Title: WEATHER MONITOR SYSTEM

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Date: June 7, 1990

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WEATHER MONITOR SYSTEM

Dwayne R. Schiebel

Introduction

This note describes a WEATHER MONITOR SYSTEM that was built to enable a
PC to input weather information through its serial port. This system was built
around the VLBA MONITOR & CONTROL CARD. In addition to weather information, 16
bits of digital input and output were provided. In order to provide isolation
between the weather monitor chassis and the PC the data link is over fiber-
optic cable. This fiber-optic cable is connected to a multiplexer built by R.
Weimer.

Programming

The selected ID for VLBA M & C card is 8. All addresses are base
address plus indicated address.

ADDRESS

0 Dew Point
1 Temperature
2 Barometric Pressure
3 Wind Speed
4 Spare Analog Ch 4
5 Spare Analog Ch 5
6 Spare Analog Ch 6
7 Spare Analog Ch 7

64 Digital Output, 16 Bits
   D0 Alarm, output a 1 to close a contact
   D1-D3 Spare output contact closures
   D4-D7 Complemented TTL output bits
   D8-D15 True TTL output bits

68 Digital Input, 16 Bits
   D0-D3 Optical isolated input bits
   D4-D15 TTL true input bits

Electronics Descriptions

M & C Card Interface

The VLBA MONITOR & CONTROL CARD and its associated interface logic is
contained in one chassis; the block diagram (B17215K001) for this system can
be found at the end of this note. It contains three modules: An RS422 to
Fiber-Optic Converter, Interface for VLBA M & C card and the VLBA M & C card.

The RS422 to Fiber Converter can be found on drawing B17215S002. This
circuit was a copy of R. Weimer's circuit used in the Receiver Monitor Control
system. This converter circuit card can be removed through the back panel of
the Weather Monitor Chassis. For test purposes a card has been designed to
allow the connection of the Weather Monitor directly to the PC without going through fiber cable, reference drawing B17215S006.

Logic to interface the outside world to the VLBA M & C card can be found on logic drawings B17215L001. Page 1 of the drawings contain the logic to generate the necessary VLBA M & C handshake signals. The digital output logic is on page 2 and digital input logic is on page 3. Take note of the optical isolated inputs D0-D3; the maximum input current is 50 mA.

A complete wiring diagram of the weather monitor chassis can be found on drawing number B17215S003.

**Analog Buffer Cards**

Two analog buffer cards were built to condition the weather information before it is supplied to the weather monitor chassis.

The first card, drawing B17215S004, was an addition to an existing buffer card. This card was used to buffer dew point, temperature and barometric pressure before it was sent to the 140-ft telescope. This card was modified by duplicating the three buffers and providing this weather information to the weather monitor chassis.

The second buffer card is used for wind speed. It plugs into the wind speed chassis and provides gain and filtering for the weather monitor.

**Credits**

Credit should be given to R. Weimer for the fiber-optic circuit, to J. Turner for constructing the necessary equipment for the weather monitor, the Green Bank Shop for constructing the chassis, and to the designers of the VLBA M & C card.
TEST BOARD TO REPLACE OPTO-CARD
AND GO DIRECTLY TO SERIAL PORT

RECEIVE DATA, SHALLOWAY CARD TO SERIAL PORT

TRANSMIT DATA, SERIAL PORT TO SHALLOWAY CARD

OPTO-CARD

RCA V. D

RECEIVE DATA

TRANSMIT DATA

PEL

DATE AUG 11, 1983 SHEET 1 OF 4
NOTE:
ID SELECTED
FOR WEATHER
MONITOR IS 8
WITH ODD
PARITY. SO
ALL SWITCHES
SHOULD BE CLOSED
EXCEPT SW 4

NOTE:
ID REQUEST
DEV REQ • ANHNB
ADDRESS DECODE
READ & WRITE ENABLES

ID: 1844

NOTE: HI/LO SEL
CAN BE USED TO
MULTIPLEX ANALOG
INPUT
ISOLATED INPUTS

DO+ 2.29 1 4N25 5
DO- 2.30 2 U009 4
D1+ 2.31 1 4N25 5
D1- 2.32 2 U010 4
D2+ 2.33 1 4N25 5
D2- 2.34 2 U011 4
D3+ 2.35 1 4N25 5
D3- 2.36 2 U012 4

TTL INPUTS

D4 3.37
D5 3.38
D6 3.39
D7 3.40

+5V

U038 4.7K

ISOLATED INPUT AND TTL INPUTS

COM/HDN

ISOLATED INPUTS

DO+ 57 0
DO- 58 1
D1+ 59 2
D1- 60 3
D2+ 61 4
D2- 62 5
D3+ 63 6
D3- 64 7
D4 65 8
D5 66 9
D6 67 10
D7 68 11

TTL INPUTS

D4 69 12
D5 70 13
D6 71 14

+5V

-14.7K 1.4K

-12V 12K

NRAO GREEN BANK

TITLE WEATHER MONITOR FOR INTER. 85-3 COMP

SIZE NUMBER B17215L001

DATE AUG 14, 1969 SHEET 3 OF
NOTE:
When in operation look at P-P level at TP1. It should be 1 to 40 P-P. For short runs it may be > 40. Short TP1 to TP2 to cut gain of first stage. Adjust pot for good crossover points after gain of first stage is adjusted. Turn pot clockwise for low input and counter clockwise for high input.

UNLESS OTHERWISE NOTED ALL RESISTORS ARE 1/4 W
WINDSPEED BUFFER

NRAO GREEN BANK

TITLE WEATHER MONITOR FOR INTER. 85-3 COMP

SIZE B  NUMBER B17215S005  F/C B

DATE AUG 22 1983  SHEET 1 OF 1
FIBER OPTIC CABLE FROM OS-3 COMM CONVERSION CHASSIS

CONVERT FIBER TO TIL CARD

SMALLWAVE CARD

MONITOR & CONTROL CARD

XMT+ J2-21
XMT- J2-22
RCU+ J2-19
RCU- J2-20
RDA-RP7 J1-49-41
CON/MON 9-15 J1-33-26
DEU REG J1-16-9
DEU ACK J1-36
ID REG J1-49
RHEN B J2-9
J1-97

ANALOG IN 0-7

J1-1-8
J1-18-25
J2-15 +15
J2-16 -15
J2-4 +6
J2-14 -15 RET
J2-17 +6 RET
J2-18 +15 RET
J2-25 -6 RET
J2-18 TRANSMIT ACTIVE LED

4 CONTACT OUTPUTS
12 TTL OUTPUTS
4 OPTO-ISOLATED INPUTS
12 TTL INPUTS
LED DRIVE DIGITAL & ANALOG

BLOCK DIAGRAM FOR WEATHER MONITOR SYSTEM

NRAO GREEN BANK

TITLE
WEATHER MONITOR FOR INTER. OS-3 COMP

SIZE
B

NUMBER
B17215X001

DATE AUG 11, 1989

SHEET 1 OF 1