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CREST

FRZ

0.2.1	
L1	1
Is → L15-22	17
SHR	2
3.2.0	
MISC	13
Q → N	14

0.2.0	
L0	0
1 → L4	1
4.16.1	
MISC	23
Q → C	16

3.2.0	
L2	2
SHL	1
1.12.2	
MISC	2
Q → P	15

1.12.2	
L0	0
1.0.7	
Q → B	7

1.0.7	
L2	2
P → K	15
Is → L15-22	16
AND	5
SHL	1
(5).5.3	
Q → P	15

2.5.3	
L1	1
B → K	1
1.11.6	
MISC	13
Q → N	14

3.5.3	
L1	1
B → K	1
1.0.7	
MISC	13
Q → B	7

1.11.6	
L0	0
Is → L0-14	13
AND	5
SHL	1
0.11.6	
MISC	47
Q → A	13

0.11.6	
L0	0
A → L	4
SHL	1
0.11.7	
Q → A	13

0.11.7	
L1	1
N → K	10
A → L	4
1.11.7	
Q → N	14

1.11.7	
L1	1
Is → L15-23	15
AND	5
4.12.7	
MISC	47
Q → B	7

4.12.7	
WRITE	1
L1	1
N → SAD	17
N → K	10
CYB0	1
5.17.7	
Q → N	14

5.17.7	
L0	0
1 → L4	1
0.11.5	
Q → B	7

0.11.5	
WRITE	1
L0	0
N → SAD	17
1 → L4	1
SHL	1
6.16.5	
Q → B	7

6.16.5	
L1	1
B → K	1
Is → L	14
1.17.6	
Q → B	7

1.17.6	
L0	0
1.15.7	
MISC	47
Q → N	14

1.15.7	
L3	3
1.12.6	
MISC	11

1.12.6	
L3	3
B → K	1
4.13.7	
MISC	15

4.13.7	
L3	3
B → K	1
ALLOW INTS	
5.5.7	

5.5.7	
L1	1
AND	5
4.5.7	
MISC	47
Q → B	7

4.5.7	
L0	0
4.13.7	
MISC	13

MISCELLANEOUS	
3	PREP. OF ORDER COMPLEX: JUMP ON PERIPH. INT TO ADDRESS 0.17.2
11	N → BAD: RESET INT
15	SET T
21	0 → EXM
23	1 → EXM
47	HANDKEYS → K: SET POMSIT TO INHIBIT ORDER INT IN FOLLOWING BEAT
13	1 → L8
2	SRIN → L, N → BAD

CONDITION		Y	N
X5	M15-23 = 0	2	3

FRZ & CREST

SUB	ISS	1	2	3
ACW	-	0876	0906	0917

PREPARATION OF ORDER

MODIFIER & MISC. BIT 6

LINKS

LINKS

4.16.1
LI 1
C→SAD 3
READ 2
Bf→K 17
Df→L 3
DVL 1
MISC 3
(0)(0)(0)
Q→AN 10

0.17.1
LI 1
M→SAD 2
READ 2
Bsm→K 7
A→L 1
DVL 1
MISC 6
(0)(0)(0)
Q→AN 10

0.17.5
LI 1
C→K 16
15→L 14
5.16.5
Q→C 16

0.17.4
Lφ φ
L φ
MISC 47
6.6.4
Q→B 7

0.17.1, 0.17.2.
0.17.3, 0.17.4
0.17.5, 0.17.6
0.17.7 OR
EXECUTION OF ORDER

0.16.6
OR
EXECUTION OF ORDER

5.16.5
Lφ φ
L φ
MISC 47
1, 5, 7
Q→B 7

6.6.4
LI 1
C→SAD 3
WRITE 1
C→K 16
C→BO 1
4.16.1
Q→C 16

PREP OF ORDER

ESM & K12-14 = III

0.16.6
Lφ φ
L φ
Bsm→K 7
3.4.6
Q→A 13

0.17.1 v 0.17.2.
EXECUTION OF ORDER

3.4.6
Lφ φ
L φ
P→K 15
4.4.6
Q→N 14

MISCELLANEOUS	
3	SET MM STAT IF MMI B21,23→X; 7→LINK79; B17,20→LINK2-6 B11,16→LINK0-2; B12,13→N22,23 V3→N22,23 CHECK FOR INTERRUPT.
6	FORCE 0.16.6 IF ESM & K12,13,14 = III B22,23→N22,23
47	HANDKEYS → K0-23

0.14.2
Lφ φ
L φ
P→K 15
1.10.6
Q→B 7

4.4.6
LI 1
N→SAD 17
READ 2
Bf→K 17
A→L 4
DVL 1

- NOTES:
- MODIFY FORCES 0.17.1
INTERRUPT FORCES 0.17.2
GROUPS 5-7, EJM FORCES 0.17.3.
INSERT FORCES 0.17.4.
ORDER FORCES 0.17.5.
DVL FAIL FORCES 0.17.6/7.
 - Bsm→K MEANS INHIBIT CARRY TO M22 AND;
(a) ESM, B0-14
(b) ESM, B→K, Bf→K MEANS:
B0-11→K v B0-14→K ACCORDING TO FR
Df→L MEANS DATUM→L ACCORDING TO FR, G & EXM

1.10.6
LI 1
L φ
Bsm→K 7
A→L 4
5.14.6
Q→N 14

3.17.2
Q→P 15

5.14.6
Lφ φ
L φ
N0-21→K 3
(0)(0)(0)
Q→A 13

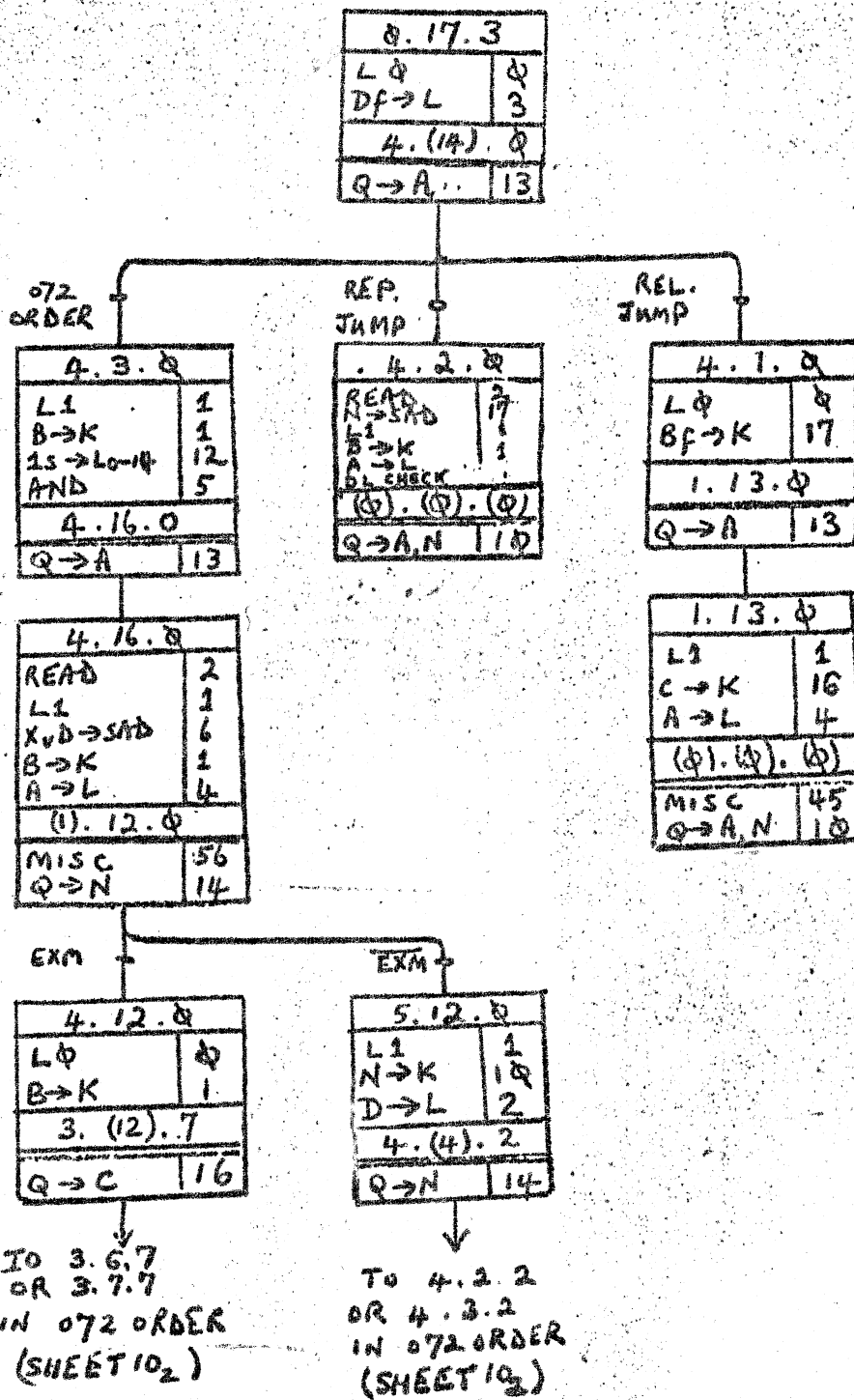
3.17.2
Lφ φ
L φ
Df→L 3
0.14.2
Q→A 13

PREPARATION OF ORDER
MODIFIER & MISC BIT 6
ORDER
INSERT

EXECUTION OF ORDER

NOTE: THERE ARE TWO ANOMALIES WHEN ON ORDER.
(1) THE LONG MODIFICATION SEQUENCE DOES NOT WORK CORRECTLY.
(2) RELATIVE JUMPS GO TO ONE LESS THAN THE CORRECT ADDRESS.

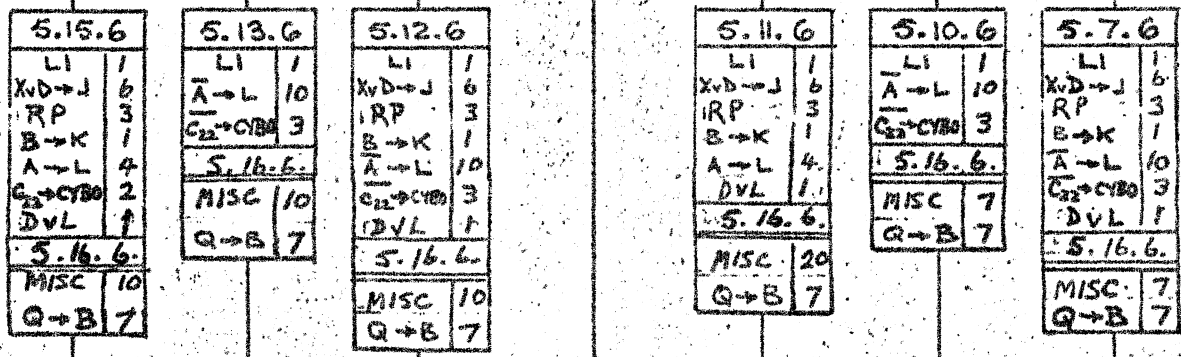
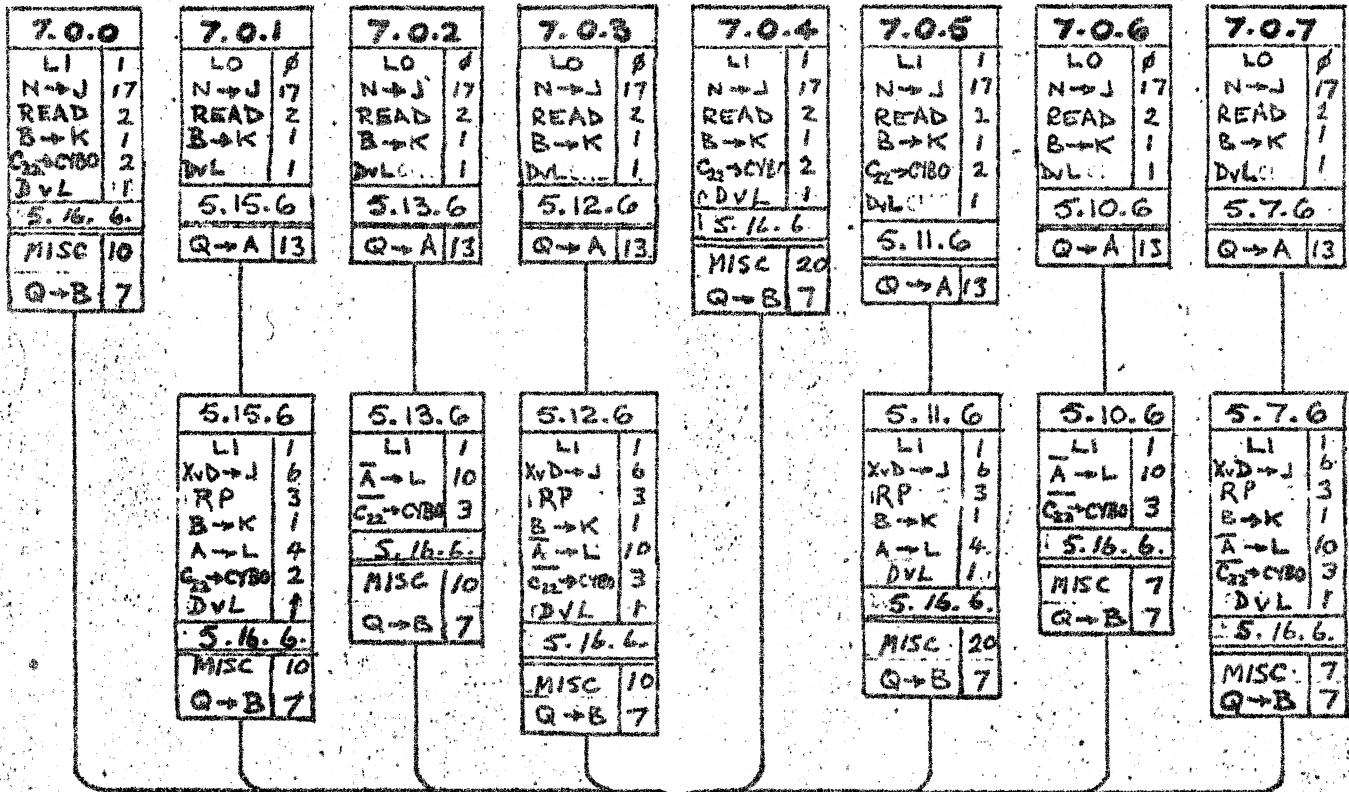
PREPN. OF ORDER FOR EJM JUMPS.



MISCELLANEOUS	
45	SIGN EXTEND A ₁₃ \rightarrow L
56	SIGN EXTEND A ₁₄ \rightarrow L

CONDITIONS			
XI	EXM	Y	N
Y4	mm3	4	5
Y14	Normal	2	3
	072 order	ϕ	
	Rep. Jump	1	
	Rel. Jump	2	
		3	

PREPARATION OF ORDER
FOR EJM JUMPS



5.16.6	
LI	1
XvD→J	6
WRITE	1
C→K	16
CY80	1
DVL	1
ALLOW INTS	
5.16.U.	
Q→CP	17

ALSO USED IN
GRPS 2, 10, 12, 17

PREP.
OF
ORDER

MISCELLANEOUS	
7	1→C ₂₂ IF M ₂₄ =1; Q ₂ →Q ₂₃
10	Q ₂ →C ₂₂ IF M ₂₄ ≠M ₂₃ 1→C ₂₅
20	M ₂₅ →C ₂₂ ; Q ₂ →Q ₂₃

GROUP 0

7.1.0 LO 0 XVD→J 6 READ 2 DVL CHECK 1.17.4.	7.1.1 LO 0 XVD→J 6 READ 2 B→K 1 DVL CHECK 4.17.6 Q→A 13	7.1.2 LO 0 XVD→J 6 READ 2 B→K 1 DVL CHECK 4.15.6 Q→A 13	7.1.3 LO 0 XVD→J 6 READ 2 B→K 1 DVL CHECK 4.14.6 Q→A 13	7.1.4 LO 0 XVD→J 6 READ 2 DVL CHECK 2,13,3.	7.1.5 LO 0 XVD→J 6 READ 2 B→K 1 DVL CHECK 4.13.6 Q→A 13	7.1.6 LO 0 XVD→J 6 READ 2 B→K 1 DVL CHECK 4.12.6 Q→A 13	7.1.7 LO 0 XVD→J 6 READ 2 B→K 1 DVL CHECK 4.11.6 Q→A 13
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1.17.4. LI 1 N→J 17 LK 0 B→K 1 C ₂₂ →CYB0 2 DVL CHECK 5.6.6. MISC 10 Q→B 7	4.17.6 LI 1 N→J 17 RP 3 B→K 1 A→L 4 C ₂₂ →CYB0 2 DVL CHECK 5.6.6. MISC 10 Q→B 7	4.15.6 LI 1 A→L 10 C ₂₂ →CYB0 3 N→J 17 DVL CHECK 5.6.6. MISC 10 Q→B 7	4.14.6 LI 1 N→J 17 RP 3 B→K 1 A→L 10 C ₂₂ →CYB0 3 DVL CHECK 5.6.6. MISC 10 Q→B 7	2.13.3. LI 1 B→K 1 C ₂₂ →CYB0 2 N→J 17 DVL CHECK 5.6.6. MISC 20 Q→B 7	4.13.6 LI 1 N→J 17 RP 3 B→K 1 A→L 4 C ₂₂ →CYB0 2 DVL CHECK 5.6.6. MISC 20 Q→B 7	4.12.6 LI 1 A→L 10 C ₂₂ →CYB0 3 N→J 17 DVL CHECK 5.6.6. MISC 7 Q→B 7	4.11.6 LI 1 N→J 17 RP 3 B→K 1 A→L 10 C ₂₂ →CYB0 3 DVL CHECK 5.6.6. MISC 7 Q→B 7
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5.6.6 LI 1 N→J 17 WRITE 1 C→K 16 CYB0 1 ALLOWINTS [4.16.1] Q→CP 17
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ALSO USED IN GRP 3.

PREP OF ORDER

MISCELLANEOUS	
7	1→C ₂₂ IF M ₂₄ ≠0; 0→Q ₂₃
10	0→C ₂₂ ; IF M ₂₄ ≠M ₂₃ ; 1→C ₂₃
20	M ₂₃ →C ₂₂ ; 0→Q ₂₃

7.1.0	LO	Ø
XVD→J	6	
READ	2	
DVL CHECK		
1.17.4.		

7.1.1	LO	Ø
XVD→J	6	
READ	2	
B→K	1	
DVL CHECK		
4.17.6		
Q→A	13	

7.1.2	LO	Ø
XVD→J	6	
READ	2	
B→K	1	
DVL CHECK		
4.15.6		
Q→A	13	

7.1.3	LO	Ø
XVD→J	6	
READ	2	
B→K	1	
DVL CHECK		
4.14.6		
Q→A	13	

7.1.4	LO	Ø
XVD→J	6	
READ	2	
DVL CHECK		
2,13,3.		

7.1.5	LO	Ø
XVD→J	6	
READ	2	
B→K	1	
DVL CHECK		
4.13.6		
Q→A	13	

7.1.6	LO	Ø
XVD→J	6	
READ	2	
B→K	1	
DVL CHECK		
4.12.6		
Q→A	13	

7.1.7	LO	Ø
XVD→J	6	
READ	2	
B→K	1	
DVL CHECK		
4.11.6		
Q→A	13	

1.17.4.	LI	1
N→J	17	
L→K	Ø	
B→K	1	
C ₂₂ →CYBØ	2	
DVL CHECK		
5.6.6.		
MISC	10	
Q→B	7	

4.17.6	LI	1
N→J	17	
RP	3	
B→K	1	
A→L	4	
C ₂₂ →CYBØ	2	
DVL CHECK		
5.6.6		
MISC	10	
Q→B	7	

4.15.6	LI	1
A→L	10	
C ₂₂ →CYBØ	3	
N→J	17	
DVL CHECK		
5.6.6.		
MISC	10	
Q→B	7	

4.14.6	LI	1
N→J	17	
RP	3	
B→K	1	
A→L	10	
C ₂₂ →CYBØ	3	
DVL CHECK		
5.6.6		
MISC	10	
Q→B	7	

2.13.3.	LI	1
B→K	1	
C ₂₂ →CYBØ	2	
N→J	17	
DVL CHECK		
5.6.6.		
MISC	20	
Q→B	7	

4.13.6	LI	1
N→J	17	
RP	3	
B→K	1	
A→L	4	
C ₂₂ →CYBØ	2	
DVL CHECK		
5.6.6		
MISC	20	
Q→B	7	

4.12.6	LI	1
A→L	10	
C ₂₂ →CYBØ	3	
N→J	17	
DVL CHECK		
5.6.6.		
MISC	7	
Q→B	7	

4.11.6	LI	1
N→J	17	
RP	3	
B→K	1	
A→L	10	
C ₂₂ →CYBØ	3	
DVL CHECK		
5.6.6		
MISC	7	
Q→B	7	

5.6.6	LI	1
N→J	17	
WRITE	1	
C→K	16	
CYBØ	1	
ALLOWINTS		
[4.16.1]		
Q→CP	17	

ALSO USED IN GRP 3.

PREP OF ORDER

MISCELLANEOUS	
7	1→C ₂₂ IF M ₂₄ ≠Ø; Ø→Q ₂₃
10	Ø→C ₂₂ ; IF M ₂₄ ≠M ₂₃ ; 1→C ₂₃
20	M ₂₃ →C ₂₂ ; Ø→Q ₂₃

7.2.0	7.2.1	7.2.2	7.2.4	7.2.5	7.2.6	7.2.7
LØ Ø	LØ Ø	LØ Ø	LØ Ø	LØ Ø	LØ Ø	LØ Ø
N→SAD 17	N→SAD 17	N→SAD 17	N→SAD 17	N→SAD 17	N→SAD 17	N→SAD 17
READ 2	READ 2	READ 2	READ 2	READ 2	READ 2	READ 2
B→K 1	B→K 1	B→K 1	B→K 6	B→K 1	B→K 1	B→K 1
D.L.CHECK	D.L.CHECK	D.L.CHECK	D.L.CHECK	D.L.CHECK	D.L.CHECK	D.L.CHECK
4.10.6	4.7.6	4.6.6	5.16.6	3.4.1	3.16.6	3.13.6
Q→A 13	MISC 5 Q→P 15	Q→A 13	MISC 5 Q→B 7	Q→A 13	Q→A 13	Q→A 13

4.10.6	4.7.6	4.6.6	3.4.1	3.16.6	3.13.6
L1 1	LØ Ø	L1 1	LØ Ø	L1 1	L1 1
X.D→SAD 6	X.D→SAD 6	X.D→SAD 6	X.D→SAD 6	X.D→SAD 6	X.D→SAD 6
RP 3	RP 3	RP 3	RP 3	RP 2	RP 2
B→K 1	B→K 5	B→K 1	B→K 7	C→K 16	C→K 16
A→L 4	D.L.CHECK	A→L 10	MISC 5	CY80 1	CY80 1
AND 5	5.16.6	EQUIV 4	Q→B 7	D.L.CHECK	D.L.CHECK
D.L.CHECK	Q→B 7	D.L.CHECK		3.15.6	3.12.6
5.16.6		5.16.6		Q→O.P 17	Q→C.P 17
MISC 5		MISC 5			
Q→B 7		Q→B 7			

6.5.6	3.15.6	3.12.6
LØ Ø	L2	L1
A→L 4	B→K 1	B→K 1
5.16.6	A→L 10	A→L 10
Q→B 4	C22→CY80 3	C22→CY80 3
	(6) 13.7	ALLOW INTS
		[4.16.1]
		MISC 64
		Q→B 7

