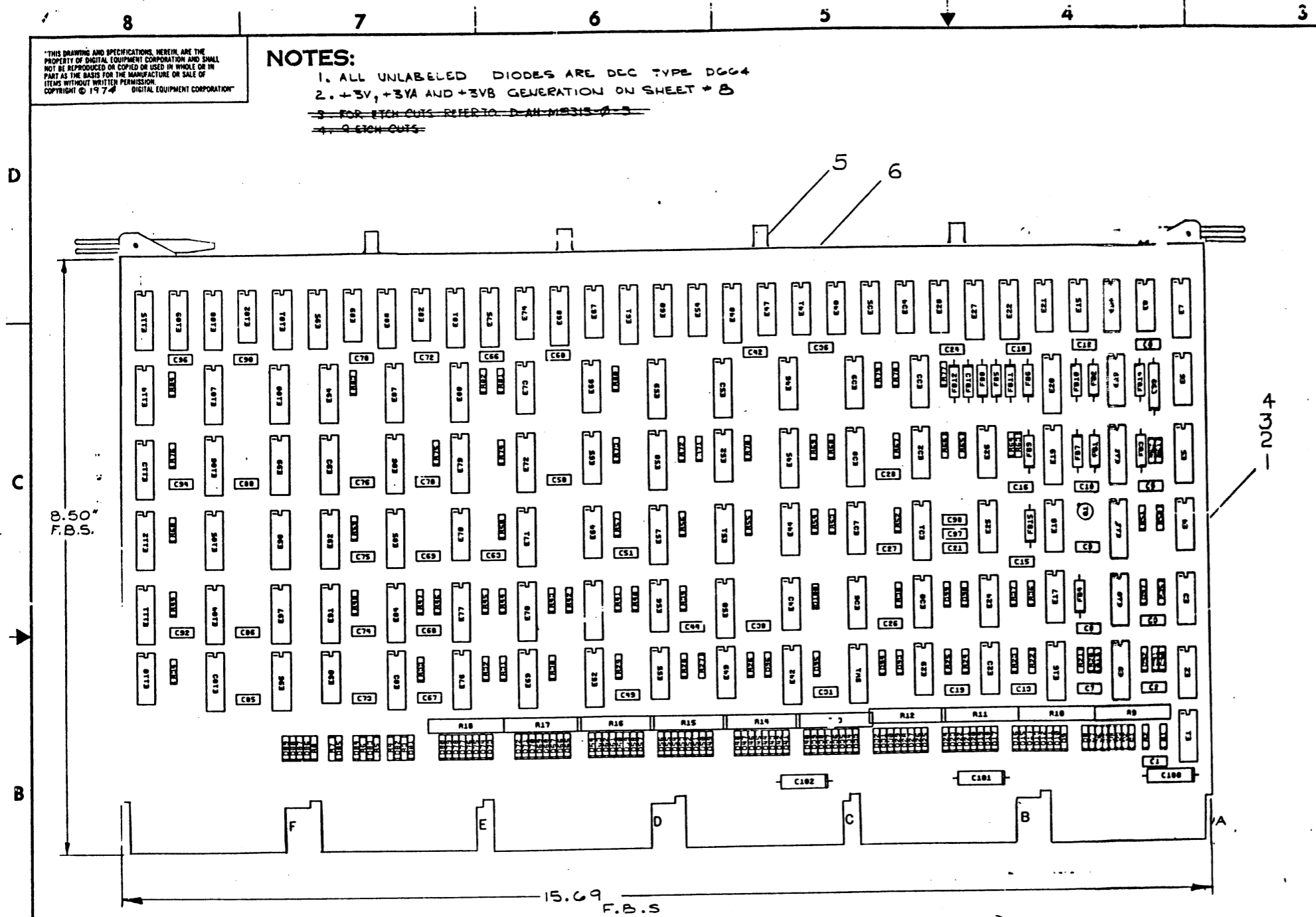


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NOTES:

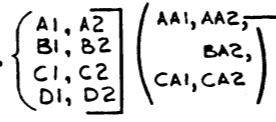
- ALL UNLABELED DIODES ARE DEC TYPE DGG4
- +3V, +3VA AND +3VB GENERATION ON SHEET # 8
- ~~FOR ETCH CUTS REFER TO D-AH-M8315-4-3~~
- ~~ETCH CUTS~~



IC 74157	B	16
745159	B	16
74163	B	16
745175	B	16
745194	B	16
380	B	16
8097	B	16
8235	B	16
8234	B	16
8271	B	16
74173-1	B	16
256 BIT ROM	B	16
IC TYPE	GND	+5V

1024 BIT ROM	B	16
7442	B	16
7483	B	16
74120	B	16
74123	B	16
745139	B	16
74151	B	16
74153	B	16
IC TYPE	GND	+5V

GND. CONNECTION—PINS C,F,N,T ON CONNECTORS



FOR ALL 0.047 μ f 0.01 μ f CAPS

REF	X-Y COORDINATE HOLE LOCATION	K-CO-M8315-#-4	ITEM NO.
REF	ASSY/DRILLING HOLE LAYOUT	D-AH-M8315-#-5	2
REF	MODULE ECO HISTORY	B-MH-8315-#-8	3
1	ETCHED CIRCUIT BOARD	5010932	4
1	HEX BOARD HANDLE ASSY	1210711-2	5
12	EYELETS	9006732	6
3	C100 THRU C102	CAP 0.047uf 35V 10%	1005306
2	C97,C98	CAP .047uf 16V DISC	1009678
1	C99	CAP 15uf 20V 10%	1004812
48	C1 THRU C3, C5 THRU C10, C12, C13, C15, C18, C19, C21, C24, C26, C27, C28, C31, C38, C39, C42, C44, C49, C51, C58, C60, C63, C68 THRU C70, C72 THRU C76, C78, C85, C88, C89, C90, C92, C94, C98	CAP .01uf 100V DISC	1001610-01
8	D88 THRU D92, D97	DIODE D882	1100113
92	D1 THRU D85, D93 THRU D98, D98 THRU D100	DIODE D864	1100114
1	SW1	DIP SWITCH PACKAGE	1211164-#4
11	R2, R5, R6, R8, R19, R36, R62 THRU R68	RES 390 1/4W 5%	1300309
12	R1, R3, R4, R7, R20, R21, R23 THRU R26, R35, R37	RES 470 1/4W 5%	1300316
45	R22, R27, R29 THRU R34, R39 THRU R49, R52, R53, R55 THRU R60, R67 THRU R84	RES 1K 1/4W 5%	1300365
1	R28	RES 3.3K 1/4W 5%	1300439
1	R81	RES 22K 1/4W 5%	1301808
2	R50, R51	RES 27 1/4W 5%	1301522
5	R9, R10, R13, R14, R18	RES PACK 390 OHM	1312114-00
5	R11, R12, R15, R16, R17	RES PACK 470 OHM	1312114-01
2	R38, R54	RES 150 1/4W 5%	1300250
1	Q1	TRANSISTOR DEC 3009B	1503100
15	FB1 THRU FB15	FERRITE BEAD CHOKES	1611257-#1
1	E2	20 MHZ X'TAL OSC	1811680-00
8	E1, E10, E17, E26, E29, E46	IC DEC 74500	1910532
1	E33	IC DEC 7402	1909004
8	E3, E23, E25, E40, E58, E78, E82, E89	IC DEC 74504	1910534
3	E47, E65, E74	IC DEC 7408	1910155
3	E24, E64, E90	IC DEC 74S10	1910536
2	E13, E28	IC DEC 74S11	1910537
1	E60	IC DEC 7412	1909955
3	E44, E49, E52	IC DEC 7417	1909929
2	E110, E102	IC DEC 74H21	1909058
1	E54	IC DEC 7430	1905578
3	E41, E43, E68	IC DEC 7432	1911521
1	E14	IC DEC 7437	1910091
2	E18, E32	IC DEC 74S40	1910541
1	E71	IC DEC 7442	1910046
2	E4, E6	IC DEC 74S51	1911712
4	E8, E15, E21, E34	IC DEC 74S74	1910544
3	E85, E101, E113	IC DEC 7483	1909932
3	E19, E22, E27	IC DEC 74120	1911314
1	E7	IC DEC 74123	1910436
2	E20, E58	IC DEC 74S139	1911676
2	E48, E59	IC DEC 74151	1909936
1	E45	IC DEC 74153	1902937

FIRST USED ON OPTION MODEL PDP8 A

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

REVISIONS
 W. KLOTZ 12-1-74
 M8315-00001 C
 W. KLOTZ 12-1-74
 M8315-00004 E
 W. KLOTZ 12-1-74
 M8315-00000 F
 W. KLOTZ 12-1-74
 M8315-00000 G
 W. KLOTZ 12-1-74
 M8315-00000 H

SCALE: 1 of 10

TITLE: HEX OMNIBUS CPU

SIZE CODE: DCS
 NUMBER: M8315-0-1
 R.V. CODE: F

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1	E51	IC DEC 74157	1910655	48
7	E68, E79, E88, E95, E107, E109, E115	IC DEC 74S158	1910549	49
3	E75, E93, E94	IC DEC 74163	1911713	50
2	E5, E42	IC DEC 74S175	1910957	51
8	E9, E11, E12, E16, E61, E99, E100, E114	IC DEC 74S194	1910552	52
1	E36	IC DEC 380	1909485	53
2	E67, E73	IC DEC 8093	1910837	54
4	E77, E84, E104, E105	IC DEC 8097	1911527	55
3	E90, E86, E98	IC DEC 8234	1911315	56
3	E81, E87, E92	IC DEC 8235	1909935	57
1	E31	IC DEC 8271	1909615	58
5	E30, E35, E37, E39, E55	IC DEC 8881	1909705	59
11	E50, E62, E83, E91, E96, E97, E103, E106, E108, E111, E112	IC DEC 74173-1	1911320-01	60
1	E69	256 BIT ROM (A)	23078A1	61
1	E57	256 BIT ROM (B)	23077A1	62
1	E70	256 BIT ROM (C)	23076A1	63
1	E72	256 BIT ROM (D)	23075A1	64
1	E76	256 BIT ROM (E)	23074A1	65
1	E63	256 BIT ROM (H)	23073A1	66
1	E38	256 BIT ROM (J)	23079A1	67
1	E53	1024 BIT ROM (F)	23080A2	68
6	WIPE	30AWS GREEN	9105740	69

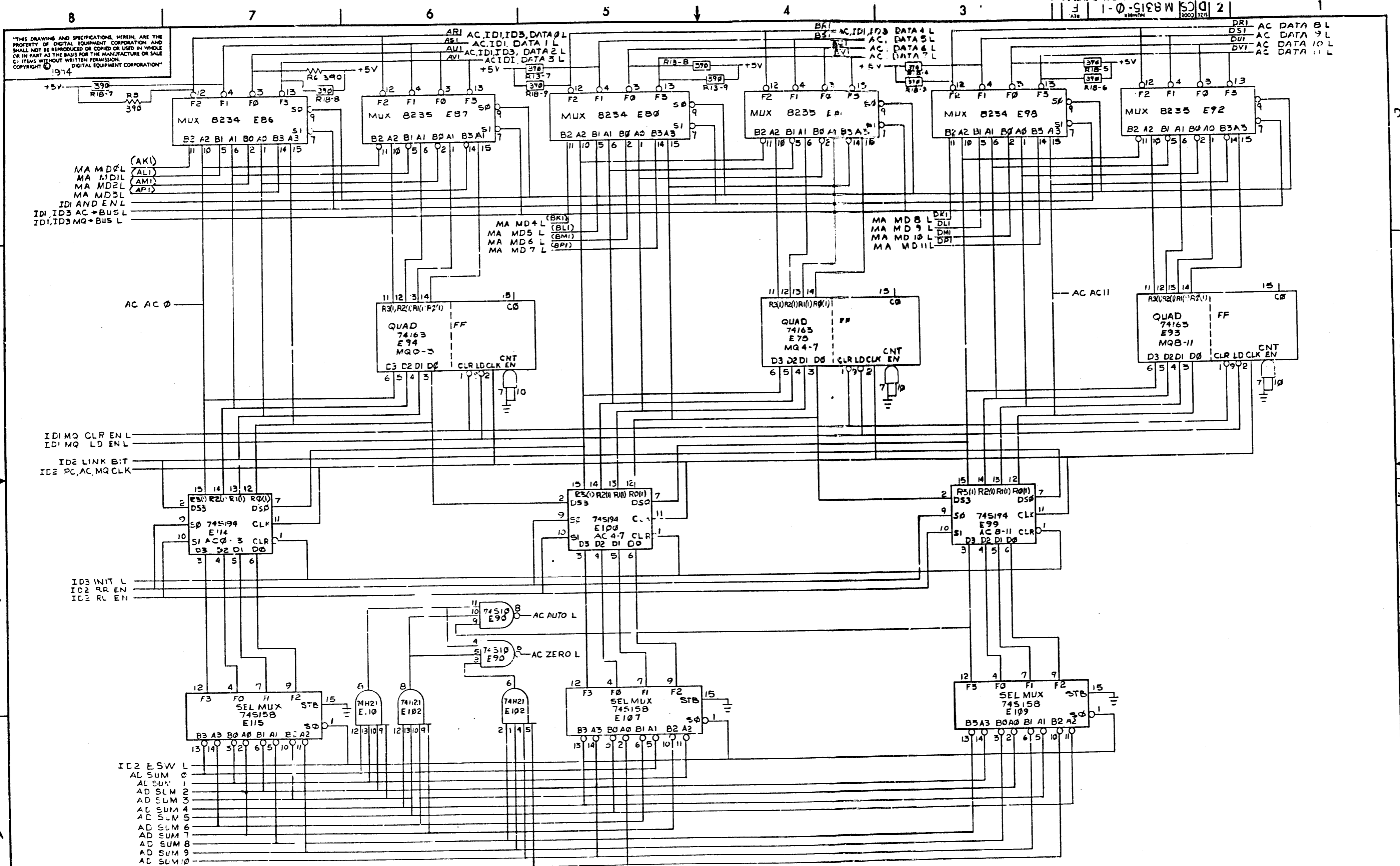
SWITCH SELECTION CHART
(FOR AUTO RESTART LOCATION)

