

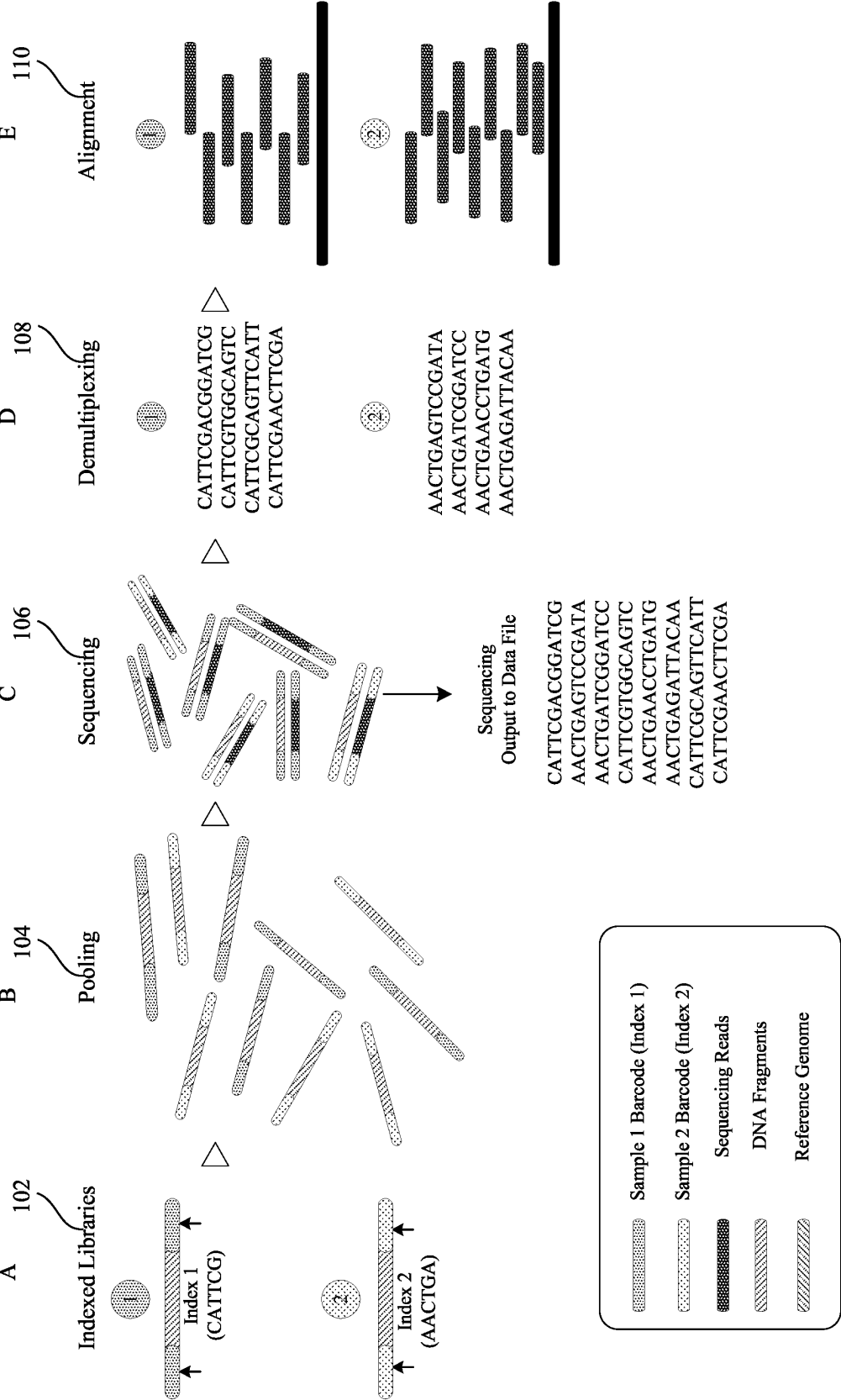


FIG. 1

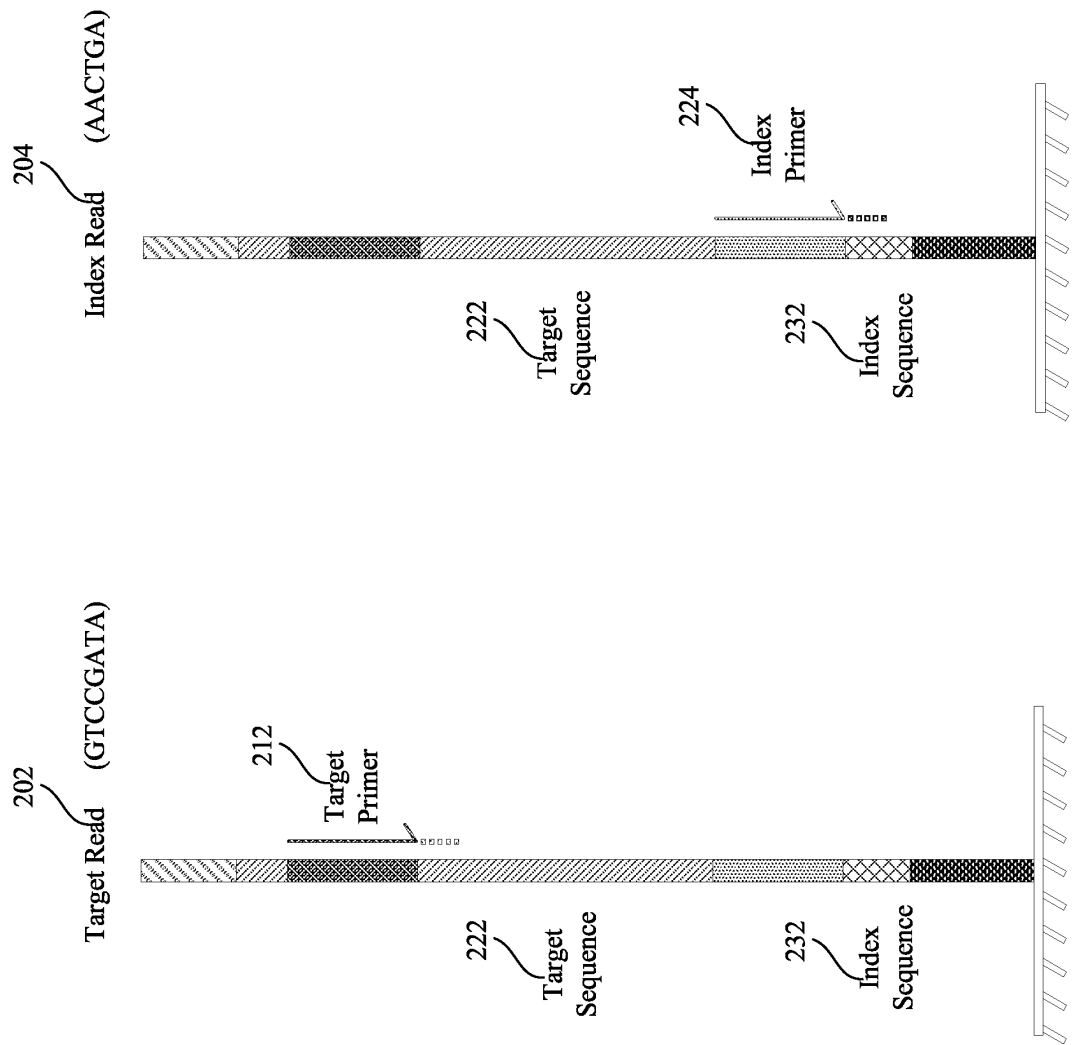


FIG. 2

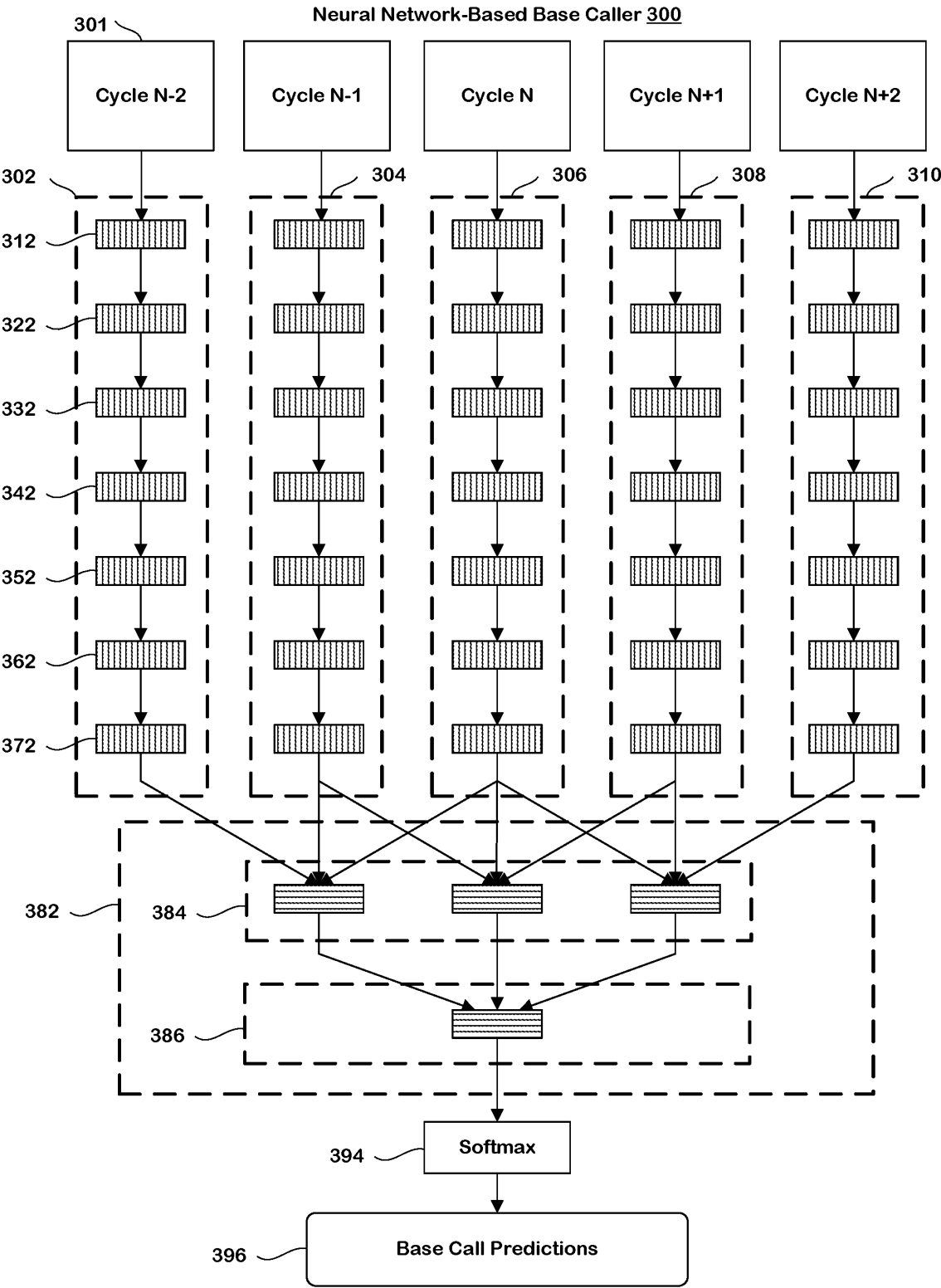


FIG. 3

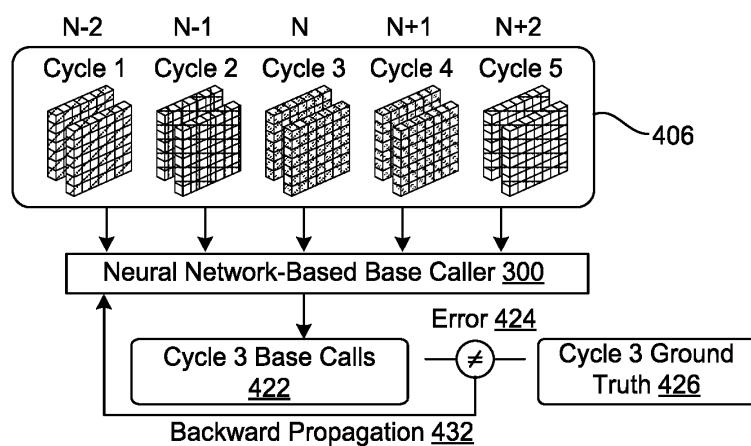


FIG. 4A

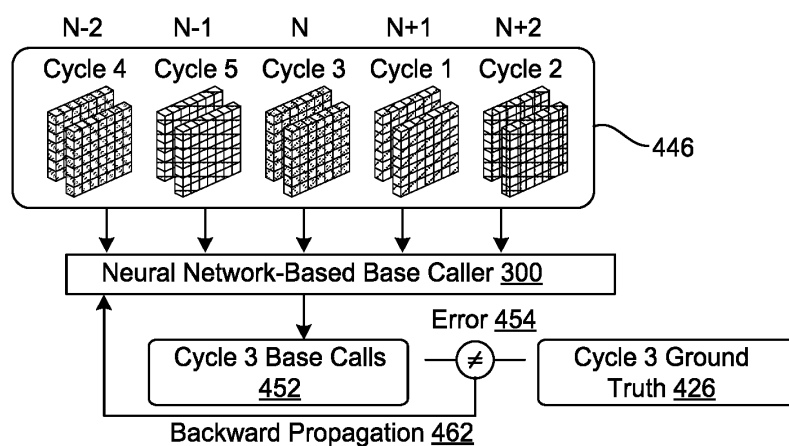


FIG. 4B

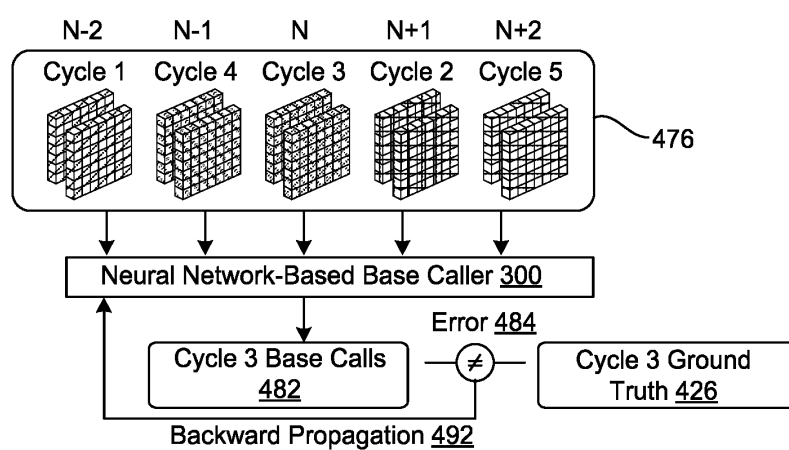


