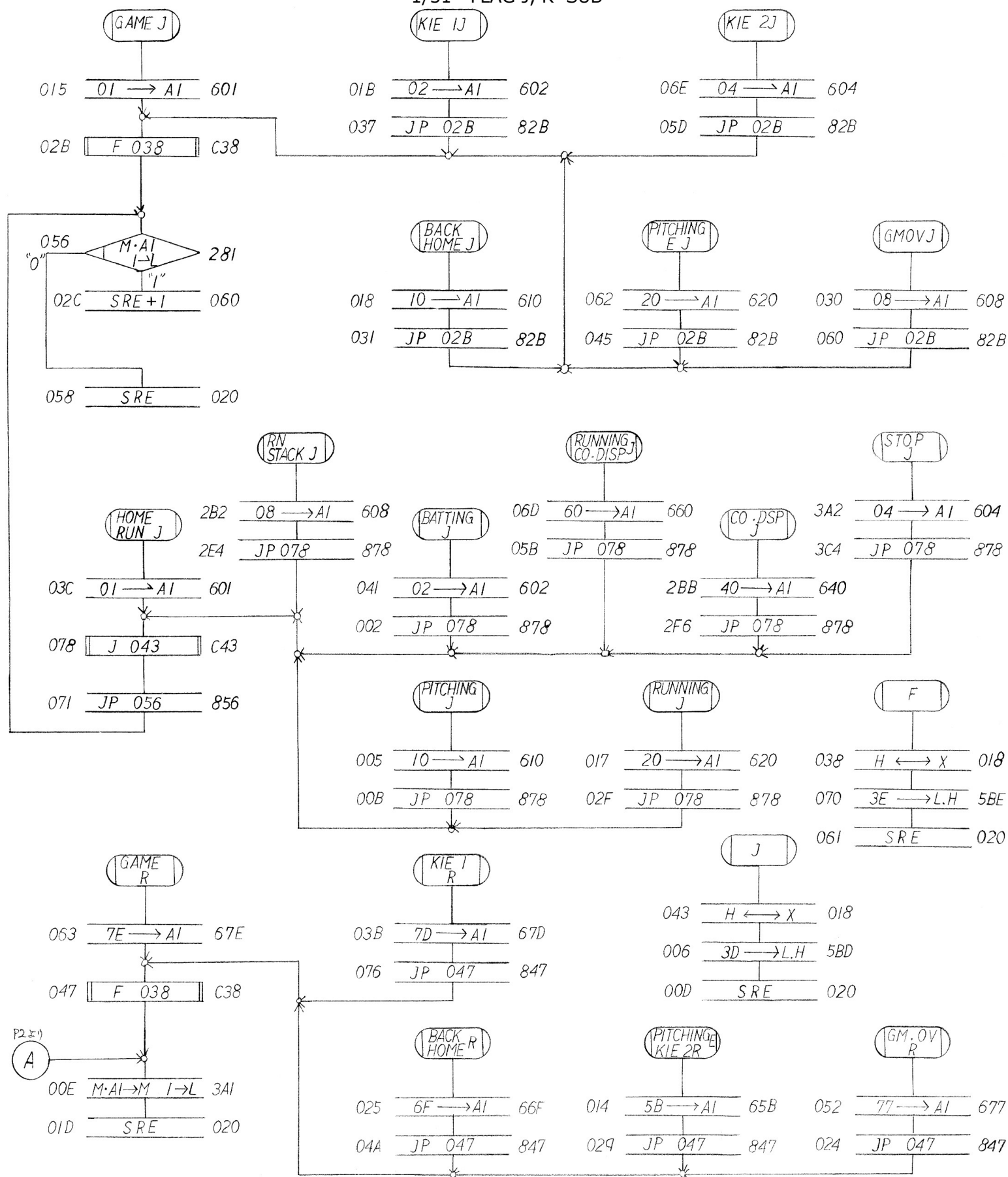


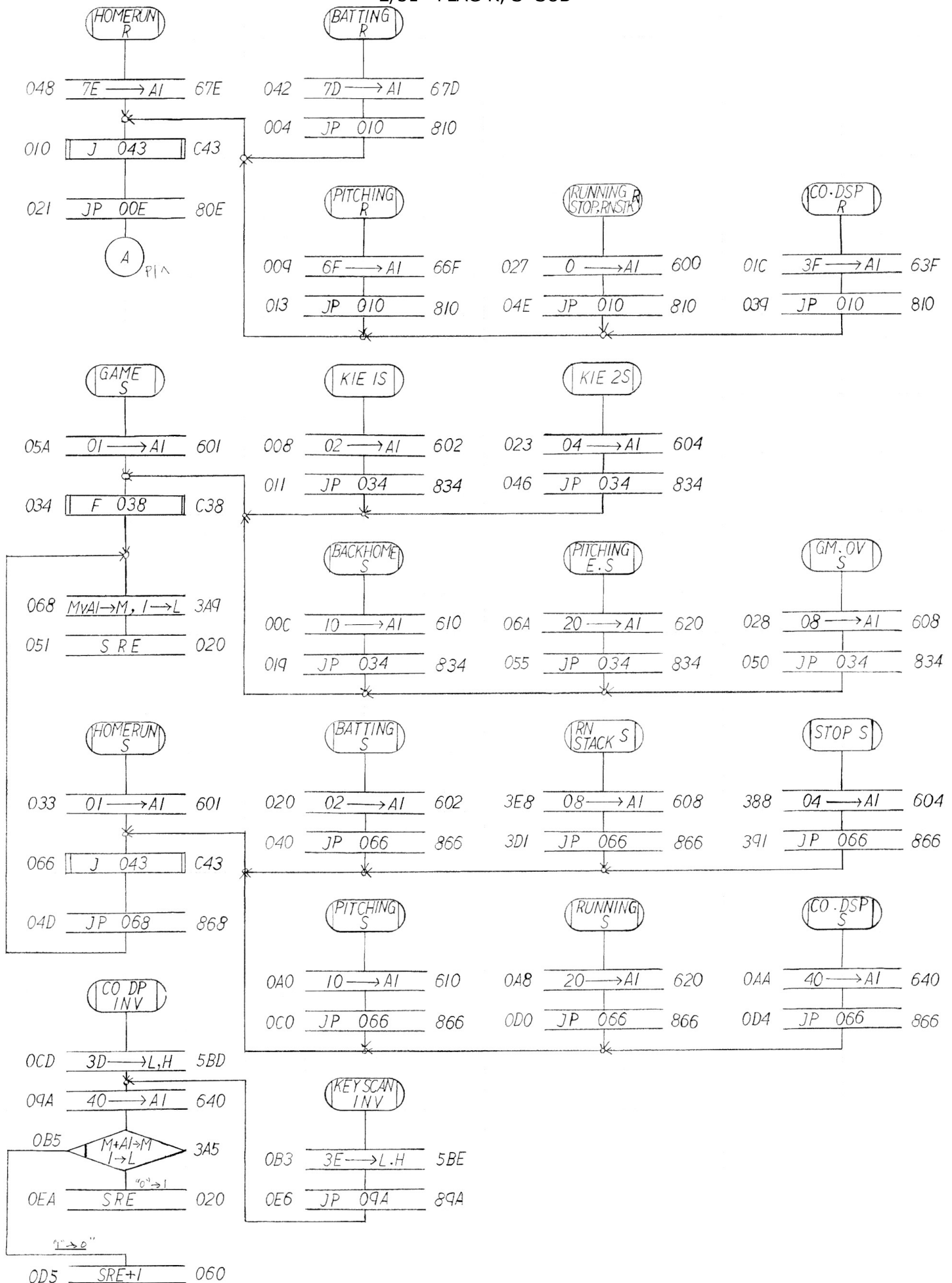
**Firmware of 7/28 bit (\*1) Video Game Microcomputer  $\mu$ PD778C (\*2)**

\*1 : 7 bit CPU with 28 bit data transfer between 28 bit SRAM cells (MA) and 28 bit register file (A) constructed by four sets of 7 bit register (A1, A2, A3, and A4) in one instruction ( $A \rightarrow MA$ ,  $MA \rightarrow A$ ,  $MA \leftrightarrow A$ ).

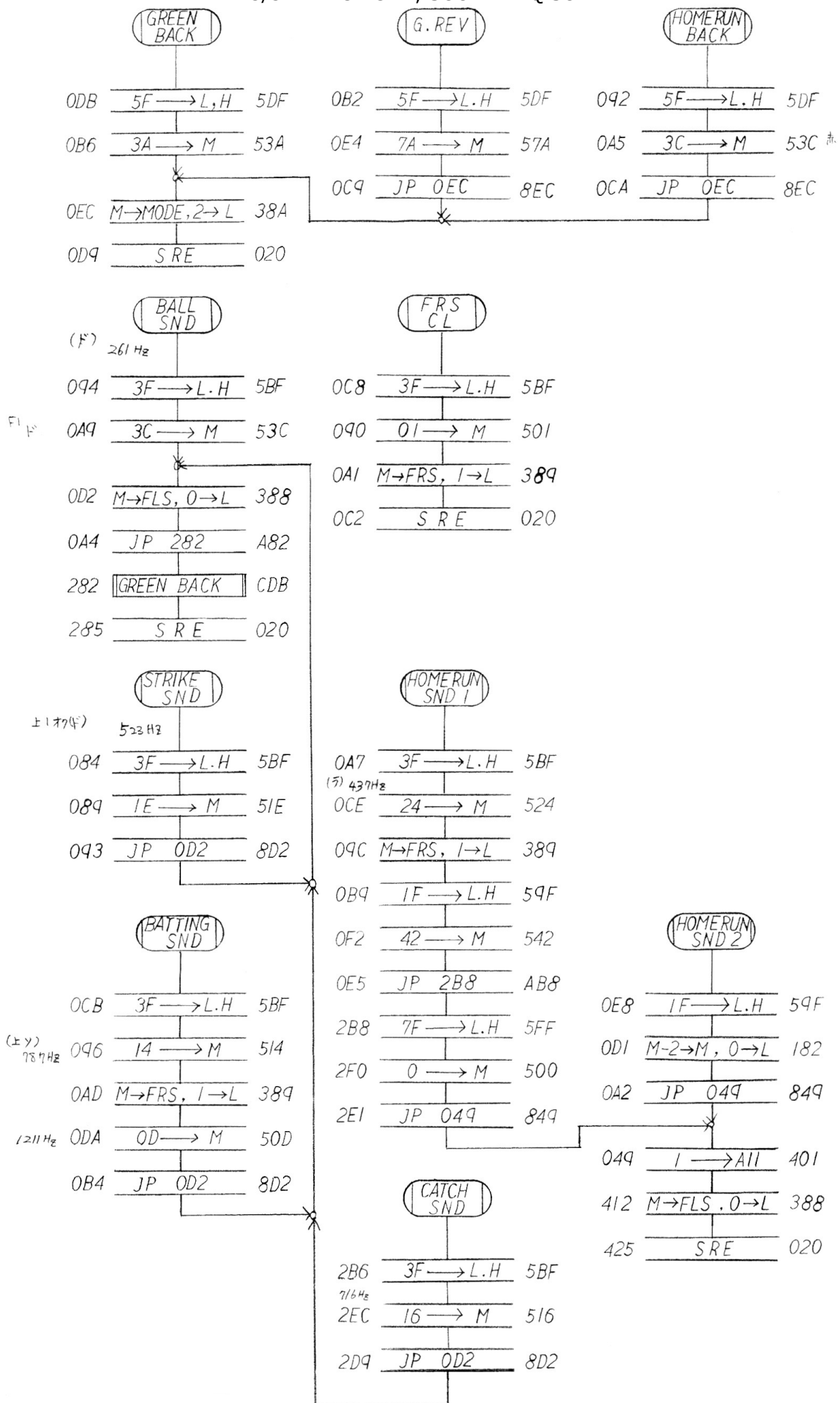
\*2 : A second LSI of  $\mu$ PD777 which die size is 5.95 mm square, supplied to EPOCH CO. LTD., in 6/1978 for their TV BASEBALL GAME. EPOCH released it on 8/21/1978. The TV BASEBALL GAME was exhibited on "TV\_game & Digital Science Exhibition" held from 7/17/2004 to 10/11/2004 at "National Museum of Nature and Science" in Tokyo, Japan. "National Museum of Nature and Science" still owns the TV BASEBALL GAME. Refer to the brochure for both events.

