

| DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS | | | | |
|---|-------------|-----------|---------------|------|
| ENGINEERING SPECIFICATION | | | DATE 11/19/74 | |
| TITLE FIELD INSTALLATION & ACCEPTANCE PROCEDURE FOR KM8-A | | | | |
| REV | DESCRIPTION | REVISIONS | | |
| | | CHG NO | ORIG | DATE |
| APPD BY | DATE | DATE | DATE | DATE |
| | | | | |

| | | | | | | | |
|-----------------------|----------|-------------------------|--------------|---|--------|---------|-----|
| ENG <i>James Nash</i> | 11/19/74 | APPD <i>Paul D. ...</i> | SIZE CODE SP | A | NUMBER | KM8-A-1 | REV |
|-----------------------|----------|-------------------------|--------------|---|--------|---------|-----|

DEC 16-1981-1022-N370
DRA 108

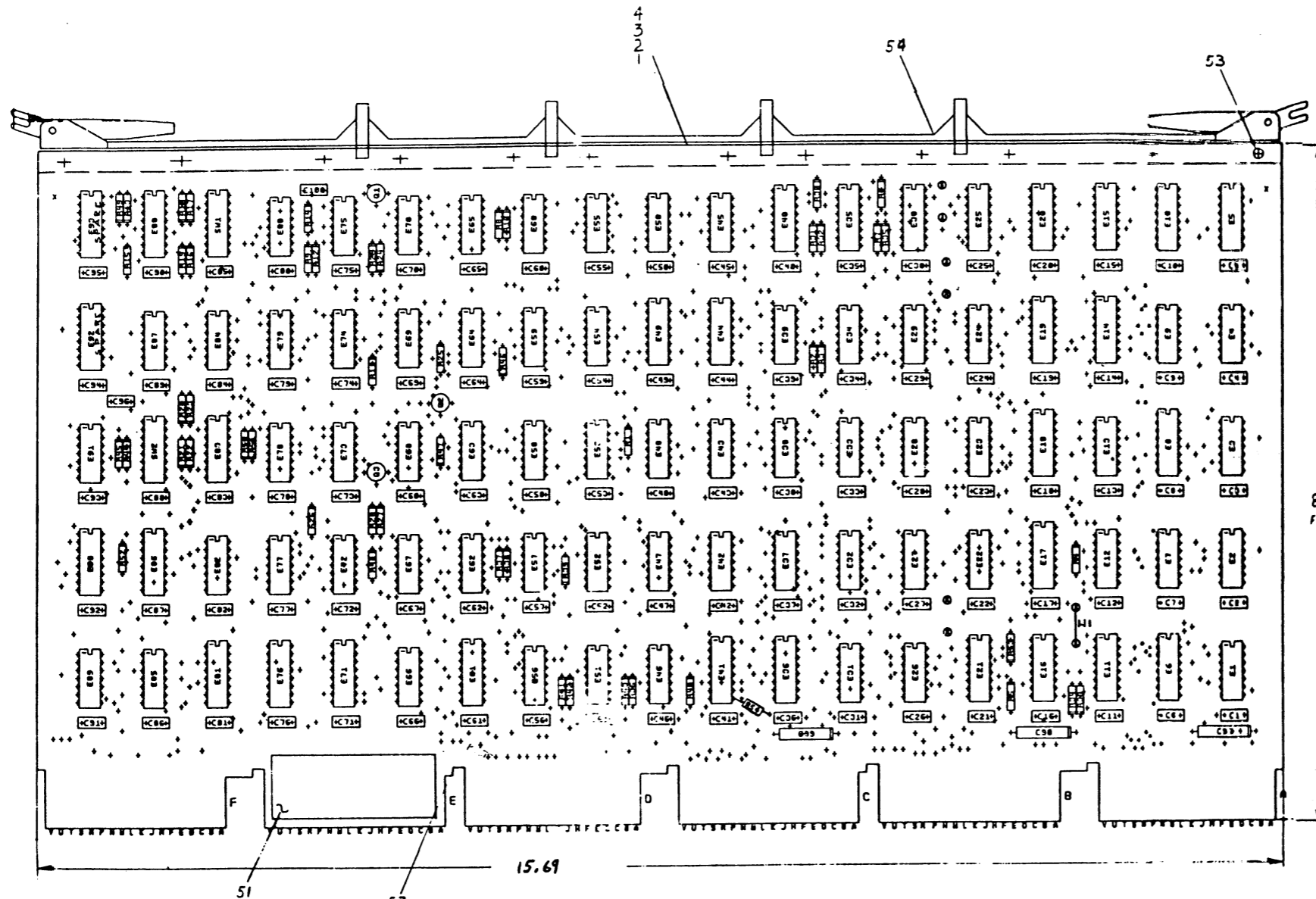
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| ENGINEERING SPECIFICATION | | | | | CONTINUATION SHEET | |
|---|--|--|--|--|--------------------|--|
| TITLE FIELD INSTALLATION & ACCEPTANCE PROCEDURE FOR KM8-A | | | | | | |
| I GENERAL | | | | | | |
| This procedure defines the performance standards required of the KM8A*, option board #2. This procedure refers to both system and add-on acceptance. | | | | | | |
| NOTE: If KM8A was shipped as part of a PDP-8A system, then proceed to installation procedure. | | | | | | |
| * Memory Extension & Time Share Bootstrap Loaders Power Fail/Auto Restart | | | | | | |
| II INSPECTION | | | | | | |
| After removing the KM8A from the packing material, inspect the module for the following: | | | | | | |
| 1. Inventory hardware against shipping list. | | | | | | |
| 2. Inventory software against software list, if ordered. | | | | | | |
| 3. Inventory prints against shipping list, if ordered. | | | | | | |
| 4. Check module for loose or broken components. | | | | | | |
| III INSTALLATION PROCEDURE | | | | | | |
| Install the equipment using the following procedure: | | | | | | |
| 1. Set the switches as indicated by the diagnostic write up. | | | | | | |
| NOTE: Refer to Operator's Handbook for switch setting descriptions. | | | | | | |
| 2. Insure that the PDP-8A power is removed from the Omnibus™. | | | | | | |
| 3. Insert the KM8A into the second or third slot of the Omnibus™. | | | | | | |
| 4. Turn the power back "ON". | | | | | | |
| IV ACCEPTANCE PROCEDURE | | | | | | |
| Perform the acceptance procedure defined in Table A. If abnormal indications are encountered, refer to the diagnostic listing for the type of error. Reference the diagnostic write ups and Operator's Manual for instructions for loading diagnostics. | | | | | | |

| ENGINEERING SPECIFICATION | | | | | CONTINUATION SHEET | |
|--|---------------|-------------|-------------------|--|--------------------|--|
| TITLE FIELD INSTALLATION & ACCEPTANCE PROCEDURE FOR KM8-A | | | | | | |
| IV ACCEPTANCE PROCEDURE (continued) | | | | | | |
| Equipment required: | | | | | | |
| 1. PDP-8A with 1K min. R/W Memory | | | | | | |
| 2. Paper Tape Input Device | | | | | | |
| 3. Diagnostic and Listings | | | | | | |
| 4. Programmer's Console (KC8-A & DAC8-A) | | | | | | |
| 5. M987 Quad Extender | | | | | | |
| NOTE: If the programmer's console and paper tape input device are not available as part of the system being used, they must be supplied in good working order by the customer. | | | | | | |
| TABLE A | | | | | | |
| Acceptance of KM8A with 4K of R/W Memory | | | | | | |
| Program Name | Maindec # | Accept Time | Restrictions | | | |
| KM8A Option Test #2 | 08-DJKMA-PB | 30 min | 4K R/W Memory Min | | | |
| Acceptance of KM8A with Less than 4K R/W Memory | | | | | | |
| KM8A Option Test #2 Segment #1 (RIM) | 08-DJKMA -PM1 | 10 min | 1K R/W memory min | | | |
| KM8A Option Test #2 Segment #2 (RIM) | 08-DJKMA -PM2 | 10 min | 1K R/W Memory Min | | | |
| KM8A Option Test #2 Segment #4 (RIM) | 08-DJKMA -PM4 | 10 min | 1K R/W Memory Min | | | |

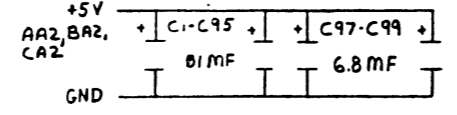
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NOTES:
 ECO 4-4-1. THIN WALL TUBING TO BE USED ON CAPACITOR LEAD GOING TO DV2.



