EDGES MEMO #166

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS 01886

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Telephone: 781-981-5400
Fax: 781-981-0590

To: EDGES Group

From: Alan E.E. Rogers
Subject: Tests of low band antenna at Haystack

The low band antenna which nominally covers 50 to 100 MHz was tested at Haystack on 10 April 2015. The antenna was on a ground plane 10x15ft (see figure 1) and oriented so that the electric field vector was aligned (i.e. the long dimension of the antenna) with the 15 ft. The S11 with 1.22" and 1.37" top plate gaps are shown in Figure 2 and 3.

The accuracy of the S11 measurements are limited because:

1. The ground plane size is a little marginal
2. There were some problems with the VNA which kept hanging with some internal system error. The difference between 1.22 and 1.37" is not as much as shown in the plots because the S11 at 1.37 was not calibrated. The calibration was lost whenever the VNA failed and recalibration was difficult because of the limited access under the ground plane to the connector.
3. The balun shield was not used – but this has little effect on the S11.

The dimensions of the balun tubes are given in Figure 4.

Figure 1. Low band (50 to 100 MHz) on temporary ground plane

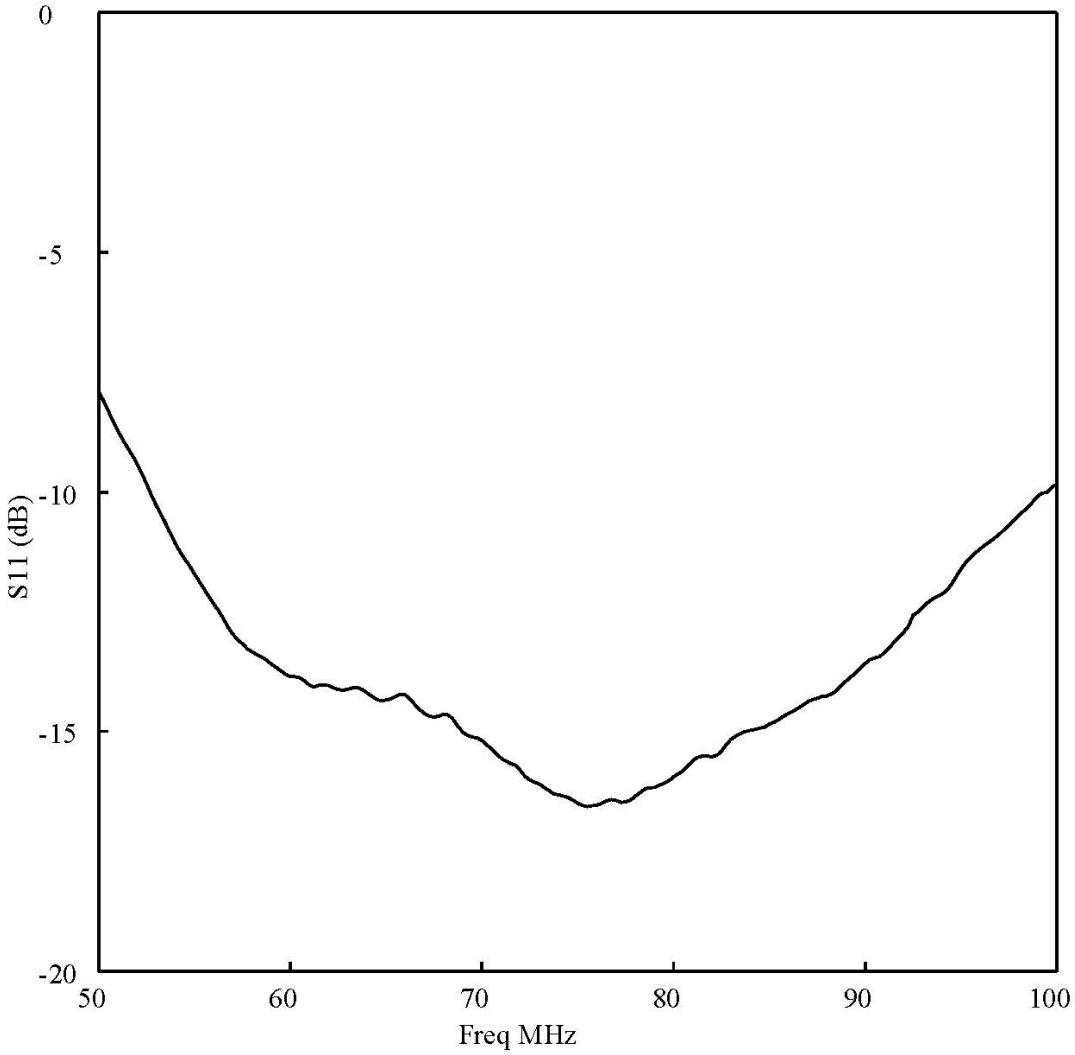

Figure 2. S11 with panel gap of 1.22”

