NATIONAL RADIO ASTRONOMY OBSERVATORY
Edgemont Road, Charlottesville

23 July 1987

TO: Bob Havlen

FROM: Alan Bridle

RE: Material for annual BAAS Report

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) began a systematic search for counterjet emission in a complete sample of 3CR quasars more than 10 arcsec in angular diameter. The purpose of this work is to image a randomly chosen sample of extended 3CR quasars at 6cm with 0.4 arcsec resolution and 20 microJy per beam r.m.s. noise, in order to constrain models for the brightness asymmetries of the radio jets in powerful extended sources. Preliminary analysis of the data has revealed jets in all of the sources, and candidate counterjet emission in about 1/3 of them. The counterjet emission is generally at least ten times fainter than that of the jets.

Bridle, with E.Fomalont (NRAO), G.Byrd (U.Alabama) and M.Valtonen (Turku Observatory) has completed an analysis of VLA observations of the unusually powerful edge-darkened radio galaxy 3C288 at 1.5, 4.9 and 15 GHz. The polarization properties of the two lobes are strikingly dissimilar. There are significant spectral index gradients across the source, most notably between the jet and the counterjet from 4.9 to 15 GHz. Although the overall radio structure of the source resembles that of a distorted "radio trail", it is overluminous for this morphology and is also identified with the dominant member of a cluster of galaxies. It may therefore be an example of an unusual pattern of backflow from the radio lobes rather than of a structure tracing the recent path of the parent galaxy.

Bridle, with S.Baum (NRAO/U.Maryland), T.Heckman (U.Maryland), G.Miley (S.T.Sc.I.) and W.van Breugel (U.C.Berkeley) used the VLA to image the total and polarized emission from the radio galaxy 3C98 at 20cm and 6cm. The galaxy has several patches of extranuclear optical line emission up to 15 kpc from its center and near the edges of radio features. The locations and shapes of the optical line-emitting regions do not, however, suggest that they delineate gas that has been ionized by entrainment into a jet leaving the active nucleus. Other explanations for the optical line emission are therefore being evaluated.