NATIONAL RADIO ASTRONOMY OBSERVATORY
Edgemont Road, Charlottesville

18 July 1988

TO: Phyllis Jackson

FROM: Alan Bridle

RE: Material for annual BAAS Report

also in CVAX as
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Bridle, with I.Browne (Jodrell Bank), J.Burns (U.New Mexico), J.Dreher (M.I.T.) D.Hough (J.P.L.), R.Laing (R.G.O.), C.Lonsdale (NEROC), A.Readhead (Cal Tech), P.Scheuer (Cavendish Lab) and J.Wardle (Brandeis) has continued a systematic search for counterjet emission in a complete sample of 3CR quasars more than 10 arcsec in angular diameter. Images at 4.9 GHz with 0.35 arcsec resolution and 20 microJy per beam r.m.s. noise have revealed jets in all 12 sources studied so far, and candidate counterjet emission in six of them. The counterjet emission is generally discontinuous and at least ten times fainter than that of the jet. In no case is the counterjet simply a faint replica of the main jet. The statistics of jet/counterjet brightness ratios are consistent with mildly relativistic bulk velocities in the jet outflows, but the brightness ratios also have large point-to-point fluctuations and so are amenable to other interpretations.

Bridle has investigated the statistics of jet prominence (apparent fraction of the total extended flux density that is contained in the brighter jet) in a sample of extragalactic radio sources with redshifts between 0.15 and 1.5. The (kiloparsec or greater scale) jets are more prominent in sources with apparently small projected linear sizes and with apparently complex morphologies, and in sources with prominent radio cores. These results are consistent with a correlation between jet prominence and orientation of sources toward the line of sight, and thus with mildly relativistic bulk velocities in the kiloparsec-scale jets.

Bridle, with S.Baum (NRAO/U.Maryland), T.Heckman (U.Maryland), G.Miley (S.T.Sc.I.) and W.van Breugel (U.C.Berkeley) completed a study of the radio properties of 38 galaxies from a representative, flux-density limited, optically unbiased sample that was also searched for extended optical line-emitting gas. The results show that extended line emitting gas is common in powerful radio galaxies. In some cases the line emission is concentrated in filaments tens of kpc (and in one case 100 kpc) long. Superpositions of the radio and optical data made using the NRAO AIPS system revealed several correlations between optical and radio properties that are being studied in detail by Baum and Heckman.