The Origin of Mirror Symmetry in High-Resolution NMR Spectra

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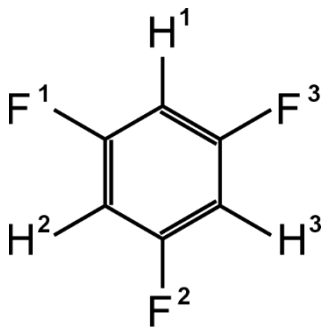
Supplement

This supplement contains a complete listing of all possible *J*-coupling matrix types resulting from spin permutations in 1,3,5-trifluorobenzene (Table 1).



The following pairs of *J*-coupling matrices (Table 1) possess the same structure except for interchange of H(A) and F(X) parts (AA'A"XX'X"/XX'X"AA'A"): (1,118), (2,117), (3,120), (4,119), (5,115), (6,116), (7,108), (8,107), (9,106), (10, 105), (11,104), (12,103), (13,114), (14,113), (15,112), (16,111), (17,110), (18,109), (19,101), (20,102), (21,98), (22,97), (23,100), (24,99), (25,84), (26,83), (27,82), (28,81), (29,80), (30,79), (31,78), (32,77), (33,76), (34,75), (35,74), (36,73), (37,72), (38,71), (39,70), (40,69), (41,68), (42,67), (43,66), (44,65), (45,64), (46,63), (47,62), (48, 61), (49,96), (50,95), (51,94), (52,93), (53,92), (54,91), (55,90), (56,89), (57,88), (58,87), (59,86), (60,85).

Table 1. Exhaustive list of 1,3,5-trifluorobenzene *J*-coupling matrix types resulting from spin reordering.

H_1	H_2	H_3	F_1	F_2	F_3
	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
		$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
			$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
				$^4J_{FF}$	$^4J_{FF}$
					$^4J_{FF}$

1

H_1	H_2	H_3	F_1	F_3	F_2
	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
		$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
			$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
				$^4J_{FF}$	$^4J_{FF}$
					$^4J_{FF}$

2

H_1	H_2	H_3	F_2	F_1	F_3
	$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
		$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
			$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
				$^4J_{FF}$	$^4J_{FF}$
					$^4J_{FF}$

3

H_1	H_2	H_3	F_2	F_3	F_1
	$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
		$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
			$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
				$^4J_{FF}$	$^4J_{FF}$
					$^4J_{FF}$

4

H_1	H_2	H_3	F_3	F_1	F_2
	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
		$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
			$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
				$^4J_{FF}$	$^4J_{FF}$
					$^4J_{FF}$

5

H_1	H_2	H_3	F_3	F_2	F_1
	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
		$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
			$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
				$^4J_{FF}$	$^4J_{FF}$
					$^4J_{FF}$

6

H_1	H_2	F_1	H_3	F_2	F_3
	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{FF}$
			$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

7

H_1	H_2	F_1	H_3	F_3	F_2
	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
		$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
			$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

8

H_1	H_2	F_1	F_2	H_3	F_3
	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
		$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
			$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

9

H_1	H_2	F_1	F_2	F_3	H_3
	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
		$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
			$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$
				$^4J_{FF}$	$^3J_{HF}$
					$^3J_{HF}$

10

H_1	H_2	F_1	F_3	H_3	F_2
	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
			$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

11

H_1	H_2	F_1	F_2	F_3	H_3
	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
		$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
			$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$
				$^4J_{FF}$	$^3J_{HF}$
					$^3J_{HF}$

12

H_1	H_2	F_2	H_3	F_1	F_3
	$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{FF}$
			$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
				$^5J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

13

H_1	H_2	F_2	H_3	F_3	F_1
	$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
			$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

14

H_1	H_2	F_2	F_1	H_3	F_3
	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
		$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
			$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

15

H_1	H_2	F_2	F_1	F_3	H_3
	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
		$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
			$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$
				$^4J_{FF}$	$^3J_{HF}$
					$^5J_{HF}$

16

H_1	H_2	F_2	F_3	H_3	F_1
	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^4J_{FF}$
			$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

17

H_1	H_2	F_2	F_1	F_3	H_3
	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
		$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
			$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
				$^4J_{FF}$	$^3J_{HF}$
					$^5J_{HF}$

18

H_1	H_2	F_3	H_3	F_1	F_2
	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
		$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
			$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

19

H_1	H_2	F_3	H_3	F_2	F_1
	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
		$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
			$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

20

H_1	H_2	F_1	F_3	H_3	F_2
	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
			$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

21

H_1	H_2	F_3	F_1	H_3	F_2
	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
		$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
			$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