SWI-	1	FIELD 7	} ONLY ONE SWITCH MAY BE CLOSED AT A TIME.
	2	4200	
	3	2200	
	4	1000	
	5	420	
	6	200	
	7	OFF (DISABLES AUTO RESTART)	
	8	OFF FOR NORMAL OPERATION	

COMPONENT SUBSTITUTION CHART

PART CALLED FOR			SUBSTITUTE PART		
QTY	PART NO	DESC	QTY	PART NO	DESC
1	1909485	IC 380	1	1910392	3350
			1	1909971	3380
			1	1910390	7330
			1	1911269	8640

REVISIONS		
CHK	CHANGE NO	REV



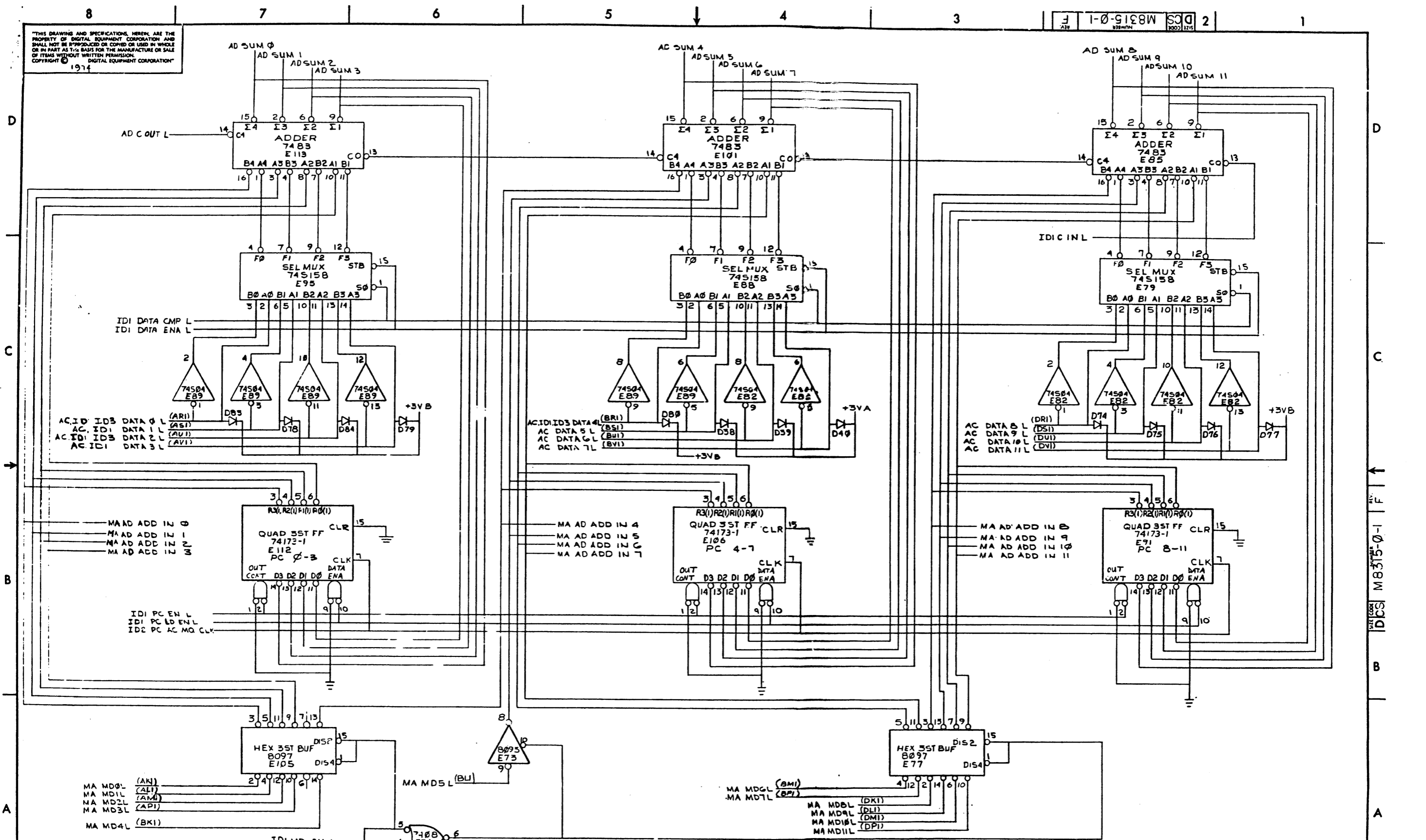
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REVISIONS		
CHK	CHANGE NO	REV

TITLE PDP8A CPU	SIZE CODE (AC) DCC	NUMBER M8315-0-1	REV. F
SCALE	SHEET 3 OF 10		

DCC M8315-0-1
 REV. F
 SHEET 3 OF 10

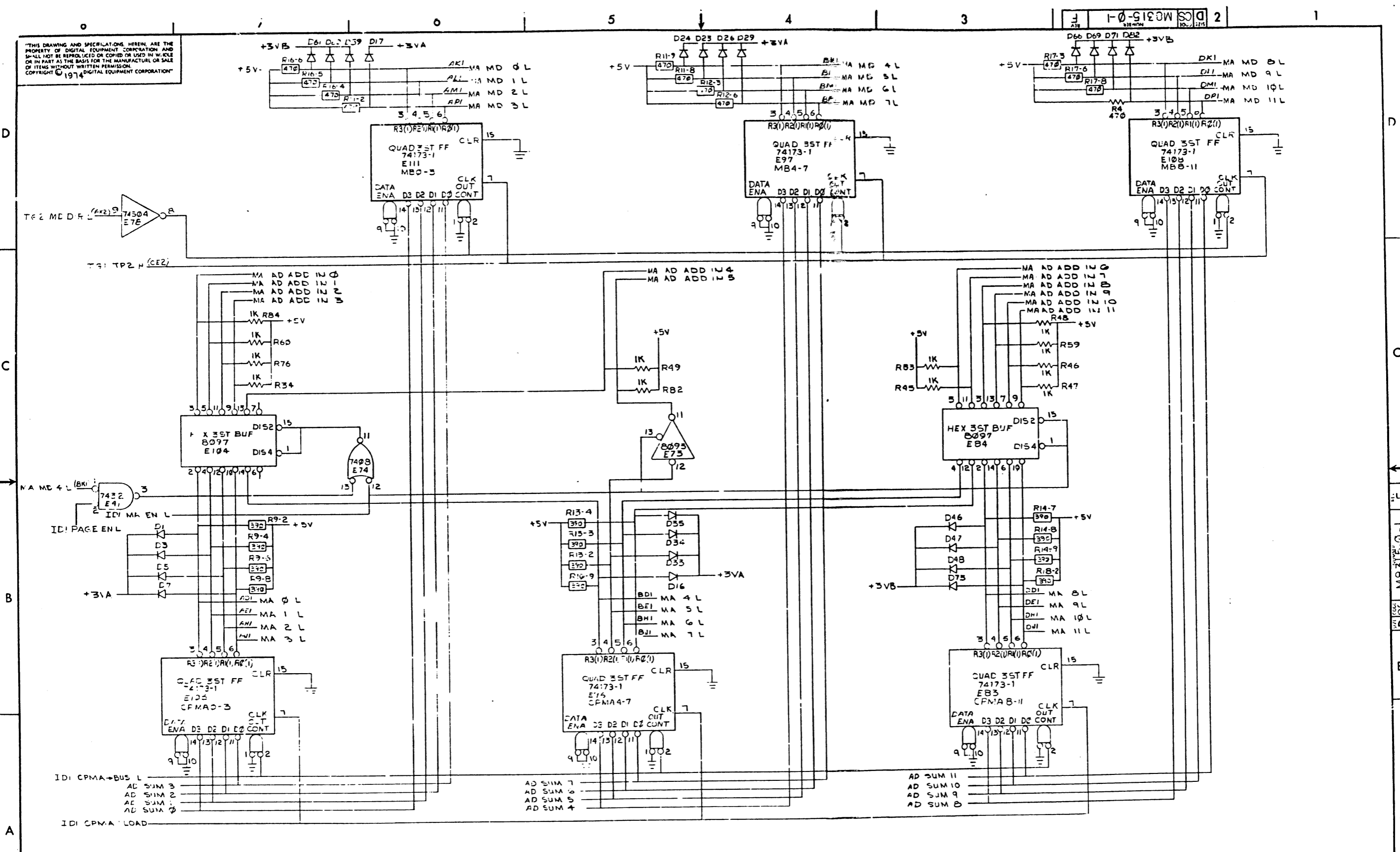
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REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	PDP8A CPU	SIZE CODE	(AD) DCS	NUMBER	M8315-0-1	REV.	F
SCALE	1/1	SHEET	4 OF 10	DIST.			

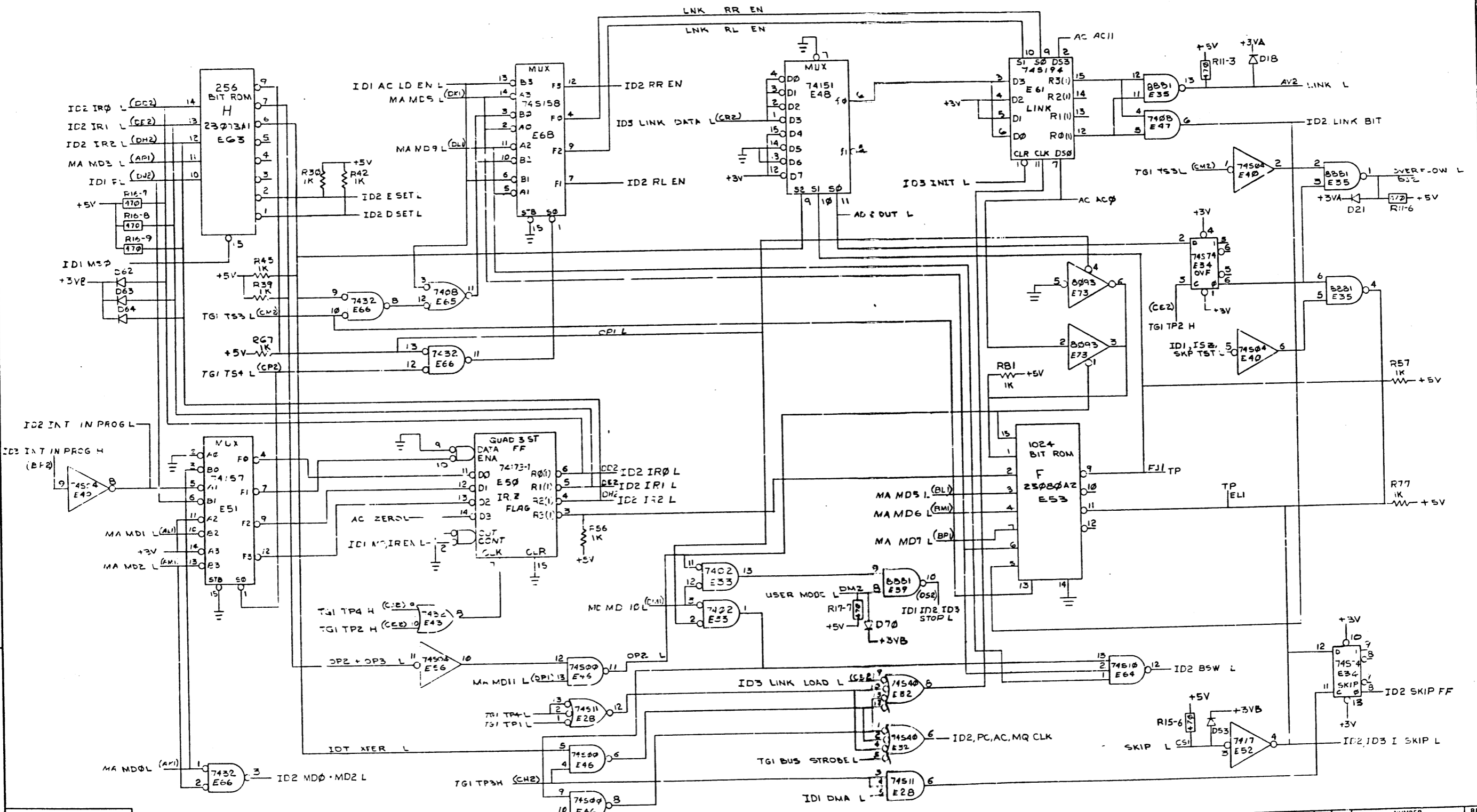
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REVISIONS		
CHK	CHANGE NO	REV

TITLE	PDP9A CPU (MA)	SIZE CODE	D.S.	NUMBER	13315-0-1	REV.	F
SCALE		SHEET	5	OF	10	DIST.	

