

| | |
|-------------------|-----------------------------|
| D-BS-MA20-0-ST31 | STACK MODULE (H217B) |
| D-BS-MA20-0-ST32 | STACK MODULE (H217B) |
| D-CS-M9005-0-TRN1 | CIRCUIT SCHEMATIC M9005 |
| | |
| D-CS-G114-0-1 | 16K SENSE/INHIBIT (SHEET 2) |
| D-CS-G114-0-1 | 16K SENSE/INHIBIT (SHEET 3) |
| D-CS-G235-0-1 | 16K X-Y DRIVE (SHEET 2) |
| D-CS-G235-0-1 | 16K X-Y DRIVE (SHEET 3) |
| D-CS-H217-0-1 | STACK BOARD (SHEET 1) |
| | |
| D-UA-M9005-0-0 | TERMINATOR |
| D-UA-M9006-0-0 | SBUS CABLE MODULE |
| D-UA-M8561-0-0 | CONTROL BOARD (M8561) |
| D-UA-M8562-0-0 | TIMING BOARD (M8562) |
| | |
| B-DD-MA20-0 | DRAWING DIRECTORY (MA20) |
| A-PL-MA20-0-0 | CORE MEMORY MA20 (PL) |
| E-UA-MA20-0-0 | CORE MEMORY MA20 |
| D-IC-MA20-0-PW | AC-DC POWER WIRING (MA20) |
| E-AD-7009465-0-0 | WIRED ASSY (MA20) |
| K-WL-MA20-0-WL | WIRE LIST (MA20) |
| A-WT-7009465-0 | AWT REVISION STATUS SHEET |

| | | | | |
|--------------------|------|------|----------|-----|
| TITLE | SIZE | CODE | NUMBER | REV |
| CORE MEMORY (MA20) | B | TC | MA20-0-1 | A |
| SHEET 2 OF 2 | | | | |

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NOTES:

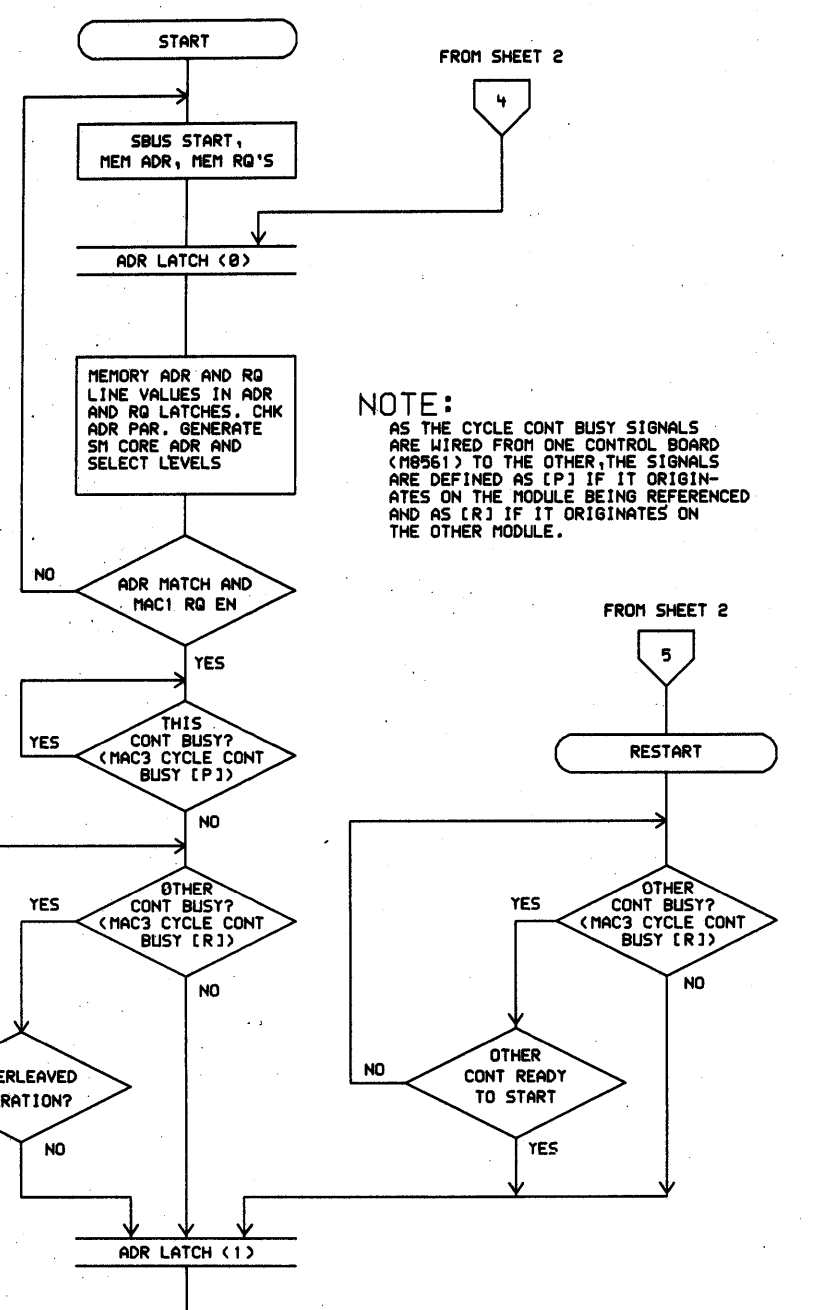
1. BC20C CABLES AND W0905 TERMINATORS SUPPLIED FOR BASIC SYSTEM USAGE. FOR EXPANSION USAGE, SEE: D-UA-KL10-0-0.
2. DRAWING SHOWS CONFIGURATION FOR A MA20 IN A CPU (E & M BOX) CABINET. WHEN A MA20 IS MOUNTED IN AN I/O CABINET, THE BC20'S ARE PLUGGED INTO SLOT 54 AND THE W0905'S ARE PLUGGED INTO SLOT 1. (IF THERE IS A DMA20 ALSO IN THE I/O CABINET, THE BC20'S ARE PLUGGED INTO SLOT 1 AND THE W0905'S ARE NOT USED.)
3. MA20-H CONSISTS OF ALL MODULES SHOWN
 MA20-G HAS BANKS 2 & 3 REMOVED IN CONTROL 0 & 1
 MA20-A HAS BANKS 1, 2 & 3 REMOVED IN CONTROL 0 & 1

| CONTROL 0 | | | | | | | | | | | | | | | | | | | | | | | | | | CONTROL 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|----------------------|----|----|----|----|----|----|----|----------------------|----|----|----|----|----|----|----|----------------------|----|-----------|----|----|----|----|----|-----------------------|----|----|----|----|----|----|----|-----------------------|----|----|----|----|----|----|----|-----------------------|----|----|----|--|--|--|--|-----------------------|--|--|--|--|--|--|--|
| 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 | 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 | | | | | | | | | | | | |
| A | | | | | | | | | | | | | | | | | | | | | | | | | | A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | | | | | | | | | | | | B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | | | | | | | | | | | | | C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | | | | | | | | | | | | | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | | | | | | | | | | | | | | E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | | | | | | | | | | | | | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BANK 0 BITS 00-17 | | | | | | | | BANK 1 BITS 00-17 | | | | | | | | BANK 2 BITS 00-17 | | | | | | | | BANK 3 BITS 00-17 | | | | | | | | BANK 0 BITS 19-PAR | | | | | | | | BANK 1 BITS 18-PAR | | | | | | | | BANK 2 BITS 18-PAR | | | | | | | | BANK 3 BITS 18-PAR | | | | | | | |

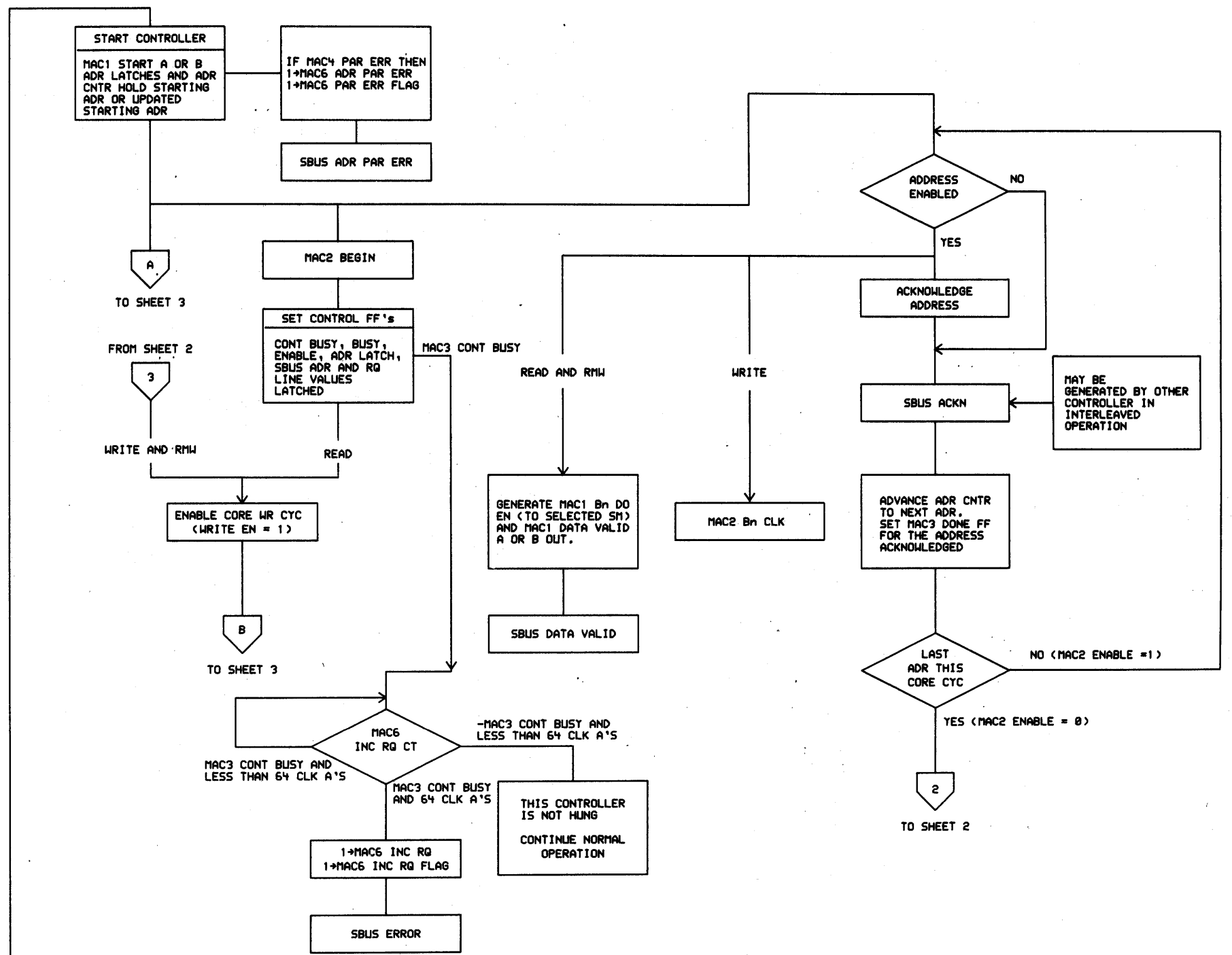
REF: PIN SIDE

| | | | | | |
|---|---|-----------------------|--------------------------------|--------------------|---------------------|
| | DESCRIPTION | | DWG. PART NO. | | ITEM NO. |
| | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES | | | | |
| | ANGLES ±0° 30' | CLASS OF ACCURACY | NOMINAL DIMENSION RANGE INCHES | | |
| SURFACE QUALITY | (CHECK ONE) | OVER 0 TO 0.2 | OVER 0.2 TO 1.2 | OVER 1.2 TO 4.0 | OVER 4.0 TO 12.0 |
| QUANTITY & VARIATION | MEDIUM | ±.004 | ±.008 | ±.012 | ±.016 |
| | PREFERRED | ±.012 | ±.016 | ±.025 | ±.04 |
| THIRD ANGLE PROJECTION | DRN. M. <i>[Signature]</i> 2-17-75 | FIRST USED ON | | KL10 | |
| REMOVE BURRS AND BREAK SHARP CORNERS | CHK'D <i>[Signature]</i> 2-24-75 | TITLE | | | |
| DO NOT SCALE DWG | PROJ. ENG. <i>[Signature]</i> 2-24-75 | MODULE UTILIZATION | | | |
| MATERIAL | PROD. <i>[Signature]</i> 2-24-75 | NEXT HIGHER ASSY. | | SIZE CODE | NUMBER |
| FINISH | | E-UA-MA20-0-0 | | D | MU MA20-0-MUAF |
| | | SCALE | NONE | DIST. | |
| | | SHEET | 1 | OF | 1 |

REV. 1
 CHANGE NO. 1
 CHK



NOTE:
 AS THE CYCLE CONT BUSY SIGNALS ARE WIRED FROM ONE CONTROL BOARD (M8561) TO THE OTHER, THE SIGNALS ARE DEFINED AS [P] IF IT ORIGINATES ON THE MODULE BEING REFERENCED AND AS [R] IF IT ORIGINATES ON THE OTHER MODULE.

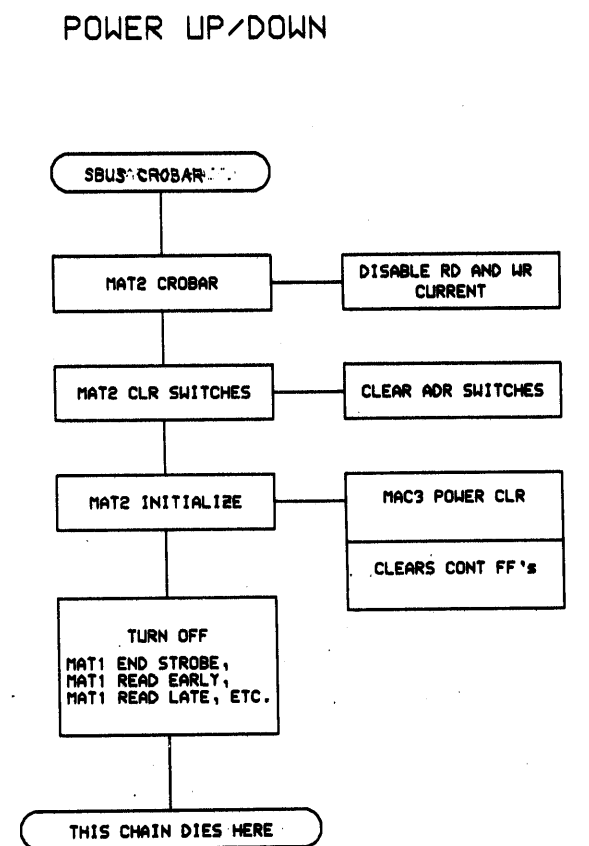
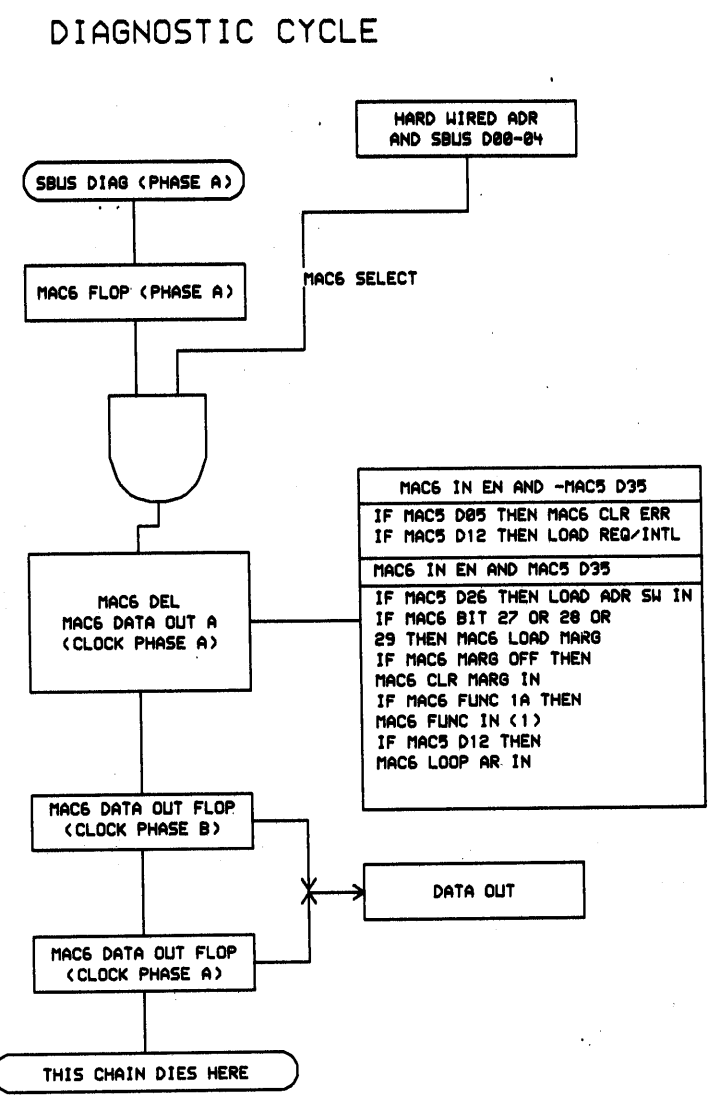
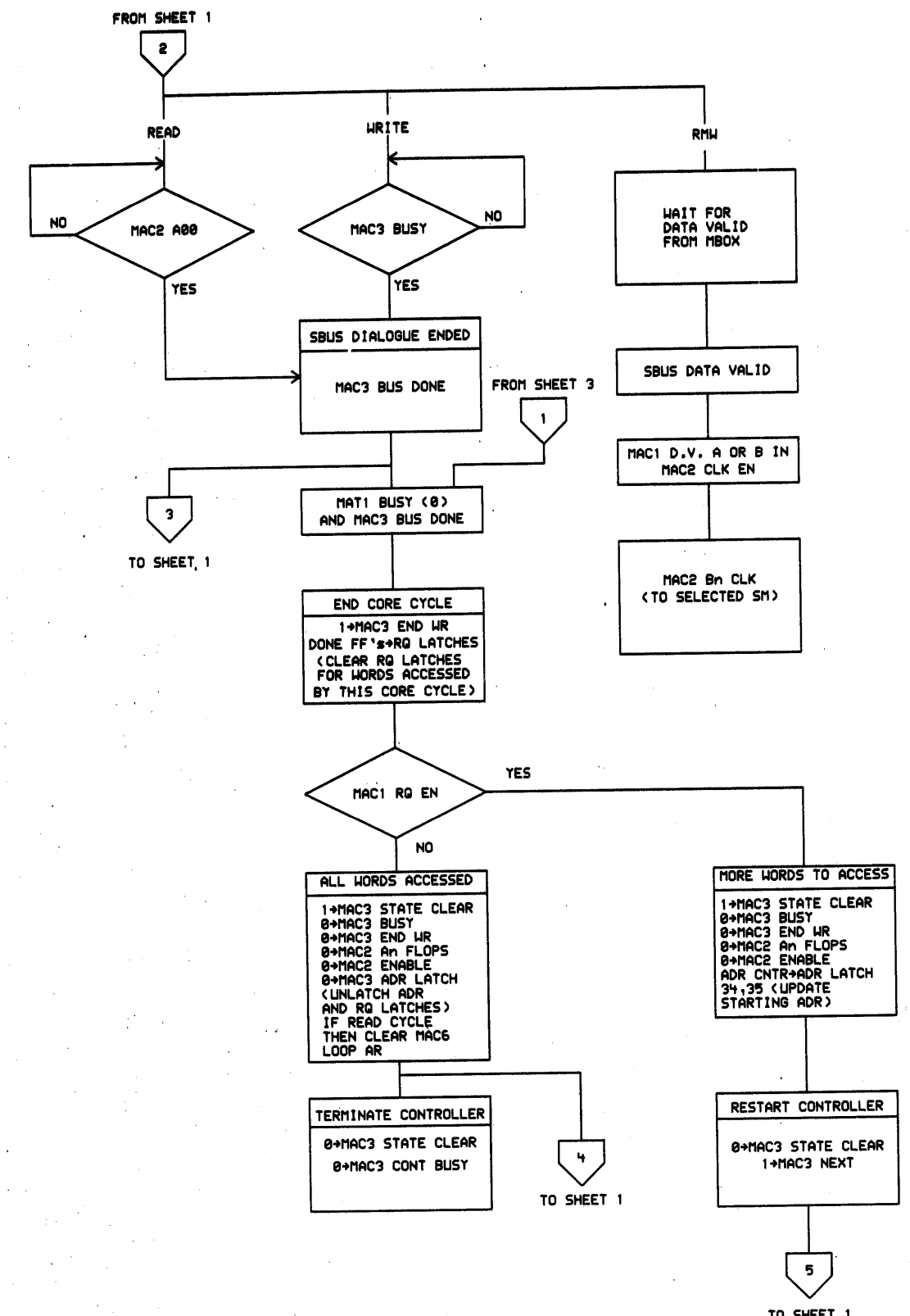


SHEET 1 OF 3

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| REVISIONS | | |
|-----------|------------|-----|
| CHK | CHANGE NO. | REV |
| | | |

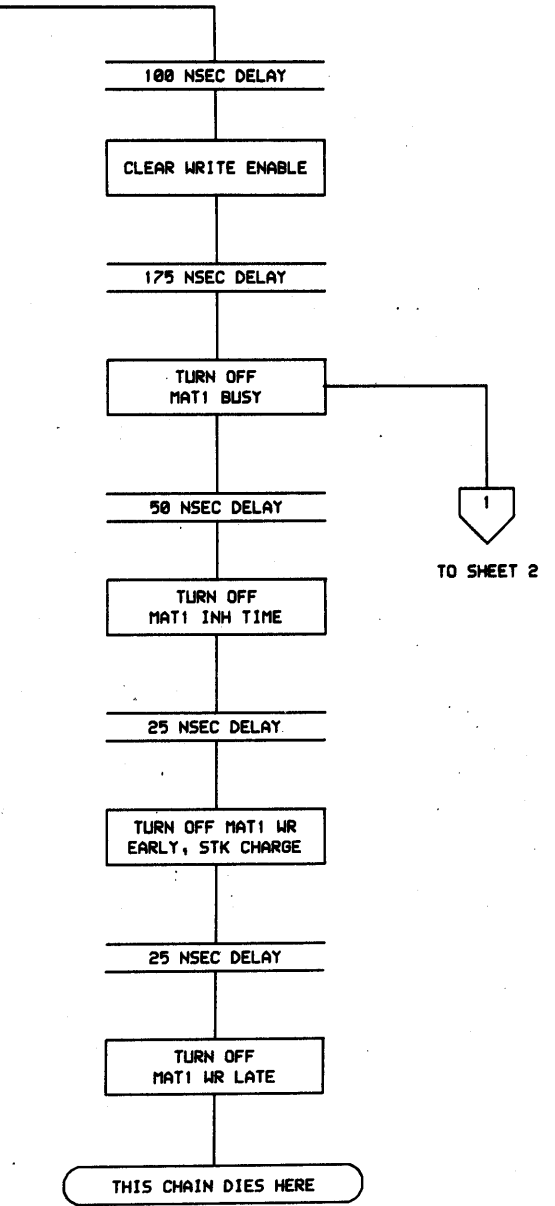
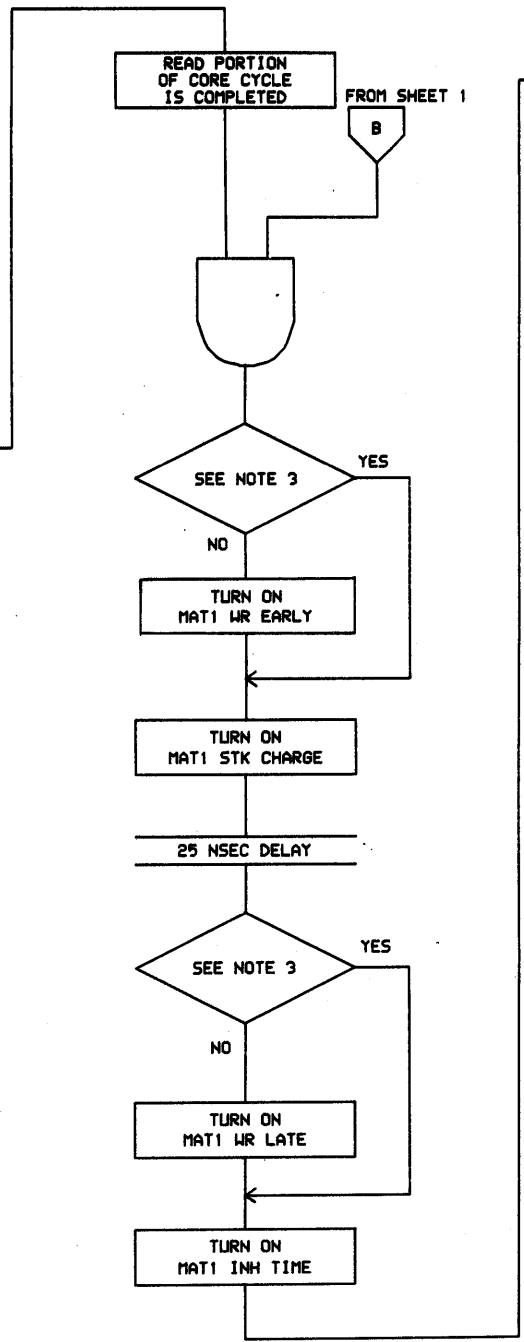
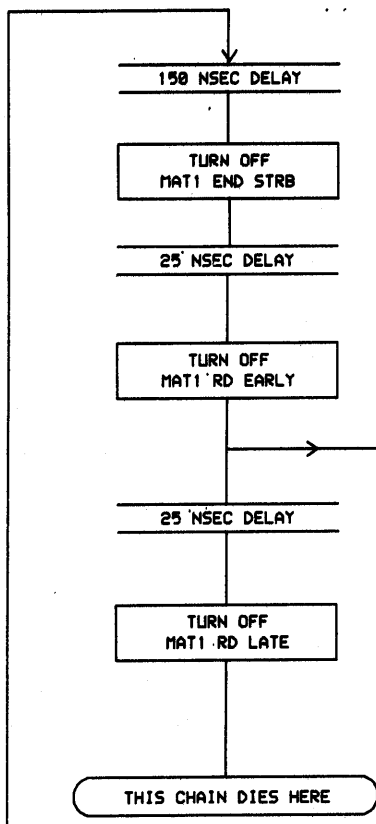
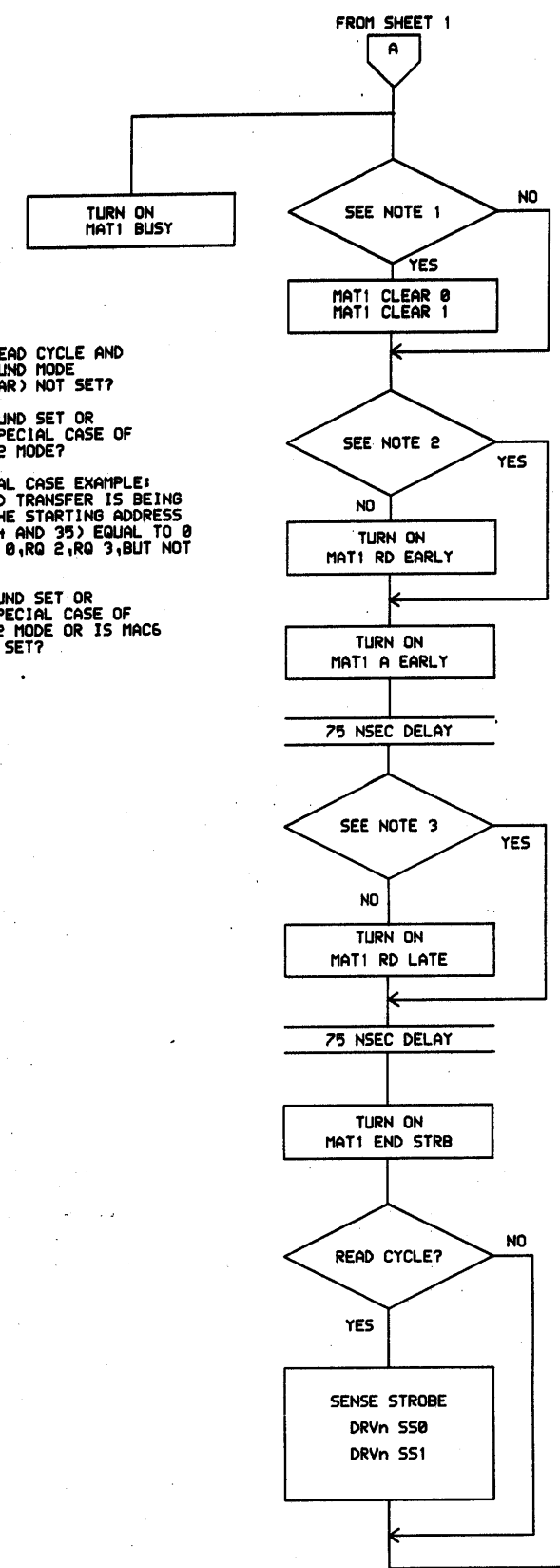
| | | | | | |
|----------------------------------|-----------------|------------------------|-------------------|--------|-----------------------------------|
| | DATE: 20-OCT-75 | ENG: P.S. M... | DATE: 12-OCT-75 | REV. # | TITLE: MA20 FLOW DIAGRAM |
| | DATE: 17-OCT-75 | BOARD LOCATION: 1 OF 3 | DATE: 17-OCT-75 | 15:49 | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 |
| FIRST USED ON OPTION/MODEL: MA20 | SIZE CODE: D | FD: MA20-0-FD | NUMBER: MA20-0-FD | REV. # | |



D
C
B
A

D
C
B
A

NOTES:
 1) IS THIS A READ CYCLE AND IS LOOP AROUND MODE (MAC6 LOOP AR) NOT SET?
 2) IS LOOP AROUND SET OR IS THIS A SPECIAL CASE OF INTERLEAVE 2 MODE?
 IL2 SPECIAL CASE EXAMPLE: A THREE WORD TRANSFER IS BEING DONE WITH THE STARTING ADDRESS (ADR BITS 34 AND 35) EQUAL TO 0 AND WITH RQ 0, RQ 2, RQ 3, BUT NOT RQ 1.
 3) IS LOOP AROUND SET OR IS THIS A SPECIAL CASE OF INTERLEAVE 2 MODE OR IS MAC6 ADR PAR ERR SET?



SHEET 3 OF 3

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| REVISIONS | | |
|-----------|------------|-----|
| CHK | CHANGE NO. | REV |
| | | |

digital DRAWN: *J. Smith* DATE: 28-OCT-75 ENG: *R. Smith* DATE: 14 JAN 76 TITLE: MA20 FLOW DIAGRAM
 CHK'D: *W. H. H. H.* DATE: 17 JAN 76 BOARD LOCATION: 3 OF 3
 FIRST USED ON OPTION/MODEL: MA20 NEXT HIGHER ASSEMBLY: B-DD-MA20-0
 SIZE CODE NUMBER REV. D FD MA20-0-FD *

FIRST CONTROLLER

SECOND CONTROLLER

| HARDWIRED CONTROLLER SELECTION | | |
|--------------------------------|---------|---------|
| | PIN EF2 | PIN EE1 |
| C0 | GND | GND |
| C1 | GND | — |
| C2 | — | GND |
| C3 | — | — |

THE CHART AT LEFT SHOWS 'NORMAL' SM INSTALLATION AND ALSO THE SIGNALS NECESSARY TO SELECT A SM FOR ALL SIZE AND INTERLEAVE COMBINATIONS.

MA20 DESKEW PROCEDURE

NOTES:

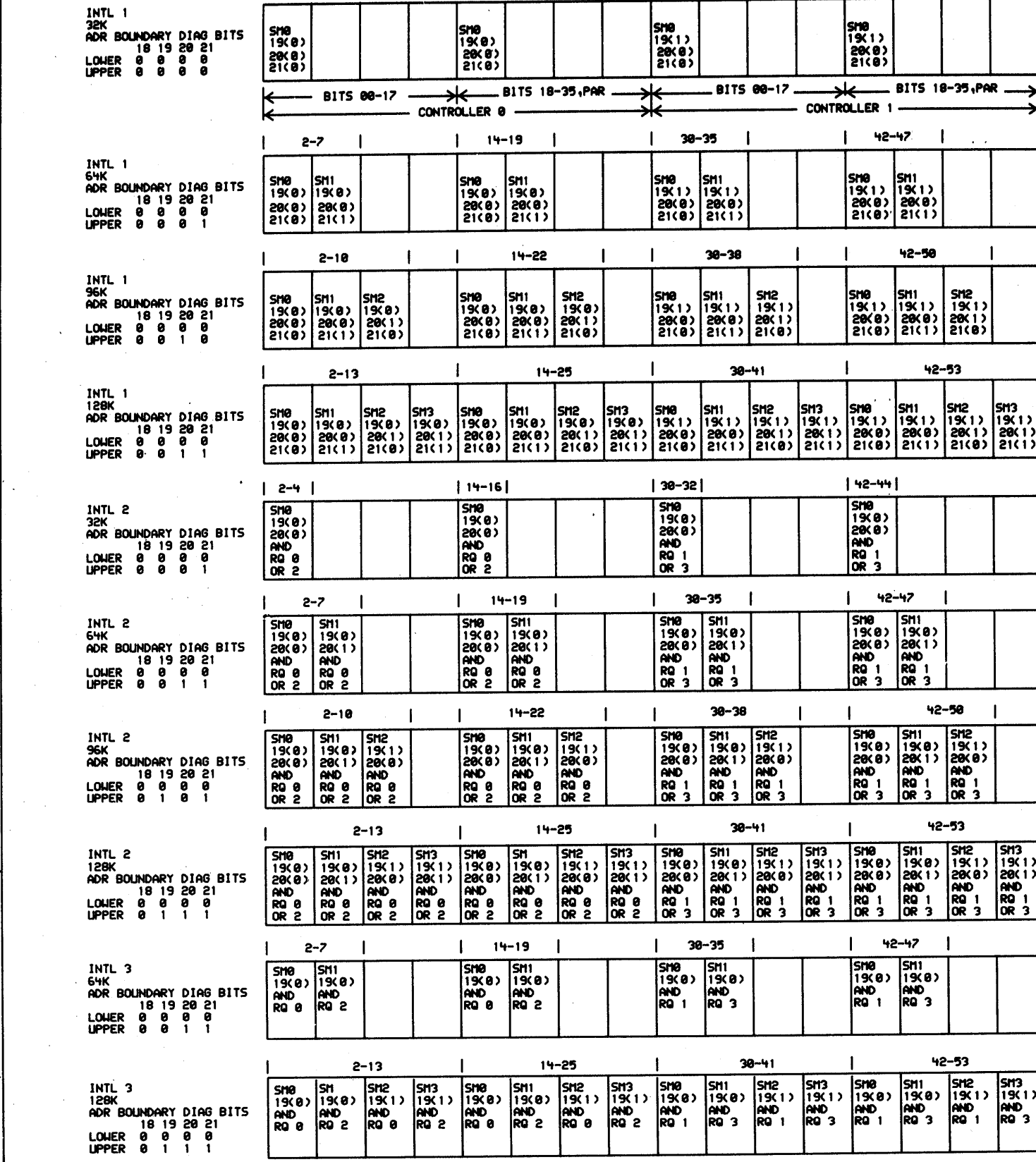
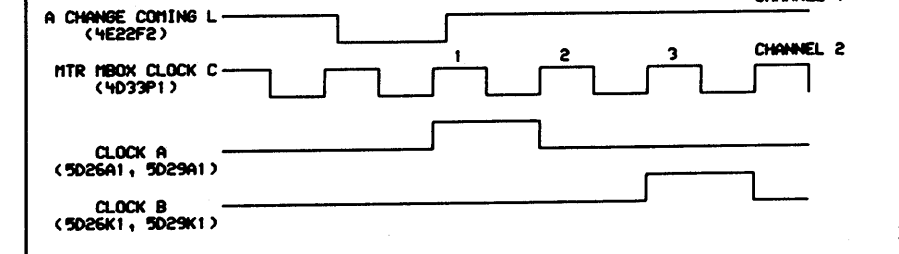
- 1- USE EQUAL LENGTH PROBES WITH SHORT GROUND CLIPS.
- 2- SELECT CLOCK RATE 0 ON KL10 (FOR ON LINE DESKEW PROCEDURE).
- 3- THE M8562 DELAY LINES ARE ARRANGED SO THAT (A) CLOCK IS THE TOP POT AND (B) CLOCK IS THE BOTTOM POT.
- 4- A 7000 SERIES OR EQUIVALENT SCOPE SHOULD BE USED WHEN DESKEWING THE MA20.
- 5- THE SCOPE SWEEP RATE SHOULD BE 5ns OR LESS PER CM.

MA20 DESKEW PROCEDURE (USING A MA20-TA)

- 1- PUT ALL SWITCHES DOWN.
- 2- PUT CHANNEL A ON THE MA20-TA AT A23M1 (CON1 CLK A H), PUT CHANNEL B ON THE MEMORY AT D26A1.
- 3- ADJUST THE UPPER DELAY ON THE M8562 IN EF01 UNTIL THE RISING EDGES MATCH OR CROSS AT +1.5V.
- 4- REPEAT STEPS 1 THROUGH 3 FOR D29A1 AND THE M8562 IN EF54.
- 5- PUT CHANNEL A ON THE MA20-TA AT A23K1 (CON1 CLK B H), PUT CHANNEL B ON THE MEMORY AT D26K1.
- 6- ADJUST THE LOWER DELAY ON THE M8562 IN EF01 UNTIL THE RISING EDGES MATCH OR CROSS AT 1.5V.
- 7- REPEAT STEPS 5 THROUGH 6 FOR D29K1 AND THE M8562 IN EF54.

MA20 DESKEW PROCEDURE (ON LINE)

- 1- SET CLOCK RATE TO 'CR0', CLOCK SOURCE TO 'CS0'. TYPE 'FX1' TO TURN THE CLOCK ON.
- 2- PLACE CHANNEL 1 PROBE ON PIN 4E22F2 'A CHANGE COMING L'. SYNC ON CHANNEL 1.
- 3- PLACE CHANNEL 2 PROBE ON PIN 4D33P1 'MTR MBOX CLOCK C'.
- 4- ALIGN THE RISING EDGE OF THE PULSE DESIGNATED AS 1, SO THAT THE 50% POINT CROSSES THE SECOND VERTICAL DIVISION OF THE SCOPE SCREEN. NOTE THIS POSITION.
- 5- PLACE CHANNEL 2 PROBE ON PIN 5D26A1. ADJUST THE TOP DELAY ON THE M8562, SLOT 5EF01 SO THAT THE LEADING EDGE 50% POINT CROSSES THE SECOND VERTICAL DIVISION OF THE SCOPE SCREEN.
- 6- PLACE CHANNEL 2 PROBE ON PIN 5D29A1. ADJUST THE TOP DELAY ON THE M8562, SLOT 5EF54 SO THAT THE LEADING EDGE 50% POINT CROSSES THE SECOND VERTICAL DIVISION OF THE SCOPE SCREEN.
- 7- REPLACE CHANNEL 2 PROBE ON PIN 4D33P1 'MTR MBOX CLOCK C'.
- 8- ALIGN THE LEADING EDGE OF THE PULSE DESIGNATED AS 3, SO THAT THE 50% POINT CROSSES THE NEAREST VERTICAL DIVISION MARK OF THE SCOPE SCREEN. NOTE THIS POSITION.
- 9- PLACE CHANNEL 2 PROBE ON PIN 5D26K1. ADJUST THE BOTTOM DELAY ON THE M8562, SLOT 5EF01 SO THAT THE LEADING EDGE 50% POINT CROSSES THE VERTICAL DIVISION MARK NOTE IN STEP 8.
- 10- PLACE CHANNEL 2 PROBE ON PIN 5D29K1. ADJUST THE BOTTOM DELAY ON THE M8562, SLOT 5EF54 SO THAT THE LEADING EDGE 50% POINT CROSSES THE VERTICAL DIVISION MARK NOTE IN STEP 8.



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| REVISIONS | |
|------------|----------------|
| CHK | CHANGE NO. REV |
| MA20-00005 | A |
| SULLIVAN | 16 JUL 76 |

digital

DATE: 16-JUL-76
 DATE: 16-JUL-76
 DATE: 16-JUL-76

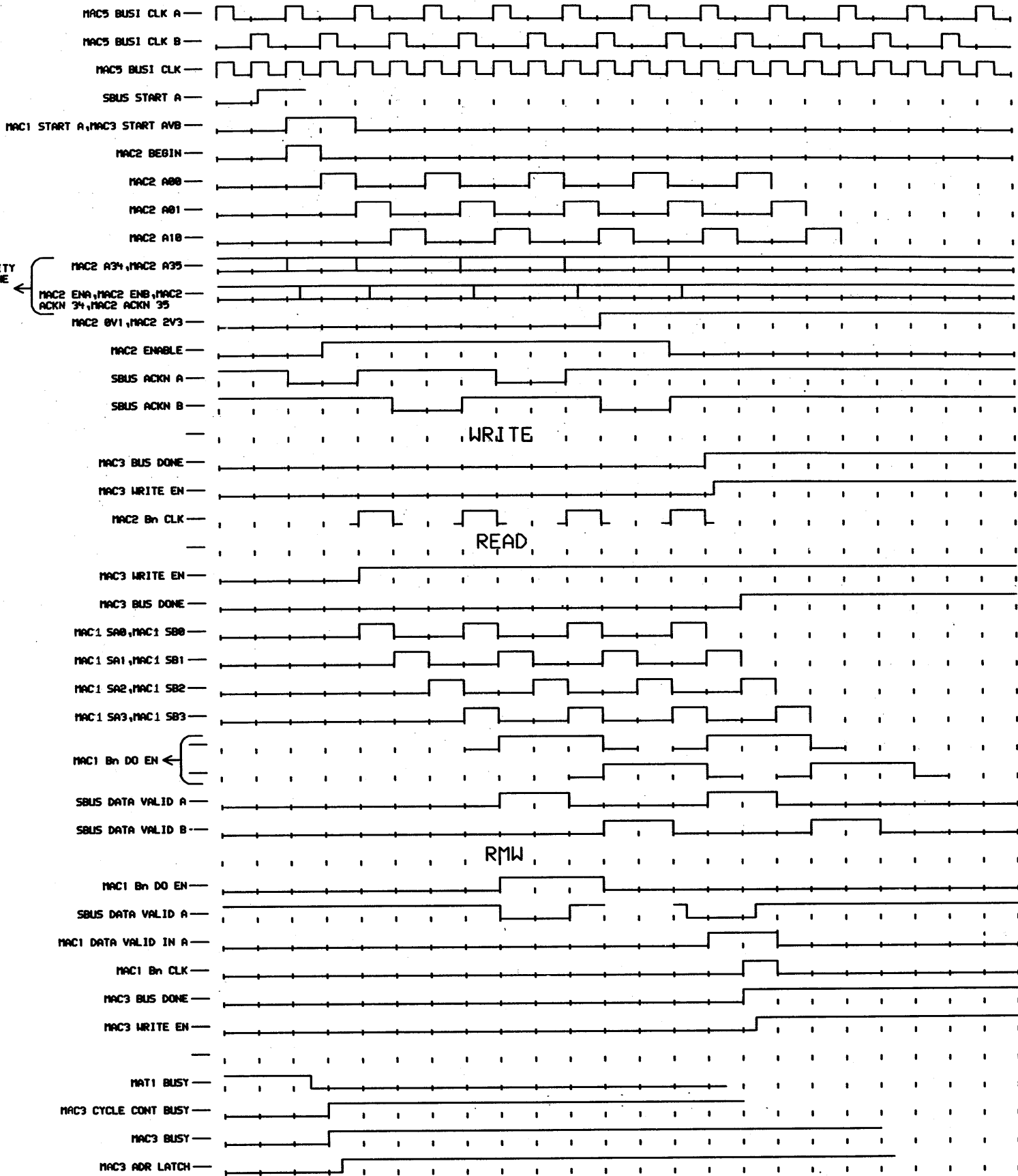
ENGINEER: J. Hamilton
 CHECKED: J. Hamilton
 DRAWN: J. Hamilton

TITLE: MA20 INSTRUCTION / SETUP CHARTS

SIZE: D
 CODE: BS
 NUMBER: MA20-0-INS
 REV: A

FIRST USED ON OPTION/MODEL: MA20 B-DD-MA20-0

MA20 INTERLEAVE MODE 3 (4 WAY), 4 WORDS (EXCEPT 1 WORD FOR RMW)



SIGNAL POLARITY DEPENDS ON THE FIRST WORD REQUESTED

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| REVISIONS | | |
|-----------|------------|------|
| CHK | CHANGE NO. | REV. |
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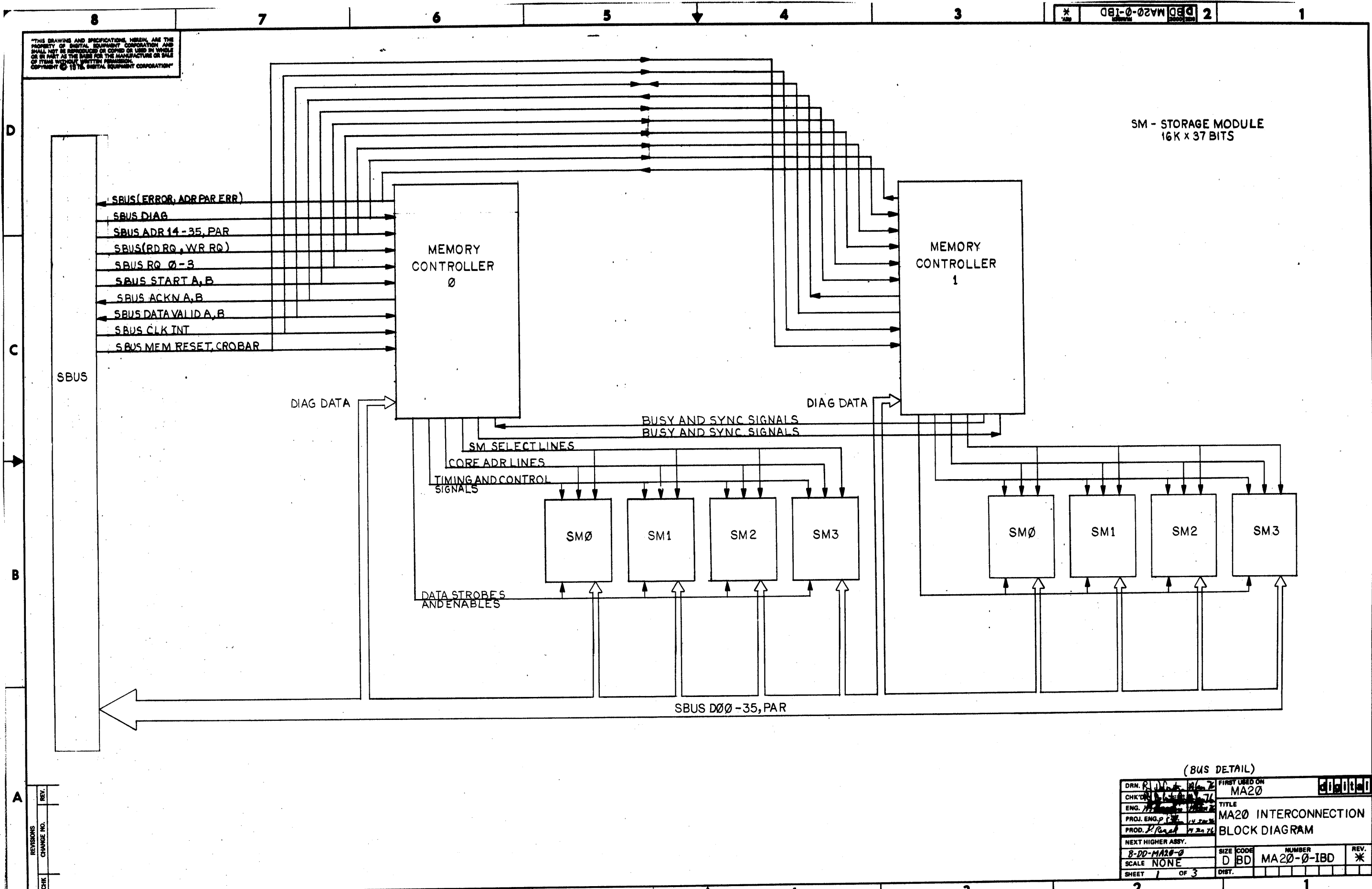
| DATE | ENG. | DATE | TITLE |
|----------|------|----------|----------------------------|
| 10-28-79 | PS | 10-28-79 | MA20 TIMING (INTERLEAVE 3) |
| | | | |

| SIZE | CODE | NUMBER | REV. |
|------|------|-----------|------|
| D | TD | MA20-0-TD | |

REV. #
D TD MA20-0-TD

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SM - STORAGE MODULE
16K x 37 BITS