5.16.6
L1 1
X.D→SAD 6
WRITE 1
C→K 16
CY80 1
D.L.CHECK
ALLOW INTS
[4.16.1]
Q→C.P 17

ALSO USED IN GRPS 0, 10, 12, 17

2.13.7	3.13.7
LØ Ø	L1 1
ALLOW INTS	I2→L 14
[4.16.1]	ALLOW INTS
	[4.16.1]
	MISC 20

CONDITION	Y	N
X6 MT=0	2	3

PREP OF ORDER

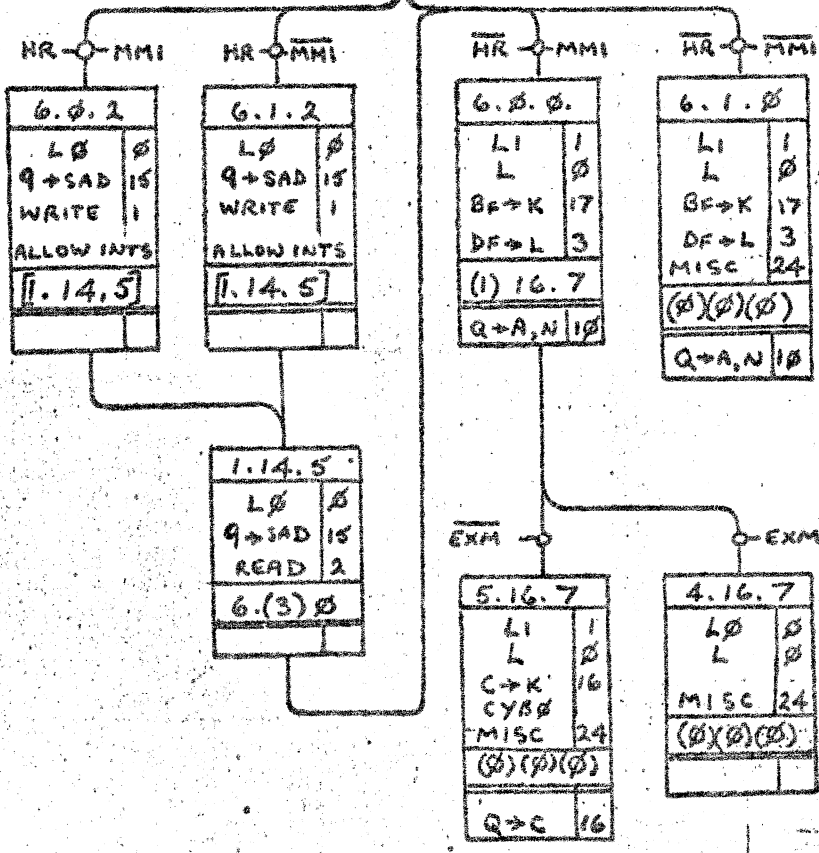
MISCELLANEOUS	
5	Ø → C22
20	IF M23 = 1, I → C22; Ø → Q23
64	CM24 → C22

CONV 02 02 02 02

GROUP 2

ISSUES		
CW		

7.2.3	
LØ	Ø
N→SAD	17
READ	2
N→K	1Ø
DVL CHECK	
6.(3)(2)	
Q→P	15



MISCELLANEOUS	
24	THE SAME AS MISC 3 EXCEPT THAT THE "A" STAT IS NOT UNSET

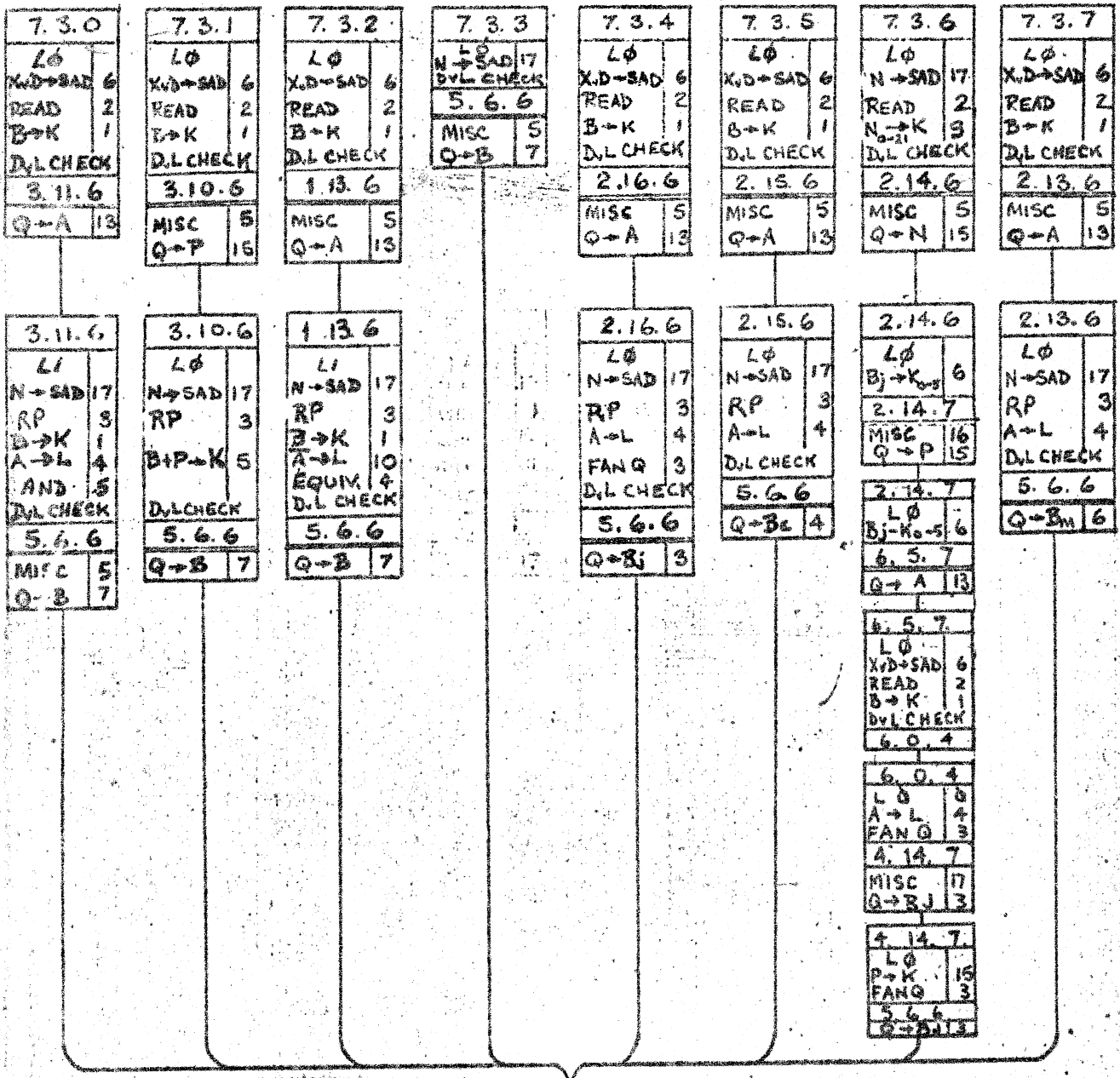
CONDITIONS		Y	N
X1	EXM	4	5
Y3	MMI	Ø	1
Z2	HR	2	Ø

FUNCTION Ø23

1904/5 E & F

LS/51

SUB	195	
ACW		
CHANGE NO.		
DATE	26/9/67	
CD	7803	



5.6.6
 L1
 N-SAD 17
 WRITE 1
 C-K 16
 CYBO 1
 ALLOW INTS
 [4.16.1]
 Q-C+P 17

ALSO USED IN GAP I

MISCELLANEOUS	
5	O → C22
16	RCH+1 → RCH
17	RCH-1 → RCH

GROUP 3

1904/5 E&F

LS 60

SUB ISS	1	
CW	0906	
CHANGE NO.	96-100	
DATE	24/9/67	23/11/67
ACD	7803	

7.4.0	
LO	Ø
N→J	17
READ	2
B→K	1
DVL CHECK	
ALLOW INTS	
G.14.1	
Q→A	13

7.4.1	
LO	Ø
N→J	17
READ	2
B→K	1
DVL CHECK	
ALLOW INTS	
3.17.1	
Q→A	13

7.4.2	
LO	Ø
N→J	17
READ	2
B→K	1
DVL CHECK	
ALLOW INTS	
2.17.1	
Q→A	13

6.14.1	
LO	Ø
XVD→J	6
READ	2
B→K	1
DVL CHECK	
G.13.1	
MISC	34
Q→P	15

3.17.1	
LO	Ø
XVD→J	6
READ	2
B→K	1
DVL CHECK	
3.16.1	
MISC	36
Q→P	15

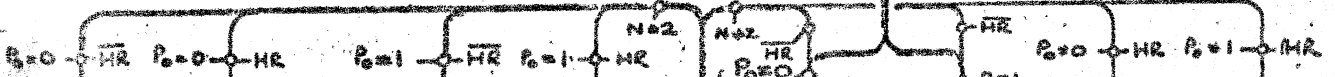
2.17.1	
LO	Ø
XVD→J	6
READ	2
B→K	1
DVL CHECK	
2.16.1	
MISC	34
Q→P	15

G.13.1	
LO	Ø
SHRD	7
(1).1.4	
Q→B	7

3.16.1	
LO	Ø
CYBO	1
SHR	2
3.13.1	
Q→B	7

3.13.1	
LO	Ø
B→K	1
SHR	2
4.10.5	
MISC	34
Q→B	7
4.10.5	
LO	Ø
SHRD	7
(1).1.4	

2.16.1	
LO	Ø
XVD→J	7
READ	2
SHRD	7
DVL CHECK	
(1).1.4	



2.0.4	
LO	Ø
XVD→J	6
WRITE	1
F→K	15
SHR	2
DVL CHECK	
5.17.2	
Q→B	7

2.0.5	
LO	Ø
XVD→J	6
WRITE	1
P→K	15
SHR	2
DVL CHECK	
5.17.2	
Q→B	7

0.0.4	
LI	1
B→K	1
A→L	10
CYBO	1
2.0.3	
MISC	10
Q→B	7

0.0.5	
LI	1
B→K	1
A→L	10
CYBO	1
2.0.5	
MISC	10
Q→B	7

2.1.4	
LO	Ø
B→K	1
SHRD	7
(1). (6). (7)	
MISC	37
Q→B	7

0.1.4	
LI	1
B→K	1
A→L	4
SHRD	7
(1). (6). (7)	
MISC	27
Q→B	7

2.1.5	
LO	Ø
S→J	15
WRITE	1
N→K	10
5.17.1	
Q→B	7

0.1.5	
LO	Ø
S→J	15
WRITE	1
N→K	10
6.17.0	
Q→B	7

5.17.2	
LI	1
XVD→J	7
WRITE	1
C→K	16
CYBO	1
DVL CHECK	
ALLOW INTS	
[4.16.1]	
MISC	5
Q→C+P	17

ALSO USED IN
Fn 043-046,
111, 113

5.17.1	
LO	Ø
10→J	14
WRITE	1
ALLOW INTS	
[5.16.1]	

6.17.0	
LO	Ø
10→J	14
WRITE	1
ALLOW INTS	
[6.15.1]	

5.16.1	
LO	Ø
10→J	14
READ	2
B→K	1
4.17.1	
Q→N	14

6.15.1	
LO	Ø
10→J	14
READ	2
B→K	1
1.15.0	
Q→N	14

4.17.1	
LO	Ø
S→J	15
READ	2
2.1.4	

1.15.0	
LO	Ø
S→J	15
READ	2
0.1.4	

MISCELLANEOUS	
5	0→C22
10	0→C22; IF M22≠M23, 1→C23
27	M24→Q23; No-9-1→No-9
34	24→No-9; 1→Nb
35	C23→Q23
36	0→Nc; LEAVE REST OF N

CONDITIONS			
X 11	P0 = 0	2	0
Y 6	No-9 = 2	0	1
Z 7	HR	5	4

FUNCTIONS 040-2

MULTIPLY

LS/70

1904/5 E & F

SUB	ISS	1
ACW		0942

7.4.3	
L1	1
N→SAD	17
READ	2
B→K	6
D.V.L CHECK	
6(15)3	
MISC.	5
Q→N	14

K→S→9 Q→K→9

6.5.3	
Lφ	φ
X→D→SAD	7
READ	2
B→K	1
D.V.L CHECK	
6.10(2)	
MISC	26
Q→A,P	11

6.4.3	
L1	1
C→K	16
CYBφ	1
5.13.7	
Q→C,P	17

5.13.7	
L1	1
I _s →L	14
ALLOW INTS	
[4.16.1]	
MISC	26

3.15.1	
L1	1
X→D→SAD	6
READ	2
B→K	1
A→L	4
C→C22	2
SHLD	6
D.V.L CHECK	
6.17.5	
MISC	10
Q→B	7

6.17.5	
Lφ	φ
P→K	15
6.15.5	
Q→A	13

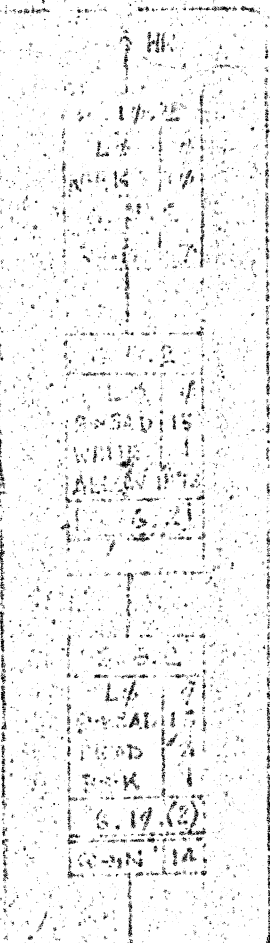
6.15.5	
L1	1
N→B→K	11
A→L	4
6.14.5	
MISC	26
Q→P	15

6.14.5	
L1	1
B→K	1
C→CYBφ	2
6.13.5	
Q→B	7
MISC	10

6.13.5	
Lφ	φ
B→K	1
3.7.0	
MISC	32
Q→B	7

T₂ SHEET 7_a

5.17.2	
L1	1
C→K	16
CYBφ	1
5.13.7	
Q→C,P	17



NR φ

6.10.2	
Lφ	φ
N→K	10
6.5.2	
Q→B	7

φNR

6.10.0	
Lφ	φ
X→D→SAD	6
READ	2
B→K	1
SHLD	6
D.V.L CHECK	
3.14.1	
Q→B	7

6.5.2	
WRITE	1
Lφ	φ
X→SAD	15
ALLOW INTS	
6.6.2	

6.6.2	
READ	2
Lφ	φ
N→K	15
B→K	1
6.10(2)	
Q→N	14

3.14.1	
Lφ	φ
B→K	1
SHLD	6
2.15.1	
Q→B	7

2.15.1	
L1	1
P→K	15
A→L	4
2.14.1	
MISC	26
Q→P	15

2.14.1	
Lφ	φ
B→K	1
3.15(1)	
Q→A	13

CONDITIONS		Y	N
Y13	K→S→9	4	5
Z2	HR	2	0

MISCELLANEOUS	
5	Q→C22
10	Q→C22, IF M21≠M23, I→C23
20	M23=1, I→C22; φ→Q23
26	SET NT=2; LEAVE REST OF N
32	φ→Q23

DECIMAL-BINARY CONVERSION
FUNCTION 043

7.11.4	
READ	2
L2	2
N→SAD	17
B→K	2
D, L CHECK	1
ALLOW INTS	1
(6).12.0	
MISC	5
Q→A	13

7.11.6	
READ	2
L2	2
N→SAD	17
B→K	2
D, L CHECK	1
ALLOW INTS	1
(6).13.0	
MISC	5
Q→A	13

MT=0	
2.12.0	
L2	2
C→K	16
1.16.1	
MISC	37
Q→P	17

MT≠0	
3.12.0	
READ	2
L2	2
X, H, D→SAD	7
B→K	1
D, L CHECK	1
4.17.2	
MISC	34
Q→P	15

MT=0	
3.13.0	
READ	2
L2	2
X, H, D→SAD	7
B→K	1
D, L CHECK	1
(16).14.0	
MISC	34
Q→P	15

MT=0	
2.13.0	
L2	2
C→K	16
CYBQ	1
4.16.1	
MISC	37
Q→P	17

M23=0	
4.17.2	
READ	2
L2	2
X, H, D→SAD	6
B→K	1
SHLD	6
D, L CHECK	1
(12).1.3	
MISC	40
Q→B	7

M23=0	
2.14.0	
L2	2
SHLD	6
(12).0.3	
Q→B	7

M23=1	
3.14.0	
L2	2
L5→L	14
SHLD	6
(12).0.3	
Q→B	7

A23=M23	
3.0.3	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12).1.3	
MISC	40
Q→B	7

A23≠M23	
1.0.3	
L2	2
B→K	1
A→L	4
SHLD	6
(12).0.1	
MISC	40
Q→B	7

A23=M23	
1.1.3	
L2	2
B→K	1
A→L	4
SHLD	6
(12).0.0	
MISC	40
Q→B	7

A23=M23	
3.1.3	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12).0.0	
MISC	37

A23=M23	
3.0.1	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12).0.1	
MISC	40
Q→B	7

A23≠M23	
1.0.1	
L2	2
B→K	1
A→L	4
SHLD	6
(6).0.0	

MT=0	
2.3.3	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12).0.0	
MISC	64

MT≠0	
1.1.3	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12).0.0	
MISC	37

N=2	
3.1.2	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12).0.0	
MISC	37

N≠2	
1.1.2	
WRITE	1
L2	2
B→SAD	15
N→K	17
3.15.4	
Q→B	7

N≠2	
3.0.0	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
6.11.1	
MISC	140

N≠2	
1.0.0	
L2	2
B→K	1
A→L	4
SHLD	6
6.12.1	
MISC	140

N=2	
3.0.2	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
6.11.1	
MISC	140

N=2	
1.0.2	
L2	2
B→K	1
A→L	4
SHLD	6
6.12.1	
MISC	140

N=2	
3.1.0	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12).0.0	
MISC	40
Q→B	7

N=2	
1.1.0	
L2	2
B→K	1
A→L	4
SHLD	6
(12).0.0	
MISC	40
Q→B	7

TO 3.15. (SHEET 2)

TO 6.11.1 (SHEET 2)

TO 6.12.1 (SHEET 2)

TO 6.11.1 (SHEET 2)

TO 6.12.1 (SHEET 2)

FROM 6.7.0 (SHEET 2) FROM 6.2.7 (SHEET 2)

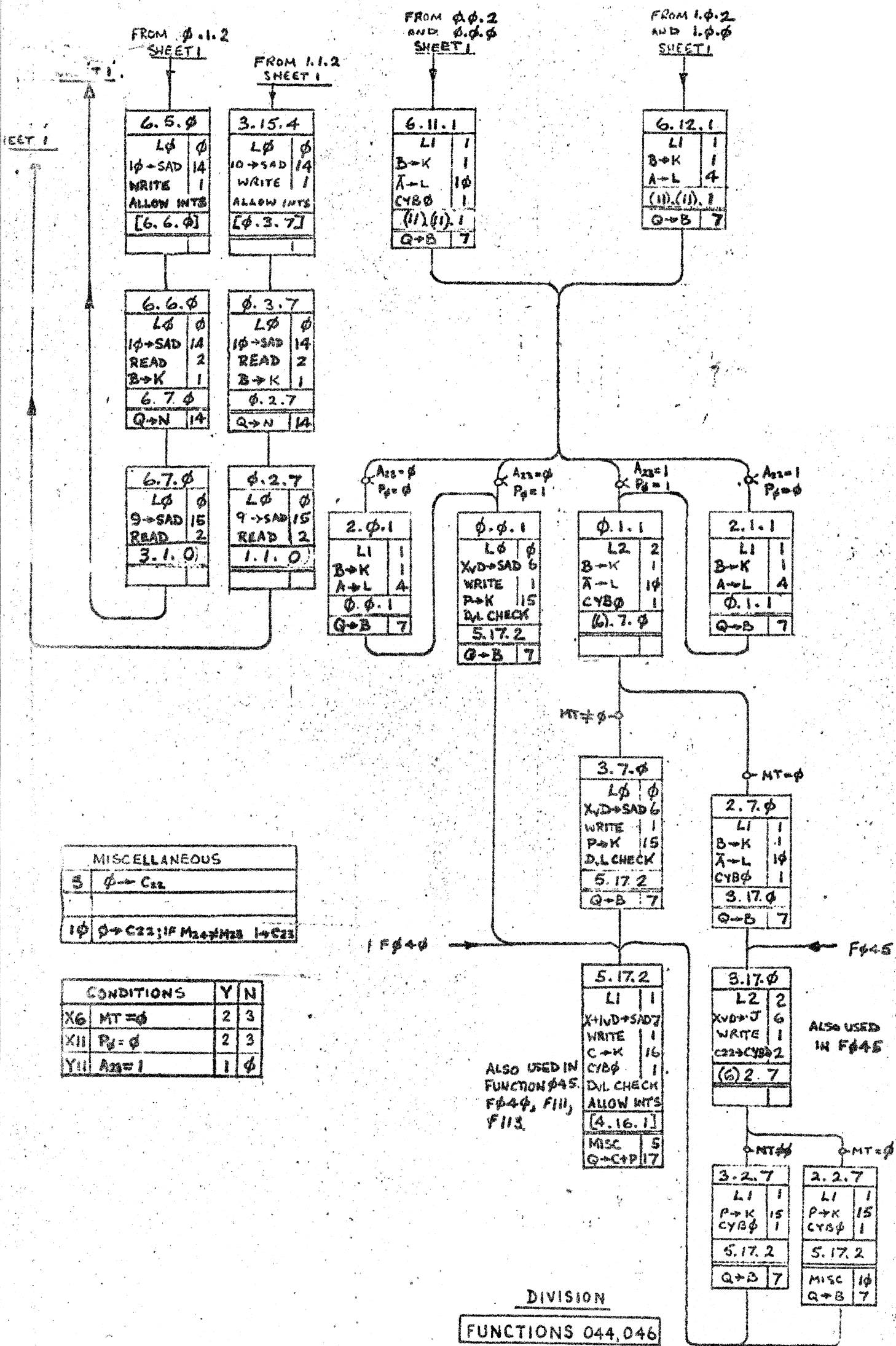
DIVISION

FUNCTIONS 044, 046

SHEET 1 OF 2

CONDITIONS		N
215	MT=0	3
X13	A23=M23	1
X14	M23=0	2 3
Y16	N=2	0 1
Z11	NR	2 0

MISCELLANEOUS	
34	24→No.9; SETN6=1
37	1→C23
44	No.9-1→No.9; A23=M23
5	0→C22
64	C M23=M23, 1→C22



MISCELLANEOUS	
5	$\phi \rightarrow C22$
10	$\phi \rightarrow C23; \text{IF } M24 \neq M23 \text{ } 1 \rightarrow C23$

CONDITIONS		
	Y	N
X6	$MT = \phi$	2 3
X11	$P_j = \phi$	2 3
Y11	$A_{23} = 1$	1 ϕ

ALSO USED IN
FUNCTION $\phi 45$
 $F\phi 44$, $F113$,
 $F113$

ALSO USED
IN $F\phi 45$

DIVISION
FUNCTIONS 044, 046
SHEET 2 of 2

UNCLASS	
SECRET	

7.4.	2
READ	2
L2	2
N→SAD	7
B→K	
DVLCHECK	
ALLOW INT	
(6).15.0	
MISC	13
Q→A	13

MISCELLANEOUS	
34	$Z_{N-2} \rightarrow N_{N-2}: SET N_{N-2} \neq 1$
37	$1 \rightarrow C_{23}$
44	$N_{N-2} \rightarrow 1 \rightarrow N_{N-2}: P_{N-2} \rightarrow P_0$
64	if $M_{23} = M_{24}$, $1 \rightarrow C_{22}$

2.15.0	
LI	1
C→K	16
CYBQ	1
4.16.1	
MISC	37
Q→CP	17

3.15.0	
READ	2
L2	2
X,D→SAD	7
B→K	1
DVLCHECK	
6.11.0	
MISC	34
Q→P	15

CONDITIONS		
	Y	N
X6	MT=0	2 3
X12	A23=M23	3 1
Y6	N=2	0 1
Z2	HR	0 2
Z7	HR	5 4

6.11.0	
READ	2
L2	2
X,D→SAD	6
B→K	1
SHLD	6
DVLCHECK	
(2).1.1	

3.1.1	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12).5.1	
MISC	40
Q→B	7

1.1.1	
L2	2
B→K	1
A→L	4
SHLD	6
(12).6.6	
MISC	40
Q→B	7

1.5.1	
L2	2
B→K	1
A→L	4
SHLD	6
(12)(6)(7)	
MISC	40
Q→B	7

3.5.1	
L2	2
B→K	1
A→L	4
SHLD	6
(12)(6)(7)	
MISC	37

1.6.6	
L2	2
B→K	1
(6).4.2	

2.4.2	
L2	2
B→K	1
A→L	4
SHLD	6
(12)(6)(7)	
MISC	64

3.4.2	
L2	2
B→K	1
A→L	4
SHLD	6
(12)(6)(7)	
MISC	37

3.6.6	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12)(6)(7)	
MISC	40
Q→B	7

3.1.5	
WRITE	1
L2	2
N→K	15
2.10.3	
Q→B	7

1.1.5	
WRITE	1
L2	2
Q→SAD	15
N→K	10
6.15.0	
Q→B	7

3.0.4	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
3.4.4	
MISC	40

3.0.5	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
3.4.4	
MISC	40

1.0.4	
L2	2
B→K	1
A→L	4
SHLD	6
0.11.4	
MISC	40

1.0.5	
L2	2
B→K	1
A→L	4
SHLD	6
0.11.4	
MISC	40

3.1.4	
L2	2
B→K	1
A→L	10
CYBQ	1
SHLD	6
(12)(6)(7)	
MISC	40
Q→B	7

1.1.4	
L2	2
B→K	1
A→L	4
SHLD	6
(12)(6)(7)	
MISC	40
Q→B	7

TO 2.10.3 (SHEET 2)

TO 6.15.0 (SHEET 2)

TO 3.4.4 (SHEET 2)

TO 3.4.4 (SHEET 2)

TO 0.11.4 (SHEET 2)

TO 0.11.4 (SHEET 2)

FROM 2.12.3 (SHEET 2)

