Filter Configurations

23/11/99

The following tables specify the *necessary* parameter values required to configure the DAS to a particular filter configuration. Where filter choice automatically constrains output and other options, these are specified too. A list of parameters likely to be relevant to each filter type is included with each parameter set.

64MHz/Unfiltered Sampler Output: Group S0

S0 Group

Filter	<70>#	<76>#
S0*64	2	5

Applies only if S0 output is required at this port.
Also check <30>, <31> & <75>.

Band Splitter Filters: Groups B1, B1S, B2, B4 & B6

NB. For all filters leave <9> = 0
<14> = 1
<19> = 0
<21> = 0
<23> = 0
<26> = 0
<28> = 0

B1 Group

Filter	<3>	<5>	<6>	<7>	<8>	<15>	<17>	<70>#	<76>#
B1*32	1	31	31	1	1	0	0	1	4
B1*16	1	31	31	2	2	0	0	0	0,1
B1*8	1	31	31	3	3	0	0	0	0,1
B1*4	1	31	31	4	4	0	0	0	0,1
B1*2	1	31	31	5	5	0	0	0	0,1
B1*1	1	31	31	6	6	0	0	0	0,1

Applies only if B1 output is required at this port.
Also check <11>, <12>, <31>, <71>..<74>, <75> & <79>.
N.b. <71>..<74> only affect data when <70> = 0.
<79> only applies when <76> = 0..3.

B1S Group

Filter	<3>	<5>	<6>	<7>	<8>	<15>	<17>	<70>#	<76>#
B1*32S	1	31	31	1	1	0	0	1	4
B1*16S	1	31	31	7	7	0	0	0	0,1
B1*8S	1	31	31	8	8	0	0	0	0,1
B1*4S	1	31	31	9	9	0	0	0	0,1
B1*2S	1	31	31	10	10	0	0	0	0,1
B1*1S	1	31	31	11	11	0	0	0	0,1

Applies only if B1S output is required at this port.
Also check <11>, <12>, <31>, <71>..<74>, <75> & <79>.
N.b. <71>..<74> only affect data when <70> = 0.
<79> only applies when <76> = 0..3.

B2 Group

Filter	<3>	<5>	<6>	<7>	<8>	<15>	<17>	<70>#	<76>#
B2*16	1	31	31	12	22	1	0,1	0	0,1
B2*8	1	31	31	13	23	1	0,1	0	0,1
B2*4	1	31	31	14	24	1	0,1	0	0,1
B2*2	1	31	31	15	25	1	0,1	0	0,1
B2*1	1	31	31	16	26	1	0,1	0	0,1

Applies only if B2 output is required at this port.
Also check <11>, <12>, <16>, <18>, <31>, <71>..<74>, <75> & <79>.

B4 Group

Filter	<3>	<5>	<6>	<7>	<8>	<15>	<17>	<70>#	<76>#
B4*8	1	31	31	17	27	1	0,1	0	0,1

Applies only if B4 output is required at this port.
Also check <11>, <12>, <16>, <18>, <31>, <71>..<74>, <75> & <79>.

B6 Group

Filter	<3>	<5>	<6>	<7>	<8>	<15>	<17>	<70>#	<76>#
B6*8	0	32	32	17	27	1	0,1	0	0,1

Applies only if B6 output is required at this port.
Also check <11>, <12>, <16>, <18>, <31>, <71>..<74>, <75> & <79>.

Fine Tuner Filters: Groups F0, F1, F1S & F2
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The input to the Fine Tuner is one of the Band Splitter's filtered outputs. The availability of FT filters and their configuration parameters therefore depend on the bandwidth ("B") of that BS filter. Proceed by setting Common Features, then find the desired FT filter in the appropriate B column in the relevant Group, and set the adjacent parameter values.

NB. For all filters leave <48> = 0
<51> = 0
<59> = 0
<61> = 0
<63> = 0

Optimal Configurations

In the following tables for F1, F1S and F2 Group filters a given final bandwidth may be achievable from more than one Band Splitter bandwidth, B, so a preferred configuration has been marked "#" for each case. These have been selected as being optimal in terms of their frequency response and resistance to interference.