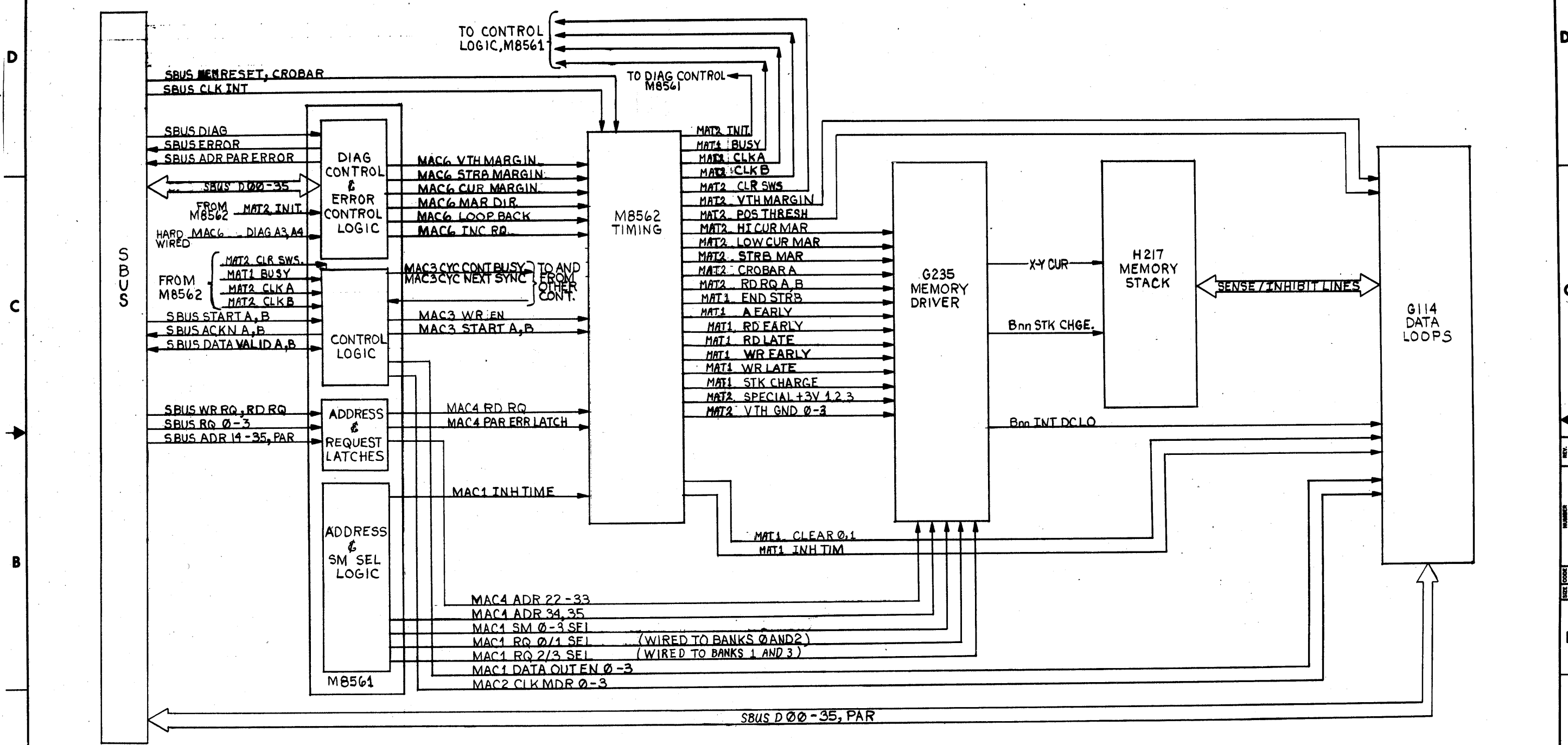


| | |
|------|--|
| REV. | |
| CHG. | |
| CHK. | |

(BUS DETAIL)

| | | |
|-------------------|--|-------------------|
| DRN. R. J. ... | FIRST USED ON MA20 | Digital |
| CHK'D ... | TITLE MA20 INTERCONNECTION BLOCK DIAGRAM | |
| ENG. ... | | |
| PROJ. ENG. P. ... | | |
| PROD. ... | | |
| NEXT HIGHER ASSY. | | |
| 8-DD-MA20-0 | SIZE CODE D BD | NUMBER MA20-0-IBD |
| SCALE NONE | | REV. * |
| SHEET 1 OF 3 | | |

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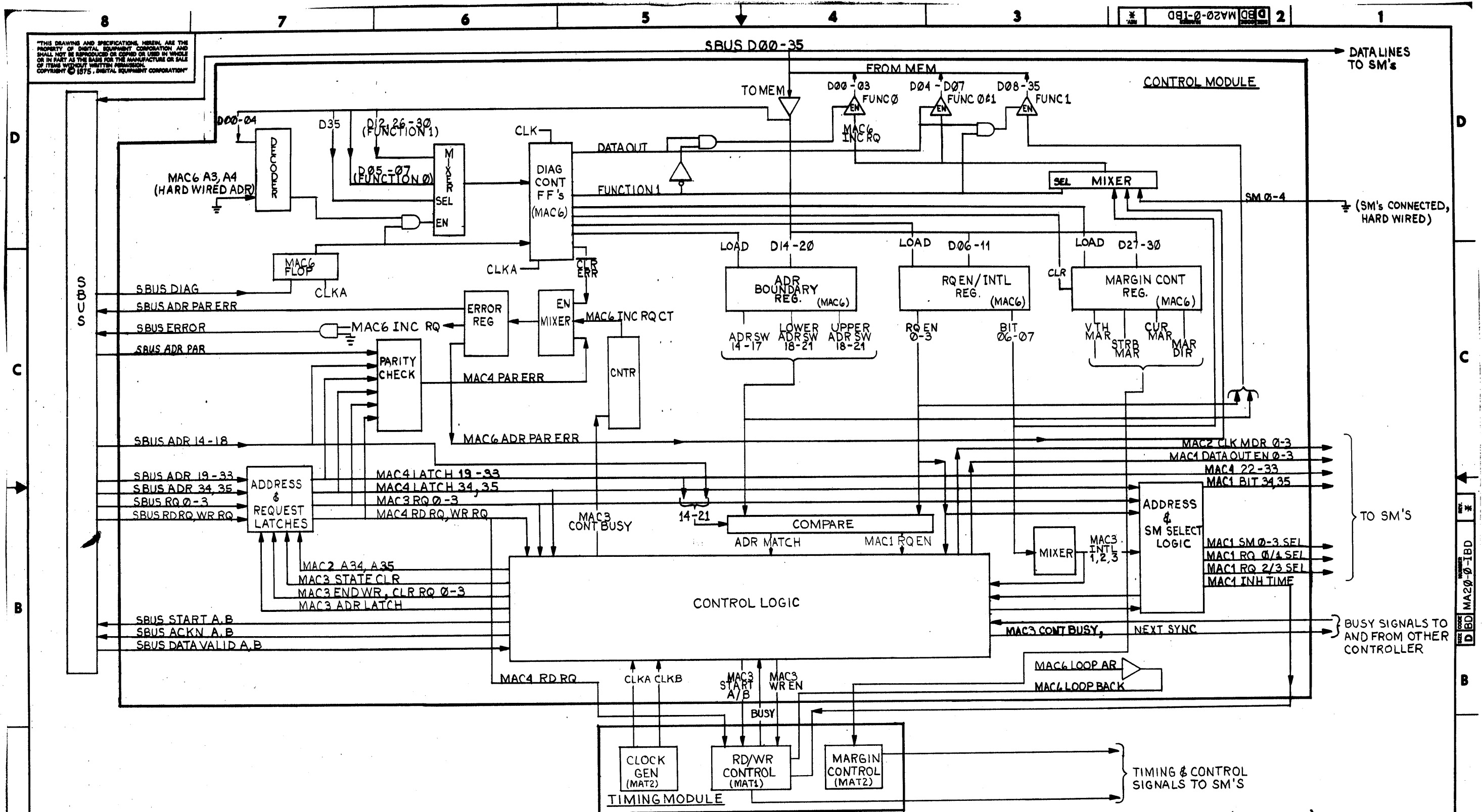


(STORAGE MODULE DETAIL)

| | | | |
|-------------------------|-------------------|------------------------------------|---------|
| DRN: D. J. ... 11/2/76 | FIRST USED ON | MA20 | DIGITAL |
| CHK: D. J. ... 11/2/76 | TITLE | MA20 INTERCONNECTION BLOCK DIAGRAM | |
| ENG: M. Ham ... 11/2/76 | PROJ. ENG.: | S. H. ... 11/2/76 | |
| PROD: P. ... 11/2/76 | NEXT HIGHER ASSY. | B-DD-MA20-0 | |
| | SCALE | NONE | |
| | SHEET | 2 OF 3 | |
| | SIZE CODE | D BD | |
| | NUMBER | MA20-0-IBD | |
| | REV. | X | |

| | |
|------------|--|
| REV. | |
| CHANGE NO. | |
| CHK | |

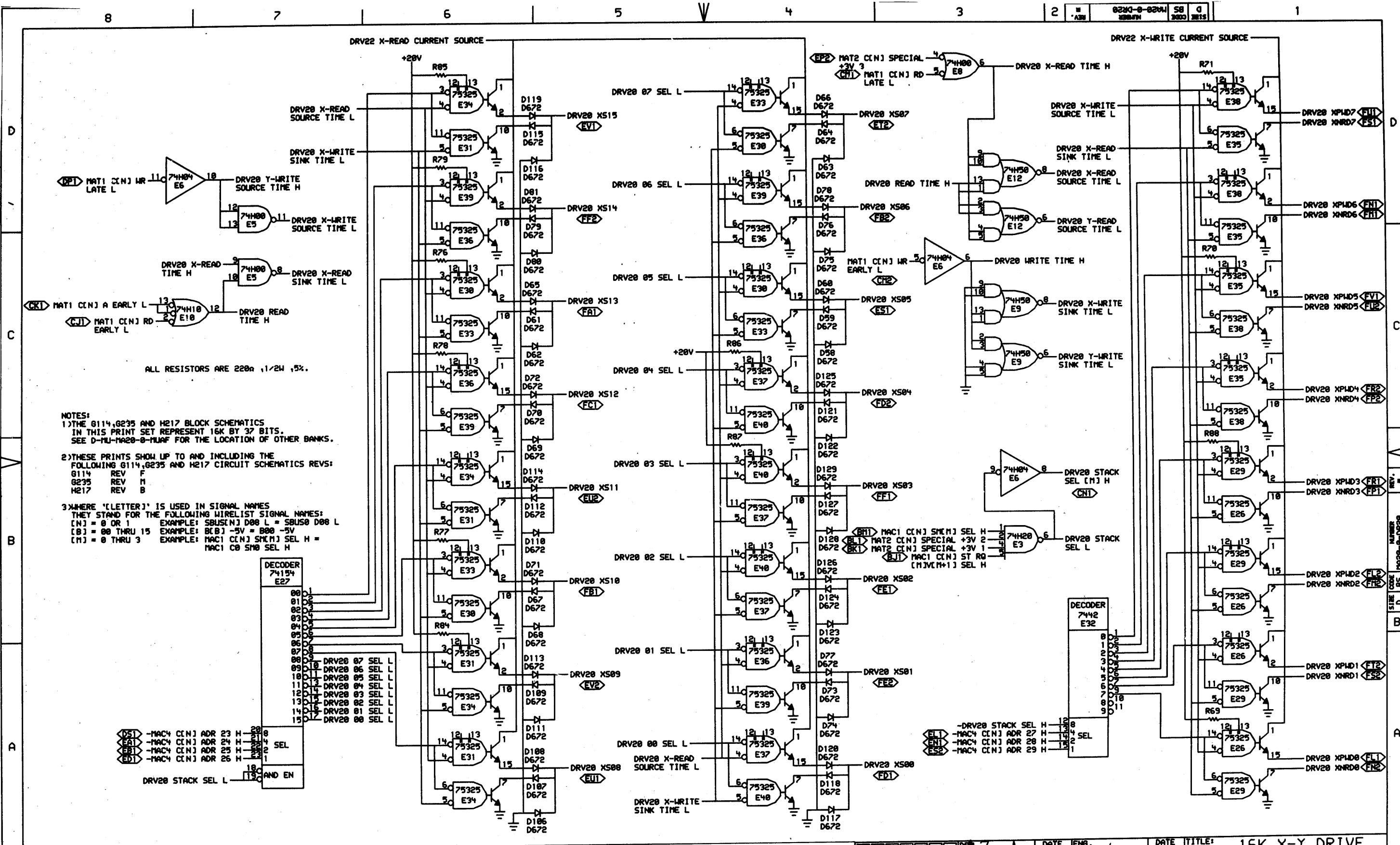
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(M8561 DETAIL)

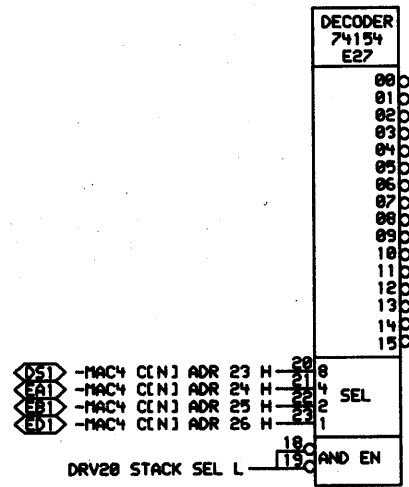
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|-------------------|-----------|------------|---------------|----------------------|---------|
| DRNK | D. J. ... | 11/27/76 | FIRST USED ON | MA20 | Digital |
| CHK'D | D. J. ... | 11/27/76 | TITLE | MA20 INTERCONNECTION | |
| ENG. | H. ... | 11/27/76 | | BLOCK DIAGRAM | |
| PROJ. ENG. | P. S. ... | 11/27/76 | | | |
| PROD. | R. ... | 11/27/76 | | | |
| NEXT HIGHER ASSY. | | | | | |
| B-DD-MA20-0 | SIZE CODE | NUMBER | | | |
| SCALE NONE | D BD | MA20-0-IBD | | | * |
| SHEET 3 OF 3 | DIST. | | | | |

| | |
|------------|--|
| REV. | |
| CHG | |
| REVISIONS | |
| CHANGE NO. | |



ALL RESISTORS ARE 220Ω, 1/2W, 5%.

- NOTES:
- 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-NUMF FOR THE LOCATION OF OTHER BANKS.
 - 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 - 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: BCB] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 (C/N) SM[M] SEL H = MAC1 C0 SM0 SEL H



| REVISIONS | | |
|-----------|------------|-----|
| CHK | CHANGE NO. | REV |
| | | |

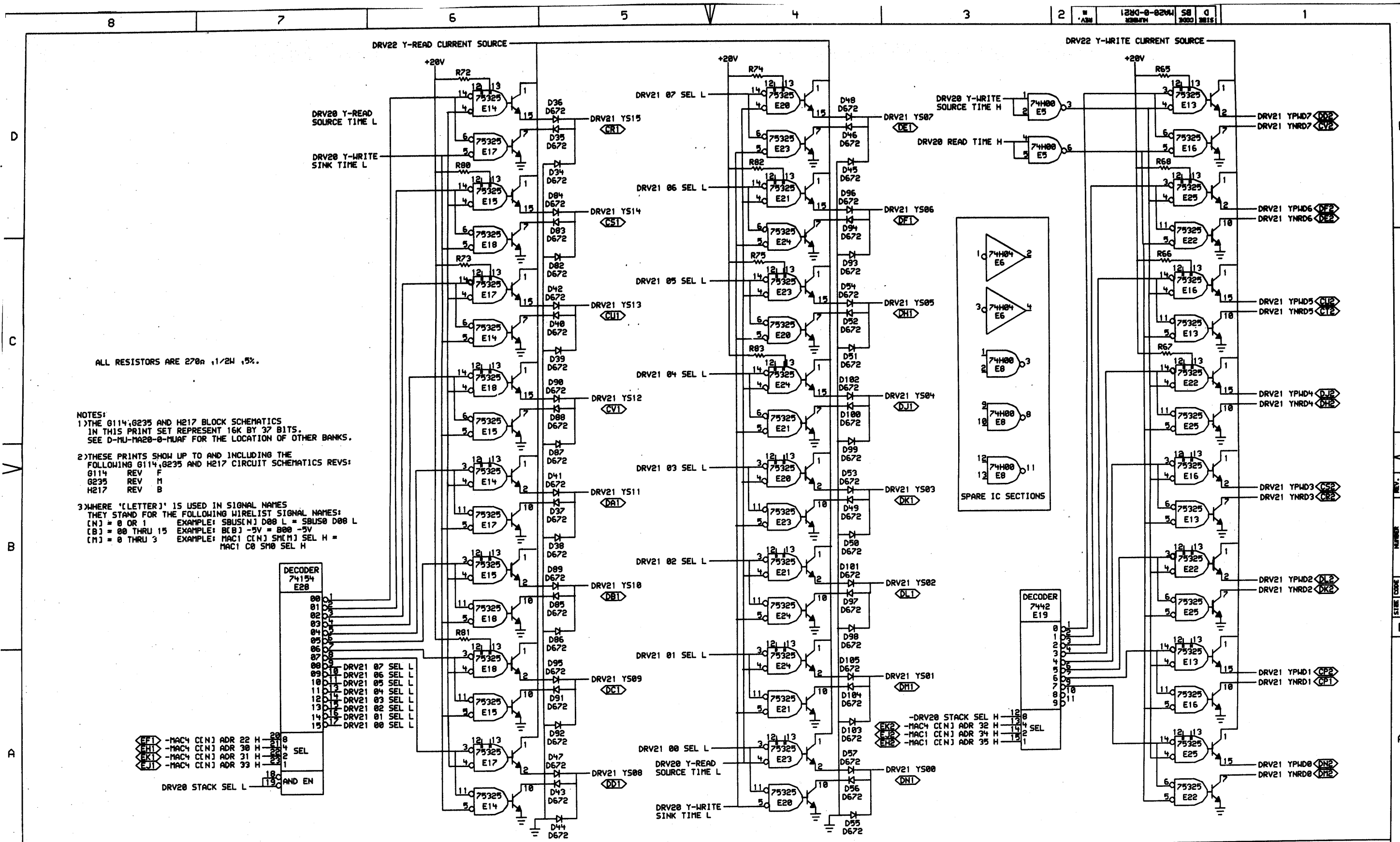
digital **DRY** *J. J. Hanlin* DATE **89-OCT-75** ENG. *P. S. Allen* DATE **12-2-76** TITLE: **16K X-Y DRIVE (G235)**

DRY *J. J. Hanlin* DATE **12-OCT-75** CHK'D *P. S. Allen* DATE **12-2-76** LOCATION: **HIGHER ASSEMBLY:**

DRY *J. J. Hanlin* DATE **12-OCT-75** CHK'D *P. S. Allen* DATE **12-2-76** LOCATION: **HIGHER ASSEMBLY:**

FIRST USED ON OPTION MODEL: **MA20** B-DD-MA20-0

| | | | |
|------|------|-------------|------|
| SIZE | CODE | NUMBER | REV. |
| D | BS | MA20-0-DR20 | 1 |



ALL RESISTORS ARE 270 Ω 1/2W 5%.

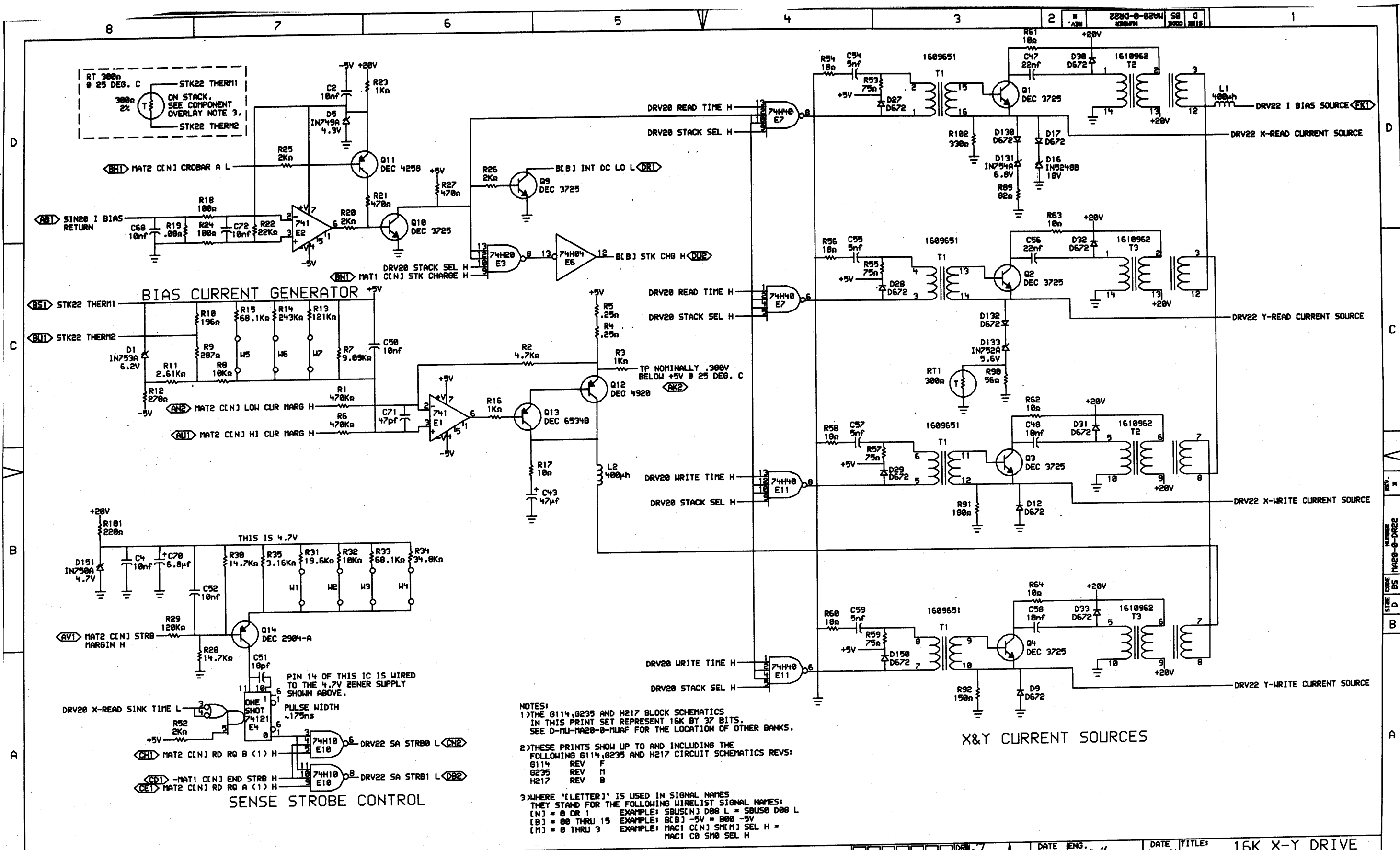
- NOTES:
- THE 0114, 0235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 - THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING 0114, 0235 AND H217 CIRCUIT SCHEMATICS REVS:
 0114 REV F
 0235 REV M
 H217 REV B
 - WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: B[B] -5V = B00 -5V
 [N] = 0 THRU 3 EXAMPLE: MAC1 C[N] SM[N] SEL H = MAC1 C0 S00 SEL H

EF -MAC4 C[N] ADR 22 H-20
 EH -MAC4 C[N] ADR 30 H-21
 EK -MAC4 C[N] ADR 31 H-22
 EJ -MAC4 C[N] ADR 33 H-23
 AND EN
 DRV20 STACK SEL L

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| REVISIONS | | |
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| CHK | CHANGE NO. | REV |
| | | |

| | | |
|----------------------------------|--|--|
| | DATE: 27-OCT-75 ENG: J. Family CHECKED: J. Family DATE: 14 JAN 76 | DATE: 17 JAN 76 TITLE: 16K X-Y DRIVE (G235) |
| | BOARD LOCATION: 1 SHEET: 1 NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | SIZE: D CODE: B5 NUMBER: MA20-0-DR21 |
| FIRST USED ON OPTION/MODEL: MA20 | | |



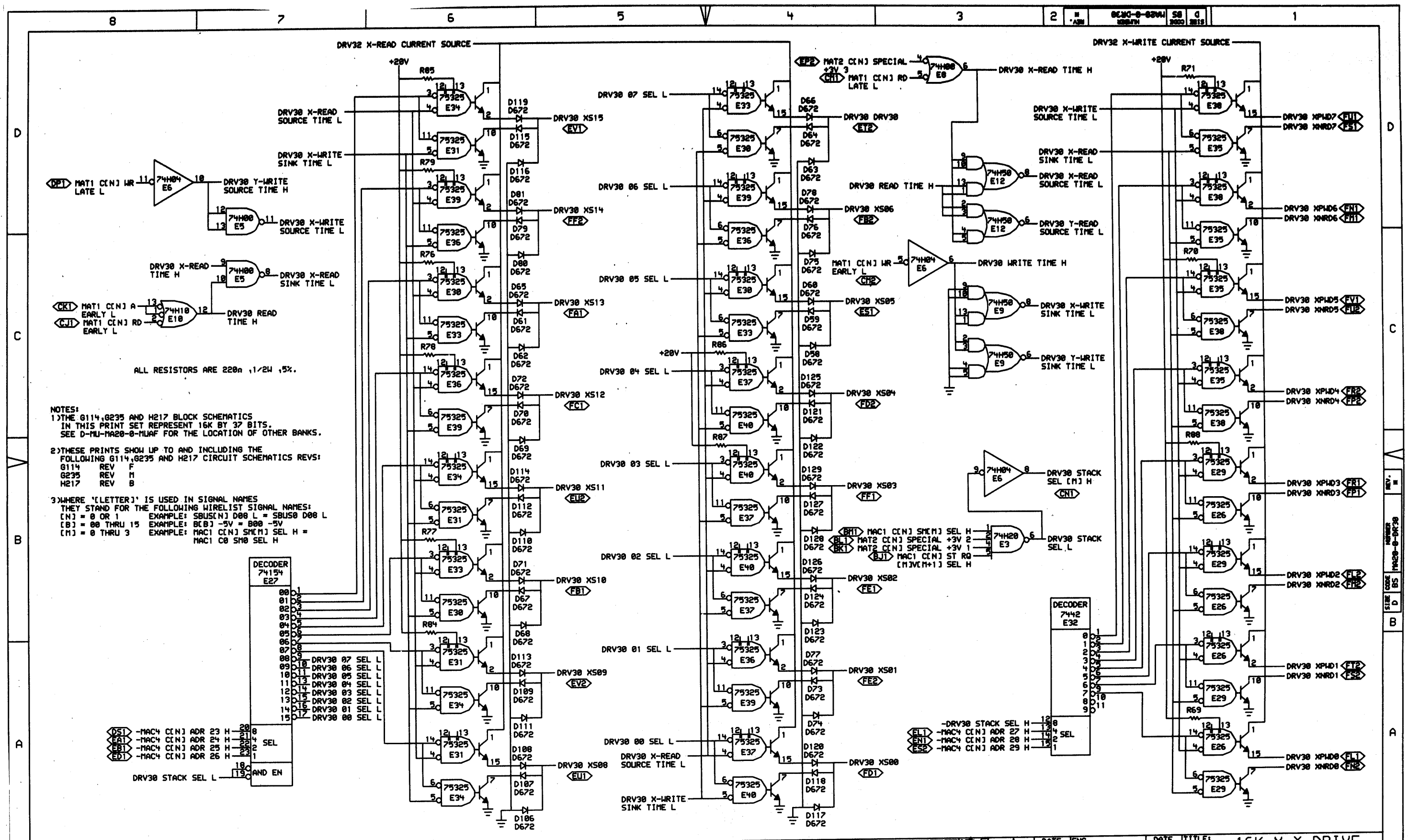
NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: BC[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 CC[N] S[M] SEL H = MAC1 C0 S0 SEL H

| | | | | |
|-----------------------------|-------------|----------------|-----------------------|----------------------|
| digital | DATE | ENG | DATE | TITLE: |
| | 29-OCT-75 | Sullivan | 17 JAN 76 | 16K X-Y DRIVE (G235) |
| CHK | DATE | BOARD LOCATION | OF | SIZE |
| W. Hamilton | 14 JAN 1976 | 1 | 1 | D |
| DRV22(4, 510) | 27-OCT-75 | 08152 | NEXT HIGHER ASSEMBLY: | NUMBER |
| FIRST USED ON OPTION/MODEL: | MA20 | B-DD-MA20-0 | | MA20-0-DR22 |
| | | | | REV. * |

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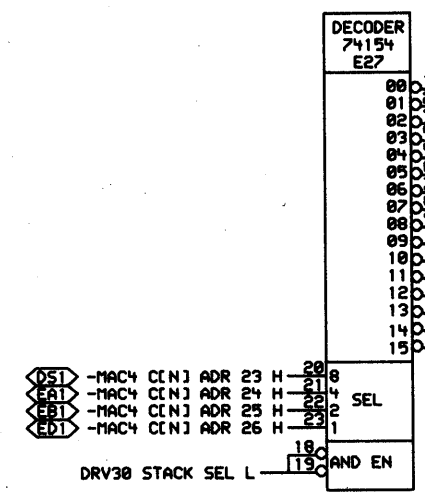
| REVISIONS | |
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| CHK | CHANGE NO. REV |
| | |

REV. X
 NUMBER
 MA20-0-DR22
 SIZE
 D
 BS



ALL RESISTORS ARE 220Ω, 1/2W, 5%.

- NOTES:
- THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 - THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 - WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: B[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[M] S[M] SEL H = MAC1 C0 S0 SEL H



8

7

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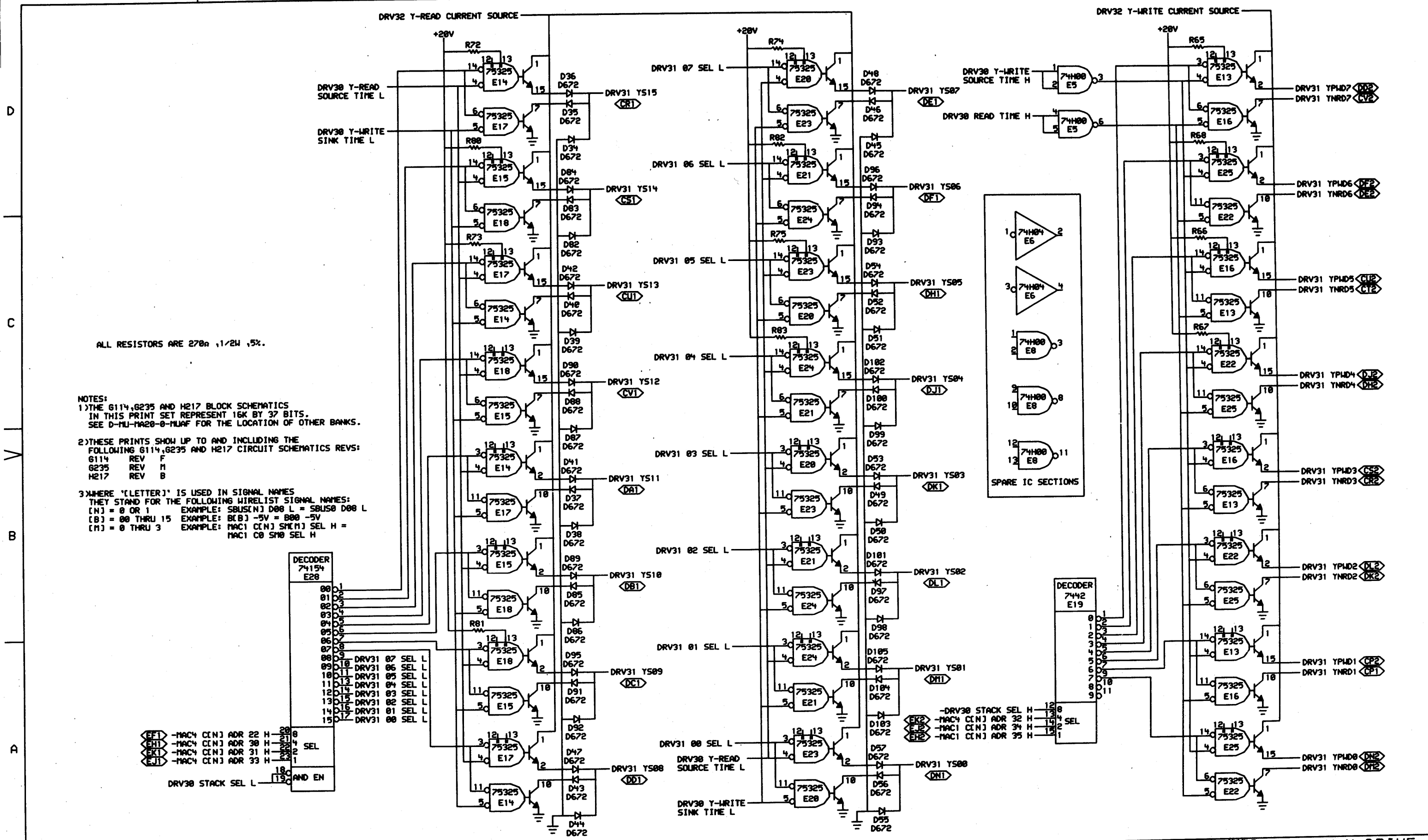
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4

3

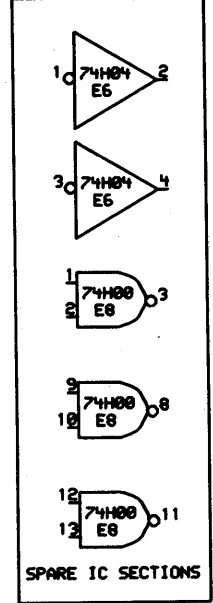
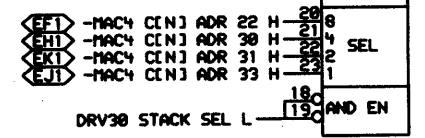
2

1



ALL RESISTORS ARE 270Ω, 1/2W, 5%.

- NOTES:
- 1) THE 6114, 6235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-114AF FOR THE LOCATION OF OTHER BANKS.
 - 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING 6114, 6235 AND H217 CIRCUIT SCHEMATICS REVS:
 6114 REV F
 6235 REV H
 H217 REV B
 - 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: B[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [M] SEL H = MAC1 00 S10 SEL H



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| REVISIONS | | |
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| CHK | CHANGE NO. | REV |
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digital DATE: 09-OCT-75 ENG: P. S. DATE: 14 JAN 76
 CHECKED: W. H. DATE: 17 OCT 75
 TITLE: 16K X-Y DRIVE (G235)
 FIRST USED ON OPTION/MODEL: MA20 B-DD-MA20-0
 SIZE CODE: D BS MA20-0-DR31
 NUMBER: 1
 REV.:

8

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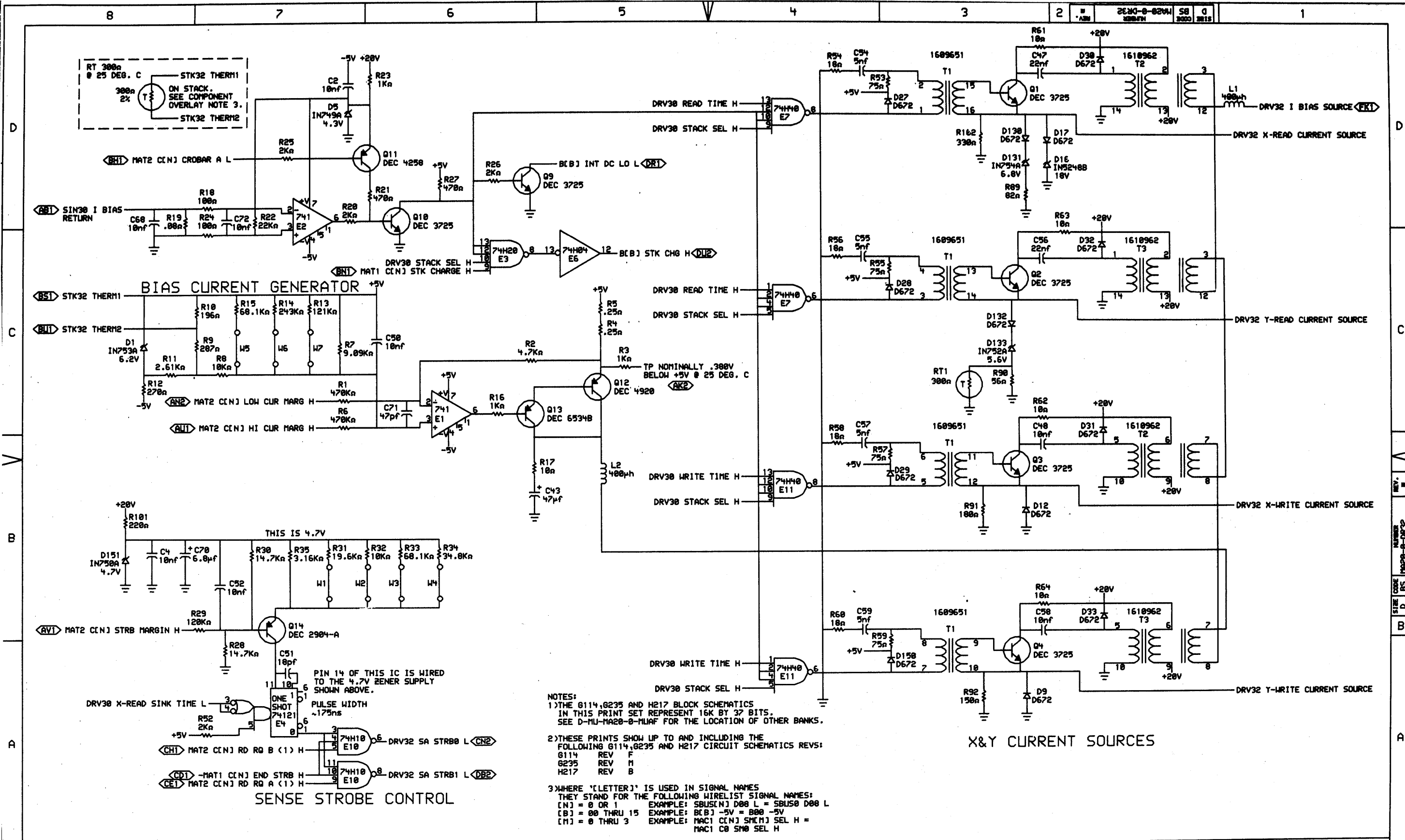
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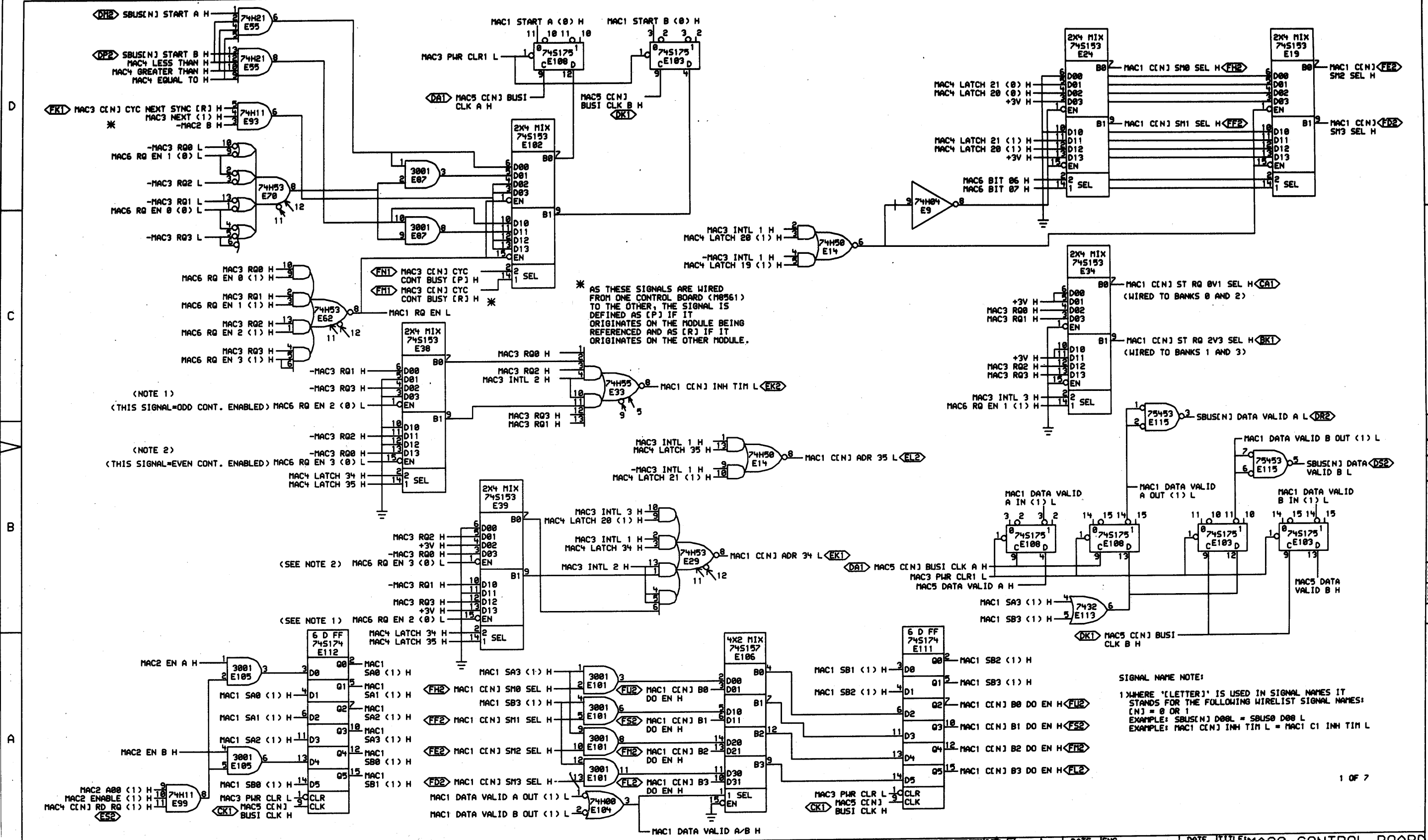
1



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|-----------------------------|-----------|----------------|-----------------------|----------------------|
| | DATE | ENG | DATE | TITLE: |
| | 22-OCT-75 | P. Sullivan | 16 Jan 76 | 16K X-Y DRIVE (G235) |
| CHK'D | DATE | BOARD LOCATION | SHEET | OF |
| W. Hamilton | 14 Jan 76 | | 1 | 1 |
| DRV32(4,510) | 17-OCT-75 | 09118 | NEXT HIGHER ASSEMBLY: | |
| FIRST USED ON OPTION/MODEL: | MA20 | B-DD-MA20-0 | | |
| SIZE | CODE | NUMBER | REV. | |
| D | B5 | MA20-0-DR32 | | |

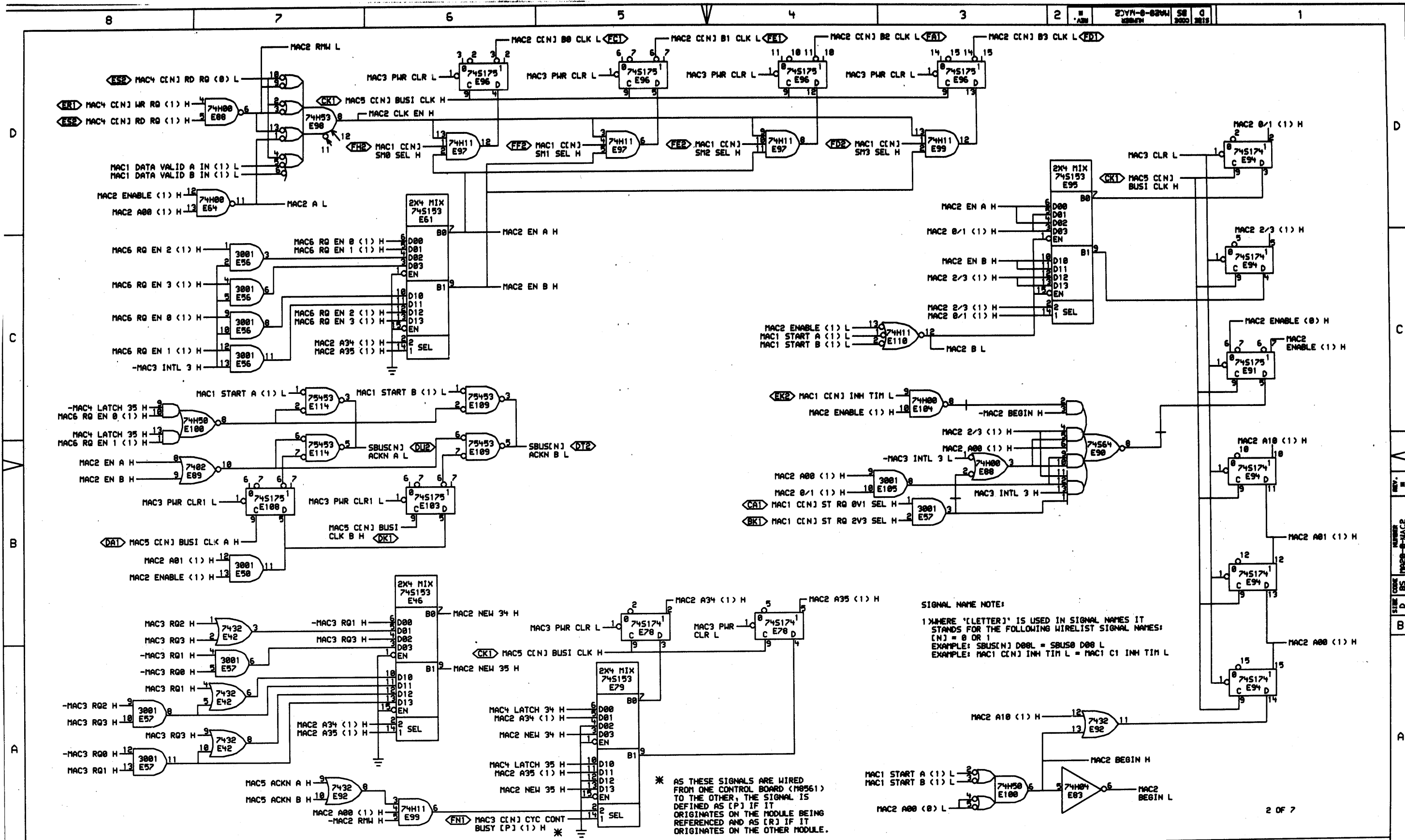


1 OF 7

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|----------------------------------|------------------|-----------------|-----------------------|------------------|-----------------------------------|------------------------|
| digital | | DATE: 20 OCT 75 | ENG: P. Callahan | DATE: 12/20/76 | TITLE: MA20 CONTROL BOARD (M8561) | |
| CHK'D: J. Hanley | DATE: 12/14/76 | BOARD LOCATION: | | NO. OF SHEETS: 1 | SIZE CODE: D | NUMBER: BS MA20-0-MAC1 |
| CONT. (4, 5, 10) | DATE: 128 OCT 75 | 07132 | NEXT HIGHER ASSEMBLY: | REV. * | | |
| FIRST USED ON OPTION/MODEL: MA20 | B-DD-MA20-0 | | | | | |



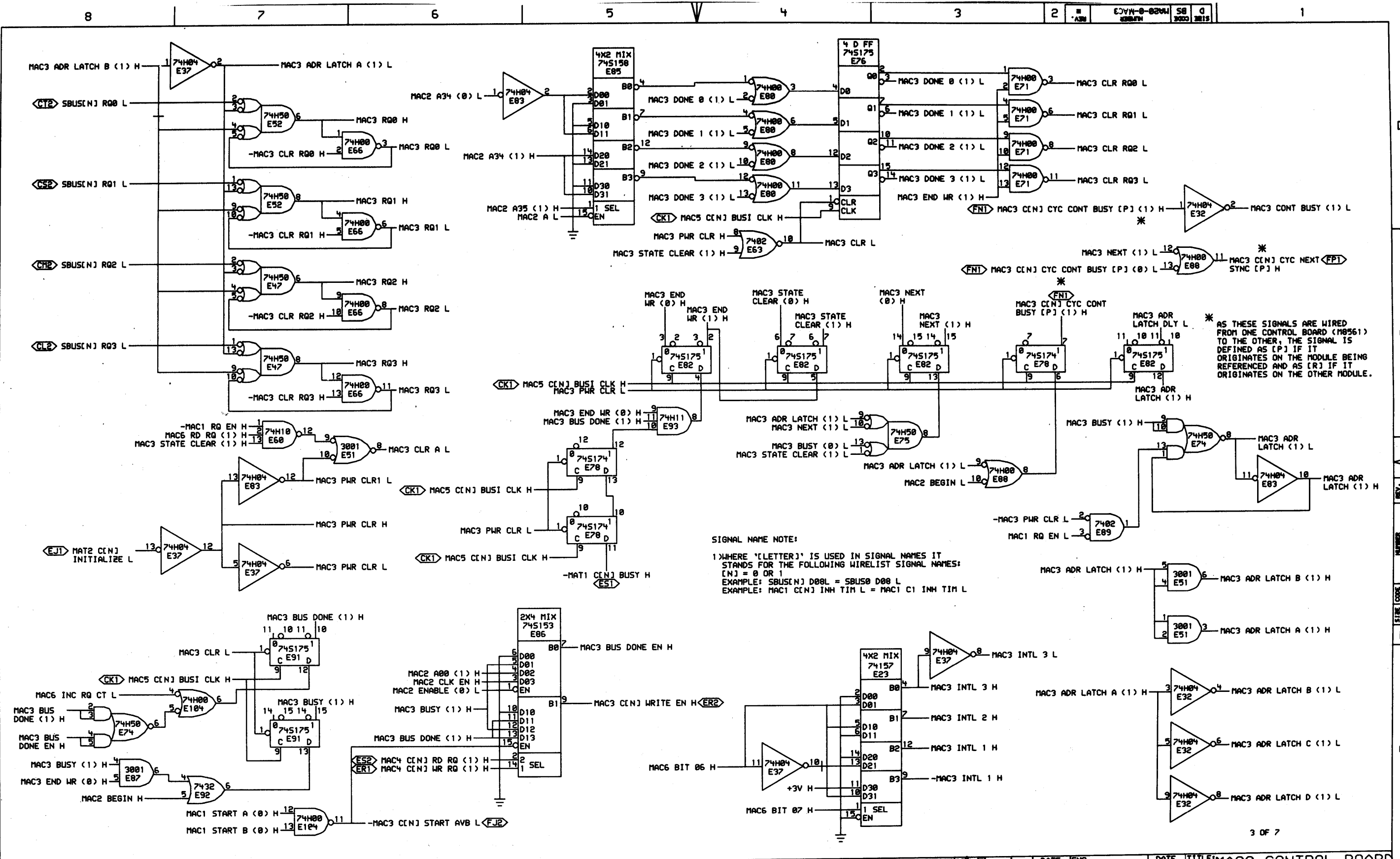
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| CHK | CHANGE NO. REV |
| | |

* AS THESE SIGNALS ARE WIRED FROM ONE CONTROL BOARD (M8561) TO THE OTHER, THE SIGNAL IS DEFINED AS [P] IF IT ORIGINATES ON THE MODULE BEING REFERENCED AND AS [R] IF IT ORIGINATES ON THE OTHER MODULE.