| REF | REF | XY COORDINATE HOLE LOCATION | K-CO-M8317-YB-4 | 1 |
|-----|-----|-------------------------------|-------------------------|------------|
| REF | REF | ASSY/DRILLING HOLE LAYOUT | D-AH-M8317-YB-5 | 2 |
| REF | REF | MODULE ECO HISTORY (INACTIVE) | B-MH-M8317-YB-6 | 3 |
| 1 | 1 | ETCHED CIRCUIT BOARD | 5010938 | 4 |
| 1 | 1 | C96 | CAP 500PF PF 100V DISC | 1001765 |
| 96 | 96 | C1-C95, C100 | CAP .01 MF 100 V 20% | 1001610-01 |
| 3 | 3 | C97-C99 | CAP 6.8 MF 35V 10% | 1005306 |
| 2 | 2 | SW1, SW2 | DIP SWITCH | 1211164-04 |
| 47 | 47 | R1-R24, R26, R28-R43 | RES. 1K 1/4 5% | 1300365 |
| | | R49-R53, R46, | | |
| 1 | 1 | R44 | RES. 100 OHM 1/4 W 5% | 1300229 |
| 4 | 4 | R25, R27, R47, R48 | RES. 27 OHM 1/4 W 5% | 1301522 |
| 3 | 3 | Q1, Q2, Q3 | TRANSISTOR DEC 3009B | 1503100 |
| 6 | 6 | E80, 63, 65, 87, 79, 84 | I.C. 7474 | 1905547 |
| 6 | 6 | E23, 45, 37, 70, 69, 91 | I.C. 7400 | 1905575 |
| 1 | 1 | E31 | I.C. 7410 | 1905576 |
| 2 | 2 | E39, 50 | I.C. 7420 | 1905577 |
| 1 | 1 | E7 | I.C. 7430 | 1905578 |
| 1 | 1 | E82 | I.C. 7473 | 1905587 |
| 3 | 3 | E38, 60, 62 | I.C. 7402 | 1909004 |
| 6 | 6 | E12, 26, 33, 34, 53, 77 | I.C. 74S11 | 1910537 |
| 2 | 2 | E19, 20 | I.C. 74S257 | 1911641 |
| 1 | 1 | E13 | I.C. 74S74 | 1910544 |
| 6 | 6 | E58, 47, 56, 51, 46, 57 | I.C. 8801 | 1909705 |
| 2 | 2 | E52, 48 | I.C. 7417 | 1909929 |
| 2 | 2 | E86, 90 | I.C. 8266 | 1909934 |
| 1 | 1 | E30 | I.C. 74153 | 1909937 |
| 1 | 1 | E28 | I.C. 74S00 | 1910532 |
| 2 | 2 | E85, 89 | I.C. 74197 | 1910035 |
| 1 | 1 | E78 | I.C. 74164 | 1910041 |
| 2 | 2 | E1740 | I.C. 7442 | 1910046 |
| 3 | 3 | E64, 67, 74 | I.C. 7437 | 1910091 |
| 4 | 4 | E24, 55, 75, 72 | I.C. 7408 | 1910155 |
| 1 | 1 | E22 | I.C. 314 | 1909704 |
| 2 | 2 | E61, 71 | I.C. 74175 | 1910651 |
| 1 | 1 | E9 | I.C. 8093 | 1910837 |
| 2 | 2 | E29, 73 | I.C. 7427 | 1910878 |
| 2 | 2 | E8, 14 | I.C. 8234 | 1911315 |
| 6 | 6 | E5, 10, 15, 25, 44, 49 | I.C. 74173 | 1911330 |
| 6 | 6 | E32, 43, 54, 59, 66, 68 | I.C. 7404 | 1909686 |
| - | - | E76 | I.C. MIKP ROM#1 (256X4) | 23465A2 |
| - | - | E81 | I.C. MIKP ROM#2 (256X4) | 23469A2 |
| 1 | 1 | E35 | I.C. MIKP ROM#3 (32X8) | 23-084A1 |
| 1 | 1 | E16 | I.C. KMTS ROM#1 (256X4) | 23-086A2 |
| 4 | 4 | E12, 3, 4 | I.C. 7412 | 1909955 |
| 6 | 6 | E6, 11, 18, 21, 36, 41 | I.C. 8837 | 1911116 |
| 1 | 1 | E42 | I.C. 74S04 | 1910534 |
| 1 | 1 | E27 | I.C. 74S10 | 1910536 |
| 4 | 4 | E76, 81, 83, 88 | SOCKET, 16 PIN | 1211813 |
| 1 | 1 | R45 | RES. 220 1/4 W 5% | 1300271 |
| 8 | 8 | | SPLIT LUG | 9006735 |
| .05 | .05 | | DECAL | 7415856 |

| | | |
|--|-----|-----|
| IC 7442 | 8 | 16 |
| IC 314 | 1 | 8 |
| IC 8234 | 8 | 16 |
| IC 74173 | 8 | 16 |
| IC 74153 | 8 | 16 |
| IC 74S257 | 8 | 16 |
| IC 8837 | 8 | 16 |
| IC 7473 | 11 | 4 |
| IC 8266 | 8 | 16 |
| IC 74175 | 8 | 16 |
| IC TYPE | GND | +5V |
| GND AND 5V ARE USUALLY PIN 7 AND 14 RESPECTIVELY EXCEPTIONS ARE STATED ABOVE | | |
| IC PIN LOCATIONS | | |



AC1, AC2, AF1, AF2, AN1, AN2, AT1, AT2
 BC1, BC2, BF1, BF2, BN1, BN2, BT1, BT2
 CC1, CC2, CF1, CF2, CN1, CN2, CT1, CT2
 DC1, DC2, DF1, DF2, DN1, DN2, DT1, DT2

FIRST USED ON OPTION MODEL
 OPTION MODULE KMBA

ETCH BOARD REV. E

DRN. DDD DATE 11-2-77
 CHKD. [Signature] DATE 12-27-77
 ENG. [Signature] DATE 5-JAN-78
 PROJ. ENG. [Signature] DATE 5-JAN-78
 PROD. [Signature] DATE 5-JAN-78
 NEXT HIGHER ASSY

B-DD-M8317-YB

SCALE NONE

SHEET 1 OF 7

DEC NO. EIA NO. M8317-YC M8317-YB DEC NO. EIA NO.

SEMICONDUCTOR CONVERSION CHART

| PARTS LIST | | TITLE | |
|-----------------|------------------|----------------|----------|
| QTY | REF. DESIGNATION | DESCRIPTION | PART NO. |
| | | | ITEM NO. |
| OPTION BOARD 2 | | digital | |
| B-DD-M8317-YB | | OPTION BOARD 2 | |
| D CS M8317-YB-1 | | NUMBER | |
| | | REV. | |

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5 158AZ/159AZ 500 2

BOOTSTRAP/AUTO RESTART FUNCTIONAL SWITCH SETTINGS

| DESIRED FUNCTION | ACTIVATING SIGNAL | S1-4 | S1-5 | S1-6 | S1-7 | S1-8 | S2-1 |
|-----------------------|-----------------------|------|-------|------|------|------|------|
| BOOTSTRAP ENABLED | "BOOT" SW | * | ↑ | OFF | OFF | ON | N/A |
| AUTO-RESTART DISABLED | N/A | | | | | | |
| BOOTSTRAP ENABLED | "BOOT" SW | * | | ON | ON | ON | N/A |
| AUTO-RESTART ENABLED | "AC LOW" | | | | | | |
| BOOTSTRAP DISABLED | N/A | * | SPARE | ON | ON | OFF | N/A |
| AUTO-RESTART ENABLED | "AC LOW" | | | | | | |
| BOOTSTRAP ENABLED | "AC LOW" | * | | ON | OFF | OFF | N/A |
| AUTO-RESTART DISABLED | N/A | | | | | | |
| BOOTSTRAP ENABLED | "AC LOW" OR "BOOT" SW | * | | ON | OFF | ON | N/A |
| AUTO-RESTART DISABLED | N/A | | | | | | |
| TIME SHARE DISABLED | N/A | N/A | N/A | N/A | N/A | N/A | ON |
| TIME SHARE ENABLED | N/A | N/A | N/A | N/A | N/A | N/A | OFF |

NOTES:

- * S1-4 "OFF" - BOOTSTRAP CAN BE ACTIVATED BY "BOOT" SW EITHER IN THE "RUN" OR "STOPPED" STATE
- S1-4 "ON" - BOOTSTRAP CAN ONLY BE ACTIVATED BY "BOOT" SW IN THE "RUN" STATE
- 1. "AC LOW" WILL CAUSE AUTO-RESTART OR BOOTSTRAP, DEPENDING ON SWITCH SETTINGS, TO OCCUR ONLY IN THE "RUN" OR STOPPED STATE
- S1-6, 7, 8 "OFF" - BOOTSTRAP & AUTO-RESTART DISABLED
- 2. E76 & E81 ARE NOT ON THE VC VARIATION KMB-AD. ALL OTHER PARTS REMAIN THE SAME
- 3. IF AUTO-RESTART IS ENABLED, THE AUTO-START FEATURE OF THE CPU (M8315) MUST BE DISABLED

BOOTSTRAP SELECT SWITCH SETTINGS FOR 158AZ/159AZ ROMS

| PROGRAM | S2-5 | S2-6 | S2-7 | S2-8 | S1-1 | S1-2 | S1-3 | ROM ST ADD | MEM ADD START |
|-------------|------|------|------|------|------|------|------|------------|---------------|
| HI-LO PTRDR | ON | ON | ON | OFF | ON | ON | ON | 20 | 7734 |
| RKBE | ON | OFF | ON | OFF | ON | OFF | ON | 124 | 24 |
| RXBE | ON | OFF | OFF | ON | OFF | ON | ON | 150 | 33 |
| RFDB/DFB2P | OFF | ON | OFF | ON | OFF | ON | OFF | 252 | 7750 |
| TABE | OFF | ON | OFF | OFF | OFF | ON | OFF | 272 | 4000 |

3. BOOTSTRAP SELECT SWITCHES ARE DEFINED AS FOLLOWS:

- (a) ROM ADDRESS RANGE: 0-377
- (b) ON = LOGIC 0 OR LOW; OFF = LOGIC 1 OR HIGH
- (c) ORDER OF SIGNIFICANCE
- $S_2 5 = 2^7 = 200$ (MSB)
- $S_2 6 = 2^6 = 100$
- $S_2 7 = 2^5 = 40$
- $S_2 8 = 2^4 = 20$
- $S_1 1 = 2^3 = 10$
- $S_1 2 = 2^2 = 4$
- $S_1 3 = 2^1 = 2$

THE LSB OF ADDRESS IS CONTROLLED BY THE BOOTSTRAP/AUTO-RESTART LOGIC

BOOTSTRAP SELECT SWITCH SETTINGS FOR 465AZ/469AZ ROMS

| PROGRAM | S2-5 | S2-6 | S2-7 | S2-8 | S1-1 | S1-2 | S1-3 | ROM ST ADD | MEM ST ADD |
|-----------|------|------|------|------|------|------|------|------------|------------|
| HI-LO PTR | ON | ON | ON | OFF | ON | ON | ON | 20 | 7734 |
| RKBE | ON | OFF | ON | OFF | ON | OFF | ON | 124 | 24 |
| RXBE | ON | OFF | OFF | ON | OFF | ON | ON | 150 | 33 |
| RLRA | OFF | ON | OFF | OFF | OFF | ON | OFF | 272 | 1 |