## 1/31 FLAG J, R SUB

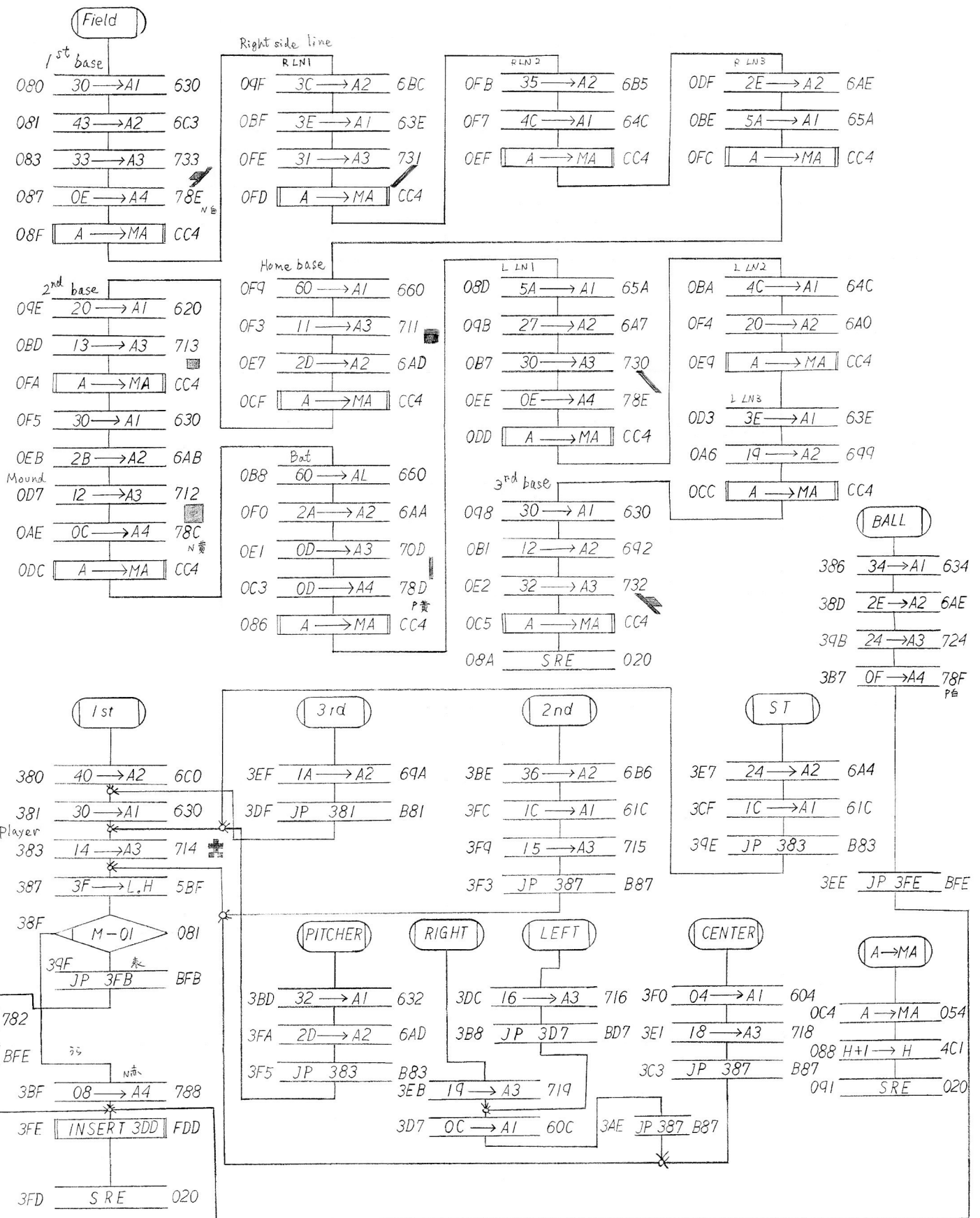