FIG. 4C

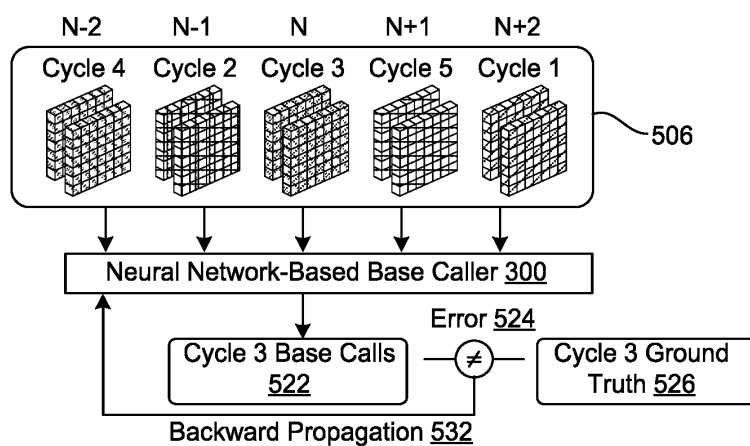


FIG. 5A

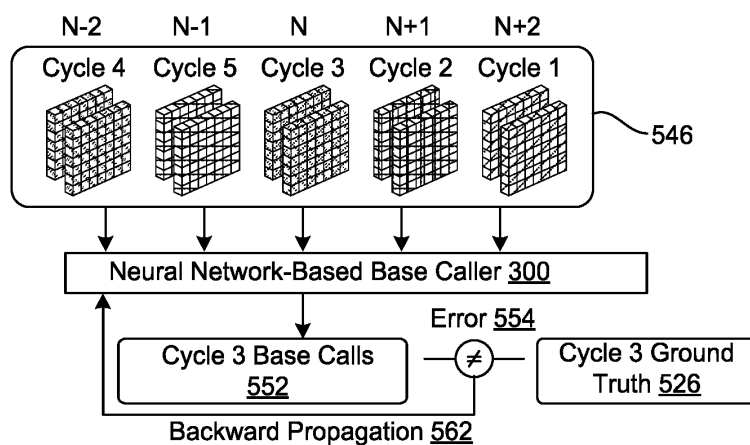


FIG. 5B

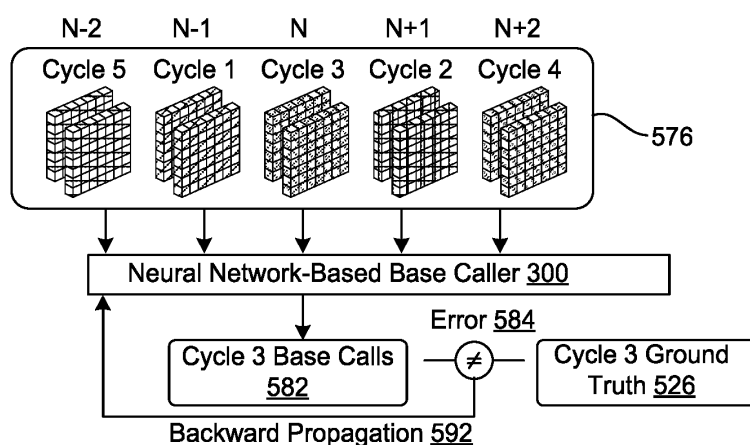


FIG. 5C

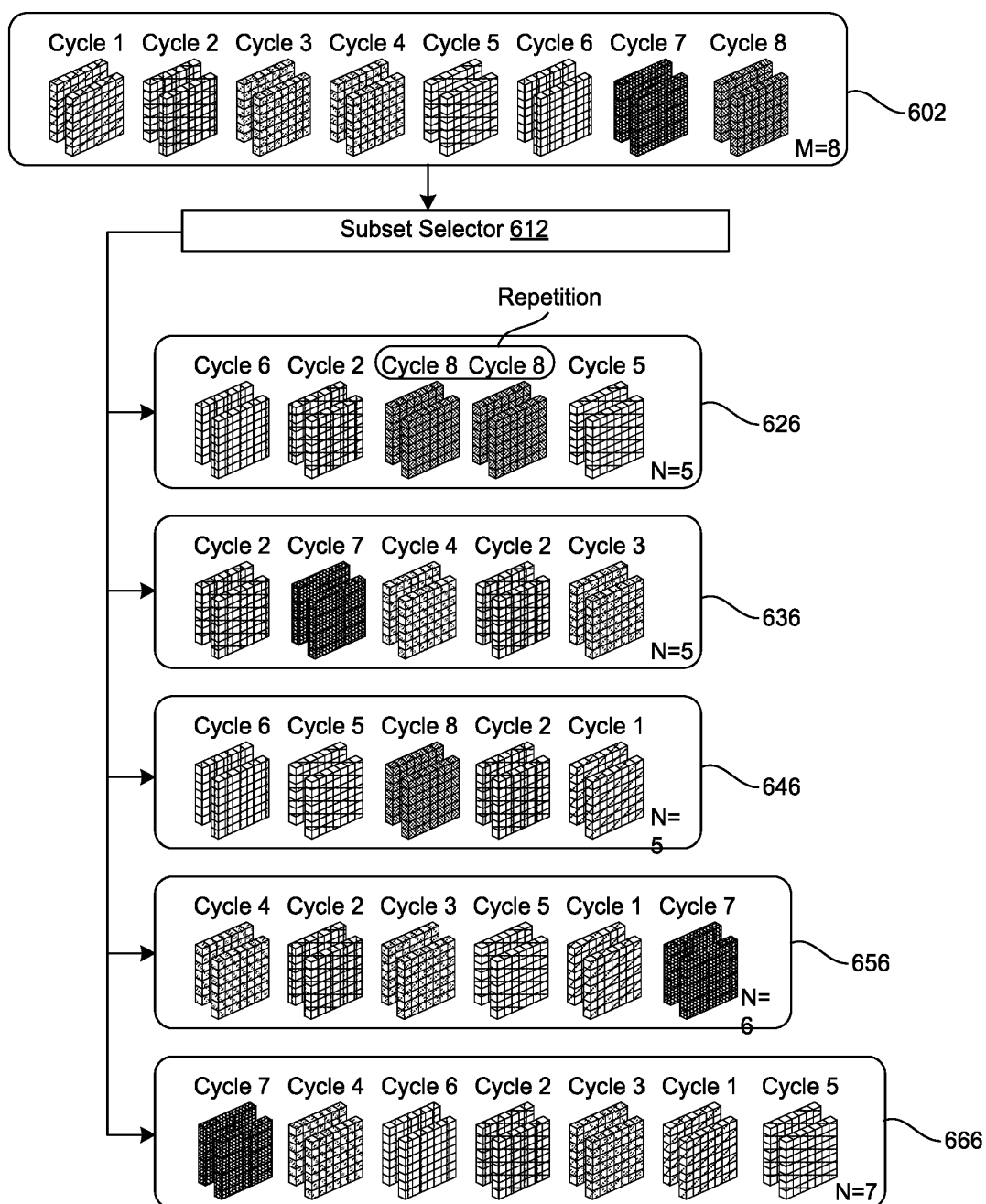


FIG. 6

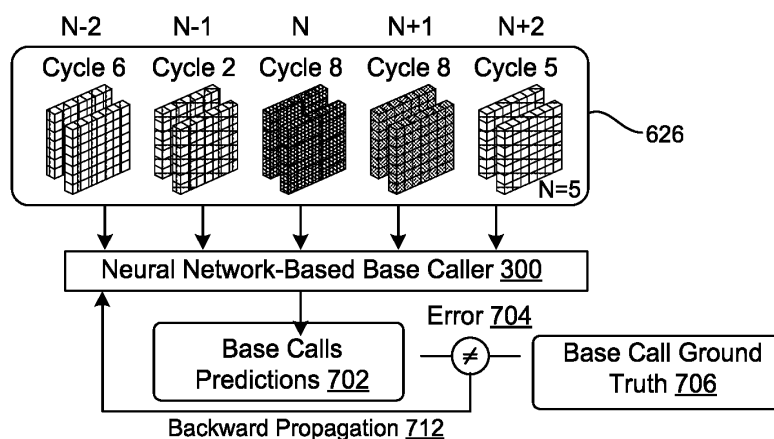


FIG. 7A

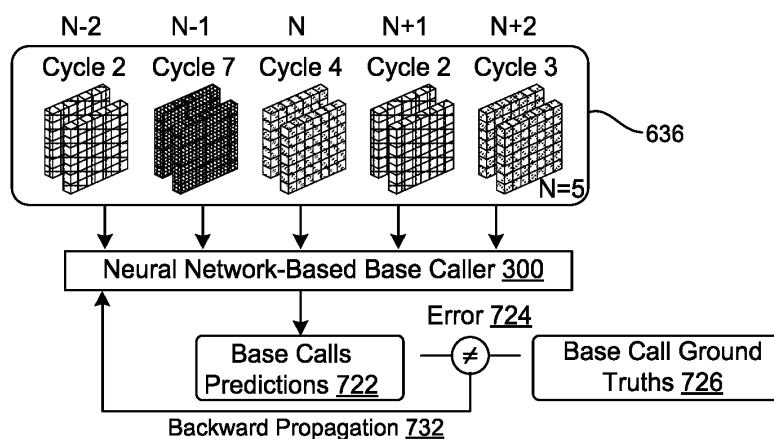