22

H_1	H_2	F_3	F_1	F_2	H_3
	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
		$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
			$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
				$^4J_{FF}$	$^5J_{HF}$
					$^3J_{HF}$

23

H_1	H_2	F_3	F_2	H_3	F_1
	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
		$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{FF}$
			$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

24

H_1	H_2	F_3	F_2	F_1	H_3
	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
		$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
			$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
				$^4J_{FF}$	$^3J_{HF}$
					$^5J_{HF}$

H_1	F_1	H_2	H_3	F_2	F_3
	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
25			$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

H_1	F_1	H_2	H_3	F_3	F_2
	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
26			$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

H_1	F_1	H_2	F_2	H_3	F_3
	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$
27			$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

H_1	F_1	H_2	F_2	F_3	H_3
	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
		$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$
28			$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^3J_{HF}$
					$^3J_{HF}$

H_1	F_1	H_2	F_3	H_3	F_2
	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$
29			$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

H_1	F_1	H_2	F_3	F_2	H_3
	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
		$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$
30			$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^3J_{HF}$
					$^3J_{HF}$

H_1	F_1	H_3	H_2	F_2	F_3
	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
		$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
31			$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

H_1	F_1	H_3	H_2	F_3	F_2
	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
		$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
32			$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

H_1	F_1	H_3	F_2	H_2	F_3
	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
		$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
33			$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^5J_{HF}$

H_1	F_1	H_3	F_2	F_3	H_2
	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
		$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
34			$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^3J_{HF}$
					$^5J_{HF}$

H_1	F_1	H_3	F_3	H_2	F_2
	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
		$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
35			$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
				$^5J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

H_1	F_1	H_3	F_3	F_2	H_2
	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
		$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
36			$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^5J_{HF}$
					$^3J_{HF}$

H_1	F_1	F_2	H_2	H_3	F_3
	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
		$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
37			$^3J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
				$^4J_{HH}$	$^4J_{FF}$
					$^5J_{HF}$
					$^3J_{HF}$

H_1	F_1	F_2	H_2	F_3	H_3
	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
		$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
38			$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$
					$^3J_{HF}$

H_1	F_1	F_2	H_3	H_2	F_3
	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
		$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
39			$^3J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
				$^4J_{HH}$	$^5J_{HF}$
					$^3J_{HF}$

H_1	F_1	F_2	H_3	F_3	H_2
	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
		$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
40			$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{HH}$
					$^5J_{HF}$

H_1	F_1	F_2	F_3	H_2	H_3
	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
		$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
41			$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

H_1	F_1	F_2	F_3	H_3	H_2
	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
		$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
42			$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{HH}$

H_1	F_1	F_3	H_2	H_3	F_2
	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$
		$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
43			$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^3J_{HF}$

H_1	F_1	F_3	H_2	F_2	H_3
	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$
		$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
44			$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

H_1	F_1	F_3	H_3	H_2	F_2
	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$
		$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
45			$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^3J_{HF}$

H_1	F_1	F_3	H_3	F_2	H_2
	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$
		$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
46			$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
				$^3J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

H_1	F_1	F_3	F_2	H_2	H_3
	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
		$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
47			$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

H_1	F_1	F_3	F_2	H_3	H_2
	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
		$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
48			$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

H_1	F_2	H_2	H_3	F_1	F_3
	$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
49			$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

H_1	F_2	H_2	H_3	F_3	F_1
	$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
50			$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

H_1	F_2	H_2	F_1	H_3	F_3
	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
51			$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
				$^5J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

H_1	F_2	H_2	F_1	F_3	H_3
	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
		$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
52			$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^5J_{HF}$
					$^3J_{HF}$

H_1	F_2	H_2	F_3	H_3	F_1
	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
53			$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^5J_{HF}$

H_1	F_2	H_2	F_3	F_1	H_3
	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
		$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
54			$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^3J_{HF}$
					$^5J_{HF}$

H_1	F_2	F_1	H_2	H_3	F_3
	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
		$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
55			$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^5J_{HF}$
					$^3J_{HF}$

H_1	F_2	F_1	H_2	F_3	H_3
	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
		$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
56			$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
				$^5J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

H_1	F_2	F_1	H_3	H_2	F_3
	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
		$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
57			$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^5J_{HF}$

H_1	F_2	F_1	H_3	F_3	H_2
	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
		$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
58			$^5J_{HF}$	$^4J_{FF}$	$^4J_{HH}$
				$^3J_{HF}$	$^5J_{HF}$