* RXBE BOOT FOR BOTH RX01 AND RX02

FOR BOTH 158AZ/159AZ & 465AZ/469AZ ROMS

AUTO-RESTART SELECT SWITCH SETTINGS

| RESTART ADDRESS | S2-2 | S2-3 | S2-4 |
|-----------------|------|------|------|
| 0 | OFF | OFF | OFF |
| 2000 | OFF | ON | OFF |
| 2000 | ON | OFF | OFF |
| 4200 | ON | ON | OFF |

4. AUTO-RESTART SELECT SWITCHES ARE DEFINED AS FOLLOWS:

- (a) ROM ADDRESS RANGE: 0-16
- (b) ON = LOGIC 1 OR LOW; OFF = LOGIC 0 OR HIGH
- (c) ORDER OF SIGNIFICANCE

$S_2 2 = 2^3 = 10$

$S_2 3 = 2^2 = 4$

$S_2 4 = 2^1 = 2$

5. TO CONFIGURE MODULE FOR USE WITH KT8-A OPTION, INSTALL JUMPERS AS SHOWN BELOW

| | W1 | W2 | W3 | W4 |
|-----------|-----|-----|-----|-----|
| NORMAL | IN | OUT | OUT | OUT |
| WITH KT8A | OUT | IN | IN | IN |

COMPONENT SUBSTITUTION CHART

| PART CALLED FOR | | SUBSTITUTE PART | | | |
|-----------------|------------|-----------------|-----|------------|-------------|
| QTY | PART NO. | DESCRIPTION | QTY | PART NO. | DESCRIPTION |
| 96 | 1001610-01 | 01MFD DISC | 96 | 1001610-00 | 01MFD GLASS |
| 3 | 15C3100 | DEC 3000B | 3 | 1509338 | DEC 6531 |
| 6 | 1911330 | 74173 | 6 | 1911711 | 8T10 |
| 1 | 1909704 | 314 | 1 | 1910391 | 5314 |
| | | | 1 | 1909972 | 6314 |
| | | | 1 | 1910389 | 7314 |
| 6 | 1909705 | 8881 | 6 | 1909973 | 97401 |
| 1 | 23158AZ | ROM 1 (E76) | 1 | 23465AZ | ROM 1 (E76) |
| 1 | 23159AZ | ROM 2 (E81) | 1 | 23469AZ | ROM 2 (E81) |

| QTY | REF. DESIGNATION | DESCRIPTION | PART NO. | ITEM NO. |
|-----|------------------|------------------------|------------|----------|
| 12 | 12 | INSULATED, JUMPER WIRE | 9009185 | 52 |
| 1 | 1 | EYELET, HANDLE | 9800024-01 | 53 |
| 1 | 1 | HANDLE ASSY | 1210711-02 | 54 |
| 1 | 1 | RES. 470Ω 1/4W 5% | 1300316 | 55 |
| 1 | 1 | CAP. 0.022MF 50V 10% | 1011683 | 56 |
| 1/2 | 1/2 | THIN WALL TUBING | 9107256-11 | 57 |

PARTS LIST

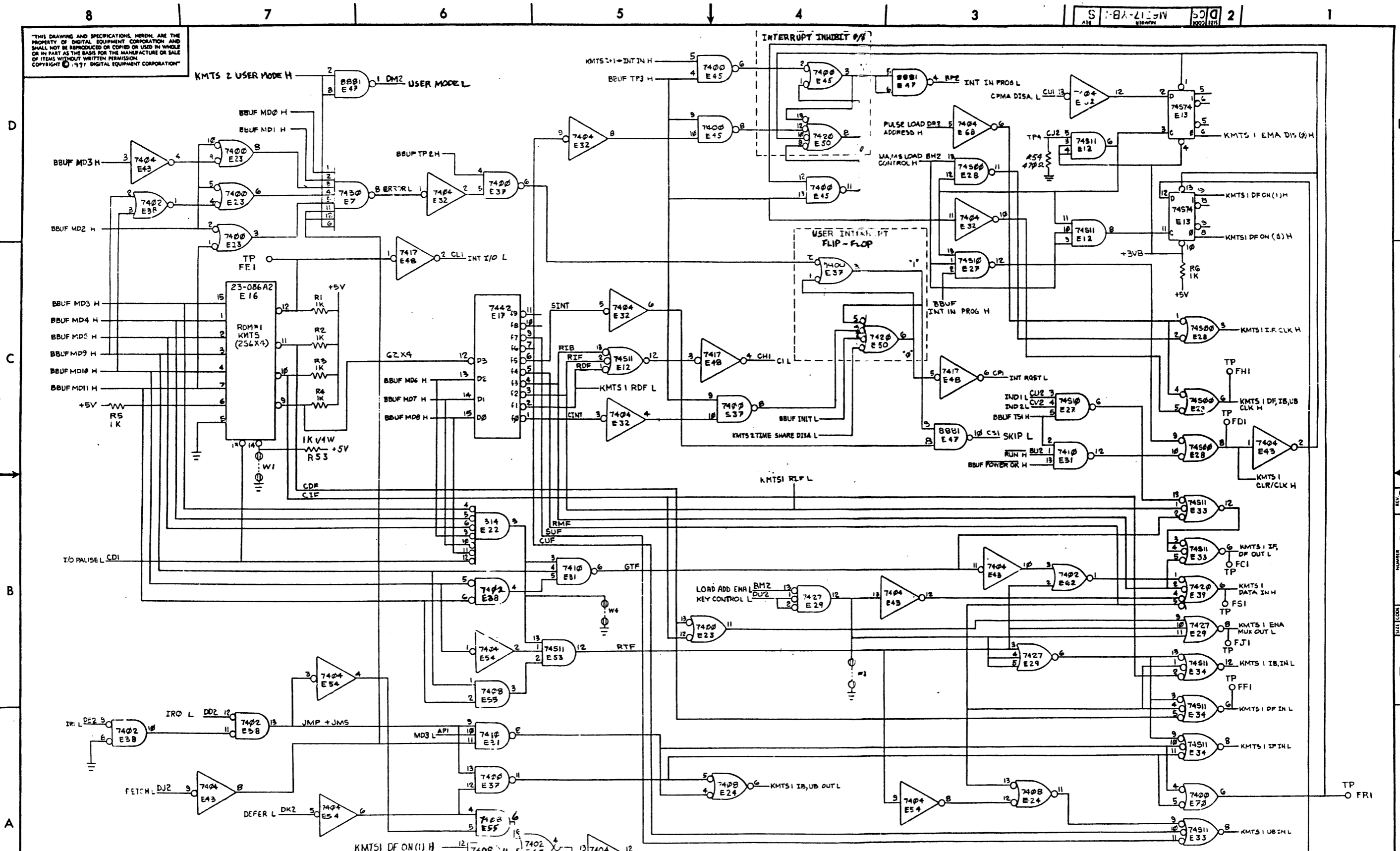
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|-----|-----|------------------|-----------------|--------------|------------|
| | | | TITLE | SIZE CODE | NUMBER |
| | | | OPTION BOARD #2 | D CS | M8317-YB-1 |
| | | | SCALE NONE | SHEET 2 OF 7 | DIST. |

