Figure 1 shows the previous design of telescope simulator as used on UKIRT (RAL tech note 42).
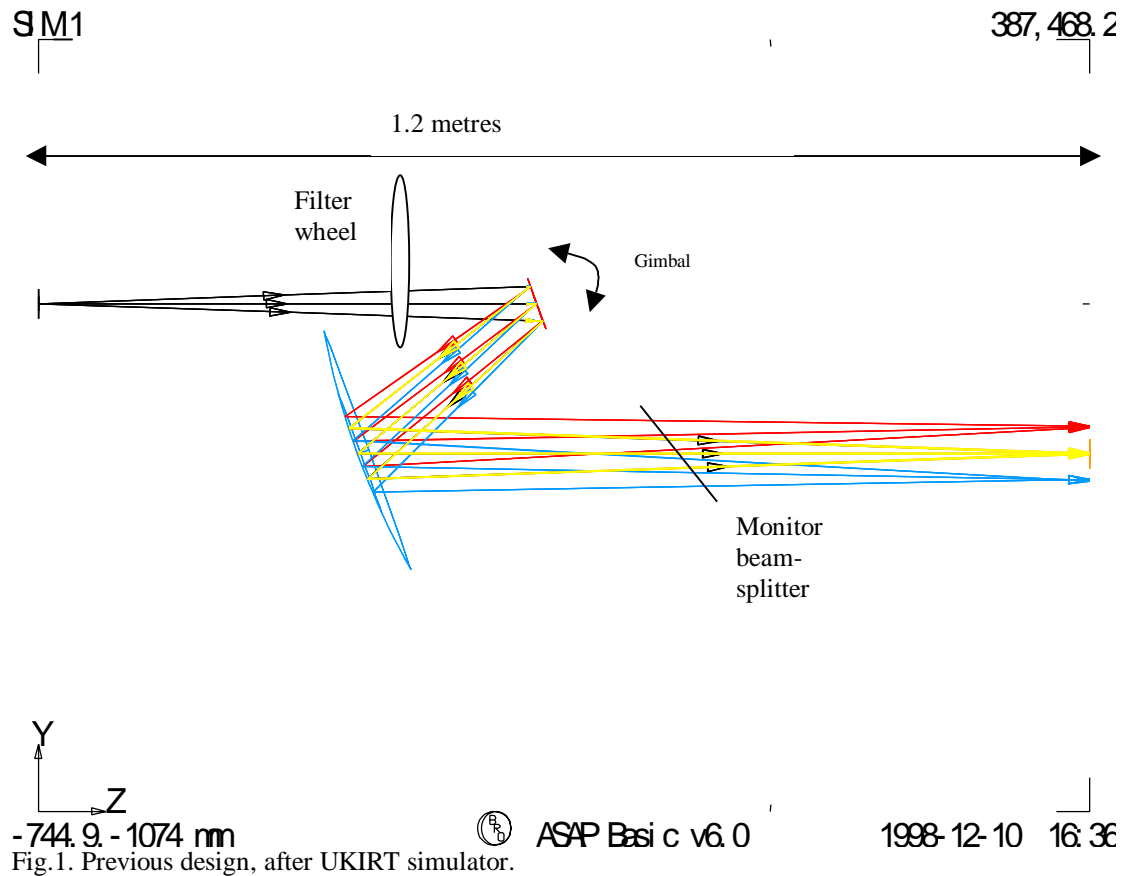

Fig.1. Previous design, after UKIRT simulator.

Here the pupil-plane mirror is gimballed in order to scan the beam across the detector array. This scheme has the disadvantage that the f-number and beam-shape vary with array position. To overcome this the alternative steering scheme, used on ISO-LWS is chosen, as shown in figure 2.
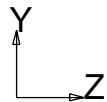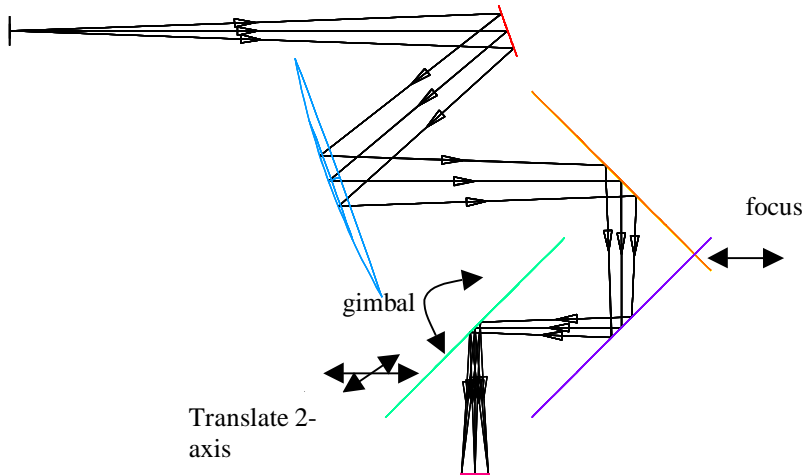
SI M1

259. 8, 468. 2

focus

gimbal

Translate 2- axis

Y

Z

-872. 1. - 1074 mm

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Fig.2. Proposed scheme, after ISO-LWS simulator.

Although not shown, this scheme too includes the filter wheel and monitor pick-off mirror. The beam steering is achieved by the final relay mirror. As well as a gimbal control this mirror must also be translated parallel to the array in a co-ordinated manner, to keep the beam angle-of-incidence at the array (& the exit pupil position) representative of the real telescope. This feature is not included in the ray-trace. The roof-top mirror arrangement is to provide focus-control and is to be translated in one-axis (trombone arrangement).

Optics equipment:

Items	Source	Cost estimated
Optical bench 6' x 3' min.	RAL existing.	0
Sources		
Calibration source, cryogenic Black body	NPL, cost as per GERB	£ 20 K
FTS monochromator	QMW existing	£ 0 K
Sub-mm source	QMW Existing equip't	0
Optics		
Filter wheel		
" filter holder plate		£ 1 K
" filters x 6		£ 6 K
" " Rotary stage	Aerotech ARS300	£ 5 K
" " " controller	U511x-2-A	£ 6 K
Pupil mirror & mask & mount	Planar, MG/Ealing	£ 2 K
Ellipsoidal collecting mirror, < 5um rms roughness	RAL technology, (2 weeks staff effort + £ 1K mat'ls)	£ 5 K
Trombone relay, 2 mirrors 30cm	MG/Ealing	£ 4 k
Linear stage+ step motor	Aerotech ATS15-200-M-20P-1-99	£ 4.5 K
Steering mirror		£ 2 K
" " gimbal mount, 292mm, 2-axis stepper	Aerotech AOM360D-30-5-RE30-DDVAC	£ 10 K
Linear stage+ step motor, x 2	Aerotech ATS15-200-M-20P-1-99	£ 9 K
" " controller	" U511 / 12	£ 6 K
Pick-off mirror/beamsplitter		£ 2 K
PC & software for control & data collection		£ 2 K
Total		**£ 84.5 K**