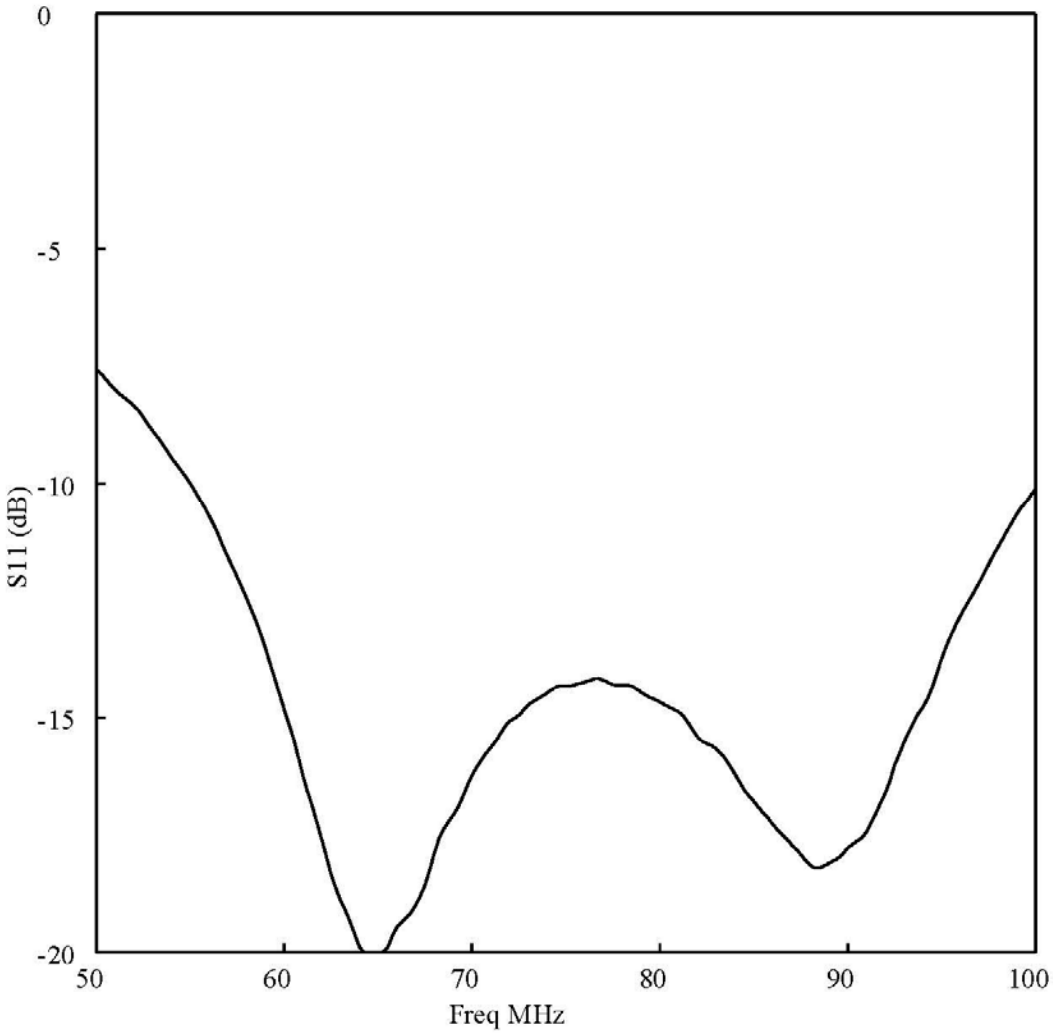

Figure 3. S11 with panel gap of 1.37”