SIGNAL NAME NOTE:
 1) WHERE 'LETTER' IS USED IN SIGNAL NAMES IT STANDS FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1
 EXAMPLE: SBUS[N] D08L = SBUS0 D08 L
 EXAMPLE: MAC1 C[N] INH TIM L = MAC1 C1 INH TIM L

| | | | | |
|-----------------------------|------------|-----------------------|-------------|----------------------------|
| digital | DATE | ENG. | DATE | TITLE |
| | 80-OCT-75 | P. J. ... | 14 JAN 76 | MA20 CONTROL BOARD (M8561) |
| CONTROL 4, 5, 18 | DATE | BOARD LOCATION | SIZE | CODE |
| | 120-OCT-75 | 14 JAN 76 | D | B5 |
| FIRST USED ON OPTION MODEL: | MA20 | NEXT HIGHER ASSEMBLY: | B-DD-MA20-0 | NUMBER |
| | | | | MA20-0-MAC2 |
| | | | | REV. |
| | | | | 1 |



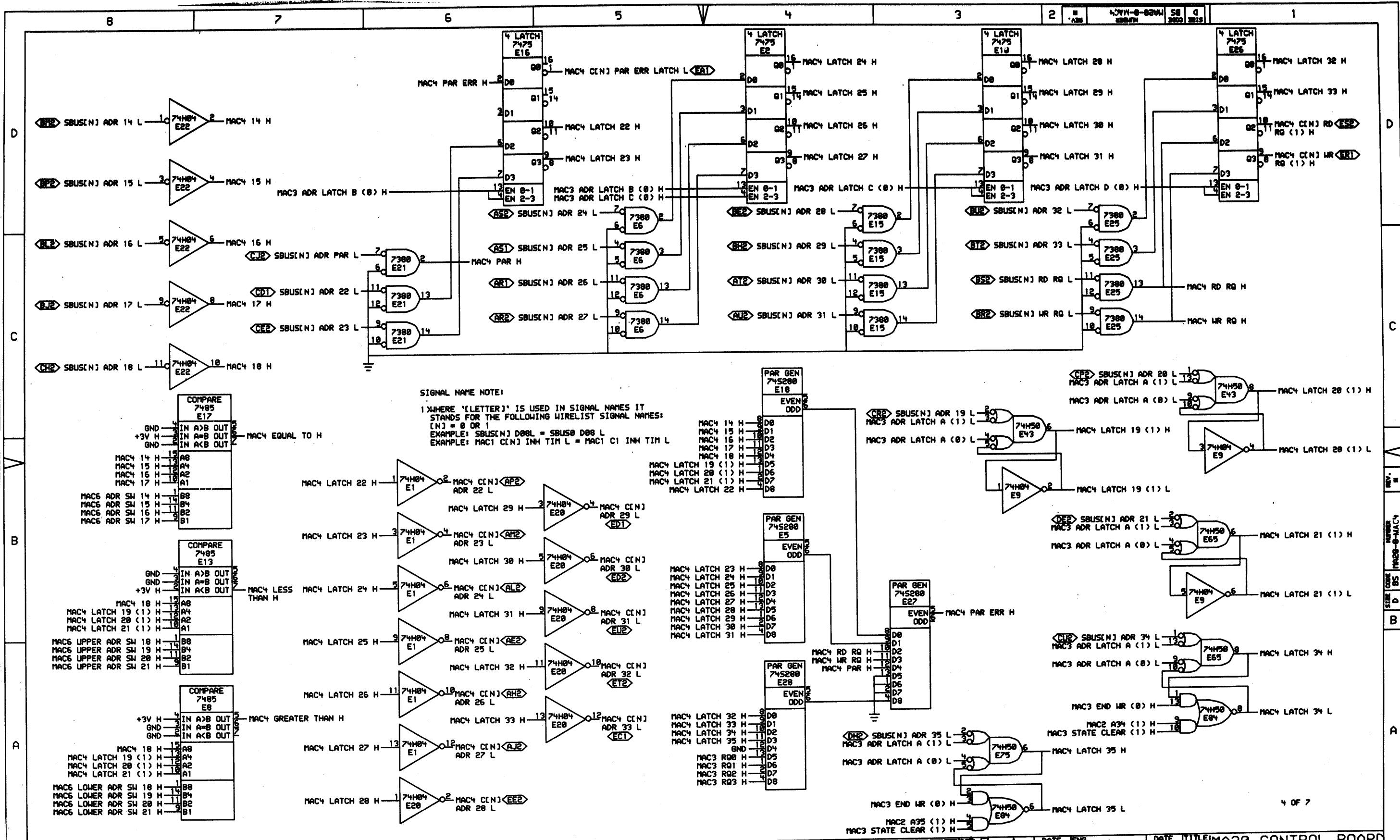
* AS THESE SIGNALS ARE WIRED FROM ONE CONTROL BOARD (M8561) TO THE OTHER, THE SIGNAL IS DEFINED AS [P] IF IT ORIGINATES FROM THE MODULE BEING REFERENCED AND AS [R] IF IT ORIGINATES ON THE OTHER MODULE.

SIGNAL NAME NOTE:
 1) WHERE 'LETTER' IS USED IN SIGNAL NAMES IT STANDS FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1
 EXAMPLE: SBUS[N] D00L = SBUS0 D00 L
 EXAMPLE: MAC1 [N] INH TIM L = MAC1 C1 INH TIM L

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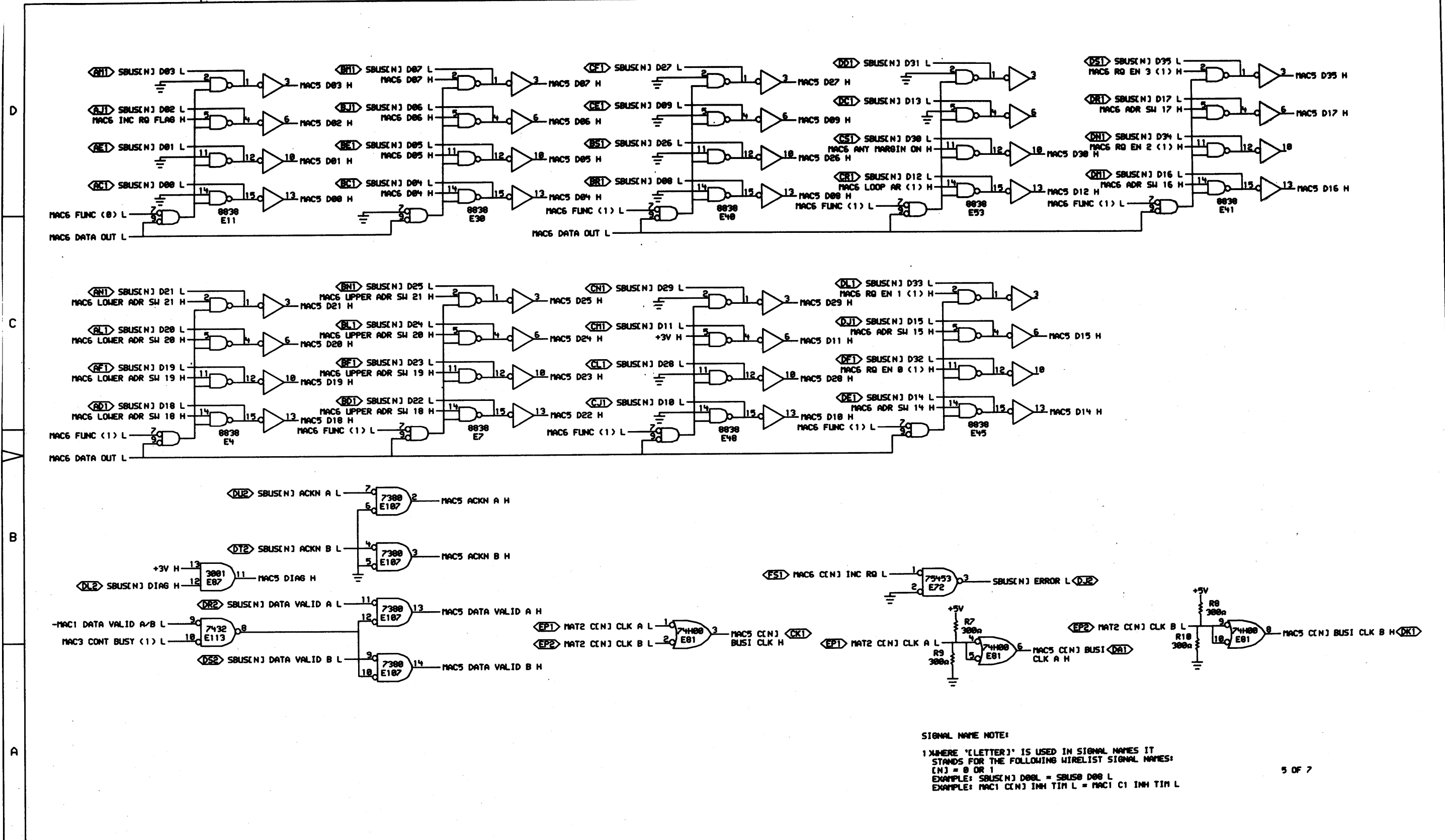
| REV. | CHANGE NO. | REVISIONS |
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|---|---|--------------------|---------------------|-----------------------------------|
| | DATE: 28-OCT-75 | ENG: P. Sullivan | DATE: 14 JAN 76 | TITLE: MA20 CONTROL BOARD (M8561) |
| | DATE: 14 JAN 76 | CHK'D: W. Hamilton | BOARD LOCATION: 1 | SIZE: D |
| CONT: 3, 4, 5, 10 FIRST USED ON OPTION/MODEL: MA20 | DATE: 28-OCT-75 TIME: 07:51 NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | SHEET: 1 OF: 1 | NUMBER: MA20-0-MAC3 | REV. # |



| | | | |
|---|-------------|---|---|
| | | DATE: 80-OCT-73 ENG: [Signature] DATE: [Signature] DESIGNED BY: [Signature] CHECKED BY: [Signature] | DATE: 11/30/73 TITLE: MA20 CONTROL BOARD (M8561) |
| CONTINUED ON SHEET: 1 FIRST USED ON OPTION/MODEL: MA20 | B-DD-MA20-0 | SIZE: D CODE: BS NUMBER: MA20-0-MAC4 | REV. 1 |

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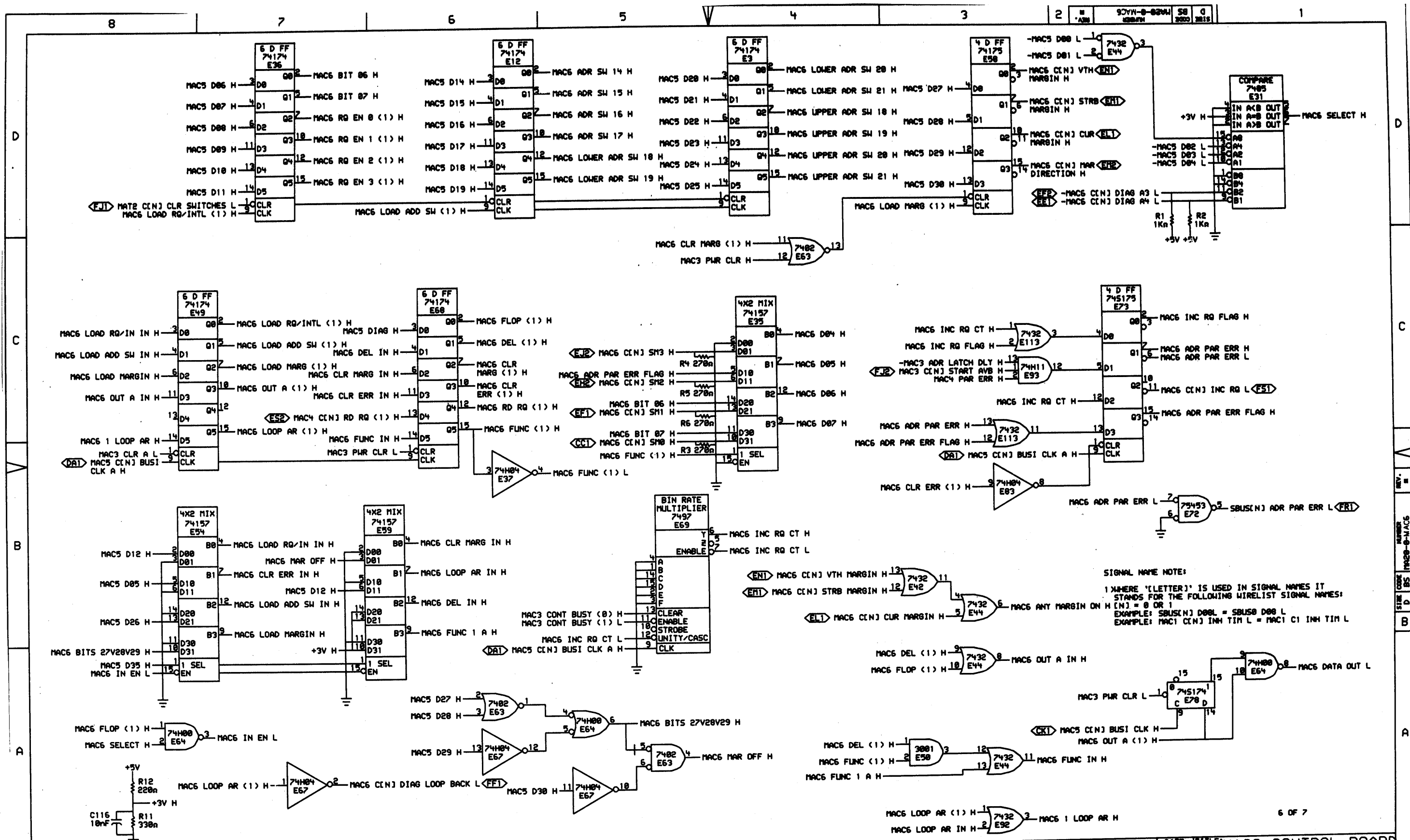


SIGNAL NAME NOTE:
 1) WHERE 'LETTER' IS USED IN SIGNAL NAMES IT STANDS FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1
 EXAMPLE: SBUSCN] D08L = SBUS0 D08 L
 EXAMPLE: MAC1 C] INH TIM L = MAC1 C1 INH TIM L

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|----------------------------------|-----------------------------------|---------------------|---------------|-----------------------------------|
| | DATE 11/20/73 | ENG. P.S. Wilson | DATE 11/20/73 | TITLE: MA20 CONTROL BOARD (M8561) |
| | DATE 12/14/73 | ENG. W. Hamilton | DATE 12/14/73 | SIZE CODE D BS |
| FIRST USED ON OPTION/MODEL: MA20 | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | NUMBER: MA20-0-MAC5 | REV. 1 | SHEET 1 |

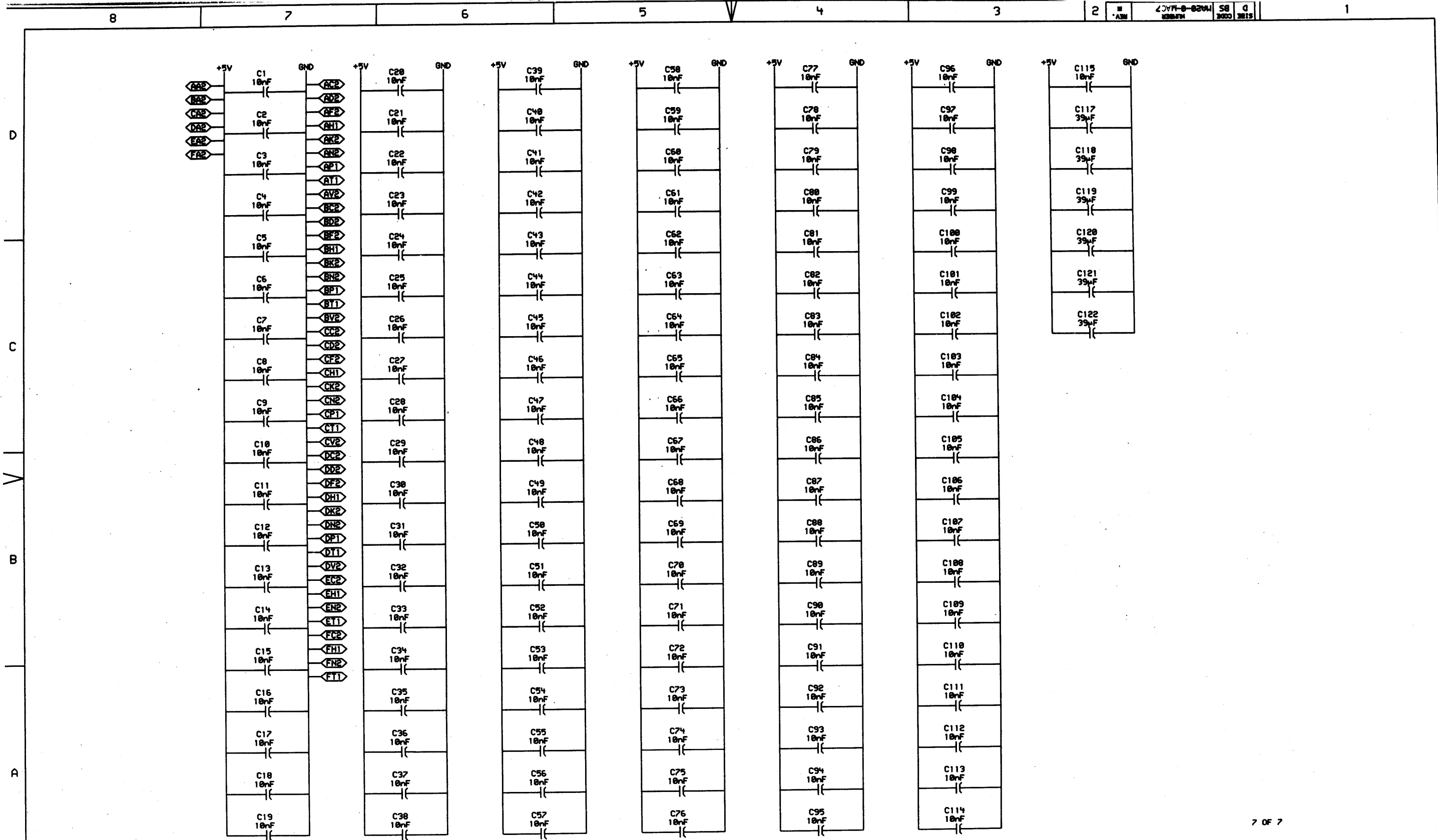


SIGNAL NAME NOTE:
 1) WHERE 'LETTER' IS USED IN SIGNAL NAMES IT STANDS FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 EXAMPLE: SBUS(N) D06 L = SBUS0 D06 L
 EXAMPLE: MAC1 (N) INH TIM L = MAC1 C1 INH TIM L

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|----------------------------------|--------------|---|--|
| | | DATE: 88-OCT-75 ENG: [Signature] DATE: 14-Jan-76 DESIGNED BY: [Signature] CHECKED BY: [Signature] | DATE: 14-Jan-76 TITLE: MA20 CONTROL BOARD (M8561) |
| FIRST USED ON OPTION MODEL: MA20 | B-D-D-MA20-0 | SIZE CODE: D BS NUMBER: MA20-0-MAC6 | REV. 1 |

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| CHK | CHANGE NO. REV |
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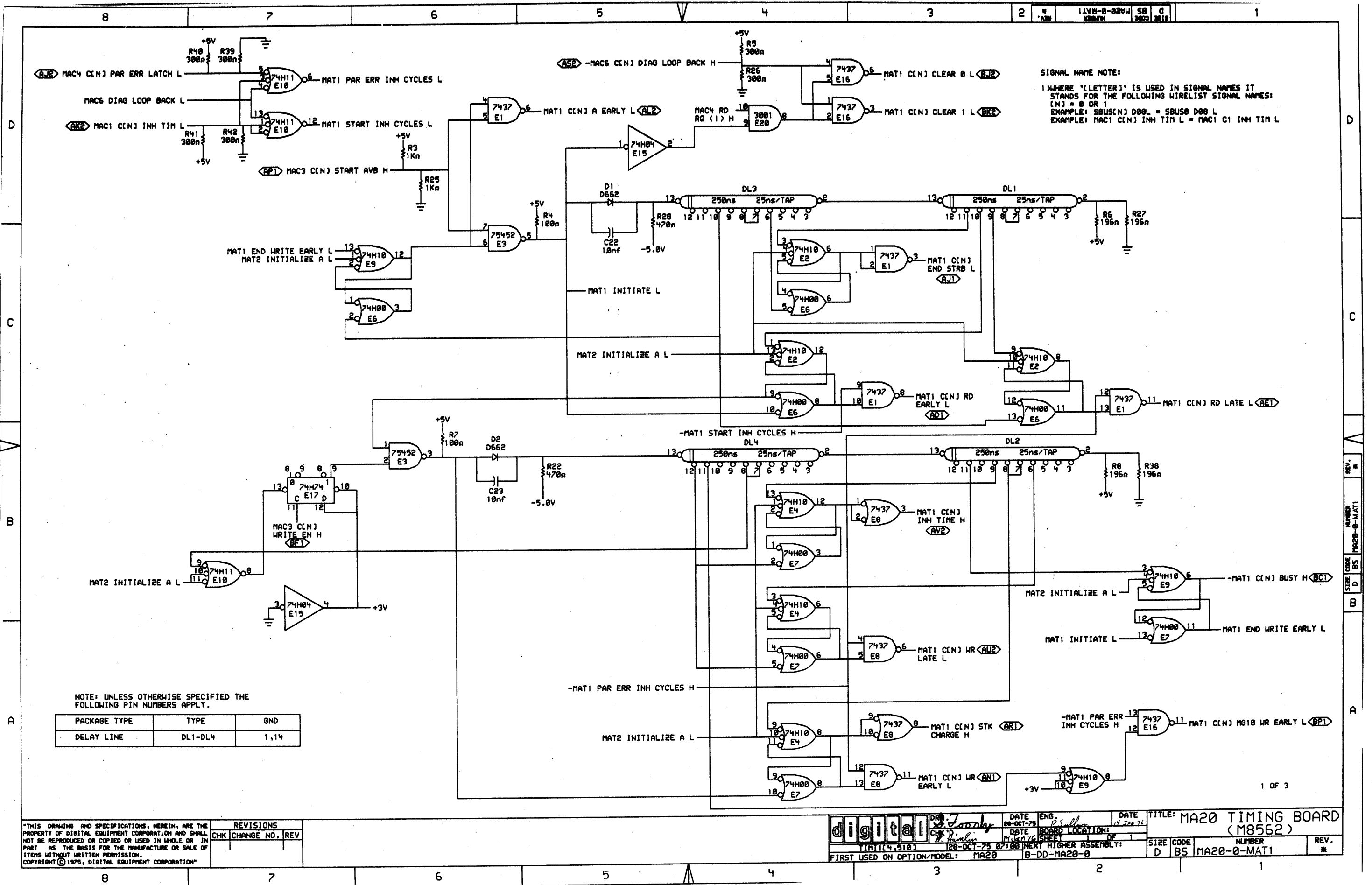
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| CHK | CHANGE NO. | REV |
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|----------------------------------|---------------------------|-----------------------------------|-----------------|-----------------|-----------------------------------|
| | DESIGNER: <i>J. J. J.</i> | DATE: 20-OCT-75 | ENG.: | DATE: 14 JAN 76 | TITLE: MA20 CONTROL BOARD (M8561) |
| | CHK'D: <i>W. Hamilton</i> | DATE: 17-OCT-75 | DATE: 14 JAN 76 | DATE: 14 JAN 76 | BOARD LOCATION: 1 |
| FIRST USED ON OPTION/MODEL: MA20 | | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | | SIZE: D | CODE: BS |
| NUMBER: MA20-0-MAC7 | | | | REV.: | * |



SIGNAL NAME NOTE:
 1) WHERE 'LETTER' IS USED IN SIGNAL NAMES IT STANDS FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 (N) = 0 OR 1
 EXAMPLE: SBUS(N) D00L = SBUS0 D00 L
 EXAMPLE: MAC1 CLN3 INH TIM L = MAC1 C1 INH TIM L

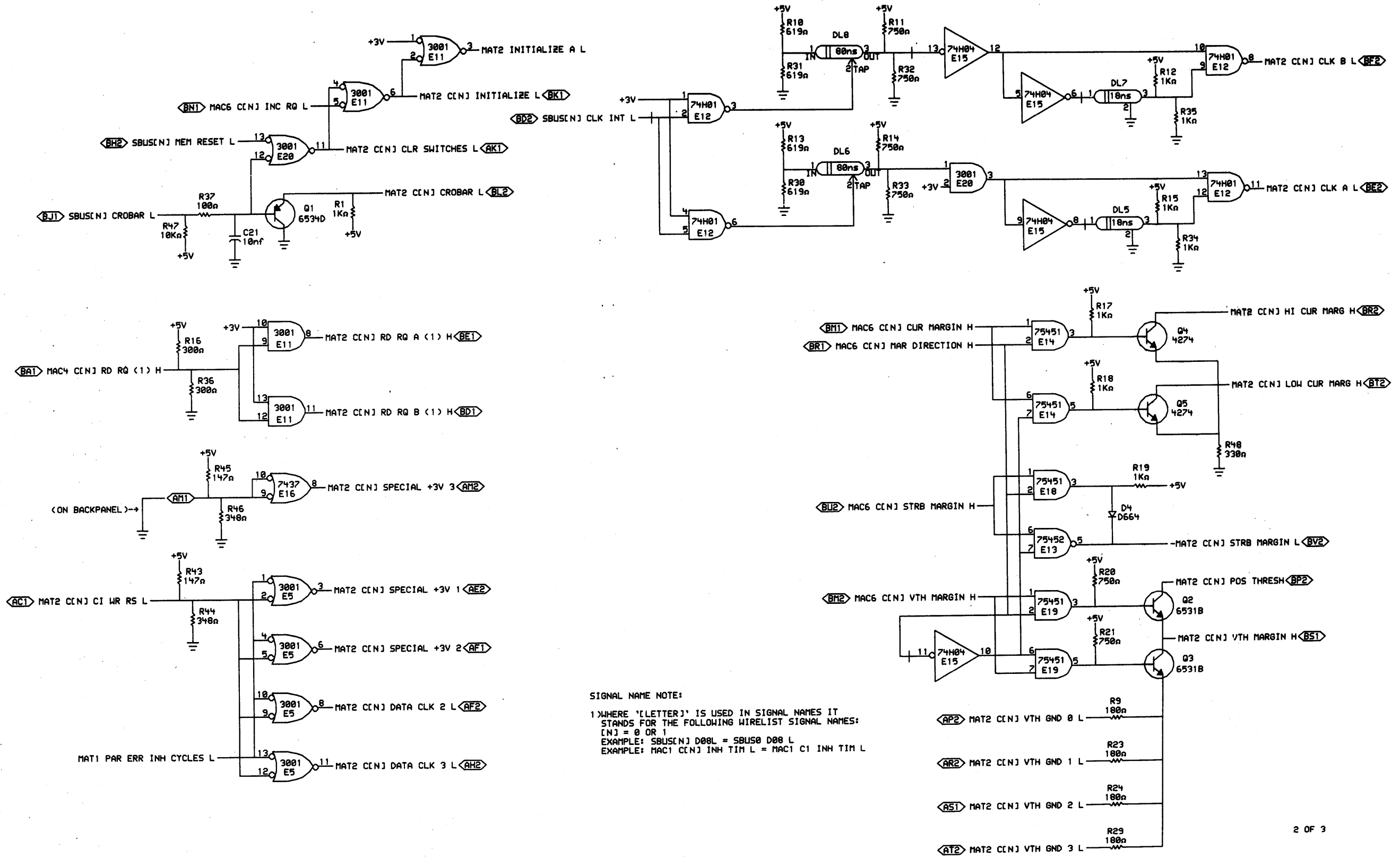
NOTE: UNLESS OTHERWISE SPECIFIED THE FOLLOWING PIN NUMBERS APPLY.

| PACKAGE TYPE | TYPE | GND |
|--------------|---------|------|
| DELAY LINE | DL1-DL4 | 1,14 |

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| REVISIONS | | |
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| CHK | CHANGE NO. | REV |
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digital
 DATE: 28-OCT-75
 DATE: 14 JAN 76
 TITLE: MA20 TIMING BOARD (M8562)
 SIZE: D BS
 CODE: MA20-0-MAT1
 NUMBER: 1
 REV: *



SIGNAL NAME NOTE:
 1) WHERE 'LETTER' IS USED IN SIGNAL NAMES IT STANDS FOR THE FOLLOWING WIRELIST SIGNAL NAMES: [N] = 0 OR 1
 EXAMPLE: SBUSCNJ D08L = SBUS0 D08 L
 EXAMPLE: MAC1 CCNJ INH TIM L = MAC1 C1 INH TIM L

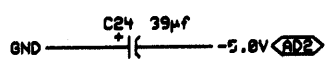
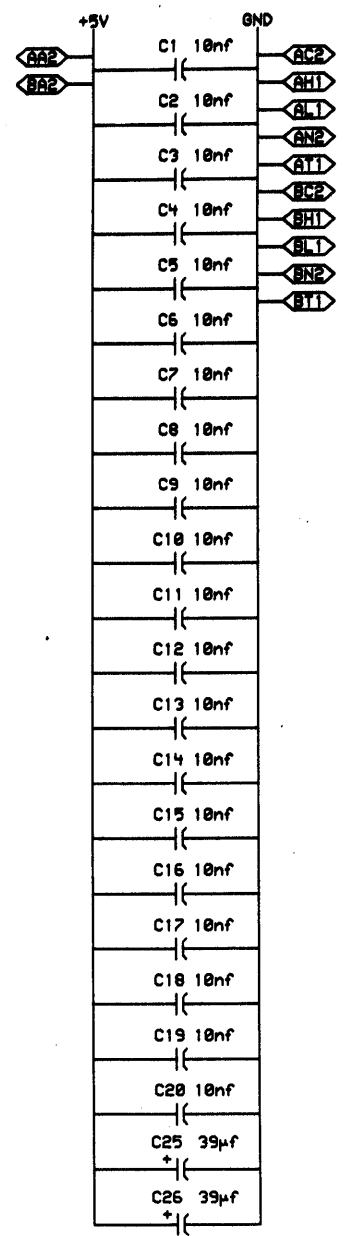
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| CHK | CHANGE NO. | REV |
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|----------------------------------|-----------|-----------------|-----------|----------------------------------|
| digital | DATE | ENG. | DATE | TITLE: MA20 TIMING BOARD (M8562) |
| | 28-OCT-75 | | 14 JAN 76 | |
| CHK'D | DATE | BOARD LOCATION: | | |
| | 28-OCT-75 | | | |
| FIRST USED ON OPTION/MODEL: MA20 | | B-DD-MA20-0 | | |
| | | | | |

8 7 6 5 4 3 2 1

REV. # 1
 CODE BS
 NUMBER MA20-0-MAT3
 SIZE D



D
C
B
A

D
C
B
A

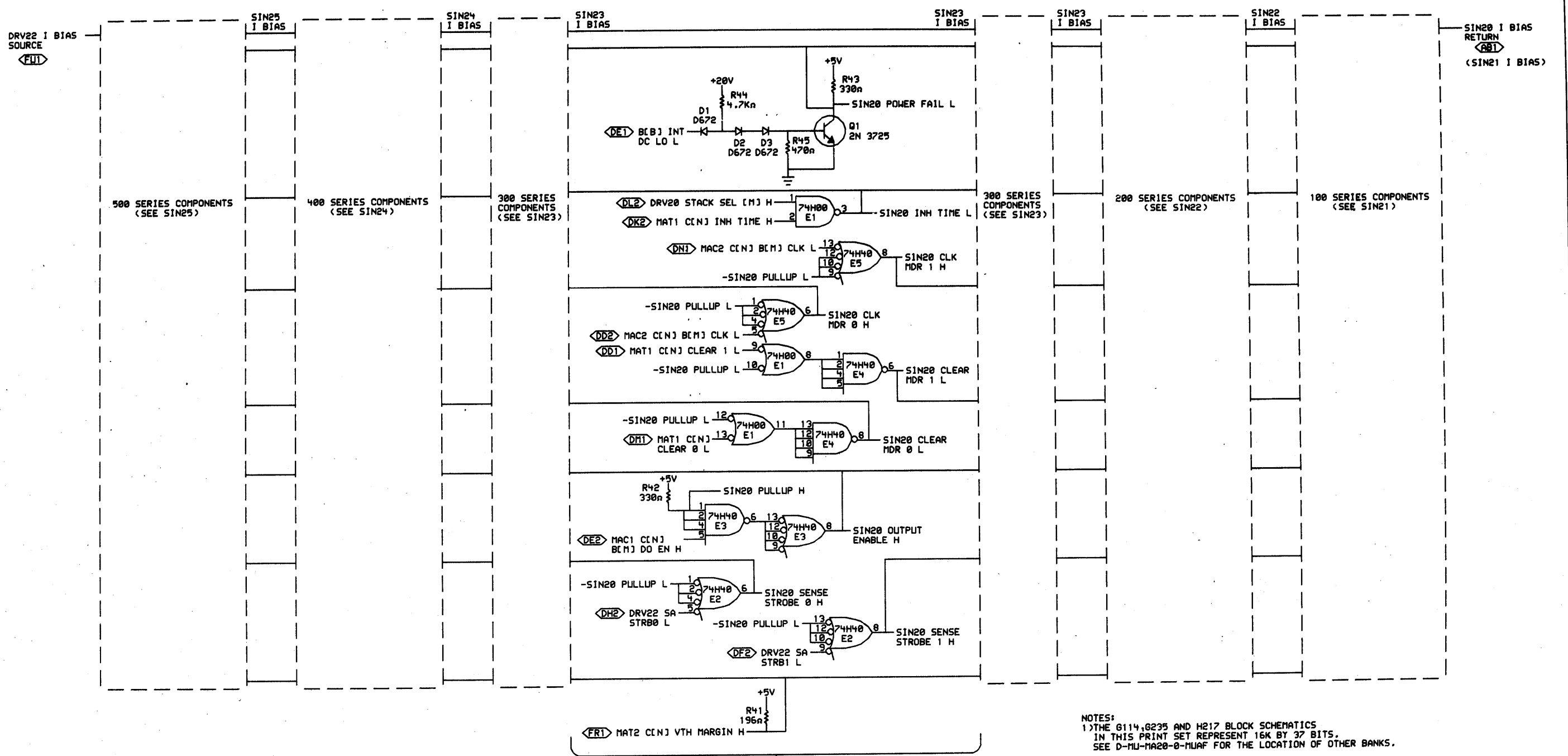
3 OF 3

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|----------------------------------|-----------------------|-----------------------------------|--------------------------|-----------------------|----------------------------------|
| digital | DRN. <i>J. J. J.</i> | DATE <i>20-OCT-75</i> | ENG. <i>J. J. J.</i> | DATE <i>14-JAN-76</i> | TITLE: MA20 TIMING BOARD (M8562) |
| | CHK'D <i>J. J. J.</i> | DATE <i>14-JAN-76</i> | BOARD LOCATION: <i>1</i> | SHEET: <i>1</i> | REV. <i>*</i> |
| FIRST USED ON OPTION/MODEL: MA20 | | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | | SIZE CODE: D BS | NUMBER: MA20-0-MAT3 |

8 7 6 5 4 3 2 1

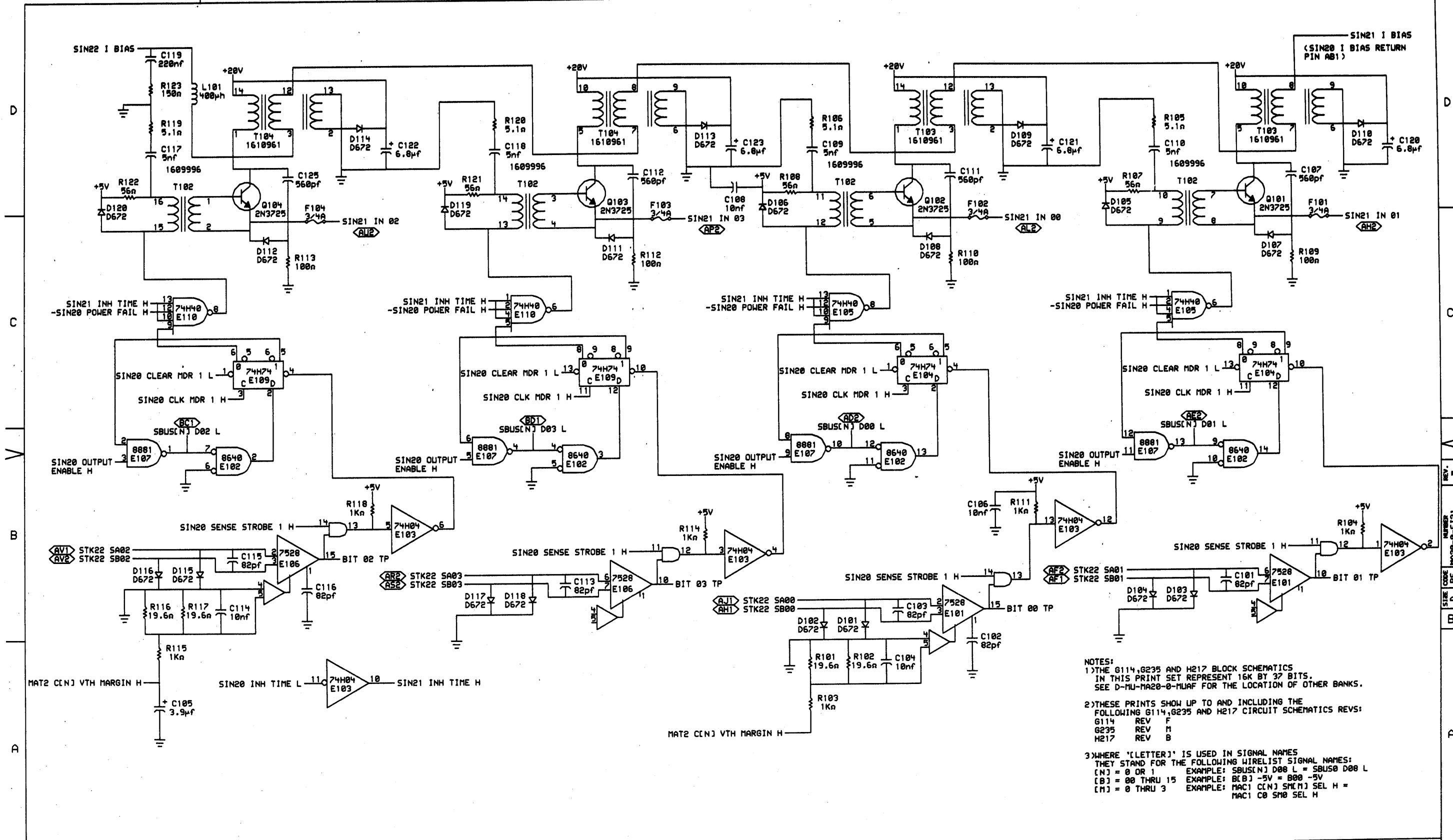


NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-NIAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUSCN] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: BC] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 CN] SMC] SEL H = MAC1 C0 SMC SEL H

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| CHK | CHANGE NO. REV |
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|----------------------------------|----------------|-------------------|-----------------------------------|---------------------------------|
| digital | DATE 22-OCT-75 | ENG. 23 | DATE 14 JAN 76 | TITLE: 16K SENSE/INHIBIT (G114) |
| | DATE 14 JAN 76 | BOARD LOCATION: 1 | SHEET 1 OF 1 | SIZE CODE D BS |
| SIN20 4,510 | | 27-OCT-75 09:38 | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | NUMBER MA20-0-S120 |
| FIRST USED ON OPTION/MODEL: MA20 | | REV. # | | REV. * |

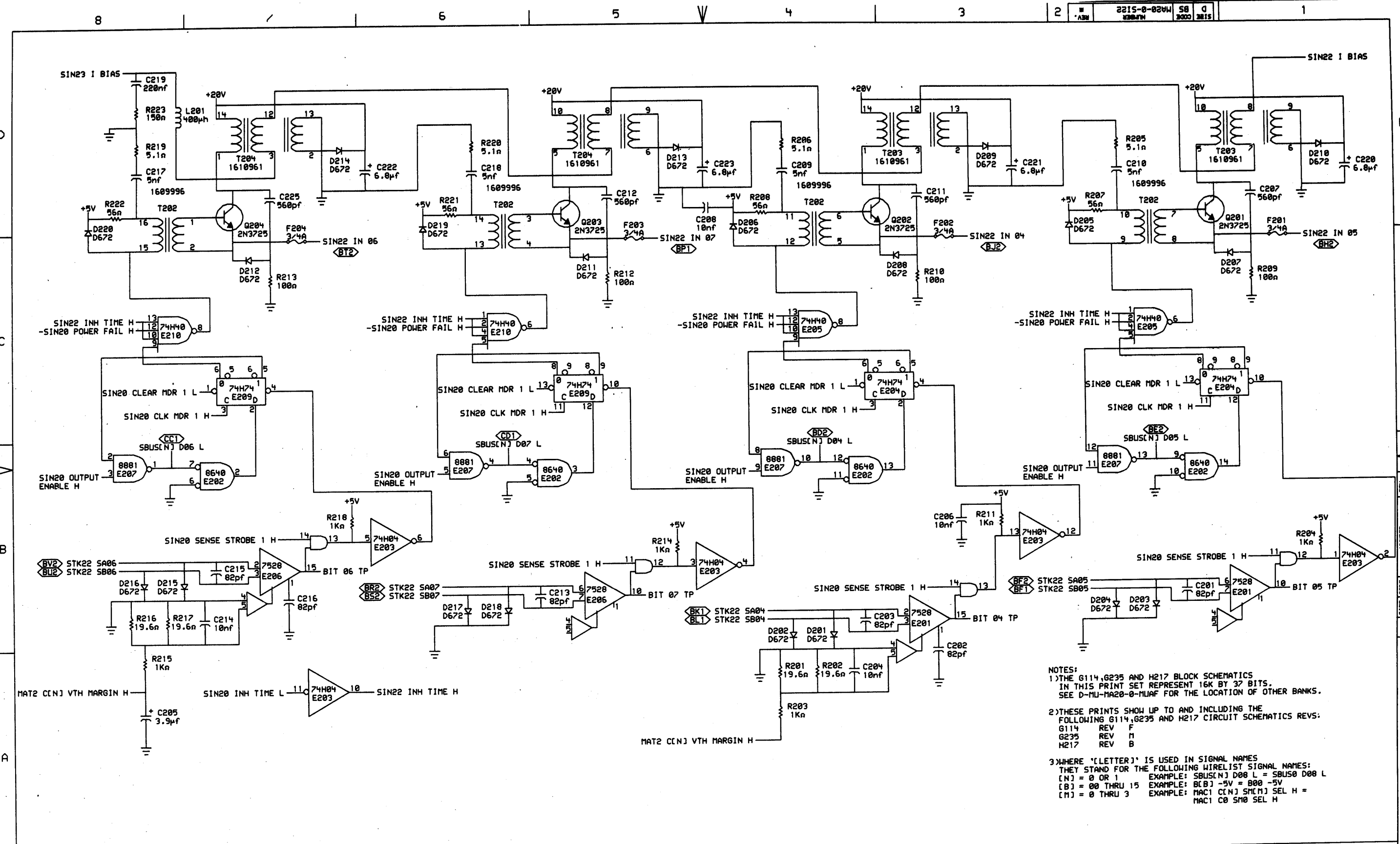


NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE '[LETTER]' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: BE[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [CN] S[M]1 SEL H = MAC1 C0 S00 SEL H

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| digital | DATE: 28-OCT-75 | ENG: [Signature] | DATE: 12 JAN 76 | TITLE: 16K SENSE/INHIBIT (G114) |
| | CHK: [Signature] | DATE: 14 JAN 76 | BOARD LOCATION: 1 | |
| SIN21(4,510) | 127-OCT-75 09:18 | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | SIZE CODE: D BS | NUMBER: MA20-0-S121 |
| FIRST USED ON OPTION MODEL: MA20 | | | | REV: * |

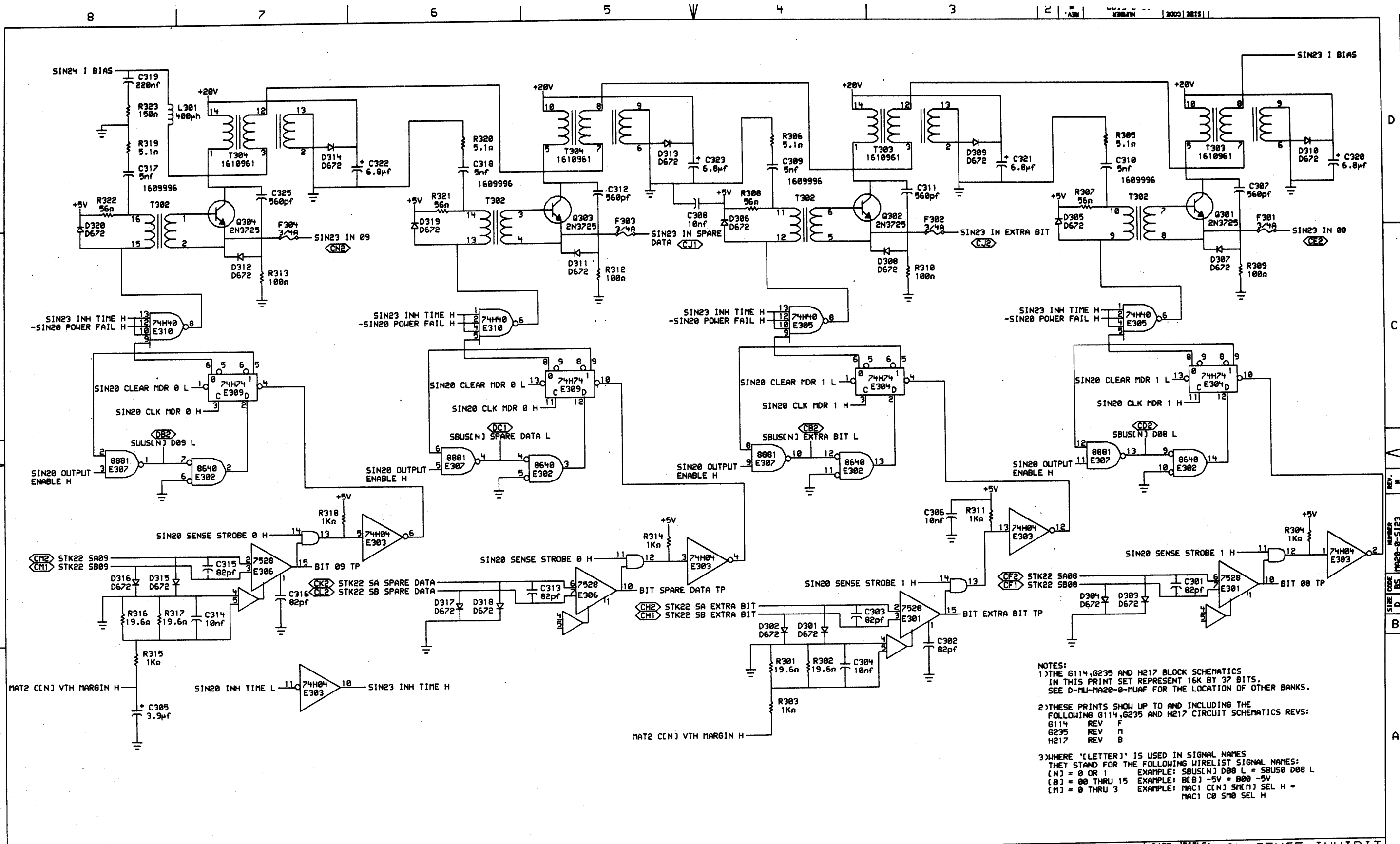


- NOTES:
- 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 - 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 - 3) WHERE '[LETTER]' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: BC[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [CN] S[M] SEL H = MAC1 C0 S00 SEL H

