM UMETS  
(2A3) 7HQ4  
(K83) UBDDO

INTERACTIVE CURSOR UPDATE PULSE FROM SEQUENCE CONTROLLER.  
1. COUNT PER PULSE.  
1. PULSE FOR HIGH RESOLUTION (9100, 9300).  
2. PULSES FOR LOW RESOLUTION (91001)

## CURSOR ELEMENT REGISTER CHANNEL ONE

LIST OF MATERIALS			
QTY	PART NO.	ITEM DESCRIPTION	REV.

TOLERANCES UNLESS OTHERWISE SPECIFIED		DO NOT SCALE DRAWING	
FRONT	DATE	SIGNATURES	DATE
ENG	9/15/76	F. LOO	
APP'D			
SCALE - PART NO.	502643		

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# CURSOR ELEMENT REGISTER — CHANNEL TWO

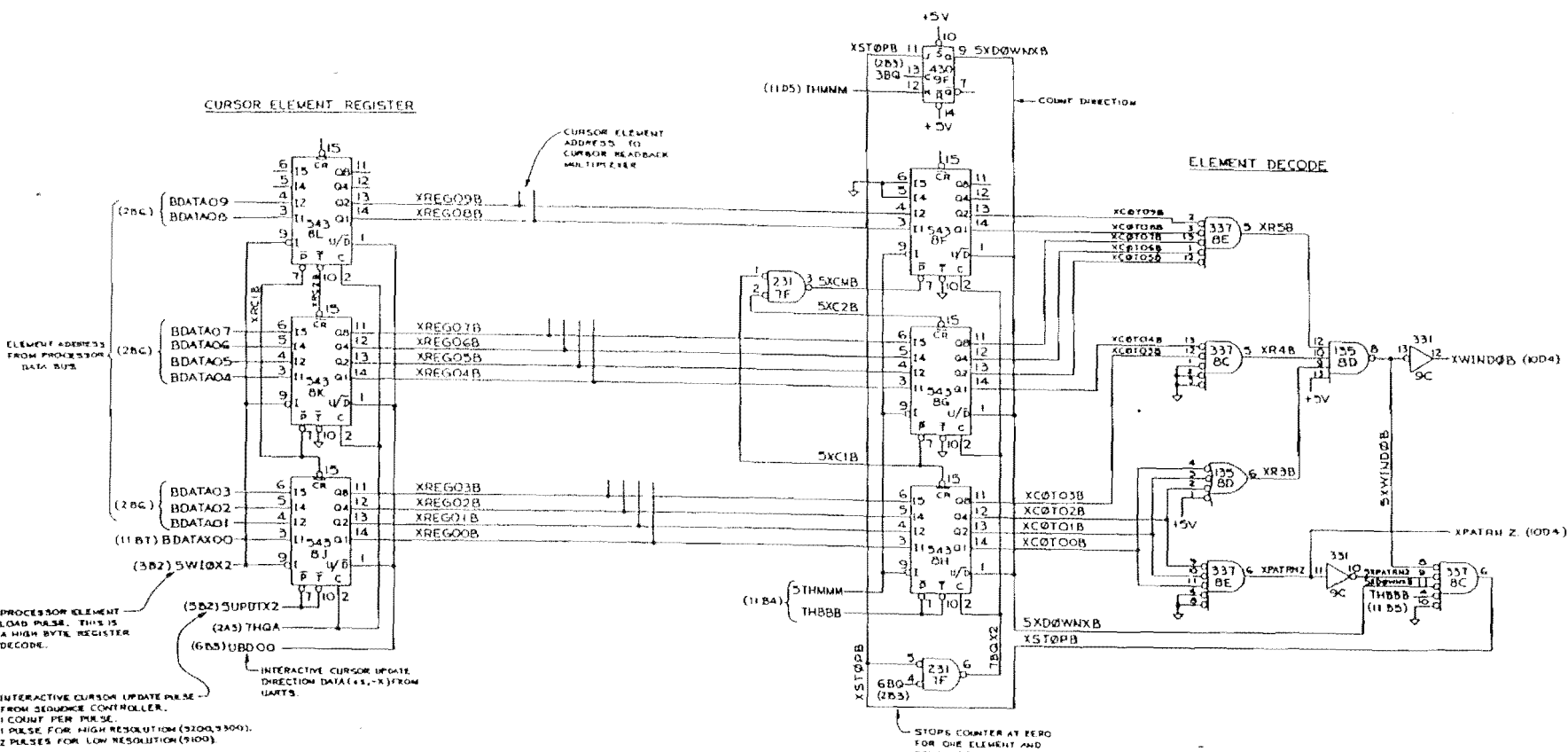
REVISIONS		
NO.	DESCRIPTION	APPRO. DATE
	SEE SHEET 1	

D

C

B

A



CURSOR ELEMENT REGISTER

ELEMENT COUNTERS

ELEMENT DECODE

ELEMENT ADDRESS FROM PROCESSOR DATA BUS

PROCESSOR ELEMENT LOAD PULSE. THIS IS A HIGH BYTE REGISTER DECODE.

INTERACTIVE CURSOR UPDATE PULSE FROM SEQUENCE CONTROLLER. 1 COUNT PER PULSE. 1 PULSE FOR HIGH RESOLUTION (2500, 3500). 2 PULSES FOR LOW RESOLUTION (9100).

CURSOR ELEMENT ADDRESS TO CURSOR READBACK MULTIPLEXER

STOPS COUNTER AT ZERO FOR ONE ELEMENT AND REVERSES COUNT DIRECTION.

## CURSOR ELEMENT REGISTER CHANNEL TWO

REV	DATE	PART NO.	ITEM DESCRIPTION	REV

LIST OF MATERIALS	

TOLERANCES	DO NOT SCALE DRAWING	SIGNATURES	DATE

RAMTEK	
LOGIC DIAGRAM SERIAL LINK	
REV. 2.2	DATE 9/16/81
REV. 2.0	DATE 5/20/81
REV. 1.0	DATE 5/20/81
REV. 0.1	DATE 5/20/81

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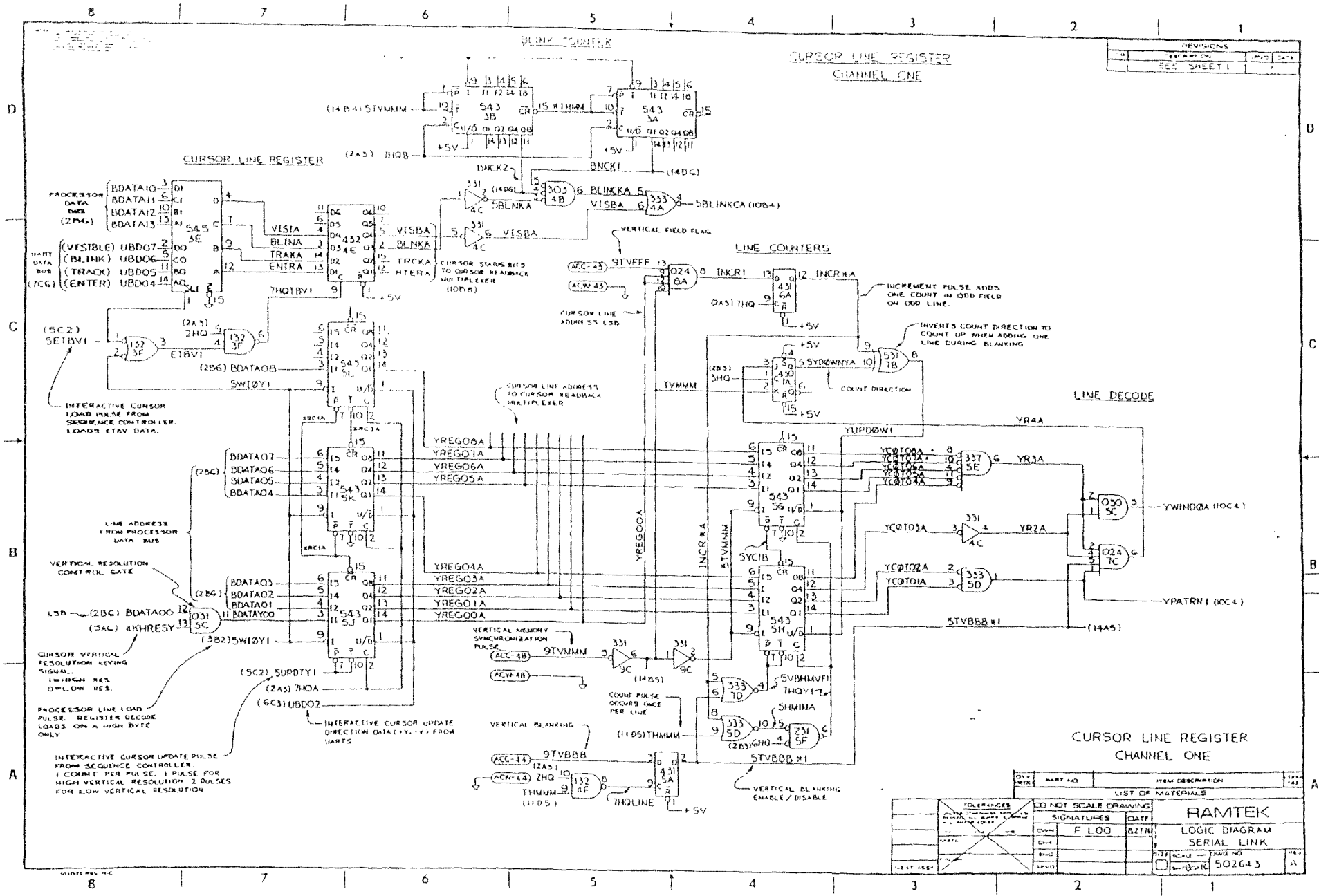
5

4

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2

1



QTY	PART NO.	ITEM DESCRIPTION	REV.
		LIST OF MATERIALS	
		DO NOT SCALE DRAWING	
		SIGNATURES	DATE
		OWN	F. LOO
		CHKD	
		ENG	
		APPD	
		SCALE	PAGE NO.
		REVISED	502643