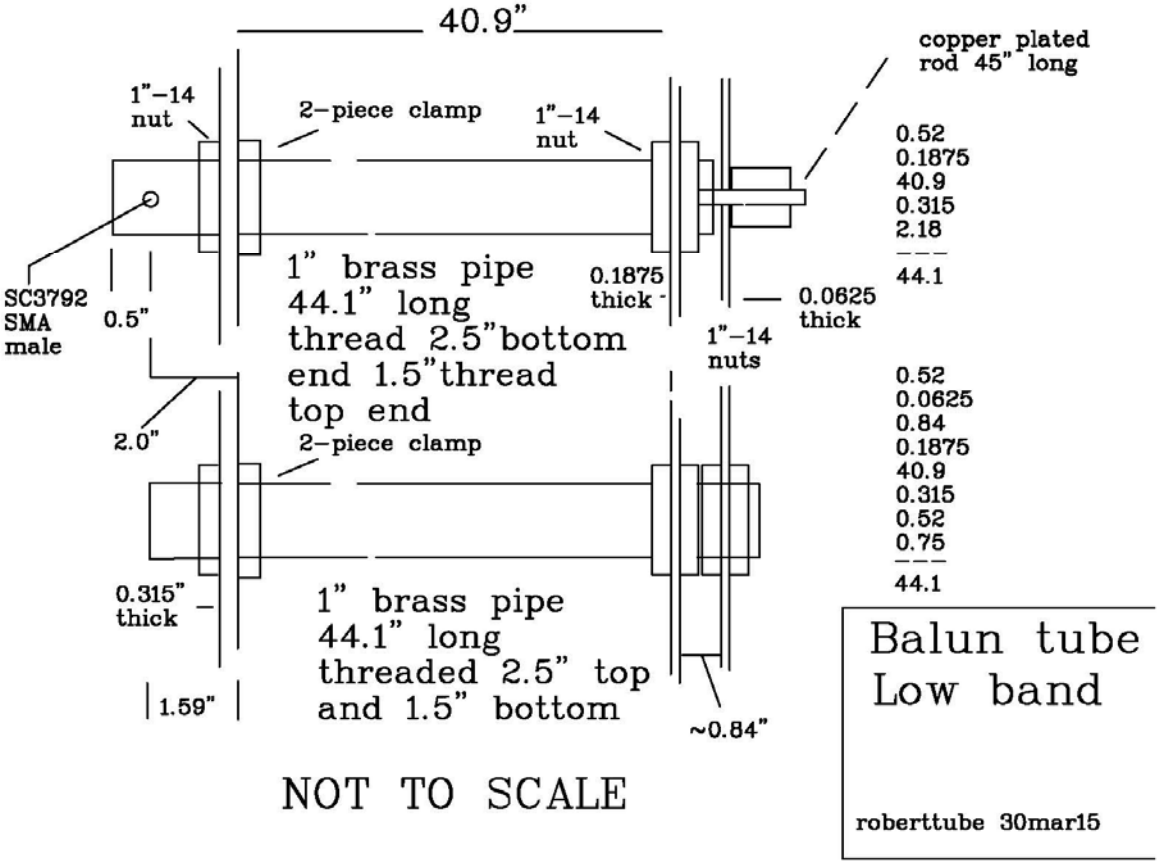

Figure 4. Balun tubes.