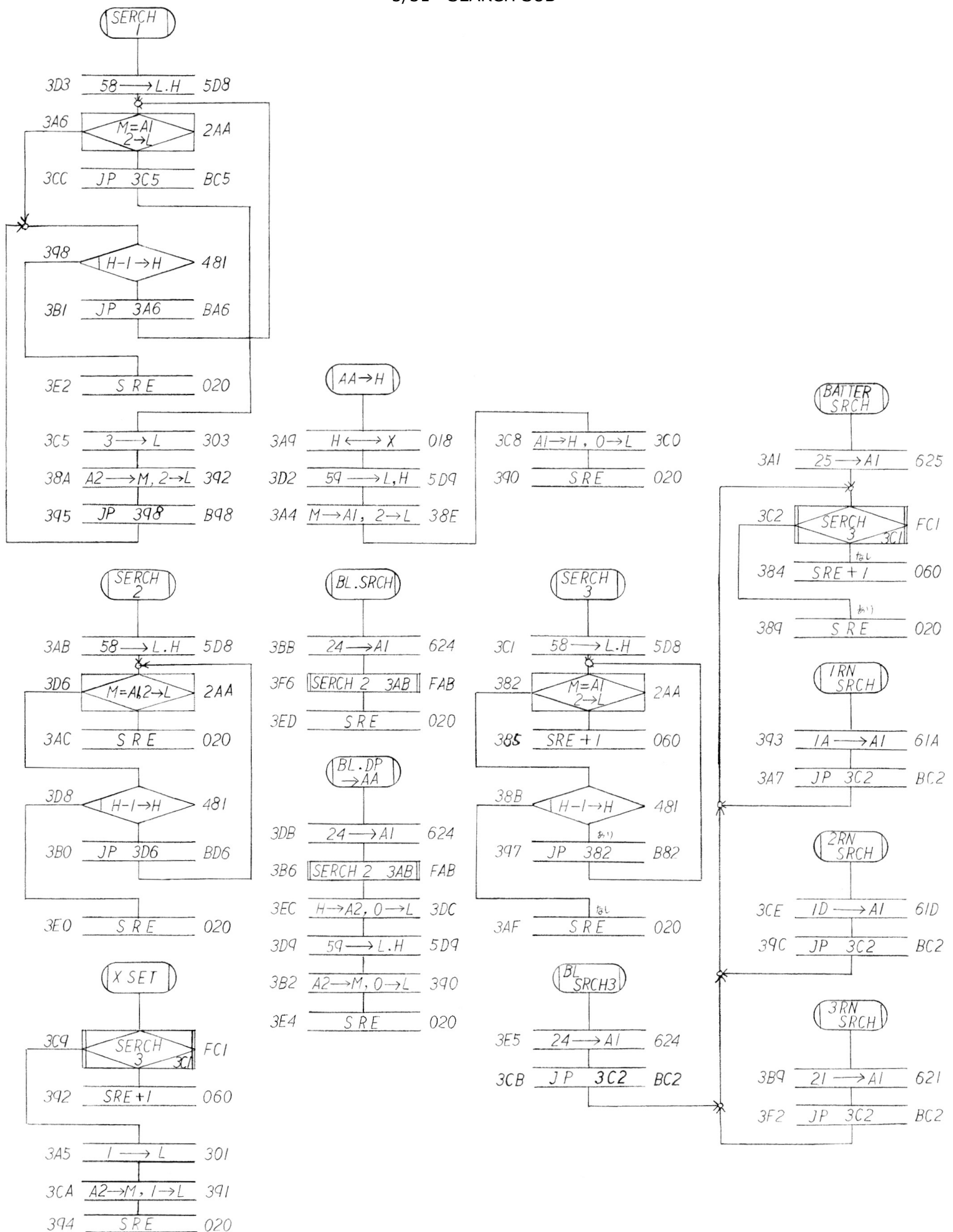


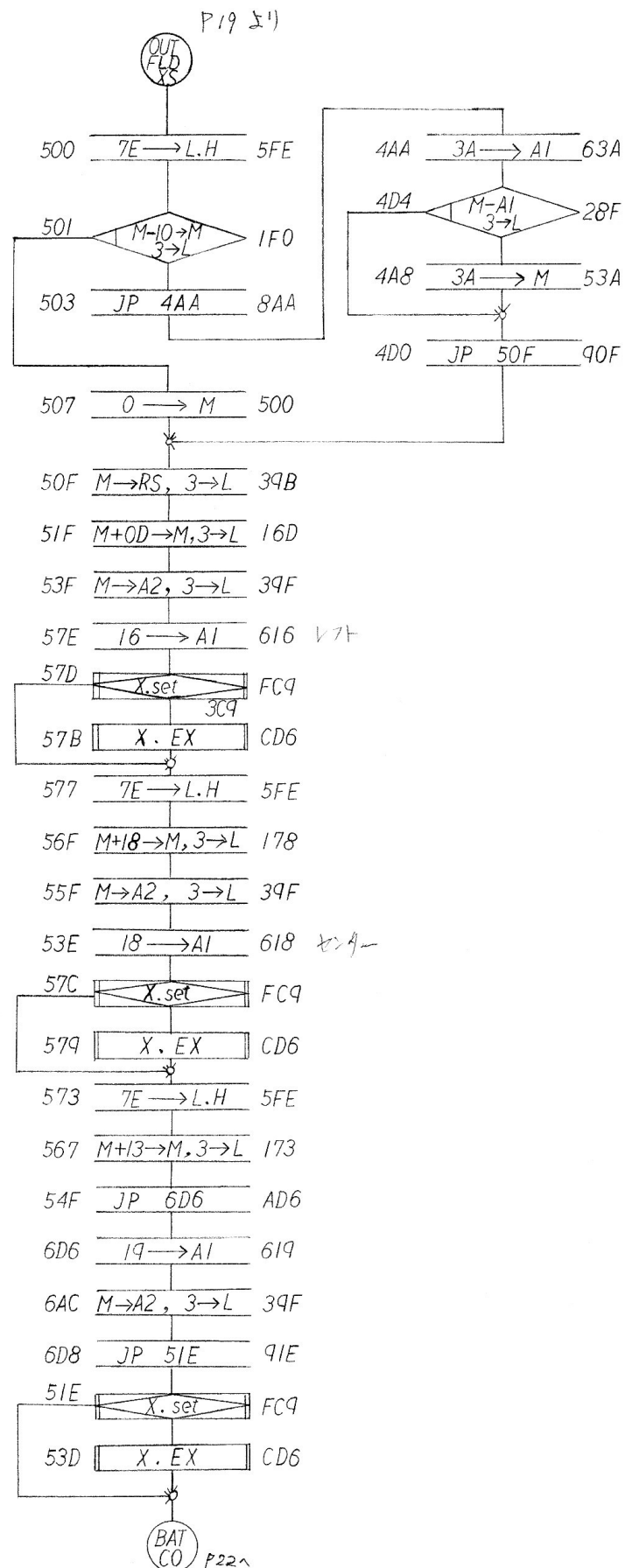
