NOTES ON POWER DISTRIBUTION IN THE EXPERIMENTAL AREAS -- A SUMMARY

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A total of about 94 MW is proposed for the experimental areas being considered for the 200-BeV accelerator of N. A. L. This total would be distributed as follows:

Internal Target Area	12 MW
Target Area L_1A	12 MW
Target Area L_1B	25 MW
Target Area L_1C	20 MW
Experimental Hall	25 MW

These figures are rounded off from the following breakdown:

AREAS:	Int.	A	B	C	Exp. Hall
Beam transport (ord. beams)	6 MW	6 MW	12 MW	3 MW	0 MW
Special beams, transp.	0	0	0	12	10
Lge. detectors & Spectrometer mags.	4	4	9	0	17
Target magnets	3	3	6	6	0
Subtotals	13	13	27	21	27
With 70% duty factor	9	9	19	15	19
Rounded off to (to take care of expt equip., cranes, misc.)	12	12	25	20	25

Justification

To arrive at the figures given above, it was assumed that:

(1) Installed beams are - in the internal target area and at station A, two ordinary counter beams @ 3 MW each.
- at station B, four similar beams (includes front end of one special beam).
- at station C, one similar beam, plus two special beams, e. g., neutrino and RF separated.
- in the experimental hall, ends of three special beams, e. g., RF separated beam from B plus counter branch, muon branch from neutrino beam, RF separated beam from C plus counter branch.

(2) The duty factor was arrived at as follows:

Of the installed beams, only 75% are in operation. Average currents and fields are such that peak demand is 70%. Conversion efficiency from installed power is 75%.

Thus $\frac{0.75 \times 0.70}{0.75} = 0.70$

Note: Average power bill will probably be only about 30% of these figures.

(3) Power for the beams has been estimated as follows:

- ordinary counter beams, about 3 MW each.

  Power figures were assumed to be about 100 kW/meter for bending magnets and about 50 kW/m for quadrupoles (see note by MHB, September 22). Typical high momentum beams (e. g., Petrucci, ECFA Vol. II, p. 19; or Longo, LRL, Vol. I, p. 137) have about 20 m of B. M. 's and 10 to 20 m of quadrupoles.

- special beams, like RF separated beams, neutrino beam, etc., about 6 MW each. A typical example is Lach's beam (see LRL, Vol. I, p. 190) for separated kaons of about 100 GeV/c. Total power required for fields given in this paper, and including the separators, is about 5. 5 MW.

(4) Power for detectors and spectrometer magnets was estimated by scaling figures for some existing magnets, e. g. :

spark-chamber magnet 14 in. high by 84 in. wide by 30 in. long - 500 kW;
spark-chamber magnet 40 in. high by 40 in. wide by 20 in. long - 1. 2 MW
(both of these are at ANL-ZGS). BNL 80 in. bubble-chamber magnet is about 3. 5 to 4 MW.