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

REV. 3
M8317-YB-1
D CS

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S 1-BX-2119N 10021375 2



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

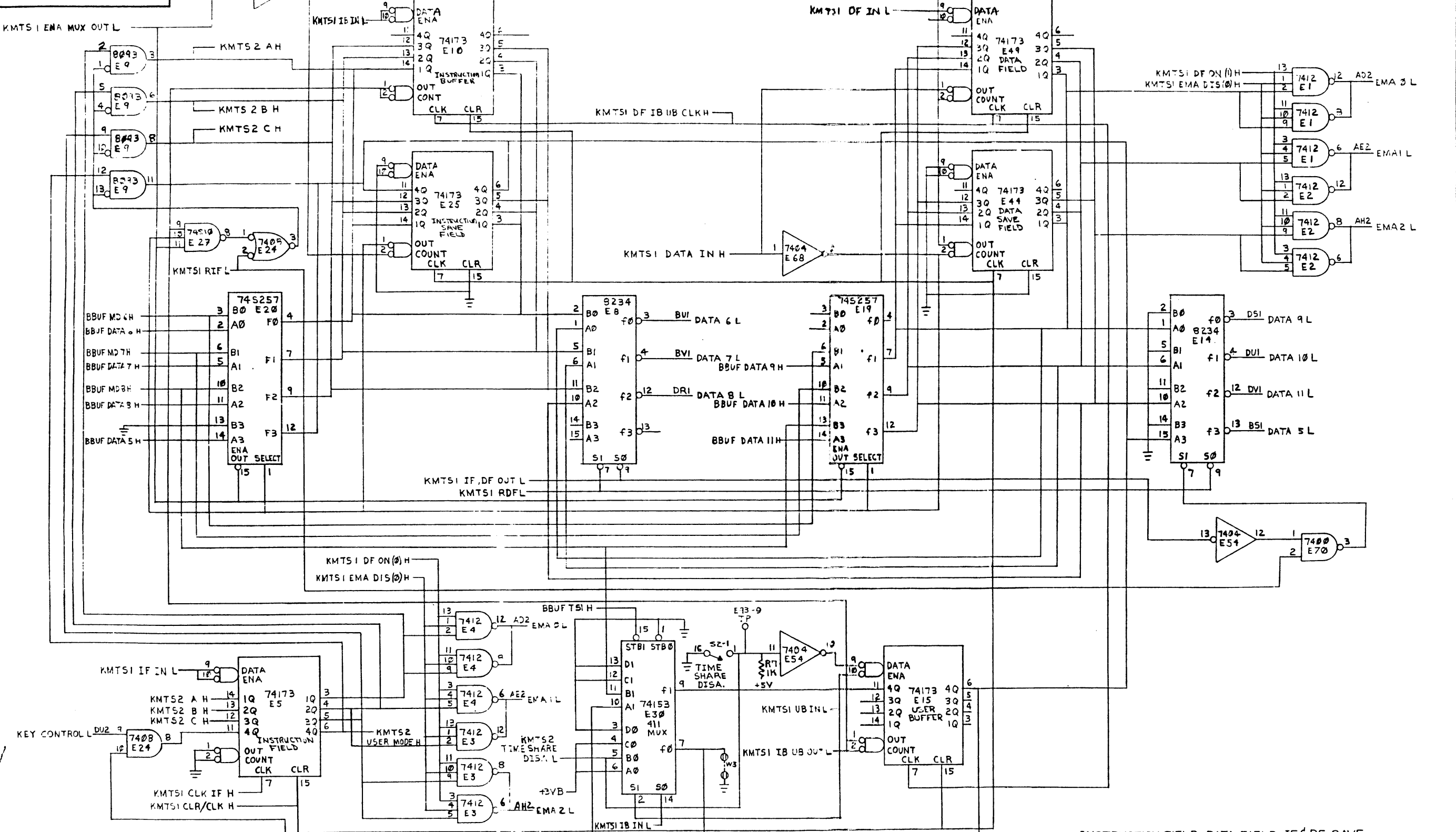
MEMORY EXT/TIME SHARE REGISTER CONTROL

| | | | | | | | |
|-------|-----------------------------|-----------|------|--------|------------|-------|---|
| TITLE | OPTION BOARD #2 (KMTS 1) | SIZE/CODE | D 05 | NUMBER | MB317-Y9-1 | REV. | S |
| SCALE | NONE | SHEET | 3 | OF | 7 | DIST. | |

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D
C
B
A

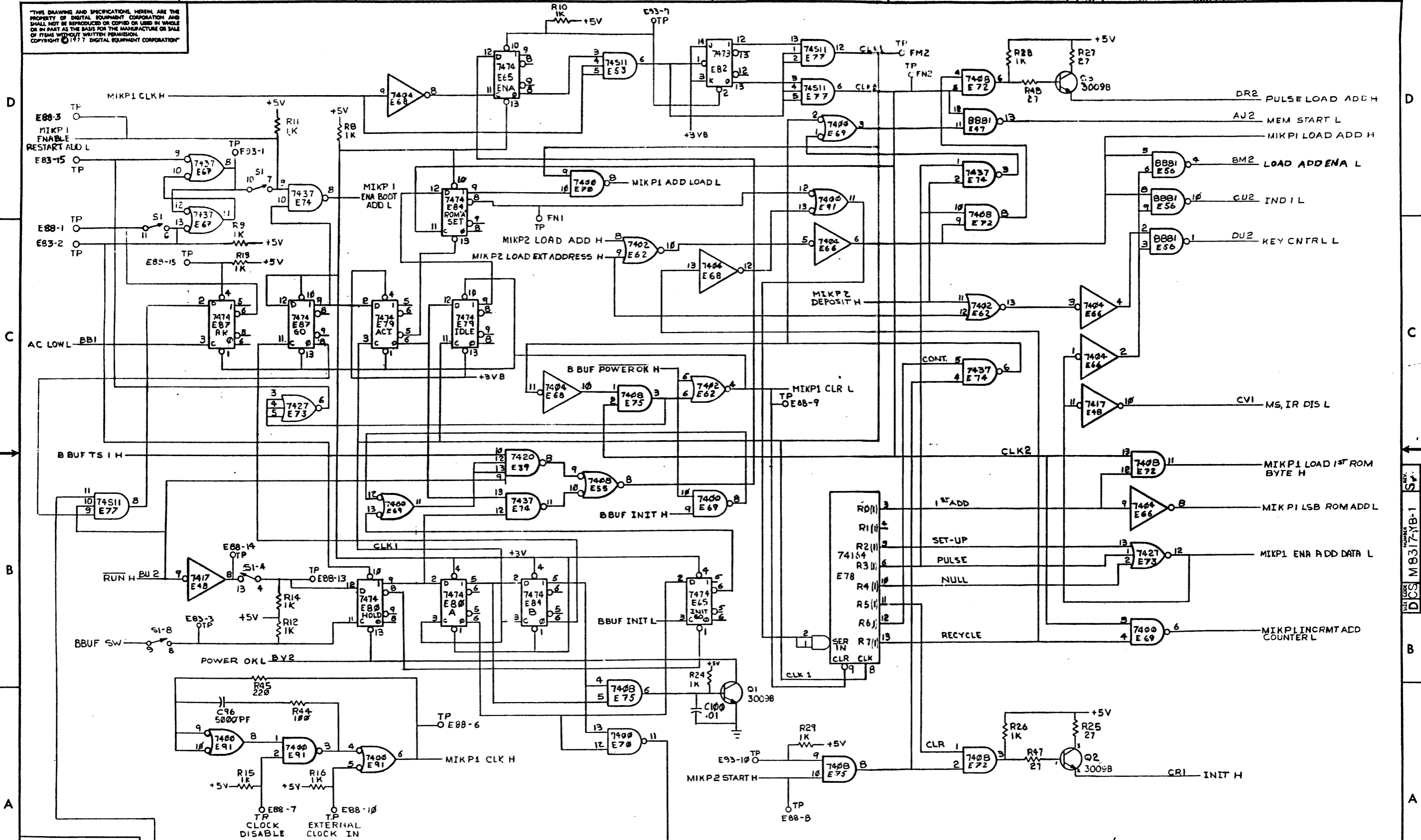
D
C
B
A



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

| | | | |
|--|-------------------------|-----------|--------|
| INSTRUCTION FIELD, DATA FIELD, IF & DF SAVE FIELD, INSTRUCTION BUFFER, USER BUFFER | | | |
| TITLE | OPTION BOARD #2 (KMTS2) | SIZE CODE | D CS |
| NUMBER | M6317-YB-1 | REV. | S |
| SCALE | NONE | SHEET | 4 OF 7 |

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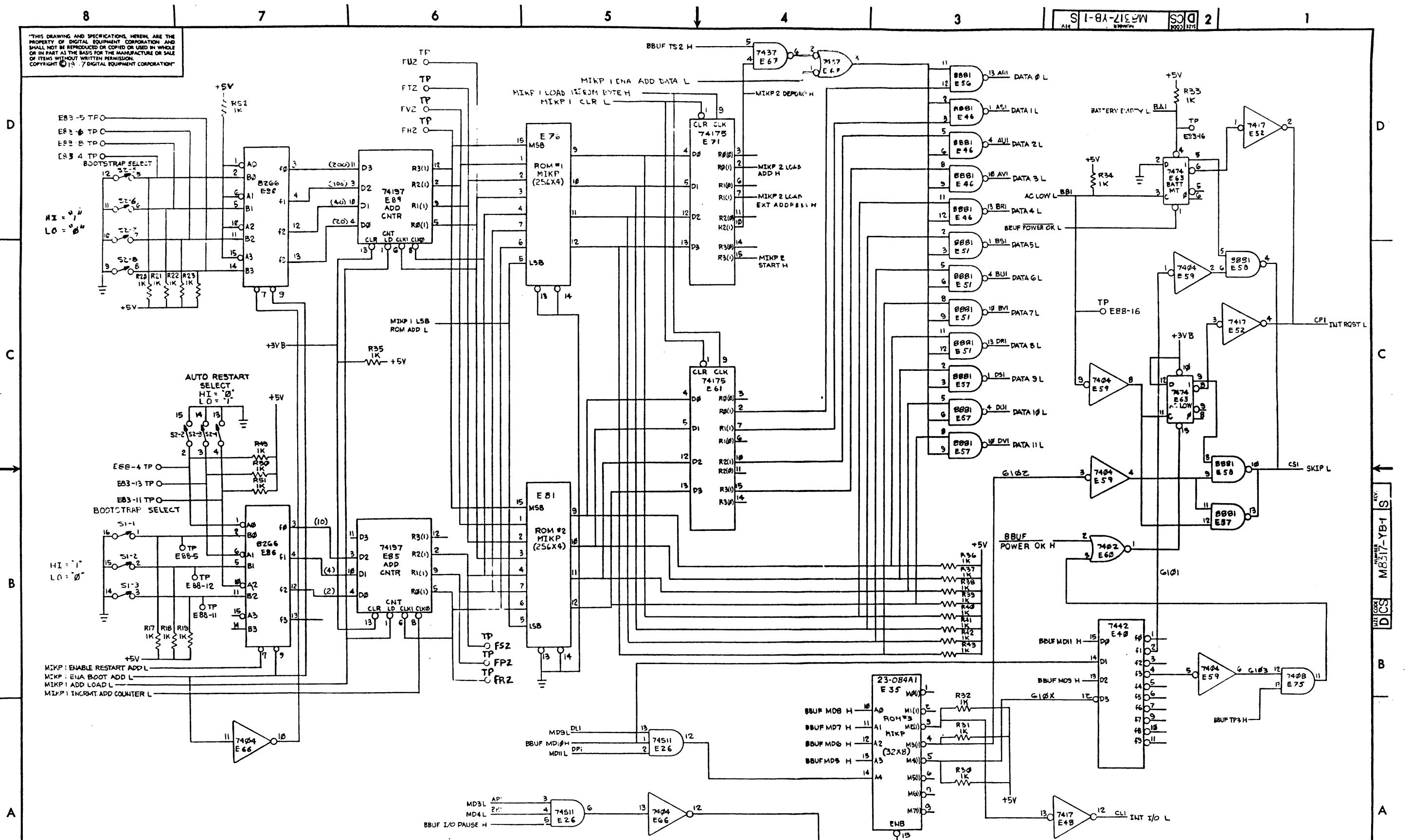


