

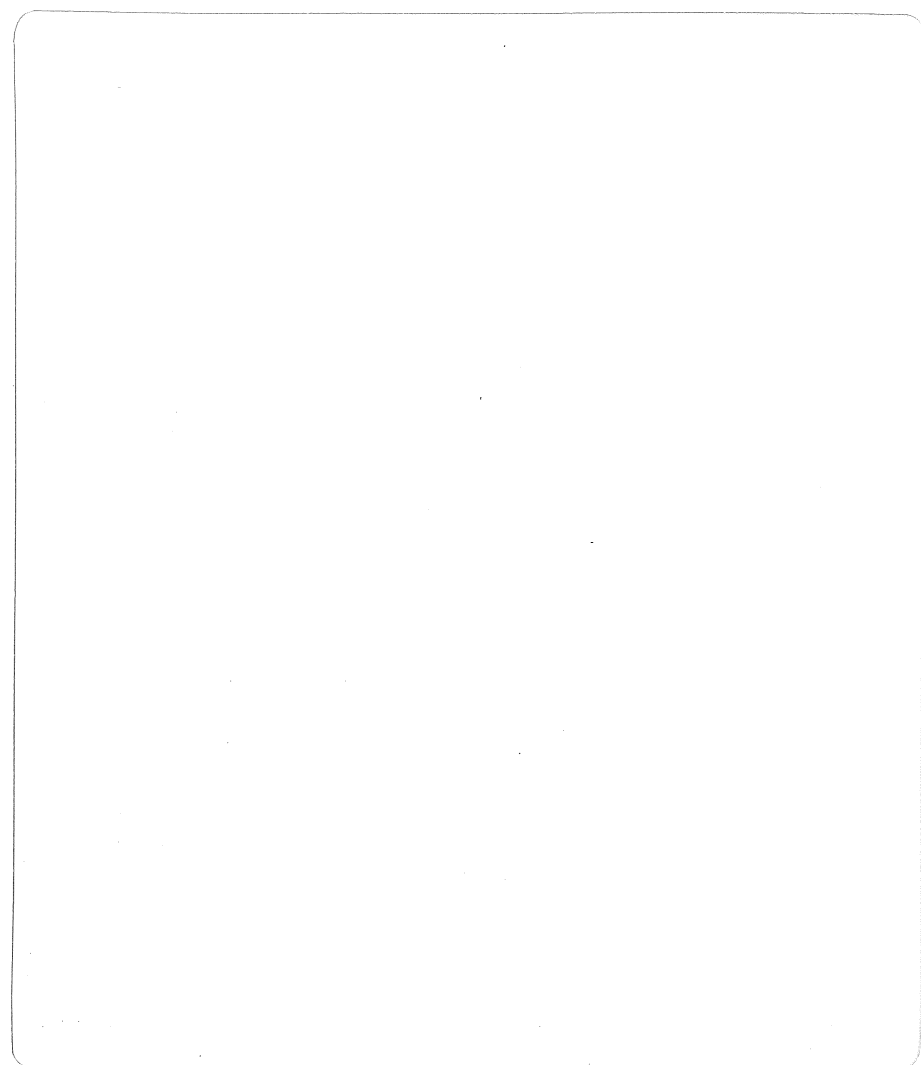
ENGINEERING DRAWINGS
ENGINEERING DRAWINGS
ENGINEERING DRAWINGS
ENGINEERING DRAWINGS
ENGINEERING DRAWINGS

FPII-A
**Field Maintenance
Print Set**

**Digital Equipment
Corporation**

PRINT SET ORDER NO.
MP00189

digital



N 82 S 123 N 7827
S 7906 158A1

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FIELD MAINTENANCE PRINT SET

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**UNIT VARIATIONS
COVERED BY THIS
PRINT SET**

FP11-A

FPII-A
Field Maintenance
Print Set

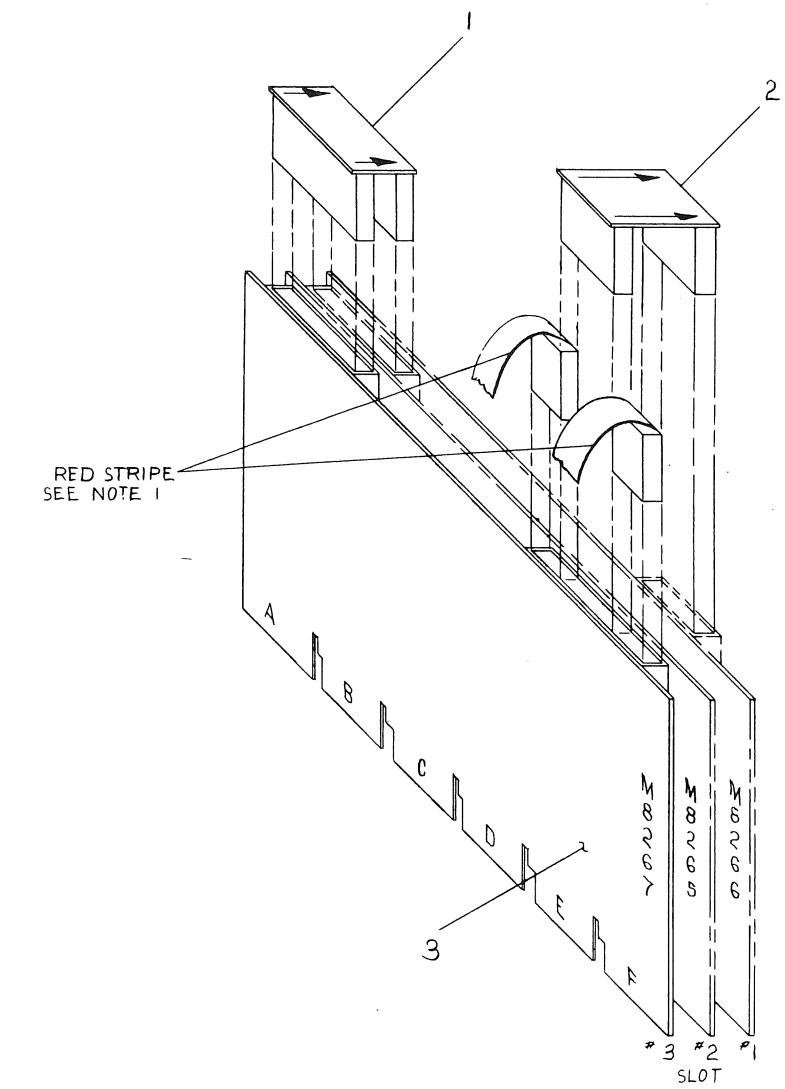
Digital Equipment Corporation

PRINT SET ORDER NO.
MP00189

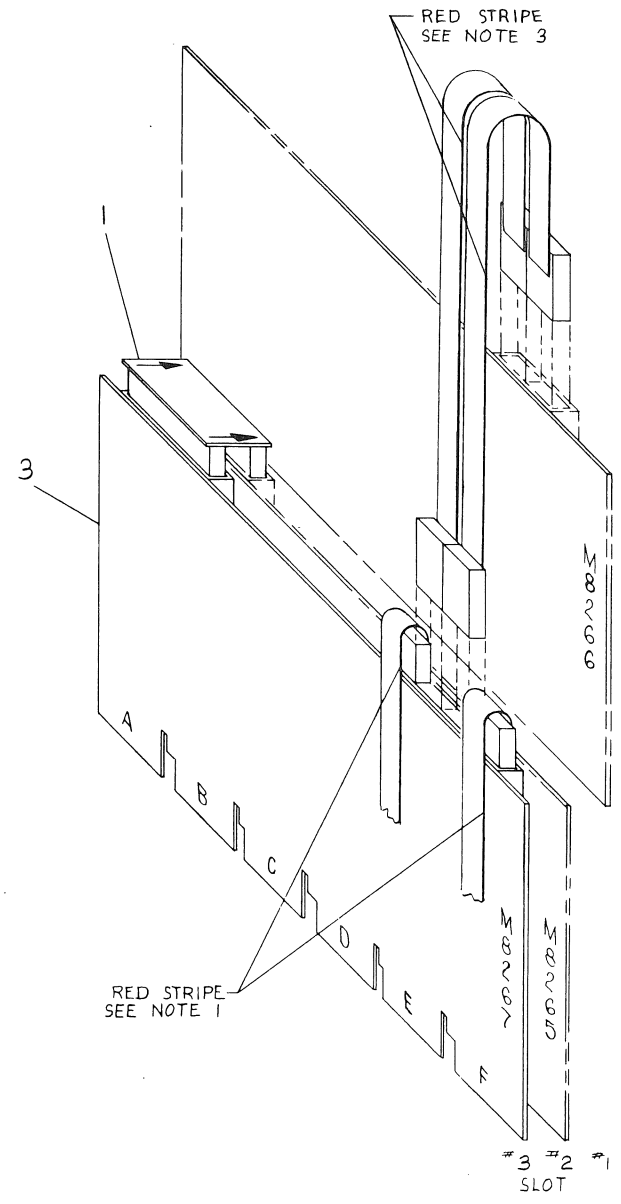
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- NOTES:
1. THESE CABLES #7011411-ID ARE PART OF KY11-LB OPTION AND MAY NOT BE PRESENT IN SOME CONFIGURATIONS.
 2. THE W9042 EXTENDER BD. ASSY. IS STORED IN THE BACKPLANE AND IS USED FOR SOME MAINTENANCE OPERATIONS.
 3. THESE CABLES ARE INSTALLED DURING MAINTENANCE ONLY, AND ARE CLIPPED TO THE W9042 FOR STORAGE. THESE CABLES #7011411-ID ARE PART OF W9042.
 4. MODULES MB265 & MB266 ARE PART OF KD11-EA & SHOWN FOR REF ONLY.



CONFIGURATION "A"



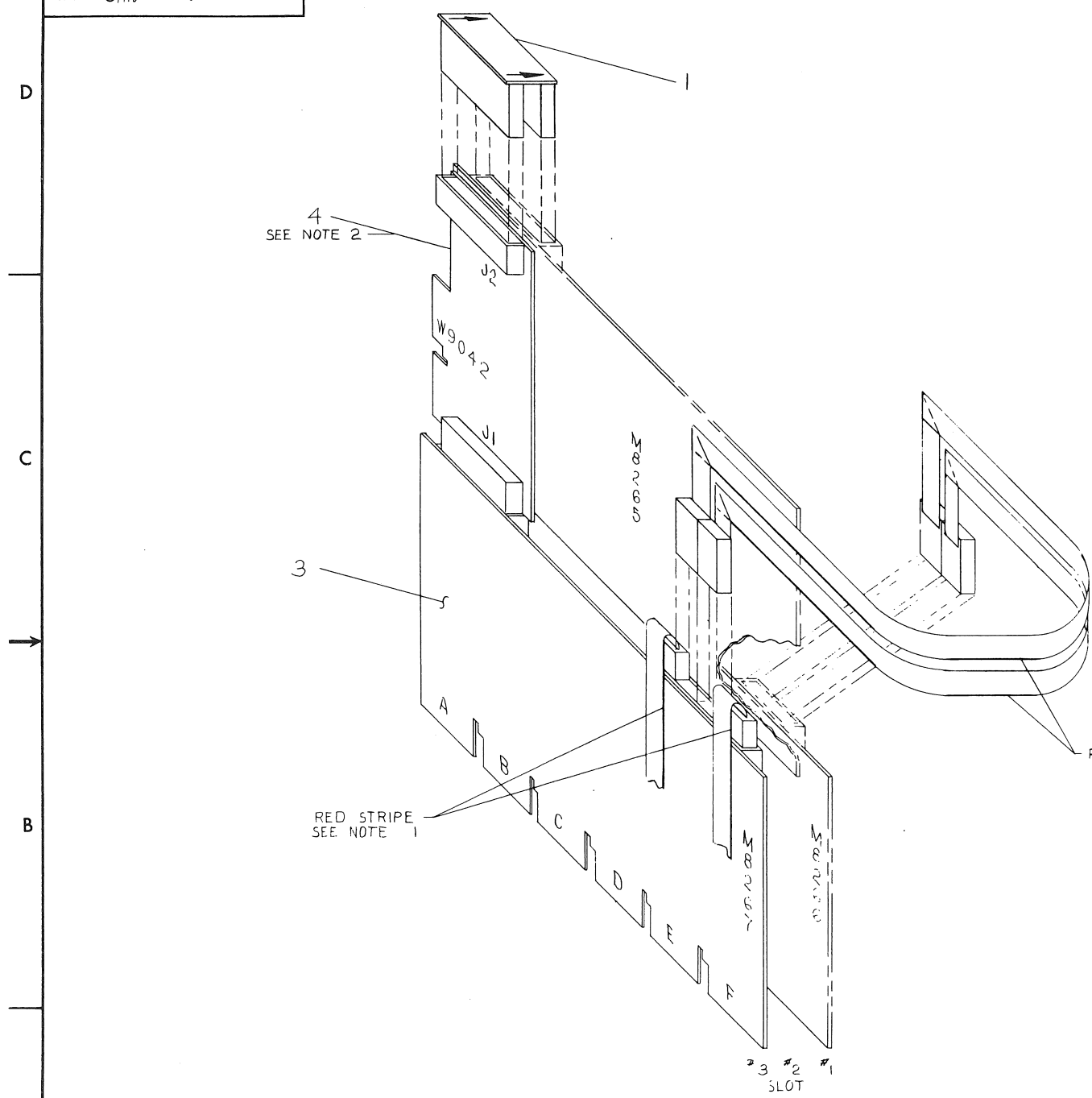
CONFIGURATION "B"

1	EXTENDER BD. ASSY.	D-UA-W9042-0-0	4
1	FLOATING POINT (FPII-A)	D-UA-M8267-0-0	3
1	BOARD, INTERCONN 20 PIN	D-UA-5412416-0-0	2
1	BOARD, INTERCONN 40 PIN	D-UA-H8821-0-0	1

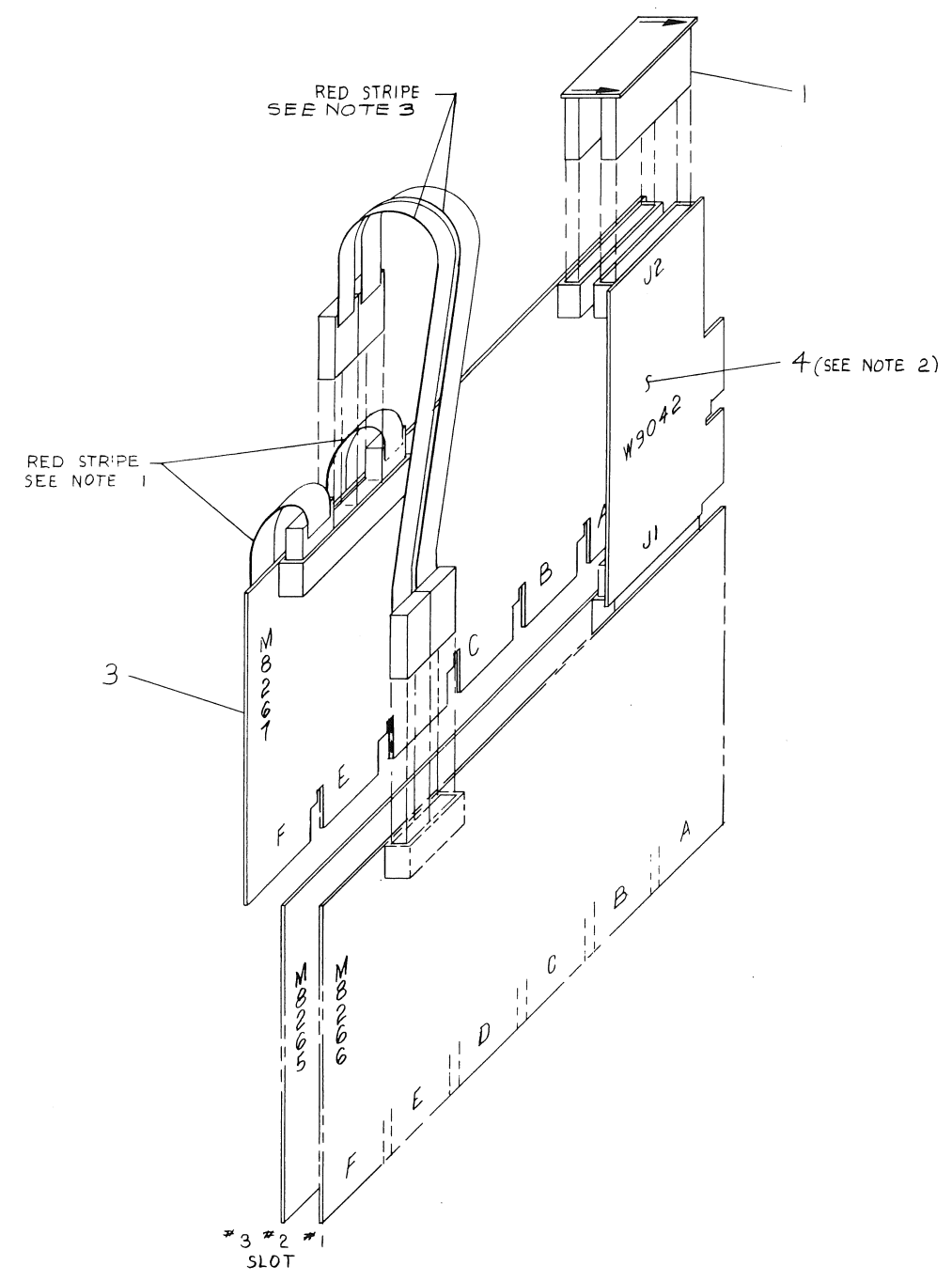
DESCRIPTION		DWG./PART NO.		ITEM NO.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES					
ANGLES ±0° 30'		NOMINAL DIMENSION RANGE INCHES			
SURFACE QUALITY IN	CLASS OF ACCURACY (CHECK ONE)	OVER 0 TO 0.2	OVER 0.2 TO 1.2	OVER 1.2 TO 12.0	OVER 12.0 TO 40.0
MICROINCHES	MEDIUM ☐	±.004	±.008	±.012	±.016
	PREFERRED ☐	±.012	±.016	±.025	±.04
				±.063	±.1

THIRD ANGLE PROJECTION	DRN. <i>B.B. [signature]</i> 11 OCT 76	FIRST USED ON 1134	digital
REMOVE BURRS AND BREAK SHARP CORNERS	CHK'D. <i>D. [signature]</i> 29 OCT 76	TITLE FLOATING POINT OPTION	
DO NOT SCALE DWG	ENG. <i>[signature]</i> 16 DEC 76	PROJECT B-DD-FPII-A	SIZE D
MATERIAL SEE PARTS LIST	PROJ. ENG. <i>[signature]</i> 26 DEC 76	NUMBER UA FPII-A-0	REV.
FINISH	PROD. <i>[signature]</i> 17 DEC 76	SHEET 1 OF 2	DIST.

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CONFIGURATION "C"



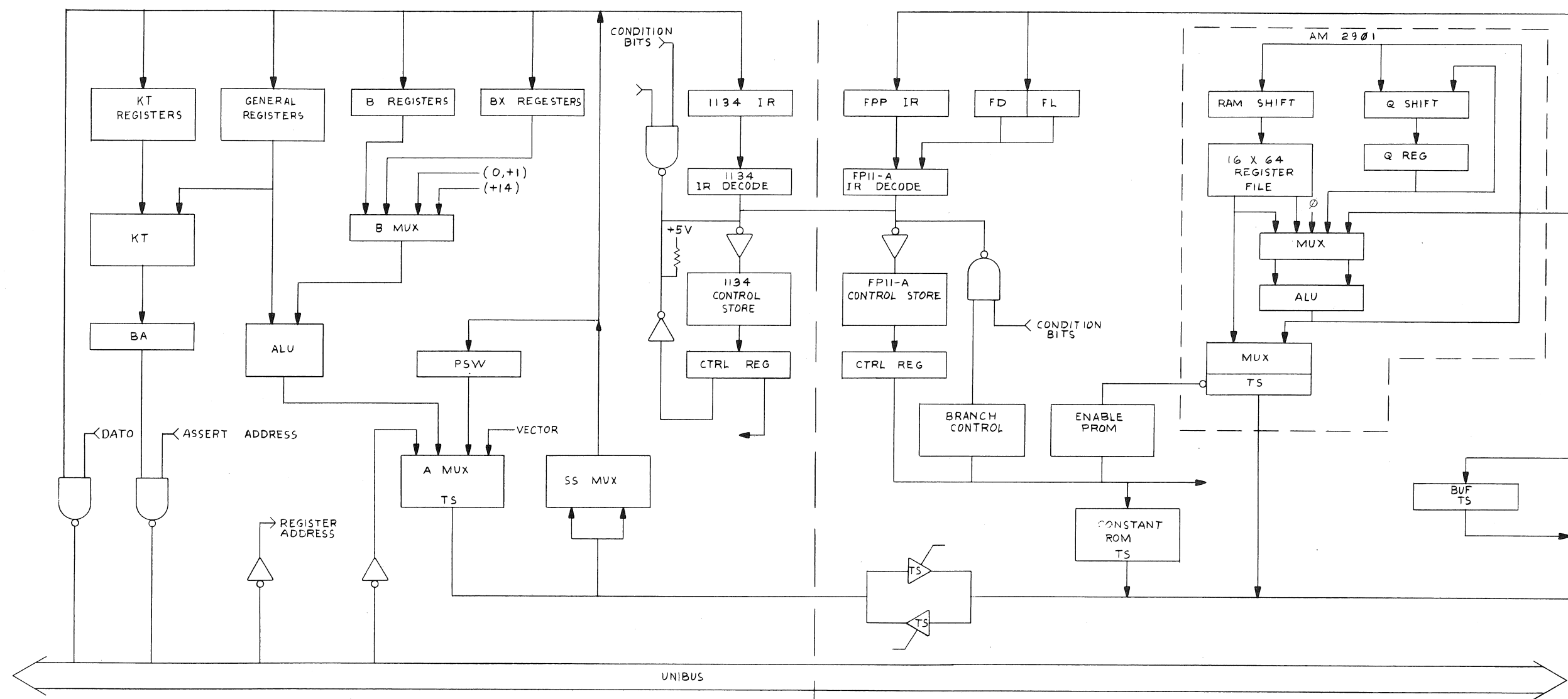
CONFIGURATION "D"

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE FLOATING POINT OPTION		SIZE CODE D UA	NUMBER FPII-A-Ø	REV.
SCALE NONE	SHEET 2	OF 2	DIST.	

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REV. 1
NUMBER
FPII-A-1
SIZE CODE
D BD
2



1134A PROCESSOR

FPII-A FLOATING POINT OPTION

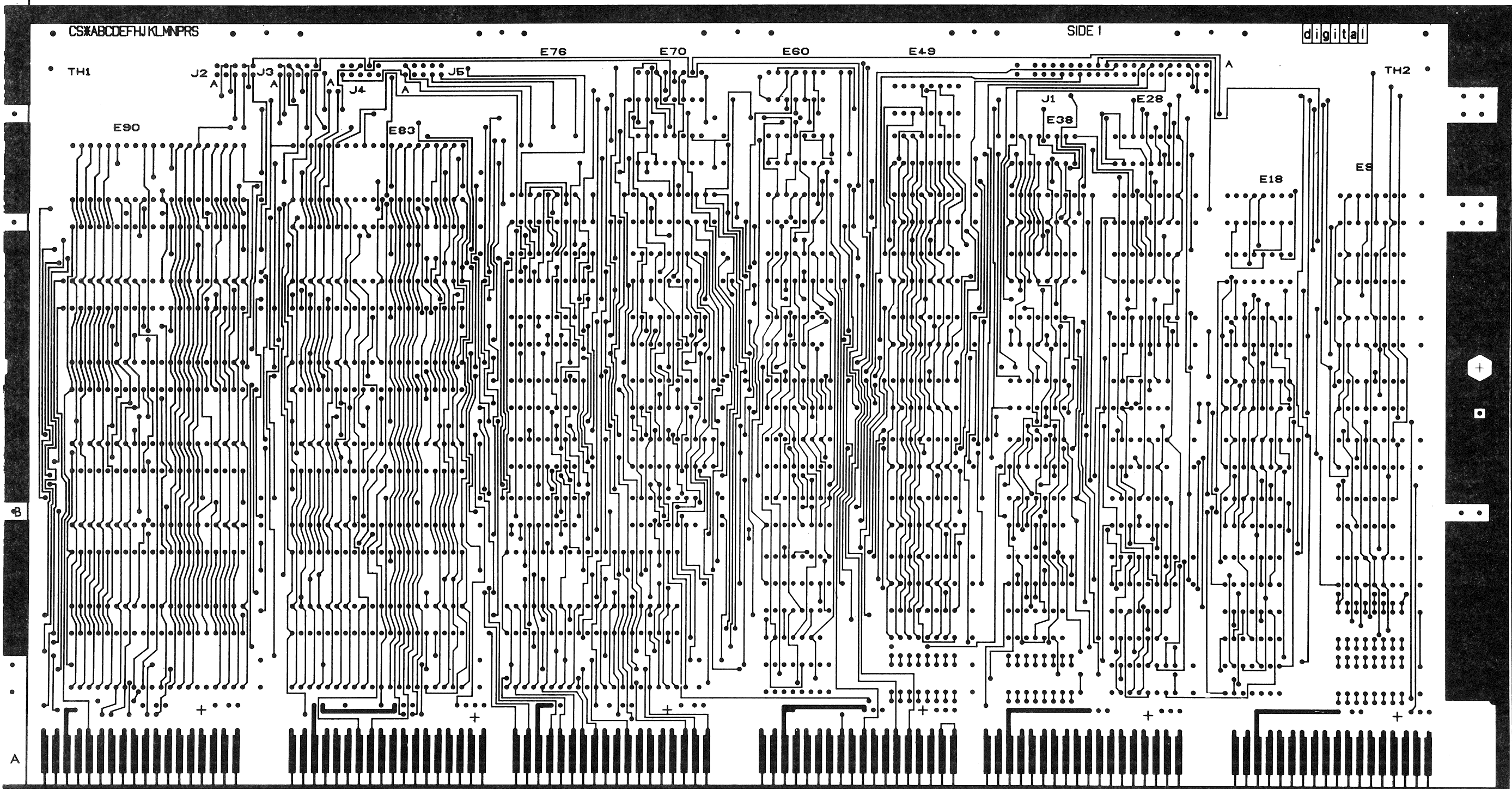
REV.	CHG.	NO.
1		

DRN. B. Blodgett	Mod 76	FIRST USED ON	1134A digital
CHK'D. J. D. 4/11/76	20 DEC 76	TITLE	1134 FLOATING POINT PROCESSOR FPII-A
ENG. J. D. 4/11/76	20 DEC 76	PROJ. ENG.	
PROD. J. D. 4/11/76	20 DEC 76	SCALE	
NEXT HIGHER ASSY.		SHEET	1 OF 1
B-DD-FPII-A		SIZE CODE	D BD
		NUMBER	FPII-A-1
		DIST.	

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LAYER 1



REVISIONS		
CHK	CHANGE NO.	REV.

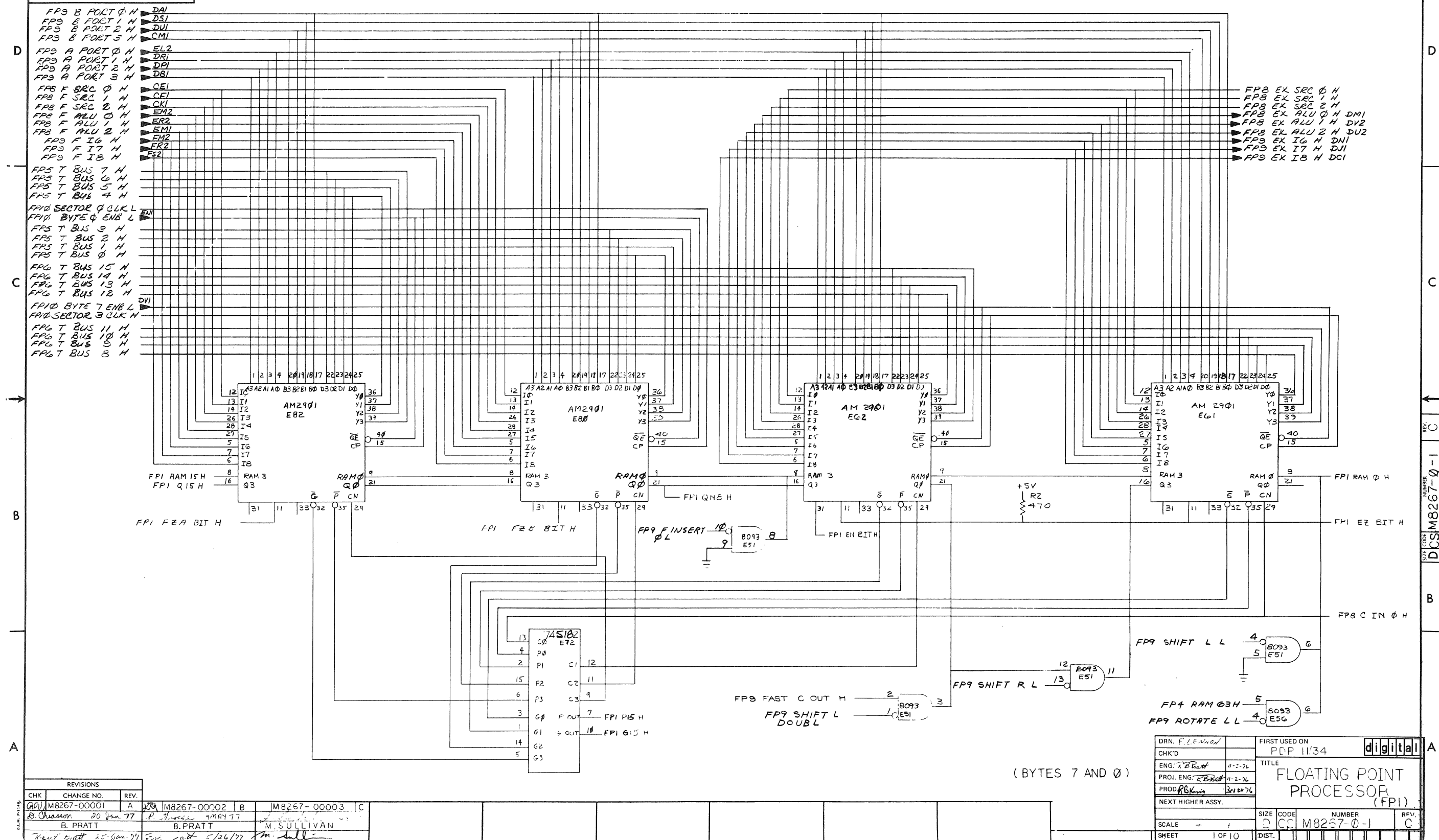
TITLE	11/34 FLOATING PT. OPTION	SIZE/CODE	NUMBER	REV.
SCALE	2/1	D UA	M8267-0-0	C
SHEET	2 OF 3	DIST.		