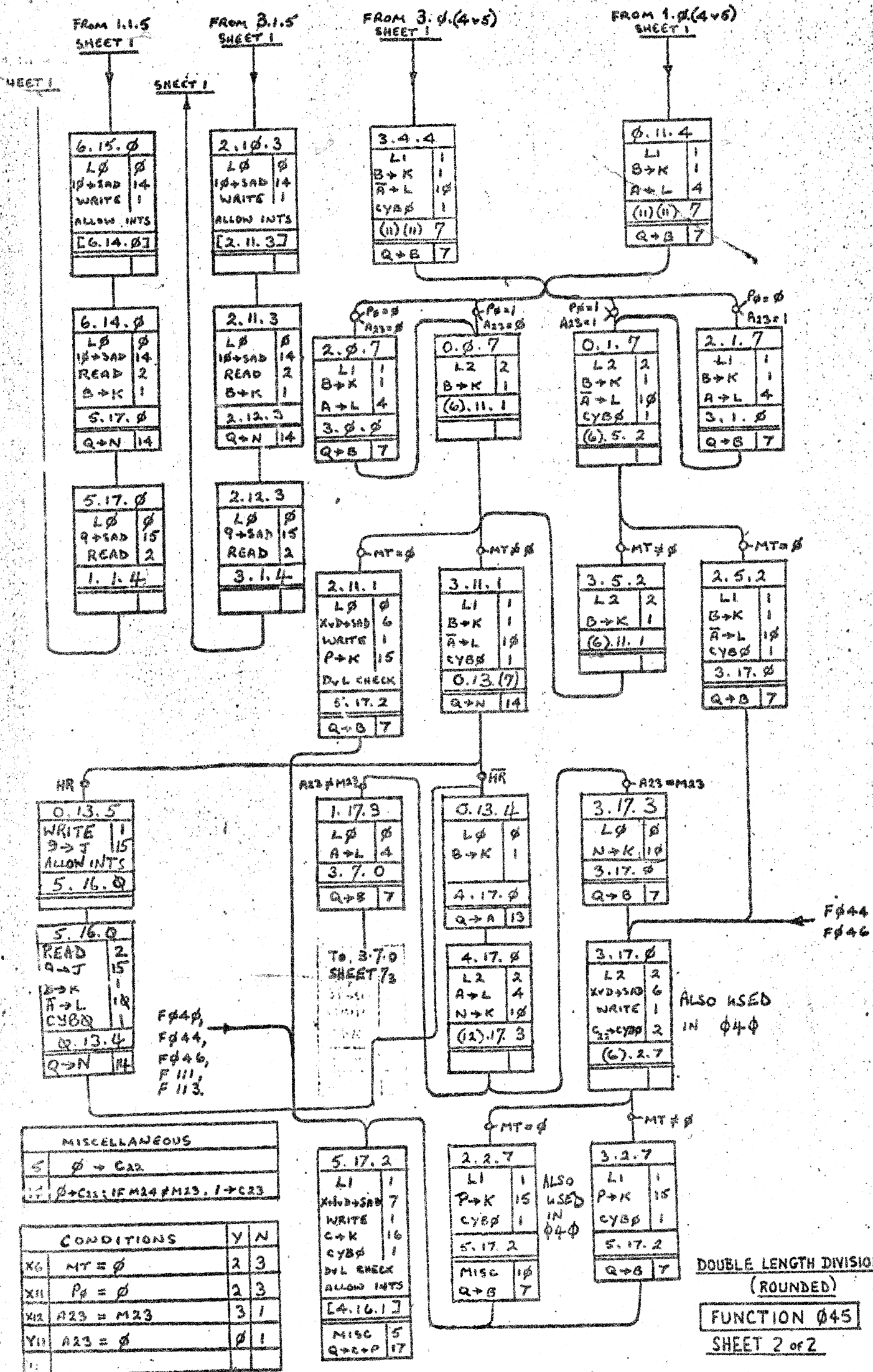
FROM 5.17.0 (SHEET 2)

DOUBLE LENGTH DIVISION (ROUNDED)

FUNCTION 045

SHEET 1 OF 2

SUB	ISS		
ACV	-		



MISCELLANEOUS		
S	φ → C23	
Y	φ → C23; IF M24 ≠ M23, 1 → C23	

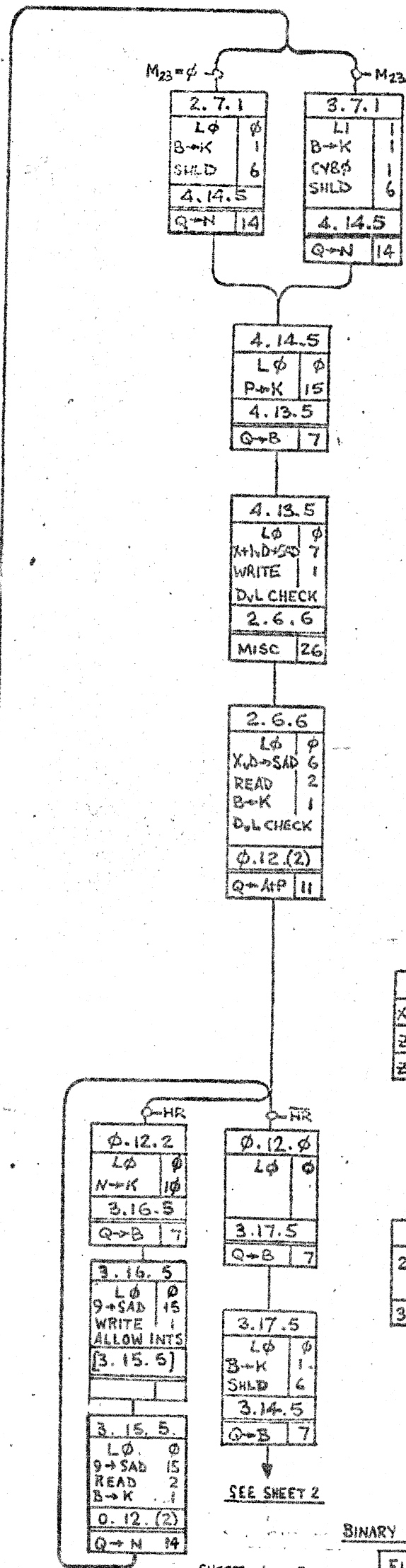
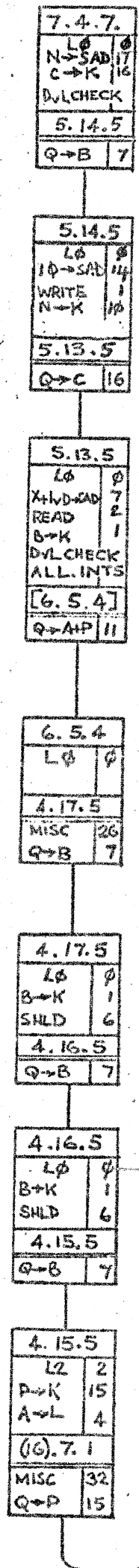
CONDITIONS		
XG	MT = φ	2 3
XII	Pφ = φ	2 3
XI2	A23 = M23	3 1
YII	A23 = φ	φ 1

5.17.2	L1	1
	XVD+SAD	7
	WRITE	1
	C→K	16
	CYBφ	1
	DVL CHECK	
	ALLOW INTS	
	[4.16.1]	
	MISC	5
	Q→B	17

2.2.7	L1	1
	P→K	15
	CYBφ	1
	5.17.2	
	MISC	1φ
	Q→B	7

3.2.7	L1	1
	P→K	15
	CYBφ	1
	5.17.2	
	Q→B	7

DOUBLE LENGTH DIVISION
(ROUNDED)
FUNCTION φ45
SHEET 2 of 2



CONDITIONS	
X16	IF M(13)=0; 2→X, ELSE 3→X
Z2	IF HR 2→Z, ELSE 0→Z
Z7	IF HR 5→Z, ELSE 4→Z

MISCELLANEOUS	
26	SET NT=2; LEAVE REST OF N.
32	φ→Q23

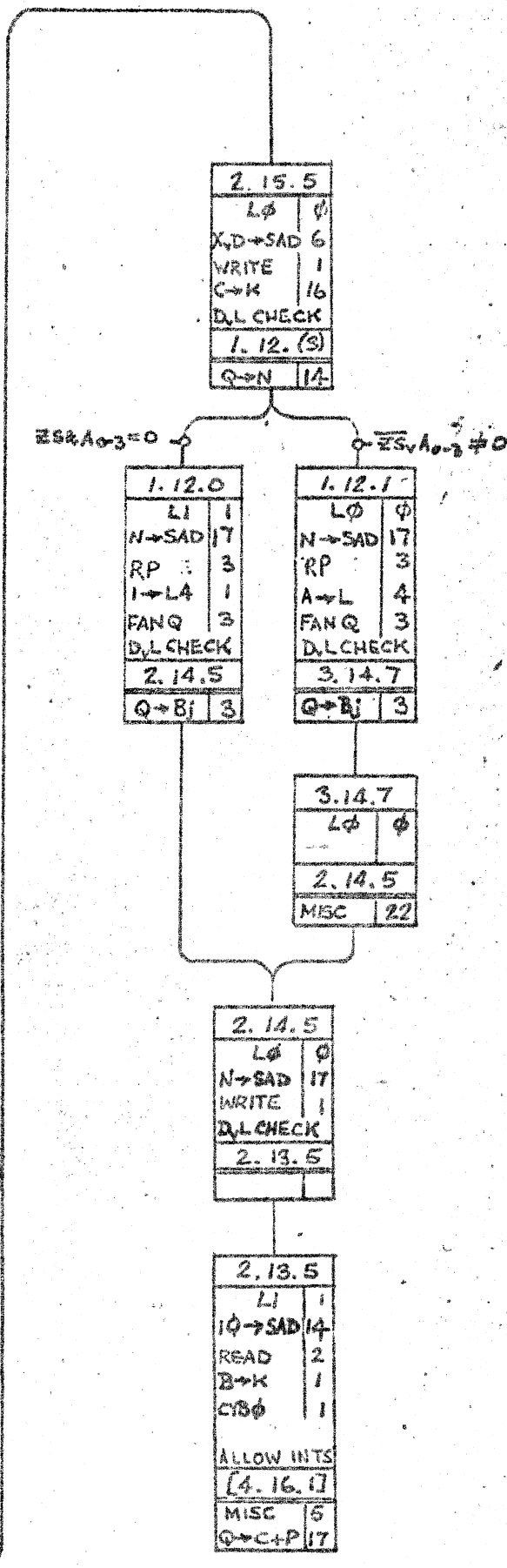
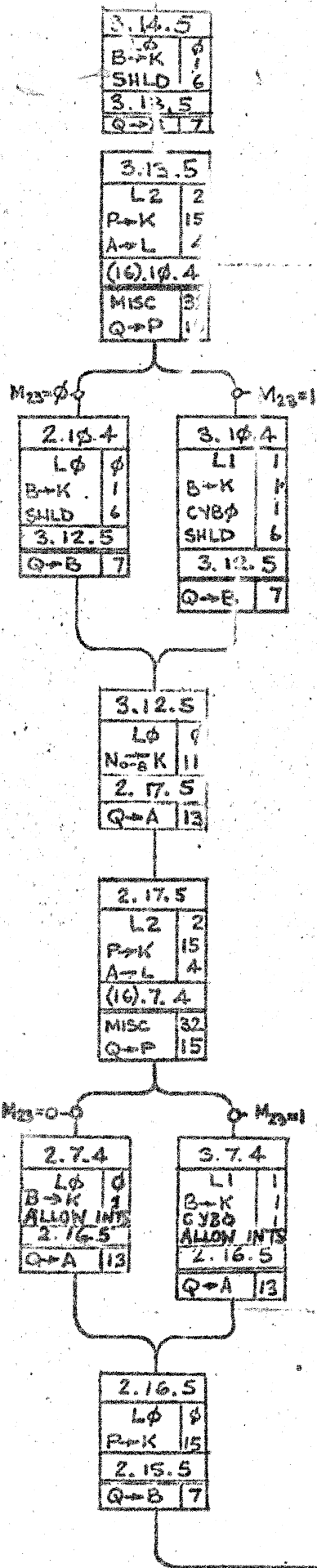
BINARY DECIMAL CONVERSION
FUNCTION 047

SHEET 1 OF 2

1904/5 E & F

LS/76

LS		
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MISCELLANEOUS	
5	$\phi \rightarrow C_{22}$
22	$Q_1 \rightarrow ZS$
32	$\phi \rightarrow Q_{23}$

CONDITIONS	
X16	IF $M(23) = \phi$; 2→X, ELSE 3→X
Z3	IF ZS AND $A(\phi-3) = \phi$; $\phi \rightarrow Z$, ELSE 1→Z

BINARY DECIMAL CONVERSION
FUNCTION 047
SHEET 2 of 2

1904/5 E&F

LS/77

CONDITIONS		Y	N
XI	EXM	4	5
Y4	MM3	2	3
Y4	A STAT SET	0	1
ZI	EJM	0	1

7.5.0	
L0	0
XV→J	2
READ	2
DVL CHECK	
(1).7.1	
MISC	5

7.5.1	
L0	0
XV→SAD	6
READ	2
DVL CHECK	
(1).7.1	
MISC	5

4.7.1	
L2	2
B→K	1
(6).11.0	

5.7.1	
L2	2
B→K	1
(6).4.1	

FROM F054, F055

M=0

2.11.0	
L0	0
N→J	17
READ	2
N→J	12
C→K	1
5.10.(7)	
Q→C+P	17

M≠0

3.11.0	
L1	1
C→K	16
CYB	0
2.11.0	
Q→N	14

M≠0 MM3

3.3.1	
L1	1
C→K	16
CYB	0
2.3.1	
Q→N	14

M≠0 MM3

3.2.1	
L1	1
C→K	16
CYB	0
2.3.1	
Q→N	14

M=0 MM3

2.3.1	
L0	0
N→J	17
READ	2
N→J	12
C→K	1
DVL CHECK	
5.10.(7)	
Q→C+P	17

M=0 MM3

2.2.1	
L1	1
C→K	16
CYB	0
ALLOW INTS	
[4.16.]	
MISC	1
Q→C+P	17

FROM F052, F053

HR

5.10.5	
L0	0
ALLOW INTS	
[5.14.4]	

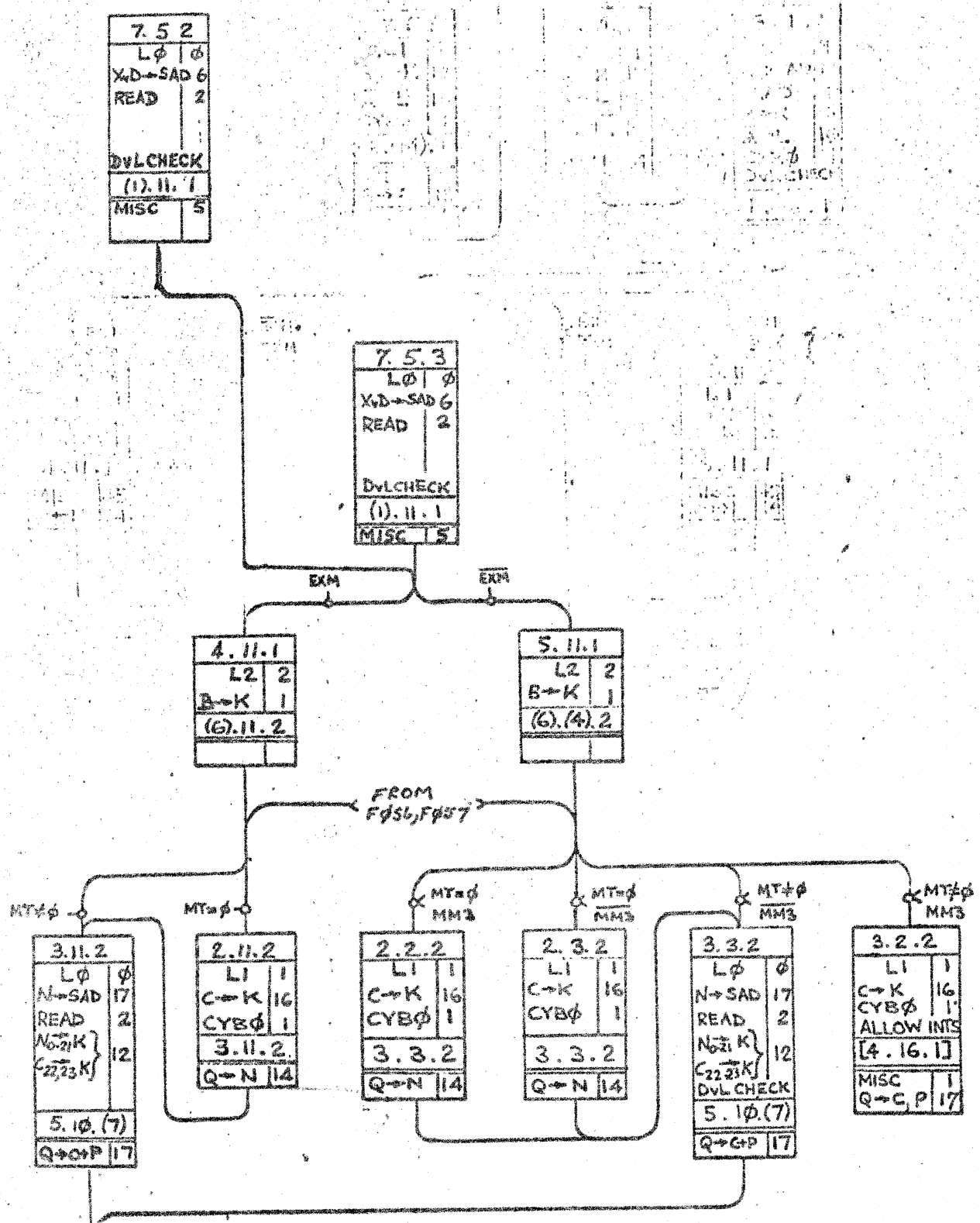
HR

5.10.4	
L1	1
B→K	17
DF→L	3
(0).(0).(0)	
MISC	3
Q→A+N	10

5.14.4	
L0	0
C→J	3
READ	2
DVL CHECK	
5.10.(7)	

MISCELLANEOUS	
1	SET MON. MODE
3	B ₂₁₋₂₃ →X; 7→LINK ₂₃ ; B ₇₋₂₃ →LINK ₃₋₆ B ₄₋₅ →LINK ₀₋₂ ; 3→N _{22,23} (SEE NOTE)
43	N(0-9)→1→N(0-9)

FUNCTIONS 050, 051
JUMP INSTRUCTIONS



HR-φ
 5.10.5
 5.10.4
 ADDRESSES IN FUNCTION φ5φ.

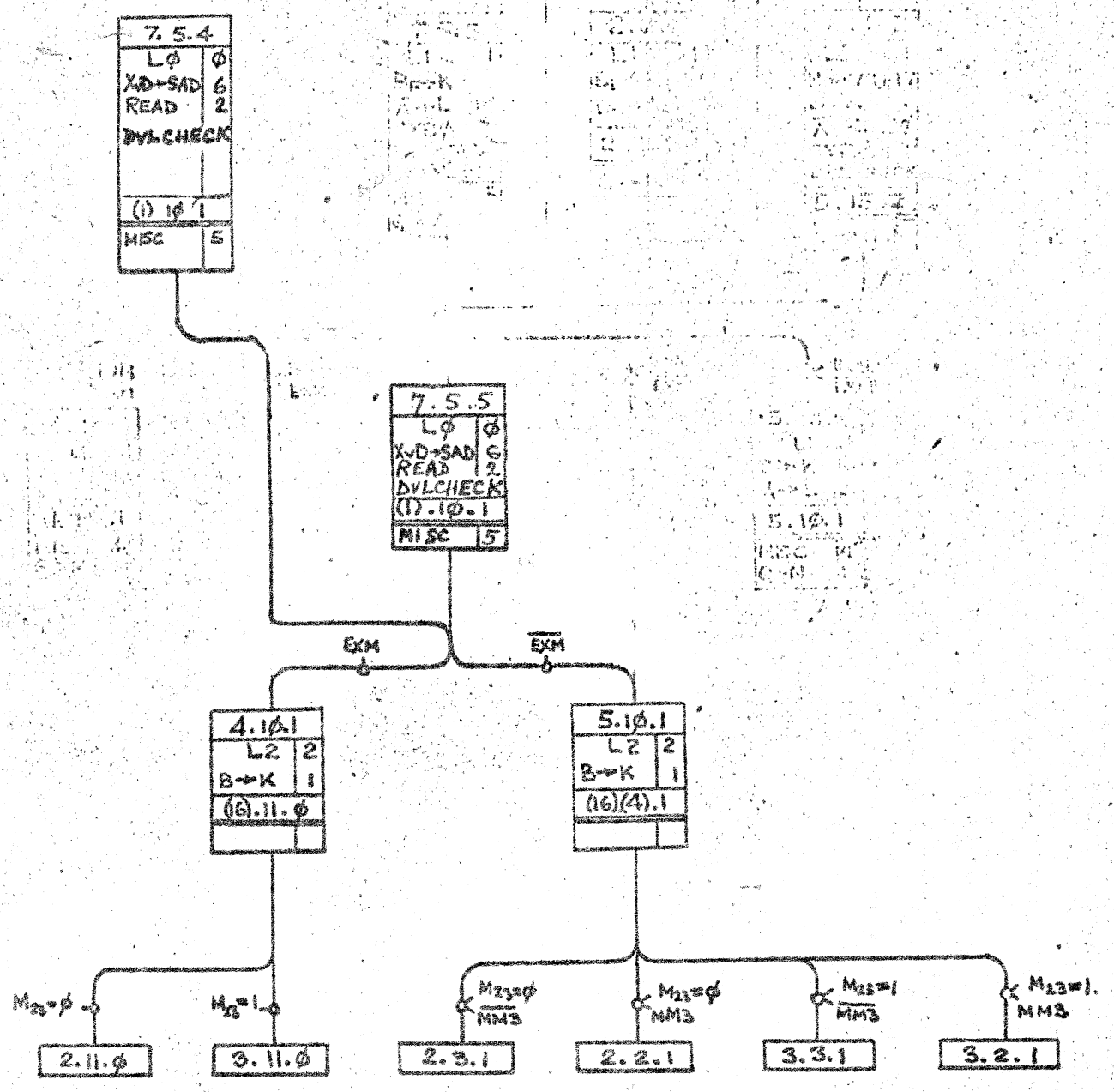
CONDITIONS		Y	N
X1	EXM	4	5
X6	MT=φ	2	3
Y4	MM3	2	3
Z7	HR	5	4

MISCELLANEOUS	
5	φ → C22
45	sign extend A13 → L

JUMP INSTRUCTIONS

FUNCTIONS 052.053

ISS		
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ALL DESTINATION ADDRESSES IN FUNCTION 050

CONDITIONS		Y	N
X1	EXM	4	5
X16	M23=φ	2	3
Y4	MM3	2	3

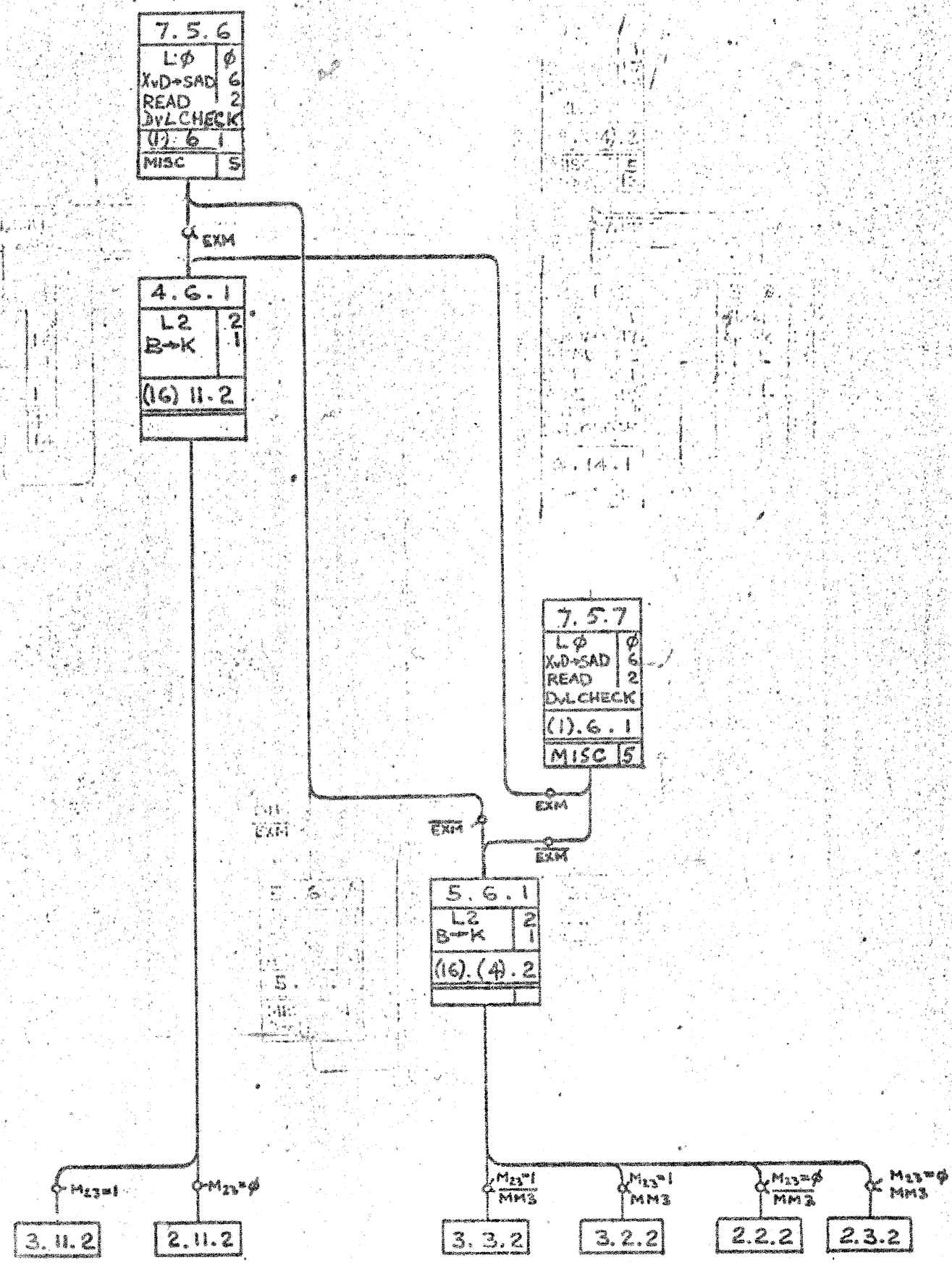
MISCELLANEOUS	
5	φ → C23
45	SIGN EXTEND A13 → L

JUMP INSTRUCTIONS
FUNCTIONS 054, 055

1904/5 E & F

LS/82

ACW	-	
CHANGE NO.	-	
DATE	7/67	
IC	7803	



ALL DESTINATION ADDRESSES IN FUNCTION ϕ 52.