FIG. 7B

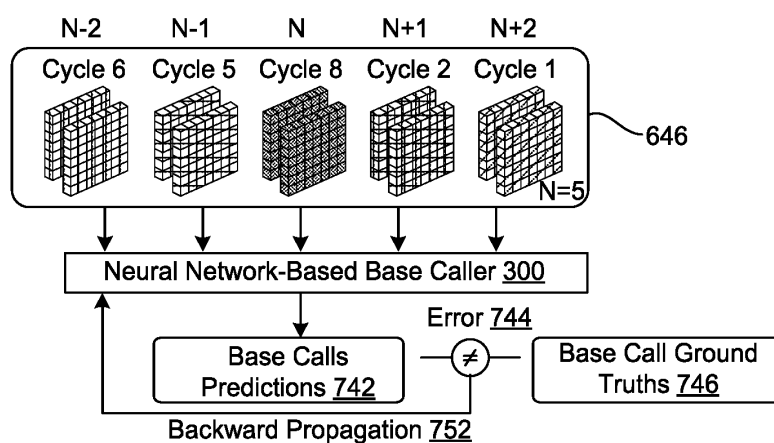


FIG. 7C

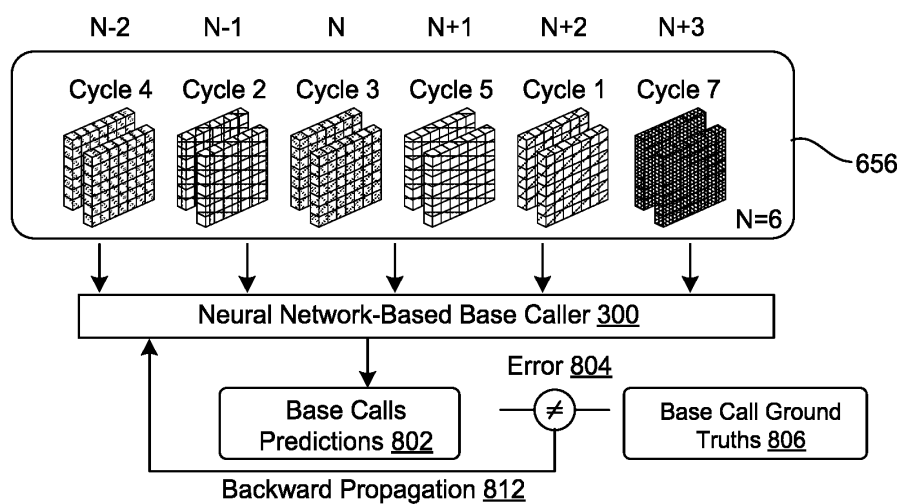


FIG. 8A

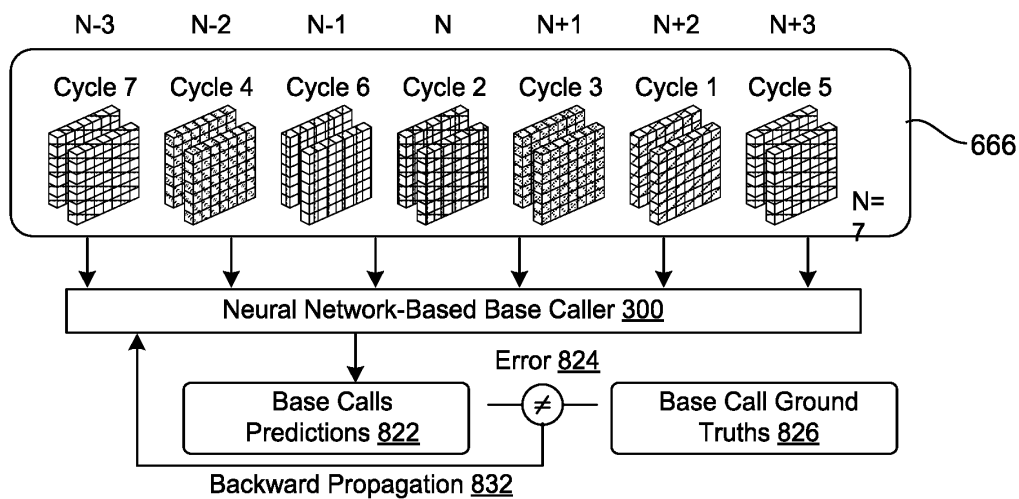


FIG. 8B

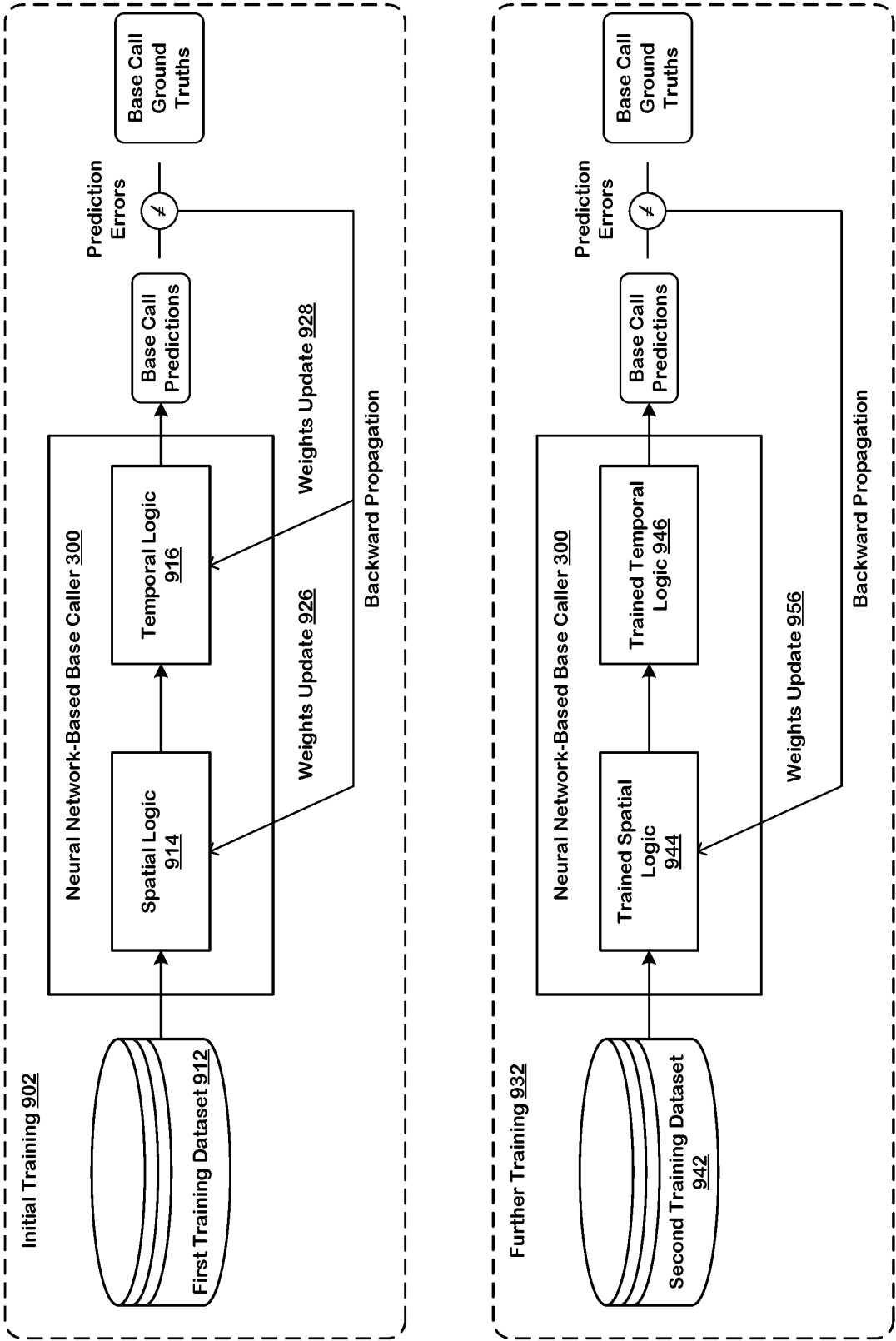
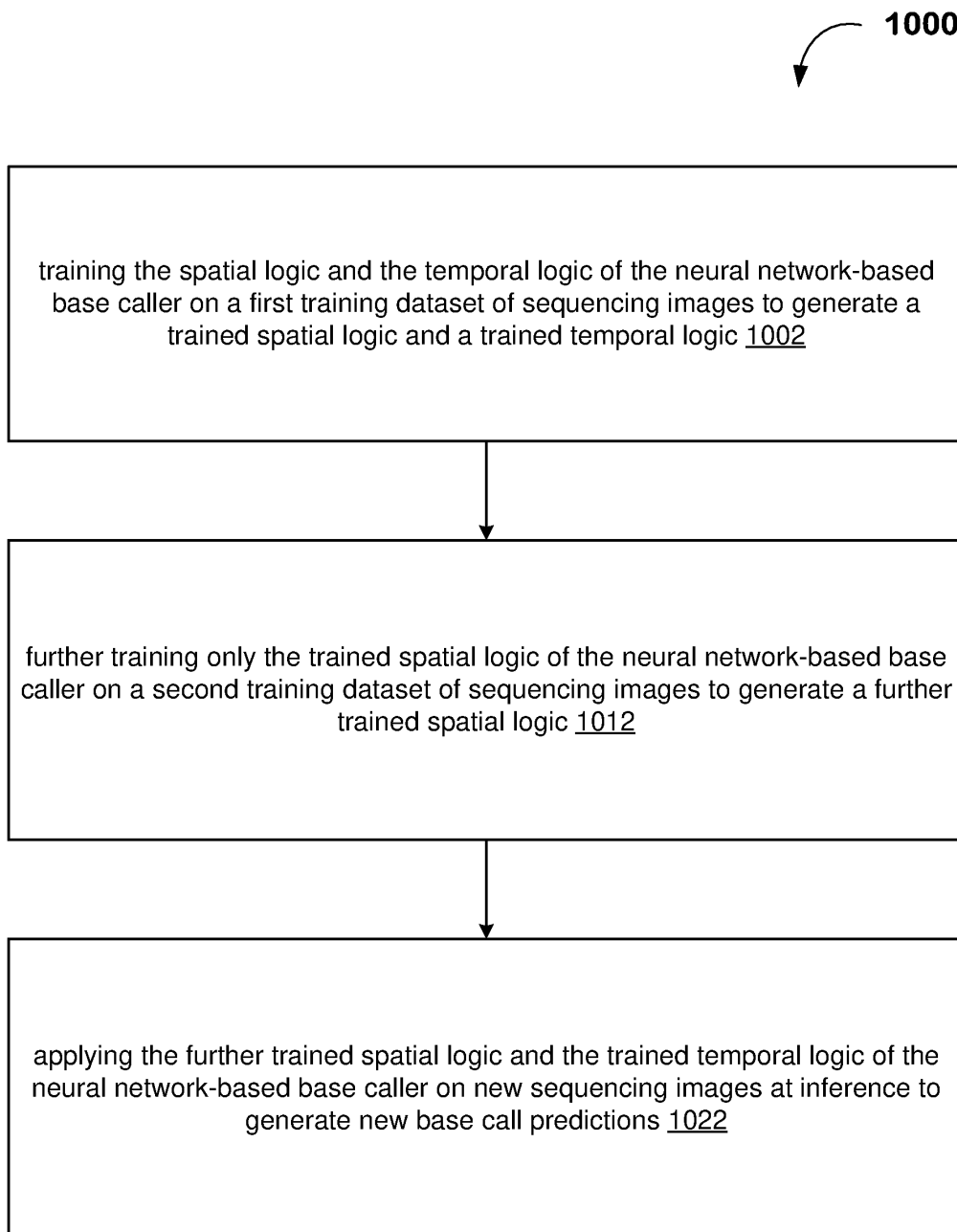
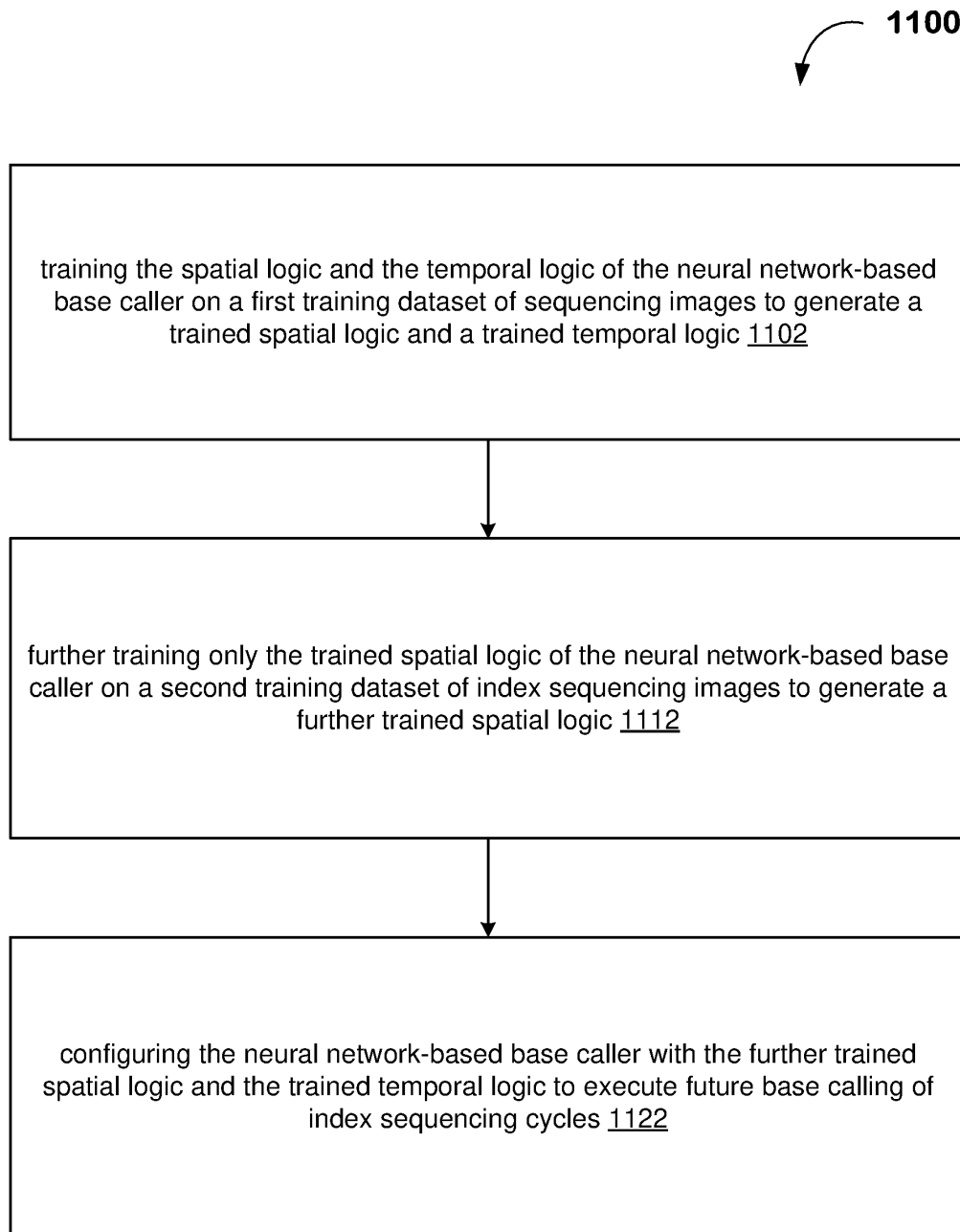


