

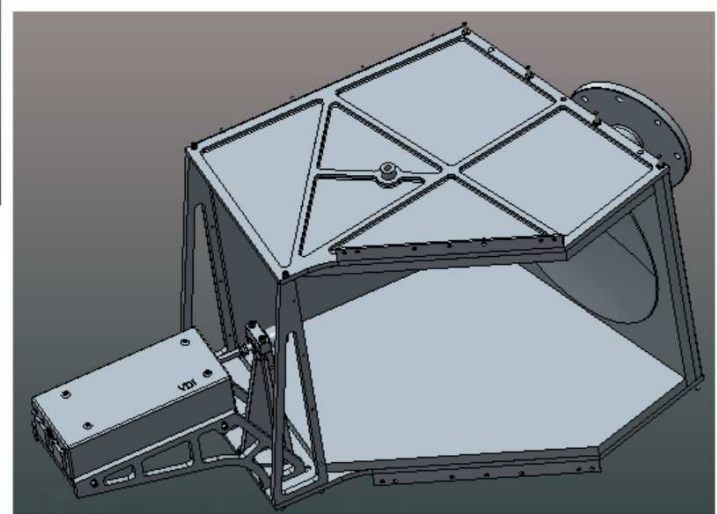
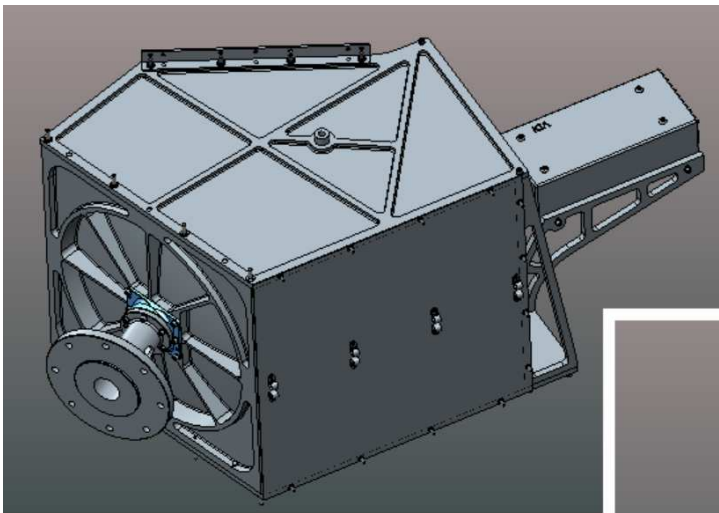


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Document Title	Manual for CATR W and V-band Illuminator and probe feeds		
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Change Record

Issue	Date	Affected Sections	Remarks
9	4/4/2016	All	Issued for internal discussion

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Reference Documents

Applicable documents

Ref	Title	Document Number	Iss./Rev.
[AD0]	SOW and technical Spec for the procurement of CATR illuminators and Probes W-band and V-band. Linear polarization	xxxxxxxxxx	1.0
[AD01]	“Improved Polarization Measurements Using a Modified Three-Antenna Technique”, A.C. Newell.	IEEE Trans. AP, Vol. 36 No. 6 June 1988	
[AD02]	“Accurate Measurement of Antenna Gain and Polarization at Reduced Distances by an Extrapolation Technique”, A.C. Newell et al.	IEEE Trans. AP Vol. 21 No. 4 July 1973, pp418 - 431.	
[AD03]	“The Definition of Cross Polarization”, A.C. Ludwig	IEEE Trans. AP January 1973, pp116 - 119.	
[AD04]	“Memo on Design of 75 GHz/110 GHz Illuminators and High Gain Probes”, S.M.Tun	“PDRReportV3.pdr” dated 26 th April 2016 from SMT Consultancies Ltd.	3.0
[AD05]	NPL certificate reference 2016020146VL	Dated 6-Oct-2016 (V band illuminator)	1
[AD06]	NPL certificate reference 2016020146WL	Dated 6-Oct-2016 (W band illuminator)	2
[AD07]	NPL certificate reference 2016020146VH	Dated 10-Oct-2016 (V band probe)	1
[AD08]	NPL certificate reference 2016020146WH	Dated 10-Oct-2016 (W band probe)	1

Abbreviations

AD Applicable Document

AIT	Assembly, Integration, Test
C	Compliant
CAD	Computer Aided Design
CDR	Critical Design Review
CTS	Consent to Ship
DUT	Device under Test
EMC	Electromagnetic Compatibility
ESD	Electrostatic Static Discharge
GRP	Glass-fibre Reinforced Plastic
I/F	Interface
IR	Infrared
ITT	Invitation to Tender
KO	Kick-Off
MRR	Manufacturing Readiness Review
NC	Non-Compliant
NIR	Near Infrared
NPL	UK National Physical Laboratory
PDR	Preliminary Design Review
RD	Reference Document
RF	Radio Frequency
S ₁₁	Scattering parameter S ₁₁ (from a port back to itself).
SOW	Statement of Work
TBC	To Be Confirmed
TBD	To Be Determined
TK	Thomas Keating (Ltd.)
TRB	Test Review Board

1. Introduction

Thomas Keating Ltd has designed, manufactured and had tested a set of two low gain "Illuminator" antenna for V and W-band operation, along with an equivalent pair of high gain "Probe", to the specifications set out in AD0

The Electromagnetic design and predicted performance, provide by Dr Soe Min Tun , is set out in AD04 and measurements -performed at the UK's National Physical Laboratory are set out in AD05 to AD08.