DIGITAL EQUIPMENT CORPORATION PARTS LIST				QUANTITY / VARIATION										NOTES:			
MADE BY D. J. SIREEN DATE 12 JULY 76		CHECKED F. SEIDMAN DATE 18 AUG 76		SECTION													
ENG <i>m. Sullivan</i> DATE 7/18/77		PROD R. B. KING DATE 15 JAN 77		ISSUED SECTION													
ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	M8267-0-0												REF DESIGNATION	
1	D-MD-5012435-0-0	5012435	ETCHED BOARD	1													
2		1005306	CAPACITOR, 6.8 uf, 35V, 10% TANT	6												C30 thru C35	
3		1012784	CAPACITOR, .047 uf 50V, CER	29												C1 thru C29	
4		1213506-01	RT. ANGLE HEADER 40 POS.	1												J1	
5		1213506-02	RT. ANGLE HEADER 52 POS.	1												J2 thru J5 (ONE CONNECTOR)	
6																	
7		1300271	RESISTOR, 220, 1/4W, 5%	1												R1	
8		1300295	RESISTOR, 330, 1/4W, 5%	2												R7, R8	
9		1300316	RESISTOR, 470, 1/4W, 5%	5												R2, R3, R9, R10, R4	
10		1300229	RESISTOR, 100, 1/4W, 5%	1												R11	
11		1301401	RESISTOR, 750, 1/4W, 5%	1												R6	
12		1910533	I.C. DEC 74S03	4												E11, E20, E23 E32	
13		1910535	I.C. DEC 74S05	1												E33	
14		1910532	I.C. DEC 74S00	2												E22, E60	
15		1910534	I.C. DEC 74S04	2												E35, E34	
16		1910536	I.C. DEC 74S10	1												E30	
17		1910539	I.C. DEC 74S20	1												E10	
18		1910544	I.C. DEC 74S74	1												E13	
19		1910547	I.C. DEC 74S153	2												E59, E69	
20		1910548	I.C. DEC 74S157	1												E70	
21		1910550	I.C. DEC 74S174	9												E27, E31, E28, E49, E52, E53, E57, E65, E67	
E.C.O. NO.																	
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								SHEET 1 OF 3				INSERTION PARTS LIST DATA BASE REV					

DIGITAL EQUIPMENT CORPORATION PARTS LIST				QUANTITY / VARIATION												NOTES:					
MADE BY D. J. SIREEN DATE 12 JULY 76		CHECKED F. SEIDMAN DATE 18 AUG 76		SECTION		M8267-Ø-Ø															
ENG <i>m Sullivan</i> DATE 7/18/77		PROD R. B. KING DATE 15 JUL 77		ISSUED SECTION																	
ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION																REF DESIGNATION		
22		1910837	I.C. DEC 8Ø93	3															E51 E56,E58		
23		1910957	I.C. DEC 74S175	2															E18,E26		
24		1911527	I.C. DEC 8Ø97	6															E5 thru E9,E16		
25		1912097	I.C. DEC 74S182	6															E50,E63,E71 thru E74		
26		1912388	I.C. DEC 74SØ2	1															E24		
27		1912746	I.C. DEC 74S37	1															E12		
28		1911330	I.C. DEC 74173	4															E3,E14,E15,E25		
29		1913245	I.C. DEC AM 29Ø1	16															E61 E62,E77 thru E90		
30		1911637	I.C. DEC 74132	1															E4		
31		1212385	40 PIN SOCKET	16															E61,E62 E77 thru E90		
32		1000015	CAPACITOR , 82 pf, 5%	1															C36		
33		7417214	HANDLE, MODIFIED	1																	
34			I.C. SPARES	4															E1,E2,E29,E39		
35		9000024-01	EYELET	9																	
36		23157A1	I.C. DEC PROM 32 x 8 T.S.	1															E17		
37		23153A1	I.C. DEC PROM 32 x 8 T.S.	1															E19		
38		23154A1	I.C. DEC PROM 32 x 8 T.S.	1															E21		
39		23155A1	I.C. DEC PROM 32 x 8 T.S.	1															E54		
40		23158A1	I.C. DEC PROM 32 x 8 T.S.	1															E55		
41		23156A1	I.C. DEC PROM 32 x 8 T.S.	1															E76		
42		23Ø14F1	I.C. DEC PROM 1K x 4 O.C.	1															E64		
E.C.O. NC																					
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								SHEET 2 OF 3				INSERTION PARTS LIST DATA BASE REV									

DIGITAL EQUIPMENT CORPORATION PARTS LIST					QUANTITY / VARIATION												NOTES:		
MADE BY DATE		CHECKED DATE		SECTION	M8267-Ø-Ø														
ENG DATE		PROD DATE		ISSUED SECTION															
D. J. SIREEN 12 JULY 76		F. SEIDMAN 18 AUG 76																	
M. Sullivan 7/18/77		R. R. KING 15 JUL 77																	
ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION														REF DESIGNATION		
43		23Ø15F1	I.C. DEC PROM 1K x 4 O.C.	1													E66		
44		23435A9	I.C. DEC PROM 512 x 4 T.S.	1													E45		
45		23436A9	I.C. DEC PROM 512 x 4 T.S.	1													E44		
46		23437A9	I.C. DEC PROM 512 x 4 T.S.	1													E43		
47		23438A9	I.C. DEC PROM 512 x 4 T.S.	1													E38		
48		23439A9	I.C. DEC PROM 512 x 4 T.S.	1													E42		
49		2344ØA9	I.C. DEC PROM 512 x 4 T.S.	1													E41		
50		23441A9	I.C. DEC PROM 512 x 4 T.S.	1													E40		
51		23442A9	I.C. DEC PROM 512 x 4 T.S.	1													E37		
52		23443A9	I.C. DEC PROM 512 x 4 T.S.	1													E36		
53		23444A9	I.C. DEC PROM 512 x 4 T.S.	1													E48		
54		23445A9	I.C. DEC PROM 512 x 4 T.S.	1													E47		
55		23446A9	I.C. DEC PROM 512 x 4 T.S.	1													E46		
56		23Ø1ØB1	I.C. DEC PROM 256 x 8 T.S.	1													E75		
57		23Ø11B1	I.C. DEC PROM 256 x 8 T.S.	1													E68		
58		1300365	RESISTOR, 1K, 1/4W, 5%	1													R5		
E.C.O. NO.																			
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										D-UA-M8267-Ø-Ø			B	PL	M8267-Ø-Ø		C		
										SHEET 3 OF 3			INSERTION PARTS LIST DATA BASE REV						

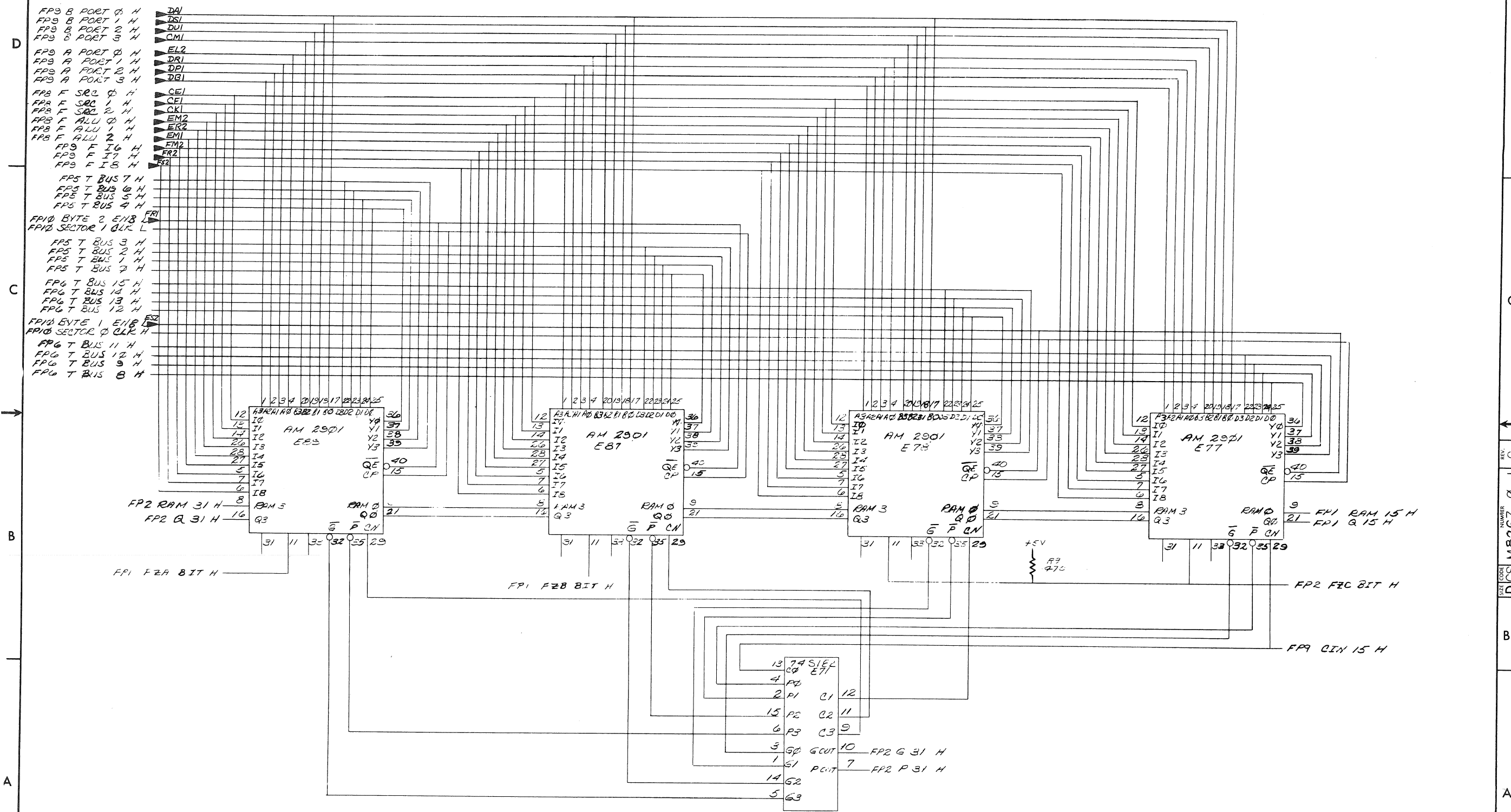
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REVISIONS			
CHK	CHANGE NO.	REV.	
001	M8267-00001	A	M8267-00002 B M8267-00003 C
B. Chasson 30 Jan. 77 P. J. 9 MAY 77 M. SULLIVAN			
B. PRATT B. PRATT M. SULLIVAN			
Kend Pratt 15 Jan. 77 Eric 1st 5/26/77 M. Sullivan			

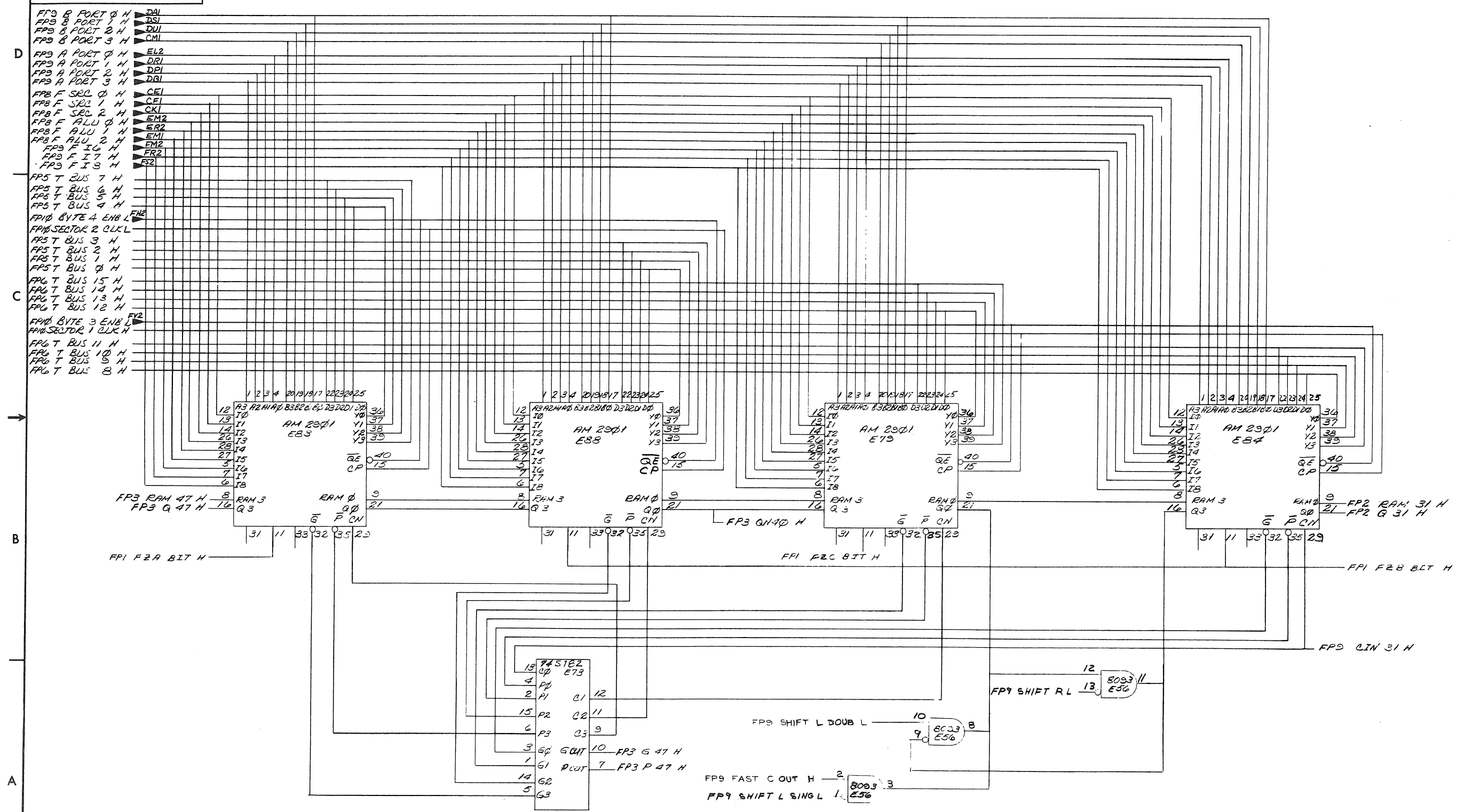
DRN. <i>F. L. ENYON</i>		FIRST USED ON		digital		A
CHK'D		PDF 11/34				
ENG: <i>R. B. Burt</i>	11-2-76	TITLE		FLOATING POINT PROCESSOR (FDP)		
PROJ. ENG: <i>R. B. Burt</i>	11-2-76					
PROD. <i>R. B. Burt</i>	2-21-76					
NEXT HIGHER ASSY.						
		SIZE	CODE	NUMBER	REV.	
SCALE	+		CC	M8257-0-1	C	
SHEET	1 OF 10	DIST.				

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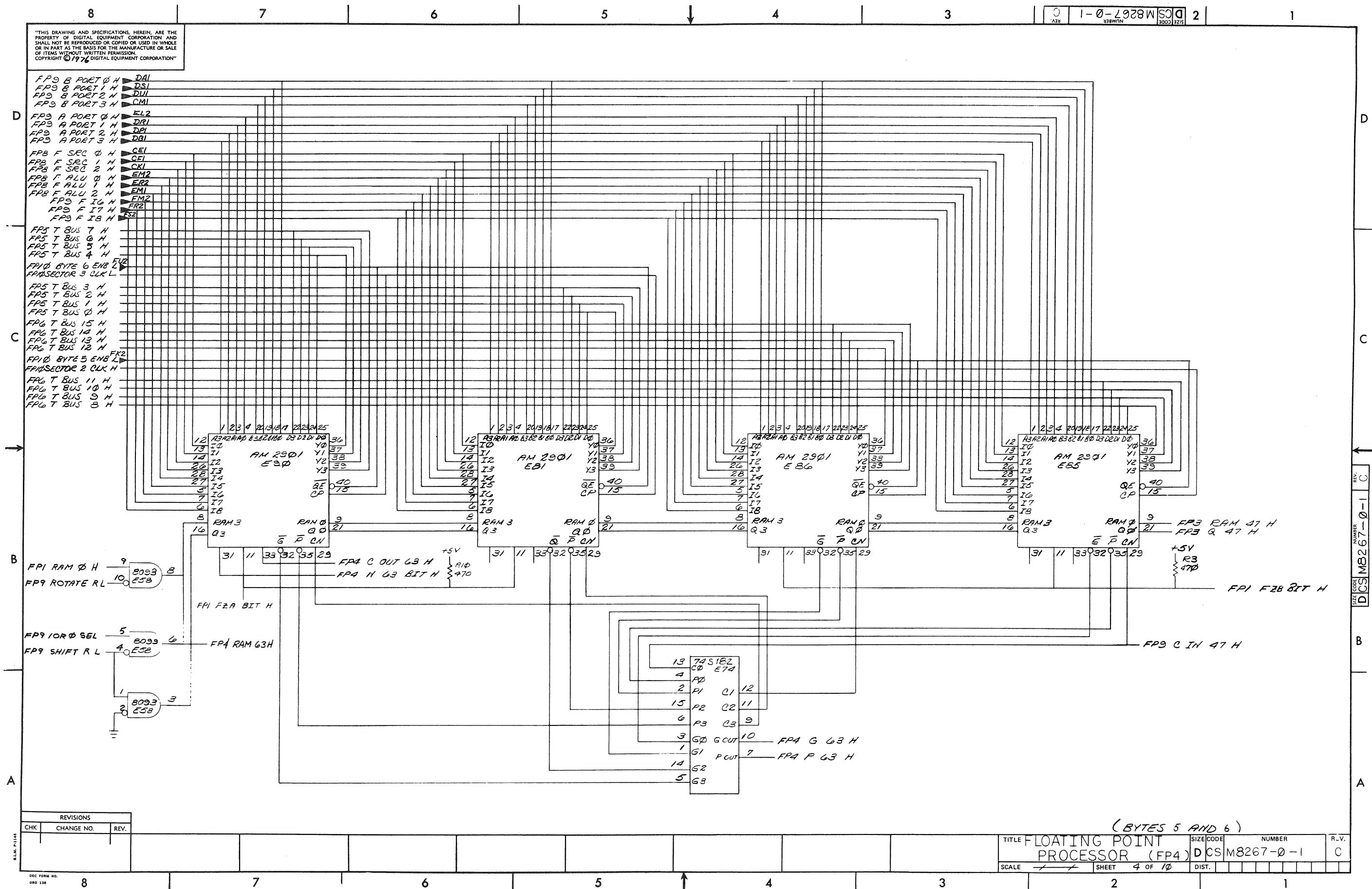


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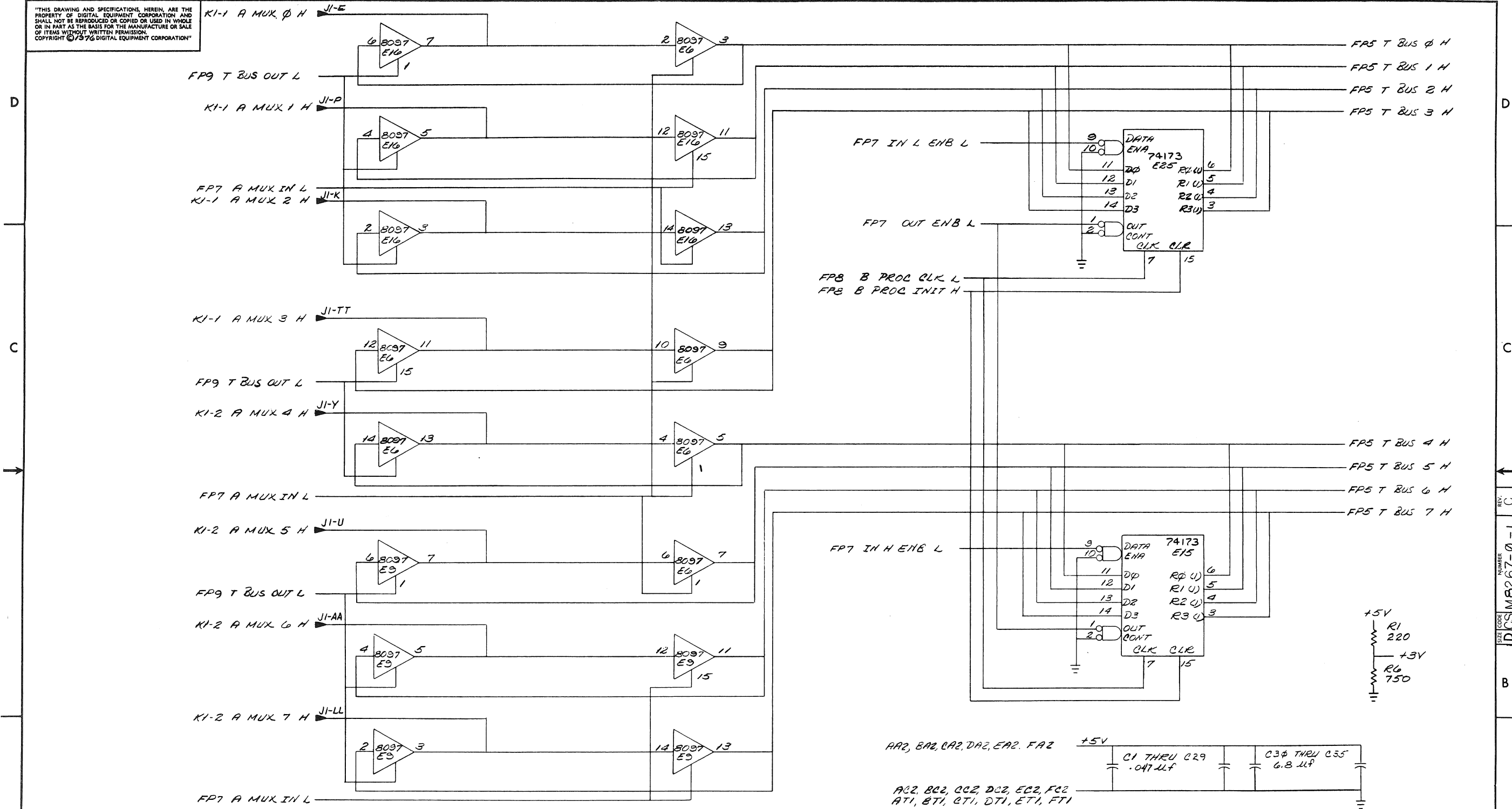
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REVISIONS		
CHK	CHANGE NO.	REV.



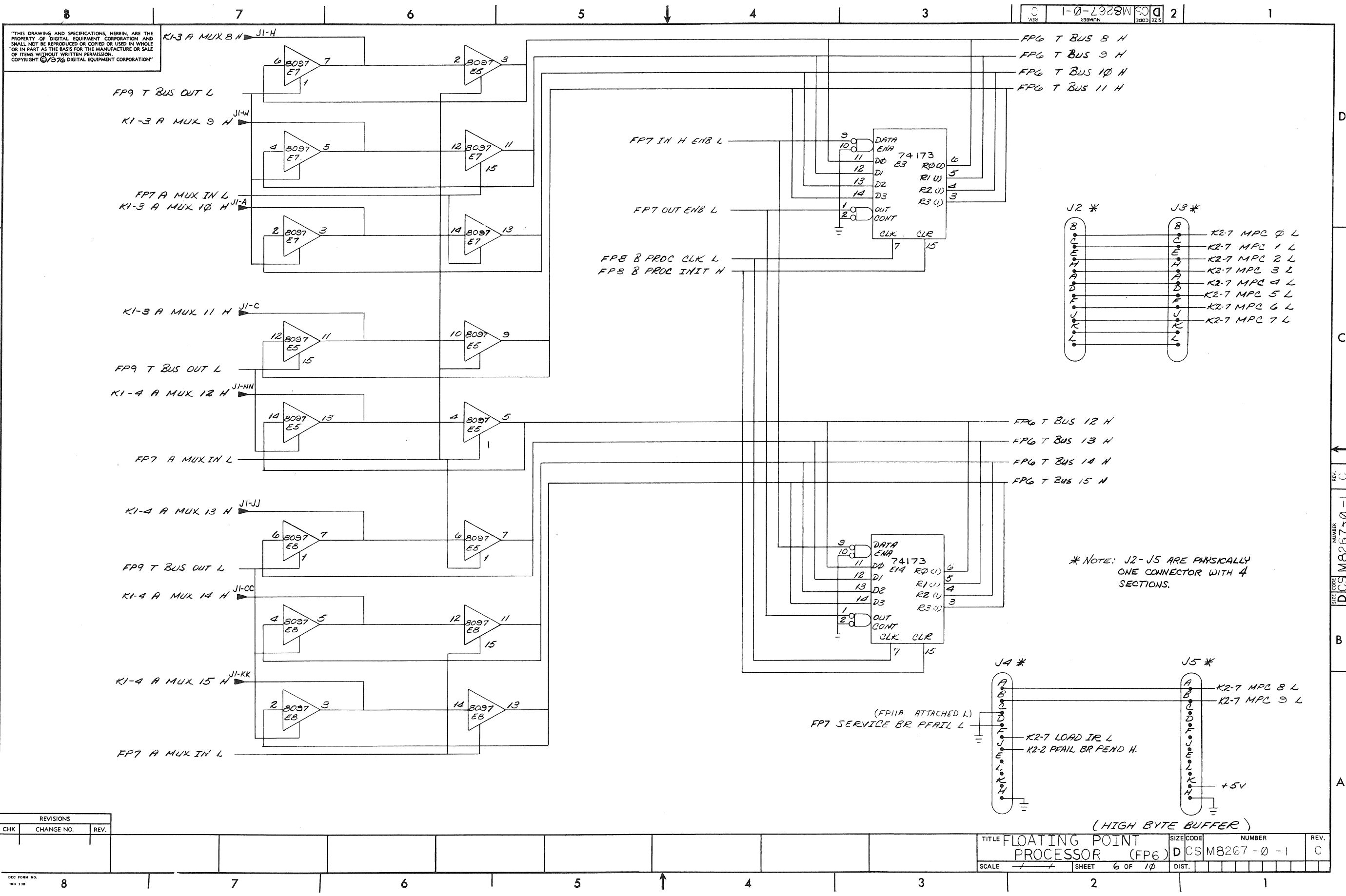
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REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
FLOATING POINT PROCESSOR (FP5)		DCS	M8267-0-1	C
SCALE	1	SHEET	5 OF 10	DIST.

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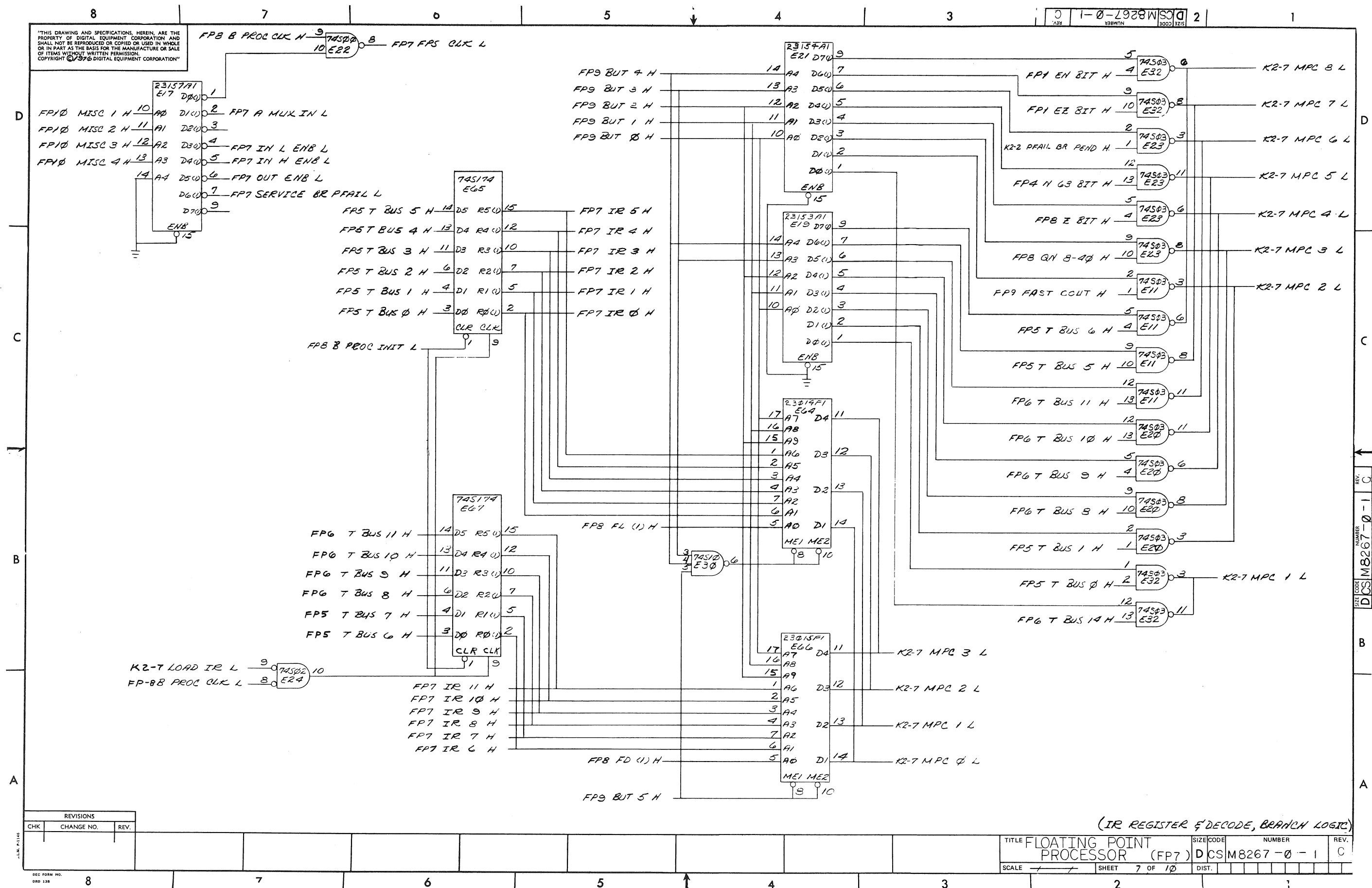


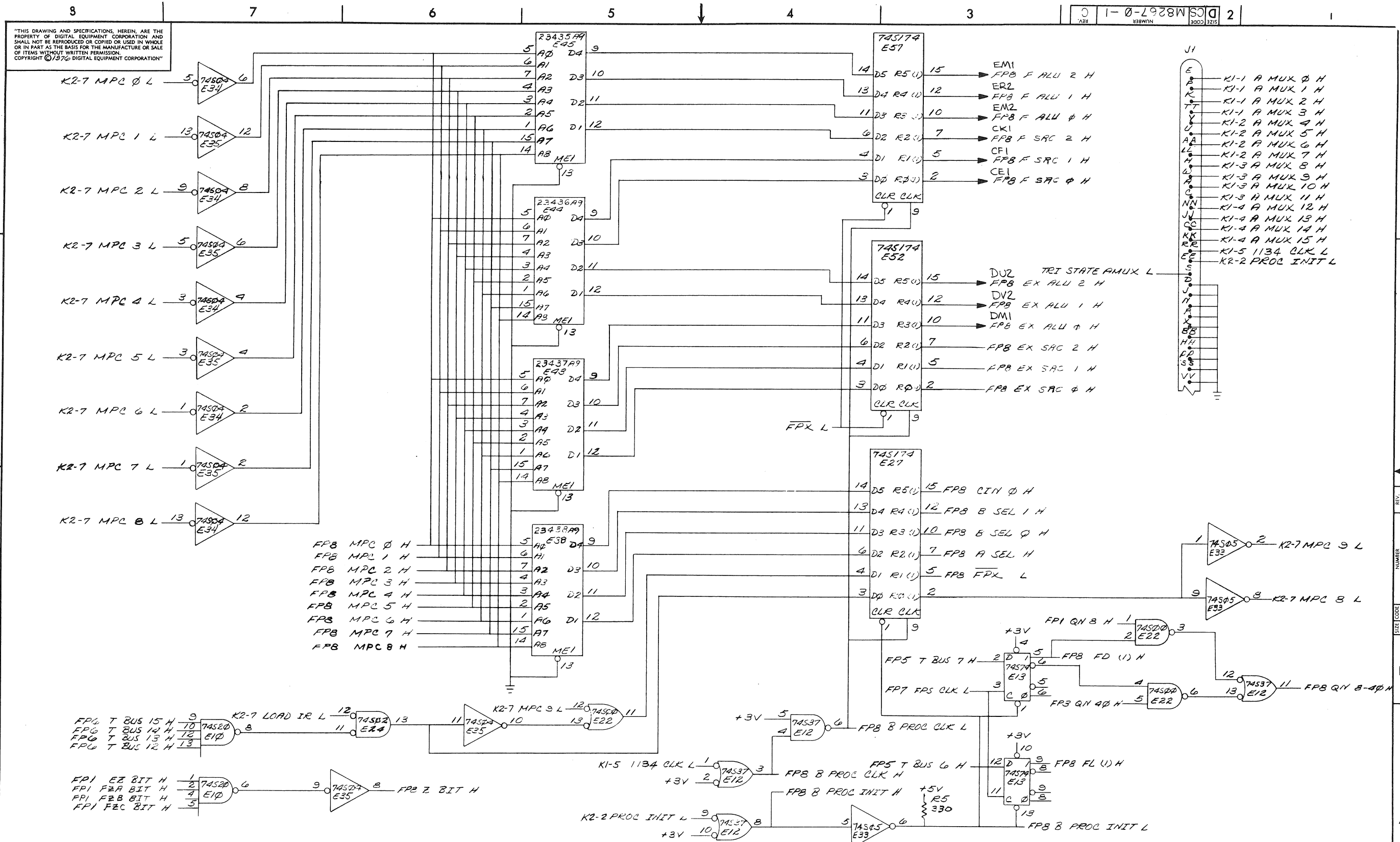
* NOTE: J2-J5 ARE PHYSICALLY ONE CONNECTOR WITH 4 SECTIONS.