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| digital | DATE 20-OCT-75 | ENG P.S. [Signature] | DATE 24-SEP-75 | TITLE: 16K SENSE/INHIBIT (G114) |
| | CHK'D [Signature] | DATE 14-JAN-76 | BOARD LOCATION: 1 | SIZE CODE D BS |
| FIRST USED ON OPTION MODEL: MA20 | | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | | NUMBER 1 |
| REV. * | | | | |



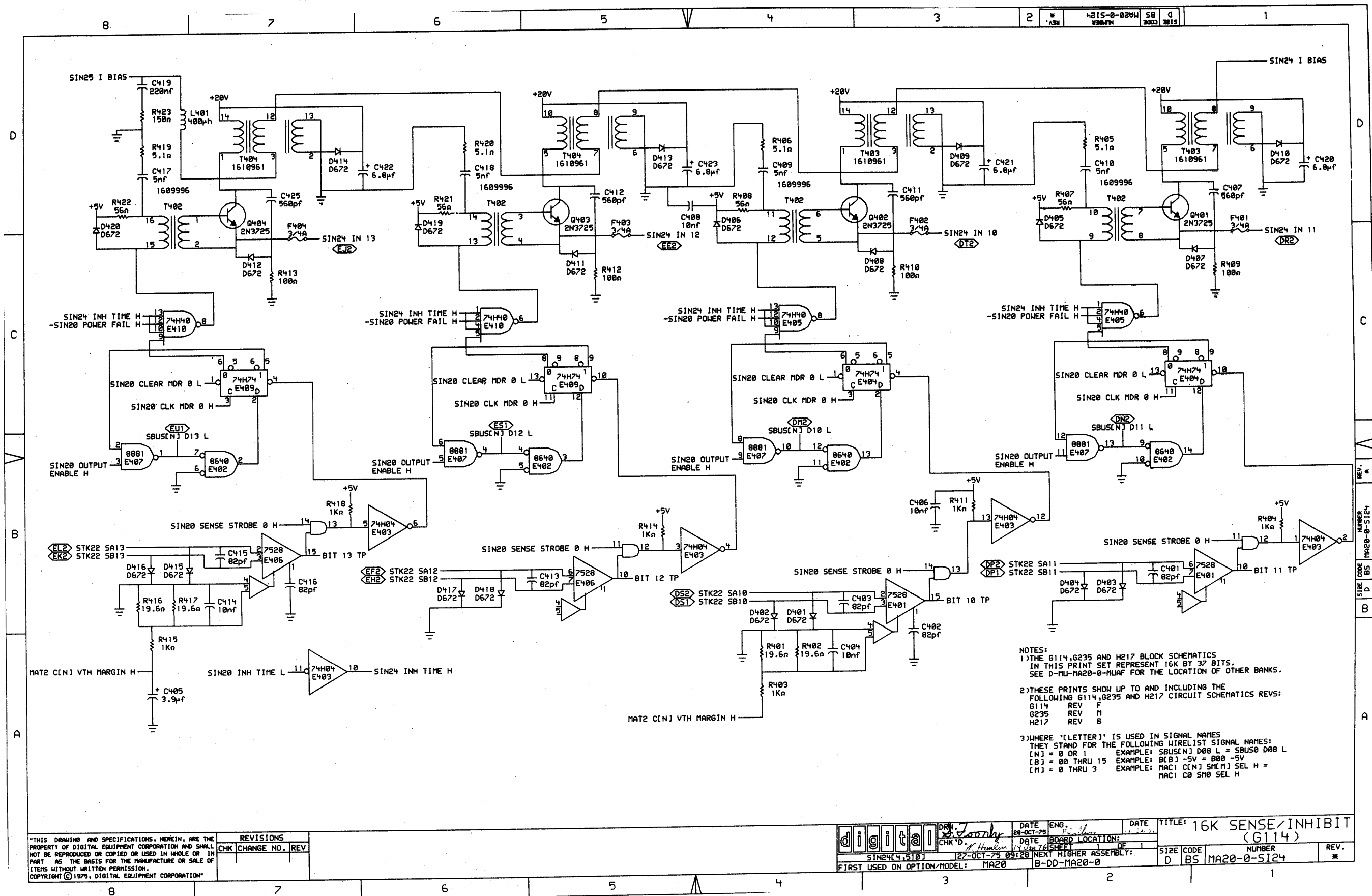
NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: B[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[N] S[M] SEL H = MAC1 C0 S0 SEL H

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| | DATE: 20-OCT-75 | ENG: P.S. Sullivan | DATE: 14 JAN 76 | TITLE: 16K SENSE/INHIBIT (G114) |
| | DATE: 14 JAN 76 | BOARD LOCATION: 1 | SHEET: 1 | SIZE: D B5 |
| FIRST USED ON OPTION MODEL: MA20 | | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | | NUMBER: MA20-0-5123 |
| REV. # | | | | * |

REV. # *
FILE CODE: MA20-0-5123
D B5

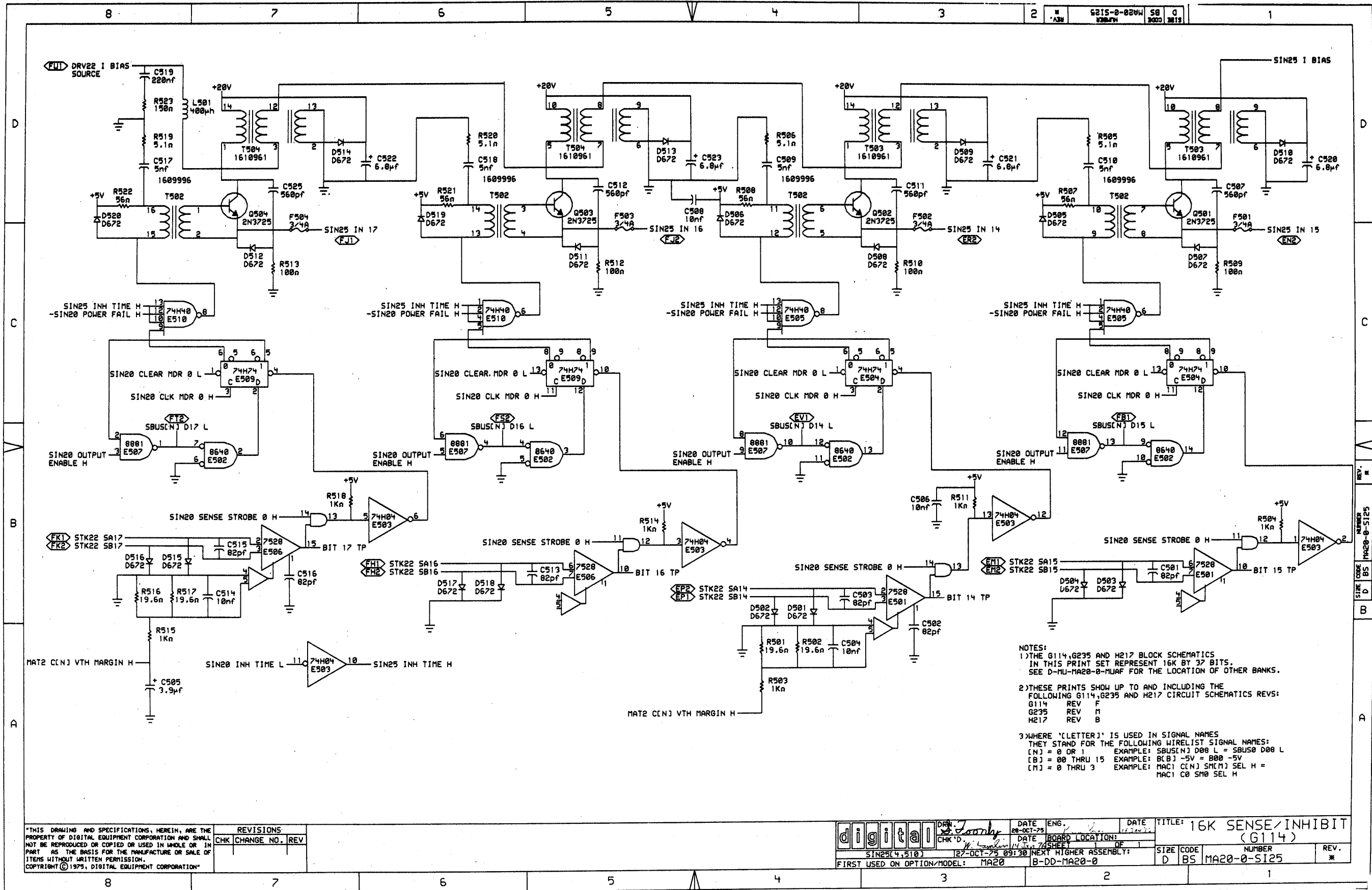


NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REV'S:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER]' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUSCN] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: CLB] -5V = 800 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 CLN] SM] SEL H = MAC1 C0 S00 SEL H

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| digital | DATE | ENG. | DATE | TITLE: |
| | 28-OCT-75 | P. J. ... | 1-2-76 | 16K SENSE/INHIBIT (G114) |
| | DATE | BOARD LOCATION: | | |
| | 27-OCT-75 | 09:28 | NEXT HIGHER ASSEMBLY: | |
| FIRST USED ON OPTION/MODEL: | MA20 | B-DD-MA20-0 | | |
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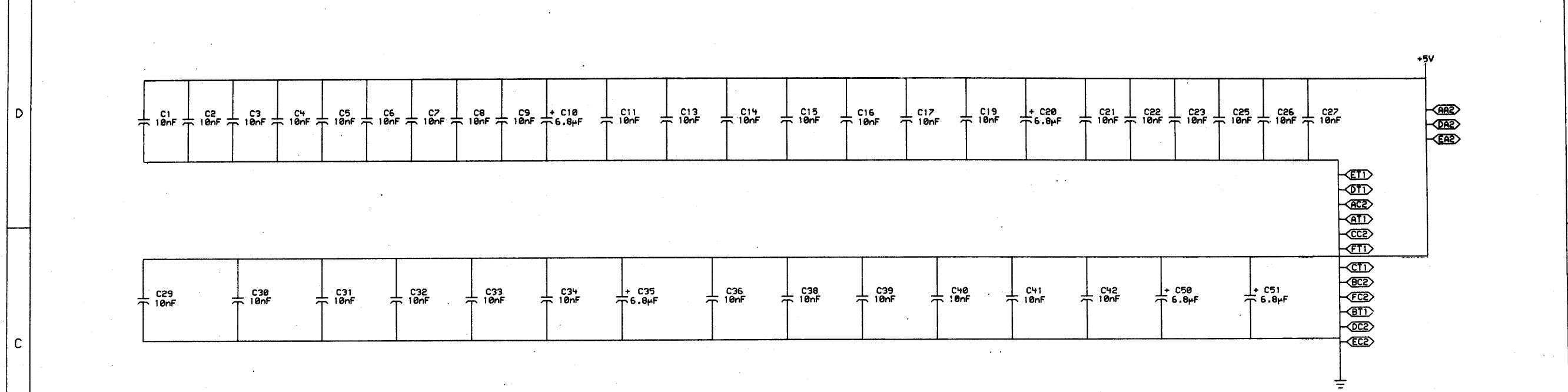


NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER]' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUSCN] D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: B[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[N] SM[M] SEL H = MAC1 C0 S00 SEL H

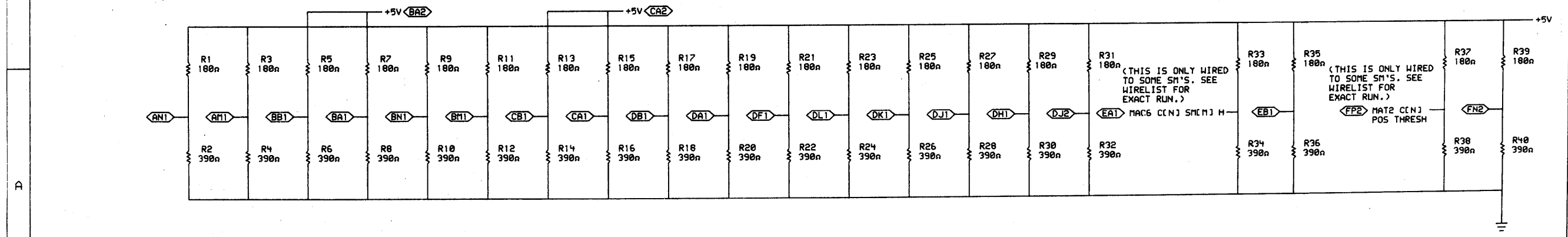
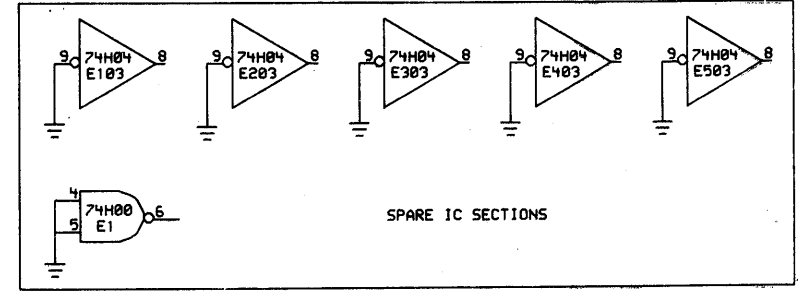
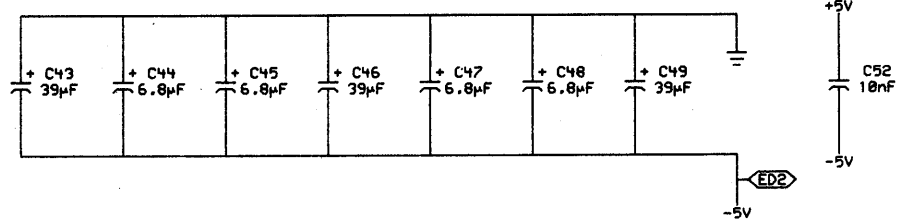
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| digital | DATE ENG. 28-OCT-75 | DATE 11/20/75 | TITLE: 16K SENSE/INHIBIT (G114) |
| | DATE BOARD LOCATION: 75SHEET 1 OF 1 | DATE 12-OCT-75 09:30 | SIZE CODE NUMBER REV. D BS MA20-0-SI25 * |
| SIN25[4,510] | INEXT HIGHER ASSEMBLY: | B-DD-MA20-0 | |
| FIRST USED ON OPTION/MODEL: MA20 | | | |



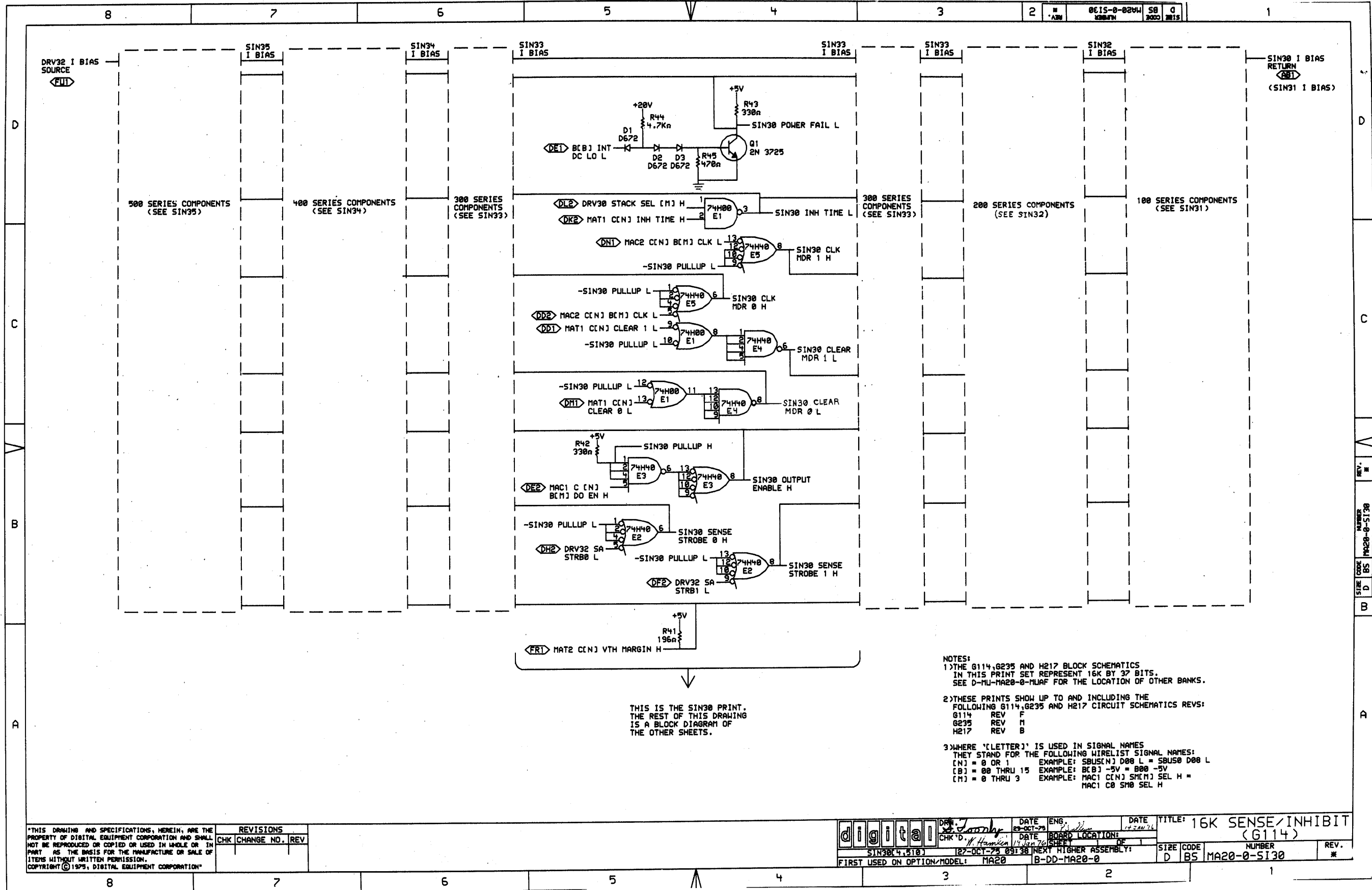
NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE '[LETTER]' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: BC[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[N] S[M] SEL H = MAC1 C0 S10 SEL H



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| digital | DATE | ENG | DATE | TITLE: 16K SENSE/INHIBIT (G114) |
| | 28-OCT-75 | J. J. [Signature] | 12 JAN 76 | |
| CHK'D | DATE | BOARD LOCATION: | OF | |
| | 27-OCT-75 | 14 JAN 76 | 1 | |
| SIN26(4,510) | 27-OCT-75 09:34 | NEXT HIGHER ASSEMBLY: | SIZE CODE | NUMBER |
| FIRST USED ON OPTION/MODEL: MA20 | B-DD-MA20-0 | | D BS | MA20-0-SI26 |



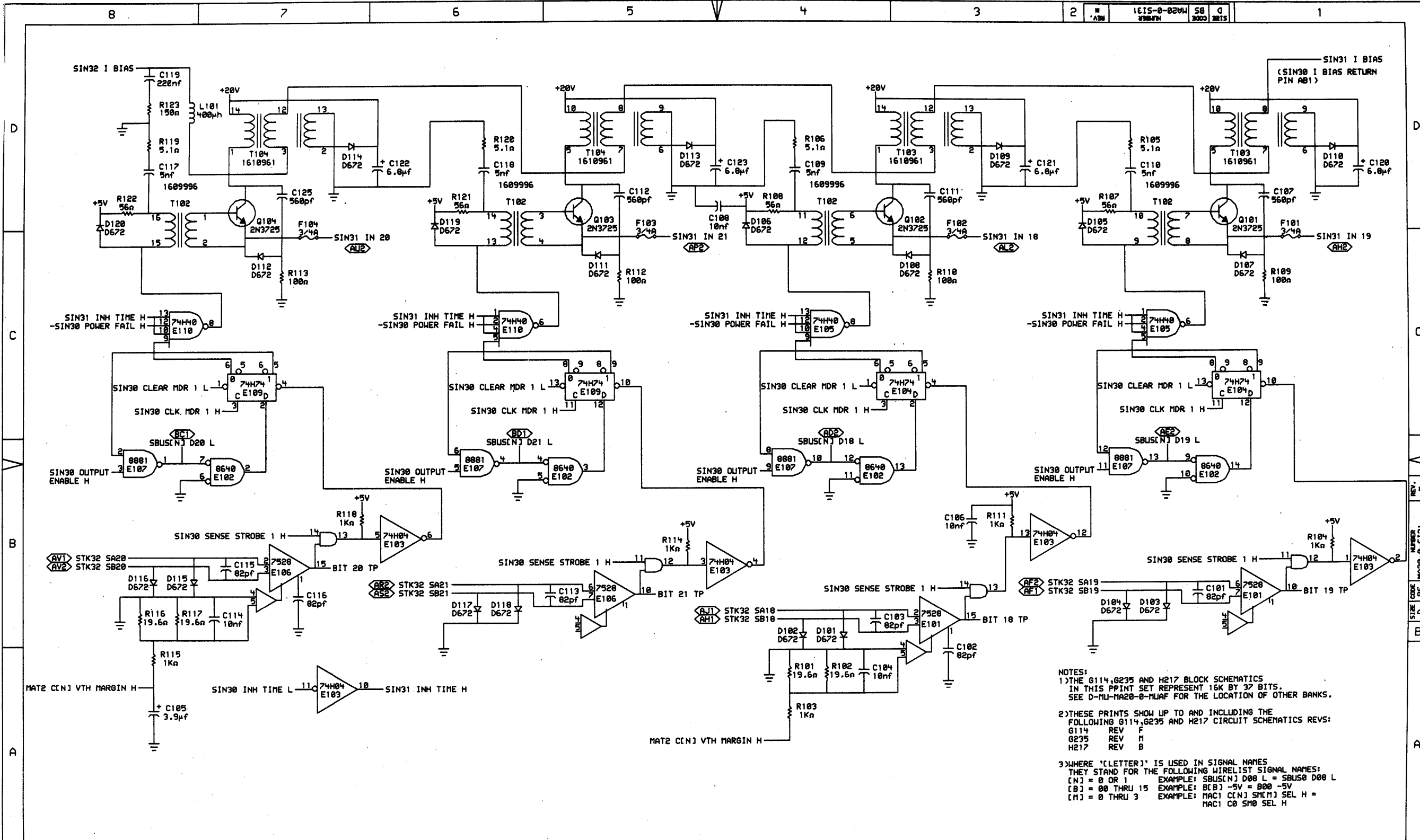
THIS IS THE SIN30 PRINT.
THE REST OF THIS DRAWING
IS A BLOCK DIAGRAM OF
THE OTHER SHEETS.

- NOTES:
- 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 32 BITS. SEE D-MU-MA20-0-PLAF FOR THE LOCATION OF OTHER BANKS.
 - 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
G114 REV F
G235 REV M
H217 REV B
 - 3) WHERE '[LETTER]' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
[N] = 0 OR 1 EXAMPLE: SBUSIN] D00 L = SBUS0 D00 L
[B] = 00 THRU 15 EXAMPLE: BC] -5V = B00 -5V
[M] = 0 THRU 3 EXAMPLE: MAC] CCN] SEL H = MAC] C0 S00 SEL H

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| digital | DATE: 12-OCT-75 | ENG: J. Hamlin | DATE: 12-20-74 | TITLE: 16K SENSE/INHIBIT (G114) |
| | CHK'D: J. Hamlin | DATE: 12-20-75 | BOARD LOCATION: B-DD-MA20-0 | SIZE: D |
| SIN30 (4, 5, 10) | 12-OCT-75 09138 | NEXT HIGHER ASSEMBLY: MA20 | CODE: BS | NUMBER: MA20-0-5130 |
| FIRST USED ON OPTION/MODEL: MA20 | | | REV.: | * |

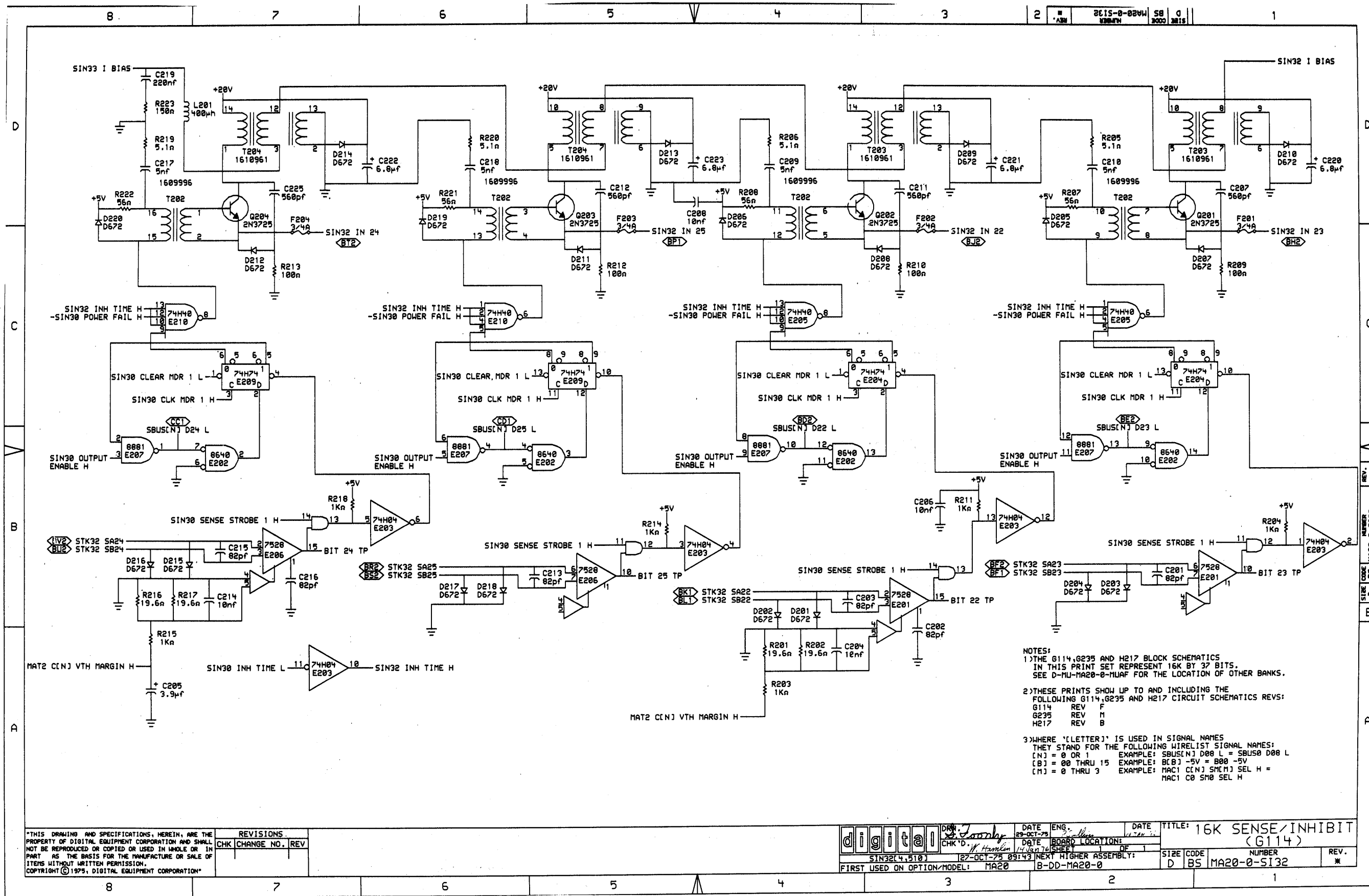


NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MAJAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REV'S:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBU5CN J D08 L = SBU50 D08 L
 [B] = 00 THRU 15 EXAMPLE: BLB J -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[N] S[M] SEL H = MAC1 C0 S0 SEL H

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| digital | DATE | ENG. | DATE | TITLE: |
| | 27-OCT-75 | J. J. J. | 17 JAN 76 | 16K SENSE/INHIBIT (G114) |
| | DATE | BOARD LOCATION: | | |
| | 14 JAN 76 | | | |
| SIN31(4,510) | 127-OCT-75 09:41 | NEXT HIGHER ASSEMBLY: | | |
| FIRST USED ON OPTION/MODEL: | MA20 | B-DD-MA20-0 | | |
| | | | SIZE CODE | NUMBER |
| | | | D BS | MA20-0-S131 |
| | | | | REV. |
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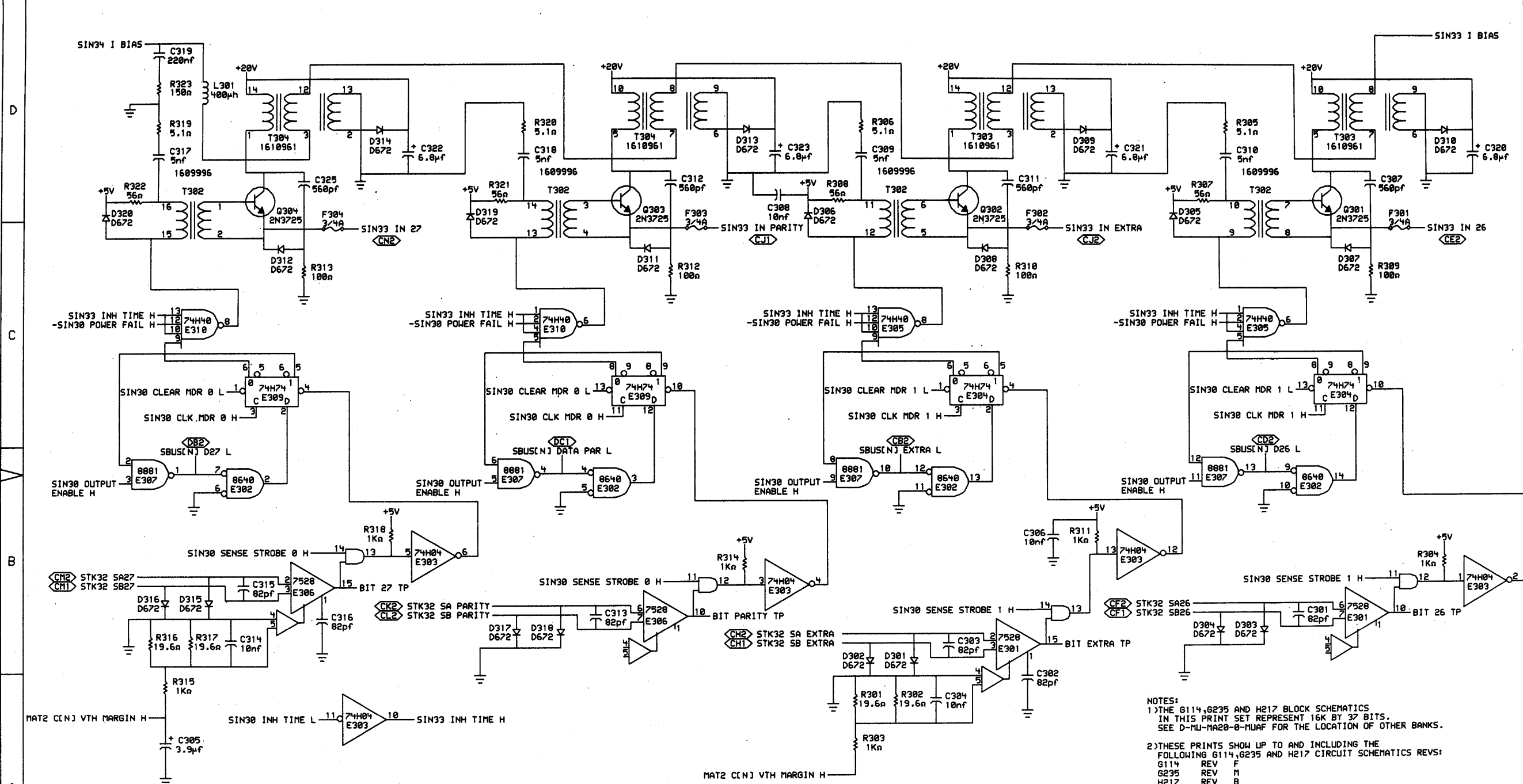


NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV H
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: BC[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [M] SM[M] SEL H = MAC1 C0 S00 SEL H

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| digital | DATE | ENG. | DATE | TITLE: 16K SENSE/INHIBIT (G114) |
| | 27-OCT-75 | J. J. J. | 11-27-75 | |
| | DATE | BOARD LOCATION: | | |
| | 14-OCT-76 | | | |
| | | | | |
| SIN32(4,510) | 27-OCT-75 09:43 | NEXT HIGHER ASSEMBLY: | SIZE CODE | NUMBER |
| FIRST USED ON OPTION-MODEL: MA20 | | B-DD-MA20-0 | D BS | MA20-0-S132 |



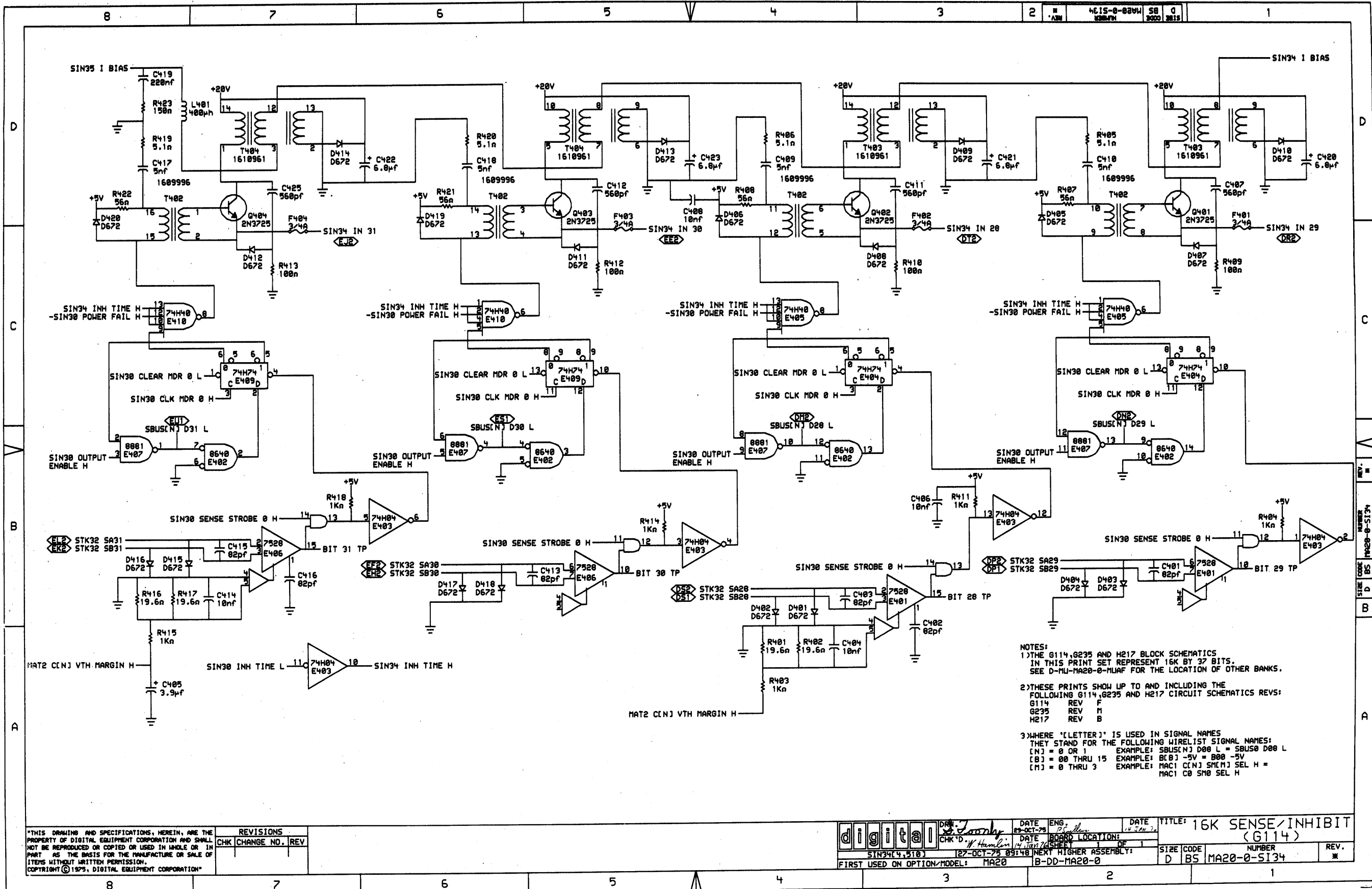
NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS(N) D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: BC[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [M] SEL H = MAC1 C0 S00 SEL H

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digital *John* DATE ENG. 23-OCT-75 DATE 14 JAN 76
 CHK'D *W. Hamlin* DATE BOARD LOCATION: 14 JAN 76 SHEET OF 1
 SIN33(4,510) [27-OCT-75 09:45] NEXT HIGHER ASSEMBLY:
 FIRST USED ON OPTION-MODEL: MA20 B-DD-MA20-0

TITLE: 16K SENSE/INHIBIT (G114)
 SIZE CODE NUMBER REV.
 D BS MA20-0-SI33 *

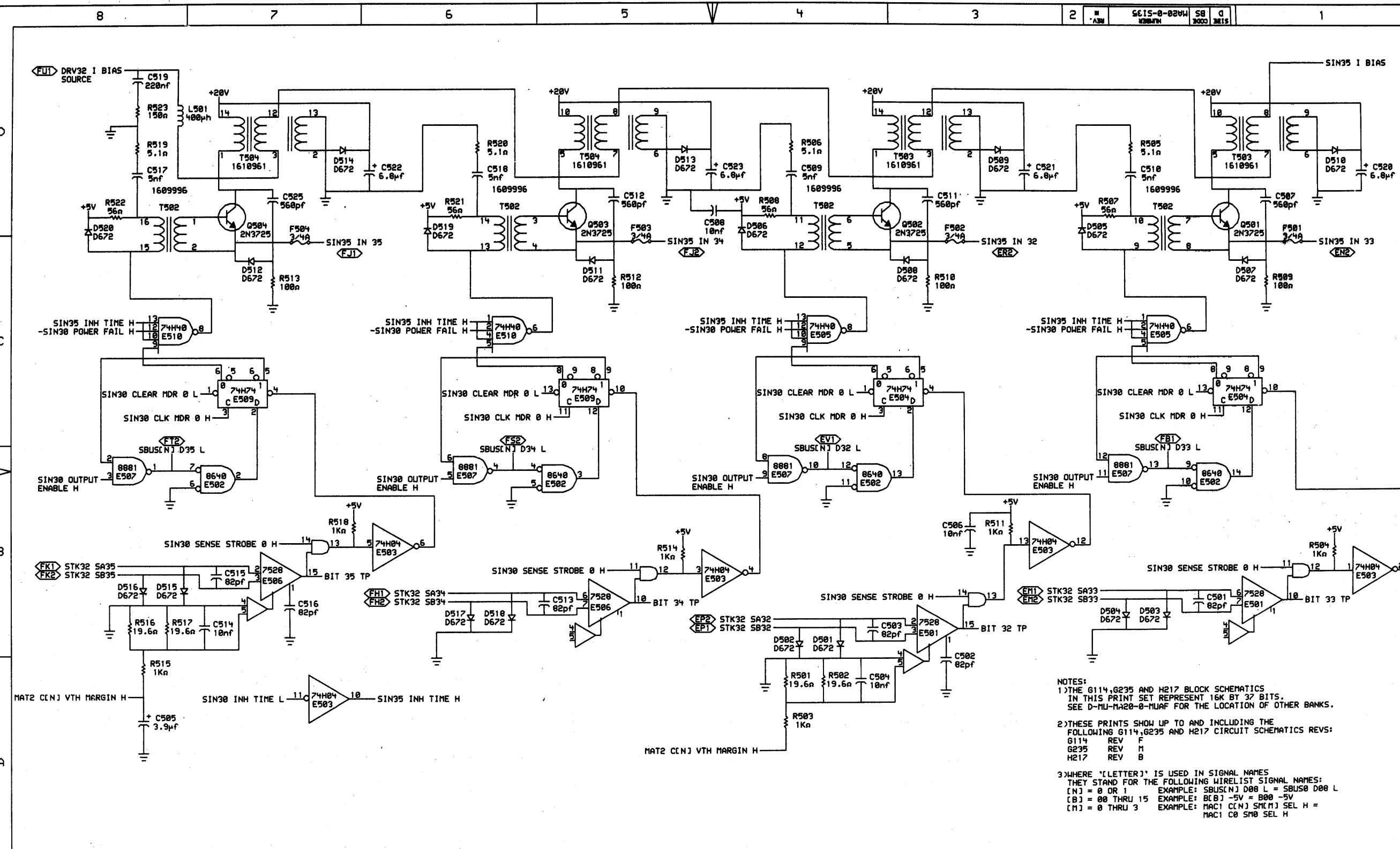


NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE '[LETTER]' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: BC[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [M] SMC[M] SEL H = MAC1 C0 SMC0 SEL H

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| digital | DATE | ENG. | DATE | TITLE: 16K SENSE/INHIBIT (G114) |
| | 23-OCT-73 | Phyllis | 14 20 73 | |
| CHK'D | DATE | BOARD LOCATION | DE | SIZE CODE |
| W. Hamilton | 14 JAN 74 | 1 | 1 | D BS |
| SIN34(4,510) | 127-OCT-73 09:48 | NEXT HIGHER ASSEMBLY: | NUMBER | REV. |
| FIRST USED ON OPTION/MODEL: | MA20 | B-DD-MA20-0 | D BS MA20-0-S134 | * |

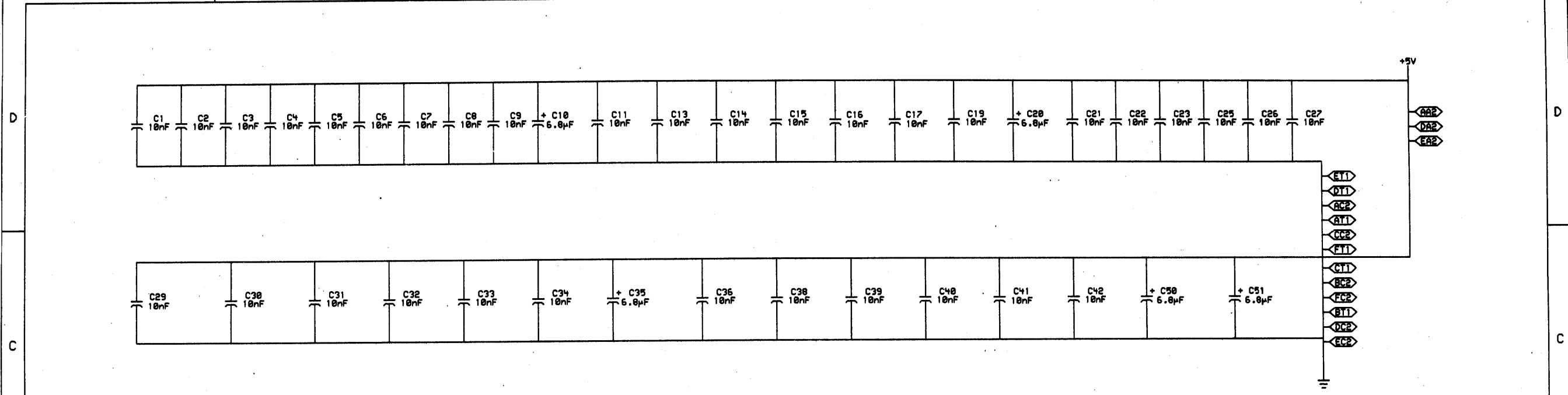


NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REV'S:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'I (LETTER)' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBU50 D00 L = SBU50 D00 L
 [B] = 00 THRU 15 EXAMPLE: BCB1 -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[N] S[M] SEL H = MAC1 C0 S00 SEL H

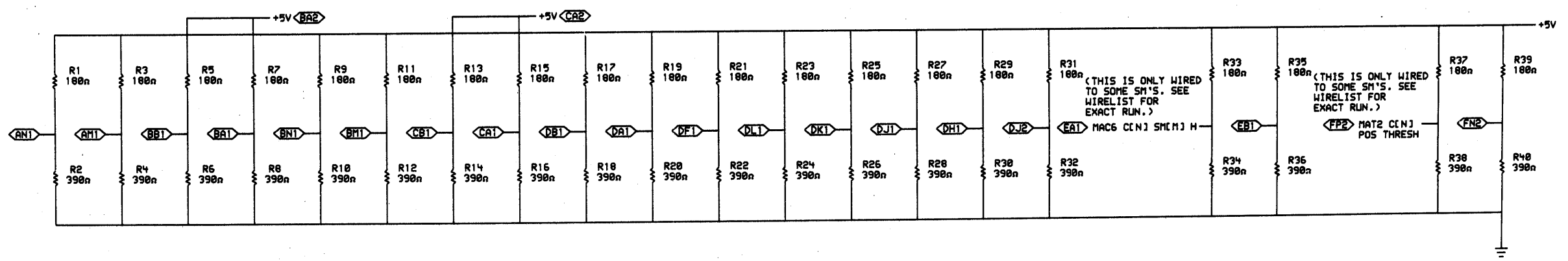
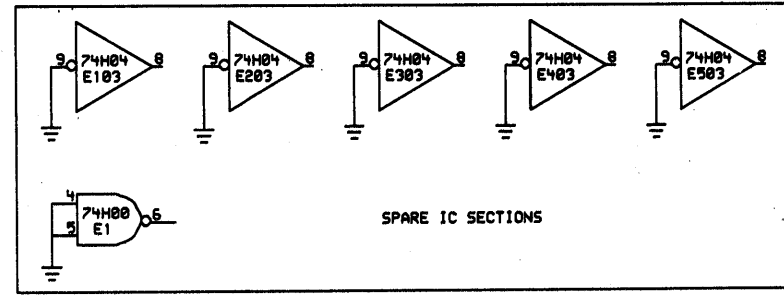
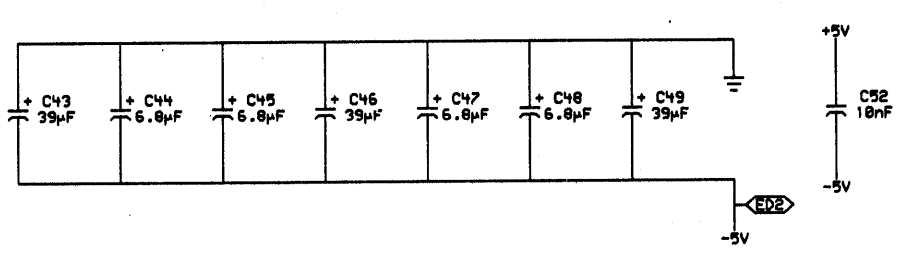
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| digital | DATE ENG. 29-OCT-75 | DATE 11/20/75 | TITLE: 16K SENSE/INHIBIT (G114) |
| | CHK'D W. Hamlin | DATE BOARD LOCATION: 14 JAN 76 | |
| | SIN35(4,510) | 127-OCT-75 09:52 | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 |
| FIRST USED ON OPTION/MODEL: MA20 | SIZE CODE D | NUMBER BS MA20-0-SI35 | REV. * |



NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV H
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: BC[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[N] S[M] SEL H = MAC1 C0 S00 SEL H

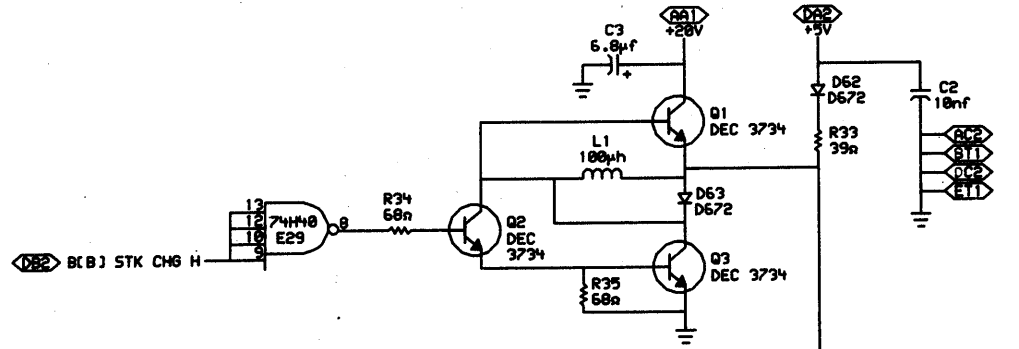


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| CHK | CHANGE NO. REV |
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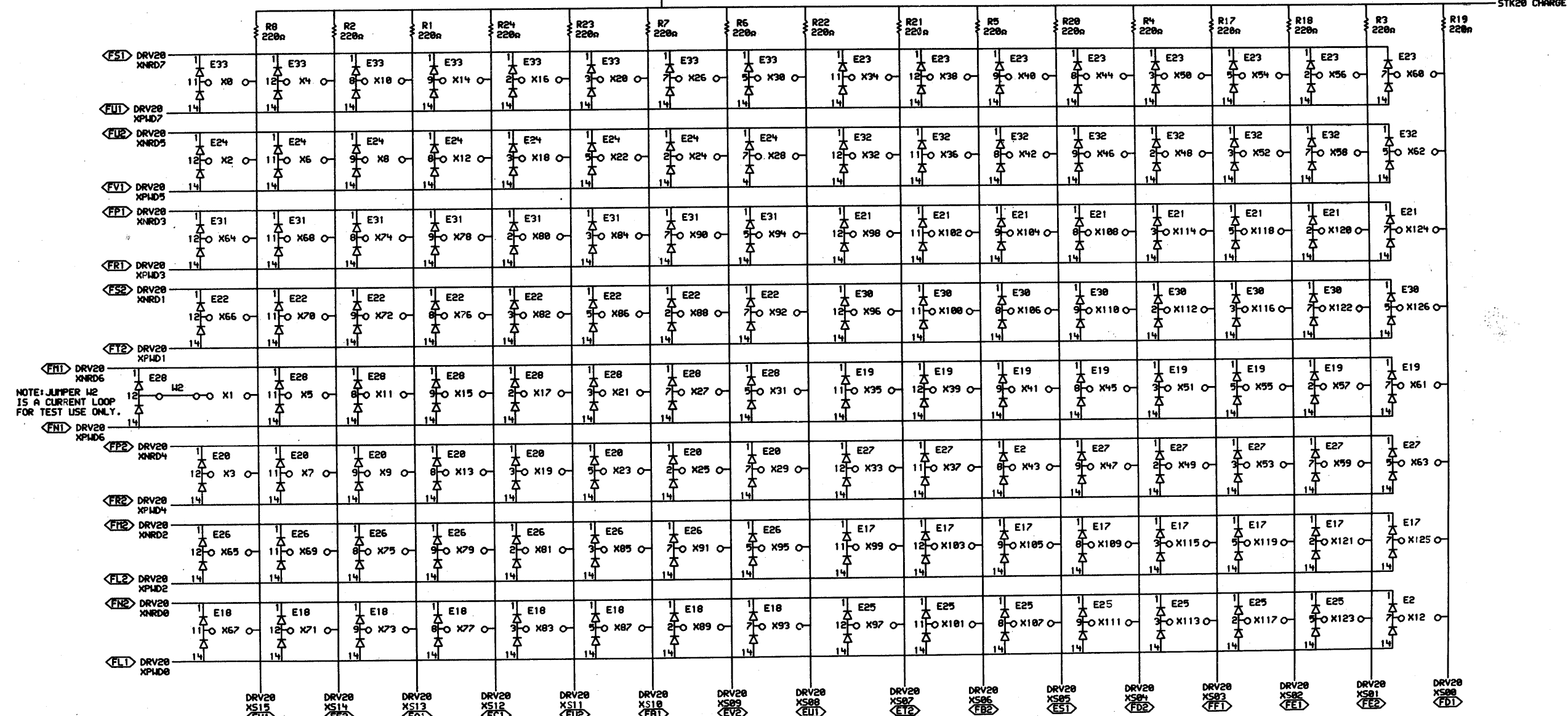
| | | | | |
|----------------------------------|-----------------|-----------------------------------|----------------|---------------------------------|
| digital | DATE 09-OCT-75 | ENG P. J. Blum | DATE 07-20-76 | TITLE: 16K SENSE/INHIBIT (G114) |
| | CHK'D W. Hamlin | DATE 10-Jan-76 | SHEET 1 OF 1 | BOARD LOCATION |
| 51N36(4,510) | 27-OCT-75 09:52 | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | SIZE CODE D BS | NUMBER MA20-0-5136 |
| FIRST USED ON OPTION/MODEL: MA20 | | | | REV. * |

REV. #
 NUMBER MA20-0-5136
 SIZE CODE D BS



NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 32 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV H
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] DOB L = SBUS0 DOB L
 [B] = 00 THRU 15 EXAMPLE: BC B1 -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [C] [N] SEL H = MAC1 C0 S10 SEL H

X AXIS



NOTE: JUMPER H2 IS A CURRENT LOOP FOR TEST USE ONLY.