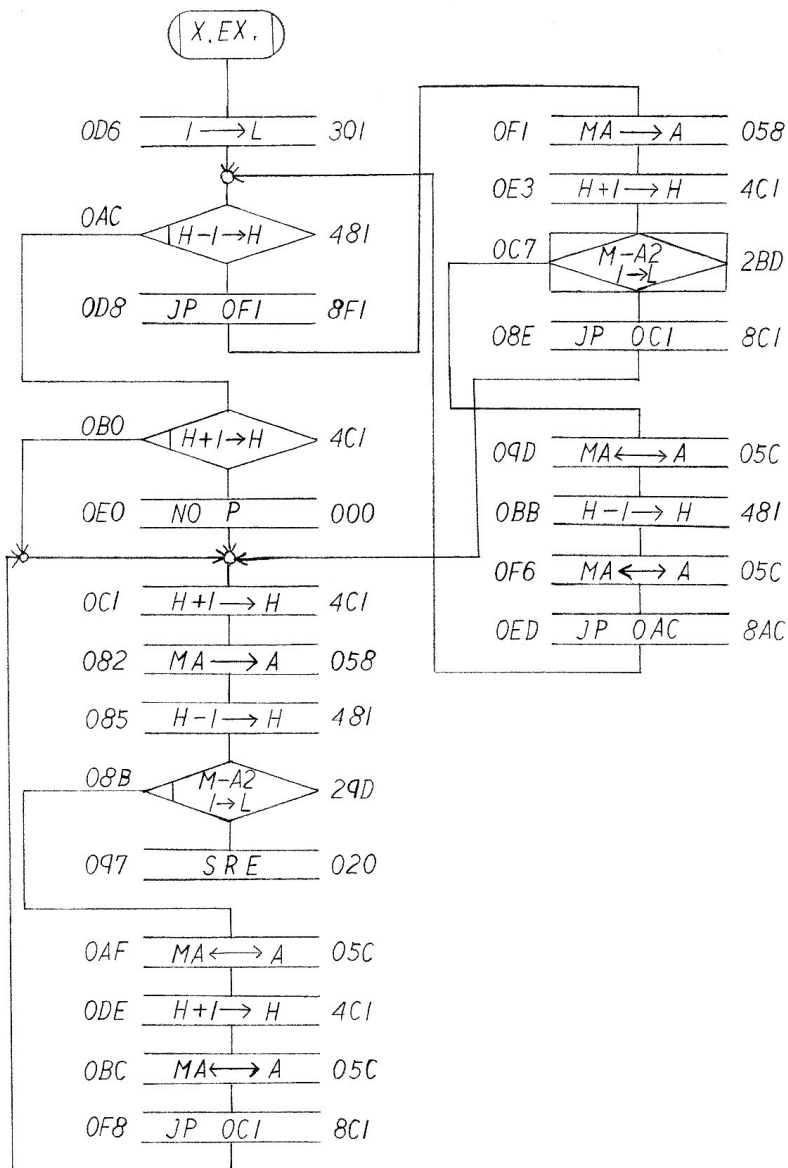
# 3/31 BACK GND, SOUND FRQ SUB

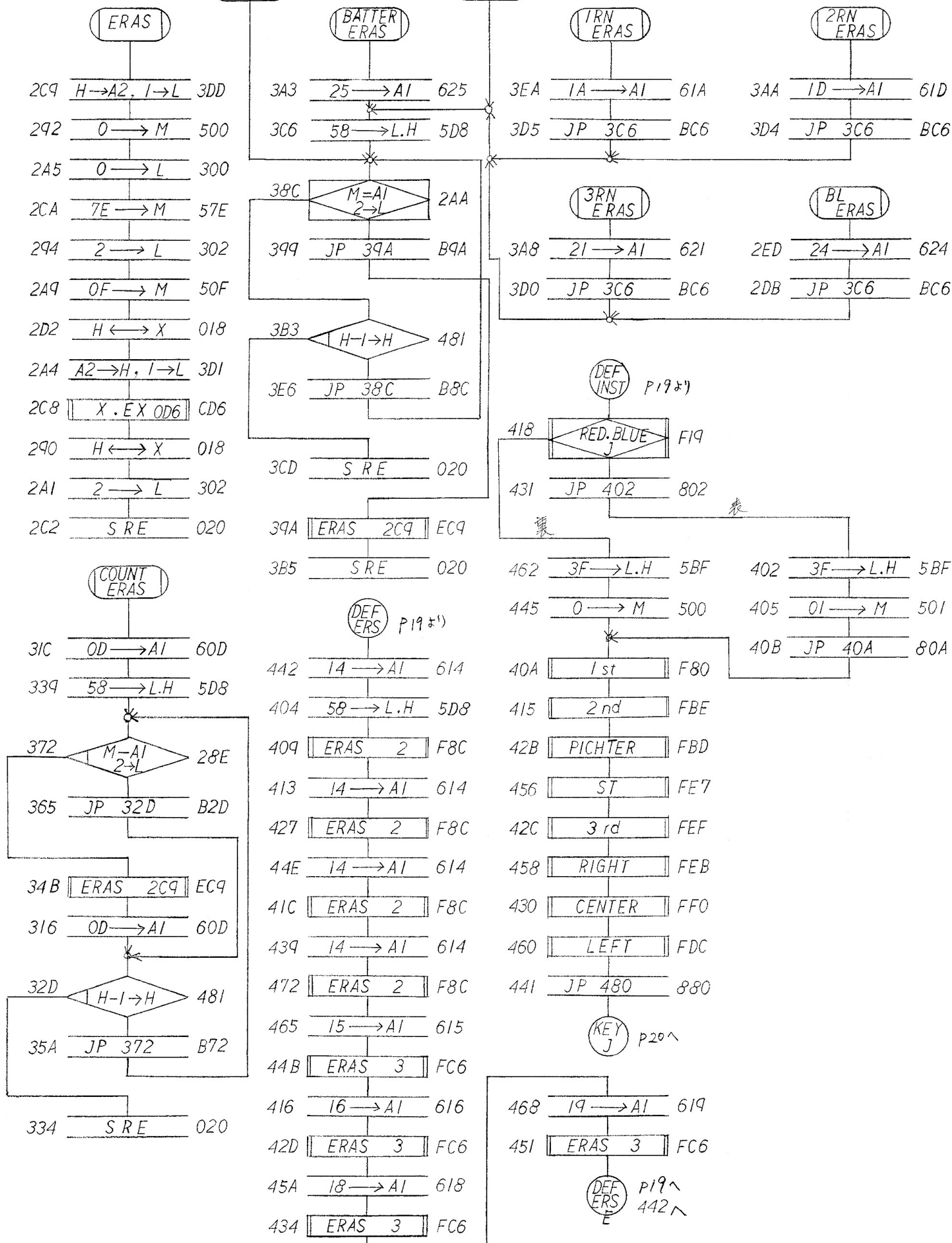


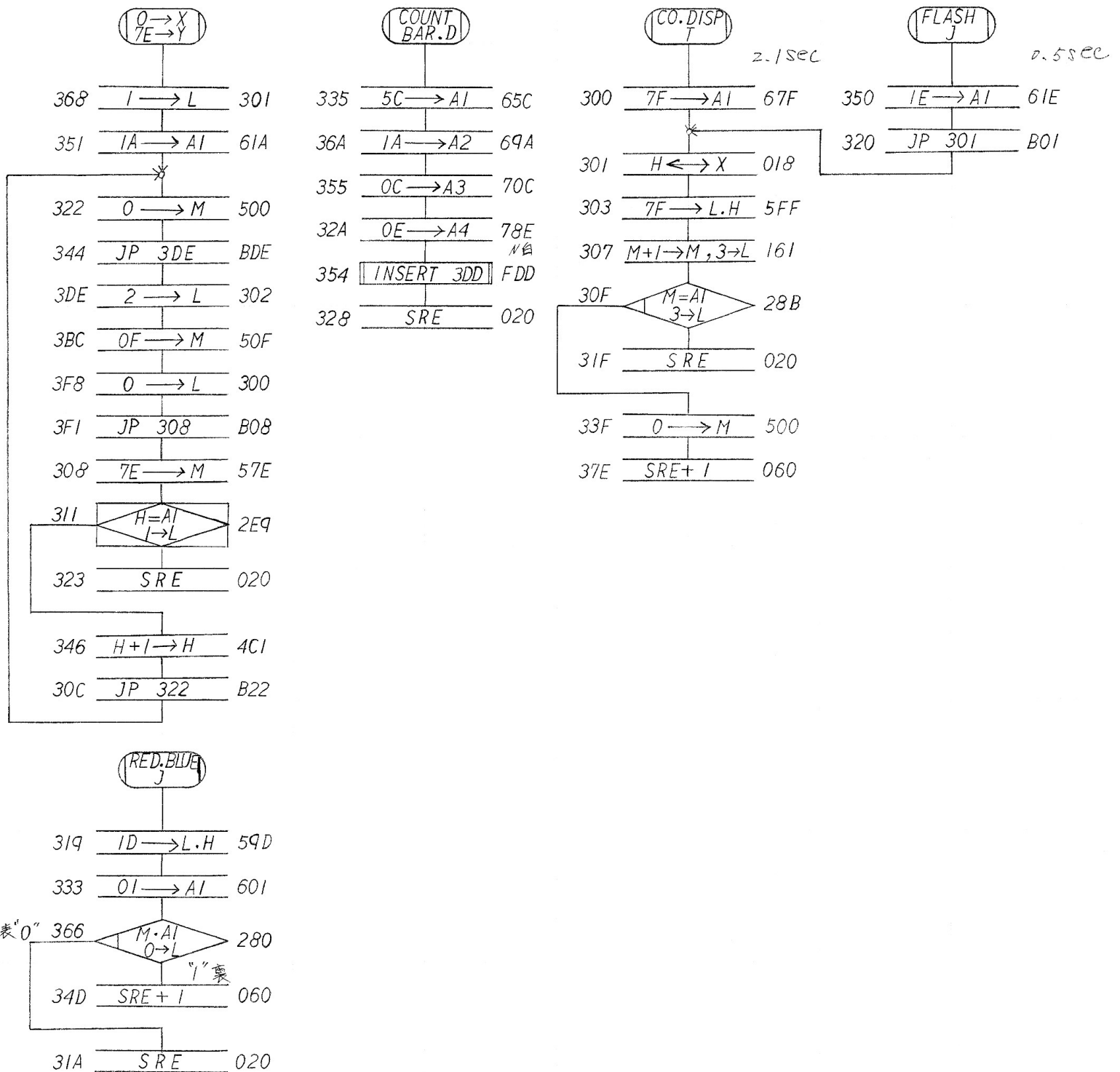