(HIGH BYTE BUFFER)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
FLOATING POINT PROCESSOR (FP6)		D CS	M8267-0-1	C
SCALE	SHEET	DIST.		
	6 OF 10			





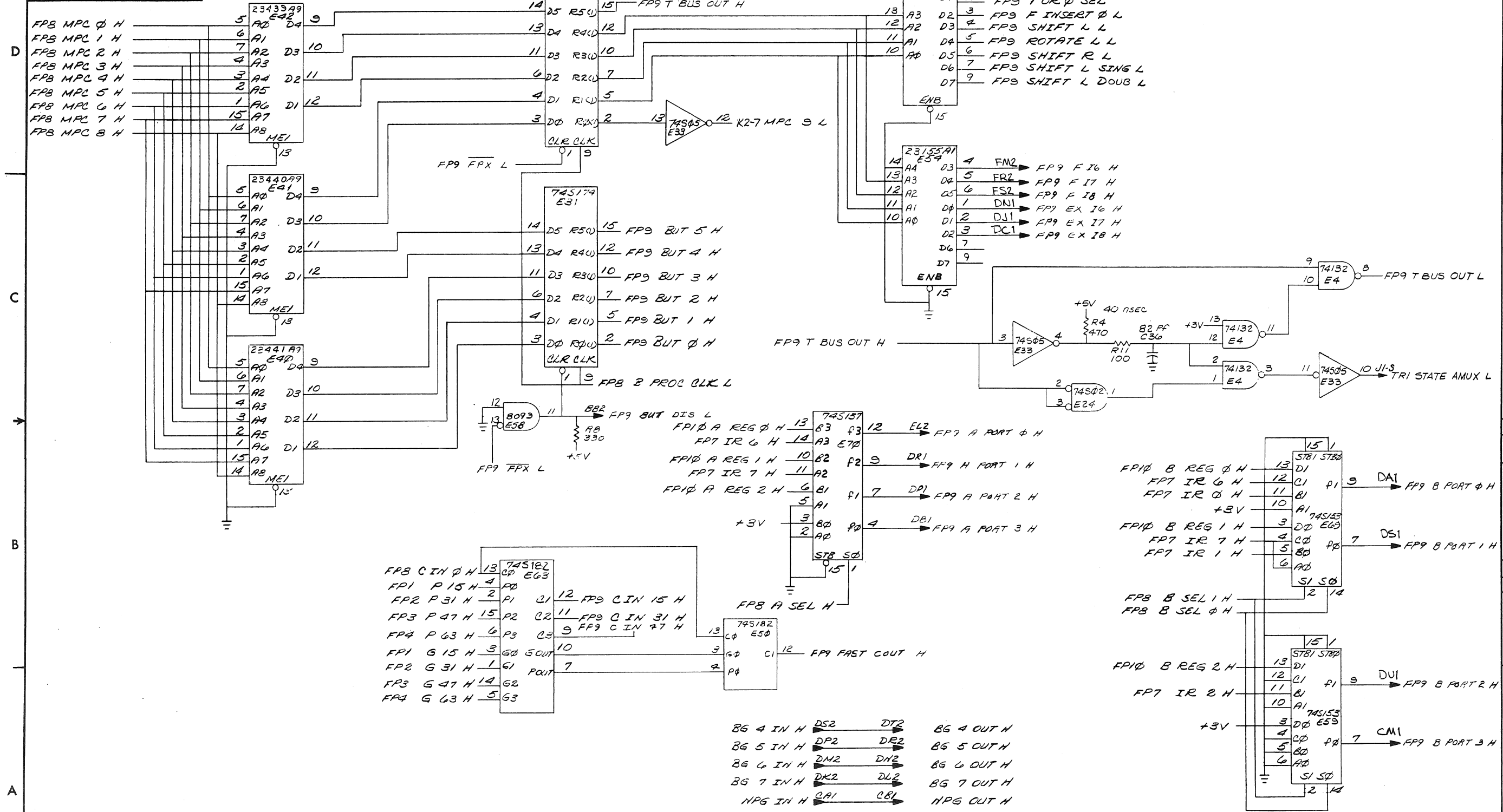
REVISIONS			TITLE		SIZE CODE		NUMBER		REV.	
CHK	CHANGE NO.	REV.	FLOATING POINT PROCESSOR (FP8)		D		CSM8267-0-1		C	
			SCALE		SHEET 8 OF 10		DIST.			

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1-0-228W 2

REV. C
NUMBER
D CSM8267-0-1

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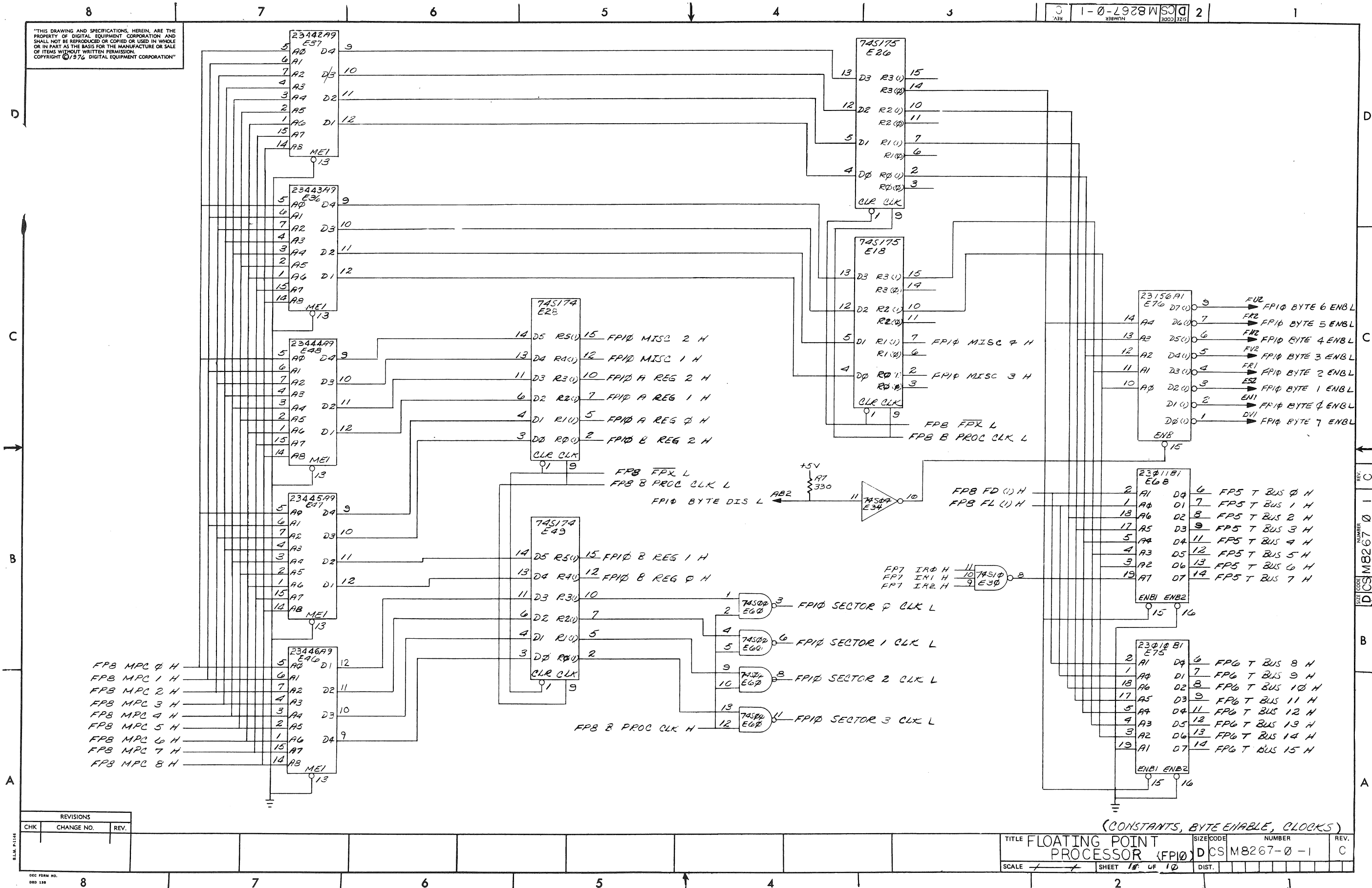


REVISIONS		
CHK	CHANGE NO.	REV.

(A PORT MUX, B PORT MUX, BUT)									
TITLE FLOATING POINT PROCESSOR (FP9)					SIZE CODE DCS		NUMBER M8267-0-1		REV. C
SCALE 11		SHEET 9 OF 10			DIST.				

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1-0-1
REV. 0
NUMBER
SIZE CODE
DCS M8267-0-1



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		DCS M8267-0-1	REV.
FLOATING POINT PROCESSOR (FPI)			C
SCALE	SHEET	18 OF 10	DIST.

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0-0-H8821-00

1

D

D

C

C

B

B

A

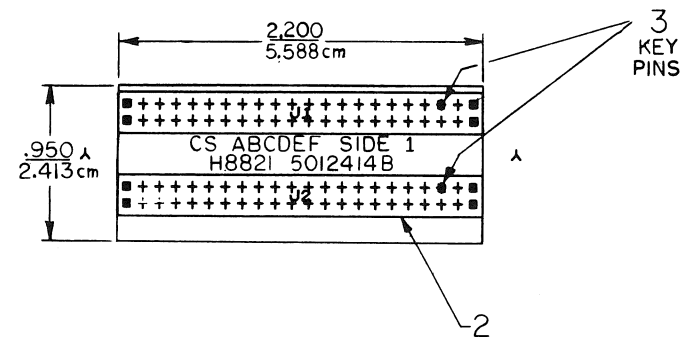
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NOTES:

CH	CHANGE	NO	REV

ETCH REV. B
P.C. DESIGN DATA BASE REV. B

SIGNATURES		DATE	digital	
DRN. F. MULLIGAN		10/27/76		
CHK'D. F. SEIDMAN		12-3-76		
ENG. R. Barry		3 DEC 76	TITLE	40 PIN
PROJ. ENG. R. Barry		3 DEC 76	INTERCONNECT BOARD	
PROD. R. Barry		6 DEC 76	SIZE	CODE
SCALE 2/1			NUMBER	REV
SHT. 1 OF 3			D UA H8821-0-0	A
NEXT HIGHER ASSY. B-DD-H8821-0				



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REV. A
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LATCH

CS ABCDEF SIDE 1
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H8821 5012414B

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REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO.
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TITLE
40 PIN INTERCONNECT BOARD

SCALE 2/1

SHEET 2 OF 3

SIZE CODE
D UA

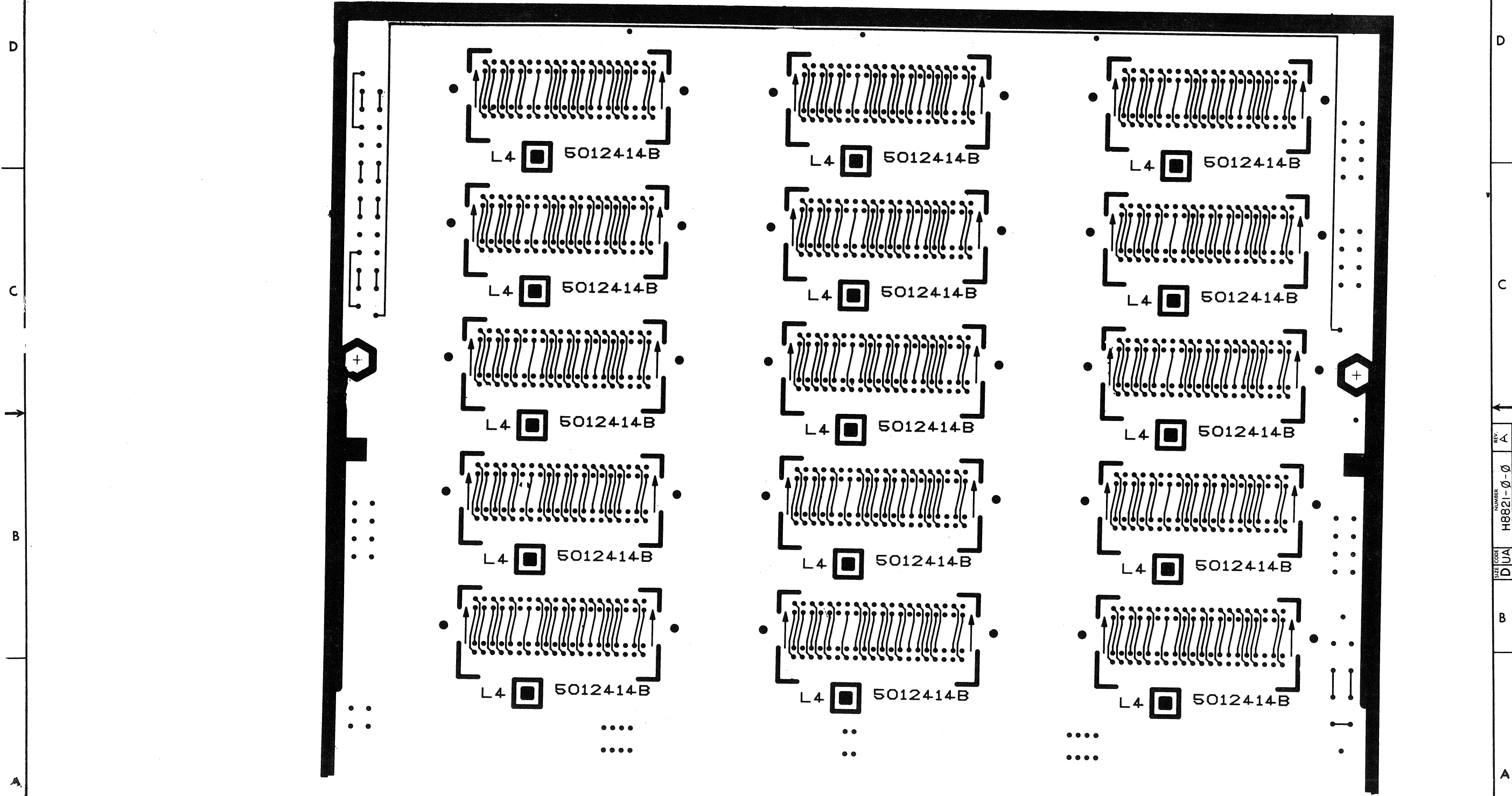
DIST.

NUMBER
H8821-Ø-Ø

REV. A

REV. A
NUMBER
H8821-Ø-Ø
SIZE CODE
D UA

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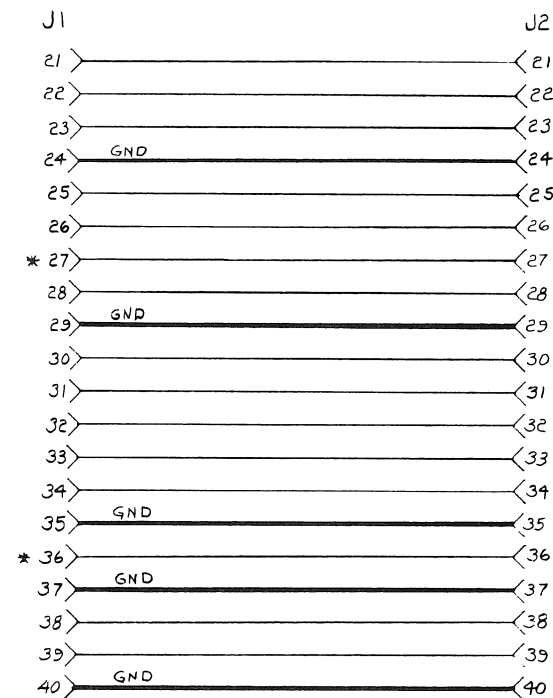
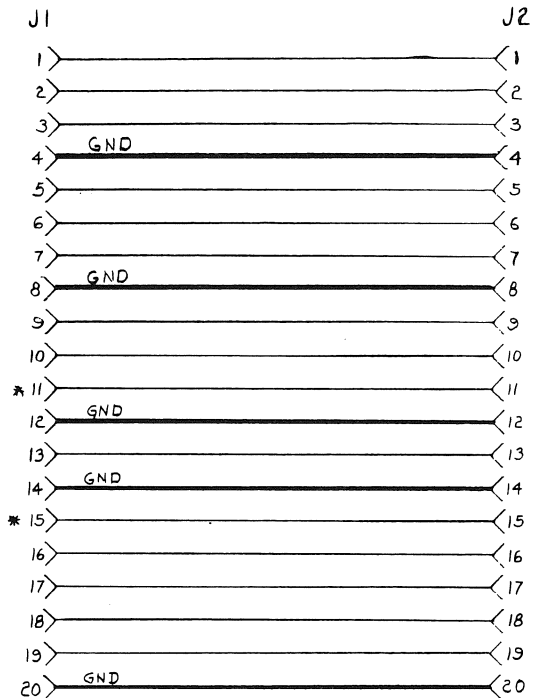


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER		REV.
40 PIN INTERCONNECT BOARD		D U A	H8821-Ø-Ø		A
SCALE	2/1	SHEET	3 OF 3	DIST.	

[illegible]

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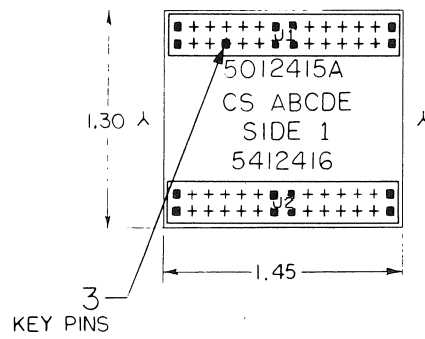
NOTES:

- * DESIGNATES CONDUCTORS TO BE LOCATED ON LAYER 2
- GND WILL BE ON LAYER 3 & REMAINING ETCH ON LAYER 4
- LAYER 1 (SIDE 1) WILL BE FREE OF ALL CIRCUITRY

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES	DRN. F. MULLIGAN	DATE 8/3/76	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
TOLERANCES	CHK'D. L. Sedman	DATE 8/4/76		
DECIMALS	ENG. R. Barry	DATE 3 DEC 76		
ANGLES	PROJ. ENG. R. Barry	DATE 3 DEC 76		
REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	PROD. A. Barry	DATE 6 DEC 76	TITLE 40 PIN INTERCONNECT BOARD	
MATERIAL	NEXT HIGHER ASSY.		SIZE CODE C CS	NUMBER H8821-0-1
FINISH	SCALE N/A	SHEET 1 OF 1	DIST.	REV. A

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NOTES:

CHK/CHANGE NO/REV

ETCH REV. A
P.C. DESIGN DATA BASE REV. A

SIGNATURES		DATE	digital	
DRN.	F. MULLER	8/2/76		
CHK'D.	F. SEIDMAN	8/4/76		
ENG.	R. Barry	3DA76		
PROJ. ENG.	R. Barry	3DA76		
PROD.	R. Barry	6DA76		
SCALE	2/1			
SHT.	1 OF 3			
NEXT HIGHER ASSY. B-DD-5412416-0				
		SIZE CODE	NUMBER	REV
		D UA	5412416-0-0	*

1 MS#60956

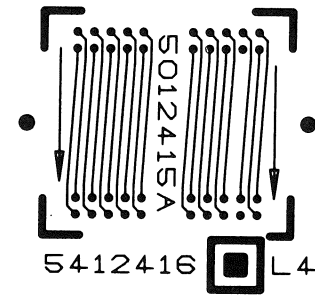
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5012415A
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SIDE 1
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REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
MODULE INTERCONNECT BOARD		D UA	5412416-0-0	*
SCALE	2/1	SHEET	2 OF 3	DIST.

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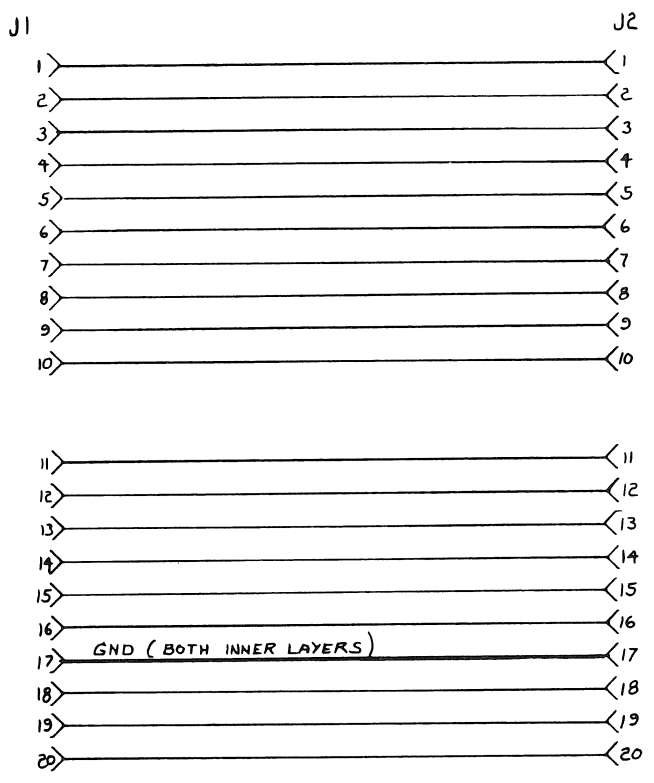


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
MODULE INTERCONNECT BOARD		D UA	5412416-Ø-Ø	*
SCALE	2/1	SHEET	3 OF 3	DIST.

[illegible]

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NOTE :
1- ALL ETCH ON SIDE 2 ONLY EXCEPT GND PLANES.

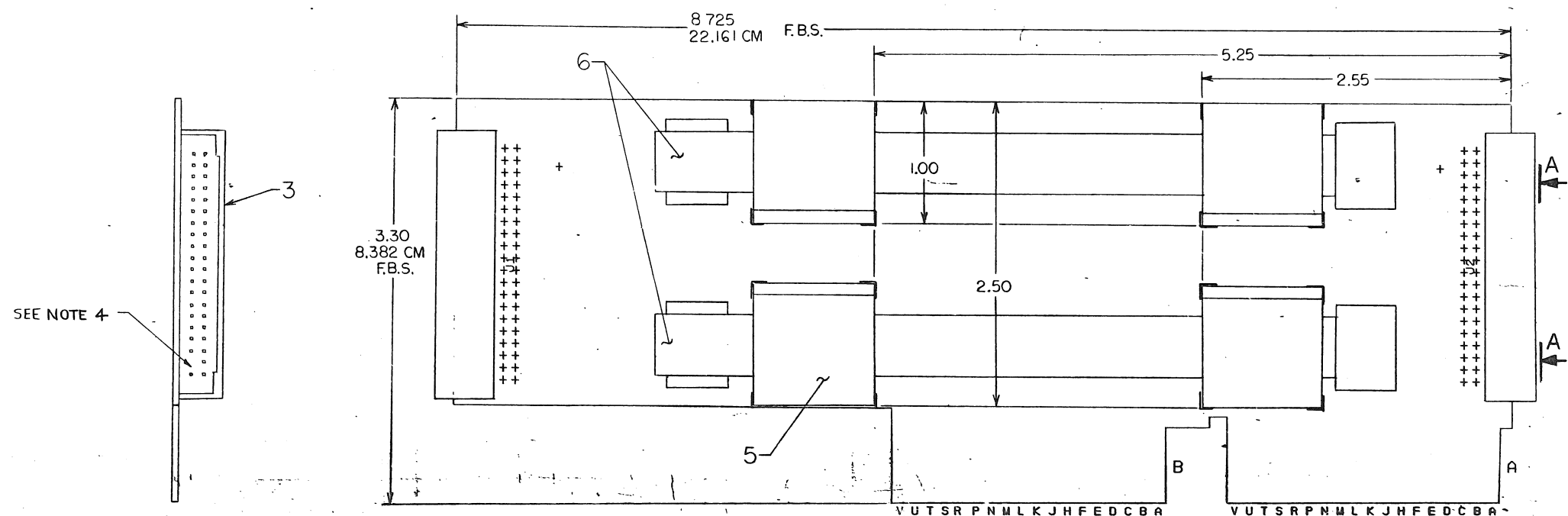
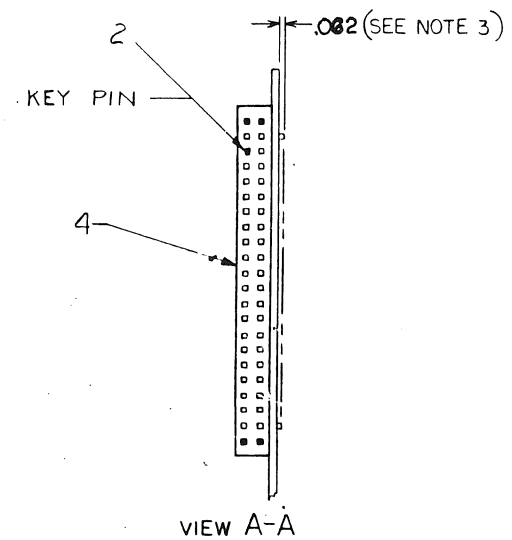
REVISIONS	
CHANGE NO.	REV.
CHK	

FIRST USED ON OPTION/MODEL	QTY.	DESCRIPTION	PART NO.	ITEM NO.
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSION IN INCHES	DRN. F. MULLIGAN	DATE 8/2/76	digital EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	
TOLERANCES	CHK'D J. Swadman	DATE 9/4/76		
DECIMALS	ENG R. Barry	DATE 3 Dec 76		
ANGLES	PROJ. ENG. R. Barry	DATE 3 Dec 76		
.xxx = .005 .xx = .02 .x = .1	REMOVE BURRS AND BREAK SHARP CORNERS SURFACE QUALITY	DATE 6 Dec 76	TITLE MODULE INTERCONNECT BOARD	
MATERIAL	NEXT HIGHER ASSY.	SIZE	CODE	NUMBER
FINISH	SCALE N/A	C	CS	5412416-0-1
	SHEET 1 OF 1	DIST.		REV. *

REV. *
NUMBER 5412416-0-0
SIZE CODE C CS

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COMPONENT SIDE VIEW



NOTES:

1. THIS MODULE CAN BE USED AS A JUMPER CONTINUITY CARD.
2. ITEM 6 CABLES ARE USED FOR MAINTENANCE PURPOSES ON THE FPIIA OPTIONS. SEE E-UA-FPIIA-0-0.
3. TRIM ITEM 4 LEADS AFTER MOUNTING.
4. REMOVE PIN INDICATED. (TO REMOVE PIN, STRAIGHTEN BACK END AND PULL OUT FROM FRONT OF CONNECTOR.)
5. USE CABLE CLAMPS ITEM 5 TO STORE CABLES ITEM 6 WHEN NOT IN USE.

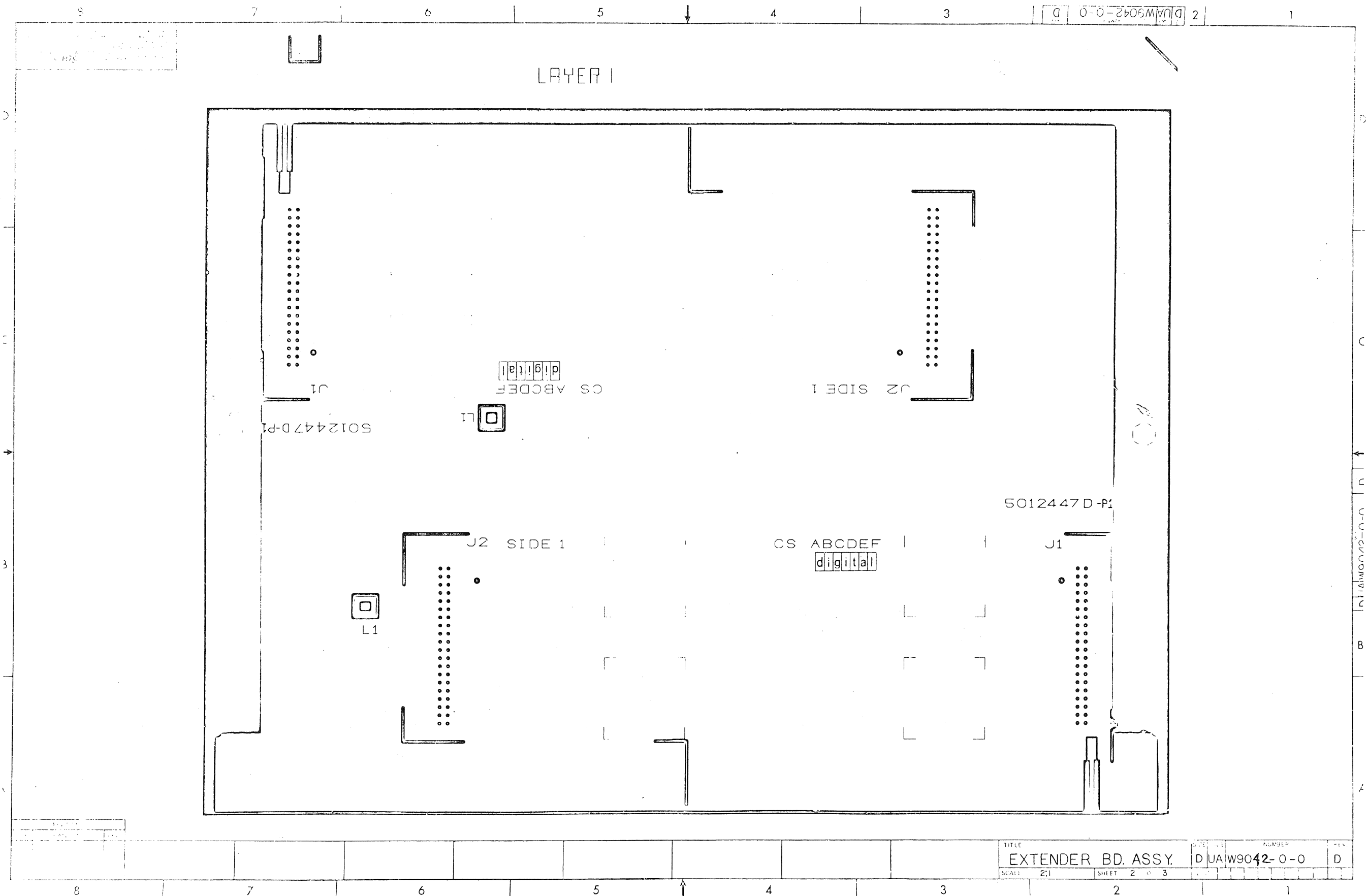
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3	1	1	1/1/76	J. MERCURI	
4	1	1	1/1/76	J. MERCURI	
5	1	1	1/1/76	J. MERCURI	
6	1	1	1/1/76	J. MERCURI	
7	1	1	1/1/76	J. MERCURI	
8	1	1	1/1/76	J. MERCURI	
9	1	1	1/1/76	J. MERCURI	
10	1	1	1/1/76	J. MERCURI	

ETCH REV. D-PI
P.C. DESIGN (REV. D-PI)

SIGNATURES	DATE	TITLE
DRN. F. MULLIGAN	1/1/76	
CHK'D. R. PUZZO	1/1/76	
ENG. R. BARRY	1/1/76	
PROJ. ENG. R. BARRY	1/1/76	
PROD. R. BARRY	1/1/76	
SCALE 2/1		
SHT. 1 OF 3		
NEXT HIGHER ASSY. B-DD-W9042-0		