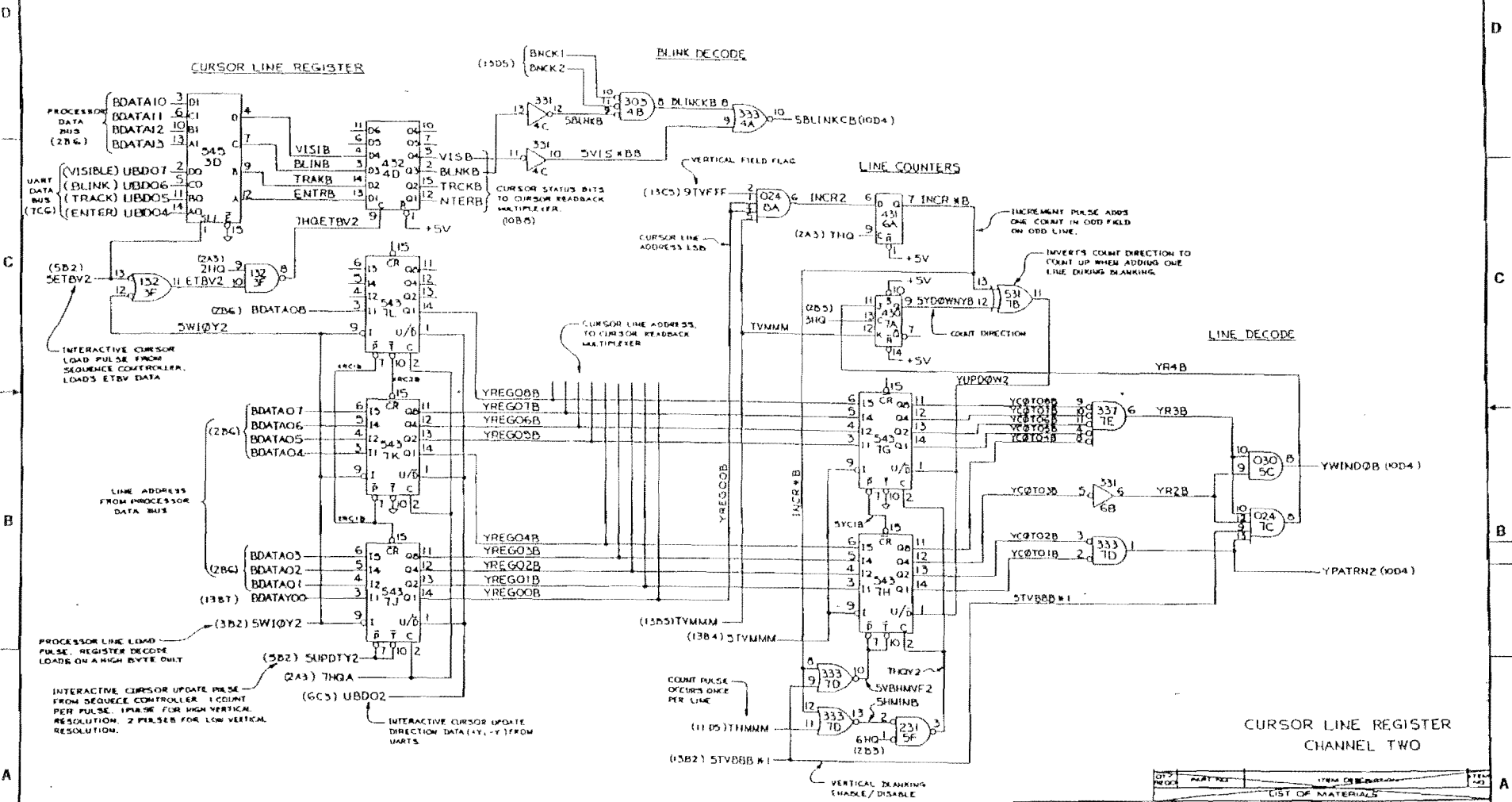
**RAMTEK**

**LOGIC DIAGRAM**

**SERIAL LINK**

CURSOR LINE REGISTER — CHANNEL TWO

REVISIONS		
NO.	DESCRIPTION	APPRO. DATE
1	SEE SHEET 1	



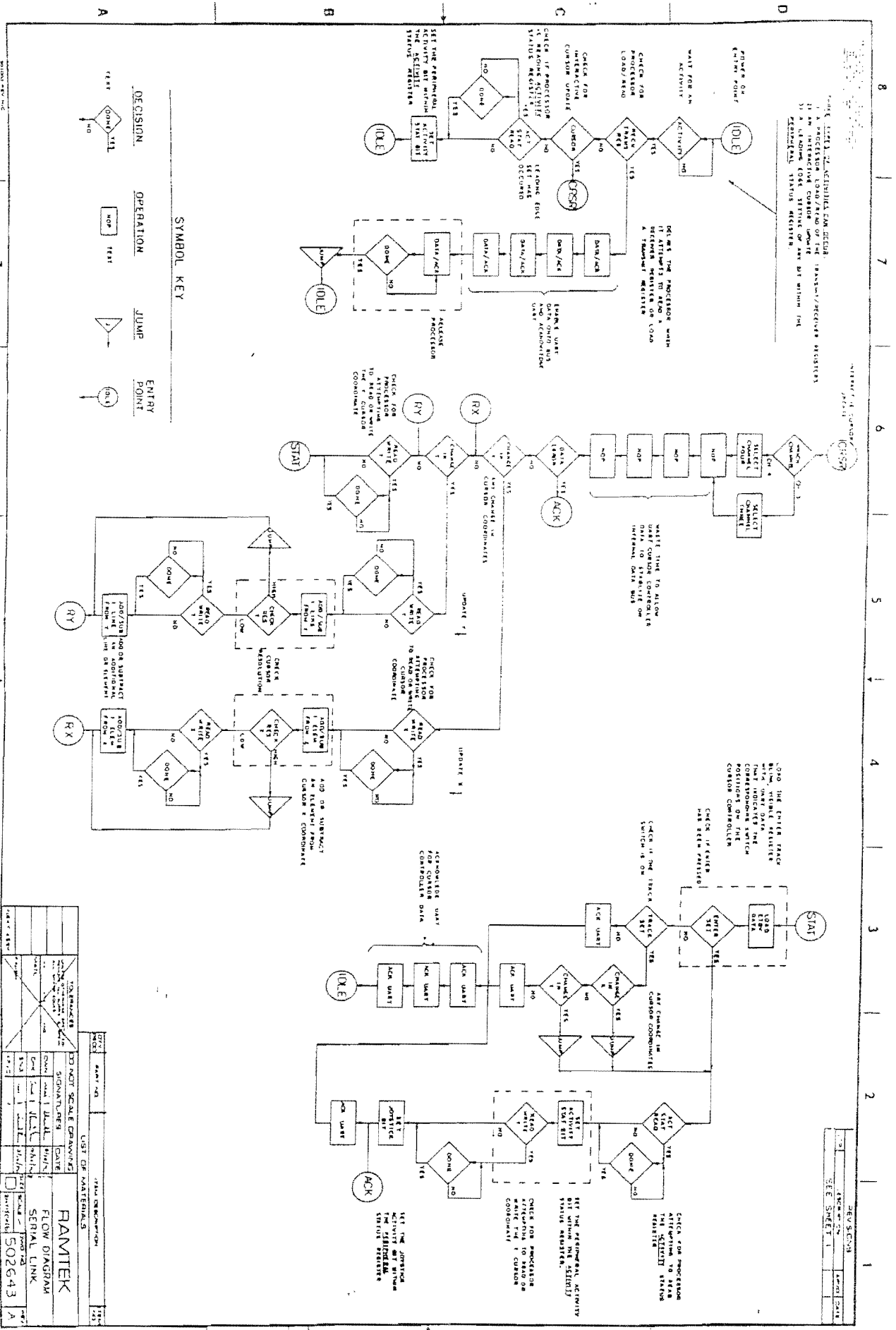
CURSOR LINE REGISTER CHANNEL TWO

DATE	BY	ITEM OR REVISION	REV.

DO NOT SCALE DRAWING		SIGNATURES		DATE	
CHKD	FLOO				
CHKD	ENG				
CHKD	APPRO				
SCALE — 1:1		SCALE — 1:1		REV	
PART NO.		PART NO.		REV	
RAMTEK		LOGIC DIAGRAM		SERIAL LINK	
002643		002643		A	

NOTE: SERIAL LINK NETWORK IS IN USE  
 1) A LAMING CODE, EITHER OF THE BI WITHIN THE  
 NETWORK STATUS REGISTER.

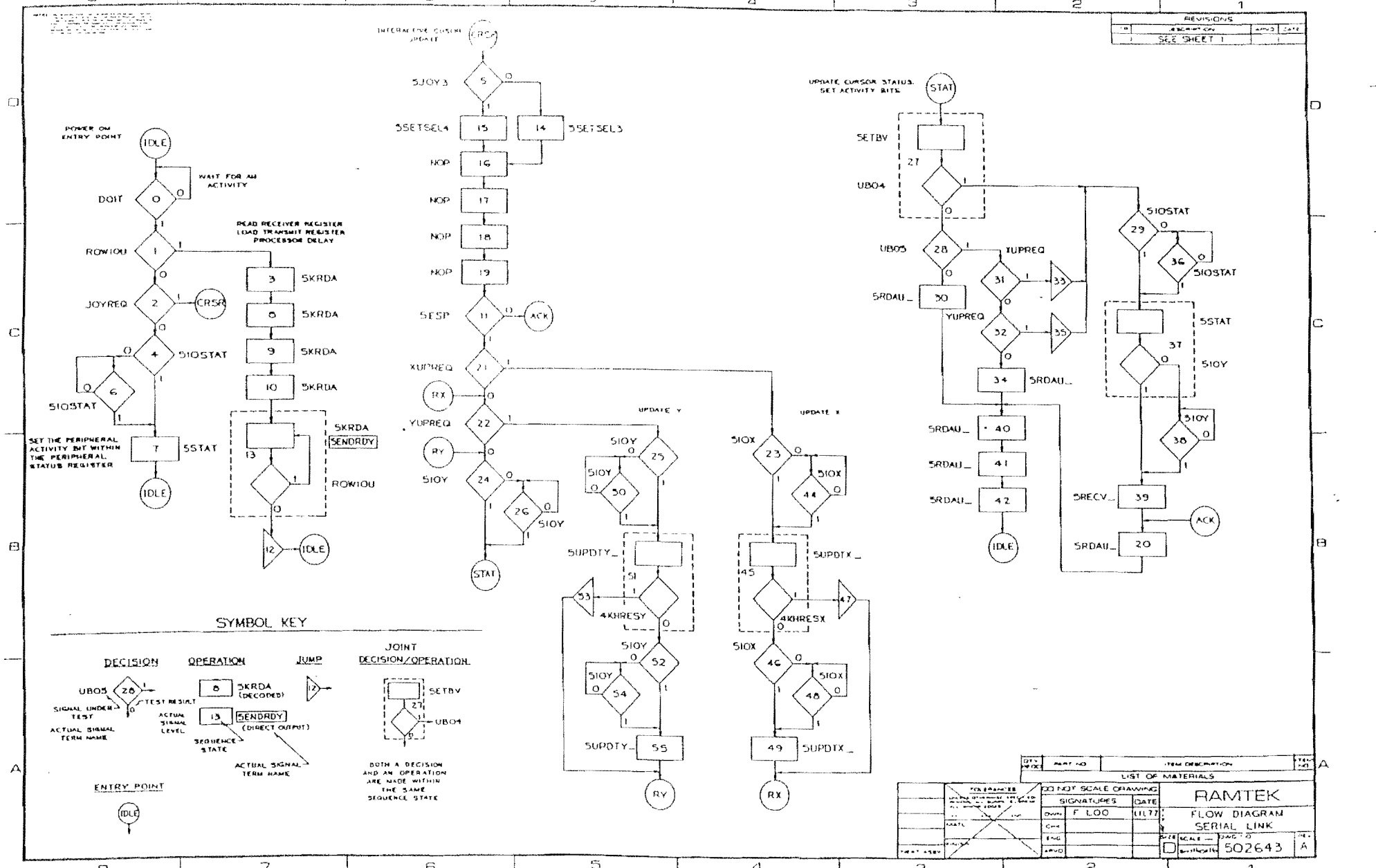
NOTE: SERIAL LINK NETWORK IS IN USE  
 1) A LAMING CODE, EITHER OF THE BI WITHIN THE  
 NETWORK STATUS REGISTER.



REV. 10/78  
 SHEET 1 OF 1  
 502643

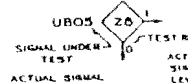
LIST OF MATERIALS	
NO. PART NO.	DESCRIPTION
1	RAMTEK
2	FLOW DIAGRAM
3	SERIAL LINK
4	502643

REVISIONS		
NO	DESCRIPTION	APPROV
1	SEE SHEET 1	



**SYMBOL KEY**

**DECISION**



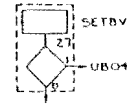
**OPERATION**



**JUMP**



**JOINT DECISION/OPERATION**



BOTH A DECISION AND AN OPERATION ARE MADE WITHIN THE SAME SEQUENCE STATE

DATE	PART NO	ITEM DESCRIPTION	REV
		LIST OF MATERIALS	
		RAMTEK	
		FLOW DIAGRAM	
		SERIAL LINK	
		SCALE - 1/8" = 1"	
		DRAWING NUMBER	
		502643	







NO.	FROM	TO	CONTRACT	TERM	NAME	DESCRIPTION
58	PZ-105	15-5			HLDDTL	TRAIL IN
59	-207	15-4			HLDDTL	TRAIL IN
60	-207	15-4			HLDDTL	TRAIL IN
61	-207	15-4			HLDDTL	TRAIL IN
62	-207	15-4			HLDDTL	TRAIL IN
63	-207	15-4			HLDDTL	TRAIL IN
64	-207	15-4			HLDDTL	TRAIL IN
65	-207	15-4			HLDDTL	TRAIL IN
66	-207	15-4			HLDDTL	TRAIL IN
67	-207	15-4			HLDDTL	TRAIL IN
68	-207	15-4			HLDDTL	TRAIL IN
69	-207	15-4			HLDDTL	TRAIL IN
70	-207	15-4			HLDDTL	TRAIL IN
71	-207	15-4			HLDDTL	TRAIL IN
72	-207	15-4			HLDDTL	TRAIL IN
73	-207	15-4			HLDDTL	TRAIL IN
74	-207	15-4			HLDDTL	TRAIL IN
75	-207	15-4			HLDDTL	TRAIL IN
76	-207	15-4			HLDDTL	TRAIL IN
77	-207	15-4			HLDDTL	TRAIL IN
78	-207	15-4			HLDDTL	TRAIL IN
79	-207	15-4			HLDDTL	TRAIL IN
80	-207	15-4			HLDDTL	TRAIL IN
81	-207	15-4			HLDDTL	TRAIL IN
82	-207	15-4			HLDDTL	TRAIL IN
83	-207	15-4			HLDDTL	TRAIL IN
84	-207	15-4			HLDDTL	TRAIL IN
85	-207	15-4			HLDDTL	TRAIL IN
86	-207	15-4			HLDDTL	TRAIL IN
87	-207	15-4			HLDDTL	TRAIL IN
88	-207	15-4			HLDDTL	TRAIL IN
89	-207	15-4			HLDDTL	TRAIL IN
90	-207	15-4			HLDDTL	TRAIL IN
91	-207	15-4			HLDDTL	TRAIL IN
92	-207	15-4			HLDDTL	TRAIL IN
93	-207	15-4			HLDDTL	TRAIL IN
94	-207	15-4			HLDDTL	TRAIL IN
95	-207	15-4			HLDDTL	TRAIL IN
96	-207	15-4			HLDDTL	TRAIL IN
97	-207	15-4			HLDDTL	TRAIL IN
98	-207	15-4			HLDDTL	TRAIL IN
99	-207	15-4			HLDDTL	TRAIL IN
100	-207	15-4			HLDDTL	TRAIL IN

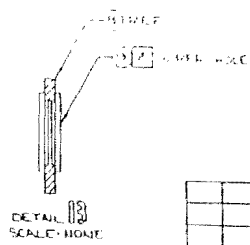
NO.	FROM	TO	CONTRACT	TERM	NAME	DESCRIPTION
101	-207	15-4			HLDDTL	TRAIL IN
102	-207	15-4			HLDDTL	TRAIL IN
103	-207	15-4			HLDDTL	TRAIL IN
104	-207	15-4			HLDDTL	TRAIL IN
105	-207	15-4			HLDDTL	TRAIL IN
106	-207	15-4			HLDDTL	TRAIL IN
107	-207	15-4			HLDDTL	TRAIL IN
108	-207	15-4			HLDDTL	TRAIL IN
109	-207	15-4			HLDDTL	TRAIL IN
110	-207	15-4			HLDDTL	TRAIL IN
111	-207	15-4			HLDDTL	TRAIL IN
112	-207	15-4			HLDDTL	TRAIL IN
113	-207	15-4			HLDDTL	TRAIL IN
114	-207	15-4			HLDDTL	TRAIL IN
115	-207	15-4			HLDDTL	TRAIL IN
116	-207	15-4			HLDDTL	TRAIL IN
117	-207	15-4			HLDDTL	TRAIL IN
118	-207	15-4			HLDDTL	TRAIL IN
119	-207	15-4			HLDDTL	TRAIL IN
120	-207	15-4			HLDDTL	TRAIL IN
121	-207	15-4			HLDDTL	TRAIL IN
122	-207	15-4			HLDDTL	TRAIL IN
123	-207	15-4			HLDDTL	TRAIL IN
124	-207	15-4			HLDDTL	TRAIL IN
125	-207	15-4			HLDDTL	TRAIL IN
126	-207	15-4			HLDDTL	TRAIL IN
127	-207	15-4			HLDDTL	TRAIL IN
128	-207	15-4			HLDDTL	TRAIL IN
129	-207	15-4			HLDDTL	TRAIL IN
130	-207	15-4			HLDDTL	TRAIL IN

**LIST OF MATERIALS**  
 DISTRICTION NAME: **PAMTEK**  
 DISTRICTION CODE: **633V 9300**  
 DATE: **5/27/69**  
 BY: **8**

**ODDLOT SCALE DRAWING**  
 SIGNATURES:  
 DATE: **5/27/69**  
 BY: **8**

NOTES: UNLESS OTHERWISE SPECIFIED  
 1. REFERENCE DRAWING SHOULD FOR LOCATION OF PIN NUMBERS OF 104 PIN CONNECTOR

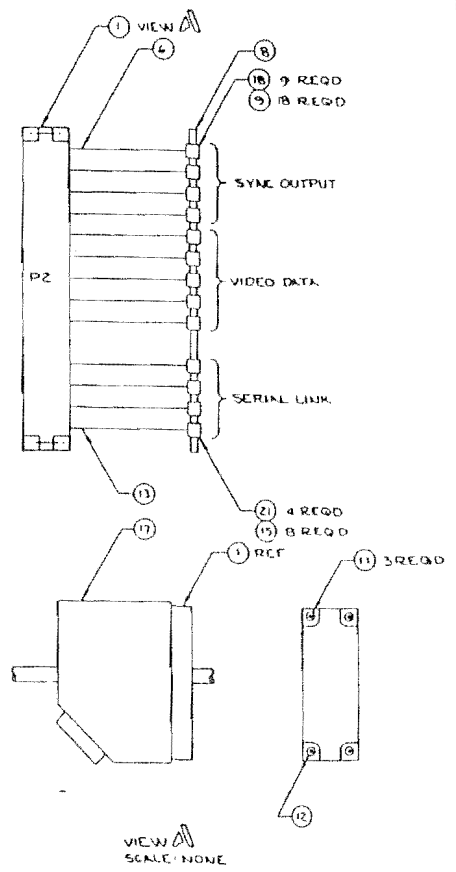
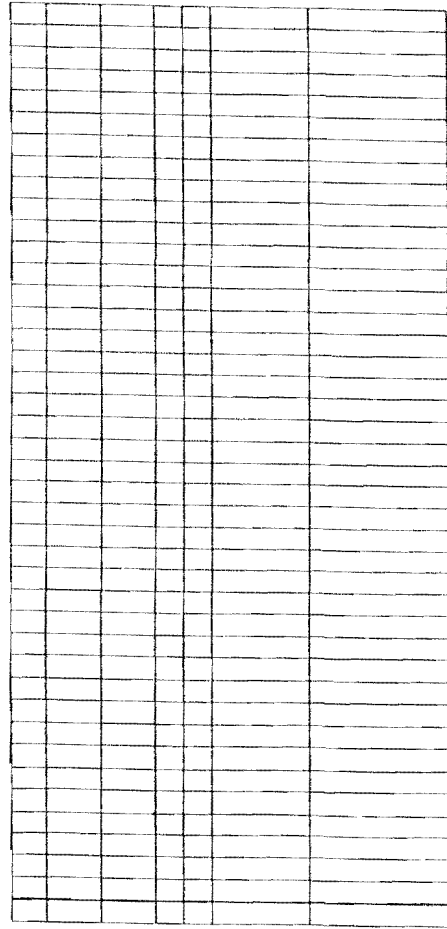
- 2. SEE DETAIL B FOR INSTALLATION OF ITEM 9 INTO BASIC CONNECTOR HOLES FOR ELECTRICAL INSULATION.
- 3. OVERALL PANEL LENGTH TO BE 170" ± 1/4".
- 4. 104 PIN CONN PARTS ARE BURNED. SEE 50453 FOR INTERCHANGEABILITY TO OTHER PARTS.
- 5. THIS ASSEMBLY MAY BE CONSTRUCTED AS AN OCTUPUS CABLE BY OMITTING THE FRONT PANEL AT MARKETING'S DISCRETION ONLY.
- 6. WHEN CONNECTING JOYSTICKS TO THIS PANEL USE CABLE NUMBER 502,048 ONLY.