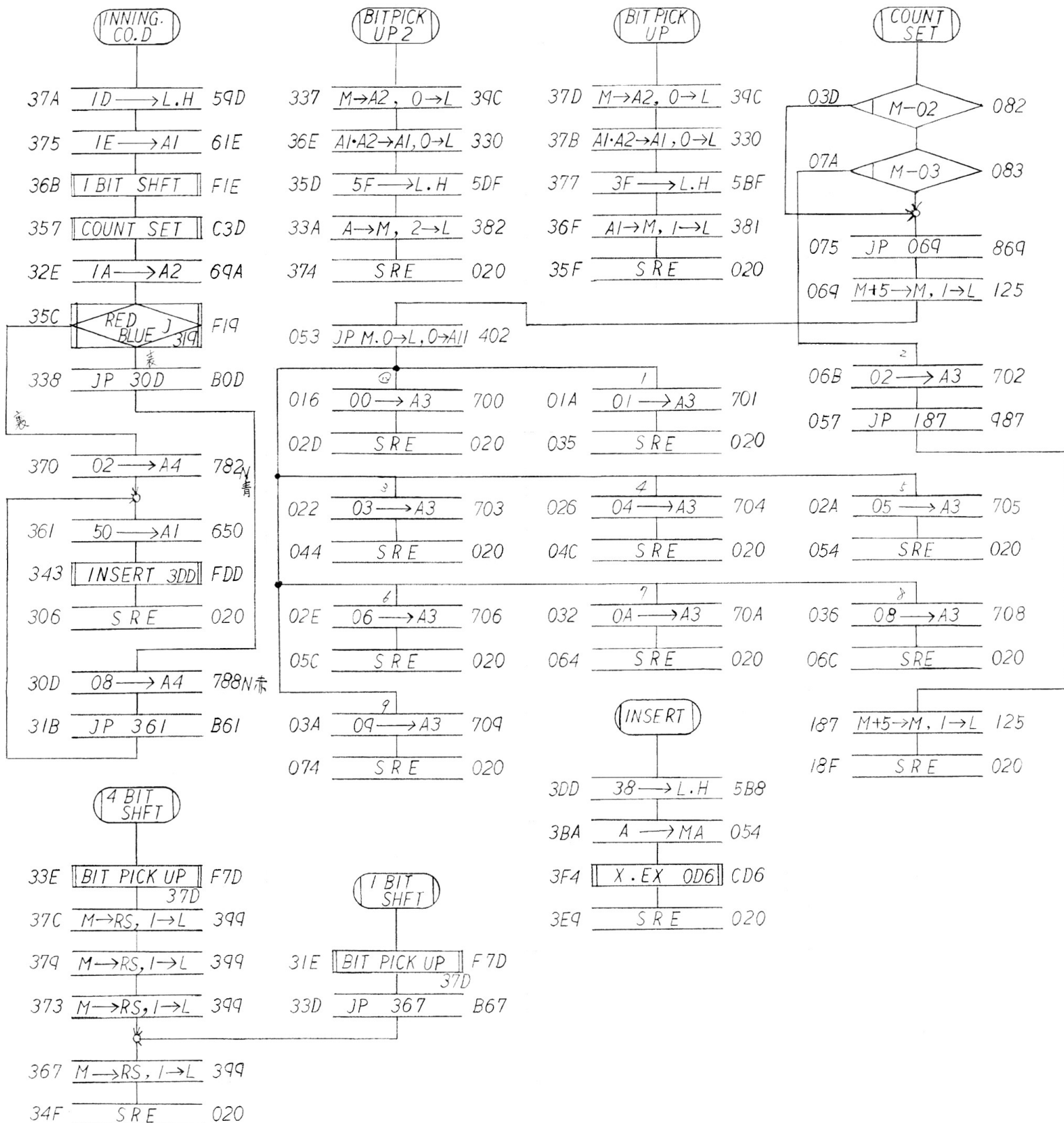


