Chromosome mapping

Your goal is to map the position of several genes A-K on their respective chormosomes.

Information you are given:

The ratios of phenotypes obtained when crossing heterozygotic individuals (obtained from crossing homozigotic pure breeding recessive or dominant for both genes analyzed).

Take in accont that:
The expected ratios for independent heredity are 9:3:3:1
The expected ratio for linked heredity (virtually, at the same place) are: 3:1, it is 12:4

And rates can range from these two edges. For example:
When genes are in the same chromosome, but separated, rates about 10:2:2:2 could be expected
When genes are near in the same chromosome, you cold expect rates about 11:1:1:2

Information you are not given:

The total number of chromosomes (but you can discover it from your data.

Process:
Every team can ask for a crossing in each round.
r team will be the expert on one gene, and in this first step will analyze the data from this gene. When ready, you can choose one ot the other teams (you will be apble to know which are the speciality of the other teams). And work together to complete your work.

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | x | 625AB:125Ab: 125aB:62ab | 562 AC: 187Ac: 187aC: 62ac | 625AD: 125aD: 125Ad: 62ad | 562 AE: 187Ae: 187aE: 62ae | 562 AF: 187Af: 187aF: 62af | 562 AG: 187Ag: 187aG: 62ag | 562 AH: 187Ah: 187aH: 62ah | 562 AI: 187Ai: 187aI: 62ai | 562 AJ: 187Aj: 187aJ: 62aj | 562 AK: 187Ak: 187aK: 62ak |
| B | | x | 562 BC: 187Bc: 187bC: 62bc | 731DB: 24Db: 26dB: 219Db | 562 BE: 187Be: 187bE: 62be | 562 BF: 187Bf: 187bF: 62bf | 562 BG: 187Bg: 187bG: 62bg | 562 BH: 187Bh: 187bH: 62bh | 562 BI: 187Bi: 187bI: 62bi | 562 BJ: 187Bj: 187bJ: 62bj | 562 BK: 187Bk: 187bK: 62bk |
| C | | | x | 562DC: 187Dc: 187dC: 62dc | 562EC: 187Ec: 187eC: 62ec | 562FC: 187Fc: 187fC: 62fc | 562GC: 187Gc: 187egC: 62gc | 562HC: 187Hc: 187hC: 62hc | 562IC: 187EIc: 187iC: 62ic | 740 JC: 260 jc | 562KC: 187Kc: 187kC: 62kc |
| D | | | | x | 562ED: 187Ed: 187eD: 62ed | 562DF: 187Df: 187dF: 62df | 562DG: 187Gd: 187gD: 62gd | 562DH: 187dH: 187Dh: 62dh | 562DI: 187dI: 187Di: 62di | 562DJ: 187dJ: 187Dj: 62dj | 562DK: 187dK: 187Dk: 62dk |
| E | | | | | x | 687FE: 62Fe: 62fE : 187fe | 562EG: 187eG: 187Eg: 62eg | 562EH: 187eH: 187Eh: 62eh | 731EI: 24Ei: 26eI: 219ei | 562EJ: 187eJ: 187Ej: 62ej | 625EK:125eK: 125Ek:62ek |
| F | | | | | | x | 562FG: 187fG: 187Fg: 62fg | 562FH: 187fH: 187Fh: 62fh | 750FI:250fi | 562FJ: 187fJ: 187Fj: 62fj | 753FK: 247fk |
| G | | | | | | | | 625HG: 125hG: 125Hg: 62hg | 562GI: 187gI: 187Gi: 62gi | 562GJ: 187gJ: 187Gj: 62gj | 562KG: 187kG: 187Kg: 62kg |
| H | | | | | | | | x | 562HI: 187hI: 187Hi: 62hi | 562HJ: 187hJ: 187Hj: 62hj | 562HK: 187hK: 187Hk: 62hk |
| I | | | | | | | | | x | 562JI: 187jI: 187Ji: 62ji | 625KI: 125Ki: 125kI: 62ki |
| J | | | | | | | | | | x | 562KJ: 187Kj: 187kJ: 62kj |
| K | | | | | | | | | | | x |

Answer:

Chromosome 1:  A…..DB
Chromosome 2: JC
Chromosome 3: E…I…F…K
Chromosome 4: H……G