REVISIONS		
NO.	DESCRIPTION	DATE
1	RELEASE PER ECO 507060	

24	T3-B	T4-B			
23	T3-2	T3-B			
22	P2-704	T3-2			9LLDR35
21	804	T2-1			*LLDR25
20	-805	T2-2			9LLDR25
19	-305	T1-1			*LLDR15
18	-205	T1-2			9LLDR15
17	-208	T4-4	GRN		*LLDT45
16	-107	T4-5	YEL		9LLDT45
15	809	T3-4	GRN		*LLDT35
14	-708	T3-5	RED		9LLDT35
13	-209	T2-4	BRN		*LLDT25
12	-108	T2-5	GRN		9LLDT25
11	-406	T1-4	GRN		*LLDT15
10	P2-306	T1-5	YEL		9LLDT15
9	P2-C	J5	C		VIDEO DIAGNOSTIC VIDEO
	-C	J5	S		2GND
8	-E	COMP SYNC	C		9VCSYSY COMPOSITE SYNC
	-E	COMP SYNC	S		*VCSYSY
7	-D	VERT DRIVE	C		9VVETE VERTICAL DRIVE
	-D	VERT DRIVE	S		*VVETE
6	-B	COMP BLANK	C		9VMPBLE COMPOSITE BLANKING
	-B	COMP BLANK	S		*VMPBLE
5	-A	HORIZ DRIVE	C		9VHORZE HORIZONTAL DRIVE
	-A	HORIZ DRIVE	S		*VHORZE
4	-802	J4	C		VIDEO BW GREY SCALE
	-802	J4	S		2GWE BW
3	-702	J3	C		VIDEO B BLUE
	-702	J3	S		2GAF B
2	-602	J2	C		VIDEO G GREEN
	-602	J2	S		2GHR G
1	-502	J1	C		VIDEO R RED
	-502	J1	S		2GNLR
1	FROM TO	FROM NAME	DESCRIPTION		

47	P2-K	T1-1			SHIELD
46	T1-3	T2-3			
45	T2-3	T3-3			
44	T3-3	T3-3			
43	T3-9	T4-3			
42	T4-3	T4-3			
41	P2-G	T1-6			SHIELD
40	T1-6	T2-6			
39	T2-6	T3-6			
38	T3-6	T3-12			
37	T3-12	T4-6			
36	T4-6	T4-12			
35	T1-10	T2-10			SL1412
34	P2-105	T1-10			SL1412
33	T4-10	T3-10			
32	T4-1	T4-10			
31	P2-808	T4-1			*LLDR45
30	T4-11	T3-11			
29	T4-2	T4-11			
28	P2-707	T4-2			9LLDR45
27	T3-7	T4-7			
26	T3-1	T3-7			
25	P2-701	T3-1			*LLDR35
24	FROM TO	FROM NAME	DESCRIPTION		



QTY	PART NO	ITEM DESCRIPTION	REV
		LIST OF MATERIALS	

TOLERANCES		DO NOT SCALE DRAWING	
UNLESS SPECIFIED	UNLESS SPECIFIED	SIGNATURES	DATE
FRONT VIEW	FRONT VIEW		
DATE	DATE		
ENG	ENG		
REV'D	REV'D		

**RAMTEK**

DISTRIBUTION PANEL

SCALE: NONE

502635

1 1 1 1 1 1 1 1

LIST OF MATERIALS

PRODUCTION ORDER										JOB NO:	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER		PRODUCTION ORDER		JOB NO:	
PRODUCTION MGR		PRODUCTION UNITS (ASSY)		SCHEDULED		BEGIN		COMPLETION		JOB NO:	
ITEM NO	PART NUMBER	PART DESCRIPTION	PART QTY	REQMNTS	STO COST						
1	502030	PC BOARD FAB	1	1							
2	0301101	LEVEL EXTRACTOR	2	2							
3	0301100	RIVET	2	2							
4	501596-01	RUSS BAR	14	14							
5	1301 031	IC SN 74LS08	2	2							
6	133	74LS00	2	2							
7	134	74LS37	1	1							
8	136	74LS20	2	2							
9	232	74LS32	1	1							
10	307	10LS5	1	1							
11	330	74LS04	5	5							
12	352	8126	10	10							
13	338	74LS02	1	1							
14	336	74LS27N	4	4							
15	337	74LS260N	1	1							
16	432	74LS174N	14	14							
17	500	74LS91	2	2							
18	532	74LS138	1	1							
19	535	74LS157	5	5							
20	540	74LS64	1	1							
21	541	74LS51	1	1							
22	1301 435	IC SN 74LS109	9	9							
23	3121332	RESISTOR PAK 898-1-R335	1	1							
24	3121471	" " 898-1-R470	2	2							
25	3126000	" " 898-5-2200	2	2							
26	3109332	" COMP 33K 1/4W 5%	1	1							
27	6706334	CAPACITOR TDR 336A020G1	3	3							
28	6701104-01	" .1mf AXIAL LEAD	32	32							
29	6701104-02	" .1mf	1	1							
30	8602004	CONNECTOR 65275-004	2	2							
31	8602001	" 65275-001	2	2							
32	8606124	TERMINAL 1350-B	2	2							
33	502328-2	STIFFENER	1	1							
34	0799435	SCREW, 4-40X 1/2", NYLON	4	4							
35	0799436	WASHER, FLAT, #4 NYLON	8	8							
36	0799482	NUT, HEX, 4-40 NYLON	4	4							
37	0301106	CARD EJECTOR, INSERTER	2	2							

PC1030

PRODUCTION ORDER										JOB NO:	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER		PRODUCTION ORDER		JOB NO:	
PRODUCTION MGR		PRODUCTION UNITS (ASSY)		SCHEDULED		BEGIN		COMPLETION		JOB NO:	
ITEM NO	PART NUMBER	PART DESCRIPTION	PART QTY	REQMNTS	STO COST						
1	502316	REAR PANEL - FAB	1	1							
2	502274	POWER SUPPLY	1	1							
3	502329	COVER P/S	1	1							
4	502336	ASSY, CPU CABLE	1	1							
5	502337-01	ASSY, MUX CABLE	1	1							
6											
7	501662-01	POWER CONTROL P.C.B. ASSY	1	1							
8	0302006	BUSBUNG, INSULATED	5	5							
9											
10	502346	DWG DIST. DIAGRAM	REF								
11											
12	6903102	FILTER BMT-1081	1	1							
13	0705102	SPACER, 1/4 LG	4	4							
14	8603100	STRAIN RELIEF	1	1							
15	3852104	POWER CORD	1	1							
16											
17											
18	8604018	GUIDE PIN, MALE	3	3							
19	8604019	GUIDE PIN, FEMALE	5	5							
20	8601190	CONN. 12 PIN FEMALE	1	1							
21											
22											
23	0799201	SCREW MACH PAN HD, 2X .325	4	4							
24	1703116	GEOMET STRIP	NR								
25											
26											
27	3110221	RESISTOR 220R 1/2W	1	1							
28	6702103	CAP, 01uF 1000V	1	1							
29	8606114	TERMINAL STRIP	1	1							
30	0799203	WASHER, FLAT #8	4	4							
31											
32	0799201	WASHER, FLAT #4	4	4							
33											
34	0799206	NUT, KEP # 6-32	2	2							
35	0799402	NUT, KEP 4-40	4	4							
36	0799504	NUT, #4.40	8	8							
					TOTAL						

PC1030

LIST OF MATERIALS E 10FL 502028

LIST OF MATERIALS D 10FL 502312

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)			REQ	AVAIL	BACK-ORDER					
PRODUCTION MGR		SCHEDULED			BEGIN	COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION	PART REQUISITS			STD COST						
			QTY	UNIT	ISS	EA	TOTAL					
1	50231701	FRONT PANEL - FAB	1	-								
2	50231702	FRONT PANEL - FAB	-	1								
3	9050056	SWITCH, MINI-PADLE <sup>9050056</sup> <sub>36 36 10120</sub>	1	1								
4	9050057	SWITCH MINI-PADLE <sup>9050057</sup> <sub>36 36 10120</sub>	1	1								
5	3203302	LED USE MTG CLIP <sub>3203302</sub> <sup>TIL 210</sup>	2	2								
6	0302007	MTG CLIP FOR LED	2	2								
7	8601090	CONN, PLUG 12PIN <sup>8601090</sup> <sub>SM512P-1</sub>	1	1								
8												
9												
10	8604002	CONTACT, PIN 20 22GA <sup>8604002</sup> <sub>2420M-101</sub>	7	7								
11	1902100	METAL NAME PLATE	1	1								
12												
13	9550550	TIE WRAP BASE	2	2								
14	9550560	TIE WRAP	2	2								
15												
16		WIRE T.P *22GA <sup>BLU</sup> <sub>WHT</sub>	30	30								
17		WIRE *22GA <sup>BLU</sup>	30	30								
18		WIRE *22GA <sup>GRN</sup>	15	15								
19												
20												
21												
22												
23												
24												
25												
TOTAL												
ISSUED BY		SIGNATURES		DATE	RAMTEK							
PARTS		OWN		2/27/76	TITLE: ASSY, FRONT							
ACVD BY		CHK			PANEL - 3100/9200							
TO INVTY CRDS		ENG			REV SHEET							
TO ACCOUNT		APVD		5/17/76	OWG NO							
LIST OF MATERIALS					D		1 of 1		502318			

PC 1030

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)			REQ	AVAIL	BACK-ORDER					
PRODUCTION MGR		SCHEDULED			BEGIN	COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION	PART REQUISITS			STD COST						
			QTY	UNIT	ISS	EA	TOTAL					
1	502330	PC BOARD	1	1	1	1	1	1	1	1	1	
2	502331	LOGIC DIAGRAM	REF									
3												
4	50159601	BUS BAR	4	4	4	4	4	4	4	4	4	
5												
6	6701104-31	CAPACITOR .1MF	70	50	90	100	110	120				
7	6701105	CAPACITOR .1MF <sup>NEED 2</sup> <sub>4X2G-1-ES</sub>	20	30	40	50	60	70				
8	6706336	CAPACITOR 33MF	16	16	16	16	16	16				
9												
10												
11	0301106	EJECTOR <sup>Calmar Sec 45 97</sup>	2	2	2	2	2	2	2	2	2	
12												
13	1301-030	IC SN74508	1	1	1	1	1	1	1	1	1	
14	1301-091	IC SN74LS08	1	1	1	1	1	1	1	1	1	
15	033	SN74LS21	3	3	3	3	3	3	3	3	3	
16	132	SN74500	1	1	1	1	1	1	1	1	1	
17	139	SN74S37	1	1	1	1	1	1	1	1	1	
18	140	SN74H00	5	5	5	5	5	5	5	5	5	
19	232	SN74LS32	2	2	2	2	2	2	2	2	2	
20	307	SN10125	1	1	1	1	1	1	1	1	1	
21	330	SN74LS04	4	4	4	4	4	4	4	4	4	
22	331	SN74S04	1	1	1	1	1	1	1	1	1	
23	332	BT26	12	12	12	12	12	12	12	12	12	
24	409	SN74166	1	2	3	4	5	6				
25	431	IC SN74S174	1	1	1	1	1	1	1	1	1	
26	450	4K DYNAMIC RAM	20	40	60	80	100	120				
27	516	SN74157	5	5	5	5	5	5	5	5	5	
28	531	SN74S86	1	1	1	1	1	1	1	1	1	
29	543	SN74S169	1	1	1	1	1	1	1	1	1	
30	544	SN74LS151	6	6	6	6	6	6	6	6	6	
31	545	SN74LS157	5	5	5	5	5	5	5	5	5	
32	1301-546	IC SN74LS158	2	2	2	2	2	2	2	2	2	
33												
34	3122220	RESISTOR Pac 222	10	10	10	10	10	10	10	10	10	
35	3109102	RESISTOR 1K, 1/4W, 5%	6	6	6	6	6	6	6	6	6	
36												
TOTAL												
ISSUED BY		SIGNATURES		DATE	RAMTEK							
PARTS		OWN		4/1/76	TITLE: PC ASSY							
ACVD BY		CHK		4/1/76	320-256 MEMORY BD							
TO INVTY CRDS		ENG		4/1/76	REV SHEET							
TO ACCOUNT		APVD		4/1/76	OWG NO							
LIST OF MATERIALS					B		1 of 2		502332			

PC 1030

PRODUCTION ORDER										JOB NO.
PREPARED BY		PRODUCTION UNITS (ASSY)		REQ'D		MFG		DATE		
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION				
ITEM NO.	PART NUMBER	PART DESCRIPTION	PART QTY					Total		
37	0301200	ROLL PIN (.062)	5	5	5	5	5	5		
38	F02A32L	STIFFENER, EDGE-	1	1	1	1	1	1		
39	502328	STIFFENER	1	1	1	1	1	1		
40										
41										
42		SCREW NYLON <sup>C-SC</sup> #40x1/16	6	6	6	6	6	6		
43		NUT, NYLON HEX #4-40	6	6	6	6	6	6		
44		WASHER, NYLON #4	6	6	6	6	6	6		
45										
46	502022	IC, PROM MM1634 (AT80)	1	1	1	1	1	1		
47	502623	" " " (AT80)	1	1	1	1	1	1		
48	502624	" " " (AT80)	1	1	1	1	1	1		
49										
50										
51										
52										
53										
54										
55										
56										
57										
58										
59										
60										
61										
62										
63										
64										
65										
66										
67										
68										
69										
70										
71										
72										
			TOTAL							

ISSUED BY	SIGNATURES	DATE	<b>RAMTEK</b> TITLE PC ASSY 3201256 MEMORY BD REV SHEET DWG NO 5 2DF2 502332
PARTS ACVD BY	OWN <i>David Howard</i>	11/1/80	
TO INVTY CROS	CHK <i>John</i>	11/1/80	
TO ACCOUNT	ENG <i>John</i>	11/1/80	