E	digital			
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76	EXTENDER BOARD ASSEMBLY			
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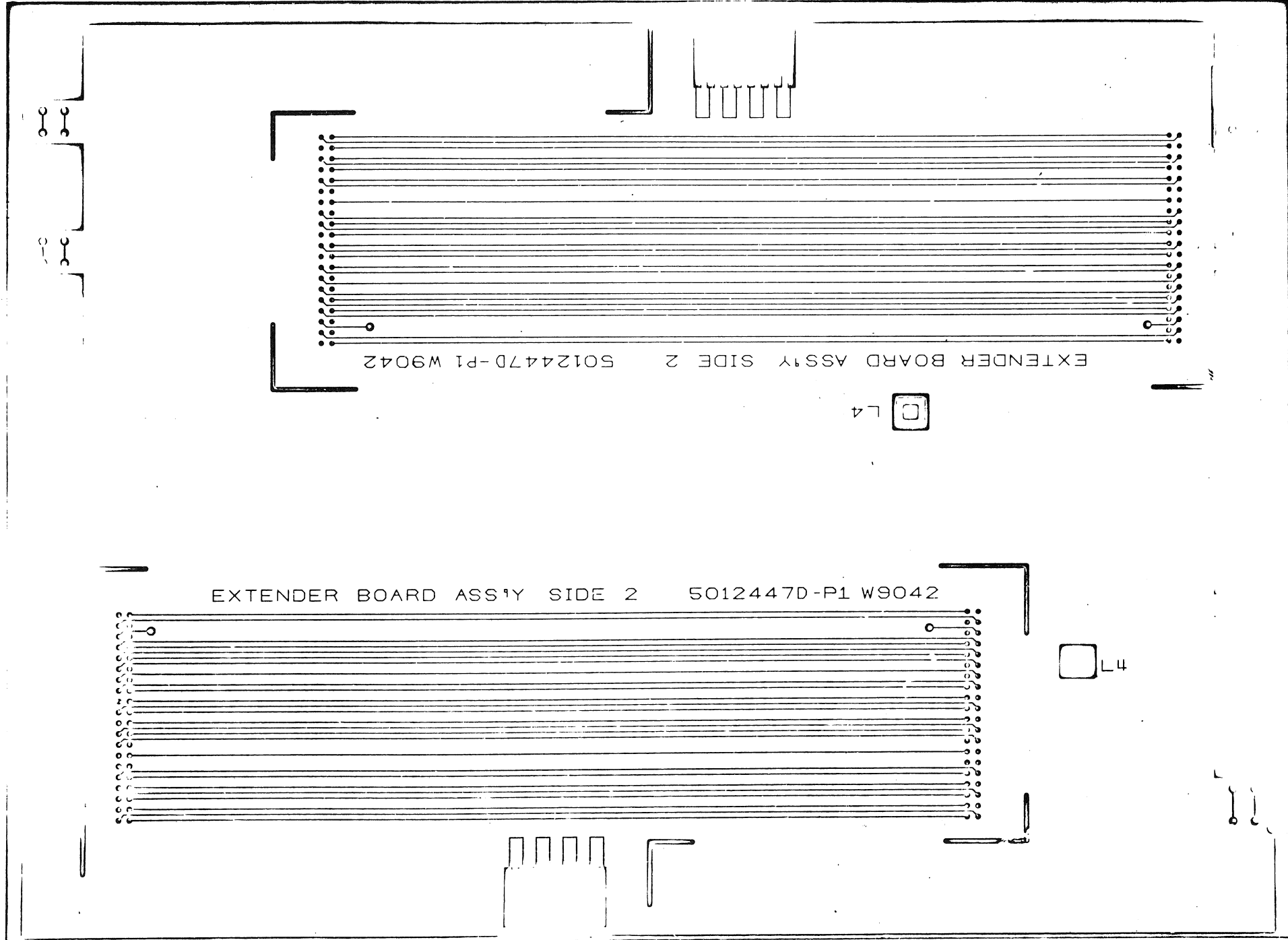
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REVISIONS		
CHK	CHANGE NO	REV

TITLE	SIZE CODE	NUMBER	REV.
EXTENDER PD. ASSY.	D	UA W9042-0-0	D
SCALE 2:1	SHEET 3 OF 3		



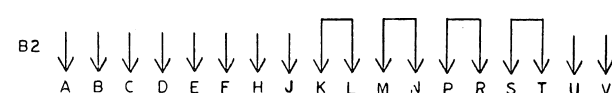
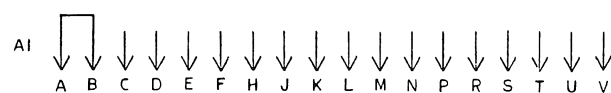
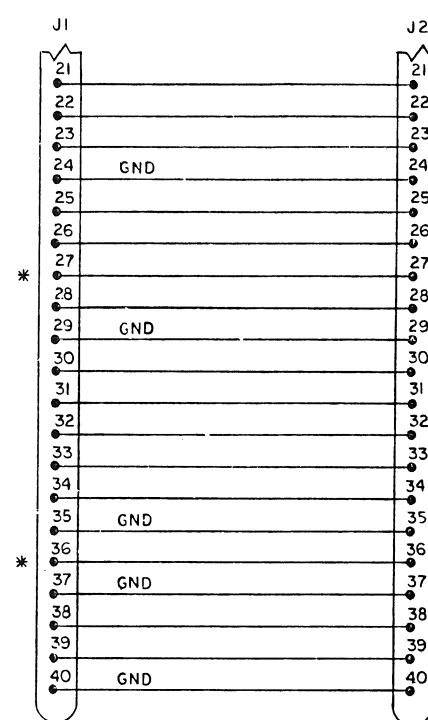
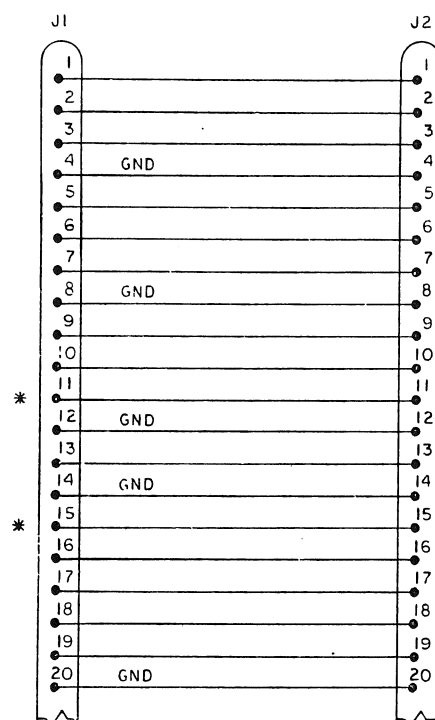
A
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C
D

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY	REFERENCE DESIGNATOR
1	1	D-MD-G012447-0-0	G012447-00	W9042	1	
2	2		1213508-03	CONN KEYING PLUG	1	
3	3		1213506-01	HEADER 40POS RT ANGLE W/3 SI	1	J2
4	4		1213947-00	SOCKET,100 40POS RT ANGLE	1	J1
5	5		9009636-00	CLAMP, CABLE, FOR FLAT CABLE	4	
6	6		7011411-1D	3M CABLE FOR KY11-LB	2	

REVISION HISTORY			BASIC PART NO: W9042				
ENG	ECO NUMBER	REV	SECTION 1 OF 1	DRN: F.MULLIGAN	DATE: 13-MAR-78	D I G I T A L	
---	INITIAL	B	SECTION VARIATION INDEX	CHK'D: F.MELANSON	DATE: 13-MAR-78	TITLE PARTS LIST	
WH	000002	C	[1] 00			FP11A EXTENDER BOARD ASSY	
RS	000003	D	[2]				
			[3]	DES.ENG: R.BARRY	DATE: 13-MAR-78		
			[4]				
			[5]				
			[6]	RESP.ENG.: R.BARRY	DATE: 13-MAR-78	DOCUMENT NUMBER	
			[7]				
			[8]				
			[9]	MFG.ENG.: R.KING	DATE: 13-MAR-78	K PL W9042-0-DBP	
			[10]				
			[11]	ASSEMBLY NUMBER:		FILE NAME:	
			[12]	D-UA-W9042-0-0		W9042.PLS	
						EDIT # 1	

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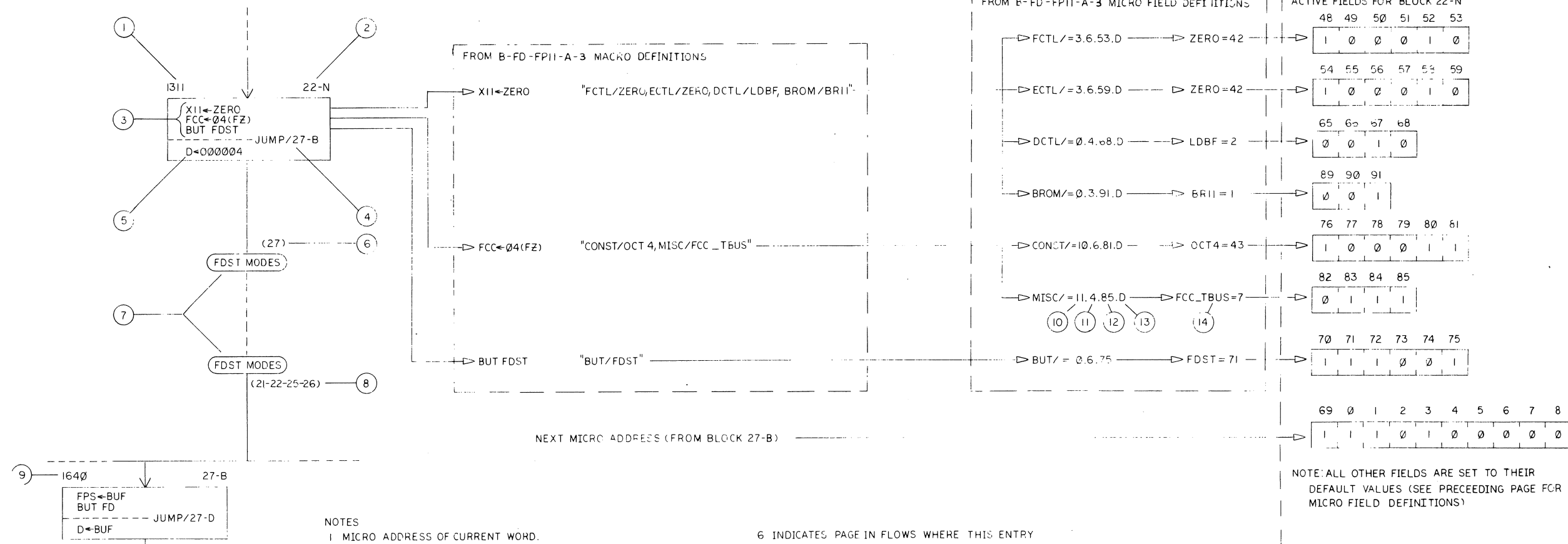
NOTE: 1. (*) DESIGNATES ETCH CONNECTION ON LAYER 2

DRN. <i>Q1111111</i>	<i>8-25-76</i>	FIRST USED ON	<i>21-11-76</i>
CHK'D <i>11/11/76</i>	<i>11/11/76</i>	TITLE	EXTENDER BOARD ASSEMBLY
ENG. <i>11/11/76</i>	<i>11/11/76</i>		
PROJ. EN. <i>11/11/76</i>	<i>11/11/76</i>		
PROD. <i>11/11/76</i>	<i>11/11/76</i>		
NEXT HIGHER AUTH.		SIZE	CODE
SCALE <i>1/1</i>		D	CS
SHEET <i>1</i> OF <i>1</i>		DIS	NUMBER <i>W9042-0-1</i>
			REV. <i>1/1</i>

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS PARTS LIST					QUANTITY / VARIATION														
MADE BY D. HEALY		CHECKED D. HEALY		SECTION		FP11-A													
DATE 10 NOV. 76		DATE 10 NOV. 76		1															
ENG <i>J. W. Mitchell</i>		PROD <i>X. Star...</i>		ISSUED SECT.															
DATE 12-20-76		DATE 12-21-76		1															
ITEM NO.	DWG NO. / PART NO.	DESCRIPTION																	
	MP00189	FP11-A FIELD MAINTENANCE PRINT SET				1													
	EK-FP11-A-TM-PRE	FP11-A FLOATING POINT MANUAL				1													
	ZJ232-RB	SOFTWARE LIBRARY KIT (PAPER TAPE)				1													
TITLE		ASSY NO.		SIZE	CODE	NUMBER				REV.		ECO NO.							
FP11-A SHIPPING LIST		NONE		A	PL	FP11-A-3													
		SHEET 1 OF 1		DIST.															

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KEY TO MICRO FLOW SYMBOLOGY



NOTES

- 1 MICRO ADDRESS OF CURRENT WORD.
- 2 SYMBOLIC TAG OF CURRENT WORD CONSISTS OF PAGE NUMBER AND BLOCK LABEL (PAGE-BLOCK)
- 3 MICRO OPERATIONS WHICH TAKE PLACE DURING THIS STATE. THE FIELDS WHICH ARE INVOLVED IN CARRYING OUT THESE OPERATIONS CAN BE DETERMINED USING:
FPII-A MACRO DEFINITIONS
FPII-A MICRO FIELD DEFINITIONS
- 4 27-B IS THE SYMBOLIC TAG OF THE NEXT MICRO WORD (TARGET) ASSUMING NO BRANCHING (DESTINATION MODE 0). THIS CAN BE USED TO DETERMINE THE NEXT ADDRESS FIELD OF THE CURRENT MICRO WORD.
- 5 "D" STANDS FOR DISPLAY. IN THIS CASE, 000004 WILL APPEAR ON THE CONSOLE DISPLAY IF OPERATING IN MAINTENANCE MODE.
- 6 INDICATES PAGE IN FLOWS WHERE THIS ENTRY POINT CAN BE FOUND.
- 7 EXIT AND ENTRY LABELS ARE USED TO INDICATE LOGICAL FLOW FROM PAGE TO PAGE
- 8 INDICATES PAGES IN FLOWS FROM WHICH ENTRY POINT IS CALLED.
- 9 THIS ADDRESS IS THE TARGET OF THE JUMP FIELD OF BLOCK 22-N
- 10 DEFAULT VALUE OF THIS FIELD
- 11 NUMBER OF BITS IN THIS FIELD
- 12 LOCATION OF RIGHT MOST BIT OF THIS FIELD WITHIN MICRO WORD
- 13 INDICATES THAT THE DEFAULT IS TAKEN IF NOTHING ELSE IS SPECIFIED
- 14 OCTAL VALUE OF MICRO FIELD LITERAL

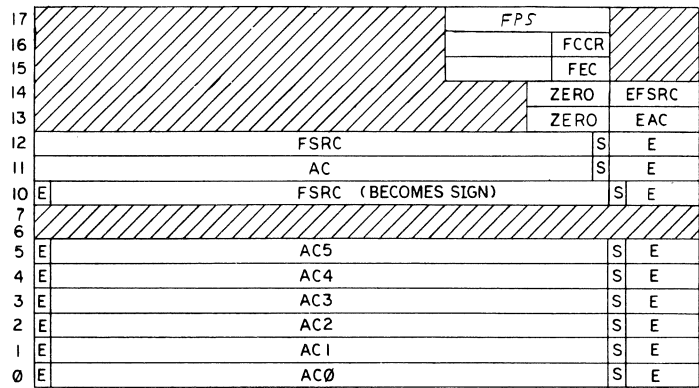
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE FPII-A FLOWS							SIZE CODE D FD	NUMBER FPII-A-2	REV.
SCALE + + +							SHEET 2	OF 40	DIST.

8 7 6 5 4 3 2 1

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FPII-A TYPICAL REGISTER USAGE



SECTOR3	SECTOR 2		SECTOR 1		SECTOR 0		SECTOR 3
BYTE 6	BYTE 5	BYTE 4	BYTE 3	BYTE 2	BYTE 1	BYTE 0	BYTE 7
F-REG							E-REG
X-REG							

FPII-A TS BUS ASSIGNMENT

TS0		Y8
TS1		Y9
TS5	FT	Y61
TS6		Y62
TS8	FIC	
TS9	FIV	
TS10	FIU	
TS11	FIUV	
TS14	FID	

FPII-A MPC BUTOFF BITS

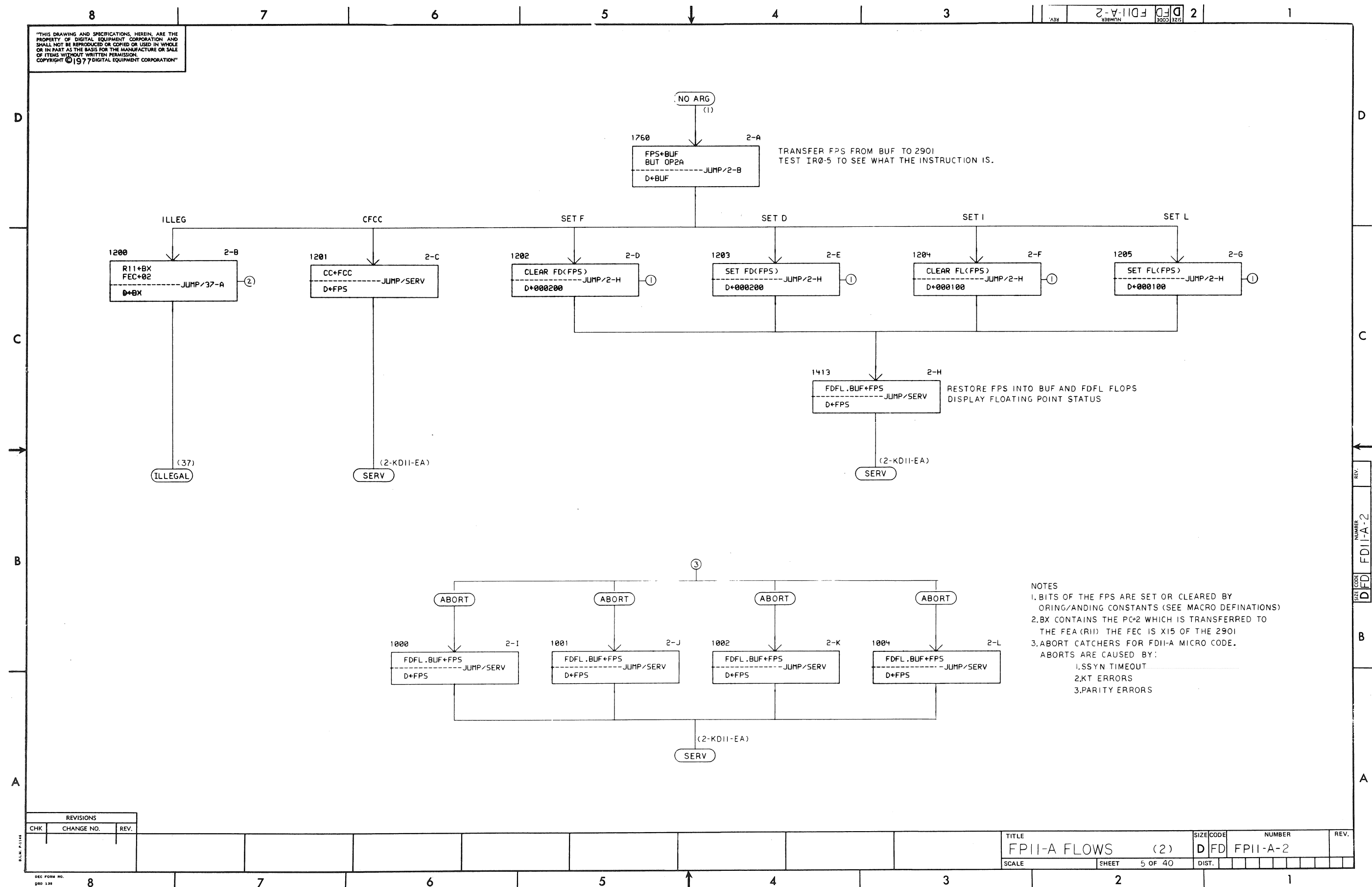
MPC	I134	FPX TS BUT	FPX CONDITIONS	FPX BUT OPI	FPX BUT OP2
0	IR09	—	—	OPI0	OP20
1	ZBIT	TS0	TS14	OPI1	OP21
2	C05	TS1	XOUT	OPI2	OP22
3	SPI5	TS8	Q8-Q40	OPI3	OP23
4	BX00	TS9	XZBT	—	—
5	BX01	TS10	XNBT	—	—
6	NBIT	TS11	BUSRQ	—	—
7	COUT	TS5	EZBT	—	—
8		TS6	ENBT	—	—

FLOATING POINT STATUS REGISTER

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
FER	FID	X	X	FIUV	FIU	FIV	FIC	FD	FL	FT	X	FN	FZ	FV	FC

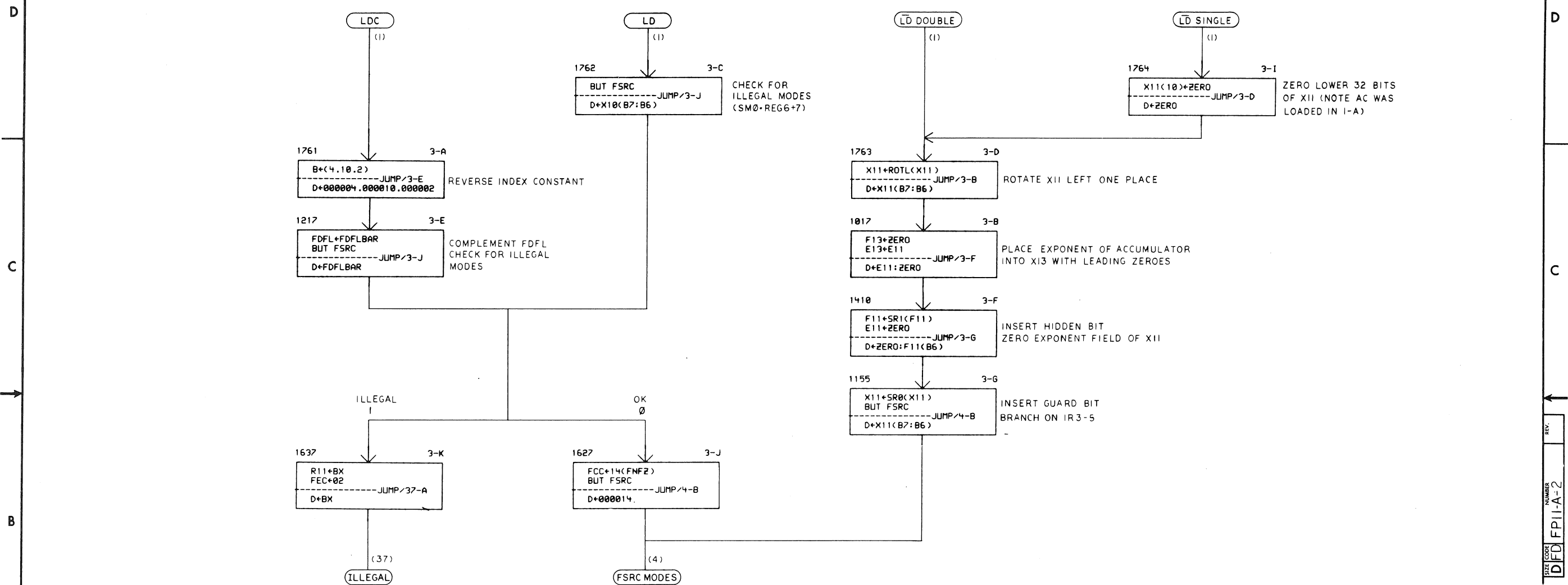
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
FPII-A FLOWS		D FD	FPII-A-2	
SCALE	SHEET	DIST.		
	3 OF 40			



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REV. 2
D FD FPII-A-2
SIZE CODE 3215

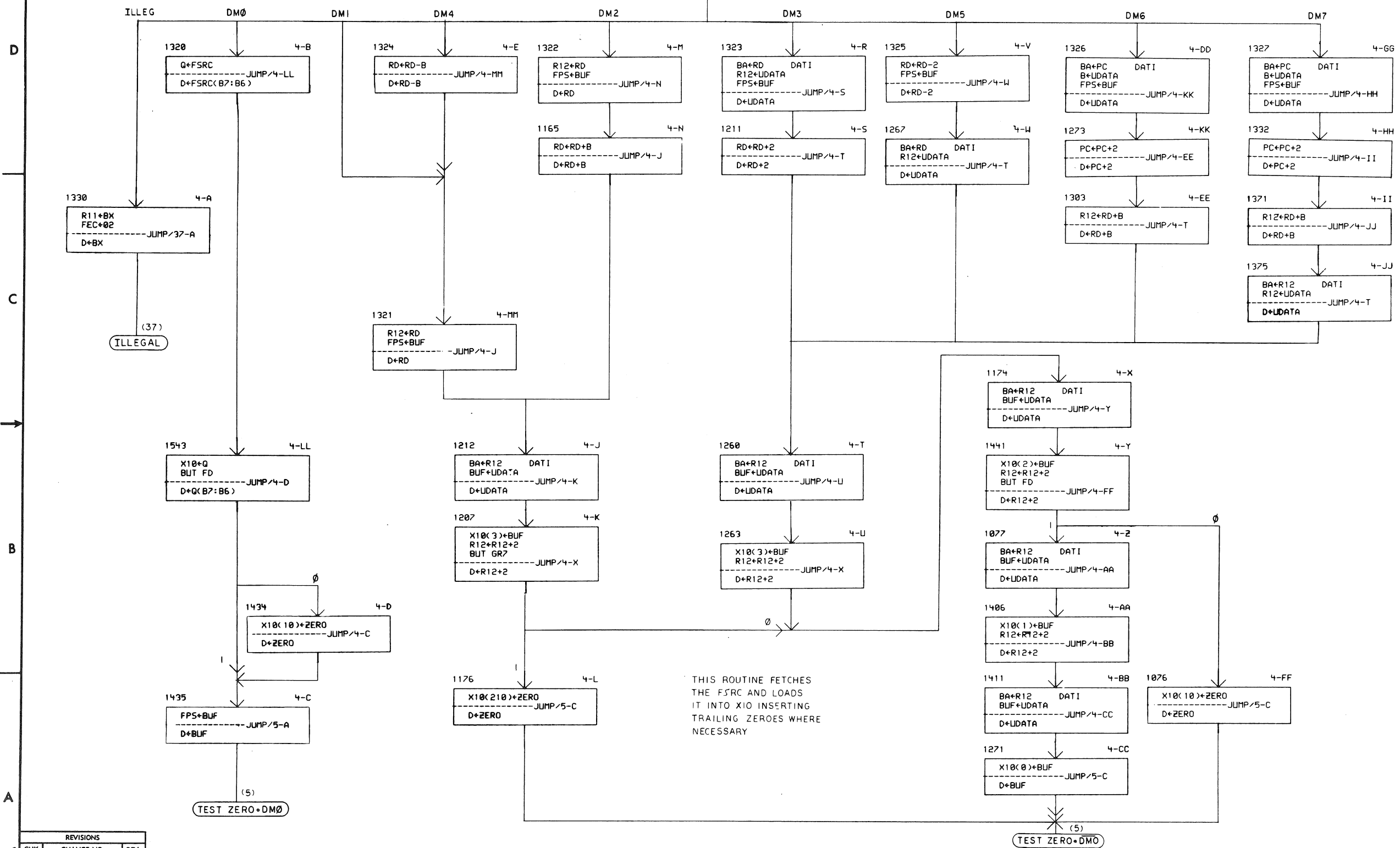


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE FPII-A FLOWS (3)							SIZE CODE D FD		NUMBER FPII-A-2		REV.
SCALE							SHEET 6 OF 40		DIST.		

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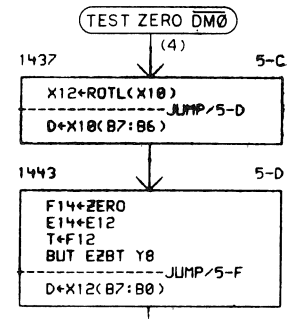
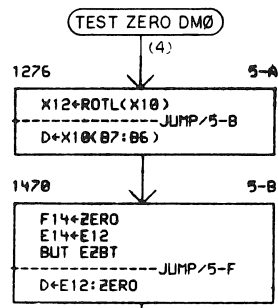
FSRC MODES
(3)



REVISIONS		
CHK	CHANGE NO.	REV.

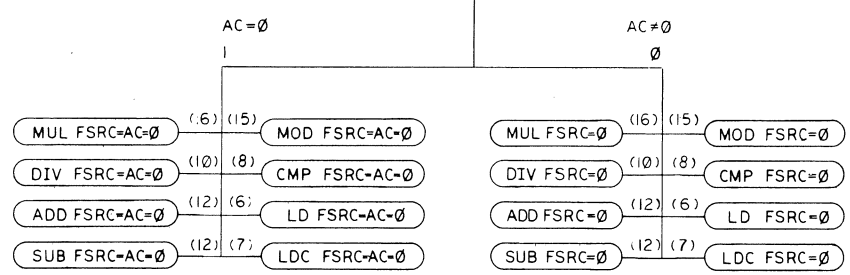
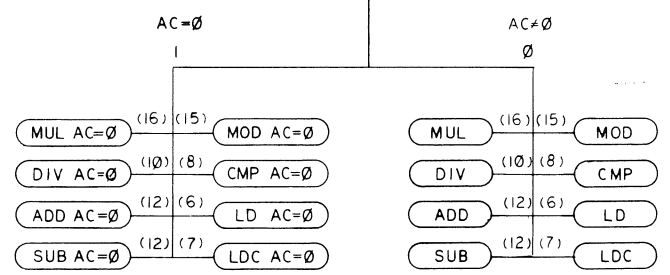
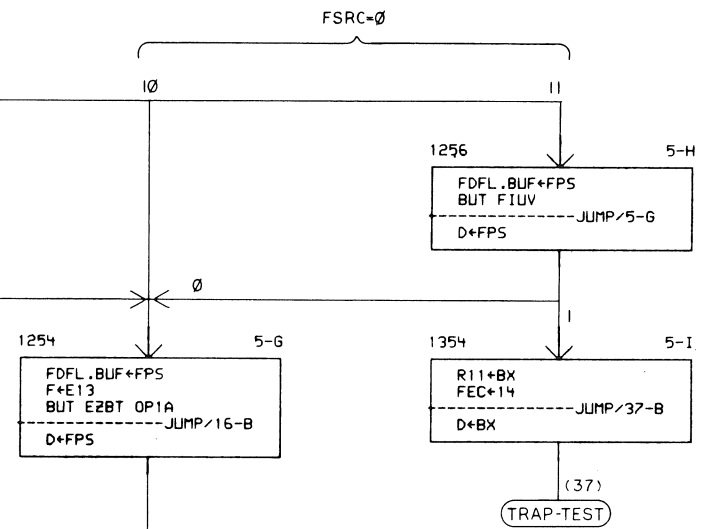
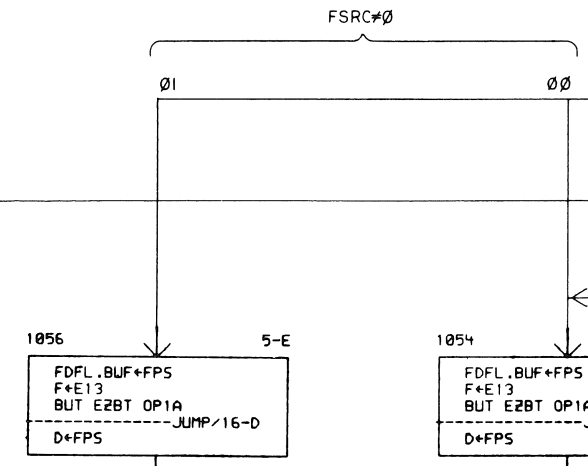
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SIZE CODE D FD 2
NUMBER FPII-A-2



ROTATE X10 LEFT ONE PLACE
AND LOAD IT INTO X12

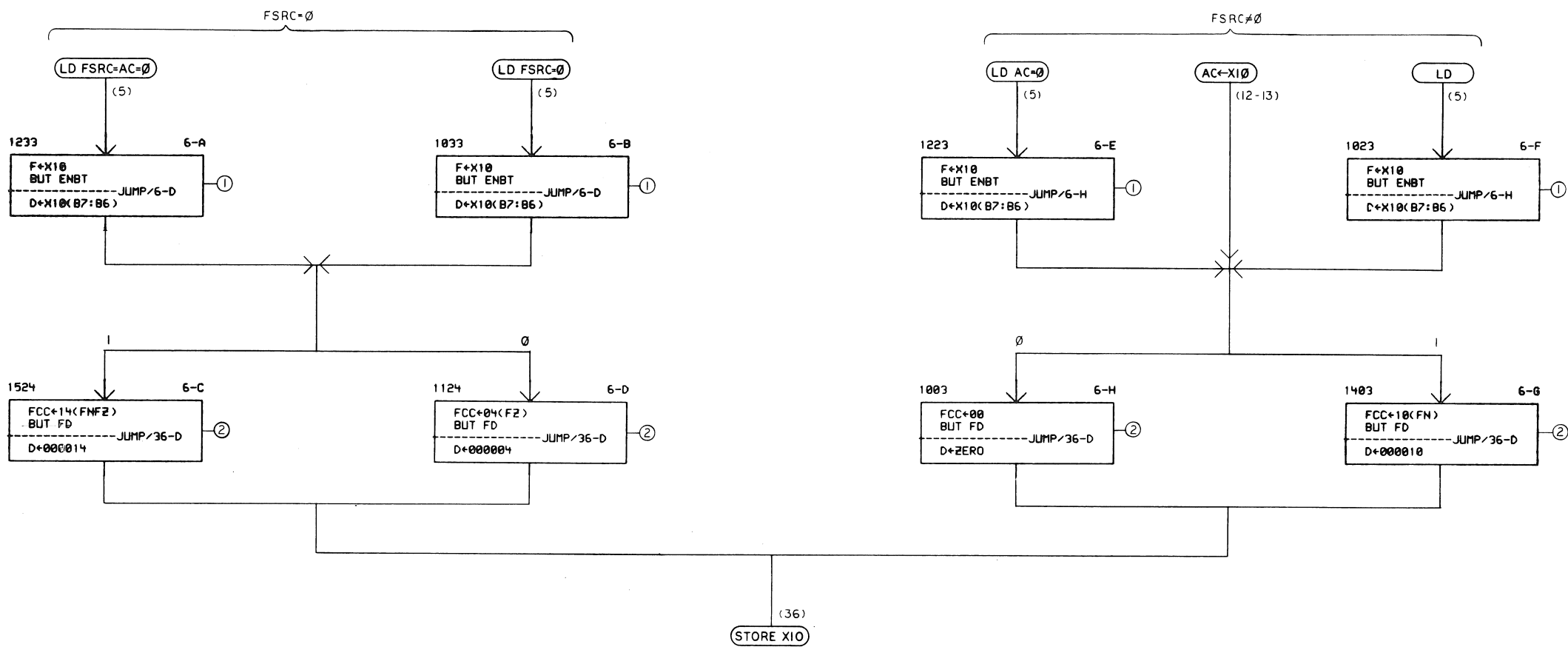
PLACE EXPONENT OF FSRC IN X14
WITH LEADING ZEROES.
TEST FOR UNDEFINED VARIABLE (MINUS ZERO)



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE FPII-A FLOWS (5)
SCALE SHEET 8 OF 40
NUMBER FPII-A-2
REV.

