NATIONAL RADIO ASTRONOMY OBSERVATORY
Green Bank, West Virginia

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TO: Scientific Staff
Electronic Engineering Staff

FROM: M. M. Davis

The enclosed sheets summarize 300-foot system performance with presently-available front-ends at 6, 11 and 21 cm. They may be of assistance in planning observations, or for general reference in answering questions concerning detection capabilities or confusion levels.

Enc.

300-Foot System Performance at 6, 11 and 21 cm

		6 cm	11 cm	21 cm†
Recommended continuum system		AIL	3-feed	4-feed
T_{system} (with switch, on telescope)	Continuum	125°K	140°K	150°K
	Polarization switching	135°K	210°K	220°K
Bandwidth		150 MHz	40 MHz	60 MHz
Beamwidth		2!7	4!9	10!5
RMS noise error in flux density at zenith for a source of known position (in 1 drift scan)		12 mfu	25 mfu	15* mfu
* Increased by confusion to ∿ 35 mfu.				
Confusion (approx.)		3 mfu	10 mfu	30 mfu
Declination limits for				
20% aperture efficiency	δ	7°→69°	-19°→90°	-19°→90°
30% aperture efficiency	δ	18°→58°	-10°→86°	-19°→90°
Maximum aperture efficiency (1 fu ≡ 1°K for aperture efficiency = 42.0%)		40%	50%	52%

† A new 70°K (without switch) 40 MHz bandwidth dual linear system will be available ∿ Summer 1972.

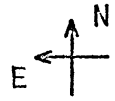
300-FOOT FRONT ENDS

BEAM CONFIGURATIONS AND E-VECTOR POSITION ANGLES FOR ROTATION ANGLE 0°. (THE CONFIGURATIONS MAY BE ROTATED ± 200° FROM THE CONTROL ROOM.)

POLARIZATION SWITCHING

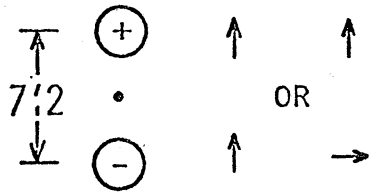
6 CM

SCALAR FEED



SINGLE

RECTANGULAR HORNS (BEAMSWITCHING)



BEAM-SWITCHING

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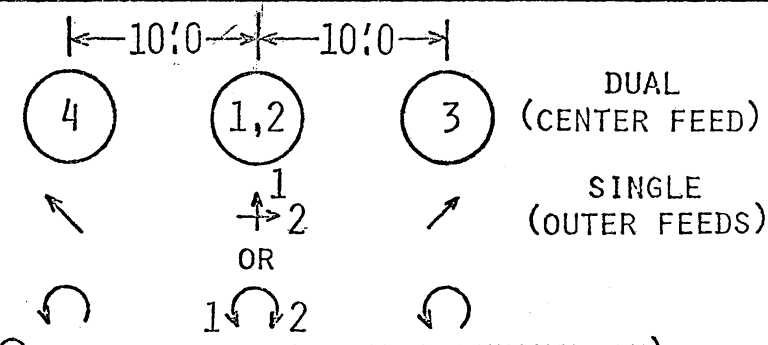
11 CM

3-FEED



DUAL (CENTER FEED)

SINGLE (OUTER FEEDS)

(↶ ≡ LEFT CIRCULAR, IEEE DEFINITION)

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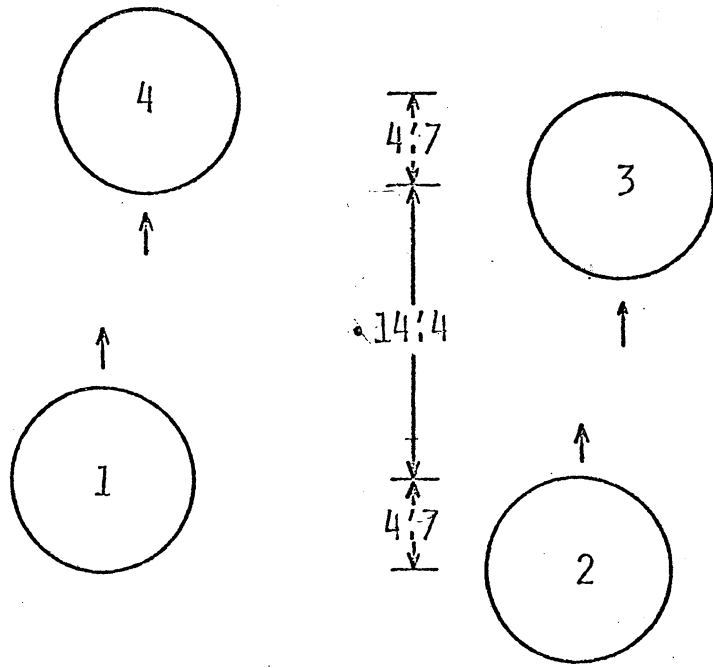
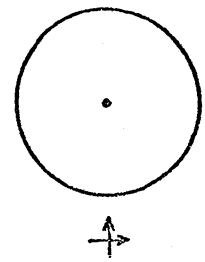
21 CM

4-FEED



NONE

ZEEMAN FEED



DUAL