VLB ARRAY MEMO No. 409

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14 November 84

To: VLBA
From: W. D. Cotton
Subject: Data Processing Meeting 13 November 1984

Present: Benson, Bridle, Burns, Cornwell, Cotton, Fiokling, Greisen, Hildrup, Kellermann, Molnar, Romney, Walker

The items discussed on the agenda were the following:

1) VLBA Project Book. Section 11 on post processing will be revised before 1 December 1984. One problem needing attention is the use of the term "fringe processor" to mean something entirely different from the devices with the same name being considered by the correlator group.

2) Flagging. The current thinking is that flagging information would go into a separate file which contains entries which describe data to be rejected. This file could be initilized using output from the fringe processor (ours not theirs) and would contain some information about the reason for flagging the data. Since this is an AIPS table file any of these entries could be temporarily disabled. A proposed extension table for flagging information is specified in DATAPROC:FLAGTAB.SPC and is appended to this document.

3) Nomenclature and use of (IFs, IF groups, channels, etc.). Should these randomly spaced, groups of frequency channels be considered as independent axes in the data arrays and if so what should we call them. A proposed extension table to define the IFs (or whatever) is specified in DATAPROC:CHANTAB.SPC and is appended to this document.

Item 1) There was considerable discussion about what the functions of this part of the correlator are, these ranged from fringe fitting the calibrators to producing fully calibrated (amplitude, delay, rate) data. There was also discussion about how much of the "fringe processing" this committee was responsible for. No conclusion was reached and further discussion was deferred to the Nov. 20 minidesign review meeting. C. Walker pointed out that the portion of section 11 of the project book comparing the relative requirements of the VLA and the VLBA were out of date; he was volunteered for the necessary rewrite.

Item 2) There was general agreement that the currently proposed scheme of keeping a table of editing criteria was a good idea. The need for having the online flags already applied (but still carried in the table) became apparent during the discussion; data that is

clearly bad (antenna off source, receiver not working etc.) should not be written onto the archive medium. E. Greisen argued that the online flags should be kept in a separate table since this list would be rather lengthy and need not be read each access of the data base.

Greisen also suggested using a table giving time ranges and bit masks to be used to flag the data. This table could be an AIPS extension table and be updated when the flagging table is changed.

Item 3) Since the VLBA and the VLA will be capable of producing data with multiple irregularly spaced blocks of regularly spaced frequency channels some provision needs to be made for this case in the data base structure. There were no objections voiced to adding a new axis to the regular array portion of a visibility record for this type of data. The nomenclature adopted was "IFs" even though this does not exactly correspond to the current VLA useage. As applied here, "IF" refers to all polarizations in the frequency range derived from a single front end receiver (VLA) or one sideband of a video converter (VLBA). (The A and C "IFs" at the VLA are a single IF by this definition.)

C. Walker pointed out that the frequency increment may need to be included in the IF table (CHANTAB). He also noted that there was a accountability problem with keeping track of the exact observing frequency for spectral line observations when there is doppler tracking.

Walker also claimed that there would be a need to allow independent sets of frequency settings for the IFs for each source in some spectral line experiments. Two possible suggestions were discussed: 1) keeping an IF frequency table in each source file entry or 2) having multiple IF tables and a pointer in each source entry to the appropriate IF table.

J. Romney pointed out that the convention used to denote sideband in the original version of the CHANTAB was the reverse of the natural one. Walker requested a utility routine to determine the frequency of a given set of data since, in the current design, the frequency must be derived from values kept in different files.

Following are the updated specification files for the flag and IF tables:

VLBA Post Processing Software Specification

Post Processing ID: 4.X Flagging table (FLAGTAB)

Version: 11/06/84

Type: AIPS table structure

Function: This table will contain editing information.

Details:

A. Overview

This extension table for a uv data set contains the editing information. This information may or may not have been applied to the data depending on the uv data file type. This file will contain a list of specifications of data to be flagged.