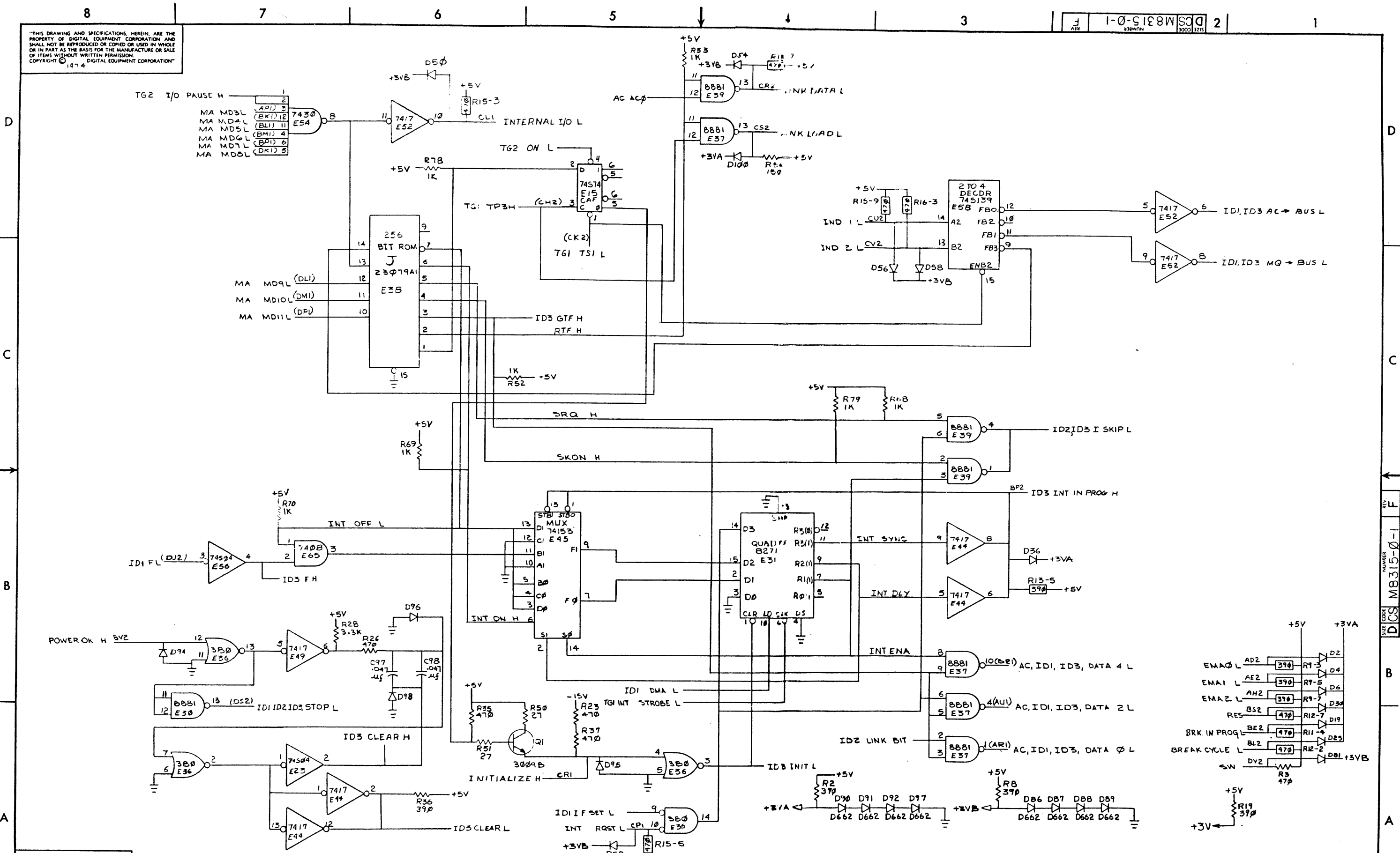
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REVISIONS		
CHK	CHANGE NO.	REV.

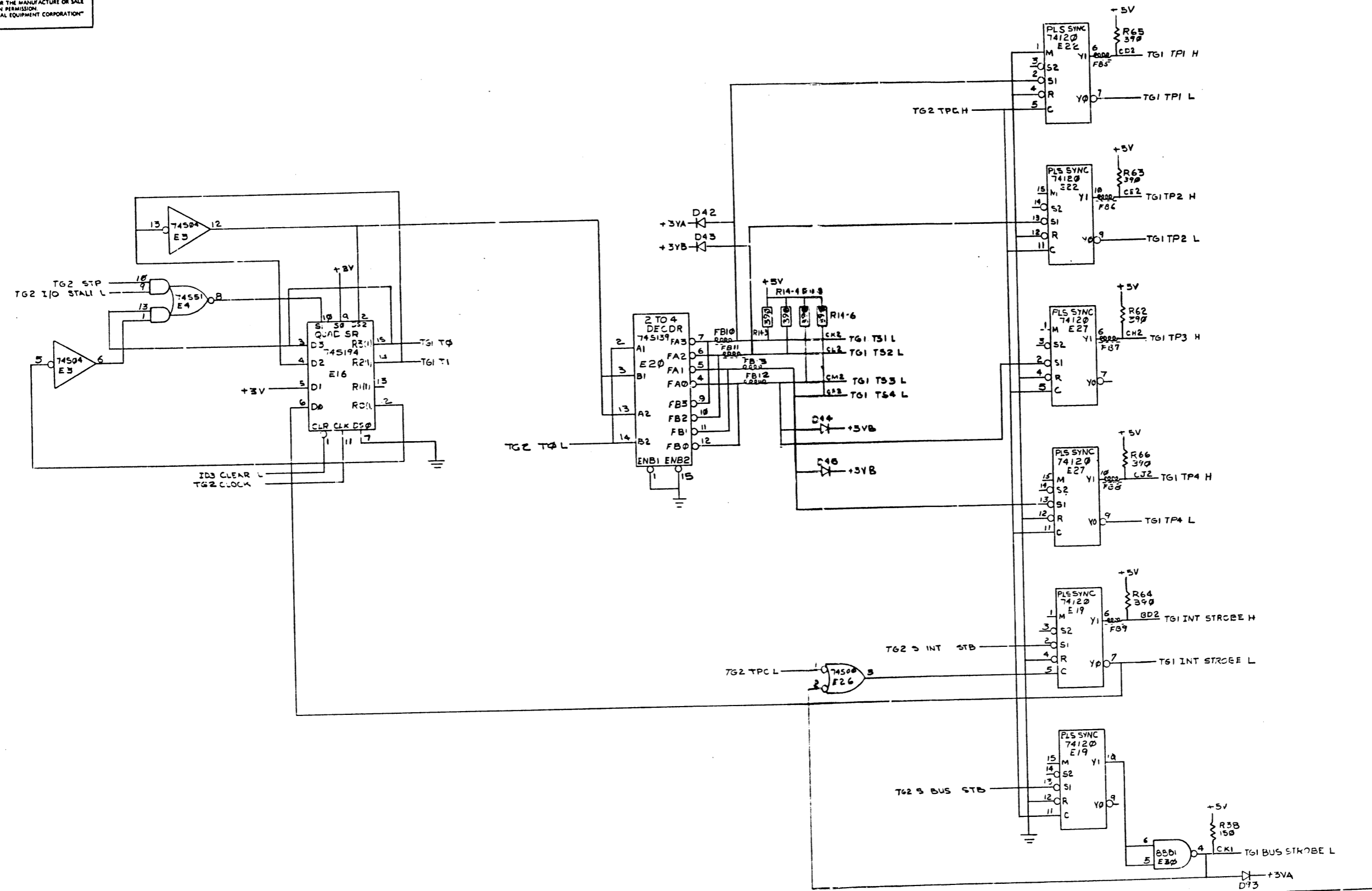
TITLE	PDP8A CPU (102)	SIZE CODE	D 02	NUMBER	18315-0-1	REV.	
SCALE		SHEET	7	OF 10			

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REVISIONS		
CHK	CHANGE NO.	REV.

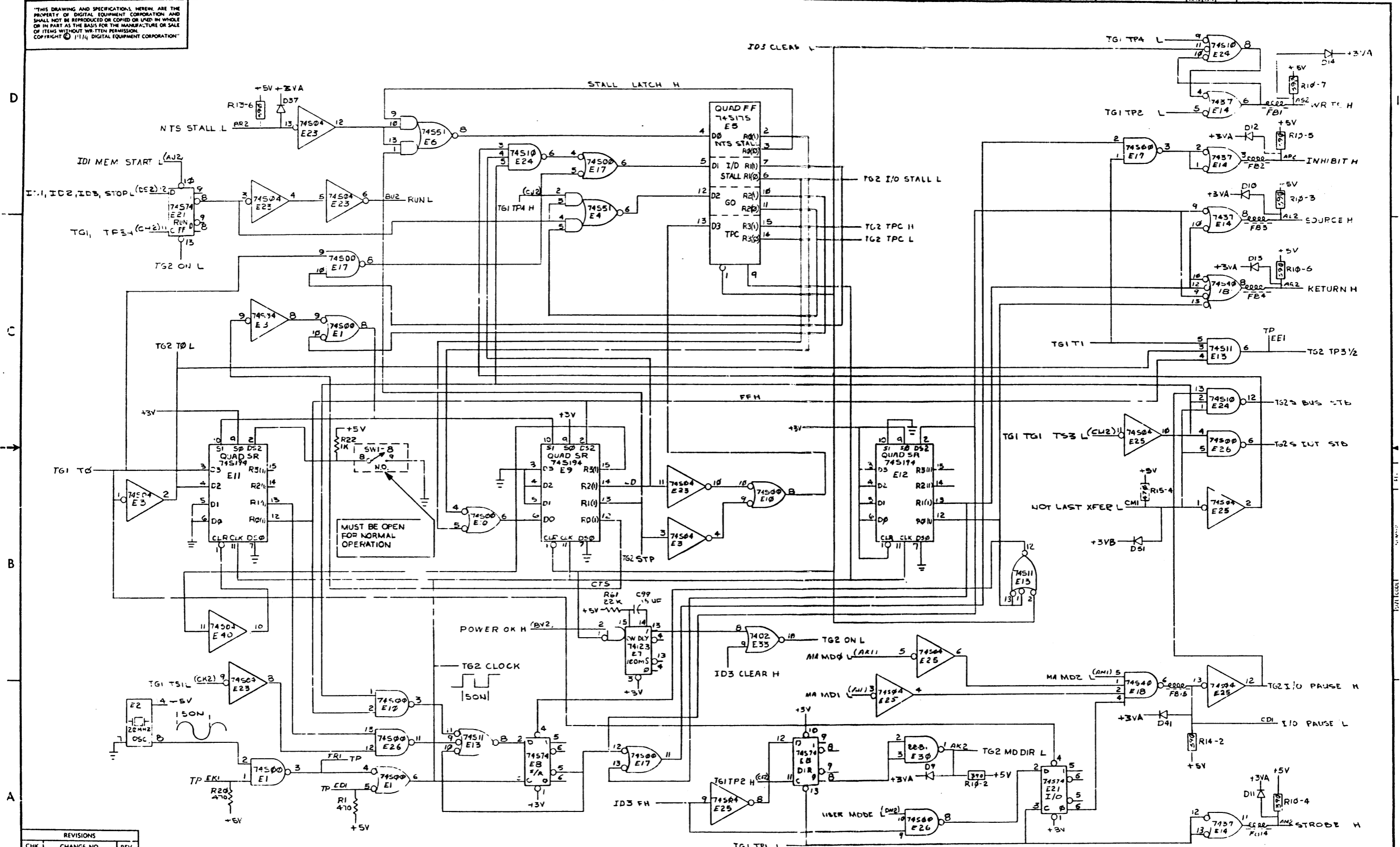
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REVISIONS		
CHK	CHANGE NO	REV.

TITLE	PDP8A CPU (TGD)	SIZE CODE	DCS	NUMBER	M315-0-1	REV.	F
SCALE	1/1	SHEET	9	OF 10	DIST		

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REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	PDP8A CPU (TG2)	SIZE CODE	D	NUMBER	M8315-0-1	REV.	F
SCALE	1:1	SHEET	10 OF 10	DATE			

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FLOW CHART INDEX

F[^]TS1^vTS2
DATA=@TS1:INDICATOR
TS2:AC
MA=INST.ADD
EMA=IF
MD=INSTRUCTION

OPERATES

I/O XFRS

MEMORY REF OR JUMP

FC0 EXECUTION OF OPERATE

F[^]TS3[^]OPR
DATA=AC^vMIQ
MA=INST.ADD
EMA=IF
MD=7XXX

FC3 EXECUTION OF IOT

F[^]TS3[^]IOT(PAUSE)
DATA=I/O INFO
MA=INST.ADD
EMA=IF
MD=6XXX

FC4 EXECUTION OF JMP D OR PAGE

F[^]JMP[^]MD3[^]TS3
MEM REF[^]F[^]TS3^vTS4
DATA=PRIOR @TS4
MA=PAGE.ADD
EMA=IF

JUMP DIRECT

DIRECT MEMORY REF

ALL INDIRECT

MS,IR DIS:DMA

FC5 EXECUTION OF JMP I OR DEFER

D[^]JMP[^]J4
D[^]JMP
DATA=@TS1:INDIC
TS4:PRIOR
MA=OPERAND.ADD
EMA=DF^v;EW IF
MD=M3←MD+AI

JUMP AND/TAD

ISZ

DCA^vJMS

MS,IR DIS:DMA

MS,IR DIS:DMA

MS,IR DIS:DMA

FC6 EXECUTE + AND OR T+D

E[^]AND^vTAD[^]TS4
DATA=@TS1:IND
@TS3[^]TAD:AC
@TS3[^]AND:AC^vMT
MA=OPERAND.ADD
EMA=DF^vIF
MD=OPERAND

FC7 EXECUTE + ISZ

E[^]ISZ[^]TS4
DATA=@TS1:IND
MA=OPERAND.ADD
EMA=DF^vIF
MD=MB+MD+1

FC8 EXECUTE + DCA OR JMS

E[^]DCA^vJMS[^]TS4
DATA=@TS1:IND
@TS2[^]DCA:AC
MA=OPERAND.ADD
EMA=IF^vDF
DCA:MD←MB+AC
JMS:MD←MB+PC

FC9 NEXT ADD OR INT

F SET AND OPI ROTATES
SENSE INTERRUPTS
MA=NEW INST.ADD
EMA=NEW IF

INTERRUPT

INTERRUPT

MS,IR DIS:DMA

MS,IR DIS:DMA

DMA

FC10 BREAK

DIRECT MEMORY ACC.
ADD TO MEMORY

CPMA DIS

CPMA DIS

MAJOR STATE ENCODING

STATE	MS0	MS1
F	L	L
D	L	H
E	H	L
BK	H	H

TIME STATE ENCODING

T0	T1	T2
1	L	L
2	H	L
3	H	H
4	L	H

ROM'S ENABLED

	FETCH	DEFER	EXECUTE	BREAK
TS1	H,J	H,J	J,A	J
TS2	H,J	C,H,J	C,J,A	J
TS3	D,-IF OPR. E,-IF IOT J C,-IF JMP	C,F,H,J	C,F,J,A	F,J
TS4	B,H,J	B,H,J	E,J,A,B	J