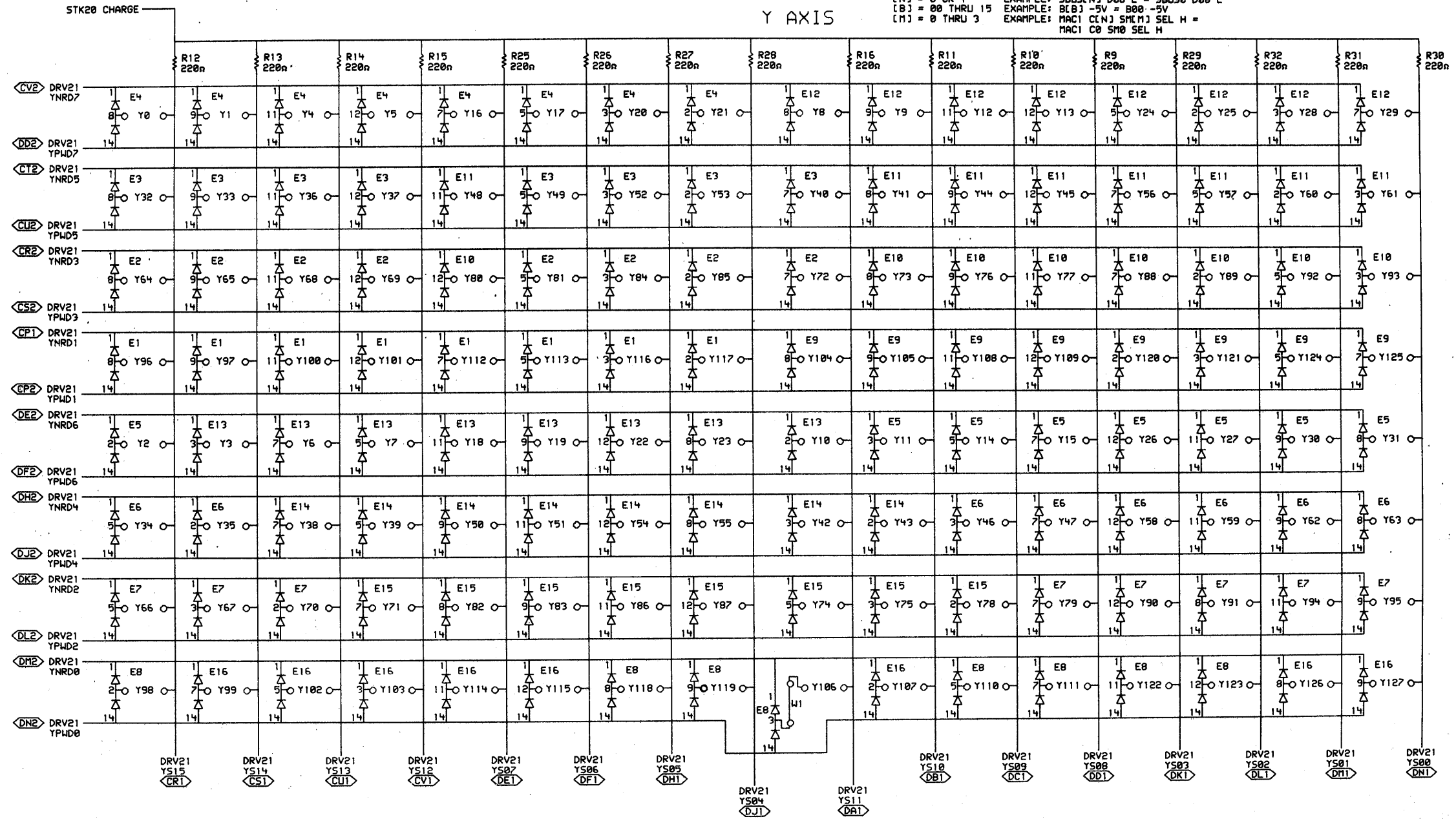
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| REVISIONS | |
|-----------|----------------|
| CHK | CHANGE NO. REV |
| | |

| | | | | |
|----------------------------------|-----------------|-----------------------------------|---------------------|-----------------------------|
| digital | DATE: 16-DEC-79 | ENG.: | DATE: 11-20-79 | TITLE: STACK MODULE (H217B) |
| | DATE: 12-01-79 | BOOK LOCATION: | OF: | SIZE: D BS |
| STR20 DRW 4, 510 | 12-01-79 11:00 | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | NUMBER: MA20-0-ST20 | REV.: |
| FIRST USED ON OPTION MODEL: MA20 | | | | |

NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUSCN D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: BLB3 -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[M] SM[M] SEL H = MAC1 C0 S00 SEL H

Y AXIS



NOTE: JUMPER W1 IS A CURRENT LOOP FOR TEST USE ONLY.

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| REVISIONS | |
|-----------|----------------|
| CHK | CHANGE NO. REV |
| | |

| | | | | | |
|----------------------------------|-------------------------------|------------------|----------------------|-----------------------------------|-----------------------------|
| digital | DESIGNED BY: <i>J. J. ...</i> | DATE: 28-OCT-75 | ENG: <i>P. ...</i> | DATE: <i>11-2-75</i> | TITLE: STACK MODULE (H217B) |
| | CHK'D BY: <i>W. ...</i> | DATE: 17-SEP-76 | BOARD LOCATION: DE 1 | SIZE: D | CODE: BS |
| STK21E4.510J | | 112-SEP-75 04:10 | | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | NUMBER: MA20-0-ST21 |
| FIRST USED ON OPTION/MODEL: MA20 | | | | REV.: | * |

8

7

6

5

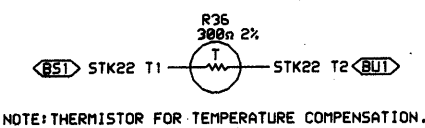
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3

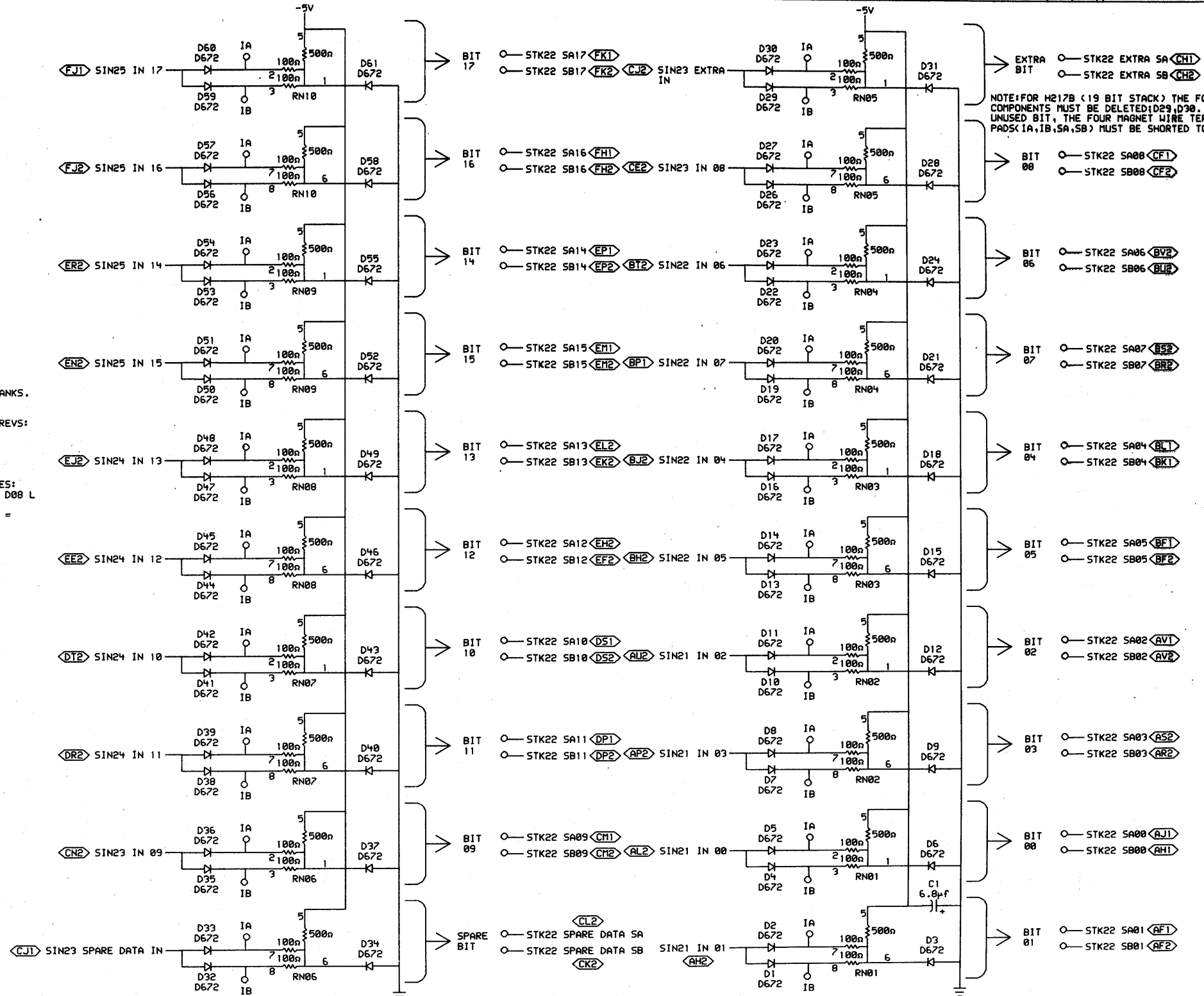
2

1

REV. NUMBER
D BS MA20-0-ST22



NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE "[LETTER]" IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: BC[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [C[N] S[M]] SEL H = MAC1 C0 S10 SEL H



NOTE: FOR H217B (19 BIT STACK) THE FOLLOWING COMPONENTS MUST BE DELETED: D29, D30, FOR THE UNUSED BIT, THE FOUR MAGNET WIRE TERMINATION PADS (1A, 1B, 5A, 5B) MUST BE SHORTED TOGETHER.

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| REVISIONS | | |
|-----------|------------|-----|
| CHK | CHANGE NO. | REV |
| | | |

digital
 DATE: 28-OCT-75
 DATE: 12-SEP-75
 DATE: 03:23
 BOARD LOCATION:
 SHEET 1 OF 1
 NEXT HIGHER ASSEMBLY:
 B-DD-MA20-0

| | | | |
|-----------------------------|------|-------------|------|
| TITLE: STACK MODULE (H217B) | | | |
| SIZE | CODE | NUMBER | REV. |
| D | BS | MA20-0-ST22 | * |

8

7

6

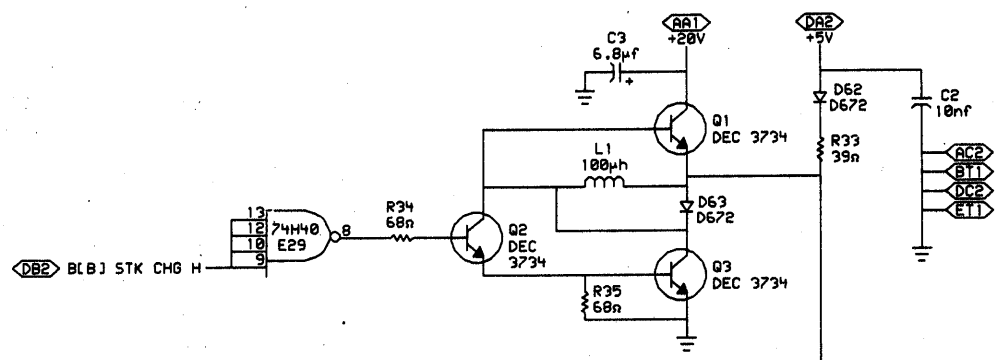
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3

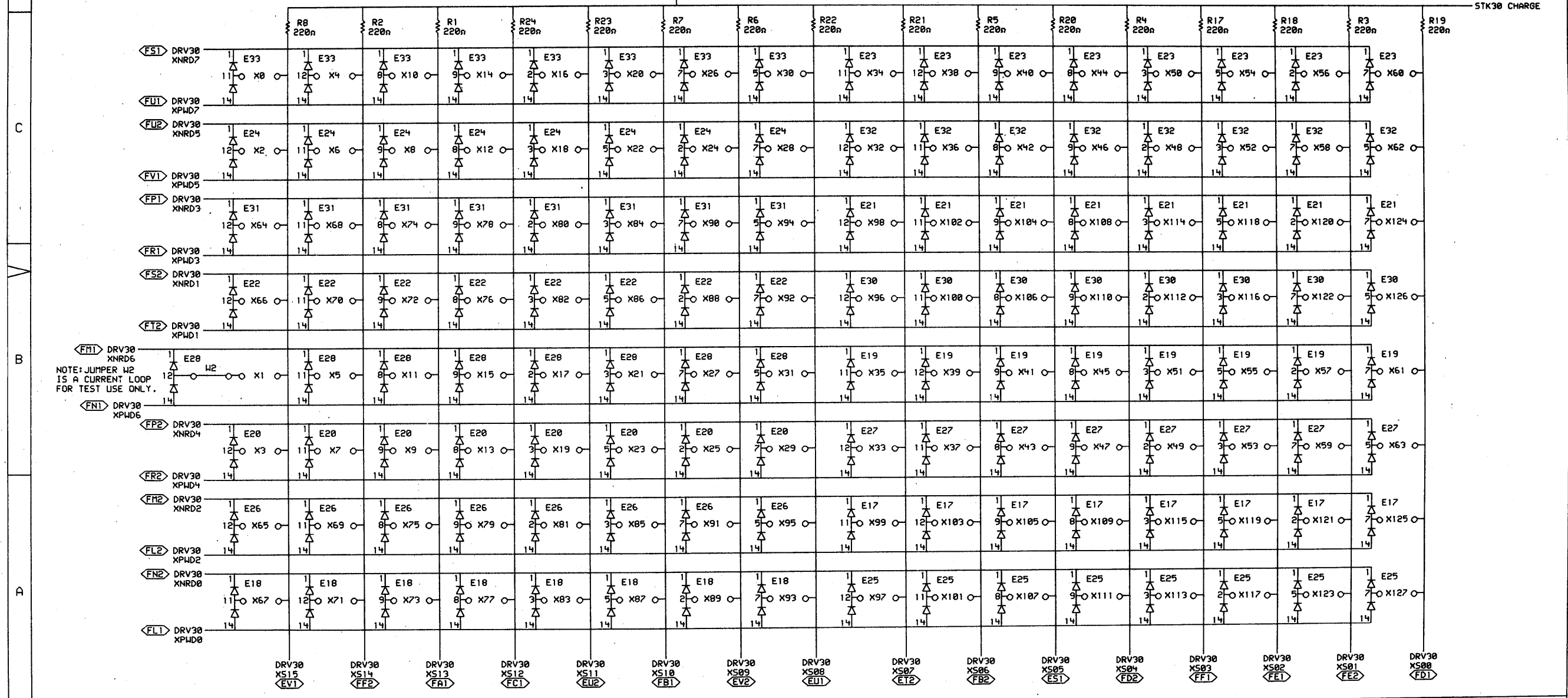
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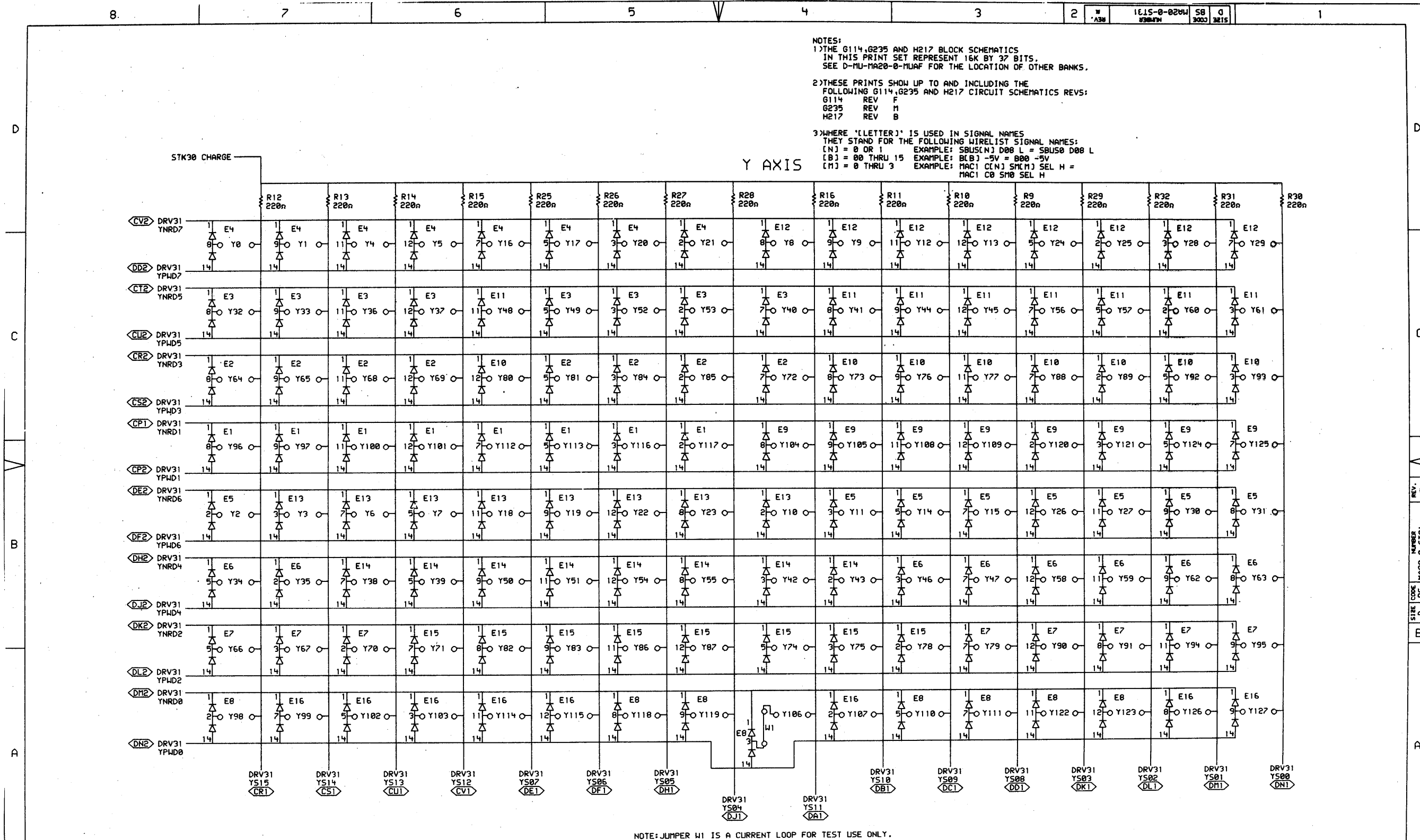
NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE '[LETTER]' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D00 L = SBUS0 D00 L
 [B] = 00 THRU 15 EXAMPLE: BE[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [C[M] SHL[M] SEL H = MAC1 C0 SH0 SEL H

X AXIS



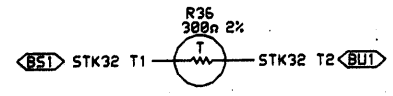
NOTE: JUMPER W2 IS A CURRENT LOOP FOR TEST USE ONLY.

| | | | |
|---|---|--|---|
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| DIGITAL STK304.5101 | DATE: 28-OCT-75 DATE: 14-Jan-76 SHEET: 1 OF 1 | ENG: [Signature] DATE: 11-03 NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | SIZE: D CODE: BS NUMBER: MA20-0-ST30 REV. #: |



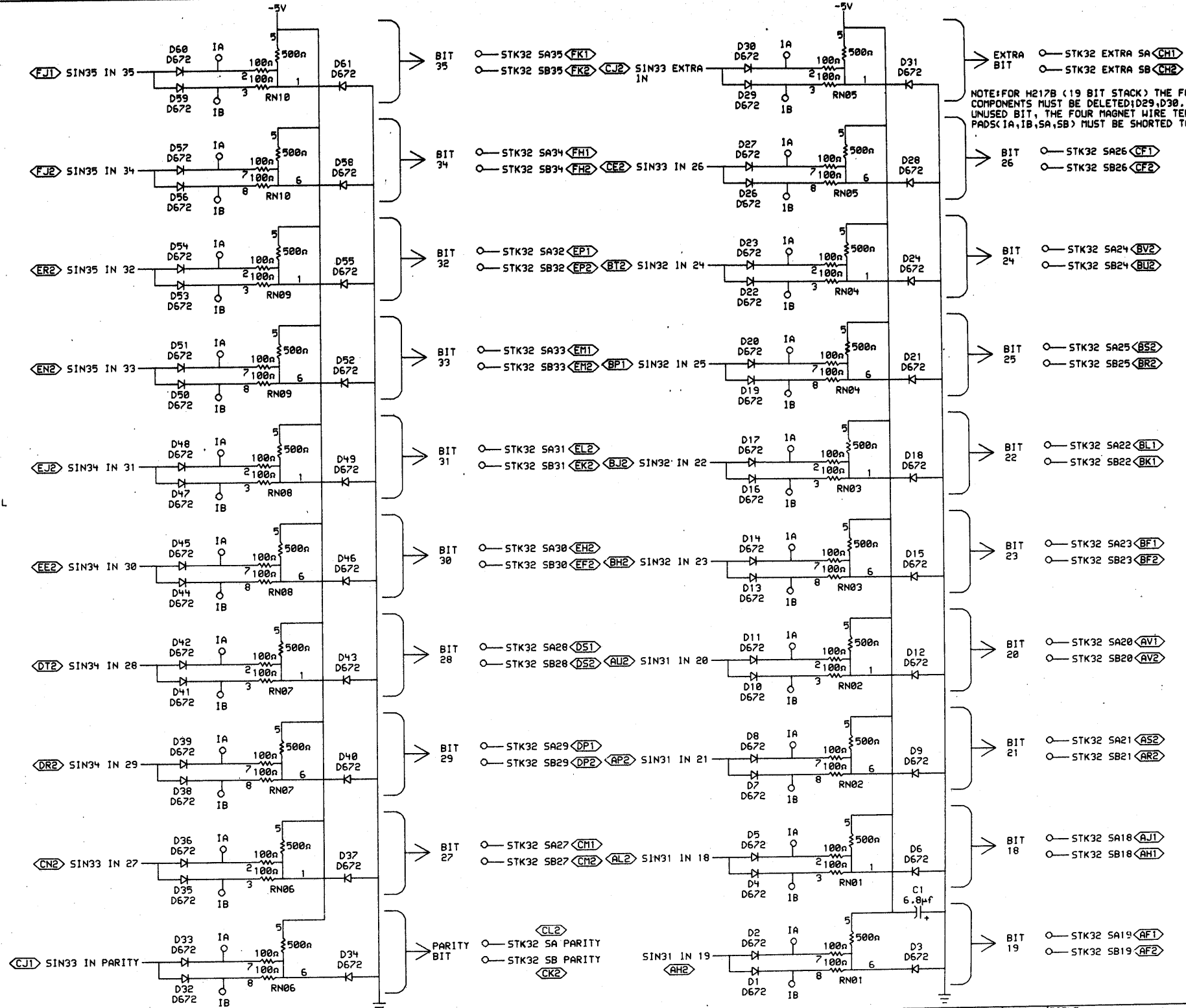
NOTES:
 1) THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 2) THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 3) WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS(N) D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: B[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 [C[N] S[M] SEL H = MAC1 C0 S10 SEL H

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|---|---|-----|------------|-----|--|--|--|---|---|
| CHK | CHANGE NO. | REV | | | | | | | |
| | | | | | | | | | |



NOTE: THERMISTOR FOR TEMPERATURE COMPENSATION.

- NOTES:
- THE G114, G235 AND H217 BLOCK SCHEMATICS IN THIS PRINT SET REPRESENT 16K BY 37 BITS. SEE D-MU-MA20-0-MUAF FOR THE LOCATION OF OTHER BANKS.
 - THESE PRINTS SHOW UP TO AND INCLUDING THE FOLLOWING G114, G235 AND H217 CIRCUIT SCHEMATICS REVS:
 G114 REV F
 G235 REV M
 H217 REV B
 - WHERE 'LETTER' IS USED IN SIGNAL NAMES THEY STAND FOR THE FOLLOWING WIRELIST SIGNAL NAMES:
 [N] = 0 OR 1 EXAMPLE: SBUS[N] D08 L = SBUS0 D08 L
 [B] = 00 THRU 15 EXAMPLE: BL[B] -5V = B00 -5V
 [M] = 0 THRU 3 EXAMPLE: MAC1 C[N] S[M] SEL H = MAC1 C0 S0 SEL H



NOTE: FOR H217B (19 BIT STACK) THE FOLLOWING COMPONENTS MUST BE DELETED: D29, D30. FOR THE UNUSED BIT, THE FOUR MAGNET WIRE TERMINATION PADS (1A, 1B, 5A, 5B) MUST BE SHORTED TOGETHER.

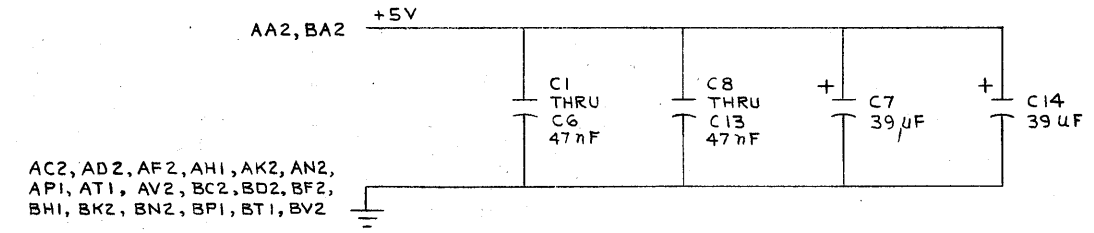
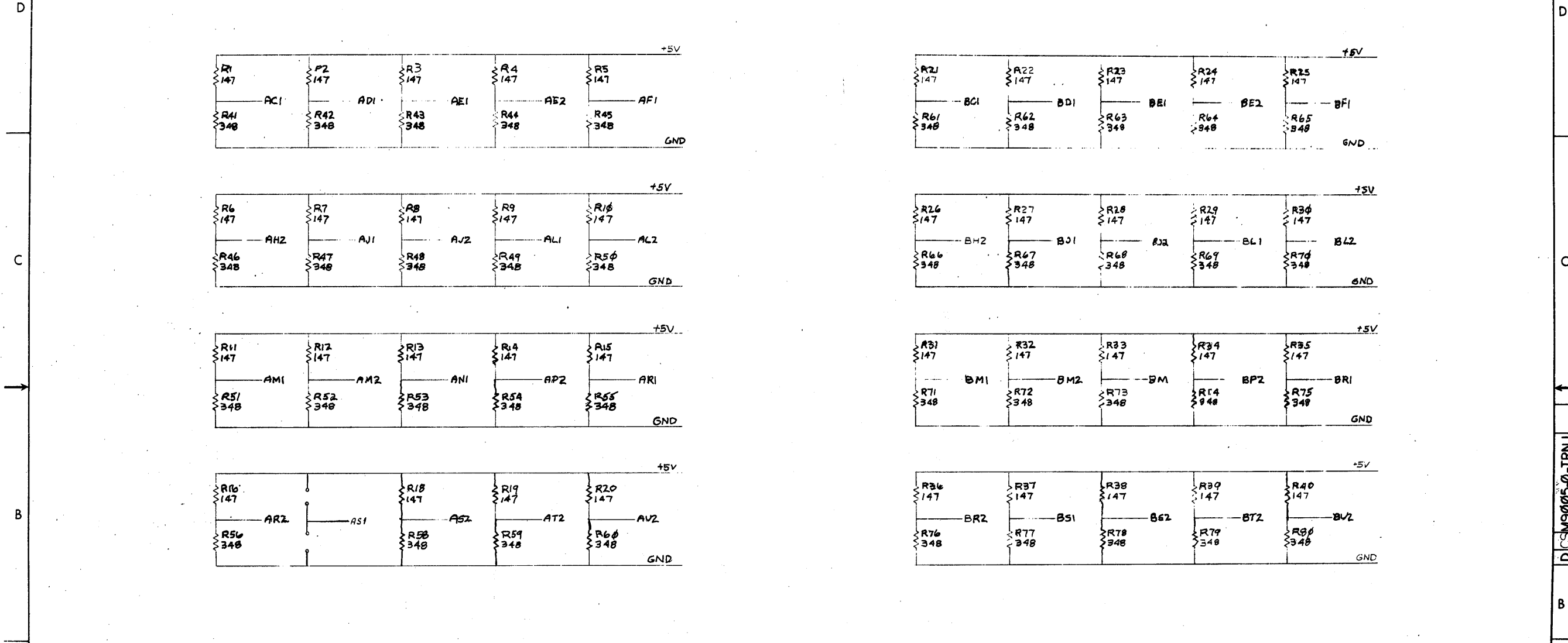
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| REVISIONS | |
|-----------|----------------|
| CHK | CHANGE NO. REV |
| | |

| | | | | |
|----------------------------------|-----------|-----------------------------------|-----------|----------------------|
| digital | DATE | ENG. | DATE | TITLE: |
| | 28-OCT-75 | J. Smith | 14 JAN 76 | STACK MODULE (H217B) |
| CHK'D | DATE | BOARD LOCATION | OF | |
| W. Hamilton | 12-SEP-75 | 14 JAN 76 | 1 | |
| FIRST USED ON OPTION/MODEL: MA20 | | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | | |
| SIZE | CODE | NUMBER | REV. | |
| D | BS | MA20-0-ST32 | * | |

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NOTE: ALL RESISTOR VALUES ARE IN OHMS, UNLESS OTHERWISE SPECIFIED.



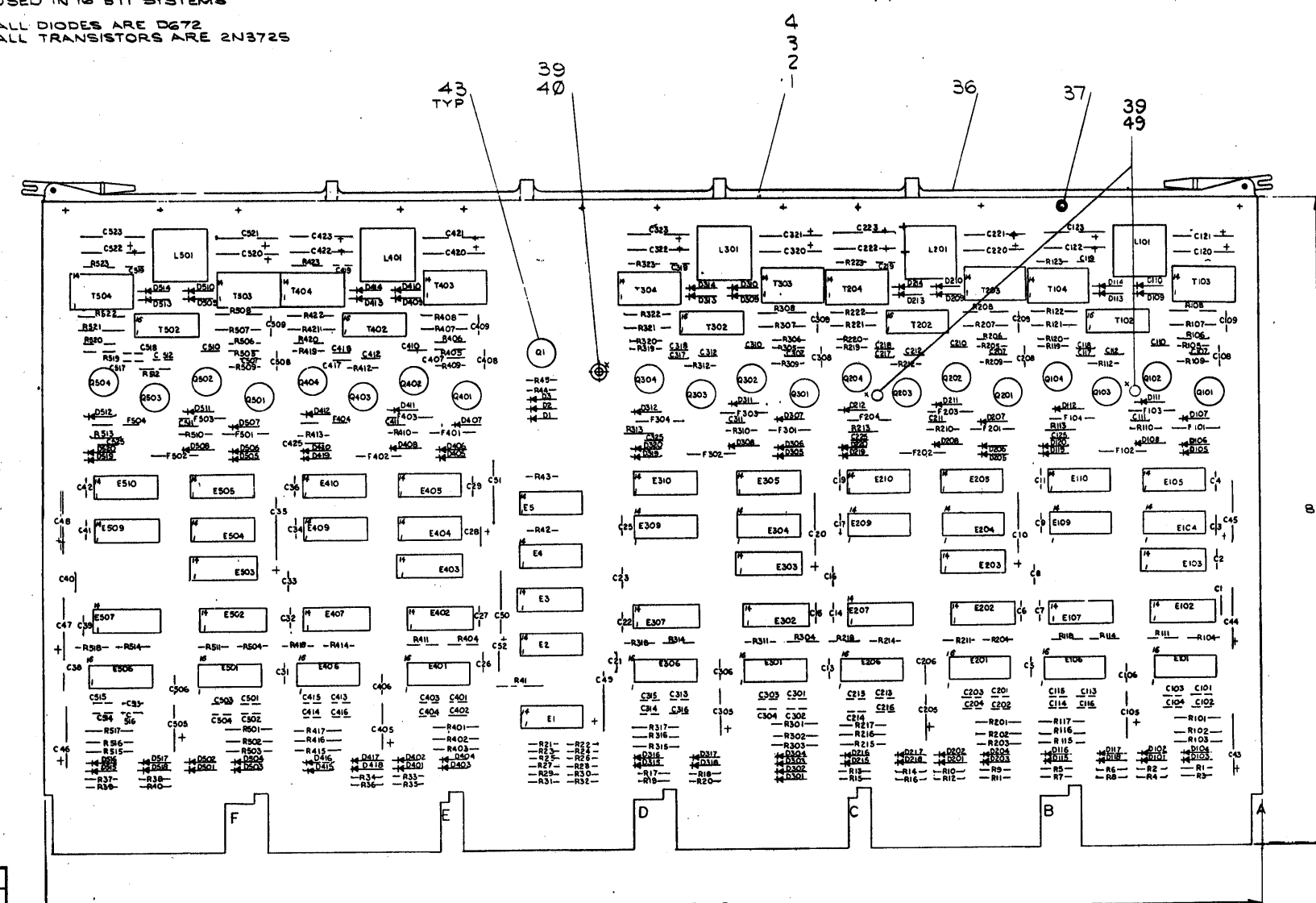
AC2, AD2, AF2, AH1, AK2, AN2, API, AT1, AV2, BC2, BD2, BF2, BHI, BK2, BN2, BPI, BT1, BV2

| REVISIONS | | |
|-----------|-----------|------|
| CHK | CHANGE NO | REV. |
| | | |

| FIRST USED ON OPTION/MODEL | QTY. | DESCRIPTION | PART NO. | ITEM NO. |
|---|------------|-------------|---|----------|
| MG10 | | | | |
| DIMENSIONAL TOLERANCE | | | | |
| DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED | | | | |
| MILLIMETERS | INCHES | ANGLES | PARTS LIST | |
| XXX ±0.10 | XXX ±0.005 | 10° 30' | TITLE: SBUS TERMINATOR NUMBER: DCS M9005-0-TRN1 REV.: | |
| XX ±0.05 | XX ±0.002 | | | |
| X ±0.2 | X ±0.1 | | | |
| THIRD ANGLE PROJECTION | | | | |
| MATERIAL: # | | | NEXT HIGHER ASSY. | |
| FINISH: # | | | SCALE: NONE | |
| | | | SHEET 1 OF 1 | |

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- NOTES:** UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE IN OHMS 1/4W
 2. ALL CAPACITANCE IS IN MICROFARADS
 3. DATA BITS 17 & 18 ARE NOT USED IN 18 BIT SYSTEMS
 4. DATA BIT 18 IS NOT USED IN 19 BIT SYSTEMS
 5. DATA BITS 16, 17, 18 & 19 ARE NOT USED IN 16 BIT SYSTEMS
 6. ALL DIODES ARE D672
 7. ALL TRANSISTORS ARE 2N3725



| IC TYPE | GND | +5V | -5V |
|-------------|-----|-----|-----|
| IC DEC 7380 | 1 | 8 | - |
| IC DEC 8640 | 1 | 8 | - |
| IC DEC 7528 | 9 | 16 | 3 |

GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY EXCEPTIONS ARE STATED ABOVE

IC PIN LOCATIONS

| QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|--------------------------------|-----------------|---|----------|----------|
| FIRST USED ON OPTION MODEL | | | | |
| MF 11-U & MF 11-UP | | | | |
| ETCH BOARD REV C | | | | |
| PARTS LIST | | | | |
| DRN | DATE | digital EQUIPMENT CORPORATION MAYFIELD MASSACHUSETTS | | |
| CHKD | DATE | TITLE 16 K SENSE/INHIBIT | | |
| BY | DATE | SIZE CODE DCS NUMBER G114-0-1 REV. F | | |
| BY | DATE | NEXT HIGHER ASSY | | |
| BY | DATE | SCALE 2 OF 9 SHEET 2 OF 9 | | |
| SEMICONDUCTOR CONVERSION CHART | | | | |
| DEC NO. | EIA NO. | DEC NO. | EIA NO. | DIST. |

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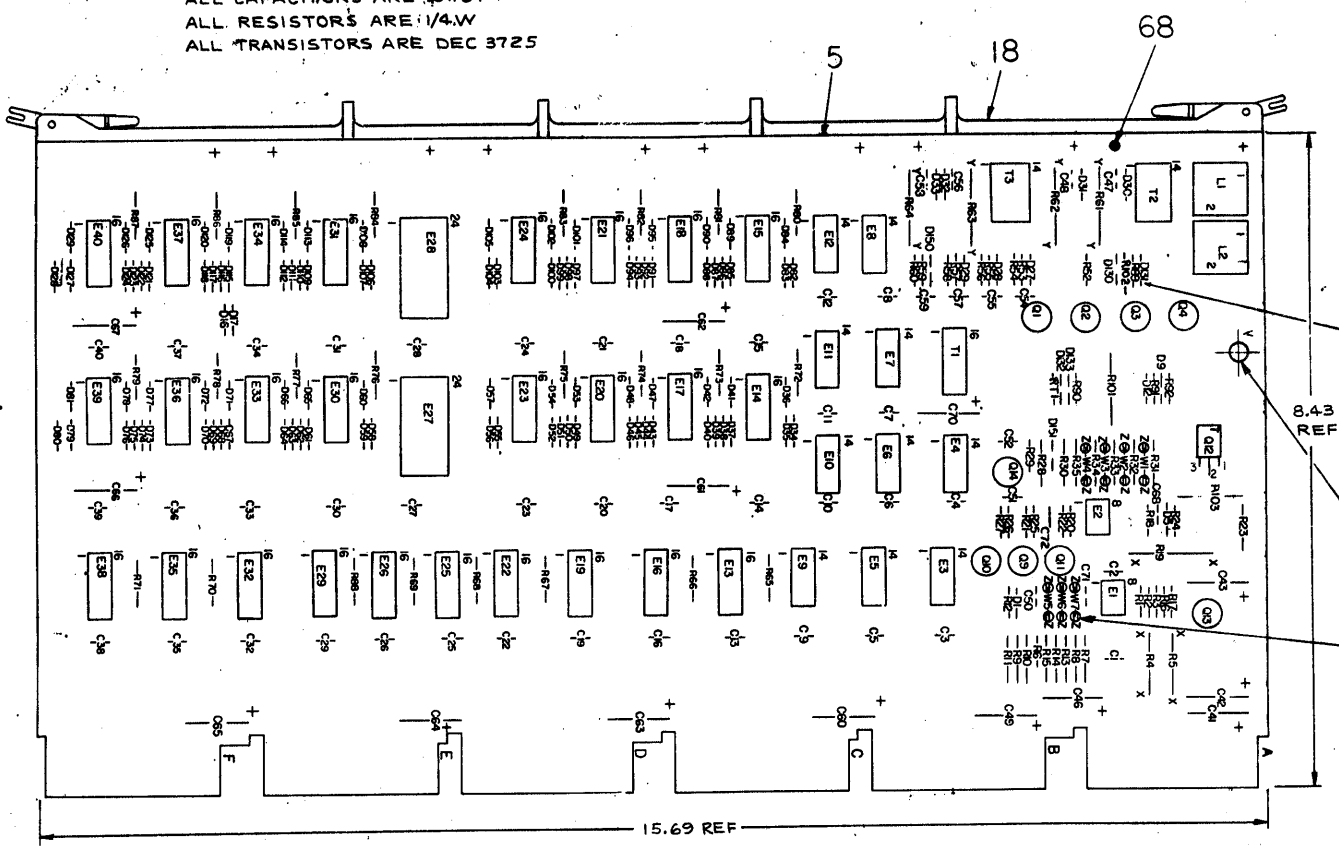
| QTY | REF | DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|-----|--|---|------------------------|----------|----------|
| 1 | E1 | IC DEC 74H00 | 1909056 | 30 | 1 |
| 14 | E2 THRU E5, E105, E110, E205, E210, E305, E310, E405, E410, E505, E510 | IC DEC 74H40 | 1905586 | 31 | 2 |
| 10 | E101, E106, E201, E206, E301, E306, E401, E406, E501, E506 | IC DEC 7528 SENSE AMP | 1910687 | 32 | 3 |
| 5 | E107, E207, E307, E407, E507 | IC DEC 8881 | 1909705 | 33 | 4 |
| 10 | E104, E109, E204, E209, E304, E309, E404, E409, E504, E509 | IC DEC 74H74 | 1909667 | 34 | 5 |
| 5 | L101, L201, L301, L401, L501 | CHOKER 400 UH | 1610963 | 35 | 6 |
| 7 | | HANDLE ASSY | 1210711-2 | 36 | 7 |
| 12 | | EYELET GS-4-7 | 9006732 | 37 | 8 |
| 20 | F101 THRU F104, F201 THRU F204, F301 THRU F304, F401 THRU F404, F501 THRU F504 | FUSE PICO FUSE 3/1A | 1210929-3 | 38 | 9 |
| 3 | | STANDOFF 1/4 X 3/8 #6-32 THRU | 9008213 | 39 | 10 |
| 3 | | SCREW NYLON 6/32 X 1/4 LG | 9009041-1 | 40 | 11 |
| 5 | E103, E203, E303, E403, E503 | I.C. DEC 74H04 | 1909931 | 41 | 12 |
| 5 | E102, E202, E302, E402, E502 | IC DEC 8640 | 1911469 | 42 | 13 |
| 21 | | TRANSIPAD | 9007201 | 43 | 14 |
| | A/R | 24 AWG WIRE | 9107470 | 45 | 15 |
| 103 | | D1, D2, D3, D101 THRU D120, D201 THRU D220, D301 THRU D320, D401 THRU D420, D501 THRU D520 | | | 16 |
| | | R1, R3, R5, R7, R9, R11, R13, R15, R17, R19, R21, R23, R25, R27, R29, R31, R33, R35, R37, R39 | RES. 180, 1/4W, 5% | 1301322 | 17 |
| 1 | R41 | | RES. 196, 1/8W, 1% MF | 1302956 | 18 |
| 20 | R2, R4, R6, R8, R10, R12, R14, R16, R18, R20, R22, R24, R26, R28, R30, R32, R34, R36, R38, R40 | | RES. 390, 1/4W, 5% | 1300309 | 19 |
| 2 | R42, R43 | | RES. 330, 1/4W, 5% | 1300295 | 20 |
| 1 | R44 | | RES. 47K, 1/4W, 5% | 1300447 | 21 |
| 20 | R101, R102, R16, R17, R201, R202, R216, R217, R301, R302, R316, R317, R401, R402, R416, R417, R501, R502, R516, R517 | | RES. 19.6, 1/8W, 1% MF | 1303110 | 22 |
| 10 | R103, R115, R203, R215, R303, R315, R403, R415, R503, R515 | | RES. 1K, 1/8W, 1% MF | 1303114 | 23 |
| 20 | R104, R111, R114, R118, R204, R211, R214, R218, R304, R311, R314, R318, R404, R411, R414, R418, R504, R511, R514, R518 | | RES. 1K, 1/4W, 5% | 1300365 | 24 |
| 20 | R109, R110, R112, R113, R209, R210, R212, R213, R309, R310, R312, R313, R409, R410, R412, R413, R509, R510, R512, R513 | | RES. 100, 1/4W, 5% | 1300229 | 25 |
| 20 | R105, R106, R119, R120, R205, R206, R219, R220, R305, R306, R319, R320, R405, R406, R419, R420, R505, R506, R519, R520 | | RES. 5.1, 1/4W, 5% | 1309422 | 26 |
| 1 | R45 | | RES. 470, 1/4W, 5% | 1300316 | 27 |
| 5 | R123, R223, R323, R423, R523 | | RES. 150, 1/4W, 5% | 1300230 | 28 |
| 20 | R107, R108, R121, R122, R207, R208, R221, R222, R307, R308, R321, R322, R407, R408, R421, R422, R507, R508, R521, R522 | | RES. 56, 1/2W, 5% | 1309995 | 29 |
| 21 | Q1, Q101 THRU Q104, Q201 THRU Q204, Q301 THRU Q304, Q401 THRU Q404, Q501 THRU Q504 | TRANS EN3725 (TOS) | | 1510959 | 30 |
| 10 | T103, T104, T203, T204, T303, T304, T403, T404, T503, T504 | TRANSFORMER SATURATING INHIBIT | | 1610961 | 31 |
| 5 | T102, T202, T302, T402, T502 | TRANSFORMER, PULSE (DIP) | | 1609996 | 32 |

| REVISIONS | | | PARTS LIST | | TITLE | | SIZE CODE | | NUMBER | | REV. | |
|-----------|------------|------|------------|-----|-------------|-------------|-----------|----------|-------------------|--------------|-------|----------|
| CHK | CHANGE NO. | REV. | QTY | REF | DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. | 16K SENSE/INHIBIT | | D CS | G114 0-1 |
| | | | | | | | | | SCALE | SHEET 3 OF 9 | DIST. | |

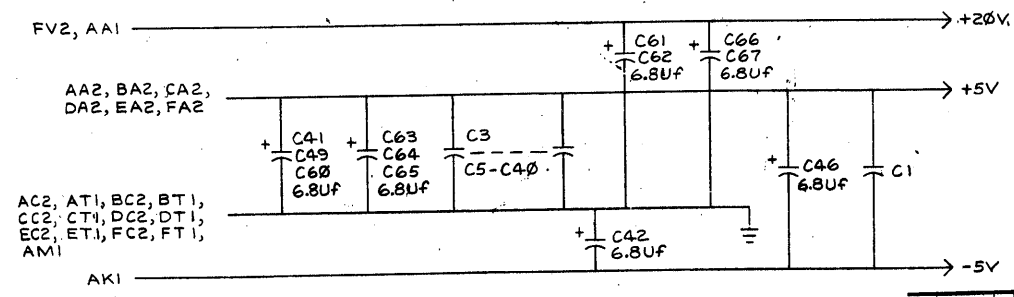
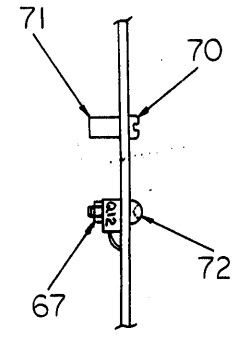
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NOTES:

- * INDICATES NOT USED ON MF11-U & MF11-UP (2 PLACES).
- ** INDICATES NOT USED ON MF11-U & MF11-UP BUT ARE TIED TO UNUSED TERMINATORS ON THE G114 MODULE, WHICH FORCES THEM TO +3V (5 PLACES).
- 1 THERMISTOR LOCATED ON H217 STACK MODULE, 1 ON 6235
- UNLESS OTHERWISE INDICATED;
ALL DIODES ARE D672
ALL CAPACITORS ARE .01UF
ALL RESISTORS ARE 1/4W
ALL TRANSISTORS ARE DEC 3725



CATHODE END OF ALL DIODES SHALL BE TOWARD FINGERS



| IC TYPE | GND | +5V | +20V |
|---------|-----|-----|------|
| 74121 | 7 | — | — |
| 741 | — | — | — |
| 75325 | — | 9 | 16 |
| 7442 | 8 | 16 | — |
| 74154 | 12 | 24 | — |

GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY. EXCEPTIONS ARE STATED ABOVE.