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NOTES

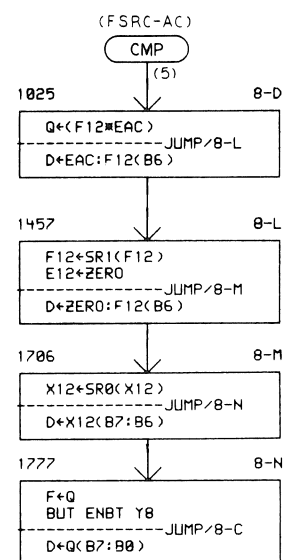
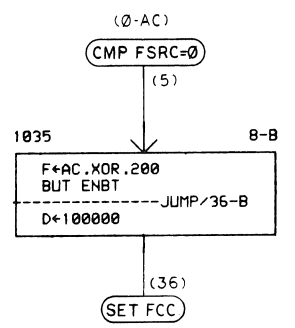
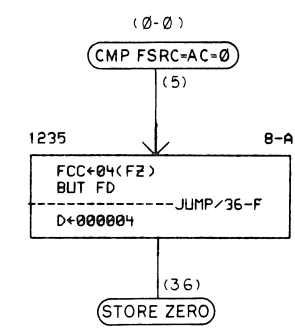
1. TEST SIGN OF FSRC (X10:BIT 7)
2. SET FLOATING CONDITION CODES (FCC) USING THE APPROPRIATE CONSTANT. NOTE THAT THE FCC IS CONTAINED IN THE LOWER FOUR BITS OF THE BUFFER (BUF).

REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO. 000 130

TITLE		SIZE	CODE	NUMBER		REV.
FPII-A FLOWS (6)		D	FD	FPII-A-2		
SCALE		SHEET 9 OF 40		DIST.		

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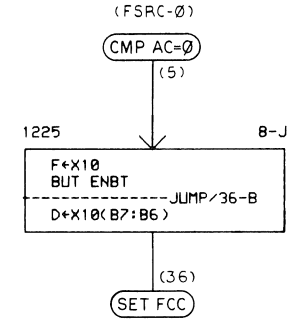


SAVE SIGNS OF AC AND FSRC IN 0 REG

INSERT HIDDEN BIT ZERO EXPONENT FIELD

INSERT GUARD BIT

GATE Q ONTO F BUS TEST SIGNS

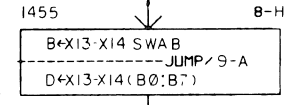
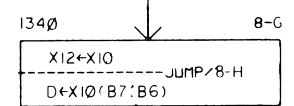
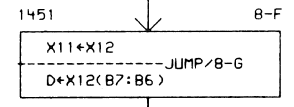
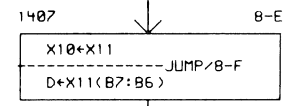
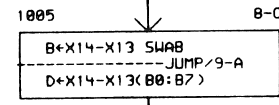


THE COMPARE INSTRUCTION IS ACCOMPLISHED BY SUBTRACTING THE AC FROM THE FSRC AND SETTING THE CONDITION CODES ON THE RESULT. THIS ALGORITHM FORCES TRIVIAL CASES TO FALL OUT AS FOLLOWS:

- 1 TEST FOR ZERO OPERANDS (8-A,8-B,8-J)
- 2 TEST FOR OPPOSITE SIGNS (8-I,8-K)
- 3 TEST FOR NONEQUAL EXPONENTS (9-G,9-H)
- 4 TEST FRACTIONAL DIFFERENCE

POSITIVE SIGNS
00

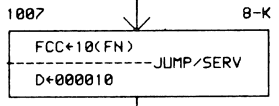
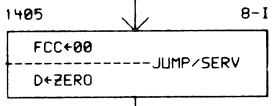
NEGATIVE SIGNS
11



(9)
TEST EXP

FSRC>AC
10

FSRC<AC
01



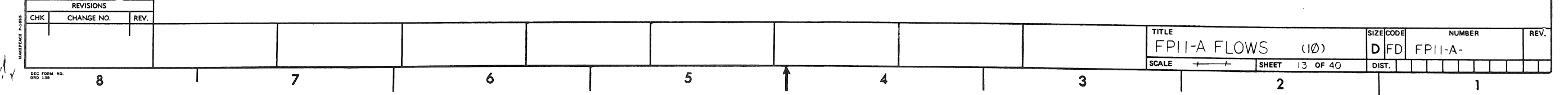
(2-KD11-EA)
SERV

SWAP AC AND FSRC FOR THE FOLLOWING REASON
((-FSRC)-(-AC))=AC-FSRC

COMPUTE EXPONENT DIFFERENCE

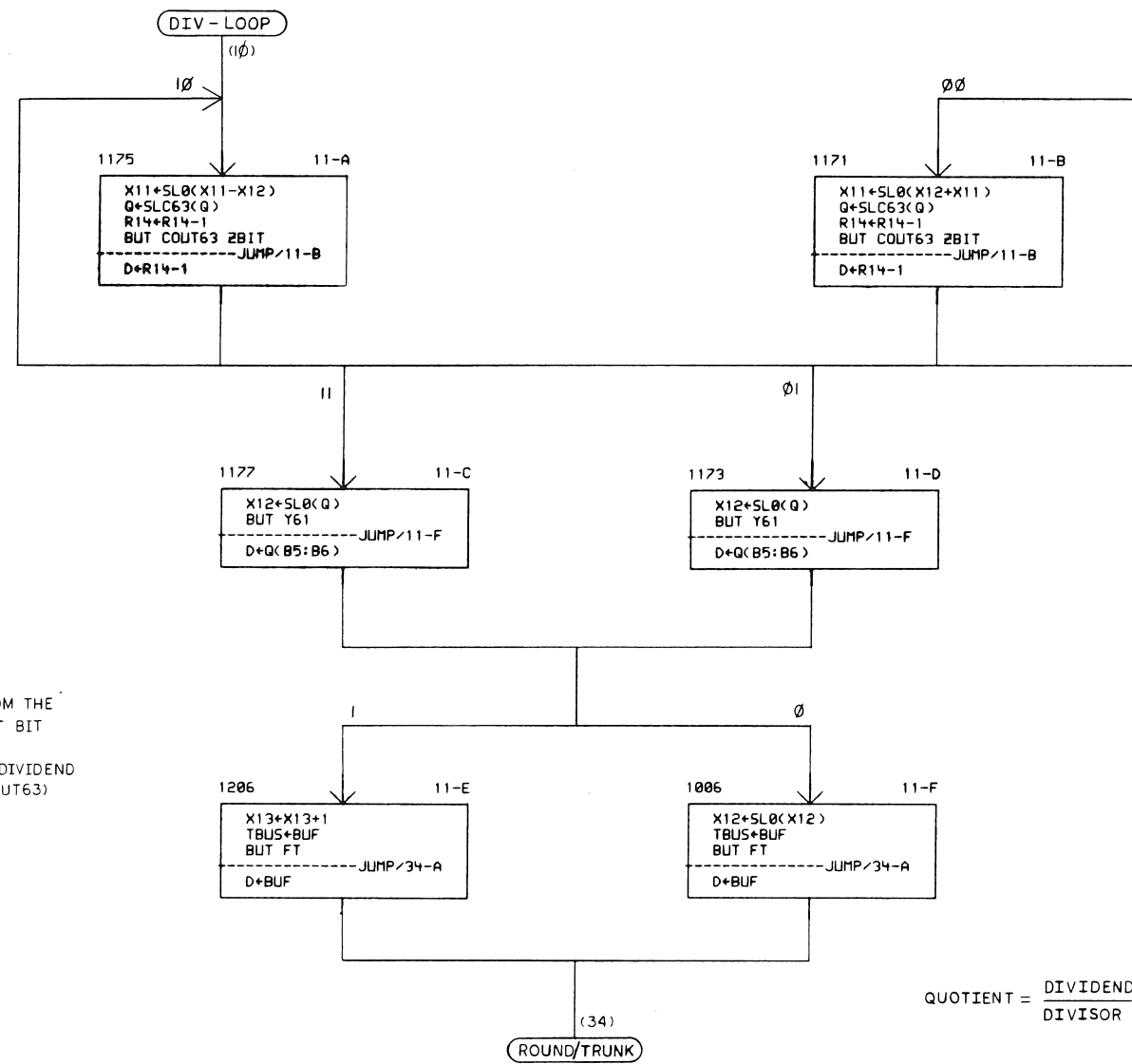
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE				SIZE CODE		NUMBER				REV.	
FPII-A FLOWS (8)				D FD		FPII-A-					
SCALE		SHEET 11 OF 40		DIST.							



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REV. 2
SIZE CODE D
FD
NUMBER FPII-A-2



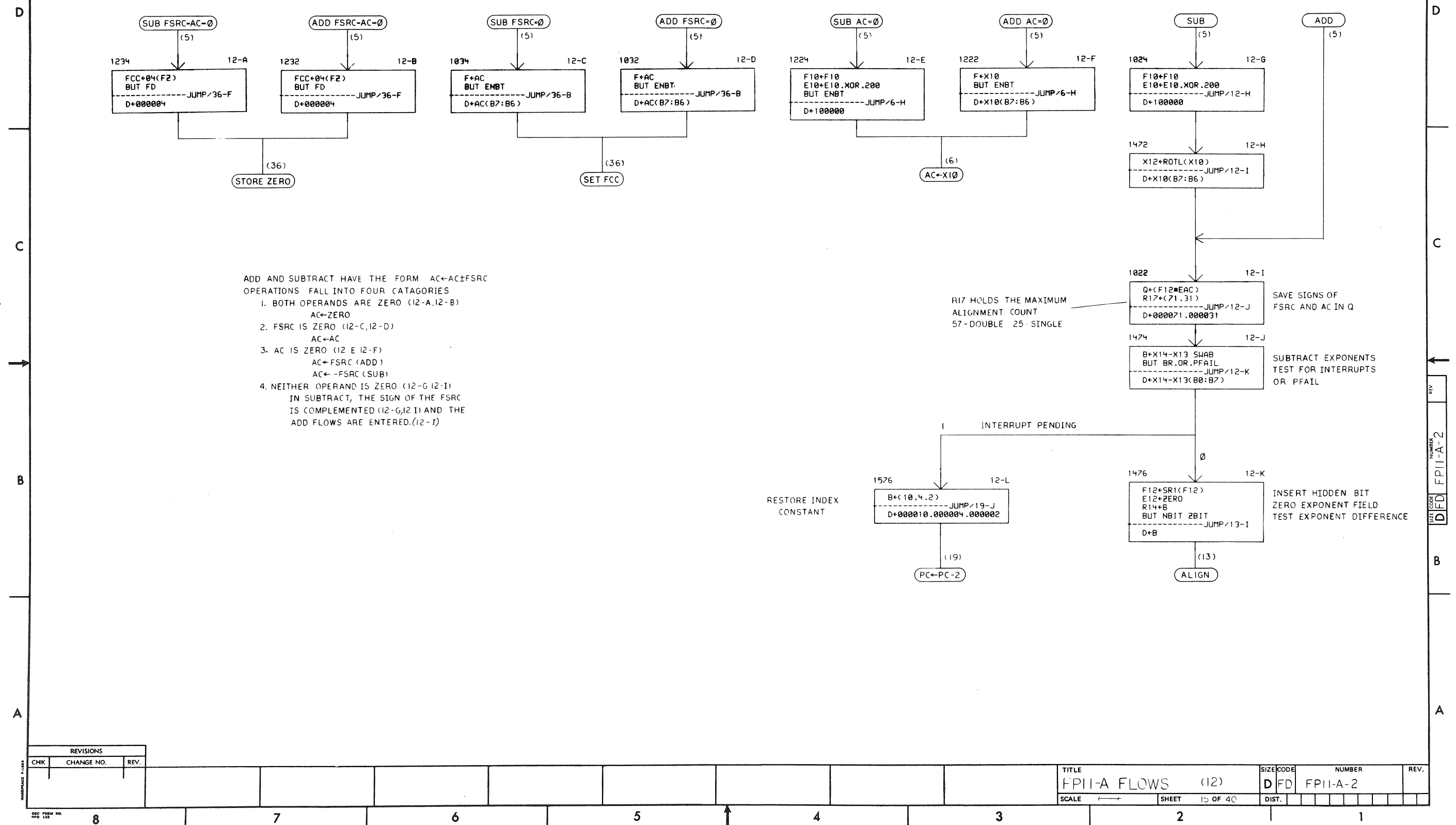
THIS IS A NONRESTORING
DIVISION ALGORITHM IN WHICH:
1. THE DIVISOR IS SUBTRACTED FROM THE
DIVIDEND IF THE LAST QUOTIENT BIT
(COUT63) WAS ONE.
2. THE DIVISOR IS ADDED TO THE DIVIDEND
IF THE LAST QUOTIENT BIT (COUT63)
WAS ZERO.

$$\text{QUOTIENT} = \frac{\text{DIVIDEND}}{\text{DIVISOR}} = \frac{AC}{FSRC} = \frac{X11}{X12}$$

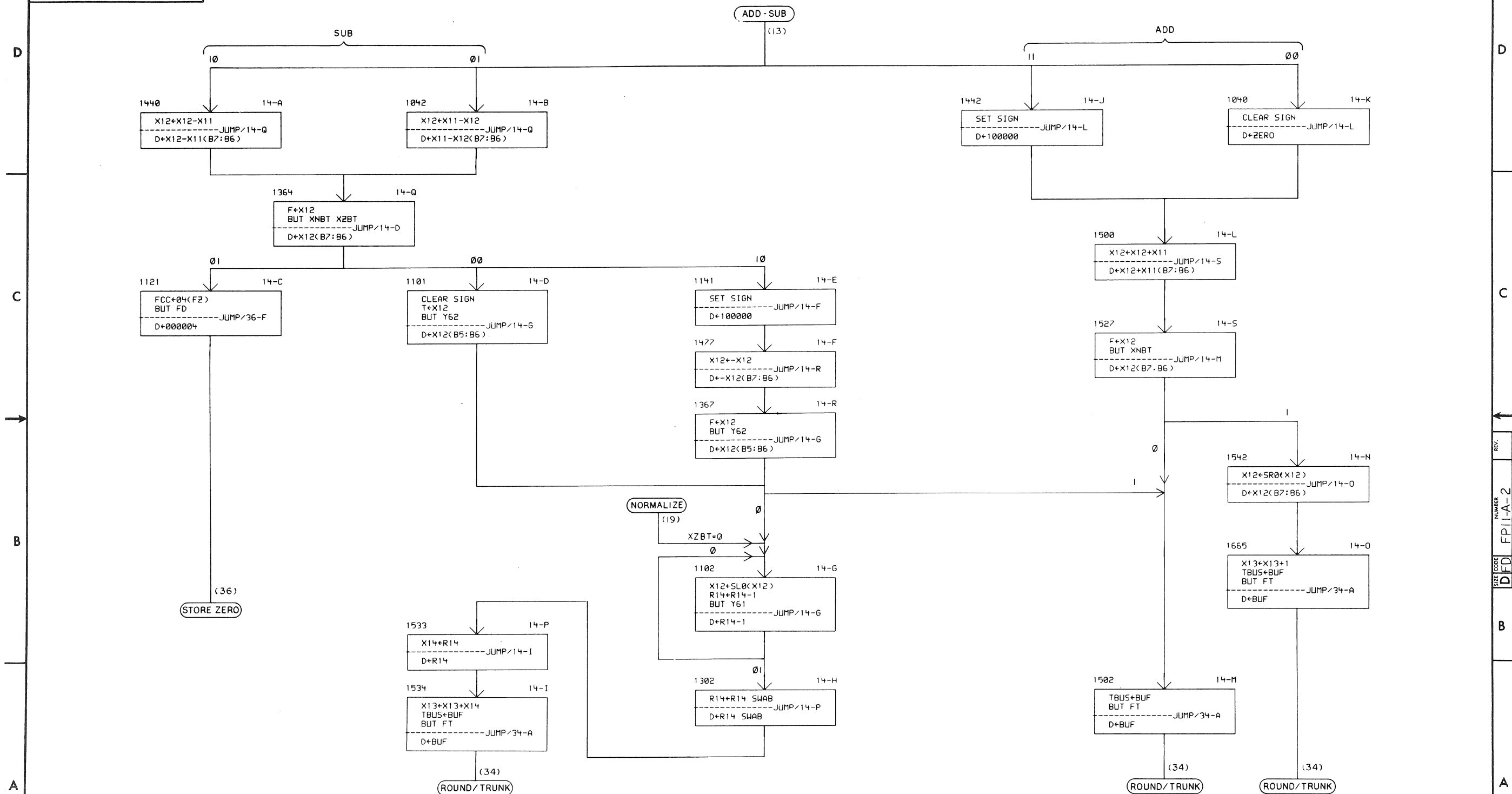
REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO.
DSD 128

TITLE		SIZE CODE	NUMBER		REV.
FPII-A FLOWS (II)		D	FD	FPII-A-	
SCALE		SHEET	14 OF 40	DIST.	

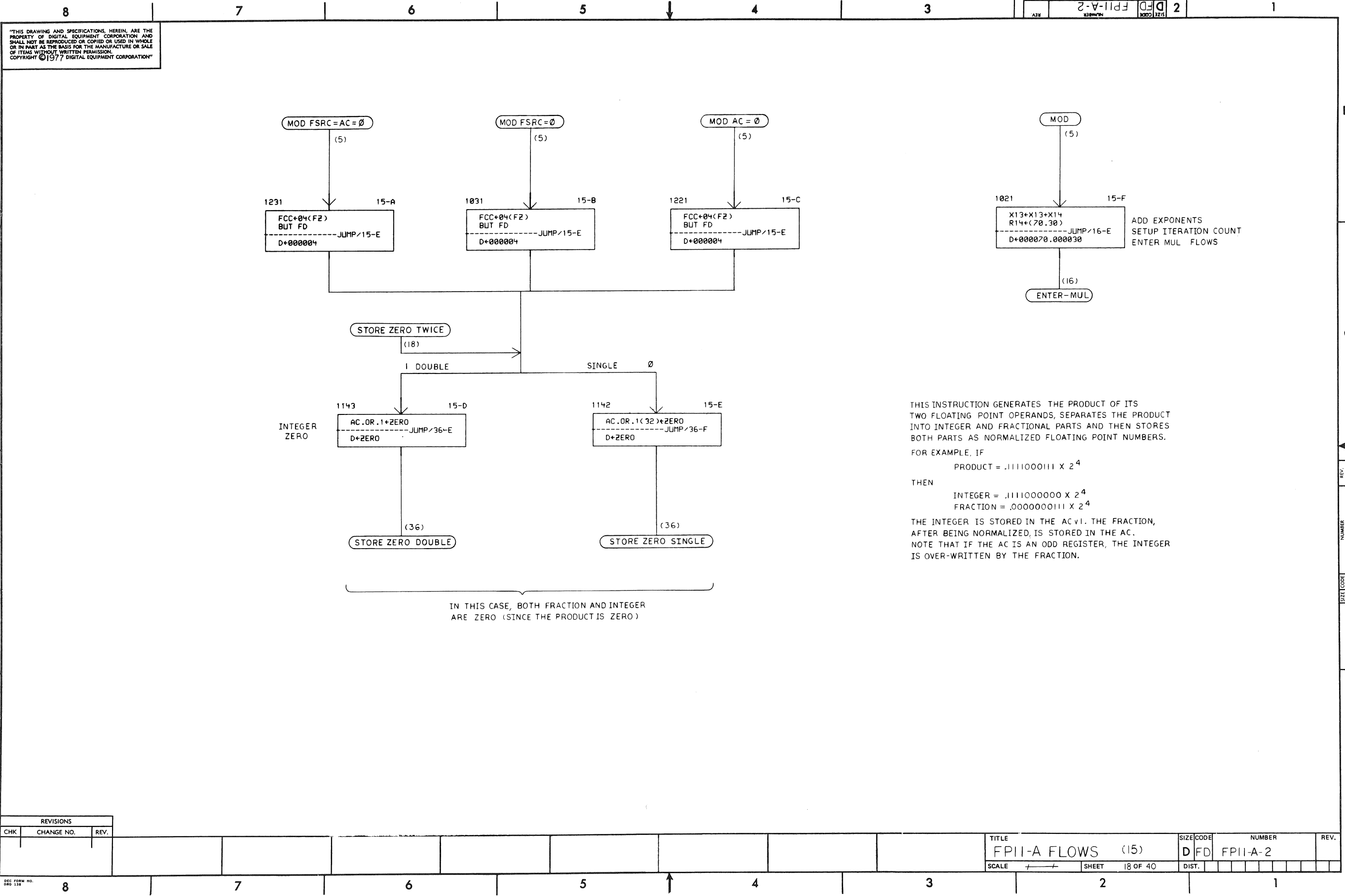


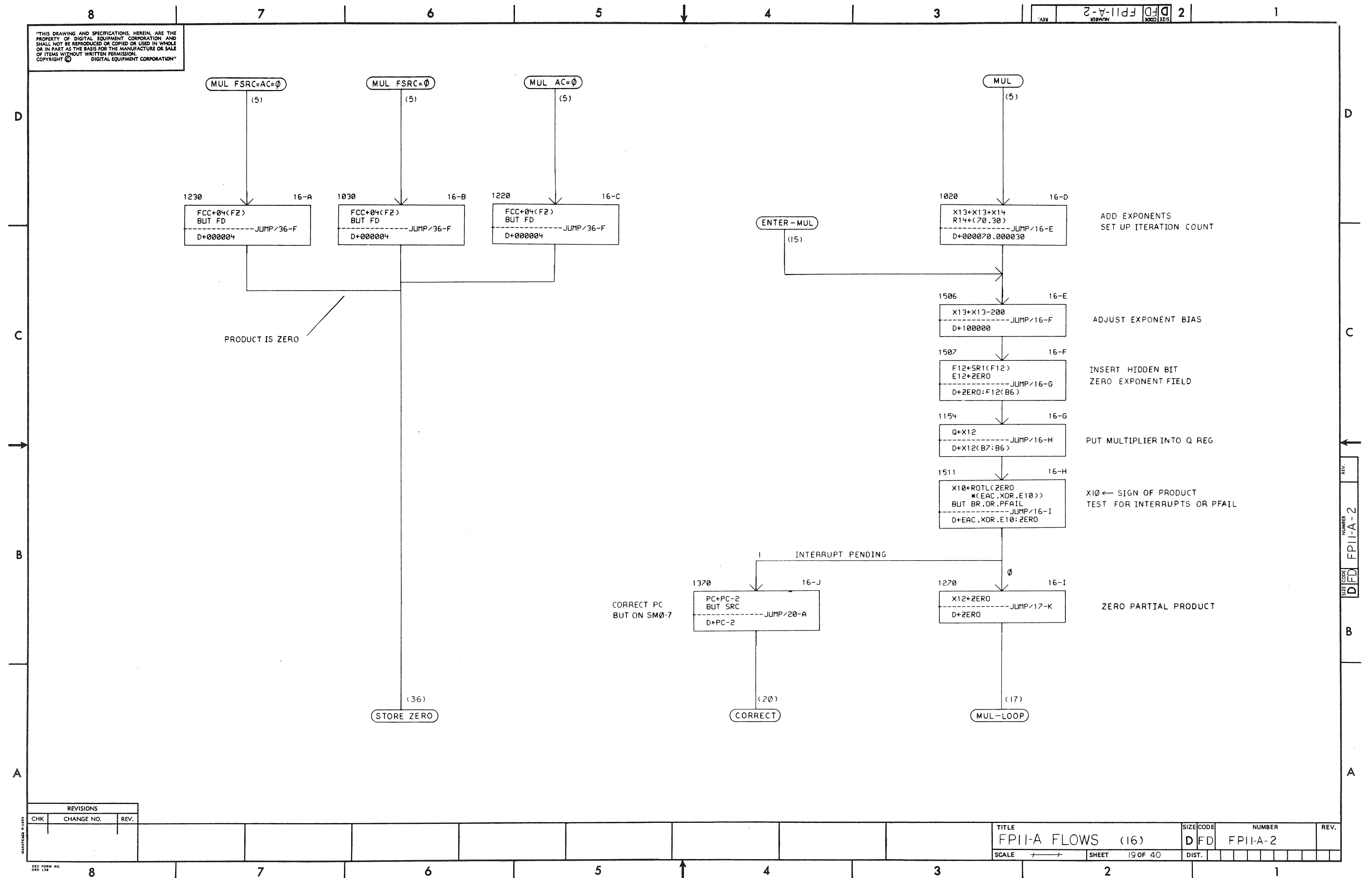
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REVISIONS		
CHK	CHANGE NO.	REV.

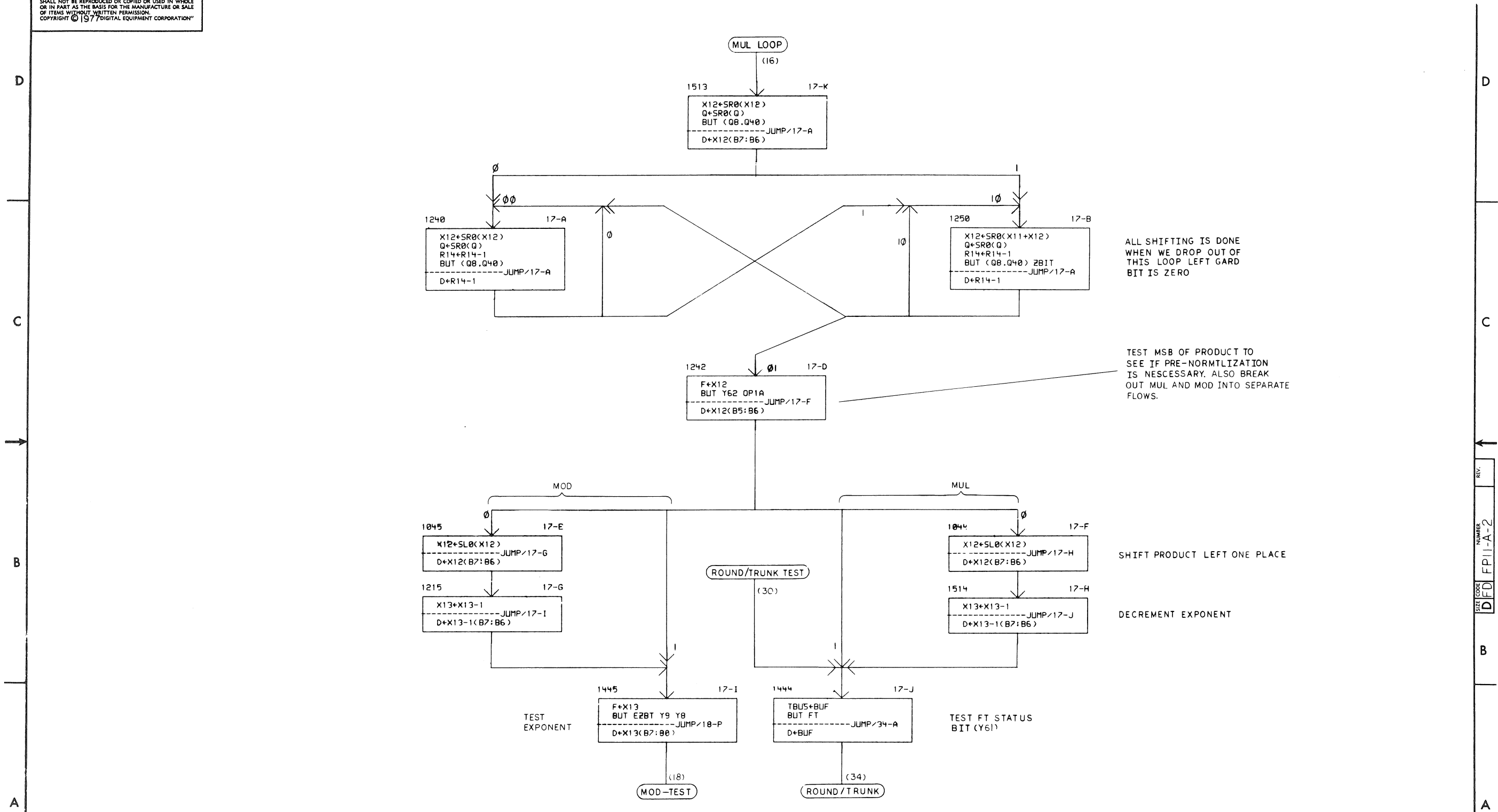
TITLE		SIZE CODE	NUMBER	REV.
FPII-A FLOWS (14)		D F D	FPII-A-2	
SCALE	SHEET	DIST.		
	17 OF 40			





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REV. 2 SIZE CODE D FD FPII-A-2



ALL SHIFTING IS DONE WHEN WE DROP OUT OF THIS LOOP LEFT GARD BIT IS ZERO

TEST MSB OF PRODUCT TO SEE IF PRE-NORMTLIZATION IS NESCESSARY. ALSO BREAK OUT MUL AND MOD INTO SEPARATE FLOWS.

SHIFT PRODUCT LEFT ONE PLACE

DECREMENT EXPONENT

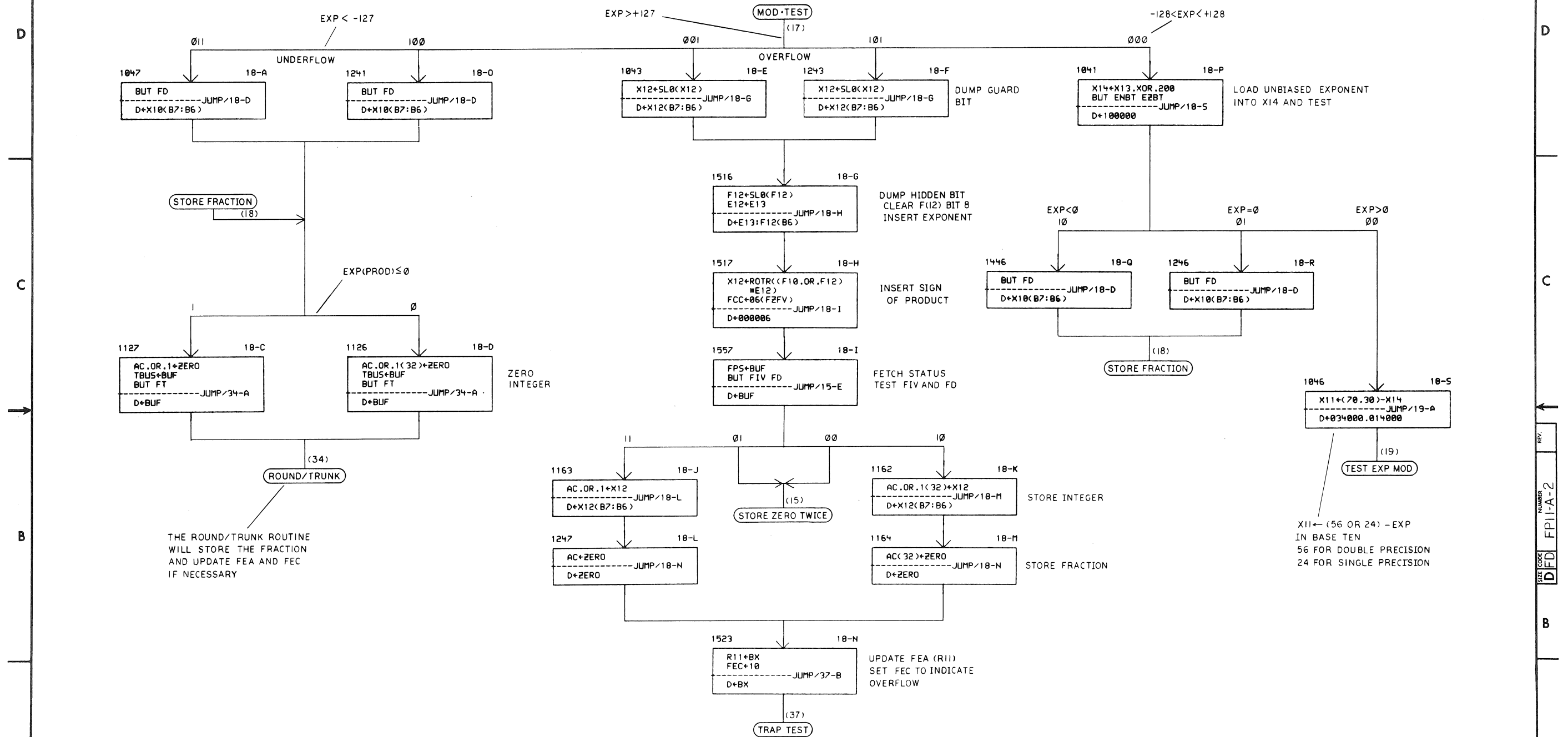
TEST FT STATUS BIT (Y61)

REVISIONS		
CHK	CHANGE NO.	REV.