FIG. 9

**FIG. 10**

**FIG. 11**

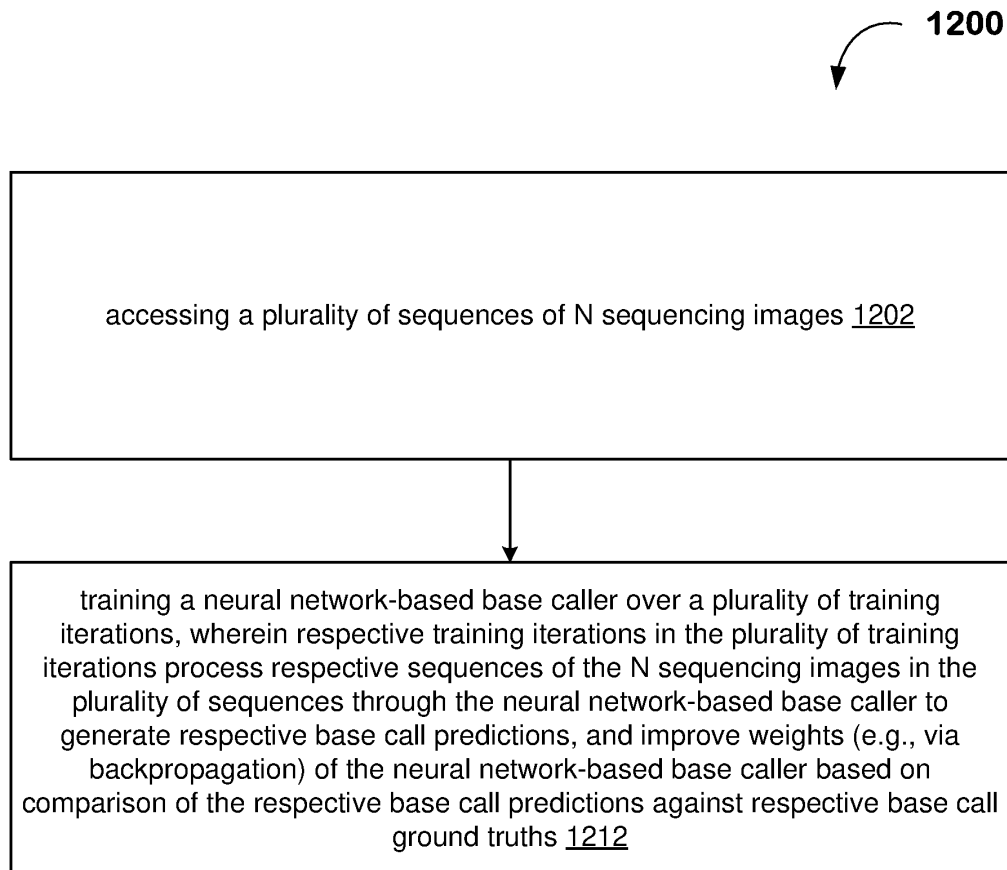
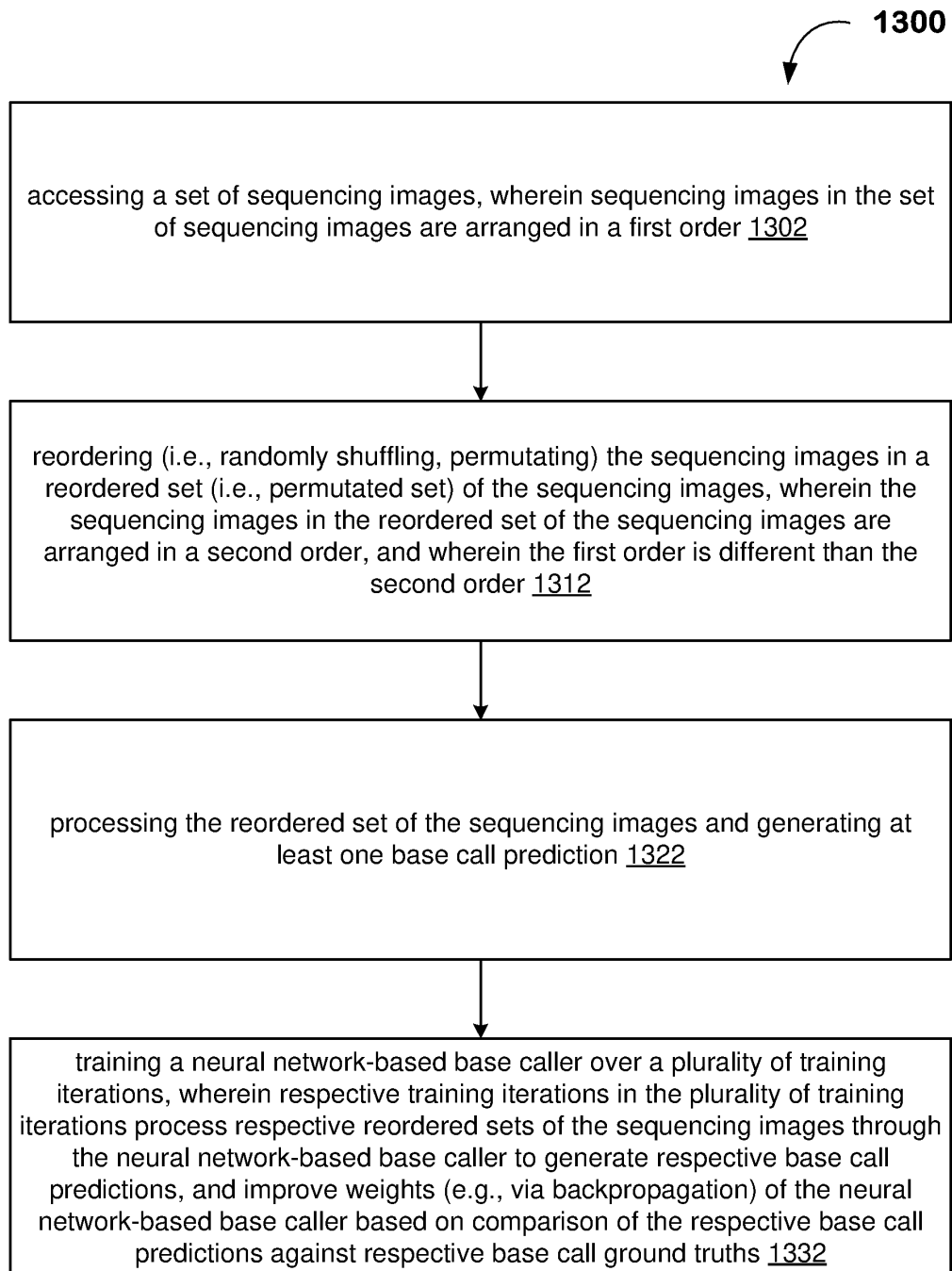
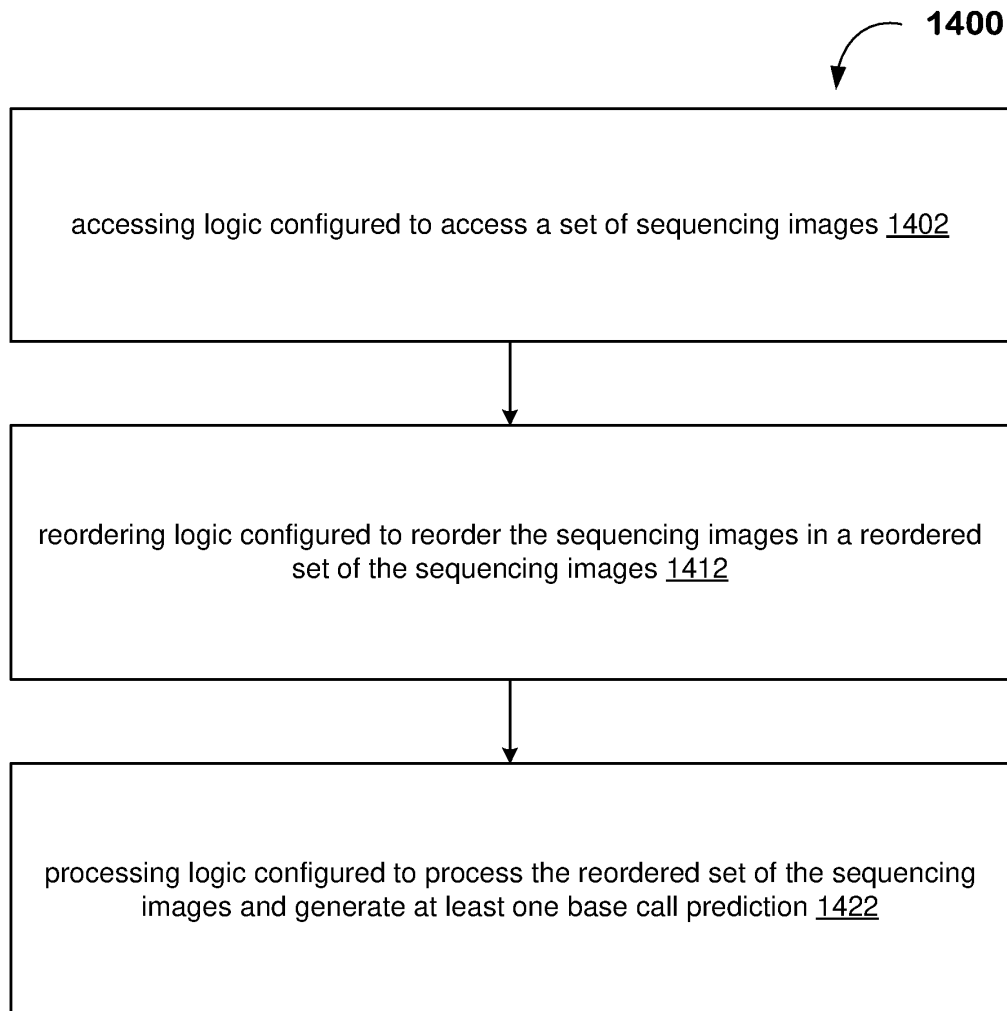


