

NATIONAL RADIO ASTRONOMY OBSERVATORY

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VLA COMPUTER MEMO #123

SOURCE CARD FORMATS
PRELIMINARY SPECIFICATION

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I propose the following format to be equivalent to the source cards now read by the interferometer computer. The card will be read by a FORTRAN program and appropriately decoded. It is anticipated that a rather more flexible program will eventually be written to make up these cards, and, at the same time, to check on elevation limits, etc. Minimal checking will be done in the program which reads these cards.

These cards will be normally found in the fourth, fifth, etc. file of the disk partition DVP for the first, second, etc. subarrays respectively.

For each field below I give the FORTRAN format, a typical prototype, and the column upon which the field ends.

CARD 1. Source Request Card

- a) Source Name, A8, ssssssss, Col. 8.
- b) Source Name Qualifier, 15, nnnnn, Col. 13. Used to delimit subdivisions of observations of one general source, if desired.
- c) Stop Time, A1, I2, 2I3, hh mm ss, Col. 22. Local apparent sidereal time. Will continue to the first 10 seconds after this time. Time greater than 24 hours means observe indefinitely. A dollar sign in Col. 14 means that the time is a duration rather than an absolute time.
- d) Position, RA, 2I3, F8.4, hh mm ss.ssss, Col. 36.
- e) Position, Dec. 1X,A1,I2,I3,F7.3, sdd mm ss.sss, Col. 50. The sign may be positive = blank, +, &, or 0, or negative = -.
- f) Epoch, A3, ccc, Col. 53. Code -- blank = 1950, m = mean position this JY, D = position of date, C = 2000, a number nn means 19nn, a number mnn is lmnn if m > 5 or 2mnn if m < 5.
- g) Front Ends, 1X,2A1, cc, Col. 56. Code -- L, C, U (for KU Band), K

ANTENNA INFORMATION

The antenna information, equivalent to the Baseline cards on the current interferometer, will be found in file one of the disk partition DVP. It, also, is card images to be read by a FORTRAN program. The format is as follows:

CARD 1. Antenna Identification

- a) Antenna ID number, I5, nn, Col. 5.
- b) Antenna address, I5, nn, Col. 10.
- c) Station ID, 2X, 3A1, cas, Col. 15
c = configuration (A,B,etc.), a = arm (E,W,N),
s = station # (1-9)

CARD 2. Antenna Location

- a) BX,BY,BZ, 3F15.4, Col. 45. Coordinates in nanoseconds relative to site center reference point.
- b) Delay center, F15.4, Col. 60. Cables and receiver delays in nanoseconds.
- c) BA, F10.4, Col. 70. Axis intersection defect, nanoseconds.
- d) H, F10.4, Col. 80. Elevation above site reference datum, nanoseconds.

CARD 3. Pointing Constants

- a) Az constants, except offset, 6F6.3, Col. 36. Minutes of arc.
- b) Az offset, I4, F7.3, dd mm.mm, Col. 47. Sign of minutes and fraction forced to agree with degrees, unless degrees is zero.
- c) Elevation constants, 5F6.3, Col. 77. Minutes of arc.

CARD 4. Receiver Particularizing.

- a) IF, frontend, special codes, A1, abc, Col. 3.
a = IF ID (A,B,etc.)
b = Frontend ID (L,C,K,etc.)
c = Reserved for special codes for IF connection reversed, diicroic reflector inserted, etc.
- b) IF peculiar delay, F7.4, Col. 10. Nanoseconds
- c) IF peculiar phase, F5.1, Col. 15. Degrees
- d) Colimation error, az and el, 2F5.2, Col. 25. Minutes of arc.
- e) Secondary rotation setting, F5.1, Col. 30. Degrees
- f) Focus curve, 2F5.1, Col. 40.
Focus = $F_0 + F_1 \sin h$ in millimeters

- g) Reserved for expansion, 5X, Col. 45.
- h) Grain and opacity curve, 4F5.4, Col. 65.

Net antenna efficiency is estimated to be
 $E = E_0 + (\sin h-1) E_1 + \cos h E_2 - (\csc h-1) E_3$

- i) Noise tube temperature, F5.3, Col. 70.
 Degrees
 Best estimate of correlated flux is measured
 correlation coefficient times
 $2k/A$ (Where A is antenna area) times geometric
 mean of

<u>System Noise Power</u>	<u>Noise Tube Temperature</u>
Detected noise tube power	Net efficiency

for the two antennas.

- j) Reserved to Col. 71.
- k) Applicable tuning digit, I1, Col. 72.
- l) Applicable first LO, I3, Col. 75.
 Hundreds of MHz
- m) Lowest second LO for which this card applies,
 F3.4 Col. 78, MHz
- n) Range of second LO covered by this card, F2.3,
 Col. 80, MHz

As many as needed receiver particularizing cards are included,
 until terminated by a blank card.

Note on ID's.

Arms are identified by a single ASCII character - E,W or N.

Subarrays are identified by a number -1, 2, etc.

IF groups are identified by a number. These will be up to four, each
 using one of the Control Room 2nd LD Systems.

Antennas are identified by a number, and further characterized by
 their address on the DCS. Both numbers lie in the range one to
 thirty-one.

Front ends are identified by a single ASCII character - currently the
 band they cover, L, C, U (meaning KU band) and K.

Preamps are identified by a single ASCII characters - currently A,
 feeding IF's A and B, and C feeding IF's C and D.

IF's are identified by a single ASCII character - A, B, C, or D.