NOTES:

THIS IS AN INDEX TO THE 8A FLOW CHARTS. THE FLOW CHART NUMBER THAT APPEARS WITHIN THE SYMBOL [FCX] REFERS TO ANOTHER FLOW WHICH DETAILS THE ACTION WHICH IS BRIEFLY DESCRIBED IN THE SYMBOL []
OPTION FLOW CHARTS WILL USE THE SAME FCX TIME REFERENCE TO SHOW ITS RELATION TO THE CPU
FLOWS WILL BE NUMBERED AS FOLLOWS
M8315-FCX CPU FLOW FOR TIME 'X'
MABCD-FCX OPTION FLOW FOR CPU TIME 'X'

THE FOLLOWING IS A LIST OF MAJOR OMNIBUS SIGNALS AND THE FLOW CHARTS MOST PERTINENT TO THEM

BUS SIGNAL	FLOW CHARTS	MOST IMPORTA. T LOGIC PRINTS
IR0-2	FC1	ID2
F, D, E	(FC1, FC4), FC5, FC8	ID1
USER MODE	FC2, FC3	ID2, T62
FSET	FC8	?D1
PULSE LA	FC10	ID1
STOP	FC2, FC10	ID1, ID3, T62
KEY CONTROL	FC10	ID1
SW	SEE M8317 TIMING & FLOW CHARTS	
I/O PAUSE	FC3	T62
C0-2	FC3	ID1
BUS STB	FC3	ID2, T61
NOT LAST XFER	FC3	T62
INT RQST	FC3	ID3
SKIP	FC7, FC8, FC9	ID2
INITIALIZE	FC3	ID3
CPMA DIS	FC4, FC5, FC9	ID1
MSIR DIS	FC10	ID1
LK LD DATA	FC3	ID2, ID3
INDI-2	FC1	ID3
MAMS LD CTRL	FC4, FC9, FC10	ID1
OVERFLCW	FC7	ID2
BK DATA CTRL	FC10	ID1
LA ENABLE	FC1, FC10	ID1
INT IN PROG	FC9	ID2, ID3
RUN	FC2, FC10	T62
PWR OK		ID3
MEM START	FC10	ID1, T62

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP8A				
DIMENSIONAL TOLERANCE				
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED				
MILLIMETERS	INCHES	ANGLES		
X.XX ±0.10	XXX ±0.008	±0°30'		
X.X ±0.08	XX ±0.02			
X ±0.2	X ±0.1			
THIRD ANGLE PROJECTION	REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	NEXT HIGHER ASSY.	SIZE CODE	NUMBER
			B-DD-KK8A-0	D FD M8315-0-16
			SCALE	
			SHEET 1 OF 1	DIST.

REVISIONS
CHANGE NO.
CHK

REV. NUMBER
M8315-0-16

A

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MA+1 IS ENABLED TO THE PC

A MEMORY READ IS STARTED (REFER TO TIMING)

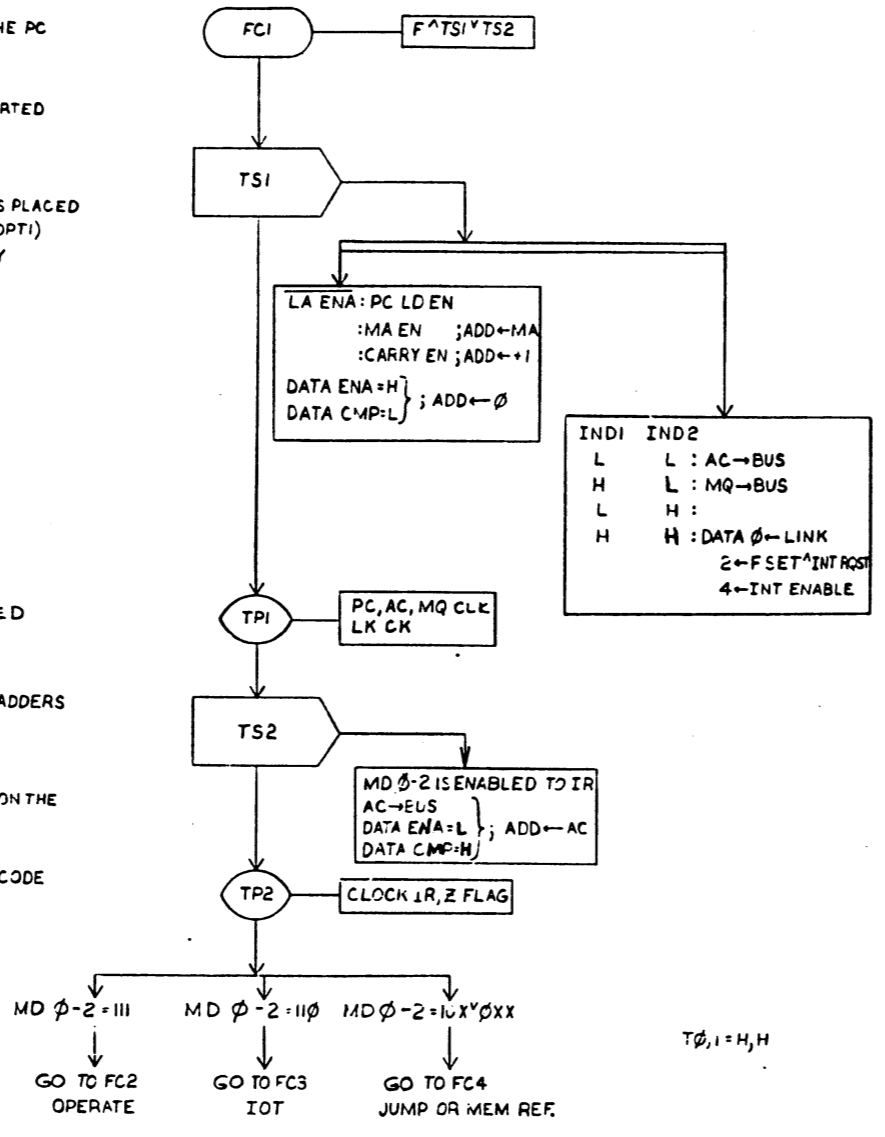
INDICATOR INFORMATION IS PLACED ON THE DATA BUS (REFER TO OPT1) FOR THE PANEL TO DISPLAY

THE PC IS LOADED

THE AC IS GATED THROUGH THE ADDERS TO SEE IF IT EQUALS 0

THE INSTRUCTION WILL APPEAR ON THE MD LINES FROM MEMORY

THE IR GETS LOADED WITH THE OPCODE AND THE Z FLAG IS ADJUSTED



MS0,1=L,L

T0,1=L,L

T0,1=H,L

THE INSTRUCTION IS DECODED AT THIS POINT AS FOLLOWS:

MD — 0 1 2 3 4 5 6 7 8 9 10 11

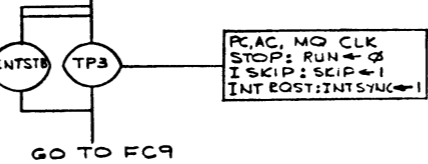
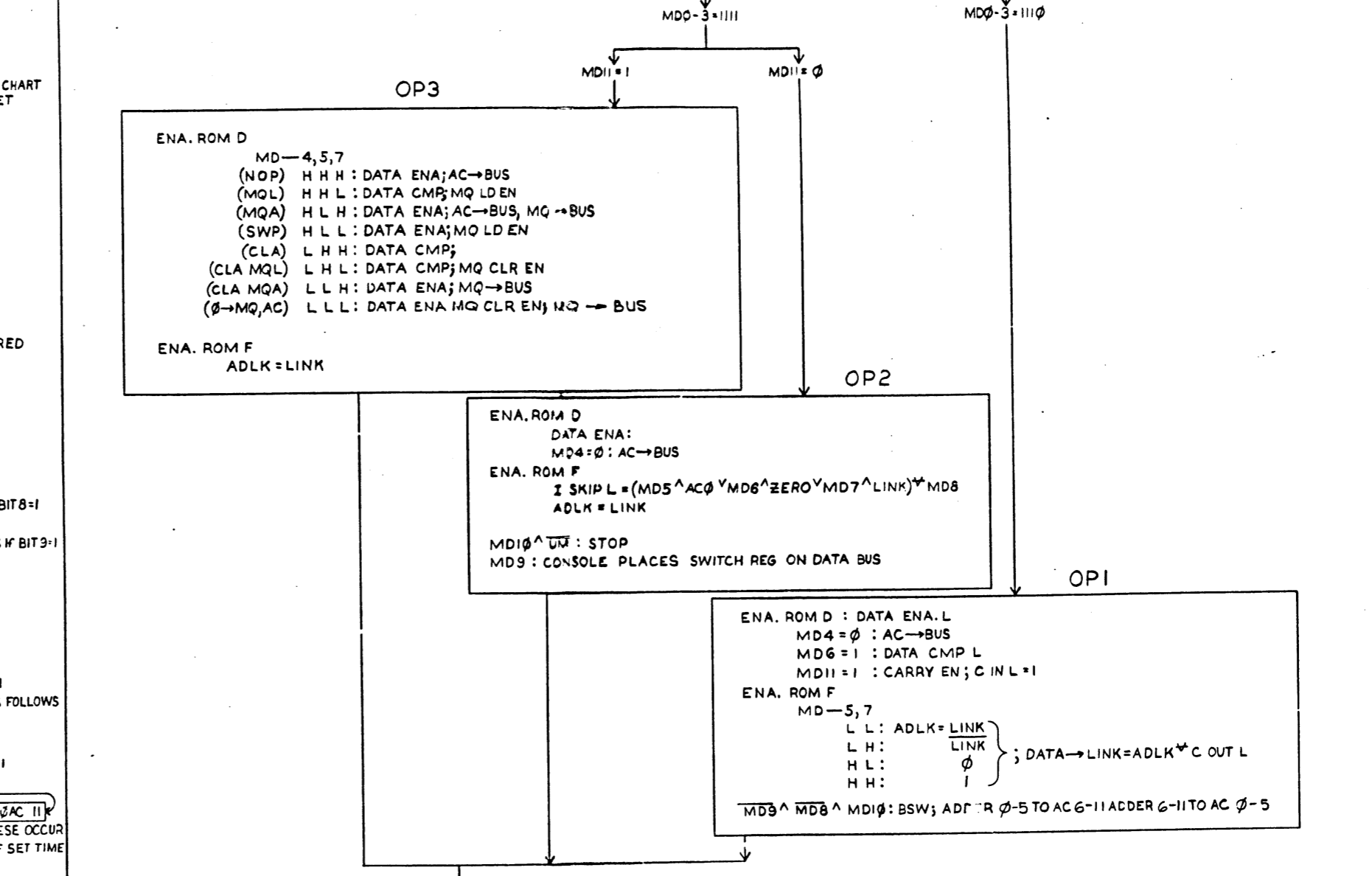
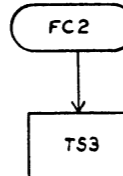
AND 0 0 0
 *AD 0 0 1
 *S2 0 1 0
 *CA 0 1 1
 *MS 1 0 0
 *MP 1 0 1
 *OT 1 1 0
 *PR 1 1 1

BITS 3-11 ARE NOT IMPORTANT AT THIS TIME

REV.	
CHANGE NO.	
CHK	

FIRST USED ON OPTION/MODEL				QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP8A							
DIMENSIONAL TOLERANCE				PARTS LIST			
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED				DRN. <i>R. Youder</i>	DATE 11-13-74	digital	
MILLIMETERS INCHES				CHKD. <i>[Signature]</i>	DATE 1/23/75		
MILLIMETERS	INCHES	ANGLES		ENG. <i>[Signature]</i>	DATE 1-21-75		
XXX ±0.10	XXX ±.005	90° 30'		PROJ. ENG. <i>[Signature]</i>	DATE 1-14-75		
XX ±0.5	XX ±.02			PROD. <i>[Signature]</i>	DATE 1-21-75	TITLE FLOW DIAGRAM M8315 FC1	
X ±.2	X ±.1			THIRD ANGLE PROJECTION		NEXT HIGHER ASSY.	
REMOVED BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓				MATERIAL		SIZE CODE	NUMBER
				FINISH		B-DD-KK8A-0	D
						SCALE	M8315-0-17
						SHEET 1 OF 1	DIST.

