

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS 01886

17 December 1993

Telephone: 508-692-4764
Fax: 617-981-0590

To: Millimeter-wave VLBI Group
From: Alan E.E. Rogers *A.E.E.R.*
Subject: Subreflector spoiler cone

A new spoiler cone with the following mechanical parameters has been designed:

Cone diameter	7"
Cone apex angle	170°

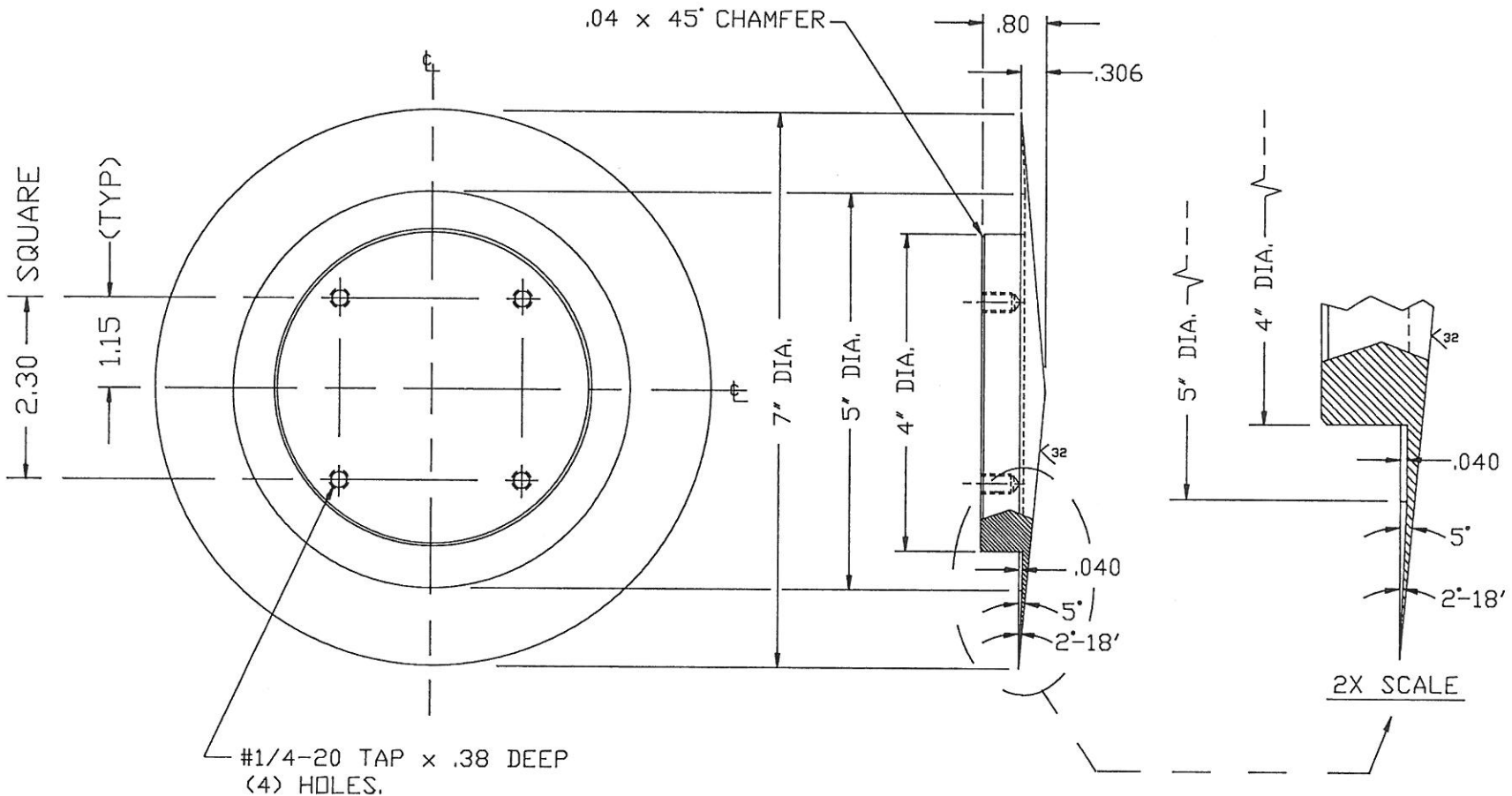
The detailed mechanical design was done by Bob Cady and the machining was done by John Moran. The following measurements were made of the performance:

Frequency	115 GHz
Frequency Switching	± 3 MHz
Ripple amplitudes:	
normal subreflector	0.5%
with 11" diameter absorber	0.2%
with cone	0.1%

The amplitudes are peak-to-peak fractions of the system temperature using ± 3 MHz frequency switching. In this frequency switching mode the ripple is enhanced by a factor of 4 when compared with a total power mode.

The reduction of the ripple by the cone by a factor of 5 is close to that expected from theory (see memo #10 of this series). The attached drawings show the details of the design.

CHANGE LETTER	DWN BY	CHGD BY	APP'D BY	DATE	D.C.N. & DESCRIPTION



NOTES

MATERIAL
ALUM. #6061-T6

FINISH AND/OR HEAT TREATMENT
NONE

SHOP NOTES UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS ARE IN INCHES
2. TOLERANCE ON DIMENSIONS
FRACTIONAL ± 1/64
DECIMAL .004 ± .005
3. SURFACE ROUGHNESS
PER MIL-STD-18
ANGULAR ± 90°
4. REMOVE BURRS AND BREAK
SHARP EDGES 1/64 MAX.
5. SCREW THREADS PER MIL-STD-9
6. ALL DIMENSIONS TO APPLY
BEFORE PLATING OR CON-
VERSION COATING.

