VLBA ACQUISITION MEMO #165

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

HAYSTACK OBSERVATORY

WESTFORD, MASSACHUSETTS 01886

30 August 1989

Area Code 508

692-4764

To: VLBA Data Acquisition Group

From: Alan E.E. Rogers

Subject: Some miscellaneous problems noted in the BBC modules

1] Board grounding

We have experienced some problems with the board grounding especially in the early prototypes which used #0-80 screws to attach the boards to the "grounding shelf". As a result of a recommendation from Sandy Weinreb, we changed to #1-72 screws. More recently, I have seen the grounding problem occur again in the oscillator submodule. In this most recent case, the screwhead had "eaten" through the board where there were no washers present. I suggest that lockwashers be used wherever possible.

2] Centering the coaxicon connectors

See Acquisition Memo #116.

3] Voltage margin for ECL divider

The voltage margin (for operation down to 4.5 volts) for satisfactory operation of the GaAs ECL logic can be increased (although no problems have been reported) by adding another 30 ohm resistor from pin 19 of the 10G070 to ground.

4] Achieving adequate image rejection

See Acquisition Memo #162.

5] Oscillator board thickness

It is important that the oscillator pc board be of the correct thickness - otherwise the inductance of the tank circuit will be incorrect and the oscillator will cover the wrong frequency range.

6] High frequency resistors

There are a few places in BBC where resistors with good microwave properties (use 1/8 w carbon or microwave film resistors) are important - these are as follows:

a) R21 and R18 in oscillator
b) 20 ohm output resistor in oscillator
c) 51 ohm hybrid termination resistor in SSB mixer

7] High Q components in oscillator

It is essential that high Q capacitors be used in the oscillator circuit. Also note that high Q capacitors from some manufacturers have resonances that depends on mounting orientation. Capacitors with resonances below 1.2 GHz should be avoided.

8] Oscillating regulators

On occasion some voltage regulators (probably a defective batch) will oscillate - even though they are bypassed with sufficient capacitance.