H_1	F_2	F_1	F_3	H_2	H_3
	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
		$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
59			$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

H_1	F_2	F_1	F_3	H_3	H_2
	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
		$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
60			$^4J_{FF}$	$^5J_{HF}$	$^5J_{HF}$
				$^3J_{HF}$	$^4J_{HH}$

F_1	H_1	H_2	H_3	F_2	F_3
	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
		$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
61			$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

F_1	H_1	H_2	H_3	F_3	F_2
	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
		$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
62			$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

F_1	H_1	H_2	H_3	F_2	F_3
	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
		$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
63			$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

F_1	H_1	H_2	F_2	F_3	H_3
	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$
		$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
64			$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^3J_{HF}$
					$^3J_{HF}$

F_1	H_1	H_2	F_3	H_3	F_2
	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$
		$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
65			$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

F_1	H_1	H_2	F_3	F_2	H_3
	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$
		$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
66			$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^3J_{HF}$
					$^3J_{HF}$

F_1	H_1	H_3	H_2	F_2	F_3
	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
		$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
67			$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

F_1	H_1	H_3	H_2	F_3	F_2
	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
		$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
68			$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

F_1	H_1	H_3	F_2	H_2	F_3
	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
		$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
69			$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{FF}$
					$^5J_{HF}$

F_1	H_1	H_3	F_2	F_3	H_2
	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
		$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
70			$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^3J_{HF}$
					$^5J_{HF}$

F_1	H_1	H_3	F_3	H_2	F_2
	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
		$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
71			$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
				$^5J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

F_1	H_1	H_3	F_3	F_2	H_2
	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
		$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
72			$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^5J_{HF}$
					$^3J_{HF}$

F_1	H_1	F_2	H_2	H_3	F_3
	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
		$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
73			$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^5J_{HF}$
					$^3J_{HF}$

F_1	H_1	F_2	H_2	F_3	H_3
	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
		$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
74			$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
				$^5J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

F_1	H_1	F_2	H_3	H_2	F_3
	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
		$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
75			$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^5J_{HF}$

F_1	H_1	F_2	H_3	F_3	H_2
	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
		$^5J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
76			$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{HH}$
					$^5J_{HF}$

F_1	H_1	F_2	F_3	H_2	H_3
	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
		$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
77			$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	H_1	F_2	F_3	H_3	H_2
	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
		$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
78			$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{HH}$

F_1	H_1	F_3	H_2	H_3	F_2
	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
		$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$
79			$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^3J_{HF}$

F_1	H_1	F_3	H_2	F_2	H_3
	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
		$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$
80			$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

F_1	H_1	F_3	H_3	H_2	F_2
	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
		$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$
81			$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^3J_{HF}$

F_1	H_1	F_3	H_3	F_2	H_2
	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$
82			$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
				$^3J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

F_1	H_1	F_3	F_2	H_2	H_3
	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
83			$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	H_1	F_3	F_2	H_3	H_2
	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
84			$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	H_3	H_1	H_2	F_2	F_3
	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
		$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
85			$^4J_{HH}$	$^5J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{FF}$

F_1	H_3	H_1	H_2	F_3	F_2
	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$
		$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$
86			$^4J_{HH}$	$^3J_{HF}$	$^5J_{HF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{FF}$

F_1	H_3	H_1	F_2	H_2	F_3
	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
		$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
87			$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
					$^5J_{HF}$

F_1	H_3	H_1	F_2	F_3	H_2
	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
		$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
88			$^5J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^3J_{HF}$
					$^5J_{HF}$

F_1	H_3	H_1	F_3	H_2	F_2
	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$
		$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$
89			$^3J_{HF}$	$^4J_{HH}$	$^5J_{HF}$
				$^5J_{HF}$	$^4J_{FF}$
					$^3J_{HF}$

F_1	H_3	H_1	F_3	F_2	H_2
	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$
		$^4J_{HH}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$
90			$^3J_{HF}$	$^5J_{HF}$	$^4J_{HH}$
				$^4J_{FF}$	$^5J_{HF}$
					$^3J_{HF}$

F_1	H_3	F_2	H_1	H_2	F_3
	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
		$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
91			$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^5J_{HF}$

F_1	H_3	F_2	H_1	F_3	H_2
	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
92			$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
				$^3J_{HF}$	$^4J_{HH}$
					$^5J_{HF}$

F_1	H_3	F_2	H_2	H_1	F_3
	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
		$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
93			$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
				$^4J_{HH}$	$^5J_{HF}$
					$^3J_{HF}$

F_1	H_3	F_2	H_2	F_3	H_1
	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
94			$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
				$^5J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