FIG. 12

**FIG. 13**

**FIG. 14**

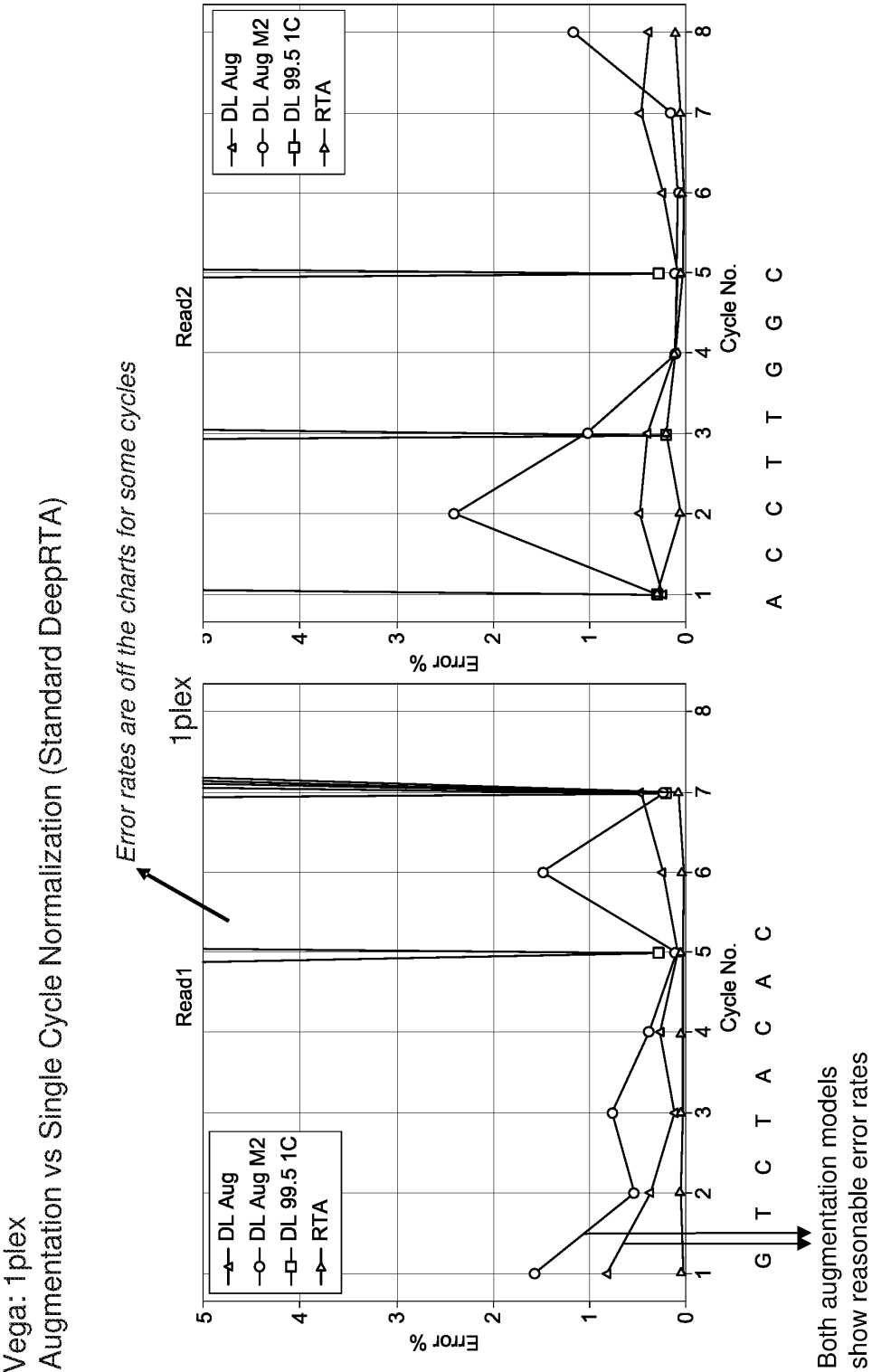


FIG. 15

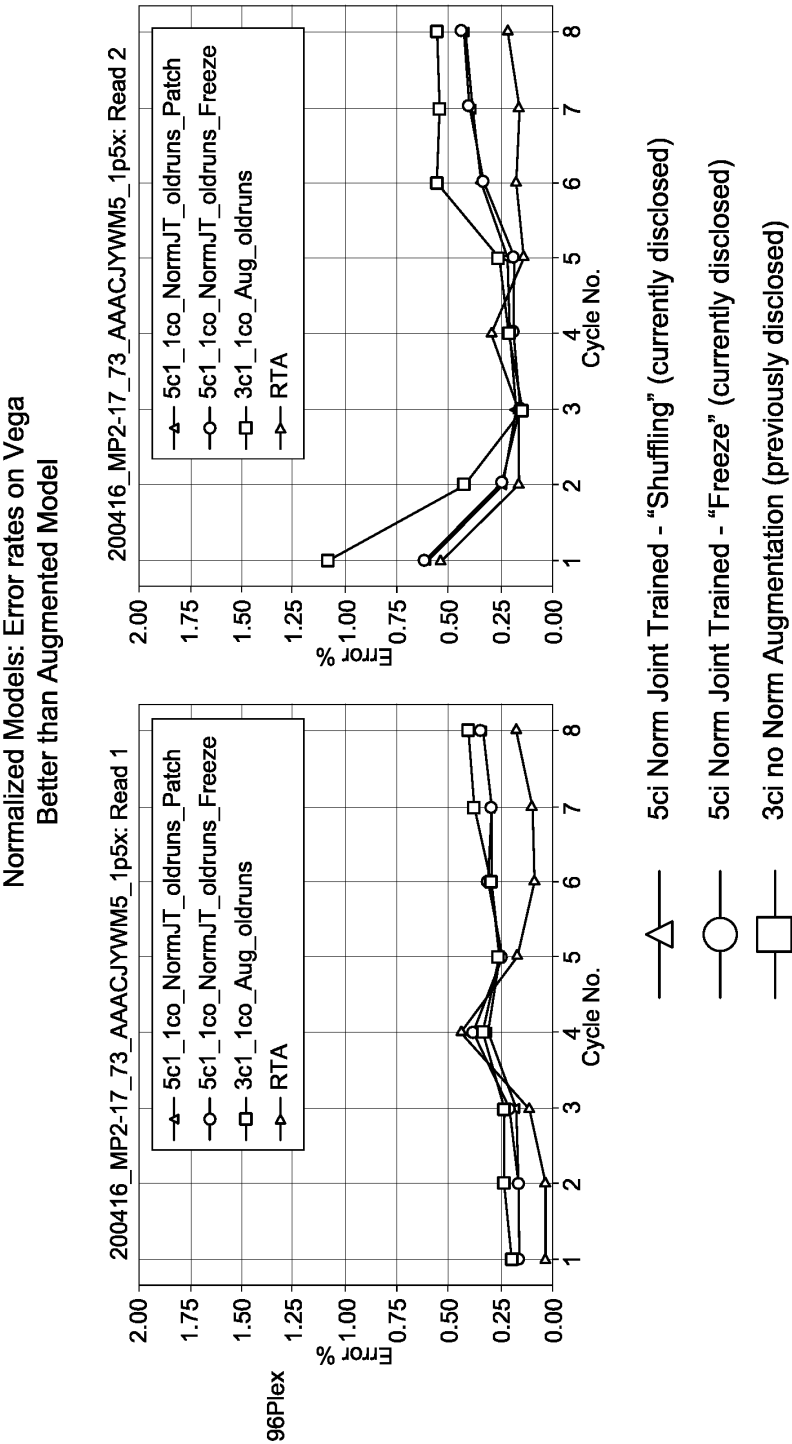


FIG. 16A

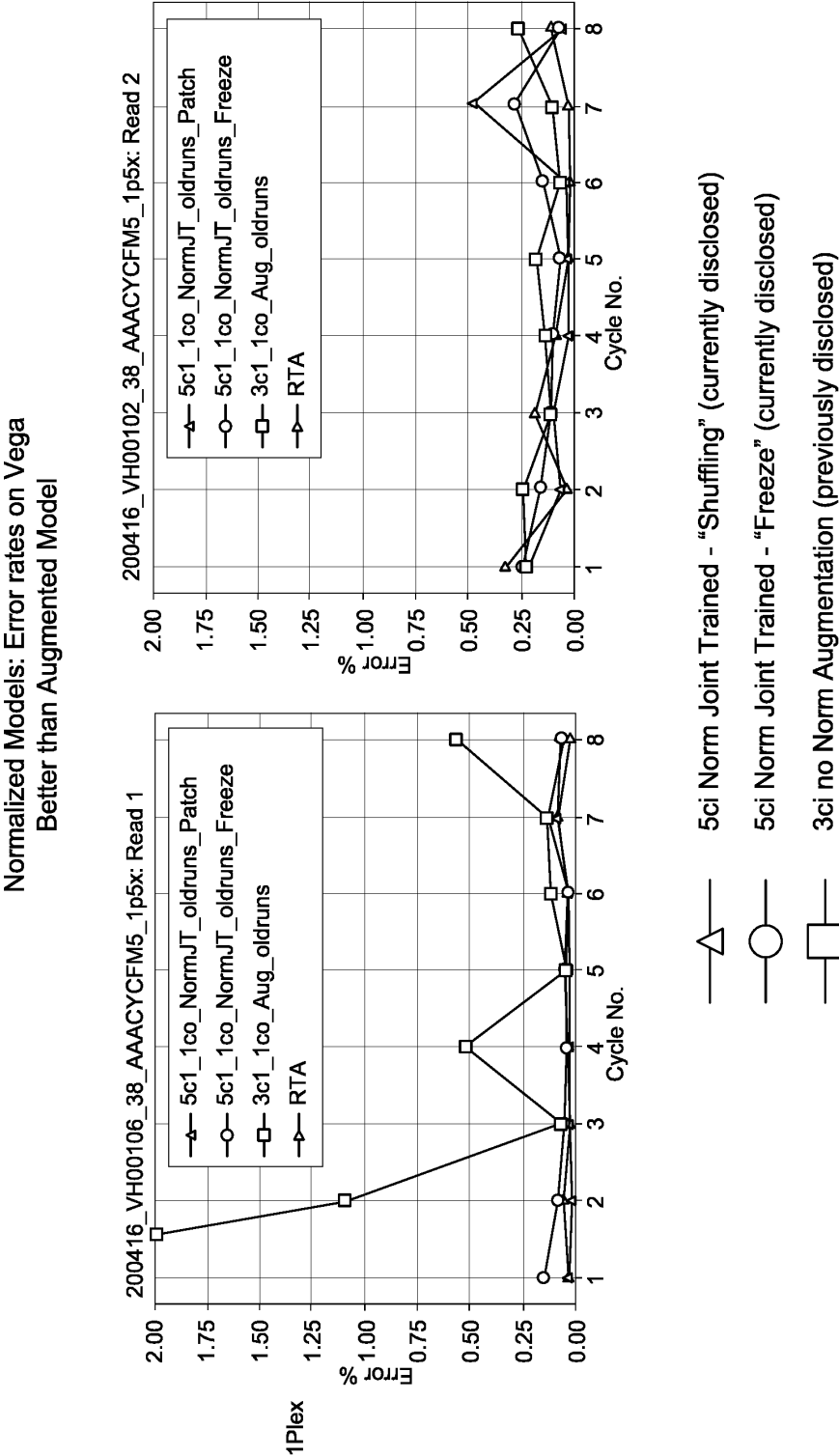


FIG. 16B

Normalized Models: Error rates on Vega
Better than Augmented Model

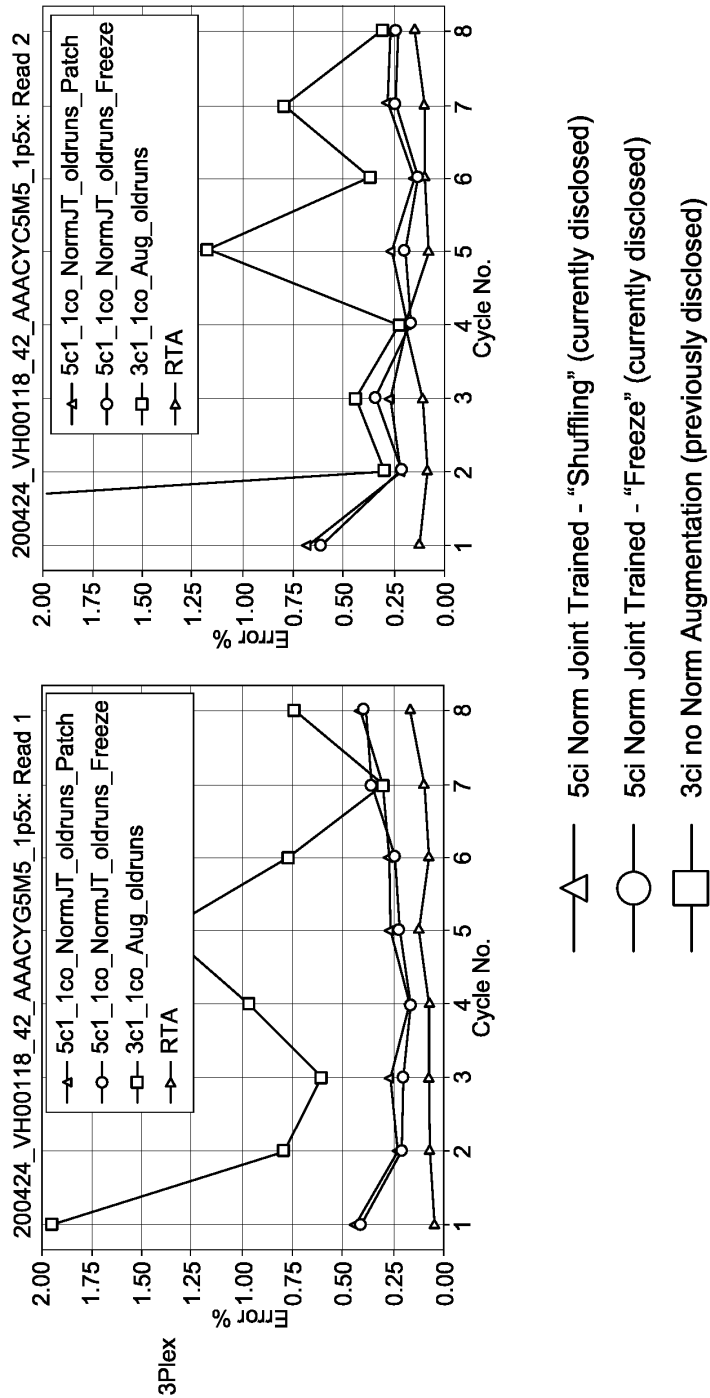