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THE INSTRUCTION IS DECODED AT THIS POINT AS FOLLOWS
 THE SEQUENCES OF OPERATION ARE LOGICAL NOT CHRONOLOGICAL
 ALL OP2 & OP3 OCCUR AT TP3
 ALL OPI EXCEPT ROTATE LEFT OR RIGHT OCCUR AT TP3
 A SINGLE LEFT OR RIGHT ROTATE OCCURS AT TP4
 A DOUBLE LEFT OR RIGHT ROTATE OCCURS AT TP3 1/2 AND 4 } SEE FLOW CHART 9 F SET

OPERATE GROUP 3

TO AC	MQ TO AC	X	AC TO MQ	X	X	X	I
-------	----------	---	----------	---	---	---	---

0 0 0 NO OPERATION
 0 0 1 AC GOES TO THE MQ AND THE AC IS CLEARED
 0 1 0 MQ "ORED" WITH THE AC GOES TO THE AC
 0 1 1 AC & MQ SWAPS WITH MQ & AC
 1 0 0 THE AC IS CLEARED
 1 0 1 BOTH THE AC AND MQ ARE CLEARED
 1 1 0 THE MQ GOES TO THE AC
 1 1 1 THE MQ GOES TO THE AC AND THE MQ IS CLEARED

OPERATE GROUP 2

TO AC	IF AC	SKIP AC	SKIP AC	SKIP AC	REVERSE	GET THE	HALT	0
AC	AC	AC	AC	AC	IF	IF	IF	SWR

1ST MAKE A SKIP DECISION
 THEN REVERSE THEN DECISION IF BIT 8=1
 THEN CLEAR THE AC IF BIT 4=1
 THEN "OR" THE AC WITH THE SWITCHES IF BIT 9=1
 THEN STOP IF BIT 10=1

OPERATE GROUP 1

TO AC	TO LINK	AC TO AC	LINK TO LINK	ROTATE	+1 TO AC
-------	---------	----------	--------------	--------	----------

1ST CLEAR THE AC & LINK IF BITS=1
 THEN COMPLEMENT IF BITS=1
 THEN INCREMENT THE L, AC IF BIT 11=1
 THEN ROTATE DEPENDENT UPON 8, 9, 10 AS FOLLOWS

MD 8 9 10

H H H	NO ROTATE
H H L	SWAP AC 0-5 WITH AC 6-11
H L H	ROTATE LEFT ONCE
H L L	ROTATE LEFT TWICE
L H H	ROTATE RIGHT ONCE
L H L	ROTATE RIGHT TWICE
L L X	ILLEGAL

THESE OCCUR AT F SET TIME

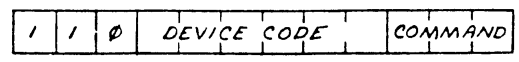
FIRST USED ON OPTION/MODEL		QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP8A					
DIMENSIONAL TOLERANCE		DRN. <i>Q. Wolfe</i>	DATE 11-7-74	digital	
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED		CHK'D <i>Mark</i>	DATE 12/1/74		
MILLIMETERS	INCHES	ANGLES	ENG. <i>Kob</i>	DATE 12/1/74	TITLE FLOW DIAGRAM M8315 FC2
XXX ±0.10	JXX ±0.006	±0°30'	PROJ. ENG. <i>Mark</i>	DATE 12/1/74	
XX ±0.8	JX ±0.02		PRD <i>Mark</i>	DATE 12/1/74	
X ±2	X ±0.1			DATE 12/1/74	
THIRD ANGLE PROJECTION	REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	NEXT HIGHER ASSY.	SIZE CODE # NUMBER REV.		
MATERIAL	FINISH	B-DD-KK8A-0	D	FD	M8315-Q-18
		SCALE	SHEET 1 OF 1		

REV.	
CHANGE NO.	
CHK	

REV. NUMBER DFD M8315-Q-18

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THE INSTRUCTION AT THIS POINT IS DECODED AS FOLLOWS: ONLY IF *USER MODE IS NEGATED THUS ALLOWING PAUSE TO BE ASSERTED.



FOR DEVICE CODE 000 THE CPU TAKES CONTROL DEPENDING UPON THE COMMAND AS FOLLOWS:

MD-9	10	11	
SKON	0	0	0 SKIP IF INT ON, TURN IT OFF
ION	0	0	1 TURN INT SYS ON
IOF	0	1	0 TURN INT SYS OFF
SRQ	0	1	1 SKIP IF INT RQST
*GTF	1	0	0 LINK, INT ON, INT RQST TO AC 0, 2, 4
*RTF	1	0	1 AC 0 TO LINK, TURN INT, SYS ON
NOP	1	1	0 NO OPERATION
CAF	1	1	1 GENERATE INITIALIZE.

* ALSO SEE OPT 2

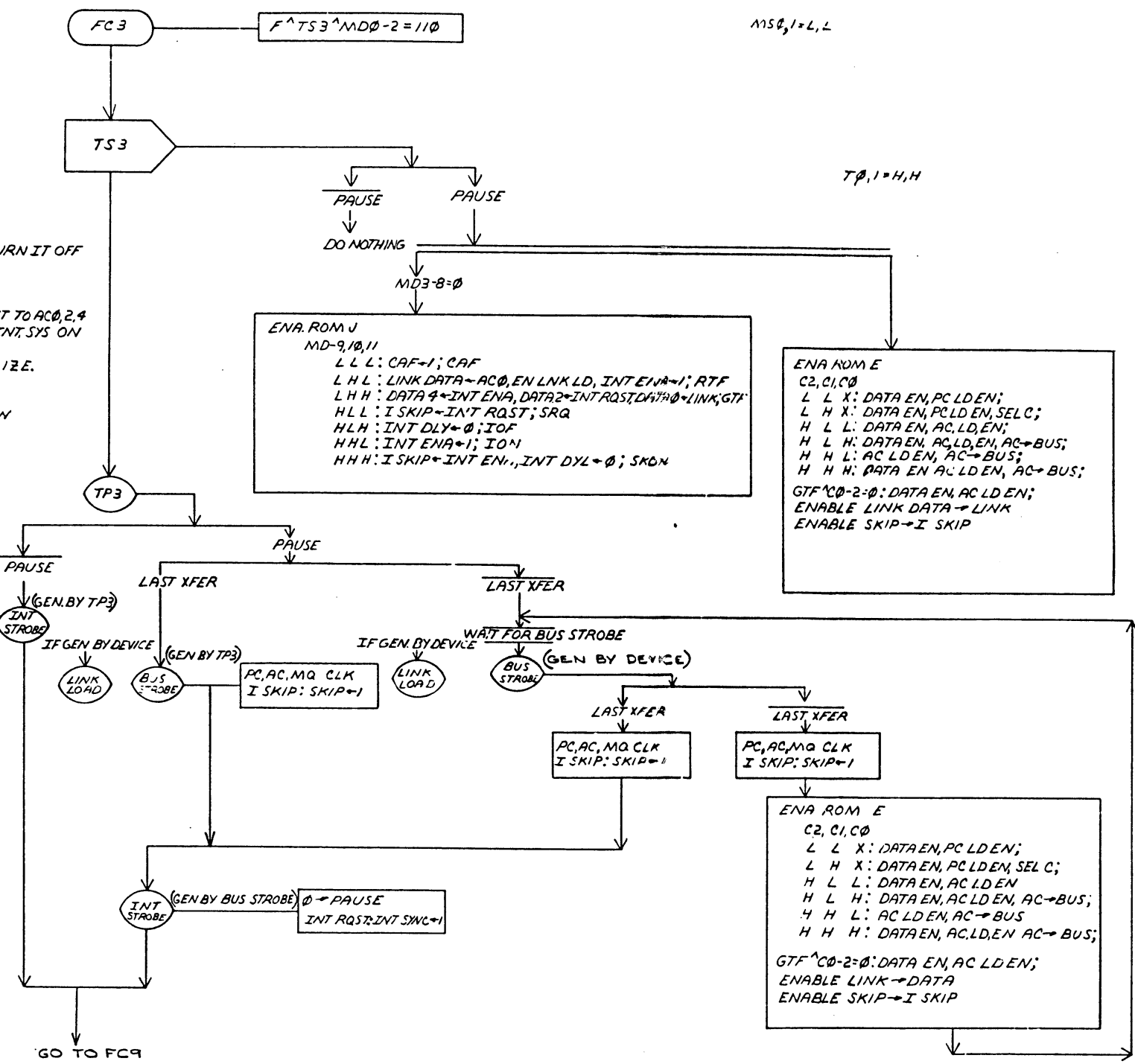
OTHER DEVICES SEND OR RECEIVE DATA DEPENDING UPON THE C LINES AS FOLLOWS:

CO C1 C2	
AC-DEV	H H H THE DEVICE RECEIVES THE AC AT TP3
RELATIVE JUMP	H H L THE DATA LINES+THE PC GO TO PC AT BUS STB
INPUT OR TO AC	H L H THE AC'ORED' WITH DATA LINES GOES TO THE AC BUS STB
ABSOLUTE JUMP	H L L THE DATA LINES GO TO THE PC AT BUS STB
AC-DEV 0-AC	L H H THE DEVICE RECEIVES THE AC AT TP3 AND THE AC IS CLEARED
INPUT JAM TO AC	L L H THE DATA LINES GO TO THE AC BUS STB

NOTE ALL I/O XFRS TAKE PLACE OVER THE DATA LINES.

IN REALITY ALL XFRS TAKE PLACE ON THE LEADING EDGE OF BUS STB IN ACCORDANCE WITH THE "C" LINES AT THAT TIME. ASSERTING NOT LAST XFER CAUSES THE CPU TO WAIT FOR A BUS STROBE TO DO THE NEXT XFER. THE CPU WILL NOT ADVANCE TO TS4 UNTIL IT SEES A BUS STROBE WITH NOT LAST XFER NEGATED - THIS IN TURN CAUSES INTERRUPT STROBE.

LINK LOAD SHOULD BE GIVEN IN SYNC WITH BUS STROBE AND CAUSES LINK DATA TO GO TO THE LINK.

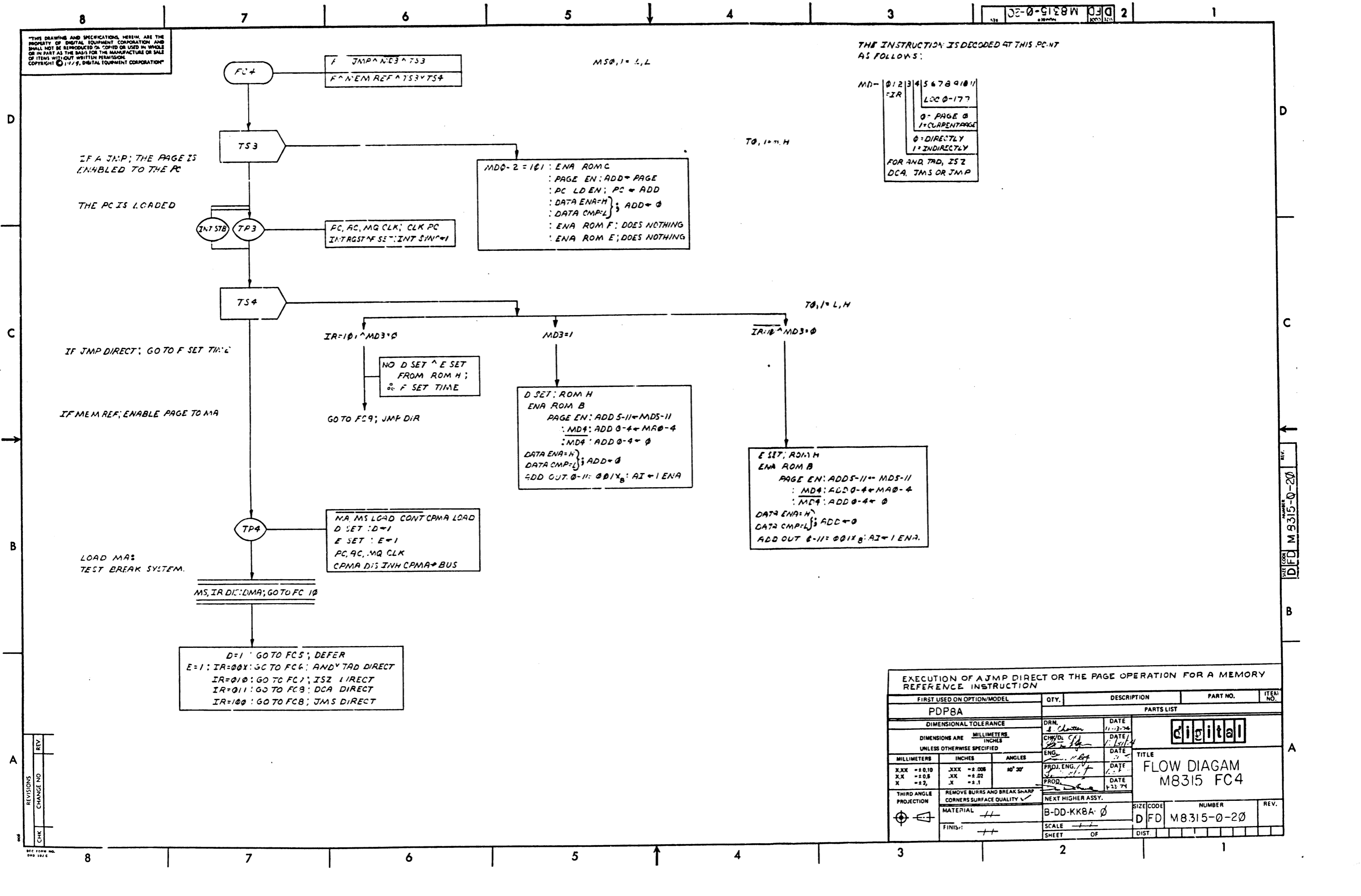
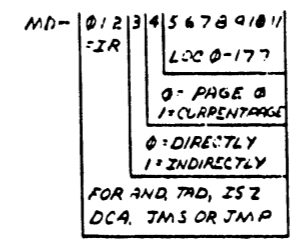


FIRST USED ON OPTION/MODEL		QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP8A					
DIMENSIONAL TOLERANCE		PARTS LIST			
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED		DRN. <i>S. Charrier</i>	DATE 11-6-74		
		CHK'D <i>[Signature]</i>	DATE 12/31/74		
		ENG. <i>[Signature]</i>	DATE 1-21-75		
		PROJ. ENG. <i>[Signature]</i>	DATE 1-21/75		
		PROD. <i>[Signature]</i>	DATE 1-23-75		
THIRD ANGLE PROJECTION		REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		TITLE	
MATERIAL		NEXT HIGHER ASSY.		FLOW DIAGRAM	
FINISH		B-DD-KK8A-0		M8315 FC3	
		SCALE		SIZE CODE	
		SHEET 1 OF 1		NUMBER	
		DIST.		M8315-0-19	
				REV.	