MISCELLANEOUS	
5	$\phi \rightarrow C22$
45	SIGN EXTEND A13 \rightarrow L

CONDITIONS		Y	N
X1	IF EXM	4	5
X16	IF M23 = ϕ	2	3
Y4	MM3	2	3

JUMP INSTRUCTIONS
FUNCTIONS 056, 057

38			
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7 6. 0	
L 0	0
X,D→SAD	6
READ	2
CYB 0	1
D,L CHECK	
(1).12.1	
MISC	5
Q→A	13

7.6.1	
READ	2
L 0	0
X,D→SAD	6
CYB 0	1
D,L CHECK	
(1).12.1	
MISC	5
Q→A	13

4.	
L 2	2
B→K	1
16→L15-23	15
CYB 0	1
(1).12.1	

5.12.1	
L 2	2
B→K	1
16→L15-23	15
CYB 0	1
(5).4.(5)	
Q→B	7

4.12.1	
L 2	2
B→K	1
16→L15-23	15
CYB 0	1
(5).11.(5)	
Q→B	7

3.11.4	
L 1	1
X,D→SAD	6
RP	3
B→K	1
A→L	4
CH	7
D,L CHECK	
3.11.5	
Q→B	7

2.11.4	
L 1	1
X,D→SAD	6
RP	3
B→K	1
A→L	4
CH	7
D,L CHECK	
3.11.5	
Q→B	7

3.11.5	
L 0	0
X,D→SAD	6
WRITE	1
NET K	12
C22,23K	
D,L CHECK	
ALLOW INTS	
[4.16.1]	
Q→C+P17	

2.11.5	
L 1	1
X,D→SAD	6
WRITE	1
C→K	16
CYB 0	1
D,L CHECK	
ALLOW INTS	
[4.16.1]	
Q→C+P17	

SEE SHEET 2

CONDITIONS		Y	N
X1	EXM	4	5
X5	M15-23=0	2	3
Y4	MM3	2	3
Z5	ESM	4	5

MISCELLANEOUS	
5	0 → C22
45	SIGN EXTEND A13 → L

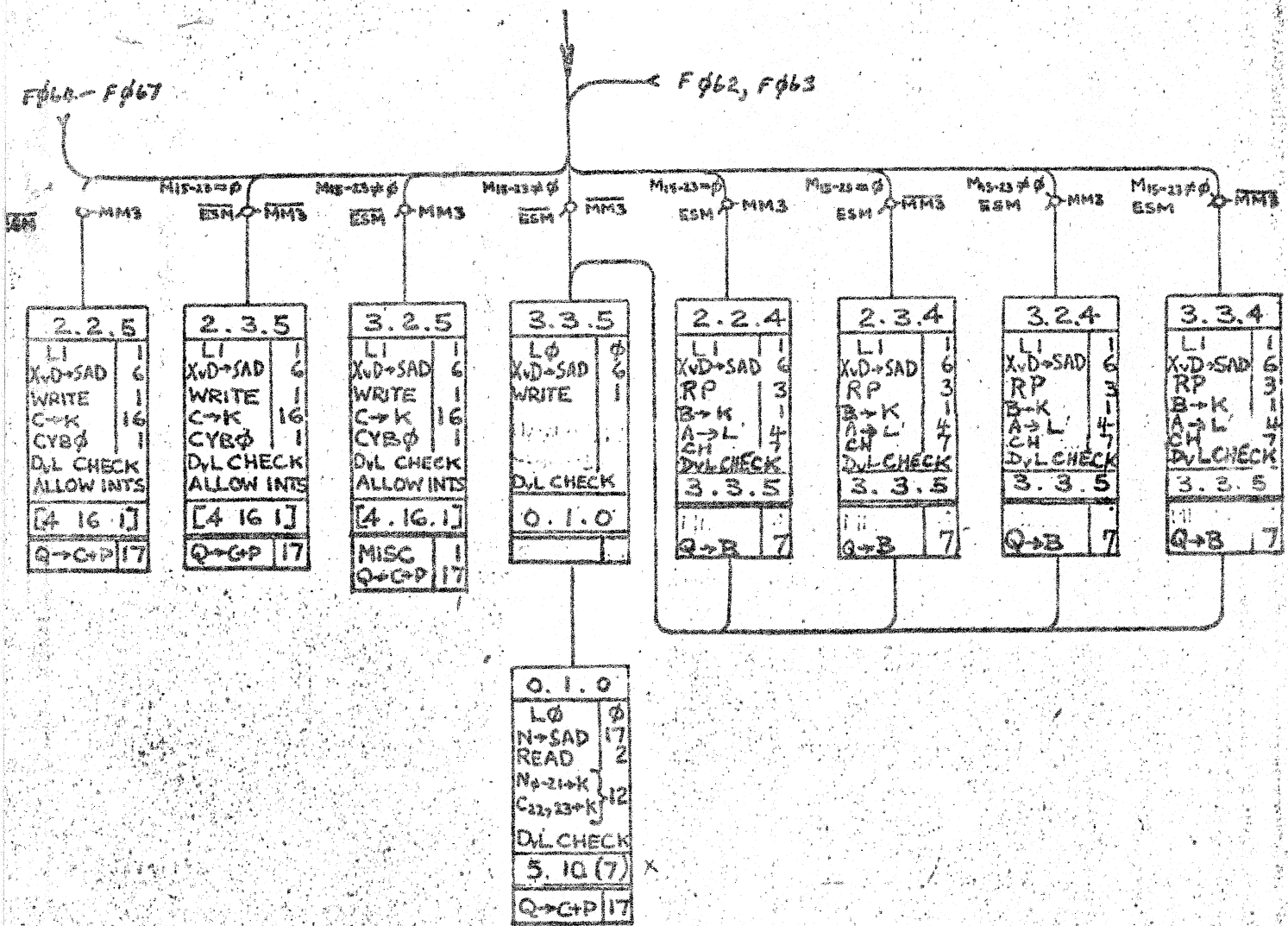
JUMP INSTRUCTIONS

FUNCTIONS 060, 061

SHEET 1 OF 2

1904/5 E&F

LS/90



CONDITIONS		Y	N
X1	IF EXM	4	5
X5	IF MIS-23 = φ	2	3
YA	IF MM3	2	3
ED	IF HR	2	Q
BI	IF EJM	φ	1
ES	IF ESM	4	5

MISCELLANEOUS	
1	SET MON MODE
3	PREPN. OF ORDER COMPLEX
4	SUPPRESS CARRY M(21-22)
5	φ → C22
45	SIGN EXTEND A13→L

JUMP INSTRUCTION

FUNCTIONS 060, 061

SHEET 2 OF 2

SUB ISS	1
ACW	0906

7.6.2	
L ϕ	0
XVD \rightarrow SAD	6
READ	2
CYB \rightarrow	1
SHL	1
D/L CHECK	1
(1) 13. 1	
MISC	5
Q \rightarrow A	13

7.6.3	
READ	2
L ϕ	0
XVD \rightarrow SAD	6
CYB \rightarrow	1
SHL	1
D/L CHECK	1
(1) 13. 1	
MISC	5
Q \rightarrow A	13



3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0

CONDITIONS		Y	N
X1	IF EXM	4	5
X5	IF M15-22 = ϕ	2	3
Y4	IF MM3	2	3
Z5	IF ESM	4	5

MISCELLANEOUS	
4	SUPPRESS CARRY M(21-22)
5	$\phi \rightarrow C22$
45	SIGN EXTEND A13 \rightarrow L

ALL DESTINATION ADDRESSES IN FUNCTION $\phi 6\phi$

JUMP INSTRUCTIONS

FUNCTIONS 062, 063

1904/5 E & F

LS/92

SUB	ISS	1	
ACW		0906	
CHANGE		96-100	
DATE	26/9/67	28/11/67	
NO.	7808		

7.6.4	
LØ	Ø
XVØ→J	6
READ	2
DVL CHECK	
(1) 14.1	
MISC	14
Q→A	13

7.6.5	
READ	2
LØ	Ø
XVØ→SAD	6
DVL CHECK	
(1) 14.1	
MISC	14
Q→A	13

3	11
LØ	11
(1)	1
MISC	11

7.6.4
7.6.5

EXM	
5.14.1	
L2	2
B→K	1
15→L15-22	16
CH	7
(4) (4) 5	
MISC	5
Q→B	7
To Fa Ø6Ø (9)	

EXM	
4.14.1	
L2	2
B→K	1
15→L15-22	16
CH	7
(4).11.5.	
MISC	5
Q→B	7
To Fa Ø6Ø (9)	

MISCELLANEOUS	
5	Ø→C22
14	ADD 1 TO M22
45	SIGN EXTEND A13→L

JUMP INSTRUCTIONS

FUNCTIONS Ø64, Ø65

CONDITIONS		Y	N
X1	EXM	4	5
X4	M15-31=Ø	2	3
Y4	M13	2	3

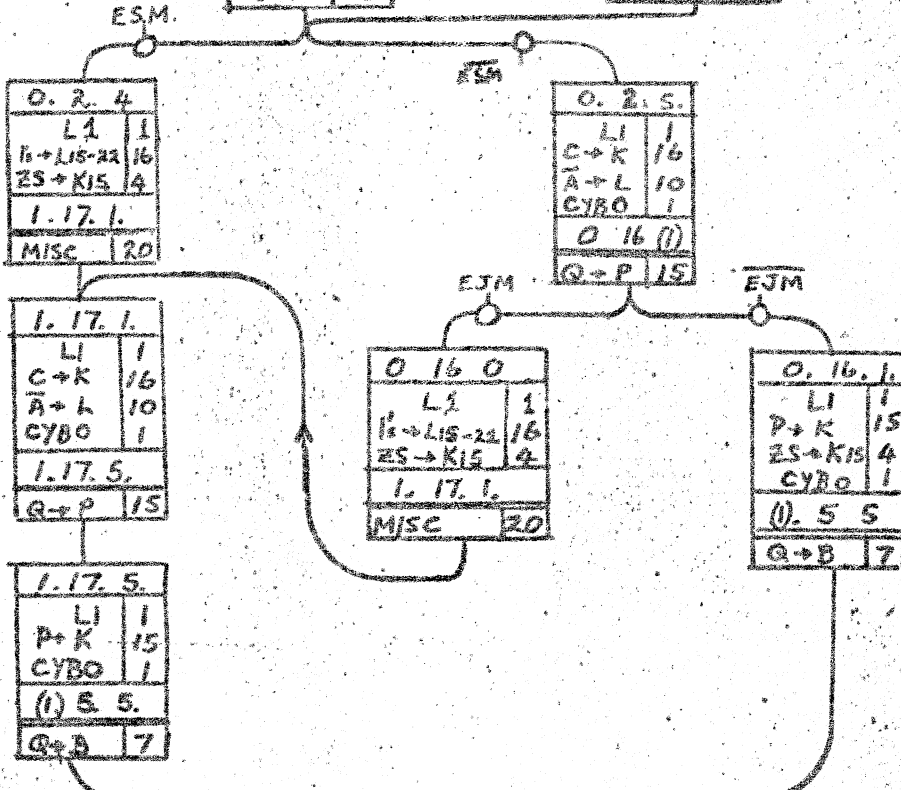
SUB ISS	- 1
ACW	- 0906

1904/5 E & F

LS/93

7. 7. 0	
LQ	0
DF→L	3
0. 2. (5)	
MISC	5
Q→A	13

7. 7. 1	
LQ	0
DF→L	3
0. 2. (5)	
MISC	5
Q→A	13



0. 2. 4	
L1	1
I ₆ →L15-22	16
ZS→K15	4
1. 17. 1	
MISC	20

0. 2. 5	
L1	1
C→K	16
A→L	10
CYBO	1
0 16 (1)	
Q→P	15

1. 17. 1	
L1	1
C→K	16
A→L	10
CYBO	1
1. 17. 5	
Q→P	15

0 16 0	
L1	1
I ₆ →L15-22	16
ZS→K15	4
1. 17. 1	
MISC	20

0. 16. 1	
L1	1
P→K	15
ZS→K15	4
CYBO	1
(1). 5 5	
Q→B	7

1. 17. 5	
L1	1
P→K	15
CYBO	1
(1) B. 5	
Q→B	7

4. 5. 5	
WRITE	1
XUD→SAD	6
LQ	0
D.V.L.CHECK	
4. 3. 1	
Q	15

5. 5. 5	
WRITE	1
XUD→SAD	6
LQ	0
D.V.L.CHECK	
4. (4). (1)	
Q	15

4. 3. 1	
LQ	0
N→SAD	17
READ	2
N ₀ -R1→K	3
D.V.L.CHECK	
1. 3. (2)	
Q→CP	17

4. 2. 1	
L1	1
C→K	16
CYBO	1
ALLOWINTS	
[4. 16. 1]	
MISC	1
Q→CP	17

1. 3. 0	
L1	1
BF→K	17
DF→L	3
MISC	3
(0) (0) (0)	
Q→A+N10	

1. 3. 2	
LQ	0
ALLOWINTS	
[4. 6. 5]	

4. 1. 5	
L1	1
C→J	3
READ	2
BF→K	17
DF→L	3
MISC	3
(0) (0) (0)	
Q→AN10	

CONDITIONS			Y	N
X1	EXM		4	5
Y4	MM3		2	3
ZZ	HR		2	0

MISCELLANEOUS	
1	SET MON MODE
3	SEE 'PREP OF ORDER'
20	IF M23=1, 1→C22; 0→Q23
45	SIGN EXTEND, A13→L

FUNCTIONS 070 & 071

SUBROUTINE ENTRY (RELATIVE)

7.7.2	
L2	1
B→K	1
15→L6-11	12
AND	5
(1).13.0	
Q→A	13

7.7.3	
L2	1
B→K	2
15→L6-11	12
AND	5
Q→A	
13	

EXM	
5.13.0	
READ	2
LQ	Q
X,D→SAD	6
0.3.(5)	
Q→P	15

EXM	
4.13.0	
READ	2
LQ	Q
X,D→SAD	6
6.2.(5)	
Q→P	15

ESM	
0.3.4	
L1	1
A→L	4
4.4.1	
MISC	56
Q→P	15

ESM	
0.3.5	
L1	1
B→K	1
A→L	4
6.4.1	
Q→PM	15

ESM	
6.2.4	
L1	1
B→K	1
A→L	4
4.3.2	
MISC	56
Q→N	14

ESM	
6.2.5	
L1	1
B→K	1
A→L	4
2.10.1	
Q→PM	5

4.4.1	
L1	1
P→K	15
L	2
4.14.2	
Q→N	14

6.4.1	
L1	1
P→K	15
D→L	2
5.4.2	
Q→N	14

2.10.1	
LQ	Q
P→K	15
Q→N	
14	

MM3	
4.2.2	
L1	1
N→SAD	17
ALLOW INTS	1
4.16.1	
MISC	1
Q→C,P	17

MM3	
4.3.2	
LQ	Q
N→SAD	17
B→K	1
DVL CHECK	1
3.(12).7	
Q→C	16

MM3	
5.2.2	
L1	1
C→K	6
CYBQ	1
4.16.1	
MISC	1
Q→C,P	17

MM3	
5.3.2	
LQ	Q
N→SAD	17
B→K	1
DVL CHECK	1
6.(12).3	
MISC	61
Q→C	16

C23=0	
3.6.7	
LQ	Q
C22→CYBQ	2
6.6.3	
MISC	22

C23=1	
3.7.7	
LQ	Q
C22→CYBQ	2
6.7.3	
MISC	22

To 6.6.3 OR
6.7.3
(SHEET 2)

To 6.6.3
(SHEET 2)

To 6.7.3
(SHEET 2)

CONDITIONS		Y	N
X1	EXM	4	5
Y4	MM3	2	3
Y12	C23=0	6	7
Z5	ESM	4	5

MISCELLANEOUS	
1	SET MON. MODE
22	Q0 → Z5
56	SIGN EXTEND A14 → L
61	K15 → Z5

FUNCTIONS 072 & 073
(SUBROUTINE EXITS)
SHEET 1 OF 2

FROM SHEET 1

C13 = 1

C13 = 0

6.7.3	
LØ	Ø
N→SAD	17
READ	2
No-21→K	3
DVL CHECK	
5.10. (7)	
MISC	37
Q→C+P	17

6.6.3	
LØ	Ø
N→SAD	17
READ	2
No-21→K	12
C22,23→K	
DVL CHECK	
5.10 (7)	
MISC	5
Q→C+P	17

To 5.10.4

OR 5 10 56 (SHEET 80)

MISC	37
Q→C+P	17
5.10 (7)	
MISC	5
Q→C+P	17

MISCELLANEOUS	
3	SET MM STAT IF MMI. B21-23 → X; 7 → LINK 7.9; B17-20 → LINK 9.6; B14-16 → LINK 0-2; B12,13 → N22,23 v 3 → N22,23 RESET 'A' STAT. CHECK FOR INTERRUPT
r	Ø → C22
37	1 → C23

CONDITIONS		Y	N
Z2	HES. REQUEST	2	Ø

FUNCTIONS 072 & 073

SUBROUTINE EXITS

SHEET 2 OF 2

1904/5 E & F

LS/102162

SUP	ISS	1	
CV		0906	

CONDITIONS		Y	N
X1	EXM	4	5
Y2	WYES(SUCCESS.JUMP)	0	1
Y4	MM3	2	3
Z1	EJM	0	1
Z2	HES. REQUEST	2	0
Z7	HES. REQUEST	5	4

7.7.4	
LI	1
C→K	16
(1)(2)	1
MISC	44
Q→C+P	17

FROM
F076 (10)
F077

MISCELLANEOUS	
1	SET MONITOR MODE F/F
3	SET MM F/F IF MM3 B21-23 → X. 7 → LINK 7-9 B17-20 → LINK 3-6 B19-16 → LINK 0-2. B12-13 → N22, 23 OR 3 → N22, 23. CHECK FOR INTERRUPT. RESET 'A' STAT
33	INHIBIT Q→C IF MM3
44	X=2v4, 0 → C23; X=7, INVERT C23; 0 → C22; YES → CY00
45	SIGN EXTEND A13 → L

7.7.5	
LI	1
C→K	16
(1)(2)	1
MISC	44
Q→C,P	17

F075 (10)

EXM
YES

EXM
YES

EXM
YES

EXM
YES

F075 (10)

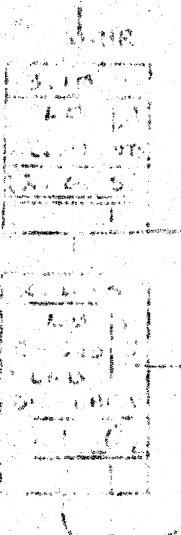
4.0.1	
L0	0
N→SAD	17
READ	2
N→21→K	12
C22,23→K	12
5.10(7)	
Q→C+P	17

4.1.1	
L0	0
C→SAD	3
READ	2
DVL CHECK	
5.10(7)	

5.1.1	
L0	0
C→SAD	3
READ	2
DVL CHECK	
5.10(7)	

5.0.1	
L0	0
N→SAD	17
READ	2
N→21→K	12
C22,23→K	12
DVL CHECK	
1(4)(7)	
MISC	33
Q→C+P	17

To 5.10.4
OR 5.10.5
(SHEET 80)



1.2.4	
LI	1
C→K	16
CY00	1
DVL CHECK	
ALLOW INTS	
[4.16.1]	
MISC	1
Q→C	16

1.3.4	
LI	1
B→K	17
D→L	3
MISC	3
(0)(0)(0)	
Q→A+N	10

1.2.5	
L0	0
ALLOW INTS	
[2.5.5]	

1.3.5	
L0	0
ALLOW INTS	
[2.5.5]	

2.5.5	
L0	0
C→SAD	3
READ	2
1(4)(7)	

FUNCTIONS 074 & 075

CONDITIONAL JUMP INSTRUCTIONS
(ON STATE OF X, V AND C)
(NORMAL & RELATIVE)

SUBMISS	1
ACW	0906

7.7.6	
LQ	0
(17).0.(7)	
MISC	5

7.7.7	
LQ	0
(17).0.(7)	
MISC	5

HR FPBZ

4.0.5	
WRITE	1
10→SAD	10
ALLOW INTS	
0.5.1	
	1

HR FPBZ

5.0.5	
LI	1
0.(15).2	
MISC	71

HR FPBZ

5.0.4	
LI	1
0.(15).2	
MISC	71

HR FPBZ

4.0.4	
LQ	0
(15).13.7	

FPU

0.5.1	
READ	2
LQ	0
10→SAD	14
A→L	4
(15).13.7	
Q→N	10

FYES

0.1.2	
LI	1
C→K	16
CYBQ	1
(15).6.2	
Q→C	16

FYES

0.0.2	
LQ	0
(15).6.2	

FPU

1.13.7	
LQ	0
P→K	15
(1).10.7	
Q→N	14

OFFPU

0.13.7	
LQ	0
B→K	1
(17).0.(7)	
MISC	35

FPU
0.13.7

OFFPU
1.13.7

FPU

1.6.2	
LQ	0
P→K	15
(1).10.7	
Q→N	14

MACRO-ORDER
SEQUENCE
(SHEET 150)

OFFPU

0.6.2	
LQ	0
C→K	16
(1).15.1	
Q→P	15

TO 074 ORDER
(SHEET 108)

MACRO-ORDER
SEQUENCE
(SHEET 150)

CONDITIONS		Y	N
X15	FPU	0	1
X17	FPBZ	4	5
Z7	HR.	5	4
Y15	FYES (SUCCESSFUL JUMP)	0	1

MISCELLANEOUS	
5	0 → C22

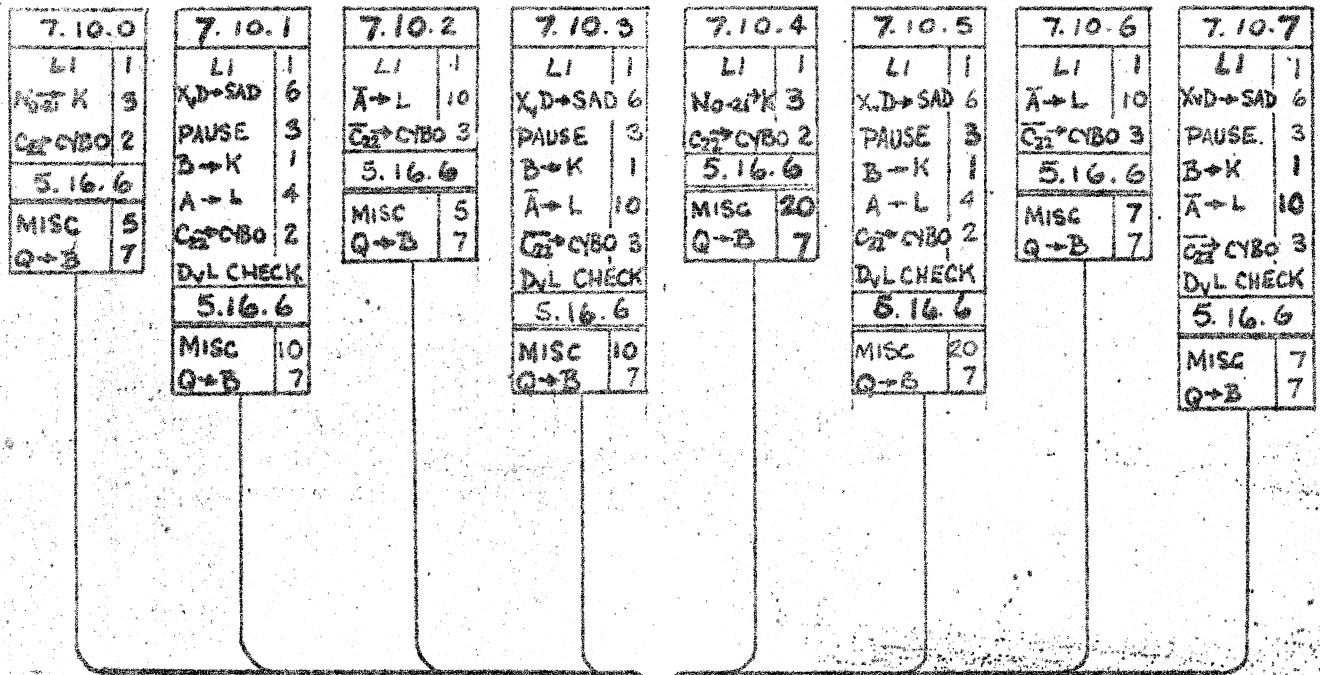
JUMP INSTRUCTIONS
(ON STATE OF X & F.P. ACC)

FUNCTIONS 076. 077
(NORMAL v RELATIVE & REPLACED)

1904/5 E & F

LS/104

SUB	ISS	1
ACW	-	0906
CHANGE	-	96-100
DATE	24/9/67	28/11/67
ACD	7803	



MISCELLANEOUS	
5	Q→C ₂₂
7	IF M ₂₃ ≠M ₂₄ , I→C ₂₂ ; O→Q ₂₃
10	O→C ₂₂ ; IF M ₂₄ ≠M ₂₅ , I→C ₂₂
20	M ₂₅ →C ₂₂ (IF 1), O→Q ₂₃

NB.