FIG. 16C

Comparison of Per-Patch Shuffle, Freeze Temporal, Random Permutation

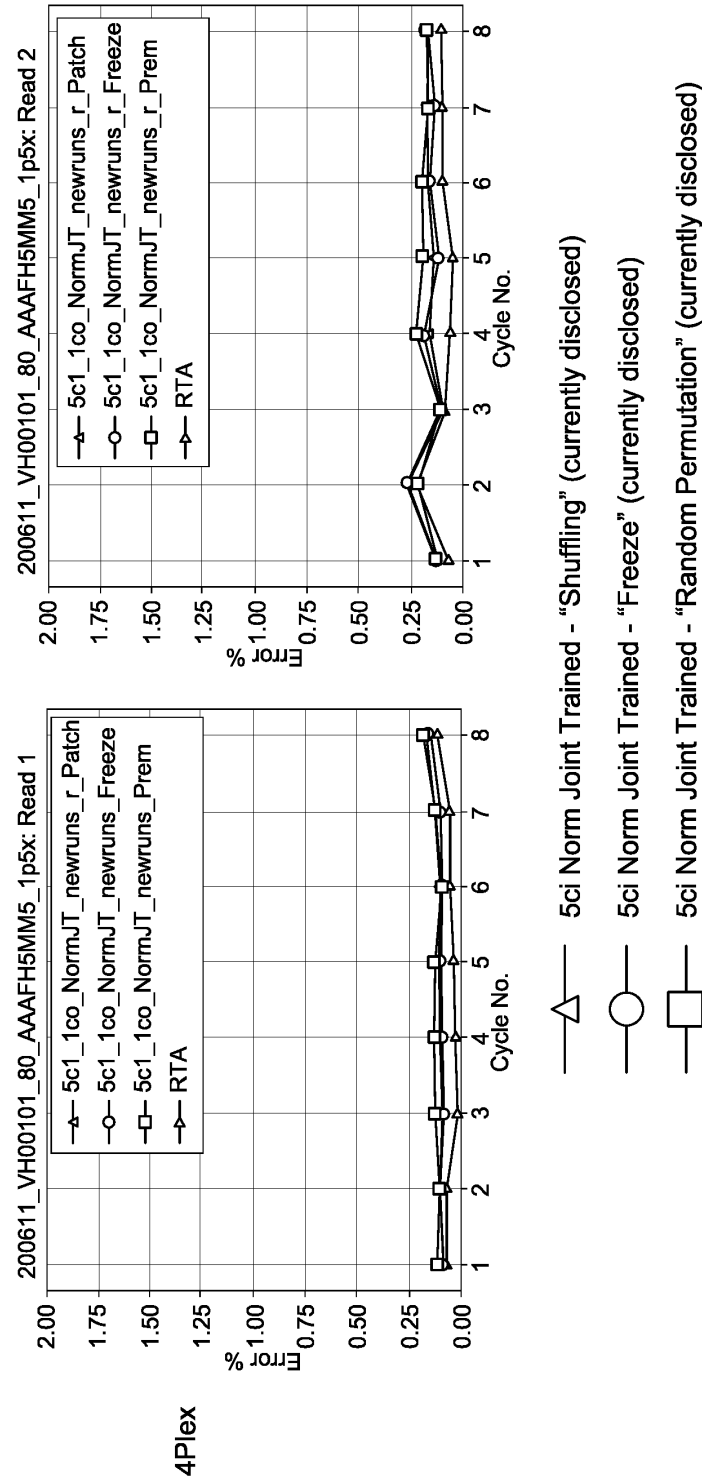


FIG. 17A

Comparison of Per-Patch Shuffle, Freeze Temporal, Random Permutation

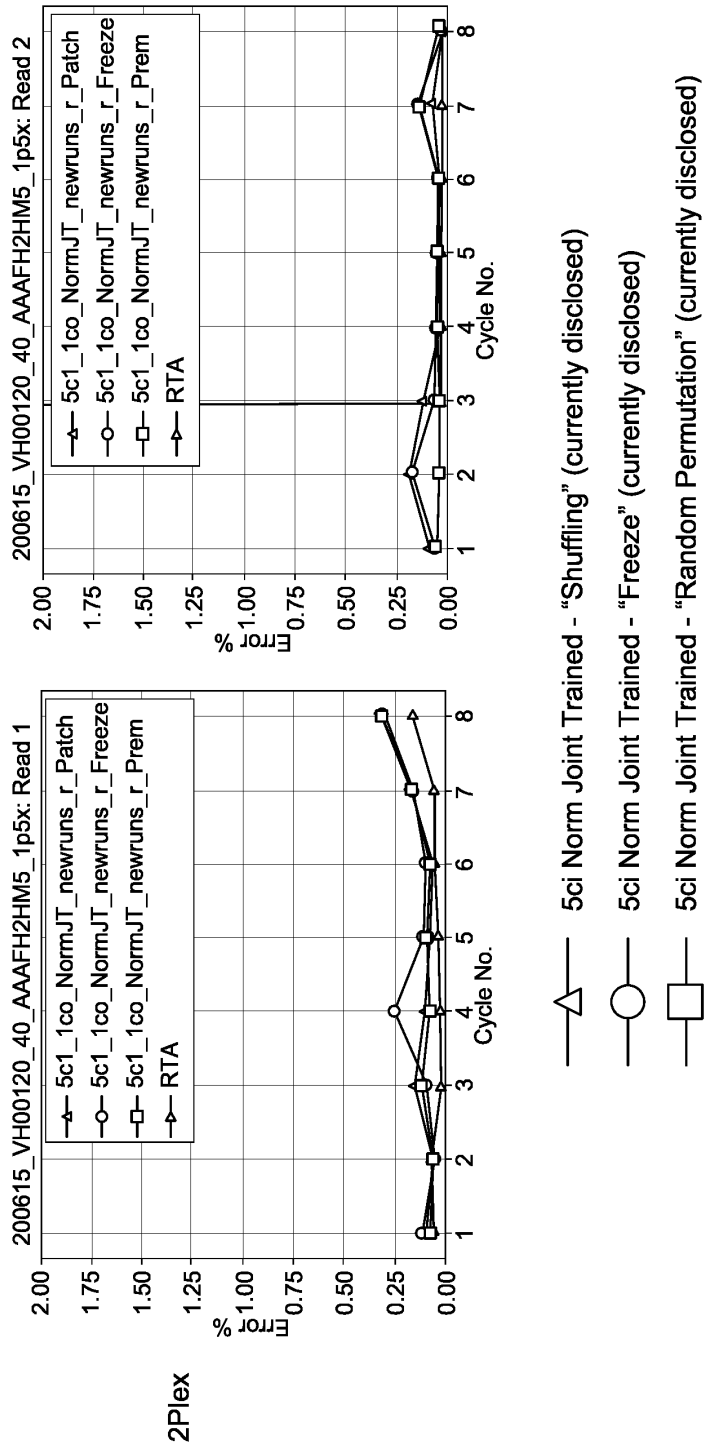


FIG. 17B