F_1	H_3	F_2	F_3	H_1	H_2
	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
95			$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{HH}$

F_1	H_3	F_2	F_3	H_2	H_1
	$^5J_{HF}$	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
96			$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	F_2	H_1	H_2	H_3	F_3
	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
		$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
97			$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
				$^4J_{HH}$	$^5J_{HF}$
					$^3J_{HF}$

F_1	F_2	H_1	H_2	F_3	H_3
	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
		$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
98			$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
				$^5J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

F_1	F_2	H_1	H_3	H_2	F_3
	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
		$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
99			$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^5J_{HF}$

F_1	F_2	H_1	H_3	F_3	H_2
	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
		$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
100			$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
				$^3J_{HF}$	$^4J_{HH}$
					$^5J_{HF}$

F_1	F_2	H_1	F_3	H_2	H_3
	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
		$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
101			$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	F_2	H_1	F_3	H_3	H_2
	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
		$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
102			$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{HH}$

F_1	F_2	H_2	H_1	H_3	F_3
	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
		$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
103			$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^3J_{HF}$

F_1	F_2	H_2	H_1	F_3	H_3
	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
104			$^4J_{HH}$	$^5J_{HF}$	$^4J_{HH}$
				$^3J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

F_1	F_2	H_2	H_3	H_1	F_3
	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
		$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
105			$^4J_{HH}$	$^4J_{HH}$	$^5J_{HF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^3J_{HF}$

F_1	F_2	H_2	F_3	H_3	H_1
	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
106			$^4J_{HH}$	$^4J_{HH}$	$^4J_{HH}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	F_2	H_2	F_3	H_1	H_3
	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
107			$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	F_2	H_2	F_3	H_3	H_1
	$^4J_{FF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
108			$^5J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
				$^3J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	F_2	H_3	H_1	H_2	F_3
	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
		$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
109			$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
				$^4J_{HH}$	$^3J_{HF}$
					$^5J_{HF}$

F_1	F_2	H_3	H_1	F_3	H_2
	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
		$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
110			$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
				$^3J_{HF}$	$^4J_{HH}$
					$^5J_{HF}$

F_1	F_2	H_3	H_2	H_1	F_3
	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$
		$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$	$^4J_{FF}$
111			$^4J_{HH}$	$^4J_{HH}$	$^3J_{HF}$
				$^4J_{HH}$	$^5J_{HF}$
					$^3J_{HF}$

F_1	F_2	H_3	H_2	F_3	H_1
	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$
		$^3J_{HF}$	$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$
112			$^4J_{HH}$	$^3J_{HF}$	$^4J_{HH}$
				$^5J_{HF}$	$^4J_{HH}$
					$^3J_{HF}$

F_1	F_2	H_3	F_3	H_1	H_2
	$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$
113			$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
				$^3J_{HF}$	$^5J_{HF}$
					$^4J_{HH}$

F_1	F_2	H_3	F_3	H_2	H_1
	$^4J_{FF}$	$^5J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$
		$^3J_{HF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$
114			$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
				$^5J_{HF}$	$^3J_{HF}$
					$^4J_{HH}$

F_1	F_2	F_3	H_1	H_2	H_3
	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
		$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
115			$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
				$^4J_{HH}$	$^4J_{HH}$
					$^4J_{HH}$

F_1	F_2	F_3	H_1	H_3	H_2
	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
		$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
116			$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
				$^4J_{HH}$	$^4J_{HH}$
					$^4J_{HH}$

F_1	F_2	F_3	H_2	H_1	H_3
	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
		$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
117			$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
				$^4J_{HH}$	$^4J_{HH}$
					$^4J_{HH}$

F_1	F_2	F_3	H_2	H_3	H_1
	$^4J_{FF}$	$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
		$^4J_{FF}$	$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
118			$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
				$^4J_{HH}$	$^4J_{HH}$
					$^4J_{HH}$

F_1	F_2	F_3	H_3	H_1	H_2
	$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
		$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
119			$^3J_{HF}$	$^3J_{HF}$	$^5J_{HF}$
				$^4J_{HH}$	$^4J_{HH}$
					$^4J_{HH}$

F_1	F_2	F_3	H_3	H_2	H_1
	$^4J_{FF}$	$^4J_{FF}$	$^5J_{HF}$	$^3J_{HF}$	$^3J_{HF}$
		$^4J_{FF}$	$^3J_{HF}$	$^5J_{HF}$	$^3J_{HF}$
120			$^3J_{HF}$	$^4J_{HH}$	$^4J_{HH}$
					$^4J_{HH}$