REVISIONS	REV.
CHANGE NO.	
CHK	

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THE INSTRUCTION IS DECODED AT THIS POINT AS FOLLOWS:



EXECUTION OF A JMP DIRECT OR THE PAGE OPERATION FOR A MEMORY REFERENCE INSTRUCTION			
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
PDP8A			
PARTS LIST			
DIMENSIONAL TOLERANCE		DRN. & CHECKED	DATE
DIMENSIONS ARE MILLIMETERS INCHES		CHKD. BY	DATE
UNLESS OTHERWISE SPECIFIED		ENG. BY	DATE
MILLIMETERS	INCHES	ANGLES	PROJ. ENG. DATE
X.XX ±0.10	.XXX ±0.006	30° 30'	PROD. DATE
X.X ±0.8	.XX ±0.02		
X ±2	.X ±0.1		
THIRD ANGLE PROJECTION		REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	NEXT HIGHER ASSY.
MATERIAL		B-DD-KK8A-0	SIZE CODE
FINISH			NUMBER
			D FD M8315-0-20
		SCALE	REV.
		SHEET OF	

REV.	CHANGE NO.	REVISIONS

REV. NUMBER M8315-0-20

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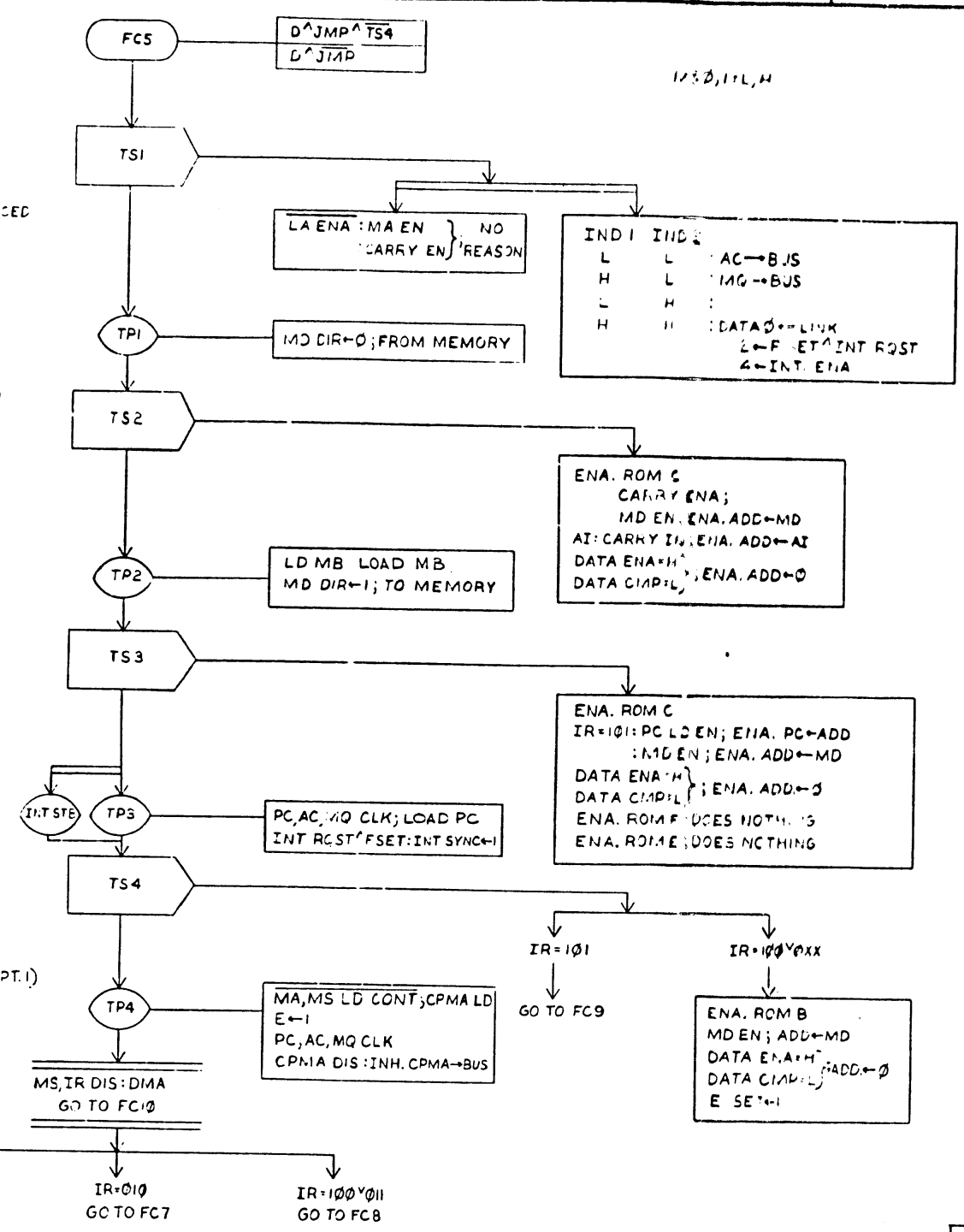
D
C
B
A

A MEMORY READ IS STARTED
INDICATOR INFORMATION IS PLACED ON DATA BUS

THE ADDRESS WILL APPEAR ON THE MD LINES
MEMORY DATA + AI GOES TO MEMORY BUFFER (AI = ADDRESS 00C-C017)

MEMORY BUFFER IS LOADED AND PLACED ON MD LINES

A MEMORY WRITE IS STARTED
IF JMP; ENABLE MD TO THE PC
IF JMP; LOAD THE PC
IF JMP; GO TO F SET TIME
IF JMP; GO TO E SET
MA ← MD PLACES THE OPERAND ADDRESS IN THE MA (THE EMA LINES MAY HAVE CHANGED-SEE OPT.1)



EXECUTION OF A JUMP INDIRECT OR CALCULATING THE INDIRECT ADDRESS FOR AND, TAD, DCA, ISZ OR JMS				
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP8A				
PARTS LIST				
DIMENSIONAL TOLERANCE		DRN	DATE	
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED		CHK'D.	DATE	
MILLIMETERS	INCHES	ENG.	DATE	
X.XX ±0.10 X.X ±0.5 X ±2	.XXX ±0.006 .XX ±0.02 .X ±.1	PROJ. ENG.	DATE	
THIRD ANGLE PROJECTION	REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROD.	DATE	TITLE
				FLOW DIAGRAM M8315 FC5
	MATERIAL		SIZE CODE	NUMBER
	FINISH		SCALE	REV.
			SHEET 1 OF 1	D F D M8315-0-21

REV.	CHANGE NO.

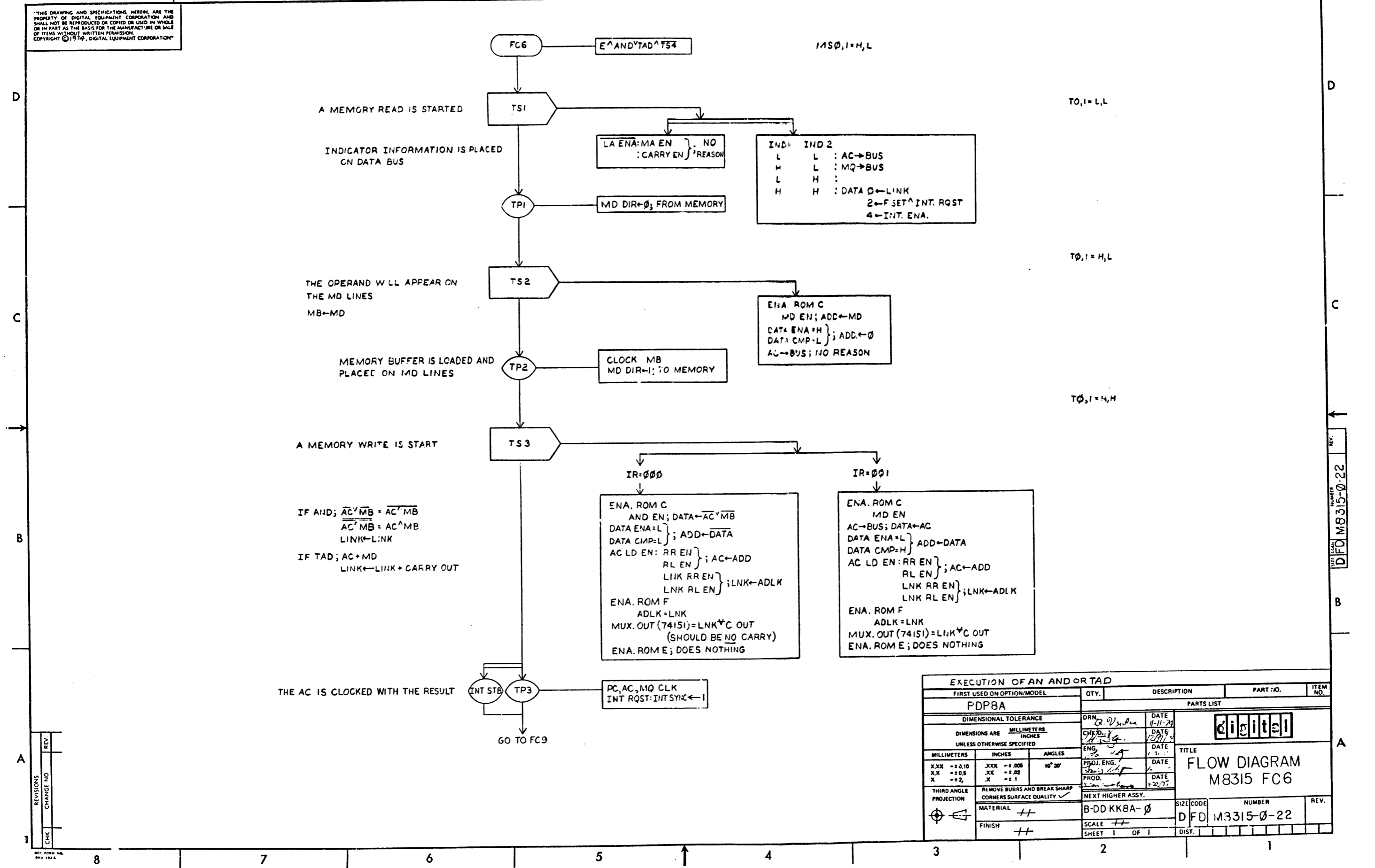
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D
C
B
A

D
C
B
A

REV	CHANGE NO

REV. 102-C



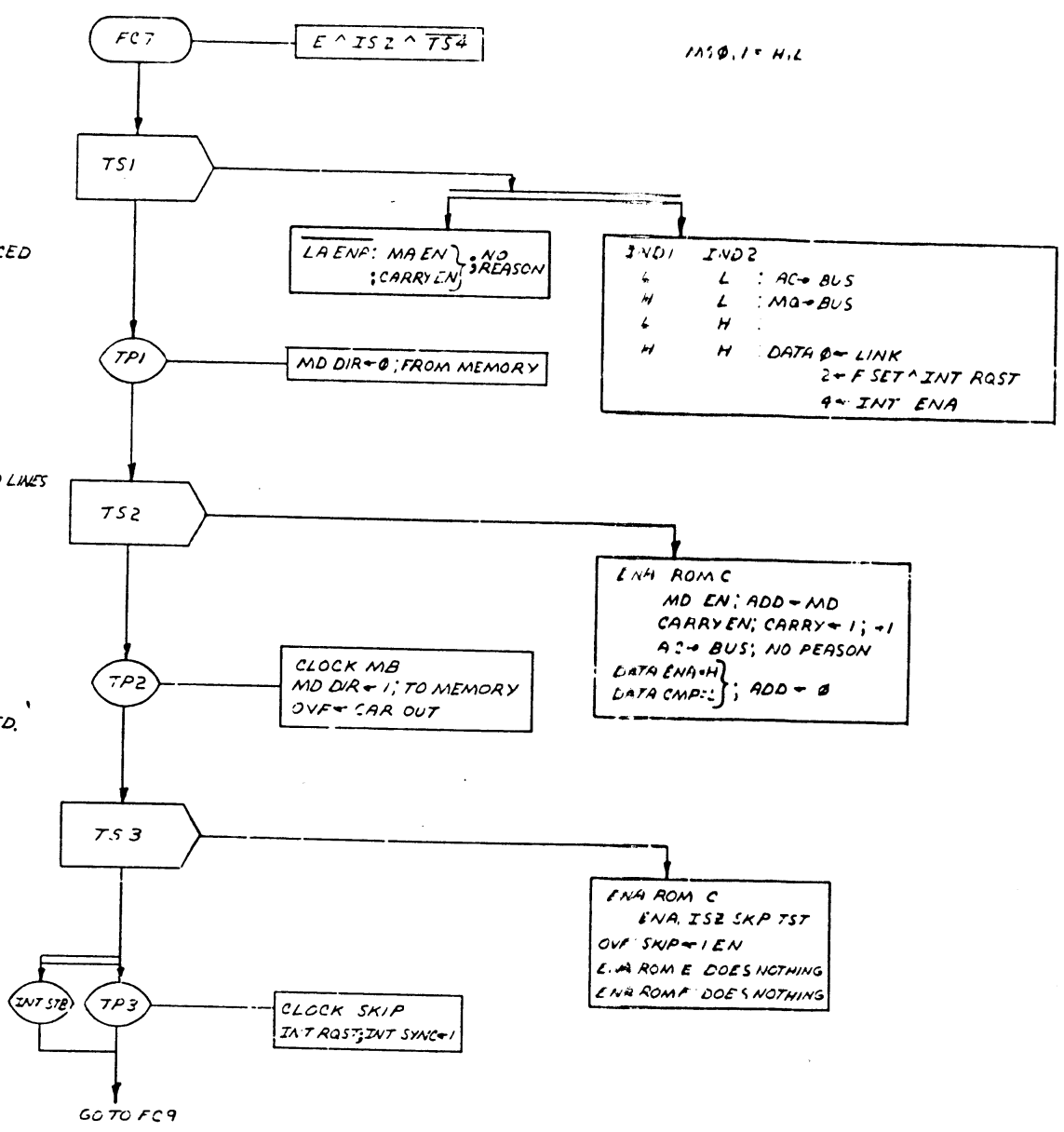
EXECUTION OF AN AND OR TAD				
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP8A				
DIMENSIONAL TOLERANCE				
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED				
MILLIMETERS	INCHES	ANGLES	PARTS LIST	
X,XX ±0.10	.XXX ±0.005	30° 30'	DRN	DATE
X,X ±0.5	.X ±0.02		CHKD BY	DATE
X ±2	.X ±0.1		ENG	DATE
THIRD ANGLE PROJECTION			PROJ. ENG.	DATE
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY			PROD.	DATE
NEXT HIGHER ASSY.			TITLE	
MATERIAL			FLOW DIAGRAM	
FINISH			M8315 FC6	
SIZE CODE			NUMBER	REV.
SCALE			D F D	M8315-0-22
SHEET			OF	DIST.