LIST OF MATERIALS

PC 1030

PRODUCTION ORDER										JOB NO.
PREPARED BY		PRODUCTION UNITS (ASSY)		REQ'D		MFG		DATE		
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION				
ITEM NO.	PART NUMBER	PART DESCRIPTION	PART QTY					Total		
1	502333C	PC BOARD	1	1	1	1	1	1		
2	502334	LOGIC DIAGRAM	1	1	1	1	1	1		
3										
4										
5	6706336	CAPACITOR 33uF, 20V (C1)	2	2	2	2	2	2		
6	670104-3	CAPACITOR .1uF, (C5-C15)	11	11	11	11	11	11		
7	6702103-1	CAPACITOR .01uF, (C1, C2)	2	2	2	2	2	2		
8	6706685	CAPACITOR 6.8uF, 15V, 20% (C16)	1	1	1	1	1	1		
9	8602012	CONNECTOR 10 PIN BERG <sup>STEP</sup> HEADER	1	1	1	1	1	1		
10	8602006	HEADER POST	1	1	1	1	1	1		
11	9101129	CRYSTAL 12.273MHZ (Y1)	2	2	2	2	2	2		
12										
13										
14	3202201	DIODE 1N4454 (CR1)	1	1	1	1	1	1		
15										
16										
17										
18	1301132	IC, SN 74800	2	2	2	2	2	2		
19	134	SN 74537	2	2	2	2	2	2		
20	135	SN 74520	1	1	1	1	1	1		
21	306	SN 10124	1	1	1	1	1	1		
22	307	SN 10125	1	1	1	1	1	1		
23	517	SN 74161	1	1	1	1	1	1		
24	330	SN 74LS04	1	1	1	1	1	1		
25	331	SN 74S04	3	3	3	3	3	3		
26	333	SN 74S02	1	1	1	1	1	1		
27	365	SN 74365	2	2	2	2	2	2		
28	430	SN 74S112	4	4	4	4	4	4		
29	431	SN 74S174	4	4	4	4	4	4		
30	532	SN 74S138	1	1	1	1	1	1		
31	534	SN 74S153	1	1	1	1	1	1		
32	1301543	IC, SN 74S169	6	6	6	6	6	6		
33										
34										
35										
36										
			TOTAL							

ISSUED BY	SIGNATURES	DATE	<b>RAMTEK</b> TITLE PC ASSY (-01) MULTI-RESOLUTION SYNC TIMING REV SHEET DWG NO E 10F2 502335-01
PARTS ACVD BY	OWN <i>David</i>	11/1/80	
TO INVTY CROS	CHK <i>John</i>	11/1/80	
TO ACCOUNT	ENG <i>John</i>	11/1/80	

LIST OF MATERIALS

PC 1030

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		ORIG REQUEST	PARTS AVAIL	BACK ORDER					
PRODUCTION MGR		SCHEDULED		BEGIN	COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION			PART EA	REQMNTS TOTL	ISS	BIO COST			
							EA	TOTAL			
37											
38	502504	IC, SN74S287	PROM	1							
39	502505			1							
40	502506			1							
41	502507	SN74S287		1							
42	502510	IC, MM6331	PROM	1							
43											
44											
45											
46	3121102	RESISTOR PAC	(R12)	1							
47	3124511	RESISTOR PAC	(R11)	1							
48											
49											
50	3109471	RESISTOR	470Ω (RT) 5% (R1)	4							
51	3109102	RESISTOR	1K (RT) 5% (R2)	1							
52	3109221	RESISTOR	220Ω (RT) 5% (R3)	1							
53	3109103	RESISTOR	10K (RT) 5% (R4)	1							
54											
55											
56	9050004	SWITCH DIP	S1	1							
				TOTAL							
PARTS ISSUED BY		SIGNATURES		DATE	RAMTEK						
RCV'D BY		OWN		9/1/80	TITLE: P.C. ASSY (-01)						
TO INVY CROSS		CHK			MULTI-RESOLUTION SYNC TIMING						
TO ACCOUNT		APVD			REV	SHEET	DWG NO.				
					E	2 OF 2	502335-01				

RC 1038

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		ORIG REQUEST	PARTS AVAIL	BACK ORDER					
PRODUCTION MGR		SCHEDULED		BEGIN	COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION			PART EA	REQMNTS TOTL	ISS	BIO COST			
							EA	TOTAL			
1	502335	PC BOARD		1							
2	502354	LOGIC DIAGRAM		1							
3											
4											
5	6706336	CAPACITOR	33μF, 20V (C3)	2							
6	670104-3	CAPACITOR	.1μF, (C5-C6)	11							
7	6702103-1	CAPACITOR	.01μF, (C1-C2)	2							
8	6706685	CAPACITOR	6.8μF, 15V, 20% (C14)	1							
9	8602202	CONNECTOR	1 BERG STK HEADPT	1							
10	8602206	HEADER POST		1							
11	9101129	CRYSTAL	12.273 MHz (H)	1							
12	9101130	CRYSTAL	13.068 MHz (H)	1							
13											
14	3202201	DIODE	1N4454 (CR1)	1							
15											
16											
17											
18	1301132	IC	SN 74300	2							
19	134	SN 74337		2							
20	135	SN 74320		1							
21	306	SN 10124		1							
22	307	SN 10125		1							
23	317	SN 74161		1							
24	330	SN 74LS01		1							
25	331	SN 74S04		3							
26	333	SN 74S02		1							
27	325	SN 74S15		2							
28	430	SN 74S112		4							
29	431	SN 74S174		4							
30	532	SN 74S139		1							
31	534	SN 74S153		1							
32	1301523	IC	SN 74S169	6							
33											
34											
35											
36											
				TOTAL							
PARTS ISSUED BY		SIGNATURES		DATE	RAMTEK						
RCV'D BY		OWN		9/2/80	TITLE: P.C. ASSY (-02)						
TO INVY CROSS		CHK		9/1/80	MULTI-RESOLUTION SYNC TIMING						
TO ACCOUNT		APVD		9/2/80	REV	SHEET	DWG NO.				
					E	2 OF 2	502335-02				

RC 1038





PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER		PRODUCTION MGR		PRODUCTION UNITS (ASSY)	
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION		PART EA	REQD TQT	ISS	EA	STO COST			
37											
38	502504	IC, SN74S287 PROM		1							
39	502505			1							
40	502506			1							
41	502509	SN74S287		1							
42	502512	IC, MM6331 PROM		1							
43											
44											
45											
46	3121102	RESISTOR PAC (R12)		1							
47	3124511	RESISTOR PAC (R11)		1							
48											
49											
50	3109471	RESISTOR, 220Ω, 1/4W, 5% (R5)		4							
51	3109102	RESISTOR, 1KΩ, 1/4W, 5% (R5)		1							
52	3109221	RESISTOR, 220Ω, 1/4W, 5% (R6)		1							
53	3109103	RESISTOR, 10KΩ, 1/4W, 5% (R7)		1							
54											
55											
56	9050004	SWITCH DIP (S1)		1							
				TOTAL							
ISSUED BY		SIGNATURES		DATE		RAMTEK					
PARTS RCVD BY		OWN		DAVE		9/1/78					
TO INVTY CRDS		CHK				TITLE: P.C. ASSY - (-03)					
TO ACCOUNT		ENG				MULTI-RESOLUTION SYNC TIMING					
		APVD				REV SHEET		OWG NO:			
						E 4 OF 2		502335-03			
LIST OF MATERIALS											

PC 1030

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER		PRODUCTION MGR		PRODUCTION UNITS (ASSY)	
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION		PART EA	REQD TQT	ISS	EA	STO COST			
1	5023330	PC BOARD		1							
2	502334	LOGIC DIAGRAM		PER							
3											
4											
5	6706336	CAPACITOR, 33μF, 20V (C3)		2							
6	6701109-3	CAPACITOR, .1μF, (C5-C15)		11							
7	6702103-1	CAPACITOR, .01μF, (C1, C2)		2							
8	6706685	CAPACITOR, 6.8μF, 16V, 20% (C16)		1							
9	8602022	CONNECTOR, BERG STD HEADER		1							
10	8602006	HEADER POST		1							
11	9101129	CRYSTAL, 12.273 MHz (U1)		1							
12	9101119	CRYSTAL, 10.910 MHz (U2)		1							
13											
14	3202201	DIODE, 1N4454 (CR1)		1							
15											
16											
17											
18	1301132	IC, SN 74800		2							
19	134	SN 74537		2							
20	135	SN 74S20		1							
21	306	SN 10124		1							
22	307	SN 10125		1							
23	517	SN 74161		1							
24	330	SN 74LS04		1							
25	331	SN 74S04		3							
26	333	SN 74S02		1							
27	365	SN 74365		2							
28	430	SN 74S112		4							
29	431	SN 74S174		4							
30	532	SN 74S138		1							
31	534	SN 74S153		1							
32	1301543	IC, SN 74S162		6							
33											
34											
35											
36											
				TOTAL							
ISSUED BY		SIGNATURES		DATE		RAMTEK					
PARTS RCVD BY		OWN		DAVE		9/1/78					
TO INVTY CRDS		CHK				TITLE: P.C. ASSY, (-04)					
TO ACCOUNT		ENG				MULTI-RESOLUTION SYNC TIMING					
		APVD				REV SHEET		OWG NO:			
						E 1 OF 2		502335-04			
LIST OF MATERIALS											

PC 1030

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER					
PRODUCTION MGR		PRODUCTION UNITS (ASSY)									
		SCHEDULED		BEGIN		COMPLETION					
ITEM NO.	PART NUMBER	PART DESCRIPTION	PART QTY			STD COST					
			EA	TOT	ISS	EA	TOTAL				
37											
38	502504	IC, SN74S287 PROM	1								
39	502505		1								
40	502506		1								
41	502508	SN 74S287	1								
42	502511	IC, MM6331 PROM	1								
43											
44											
45											
46	3121102	RESISTOR PAC (R12)	1								
47	3124511	RESISTOR PAC (R11)	1								
48											
49											
50	3109171	RESISTOR, 470Ω, 1/4W, 5% (R1)	1								
51	3109102	RESISTOR, 1KΩ, 1/4W, 5% (R5)	1								
52	3109221	RESISTOR, 220Ω, 1/4W, 5% (R6)	1								
53	3109103	RESISTOR, 10KΩ, 1/4W, 5% (R7)	1								
54											
55											
56	9050004	SWITCH DIP (S1)	1								
TOTAL											
ISSUED BY	SIGNATURES	DATE	RAMTEK								
PARTS	DWN	DAVE	TITLE P.C. ASSY, (-02)								
ADVISED BY	CHK		MULTI-RESOLUTION SYNC TIMING								
TO INVTY CROS	ENG		REV SHEET DWG NO:								
TO ACCOUNT	APVD		E 2 OF 2 502335-04								
LIST OF MATERIALS											

PC 1030

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER					
PRODUCTION MGR		PRODUCTION UNITS (ASSY)									
		SCHEDULED		BEGIN		COMPLETION					
ITEM NO.	PART NUMBER	PART DESCRIPTION	PART QTY			STD COST					
			EA	TOT	ISS	EA	TOTAL				
1	502341	P.C. BOARD, BACKPLANE 320V254	1								
2	502322	CONNECTOR MTG PLATE	1	1							
3	8602X06	CONNECTOR, BERG	2	2							
4		BRNG INTO THE FOLLOWING									
5		2-25 PIN, 1-3 PIN, 1-12 PIN)									
6	8601034	CONNECTOR, BERG 3 PIN	1	1							
7	3202215	DIODE, MBR1520 OR N5826	3	3							
8	8601090	CONNECTOR, BERG 12 PIN	1	1							
9	502323	BOARD ALIGNMENT BOLT	1	1							
10	502346	POWER DIST. DIAG.									
11	3109221	RES, 220Ω, 1/4W, 5%	1	1							
12	502785	P.C. BOARD, BACKPLANE 640X256	1	1							
13	8604023	SOLEXT, BERG	2	2							
14	8604002	PIN BURNISH	1	1							
15											
16	3851187	3/16" FLAT BRAID	51	51							
17	3851250	3/16" FLAT BRAID	68	68							
18											
19	0729204	SCREW, PAN HD, 4-40, 3/16"	16	16							
20	0729202	SCREW, PAN HD 4-40 X 1/2	3	3							
21	0729256	FLAT WASHER, NYLON, #4	2	2							
22	0729201	FLAT WASHER, #4	19	19							
23											
24	8602064	RING LUG <sup>IMP</sup> RAICOR, #175	3	3							
25											
26	3813096	TWISTED PAIR WIRE, NHT-CLW	1/2	1/2							
27		#30 GA									
28	3854000	3/16" SHRINK TUBING YEL, BUL, 0.6	1/2	1/2							
29	3854008	3/16" SHRINK TUBING RED, 0.6	1/2	1/2							
TOTAL											
ISSUED BY	SIGNATURES	DATE	RAMTEK								
PARTS	DWN	DAVE	TITLE 320 V 256								
ADVISED BY	CHK		MULTI-RESOLUTION SYNC TIMING								
TO INVTY CROS	ENG		REV SHEET DWG NO:								
TO ACCOUNT	APVD		D 1 OF 1 502340-								
LIST OF MATERIALS											

-01 3100  
-02 3200

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		DRG REQUEST	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS	STD COST							
				EA	TOT	ISS	EA	TOTAL				
1	502320	MAIN CHASSIS FAB	1									
2	502327	COVER, BOTTOM	1									
3												
4	502321	CARD GUIDE BRKT	6									
5	502324	INJECTOR-EJECTOR BRKT	2									
6	502312	ASSY, REAR PANEL	1									
7	50231801	ASSY, FRONT PANEL	1									
8	50234001	ASSY, MOTHER BOARD	1									
9	502355-01	ASSY, SYNC TIMING BO	*1									
10		WIRE, STRD, 14GA, WHT, 1/2" LNC	2									
11	8606104	TERMINAL LUG NO. 6	4									
12	502315	PC 80 LOADING CONFIG.	REF									
13	502346	PWR DISTRIBUTION SCHEMATIC	REF									
14	502340	ASSY SYNC TIMING INTERNAL CABLE	1									
15	502339-01	ASSY, INTERNAL CABLE	1									
16	0100102	FAN	6									
17	8609101	TERMINAL BLOCK	1									
18												
19	0706003	CARD GUIDES	26									
20	0300107	LATCH, PUSHBUTTON	2									
21	0302007	BUSHING NYLON	2									
22	0705102	SPACER 1/4 LG #4	5									
23	9550550	TIE BASE	4									
24	0499482	NUT, NYLON 4-40	5									
25	0799652	SCREW 6-32 x 3/8 LC	8									
26	0799602	SCREW #4-40 x 1/2	5									
27	0799902	SCREW #6-32 x 1/2 LG #2	26									
28	0799851	SCREW #4-40 x 1/4 LG #2	14									
29	0799900	SCREW #6-32 x 1/4 LG #2	12									
30	0799600	SCREW #4-40 x 1/4 LG	20									
31	502335-02	ASSY, SYNC TIMING BOARD	*1									
32	502335-03	ASSY, SYNC TIMING BOARD	*1									
33	0799202	WASHER, FLAT #6	43									
34	0799201	WASHER, FLAT #4	25									
35	0799406	NUT, KEP #6	28									
36	0799402	NUT, KEP #4	16									
TOTAL												
ISSUED BY		SIGNATURES		DATE	RAMTEK							
PARTS		OWN		5/29/76	TITLE: FINAL ASSY							
REV'D BY		CHK			MAIN CHASSIS-9100							
TO INVTY CROS		ENG			REV SHEET		DWG NO:					
TO ACCOUNT		APVD		1-8-76	H		1 OF 2		502344-01			