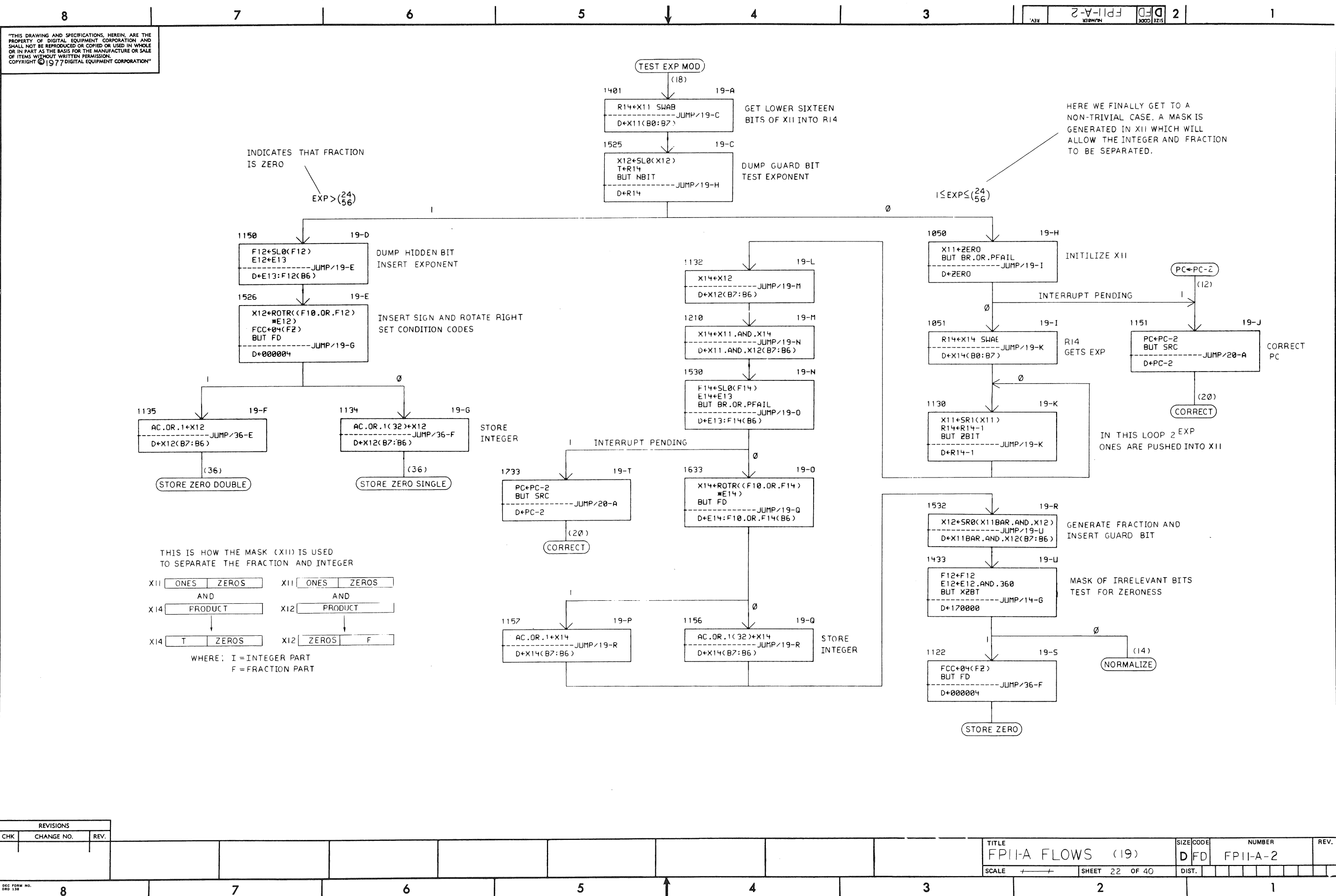
DEC FORM NO. 000 100

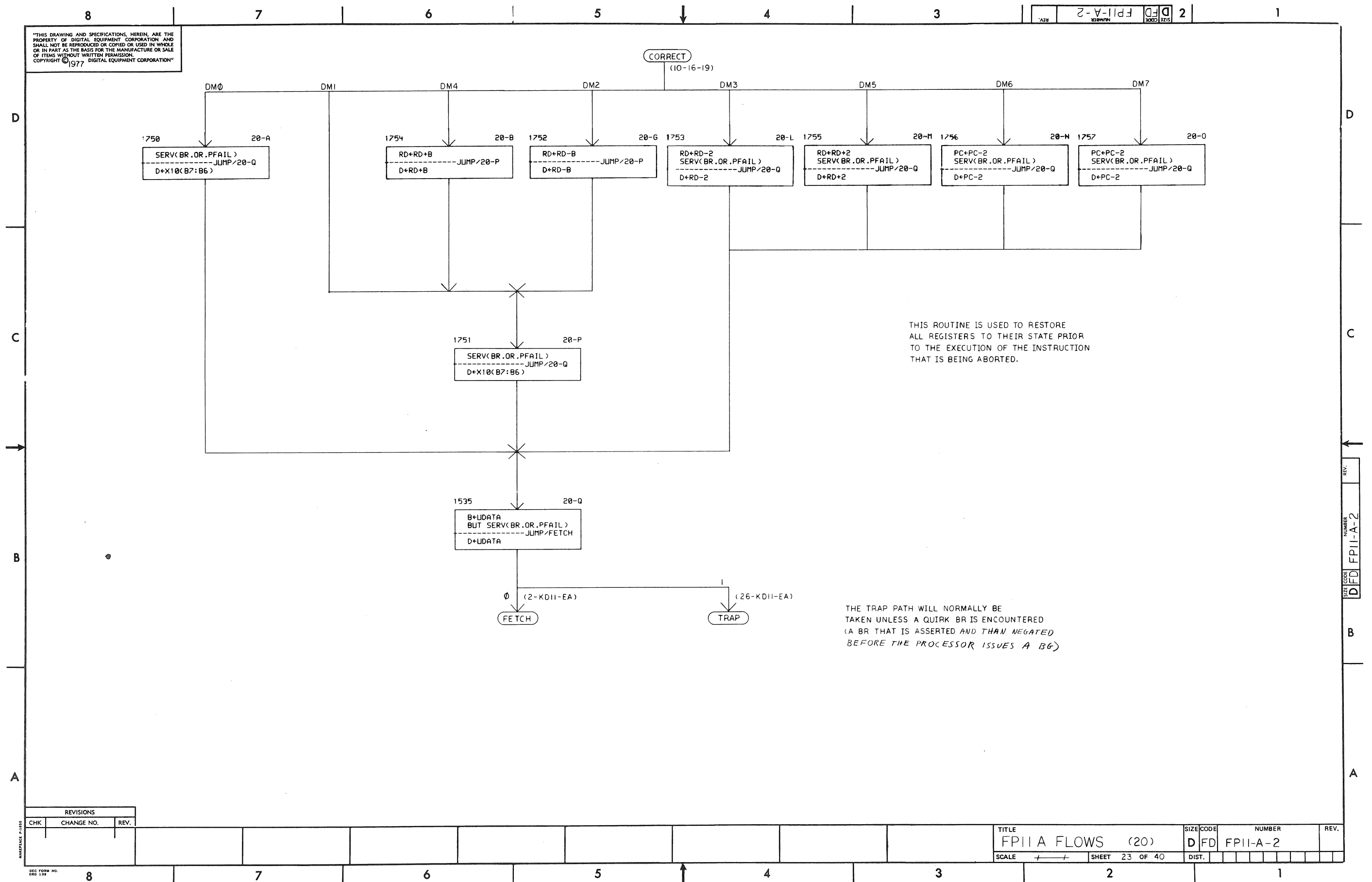
TITLE FPII-A FLOWS (17)		SIZE CODE D FD	NUMBER FPII-A-2	REV.
SCALE		SHEET 20 OF 40		DIST.

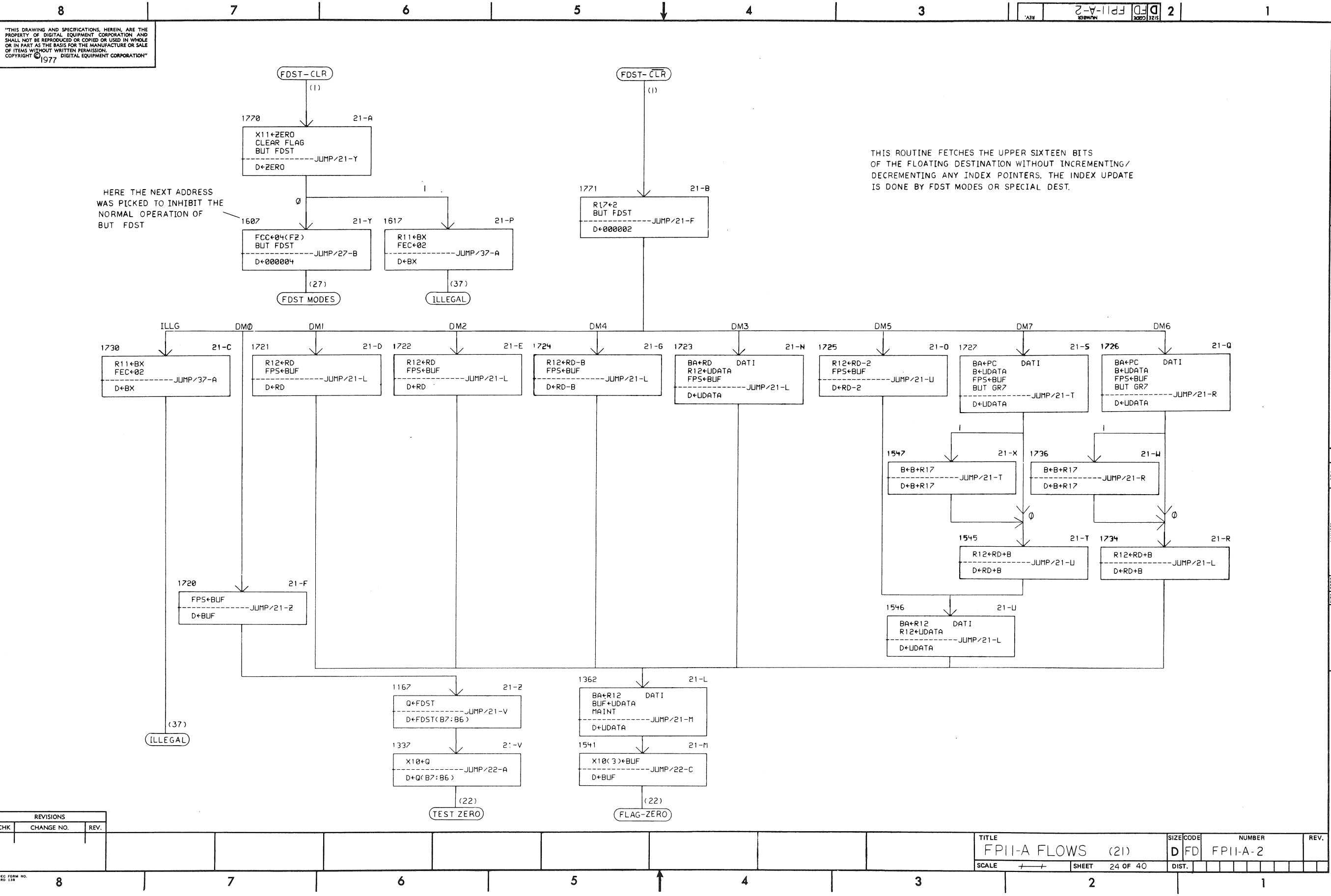
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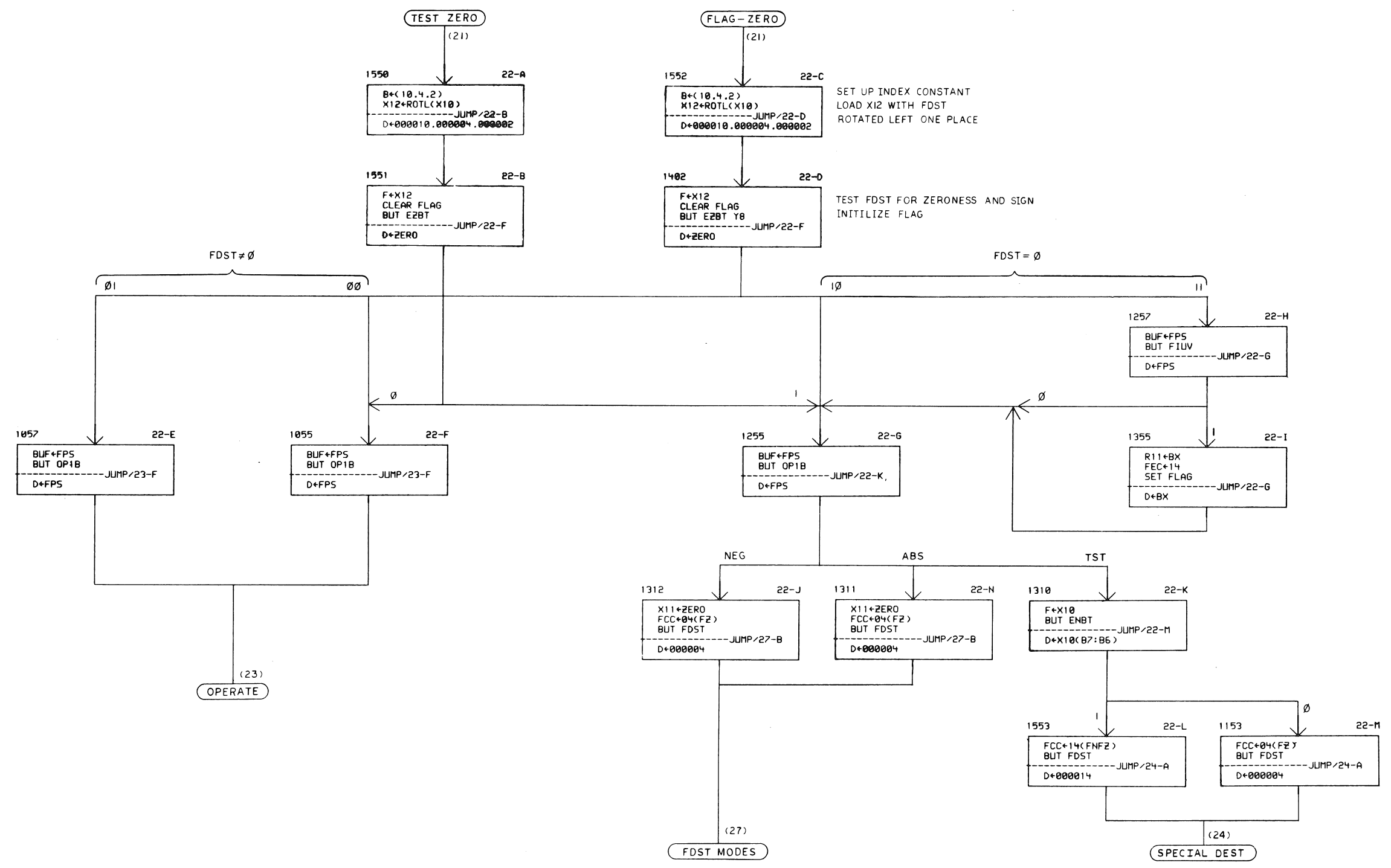
REVISIONS		
CHK	CHANGE NO.	REV.



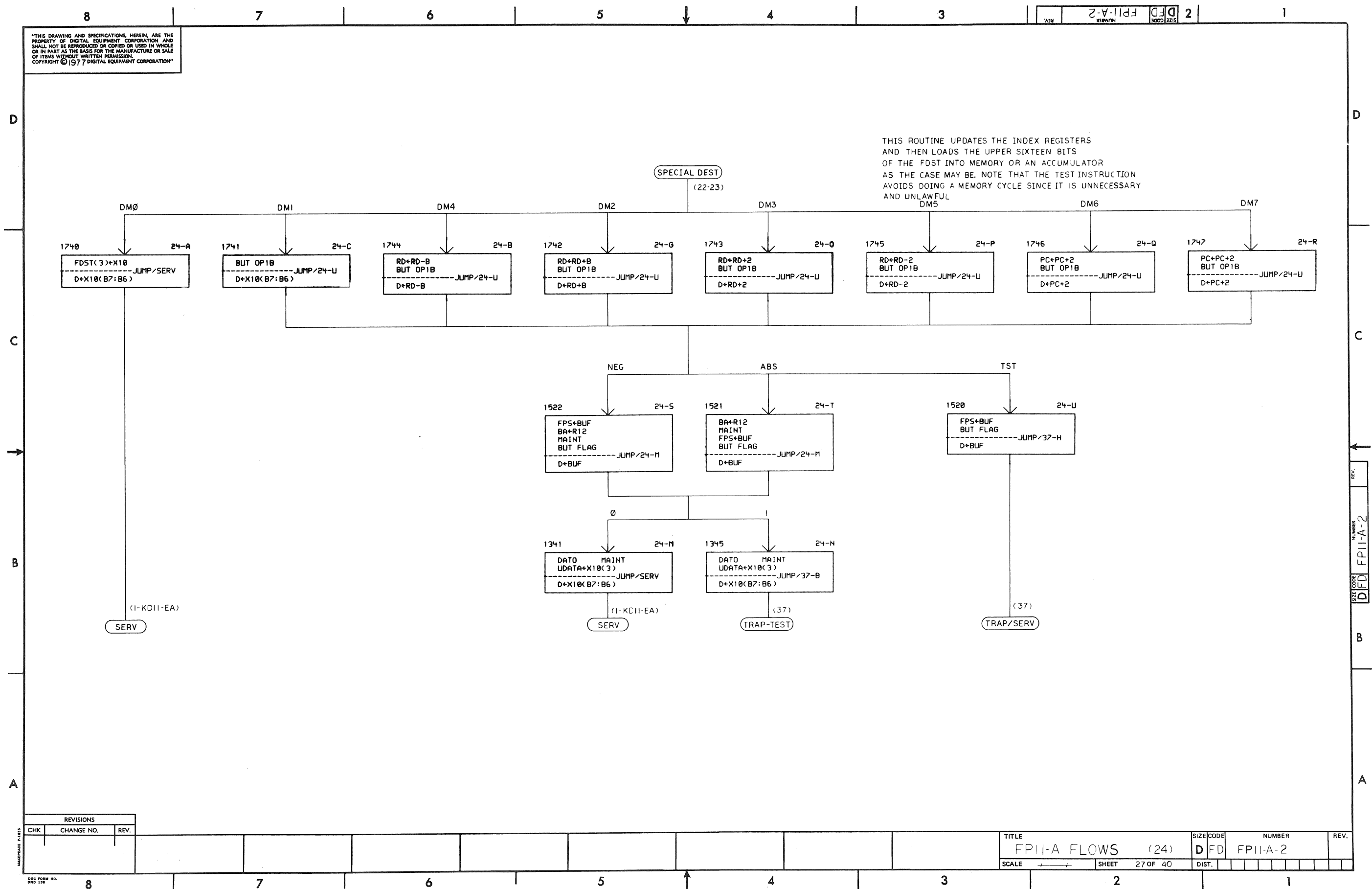




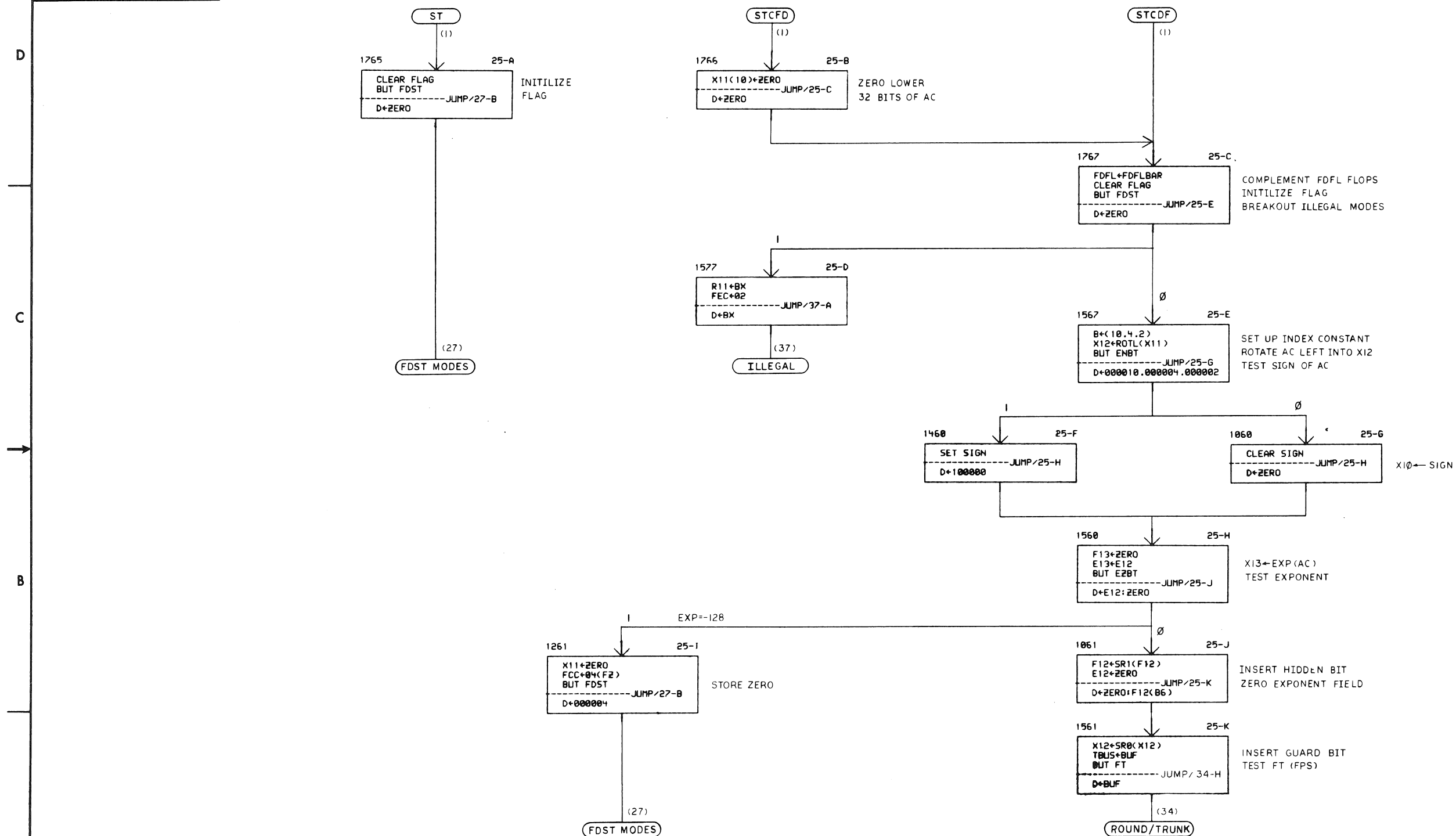
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REVISIONS		
CHK	CHANGE NO.	REV.



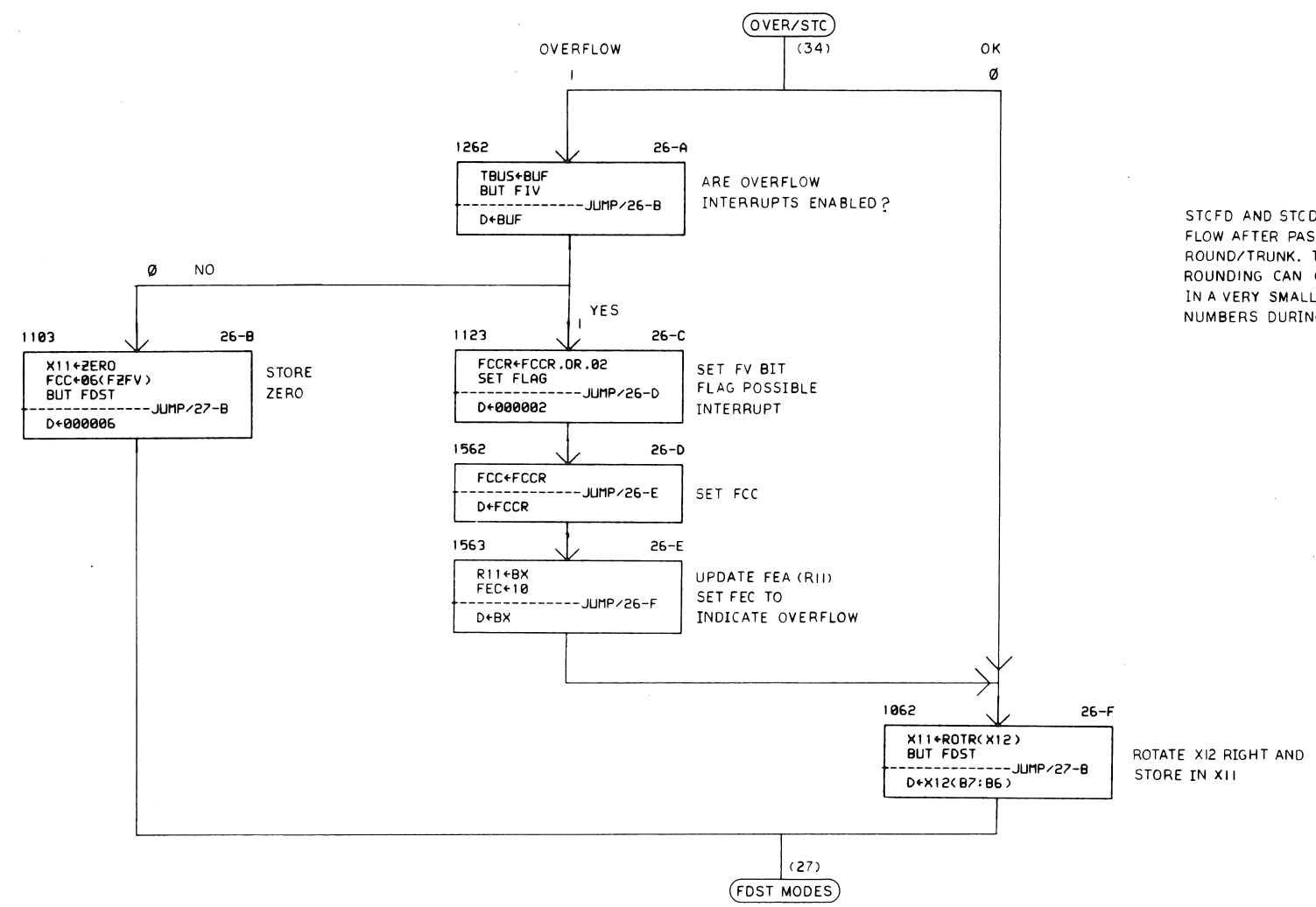
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REVISIONS		
CHK	CHANGE NO.	REV.