IC PIN LOCATIONS

| QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|--------------------------------|-----------------|-------------------------------|----------|----------|
| PARTS LIST | | | | |
| FIRST USED ON OPTION MODEL | | | | |
| MF11-U & MF11-UP | | | | |
| ETCH BOARD REV D | | | | |
| DRN | DATE | DIGITAL EQUIPMENT CORPORATION | | |
| CHK'D | DATE | MAYNARD, MASSACHUSETTS | | |
| WAS HAND | DATE | TITLE | | |
| ENG | DATE | 16K X-Y DRIVE | | |
| PROJ. ENG | DATE | SIZE CODE | | |
| PROD. | DATE | NUMBER | | |
| NEXT HIGHER ASSY | | REV. | | |
| DEC NO. | EIA NO. | DEC NO. | EIA NO. | SCALE |
| SEMICONDUCTOR CONVERSION CHART | | | | |
| SHEET 2 | | OF 6 | | |

DCS G235-0-1
 NUMBER
 REV. P

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| QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. | QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|-----|------------------------------------|---------------------------------------|------------|----------|-----|-------------------------------|---------------|----------|----------|
| 1 | E8 | IC DEC 74H04 | 1909931 | 82 | | | | | |
| 1 | E10 | IC DEC 74H10 | 1909057 | 83 | REF | X-Y COORDINATE HOLE LOCATION | K-CO-G235-0-4 | 2 | |
| 2 | E7, E11 | IC DEC 74H40 | 1905586 | 84 | REF | ASSY/DRILLING HOLE LAYOUT | D-AH-G235-0-5 | 3 | |
| 24 | E13-E18, E20-E26, E29-E31, E33-E40 | IC DEC 75325 | 1910980 | 85 | REF | ECO MODULE HISTORY | B-MH-G235-0-8 | 4 | |
| 2 | E9, E12 | IC DEC 74H50 | 1909060 | 86 | 1 | ETCHED CIRCUIT BD. | 5010145 | 5 | |
| 1 | | KEPNUT 4-40 | 9008557 | 87 | 46 | CAP 47 PF 100V 5% D.M. | 1000011 | 6 | |
| 12 | | EYELET HANDLE | 9008732 | 88 | 4 | CAP .01UF 50V 20% | 1001610 | 7 | |
| 14 | | SPLIT LUGS | 9008735 | 89 | 1 | CAP .005 UF 100V 20% DISC | 1001765 | 8 | |
| 1 | | SCREW NYLON 6-32 | 9008212-1 | 70 | 1 | CAP 18 PF 100V 5% D.M. | 1002608 | 9 | |
| 1 | | STAND OFF 1/4 X 3/8 | 9008213 | 71 | 13 | CAP 47 UF 20V 10% S. TANT | 1004814 | 10 | |
| 1 | | SCREW (PHILLIPS PAN HEAD) 4-40 X 5/16 | 9006018-1 | 72 | 1 | CAP 6.8UF 35V 10% S. TANT | 1005306 | 11 | |
| 1 | R31 | RES 19.6K 1/8W 1% | 1309419 | 73 | 109 | DIODE ZENER IN753A 6.2V ± 1% | 1102421-1 | 12 | |
| AR | W1-W7 | WIRE #22 AWG (SOLID) | 9107560-1 | 74 | 1 | DIODE D872 | 1105275 | 13 | |
| 1 | R91 | RES 180Ω 1/4W 5% | 1301322 | 75 | 1 | DIODE ZENER IN8248B 18V ± 10% | 1110766 | 14 | |
| 1 | D133 | DIODE ZENER IN752A 5.6V ± 1% | 1102808-1 | 76 | 1 | DIODE ZENER IN749A 4.3V ± 5% | 1109977 | 15 | |
| 1 | R92 | RES 150Ω 1/4W 5% | 1300250 | 77 | 1 | DIODE ZENER IN754A 6.8V ± 5% | 1109991 | 16 | |
| 2 | C47, C56 | CAP .022UF 50V | 1011683 | 78 | 1 | DIODE ZENER IN750A 4.7V ± 5% | 1100124 | 17 | |
| 1 | RT1 | THERMISTOR 300Ω 2% | 1309785 | 79 | 2 | HANDLE ASSY | 1210711-2 | 18 | |
| 1 | R102 | RES 330Ω 1/4W 5% | 1300295 | 80 | 12 | RES 100 1/4W 5% | 1300229 | 19 | |
| 1 | Q11 | TRANS. DEC 4258 | 1505321 | 81 | 1 | RES 220 1/2W 5% | 1300274 | 20 | |
| 1 | E3 | I.C. DEC 74H20 | 1905635 | 82 | 1 | RES 220 2W 10% | 1300278 | 21 | |
| 1 | R7 | RES. 9.09K 1/8W 1% | 1304855 | 83 | 12 | RES 270 1/2W 5% | 1300285 | 22 | |
| 1 | R103 | RES. 75Ω 1W 5% | 1305281 | 84 | 2 | RES 470 1/4W 5% | 1300316 | 23 | |
| A/R | | WIRE #30 | 9105740-55 | 85 | 1 | RES 1K 1/4W 5% | 1300385 | 24 | |
| | | | | | 1 | RES 1K 1/2W 5% | 1300364 | 25 | |
| | | | | | 1 | RES 4.7K 1/4W 5% | 1300447 | 26 | |
| | | | | | 1 | RES 10 1/4W 5% | 1301317 | 27 | |
| | | | | | 1 | RES 82Ω 1/4W 5% | 1301477 | 28 | |
| | | | | | 4 | RES 10Ω 2W 10% | 1300172 | 29 | |
| | | | | | 1 | RES 22K 1/4W 5% | 1301808 | 30 | |
| | | | | | 1 | RES 270 1/4W 5% | 1301972 | 31 | |
| | | | | | 4 | RES 18 1/4W 5% | 1302124 | 32 | |
| | | | | | 4 | RES 75 1/4W 5% | 1302378 | 33 | |
| | | | | | 4 | RES 2K 1/4W 5% | 1302388 | 34 | |
| | | | | | 2 | RES 470K 1/4W 5% | 1302398 | 35 | |
| | | | | | 1 | RES 120K 1/4W 5% | 1300539 | 36 | |
| | | | | | 2 | RES 10K 1/8W 1% | 1302886 | 37 | |
| | | | | | 2 | RES 14.7K 1/8W 1% | 1302941 | 38 | |
| | | | | | 1 | RES 207 1/8W 1% | 1305124 | 39 | |
| | | | | | 1 | RES 196 1/8W 1% | 1302956 | 40 | |
| | | | | | 1 | RES 3.16K 1/8W 1% | 1303045 | 41 | |
| | | | | | 1 | RES 34.8K 1/8W 1% | 1303156 | 42 | |
| | | | | | 1 | RES 243K 1/8W 1% | 1304843 | 43 | |
| | | | | | 1 | RES 2.61K 1/8W 1% | 1303303 | 44 | |
| | | | | | 2 | RES 88 1/8W 1% | 1305252 | 45 | |
| | | | | | 1 | RES 121K 1/8W 1% | 1305255 | 46 | |
| | | | | | 2 | RES .25 3W 1% | 1310219 | 47 | |
| | | | | | 1 | RES .08 5W 3% | 1310983 | 48 | |
| | | | | | 1 | RES 56Ω 1/4W 5% | 1302502 | 49 | |
| | | | | | 1 | TRANS DEC 2904A | 1501913 | 50 | |
| | | | | | 1 | TRANS DEC 6534B | 1503409-1 | 51 | |
| | | | | | 1 | TRANS DEC 4920 | 1509605 | 52 | |
| | | | | | 6 | TRANS DEC 3725 | 1510959 | 53 | |
| | | | | | 1 | PULSE TRANSFORMER (DIP) | 1809851 | 54 | |
| | | | | | 2 | SATURATING TRANSFORMER-XY | 1610582 | 55 | |
| | | | | | 2 | CHOKER 400 UH | 1610963 | 56 | |
| | | | | | 2 | IC DEC 74154 | 1809701 | 57 | |
| | | | | | 2 | IC DEC 7442 | 1910046 | 58 | |
| | | | | | 1 | IC DEC 74121 | 1910230 | 59 | |
| | | | | | 2 | IC DEC 741 | 1910298 | 60 | |
| | | | | | 2 | IC DEC 74H00 | 1909056 | 61 | |

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|----------------------|------------|------|-----|-----------------|-------------|----------|----------|-----|-----------------|----------------|------------------|----------|
| REVISIONS | | | QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. | QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
| CHK | CHANGE NO. | REV. | | | | | | | | | | |
| TITLE: 16K X-Y DRIVE | | | | | | | | | | SIZE CODE: DCS | NUMBER: G235-0-1 | REV. P |
| SCALE: 1/1 | | | | | | | | | | SHEET: 3 OF 6 | DIST. | |

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NOTES:


1. FOR DRAWING DIRECTORY, REFER TO: B-DD-M9005-0

0-0-9006W 2

| QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|-----|----------------------------|-----------------------------|-----------|----------|
| 1 | | ETCHED CIRCUIT BOARD | 5010683 | 1 |
| 2 | C7, C14 | CAP. 39uf 10% 10V | 1000076 | 2 |
| 12 | C1 THRU C6, C8 THRU C13 | CAP. 47nF 16V | 1009678 | 3 |
| 39 | R1 THRU R16, R18 THRU R40 | RES. 147 1% 1/4W | 1302874 | 4 |
| 39 | R41 THRU R56, R58 THRU R80 | RES. 348 1% 1/4W | 1304858 | 5 |
| 4 | | EYELET (HANDLE) | 9006732 | 6 |
| 2 | | HANDLE, FLIP CHIP (MAGENTA) | 9008337-6 | 7 |

FIRST USED ON
MG10

PARTS LIST

| | | | |
|--------------------------------|---------|---|---------|
| DRN. | DATE |  digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS | TITLE |
| CHK'D. | DATE | | |
| ENG. | DATE | | |
| PROJ. ENG. | DATE | | |
| PROD. | DATE | | |
| | DATE | | |
| NEXT HIGHER ASSY | | B-DD-M9005-0 | |
| DEC. NO. | EIA NO. | DEC. NO. | EIA NO. |
| SEMICONDUCTOR CONVERSION CHART | | | |
| SCALE | NONE | | |
| SHEET | 1 OF 4 | | |

SBUS TERMINATOR

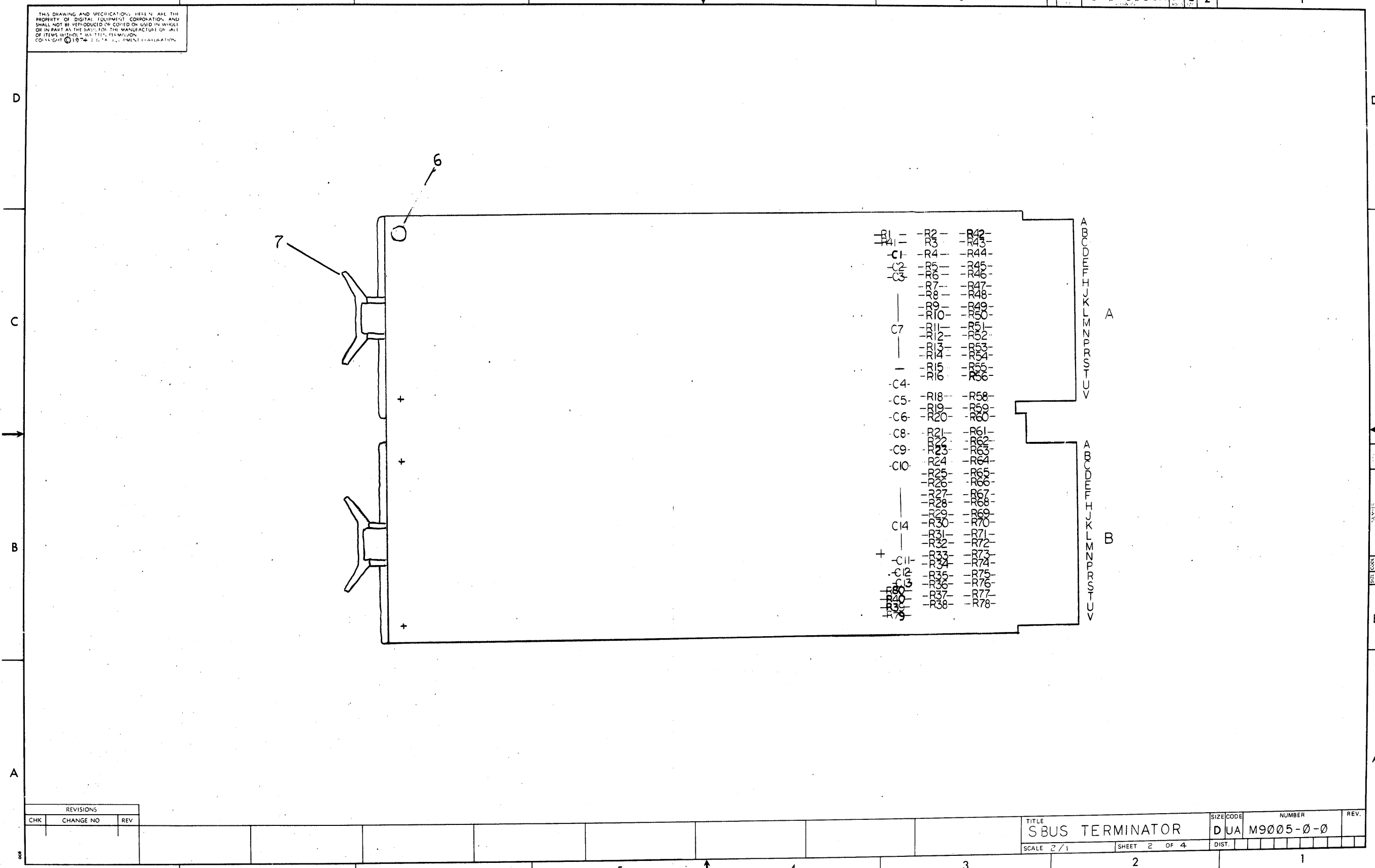
SIZE CODE: DJUA M9005-0-0

REV. NUMBER
DJA M9005-0-0

BRUNING 40-107, 15868

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0-0-5006MVA 2



| | | |
|-----|-----|-----|
| R1 | R2 | R3 |
| C1 | C2 | C3 |
| C4 | C5 | C6 |
| C7 | C8 | C9 |
| C10 | C11 | C12 |
| C13 | C14 | C15 |
| C16 | C17 | C18 |
| C19 | C20 | C21 |
| C22 | C23 | C24 |
| C25 | C26 | C27 |
| C28 | C29 | C30 |
| C31 | C32 | C33 |
| C34 | C35 | C36 |
| C37 | C38 | C39 |
| C40 | C41 | C42 |
| C43 | C44 | C45 |
| C46 | C47 | C48 |
| C49 | C50 | C51 |
| C52 | C53 | C54 |
| C55 | C56 | C57 |
| C58 | C59 | C60 |
| C61 | C62 | C63 |
| C64 | C65 | C66 |
| C67 | C68 | C69 |
| C70 | C71 | C72 |
| C73 | C74 | C75 |
| C76 | C77 | C78 |

| REVISIONS | | |
|-----------|-----------|-----|
| CHK | CHANGE NO | REV |
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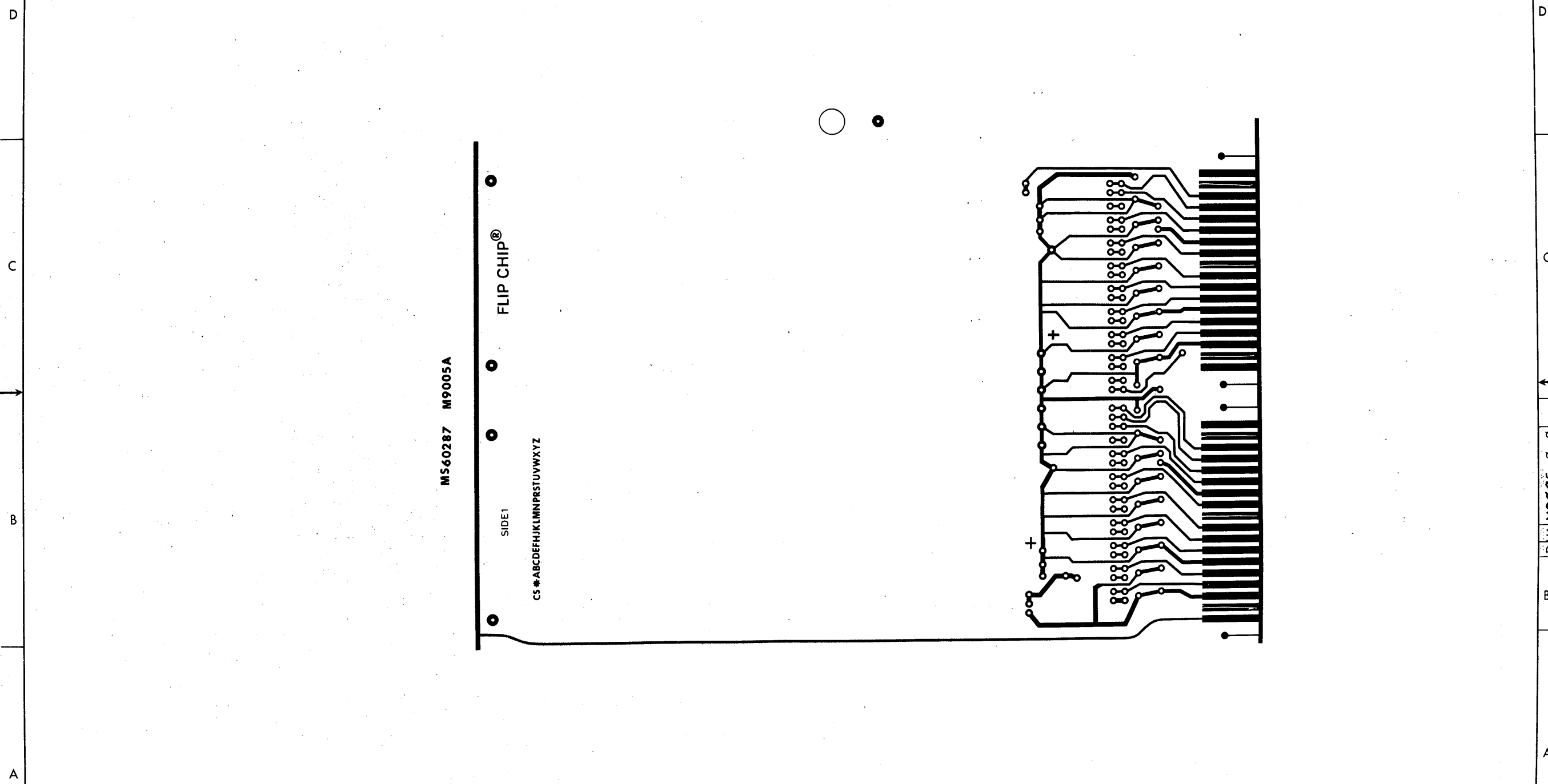
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|-----------------|--------------|-----------|------|
| TITLE | SIZE CODE | NUMBER | REV. |
| SBUS TERMINATOR | DUA | M9005-0-0 | |
| SCALE 2/1 | SHEET 2 OF 4 | DIST. | |

DUA M9005-0-0

8 7 6 5 4 3 2 1

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DUAL M9005-0-0 2



DUAL M9005-0-0

| REVISIONS | | |
|-----------|-----------|------|
| CHK | CHANGE NO | REV. |
| | | |

8 7 6 5 4 3 2 1

| | | | |
|-----------------|--------------|-----------|------|
| TITLE | SIZE CODE | NUMBER | REV. |
| SBUS TERMINATOR | DUAL | M9005-0-0 | |
| SCALE 2/1 | SHEET 3 OF 4 | DIST. | |

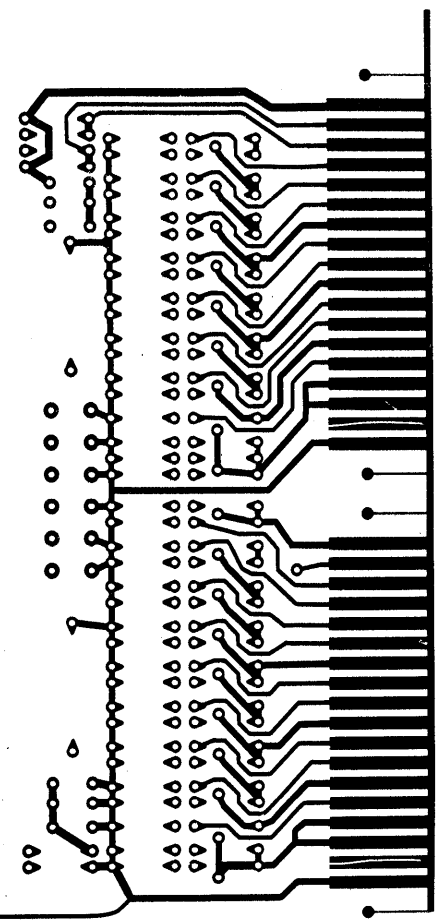
8 7 6 5 4 3 2 1

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5010683A
M9005
SIDE2 MS60287
SBUS TERMINATOR



| | | | | | | | | | | | | | | | |
|-----------------|--|---|--|---|--|---|--|---|--|---|--|------|------|-----------|-----|
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |
| SBUS TERMINATOR | | | | | | | | | | | | SIZE | CODE | NUMBER | REV |
| 2/1 | | | | | | | | | | | | 4 | 4 | | |
| | | | | | | | | | | | | D | UA | M9005-0-0 | |

DUA M9005-0-0

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NOTES:

1. FOR DRAWING DIRECTORY, REFER TO B-DD-M9006-0
2. COVERS OF CONNECTORS ITEM 2 NOT ATTACHED UNTIL CABLE ASSEMBLY TIME, SEE D-UA-BC20C-0-0

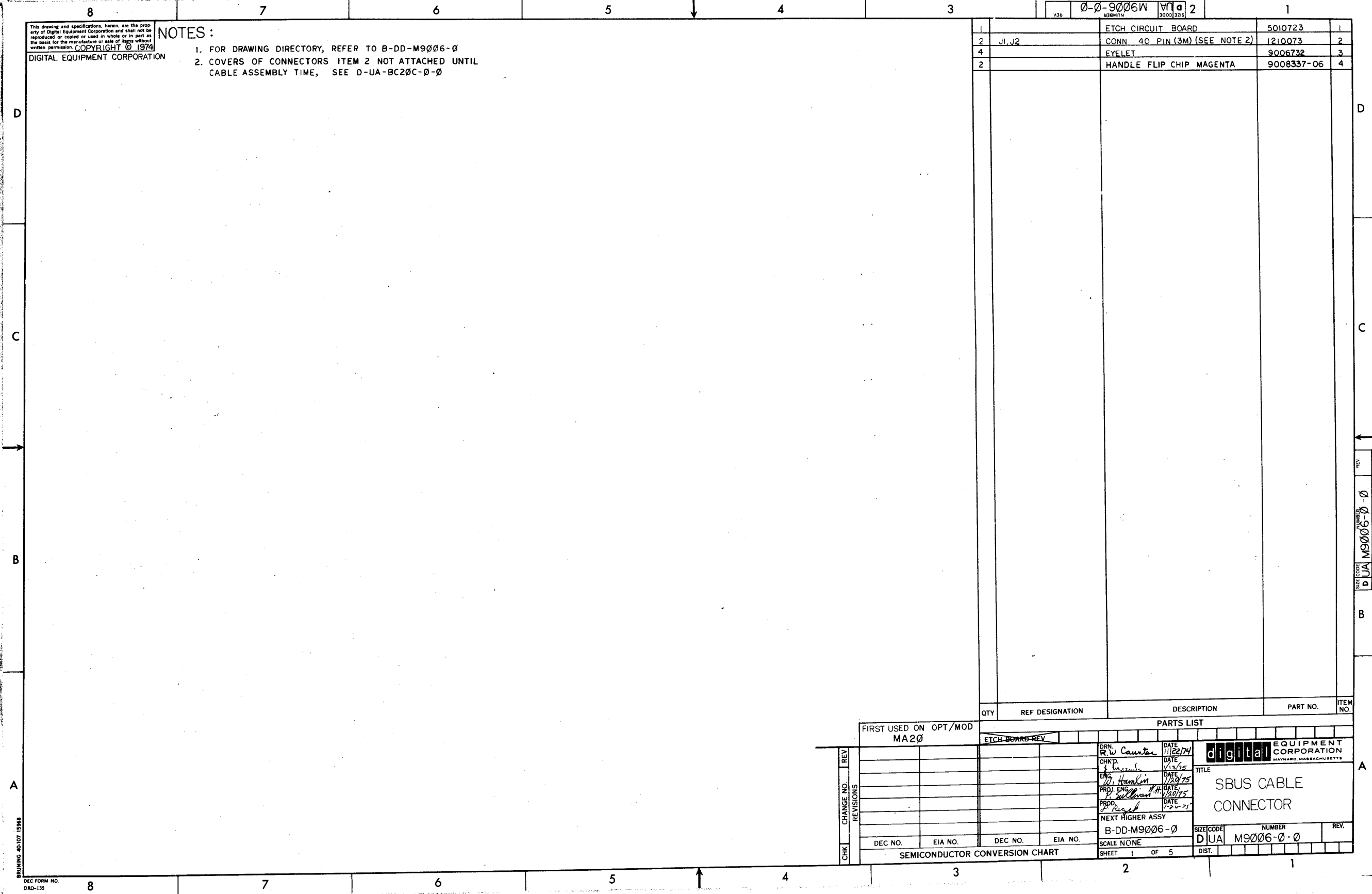
0-0-9006W V1a 2

| QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|-----|-----------------|-------------------------------|------------|----------|
| 1 | | ETCH CIRCUIT BOARD | 5010723 | 1 |
| 2 | J1, J2 | CONN 40 PIN (3M) (SEE NOTE 2) | 1210073 | 2 |
| 4 | | EYELET | 9006732 | 3 |
| 2 | | HANDLE FLIP CHIP MAGENTA | 9008337-06 | 4 |

| | | | | | | | |
|---|--|--|--|---|--|--|--|
| FIRST USED ON OPT/MOD MA20 | | | | PARTS LIST | | | |
| ETCH BOARD-REV | | | | DRN. R.W. Caunter DATE 11/22/74 CHK'D. DATE 1/13/75 ENG. Hamlen DATE 1/29/75 PROJ. ENG. P. Sullivan DATE 1/20/75 PRD. R. Regan DATE 1-25-75 NEXT HIGHER ASSY B-DD-M9006-0 SCALE NONE SHEET 1 OF 5 | | | |
| DEC NO. EIA NO. DEC NO. EIA NO. SEMICONDUCTOR CONVERSION CHART | | | | digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS TITLE SBUS CABLE CONNECTOR SIZE CODE D U A NUMBER M9006-0-0 REV. | | | |

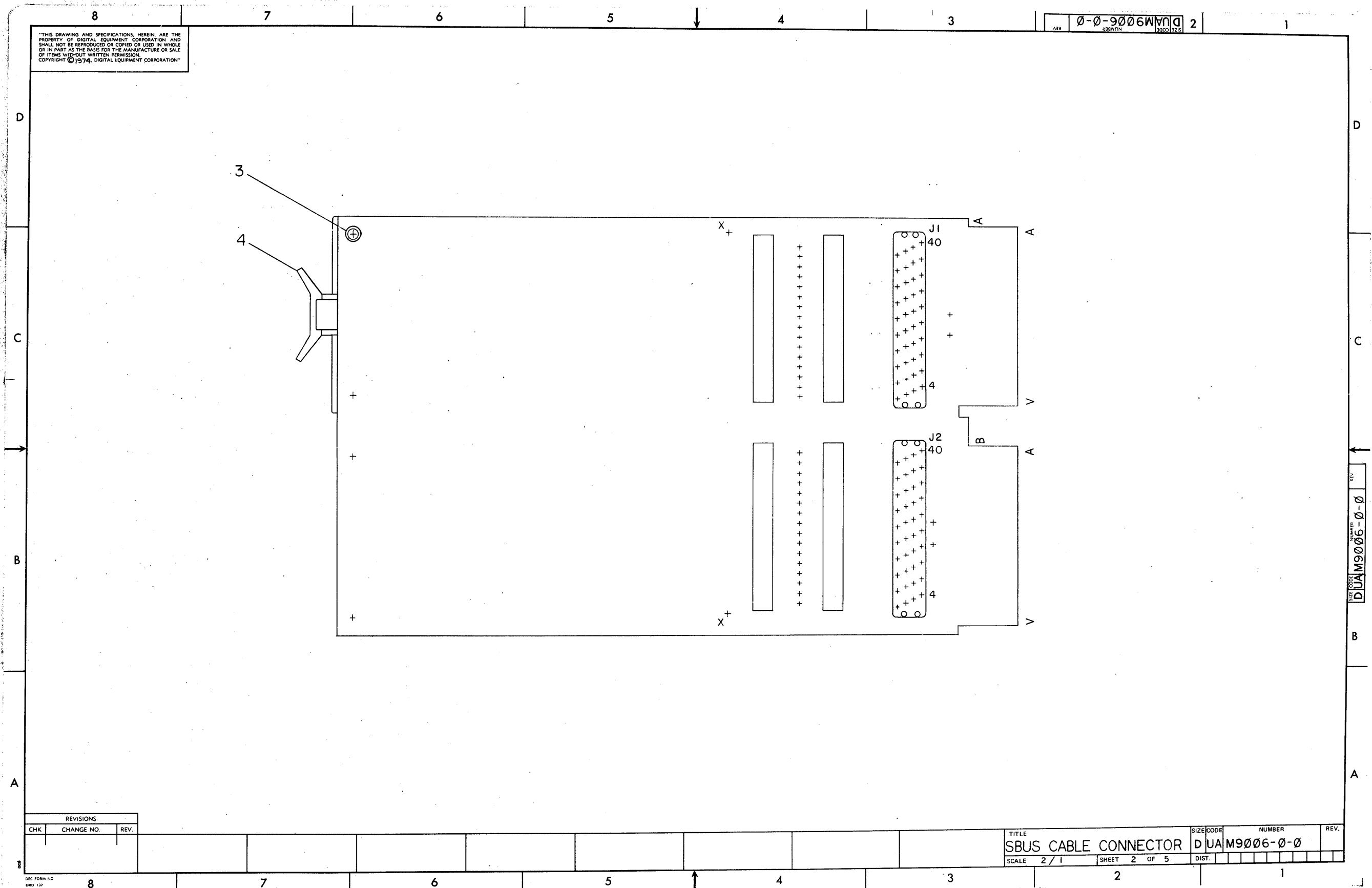
BRUNING 40-107 15568

REV. NUMBER M9006-0-0



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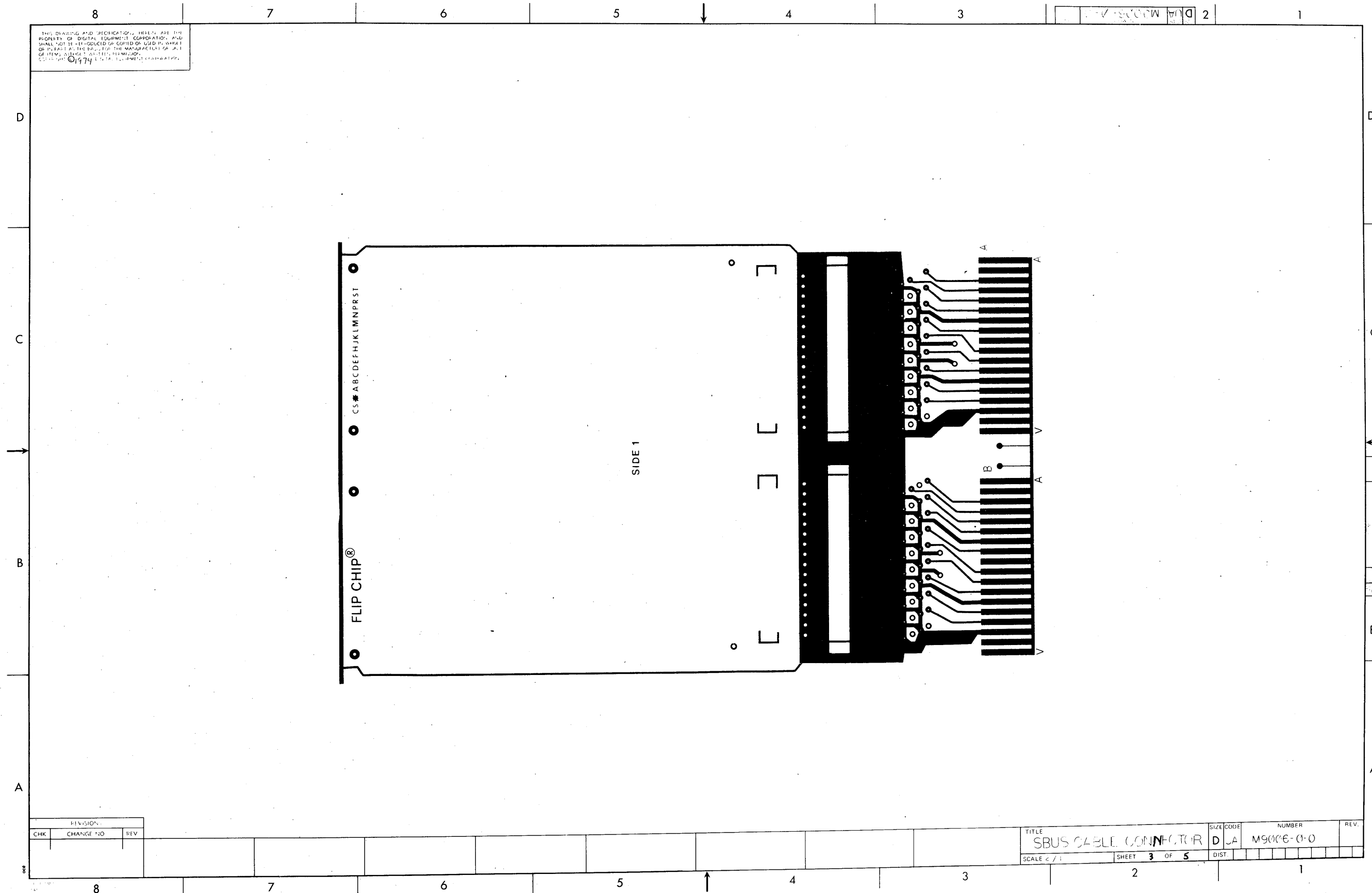
REV. 2
 NUMBER DUA M9006-0-0



| REVISIONS | | |
|-----------|------------|------|
| CHK | CHANGE NO. | REV. |
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DEC FORM NO 080 137

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| REVISION | | |
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| CHK | CHANGE NO | REV |
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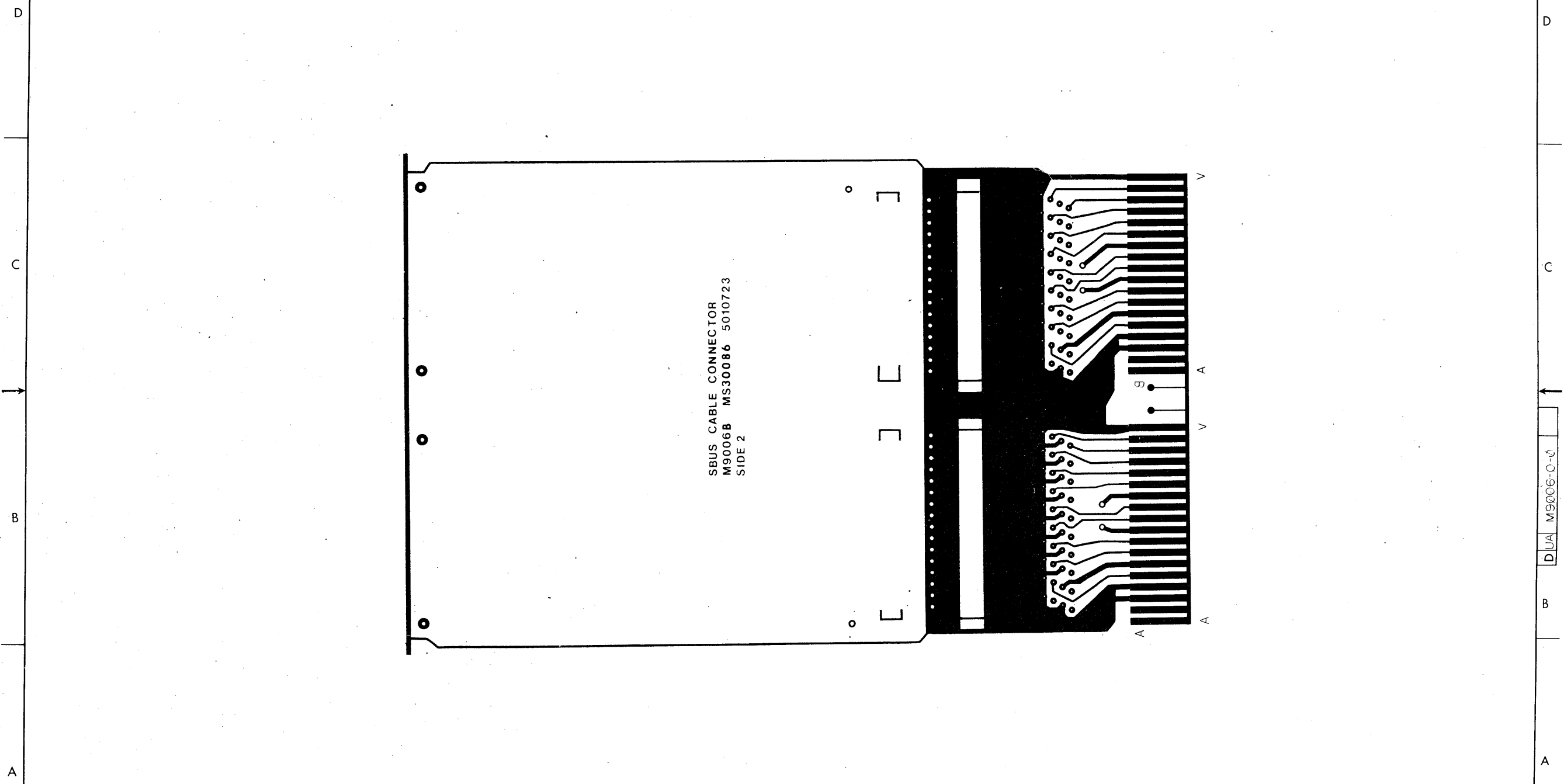
| | | | |
|----------------------|--------------|-----------|------|
| TITLE | SIZE CODE | NUMBER | REV. |
| SBUS CABLE CONNECTOR | DJA | M9006-0-0 | |
| SCALE 1/1 | SHEET 3 OF 5 | DIST. | |

DJA M9006-0-C

8 7 6 5 4 3 2 1

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DUA M9006-C-0 2



SBUS CABLE CONNECTOR
 M9006B MS30086 5010723
 SIDE 2

DUA M9006-C-0

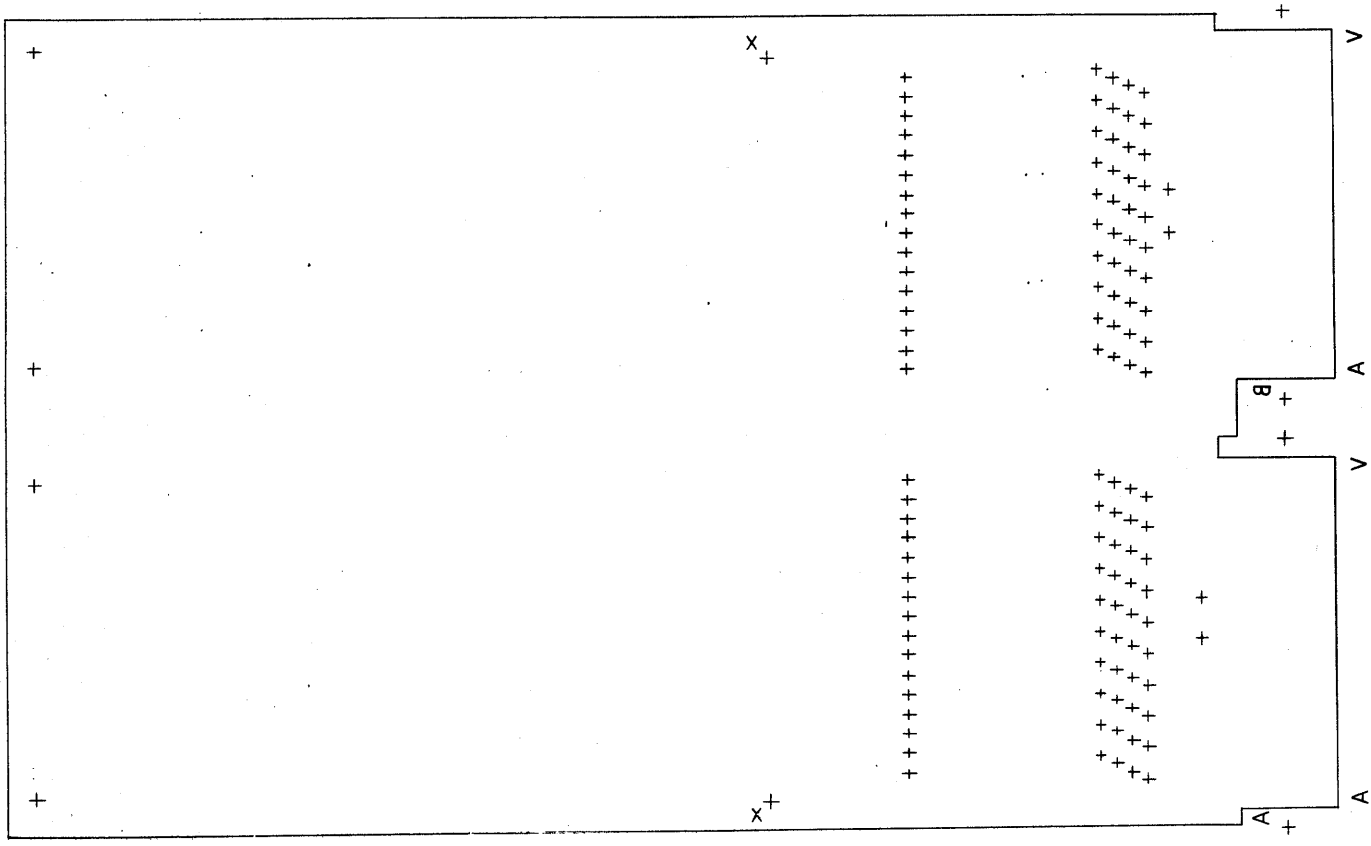
| REVISION | | |
|----------|-----------|-----|
| CHK | CHANGE NO | REV |
| | | |

| | | | | |
|-------------------------------|--------------|------------------|---------------------|------|
| TITLE SBUS CABLE CONNECTOR | | SIZE CODE DUA | NUMBER M9006-C-0 | REV. |
| SCALE 2/1 | SHEET 4 OF 5 | DIST. | | |

8 7 6 5 4 3 2 1

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0-0-9006MUA 2



| REVISIONS | | |
|-----------|------------|------|
| CHK | CHANGE NO. | REV. |
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TITLE: SBUS CABLE CONNECTOR
 SCALE: 2/1
 SHEET: 5 OF 5
 SIZE CODE: DUA
 NUMBER: M9006-0-0
 DIST.:

REV. 0-0-9006MUA

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NOTE:

- FOR DRAWING DIRECTORY, REFER TO: B-DD-M8561-0
- UNLESS OTHERWISE SPECIFIED, THE FOLLOWING PIN NUMBERS APPLY:

| PACKAGE TYPE | GND | +5V |
|--------------|-----|-----|
| 18 PIN DIP | 8 | 18 |
| 14 PIN DIP | 7 | 14 |
| 8 PIN DIP | 4 | 8 |
| DEC. 7475 | 12 | 5 |
| DEC. 7380 | 1 | 8 |

PRE L/R

ETCH CUTS SIDE #1 AS SHOWN

- CUT ETCH BETWEEN E37 (3) AND E37 (12).
- CUT ETCH BETWEEN E92 (10) AND E77 (6).
- CUT ETCH BETWEEN E82 (12) AND P.T.H. NEXT TO E77 (4) AND (5).
- CUT ETCH BETWEEN E91 (12) AND P.T.H. BETWEEN R10 AND E72.
- CUT ETCH BETWEEN E77 (1) AND P.T.H. BETWEEN E77 AND E82.
- CUT ETCH AT E86 (4).
- CUT ETCH BETWEEN E77 (10) AND E59 (10).
- CUT ETCH BETWEEN E77 (10) AND P.T.H. NEAR E87 (8).
- CUT ETCH BETWEEN E77 (5) AND E77 (11).
- CUT ETCH BETWEEN E77 (15) AND P.T.H. UNDER E68.
- CUT ETCH BETWEEN E77 (13) AND E73 (14).
- CUT ETCH BETWEEN E77 (3) AND P.T.H. BETWEEN E77 AND E73.
- CUT ETCH BETWEEN E77 (4) AND E73 (4).
- CUT ETCH BETWEEN E77 (12) AND E73 (12).
- CUT ETCH BETWEEN E36 (1) AND P.T.H. ABOVE E73 (1).