REV 275

LIST OF MATERIALS

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		DRG REQUEST	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS	STD COST							
				EA	TOT	ISS	EA	TOTAL				
37	502669	IDENTIFICATION RATE	1									
38	501578	MARKER STRIP CARD MAGAZINE	1									
39	0799805	SCREW, PAN HD #10-32 x .50	2									
40	0799901	SCREW, FLTHD, 6-32 x 3/8	2									
41	0799703	SCREW #4-40 x 1/2 RECESS	2									
42	0799203	WASHER #8 SM	2									
43	0799410	NUT, KEP #8-32 SS	2									
44												
45												
46												
47												
48												
NOTE:												
* MARKETING TO SPECIFY												
DASH NUMBER.												
TOTAL												
ISSUED BY		SIGNATURES		DATE	RAMTEK							
PARTS		OWN			TITLE: FINAL ASSY.							
REV'D BY		CHK			MAIN CHASSIS-9100							
TO INVTY CROS		ENG			REV SHEET		DWG NO:					
TO ACCOUNT		APVD			H		2 OF 2		502344-01			

LIST OF MATERIALS

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		QTY	PLTS	MA	DATE				
PRODUCTION MGR		SCHEDULED		REQ'D	AVAIL		20250				
		BEGIN									
		COMPLETION									
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS TOT	ISS	STD	CCST	EA		TOTAL	
1	502449	FRONT PANEL EA 3	1								
2	0300110	PUL SCR - BRAIND EJECT (OUTDRG 8716-110-21)	4								
3	4050056	SWITCH-MULTIPLE 3C3215L74	1								
4	4050057	SWITCH-MULTIPLE 3C3215L74	1								
5	3203202	LED 70220	2								
6	0300007	CLIP FOR LED	2								
7											
8	260198	WIRE 22 AWG 3-1129-1	1								
9											
10	8604000	CONNECTOR PIN 20-22GA (SMT-102)	7								
11											
12											
13	3550450	WIRE 22 AWG BLACK	2								
14	3550460	TIE WELD	2								
15											
16	3912069	WIRE 22 AWG BLUE/WHT	2/R								
17	3913096	WIRE 22 AWG WHITE/BLU	2/R								
18	3919004	WIRE 22 AWG YELLOW	2/R								
19	3919003	WIRE 22 AWG ORANGE	2/R								
TOTAL											
ISSUED BY		SIGNATURES		DATE		RAMTEK					
PARTS		OWN		3-25-77		TITLE FRONT PANEL Assy					
PCVD BY		CHK		3-25-77		9300					
TO INVTYCROS		ENG		3-25-77		REV SHEET DWG NO					
TO ACCOUNT		APVC		3-25-77		D 10FL 502422					
LIST OF MATERIALS											

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		QTY	PLTS	MA	DATE				
PRODUCTION MGR		SCHEDULED		REQ'D	AVAIL						
		BEGIN									
		COMPLETION									
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS TOT	ISS	STD	CCST	EA		TOTAL	
1	502434	CONNECTOR PLATE	1								
2											
3	502790	CABLE ASSY, CPU	1								
4	502789	CABLE ASSY, SERIAL LINE NUMBER	1								
5	501684	COVER PLATE	2								
6	8604013	GUIDE PIN, MALE (SMT-102)	3								
7	8604014	GUIDE PIN, FEMALE (SMT-102)	5								
8	0703101	FACTORY 1/4 TURN	4								
9	0302002	WIRE BONDING 25-UL-101-11	4								
10	0704101	RESISTOR WIRE 10-15-150-24	4								
11	0703116	WHT STRAINER 15-34-101-20	4								
12	9607006	WAL PLUG	2								
13											
14	1703116	SCREW 2.4x1.4x3 2/B	8								
15											
16	0302006	INSULATING BONDING	8								
17											
TOTAL											
ISSUED BY		SIGNATURES		DATE		RAMTEK					
PARTS		OWN		3-25-77		TITLE CONNECTOR PLATE Assy					
PCVD BY		CHK		3-25-77		9300					
TO INVTYCROS		ENG		3-25-77		REV SHEET DWG NO					
TO ACCOUNT		APVC		3-25-77		A 10FL 502423					
LIST OF MATERIALS											

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		QTY	REAS	DATE					
PRODUCTION MGR		SCHEDULED		BEGIN	COMPLETION						
ITEM	PART NUMBER	PART DESCRIPTION	PART QTY		REQ	ISS	STD COST				
1	502441-C	PC BOARD	1	1			EA	TOTAL			
2	502442	LOGIC DIAGRAM	REF	REF							
3											
4											
5	6706336	CAPACITOR .33UF, 25V	11	11							
6		C1, 2, 3, 6, 41, 46, 47, 59, 60, 71, 72									
7	6706685-1	CAPACITOR 6.8UF (C27)	1	1							
8	6701105-1	" 1UF, 50V	8	8							
9		C16, 30, 33, 36, 42 THRU 45									
10	6701104-3	CAPACITOR .1UF	53	53							
11		C4, 5, 7 THRU 25, 28, 29, 31, 32, 34, 36									
12		37 THRU 40, 48 THRU 50, 52, 53 THRU 55									
13	6701472	CAPACITOR .0047UF (C74)	1	1							
14	6701103	" .01UF (C75)	1	1							
15											
16											
17	1301031	IC 74LS08 (5E, 8J)	2	2							
18	083	74LS21 (5H, 7K)	2	2							
19	105	7438 (8L)	1	1							
20	132	74500 (8M, 9K)	2	2							
21	133	74LS00 (80)	1	1							
22	134	74LS37 (76, 7B)	2	2							
23	136	74LS20 (6K)	1	1							
24	232	74LS32 (6F, 84)	2	2							
25	307	10125 (88, 86)	2	2							
26	330	74LS04 (6F, 8K, 6M)	5	3							
27	332	BT26 (4, 4, 5, 5, 3, 6, 6)	7	7							
28	334	74LS02 (6H)	1	1							
29	336	74LS27 (6J)	1	1							
30	365	74365 (85, 82, 89, 6P, 5P)	5	5							
31	404	74123 (5G)	1	1							
32	430	74S112 (6L)	1	1							
33	432	74LS174 (7M, 3L, 7K, 4J)	4	4							
34	435	74LS109 (7H, 7J, 7L, 6B)	4	4							
35	444	74S374 (6R, 6S)	2	2							
36	1301450	IC M68004 (8A TO 3H, 8A TO 4H)	16	16							
			TOTAL								

ISSUED BY	SIGNATURES	DATE	<b>RAMTEK</b> TITLE: PC ASSEMBLY MEMORY EXPANSION REV: SHEET 1 OF 2 DWG NO: 502440
PARTS RCVD BY	OWN: DMS	11-76	
TO INVTY CRDS	CHK: DMS	8-8-76	
TO ACCOUNT	ENG: [Signature]	12-8-76	
	APVD: [Signature]	7-8-76	

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		QTY	REAS	DATE					
PRODUCTION MGR		SCHEDULED		BEGIN	COMPLETION						
ITEM	PART NUMBER	PART DESCRIPTION	PART QTY		REQ	ISS	STD COST				
37	1301516	IC 74157 (8R, 5S, 4R, 4S, 4W)	6	6							
38	1301532	IC 745438 (9J)	1	1							
39	1301536	IC 743161 (7J, 7K, 7L, 7M, 7N)	6	6							
40											
41											
42											
43											
44	3108680	RESISTOR 68R ±5%, 1/4W (R3, R4)	2	2							
45	3108330	" 33R ±5%, 1/4W (R5, R6)	2	2							
46	3109202	" 2K ±5%, 1/4W (R7)	1	1							
47	3109752	" 7.5K ±5%, 1/4W (R8)	1	1							
48	3109102	" 1K ±5%, 1/4W (R7)	8	8							
49		R8, 9, 10, 11, 12, 13, 14									
50	8608002	SOCKET 16 PIN IC	4	4							
51	8608008	SOCKET 24 PIN IC	28	28							
52	501596-01	BUS BAR	18	18							
53	502432	STIFFENER	1	1							
54	0301106	CARD EJECTOR/INSERTER	2	2							
55	0301200	ROLL PIN (1R-06R-0250)	5	5							
56											
57	502804	PROM 5610 (3P)	1	-							
58	502805	" (3R)	1	-							
59	502806	" (3N)	1	-							
60	502807	" (3S)	1	-							
61	302229	PROM 512 X 9 (1A)	1	-							
62	* REF ONLY	IC PROM 512 X 8 (20W1 & 2)	2	-							
63		* NOTE: THE PROGRAM									
64		IS TO BE SPECIFIED BY									
65		MARKETING AND LOADED									
66		BY FINAL TEST.									
67	* REF ONLY	PROM 1K X 8 (270B)	-	14							
68	503025	PROM 5610 (3P)	-	1							
69	503026	PROM 5610 (3R)	-	1							
70											
71											
72											
			TOTAL								

ISSUED BY	SIGNATURES	DATE	<b>RAMTEK</b> TITLE: PC ASSEMBLY MEMORY EXPANSION REV: SHEET 1 OF 2 DWG NO: 502440
PARTS RCVD BY	OWN: DMS	11-76	
TO INVTY CRDS	CHK: DMS	8-8-76	
TO ACCOUNT	ENG: [Signature]	12-8-76	
	APVD: [Signature]	7-8-76	

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		CHG REQ'EST	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION		PART EA	REQMNTS TOT	ISS	STO EA	STO TOT				
1	502447	VIDEO TYPE I PWB		1								
2	502448	LOGIC DIAGRAM		REF								
3	0301106	CARD EJECTOR, CALMARK		2								
4	502432	CARD EDGE STIFFENER		1								
5	0301200	ROLL PIN, 12-061-0250, GROOV PIN		5								
6	502437	BOARD STIFFENER		1								
7		NUT, HEX 4/40, NYLON		6								
8		SCREW, CSK, 4/40 X 1/2"		6								
9		WASHER, 4/40, NYLON		6								
10	501596	BUS BAR, FS2000 BD		19								
11	502338	DAC COVER		3								
12		SLEEVING FOR #24 WIRE SIZE		1/2								
13	8608002	I.C. SOCKET, 16 PIN		4								
14		5U, 5H, 6F, 6E										
15		BUSS WIRE #24 AWG SOLID THREADED		4/2								
16												
17												
18												
19												
20	1301031	I.C.	SN74LS08 (5F)	1								
21	134		SN74S37 (4C, 4D, 4A, 3F)	4								
22	138		SN74S140 (3A)	1								
23	231		SN74S32 (3G)	1								
24	304		145003 (3E)	1								
25	307		10125 (8B)	1								
26	330		SN74LS08 (4F)	1								
27	331		SN74S04 (1G, 2G)	2								
28	430		SN74S112 (1D, 1E, 1A, 1F, 1E, 4B)	7								
29	431		SN74LS174 (6A, 4F, 5G, 5A, 4D, 4E, 2D)	7								
30	432		SN74LS174 (6A, 4F, 5G, 5A, 4D, 4E, 2D)	13								
31	526		NE5556A (2D)	1								
32	1301561	I.C.	SN74S253 (2G, 2A, 2C)	6								
33												
34												
35												
36												
TOTAL												
ISSUED BY		SIGNATURES		DATE		<b>RAMTEK</b> TITLE: PC ASSEMBLY VIDEO TYPE I REV: SHEET: DWG NO. J LCF 502446						
RECV BY		OWN		7-19-76								
TO INVTY CRDS		CHK		7-22-76								
TO ACCOUNT		ENG		7-11-76								
		APVD		7-15-76		LIST OF MATERIALS						

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		CHG REQ'EST	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION		PART EA	REQMNTS TOT	ISS	STO EA	STO TOT				
37	1301318	OP AMP LH0002		18								
38		5P5R, 5A, 5L, 6R, 6P, 6N, 6L, 6R,										
39		8P, 8N, 8L, 3P, 3L, 3A, 1A, 1L, 1P										
40	REF ONLY *	PROM 93440-DC 5J, 5H, 6F, 6E		4								
41		NOTE: THE PROGRAM IS TO BE										
42		SUPPLIED BY MARKETING &										
43		THE PROMS LOADED BY FINAL TEST										
44	6701103	CAPACITOR .1UF (45, 46, 179)		3								
45	6701104-2	CAPACITOR .1UF (.2 SPACING)		660								
46		C85 - C30 90 91 93 95 96 97 99 101										
47		102 103 105 107 108 110 112 113 114 116 118										
48		119 120 122 124 125 126 128 130 131 132										
49		133 135 137 138 139 141 143 144 145 147 149										
50		150 151 153 155 156 158 160 161 162 164										
51		166 167 168 170 172 173 174 176 178 179										
52												
53	6701104-1	CAPACITOR .1UF (.15 PACE)		21								
54		C66 - C70, 72 - 79, 81 - 87, 89										
55												
56												
57	6701104-3	CAPACITOR .1UF (.25 SPACING)		17								
58		C1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 41, 44, 51, 58,										
59		62, 64, 65										
60												
61	6701105	CAPACITOR .1UF 50V		35								
62		C16 THRU 24, 32 THRU 40,										
63		42, 43, 47, 48, 49, 50, 52, 53, 54, 55, 56,										
64		57, 59, 60, 61, 63, 180										
65												
66	6701105	CAPACITOR .1UF 15V 20%		30								
67		C74, 92, 93, 100, 104, 106, 109, 111, 115,										
68		117, 121, 123, 127, 129, 134, 136, 140, 142,										
69		146, 148, 152, 154, 157, 159, 163, 165,										
70		169, 171, 175, 177										
71												
72												
TOTAL												
ISSUED BY		SIGNATURES		DATE		<b>RAMTEK</b> TITLE: PC ASSEMBLY VIDEO TYPE I REV: SHEET: DWG NO. J LCF 502446						
RECV BY		OWN		7-22-76								
TO INVTY CRDS		CHK		7-17-76								
TO ACCOUNT		ENG		7-22-76								
		APVD		7-11-76		LIST OF MATERIALS						

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER					
PRODUCTION MGR		PRODUCTION UNITS (ASSY)									
		SCHEDULED		BEGIN		COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS TOT	REQMNTS ISS	STOCK EA	STOCK TOT				
73	6703336	CAPACITOR, 33µF, 20V, 20%	5								
74		C3, 6, 9, 12, 15									
75											
76	6707470	CAPACITOR, 47PF 5%	3								
77		C80, 71, 88									
78											
79											
80											
81											
82	6901103	INDUCTOR, 100µH	5								
83											
84	3109100	RESISTOR, 10.0, 1/4W, 5%	18								
85		R3, 26, 63, 81, 82, 90, 99, 109, 125,									
86		133, 139, 147, 155, 163, 173,									
87		189, 197, 117									
88											
89	3109680	RESISTOR, 68.0, 1/4W, 5%	15								
90		R210 THRU R224									
91											
92	3109277	RESISTOR, 270.0, 1/4W, 5%	24								
93		R2, 4, 6, 8, 12, 14, 16, 18, 29, 31, 33,									
94		35, 39, 41, 43, 45, 56, 58, 60, 62,									
95		66, 68, 70, 72									
96											
97	3109301	RESISTOR, 300.0, 1/4W, 5%	15								
98		R83, 91, 100, 108, 124, 132, 140,									
99		148, 156, 164, 172, 180, 188, 196									
100		116									
101	3109471	RESISTOR, 470.0, 1/4W, 5%	1								
102		R237									
103											
104	3109221	RESISTOR, 220.0, 1/4W, 5%	12								
105		R225 THRU R236									
106											
107	3109334	RESISTOR 330K 1/4W 5%	2								
108		R203, 204									
			TOTAL								
ISSUED BY		SIGNATURES		DATE		RAMTEK					
REV'D BY		OWN		1/19/76		TITLE: PC ASSEMBLY					
TO INV'TY CRCS		CHK		5/9/76		VIDEO TYPE I					
TO ACCOUNT		ENG		3/1/76		REV SHEET NO. AND					
		APVD		1/1/76		J		2 OF 2		502446	

