National Radio Astronomy Observatory
Tucson, Arizona

March 31, 1988

MEMORANDUM

To:   Operators and Observers

From:  P. R. Jewell

Subject:  Vane Calibration of Continuum Data

To calibrate continuum data taken with the Digital Backend using the ambient temperature vane, follow these instructions:

1.   The DBE (digital backend) observing task must be loaded in the FORTH computer.

2.   You may chose the number of repeats of the VANE-SKY cycle by setting the FORTH parameter CRPT. For example, 1 CRPT ! sets in one repeat.

   You may chose the length of the integration time for each sample (vane or sky) by setting the FORTH parameter CSEC (number of seconds x 10). For example, for 5 second samples, enter  50 CSEC !

3.   To perform the vane calibration, type CALIBRATE at the FORTH console.

4.   The formalism for calibrating continuum ON-OFF data is

$$T_R* = [T_A(on) - T_A(off)] * TC / [T_{vane} - T_{sky}].$$

   TC is the scale factor which should be set to about 400. To compute the quantity $[T_{vane} - T_{sky}]$ from the vane calibration scan, install the procedure VCAL into CONDAR (the continuum analysis package) by typing

      INSTALL VCAL

   at the observer's terminal. Then type

      scan_number VCAL

   This will print out a message "SET DSF TO" xxxxx. Tell the operator that this is the new DSF value (see below). Do this for both polarization channels. To display the calibration scan, type
      scan_number T

5. The observer having done Step 4, the operator should enter the
   following information into the control computer:

   4000 TC !
   4000 TC 1+ !     (set TC for both channels to 400)
   0 TAU0 !  (the zenith optical depth must be 0 or the
                atmosphere will be corrected for twice!)
   0 NT  (should already by set; indicates no noise tube)

   If both polarization channels have the about the same
   calibration scales (probably not the case) enter

   xxxxx DSF  (where xxxxx is the number generated in Step 4.

   If the 2 channels have different calibration, enter

   xxxxx #CP  (for the DSF value of Receiver 1), or
   xxxxx #CP 1+  (for Receiver 2).


6. Any DBE data taken thereafter will be calibrated on the $T_R^*$
   scale.  Of course, the calibration procedure should be
   repeated frequently to properly correct for changes in the
   atmospheric transmission.

7. For more information, see Chapter 6 of the "Draft Users
   Manual" (available at the telescope) and "12 Meter Memo No.
   242" on the Digital Backend.

```
PROCEDURE VCAL(XSCAN)
* THIS PROC CALCULATES CONTINUUM VANE CAL NUMBERS
* PRJ   8 MAY 1987
* Modified 31 Mar 87
GET XSCAN
NPT = NOPTS
LEN = HEADLEN
TAVANE = 0
TASKY = 0
P = PTWH
FOR J = 1 TO NPT/8
    K = LEN + 2*J - 1
    TAVANE = TAVANE + TWH(K,P) + TWH(K+1,P) + TWH(K+2,P) + TWH(K+3,P)
    TASKY  = TASKY + TWH(K+4,P) + TWH(K+5,P) + TWH(K+6,P) + TWH(K+7,P)
    END
TAVANE = TAVANE*2./NPT
TASKY = TASKY*2./NPT
TDIFF = TAVANE - TASKY
PRINT '      TA_SKY  = ' TASKY
PRINT '      TA_VANE = ' TAVANE
PRINT '      TA_DIFF = ' TDIFF
PRINT '      SET DSF TO ' TDIFF
RETURN
FINISH
```