BOOTSTRAP/AUTORESTART CONTROL

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

| | | | | | | | |
|-------|--------------------------|-----------|------|--------|------------|-------|---|
| TITLE | OPTION BOARD # 2 (MIKP1) | SIZE CODE | D CS | NUMBER | M8317-YB-1 | REV. | S |
| SCALE | + | SHEET | 5 | OF | 7 | DIST. | |

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

| | | | | | | | | | |
|-------|--|-----------------|--|-----------|--|------------|--|-------|--|
| TITLE | | OPTION BOARD #2 | | SIZE CODE | | NUMBER | | REV. | |
| | | (MKP 2) | | DCS | | M8317-YB-1 | | S2 | |
| SCALE | | NONE | | SHEET | | 6 OF 7 | | DIST. | |

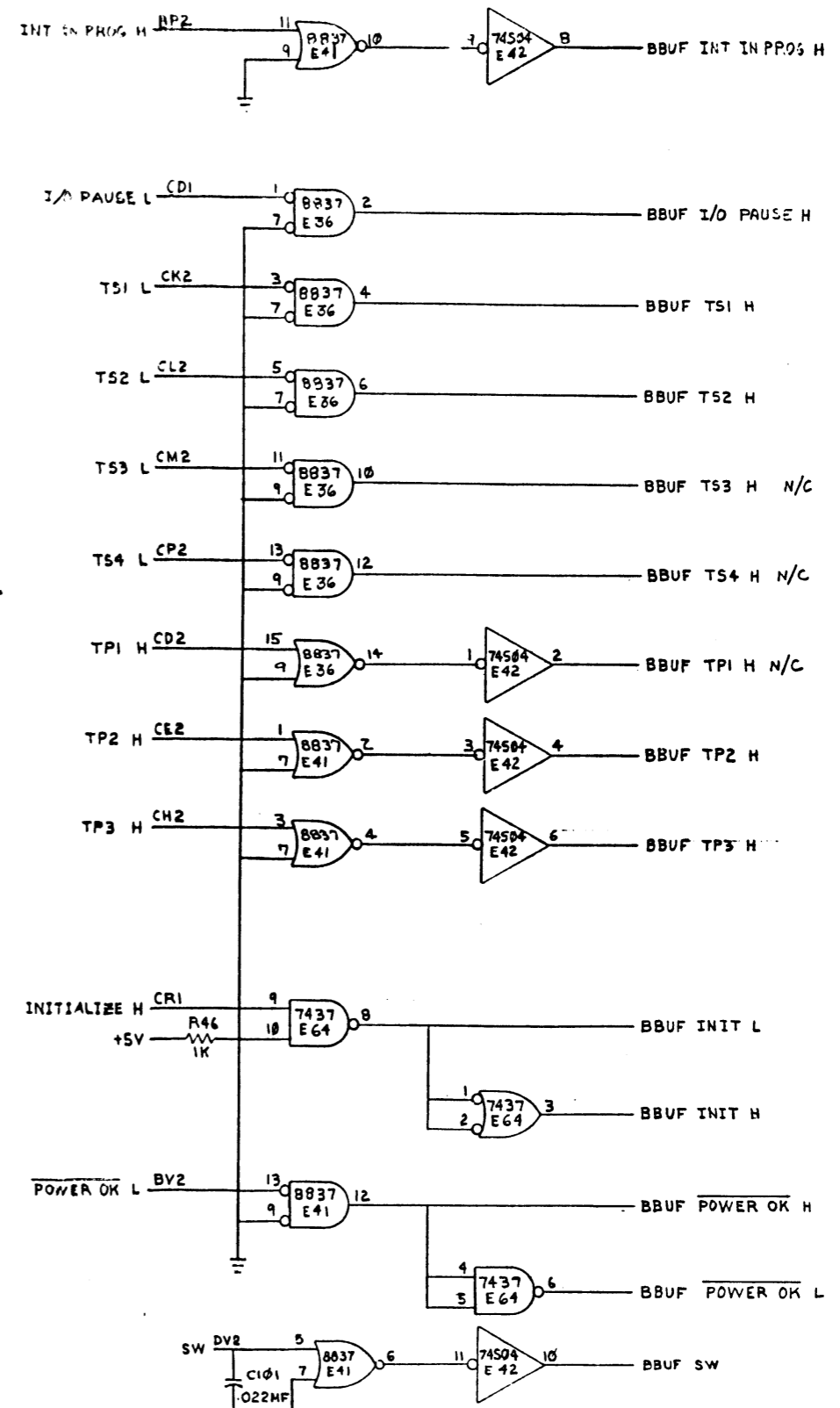
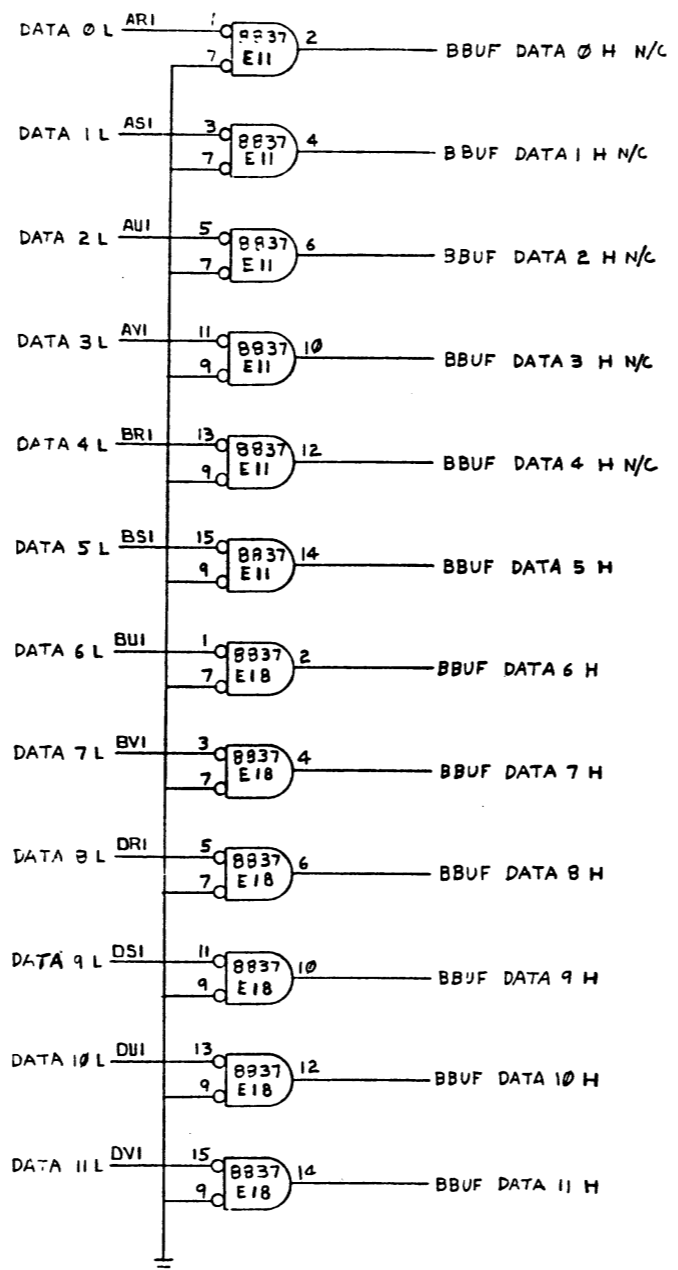
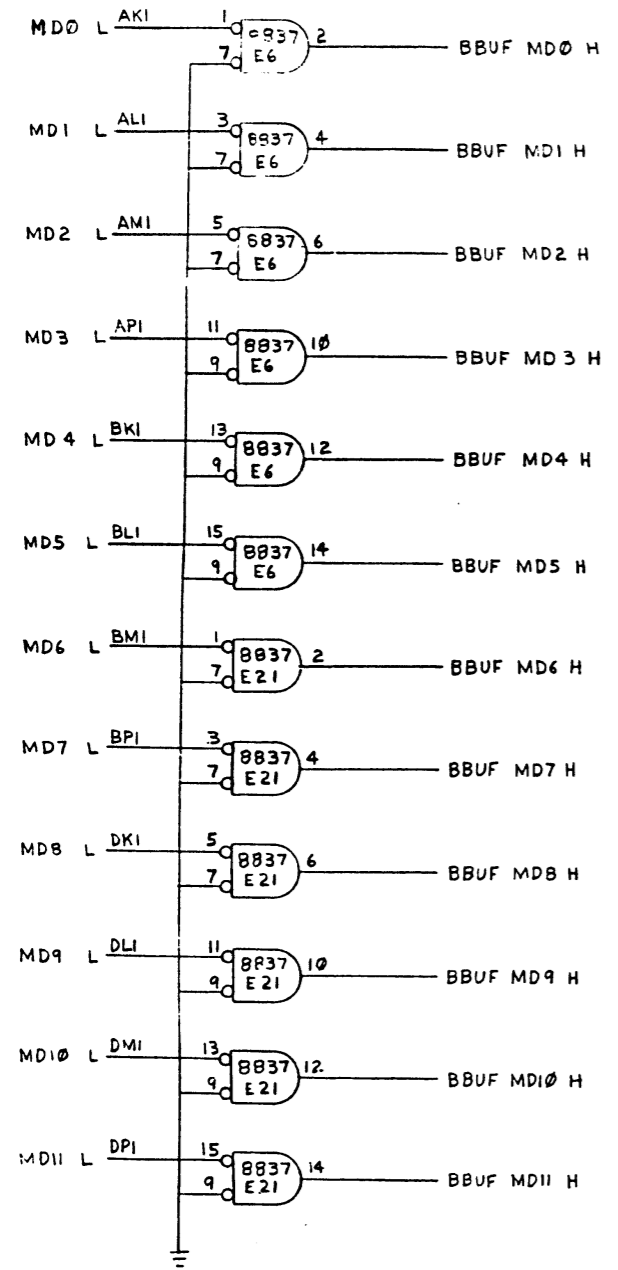
REV. S2 NUMBER M8317-YB-1 SIZE CODE DCS