Common Features

Use 'B' in the Group tables below.
Set <40> (decimation) as tabulated
    <41> (LO frequency) as tabulated

Source (Band Splitter Filter)	B(MHz)	<40>	<41>
B1*16, B1*16S, B2*16.X, B2*16.Y	16	1	0-16.0E6
B1*8, B1*8S, B2*8.X, B2*8.Y	8	2	0-8.0E6
B4*8.X B4*8.Y B6*8.X B6*8.Y	8	2	0-8.0E6
B1*4, B1*4S, B2*4.X, B2*4.Y	4	4	0-4.0E6
B1*2, B1*2S, B2*2.X, B2*2.Y	2	8	0-2.0E6
B1*1, B1*1S, B2*1.X, B2*1.Y	1	16	0-1.0E6

Also check <42>..<47>.
Usually <43> = 0, <45> = 1 & <47> = 1.
If non-zero, <42> has the same range as <41>.

F0 Group (See also "Common Features" above)

Set <41> = 0
    <43> = 0
    <46> = 0
    <47> = 0

B=16	B=8	B=4	B=2	B=1	<49>	<50>	<55>	<57>
F0*16	F0*8	F0*4	F0*2	F0*1	21	21	1	0,1

Also check <31>, <53>, <54>..<56>, <58>, <68>, <70>..<74>, <75>..<79>.

F1 Group (See also "Common Features" above)

B=16	B=8	B=4	B=2	B=1	<49>	<50>	<55>	<57>
F1*16#	F1*8	F1*4	F1*2	F1*1	2	2	0	0
F1*8#	F1*4	F1*2	F1*1	F1*0.5	3	3	0	0
F1*4#	F1*2	F1*1	F1*0.5	F1*0.25	4	4	0	0
F1*2#	F1*1#	F1*0.5#	F1*0.25#	F1*0.125#	5	5	0	0
F1*1	F1*0.5	F1*0.25	F1*0.125	F1*0.0625#	6	6	0	0

Also check <31>, <53>, <54>, <68>, <70>..<74>, <75>..<79>.

F1S Group (See also "Common Features" above)

B=16	B=8	B=4	B=2	B=1	<49>	<50>	<55>	<57>
F1*16S#	F1*8S	F1*4S	F1*2S	F1*1S	7	7	0	0
F1*8S#	F1*4S	F1*2S	F1*1S	F1*0.5S	8	8	0	0
F1*4S#	F1*2S	F1*1S	F1*0.5S	F1*0.25S	9	9	0	0
F1*2S#	F1*1S#	F1*0.5S#	F1*0.25S#	F1*0.125S#	10	10	0	0
F1*1S	F1*0.5S	F1*0.25S	F1*0.125S	F1*0.0625S#	11	11	0	0

Also check <31>, <53>, <54>, <68>, <70>..<74>, <75>..<79>.

F2 Group (See also "Common Features" above)

B=16	B=8	B=4	B=2	B=1	<49>	<50>	<55>	<57>
F2*8#	F2*4	F2*2	F2*1	F2*0.5	13	23	1	0,1
F2*4#	F2*2	F2*1	F2*0.5	F2*0.25	14	24	1	0,1
F2*2#	F2*1	F2*0.5	F2*0.25	F2*0.125	15	25	1	0,1
F2*1#	F2*0.5#	F2*0.25#	F2*0.125#	F2*0.0625#	16	26	1	0,1

Also check <31>, <53>, <54>, <56>, <58>, <68>, <70>..<74>, <75>..<79>.

CW Filters

The B and F Group filter specifications above select coefficient sets scaled to give constant output with flat spectrum noise inputs, the usual condition for radio astronomy. If the DAS is used to acquire narrow band, ie. predominantly coherent, signals, the set of constant gain filters should be used instead to avoid overload, by substituting the regular filter numbers in <7>, <8>, <49> and <50> as follows:

Normal:	1	2	3	4	5	6	12	13	14	15	16	17	22	23	24	25	26	27
CW:	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50

There are no substitutes for #7..11; use #34..38 instead.

Note that these filters are installed for test and debug purposes only and their performance may not match those in the primary set.

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file Fltrcfgs.doc; printed 23-Nov-99