Their performance, and orientation information required to provide the optimum co and cross polar performance is set out in the measurement reports and ref , supplied in the EIDP

Mechanical drawings are also supplied in the EIDP

Low Gain Illuminator Feeds Handling

These are low weight and require no special handling other than normal care and attention due to any precision microwave components. Any damaging to the choke rings could reduce the excellent X-polar performance that they provide.

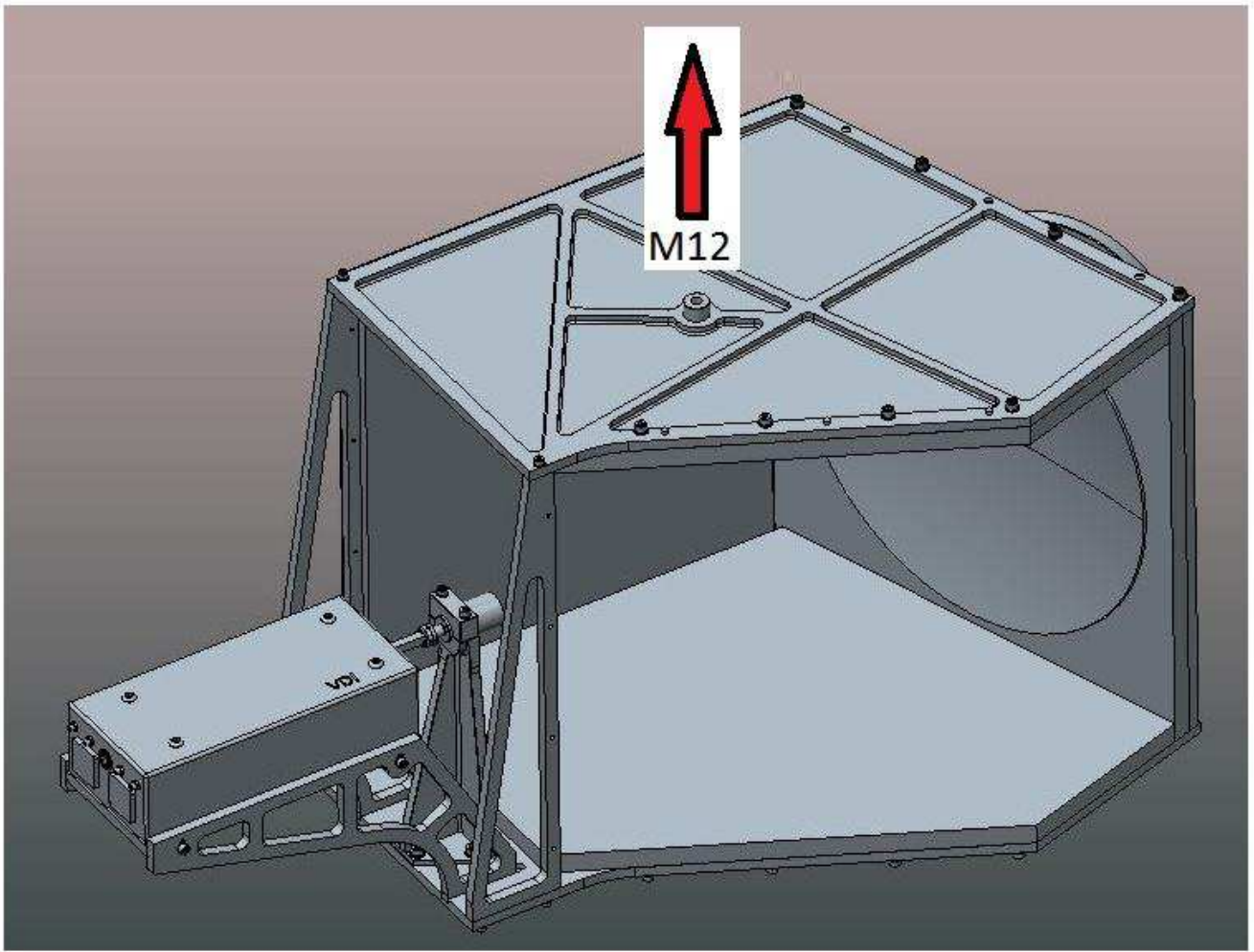
The captive bolts on the anti-cocking flanges should be tightened in symmetrical order, to ensure that the waveguide mating faces are flat and in good contact

High Gain Probe Feeds Handling

The two high gain antennas have a mass of 15.25 Kg, and are quite large: and therefore require special handing.

Two people should be used to hold and manipulate the antennas. There is a spigot (M12) on the top of the antennas which can be used for lifting with an appropriate eye bolt (two are supplied)





For manual handling we suggest the approach shown in the two photos is followed:



The corrugated horns are sensitive to excessive humidity and such be stored and used in a dry environment.