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NOTE: SIGNALS WITH N/C HAVE NO CONNECTION

REV. 1
D CS M8317-YB-1

D
C
B
A



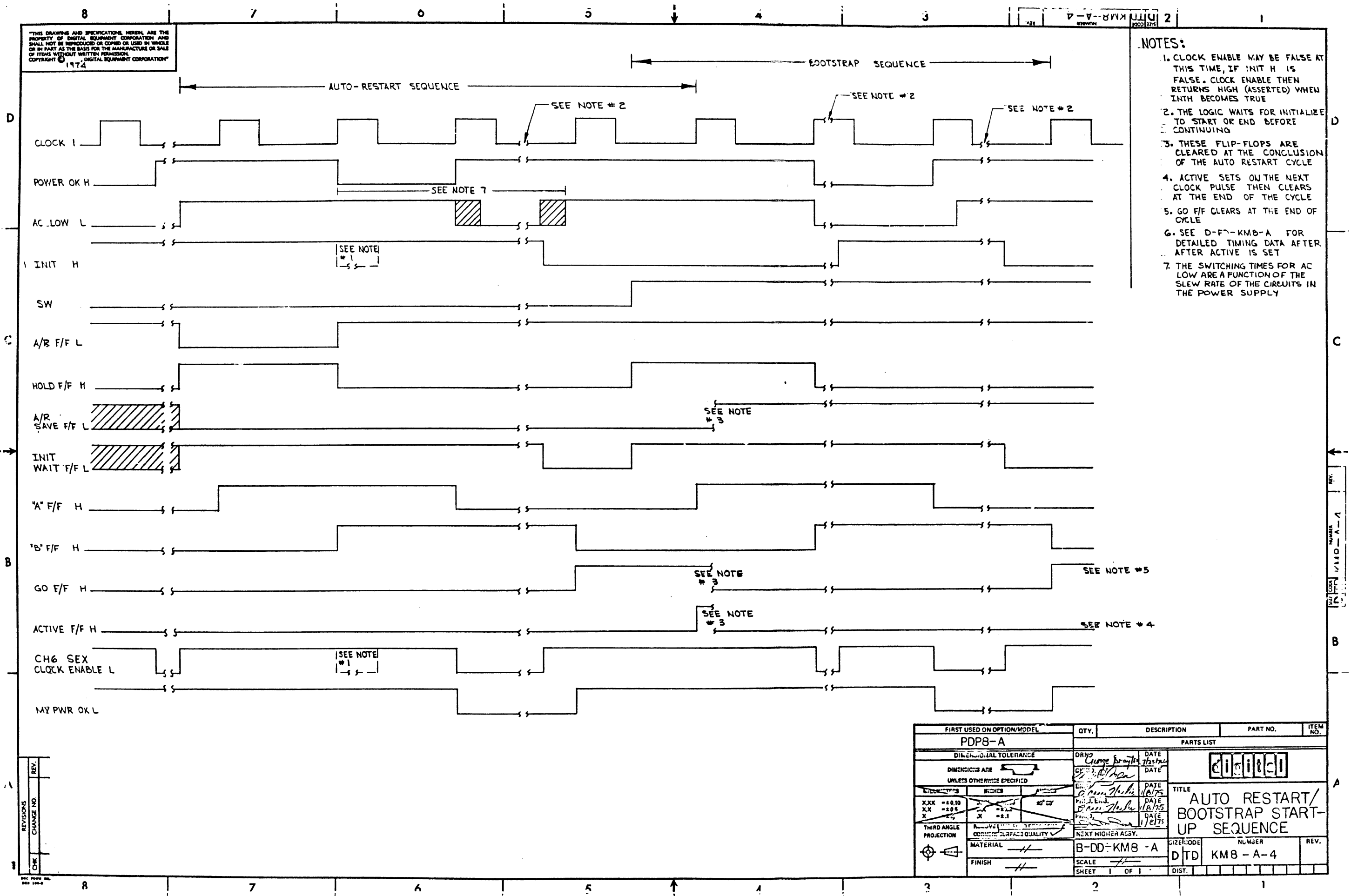
BUS BUFFERS

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

| | | | | | | | |
|-------|-------------------------------|------------|------|--------|------------|-------|---|
| TITLE | 8/A INTERNAL OPTION #2 (BBUF) | SIZE/SCALE | D CS | NUMBER | M8317-YB-1 | REV. | S |
| SCALE | NONE | SHEET | 7 | OF | 7 | DIST. | |

REV. 1
D CS M8317-YB-1

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 1974



- NOTES:
1. CLOCK ENABLE MAY BE FALSE AT THIS TIME, IF INIT H IS FALSE. CLOCK ENABLE THEN RETURNS HIGH (ASSERTED) WHEN INTH BECOMES TRUE
 2. THE LOGIC WAITS FOR INITIALIZATION TO START OR END BEFORE CONTINUING
 3. THESE FLIP-FLOPS ARE CLEARED AT THE CONCLUSION OF THE AUTO RESTART CYCLE
 4. ACTIVE SETS ON THE NEXT CLOCK PULSE THEN CLEARS AT THE END OF THE CYCLE
 5. GO F/F CLEARS AT THE END OF CYCLE
 6. SEE D-FD-KMB-A FOR DETAILED TIMING DATA AFTER ACTIVE IS SET
 7. THE SWITCHING TIMES FOR AC LOW ARE A FUNCTION OF THE SLEW RATE OF THE CIRCUITS IN THE POWER SUPPLY

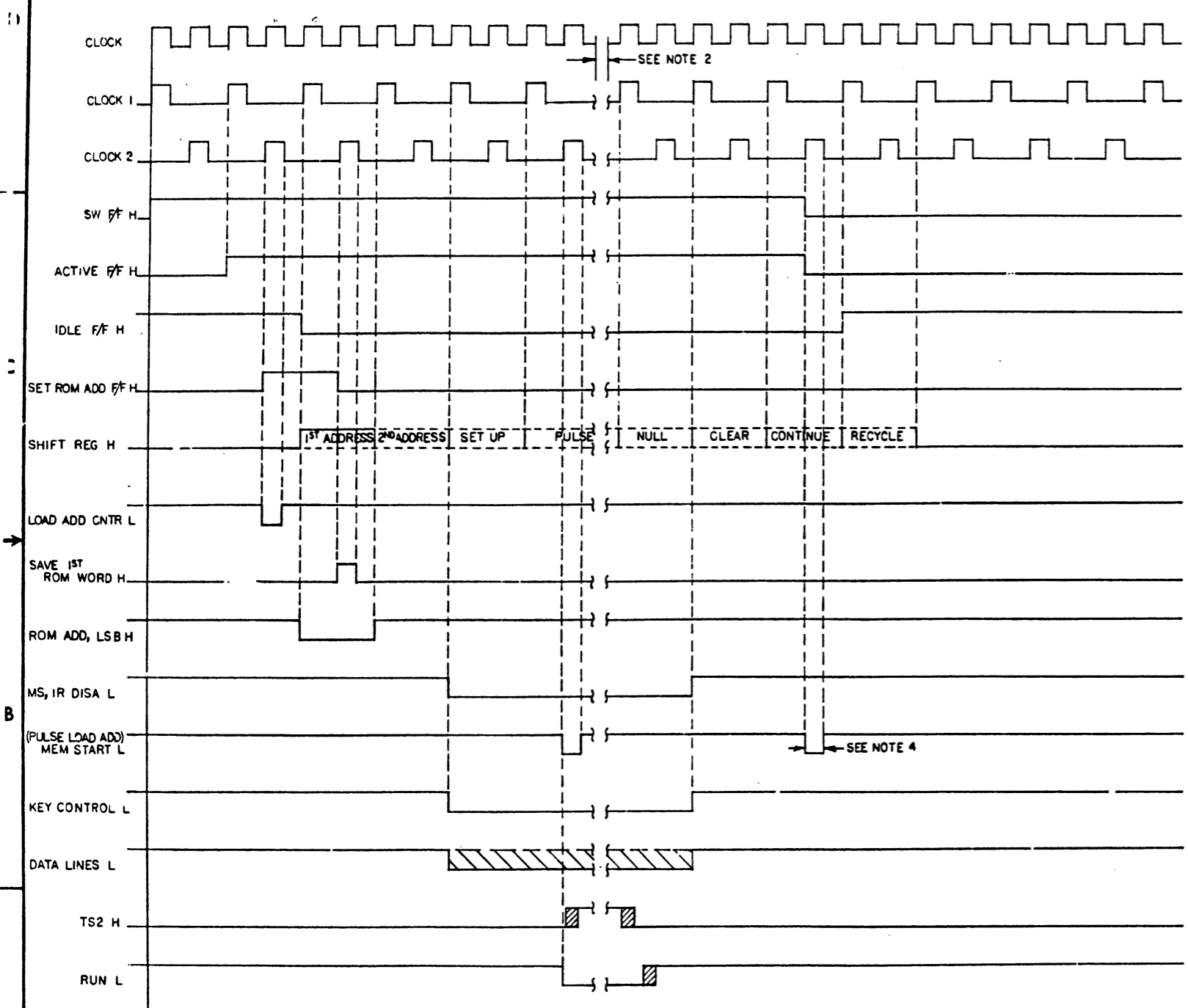
| REV. | CHANGE NO. |
|------|------------|
| | |