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER					
PRODUCTION MGR		PRODUCTION UNITS (ASSY)									
		SCHEDULED		BEGIN		COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS TOT	REQMNTS ISS	STOCK EA	STOCK TOT				
109	3109511	RESISTOR, 510.0, 1/4W, 5%	24								
110		R1, 3, 5, 7, 11, 13, 15, 17, 28, 30, 32, 34,									
111		38, 40, 42, 44, 55, 57, 59, 61, 65, 67,									
112		69, 71									
113											
114											
115											
116	3109681	RESISTOR, 680.0, 1/4W, 5%	15								
117		R85, 94, 102, 110, 118, 126, 134,									
118		142, 150, 158, 166, 174, 182, 190									
119		198									
120											
121	3109102	RESISTOR, 1K, 1/4W, 5%, R205	1								
122											
123	3103102	RESISTOR, 1K, .3W, .1% (VISUAY)	9								
124		R20, 22, 24, 47, 49, 51, 74, 76, 78									
125											
126	3103202	RESISTOR, 2K, .3W, .1% (VISUAY)	16								
127		R19, 21, 23, 25, 27, 46, 48, 50,									
128		52, 54, 73, 75, 77, 79, 80, 81									
129											
130											
131											
132	3109332	RESISTOR, 3.3K, 1/4W, 5%, R10	3								
133		R37, R64									
134	3109272	RESISTOR, 2.7K, 1/4W, 5%	30								
135		87, 88, 96, 97, 104,									
136		105, 112, 113, 120, 121,									
137		128, 129, 136, 137, 144,									
138		145, 152, 153, 169, 161,									
139		168, 169, 176, 177,									
140		184, 185, 192, 193, 200,									
141		201									
142											
143											
144											
			TOTAL								
ISSUED BY		SIGNATURES		DATE		RAMTEK					
REV'D BY		OWN		7/19/76		TITLE: PC ASSEMBLY					
TO INV'TY CRCS		CHK		8/3/76		VIDEO TYPE I					
TO ACCOUNT		ENG		7/1/76		REV SHEET NO. AND					
		APVD		7/1/76		J		2 OF 2		502446	



PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)			PARTS		BACK					
PRODUCTION MGR		BEGIN			TOTAL		ORDER					
SCHEDULED		COMPLETION										
ITEM NO	PART NUMBER	PART DESCRIPTION			PART REQMENTS	STD QTY		TOTAL				
					EA	TOT	ISS	EA	TOTAL			
145	3109103	RESISTOR, 10K, 1/4W, 5%			3							
146		R206 THRU R209										
147												
148	3109104	RESISTOR, 100K, 1/4W, 5%			15							
149		R84, 92, 101, 107, 123, 131, 141,										
150		149, 157, 165, 171, 179, 187, 195, 115										
151												
152	3121102	RESISTOR PACK, 898-1-PIK			5							
153		8A, 8E, 8H, 8J, 7E										
154												
155	3122171	RESISTOR PACK, 899-3-R170, 30			1							
156												
157												
158												
159	3202216	DIODE, 1N4148A, CRI TRIPLE CRI 2			12							
160												
161	3201119 *	TRANSISTOR, 2N3646			12							
162		Q1, 3, 5, 7, 9, 11, 13, 15, 17, 21, 23										
163												
164	3201107	TRANSISTOR, 2N425B			19							
165		Q25 THRU Q43										
166												
167	3201107-01	TRANSISTOR (FAIRCHILD) 2N4250			12							
168		Q2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24										
169												
170												
171	*	NOTE: ALL 2N3646 TRANSISTORS										
172		USED MUST BE FAIRCHILD										
173												
174	3109621	RESISTOR, 620A, 1/4W, 5%			15							
175		R89, 96, 106, 114, 122, 130, 136										
176		146, 154, 162, 170, 178, 186, 194, 202										
177												
178	3109302	RESISTOR, 3K, 1/4W, 5%			15							
179		R86, 95, 103, 111, 119, 127, 135, 143,										
180		151, 159, 167, 175, 183, 191, 199										
TOTAL												
ISSUED BY		SIGNATURES		DATE	<b>RAMTEK</b> TITLE PC ASSEMBLY VIDEO TYPE I REV SHEET DWG NO J 20F2 502450							
PARTS		CHK		7-15-72								
TO INVTY CRDS		ENGR		8-2-72								
TO ACCOUNT		APPROV		9-1-72								
LIST OF MATERIALS												

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)			PARTS		BACK					
PRODUCTION MGR		BEGIN			TOTAL		ORDER					
SCHEDULED		COMPLETION										
ITEM NO	PART NUMBER	PART DESCRIPTION			PART REQMENTS	STD QTY		TOTAL				
					EA	TOT	ISS	EA	TOTAL			
1	502451-C	P.C. BOARD			1							
2	502548	LOGIC DIAGRAM			REF							
3	1301030	I.C. 74508 (4D, 8D)			2							
4	031	74LS08 (4C, 4R, 5E)			3							
5	033	74LS21 (7E, 4G)			2							
6	105	7438 (4B, 5B, 9L, 9M)			4							
7	132	74S00 (2D, 4F, 4J, 4M)			4							
8	133	74LS00 (3S, 9K)			2							
9	134	74S37 (9C)			1							
10	135	74S20 (2L, 4P, 7L)			3							
11	140	74H00 (8J)			1							
12	231	74S32 (7F, 9E)			2							
13	232	74LS32 (2C, 4N, 7G)			3							
14	307	10125 (9B, 9J)			2							
15	330	74LS04 (4S, 9H)			2							
16	331	74S04 (1V, 4E, 4K, 8L)			4							
17	332	8T26 (1P, 1R, 6L, 6P, 6R, 6S, 6T, 7N, 7P, 7S, 8N, 8P, 8S)			13							
18	333	74S02 (4L)			1							
19	334	74LS02 (7D, 7T)			2							
20	350	DS0026CN (8T)			1							
21	365	74365 (5P, 5R, 5S, 5T, 7H, 7K, 8F, 8G, 8H, 9F, 9G, 9U, 9V, 9W)			14							
22	366	74366 (9D, 9N, 9P)			3							
23	431	74S174 (3B, 6F, 8B, 8C, 9R, 9S)			6							
24	432	74LS174 (1G, 1H, 2E, 2F, 6K, 7R, 8K, 8M, 8R)			9							
25	433	74LS194 (3M, 3N)			2							
26	435	74LS109 (1C, 3L, 3P, 4H, 6J, 7J, 8E)			7							
27	445	74170- (6N, 6U, 7M)			3							
28	531	74S86 (3R, 5J)			2							
29	1301532	I.C. 74S138 (2N10N)			2							
LIST OF MATERIALS												
ISSUED BY		SIGNATURES		DATE	<b>RAMTEK</b> TITLE PC ASSEMBLY VIDEO TYPE I REV SHEET DWG NO J 20F2 502450							
PARTS		CHK		7-15-72								
TO INVTY CRDS		ENGR		8-2-72								
TO ACCOUNT		APPROV		9-1-72								
LIST OF MATERIALS												

M 1 = 1 502450-01

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		CRG REQ'D	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		BEGIN		SCHEDULED		COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS	ISS	STD COST	EA	TOTAL				
30	1301535	IC, 74S157 (5F,5G,5H)	3									
31	539	74S158 (6G,6H)	2									
32	541	74LS51 (3K)	1									
33	543	74S169 (1D,1F,2G, 2J,2H,3D,3E,3F,3G,3H,3J, 5A,5L,5M,5N)	15									
34	544	74LS151 (2A,2B,5C,5D)	4									
35	545	74LS157 (1L,1M,1N,5K)	4									
36	552	74S168 (1E,2K)	2									
37	538	AY52513 (2R)	1									
	430	74S194 (7C)	1									
38	426	91L12C (4U,4V,5U,5V)	4									
39	1301600	IC 8080A-1 (7V)	1									
40	1301517	IC 74161 (4A)	1									
41		CONT. ON SHT. 3										
42												
43	3121102	RES, DIP, 1K $\Omega$ , 898-1-R1.0K (6V,6M,9T,1S,4W)	5									
44	9050020	SWITCH, DIP, (S2) (1U)	1									
45	9050077	SWITCH, TOGGLE (S1)	1									
46	13202200	DIODE, IN914 (CR1)	1									
47	3203302	LED TIL 220	1									
48	3109220	RES, 22 $\Omega$ , 1/4W, 5% (R2,R3)	2									
49	3109510	51 $\Omega$ , 1/4W, 5% (R7,R16)	10									
50	3109101	100 $\Omega$ , 1/4W, 5% (R1)	1									
51	3109471	470 $\Omega$ , 1/4W, 5% (R6)	1									
52	3109102	1K $\Omega$ , 1/4W, 5% (R17-R5, R1-R3)	18									
	3109221	220 $\Omega$ , 1/4W, 5% (R26)	1									
	3109103	RES 10K, 1/4W, 5% (R4/R5)	2									
TOTAL												
PARTS ISSUED BY		SIGNATURES		DATE		<p style="text-align: center;"><b>RAMTEK</b></p> <p>FILE: P.L. ASSEMBLY MULTI-RESOLUTION CONTROL AD</p> <p>REV SHEET DWG NO: M 2084 502450-01</p>						
PARTS REV'D BY		OWN		DATE								
TO NOTIFY CROSS		CHK		DATE								
TO ACCOUNT		ENG		DATE								
LIST OF MATERIALS						LIST OF MATERIALS						

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		CRG REQ'D	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		BEGIN		SCHEDULED		COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS	ISS	STD COST	EA	TOTAL				
53	6701104-3	CAP 0.1UF C5,C6,C50,51,5A, 69,73,81	10									
54	6706005	6.81UF C3,C4,C9,C10	4									
55	6701104-2	0.1UF C15,TRU(CA9,C51,TRU,C51 (C54,TRU,C68,70,71),3,24,25,26,27)	60									
56	6706336	33UF C11,C12	2									
57	6702251	250PF C2	1									
58	6702501	CAP 500PF C1	1									
59	8608008	LOW PRD 24 PIN IC SOCKET	4									
60	8608009	LOW PRD 40 PIN IC SOCKET	1									
61	502432	STIFFENER, EDGE	1									
62	0301200	ROLL PIN (.062)	7									
63												
64	0301106	CARD EJECTOR/INSERTER	2									
65												
66	502571	IC PROM 6E	1									
67	572	6C	1									
68	573	6D	1									
69	574	6A	1									
70	575	6B	1									
71	619	7B	1									
72	620	7A	1									
73	621	8A	1									
74	589	3A	1									
75	590	3C	1									
76	633	3W	1									
77	592	3V	1									
78	593	4T	1									
79	594	3U	1									
80	595	3T	1									
81	605	1J	1									
82	606	1K	1									
83	607	2W	1									
84	608	2V	1									
85	609	2T	1									
86	502610	IC PROM 2S	1									
87	6702101	CAPACITOR 100PF (C16)	1									
88	8608002	SOCKET	17									
89	6702302	CAPACITOR 3000PF (C80)	1									
PARTS ISSUED BY		SIGNATURES		DATE		<p style="text-align: center;"><b>RAMTEK</b></p> <p>FILE: P.L. ASSEMBLY MULTI-RESOLUTION CONTROL AD</p> <p>REV SHEET DWG NO: M 2084 502450-01</p>						
PARTS REV'D BY		OWN		DATE								
TO NOTIFY CROSS		CHK		DATE								
TO ACCOUNT		ENG		DATE								
LIST OF MATERIALS						LIST OF MATERIALS						

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		ORIG REQUEST	PARTS AVAILABLE	BACK ORDER					
PRODUCTION MBR		SCHEDULED		BEGIN	COMPLETION						
ITEM I.D.	PART NUMBER	PART DESCRIPTION	PART EA	REQS TOTAL	ISS	STD COST					
			EA			EA	TOTAL				
90		MACHINE SCREW, NYLON 4-40 1/2"	6								
91		WEX NUT, NYLON, 4-40	6								
92		FLAT WASHER, NYLON 4-40	12								
93	502450	STIFFENER	1								
TOTAL											
PARTS ISSUED BY		SIGNATURES		DATE		RAMTEK					
RCVD BY		OWN	Rou	4/1/73		TITLE: PC ASSY					
TO INVTY CRDS		CHK				MULTI-RESOLUTION					
TO ACCOUNT		ENG				CONTROL BOARD					
		APVD				REV SHEET DWG NO					
						M 4092 502450-01					

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		ORIG REQUEST	PARTS AVAILABLE	BACK ORDER					
PRODUCTION MBR		SCHEDULED		BEGIN	COMPLETION						
REV NO	PART NUMBER	PART DESCRIPTION	PART EA	REQS TOTAL	ISS	STD COST					
			EA			EA	TOTAL				
1	502451	PC BOARD	1								
2	502548	LOGIC DIAGRAM	REF								
3	1301030	I.C. 74503 (4D, 8D)	2								
4	031	74LS08 (4C, 2R, 5E)	3								
5	033	74LS21 (7E, 1G)	2								
6	105	7433 (4B, 5B, 9L, 3M)	4								
7	132	74500 (2U, 4F, 4J, 4K)	4								
8	133	74LS00 (3S, 9K)	2								
9	134	74537 (9C)	1								
10	135	74520 (2L, 4P, 7L)	3								
11	140	74H00 (8J)	1								
12	231	74532 (7F, 9E)	2								
13	232	74LS52 (2C, 4H, 7G)	3								
14	307	10125 (9B, 9J)	2								
15	330	74LS04 (4S, 9H)	2								
16	331	74504 (1V, 4E, 4K, 9L)	4								
17	332	8T26 (1P, 1R, 3L, 6P, 6R, 6S, 6T, 7N, 7P, 7S, 8W, 3P, 6S)	13								
18	333	74502 (4L)	1								
19	334	74LS02 (10 7T)	2								
20	350	050024CN (8T)	1								
21	365	74365 (5F, 5R, 5S, 5T, 7H, 7K, 8F, 5G, 8H, 9F, 9G, 9U, 9V, 9W)	14								
22	366	74364 (9D, 9M, 9P)	3								
23	431	745174 (3B, 6F, 8B, 8C, 9R, 9S)	6								
24	432	74LS174 (1G, 1H, 2E, 2F, 6K, 7R, 8K, 9M, 5R)	9								
25	433	74LS184 (3A, 5M)	2								
26	435	74LS104 (1C, 3L, 3R, 4H, 6J, 7J, 8E)	7								
27	445	74170 (5N, 6U, 7N)	3								
28	531	74585 (3R, 5J)	2								
29	1301532	I.C. 745153 (2A, 3D)	2								
PARTS ISSUED BY		SIGNATURES		DATE		RAMTEK					
RCVD BY		OWN		4/1/73		TITLE: PC ASSEMBLY					
TO INVTY CRDS		CHK				MULTI-RESOLUTION					
TO ACCOUNT		ENG				CONTROL BOARD					
		APVD				REV SHEET DWG NO					
						M 1092 502450-02					