Comparison of Per-Patch Shuffle, Freeze Temporal, Random Permutation

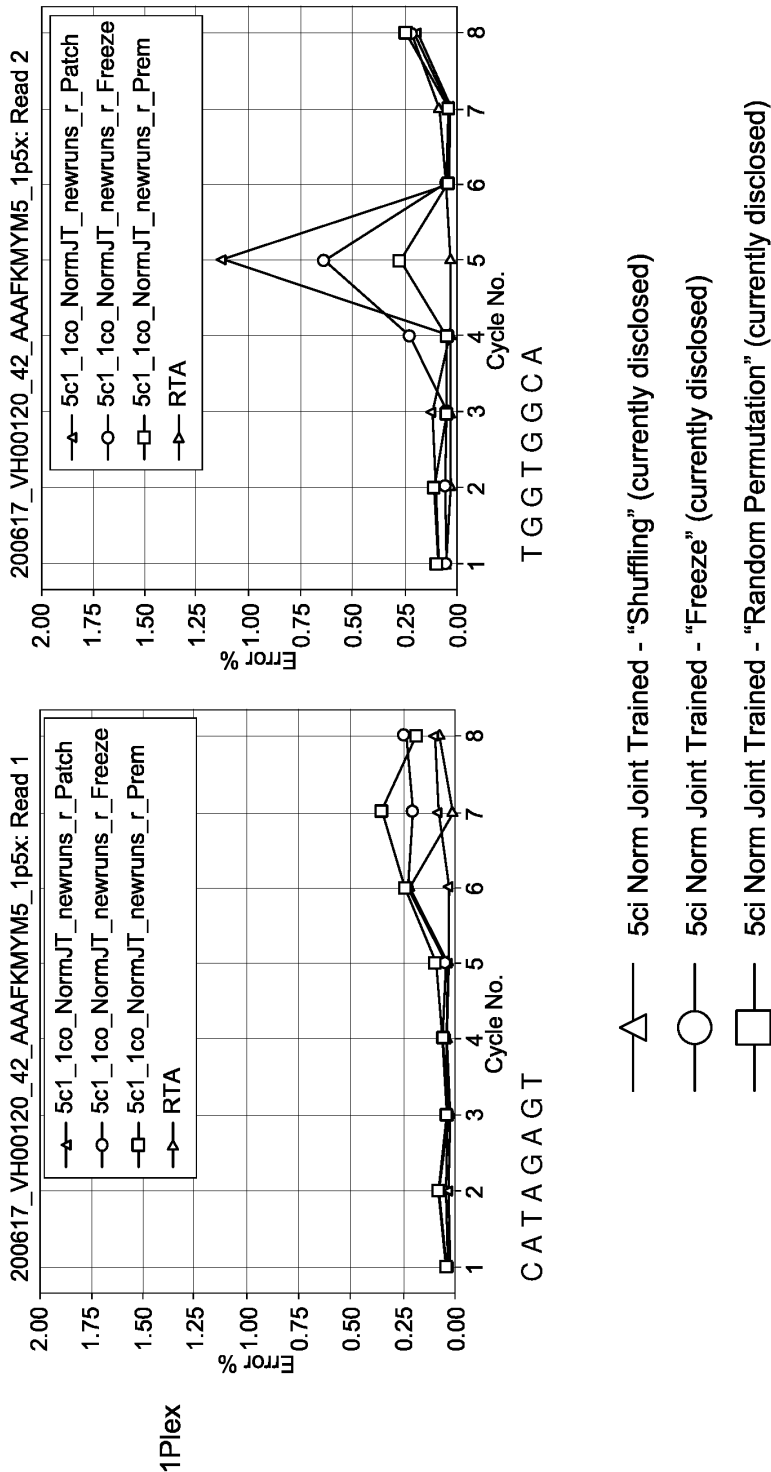


FIG. 17C

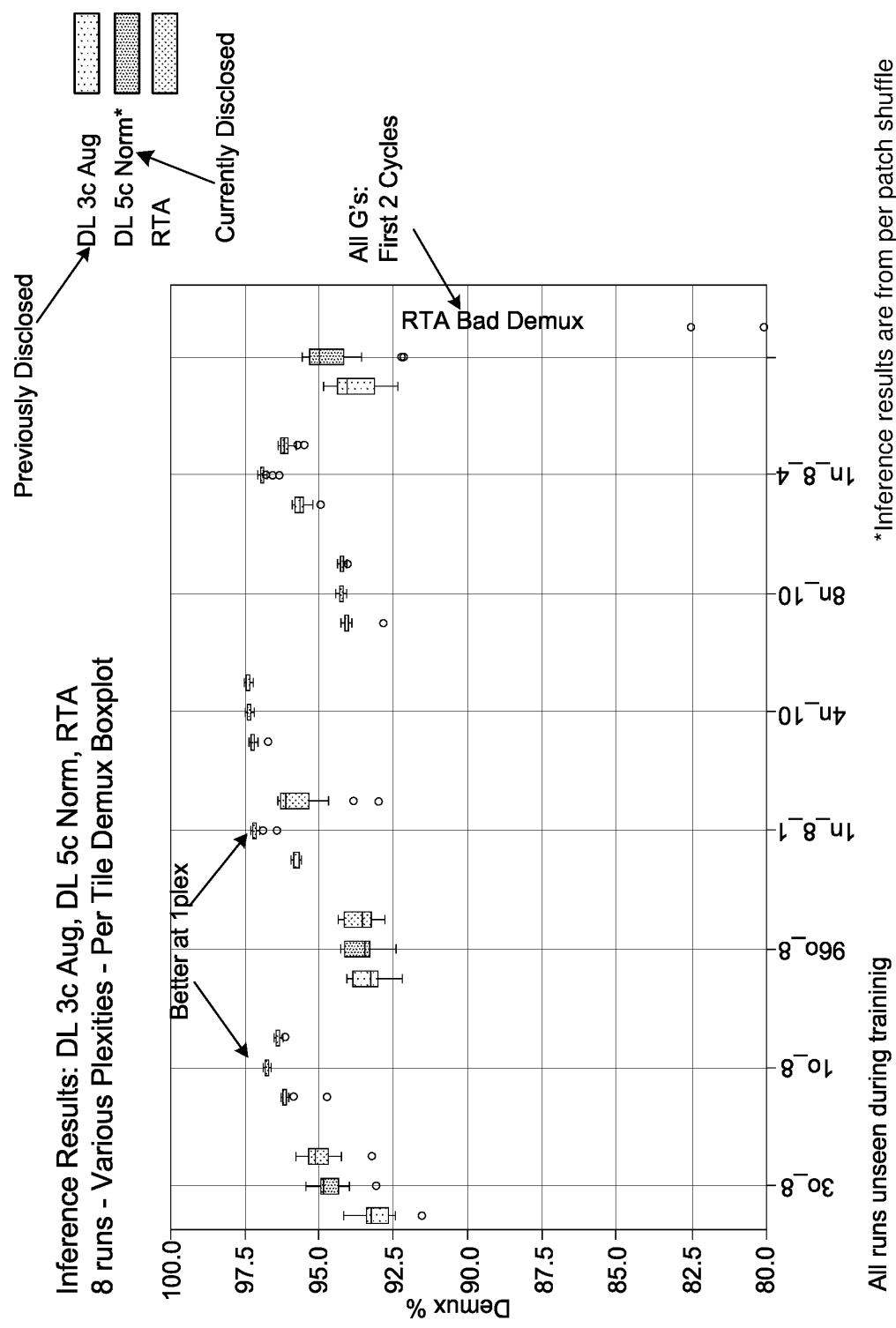


FIG. 18

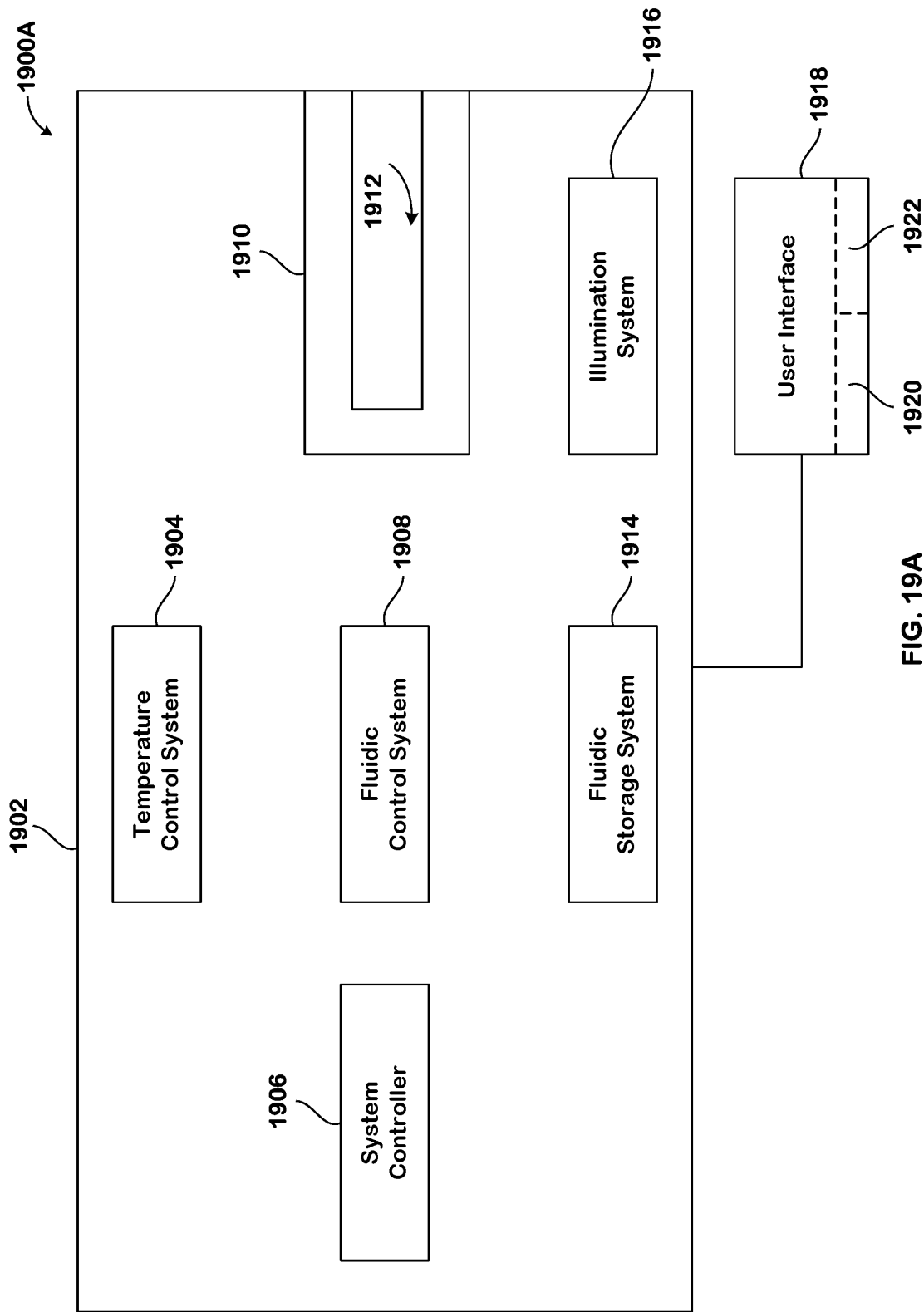


FIG. 19A

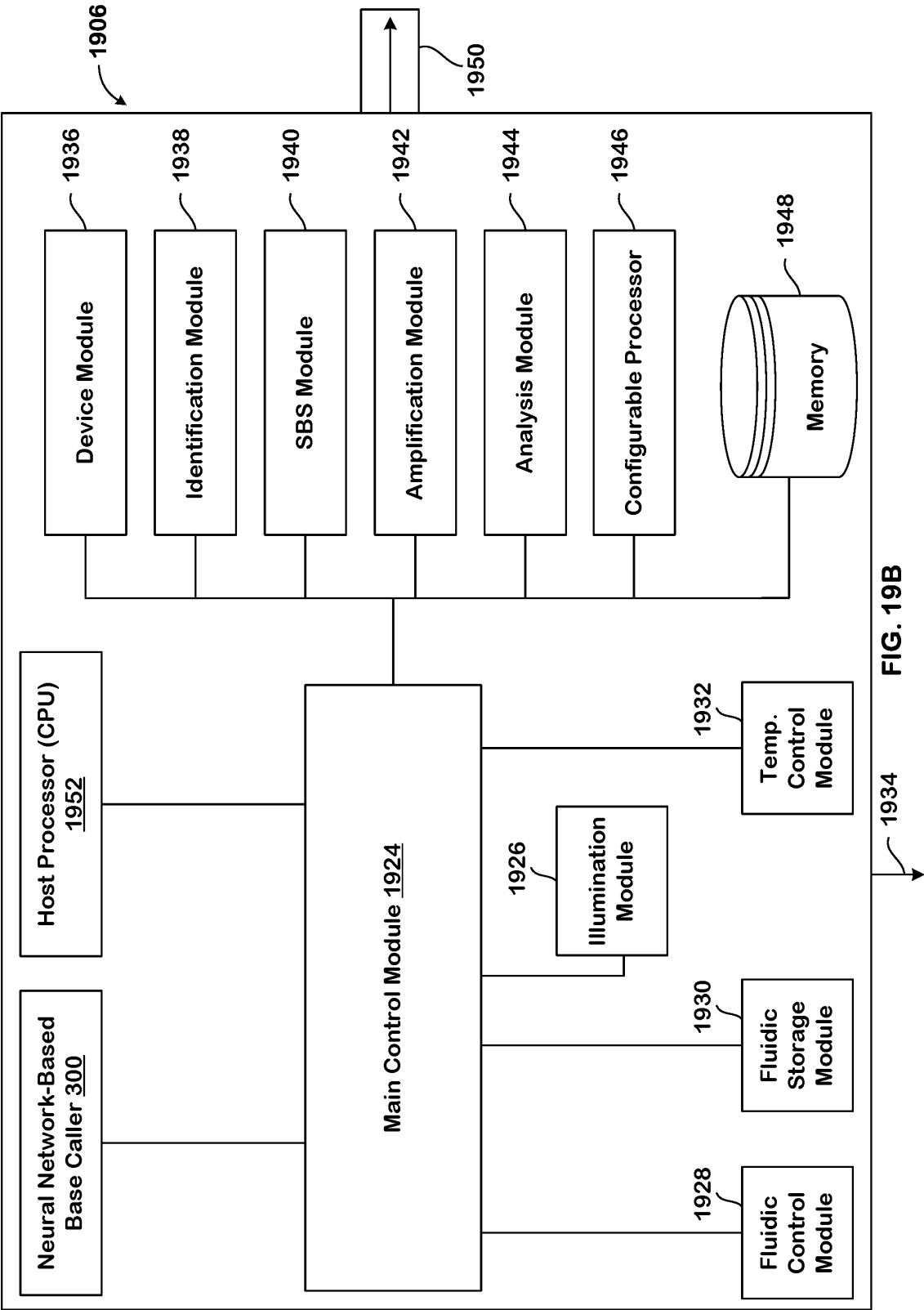
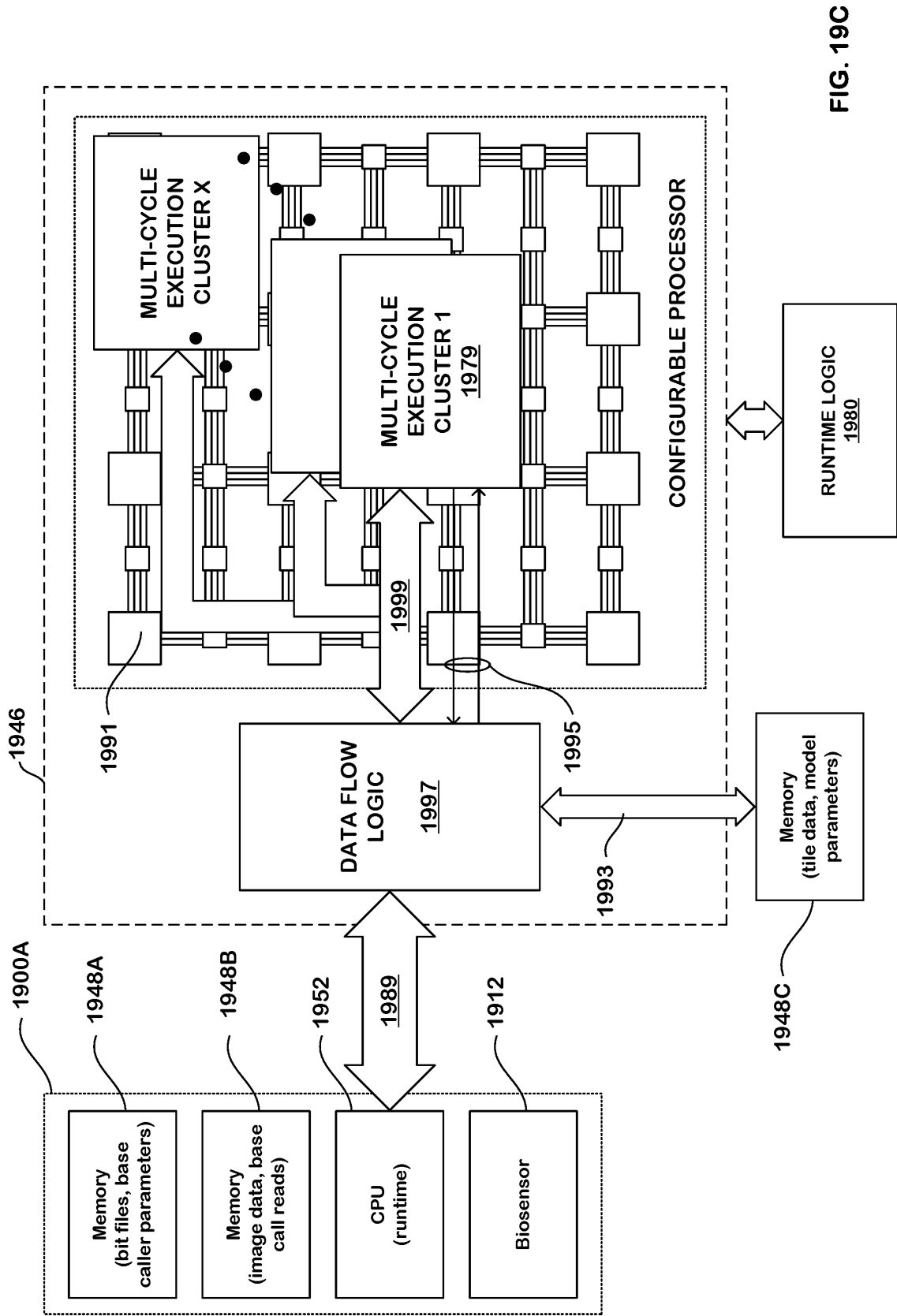