PAUSE = READ PAUSE.

LITERALS

GROUP 10

1904/5 E & F

LS/110

SUB	ISS		
ACW	:		
DATE	24/9/67		
ACD	7803		

7.11.0	
LO	8
X,D→SAD	6
READ	2
DVL CHECK	
(S) 10.1	
MISC	43

No-g=0

No-g=0

0.10.1	
LI	1
C→K	16
CYBO	1
ALLOW INTS	
[4.16.1]	
Q→CP17	

1.10.1	
LO	8
B→K	1
SHL	1
(7).4.(7)	
MISC	43
Q→B	7

No-g=1 HR

No-g=1 HR

No-g=1 HR

No-g=1 HR

1.4.5	
LO	8
S→SAD	15
WRITE	1
N→K	10
6.12.0	
Q→B	7

1.4.4	
LO	8
B→K	1
SHL	1
(7).4.(7)	
MISC	43
Q→B	7

0.4.5	
WRITE	1
LI	1
X,D→SAD	6
C→K	16
CYBO	1
DVL CHECK	
ALLOW INTS	
[4.16.1]	
Q→CP17	

0.4.4	
WRITE	1
LI	1
X,D→SAD	6
C→K	16
CYBO	1
DVL CHECK	
ALLOW INTS	
[4.16.1]	
Q→CP17	

6.12.0	
LO	8
10→SAD	14
WRITE	1
ALLOW INTS	
6.17.3	

6.17.3	
LO	8
10→SAD	14
READ	2
B→K	1
6.16.3	
Q→N	14

6.16.3	
LO	8
S→SAD	15
READ	2
1.4.4	

CONDITIONS		Y	N
X7	No-g=1	0	1
X13	No-g=0	0	1
Z7	HR	5	4

MISCELLANEOUS	
5	0→C22
43	No-g-1→No-g

SHIFT LEFT (SL)

FORCE 110

W	50	63	75
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1904/5 E&F

LS/120

SUB	ISS	1
CW		0917

7.11.1	
L0	0
X+D→SAD	7
READ	2
DL CHECK	
(15)	10 5
MISC	5

Q-Neg=0

P-Neg=0

1.10.5	
L0	0
B→K	1
6.15.3	
Q→P	15

0.10.5	
L1	1
C→K	16
CYBO	1
ALLOW INTS	
[4.16.1]	
Q→C,P	17

6.15.3	
L0	0
X,D→SAD	6
READ	2
DL CHECK	
1.6.4	

6.17.1	
L0	0
10→SAD	14
READ	2
B→K	1
6.16.1	
Q→N	14

6.16.1	
L0	0
9→SAD	15
READ	2
1.6.4	

1.6.4	
L0	0
B→K	1
SHLD	6
(7) 6 (7)	
MISC	43
Q→B	7

XHR, Neg=1

XHR, Neg=1

XHR, Neg=1

XHR, Neg=1

1.6.5	
L0	0
9→SAD	15
WRITE	1
N→K	10
6.14.3	
Q→B	7

0.6.5	
L0	0
X,D→SAD	6
WRITE	1
P→K	15
DL CHECK	
5.17.2	
Q→B	7

0.6.4	
L0	0
X,D→SAD	6
WRITE	1
P→K	15
DL CHECK	
5.17.2	
Q→B	7

NEG = X+1

6.14.3	
L0	0
10→SAD	14
WRITE	1
ALLOW INTS	
[6.17.1]	

5.17.2	
L1	1
X+D→SAD	7
WRITE	1
C→K	16
CYBO	1
DL CHECK	
ALLOW INTS	
[4.16.1]	
MISC	5
Q→C,P	17

ALSO USED IN
FUNCTIONS
040-046,
& 113.

CONDITIONS		Y	N
X7	Neg=1	0	1
X13	Neg=0	0	1
Z7	HR	5	4

MISCELLANEOUS	
5	Q→C22
43	Neg-1 → Neg

SHIFT LEFT (DL)
FUNCTION III

1904/5 E&F

LS/12

SUB	ISS		
ACW			
CHANGE			
NO			
DATE	2/19/63		
ACD	7803		

7.11.2	
LO	Ø
XWD→SAD	6
READ	2
D.L. CHECK	
(13.10.4	
MISC	5

|| No-g=0 No-g=0

1.10.4	
LO	Ø
B→K	1
SHR	2
(7) 7 (7)	
MISC	43
Q→B	7

0.10.4	
LI	1
C→K	16
CYBO	1
ALLOW INTS	
[4.16.1]	
Q→C,P	17

No-g=1 CHR No-g=1 CHR No-g=1 CHR No-g=1

1.7.4	
LO	Ø
B→K	1
SHR	2
(7) 7 (7)	
MISC	43
Q→B	7

1.7.5	
LO	Ø
9→SAD	15
WRITE	1
N→K	10
6.13.3	
Q→B	7

0.7.4	
LI	1
B→K	1
C2→CYBO	2
6.16.0	
Q→B	7

0.7.5	
LI	1
B→K	1
C2→CYBO	2
6.16.0	
Q→B	7

6.13.3	
LO	Ø
10→SAD	14
WRITE	1
ALLOW INTS	
[6.12.3]	

6.16.0	
LI	1
XWD→SAD	6
WRITE	1
C→K	16
CYBO	1
D.L. CHECK	
ALLOW INTS	
[4.16.1]	
MISC	5
Q→C,P	17

ALSO USED IN FUNCTION 110

6.12.3	
LO	Ø
10→SAD	14
READ	2
B→K	1
6.11.3	
Q→N	14

6.11.3	
LO	Ø
9→SAD	15
READ	2
1.7.4	

CONDITIONS		Y	N
X7	No-g=1	0	1
X13	No-g=0	0	1
Z7	HR	3	4

MISCELLANEOUS	
5	0→C22
43	No-g=1→No-g

SHIFT RIGHT (SL)

FUNCTION 112

1904/5 E&F

LS/122

SUB	ISS		
IA	W		

7.11.3	
LO	Ø
X+D→SAD	7
READ	2
D.L.CHECK	
(13) 10.2	
MISC	5
Q→P	15

1. $Q=N, N \neq 0$

2. $Q=N \neq 0$

1.10.2	
LO	Ø
B→K	1
3.17.4	
Q→P	15

0.10.2	
LI	1
C→K	16
CYBO	1
ALLOW INTS	
[4.16.1]	
Q→C,P	17

3.17.4	
READ	2
X,D→SAD	6
LN	8
D.L.CHECK	
1.16.4	

1.7.6	
LO	Ø
IO→SAD	14
READ	2
B→K	1
4.15.4	
Q→N	14

2.6.4	
LO	Ø
Q→SAD	15
READ	2
1.16.4	

1.16.4	
LO	Ø
B→K	1
SHRD	7
(7) 16 (7)	
MISC	43
Q→B	7

3. $HR, N \neq 1$

4. $HR, N \neq 1$

5. $HR, N \neq 1$

6. $HR, N \neq 1$

1.16.5	
LO	Ø
Q→SAD	15
WRITE	1
N→K	10
2.17.2	
Q→B	7

0.16.5	
LO	Ø
X,D→SAD	6
WRITE	1
P→K	15
D.L.CHECK	
5.17.2	
Q→B	7

2.16.4	
WRITE	1
X,D→SAD	6
LO	Ø
P→K	15
D.L.CHECK	
5.17.2	
Q→B	7

2.17.2	
LO	Ø
IO→SAD	14
WRITE	1
ALLOW INTS	
[1.7.6]	

5.17.2	
LI	1
X+D→SAD	7
WRITE	1
C→K	16
CYBO	1
D.L.CHECK	
ALLOW INTS	
[4.16.1]	
MISC	5
Q→C,P	17

ALSO USED IN
FUNCTIONS
Ø4 Ø - Ø4 Ø,
& III

CONDITIONS		Y	N
X7	$N \neq 0 = 1$	0	1
X13	$N \neq 0 = 0$	0	1
Z7	HR	5	4

SHIFT RIGHT (DL)

FUNCTION 113

MISCELLANEOUS	
5	$0 \rightarrow C_{32}$
43	$N \neq 0 - 1 \rightarrow N \neq 0$

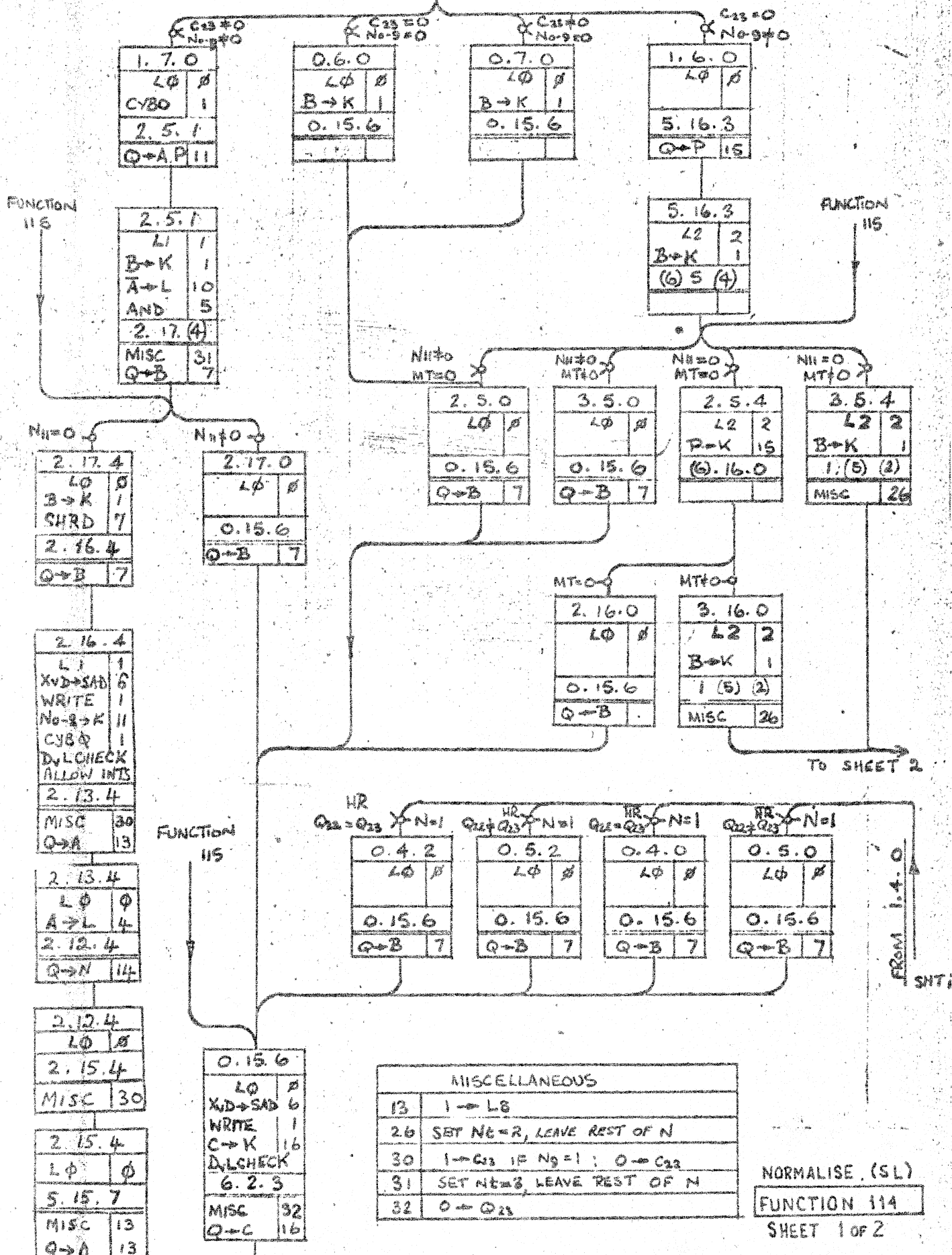
1904/5 E&F

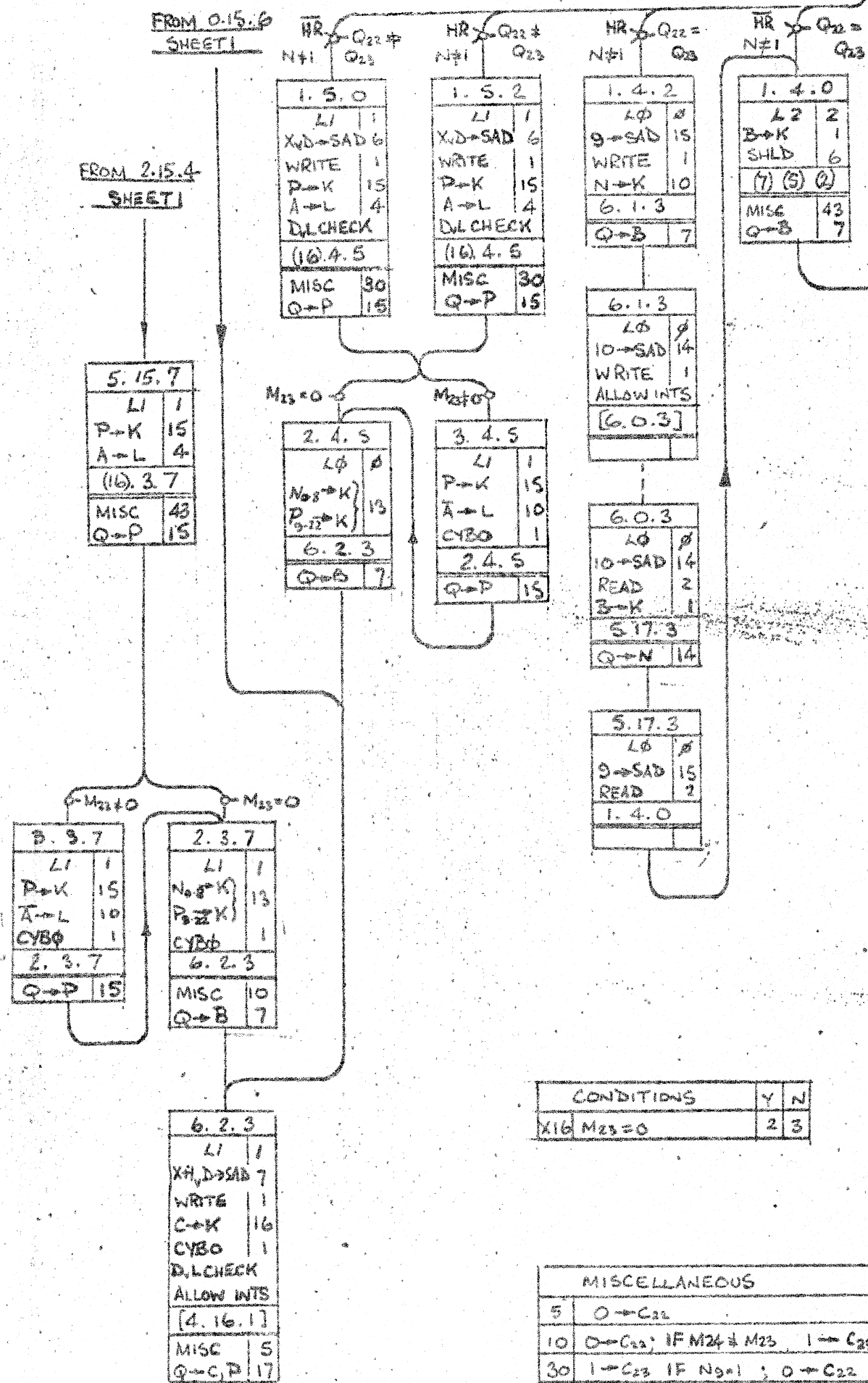
LS/123

SUB	ISS	1		
ACW	-	0906		

CONDITIONS		Y	N
X6	MT=0	2	3
X7	N=1	0	1
X13	N ₉ ≠0	0	1
Y5	Q ₂₂ =Q ₂₃	4	5
Y12	C ₂₂ =0	6	7
Z2	NR	2	0
Z4	N ₁₁ =0	4	0

7.11.4
L0 ϕ
XVD→SAD 6
READ 12
DJLCHECK
(10) (12) 0
MISC 13
Q→A 13





CONDITIONS	Y	N
X16 M23 = 0	2	3

MISCELLANEOUS	
5	Q \rightarrow C22
10	Q \rightarrow C23; IF M24 \neq M23 1 \rightarrow C23
30	1 \rightarrow C23 IF No = 1; Q \rightarrow C22
43	No - 9 - 1 \rightarrow No - 9

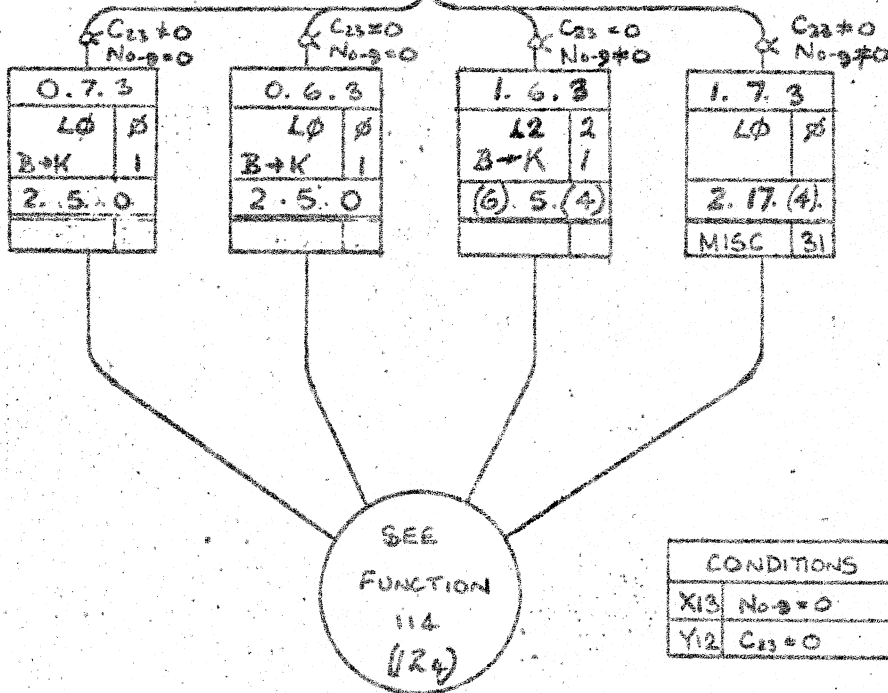
SEE
PREP. OF ORDER
SEQUENCE

NORMALISE (SL)
FUNCTION 114

SUB	ISS		
ACW			

7. 11. 5	
L0	15
X+Y, D → S13 7	
READ	2
B → K	1
D.L. CHECK	
5. 15. 3	
MISC	32
Q → P	15

5. 15. 3	
L0	15
X, D → S13 6	
READ	2
D.L. CHECK	
(13) (12) 3	
MISC	13
Q → A	13



CONDITIONS		Y	N
X13	$No-g = 0$	0	1
Y12	$C_{23} = 0$	6	7

MISCELLANEOUS	
13	1 → L8
31	SET $N_{13} = 3$, LEAVE REST OF N
32	0 → Q25

NORMALISE (DL)

FUNCTION 115

1904/5 E & F

LS/126

SUB	ISS	1	
ACW	-	0906	
CHANGE NO	-	96-100	
DATE	26/9/67	28/11/67	
ACD	7803	-	

READ	2
LQ	0
XVD→SAD	7
C→K	16
DYL CHECK	
(1). 11. 5	
MISC	43
Q→P	15

EXM

5. 11. 5	
LQ	0
No-9→K	11
5. 12. 3	
MISC	36
Q→H	13

EXM

4. 11. 5	
LQ	0
Bsm→K	7
1. 3. 3	
Q→C	116

5. 12. 3	
LQ	0
A→L	4
SHR	2
1. 16. 6	
Q→A	13

1. 3. 3	
LQ	0
P→K	15
0. 14. 3	
Q→B	17

1. 16. 6	
LQ	0
A→L	4
SHR	2
6. 3. 2	
Q→A	13

0. 14. 3	
WRITE	1
L1	1
IO→SAD	14
No-9→K	11
ALLOW INTS	
1. 10. 3	
Q→P	115

6. 3. 2	
L1	1
Bsm→K	7
D→L	2
6. 5. 5	
Q→N	114

1. 10. 3	
READ	2
LQ	0
XVD→SAD	6
Bsm→K	7
DYL CHECK	
1. 14. 3	
Q→N	114

6. 5. 5	
LQ	0
N→SAD	17
N→K	10
A→L	4
CH	7
DYL CHECK	1
1. 3. 1	
Q→N	114

To 1. 14. 3
(SHEET 20)

CONDITIONS		Y	N
X1	EXM SET	4	5

1. 3. 1	
L1	1
N→SAD	17
Bsm→K	7
D→L	2
ALLOW INTS	
DYL CHECK	
3. 14. 6	
Q→P	15

MISCELLANEOUS	
114	add 1 to L22
34	24→N(0-9): set N _t = 1
36	set N _t = 0
43	No-9 -1 → No-9

3. 14. 6	
READ	2
L1	1
XVD→SAD	6
Bsm→K	7
D→L	2
DYL CHECK	
0. 16. 3	
Q→N	114

To 0. 16. 3
(SHEET 20)

TRANSFER CHARACTER(S)
FUNCTION 116
SHEET 1 of 3

1904/5 E & F

LS/127

SUB	ISS		
ACW	-		

FROM 1.10.3
SHEET 127

FROM 3.14.6
(SHEET 127)

1.15.3	
W	1
LO	0
10→SAD	14
P→K	15
0.15.3	
Q→C	16

0.16.3	
L1	1
N→SAD	17
N→K	19
A→L	4
CH	7
DYL CHECK	
6.7.3	
Q→N	14

0.15.3	
LO	0
A→L	4
SHL	1
1.3.6	
Q→A	13

5.7.3	
LO	0
N→SAD	17
C→K	16
>	
DYL CHECK	
1.15.3	
MISC	36
Q→B	7

1.3.6	
LO	0
A→L	4
SHL	1
1.14.6	
Q→A	13

1.14.6	
READ	2
L1	1
XVD→SAD	6
A→L	4
CYBO	1
1.16.3	
Q→P	15

1.16.3	
L1	1
Bsm→K	7
D→L	2
1.14.3	
Q→N	14

3.11.7	
LO	0
B→K	1
CYBO	1
2.7.5	
Q→B	7

1.14.3	
L1	1
N→SAD	17
READ	2
P→K	15
B→L	14
6.16.6	
Q→D	15

2.7.5	
LO	0
ALLOW INTS	10
6.6.6	
MISC	176

6.16.6	
LO	0
Bj→K	6
6.3.(7)	
Q→A	13

6.6.6	
READ	2
LO	0
9→SAD	15
B→K	1
6.3.(7)	
Q→N	14

HR 0	
6.3.5	
LO	0
N→K	10
3.12.7	
Q→B	7

HR 0	
6.5.4	
L1	1
N→K	10
CH	7
5.6.3	
MISC	14
Q→B	7

CONDITIONS		Y	N
27	HR	5	4

3.12.7	
LO	0
9→SAD	15
WRITE	1
1→L4	1
SHL	1
3.11.7	
Q→B	7

MISCELLANEOUS	
14	1 → M22
25	1 → ILL0P

TRANSFER CHARACTER(S)