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACKLOG					
PRODUCTION MGR		PRODUCTION UNITS (ASSY)									
		SCHEDULED		BEGIN		COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION	PART DEPTS	PART REQMTS		STO COST					
				EA	TOT	ISS	EA	TOTAL			
30	1301535	IC 74S157 (5F,5G,5H)	3								
31	539	74S158 (6G,6H)	2								
32	541	74LS51 (3K)	1								
33	543	74S169 (1D,1F,2G, 2J,2H,3D,3E,3F,3G,3H,3J, 5A,5L,5M,5N)	15								
34	544	74LS151 (2A,2B,5C,5D)	4								
35	545	74LS157 (1L,1M,1N,5K)	4								
36	552	74S168 (1E,2K)	2								
37	528	AY52513 (2R)	1								
	436	74S194 (7C)	1								
38	426	91L12C (4U,4V,5U,5V)	4								
39	1301600	IC 80BOA-1 (7V)	1								
40	1301517	IC 74161 (9A)	1								
41		CONT ON SHT. 3									
42											
43	3121102	RES, DIP, 1K $\Omega$ , 823-1-R10K, (6V,6M,9T,1S,4W)	5								
44	9050020	SWITCH, DIP, (S2) (1U)	1								
45	9050077	SWITCH, TOGGLE (S1)	1								
46	3202200	DIODE, IN914 (C1)	1								
47	3203302	LED TIL 220	1								
48	3109220	RES, 22 $\Omega$ , 1/4W, 5% (R2,R3)	2								
49	3109510	51 $\Omega$ , 1/4W, 5% (R7-R6)	10								
50	3109101	100 $\Omega$ , 1/4W, 5% (R1)	1								
51	3109471	470 $\Omega$ , 1/4W, 5% (R6)	1								
52	3109102	1K $\Omega$ , 1/4W, 5% (R17-R25, R27-R35)	18								
-	3109103	RES 10K, 1/4W, 5% (R4,R5)	2								
-	3109221	RES 220 $\Omega$ , 1/4W, 5% (R26)	1								
				TOTAL							
PARTS		REVISIONS		SIGNATURES		DATE					
PREPARED BY		REVISED BY		DRAWN		CHK		ENG		DATE	
TO NAVY/CSS		TO MED/NSA		BY		DATE					
LIST OF MATERIALS		M 2004		502450-02							

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACKLOG					
PRODUCTION MGR		PRODUCTION UNITS (ASSY)									
		SCHEDULED		BEGIN		COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION	PART DEPTS	PART REQMTS		STO COST					
				EA	TOT	ISS	EA	TOTAL			
53	6701104-3	CAP 0.1UF C9 THRU C5, C40, 51, 5B, 52, 53	9								
54	6706085	6.8UF C3, C4, C9, C10	4								
55	6701104-2	0.1UF C13 THRU C14, C15, C16, C17, C18, C19	59								
56	6706336	33UF C11, C12	2								
57	6702251	250PF C2	1								
58	6702501	CAP 500PF C1	1								
59	6608008	LOW PRO 24 PIN IC SOCKET	4								
60	86-08009	LOW PRO 40 PIN IC SOCKET	1								
61	502432	STIFFENER, EDGE	1								
62	0701200	ROLL FIN (.002)	7								
63											
64	0301106	CARD EJECTOR/INSERTER	2								
65	6707470	CAPACITOR, 47 PF (C7)	1								
66	502571	IC PROM 6E	1								
67	572	6C	1								
68	573	6D	1								
69	574	6A	1								
70	575	6B	1								
71	619	7B	1								
72	620	7A	1								
73	621	8A	1								
74	589	3A	1								
75	590	3C	1								
76	633	3W	1								
77	592	3V	1								
78	593	4T	1								
79	594	3U	1								
80	595	3T	1								
81	605	1J	1								
82	606	1K	1								
83	671	2W	1								
84	502612	IC PROM 2V	1								
85											
86											
87	6702101	CAPACITOR 100PF (C16)	1								
88	6602002	SOCKET	1								
89	6702302	CAPACITOR 200PF (C6)	1								
PARTS		REVISIONS		SIGNATURES		DATE					
PREPARED BY		REVISED BY		DRAWN		CHK		ENG		DATE	
TO NAVY/CSS		TO MED/NSA		BY		DATE					
LIST OF MATERIALS		M 2004		502450-02							

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER					
PRODUCTION MGR		PRODUCTION UNITS (ASSY)									
		SCHEDULED		BEGIN		COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS TOT	198	EA	TOTAL	STO	CCST		
90		MACHINE SCREEN, NYLON 4-40 1/4	6								
91	0799482	HEX NUT NYLON 4-40	6								
92	0789456	FLAT WASHER	12								
93	502450	STIFFENER	1								
TOTAL											
PARTS ISSUED BY		SIGNATURES		DATE		RAMTEK					
ACVD BY		OWN		4/4/76		TITLE: PC ASSY					
TO INVTY CROS		CHK				MULTI-RESOLUTION					
TO ACCOUNT		ENG				CONTROL BOARD					
		APVD				REV SHEET		OWG NO			
						M		2 OF 2 502450-02			
LIST OF MATERIALS											

PRODUCTION ORDER										JOB NO.	
PREPARED BY		ORIG REQUEST		PARTS AVAIL		BACK ORDER					
PRODUCTION MGR		PRODUCTION UNITS (ASSY)									
		SCHEDULED		BEGIN		COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION	PART EA	REQMNTS TOT	198	EA	TOTAL	STO	CCST		
1	8601200	CONN, 104 PIN	1								
2											
3	8604030	PIN, COAX	9								
4											
5											
6	3899120	CABLE, COAX (RG174/U)	1/2								
7											
8	502634	PANEL, DISTRIBUTION	1								
9	302006	INSULATED BUSHING	18								
10											
11	8604018	GUIDE PIN, MALE	3								
12	8604019	GUIDE PIN, FEMALE	1								
13	3850099	10 COND RIBBON CABLE	1/2								
14											
15	8601002	PIN, 22 AWG (SM20M-1027)	8								
16											
17	8605501	HOOD, CONNECTOR	1								
18	8611109	CONN, ENC	9								
19											
20											
21	8601190	CONN, PLUG	1								
22											
TOTAL											
PARTS ISSUED BY		SIGNATURES		DATE		RAMTEK					
ACVD BY		OWN		7-31-76		TITLE: ASSEMBLY					
TO INVTY CROS		CHK				DISTRIBUTION PANEL					
TO ACCOUNT		ENG		7/1/76		REV SHEET		OWG NO			
		APVD				A		1 OF 1 502635			
LIST OF MATERIALS											

PRODUCTION ORDER										JOB NO.		
PREPARED BY		DRG	PARTS	BACK-								
		REQUEST	AVAIL	ORDER								
PRODUCTION MGR		PRODUCTION UNITS (ASSY)										
		BEGIN	SCHEDULED									
		COMPLETION										
ITEM NO	PART NUMBER	PART DESCRIPTION	PART	REQMNTS	STD COST							
			EA	TOTL	ISS	EA	TOTAL					
1	502642	P.C.B. FABRICATION	1									
2	502643	LOGIC DIAGRAM	REF									
3												
4												
5	1301024	I.C., SN74H21 - 7C,8A	2									
6	030	SN74508 - 5C,10D	2									
7	031	SN74LS08 - 4M,4P, 4R,4S,7U,10L	6									
8	033	SN74LS21 4N	1									
9	105	SN7438 - 9L	1									
10	108	SN7430 - 8B	1									
11	132	SN74500 - 3F,5M,4F	3									
12	133	SN74LS00 - 3T,3N, 9S,10E,10S	5									
13	134	SN74537 - 10A,10B	2									
14	135	SN74S20 - 6D,8D,8B	3									
15	136	SN74LS20 - 3S,5S,5T	3									
16	231	SN74S32 - 5F,7F	2									
17	232	SN74LS32 - 2P,4T	2									
18	303	SN7427 - 4B	1									
19	305	SN75182 - 6N,6M	2									
20	307	10125 - 10C	1									
21	309	SN75183 - 6P,7N	2									
22	330	SN74LS04 - 1S,2U, 3R,9T,10T	5									
23	331	SN74S04 - 4C,5P,6B, 8M,9M,9C,9B,10M	8									
24	332	8T26 - 8P,9P,10P	3									
25	333	SN74S02 - 4A,5D,7D	3									
26	336	SN74LS27 - 2J,2M	2									
27	337	SN74S260 - 5E,6E,6C, 7E,8E,8C	6									
28	338	SN75188 - 7P	1									
29	339	SN75189 - 7M	1									
30	1301365	I.C., SN74365 - 9U,10U	2									
TOTAL												

ISSUED BY	SIGNATURES	DATE	<b>RAMTEK</b> TITLE: P.C.B. ASSEMBLY, SERIAL LINK REV SHEET DWG NO: 5 2 OF 2 502641
PARTS	OWN: <i>N.R. Pagan</i>	8/16/72	
RECD BY	CHK: <i>Carl K. L.</i>	8/16/72	
TO INVTY CROS	ENG: <i>Carl K. L.</i>	8/16/72	
TO ACCOUNT	APVD: <i>[Signature]</i>	8/16/72	

LIST OF MATERIALS

PRODUCTION ORDER										JOB NO.		
PREPARED BY		DRG	PARTS	BACK-								
		REQUEST	AVAIL	ORDER								
PRODUCTION MGR		PRODUCTION UNITS (ASSY)										
		BEGIN	SCHEDULED									
		COMPLETION										
ITEM NO	PART NUMBER	PART DESCRIPTION	PART	REQMNTS	STD COST							
			EA	TOTL	ISS	EA	TOTAL					
31	1301366	I.C., SN74366 - 8U,8N, 9U,9R,10R,10N	6									
32	430	SN74S112 - 5B,7A,9F	3									
33	431	SN74S174 - 2D,5R 5A,6A,10E	5									
34	432	SN74LS174 - 2T,4D,4E, 5U,7R,7S,7T,8R	8									
35	435	SN74LS109 - 3U,3M,4U	3									
36	504	TR1602 - 3G,3H,3K,3L	4									
37	507	SN74LS153 - 9H,10H 9G,9J,10J	5									
38	522	MM5307 - 1P,1R	2									
39	531	SN74S86 - 7B,10K	2									
40	543	SN74S169 - 2A,3B,5L, 5G,5H,5J,5K,6E,6G,6H, 6J,6K,6L,7G,7H,7J,7K, 7L,8F,8G,8H,8J,8K,8L	24									
41	544	SN74LS151 - 1E,1F,2F	3									
42	545	SN74LS157 - 3D,3E, 5U,10G	4									
43	1301549	I.C., SN74LS138 - 2K,2L,2M 3P,6R,6S,6T,6U	8									
44	502795	PROM, PROGRAMMED - 2E	1									
45	502796	- 2F	1									
46	502797	- 2G	1									
47	502798	PROM - PROGRAMMED - 2H	1									
48												
49	502328	STIFFENER, BOARD	1									
50	0799482	NUT, HEX 4/40, NYLON	6									
51	0799433	SCREW, CSK, 4/40 x 1/2", NYLON	6									
52	0799456	WASHER, 4/40, NYLON	6									
53												
54												
55	9050020	SWITCH - 1U,1K,1G,2R,8T	5									
56												
57												
TOTAL												

ISSUED BY	SIGNATURES	DATE	<b>RAMTEK</b> TITLE: P.C.B. ASSEMBLY, SERIAL LINK REV SHEET DWG NO: 5 2 OF 2 502641
PARTS	OWN: <i>N.R. Pagan</i>	8/16/72	
RECD BY	CHK: <i>Carl K. L.</i>	8/16/72	
TO INVTY CROS	ENG: <i>Carl K. L.</i>	8/16/72	
TO ACCOUNT	APVD: <i>[Signature]</i>	8/16/72	

LIST OF MATERIALS

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		ORIG REQUEST	PARTS AVAIL	BACK ORDER					
PRODUCTION MGR		SCHEDULED		BEGIN	COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION	PART REQMTS	BTO COST							
			EA	TOT	ISS	EA	TOTAL				
58	3109471	RES, 470Ω, 1/4W, ±5% - R3, R4	2								
59	3121102	RES PACK, 1K, 898-1-K, -1M, 1H	2								
60	3109102	RES, 1K, 1/4W, ±5% - R1, R2, R5	3								
61	6701104-3	CAP, 0.1MF (.250 SPACING) C19, 27, 30, 37	4								
63											
64	6701104-2	CAP, 0.1MF (.200 SPACING) C1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 74, 76, 77, 78, 79	56								
65	6702501	CAP, 500PF (.250 SPACING) C64, 65, 66, 69, 70, 71, 72, 75	8								
66	6706336	CAP, 33MF - C56, 57, 58, 59, 60	5								
67											
68	6701103	CAP, .01MF (.150 SPACING) C63, 67, 68, 73	4								
70	9101123	CRYSTAL 0.9216 Mhz - Y1	1								
71											
72											
73	030106	CARD EJECTOR/INSERTOR	2								
74											
75	502432	CARD EDGE STIFFNER	1								
76											
77	0301200	ROLL PIN, 12-062-0250, GROOVE PIN	5								
78											
79	B608002	I.C. SOCKET, 16 PIN - 2E, 2F, 2G, 2H	4								
			TOTAL								
ISSUED BY		SIGNATURES		DATE		RAMTEK					
PARTS		OWN		8/11/76		TITLE PC 3 ASSEMBLY, SERIAL LINK					
RCVD BY		CHK		12/11/76							
TO INVTY CRDS		ENG		11/11/76							
TO ACCOUNT		APVC				REV SHEET DWG NO.					
						B 20F2 502641					
LIST OF MATERIALS											

PRODUCTION ORDER										JOB NO.	
PREPARED BY		PRODUCTION UNITS (ASSY)		ORIG REQUEST	PARTS AVAIL	BACK ORDER					
PRODUCTION MGR		SCHEDULED		BEGIN	COMPLETION						
ITEM NO	PART NUMBER	PART DESCRIPTION	PART REQMTS	BTO COST							
			EA	TOT	ISS	EA	TOTAL				
1	502425	FAN HOUSING	1								
2											
3											
4	0100100	FAN PAPER 4600L	6								
5	501973	FINGER GUARD	6								
6	B609101	TERMINAL BLOCK 150-110-001	1								
7	502435	POWER DISTRIBUTION BOARD	1								
8											
9	0799655	SCREW, PAN HD, 6-32 x 3/4	24								
10	0799656	SCREW, PAN HD, 6-32 x 5/8	2								
11	0707110	TERMINAL STRIP 150-110-001	2								
12	3859009	WIRE, 22 AWG, WHITE	1/2								
13	3859006	WIRE, 22 AWG, BLUE	1/2								
14	B63101	TERMINAL BOARD 150-110-001	8								
15		WASHER, FLAT 1/4	26								
16	9550550	TERMINAL BASE 150-110-001	3								
17	9550560	TERMINAL BASE 150-110-001	9								
18	9601010	TERMINAL LOG 150-110-001	2								
19	0799406	WIRE, 22 L-32	26								
			TOTAL								
ISSUED BY		SIGNATURES		DATE		RAMTEK					
PARTS		OWN		8/11/76		TITLE PC 3 ASSEMBLY, SERIAL LINK					
RCVD BY		CHK		12/11/76							
TO INVTY CRDS		ENG		11/11/76							
TO ACCOUNT		APVC				REV SHEET DWG NO.					
						B 20F2 502641					
LIST OF MATERIALS											