ETCH CUTS SIDE #2 AS SHOWN

- CUT ETCH BETWEEN E73 (7) AND P.T.H. BETWEEN E73 AND E74.
- CUT ETCH BETWEEN E73 (6) AND P.T.H. BETWEEN AND BELOW R10 AND E72.
- CUT ETCH BETWEEN E35 (5) AND P.T.H. NEXT TO E35 (1).
- CUT ETCH AT E37 (4).
- CUT ETCH BETWEEN E37 (3) AND E37 (5).
- CUT ETCH BETWEEN E82 (11) AND E91 (13).
- CUT ETCH BETWEEN E91 (11) AND P.T.H. BETWEEN E77 AND E82.
- CUT ETCH BETWEEN E73 (5) AND P.T.H. BETWEEN E73 AND E74.
- CUT ETCH BETWEEN E77 (11) AND E77 (14).
- CUT ETCH BETWEEN E77 (9) AND P.T.H. BETWEEN E73 AND E77.
- CUT ETCH BETWEEN E77 (2) AND P.T.H. NEAR E78 (6) AND (7).
- CUT ETCH BETWEEN E77 (5) AND P.T.H. NEAR E78 (3) AND (4).
- CUT ETCH BETWEEN E77 (6) AND P.T.H. ABOVE R7 AND R9.
- CUT ETCH BETWEEN E77 (7) AND P.T.H. NEAR E77 (4) AND (5).
- CUT ETCH AT E73 (1).

PRE L/R (CONT'D)

WIRE ADDS SIDE #1 AS SHOWN

- ADD WIRE FROM E36 (1) TO E31 (3)
- ADD WIRE FROM E113 (2) TO E73 (2)
- ADD WIRE FROM E113 (3) TO E73 (4)
- ADD WIRE FROM E113 (13) TO E73 (7)
- ADD WIRE FROM E113 (12) TO E73 (15)
- ADD WIRE FROM E73 (15) TO E35 (5)
- ADD WIRE FROM E93 (12) TO E73 (5)
- ADD WIRE FROM E93 (9) TO E68 (10)
- ADD WIRE FROM E93 (9) TO E73 (1)
- ADD WIRE FROM E59 (10) TO P.T.H. BELOW AND TO RIGHT OF E87 (8)
- ADD WIRE FROM E73 (11) TO CONNECTOR PIN FS1
- ADD WIRE FROM E73 (6) TO E72 (7)
- ADD WIRE FROM E68 (15) TO P.T.H. ABOVE C74
- ADD WIRE FROM E37 (3) TO P.T.H. ABOVE C74
- ADD WIRE FROM E113 (11) TO E73 (13)
- ADD WIRE FROM E69 (6) TO E73 (12)
- ADD WIRE FROM E113 (1) TO E68 (6)
- ADD WIRE FROM E44 (11) TO E68 (14)
- ADD WIRE FROM E37 (4) TO P.T.H. BELOW AND TO LEFT OF E72
- ADD WIRE FROM E37 (5) TO E37 (12)
- ADD WIRE FROM E72 (4) TO E72 (6)
- ADD WIRE FROM E72 (5) TO CONNECTOR PIN FR1
- ADD WIRE FROM E94 (13) TO E86 (4)

ECO#1 =

DELETIONS SIDE #1 AS SHOWN:

- WIRE FROM E36(1) TO E31(3)

ETCH CUTS SIDE #1 AS SHOWN:

- ETCH RUNNING BETWEEN E93 (2&3) FROM E93 (13)

ETCH CUTS SIDE #2 AS SHOWN:

- ETCH FROM E93 (13) TO THE PTH ABOVE E93 (14)

SINGLE WIRE ADDS SIDE #1 AS SHOWN: (ITEM#39)

- FROM E36 (1) TO FINGER PIN FJ1
- FROM E83 (10) TO E82 (12)
- FROM E82 (11) TO E93 (13)
- FROM E113(10) TO THE PTH ABOVE E93 (14)

(CONTINUED ON SHEET 2)

| QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|-----|--|------------------------------|------------|----------|
| | | ETCHED CIRCUIT BOARD | 5010696 | 1 |
| 116 | C1 THRU C116 | CAP. 10uf 50V 20 % | 1001610-00 | 2 |
| 6 | C117 THRU C122 | CAP. 39uf 10V 10 % | 1000076 | 3 |
| 2 | R1, R2 | RES. 1K 5% 1/4W | 1300385 | 4 |
| 4 | R3 THRU R6 | RES. 270 5% 1/4W | 1301972 | 5 |
| 4 | R7 THRU R10 | RES. 300 5% 1/4W | 1301425 | 6 |
| 1 | R11 | RES. 330 5% 1/4W | 1300295 | 7 |
| 1 | R12 | RES. 220 5% 1/4W | 1300271 | 8 |
| 8 | E1, E9, E20, E22, E32, E37, E67, E83 | I.C. DEC 1074H04 | 1910463 | 9 |
| 4 | E2, E10, E16, F26 | I.C. DEC 7475 | 1908050 | 10 |
| 5 | E3, E12, E36, E49, E69 | I.C. DEC 74174 | 1910652 | 11 |
| 9 | E4, E7, E11, E20, E40, E41, E45, E48, E53 | I.C. DEC 8938 | 1911117 | 12 |
| 4 | E5, E19, E27, E28 | I.C. DEC 74S280 | 1911573 | 13 |
| 5 | E6, E15, E21, E25, E107 | I.C. DEC 7390 | 1910390 | 14 |
| 4 | E8, E13, E17, E31 | I.C. DEC 7485 | 1910224 | 15 |
| 9 | E14, E43, E47, E52, E65, E74, E75, E94, E100 | I.C. DEC 1074H50 | 1910512 | 16 |
| 11 | E19, E21, E34, E39, E39, E48, E61, E73, E86, E95, E102 | I.C. DEC 74S153 | 1910547 | 17 |
| 4 | E23, E35, E54, E59 | I.C. DEC 74157 | 1910655 | 18 |
| 4 | E29, E62, E70, E98 | I.C. DEC 1074H53 | 1910514 | 19 |
| 1 | E33 | I.C. DEC 1074H55 | 1910515 | 20 |
| 4 | E42, E44, E92, E113 | I.C. DEC 7432 | 1211521 | 21 |
| 7 | E50, E51, E56, E57, E97, E101, E105 | I.C. DEC 3001 | 1909514 | 22 |
| 1 | E55 | I.C. DEC 1074H21 | 1910467 | 23 |
| 1 | E58 | I.C. DEC 74175 | 1910651 | 24 |
| 1 | E60 | I.C. DEC 1074H10 | 1910464 | 25 |
| 2 | E63, E89 | I.C. DEC 7402 | 1909004 | 26 |
| 6 | E64, E104, E71, E80, E81, E88, | I.C. DEC 1074H00 | 1910462 | 27 |
| 1 | E69 | I.C. DEC 7497 | 1911195 | 28 |
| 4 | E72, E109, E114, E115 | I.C. DEC 75453 | 1911036 | 29 |
| 7 | E73, E76, E82, E91, E96, E103, E108 | I.C. DEC 74S175 | 1910957 | 30 |
| 1 | E106 | I.C. DEC 74S157 | 1910548 | 31 |
| 4 | E78, E94, E111, E112 | I.C. DEC 74S174 | 1910550 | 32 |
| 1 | E85 | I.C. DEC 74S158 | 1910549 | 33 |
| 1 | E90 | I.C. DEC 74S64 | 1910542-00 | 34 |
| 4 | E93, E97, E99, E110 | I.C. DEC 1074H11 | 1910465 | 35 |
| 1 | | HANDLE ASSY | 1210711-02 | 36 |
| 12 | | EYELET, HANDLE | 9006732 | 37 |
| L/R | | #30 AWG WIRE WRAP WIRE WHITE | 9105740-99 | 38 |
| A/R | | 30 AWG WIRE WRAP WIRE GREEN | 9105740-55 | 39 |
| 1 | E66 | I.C. DEC 74S00 | 1910532 | 40 |
| 4 | E8, E13, E17, E31 | I.C. DEC 74S85 | 1912089 | 41 |

| | | | | | |
|----------------------------------|------------------|--------------------------------|--|------------|--|
| FIRST USE ON MA20 | | ETCH BOARD REV | | PARTS LIST | |
| DRN R. W. Carter | DATE 12/12/74 | | | | |
| CHK'D | DATE | TITLE CONTROL LOGIC MA20 | | | |
| ENG. | DATE | SIZE/CODE DUA M8561-0-0 | | | |
| PROJ. ENG. | DATE | NUMBER REV. B | | | |
| PROD. | DATE | SCALE NONE | | | |
| NEXT HIGHER ASSY B-DD-M8561-0 | | SHEET 1 OF 5 | | | |
| DEC NO. | | EIA NO. | | DEC NO. | |
| SEMICONDUCTOR CONVERSION CHART | | | | | |

REVISION 00-007 15588
 DEC FORM NO DRJ-135

DUA M8561-0-0
 REV B

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ECO*2-0

DELETE COMPONENT SIDE 1 AS SHOWN:
(P/N 1910224)

1. E8 (IC 7485)
2. E13 (IC 7485)
3. E17 (IC 7485)
4. E31 (IC 7485)
5. E66 (IC 1074H00) (P/N 1910462)

ETCH CUTS SIDE 2 AS SHOWN

1. AT E44 (10)

COMPONENT ADDS SIDE 1 AS SHOWN:
(P/N 1912089)

1. E8 (IC 74S85)
2. E13 (IC 74S85)
3. E17 (IC 74S85)
4. E31 (IC 74S85)
5. E66 (IC 74S00) (P/N 1910532)

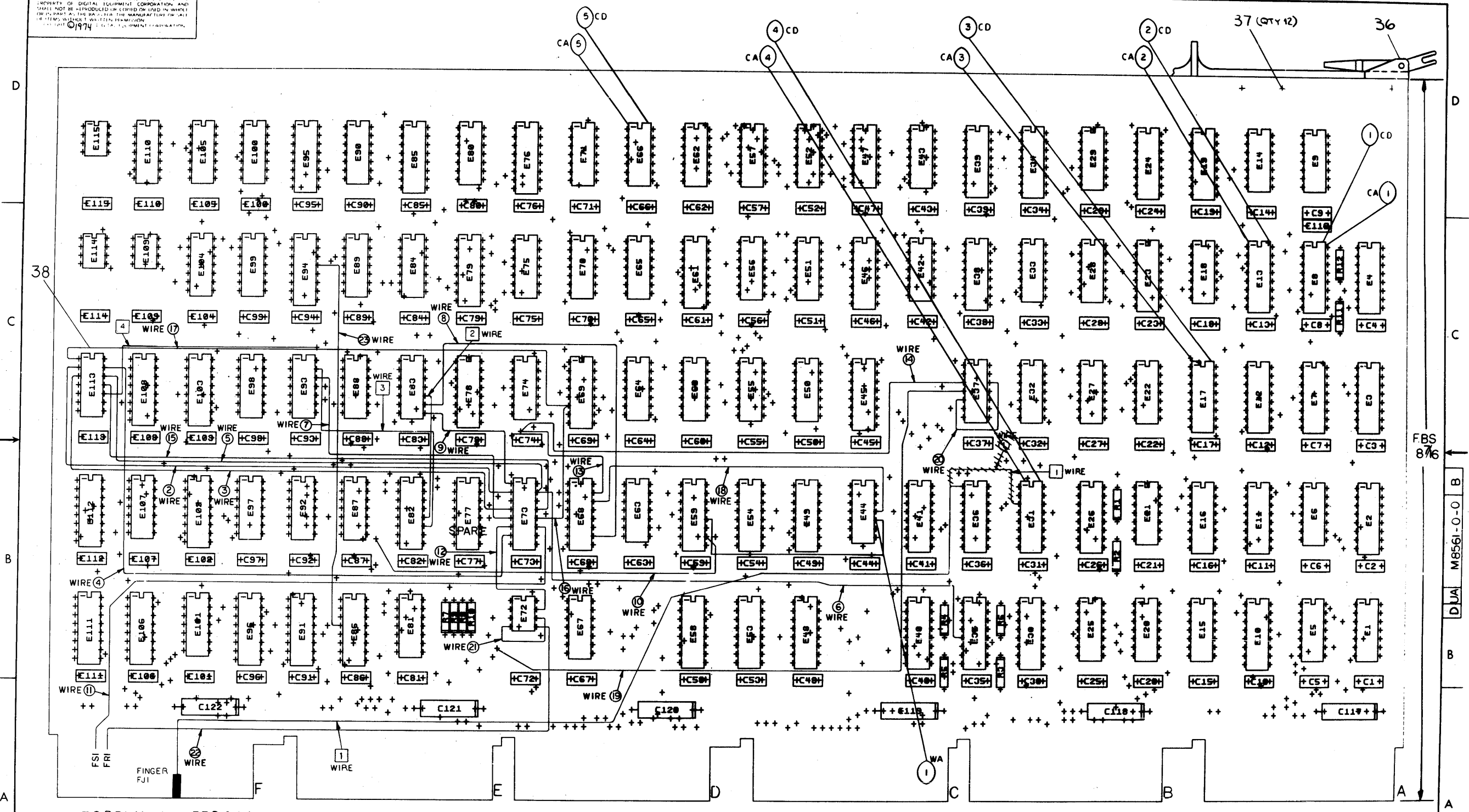
WIRE ADDS SIDE 1 AS SHOWN:

1. FROM E44 (10) TO E59 (12)
(P/N 9105740-55)

| REVISIONS | | |
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| CHK | CHANGE NO. | REV. |
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| TITLE CONTROL LOGIC MA20 | | SIZE CODE D UA | NUMBER M8561-0-0 | REV. B |
| SCALE 1/1 | SHEET 2 OF 6 | | DIST. | |

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VUTSRPNMLKJHFEDCBA VUTSRPNMLKJHFEDCBA VUTSRPNMLKJHFEDCBA VUTSRPNMLKJHFEDCBA VUTSRPNMLKJHFEDCBA VUTSRPNMLKJHFEDCBA

| CHK | CHANGE NO. | REV. |
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|-------|--------------------|-----------|--------|--------|-----------|------|---|
| TITLE | CONTROL LOGIC MA20 | SIZE CODE | DUA | NUMBER | M8561-0-0 | REV. | B |
| SCALE | 2/1 | SHEET | 3 OF 6 | DIST. | | | |

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8 0-0-1958W DUA 2



| REV. | CHANGE NO. | DESCRIPTION |
|------|------------|-------------|
| | | |

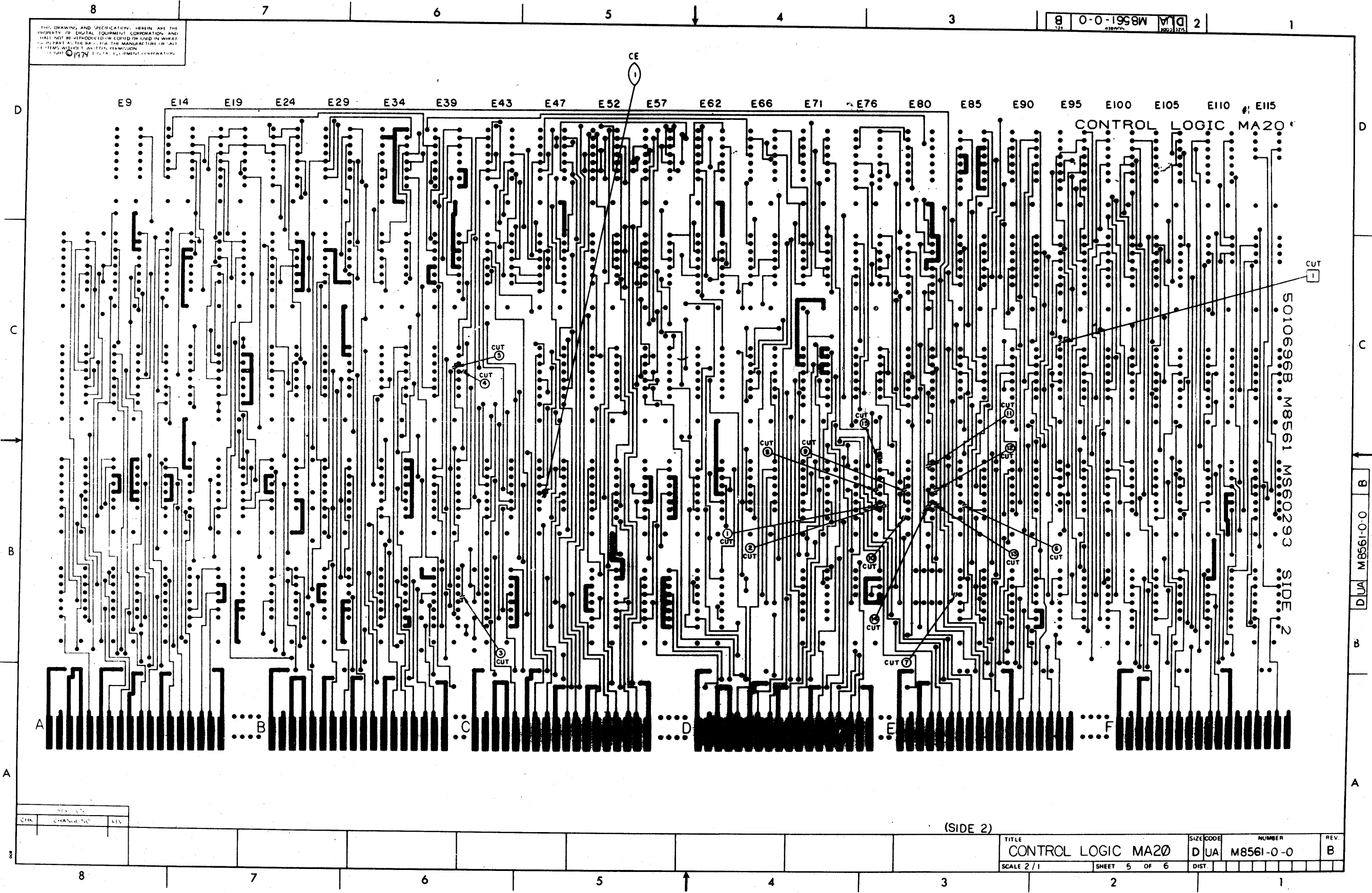
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| (SIDE 1) | | TITLE | SIZE CODE | NUMBER | REV. |
| | | CONTROL LOGIC MA20 | DUA | M8561-0-0 | B |
| SCALE 2/1 | SHEET 4 OF 6 | DIST | | | |

8 7 6 5 4 3 2 1

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DUA M8561-0-0 B

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8 0-0-1958W A D 2



CONTROL LOGIC MA20

5010696B, M8561 MS60293 SIDE 2

| REV. | DATE | BY |
|------|------|----|
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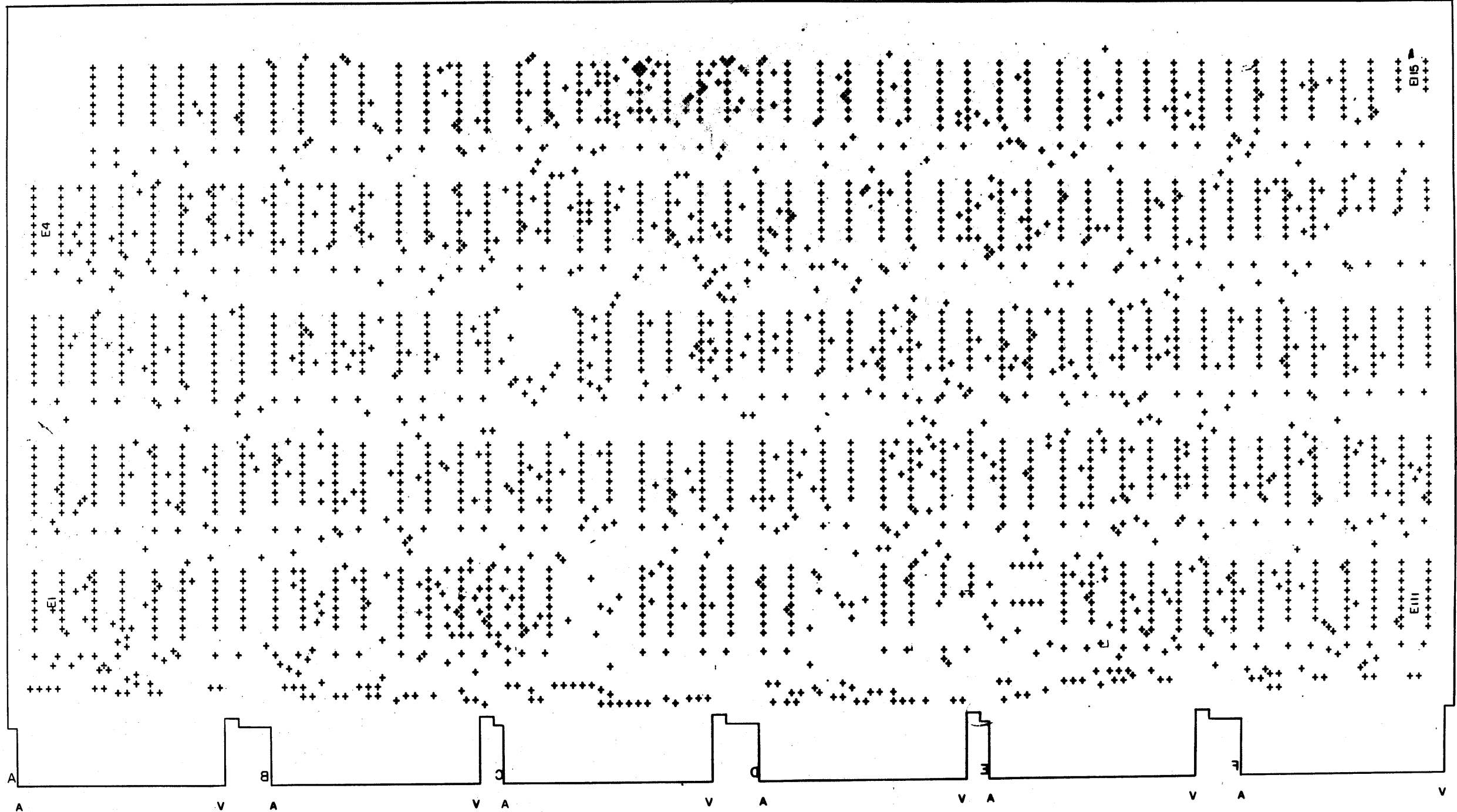
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|--------------------|--------------|-----------|------|
| TITLE | SIZE CODE | NUMBER | REV. |
| CONTROL LOGIC MA20 | D UA | M8561-0-0 | B |
| SCALE 2/1 | SHEET 5 OF 6 | DIST. | |

8 7 6 5 4 3 2 1

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0-0-1950W W/D 2



| REVISIONS | | |
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(SIDE 2)

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|-------|--------------------|-----------|--------|--------|-----------|------|---|
| TITLE | CONTROL LOGIC MA20 | SIZE CODE | DUA | NUMBER | M8561-0-0 | REV. | B |
| SCALE | 2/1 | SHEET | 6 OF 6 | DATE | | | |

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NOTES:

- FOR DRAWING DIRECTORY, REFER TO: B-DD-M8562-B
- UNLESS OTHERWISE SPECIFIED, THE FOLLOWING PIN NUMBERS APPLY:

PACKAGE TYPE NCC GND
 16 PIN DIP 14 8
 14 PIN DIP 14 8
 REWORK INSTRUCTIONS

PRE L/R = 0

ETCH CUTS SIDE 1

- CUT ETCH BETWEEN R10 AND DL8 (OUT)
- CUT ETCH BETWEEN IC E15 (13) AND DL8 (TAP)
- CUT ETCH BETWEEN R14 AND DL8 (TAP)
5. CUT ETCH BETWEEN DL8 (IN) AND E12 (6) BOTH ENDS
- CUT ETCH BETWEEN DL8 (IN) AND E12 (3)
- CUT ETCH BETWEEN E10 (2) AND P.T.H. HOLE JUST ABOVE E9 (14)
- CUT ETCH BETWEEN E10 (12) AND E9 (13)
- CUT ETCH BETWEEN E9 (2) AND E9 (12)
- 10-11. CUT ETCH BETWEEN E9 (9) AND FINGER AK1 BOTH ENDS
- CUT ETCH BETWEEN E9 (9) AND P.T.H. JUST BELOW E5
- CUT ETCH BETWEEN E1 (4) AND THE ETCH LINE JUST ABOVE IT.

ETCH CUTS SIDE 2

- CUT ETCH BETWEEN R13 AND DL8 (OUT)
- CUT ETCH BETWEEN E8 (2) AND E8 (4)
- CUT ETCH BETWEEN E9 (9) AND E8 (12)

ADD SINGLE WIRE SIDE #2 (ITEM #35)

- ADD A WIRE BETWEEN DL8 (OUT) AND E15 (13)
- ADD A WIRE BETWEEN DL8(TAP) AND E12 (3)
- ADD A WIRE BETWEEN R31 AND DL 8 (IN)
- ADD A WIRE BETWEEN DL8 (OUT) AND R14
- ADD A WIRE BETWEEN DL8 (TAP) AND E12 (6)
- ADD A WIRE BETWEEN R38 AND DL8 (IN)

ADD SINGLE WIRE SIDE #1 (ITEM #35)

- ADD A WIRE BETWEEN DL4 (11) AND E9 (9)
- ADD A WIRE BETWEEN E9 (12) AND E1 (4)
- ADD A WIRE BETWEEN E9 (9) AND E16 (12)
- ADD A WIRE BETWEEN E8 (1) AND E9 (2)
- ADD A WIRE BETWEEN E9 (9) AND P.T.H. HOLE THAT IS CONNECTED TO E9 (10)
- ADD A WIRE BETWEEN E10 (1) AND E10 (2)
- ADD A WIRE BETWEEN E8 (4) AND E9 (12)

COMPONENT MODIFICATIONS

INSERT TRANSISTORS Q1, Q2, Q3, Q4, AND Q5 IN BACKWARDS SO THAT EMITTER TABS ARE OPPOSITE THAT SHOWN ON DRAWING

- Q1
- Q2, Q3
- Q4, Q5

ECO # 1 = □

ETCH CUTS SIDE 2, AS SHOWN:

- CUT ETCH BETWEEN PTH BESIDE E11(5) AND C21.
 - CUT ETCH BETWEEN PTH BESIDE E11(4) AND FINGER PIN BH2.
- SINGLE WIRE ADDS SIDE 1, AS SHOWN (ITEM 37):
- ADD FROM E11(5) TO FINGER PIN BN1.
 - ADD FROM E11(4) TO FINGER PIN AK1.
 - ADD FROM E11(4) TO E20(11).
 - ADD FROM R37 TO E20(12).
- SINGLE WIRE ADDS SIDE 2, AS SHOWN (ITEM 37):
- ADD FROM E20(13) TO FINGER PIN BH2.

ECO # 2 = ○

- ETCH CUT SIDE 1 AS SHOWN:
 1. TO THE LEFT OF E5 (4).
 ETCH CUT SIDE 2 AS SHOWN:
 1. AT Q4 EMITTER.
 COMPONENT ADD SIDE 1 AS SHOWN:
 1. R48 (330 ohms 1300295) AND WIRE FROM E14(4), TO Q4 EMITTER.
 WIRE ADD SIDE 1 AS SHOWN: (9105740-55)
 1 FROM E5(4) TO E10(6).

ECO # 3

NOTE: ECO # 3 IS A PHASE-IN ECO ALL BOARDS ARE COMPATIBLE.

0-0-2998W 2

| QTY | REF DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|-----|--|------------------------------|------------|----------|
| | | ETCHED CIRCUIT BOARD | 9010397 | 1 |
| 3 | C24 THRU C28 | CAP. 30uf 10V | 1000370 | 2 |
| 23 | C1 THRU C23 | CAP. .01uf 100V DISC | 1001810-01 | 3 |
| 2 | D1, D2 | DIODE 0062 | 1100113 | 4 |
| 1 | D4 | DIODE 0084 | 1100114 | 5 |
| 3 | R4, R7, R37 | RES. 100 5% 1/4W | 1300229 | 6 |
| 2 | R22, R28 | RES. 470 5% 1/4W | 1300318 | 7 |
| 11 | R3, R12, R15, R17, R18, R19, R25, R34, R35, R1 R+S | RES. 1K 5% 1/4W | 1300365 | 8 |
| 2 | | HANDLE, FLIP CHIP - MAGNETA | 9008337-6 | 9 |
| 1 | R47 | RES. 10K 5% 1/4W | 1300479 | 10 |
| 4 | R9, R23, R24, R29 | RES. 180 5% 1/4W | 1301322 | 11 |
| 6 | R11, R14, R32, R33, R20, R21 | RES. 750 5% 1/4W | 1301401 | 12 |
| 8 | R5, R10, R20, R30, R39 THRU R42 | RES. 300 5% 1/4W | 1301425 | 13 |
| 4 | | EYELET, HANDLE | 9006732 | 14 |
| 2 | R43, R45 | RES. 147 1% 1/4W | 1302874 | 15 |
| 4 | R6, R8, R27, R38 | RES. 196 1% 1/4W | 1302958 | 16 |
| 2 | R44, R46 | RES. 349 1% 1/4W | 1304858 | 17 |
| 4 | R10, R13, R30, R31 | RES. 619 1% 1/4W | 1305128 | 18 |
| 1 | Q1 | TRANSISTOR DEC 6534D | 1503409-00 | 19 |
| 2 | Q4, Q5 | TRANSISTOR DEC 4274 | 1505302-00 | 20 |
| 2 | Q2, Q3 | TRANSISTOR DEC 6531B | 1509338-00 | 21 |
| 2 | DL6, DL8 | DELAY LINE 80NS | 1610079 | 22 |
| 2 | DL5, DL7 | DELAY LINE 18NS | 1610080-00 | 23 |
| 4 | DL1 THRU DL4 | DELAY LINE 250NS | 1611243 | 24 |
| 2 | E6, E7 | I.C. DEC 74H00 | 1909056-00 | 25 |
| 3 | E2, E4, E9 | I.C. DEC 74H10 | 1909057 | 26 |
| 1 | E10 | I.C. DEC 74H11 | 1909267 | 27 |
| 1 | E12 | I.C. DEC 1074HD1 | 1910887 | 28 |
| 3 | E1, E8, E16 | I.C. DEC 7437 | 1910091 | 29 |
| 3 | E5, E11, E20 | I.C. DEC 3001 | 1909514 | 30 |
| 3 | E14, E18, E19 | I.C. DEC 75451 | 1910408 | 31 |
| 1 | E15 | I.C. DEC 1074HD4 | 1910463 | 32 |
| 1 | E17 | I.C. DEC 74H74 | 1909667 | 33 |
| 2 | E3, E13 | I.C. DEC 75452 | 1910845-00 | 34 |
| 3FT | | #30 AWG WIRE WRAP WIRE WHITE | 9105740-99 | 35 |
| 5IN | | SLEEVING TEFLON CLR | 9107256-10 | 36 |
| A/R | | #30 AWG WIRE WRAP WIRE GREEN | 9105740-55 | 37 |

FIRST USED ON MA20

| REV | DATE | DESCRIPTION |
|-----|----------|-------------|
| 1 | 11/1/74 | DRN |
| 2 | 11/9/74 | CHG |
| 3 | 12-9-74 | ENG |
| 4 | 12-9-74 | PROJ. ENG. |
| 5 | 12-9-74 | PRD. |
| 6 | 12/15/74 | REVISED |

ETCHED BOARD REV

DATE 11/1/74

DATE 11/9/74

DATE 12-9-74

DATE 12-9-74

DATE 12-9-74

DATE 12/15/74

REVISIONS

DEC NO. EIA NO. DEC NO. EIA NO.

SEMICONDUCTOR CONVERSION CHART

SCALE NONE

SHEET 1 OF 5

DRN: *J. Munn* DATE: 11/1/74

CHG: *J. Munn* DATE: 11/9/74

ENG: *J. Chen* DATE: 12-9-74

PROJ. ENG: *J. Chen* DATE: 12-9-74

PRD: *J. Chen* DATE: 12-9-74

REVISED: *J. Chen* DATE: 12/15/74

TITLE: MA20 TIMING BOARD

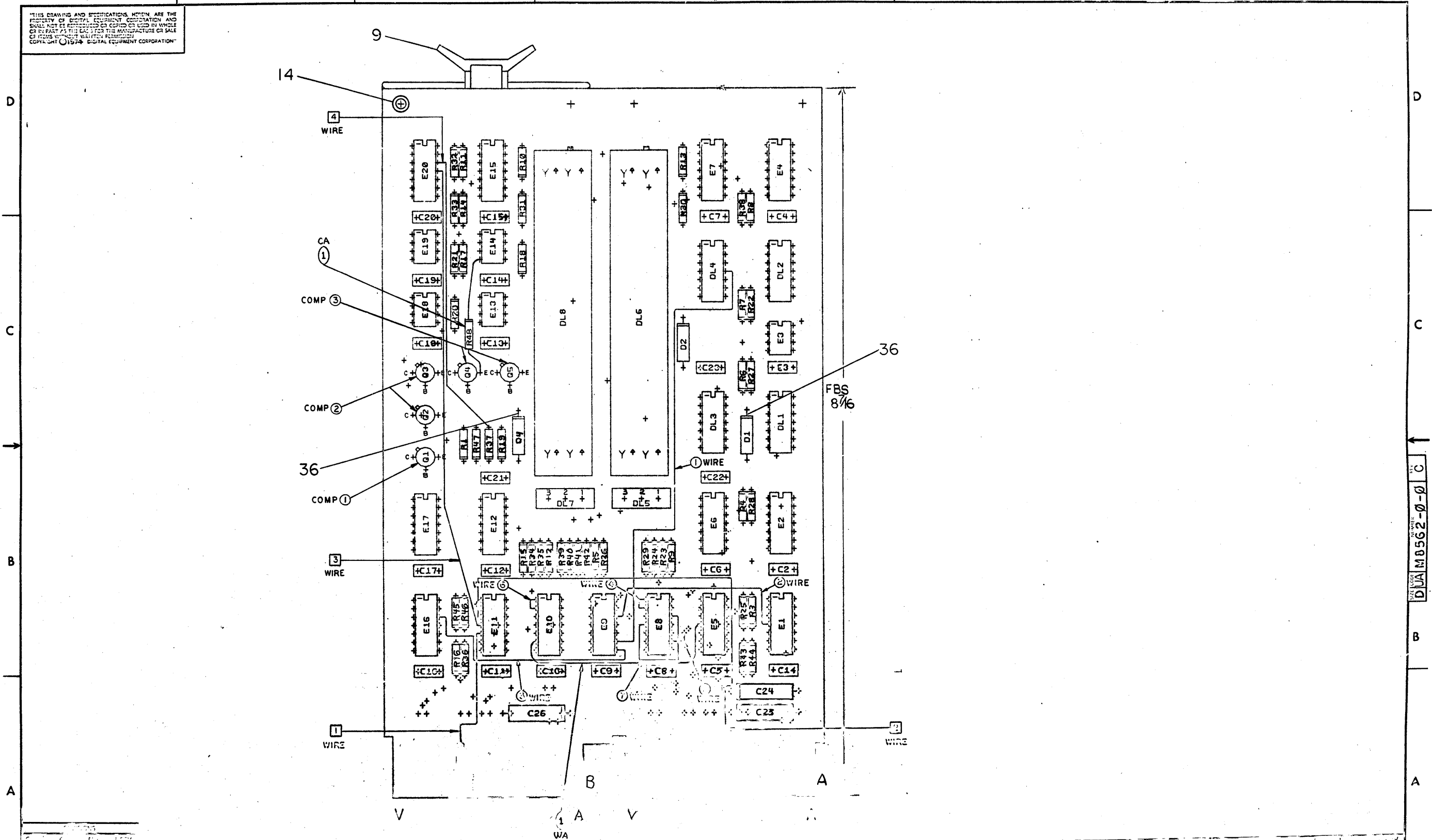
NUMBER: DUA M8562-0-0

REV: C

REVISIONS

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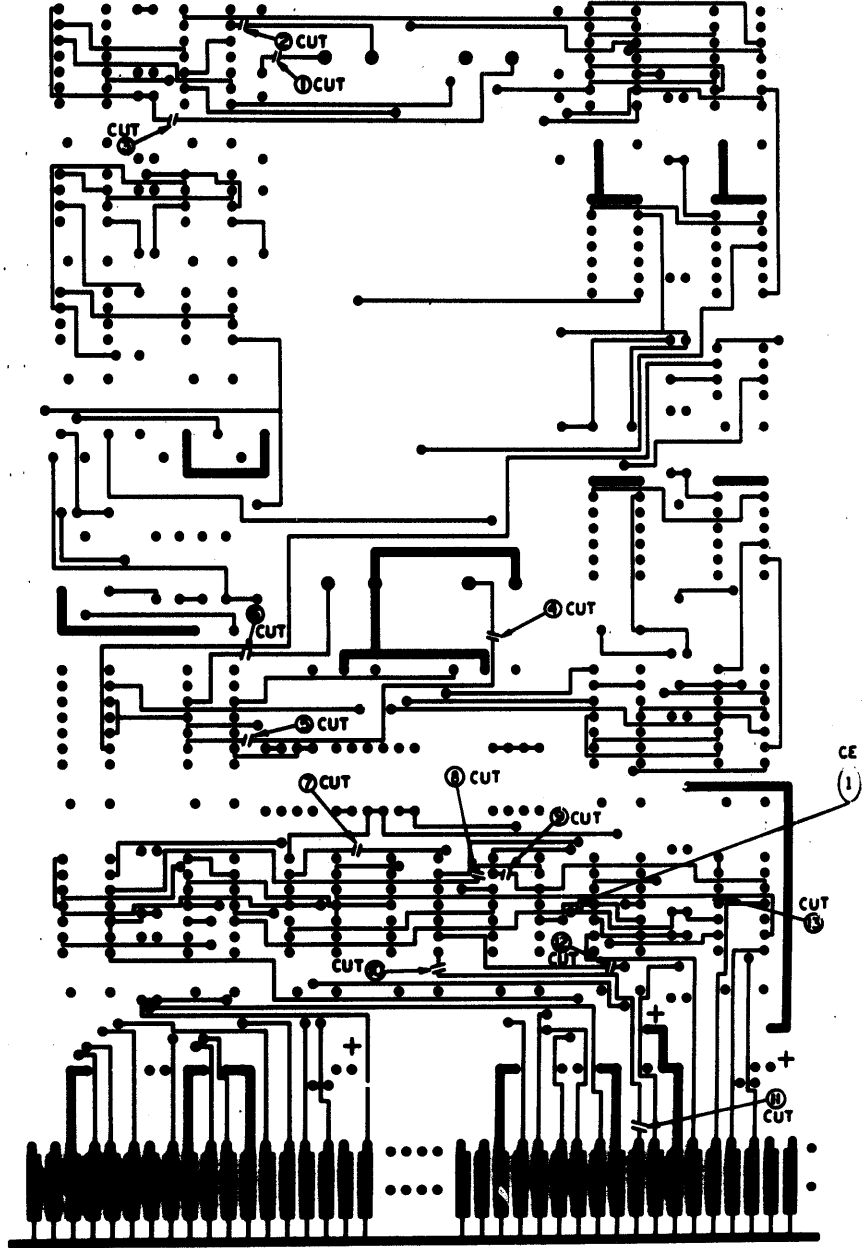
DUA M8562-0-0 C

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DJA M8562-0-0 2

5010697B M8562 M860349

CS-XABCDEFGHIJKLMN FLIPCHIP SIDE 1

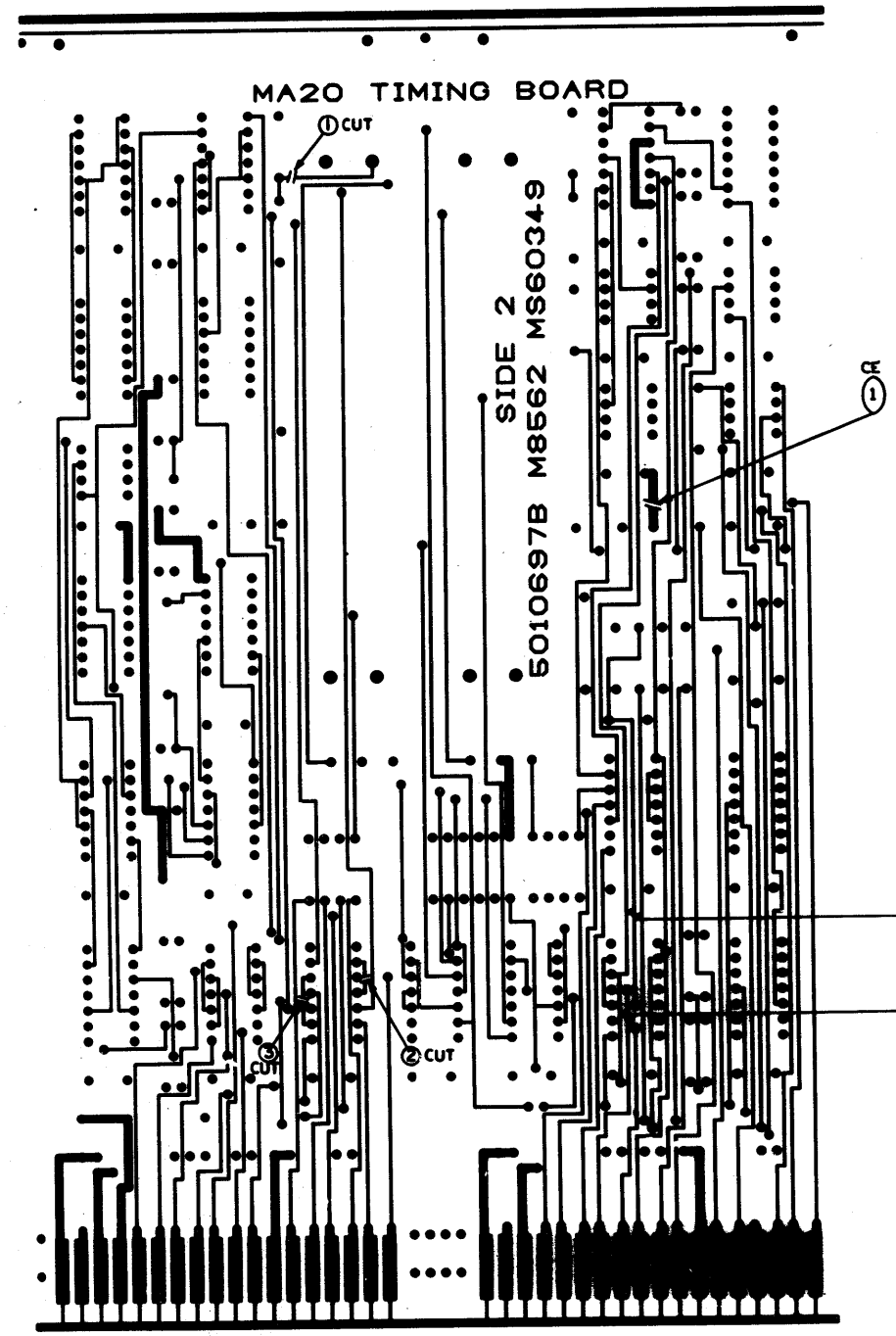


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| TITLE | SIZE/SCALE | NUMBER | REV. |
| MA20 TIMING BOARD | DJA M8562-0-0 | C | |
| SCALE 2/1 | SHEET 3 OF 5 | DIST | |

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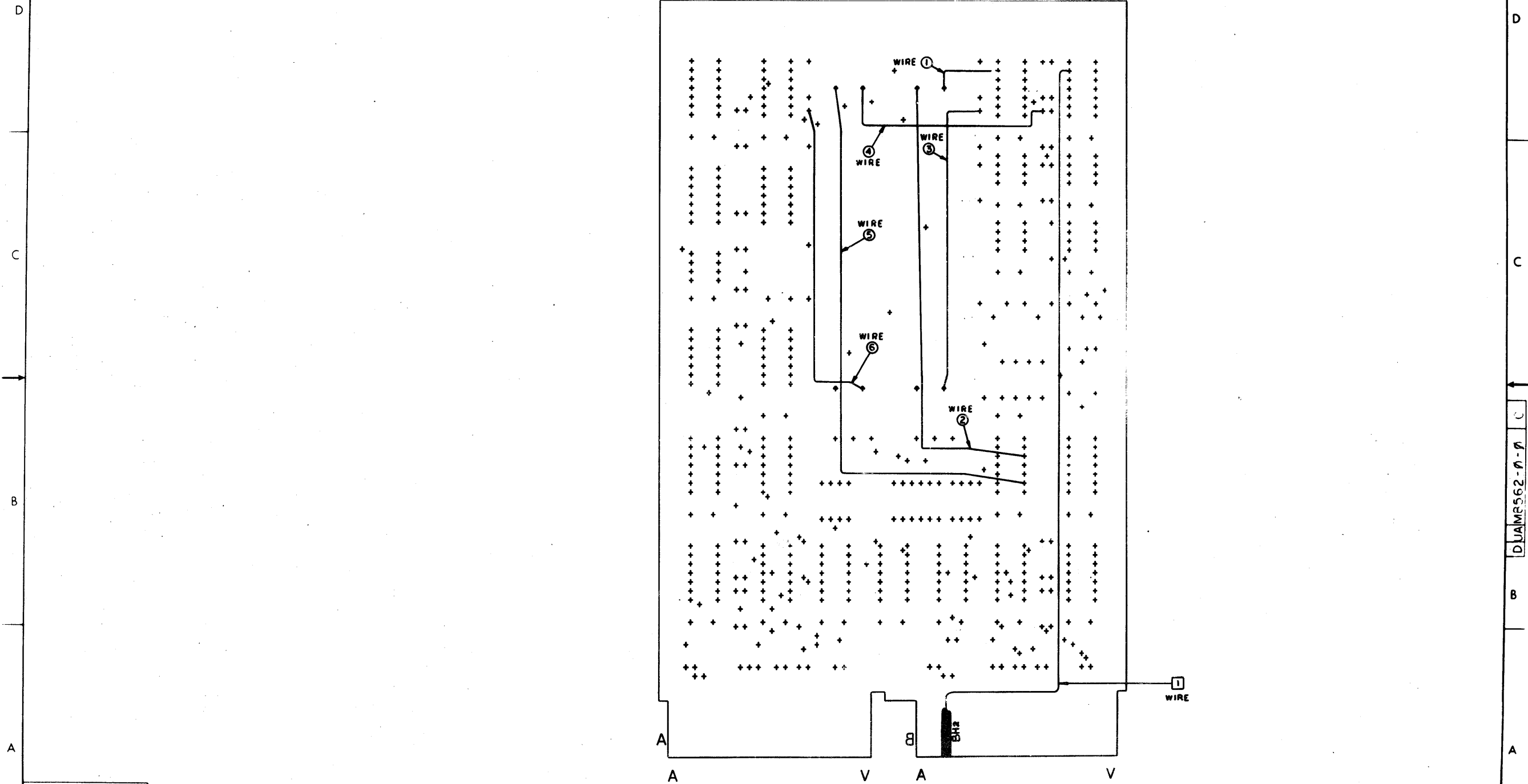
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| DATE | CHANGE BY | REV. |
| | | |

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|-------|-------------------|-----------|---------------|--------|---|------|---|
| TITLE | MA20 TIMING BOARD | SIZE/CODE | DJA M8562-0-0 | NUMBER | C | REV. | C |
| SCALE | 2/1 | SHEET | 4 OF 5 | DIST. | | | |