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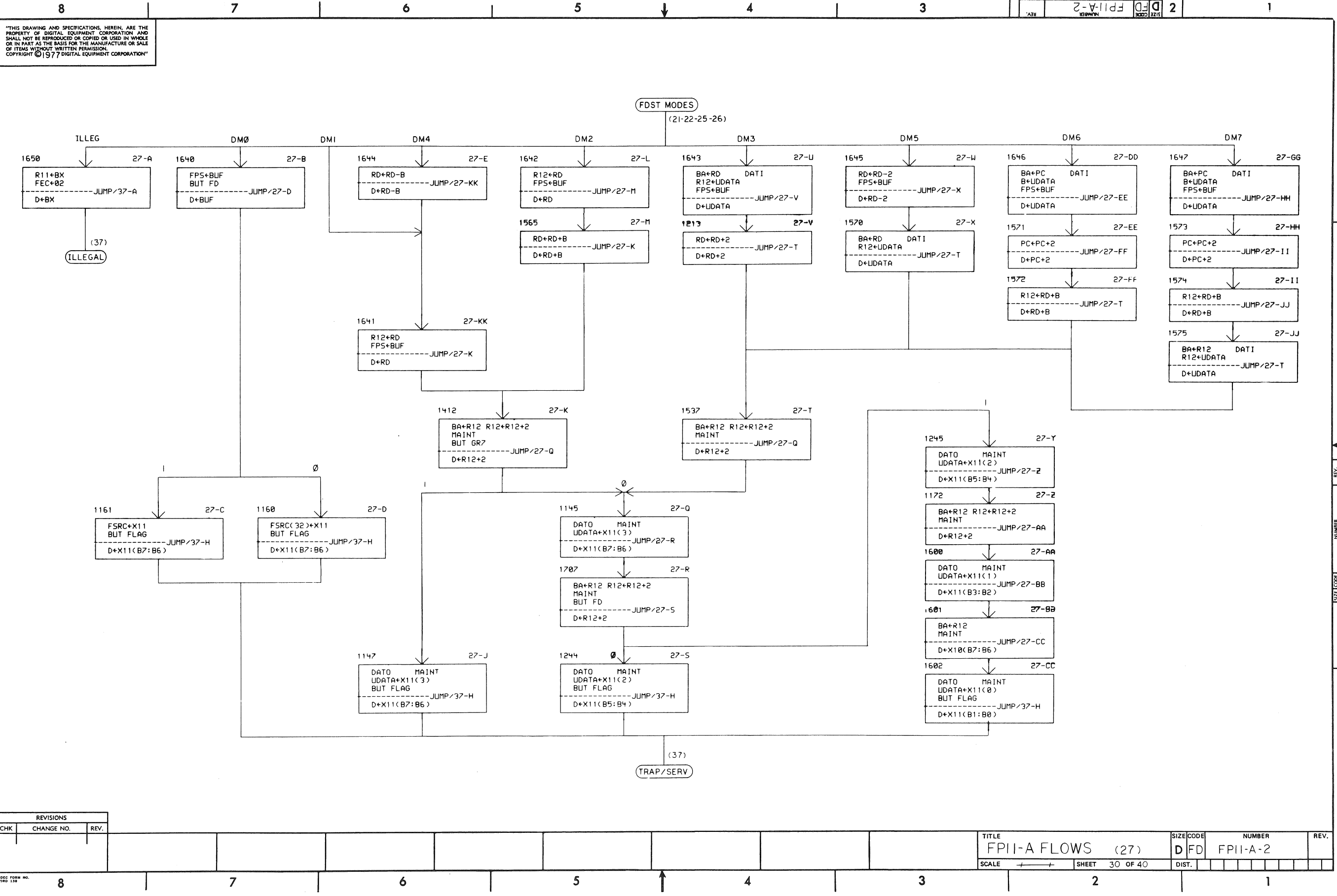
SIZE CODE D FD FPII-A-2 2



STCFD AND STCDF ENTER THIS FLOW AFTER PASSING THROUGH ROUND/TRUNK. THE PROCESS OF ROUNDING CAN CAUSE AN OVERFLOW IN A VERY SMALL CLASS OF VERY LARGE NUMBERS DURING STCDF (PROBABILITY = $\frac{1}{\infty}$)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
FPII-A FLOWS (26)		D FD	FPII-A-2	
SCALE	SHEET	DIST.		
	29 OF 40			

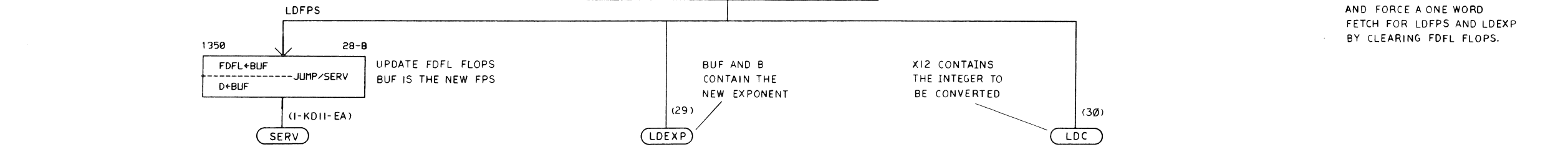
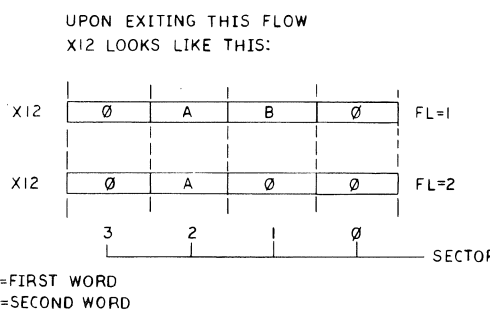
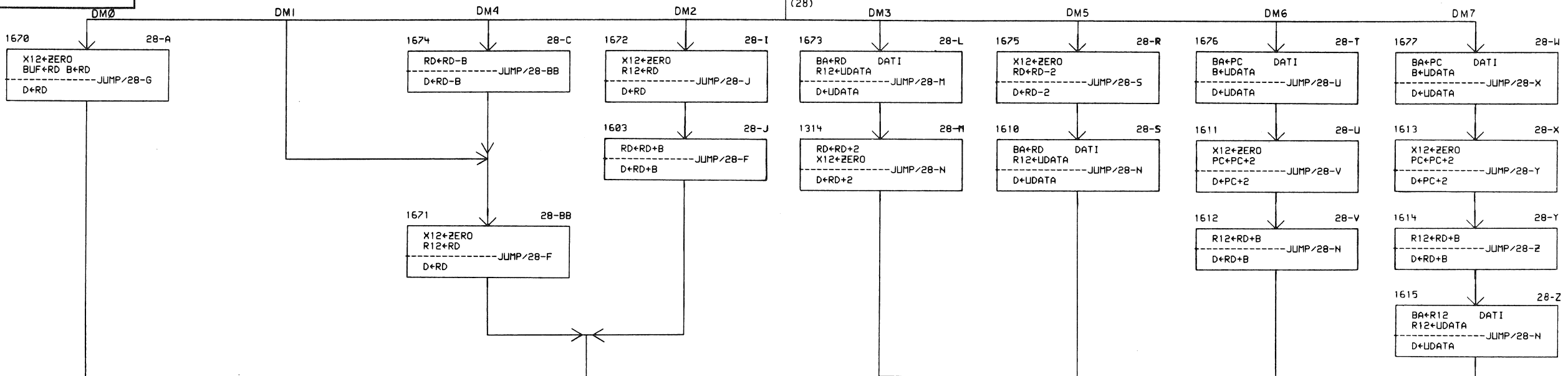


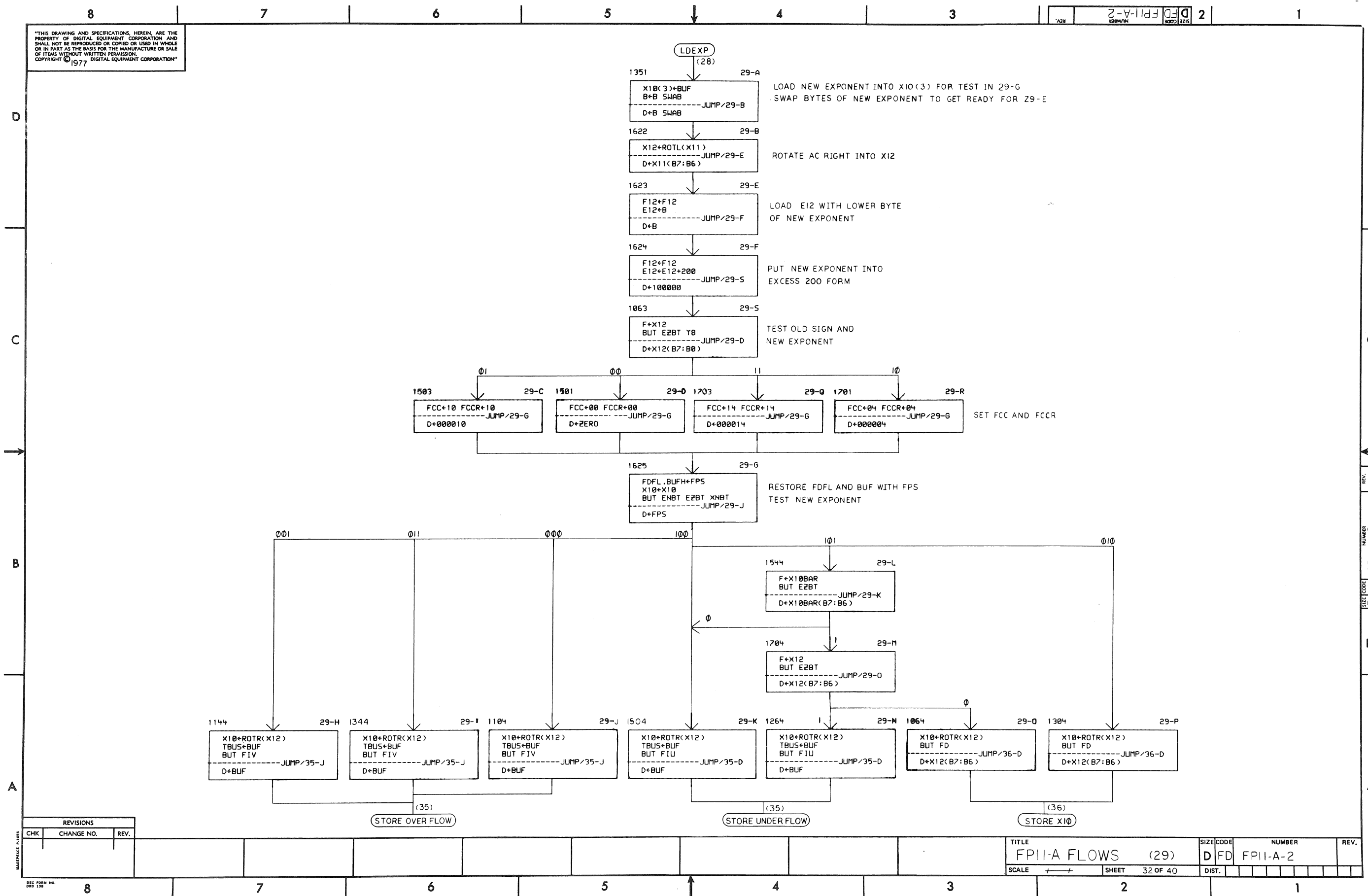
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
FPII-A FLOWS (27)		D FD	FPII-A-2	
SCALE	SHEET	DIST.		
	30 OF 40			

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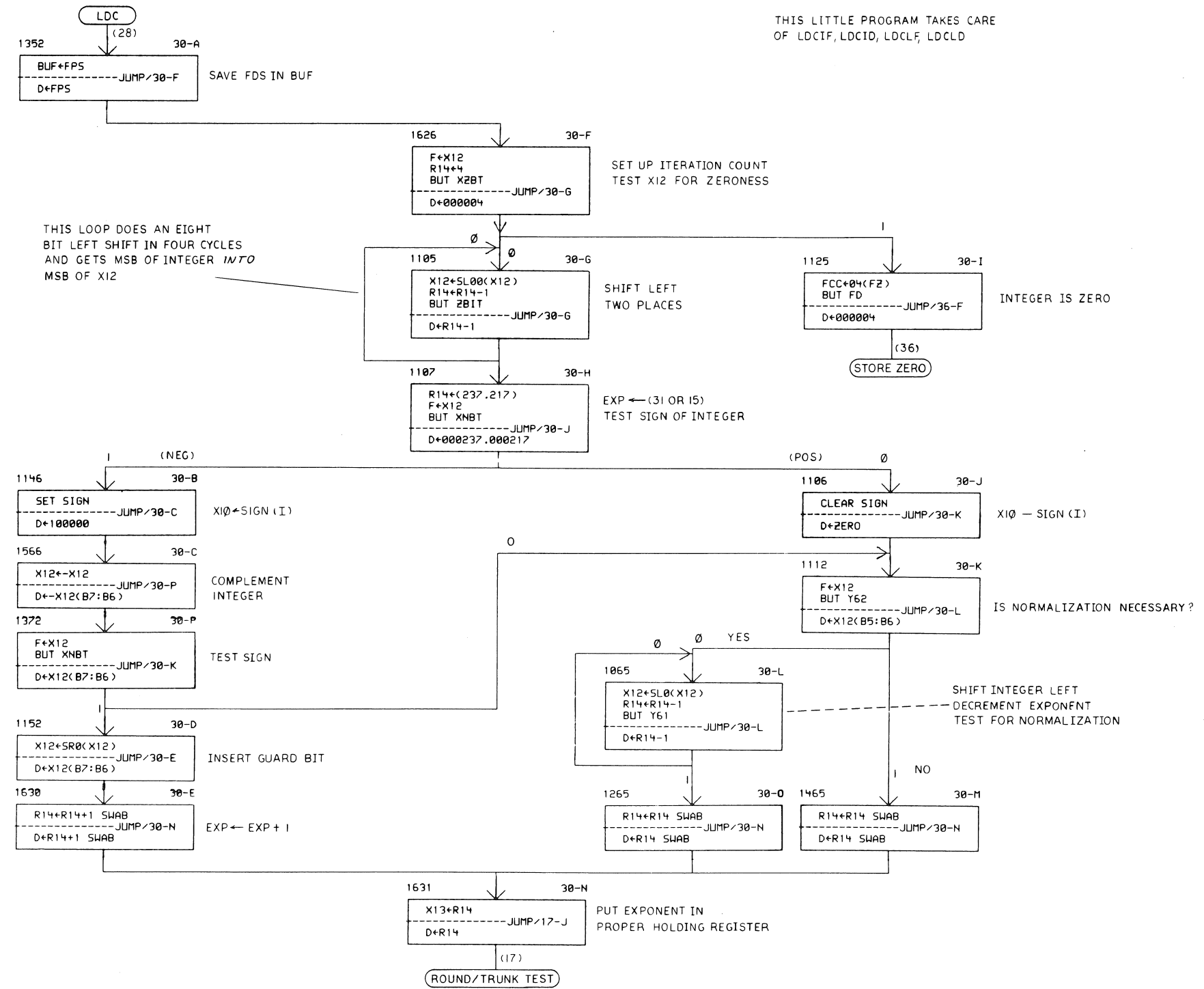
SOURCE MODES (28)





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THIS LITTLE PROGRAM TAKES CARE OF LDCIF, LDCID, LDCIF, LDCID

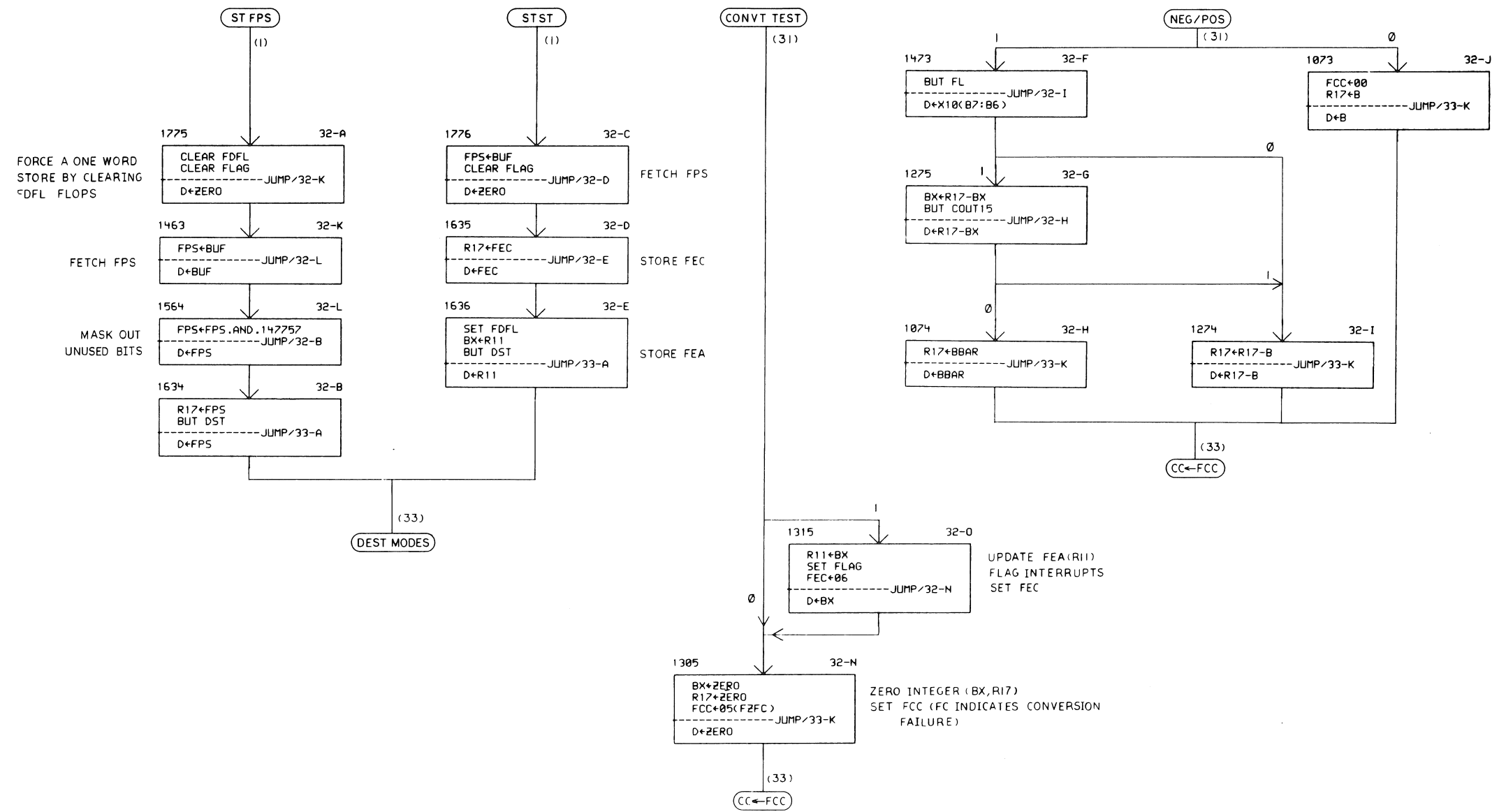


INTEGER IS MOST NEGATIVE NUMBER
 $I = 2^{15}$ OR 2^{31}

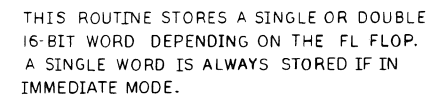
REVISIONS		
CHK	CHANGE NO.	REV.

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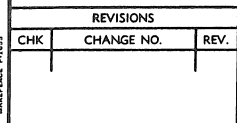
UPON ENTERING THIS ROUTINE, THE INTEGER
IS IN B AND BX, RI7 CONTAINS ZERO.
THE INTEGER IS COMPLEMENTED (IF NECESSARY)
AND STORED IN RI7 AND BX.



REVISIONS		
CHK	CHANGE NO.	REV.



TITLE FPII-A FLOWS (33)		SIZE D	CODE FD	NUMBER FPII-A-2		REV
SCALE 1" = 1'	SHEET 36 OF 40	DIST.				

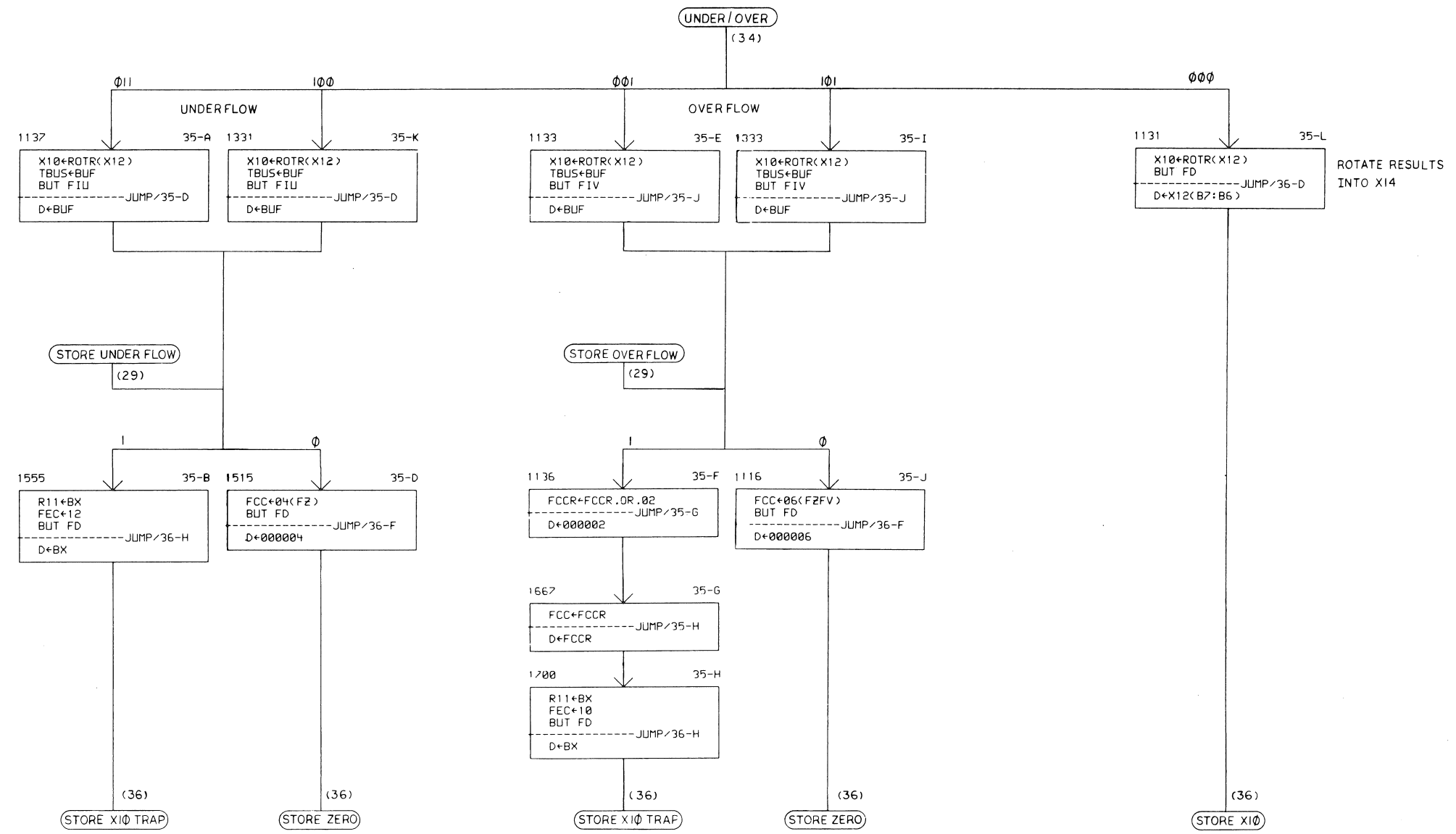


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REV. 2
SIZE CODE DFD
NUMBER FPII-A-2

D
C
B
A

D
C
B
A



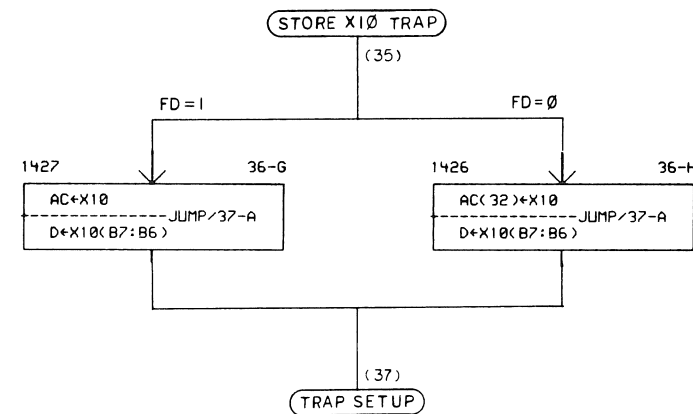
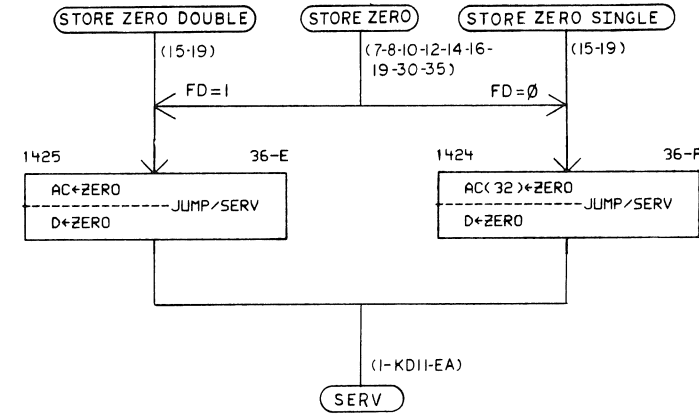
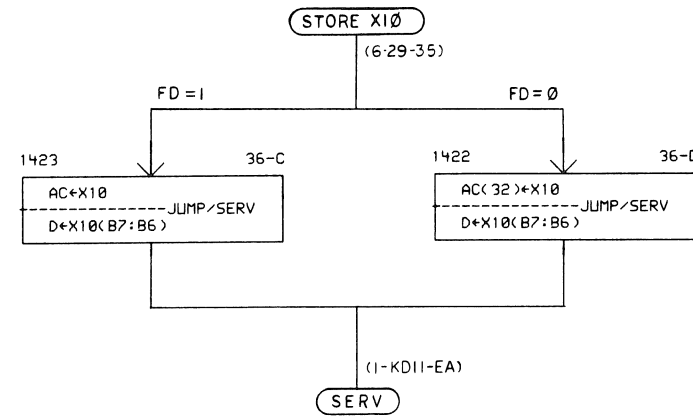
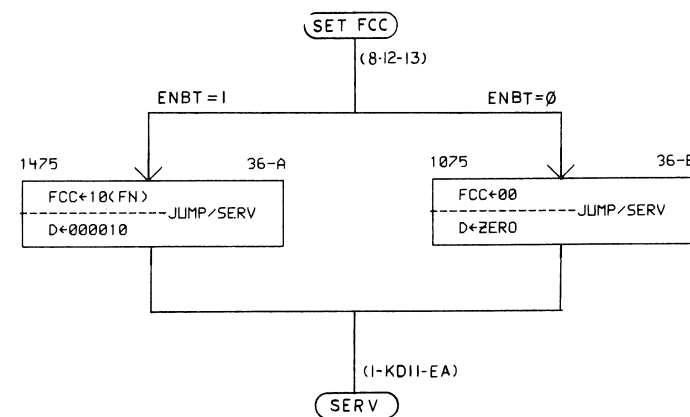
REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO. 130

TITLE
FPII-A FLOWS (35)
SCALE + + +
SHEET 38 OF 40
SIZE CODE DFD
NUMBER FPII-A-2
REV. 2
DIST.

8 7 6 5 4 3 2 1

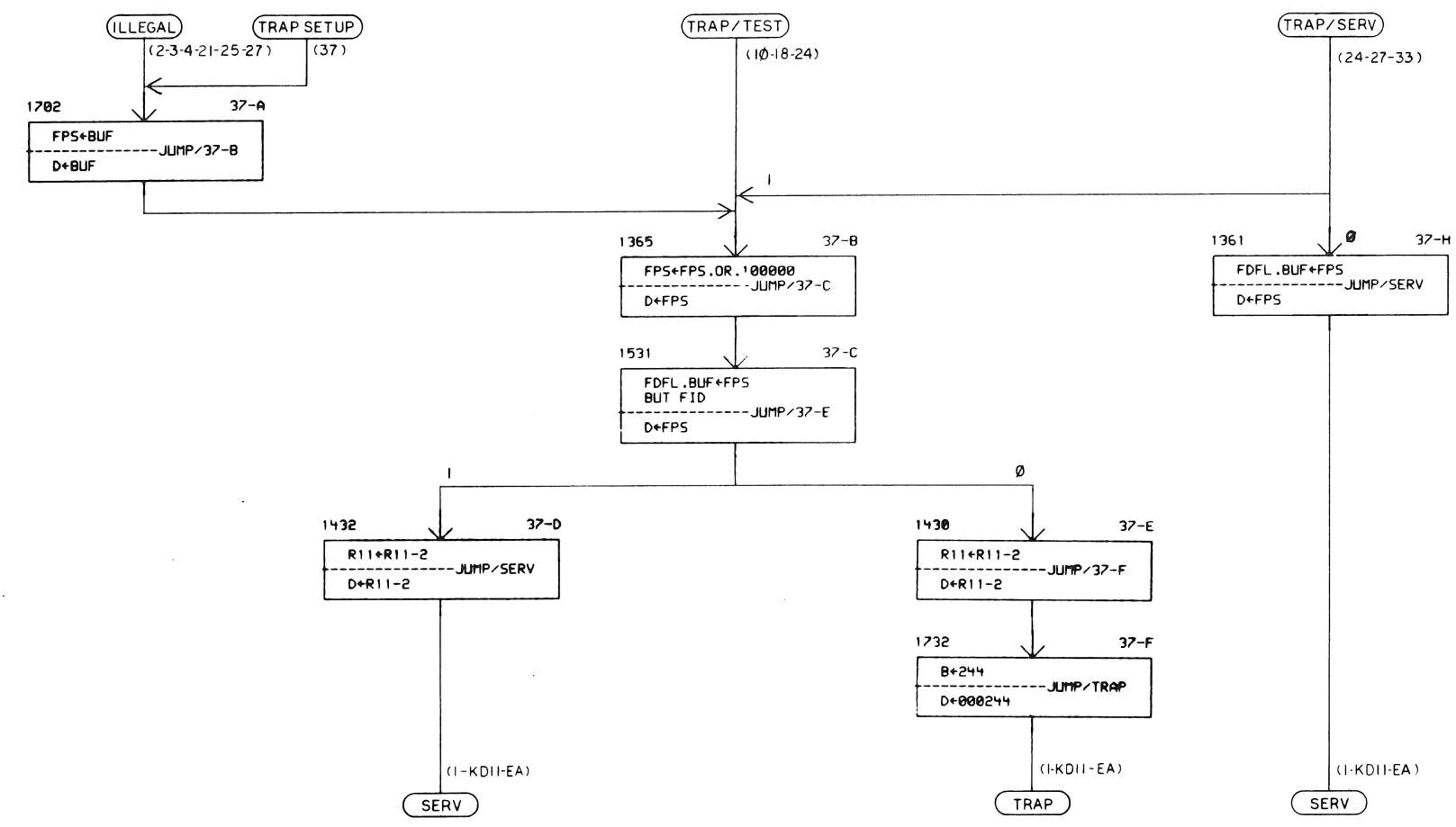
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REVISIONS		
CHK	CHANGE NO.	REV.

TITLE FPII A FLOWS (36)		SIZE D	CODE FD	NUMBER FPII-A-2				REV.
SCALE 1" = 1'-0"	SHEET 39 OF 40	DIST.						

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REVISIONS		
CHK	CHANGE NO.	REV.

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MICRO FIELD DEFINITIONS

FCTL/=3,6,53,D

A.AND.B=41
D.AND.A=45
A.OR.B=31
D.OR.A=35
D.XOR.A=65
BBAR=73
QPASS=62
BPASS=63
APASS=64
DPASS=67
ZERO=42
ABAR.AND.B=51
DBAR.AND.A=55
A+B=1
D+A=5
BPLUS=3
B-1=13
-B-1=23
B-A-1=11
A-D-1=15
A-B-1=21
D-A-1=25

ECTL/=3,6,59,D

A.AND.B=41
D.AND.A=45
D.OR.A=35
A.XOR.B=61
D.XOR.A=65
BBAR=73
QPASS=62
BPASS=63
APASS=64
DPASS=67
ZERO=42
ABAR.AND.B=51
DBAR.AND.A=55
A+B=1
D+A=5
BPLUS=3
B-1=13
-B-1=23
B-A-1=11
A-D-1=15
A-B-1=21
D-A-1=25

ECIN/=0,1,60,D

ZERO=0
ONE=1

BSEL/=3,2,62,D

AC.OR.1=0
FDST=1
FSRC=1
AC=2
BROM=3

ASEL/=1,1,63,D

AC=0
AROM=1

TOUT/=1,1,64,D

NOP=0
1134_TBUS=1

DCTL/=0,4,68,D

NOP=0
LDBT=1
LDBF=2
LDQF=3
ROTL=4
ROTR=5
SLALU0=6
SROALU=7
SR1ALU=10
SLALU0.LDBF=11
SR1ALU.LDBF=12
SROALUQ=14
SLALU0Q=15

RET/=1,1,69,D

RETURN=0
STAY=1

BUT/=0,6,75,D

NOP=0
ENBT=54
EZBT=52
BUSRQ=55
FNBT=56
XZBT=57
Q8.Q40=60
COUT63=61
EZBT.OP1A=13
FID=41
EZBT.Y8.Y9=62
EZBT.Y8=63
ENBT.Y8=64
ENBT.EZBT.FNBT=65
FNBT.XZBT=66
FIV=42
Y62=43
FIU=45
FIUV=46
FIC=47
FT=44
ENBT.EZBT=67
Y8=50
Y61=44
FD.FIV=2
Y62.OP1A=3
BREAKOUT=31
FD=32
OP1B=34
OP1C=35
OP1D=36
OP1E=37
FDST=71
FSRC=71
DST=72
SRC=72
GR7=73
GR7.FLBAR=74
FL=75
FLBAR=76
OP2A=77

CONST/=10,6,81,D

NOP=0
ZERO=53
ONES=40
OCT2=41
OCT5=42
OCT4=43
OCT6=44
OCT10=45
OCT12=46
OCT14=47
OCT100=50
OCT200=51
OCT100000=60
OCT40000=61
OCT147757=63
(143.159)=62
OCT10.4.2=64
OCT4.2=65
FDFLBAR=66
OCT4.10.2=67
(56.24)=55
(57.25)=56
(58.26)=57
OCT244=52
(31.15)=54
(56.24)*=70
OCT170000=71
BYTE10=3
BYTE32=4
BYTE43=5
BYTE54=6
BYTE65=7
BYTE76=10
BYTE07=11

MISC/=11,4,85,D

TBUS_1134=0
TBUS_BUF=1
BUF_TBUS=4
BUF_1134=5
FDFL_TBUS=6
FCC_TBUS=7
SERV.BR=10
NOP=11
FDFL_BUF=12
FDFL_BUF_TBUS=13
FDFL_BUFH_TBUS=15

