

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY
HAYSTACK OBSERVATORY**

WESTFORD, MASSACHUSETTS 01886

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Telephone: 781-981-5407
Fax: 781-981-0590

To: Broad Band Development Group
From: A.E.E. Rogers
Subject: Modification to NASA/Honeywell pcal for 5 MHz repetition rate

The current MK III/MKIV geodesy phase cal uses a tunnel diode pulse generator module (described in memo last up-dated 5 May 1989) and using a PC board dated 16 May 88. This module was designed to output pulses at a 1 MHz rate from a 5 MHz input. The repetition rate can be increased to 5 MHz by cutting the trace from pin 2 of the 74HCT00 (see circuit diagram drawing D 6359 4/88 attached) and connecting pin 2 via a 470 ohm resistor to + 5 volts on pin 14 of the same IC.

The advantage of a 5 MHz repetition rate for the VLBI2010 broadband system are as follows:

- 1] Phase cal rails can be made 14 dB stronger for a fixed peak pulse power.
- 2] An L.O. offset can be introduced in the UDC by selecting a 1st UDC L.O. frequency MHz digit that does not end in 0 or 5.

This phase cal pulse generator is a relatively new design and is extremely stable with temperature coefficient of 1.5 ps/C made even smaller by the temperature control unit design by Honeywell. It should be adequate for the initial testing of the VLBI 2010 system.