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D
C
B
A

REV	
CHK	
CHG	
REV	

A MEMORY READ IS STARTED
 INDICATOR INFORMATION IS PLACED ON DATA BUS
 THE OPERAND WILL APPEAR ON THE MD LINES
 MB = MD + 1
 THE INCREMENTED MD IS SAVED IN THE MB AND PLACED ON THE MD LINES; THE CARRY IS SAVED.
 SET SKIP = OVER FLOW



EXECUTION OF AN ISZ					
FIRST USED ON OPTION/MODEL		QTY.	DESCRIPTION	PART NO.	ITEM NO.
PDP8A					
DIMENSIONAL TOLERANCE				PARTS LIST	
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED				DRN. DATE	
MILLIMETERS				CHK'D. DATE	
INCHES				ENG. DATE	
ANGLES				PROJ. ENG. DATE	
THIRD ANGLE PROJECTION				PROD. DATE	
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY				NEXT HIGHER ASSY.	
MATERIAL				SIZE CODE	
FINISH				NUMBER	
SCALE				REV.	
SHEET OF				DIS1	

digital

TITLE: FLOW DIAGRAM M8315 FC7

SIZE: B-DD-KK8A-0

SCALE: DFD

NUMBER: M8315-0-23

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D
C
B
A

D
C
B
A

REV.	CHANGE NO.

REV. FROM 1.5
END 102 C

A MEMORY READ IS STARTED

INDICATOR INFORMATION IS PLACED ON DATA BUS.

THE OPERAND WILL APPEAR ON THE MD LINES

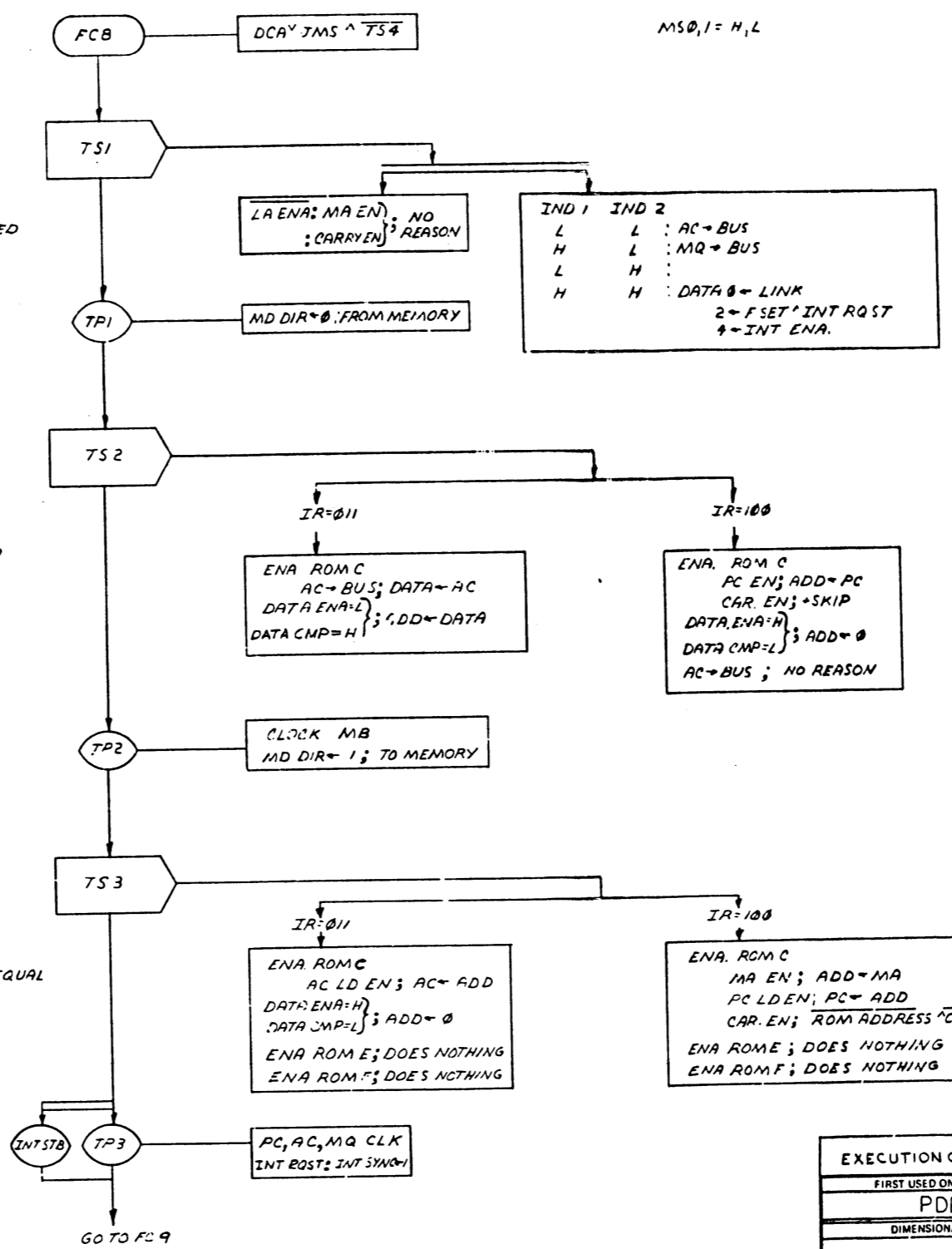
IF DCA; THE AC IS GATED TO THE MB
IF JMS; THE PC + SKIP IS GATED TO THE MB.

MB IS CLOCKED AND PLACED ON MD LINES

A MEMORY WRITE IS STARTED

IF DCA; THE AC GETS CLEARED
IF JMS; THE PC IS UPDATED TO EQUAL THE MA + ROM ADDRESS ^ CPMA DIS (+1 IS NORMAL)

IF DCA; CLOCK AC TO ZERO IT
IF JMS; CLOCK PC TO GET NEXT INST ADD.



MS0,1 = H,L

T0,1 = L,L

T0,1 = H,L

T0,1 = H,H

LA ENA: MA EN; NO REASON
: CAR EN; ^ REASON

IND 1 IND 2
L L : AC ^ BUS
H L : MQ ^ BUS
L H : DATA ^ LINK
H H : 2 ^ FSET ^ INT RQST
4 ^ INT ENA.

IR=011
ENA ROM C
AC ^ BUS; DATA ^ AC
DATA ENA=L; DD ^ DATA
DATA CMP=H

IR=100
ENA ROM C
PC EN; ADD ^ PC
CAR EN; ^ SKIP
DATA ENA=H; ADD ^ 0
DATA CMP=L
AC ^ BUS; NO REASON

TP2
CLOCK MB
MD DIR ^ 1; TO MEMORY

IR=011
ENA ROM C
AC LD EN; AC ^ ADD
DATA ENA=H; ADD ^ 0
ENA ROM E; DOES NOTHING
ENA ROM F; DOES NOTHING

IR=100
ENA ROM C
MA EN; ADD ^ MA
PC LD EN; PC ^ ADD
CAR EN; ROM ADDRESS ^ CPMA DIS ^ +1
ENA ROM E; DOES NOTHING
ENA ROM F; DOES NOTHING

TP3
PC, AC, MQ CLK
INT RQST; INT SYNC

GO TO PC 9

EXECUTION OF A DCA or JMS		QTY.	DESCRIPTION	PART NO.	ITEM NO.												
FIRST USED ON OPTION/MODEL		PDP8A															
DIMENSIONAL TOLERANCE		PARTS LIST															
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED		<table border="1"> <tr> <td>DRN.</td> <td>DATE</td> <td rowspan="4"> </td> </tr> <tr> <td>CHK'D</td> <td>DATE</td> </tr> <tr> <td>ENG.</td> <td>DATE</td> </tr> <tr> <td>PROJ. ENG.</td> <td>DATE</td> </tr> <tr> <td>PRCD.</td> <td>DATE</td> <td></td> </tr> </table>				DRN.	DATE		CHK'D	DATE	ENG.	DATE	PROJ. ENG.	DATE	PRCD.	DATE	
DRN.	DATE																
CHK'D	DATE																
ENG.	DATE																
PROJ. ENG.	DATE																
PRCD.	DATE																
THIRD ANGLE PROJECTION		REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY		TITLE													
MATERIAL		NEXT HIGHER ASSY.		FLOW DIAGRAM M8315 FC8													
FINISH		MATERIAL		SIZE CODE													
SCALE		B-DD-KK8A-0		NUMBER													
SHEET 1 OF 1		SCALE		D FD M8315-0-24													
		DIST		REV.													

REV. 2
D FD M8315-0-24

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IF NO INTERRUPT, PREPARE TO GET NEXT INSTRUCTION
PC ← SKIP → MA
IF INTERRUPT, EXECUTE A JMS TO LOCATION Ø

CLOCK THE MA

FC9 F SET TIME MSC, I=X, X

TS4

TØ, I=L, "

ENA. ROM B
INT. IN PROG ^ F V D 'E : PC EN; ADD ← PC
: CAR. EN: SKIP; CAR ← 1; ADD ← SKIP
: F SET ← 1
INT. IN PROG : NO ENABLES; ADD ← Ø
: JMS → IR ENA.
: E SET ← 1

IF OPI: ENABLE 74S158 ROTATE MUX;

1/Ø	5	9	
	Ø	Ø	NOP
	Ø	1 RL EN	ROTATE LEFT
	1	Ø PR EN	ROTATE RIGHT
	1	1 RR EN, RL EN	LOAD; SHOULD NOT BE USED

TP3 1/2

OPI ^ MDI Ø : PC, AC, MQ CLK

TP4

MA, MS LOAD CONT: CPMA LOAD
F SET: F ← 1
E SET: E ← 1
: IR ← JMS; IR Ø-2 = Ø Ø
PC, AC, MQ CLK
CPMA DIS: INH CPMA → BUS

MS, IR DIS: DMA
GC TO FC1 Ø

F
GO TO FC1

E
GO TO FC8
AN INTERRUPT HAS BEEN ALLOWED

REV. 1

REV.	CHANGE NO.

GETTING ADDRESS OF NEXT INSTRUCTION, OR ANSWERING INTERRUPT

FIRST USED ON OPTION/MODEL PDP9A	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST				
DIMENSIONAL TOLERANCE		DRN. <i>Q. Jowles</i>	DATE 11-6-74	digital
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED		CH'D. <i>[Signature]</i>	DATE 12/1/74	
MILLIMETERS	INCHES	ANGLES	DATE 1-21-75	
X,XX ± 0.10 X,X ± 0.5 X ± 2	.XXX ± .006 .XX ± .02 .X ± .1	30° 30'	DATE 1-21-75	
THIRD ANGLE PROJECTION	REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY ✓	ENG. <i>[Signature]</i>	DATE 1-23-75	TITLE FLOW DIAGM M8315 FC9
MATERIAL	FINISH	PROJ. ENG. <i>[Signature]</i>	DATE	SIZE CODE B-DD-KK6A-Ø
		PROP. <i>[Signature]</i>	DATE	NUMBER DFD M8315-0-25
				REV.
		SCALE		
		SHEET 1 OF 1	DIST.	

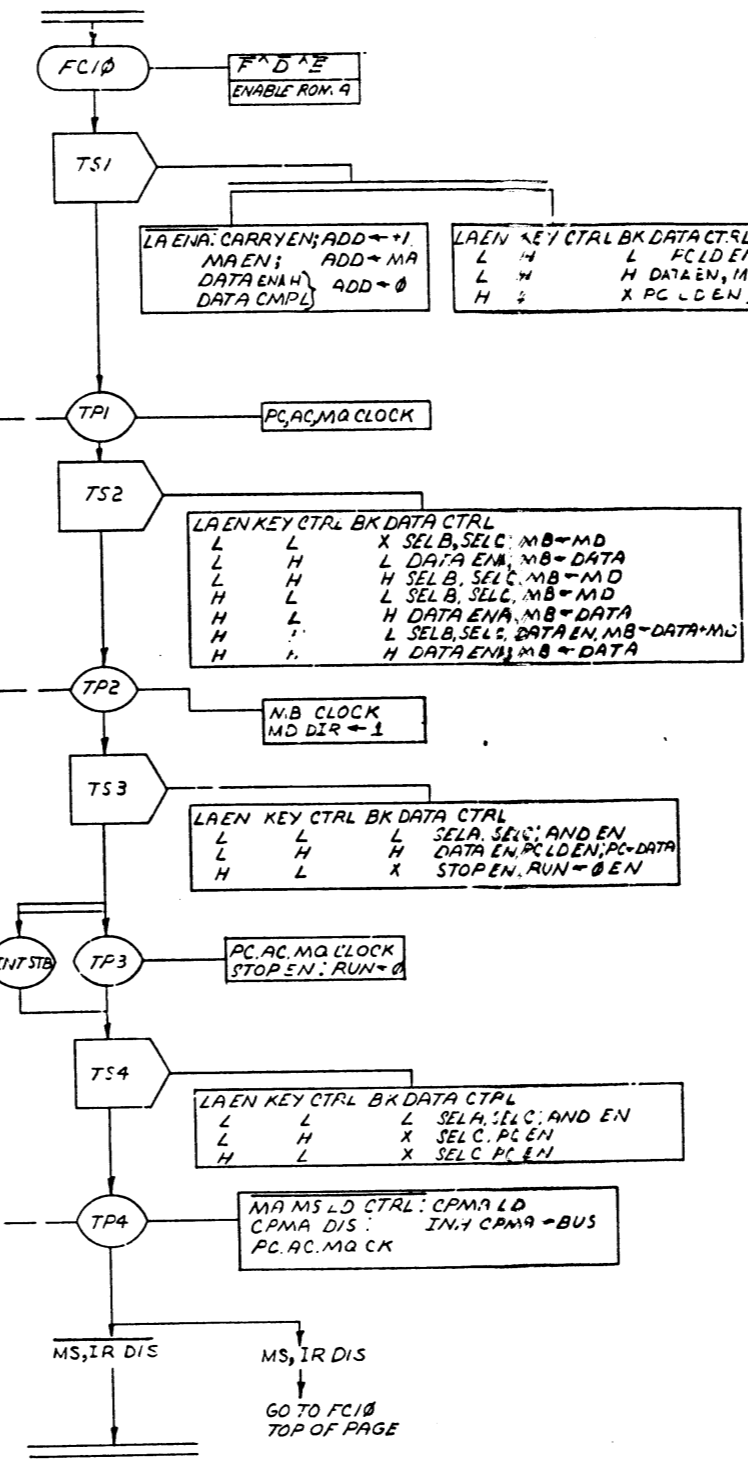
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THE BREAK CONTROL WORD (LAEI KEY CTRL BK DATA CTRL) IS NORMALLY SET UP AT THE BEGINNING OF THE DMA CYCLE AND REMAINS STABLE FOR THE ENTIRE CYCLE. IT DEFINES OPERATIONS AS FOLLOWS.