| | | | | | | | | | | | | | | |
|---|------------|--|-------------|----------|----------|-------|------------|--------|----------------|--|------|-------------|------|------|
| FIRST USED ON OPTION/MODEL | | QTY. | DESCRIPTION | PART NO. | ITEM NO. | | | | | | | | | |
| PDP8-A | | | | | | | | | | | | | | |
| DIMENSIONAL TOLERANCE | | PARTS LIST | | | | | | | | | | | | |
| DIMENSIONS ARE UNLESS OTHERWISE SPECIFIED | | <table border="1"> <tr> <td>DRND</td> <td>DATE</td> <td rowspan="4"> </td> </tr> <tr> <td>GEORGE BRAYTON</td> <td>DATE</td> </tr> <tr> <td>DATE</td> <td>DATE</td> </tr> <tr> <td>DATE</td> <td>DATE</td> </tr> </table> | | | | DRND | DATE | | GEORGE BRAYTON | DATE | DATE | DATE | DATE | DATE |
| DRND | DATE | | | | | | | | | | | | | |
| GEORGE BRAYTON | DATE | | | | | | | | | | | | | |
| DATE | DATE | | | | | | | | | | | | | |
| DATE | DATE | | | | | | | | | | | | | |
| THIRD ANGLE PROJECTION | | <table border="1"> <tr> <td>TITLE</td> <td>SIZE/SCALE</td> <td>NUMBER</td> <td>REV.</td> </tr> <tr> <td>AUTO RESTART/BOOTSTRAP START-UP SEQUENCE</td> <td>D TD</td> <td>KMB - A - 4</td> <td></td> </tr> </table> | | | | TITLE | SIZE/SCALE | NUMBER | REV. | AUTO RESTART/BOOTSTRAP START-UP SEQUENCE | D TD | KMB - A - 4 | | |
| TITLE | SIZE/SCALE | NUMBER | REV. | | | | | | | | | | | |
| AUTO RESTART/BOOTSTRAP START-UP SEQUENCE | D TD | KMB - A - 4 | | | | | | | | | | | | |
| FINISH | | <table border="1"> <tr> <td>SCALE</td> <td>SHEET</td> <td>OF</td> <td>DIST.</td> </tr> <tr> <td></td> <td>1</td> <td>1</td> <td></td> </tr> </table> | | | | SCALE | SHEET | OF | DIST. | | 1 | 1 | | |
| SCALE | SHEET | OF | DIST. | | | | | | | | | | | |
| | 1 | 1 | | | | | | | | | | | | |

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NOTES:

- ONE "DEPOSIT" CYCLE IS SHOWN IN : DIAGRAM.
- WHEN "RUN" IS TRUE (LOW) ALL TIMING IS HELD OFF UNTIL THE NEXT CLOCK PULSE AFTER "RUN" GOES FALSE (HIGH).
- FOR THE "LOAD ADD" CYCLE SIGNALS REMAIN THE SAME AS SHOWN EXCEPT THAT "PULSE LOAD ADD" REPLACES "MEM START" AND "KEY CONTROL" IS NEGATED. FOR "EXT. LOAD ADD" KEY CONTROL IS TRUE.
- MEM START APPEARS HERE ONLY FOR THE "START" FUNCTION. THE EARLIER MEM START IS FOR "DEPOSITS" ONLY.

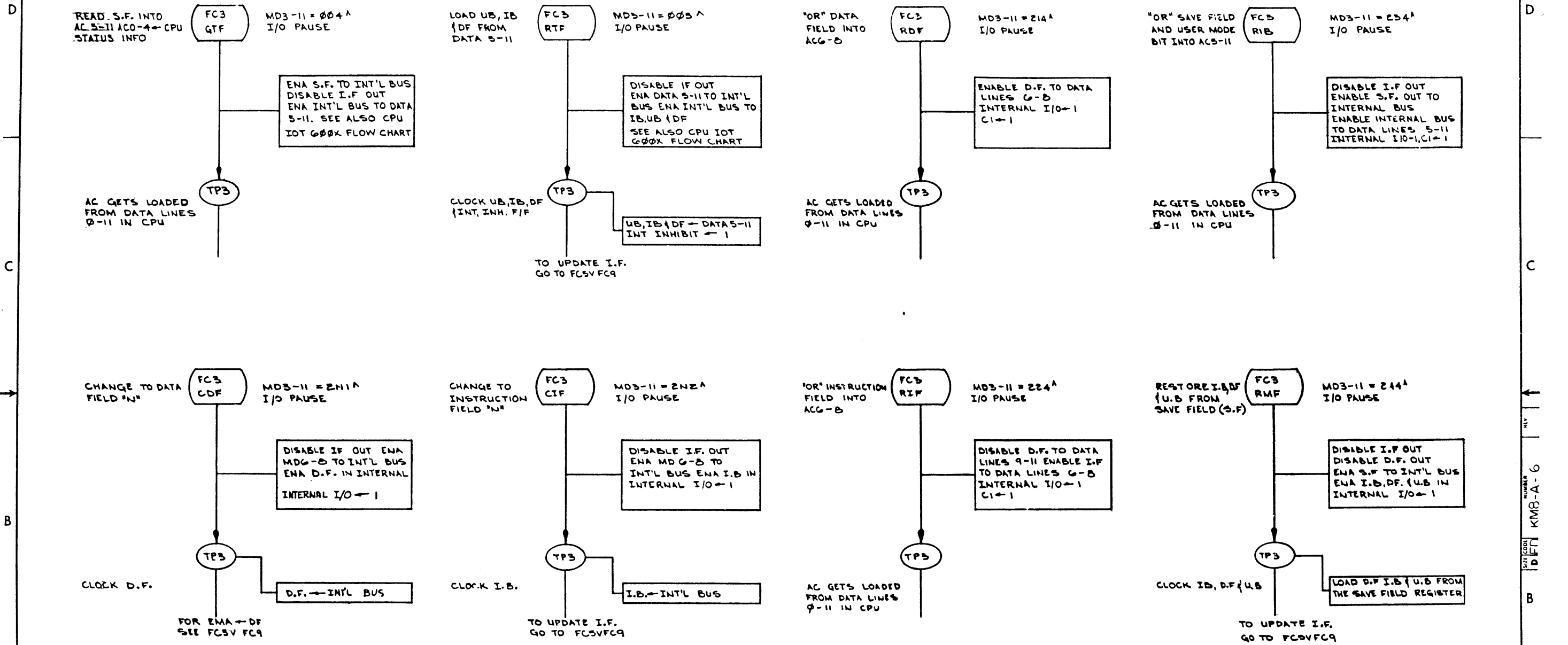


| | |
|------------|--|
| REV. | |
| CHANGE NO. | |
| CHK | |

| | | | | | |
|---|--|---------------------------------|--------------|--------------------|-------------------|
| FIRST USED ON OPTION/MODEL PDP8-A | | QTY. | DESCRIPTION | PART NO. | ITEM NO. |
| PARTS LIST | | | | | |
| DIMENSIONAL TOLERANCE DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED | | DRW. <i>mwhite</i> | DATE 7-31-74 | | |
| MILLIMETERS INCHES ANGLES XXX ±0.10 JXX ±0.025 90° 30' XX ±0.5 JX ±0.02 X ±2. X ±0.1 | | <i>W. J. L. L.</i> | DATE 1-8-75 | | |
| THIRD ANGLE PROJECTION MATERIAL FINISH | | NEXT HIGHER ASSY. B-DD-KMB-A | | SHEET CODE D TD | NUMBER KMB-A-5 |
| | | SCALE NONE | | DIST. | REV. |
| | | SHEET OF 1 | | | |

D I T D KMB-A-5

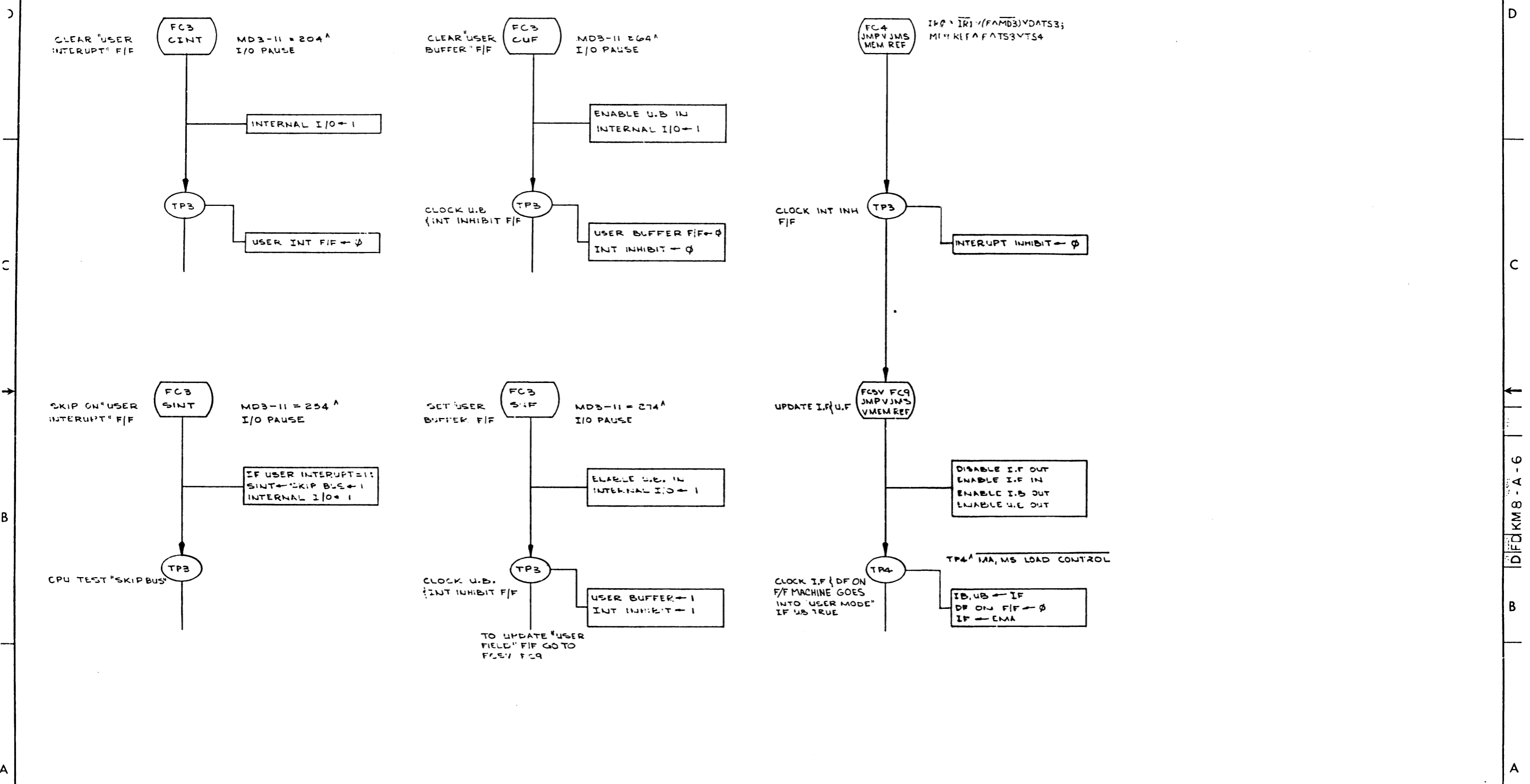
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| | |
|------|-----|
| REV. | NO. |
| | |
| CHK | |