USED IN

DRAWN FOR A.E.F. ROGERS DATE 11/93
DRAWN BY R.J. CADY DATE 11/93
CHECKED BY

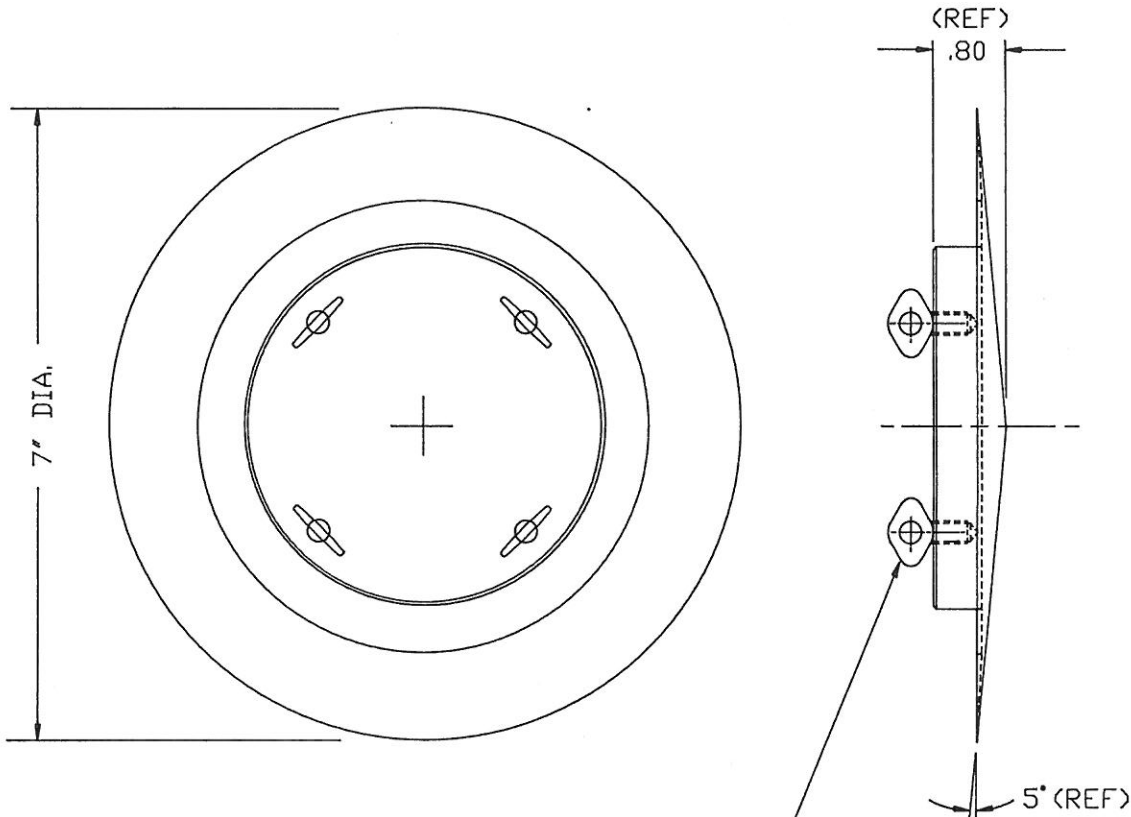
PROJECT
DESIGNER
MATERIAL & PROCESS
STRUCTURES
THERMAL
MECHANICAL ANALYSIS

NORTHEAST RADIO OBSERVATORY CORPORATION
HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS

SECONDARY REFLECTOR
CENTRAL CONICAL PLUG

ANTPLUG3	C		
CAD FILE	DWG SIZE	DWG. NO.	REV.

CHANGE LETTER	DWN BY	CHK'D BY	APP'D BY	DATE	D.C.M. & DESCRIPTION



MODIFIED #1/4-20 THUMB SCREW
(4) REQ'D - SEE CAD FILE ANTPLUG4

NOTES

1. FOR CONICAL PLUG DETAIL SEE CAD FILE ANTPLUG3.

MATERIAL	ALUM. #6061-T6
FINISH AND/OR HEAT TREATMENT	NONE

SHOP NOTES UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS ARE IN INCHES
2. TOLERANCE ON DIMENSIONS FRACTIONAL $\pm 1/64$ DECIMAL $\pm .01$
3. SURFACE ROUGHNESS PER MIL-STD-19 ANGULAR $\pm 90^\circ$ ✓ 63
4. REMOVE BURRS AND BREAK SHARP EDGES 1/64 MAX.
5. SCREW THREADS PER MIL-STD-9
6. ALL DIMENSIONS TO APPLY BEFORE PLATING OR CONVERSION COATING.

USED ON	
NEXT ASSEMBLY	
WEIGHT	
SCALE	FULL
CLASSIFICATION	

DRAWN FOR	A.E.F. ROGERS	DATE	11/93
DRAWN BY	R.J. CADY	DATE	11/93
CHECKED BY			
PROJECT			
ENGINEER			
MATL. & PROCESS			
STRUCTURES			
THERMAL			
META ANALYSIS			

NORTHEAST RADIO OBSERVATORY CORPORATION HAYSTACK OBSERVATORY WESTFORD, MASSACHUSETTS			
SECONDARY REFLECTOR CENTRAL CONICAL PLUG ASSEMBLY			
ANTPLUGS	C		
CAD FILE	DWG. SIZE	DWG. NO.	REV.

C-1