DATA TO MEM	ADD TO MEM	CON DEPOSIT	CON EXAMINE	LOAD ADD	BOOT DEPOSIT	LOAD FIELD 0	LOAD FIELD 7
THE CONTENTS OF THE DATA LINES GO TO THE A,B	THE CONTENTS OF THE MD LINES PLUS THE CONTENTS OF THE DATA LINES GO TO THE MB	THE CONTENTS OF THE DATA LINES GO TO THE MB	THE CONTENTS OF THE MD LINES GO TO THE MB	THE CONTENTS OF THE MD LINES GO TO THE MB	THE CONTENTS OF THE MD LINES GO TO THE MB	THE CONTENTS OF THE MD LINES GO TO THE MB	THE CONTENTS OF THE MD LINES GO TO THE MB
THE MB IS WRITTEN INTO MEMORY	THE MB IS WRITTEN INTO MEMORY	THE MB IS WRITTEN INTO MEMORY	THE MB IS WRITTEN INTO MEMORY	THE MB IS WRITTEN INTO MEMORY	THE MB IS WRITTEN INTO MEMORY	THE MB IS WRITTEN INTO MEMORY	THE MB IS WRITTEN INTO MEMORY
		RUN IS CLEARED	RUN IS CLEARED	THE CONTENTS OF THE DATA LINES GO TO THE PC		CAUTION: "AND EN" CAUSES THE DATA BUS TO = 7777 THIS DEPENDS UPON THE AC = 0000 THE CONTENTS OF THE DATA LINES GOES TO THE MEMORY EXTENSION CONTROLS IF AT TP3	
		THE PC GOES TO THE MA	THE PC GOES TO THE MA	THE PC GOES TO THE MA	THE PC GOES TO THE MA	AND IF AT TP4	AND IF AT TP4

TO DO A TRANSFER OF DATA TO A DEVICE DO AN ADD TO MEM WITH THE DATA LINES EQUAL TO 0 AND TAKE DATA FROM THE MD LINES AT TP3.

SWITCH SELECTED 1ST CYCLE OR 1ST CICLE THESE ARE THE 1ST TWO CYCLES DURING A CPU AUTO RESTART



MS0,1 = H,H
 T0,1 = L,L
 T0,1 = H,L
 T0,1 = H,H
 T0,1 = L,H

REV	CHG

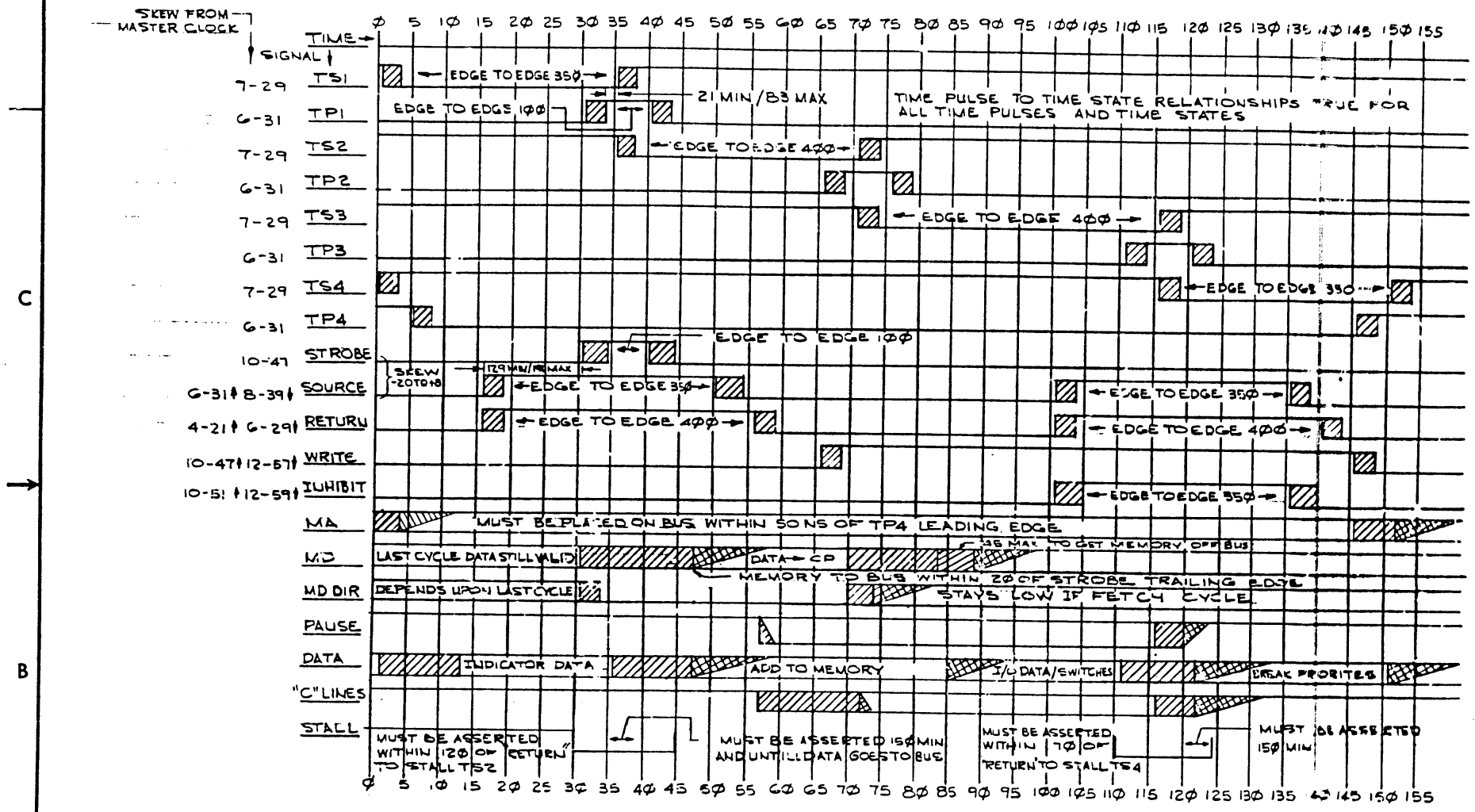
DATA BREAK/CONSOLE OPERATIONS/AUTO RESTART			
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
PDP8A			
PARTS LIST			
DIMENSIONAL TOLERANCE	DRH. 11-7-74	DATE	digital
DIMENSIONS ARE MILLIMETERS INCHES	CHK'D. 11-7-74	DATE	
UNLESS OTHERWISE SPECIFIED			
MILLIMETERS	INCHES	ANGLES	
X.XX ±0.10 X.X ±0.8 X ±2.	.XXX ±0.005 .XX ±0.02 .X ±0.1	30° 30'	TITLE
THIRD ANGLE PROJECTION	REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	NEXT HIGHER ASSY.	FLOW DIAGRAM M8315 FC10
MATERIAL	FINISH	SCALE	SIZE CODE
B DD KK 8A-0		1 OF 1	NUMBER
			D FD M8315-0-26
			REV.

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D

D

($\phi = 155 \times 10^9$ IN NANO SEC'S)



A

B

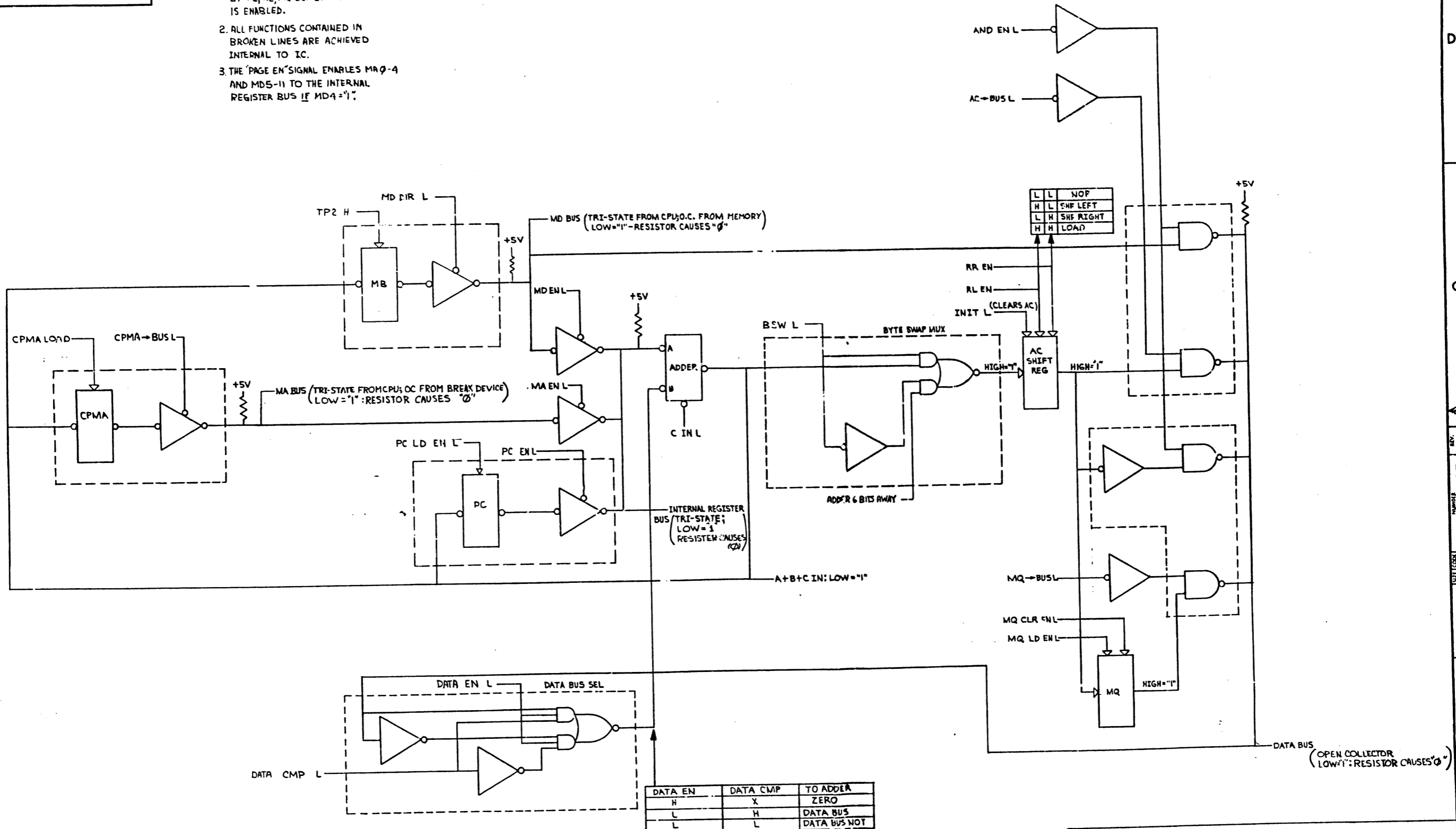
REV.	CHANGE NO.

PDP-8A DATA PATH FUNCTION & TIMING			
FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.
PDP-8A			
DIMENSIONAL TOLERANCE			
DIMENSIONS ARE MILLIMETERS UNLESS OTHERWISE SPECIFIED		INCHES	
MILLIMETERS	INCHES	ANGLES	
X.XX = ±0.10 X.X = ±0.5 X = ±2	.XXX = ±0.008 .XX = ±0.02 .X = ±0.1	40° 30'	
THIRD ANGLE PROJECTION	REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	NEXT HIGHER ASSY.	
MATERIAL		B-DDK18A-3	SIZE CODE
FINISH		SCALE	NUMBER
		SHEET 1 OF 2	D F D M8315-0-27
		DIST.	REV.

REV. 2 22-C-9189M03 D 2 1

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- NOTES:
1. THE PC, AC AND MQ ARE LOADED BY PC, AC, MQ CLK IF THE LOAD IS ENABLED.
 2. ALL FUNCTIONS CONTAINED IN BROKEN LINES ARE ACHIEVED INTERNAL TO IC.
 3. THE 'PAGE EN' SIGNAL ENABLES MQ-4 AND MD5-11 TO THE INTERNAL REGISTER BUS IF MD4='1'.



L	L	NOF
H	L	ENF LEFT
L	H	SHF RIGHT
H	H	LOAD

DATA EN	DATA CMP	TO ADDER
H	X	ZERO
L	H	DATA BUS
L	L	DATA BUS NOT

REVISIONS		DATA PATH FUNCTIONS		SIZE CODE	NUMBER	REV.
CHK	CHANGE NO.	REV.	TITLE	D	FD	M8315-0-27
			FLOW DIAGRAM M8315 BUS TIMING			
			SCALE		SHEET 2 OF 2	

REV. 1
M8315-0-27