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National Radio Astronomy Observatory
Tucson, Arizona
March 9, 1989

MEMORANDUM

To: 12 Meter Computing Report Series
From: P. R. Jewell
Subject: PSM and TPM Observing Procedures

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CHARLOTTESVILLE, VA.

MAY 23 1989

Some questions have arisen on the Forth observing procedures PSM (position-switched mapping) and TPM (total power mapping), and whether they constitute a substitute for APM (absolute position-switching, or catalog mapping).

PSM and TPM work by building up a grid of RA/DEC offsets relative to a single RA/DEC center position. When the map is executed, only the center position appears on the Forth status monitor. The offsets for each grid point also appear on the screen and are written to the header of the scan saved on the VAX disk. The starting point of the map is the negative-most RA and negative-most DEC offset. The map is built up by scanning from West to East in Right Ascension, then from low to high declination.

The reference (OFF) position is relative to the center of the map, not the particular grid point. Reference positions can be specified in the AZ/EL or RA/DEC frames. Note that if you specify an RA/DEC offset, the switching mode is equivalent to *absolute position switching*, since the reference position always goes to the same RA/DEC position on the sky. The reference position offset cannot be more than $2^{\circ}48'$ from the map center; $2^{\circ}48'$ is equivalent to 11^m12^s of Right Ascension at the celestial equator.

Can PSM be used as a substitute for APM? In many cases, yes. Both PSM and APM execute rectangular grid maps, but PSM is easier to set up and offers a little more flexibility in terms of executing subsets of the map. The main limitation of PSM is that the reference offset must be less than $2^{\circ}48'$. For complex emission fields, such as found near the Galactic plane, this is often not enough. In addition, with APM you can construct your own catalog of map positions (not necessarily a rectangular grid) and have them executed automatically.

Distribution:

- 12 Meter Computing Series Notebooks (KP, TUC, CV) ✓
- C. Biemesderfer
- D. Chase
- D. Emerson
- P. Jewell
- P. Murphy
- B. Peters
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