FIG. 19B



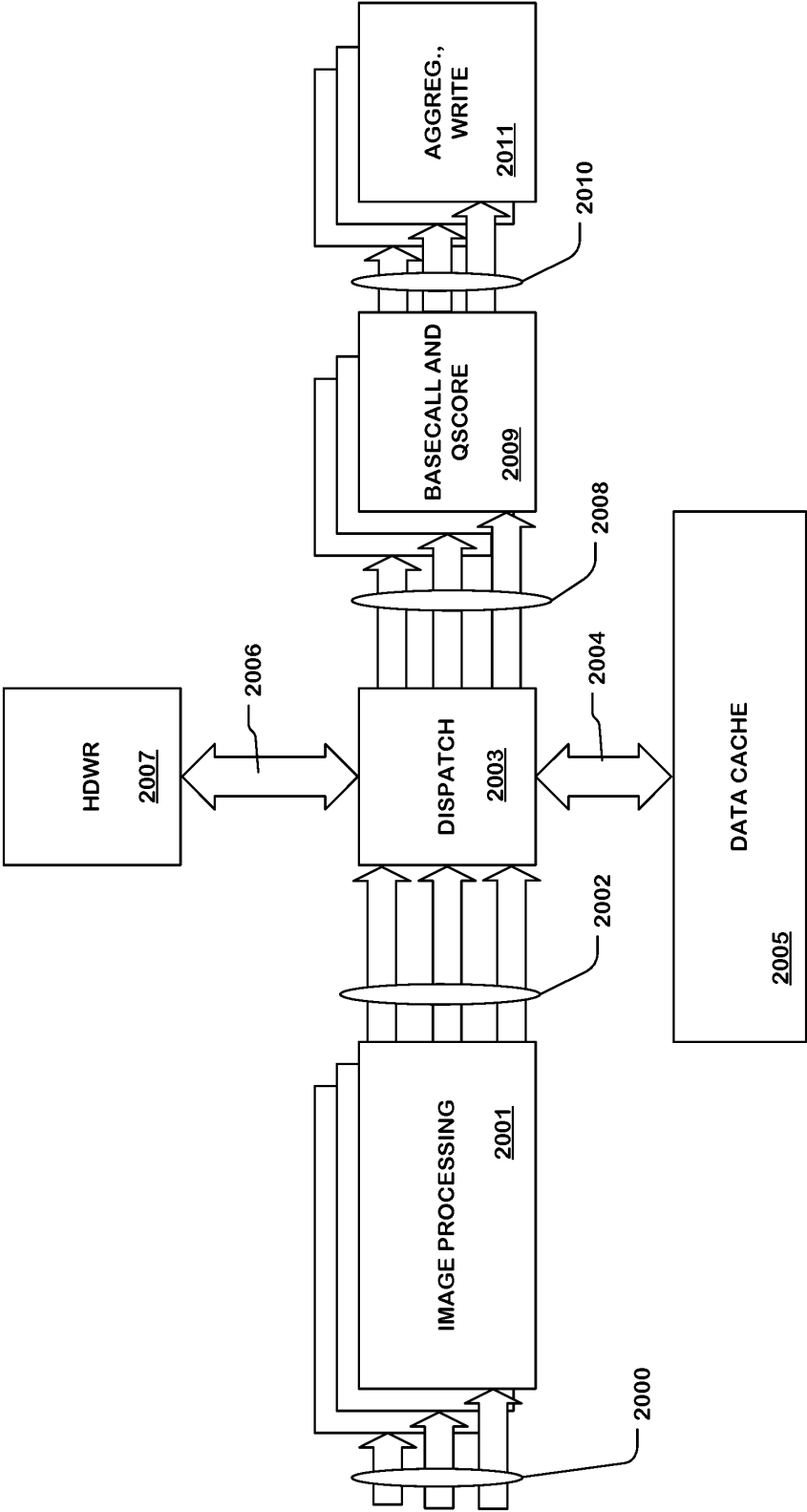


FIG. 20A

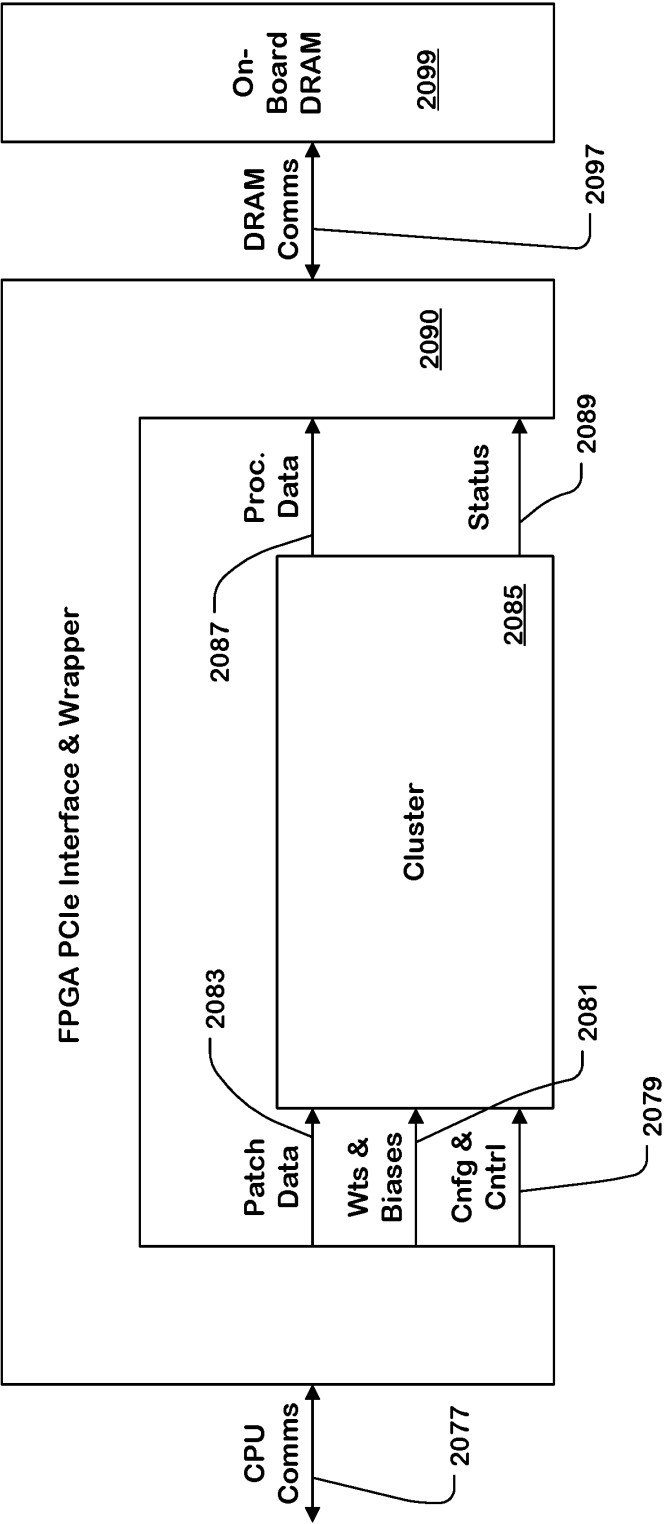


FIG. 20B

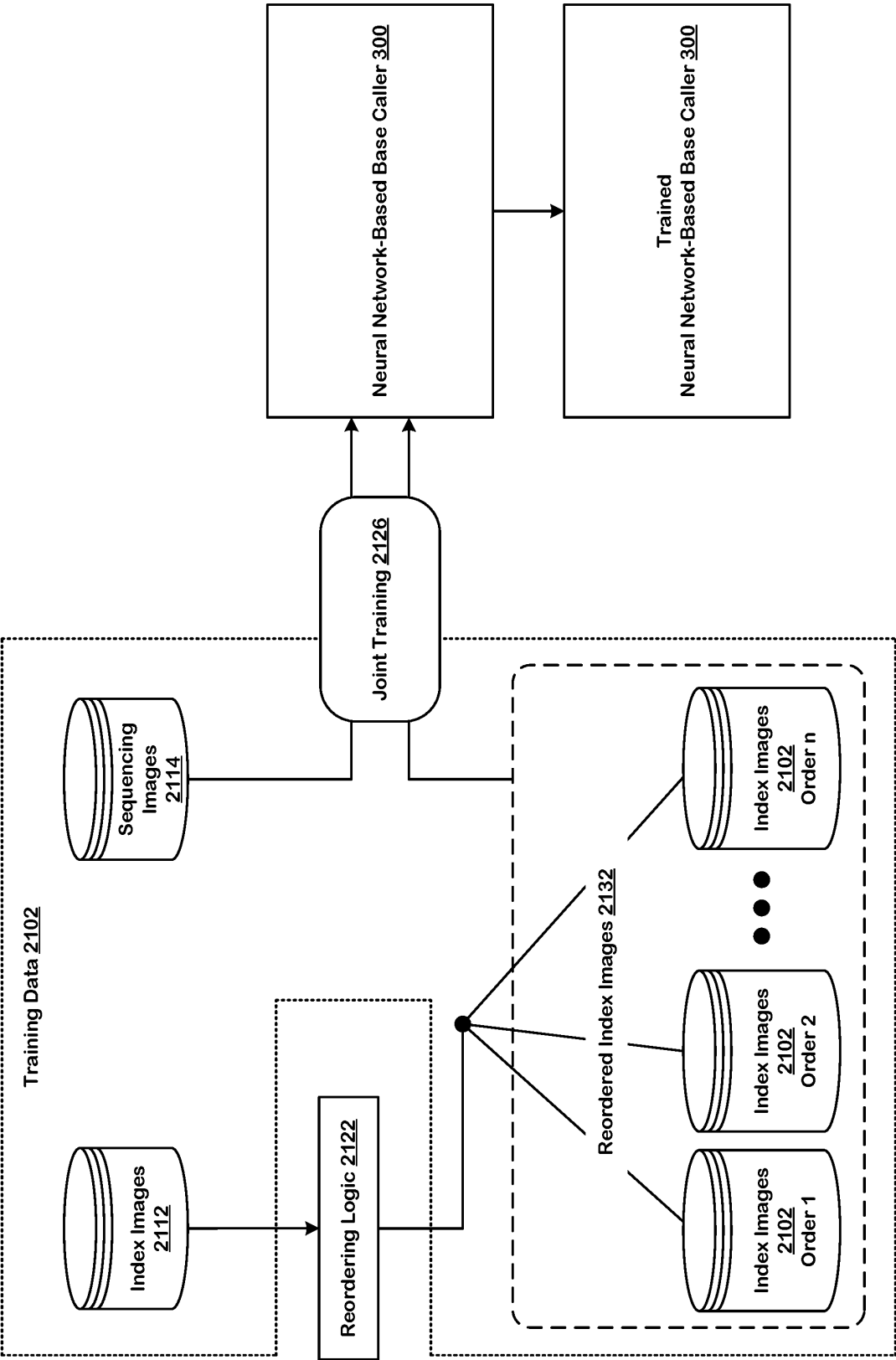


FIG. 21A

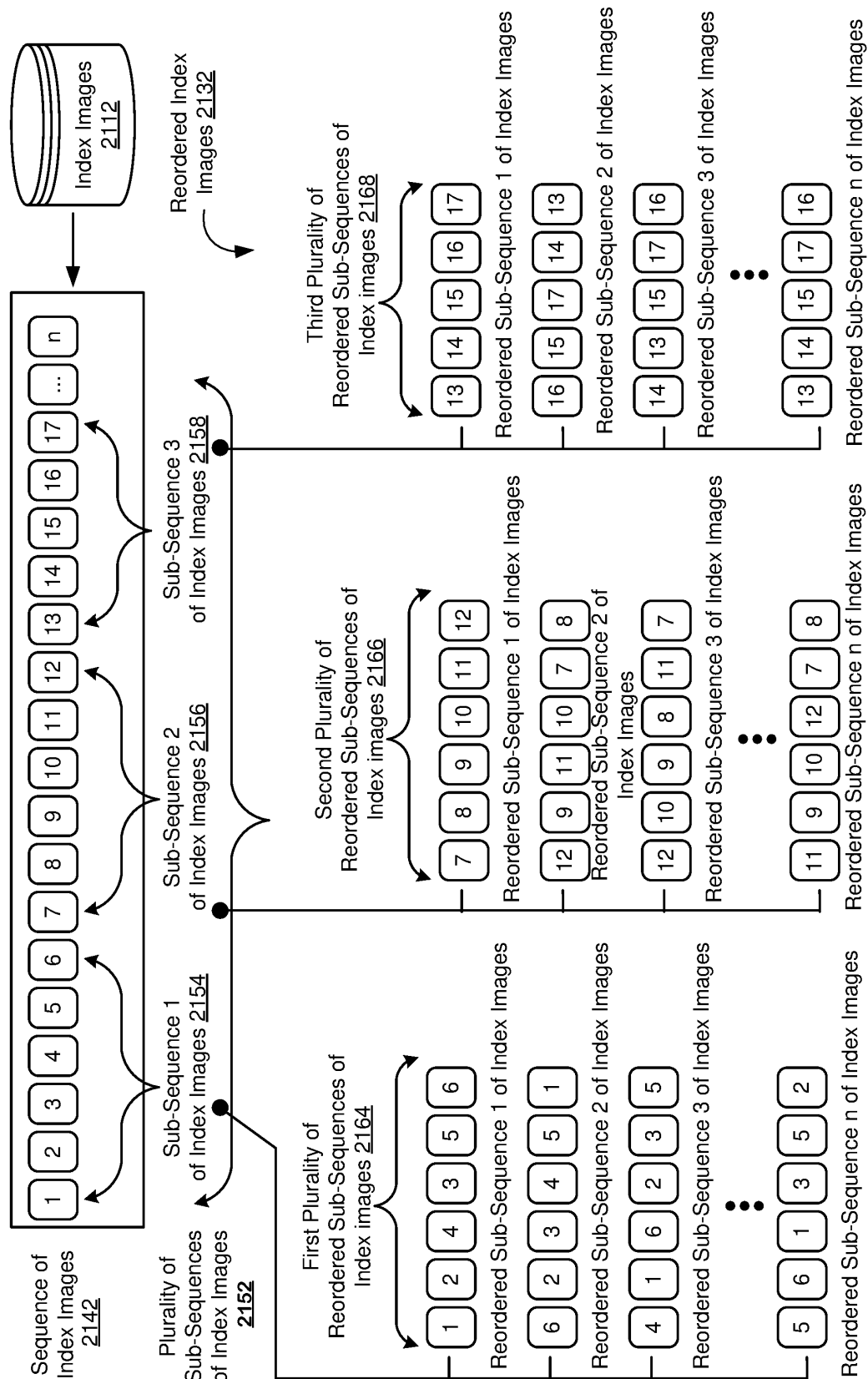


FIG. 21B

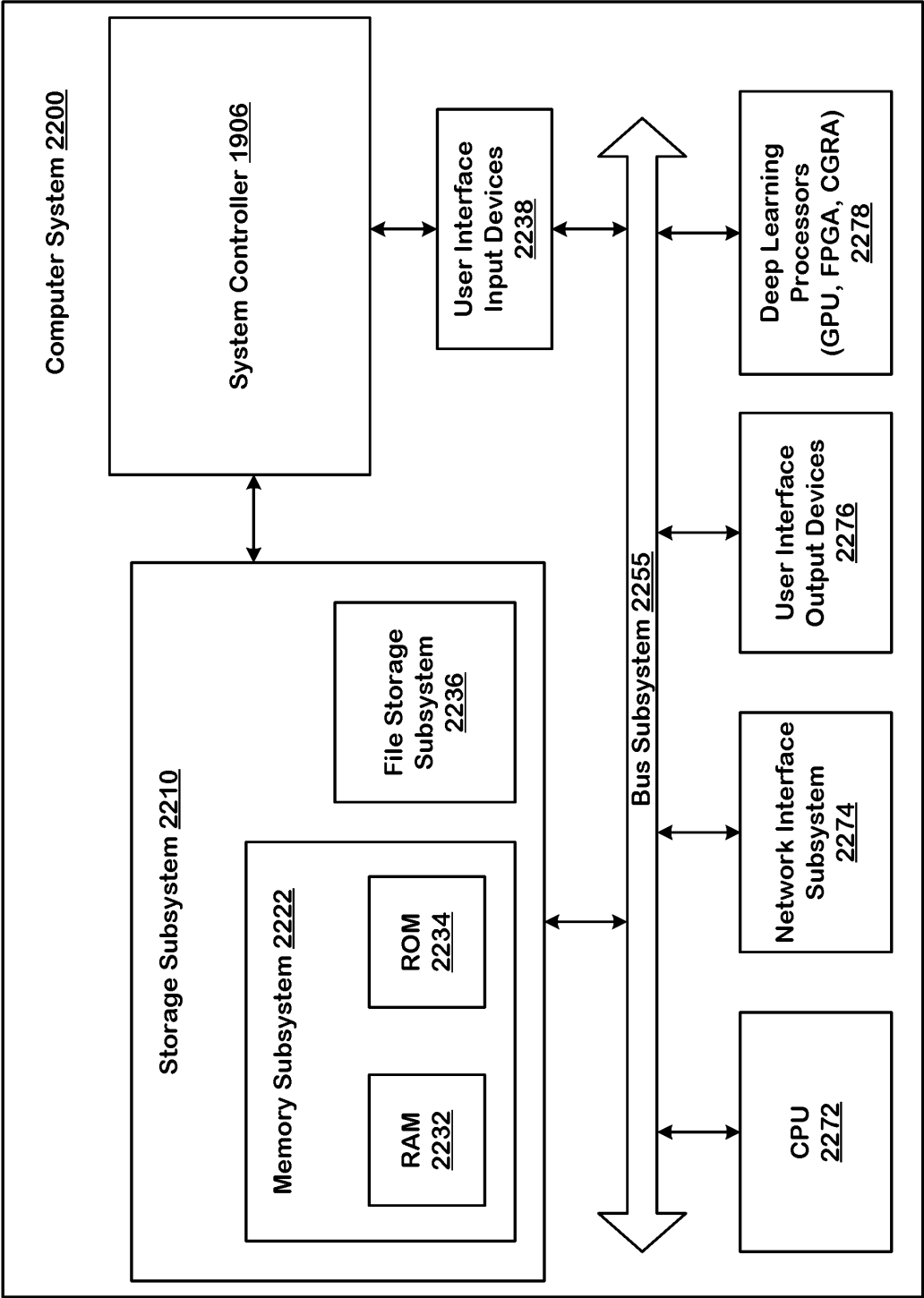


FIG. 22

12-Plex

	1	2	3	4	5	6	7	8	9	10	11	12
A	H701 H505	H702 H506	H703 H517	H705 H505	H707 H506	H723 H517	H706 H505	H712 H506	H720 H517	H710 H505	H711 H506	H714 H517
B	H702 H517	H703 H505	H701 H506	H707 H517	H723 H505	H705 H506	H712 H517	H720 H505	H706 H506	H711 H517	H714 H505	H710 H506
C	H703 H506	H701 H517	H702 H505	H723 H506	H705 H517	H707 H505	H720 H506	H706 H517	H712 H505	H714 H506	H710 H517	H711 H505
D	H705 H503	H707 H503	H723 H503	H706 H503	H712 H503	H720 H503	H710 H503	H711 H503	H714 H503	H701 H503	H702 H503	H703 H503
E	H706 H516	H712 H516	H720 H516	H710 H516	H711 H516	H714 H516	H701 H516	H702 H516	H703 H516	H705 H516	H707 H516	H723 H516
F	H710 H522	H711 H510	H714 H513	H701 H522	H702 H510	H703 H513	H705 H522	H707 H510	H723 H513	H706 H522	H712 H510	H720 H513
G	H711 H513	H714 H522	H710 H510	H702 H513	H703 H522	H701 H510	H707 H513	H723 H522	H705 H510	H712 H513	H720 H522	H706 H510
H	H714 H510	H710 H513	H711 H522	H703 H510	H701 H513	H702 H522	H723 H510	H705 H513	H707 H522	H720 H510	H706 H513	H712 H522

8-rxn

FIG. 23

96 Indexes

Changes in IndexBase Calling : Different Training Strategy

Before Method	New Method
Augmented <i>Unnormalized</i> Model • Showed model performance is comparable to RTA. • Does not need training with index cycles. • However, 5c model in ushort would have trouble fitting in memory. • Move to 3c model - very little performance degradation, but not better than RTA.	Joint Trained <i>Normalized</i> Model • Improved performance than augmented models. • <i>Requires training with index cycles and specialized training to prevent memorization of index cycles*</i>. • Similar normalization as sequencing cycles (ease of implementation). • 5c model can fit in memory. • Method of training applicable for low diversity sequences in general – not just index cycles.

FIG. 24

Joint Training with Index Cycles

- ☐ Different Training tricks to prevent memorization of the order of cycles.
- a. Shuffle order of input 5 cycles

b. Load all 8/10 cycles of index cycles - permute at random allowing repetition and select 5 cycles.

c. Freeze temporal layers of model trained on “sequencing cycles”, and retain with sequencing cycles and index cycles
- ☐ All methods improved performance over augmentation. Will use (c) going forward; best results and ease of training. Inference results presented for (a).

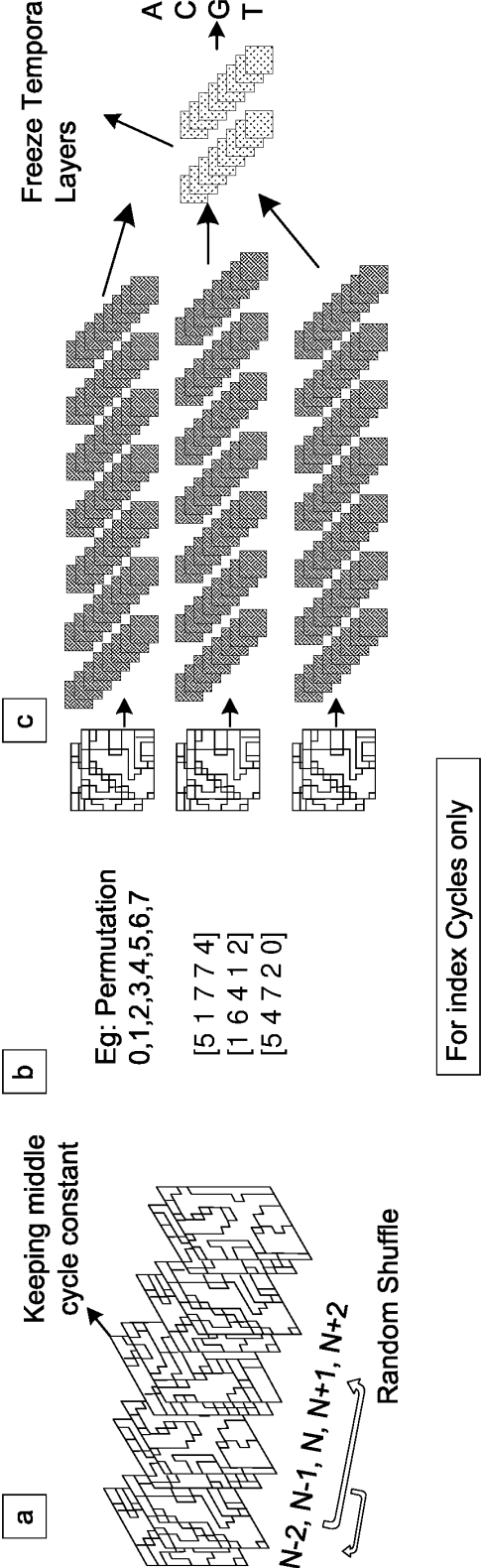


FIG. 25