Names: The file name is FGdsssvv where d is disk number, sss=catalog number and vv = version number.

B. File structure.

Each logical record consists of a specification of data to be flagged. These specifications are independent and may overlap. Data is to be rejected if it is specified in any flagging record that is currently selected. Any entry may be temporarily disabled by deselecting that table entry.

The file header record contains no KEYWORDs.

Table entries:

Title	Units	Description
SOURCE	char.	Name of the source to be flagged, (8 Char) blank => all sources
SUBARRAY	integer	Subarray number, 0 => all
ANT1	integer	The number of the first antenna, 0 => all baselines to all antennas flagged
ANT2	integer	The number of the second antenna, 0 => all baselines to ANT1 flagged
BTIME	Days	Time of beginning of flagging in the same system as the data is labeled.
ETIME	Days	Time of end of flagging in the same system as the data is labeled.
BIF	integer	Number of first IF group to be flagged.
EIF	integer	Number of last IF group to be flagged.
BCHAN	integer	First channel number in IF group.
ECHAN	integer	Last channel number in IF group.
BPOLN	integer	First polarization to be flagged, 0=> all; 1=>Ipol, 2=>Qpol, 3=>Upol, 4=>Vpol, -1=>RR, -2=>LL, -3=>RL, -4=>LR, -5=>HH, -6=>VV, -7=>HV, -8=>VH
EPOLN	integer	Last polarization to be flagged, 0=> all;
REASON	char	Reason code for flagging (8 char)

C. User notes.

D. Routines to write FG files:
Chapter 14 of "Going AIPS" given a detailed description of routines to access tables files.

E. Routines to access FG files:
Chapter 14 of "Going AIPS" given a detailed description of routines to access tables files.

Special Requirements: none.

Revision:
11/06/84 W. Cotton Original specifications.

VLBA Post Processing Software Specification

Post Processing ID: 4.X IF table (CHANTAB)

Version: 11/07/84

Type: AIPS table structure

Function: This table will contain information about the IF groups in the raw uv-data file.

Details:

A. Overview

This extension table for a uv data set contains relevant information about the IFs in the raw uv data file. For these purposes an IF consists of the output from an IF at the telescope which can be arbitrarily spaced in frequency form other such IFs. Examples are the A-C and B-D IFs of the VLA and the output of independent video converters in VLBI recorders. Individual, regularly spaced frequency or delay channels derived from the correlation of such IFs are not themselves considered IFs.

Names: The file name is CHdsssvv where d is disk number, sss-catalog number and vv = version number.

B. File structure.

This extension tables contains all of its information as keywords in the header; there are no regular data records. These keyword/value pairs tell the number of IFs (also given in the catalogue header record) and the frequency offset to the center of the IF and the sideband of each IF.

The file header record contains the following KEYWORDs:

Keyword	Type	Description
INOGRP	Integer	The number of IF groups.
FOFF1	Real	Frequency offset in Hz from reference frequency in the catalogue header of the first IF group.
ISIDE1	Integer	Sideband of the first IF,

		-1-› 0 video freq. is the high frequency end 1-› 0 video freq. is the low frequency end
...		
FOFFn	Real	Frequency offset in Hz from reference frequency in the catalogue header of the n th IF group.
ISIDEn	Integer	Sideband of the n th IF, -1-› 0 video freq. is the high frequency end 1-› 0 video freq. is the low frequency end

C. User notes.

The true frequency of the observations are the signed sums of the reference frequency in the catalogue header, the peculiar source frequency offset from the source table (SU file) and the IF frequency offset from this file.

D. Routines to write CH files:
Chapter 14 of "Going AIPS" given a detailed description of routines to access tables files.

E. Routines to access CH files:
Chapter 14 of "Going AIPS" given a detailed description of routines to access tables files.

Special Requirements: none.

Revision:
11/07/84 W. Cotton Original specifications.