FUNCTION 116

SHEET 2 OF 3

FROM 6.15.6
SHEET 3

TO SHEET 129

1904/5 E & F

LS/128

FROM 6.8.4
SHEET 129

5.6.3	
L0	0
C→K	16
5.14.7	
Q→N	14

5.14.7	
L0	0
B→K	1
1.5.4	
Q→C	16

1.5.4	
RP	3
N→SAD	17
L0	0
A→L	4
FANQ	3
1.5.5	
Q→Bj	3

1.5.5	
WRITE	1
N→SAD	17
L2	2
P→K	15
(6).17.6	

MT=0 →

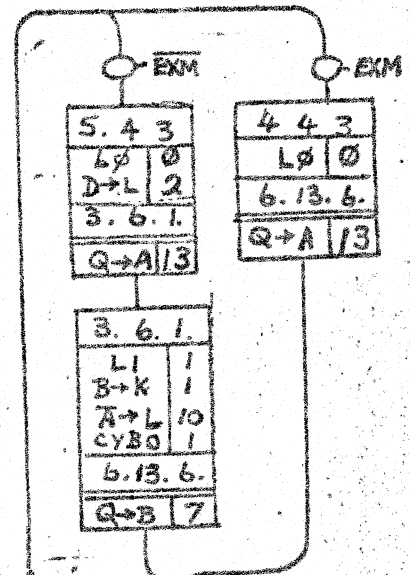
3.17.6	
L1	1
N→K	10
CH	7
6.7.6	
MISC	14
Q→B	7

MT=0 →

2.17.6	
L1	1
N→K	10
CH	7
(1) 4.3.	
MISC	14
Q→B	7

6.7.6	
L0	0
C→K	16
6.15.6	
Q→N	14

6.15.6	
L0	0
B→K	1
1.14.3	
Q→C	16



5.4.3	
L0	0
D→L	2
3.6.1	
Q→A	13

4.4.3	
L0	0
6.13.6.	
Q→A	13

3.6.1	
L1	1
B→K	1
A→L	10
CYBO	1
6.13.6.	
Q→B	7

6.13.6	
WRITE	1
X+I, D→SAD	7
L2	1
C→K	16
A→L	10
CYBO	1
DYL CHECK	1
6.12.6	
Q→B	7

6.12.6	
WRITE	1
X/D→SAD	6
L0	0
DYL CHECK	1
6.11.6	

6.11.6	
L1	1
10→SAD	14
READ	2
B→K	1
CYBO	1

ALLOW INTS	
[4.16.1]	
Q→C/P	17

SEE
PREP. OF ORDER
SEQUENCE

TRANSFER CHARACTERS
FUNCTION 116
SHEET 3 of 3

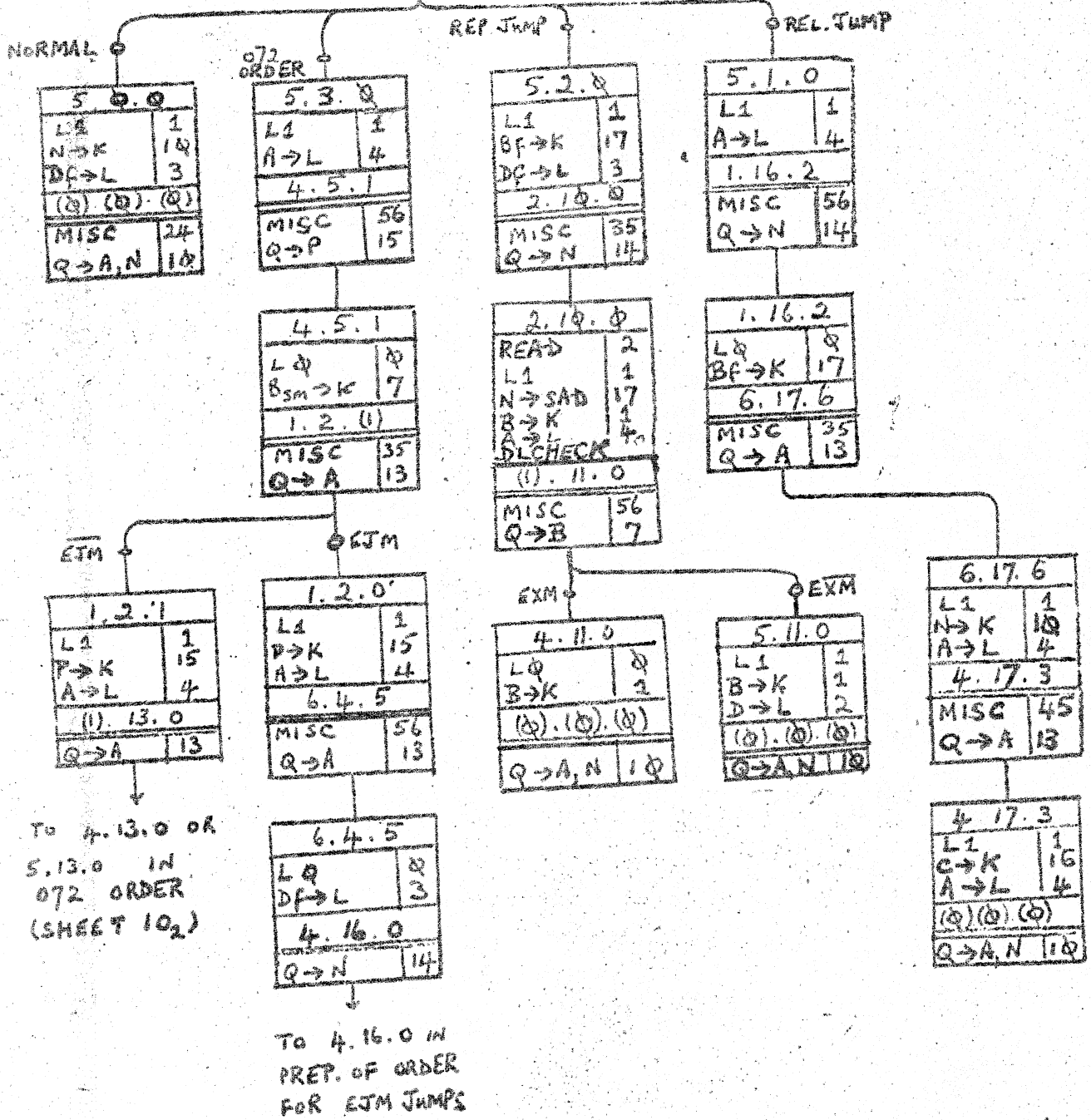
CONDITIONS		Y	N
X0	MT=0	2	3

MISCELLANEOUS	
14.1	→ M22

SHEET 2

SUB	ISS	
ACW		

FROM 4.7.5 (SHEET 12₁₀)



CONDITIONS		Y	N
X1	EXM	4	5
Z1	EJM	Q	1
Y14	Normal	Q	
	072 Order	3	
	Rep. Jump	2	
	Rel. Jump	1	

MISCELLANEOUS	
24	SAME AS 3 EXCEPT A STAT NOT RESET
35	Set Link
45	sign extend A13→L
56	sign extend A14→L

117 ORDER
SHEET 2 of 2

1904/5 E&F

LS/1211

SUB	ISS.		

7.12.3	
LI	1
C→K	16
CYBO	1
ALLOW INTS	
4.16.1	
MISC	57
Q→S	17

7.12.4	
LD	0
N→B+K	11
SHL	1
2.1.(4)	
Q→B	7

2.1.0	
LD	0
H→L	14
5.13.4	
Q→N	14

2.1.2	
WRITE	1
S→T	15
ALLOW INTS	
Q.7.6	

5.13.4	
LI	1
B→K	1
SHL	1
5.12.4	
Q→B	7

Q.7.6	
READ	2
S→T	15
2.1.0	

5.12.4	
LD	0
B→K	1
SHL	1
Q.12.1	
Q→B	7

CONDITION			
XI	EXM	4	5
Y4	HR	2	0

7.12.5	
LI	1
C→K	16
CYBO	1
(1).13.2	
MISC	5
Q→A	17

Q.12.1	
LD	0
EJ→K	6
4.13.4	
MISC	17
Q→A	13

4.13.2	
LO	0
A→L	4
ALLOW INTS	
[4.16.1]	
MISC	46

5.13.2	
LO	0
N→K	10
ALLOW INTS	
[4.16.1]	
MISC	22

4.13.4	
LD	0
EJ→K	6
4.12.4	
MISC	17
Q→P	15

4.12.4	
LO	0
4.11.4	
Q→B	7

7.12.0	
LI	1
X→J	6
RP	3
B→K	1
A→L	4
AND	5
DYL CHECK	
5.16.6	
MISC	5
Q→B	7

7.12.1	
LO	0
X→J	6
RP	3
N→K	3
DYL CHECK	
4.10.4	
MISC	5
Q→P	15

7.12.2	
LI	1
X→J	6
RP	3
B→K	1
A→L	10
EQU	4
DYL CHECK	
5.16.6	
MISC	5
Q→B	7

4.11.4	
LO	0
A→L	4
FANQ	3
G.11.4	
MISC	17
Q→Bj	3

4.10.4	
LD	0
B&P→K	5
5.16.6	
Q→B	7

G.11.4	
LO	0
P→K	15
FANQ	3
5.16.6	
MISC	5
Q→Bj	3

MISCELLANEOUS	
5	O→C22
17	RCH-1→RCH
25	SET ILOOP
57	SET MM IF X=7&NM2,3,4
22	Q0→Z5
46	Q3-5→G3-5, Q8→Z5

5.16.6	
LI	1
X→J	6
WRITE	1
C→K	16
CYBO	1
DYL CHECK	
ALLOW INTS	
[4.16.1]	
Q→CP	17

ALSO USED IN
GOPS 0,2,10,17

FUNCTIONS 120-5

7.12.6	
READ	2
LQ	0
X+D→SAD	7
C→K	16
(1).5.0	
NISC	43
Q→P	15

EXM0

5.5.0	
Lφ	φ
No-8→K	11
1.17.2	
Q→A	18

EXM

4.5.0	
Lφ	φ
BSM→K	7
φ.3.3	
Q→C	16

1.12.3	
L1	1
N→SAD	17
N→K	10
A→L	4
CYBO	1
D.V.L.CHECK	
Q.12.3	
Q→N	114

1.17.2	
L1	1
BSM→K	7
D→L	2
5.5.1	
Q→N	114

0.3.3	
Lφ	φ
P→K	15
1.11.3	
Q→B	17

0.12.3	
LQ	0
C→K	16
6.12.2	
Q→B	17

5.5.1	
L1	1
N→SAD	17
N→K	10
A→L	4
D.V.L.CHECK	
5.14.2	
Q→N	114

1.11.3	
WRITE	2
LQ	0
10→SAD	14
No-8→K	11
CYBO	1
ALLOW INTS	
Q.10.3	
Q→P	115

6.12.2	
WRITE	1
LQ	0
10→SAD	14
P→K	15
Q.11.3	
Q→C	16

5.14.2	
L1	1
N→SAD	17
BSM→K	7
D→L	2
ALLOW INTS	
D.V.L.CHECK	
1.13.3	
Q→P	115

0.10.3	
READ	2
LQ	0
X+D→SAD	6
BSM→K	7
3.6.(2)	
Q→N	114

0.11.3	
L1	1
A→L	4
CYBO	1
3.6.(2)	
Q→P	115

1.13.3	
READ	2
L1	1
X+D→SAD	6
BSM→K	7
D→L	2
Q.13.3	
Q→N	114

To 3.6.0
OR 3.6.2
(SHEET 2)

To 3.6.0.
OR 3.6.2.
(SHEET 2)

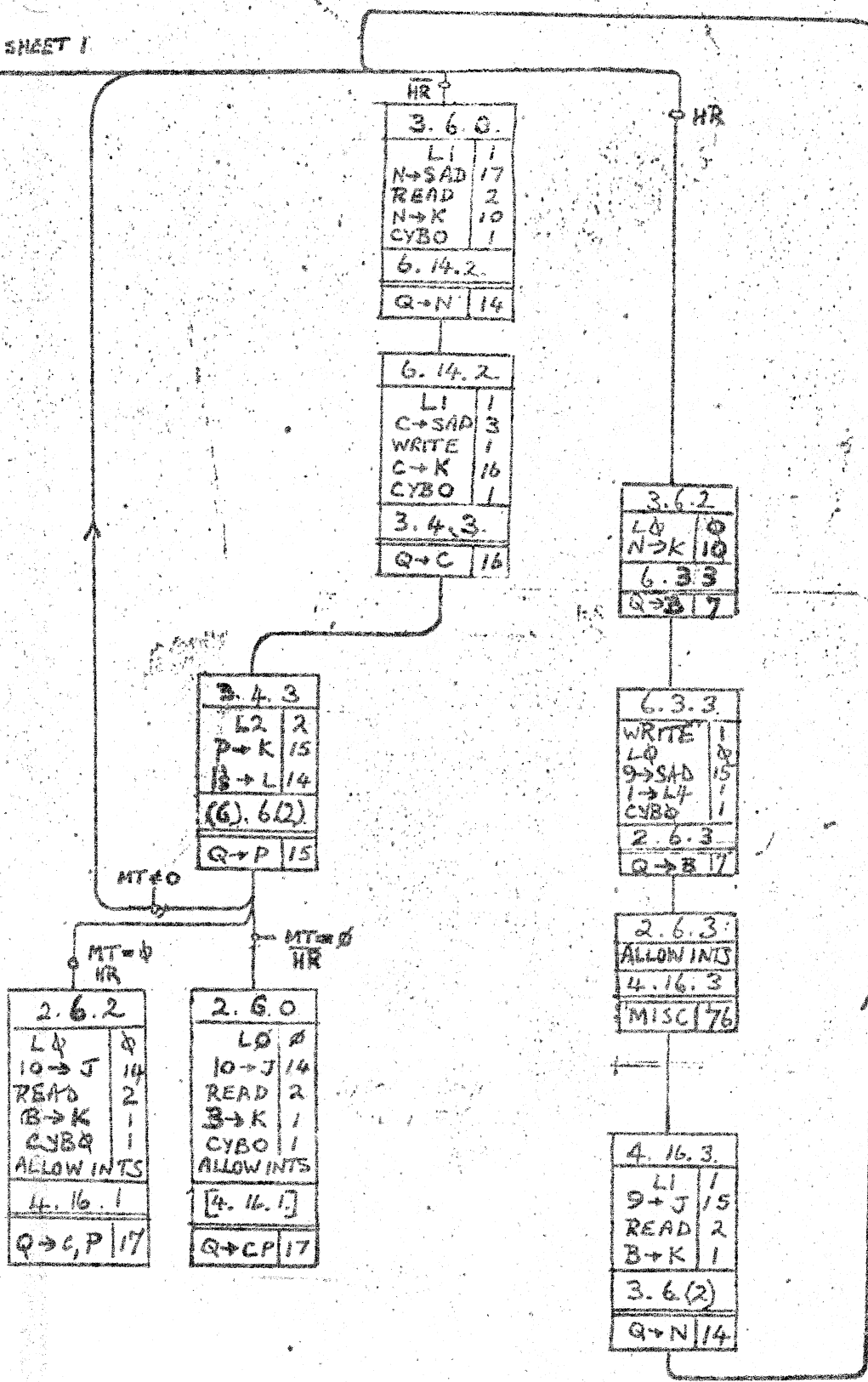
0.13.3	
L1	1
N→SAD	17
N→K	10
A→L	4
D.V.L.CHECK	
1.12.3	
Q→N	114

MISCELLANEOUS	
34	24→No-9; 1→NE
43	No-9-1→No-9

CONDITIONS		Y	N
X1	EXM	4	5
X3	DVL FAIL	0	1

A.c.w -

FROM SHEET 1



2.6.2	
LQ	Ø
10→J	14
READ	2
B→K	1
CYBO	1
ALLOWINTS	
4.16.1	
Q→C,P	17

2.6.0	
LQ	Ø
10→J	14
READ	2
B→K	1
CYBO	1
ALLOWINTS	
4.16.1	
Q→CP	17

CONDITIONS		Y	N
X6	MT=Ø	2	3
Z2	HR	2	0

FUNCTION 126 (MOVE)

SHEET 2 OF 2

1904/5 E&F

LS/132

512	ISS		
ACW	-		

MISCELLANEOUS	
5	$\emptyset \rightarrow C22$
43	$N(6-9) - 1 \rightarrow N(6-9)$

CONDITIONS		Y	N
X1	EXM	4	5
X13	$N(6-9) = \emptyset$	\emptyset	1
X7	HESITATION REQUEST	5	4

7.12.7	
L \emptyset	0
C \rightarrow K	16
6.15.2	
Q \rightarrow P	15
MISC	43

6.15.2	
READ	2
L \emptyset	0
X+I, D \rightarrow SAD	7
N \rightarrow B \rightarrow K	11
D.V.L CHECK	
(1.5.4)	
Q \rightarrow A, N	10

5.5.4	
L1	1
B \rightarrow M \rightarrow K	7
D \rightarrow L	2
(1.13.0)	
Q \rightarrow N	14

(1.13.0)	
L1	2
N \rightarrow SAD	17
N \rightarrow K	18
A \rightarrow L	4
D.V.L CHECK	
3.12.2	
Q \rightarrow N	14

3.12.2	
L1	1
N \rightarrow SAD	17
B \rightarrow M \rightarrow K	7
D \rightarrow L	2
D.V.L CHECK	
ALLOW INTS	
3.13.2	
Q \rightarrow C	16

3.13.2	
L \emptyset	0
A \rightarrow L	4
1.5.6	
Q \rightarrow N	14

4.5.4	
L \emptyset	0
B \rightarrow M \rightarrow K	7
1.5.6	
Q \rightarrow C	16

1.5.6	
L \emptyset	0
1.12.(7)	
Q \rightarrow A	13

1.12.4	
L1	1
C \rightarrow SAD	3
READ	2
C \rightarrow K	16
CYB \emptyset	1
D.V.L CHECK	
6.16.2	
Q \rightarrow C	16

6.16.2	
L1	1
B \rightarrow K	1
A \rightarrow L	4
(13)12(7)	
MISC	43
Q \rightarrow A	13

(1.12.4)	
L \emptyset	0
A \rightarrow L	4
4.14.3	
Q \rightarrow B	7

HR \rightarrow N \rightarrow 9 \neq 0	
1.12.5	
L \emptyset	0
N \rightarrow K	10
4.15.3	
Q \rightarrow B	7

4.15.3	
L \emptyset	0
9 \rightarrow SAD	15
WRITE	1
ALLOW INTS	
[6.17.2]	

6.17.2	
L \emptyset	0
9 \rightarrow SAD	15
READ	2
B \rightarrow K	1
1.12.4	
Q \rightarrow N	10

HR \rightarrow N \rightarrow 9 \neq 0	
(1.12.5)	
L \emptyset	0
A \rightarrow L	4
4.14.3	
Q \rightarrow B	7

4.14.3	
WRITE	1
X+D \rightarrow SAD	6
L \emptyset	0
P \rightarrow K	15
CYB \emptyset	1
ALLOW INTS	
D.V.L CHECK	
[4.16.1]	
Q \rightarrow S,P	17

FUNCTION 127
FORM CHECKSUM

SUB	165		
ACW			

7. 13. 0. LQ 0 A→L 4 (17). 1. (7) Q→N 14	7. 13. 2. LQ 0 A→L 4 (17). 1. (7) Q→N 14	7. 13. 3. LQ 0 A→L 4 (17). 1. (7) Q→N 14	7. 13. 4. LQ 0 A→L 4 (17). 1. (7) Q→N 14	7. 13. 5. LQ 0 A→L 4 (17). 1. (7) Q→N 14	7. 13. 6. LQ 0 A→L 4 (17). 1. (7) Q→N 14
--	--	--	--	--	--

FPBZ 0 HR

4. 1. 5	
LQ	
ALLOW INTS	
(0) (0) (0)	

FPBZ 0 HR

5. 1. 5	
READ	2
L1	1
N→SAD	17
N→K	10
CYBO	1
2. 11. 7	
MISC	71
Q→N	14

FPBZ 0 HR

5. 1. 4	
READ	2
L1	1
N→SAD	17
N→K	10
CYBO	1
2. 11. 7	
MISC	71
Q→N	14

FPBZ 0 HR

4. 1. 4	
LQ	0
(15). 12. 7	
MISC	5

FPU 0

1. 12. 7	
LQ	0
P→K	15
(1). 10. 7	
Q→N	14

FPU

0. 12. 7	
LQ	0
(17). 1. (7)	

7. 13. 1	
LQ	0
P→K	15
(1) 10. 7	
MISC	5
Q→N	14

↓
To 4. 10. 7
OR 5. 10. 7
(SHEET 150)

2. 11. 7	
WRITE	1
L1	1
(15) 13. 1	
MISC	72
Q→B	7

↓
To 4. 10. 7 OR
5. 10. 7
(SHEET 150)

FPU 0	
0. 13. 1	
READ	2
L1	1
N→SAD	17
C→K	16
CYBO	1
2. 7. 7	
MISC	5
Q→C, P	17

FPU 0

1. 13. 1	
LQ	0
P→K	15
(1). 10. 7	
Q→N	14

↓
To 4. 10. 7 OR
5. 10. 7
(SHEET 150)

2. 7. 7	
WRITE	1
L1	1
ALLOW INTS	
(4. 16. 1)	
MISC	73
Q→B	7

MISCELLANEOUS	
5	0→C22
71	LOAD FP F&X STATS
72	LOAD FP ARGUMENT
73	LOAD FP EXPONENT

CONDITIONS		
	Y	N
X1	EXM	4 5
X15	HARDWARE FP	0 1
X17	FP UNIT BUSY	4 5
Z7	HESITATION REQUEST	5 4

FUNCTIONS	130, 132, 133 134, 135, 136
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1904/5 E & F

LS/140

SUB	ISS	1	2
AEW	-	10906	0941

7.13.7
LQ 0
A→L 14
(17) 4(7)
Q→N 14

FPBZ - O - HR

4.4.5
LQ 0
ALLOW INTS
(0)(0)(0)

HR - O - FPBZ

5.4.5
READ 2
L1 1
N→SAD 17
15→LIS22 16
DVL CHECK
6.6.7
MISC 75
Q→A 13

FPBZ - O - HR

5.4.4
READ 2
L1 1
N→SAD 17
15→LIS22 16
MISC 75
DVL CHECK
6.6.7
Q→A 13

FPBZ - O - HR

4.4.4
LQ 0
(15) 10.7
MISC 15

FPU - O

1.10.7
LQ 0
P→K 15
(1) 10.7
Q→N 14

QFPU

0.10.7
LQ 0
(17) 4(7)

TO 4.10.7
OR 5.10.7
(SHEET 150)

6.6.7
WRITE 1
N→SAD 17
L1 1
N→K 10
CYB0 1
4.12.3
Q→N 14

4.12.3
READ 2
L1 1
N→SAD 17
CYB0 1
MISC 75
DVL CHECK
4.11.3
Q→CPI 17

4.11.3
WRITE 1
N→SAD 17
L1 1
B→K 1
A→L 10
CH 7
ALLOW INTS
4.16.1
MISC 10

MISCELLANEOUS	
5	0→C22
74	unload FP exponent
75	unload FP argument

CONDITIONS		
	Y	N
X1	EXM	4 5
X15	HARDWARE FP	0 1
X17	FP UNIT BUSY	4 5
Z7	HRS REQUEST	5 4

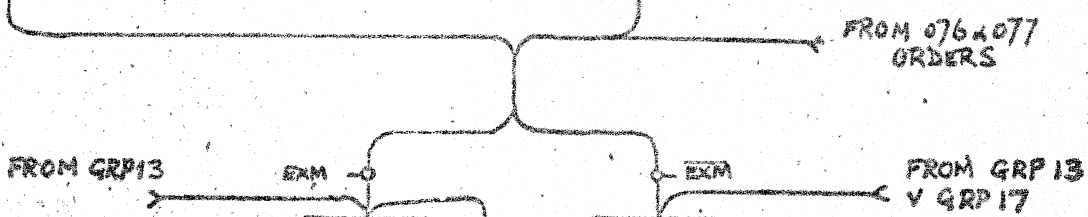
1904/5 E&F

FUNCTION 137

LS/141

SUB	ISS	WAS	1	
ACW		142	0906	
CHANGE			96-100	
DATE	1/19/67		28/1/67	
ACD	7803		-	

7.14.0	7.14.1 TO 7.14.7	7.16.7
L0 0	7.15.3 TO 7.15.7	L0 0
P→K 15	7.16.0 TO 7.16.3	P→K 15
(1).10.7	7.16.5 AND 7.16.6	(1).10.7
MISC 5	ARE SIMILAR TO 7.14.0 & 7.16.7	MISC 5
Q→N 14		Q→N 14



4.10.7
L0 0
4.10.7

5.10.7
L0 0
N→J 17
READ 2
1→L4 1
(3).7.2
Q→P 15

4.17.7
L0 0
1→L18 17
15→L15-22
SHR 2
1.17.7
MISC 15
Q→N 14

PM 0
1.7.2
L0 0
2→J 16
WRITE 1
A→L 4
4.17.7
Q→B 7

PM 0
0.7.2
L0 0
XVD→SD 6
READ 2
DYLCHECK
2.15.2
MISC 62

4.17.7
L2 2
0.15.7
MISC 2
Q→N 14

2.7.6
L0 0
1→J 1
WRITE 1
SHLD 6
0.5.7

3.4.0
L0 0
B→K 1
ALLOW INTS
4.15.7
MISC 55

0.15.7
L 2
N→K 10
15→L15-22 16
AND 5
(5).7.6

0.5.7
L1 1
C→K 16
CYB0 1
3.14.3
Q→C 16

4.15.7
L0 0
15→L15-22 17
SHL 1
0.11.2
Q→P 15

MISCELLANEOUS	
5	0→C22
2	SRIN→L: N→BAD
55	K20→ZS:
13	1→L8
76	SET PM ETC.