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		ORIG REQUEST	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION						
ITEM	PART NUMBER	PART DESCRIPTION		PART REQMTS	STO COST							
1-3		EA	TOT	ISS	EA	TOTAL						
1	B601200	CONN, 104 IP N (BURNDY M204PM-4G)		1								
2												
3	B604046	PIN, COAX, MALE		34								
4												
5												
6	B899120	CABLE, COAX (R0174/U)		Δ/2								
7												
8	502768	PANEL, DISTRIBUTION		1								
9	0302006	BUSLING, INSULATED		68								
10												
11	B604018	PIN, MALE GUIDE (BURNDY M204PM-4G)		2								
12	B604019	PIN, FEMALE GUIDE (BURNDY M204PM-4G)		2								
13		CABLE, 20 COND RIBBON		Δ/2								
14												
15	B604002	PIN, 22 AWG (SM20M-1027)		24								
16												
17	B605501	HOOD, CONN. (BURNDY M20104-1)		1								
18	B611109	CONN, BNC (ΔMP 1-331693-2)		34								
19												
20												
21	B601190	CONN, PLUG (BURNDY SMS2P-1)		12								
TOTAL												
ISSUED BY		SIGNATURES		DATE	RAMTEK							
PARTS		OWN		5-26-72	TITLE: DISTRIBUTION PANEL ASSY 9300							
TO INVTY CROSS		CHK		5-27-72	REV SHEET DWG NO							
TO ACCOUNT		ENG		5-27-72	1 OF 1 502769							
		APVD		5-27-72	LIST OF MATERIALS							

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		ORIG REQUEST	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION						
ITEM	PART NUMBER	PART DESCRIPTION		PART REQMTS	STO COST							
1-3		EA	TOT	ISS	EA	TOTAL						
1	503047	P.C.B FABRICATION		1								
2	503046	LOGIC DIAGRAM		REF								
3												
4												
5												
6												
7	1301030	I.C., 3N74508		6N	1							
8												
9	031	SN74LS08		45.83	2							
10												
11	035	SN7409		6K	1							
12												
13	105	7438		4C	1							
14	132	74400		6L, 7A	2							
15	231	SN74532		7B, 8L	2							
16	134	74537		9J, 8A, 7K	3							
17	232	SN74LS32		6P, 7L, 7N	3							
18	138	745140		8J	1							
19	304	1M5003		9L	1							
20												
21	307	10125		9A	1							
22												
23	308	75107		3A, 3B, 3E, 3F	4							
24												
25	318	LH0002		1E, 1F, 1H, 1J, 1L, 1M, 1R, 1S	8							
26												
27												
28	331	SN74504		3D, 3H, 3P	9							
29												
30												
31	332	BT26		9M, 9N, 9P	2							
32												
33	333	6N74502		50, 7M, 9S	3							
34												
35	1301334	I.C., SN74LS02		6M	1							
36												
TOTAL												
ISSUED BY		SIGNATURES		DATE	RAMTEK							
PARTS		OWN		5-27-72	TITLE: P.C.B. ASSEMBLY - VIDEO TYPE 2A							
TO INVTY CROSS		CHK		5-27-72	REV SHEET DWG NO							
TO ACCOUNT		ENG		5-27-72	8 OF 8 503045							
		APVD		5-27-72	LIST OF MATERIALS							



PRODUCTION ORDER										JOB NO
PREPARED BY		PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION		JOB NO
ITEM NO	PART NUMBER	PART DESCRIPTION			PART EA	REQD QTY	ISS QTY	STOCK	UNIT COST	TOTAL
37	1301430	I.C., 74311Z 2A, 2B, 2D			12					
38		2E, 2G, 2J, 2L, 2M, 2R, 2P								
39		4J, 7G								
40										
41	431	SN74S174 4B, 4F, 4D,			10					
42		4R, 6C, 6F, 6H, 7H, 7J, 8K								
43										
44	432	SN74LS174 6G, 6R,			12					
45		8C, 8D, 8E, 8F, 8H, 9C,								
46		9D, 9E, 9F, 9H								
47										
48	434	SN74S74 6S			1					
49										
50	443	N82511 5E, 5F,			12					
51		5G, 5H, 5J, 5K, 5L, 5M,								
52		5N, 5P, 5R, 5S								
53										
54	444	SN74S374 9R			1					
55										
56	532	SN74S138 7R, 8R,			2					
57										
58	534	SN74S153 6D, 6E			6					
59		7C, 7D, 7E, 7F								
60										
61	535	SN74S157 5A, 5B, 5C			3					
62										
63	1301536	I.C., SN74S161 8M, 8N, 8P			3					
64										
65	1302107*	PROM, 93446 FAIRCHILD, 4G			1					
66		PROM, 4H			1					
67		PROM, 4L			1					
68		PROM, 4M			1					
69	1302107*	PROM, 93446 FAIRCHILD, 4N			1					
70		*NOTE: PART NO. 15 FOR								
71		BLANK PROM								
72										
TOTAL										
PARTS ISSUED BY		SIGNATURES		DATE		RAMTEK				
PARTS RCVD BY		DANN		3/77		TITLE: R.C.B. ASSEMBLY-VIDEO TYPE 2A				
TO INVTY CRG		CRA		3/77		REV: SHEET 08 OF 10				
TO ACCOUNT		ENG		3/77		DRAWING NO 503045				
LIST OF MATERIALS										B 208 503045

PRODUCTION ORDER										JOB NO
PREPARED BY		PRODUCTION MGR		SCHEDULED		BEGIN		COMPLETION		JOB NO
ITEM NO	PART NUMBER	PART DESCRIPTION			PART EA	REQD QTY	ISS QTY	STOCK	UNIT COST	TOTAL
73	3109360	RES., 36Ω 1/4W±5%			4					
74		R26, 61, 96, 131								
75										
76	3109680	RES., 68Ω 1/4W±5%			4					
77		R27, 62, 97, 132								
78										
79	3109101	RES., 100Ω 1/4W±5%			16					
80		R34, 35, 69, 70, 104,								
81		105, 139, 140, 176, 189, 194,								
82		199, 204, 209, 214, 219								
83										
84	3109131	RES., 130Ω 1/4W±5%			1					
85		R221								
86										
87	3109151	RES., 150Ω 1/4W±5%			9					
88		R106, 111, 116, 121, 141,								
89		146, 151, 156, 220								
90										
91	3109181	RES., 180Ω 1/4W±5%			12					
92		R5, 10, 15, 20, 40, 45,								
93		50, 55, 75, 80, 85, 90								
94										
95	3109221	RES., 220Ω 1/4W±5%			11					
96		R21, 28, 30, 56, 63,								
97		65, 91, 98, 100, 133, 135								
98										
99	3109271	RES., 270Ω 1/4W±5%			12					
100		R1, 6, 11, 16, 36, 41,								
101		46, 51, 71, 76, 81, 86								
102										
103	3109301	RES., 300Ω 1/4W±5%			12					
104		R109, 114, 119, 124,								
105		144, 149, 154, 159, 223, 225,								
106		227, 229								
107										
108										
TOTAL										
PARTS ISSUED BY		SIGNATURES		DATE		RAMTEK				
PARTS RCVD BY		DANN		3/77		TITLE: R.C.B. ASSEMBLY-VIDEO TYPE 2A				
TO INVTY CRG		CRA		3/77		REV: SHEET 08 OF 10				
TO ACCOUNT		ENG		3/77		DRAWING NO 503045				
LIST OF MATERIALS										B 308 503045

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		DRG REQUEST	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		SCHEDULED		BEGIN								
		COMPLETION										
ITEM NO	PART NUMBER	PART DESCRIPTION			PART REQ	REQ UNITS	EST COST					
					EA	TOT	ISS	EA	TOTAL			
109	3109471	RES., 470. $\mu$	1/4W $\pm$ 5%		1							
110		R165										
111												
112	3109511	RES., 510. $\mu$	1/4W $\pm$ 5%		4							
113		R32,67,102,137										
114												
115	3109681	RES., 680. $\mu$	1/4W $\pm$ 5%		24							
116		R4,9,14,19,29,31,										
117		39,44,49,54,64,66,74,79										
118		84,89,99,101,134,136,167,										
119		168,169,170										
120												
121	3109751	RES., 750. $\mu$	1/4W $\pm$ 5%		8							
122		R108,113,118,										
123		123,143,148,153,158										
124												
125	3109102	RES., 1K. $\mu$	1/4W $\pm$ 5%		5							
126		R33,68,103,138,166										
127												
128	3109152	RES., 1.5K	1/4W $\pm$ 5%		12							
129		R3,8,13,18,38,43,										
130		48,53,73,78,83,88										
131												
132	3109472	RES., 4.7K. $\mu$	1/4W $\pm$ 5%		1							
133		R171										
134												
135	3109103	RES., 10K. $\mu$	1/4W $\pm$ 5%		8							
136		R172,177,190,195,										
137		200,205,210,215										
138												
139												
140												
141												
142	3108101	RES., 100. $\mu$	1/8W $\pm$ 5%		4							
143		R222,224,226,228										
144												
TOTAL												
ISSUED BY		SIGNATURES		DATE	RAMTEK							
RECD BY		CWR		5/27/77	TITLE: P.C.B. ASSEMBLY-							
TO INVTY CROSS		ENG		5/27/77	VIDEO TYPE 2A							
TO ACCOUNT		ARVD			REV	SHEET	DRG NO:					
					8	1 of 8	503045					

PRODUCTION ORDER										JOB NO.		
PREPARED BY		PRODUCTION UNITS (ASSY)		DRG REQUEST	PARTS AVAIL	BACK ORDER						
PRODUCTION MGR		SCHEDULED		BEGIN								
		COMPLETION										
ITEM NO	PART NUMBER	PART DESCRIPTION			PART REQ	REQ UNITS	EST COST					
					EA	TOT	ISS	EA	TOTAL			
145	3108221	RES., 220. $\mu$	1/8W $\pm$ 5%		8							
146		R175,180,193,198,										
147		203,208,213,218										
148												
149	3108681	RES., 680. $\mu$	1/8W $\pm$ 5%		8							
150		R173,178,191,196										
151		201,206,211,216										
152												
153												
154												
155	3103750	RES., 75. $\mu$	0.3W $\pm$ 0.1%		16							
156		R22,23,24,57,58,										
157		59,92,93,94,127,128,129,										
158		130,161,162,163										
159												
160	3103151	RES., 150. $\mu$	0.3W $\pm$ 0.1%		25							
161		R2,7,12,17,25,37,										
162		42,47,52,60,72,77,82,87,										
163		95,107,112,117,122,126,142,										
164		147,152,157,164										
165												
166												
167												
168	3101121	RES., POT., 500. $\mu$	.5W $\pm$ 20%		8							
169		R110,115,120,125,										
170		145,150,155,160										
171												
172	3101120	RES., POT., 2K. $\mu$	.5W $\pm$ 20%		8							
173		R174,179,192,										
174		197,202,207,212,217										
175												
176	3122471	RES. PACK, 470. $\mu$	898-3-470		1							
177		-9K										
178												
179	3121102	RES. PACK, 1K. $\mu$	898-1-1K		4							
180		88,89,98,99										
TOTAL												
ISSUED BY		SIGNATURES		DATE	RAMTEK							
RECD BY		CWR		5/27/77	TITLE: P.C.B. ASSEMBLY-							
TO INVTY CROSS		ENG		5/27/77	VIDEO TYPE 2A							
TO ACCOUNT		ARVD			REV	SHEET	DRG NO:					
					8	2 of 8	503045					

PRODUCTION ORDER										JOB NO
PREPARED BY		DRG NO	DRG REV	DATE	DRG	DRG	DRG	DRG	DRG	DRG
PRODUCTION MGR		PRODUCTION UNITS (ASSY)	SCHEDULED	BEGIN	COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION	PART QTY	REQMNTS	STD COST					
181	3201107	TRANSISTOR, 2N4258	4							
182		Q21, 22, 23, 24								
183										
184	3201119	TRANSISTOR, 2N3646 *	20							
185		Q1, 2, 3, 4, 5, 6, 7, B,								
186		9, 10, 11, 12, 13, 14, 15, 16, 17,								
187		18, 19, 20,								
188		* MFR MUST BE FAIRCHILD								
189										
190	3202201	DIODE, 1N4454	12							
191		C1, 2, 3, 4, 5, 6, 7,								
192		8, 9, 10, 11, 12, 13, 14, 15, 16, 17,								
193		18, 19, 20, 21, 22, 23, 24, 25,								
194		26, 27, 28, 29, 30, 31, 32, 33,								
195		34, 35, 36, 37, 38, 39, 40, 41, 42								
196										
197										
198										
199	6701103	CAP., 0.01UF, 100V ±10%	1							
200		C1								
201										
202	6701104-1	CAP., 0.1UF, (100V) 50V ±20%	168							
203		C32, 33, 34, 35, 36,								
204		37, 38, 39, 42, 43, 50, 51, 53, 54,								
205		55, 56, 57, 58, 59, 60, 63, 64, 71,								
206		72, 74, 75, 76, 77, 78, 79, 80, 81,								
207		84, 85, 92, 93, 95, 96, 97, 98, 99								
208		100, 101, 102, 105, 106, 113, 114, 116,								
209		117, 118, 119, 120, 121, 122, 123, 124,								
210		125, 126, 127, 128, 129, 130, 131,								
211		132, 133, 134, 135								
212										
213										
214										
215										
216										
TOTAL										
ISSUED BY		SIGNATURES	DATE	RAMTEK						
PARTS RCVD BY		CHK	DATE	TITLE P.C.B. ASSEMBLY-VIDEO TYPE 2A						
TO INVTY CRDS		ENG	DATE	REVISEE: DWG NO						
TO ACCOUNT		APPROV	DATE	B 503045						
LIST OF MATERIALS										

PRODUCTION ORDER										JOB NO
PREPARED BY		DRG NO	DRG REV	DATE	DRG	DRG	DRG	DRG	DRG	DRG
PRODUCTION MGR		PRODUCTION UNITS (ASSY)	SCHEDULED	BEGIN	COMPLETION					
ITEM NO	PART NUMBER	PART DESCRIPTION	PART QTY	REQMNTS	STD COST					
217	6701104-2	CAP., 0.1UF, (.200V) 50V ±20%	61							
218		C6, 7, 8, 9, 10, 11, 12, 13,								
219		14, 15, 16, 17, 18, 19, 20, 21, 22, 23,								
220		24, 25, 26, 27, 28, 29, 30, 31,								
221		139, 141, 142, 143, 144, 145,								
222		148, 151, 153, 154, 157, 158, 159,								
223		161, 162, 163, 165, 166, 167, 168								
224		169, 164, 170, 171, 172, 173, 174,								
225		175, 176, 177, 179, 180, 178								
226		182, 183								
227	6701105-1	CAP., 1.0UF, (.200V) 50V ±10%	8							
228		C146, 147, 149, 150,								
229		152, 155, 156, 160								
230										
231	6706685	CAP., 6.8UF, 35V ±20%	16							
232		C41, 44, 49, 52, 62, 65, 70, 73, 83,								
233		86, 91, 94, 104, 107, 112, 115,								
234										
235	6703336	CAP., .33UF, 25V, -10%+50%	5							
236		C3, 4, 5, 140, 184								
237										
238	6706227	CAP., 220UF, 10V ±10%	3							
239		C136, 137, 138								
240										
241	6707470	CAP., 47PF, 500V ±10%	9							
242		C45, 46, 66, 67,								
243		87, 88, 108, 109, 181								
244										
245	6701221	CAP., 220PF, 200V ±10%	8							
246		C47, 48, 68, 69,								
247		89, 90, 110, 111								
248										
249										
250										
251										
252										
TOTAL										
ISSUED BY		SIGNATURES	DATE	RAMTEK						
PARTS RCVD BY		CHK	DATE	TITLE P.C.B. ASSEMBLY-VIDEO TYPE 2A						
TO INVTY CRDS		ENG	DATE	REVISEE: DWG NO						
TO ACCOUNT		APPROV	DATE	B 503045						
LIST OF MATERIALS										