TITLE FPII-A
FLOW DIAGRAMS

SHEET 2 OF 8	SIZE CODE	NUMBER	REV
	BFD	FPII-A-5	

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AROM/=0,3,88,D

AR10=0
AR11=1
AR12=2
AR13=3
AR14=4
FCCR=6
FPS=7

BROM/=0,3,91,D

BR10=0
BR11=1
BR12=2
BR13=3
BR14=4
FEC=5
FCCR=6
FPS=7

SECT/=17,4,95,D

S1=1
S2=2
S3=3
S4=4
S7=7
S10=10
S14=14
S17=17

RSFA/=0,4,47,D

PC=10
R11=6
R12=5
R14=3
R17=0

FORCE KER/=0,1,43,D

KER=1

BUT SERV/=0,1,42,D

SERV=1

PREVIOUS MODE/=1,1,41,D

ASSERT=0

FORCE RS+1/=1,1,40,D

RS+1=0

DST SEL/=3,2,39,D

RD=2
ROM=0

SRC SEL/=0,2,37,D

RD=2
ROM=0
RBA=3

BUT BITS/=0,4,35,D

NOP=0
NBIT=1
ZBIT=2
C05=3
COUT=7
NBITZBIT=11
NOSERV=17

AMUX/=1,2,31,D

UBUS=3
ALU=1

SSMUX/=0,2,29,D

STRT=0
SWAB=2

BBX CTRL/=0,4,27,D

HOLD=0
LOADB=1
LOADBX=2

ALU BLEG/=5,5,23,D

ZERO=0
A+1=2
A-1=3
A-B=4
A=5
B=6
A+B=10
A-BX=22
A+2=24
A-2=25
BX=27
BBAR=30

AUX CTRL/=0,1,18,D

AUX=1

CYCLE/=1,1,17,D

SHORT=1
LONG=0

LOAD BA/=0,1,16,D

BA=1

ENAB MAINT/=0,1,15,D

MAINT=1

BUS CTRL/=0,2,14,D

DATI=0
DATO=2

DATA TRAN/=0,1,12,D

TRAN=1

MISC CTRL/=0,3,11,D

NOP=0
LOADCC=3
LOADC=6
COUNT=7

J/=0,9,8,+

TITLE FPII-A
FLOW DIAGRAMS

SHEET 3 OF 8

SIZE CODE
BFD

NUMBER
FPII-A-5

REV

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FP11A MACRO DEFINITIONS

AC(32)_X10	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/AC,AROM/AR10,SECT/S14"
AC(32)_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BSEL/AC,SECT/S14"
AC.OR.1(32)_X12	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/AC.OR.1,AROM/AR12,SECT/S14"
AC.OR.1(32)_X14	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/AC.OR.1,AROM/AR14,SECT/S14"
AC.OR.1(32)_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BSEL/AC.OR.1,SECT/S14"
AC.OR.1_X12	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/AC.OR.1,AROM/AR12"
AC.OR.1_X14	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/AC.OR.1,AROM/AR14"
AC.OR.1_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BSEL/AC.OR.1"
AC_X10	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/AC,AROM/AR10"
AC_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BSEL/AC"
BA_PC	"LOAD BA/BA,RSPA/PC"
BA_R12	"LOAD BA/BA,RSPA/R12"
BA_R12 R12_R12+2	"LOAD BA/BA,DST SEL/ROM,RSPA/R12,ALU BLEG/A+2,TOUT/NOP"
BA_RD	"LOAD BA/BA,SRC SEL/RD"
BUF_FPS	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE10,MISC/BUF_TBUS,BROM/FPS"
BUF_RD B_RD	"MISC/BUF_1134,BBX CTRL/LOADB,SRC SEL/RD,TOUT/NOP,CONST/NOP"
BUF_UDATA	"MISC/BUF_1134,AMUX/UBUS,TOUT/NOP,CONST/NOP"
BUT (Q8.Q40)	"BUT/Q8.Q40,CYCLE/LONG"
BUT (Q8.Q40) ZBIT	"BUT/Q8.Q40,BUT BITS/ZBIT,CYCLE/LONG"
BUT BR.OR.PFAIL	"BUT/BUSRQ,CYCLE/LONG"
BUT BREAKOUT	"BUT/BREAKOUT"
BUT COUT15	"BUT BITS/COUT,CYCLE/LONG"
BUT COUT63 ZBIT	"BUT/COUT63,BUT BITS/ZBIT,CYCLE/LONG"
BUT DST	"BUT/DST"
BUT ENBT	"BUT/ENBT,CYCLE/LONG"
BUT ENBT EZBT	"BUT/ENBT.EZBT,CYCLE/!LONG"
BUT ENBT EZBT XNBT	"BUT/ENBT.EZBT.FNBT,CYCLE/LONG"
BUT ENBT Y8	"BUT/ENBT.Y8,CONST/BYTE07,CYCLE/LONG"
BUT EZBT	"BUT/EZBT,CYCLE/LONG"
BUT EZBT OP1A	"BUT/EZBT.OP1A,CYCLE/LONG"
BUT EZBT Y8	"BUT/EZBT.Y8,CONST/BYTE07,CYCLE/LONG"
BUT EZBT Y9 Y8	"BUT/EZBT.Y8.Y9,CONST/BYTE07,CYCLE/LONG"
BUT FD	"BUT/FD"
BUT FDST	"BUT/FDST"
BUT FIC	"BUT/FIC,CYCLE/LONG"
BUT FID	"BUT/FID,CYCLE/LONG"
BUT FIU	"BUT/FIU,CYCLE/LONG"
BUT FIUV	"BUT/FIUV,CYCLE/LONG"
BUT FIV	"BUT/FIV,CYCLE/LONG"
BUT FIV FD	"BUT/FD.FIV,CYCLE/LONG"
BUT FL	"BUT/FL"
BUT FLAG	"BUT BITS/C05"
BUT FLBAR	"BUT/FLBAR"
BUT FSRC	"BUT/FSRC"
BUT FT	"BUT/FT,CYCLE/LONG"
BUT GR7	"BUT/GR7"
BUT GR7.OR.FLBAR	"BUT/GR7.FLBAR"
BUT NBIT	"BUT BITS/NBIT,CYCLE/LONG"
BUT NBIT ZBIT	"BUT BITS/NBITZBIT,CYCLE/LONG"
BUT NOSERV	"BUT BITS/NOSERV"
BUT OP1B	"BUT/OP1B"
BUT OP1C	"BUT/OP1C"
BUT OP1D	"BUT/OP1D"

TITLE

FP11-A FLOWS

SIZE CODE

B FD

NUMBER

FP11-A-5

REV

SHEET 4 OF 8

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BUT OP1E	"BUT/OP1E"
BUT OP2A	"BUT/OP2A"
BUT SERV(BR.OR.PFAIL)	"BUT SERV/SERV,MISC/SERV.BR"
BUT SRC	"BUT/SRC"
BUT XNBT	"BUT/FNBT,CYCLE/LONG"
BUT XNBT XZBT	"BUT/FNBT,XZBT,CYCLE/LONG"
BUT XZBT	"BUT/XZBT,CYCLE/LONG"
BUT Y61	"BUT/Y61,CONST/BYTE65,CYCLE/LONG"
BUT Y62	"BUT/Y62,CONST/BYTE65,CYCLE/LONG"
BUT Y62 OP1A	"BUT/Y62.OP1A,CONST/BYTE65,CYCLE/LONG"
BUT Y8	"BUT/Y8,CONST/BYTE10,CYCLE/LONG"
BUT ZBIT	"BUT BITS/ZBIT,CYCLE/LONG"
BX_R11	"BBX CTRL/LOADBX,RSPA/R11,TOUT/NOP"
BX_R14	"BBX CTRL/LOADBX,RSPA/R14,TOUT/NOP"
BX_R17-BX	"BBX CTRL/LOADBX,RSPA/R17,ALU BLEG/A-BX,TOUT/NOP"
BX_X11(L) SWAB	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE43,BROM/BR11,BBX CTRL/LOADBX,SSMUX/SWAB"
BX_X11(L) SWAB F_EAC	"FCTL/BPASS,ECTL/APASS,ASEL/AC,CONST/BYTE43,BROM/BR11,BBX CTRL/LOADBX,SSMUX/SWAB"
BX_ZERO	"BBX CTRL/LOADBX,ALU BLEG/ZERO,TOUT/NOP"
B_(10.4.2)	"CONST/OCT10.4.2,BBX CTRL/LOADB"
B_(4.10.2)	"CONST/OCT4.10.2,BBX CTRL/LOADB"
B_(4.2)	"CONST/OCT4.2,BBX CTRL/LOADB"
B_2 CLEAR FDFL	"CONST/OCT2,MISC/FDFL_TBUS,BBX CTRL/LOADB"
B_244	"CONST/OCT244,BBX CTRL/LOADB"
B_B SWAB	"BBX CTRL/LOADB,ALU BLEG/B,SSMUX/SWAB,TOUT/NOP"
B_B+R17	"DST SEL/ROM,RSPA/R17,ALU BLEG/A+B,BBX CTRL/LOADB,TOUT/NOP"
B_R17	"BBX CTRL/LOADB,RSPA/R17,TOUT/NOP"
B_UDATA	"BBX CTRL/LOADB,AMUX/UBUS,TOUT/NOP"
B_UDATA BUF_UDATA	"BBX CTRL/LOADB,AMUX/UBUS,MISC/BUF_1134,TOUT/NOP,CONST/NOP"
B_X11(H) SWAB	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE65,BROM/BR11,BBX CTRL/LOADB,SSMUX/SWAB"
B_X11(H) SWAB F_EAC	"FCTL/BPASS,ECTL/APASS,ASEL/AC,CONST/BYTE65,BROM/BR11,BBX CTRL/LOADB,SSMUX/SWAB"
B_X13-X14 SWAB	"BBX CTRL/LOADB,FCTL/A-B-1,ECTL/A-B-1,ECIN/ONE,CONST/BYTE07,AROM/AR13,BROM/BR14,SSMUX/SWAB,CYCLE/LONG"
B_X14-X13 SWAB	"BBX CTRL/LOADB,FCTL/B-A-1,ECTL/B-A-1,ECIN/ONE,CONST/BYTE07,AROM/AR13,BROM/BR14,SSMUX/SWAB,CYCLE/LONG"
CC_FCC	"MISC/TBUS_BUF,MISC CTRL/LOADCC,CONST/NOP"
CLEAR FD(FPS)	"FCTL/DBAR.AND.A,ECTL/DBAR.AND.A,DCTL/LDBF,CONST/OCT200,AROM/FPS,BROM/FPS"
CLEAR FDFL	"CONST/ZERO,MISC/FDFL_TBUS"
CLEAR FL(FPS)	"FCTL/DBAR.AND.A,ECTL/DBAR.AND.A,DCTL/LDBF,CONST/OCT100,AROM/FPS,BROM/FPS"
CLEAR FLAG	"MISC CTRL/LOADC,ALU BLEG/ZERO,TOUT/NOP"
CLEAR SIGN	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BROM/BR10"
CLEAR SIGN T_X12	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBT,AROM/AR12,BROM/BR10"
DATI	"DATA TRAN/TRAN"
DATO	"DATA TRAN/TRAN,BUS CTRL/DATO,CYCLE/LONG"
F10_F10 E10_E10.AND.177	"FCTL/BPASS,ECTL/DBAR.AND.A,DCTL/LDBF,CONST/OCT100000,AROM/AR10,BROM/BR10"
F10_F10 E10_E10.XOR.200	"FCTL/BPASS,ECTL/D.XOR.A,DCTL/LDBF,CONST/OCT100000,AROM/AR10,BROM/BR10"
F11_SR1(F11) E11_E11	"FCTL/BPASS,ECTL/BPASS,DCTL/SR1ALU,LDBF,BROM/BR11"
F11_SR1(F11) E11_ZERO	"FCTL/BPASS,ECTL/ZERO,DCTL/SR1ALU,LDBF,BROM/BR11"
F12_F12 E12_B	"FCTL/BPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_1134,BROM/BR12,ALU BLEG/B,TOUT/NOP,CONST/NOP"
F12_F12 E12_E12+200	"FCTL/BPASS,ECTL/D+A,DCTL/LDBF,CONST/OCT100000,AROM/AR12,BROM/BR12,CYCLE/LONG"
F12_F12 E12_E12.AND.360	"FCTL/BPASS,ECTL/D.AND.A,DCTL/LDBF,CONST/OCT170000,AROM/AR12,BROM/BR12"
F12_F12.OR.F10 E12_E12	"FCTL/A.OR.B,ECTL/BPASS,DCTL/LDBF,AROM/AR10,BROM/BR12"
F12_SLO(F12) E12_E13	"FCTL/BPASS,ECTL/APASS,DCTL/SLALU0,LDBF,AROM/AR13,BROM/BR12"
F12_SR1(F12) E12_ZERO	"FCTL/BPASS,ECTL/ZERO,DCTL/SR1ALU,LDBF,BROM/BR12"
F13_ZERO E13_E11	"FCTL/ZERO,ECTL/APASS,DCTL/LDBF,AROM/AR11,BROM/BR13"
F13_ZERO E13_E11.XOR.200	"FCTL/ZERO,ECTL/D.XOR.A,DCTL/LDBF,CONST/OCT100000,AROM/AR11,BROM/BR13"
F13_ZERO E13_E12	"FCTL/ZERO,ECTL/APASS,DCTL/LDBF,AROM/AR12,BROM/BR13"
F13_ZERO E13_E12 T_X12	"FCTL/ZERO,ECTL/APASS,DCTL/LDBT,AROM/AR12,BROM/BR13"

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F14_SLO(F14) E14_E13	"FCTL/BPASS,ECTL/APASS,DCTL/SLALU0,LDBF,AROM/AR13,BROM/BR14"
F14_ZERO E14_E12	"FCTL/ZERO,ECTL/APASS,DCTL/LDBF,AROM/AR12,BROM/BR14"
F14_ZERO E14_E12 T_X12	"FCTL/ZERO,ECTL/APASS,DCTL/LDBT,AROM/AR12,BROM/BR14"
FCCR_FCCR.0R.02	"FCTL/D.0R.A,ECTL/D.0R.A,DCTL/LDBF,CONST/OCT2,AROM/FCCR,BROM/FCCR"
FCC_00	"CONST/ZERO,MISC/FCC_TBUS"
FCC_00 FCCR_00	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/ZERO,MISC/FCC_TBUS,BROM/FCCR"
FCC_04 FCCR_04	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT4,MISC/FCC_TBUS,BROM/FCCR"
FCC_04(FZ)	"CONST/OCT4,MISC/FCC_TBUS"
FCC_05(FZFC)	"CONST/OCT5,MISC/FCC_TBUS"
FCC_06(FZFU)	"CONST/OCT6,MISC/FCC_TBUS"
FCC_10 FCCR_10	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT10,MISC/FCC_TBUS,BROM/FCCR"
FCC_10(FN)	"CONST/OCT10,MISC/FCC_TBUS"
FCC_14 FCCR_14	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT14,MISC/FCC_TBUS,BROM/FCCR"
FCC_14(FNFZ)	"CONST/OCT14,MISC/FCC_TBUS"
FCC_FCCR	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE10,MISC/FCC_TBUS,BROM/FCCR"
FDFL.BUFH_FPS X10_X10	"FCTL/BPASS,ECTL/BPASS,DCTL/LDBT,CONST/BYTE10,MISC/FDFL.BUFH_TBUS,AROM/FPS,AROM/BR10"
FDFL.BUF_FPS	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE10,MISC/FDFL.BUF_TBUS,BROM/FPS"
FDFL.BUF_FPS F_E13	"FCTL/BPASS,ECTL/APASS,CONST/BYTE10,MISC/FDFL.BUF_TBUS,AROM/AR13,BROM/FPS"
FDFL_BUF	"MISC/FDFL_BUF,CONST/NOP"
FDFL_FDFLBAR	"CONST/FDFLBAR,MISC/FDFL_TBUS"
FDST(3)_X10	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/FDST,AROM/AR10,SECT/S10"
FEC_02	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT2,BROM/FEC"
FEC_04	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT4,BROM/FEC"
FEC_06	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT6,BROM/FEC"
FEC_10	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT10,BROM/FEC"
FEC_12	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT12,BROM/FEC"
FEC_14	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT14,BROM/FEC"
FPS_BUF	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_BUF,BROM/FPS,CONST/NOP"
FPS_BUF CC_BUF	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_BUF,BROM/FPS,MISC CTRL/LOADCC,CONST/NOP"
FPS_FPS.AND.147757	"FCTL/D.AND.A,ECTL/D.AND.A,DCTL/LDBF,CONST/OCT147757,AROM/FPS,BROM/FPS"
FPS_FPS.0R.100000	"FCTL/D.0R.A,ECTL/D.0R.A,DCTL/LDBF,CONST/OCT100000,AROM/FPS,BROM/FPS"
FSRC(32)_X11	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/FSRC,AROM/AR11,SECT/S14"
FSRC_X11	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,BSEL/FSRC,AROM/AR11"
F_AC	"FCTL/BPASS,ECTL/BPASS,BSEL/AC"
F.AC.XOR.200	"FCTL/D.XOR.A,ECTL/D.XOR.A,ASEL/AC,CONST/OCT100000"
F_Q	"FCTL/QPASS,ECTL/QPASS"
F_X10	"FCTL/BPASS,ECTL/BPASS,BROM/BR10"
F_X10BAR	"FCTL/BBAR,ECTL/BBAR,BROM/BR10"
F_X12	"FCTL/BPASS,ECTL/BPASS,BROM/BR12"
F_X13	"FCTL/BPASS,ECTL/BPASS,BROM/BR13"
MAINT	ENAB MAINT/MAINT"
PC_PC+2	"DST SEL/ROM,RSPA/FC,ALU BLEG/A+2,TOUT/NOP"
PC_PC-2	"DST SEL/ROM,RSPA/FC,ALU BLEG/A-2,TOUT/NOP"
Q_(F12*EAC)	"FCTL/APASS,ECTL/BPASS,DCTL/LDQF,BSEL/AC,AROM/AR12"
Q_FDST	"FCTL/BPASS,ECTL/BPASS,DCTL/LDQF,BSEL/FDST"
Q_FSRC	"FCTL/BPASS,ECTL/BPASS,DCTL/LDQF,BSEL/FSRC"
Q_X12	"FCTL/BPASS,ECTL/BPASS,DCTL/LDQF,BROM/BR12"
Q_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDQF"
R11_BX	"DST SEL/ROM,RSPA/R11,ALU BLEG/BX,TOUT/NOP"
R11_R11-2	"DST SEL/ROM,RSPA/R11,ALU BLEG/A-2,TOUT/NOP"
R12_R12+2	"DST SEL/ROM,RSPA/R12,ALU BLEG/A+2,TOUT/NOP"
R12_RD	"DST SEL/ROM,RSPA/R12,ALU BLEG/A+2,TOUT/NOP"
R12_RD+B	"DST SEL/ROM,RSPA/R12,ALU BLEG/A+B,TOUT/NOP"
R12_RD-2	"DST SEL/ROM,RSPA/R12,ALU BLEG/A-2,TOUT/NOP"
R12_RD-B	"DST SEL/ROM,RSPA/R12,ALU BLEG/A-B,TOUT/NOP"

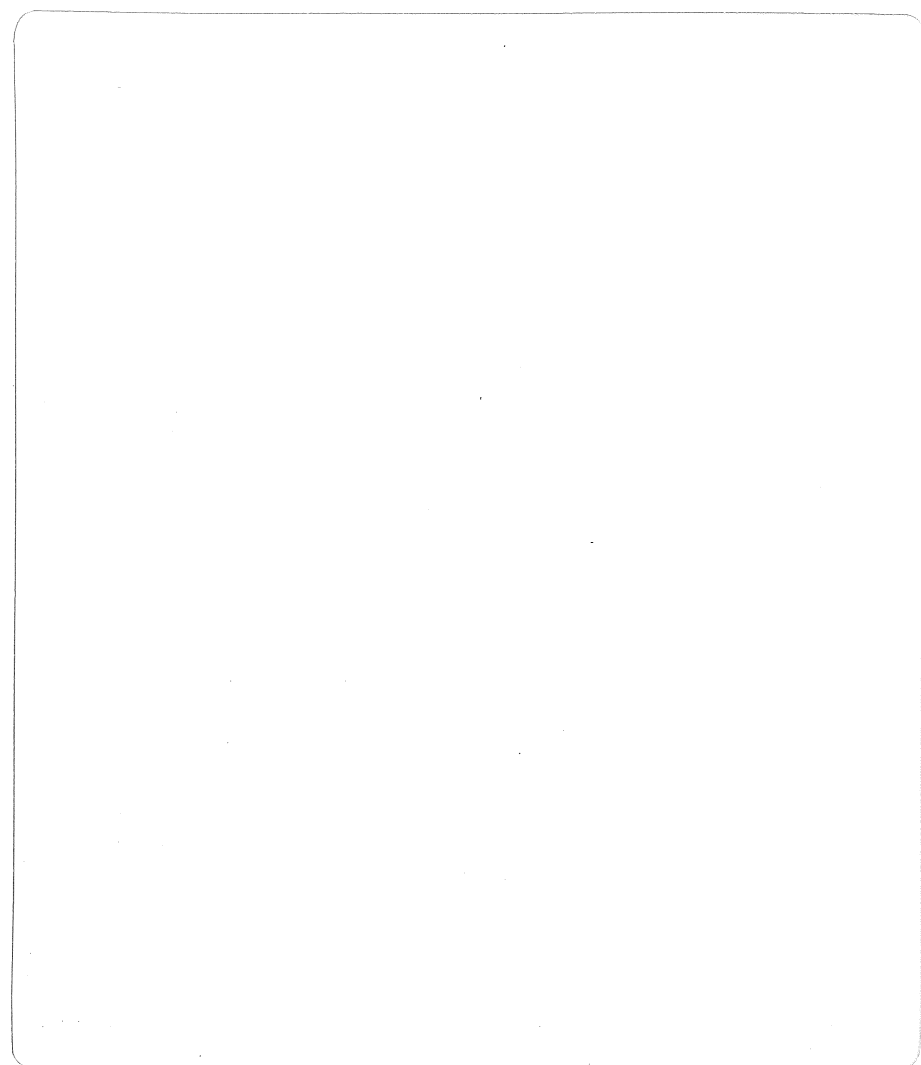
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R12_UDATA	"DST SEL/ROM,RSPA/R12,AMUX/UBUS,TOUT/NOP"
R14_(237,217)	"CONST/(143,159),DST SEL/ROM,RSPA/R14"
R14_(70,30)	"CONST/(56,24),DST SEL/ROM,RSPA/R14"
R14_(72,32)	"CONST/(58,26),DST SEL/ROM,RSPA/R14"
R14_4	"CONST/OCT4,DST SEL/ROM,RSPA/R14"
R14_B	"DST SEL/ROM,RSPA/R14,ALU BLEG/B,TOUT/NOP"
R14_BX	"DST SEL/ROM,RSPA/R14,ALU BLEG/BX,TOUT/NOP"
R14_R14 SWAB	"DST SEL/ROM,RSPA/R14,SSMUX/SWAB,TOUT/NOP"
R14_R14+1	"DST SEL/ROM,RSPA/R14,ALU BLEG/A+1,TOUT/NOP"
R14_R14+1 SWAB	"DST SEL/ROM,RSPA/R14,ALU BLEG/A+1,SSMUX/SWAB,TOUT/NOP"
R14_R14-1	"DST SEL/ROM,RSPA/R14,ALU BLEG/A-1,TOUT/NOP"
R14_X11 SWAB	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE07,BROM/BR11,DST SEL/ROM,RSPA/R14,SSMUX/SWAB,CYCLE/LONG"
R14_X13 SWAB	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE07,BROM/BR13,DST SEL/ROM,RSPA/R14,SSMUX/SWAB,CYCLE/LONG"
R14_X14 SWAB	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE07,BROM/BR14,DST SEL/ROM,RSPA/R14,SSMUX/SWAB,CYCLE/LONG"
R17_(71,31)	"DST SEL/ROM,RSPA/R17,CONST/(57,25)"
R17_2	"CONST/OCT2,DST SEL/ROM,RSPA/R17"
R17_B	"DST SEL/ROM,RSPA/R17,ALU BLEG/B,TOUT/NOP"
R17_BBAR	"DST SEL/ROM,RSPA/R17,ALU BLEG/BBAR,TOUT/NOP"
R17_FEC	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE10,BROM/FEC,DST SEL/ROM,RSPA/R17,CYCLE/LONG"
R17_FPS	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE10,BROM/FPS,DST SEL/ROM,RSPA/R17,CYCLE/LONG"
R17_R17-B	"DST SEL/ROM,RSPA/R17,ALU BLEG/A-B,TOUT/NOP"
R17_X13 SWAB	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE07,BROM/BR13,DST SEL/ROM,RSPA/R17,SSMUX/SWAB,CYCLE/LONG"
R17_ZERO	"DST SEL/ROM,RSPA/R17,ALU BLEG/ZERO,TOUT/NOP"
RD_R17	"DST SEL/RD,SRC SEL/ROM,RSPA/R17,TOUT/NOP"
RD_RD+2	"DST SEL/RD,SRC SEL/RD,ALU BLEG/A+2,TOUT/NOP"
RD_RD+B	"DST SEL/RD,SRC SEL/RD,ALU BLEG/A+B,TOUT/NOP"
RD_RD-2	"DST SEL/RD,SRC SEL/RD,ALU BLEG/A-2,TOUT/NOP"
RD_RD-B	"DST SEL/RD,SRC SEL/RD,ALU BLEG/A-B,TOUT/NOP"
RETURN	"RET/RETURN"
SERV(BR.OR.PFAIL)	"MISC/SERV.BR"
SET FD(FPS)	"FCTL/D.OR.A,ECTL/D.OR.A,DCTL/LDBF,CONST/OCT200,AROM/FPS,BROM/FPS"
SET FDFL	"CONST/ONES,MISC/FDFL,TBUS"
SET FL(FPS)	"FCTL/D.OR.A,ECTL/D.OR.A,DCTL/LDBF,CONST/OCT100,AROM/FPS,BROM/FPS"
SET FLAG	"MISC CTRL/COUNT"
SET SIGN	"FCTL/ZERO,ECTL/DPASS,DCTL/SLALU0,CONST/OCT1000000,BROM/BR10"
TBUS_BUF	"MISC/TBUS_BUF,CONST/NOP"
T_B	"ALU BLEG/B,TOUT/NOP"
T_R14	"RSPA/R14,TOUT/NOP"
T_R14-B	"RSPA/R14,ALU BLEG/A-B,TOUT/NOP"
T_R17+B	"RSPA/R17,ALU BLEG/A+B,TOUT/NOP"
UDATA_BX	"ALU BLEG/BX,TOUT/NOP"
UDATA_R17	"SRC SEL/ROM,RSPA/R17,TOUT/NOP"
UDATA_X10(3)	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE76,BROM/BR10"
UDATA_X11(0)	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE10,BROM/BR11"
UDATA_X11(1)	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE32,BROM/BR11"
UDATA_X11(2)	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE54,BROM/BR11"
UDATA_X11(3)	"FCTL/BPASS,ECTL/BPASS,CONST/BYTE76,BROM/BR11"
X10(0)_BUF	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_BUF,BROM/BR10,SECT/S1,CONST/NOP"
X10(1)_BUF	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_BUF,BROM/BR10,SECT/S2,CONST/NOP"
X10(10)_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BROM/BR10,SECT/S3"
X10(2)_BUF	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_BUF,BROM/BR10,SECT/S4,CONST/NOP"
X10(210)_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BROM/BR10,SECT/S7"
X10(3)_BUF	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_BUF,BROM/BR10,SECT/S10,CONST/NOP"
X10_Q	"FCTL/QPASS,ECTL/QPASS,DCTL/LDBF,BROM/BR10"
X10_ROT(ZERO*(EAC.XOR.E10)	"FCTL/ZERO,ECTL/A.XOR.B,DCTL/ROT,ASEL/AC,BROM/BR10"

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X10_ROT R(X12)	"FCTL/APASS,ECTL/APASS,DCTL/ROT R,AROM/AR12,BROM/BR10"
X10_X11	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,AROM/AR11,BROM/BR10"
X11(10)_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BROM/BR11,SECT/S3"
X11_(70,30)-X14	"FCTL/D-A-1,ECTL/D-A-1,DCTL/LDBF,ECIN/ONE,CONST/(56.24)*,AROM/AR14,BROM/BR11,CYCLE/LONG"
X11_AC	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,ASEL/AC,BROM/BR11"
X11_ROT L(X11)	"FCTL/BPASS,ECTL/BPASS,DCTL/ROT L,BROM/BR11"
X11_ROT R(X12)	"FCTL/APASS,ECTL/APASS,DCTL/ROT R,AROM/AR12,BROM/BR11"
X11_SL0(X11-X12) Q_SLC63(Q)	"FCTL/B-A-1,ECTL/B-A-1,DCTL/SLALUOQ,ECIN/ONE,AROM/AR12,BROM/BR11"
X11_SL0(X12+X11) Q_SLC63(Q)	"FCTL/A+B,ECTL/A+B,DCTL/SLALUOQ,AROM/AR12,BROM/BR11"
X11_SR0(X11)	"FCTL/BPASS,ECTL/BPASS,DCTL/SROALU,BROM/BR11"
X11_SR1(X11)	"FCTL/BPASS,ECTL/BPASS,DCTL/SR1ALU,BROM/BR11"
X11_X12	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,AROM/AR12,BROM/BR11"
X11_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BROM/BR11"
X12(1)_BUF	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_BUF,BROM/BR12,SECT/S2,CONST/NOP"
X12(2)_BUF	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_BUF,BROM/BR12,SECT/S4,CONST/NOP"
X12_-X12	"FCTL/-B-1,ECTL/-B-1,ECIN/ONE,DCTL/LDBF,BROM/BR12,CYCLE/LONG"
X12_ROT L(X10)	"FCTL/APASS,ECTL/APASS,DCTL/ROT L,AROM/AR10,BROM/BR12"
X12_ROT L(X11)	"FCTL/APASS,ECTL/APASS,DCTL/ROT L,AROM/AR11,BROM/BR12"
X12_ROT R(F10.OR.F12)*E12)	"FCTL/A.OR.B,ECTL/BPASS,DCTL/ROT R,AROM/AR10,BROM/BR12"
X12_SL0(Q)	"FCTL/QPASS,ECTL/QPASS,DCTL/SLALU0,BROM/BR12"
X12_SL0(X12)	"FCTL/BPASS,ECTL/BPASS,DCTL/SLALU0,BROM/BR12"
X12_SL00(X12)	"FCTL/A+B,ECTL/A+B,DCTL/SLALU0,AROM/AR12,BROM/BR12,CYCLE/LONG"
X12_SR0(X11+X12) Q_SR0(Q)	"FCTL/A+B,ECTL/A+B,DCTL/SROALUQ,AROM/AR11,BROM/BR12"
X12_SR0(X11BAR.AND.X12)	"FCTL/ABAR.AND.B,ECTL/ABAR.AND.B,DCTL/SROALU,AROM/AR11,BROM/BR12"
X12_SR0(X12)	"FCTL/BPASS,ECTL/BPASS,DCTL/SROALU,BROM/BR12"
X12_SR0(X12) Q_SR0(Q)	"FCTL/BPASS,ECTL/BPASS,DCTL/SROALUQ,BROM/BR12"
X12_X10	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,AROM/AR10,BROM/BR12"
X12_X11-X12	"FCTL/A-B-1,ECTL/A-B-1,DCTL/LDBF,ECIN/ONE,AROM/AR11,BROM/BR12,CYCLE/LONG"
X12_X12+X11	"FCTL/A+B,ECTL/A+B,DCTL/LDBF,AROM/AR11,BROM/BR12,CYCLE/LONG"
X12_X12+X14	"FCTL/A+B,ECTL/A+B,DCTL/LDBF,AROM/AR14,BROM/BR12,CYCLE/LONG"
X12_X12-X11	"FCTL/B-A-1,ECTL/B-A-1,DCTL/LDBF,ECIN/ONE,AROM/AR11,BROM/BR12,CYCLE/LONG"
X12_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BROM/BR12"
X13_(37,17)-X13	"FCTL/D-A-1,ECTL/D-A-1,DCTL/LDBF,ECIN/ONE,CONST/(31.15),AROM/AR13,BROM/BR13,CYCLE/LONG"
X13_R14	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_1134,BROM/BR13,RSPA/R14,CYCLE/LONG,TOUT/NOP,CONST/NOP"
X13_X13+1	"FCTL/BPLUS,ECTL/BPLUS,DCTL/LDBF,ECIN/ONE,BROM/BR13"
X13_X13+200	"FCTL/D+A,ECTL/D+A,DCTL/LDBF,CONST/OCT100000,AROM/AR13,BROM/BR13,CYCLE/LONG"
X13_X13+X14	"FCTL/A+B,ECTL/A+B,DCTL/LDBF,AROM/AR14,BROM/BR13"
X13_X13-1	"FCTL/B-1,ECTL/B-1,DCTL/LDBF,BROM/BR13"
X13_X13-200	"FCTL/A-D-1,ECTL/A-D-1,DCTL/LDBF,ECIN/ONE,CONST/OCT100000,AROM/AR13,BROM/BR13,CYCLE/LONG"
X13_X13-X14	"FCTL/B-A-1,ECTL/B-A-1,ECIN/ONE,DCTL/LDBF,AROM/AR14,BROM/BR13"
X13_X14	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,AROM/AR14,BROM/BR13"
X14(1)_40000	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT40000,BROM/BR14,SECT/S2"
X14(3)_40000	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,CONST/OCT40000,BROM/BR14,SECT/S10"
X14_R14	"FCTL/DPASS,ECTL/DPASS,DCTL/LDBF,MISC/TBUS_1134,BROM/BR14,RSPA/R14,CYCLE/LONG,TOUT/NOP,CONST/NOP"
X14_ROT R(F10.OR.F14)*E14)	"FCTL/A.OR.B,ECTL/BPASS,DCTL/ROT R,AROM/AR10,BROM/BR14"
X14_X11.AND.X14	"FCTL/A.AND.B,ECTL/A.AND.B,DCTL/LDBF,AROM/AR11,BROM/BR14"
X14_X12	"FCTL/APASS,ECTL/APASS,DCTL/LDBF,AROM/AR12,BROM/BR14"
X14_X13.XOR.200	"FCTL/D.XOR.A,ECTL/D.XOR.A,DCTL/LDBF,CONST/OCT100000,AROM/AR13,BROM/BR14"
X14_ZERO	"FCTL/ZERO,ECTL/ZERO,DCTL/LDBF,BROM/BR14"

TITLE	SIZE	CODE	NUMBER	REV
FPII-A FLOWS	SHEET 8 OF 8	B FD	FPII-A-5	



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