MT=0 15-23 0 MT=0 15-25

3.7.6
WRITE 1
L1 1
P→K 15
CYB0 1
0.5.7
Q→P 15

INTERRUPT SEQUENCE

TO 0.11.2 IN 164 ORDER (SHEET 153)

GROUPS 14, 15, 16 (MACRO-ORDERS) EXCEPT 150-2, 164

1904/5 E&F

LS/150

JOB	ISS	1
VCW	-	0906
		96-100
DATE	26/9/67	28/11/67
ACC	7803	-

7.15.φ	
Lφ	φ
(1).7.φ	
MISC	5

7.15.1	
Lφ	φ
(1).6.φ	
MISC	5

EXM

EXM

4.7.φ	
READ	3
Lφ	φ
XYP→SAD	6
B→K	1
6.14.6	
Q→A	

5.7.φ	
Lφ	φ
P→K	15
5.1φ.7	
Q→N	14

6.14.6	
RP	3
L2	2
N→SAD	17
B→K	1
EQUIV	4
(6).10.5	

TO MACRO-ORDER SEQUENCE (SHEET 150)

MT=0

MT≠0

2.10.5	
WRITE	1
Lφ	φ
IL4	1
Q→P 15	

3.1φ.5	
L1	1
B→K	1
A→L	10
EQUIV	4
5.6.6	
Q→B	7

1.15.6	
Lφ	φ
N→K	1φ
Q→A 13	

5.6.6	
Q→B 7	

3.2.3	
L3	3
P→K	15
1's→L	14
ALINTS	
(6).2.3	
Q→P	

MT≠0

MT=0

2.2.3	
Lφ	φ
A→L	4
4.7.φ	
Q→N	14

EXM

EXM

4.6.φ	
RP	3
L2	2
N→SAD	17
(6).15.3	

5.6.φ	
Lφ	φ
P→K	15
Q→N 14	

TOMACR ORDER SEQUENC

MT=0

MT=0

3.15.3	
WRITE	1
Lφ	φ
IL4	1
1.11.2	
Q→P	15

2.15.3	
Lφ	φ
1's→L	14
5.6.6	
Q→B	7

1.11.2	
Lφ	φ
N→K	1φ
Q→A 13	

TO 5.6.6 (SHEET 60)

3.3.0	
L2	2
P→K	15
1's→L	14
ALINTS	
(6).3.φ	
Q→P	15

MT≠0

MT=0

2.3.0	
Lφ	φ
A→L	4
4.6.φ	
Q→N	14

MISCELLANEOUS	
5	0→C22

FUNCTIONS 150, 151

7.15.2		7.15.3		7.15.4	
Lφ	φ	Lφ	φ	Lφ	φ
C→K	16	C→K	16	C→K	16
(1).7.4		(1).7.4		(1).7.4	
Q→B		Q→B		Q→B	
MISC	5	MISC	5	MISC	5

3.7.2	
READ	2
Lφ	φ
X+VD→SAD	7
N→K	10
15→L0-14	12
AND	5
φ.10.6	
Q→C	16

EXM

4.7.4	
WRITE	1
Lφ	φ
Q→SAD	15
4.4.φ	

EXM

5.7.4	
Lφ	φ
P→K	15
5.10.7	
Q→N	14

φ.10.6	
Lφ	φ
B→K	1
φ.12.6	
Q→A	13

4.4.φ	
READ	2
Lφ	φ
N→SAD	17
B→K	1
2.4.3	
Q→P	15

MACRO ORDER SEQUENCE (SHEET 150)

CONDITIONS		Y	N
X1	EXM	4	5
X5	M15-23 = φ	2	3
X6	MT = φ	2	3
Zφ	LINK(φ-2) → Z		

0.12.6	
READ	2
Lφ	φ
C→SAD	3
N→K	10
5.4.7	
Q→C	16

2.4.3	
READ	2
Lφ	φ
XUD→SAD	6
B→K	1
3.7.2	
Q→C	16

MISCELLANEOUS	
5	φ → C22
20	if M23=1, 1 → C22: φ → φ23
64	CM24 → C22

5.4.7	
Lφ	φ
B→K	1
A→L	4
AND	5
ALLOW INTS	
5.11.φ	
Q→A	13

φ153ORDER

3.15.2	
L2	2
N→K	10
15→L15-23	15
CYBφ	1
(5).7.2	
Q→N	14

φM15-23=φ

2.7.2	
READ	2
Lφ	φ
9→SAD	15
N→K	10
φ.14.6	
Q→A	13

φ.14.6	
Lφ	φ
B→K	1
1.14.7	
Q→C	16

1.14.7	
Lφ	φ
15→L	14
φ.3.6	
MISC	20

φ154ORDER

5.11.3	
Lφ	φ
C→K	16
φ.14.7	
Q→N	14

0.14.7	
L2	2
P→K	15
A→L	10
φ.11.1	
MISC	64

φ.11.1	
L2	2
C22→CYBφ	3
(6).15.2	

φ154ORDER

5.11.4	
Lφ	φ
C→K	16
2.4.7	
Q→N	14

2.4.7	
L2	2
P→K	15
A→L	10
4.11.2	
MISC	64

4.11.2	
L2	2
C22→CYBφ	3
(6).15.2	

φ152ORDER

5.11.2	
Lφ	φ
C→K	16
1.14.φ	
Q→N	14

1.14.φ	
L2	2
P→K	15
A→L	10
EQUIV	4
(6).15.2	

φMT=φ

2.15.2	
READ	2
Lφ	φ
9→SAD	15
N→K	10
φ.13.6	
Q→N	14

φ.13.	
L1	
B→K	
φ.3.C	
MISC	
Q→C	

φ.3.	
Lφ	
A→L	
5.16.	
Q→B	

To 5. (SHEET)

152.153.154 ORD TABLE SEARCH 0

7.17.0	
LO	∅
CYB∅	1
SHL	1
(1).1.6	
MISC	5
Q+B	7

4.1.6	
LO	∅
B→K	1
SHL	1
(7).2.6	
Q+B	7

5.1.6	
LO	∅
P→K	15
5.10.7	
Q→N	14

MACRO-ROUTINE (15)

1.2.6	
L3	3
MISC	2
5.16.6	
Q+B	7

0.2.6	
L3	3
MISC	2
1.14.1	
Q→A	13

5.16.6	
WRITE	1
XVD→SAD	6
C→K	16
CYB∅	1
DVL CHECK	
ALLOW INTS	
4.16.1	
Q→G,P	17

ALSO USED IN SPS 4, 2, 10, 12

1.14.1	
LO	∅
B→K	1
MISC	13
1.15.1	
Q→N	14

1.15.1	
L1	1
N→SAD	17
READ	2
B→K	1
A→L	4
DVL CHECK	
5.17.6	
Q→B	7

5.17.6	
WRITE	1
XVD→SAD	6
L3	3
DVL CHECK	
5.12.7	
Q→B	7

5.12.7	
WRITE	1
L3	3
N→SAD	17
C→K	16
CYB∅	1
ALLOW INTS	
4.16.1	
Q→G,P	17

7.17.1	
LO	∅
(1).0.6	
MISC	5
Q+B	7

5.0.6	
LO	∅
P→K	15
5.10.7	
Q→N	14

MACRO-ROUTINE (15)

4.0.6	
L2	1
XVD→J	6
READ	2
B→K	1
MISC	2
DVL CHECK	
4.16.6	

4.16.6	
L1	1
C→K	16
CYB∅	1
ALLOW INTS	
[4.16.1]	
Q→G,P	17

PREP OF ORDER (2)

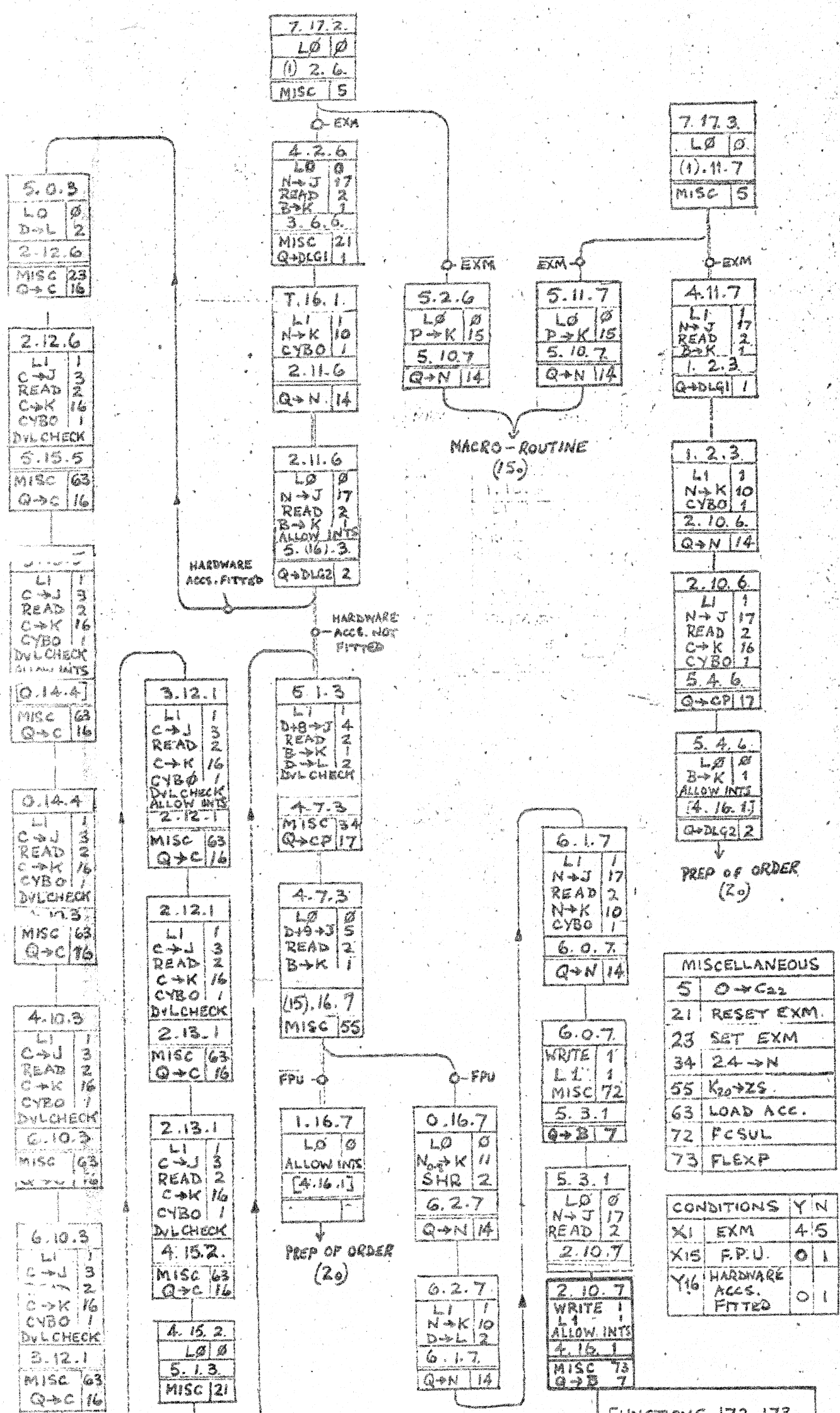
MISCELLANEOUS			
2	SRIN→L, N→BAD		
5	∅→C22		
13	1→L8		
CONDITION		Y	N
X1	EXM	4	5
X7	N ₀₋₉ =1	0	1

FUNCTIONS 170, 171

1904/5 E&F

LS/160

SUB	ISS		
ACW	-		



7.17.2.
LD 0
(1) 2.6.
MISC 5

7.17.3.
LD 0
(1).11.7
MISC 5

5.0.3
LD 0
D→L 2
2.12.6
MISC 23
Q→C 16

4.2.6
LD 0
N→J 17
READ 2
B→K 1
3.6.6.
MISC 21
Q→DLG1 1

2.12.6
LI 1
C→J 3
READ 2
C→K 16
CYBO 1
DVL CHECK
5.15.5
MISC 63
Q→C 16

T.16.1.
LI 1
N→K 10
CYBO 1
2.11.6
Q→N 14

5.2.6
LD 0
P→K 15
5.10.7
Q→N 14

5.11.7
LD 0
P→K 15
5.10.7
Q→N 14

4.11.7
LI 1
N→J 17
READ 2
B→K 1
1.2.3
Q→DLG1 1

MACRO-ROUTINE (15)

HARDWARE ACCS. FITTED

2.11.6
LD 0
N→J 17
READ 2
B→K 1
ALLOW INTS
5.16.3.
Q→DLG2 2

1.2.3
LI 1
N→K 10
CYBO 1
2.10.6.
Q→N 14

LI 1
C→J 3
READ 2
C→K 16
CYBO 1
DVL CHECK
ALLOW INTS
Q.14.4
MISC 63
Q→C 16

HARDWARE ACCS. NOT FITTED

3.12.1
LI 1
C→J 3
READ 2
C→K 16
CYBO 1
DVL CHECK
ALLOW INTS
2.12.1
MISC 63
Q→C 16

5.1.3
LI 1
D→B→J 4
READ 2
B→K 1
D→L 2
DVL CHECK
4.7.3
MISC 34
Q→CP17

2.10.6
LI 1
N→J 17
READ 2
C→K 16
CYBO 1
5.4.6
Q→CP17

Q.14.4
LI 1
C→J 3
READ 2
C→K 16
CYBO 1
DVL CHECK
5.3.
MISC 63
Q→C 16

2.12.1
LI 1
C→J 3
READ 2
C→K 16
CYBO 1
DVL CHECK
2.13.1
MISC 63
Q→C 16

4.7.3
LD 0
D→J→J 5
READ 2
B→K 1
(15).16.7
MISC 55

5.4.6
LD 0
B→K 1
ALLOW INTS
(4.16.1)
Q→DLG2 2

PREP OF ORDER (20)

4.10.3
LI 1
C→J 3
READ 2
C→K 16
CYBO 1
DVL CHECK
Q.10.3
MISC 63
Q→C 16

2.13.1
LI 1
C→J 3
READ 2
C→K 16
CYBO 1
DVL CHECK
4.15.2.
MISC 63
Q→C 16

1.16.7
LD 0
ALLOW INTS
[4.16.1]

0.16.7
LD 0
N→K 11
SHR 2
6.2.7
Q→N 14

6.1.7
LI 1
N→J 17
READ 2
N→K 10
CYBO 1
6.0.7.
Q→N 14

MISCELLANEOUS	
5	Q→C22
21	RESET EXM.
23	SET EXM
34	24→N
55	K20→Z5
63	LOAD ACC.
72	FCSUL
73	FLEXP

6.10.3
LI 1
C→J 3
READ 2
C→K 16
CYBO 1
DVL CHECK
3.12.1
MISC 63
Q→C 16

PREP OF ORDER (20)

6.2.7
LI 1
N→K 10
D→L 2
6.1.7.
Q→N 14

6.0.7.
WRITE 1
LI 1
MISC 72
5.3.1
Q→B 7

CONDITIONS		
X	EXM	Y/N
X1	EXM	4/5
X15	F.P.U.	0/1
Y16	HARDWARE ACCS. FITTED	0/1

FUNCTIONS 172, 173 EXECUTIVE INSTRUCTIONS

ACW 0941.

1904/5 E & F

LS/161

7 17 5
LO 0
(1) 3 3

7 17 6
LO 0
(1) 3 3

7.17.4
LO 0
N → KI 10
(1) 7.7
MISC 5
Q → BI 7

EXM
5.3.3
LO 0
P → K 15
5.10.7
Q → N 14

EXM
4.3.3
LI 1
C → K 16
CYBO 1
4.16.1
Q → CP 17

EXM
5.7.7
LO 0
(3) 7.1

EXM
4.7.7
L3 3
XVD → J 6
READ 2
B → K 1
MISC 11
DYL CHECK
3.0.7

MACRO-ORDERS SHEET 150

PREP OF ORDER (20)

7.17.7
LO 0
(1) 3.6

3.0.7
L3 3
B → K 1
3.5.6

EXM
4.3.6
LO 0
XVD → J 6
READ 2
B → K 1
DYL CHECK
6.3.6
MISC 21
Q → N 14

EXM
5.3.6
LO 0
P → K 15
5.10.7
Q → N 14

MACRO-ROUTINE (150)

PM 6
1.7.1
LO 0
P → K 15
5.10.7
Q → N 14

OPM
0.7.1
LO 0
2.10.2
MISC 41

3.5.6
L3 3
B → K 1
2.5.6

TO MACRO ROUTINE (150)

Q _{N1} = 1
2.4.0
LO 0
4.15.4

2.10.2
R 2
LO 0
XVD → SAD 6
B → K 1
DYL CHECK
2.4.14
MISC 42

2.5.6
L3 3
B → K 1
2.4.6
MISC 15
Q → A 13

Q _{N1} = 0
2.4.4
LO 0
N → K 10
SHL 1
4.15.4
Q → N 14

2.4.4
LO 0
N → K 10
SHL 1
4.15.4
Q → N 14

2.4.6
L3 3
B → K 1
3.3.6

6.3.6
LO 0
N → J 17
DYL CHECK
6.12.5
MISC 23

CONDITION	Y	N
X1 EXM	4	5
X3 PM	0	1
Z4 N ₁₁ = 1	0	4

N ₁₁ = 0
4.15.4
LF 3
LO 0
XVD → SAD 6
DYL CHECK
2.12.2
PIF → B

Q _{N1} = 1
4.15.0
40 0
2.13.2
Q → B 7

3.3.6
LO 0
A → L 4
5.16.6
Q → BJ 3

6.12.5
LI 1
C → K 16
CYBO 1
ALLOW INTS
[4.16.1]
Q → CP 17

MISCELLANEOUS	
5	0 → C22
11	N → BAD ; RESET INT
15	SET "T"
21	RESET EXM
23	SET EXM
25	SET ILLOP
64 724	→ C22
41	Set Priority Control Stabs
42	Set Priority Data Stabs

N ₁₁ = 0
2.12.2
W 4
LO 0
2.13.2
Q → B 7

Q _{N1} = 1
2.13.2
LO 1
ALLOW INTS
[4.16.1]
MISC 41

5.16.6
LI 1
XVD → J 6
WRITE 1
C → K 16
CYBO 1
ALLOW INTS
DYL CHECK
[4.16.1]
Q → CP 17

EXECUTIVE INSTRUCTIONS

174-177 ORDERS

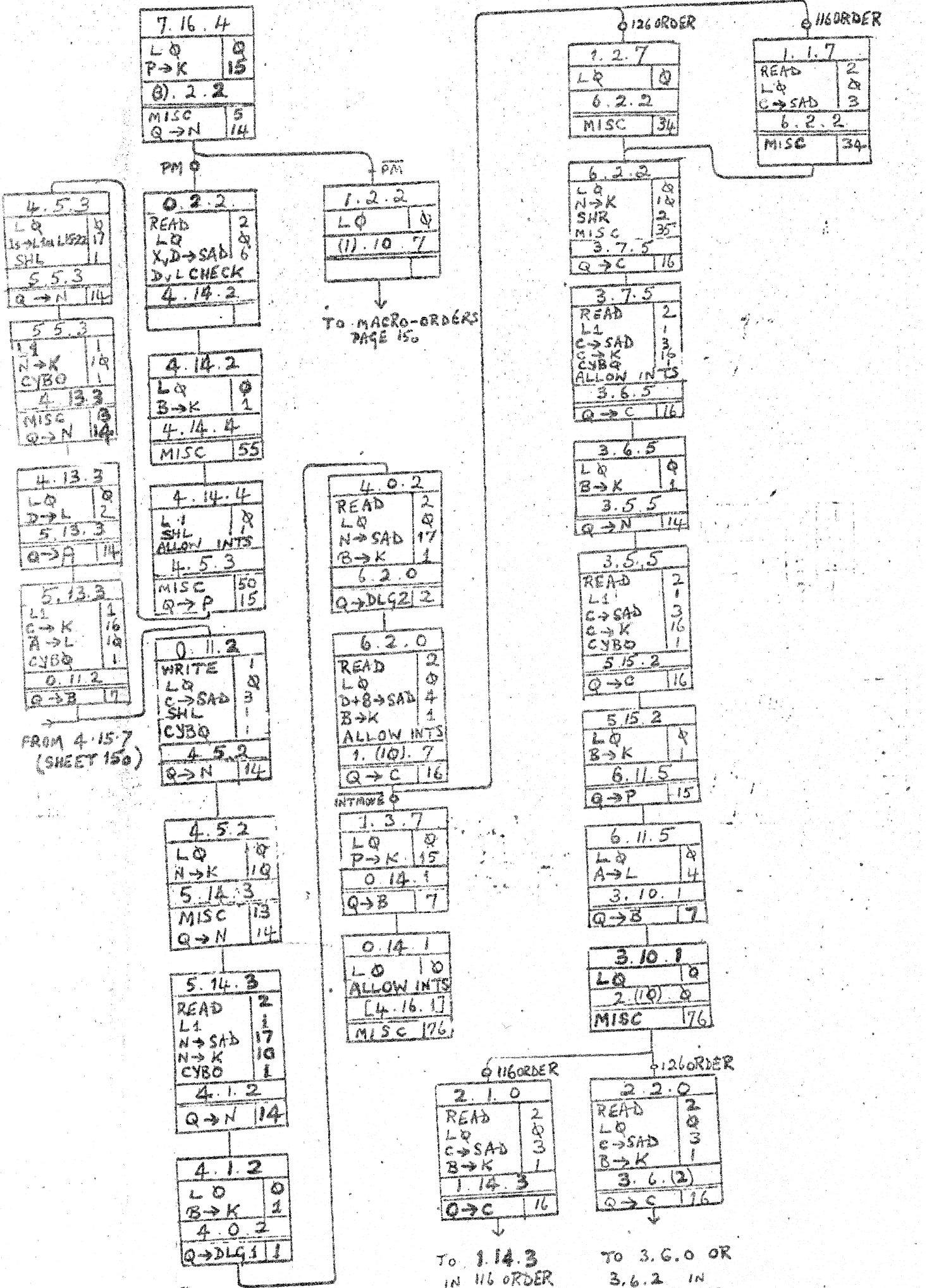
SEE 160

PREP OF ORDER (20)

1904/5 E&F

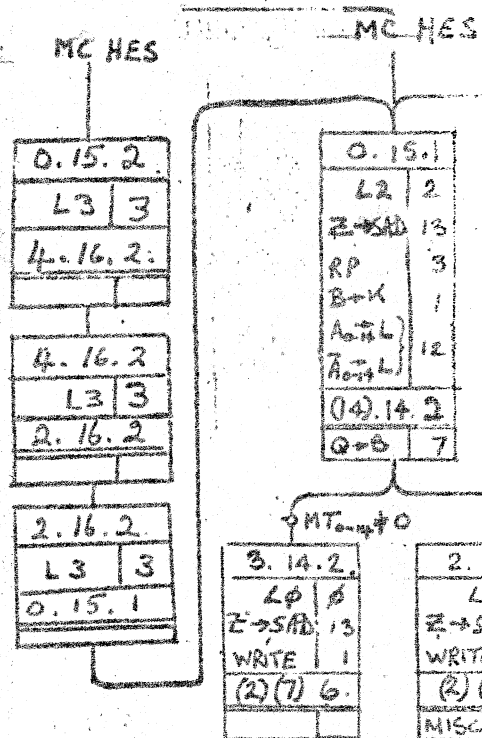
LS/162

SUB	ISS	1	2
ACW		0906	0941
CHANGE No		96-100	103-105/107
DATE	24/9/67	26/11/67	12/11/68
ACD	7803		



164 ORDER

SUB ISS	
ACW	

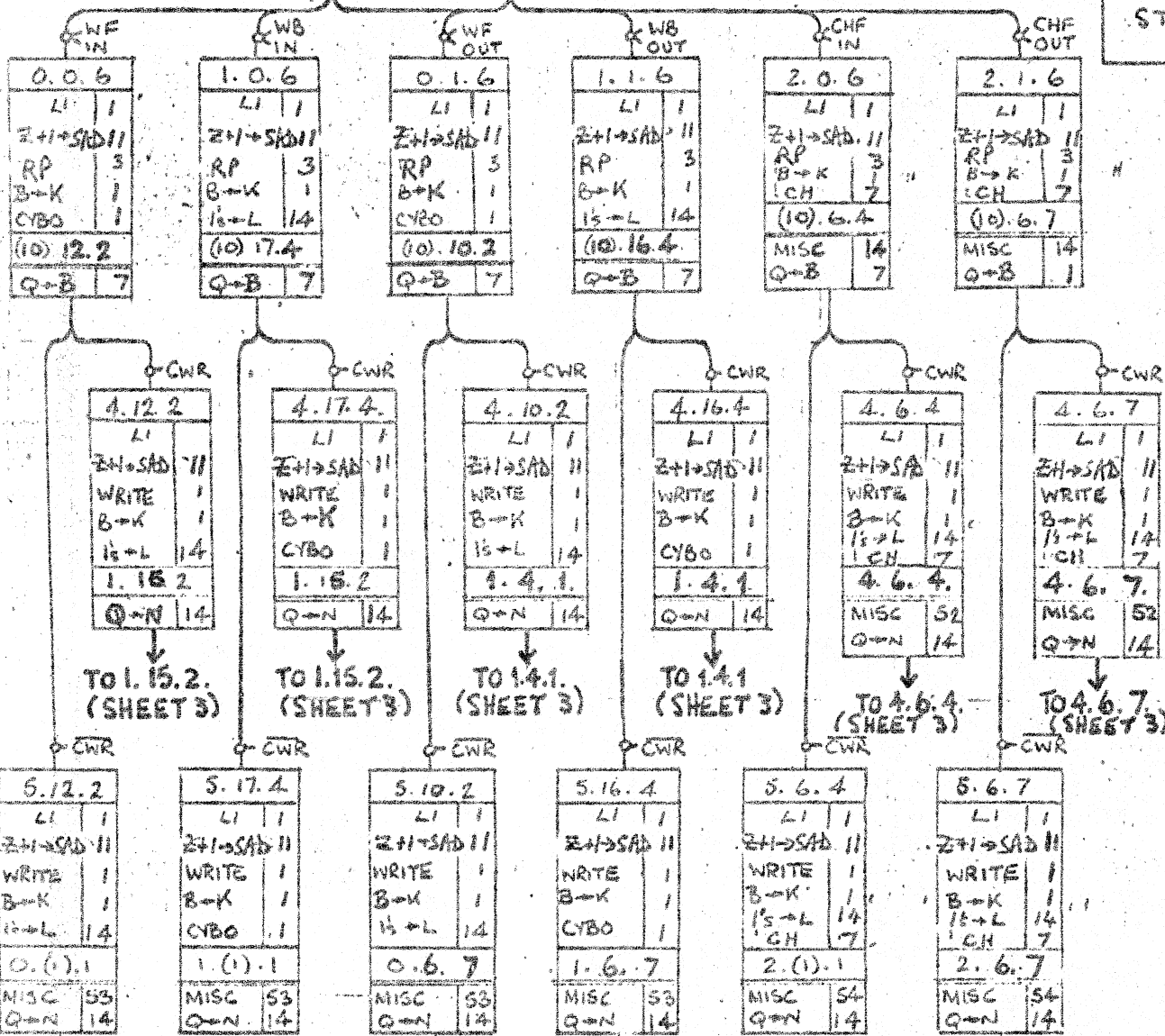


CONDITIONS		Y	N
X2	WF	0	1
	WB	1	0
	CHF	2	0
X10	CWR	4	5
X14	MT=0	2	3
Y1	MCN	4	6
Y7	IN	0	1

MISCELLANEOUS	
2	SRIN→L, N→BAD
12	1→BSTOP
14	1→M22
52	IFBSTOP SET, GATE L
53	RESET KP STAT
54	RESET KP STAT; IF BSTOP SET, GATE L

3.0.6
LOOP
STOP

3.1.6
LOOP
STOP



* TO SHEET 2

0.4.1.
0.6.1.