| | | | | |
|--|--|--|--|--|
| FIRST USED ON OPTION MODEL PDP8A | QTY. | DESCRIPTION | PART NO. | ITEM NO. |
| PARTS LIST | | | | |
| UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES TOLERANCES DECIMALS FRACTIONS ANGLES ± .008 ± 1/64 ± 0°27' FINAL SURFACE QUALITY REMOVE BURRS AND BREAK SHARP CORNERS | DATE 12/23/74 G.M. DATE 12/23/74 S.M. DATE 12/23/74 S.M. DATE 12/23/74 S.M. | DATE 12/23/74 DATE 12/23/74 DATE 12/23/74 DATE 12/23/74 | DATE 12/23/74 DATE 12/23/74 DATE 12/23/74 DATE 12/23/74 | DATE 12/23/74 DATE 12/23/74 DATE 12/23/74 DATE 12/23/74 |
| MATERIAL // | SCALE B-DD-KMB-A | TITLE FLOW CHART FOR OPTION BOARD #2 M8317 | NUMBER DFO KMB-A-6 | REV. |
| FINISH // | SHEET 1 OF 2 | DIGT. | | |

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

| DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS | | | | | | |
|---|---------------|--------|-----------|-----------|----------|-----------|
| ENGINEERING SPECIFICATION | | DATE | 5/8/74 | | | |
| TITLE ROM PROGRAMMING DIRECTIONS FOR 8A OPTION BOARD #2 KMB-AD (M8317-YC) | | | | | | |
| REVISIONS | | | | | | |
| REV | DESCRIPTION | CHG NO | ORIG DATE | APPD BY | DATE | |
| A | E.C.O. CHANGE | 00001 | L.NARHI | 14 MAY 76 | L. Narhi | 21 MAY 76 |
| B | E.C.O. CHANGE | 00002 | L.NARHI | 12-14-77 | L. Narhi | 5-14-80 |

| | | | | | | | | | | | | |
|----------------------|-------------|------|-------------|----------|------|---|------|----|--------|---------|-----|---|
| ENG | Larry Nathi | APPD | Larry Narhi | 12/24/74 | SIZE | A | CODE | SP | NUMBER | KMB-A-7 | REV | B |
| DEC FORM NO. DRA 108 | | | | | | | | | | | | |
| 1 of 6 | | | | | | | | | | | | |

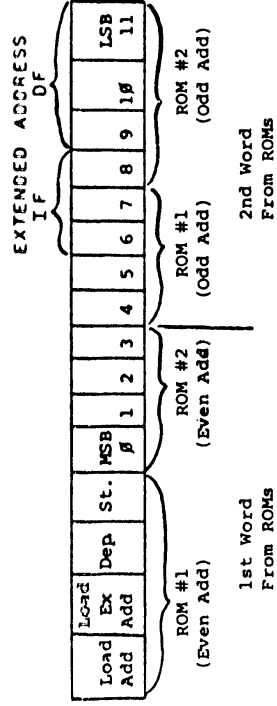
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| ENGINEERING SPECIFICATION | | CONTINUATION SHEET |
|---|--|--|
| TITLE ROM PROGRAMMING DIRECTIONS FOR 8A OPTION BOARD #2 KMB-AD (M8317-YC) | | |
| 1. | <p>Introduction</p> <p>This document describes the organization of the two 256 x 4 ROMs, hereafter called ROM #1 and ROM #2, that control and supply data for the Auto-Restart and Bootstrap portions of Option Board #2.</p> <p>This information is made available to help users program their own ROMs for their specific Auto-Restart and/or Bootstrap program(s).</p> <p>Organization</p> <p>The two ROMs are connected as follows: the address lines are connected in parallel; i.e., two corresponding address lines of each ROM are connected together, the outputs are arranged in serial fashion forming an 8 bit word, 4 outputs from each ROM. Because 12 bits are required for data/address information, two sequential addresses must be accessed from the ROMs to form a 16 bit word. Where the first 8 bits are temporarily stored in a register, then the next 8 bits are accessed from the ROMs. At this point the control then decides what to do with 12 of the 16 bits. There are four possible actions that can take place at this time:</p> <ol style="list-style-type: none"> Load Address Load Extended Address, IF AND DF Deposit Start <p>The remaining 4 bits of the 16 actually tell the control which of the four actions are to take place. So the 16 bit word would look like the word in Figure 1.</p> | SIZE A CODE SP NUMBER KMB-A-7 REV B |
| DEC FORM NO DEC 16-(181)-1022-N370 DRA 108 | | |
| SHEET 2 OF 6 | | |

| ENGINEERING SPECIFICATION | | CONTINUATION SHEET |
|---|--|--|
| TITLE ROM PROGRAMMING DIRECTIONS FOR 8A OPTION BOARD #2 KMB-AD (M8317-YC) | | |
| 3. | <p>Auto-Restart/Bootstrap Sequence</p> <p>The following events should take place when an auto-restart is initiated:</p> <ol style="list-style-type: none"> LOAD THE IF AND DF AND START. <p>The following events should take place when the Bootstrap is initiated:</p> <ol style="list-style-type: none"> Load a 12 bit initial address. Load the IF AND DF Deposit 12 bit data words repeating as required by length of program to be deposited. Load a 12 bit starting address and start. | SIZE A CODE SP NUMBER KMB-A-7 REV B |
| DEC FORM NO DEC 16-(181)-1022-N370 DRA 108 | | |
| SHEET 3 OF 6 | | |

| ENGINEERING SPECIFICATION | | CONTINUATION SHEET |
|---|--|--|
| TITLE ROM PROGRAMMING DIRECTIONS FOR 8A OPTION BOARD #2 KMB-AD (M8317-YC) | | |
| 4. | <p>ROM Programming Examples</p> <p>Auto-restart example:</p> <ol style="list-style-type: none"> Load address $\beta\beta\beta$ Load field β, start <p>Starting at ROM address $\beta\beta\beta$</p> <p>Bootstrap example:</p> <ol style="list-style-type: none"> Load address $\beta\beta\beta$ Load field 7 (BOTH IF AND DF) Deposit $2\beta\beta\beta$ Deposit 6745 Deposit $\beta\beta\beta$ Deposit 765β Deposit 5$\beta\beta$4 Deposit 5733 Deposit 5$\beta\beta$1 Load address $\beta\beta\beta$4 and start <p>Starting at ROM address 124.</p> | SIZE A CODE SP NUMBER KMB-A-7 REV B |
| DEC FORM NO DEC 16-(181)-1022-N370 DRA 108 | | |
| SHEET 4 OF 6 | | |

Figure 1



The use of ROMs that have 256 addressable locations allows up to 128 words of ROM storage. These 128 locations may be used for Bootstrap and/or Auto-restart programs. Any Auto-restart or Bootstrap program may be located anywhere in the ROMs so long as the program starts in an even address in the ROM. If it is required that both Bootstrap and Auto-restart programs be accessible at the same time, activated by different signals; of course the Auto-restart program(s) must be located in addresses β through 15 in the ROMs. This is due to the addressing limits of the Auto-restart select switches.

The decision to do a Bootstrap or an auto-restart is directed by a set of switches on the module. The Bootstrap may be actuated by the transition of the signal AC Low from a logic low to a logic high or by a similar transition of the SW line on the OMNIBUS.

AN AUTO-RESTART MAY ONLY BE INITIATED BY THE AC LOW SIGNAL. IT SHOULD BE OBVIOUS THAT BOTH THE BOOTSTRAP OR AUTO-RESTART SHOULD NOT BE ACTIVATED BY THE SAME INITIALIZING SIGNAL.

TITLE ROM PROGRAMMING DIRECTIONS FOR 8A OPTION BOARD #2 KM8-AD (M8317-YC)

Auto-Restart example:

| Bit Add | ROM #1 | | | | ROM #2 | | | |
|------------|--------|---|---|---|--------|---|---|---|
| | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 |
| 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Load Address
0200
Load Ext. Add 0
and Start

NOTE: Logic one (1) = +3V

Bootstrap example:

| Bit Add | ROM #1 | | | | ROM #2 | | | |
|------------|--------|---|---|---|--------|---|---|---|
| | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 |
| 124 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 125 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 126 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 127 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 130 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 131 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 132 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 133 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 134 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 135 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 136 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| 137 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 140 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 141 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 142 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 143 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 144 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 145 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 146 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 147 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |

Load Add 0023
Load Ext Add 7
Dep 2000
Dep 6745
Dep 0023
Dep 7650
Dep 5024
Dep 6733
Dep 5031
Load Add 24 & Start

SIZE CODE NUMBER REV
A SP KM8-A-7 B

TITLE ROM PROGRAMMING DIRECTIONS FOR 8A OPTION BOARD #2 KM8-AD (M8317-YC)

5. ROMs

Unprogrammed ROMs should be purchased by the user from Digital Equipment Corporation. The part number for an unprogrammed 256 x 4 ROM is 23-000A2.

SIZE CODE NUMBER REV
A SP KM8-A-7 B