DJA M8562-0-0 C

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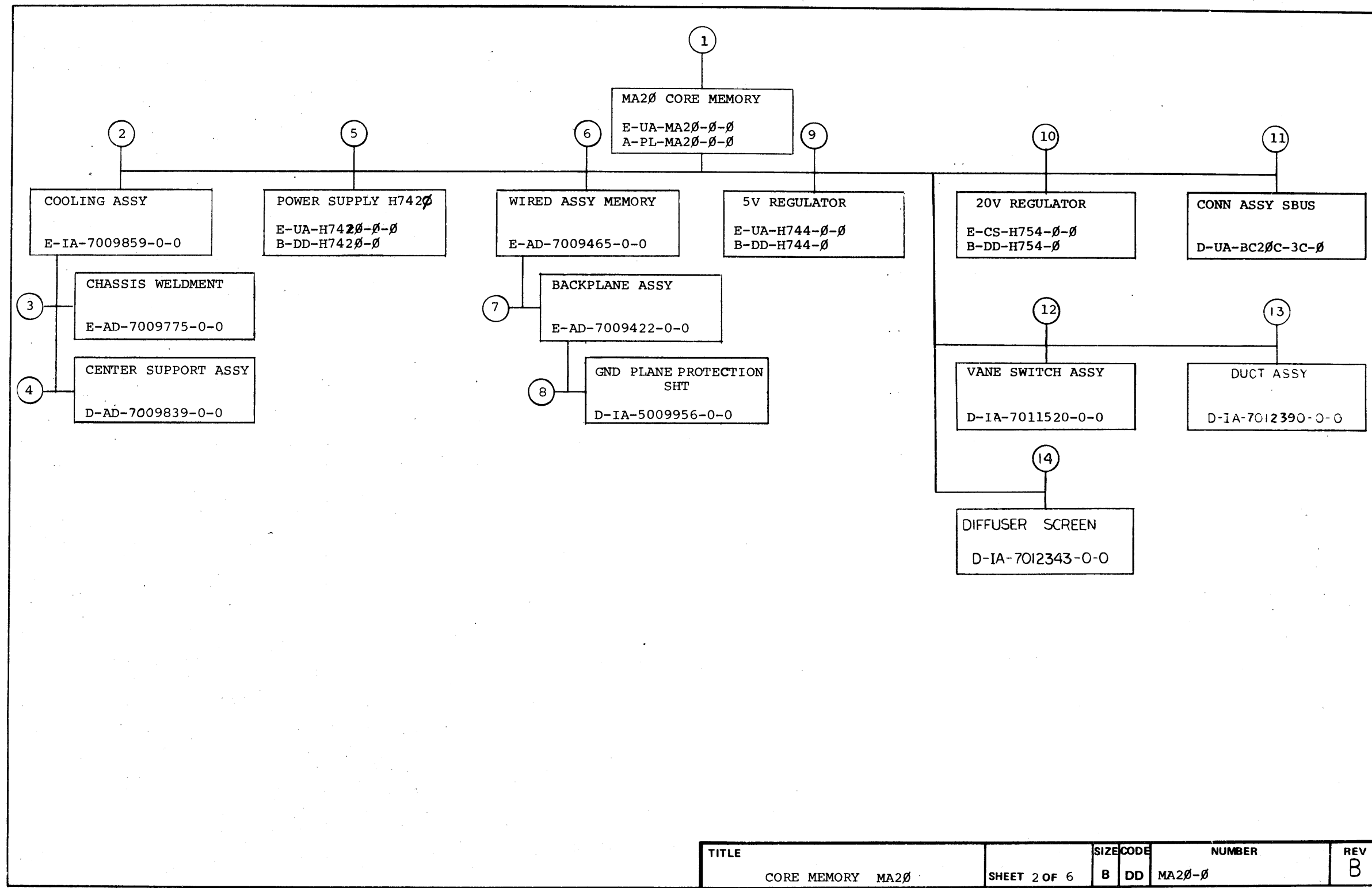
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|-------------------|--------------|--------|-----|
| TITLE | SIZE CODE | NUMBER | REV |
| MA20 TIMING BOARD | DJAM8562-0-0 | | C |
| SCALE 2/1 | SHEET 5 OF 5 | DIST | |



| TITLE | SHEET | SIZE | CODE | NUMBER | REV |
|------------------|--------|------|------|--------|-----|
| CORE MEMORY MA2Ø | 2 OF 6 | B | DD | MA2Ø-Ø | B |

| CUSTOMER PRINT SET | | ELECTRICAL | | | | | CUSTOMER PRINT SET | | ELECTRICAL | | | | | | |
|--------------------|---------|------------|------------------|-----|-----------|---------------------------------|----------------------|-----------|------------|----------|------------------|-----|-----------|---------------------------|----------------------|
| PRINT SET CODES | MFG SET | FIND NO. | DRAWING NO. | REV | NO OF SHT | DESCRIPTION | OPTION NO./FILE DATE | PRINT SET | MFG SET | FIND NO. | DRAWING NO. | REV | NO OF SHT | DESCRIPTION | OPTION NO./FILE DATE |
| | | 1 | E-UA-MA20-0-0 | # | 1 | CORE MEMORY MA20 | | | | | D-BS-MA20-0-SI33 | # | 1 | 16K SENSE/INHIBIT (G114) | |
| | | | C-PL-MA20-0-0 | # | 1 | CORE MEMORY MA20 (P.L.) | | | | | D-BS-MA20-0-SI34 | # | 1 | 16K SENSE/INHIBIT (G114) | |
| | | | D-MU-MA20-0-MUAF | # | 1 | MODULE UTILIZATION | | | | | D-BS-MA20-0-SI35 | # | 1 | 16K SENSE/INHIBIT (G114) | |
| | | | D-IA-7010805-0-0 | # | 1 | AC WIRING HARNESS ASSY NO. 1 | | | | | D-BS-MA20-0-SI36 | # | 1 | 16K SENSE/INHIBIT (G114) | |
| | | | J-IA-7012094-0-0 | # | 1 | HARNESS DC. MA20 | | | | | D-CS-H217-0-1 | # | 3 | STACK BOARD | |
| | | | D-UA-M9005-0-0 | # | 4 | TERMINATOR | | | | | D-BS-MA20-0-ST20 | # | 1 | STACK MODULE (H217) | |
| | | | B-DD-M9005-0 | # | 2 | M9005 DRAWING DIRECTORY | | | | | D-BS-MA20-0-ST21 | # | 1 | STACK MODULE (H217) | |
| | | | J-IA-7012477-0-0 | # | 1 | HARNESS, MEM #2 | | | | | D-BS-MA20-0-ST22 | # | 1 | STACK MODULE (H217) | |
| | | | | | | | | | | | D-BS-MA20-0-ST30 | # | 1 | STACK MODULE (H217) | |
| | | | D-FD-MA20-0-FD | # | 3 | FLOW DIAGRAM | | | | | D-BS-MA20-0-ST31 | # | 1 | STACK MODULE (H217) | |
| | | | D-BS-MA20-0-INS | # | 1 | INSTRUCTION/SETUP SHEET | | | | | D-BS-MA20-0-ST32 | # | 1 | STACK MODULE (H217) | |
| | | | D-BS-MA20-0-IBD1 | # | 3 | INTERCONNECTION BLOCK DIAGRAM | | | | | D-IC-MA20-0-PW | # | 2 | AC-DC POWER WIRING | |
| | | | D-TD-MA20-0-TD | # | 1 | TIMING DIAGRAM (MA20) | | | | | A-SP-MA20-0-TP | # | 59 | CHECKOUT PROCEDURE (MA20) | |
| | | | D-UA-M8562-0-0 | # | 5 | TIMING BOARD MA20 | | | | | A-SP-MA20-0-TS | # | 5 | TEST SPECIFICATION (MA20) | |
| | | | B-DD-M8562-0 | # | 2 | M8562 DRAWING DIRECTORY | | | | | A-PL-7013249-0-0 | # | 1 | INSTALLATION KIT (60 HZ) | |
| | | | D-BS-MA20-0-MAT1 | # | 1 | TIMING BOARD (M8562) | | | | | A-PL-7013249-1-0 | # | 1 | INSTALLATION KIT (50 HZ) | |
| | | | D-BS-MA20-0-MAT2 | # | 1 | TIMING BOARD (M8562) | | | | | A-SP-3700258-0-0 | # | 1 | PACKAGING INSTRUCTIONS | |
| | | | D-BS-MA20-0-MAT3 | # | 1 | TIMING BOARD (M8562) | | | | | | | | | |
| | | | D-UA-M8561-0-0 | # | 5 | CONTROL BOARD MA20 | | | | | | | | | |
| | | | B-DD-M8561-0 | # | 2 | M8561 DRAWING DIRECTORY | | | | | | | | | |
| | | | D-BS-MA20-0-MAC1 | # | 1 | CONTROL BOARD (M8561) | | | | | | | | | |
| | | | D-BS-MA20-0-MAC2 | # | 1 | CONTROL BOARD (M8561) | | | | 5 | E-UA-H7420-A-0 | # | 2 | POWER SUPPLY (H7420-A) | |
| | | | D-BS-MA20-0-MAC3 | # | 1 | CONTROL BOARD (M8561) | | | | | E-UA-H7420-B-0 | # | 2 | POWER SUPPLY (H7420-B) | |
| | | | D-BS-MA20-0-MAC4 | # | 1 | CONTROL BOARD (M8561) | | | | | B-DD-H7420-0 | # | 3 | H7420 DRAWING DIRECTORY | |
| | | | D-BS-MA20-0-MAC5 | # | 1 | CONTROL BOARD (M8561) | | | | | | | | | |
| | | | D-BS-MA20-0-MAC6 | # | 1 | CONTROL BOARD (M8561) | | | | | | | | | |
| | | | D-BS-MA20-0-MAC7 | # | 1 | CONTROL BOARD (M8561) | | | | | | | | | |
| | | | D-CS-G235-0-1 | # | 6 | X-Y DRIVE CURRENT SOURCE DECODE | | | | | | | | | |
| | | | D-BS-MA20-0-DR20 | # | 1 | 16K X-Y DRIVE (G235) | | | | | | | | | |
| | | | D-BS-MA20-0-DR21 | # | 1 | 16K X-Y DRIVE (G235) | | | | | | | | | |
| | | | D-BS-MA20-0-DR22 | # | 1 | 16K X-Y DRIVE (G235) | | | | | | | | | |
| | | | D-BS-MA20-0-DR30 | # | 1 | 16K X-Y DRIVE (G235) | | | | | | | | | |
| | | | D-BS-MA20-0-DR31 | # | 1 | 16K X-Y DRIVE (G235) | | | | | | | | | |
| | | | D-BS-MA20-0-DR32 | # | 1 | 16K X-Y DRIVE (G235) | | | | 6 | E-AD-7009465-0-0 | # | 1 | WIRED ASSY MEMORY | |
| | | | D-CS-G114-0-1 | # | 9 | 16K SENSE/INHIBIT | | | | | K-WL-MA20-0-WL | # | 1 | WIRE LIST MA20 | |
| | | | D-BS-MA20-0-SI21 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | A-WT-7009465-0 | # | 1 | AWT REVISION STATUS | |
| | | | D-BS-MA20-0-SI22 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | | | | | |
| | | | D-BS-MA20-0-SI23 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | | | | | |
| | | | D-BS-MA20-0-SI24 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | | | | | |
| | | | D-BS-MA20-0-SI25 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | | | | | |
| | | | D-BS-MA20-0-SI26 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | | | | | |
| | | | D-BS-MA20-0-SI30 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | | | | | |
| | | | D-BS-MA20-0-SI31 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | | | | | |
| | | | D-BS-MA20-0-SI32 | # | 1 | 16K SENSE/INHIBIT (G114) | | | | | | | | | |

DRB 108

digital EN-01062-2B-16-R972-(325)

| | | | | | | |
|--------------------------|--|------------------|--------------|------|--------|-----|
| CUSTOMER PRINT SET CODES | X = PRINT OF DOCUMENT INCLUDED IN PRINT SET C = INCLUDES ALL PRINTS INDICATED ON DOCUMENT S = CONFIDENTIAL AUTHORIZED SIGNATURE REQUIRED | TITLE | SIZE | CODE | NUMBER | REV |
| | | CORE MEMORY MA20 | B | DD | MA20-0 | B |
| | | | SHEET 3 OF 6 | | | |

| CUSTOMER PRINT SET | | ELECTRICAL | | | | | CUSTOMER PRINT SET | | | | | | |
|--------------------|----------|------------------|-----|-----------|-------------------------|----------------------|--------------------|----------|-------------|-----|-----------|-------------|----------------------|
| MFG. SET | FIND NO. | DRAWING NO. | REV | NO OF SHT | DESCRIPTION | OPTION NO./FILE DATE | MFG. SET | FIND NO. | DRAWING NO. | REV | NO OF SHT | DESCRIPTION | OPTION NO./FILE DATE |
| | 9 | E-UA-H744-0-0 | # | 1 | 5V REGULATOR | | | | | | | | |
| | | B-DD-H744-0 | # | 2 | H744 DRAWING DIRECTORY | | | | | | | | |
| | 10 | E-CS-H754-0-0 | # | 2 | 20V REGULATOR | | | | | | | | |
| | | B-DD-H754-0 | # | 3 | H754 DRAWING DIRECTORY | | | | | | | | |
| | 11 | D-UA-BC20C-3C-0 | # | 1 | CONN ASSY SBUS | | | | | | | | |
| | | D-UA-M9006-0-0 | # | 5 | SBUS CABLE MODULE | | | | | | | | |
| | | B-DD-M9006-0 | # | 2 | M9006 DRAWING DIRECTORY | | | | | | | | |
| | 12 | D-IA-7011520-0-0 | # | 1 | VANE SWITCH ASSY | | | | | | | | |

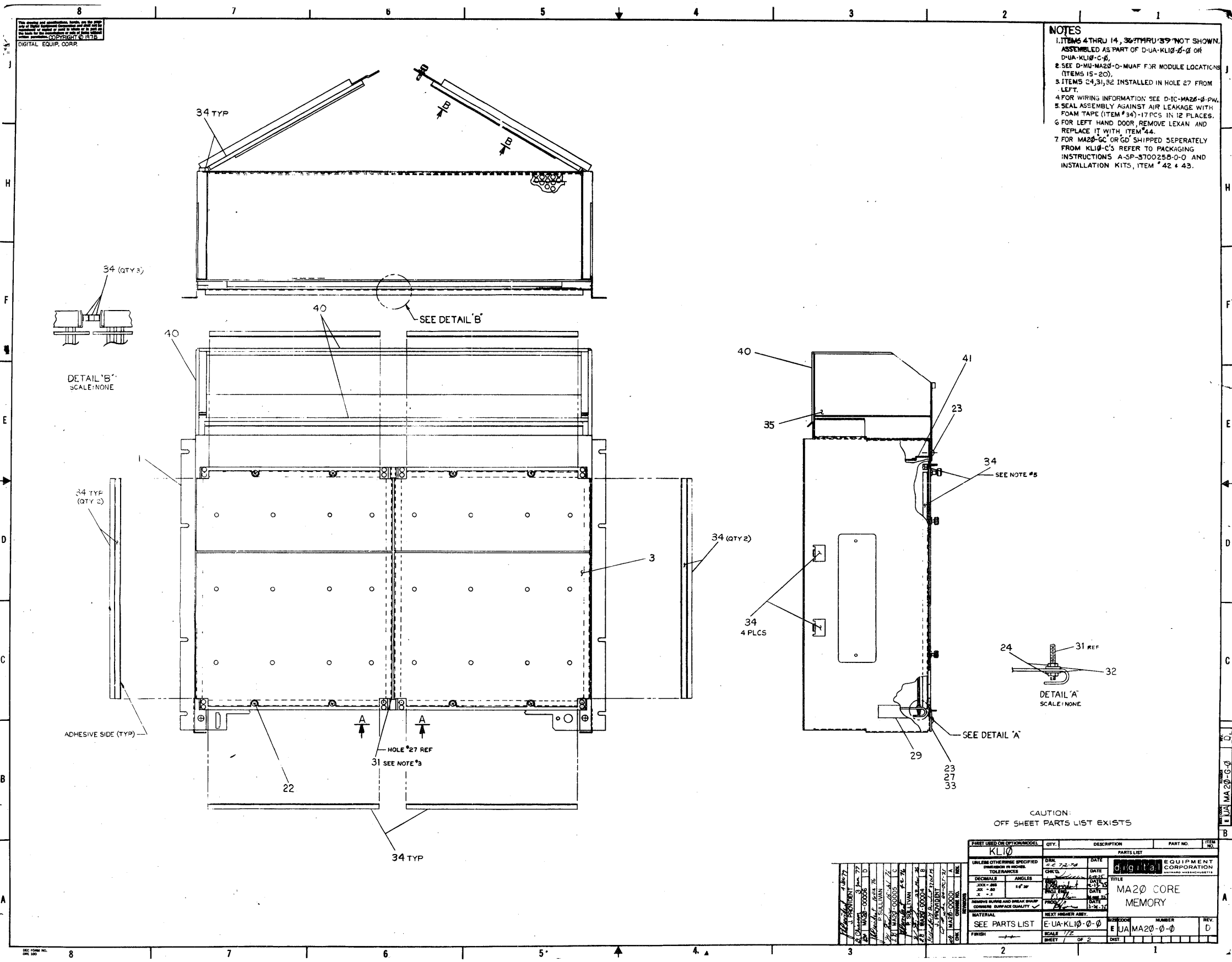
CUSTOMER PRINT SET CODES
X = PRINT OF DOCUMENT INCLUDED IN PRINT SET
C = INCLUDES ALL PRINTS INDICATED ON DOCUMENT
S = CONFIDENTIAL AUTHORIZED SIGNATURE REQUIRED

TITLE
CORE MEMORY MA20
SHEET 4 OF 6
SIZE CODE
B DD
NUMBER
MA20-0
REV
B

| CUSTOMER PRINT SET | | MECHANICAL | | | | CUSTOMER PRINT SET | | MECHANICAL | | | | | |
|--------------------|----------|------------------|-----|-----------|-------------------------------|----------------------|----------|------------|------------------|-----|-----------|------------------------|----------------------|
| MFPG SET | FIND NO. | DRAWING NO. | REV | NO OF SHT | DESCRIPTION | OPTION NO./FILE DATE | MFPG SET | FIND NO. | DRAWING NO. | REV | NO OF SHT | DESCRIPTION | OPTION NO./FILE DATE |
| | 8 | D-IA-5009956-0-0 | # | 1 | GROUND PLANE PROTECTION SHEET | | | 12 | D-IA-7011520-0-0 | # | 1 | VANE SWITCH ASSY | |
| | | D-SS-5009956-0-1 | # | 1 | SILK SCREEN | | | | D-MD-7414328-0-0 | # | 1 | BRACKET, VANE SWITCH | |
| | 9 | E-UA-H744-Ø-Ø | # | 1 | 5V REGULATOR H744 | | | 13 | D-IA-7012390-0-0 | # | 1 | DUCT ASSY | |
| | | B-DD-H744-Ø | # | 2 | H744 DRAWING DIRECTORY | | | | D-MD-7416164-0-0 | # | 1 | DUCT TOP | |
| | | | | | | | | | D-MD-7416165-0-0 | # | 1 | DUCT BOTTOM | |
| | | | | | | | | | D-MD-7416163-0-0 | # | 1 | END CAP, DUCT | |
| | | | | | | | | | D-MD-7416163-1-0 | # | 1 | END CAP, DUCT | |
| | | | | | | | | | C-MD-7416162-0-0 | # | 1 | SCREEN FILTER HOLDER | |
| | | | | | | | | | C-MD-7416161-0-0 | # | 1 | DUCT MTG ANGLE | |
| | 10 | E-CS-H754-Ø-Ø | # | 2 | 20V REGULATOR H754 | | | 14 | D-IA-7012343-0-0 | # | 1 | DIFFUSER SCREEN (CPU) | |
| | | B-DD-H754-Ø | # | 3 | H754 DRAWING DIRECTORY | | | | D-MD-7415623-0-0 | # | 1 | BRACKET, MGT. DIFFUSER | |
| | | | | | | | | | D-MD-7415530-0-0 | # | 1 | SCREEN, DIFFUSER | |
| | 11 | D-UA-BC2ØC-3C-Ø | # | 1 | CONN ASSY SBUS | | | | | | | | |

CUSTOMER PRINT SET CODES
X = PRINT OF DOCUMENT INCLUDED IN PRINT SET
C = INCLUDES ALL PRINTS INDICATED ON DOCUMENT
S = CONFIDENTIAL AUTHORIZED SIGNATURE REQUIRED

TITLE
CORE MEMORY MA2Ø
SHEET 6 OF 6
SIZE CODE
B DD
NUMBER
MA2Ø-Ø
REV
B



NOTES

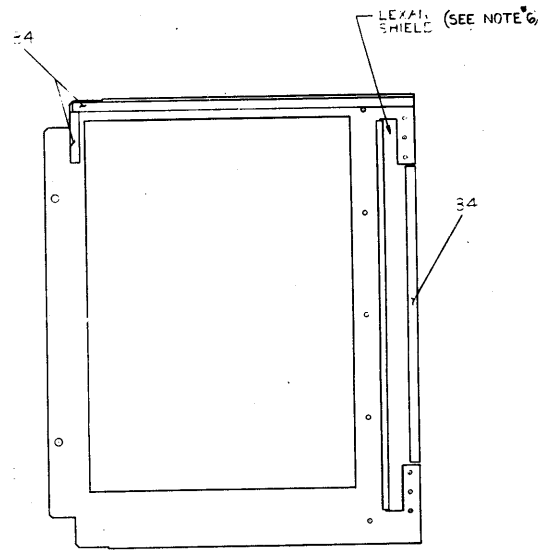
- ITEMS 4 THRU 14, 30 THRU 39 NOT SHOWN, ASSEMBLED AS PART OF D-UA-KLI0-0-0 OR D-UA-KLI0-C-0.
- SEE D-MU-MA20-0-MUAF FOR MODULE LOCATIONS (ITEMS 15-20).
- ITEMS 24, 31, 32 INSTALLED IN HOLE 27 FROM LEFT.
- FOR WIRING INFORMATION SEE D-IC-MA20-0-PW.
- SEAL ASSEMBLY AGAINST AIR LEAKAGE WITH FOAM TAPE (ITEM #34) - 17 PCS IN 12 PLACES.
- FOR LEFT HAND DOOR, REMOVE LEXAN AND REPLACE IT WITH ITEM #44.
- FOR MA20-GC OR GD SHIPPED SEPARATELY FROM KLI0-C'S REFER TO PACKAGING INSTRUCTIONS A-SP-370025B-0-0 AND INSTALLATION KITS, ITEM #42 & 43.

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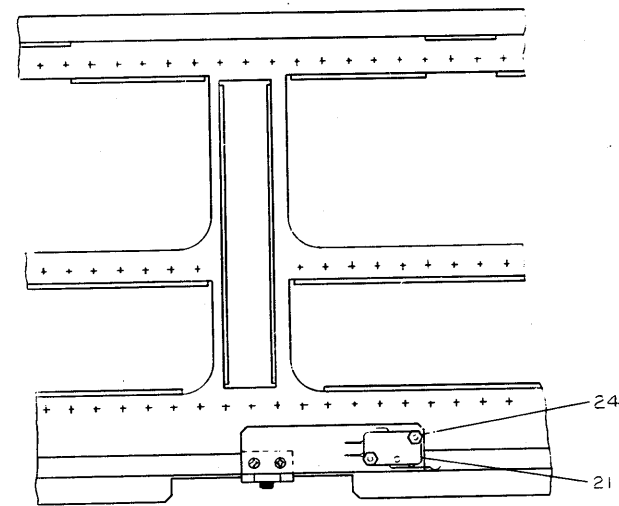
CAUTION:
OFF SHEET PARTS LIST EXISTS

| REV. | DATE | DESCRIPTION |
|------|---------|------------------|
| 1 | 1-26-77 | MA20 CORE MEMORY |
| 2 | 3-1-77 | MA20 CORE MEMORY |
| 3 | 3-1-77 | MA20 CORE MEMORY |
| 4 | 3-1-77 | MA20 CORE MEMORY |
| 5 | 3-1-77 | MA20 CORE MEMORY |
| 6 | 3-1-77 | MA20 CORE MEMORY |
| 7 | 3-1-77 | MA20 CORE MEMORY |
| 8 | 3-1-77 | MA20 CORE MEMORY |
| 9 | 3-1-77 | MA20 CORE MEMORY |
| 10 | 3-1-77 | MA20 CORE MEMORY |
| 11 | 3-1-77 | MA20 CORE MEMORY |
| 12 | 3-1-77 | MA20 CORE MEMORY |
| 13 | 3-1-77 | MA20 CORE MEMORY |
| 14 | 3-1-77 | MA20 CORE MEMORY |
| 15 | 3-1-77 | MA20 CORE MEMORY |
| 16 | 3-1-77 | MA20 CORE MEMORY |
| 17 | 3-1-77 | MA20 CORE MEMORY |
| 18 | 3-1-77 | MA20 CORE MEMORY |
| 19 | 3-1-77 | MA20 CORE MEMORY |
| 20 | 3-1-77 | MA20 CORE MEMORY |
| 21 | 3-1-77 | MA20 CORE MEMORY |
| 22 | 3-1-77 | MA20 CORE MEMORY |
| 23 | 3-1-77 | MA20 CORE MEMORY |
| 24 | 3-1-77 | MA20 CORE MEMORY |
| 25 | 3-1-77 | MA20 CORE MEMORY |
| 26 | 3-1-77 | MA20 CORE MEMORY |
| 27 | 3-1-77 | MA20 CORE MEMORY |
| 28 | 3-1-77 | MA20 CORE MEMORY |
| 29 | 3-1-77 | MA20 CORE MEMORY |
| 30 | 3-1-77 | MA20 CORE MEMORY |
| 31 | 3-1-77 | MA20 CORE MEMORY |
| 32 | 3-1-77 | MA20 CORE MEMORY |
| 33 | 3-1-77 | MA20 CORE MEMORY |
| 34 | 3-1-77 | MA20 CORE MEMORY |
| 35 | 3-1-77 | MA20 CORE MEMORY |
| 40 | 3-1-77 | MA20 CORE MEMORY |
| 41 | 3-1-77 | MA20 CORE MEMORY |

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VIEW B-B
SCALE: 1/2
TYP FOR BOTH DOORS

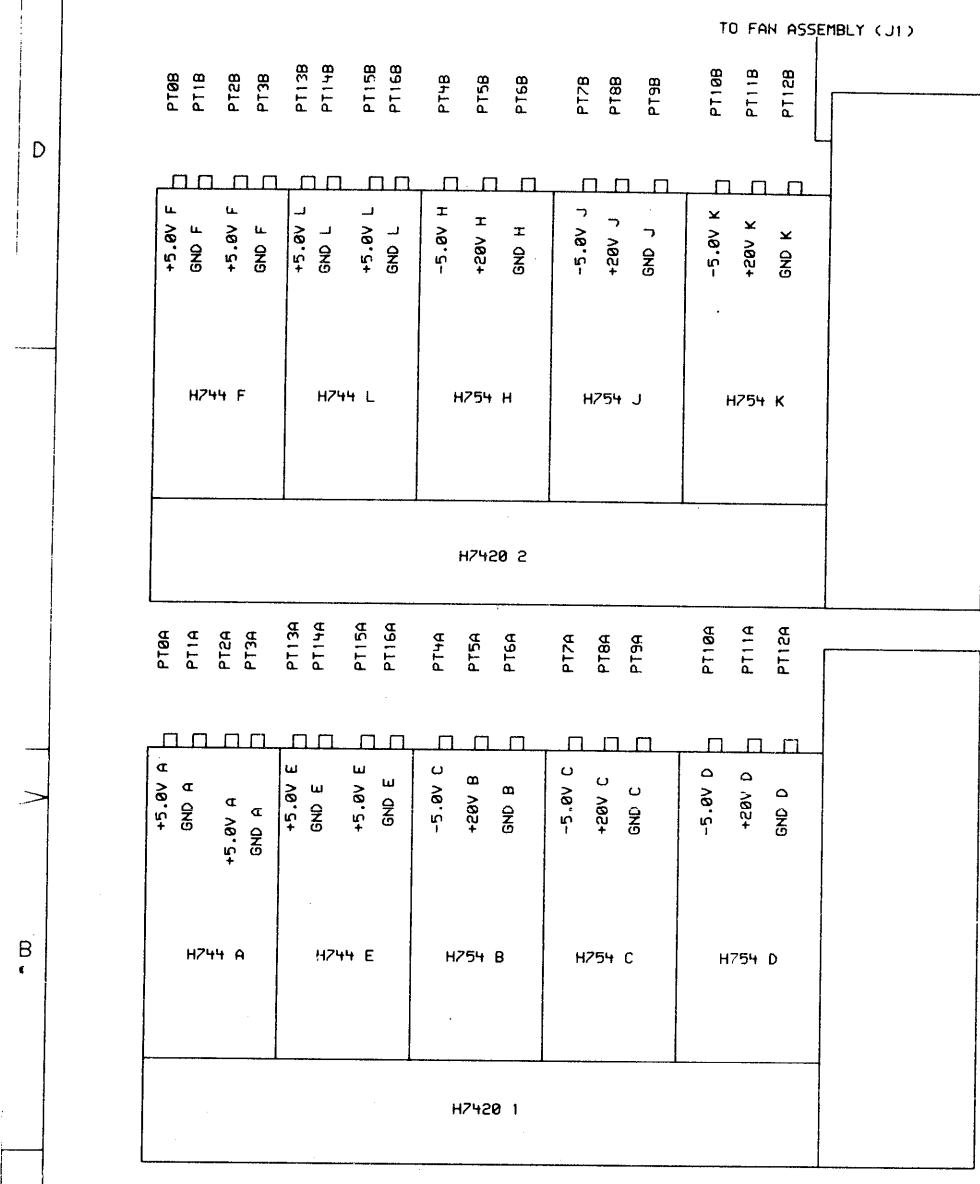


VIEW A-A
SCALE: 1/1

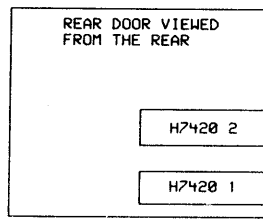
| REVISIONS | | |
|-----------|------------|------|
| DATE | CHANGE NO. | REV. |
| | | |

| | | | | | | | |
|-------|------------------|-------------|-----|--------|----------|-------|---|
| TITLE | MA20 CORE MEMORY | DESIGN CODE | EUA | NUMBER | MA20-0-0 | REV. | D |
| SCALE | 1/2 | SHEET | 2 | OF | 2 | DIST. | |

MA20-0-0

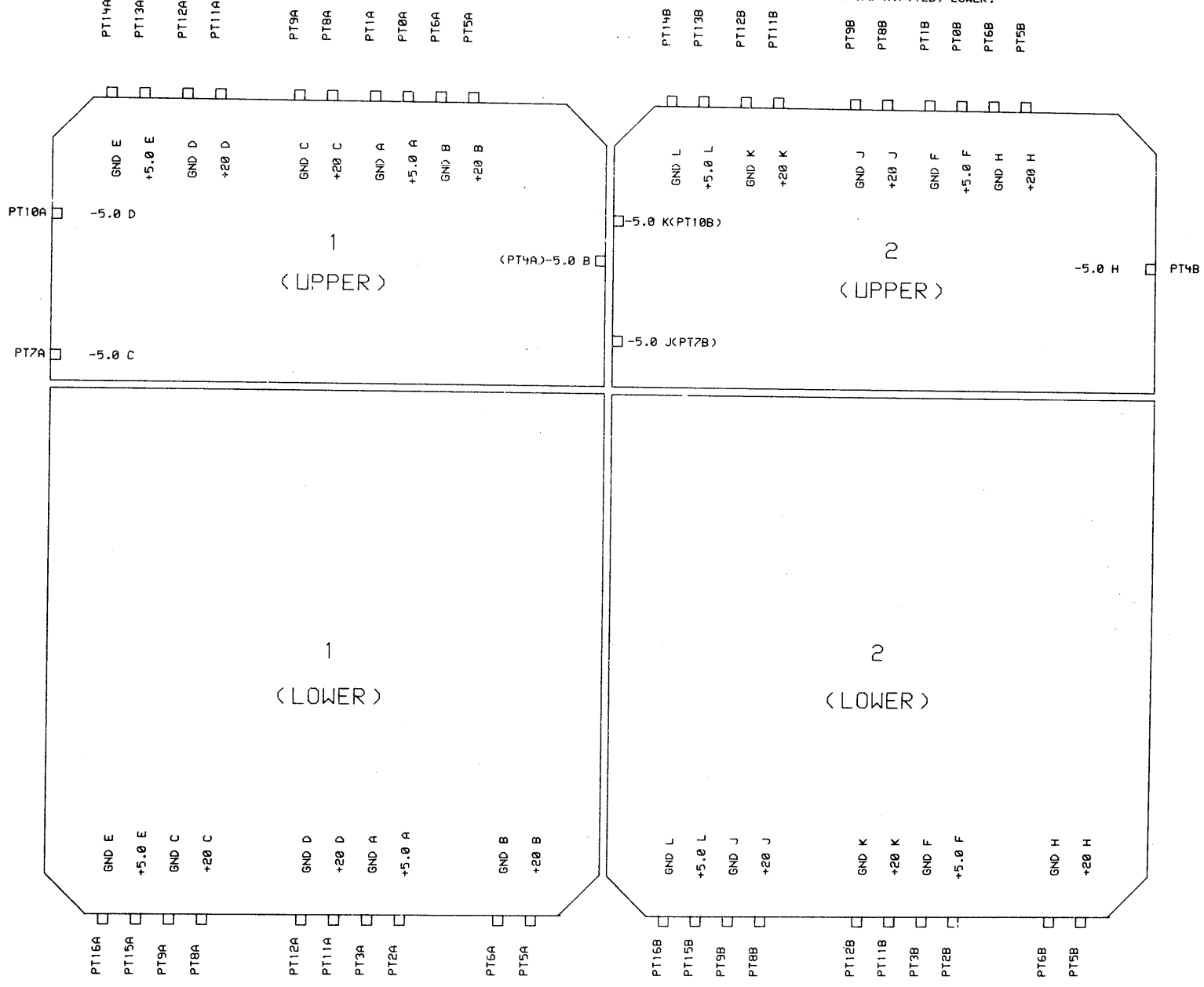


POWER SUPPLY LOCATIONS



NOTES:

- 1- JUMPER +20V B(PT5A) UPPER TO +20V B(PT5A) LOWER.
- JUMPER GND B(PT6A) UPPER TO GND B(PT6A) LOWER.
- JUMPER +20V C(PT8A) UPPER TO +20V C(PT8A) LOWER.
- JUMPER GND C(PT9A) UPPER TO GND C(PT9A) LOWER.
- JUMPER +20V D(PT11A) UPPER TO +20V D(PT11A) LOWER.
- JUMPER GND D(PT12A) UPPER TO GND D(PT12A) LOWER.
- JUMPER +20V H(PT5B) UPPER TO +20V H(PT5B) LOWER.
- JUMPER GND H(PT6B) UPPER TO GND H(PT6B) LOWER.
- JUMPER +20V J(PT8B) UPPER TO +20V J(PT8B) LOWER.
- JUMPER GND J(PT9B) UPPER TO GND J(PT9B) LOWER.
- JUMPER +20V K(PT11B) UPPER TO +20V K(PT11B) LOWER.
- JUMPER GND K(PT12B) UPPER TO GND K(PT12B) LOWER.



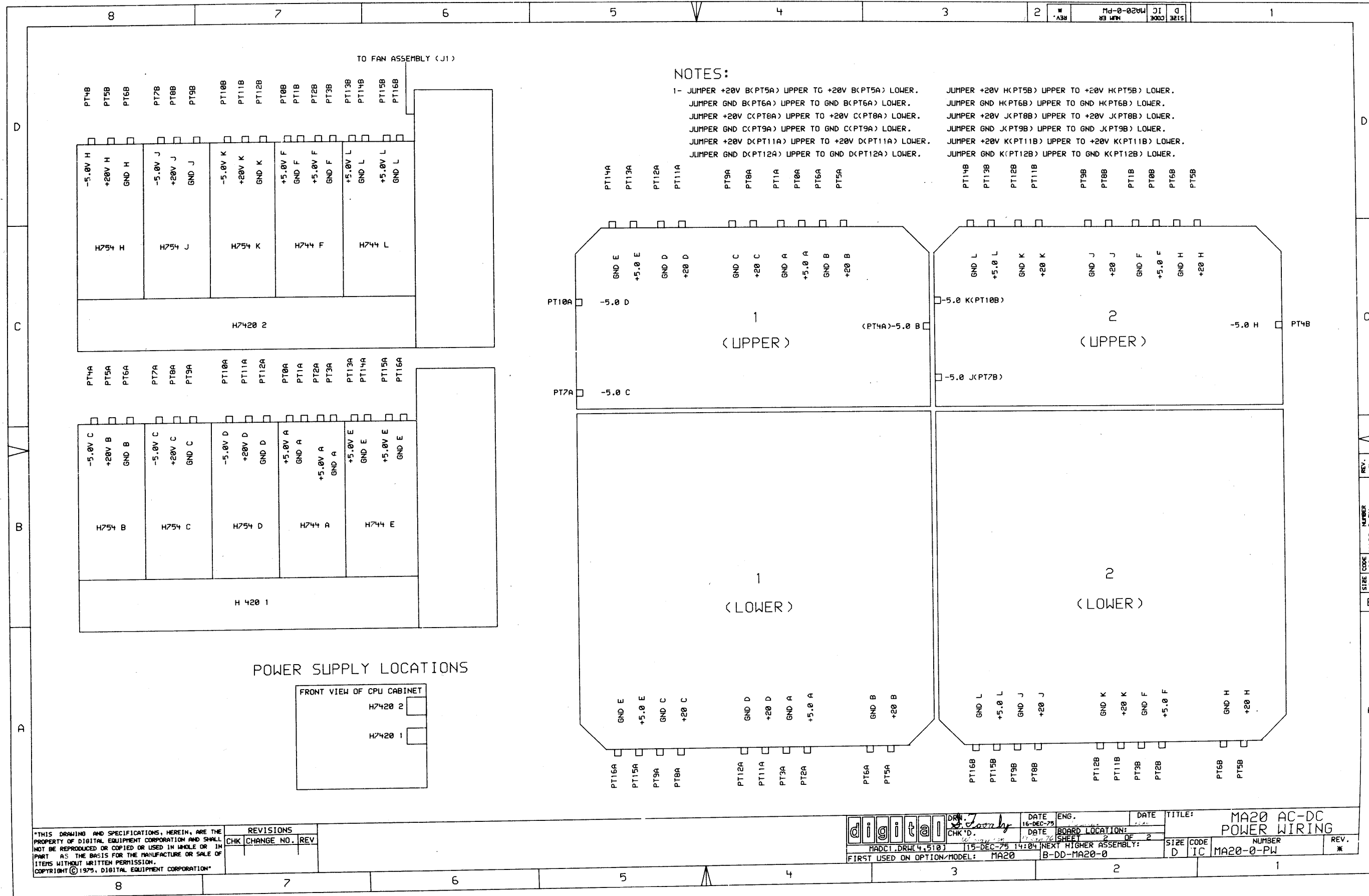
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| REVISIONS | |
|-----------|-----------------|
| CHK | CHANGE NO. REV. |
| | |

digital
MADC.DRILL(4,510)FIRST USED ON OPTION/MODEL: MA20

DATE: 15-DEC-75
DATE: 15-DEC-75 14:04
SHEET 2 OF 2
NEXT HIGHER ASSEMBLY: B-DD-MA20-0

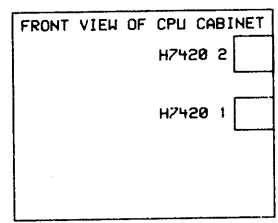
DATE: 15-DEC-75
ENG. [Signature]
BOARD LOCATION: [Blank]
TITLE: MA20 AC-DC POWER WIRING
SIZE CODE: D
NUMBER: MA20-0-PW
REV. *



NOTES:

- 1- JUMPER +20V B(PT5A) UPPER TO +20V B(PT5A) LOWER.
- JUMPER GND B(PT6A) UPPER TO GND B(PT6A) LOWER.
- JUMPER +20V C(PT8A) UPPER TO +20V C(PT8A) LOWER.
- JUMPER GND C(PT9A) UPPER TO GND C(PT9A) LOWER.
- JUMPER +20V D(PT11A) UPPER TO +20V D(PT11A) LOWER.
- JUMPER GND D(PT12A) UPPER TO GND D(PT12A) LOWER.
- JUMPER +20V H(PT5B) UPPER TO +20V H(PT5B) LOWER.
- JUMPER GND H(PT6B) UPPER TO GND H(PT6B) LOWER.
- JUMPER +20V J(PT8B) UPPER TO +20V J(PT8B) LOWER.
- JUMPER GND J(PT9B) UPPER TO GND J(PT9B) LOWER.
- JUMPER +20V K(PT11B) UPPER TO +20V K(PT11B) LOWER.
- JUMPER GND K(PT12B) UPPER TO GND K(PT12B) LOWER.

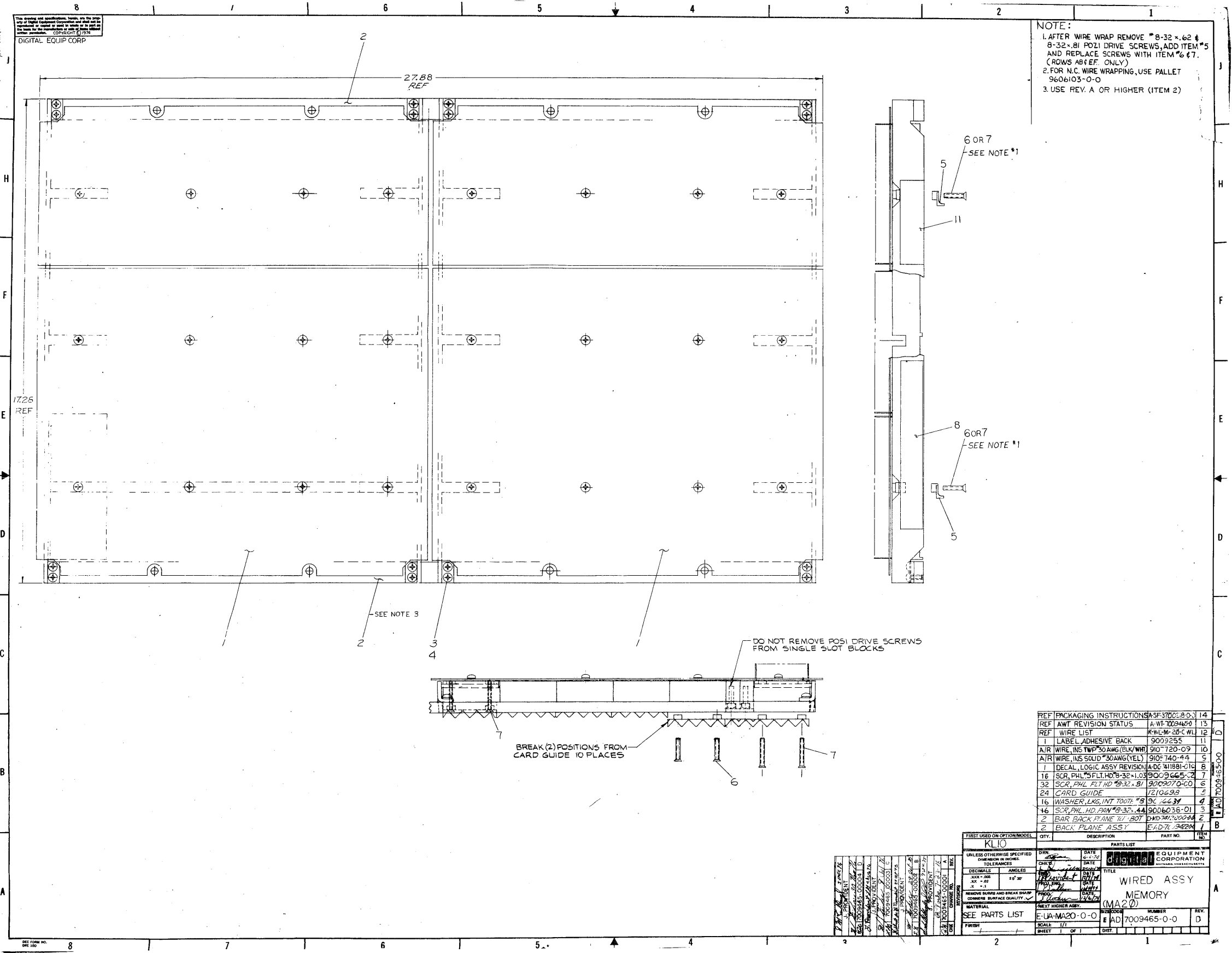
POWER SUPPLY LOCATIONS



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| REVISIONS | | |
|-----------|------------|-----|
| CHK | CHANGE NO. | REV |
| | | |

| | | | | |
|----------------------------------|-----------|-----------------------------------|-----------|-------------------------|
| | DATE | ENG. | DATE | TITLE: |
| | 15-DEC-75 | J. J. J. | 15-DEC-75 | MA20 AC-DC POWER WIRING |
| CHK'D. | DATE | BOARD LOCATION: | SHEET | OF |
| | | | | |
| FIRST USED ON OPTION/MODEL: MA20 | | NEXT HIGHER ASSEMBLY: B-DD-MA20-0 | | REV. * |



NOTE:
 1. AFTER WIRE WRAP REMOVE #8-32 x .62 & 8-32 x .81 POSI DRIVE SCREWS, ADD ITEM #5 AND REPLACE SCREWS WITH ITEM #6 & 7. (ROWS AB & EF ONLY)
 2. FOR N.C. WIRE WRAPPING, USE PALLET 9606103-0-0
 3. USE REV. A OR HIGHER (ITEM 2)

| REF | DESCRIPTION | QTY | PART NO. | ITEM NO. |
|-----|---------------------------------|-----|----------------|----------|
| REF | PACKAGING INSTRUCTIONS | 1 | 5F37005-0-0 | 14 |
| REF | AWT REVISION STATUS | 1 | A-WF-7009465-0 | 13 |
| REF | WIRE LIST | 1 | K-WL-M-20-C-WL | 12 |
| 1 | LABEL ADHESIVE BACK | 1 | 9009255 | 11 |
| A/R | WIRE, INS TWP #30AWG (BLK/WH) | 1 | 910720-09 | 10 |
| A/R | WIRE, INS SOLID #30AWG (VEL) | 1 | 910740-44 | 9 |
| 1 | DECAL, LOGIC ASSY REVISION | 1 | ADG #11881-110 | 8 |
| 16 | SCR, PHL #5 FLT. HD #8-32 x .44 | 1 | 9009665-02 | 7 |
| 32 | SCR, PHL FLT HD #8-32 x .81 | 1 | 9009070-00 | 6 |
| 24 | CARD GUIDE | 1 | 7210699 | 5 |
| 16 | WASHER, LKG, INT TOOTH #8 | 1 | 9012663 | 4 |
| 16 | SCR, PHL HD PAN #8-32 x .44 | 1 | 9006036-01 | 3 |
| 2 | BAR BACK PLANE INT BOT | 1 | DMD #1700044 | 2 |
| 2 | BACK PLANE ASSY | 1 | EAD-71-34204 | 1 |

| KLIQ | | DATE | DATE | EQUIPMENT CORPORATION | |
|--|----------|------------------|------------|-----------------------|--|
| DRN | DATE | 6-2-72 | DATE | CORPORATION | |
| UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES. TOLERANCES | DECIMALS | ANGLES | TITLE | | |
| .XX - .001 | 10' | 30' | WIRED ASSY | | |
| .XX - .01 | 10' | 30' | MEMORY | | |
| .XX - .1 | 10' | 30' | (MA 20) | | |
| REMOVE BURRS AND BREAK SHARP CORNERS. SURFACE QUALITY | MATERIAL | SEE PARTS LIST | REV | REV | |
| SEE PARTS LIST | FINISH | E-UA-MA20-0-0 | REV | REV | |
| SCALE | 1/1 | E AD 7009465-0-0 | REV | REV | |
| SHEET | 1 | OF 1 | DIST | D | |

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NOTES:

1. LIST OF PAPER TAPE FILES USED.
2. LIST OF AWT FILES USED.

MA2Ø.NCC
MA2Ø.TPC

MA2ØC.ALL
7Ø9442.RCC (MA2Ø AND MG1Ø ETCH ONLY TEST TAPE)

| FIRST USED ON OPTION MODEL | QTY. | DESCRIPTION | PART NO. | ITEM NO. |
|--|-----------------|--|---------------------|-----------|
| KL1Ø | | PARTS LIST | | |
| DRN. <i>Phil Reed</i> | DATE 7-15-75 | digital EQUIPMENT CORPORATION <small>MAYNARD, MASSACHUSETTS</small> TITLE WIRED ASSY (MEMORY) | | |
| CHK'D <i>Bill Hovey</i> | DATE 7-15-75 | | | |
| ENG. <i>W. Hamlin</i> | DATE 9/30/75 | | | |
| PROJ. ENG. <i>PJ Sullivan</i> | DATE 7-11-75 | | | |
| PROD. <i>J. Cuck</i> | DATE 7/16/75 | | | |
| NEXT HIGHER ASSEMBLY E-AD-7009465-0-0 | | SIZE CODE K WL | NUMBER MA2Ø-Ø-WL | REV. C |
| SCALE | — / — | | | |
| SHEET | OF | DIST. | | |

| REVISIONS | CHANGE NO. | REV. |
|-----------|----------------|--------|
| | MA2Ø-00002 | ORIG B |
| | MA2Ø-00003 | C |
| CHK | <i>1-16-75</i> | |
| | <i>3-17-75</i> | |

DEC FORM NO. DRB 109