3.4.1.
0.6.1.

0.6.7.

0.6.7.

2.4.1.
2.6.1.

2.6.7.

HESITATION SEQUENCE
SHEET 1 OF 3

NB: Z - 256+4N

ACW 0941

1904/5 E&F

LS/170

CONTROL WORD RECHARGE

FROM
4.12.2
OR 4.17.4
(SHEET 1)

1.15.2
READ 2
LΦ Φ
Z+3→SAD12
1.14.2

1.14.2
WRITE 1
LΦ Φ
Z+1→SAD11
1.13.2

1.13.2
READ 2
LΦ Φ
Z+2→SAD10
6.0.6

6.0.6
WRITE 1
LΦ Φ
Z→SAD13
0.11.1
MISC 53

To 0.4.1
OR 0.6.1
(SHEET 2)

FROM
4.10.2
OR 4.16.4
(SHEET 1)

1.4.1
READ 2
LΦ Φ
Z+3→SAD12
1.6.1

1.6.1
WRITE 1
LΦ Φ
Z+1→SAD11
1.6.7

1.6.7
READ 2
LΦ Φ
Z+2→SAD10
5.15.4

5.15.4
WRITE 1
LΦ Φ
Z→SAD13
0.6.7
MISC 53

To 0.6.7
(SHEET 2)

FROM
4.6.4
(SHEET 1)

5.2.7
READ 2
LΦ Φ
Z+3→SAD12
6.1.6

6.1.6
WRITE 1
LΦ Φ
Z+1→SAD11
4.7.2

4.7.2
READ 2
LΦ Φ
Z+2→SAD10
5.7.5

5.7.5
WRITE 1
LΦ Φ
Z→SAD13
2.11.1
MISC 53

To 2.4.1
OR 2.6.1
(SHEET 2)

FROM
4.6.7
SHEET 1

0.3.1
LΦ Φ
Z+3→SAD12
READ 2
5.4.1

5.4.1
LΦ Φ
Z+1→SAD11
WRITE 1
6.3.0

6.3.0
LΦ Φ
Z+2→SAD10
READ 2
4.7.5

4.7.5
WRITE 1
LΦ Φ
Z→SAD13
2.6.7
MISC 53

To 2.6.7
(SHEET 2)

MILL TIMER HES

0.14.0
RP 3
LΦ Φ
Z→SAD 13
CYB 1
2.3.6
Q→N 14

2.3.6
L1 1
B→K 1
0.16.2
MISC 2
Q→B 7

0.16.2
WRITE 1
LΦ Φ
ALLOW INT
(Φ) (Φ) (Φ)

MISCELLANEOUS	
2	SRIN → L, N → BAD
53	RESET KP STAT

CONDITION		Y	N
Y1	MCH	4	6

HESITATION SEQUENCE

1904/5 E & F

LS/172

SUB	ISS	1	2
HCW		0906	0941

PERIPHERAL INTERRUPTS

FROM MACROS

SHEET NO

3.14.3
LI 1
D→L 2
ALLOW INTS
4.6.3
Q→A 13

Ø.17.2
LI 1
D→L 2
A→CYBØ 6
4.2.7
Q→A 13

ILLOP, OR DVL FAIL

Ø.17.6
LI 1
WRITE 1
C→K 16
CYBØ 1
ALLOW INTS
(Ø) 6 2
Q→C 16

Ø.17.7
LI 1
C→K 16
CYBØ 1
ALLOW INTS
(Ø) 6 2
Q→C 16

4.2.7
LØ Ø
I→L4 1
4.6.3
Q→P 15

EXM Ø
4.6.2
LI 1
I→L 14
2.14.4
MISC 20

EXM
5.6.2
LØ Ø
D→L 2
4.2.7
Q→A 13

MISCELLANEOUS	
23	I→EXM
34	24→NØ-9: NØ=1
46	Q(3-5)→G(3-5) QØ→Z5
6Ø	'A' STAT→K21, INHIBIT C15-21→K INHIBIT B15-21→K Z5→K2Ø
62	UNLOAD HARDWARE ACCS.
63	LOAD HARDWARE ACCS
74	unload FP exponent
75	unload FP argument

4.6.3
LI 1
C→K 16
A→L 1Ø
CYBØ 1
3.13.4
Q→B 7

2.14.4
LØ Ø
C→K 16
ALLOW INTS
4 16 1
Q→P 15

3.13.4
LØ Ø
D+8→SAD 4
WRITE 1
2.7.3

Ø.7.7
LØ Ø
Ø.14.5
MISC 34
Q→B 7

Ø.FBZ
5.3.7
READ 2
N→K 1Ø
D→L 2
MISC 75
6.4.7
Q→N 14

2.7.3
LI 1
D+9→SAD 5
RP 3
B→K 1
MISC 6Ø
5 (16) 7
Q→B 7

Ø.14.5
LØ Ø
NØ-8→K 11
SHR 2
(17) 3.7
Q→A+N 1Ø

6.4.7
LØ Ø
N→SAD 17
WRITE 1
1.11.1
Q→B 7

CONDITIONS		
	Y	N
X15	HARDWARE F.P.	Ø 1
X17	F.P. BUSY	4 5
Y16	HARDWARE ACCS.	Ø 1

FBZ
4.3.7
LØ Ø
ALLOW INTS
[3.12.4]

1.11.1
READ 2
LI 1
N→K 1Ø
CYBØ 1
MISC 74
6.3.7
Q→N 14

ACCSN →

5.Ø.7
LØ Ø
D+9→SAD 5
WRITE 1
D→L 2
MISC 34
6.1Ø.1
Q→C 16

→ACCSN

5.1.7
LØ Ø
D+9→SAD 5
WRITE 1
P→K 15
ALLOW INTS
(15) 7.7
MISC 23
Q→C+P 17

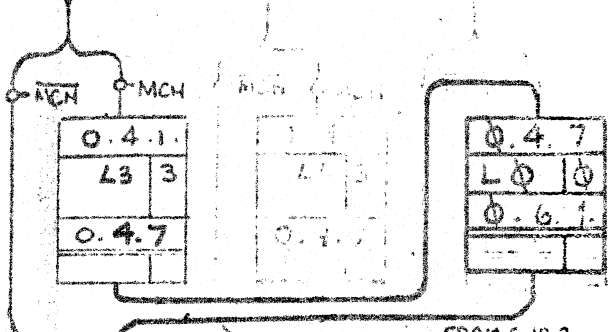
NEW NO 2/11/50

FPV
1.7.7
LØ Ø
[4.16.1]
MISC 46

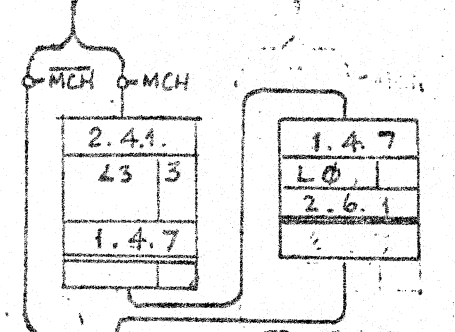
TO SHEET 2
(6.1Ø.1)

INTERRUPT SEQUENCE

FROM 5.12.2
v 6.0.6.



FROM 5.6.4
v 6.0.6.



FROM 5.10.2
v 6.1.6.

FROM 5.6.4
v 6.1.6.

FROM 5.6.7.
v 6.1.6.

0.6.1	
L0 0	
BINF	5
3.13.3	
MISC	15
Q-Bj	3

1.6.1	
L2 3	
BINF	
3.13.3	
MISC	15
Q-Bj	3

0.6.7	
L0 0	
N-SAD	17
READ	2
Bj-K	6
3.10.3	
MISC	15

1.6.7	
L2 3	
N-SAD	17
READ	2
Bj-K	6
3.10.3	
MISC	15

2.6.1.	
L0 0	
N-SAD	17
PAUSE	3
BINF	5
3.6.4	
MISC	15
Q-Bj	3

2.6.7	
L0 0	
N-SAD	17
READ	2
Bj-K	6
5.17.5	
MISC	15

3.13.3	
L3 3	
6.17.4	
MISC	16

3.10.3	
L3 3	
Bj-K	6
6.14.4	
MISC	16

3.6.4	
L0 0	
N-SAD	17
WRITE	1
ALLOW INTS	
(0)(0)(0)	

5.17.5	
L3 3	
Bj-K	6
ALLOW INTS	
(0)(0)(0)	

6.17.4	
L3 3	
BINF	5
FANQ	3
3.12.3	
MISC	15
Q-Bj	3

6.14.4	
L3 3	
Bj-K	6
3.7.3	
MISC	15

3.12.3	
L3 3	
6.16.4	
MISC	16

3.7.3	
L3 3	
Bj-K	6
6.13.4	
MISC	16

6.16.4	
L3 3	
BINF	5
3.11.3	
MISC	15
Q-Bj	3

6.13.4	
L3 3	
Bj-K	6
3.6.3	
MISC	15

6.15.4	
L3 3	
BINF	5
3.6.4	
MISC	15
Q-Bj	3

3.6.3	
L3 3	
Bj-K	6
6.11.2	
MISC	52

6.12.4	
L0 0	
Bj-K	6
5.17.5	
MISC	15

3.11.3	
L0 0	
6.0.5	
MISC	52

6.11.2	
L0 0	
6.12.4	
MISC	16

TO 5.17.5.
(ABOVE)

6.0.5	
L0 0	
6.15.4.	
MISC	16

MISCELLANEOUS	
15	SET T
16	RCH+1 -> RCH
52	IF BSTOP SET, GATE L.
53	RESET KP STAT

HESITATION SEQUENCES
SHEET 2 OF 3

1904/5 E&F

LS

SUB	ISS	1	2
ACW	-	0906	0941

FROM SHEET 1
(5.0.7)

6.10.1	
L0	0
1s→L1	17
and L15-22	
SHL	1
1.4.3	
Q→N 14	

MISCELLANEOUS	
23	1→EXM
43	No-9-1→No-9
62	UNLOAD HARDWARE ACCS
63	LOAD HARDWARE ACCS

1.4.3	
L0	0
C→SAD	3
RP	3
6.7.1	

CONDITIONS			Y	N
X15	HARDWARE FP	0	1	
X7	No-9=1	0	1	

6.7.1	
L1	1
C→SAD	3
WRITE	1
C→K	3
CYBO	1
(7) 4.3	
MISC	43
Q→C	16

0.4.3	
L0	0
1→SAD	1
READ	2
ALLOW INTS	
6.6.1	
MISC	63

6.6.1	
L0	0
2→SAD	16
READ	2
1s→L	14
3.16.3	
Q→N 14	
MISC	63

3.16.3	
L0	0
1s→L1end	17
L15-22	
SHL	1
1.5.3	
Q→N 14	

1.5.3	
L0	0
C→SAD	3
RP	3
6.5.1	

6.5.1	
L1	1
C→SAD	3
WRITE	1
C→K	3
CYBO	1
(7) 5.3	
MISC	43
Q→C	16

0.5.3	
L0	0
P→K	15
ALLOW INTS	
(15) 7.7	
MISC	23
Q→C	16

TO SHEET 190

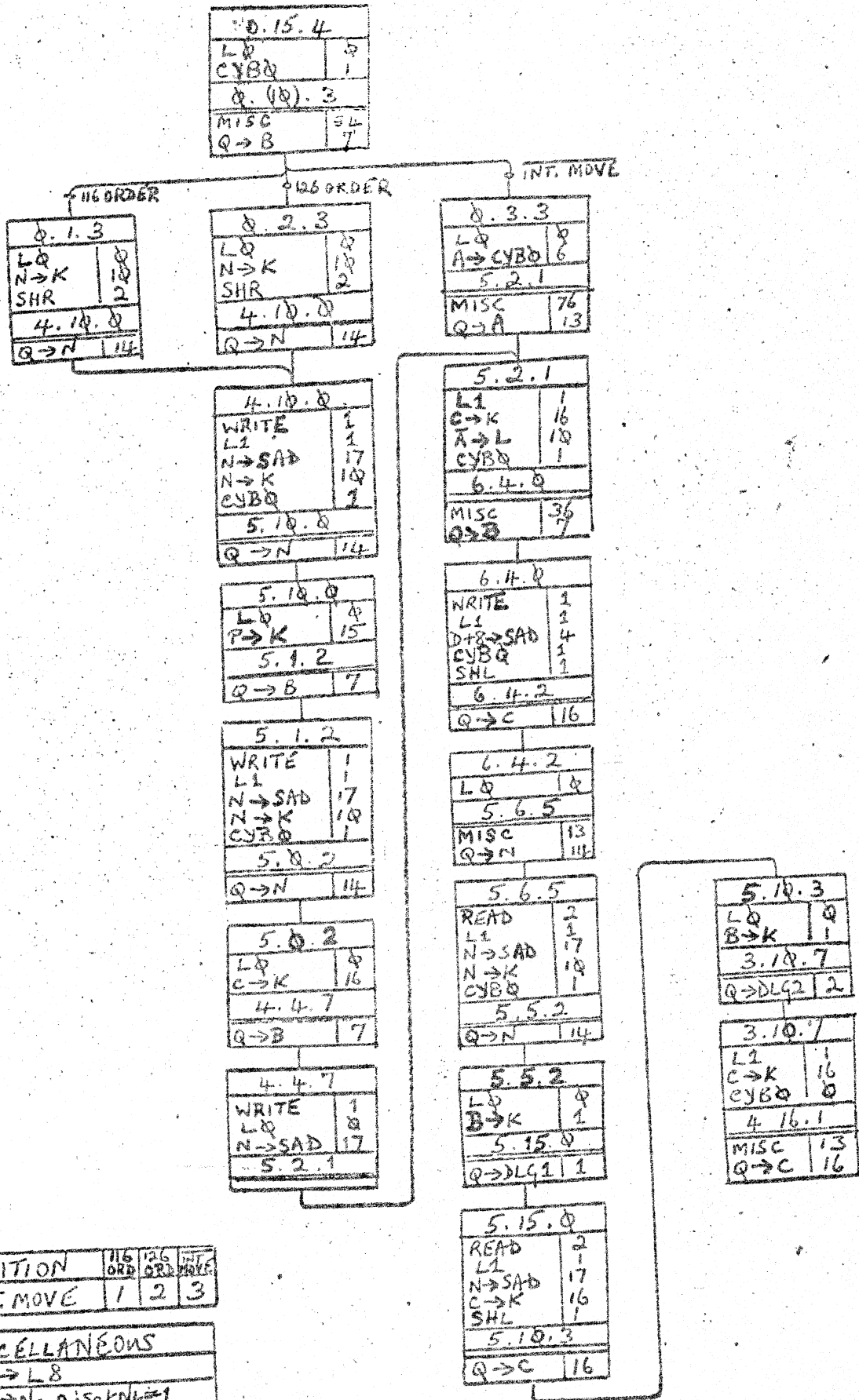
INTERRUPT SEQUENCE

SHEET 2 OF 2

1904/5 E&F

LS/1

SUB	ISS		
ACW			



CONDITION	116 ORD	126 ORD	INT. MOVE
Y10 INT. MOVE	1	2	3

MISCELLANEOUS	
13	1 → L8
34	24 → No-9: set N _L = 1
36	set N _L = 0
76	set P mem.

REAL TIME
INTERRUPT SEQUENCE

X=0

Y →

	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17
0	TEST	060	CRF	060	114	114	114	114	TEST		047	127	HES	TYH	070	117
1	044	044	CREST		HES		HES	174	110	126	152		164	HES	070	MOD
2			164	060	114	114		140	113	164	047	117	MOD	HES	HES	INT
3			126	126	INT	INT	115	115	126	126	126	126	116	116	116	P.O.
4	040	040	070	072	110	TYH	111	112	112	045	127	045	172	RTI	113	INSERT
5	040	040	070	072	110	117	111	112	111	CREST	127	045	INT	TYH	113	ORDER
6	HES	HES	170	152		117	115	124	152		152	152	152	114	MOD	INT
7	045	045	044	044	HES	140	HES	INT	137	131	130	076		CREST	172	INT

X=1

Y →

	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17
0	044	044	117	070	114	114	114	114			047	P.O.	060	040	066	066
1	044	045	117	116	HES	045	HES	174	110	INT	047		170	170	172	070
2	044	044	164	070	114	114		140	113	126		HES	HES	HES	117	
3	044	044	116	116	INT	INT	115	115	116	126	126	126	116	116	116	045
4	045	045	074	074	110	116	111	112	112	066	127	117	TYH	TYH	113	010
5	045	045	074	074	110	116	111	112	111	066	127	117	023	TYH	113	070
6	HES	HES	170	116		127	045	113	MOD		CREST	140	116	150	150	CREST
7				173	131	ORDER	HES	INT	137	131	130	076		CREST	172	CREST

X=2

Y →

	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17
0			126	126	174	114	126	044	117	050	044	046	046	045	114	114
1	044	044	050	050	HES	114	HES	047	072	045	172	172	043	043	042	042
2			052	052	045	045	126	152	174	052	174	174	HES	152	HES	113
3			150	044	152	126	126	INT	045	045	045	014	TYH	151	TYH	TYH
4	040	040	060	060	174	114	113	047	047	060	114	114	INT	114	114	114
5	040	040	060	060	114	074	074	126	150	060	140	047	047	047	047	047
6	HES	HES	TYH	HES	174	174	047	CREST	173	172	172	037	036	035	034	116
7	045	045	044	114	HES	TYH	HES	130	130	130	TYH	026	036	TYH	TYH	TYH

X=3

Y →

	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17
0	044	044	RTI	RTI	140	114	126	044	074	050	044	046	046	045	114	044
1	044	045	050	050	025	045	116	047	164	045	172	041	043	043	041	041
2	044	044	052	052	045	045	126	152	074	052	127	127	HES	152		MOD
3	044	044	150	044	126	116	HES	HES	HES	HES	HES	HES	INT	151	INT	045
4	045	045	060	060	045	114	HES	047	047	060	INT	INT	TYH	044		113
5	045	045	060	060	114	116	116	116	150	060	047	047	047	047	047	047
6			TYH	174	MOD	174	045	032	031	030	027	027	116	026	026	116
7			044	114	117	TYH	072	072			116	026	047	TYH	TYH	TYH

FIXED STORE MAP

SHEET 1 OF 2

1904/5 FRF

LS/210

X=4

Y →

Z ↓

φ	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17
0		P.O.O	P.O.O	P.O.O	152	126	151	150	RTI	117	P.O.O	072		174	P.O.O	045
1	074	074	070	070	072	117	056	050	054	052	060	062	064	056	P.O.O	040
2	164	164	072	072	117	164	INT		HES		HES	125	164	172	HES	044
3	TYH	TYH		175	116		INT	172	172	137	137		127	127	126	117
4	076	130	131	131	137	127	HES	152	121	124	124	124	164	174	HES	HES
5	076	130	131	131	137	070	070		041	116	056	047	047	047	047	047
6	171	170	172	177	MOD		022	021	020	017	016	015	013	012	171	011
7			INT	INT	RTI	CREST	HES	174	140	173		CREST	036	140	023	CREST

X=5

Y →

Z ↓

φ	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17
0	117	117	117	117	RTI	126	151	150	RTI	117	P.O.O	072		RTI	045	045
1	074	074	RTI	172		126	056	050	054	052	060	062	064	056	040	040
2	RTI	RTI	072	072	117	RTI	INT		HES		HES	125	126	151	117	040
3	172	172		175	116		116	116	RTI	116	116		164	115	114	114
4	076	130	131	131	137	127	HES	152	050	124	124	124	050	HES	HES	HES
5	076	130	131	131	137	070	RTI		050	116	056	047	047	172	ORDER	HES
6	171	170	172	177	173		010	007	006	005	003	002	MOD	001	000	170
7	INT	INT	HES	INT	152	CREST	HES	174	140	173	170	043	116	114	023	CREST

X=6

Y →

Z ↓

φ	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17
0	023	023	164		RTI	044	044	044	043	045	110	072	045	045	110	040
1	117	117	117	117	072	INT	INT	INT	INT	044	044	040	040	040	111	111
2	023	023	116	116	RTI	043	043	131	043	HES	126	072	126	127	127	127
3	114	114	114	126	043	043	072	072	172	112	112	112	111	111	110	110
4		117	072	116	137	047	INSERT	117	117	124	HES	HES	HES	HES	HES	HES
5	130	117	072	116	117	116	072	117	117	116	177	043	043	043	CREST	043
6	HES	HES	066	177	117	026	116	116	117	116	116	116	150	116	116	117
7	172	172	172	INT	INT	036	137	117	TYH	TYH	117	TYH	TYH	TYH	TYH	TYH

X=7

Y →

Z ↓

φ	0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17
0	000	010	020	030	040	050	060	070	100	110	120	130	140	150	160	170
1	001	011	021	031	041	051	061	071	101	111	121	131	141	151	161	171
2	002	012	022	032	042	052	062	072	102	112	122	132	142	152	162	172
3	003	013	023	033	043	053	063	073	103	113	123	133	143	153	163	173
4	004	014	024	034	044	054	064	074	104	114	124	134	144	154	164	174
5	005	015	025	035	045	055	065	075	105	115	125	135	145	155	165	175
6	006	016	026	036	046	056	066	076	106	116	126	136	146	156	166	176
7	007	017	027	037	047	057	067	077	107	117	127	137	147	157	167	177

FIXED STORE MAP

SHEET 2 OF 2

1904/5 E&F

LS/211

SUB	ISS	
ACW	-	