SEPT. 12, 1973

NO. 37

FED BEAM COMMISSIONING STUDY

BENNETT, BLUMBERG, CASEY, CULWICK, GLASMANN, GUTHY, KEANE, RAKA

SCHEDULED: 0001 – 0800 ACTUAL: 0001 – 0730

OBJECTIVE: EXTRACT TO 8° BEND POINT. SET UP OPTICS, OBTAIN RADIATION SURVEY. FRACTIONAL EXTRACTION.

1. STABILITY OF H10 EJECTOR MAGNET POWER SUPPLY WAS STUDIED BY OBSERVING SHUNT SIGNAL ON TEKTRONIX 555 WITH TYPE Z PLUG-IN. WE SAW ~4% FLUCTUATIONS IN AMPLITUDE OF 21 000 A PEAK CURRENT, WHICH COULD ACCOUNT FOR PREVIOUSLY OBSERVED ~1" FLUCTUATIONS IN BEAM POSITION ON U15 FLAG. HOWEVER, SCHIRNER POINTS OUT THAT SHUNT SIGNAL CAN FLUCTUATE FOR REASONS OTHER THAN CURRENT VARIATION, SO CAUSE OF POSITION VARIATION IS STILL UNCERTAIN.

2. BEAM SPOT WAS OBSERVED ON U273 FLAG (~8° BEND POINT), vertically truncated. WE LATER DISCOVERED THAT TOP JAW OF U259 COLLIMATED WAS LEFT IN. WITH JAW REMOVED, SPOT WAS > 2" VERTICALLY AND ~ $\frac{1}{8}$" HORIZ. CALCULATED VALUES FOR FRACTIONAL EXTRACTION AT THIS POINT ARE .3" H X 1" V. WE DID NOT HAVE CALCULATED LENS SETTINGS, HOWEVER, SINCE INCREASING UQ2 EXCITATION STEERED BEAM. WE HAD UQ1 AT ~60% (52 mv) STRENGTH AND UQ2 ~20% (17 mv). STEERING BY QUADS IS EXPECTED SINCE SPOT AT U15 FLAG IS ~ $\frac{1}{2}$" LOW. THE SPOT WAS HORIZONTALLY WELL CENTERED AT U273 (~ $\frac{1}{16}$" OFF) AND <u>VERY</u> STABLE IN POSITION. THE $4\frac{1}{4}$° BEND WAS VARIED BY ~ ±2% WITH NEGLIGIBLE MOTION OF U273 SPOT. THIS PROVES THAT WE HAVE MOMENTUM RECOMBINATION AT 8° POINT, AS INTENDED. INCREASING EXCITATION OF QUADS UQ3,...7 FROM 180 A TO 320 A PRODUCED SPOT AT U273 OF $\frac{1}{2}$" V X ~ $\frac{1}{4}$" H SO ITS PRETTY CLEAR THAT WE CAN GET THROUGH THE $2\frac{3}{4}$" 8° APERTURE.

3. RADIATION SURVEYS WERE TAKEN WITH ABOVE CONDITION AND WITH "FAULT" CONDITION OF U259 JAW CLOSED. LEVELS ABOVE EARTH SHIELD WERE ~ 1.5 Rem/HR WITH FAULT AND ~4 x 10" p/p (25% of 1.7 x 10^{12} cBA) EXTRACTION. WITH BETTER SET UP, LEVELS ABOVE EARTH SHIELD DROPPED TO ~500 mR/hr ~60 mR/hr IN RECTIFIER BLDG, AND ~3.5 Rem/hr ON SIDE OF EARTH SHIELD DOWNSTREAM OF 8°. WITH A FACTOR OF 10 MORE INTENSITY and bigger beam WE MAY BE IN TROUBLE IN RECTIFIER BLDG. UNLESS U5 AND U12 COLLIMATORS CLEAN UP THE HALO.