BBDEV. MEMO #017

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To: Broad Band Development Group

From: A.E.E. Rogers
Subject: Modification to NASA/Honeywell pcal for 5 MHz repetition rate

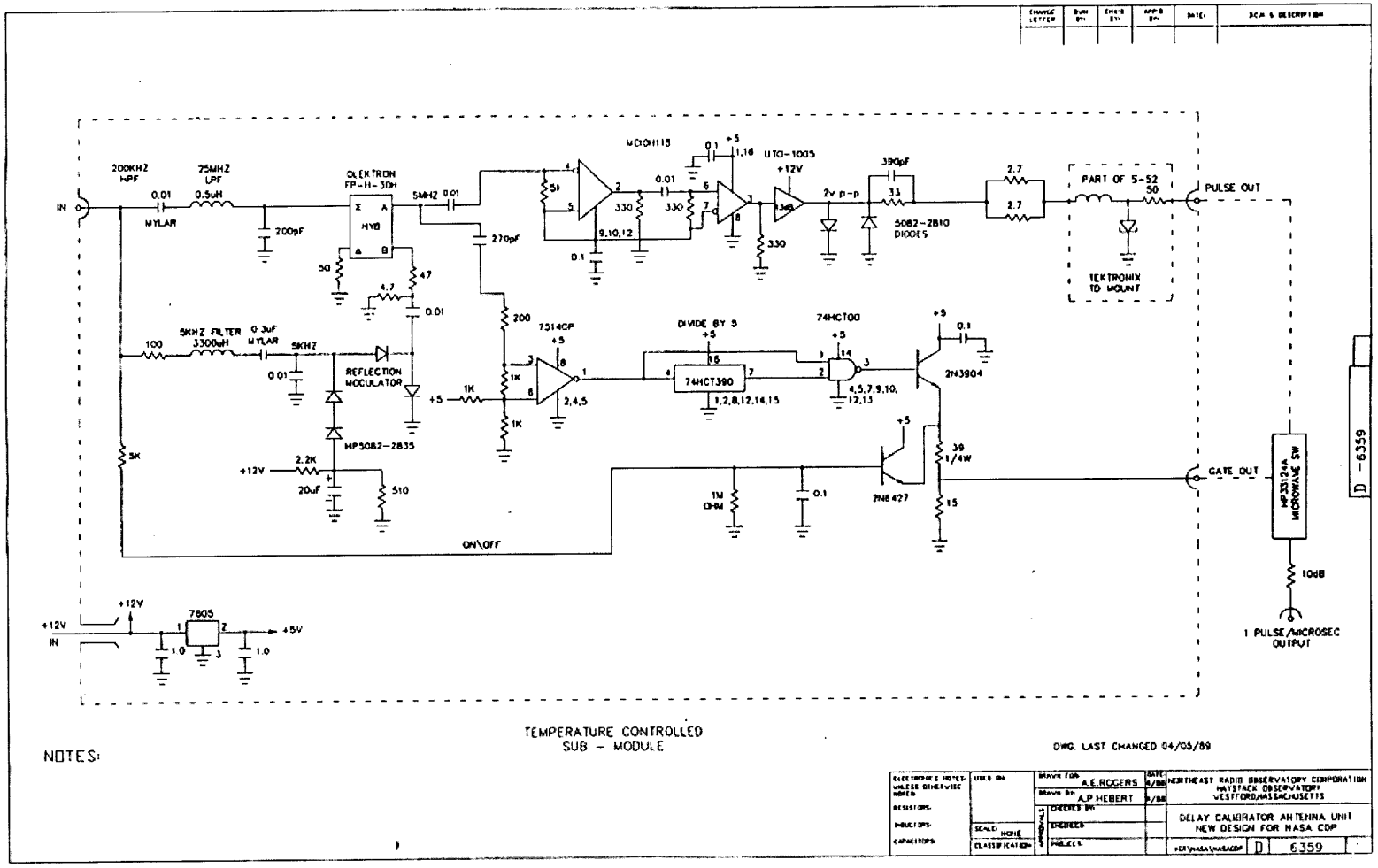
The current MK III/MKIV geodesy phase cal uses a tunnel diode pulse generator module (described in memo last up-dated 5 May 1989) and using a PC board dated 16 May 88. This module was designed to output pulses at a 1 MHz rate from a 5 MHz input. The repetition rate can be increased to 5 MHz by cutting 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 1$^{st}$ 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.


IN
200KHZ HPF
25MHZ LPF
0.01
MYLAR
0.5uH
200pF
OLEKTRON FP-H-30H
HYB
5MHZ
270pF
MC10115
UTO-1005
+12V
2v p-p
390pF
5082-2810 DIODES
PART OF 5-52
50
PULSE OUT
TEKTRONIX TO MOUNT
5KHZ FILTER
3300uH
0.3uF MYLAR
5KHZ
REFLECTION MODULATOR
MP5082-2835
7514CP
DIVIDE BY 5
74HCT390
74HCT00
2N3904
2N8427
GATE OUT
MP33124A MICROWAVE SW
10dB
1 PULSE/MICROSEC OUTPUT
ON\OFF
7805
+12V IN
+5V
NOTES:
TEMPERATURE CONTROLLED SUB - MODULE
DWG. LAST CHANGED 04/05/89
DRAWN BY A.E.ROGERS
DRAWN BY A.P.HEBERT
NORTHEAST RADIO OBSERVATORY CORPORATION HAYSTACK OBSERVATORY WESTFORD,MASSACHUSETTS
DELAY CALIBRATOR ANTENNA UNIT NEW DESIGN FOR NASA CDP
D 6359
D - 6359