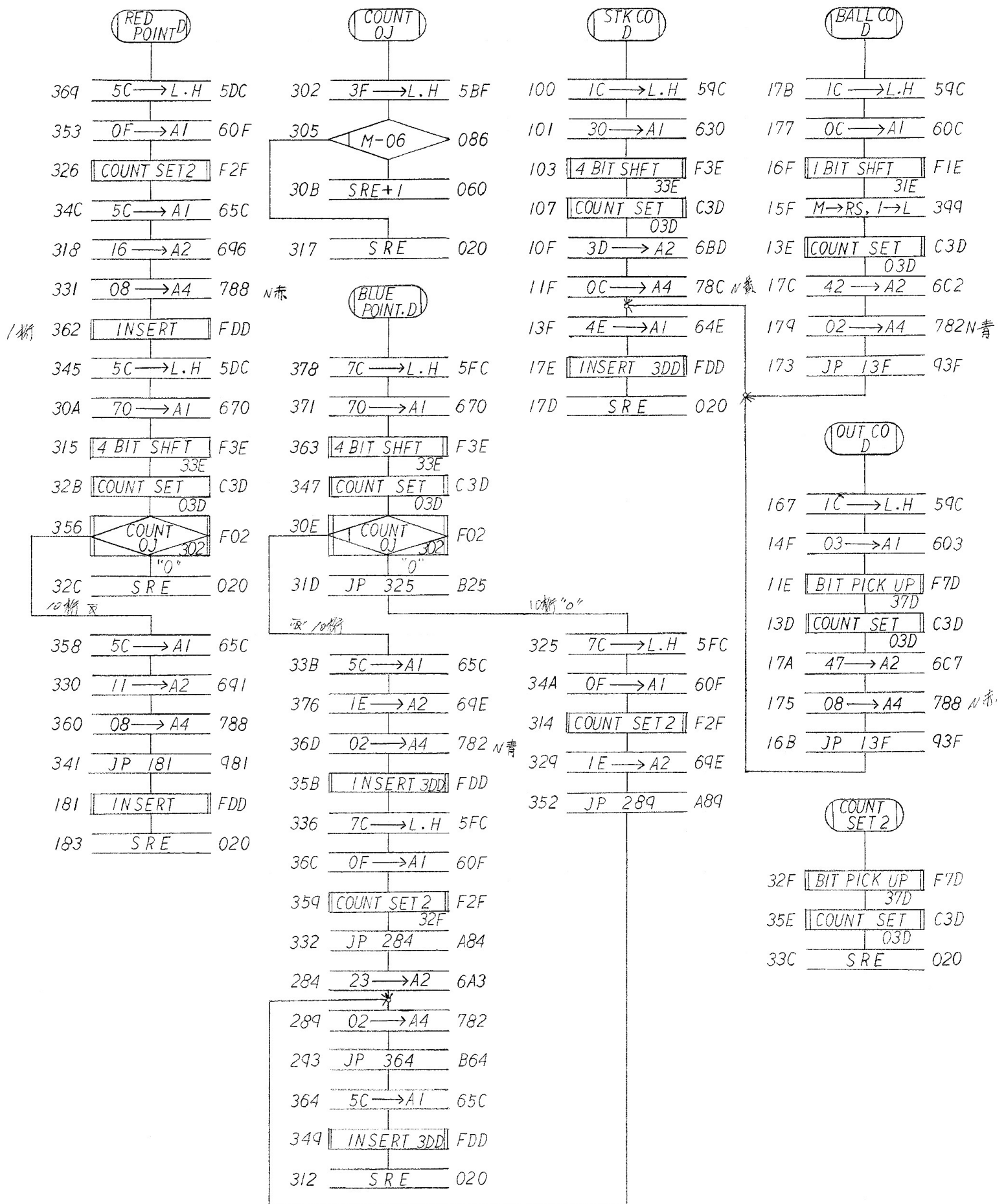


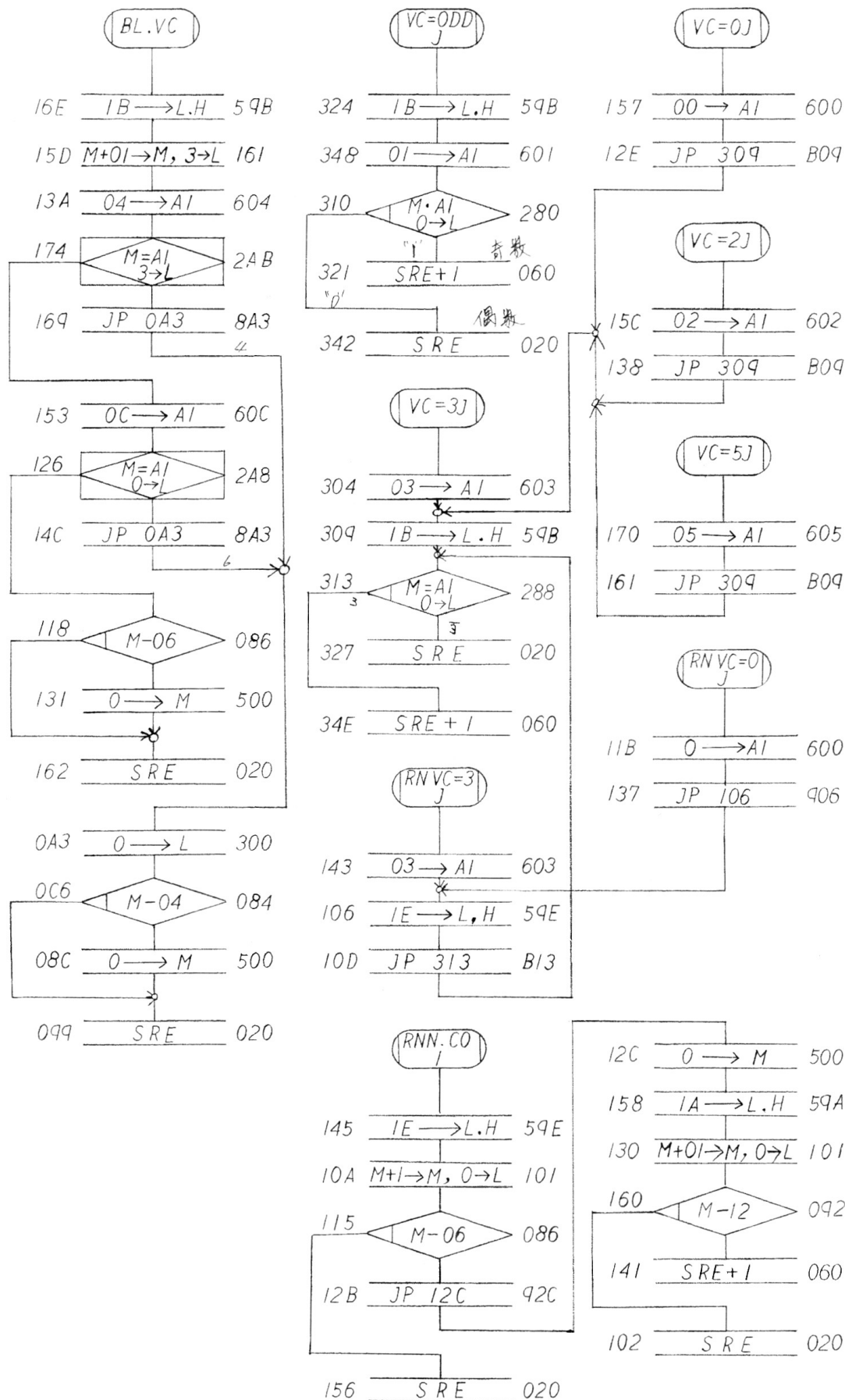






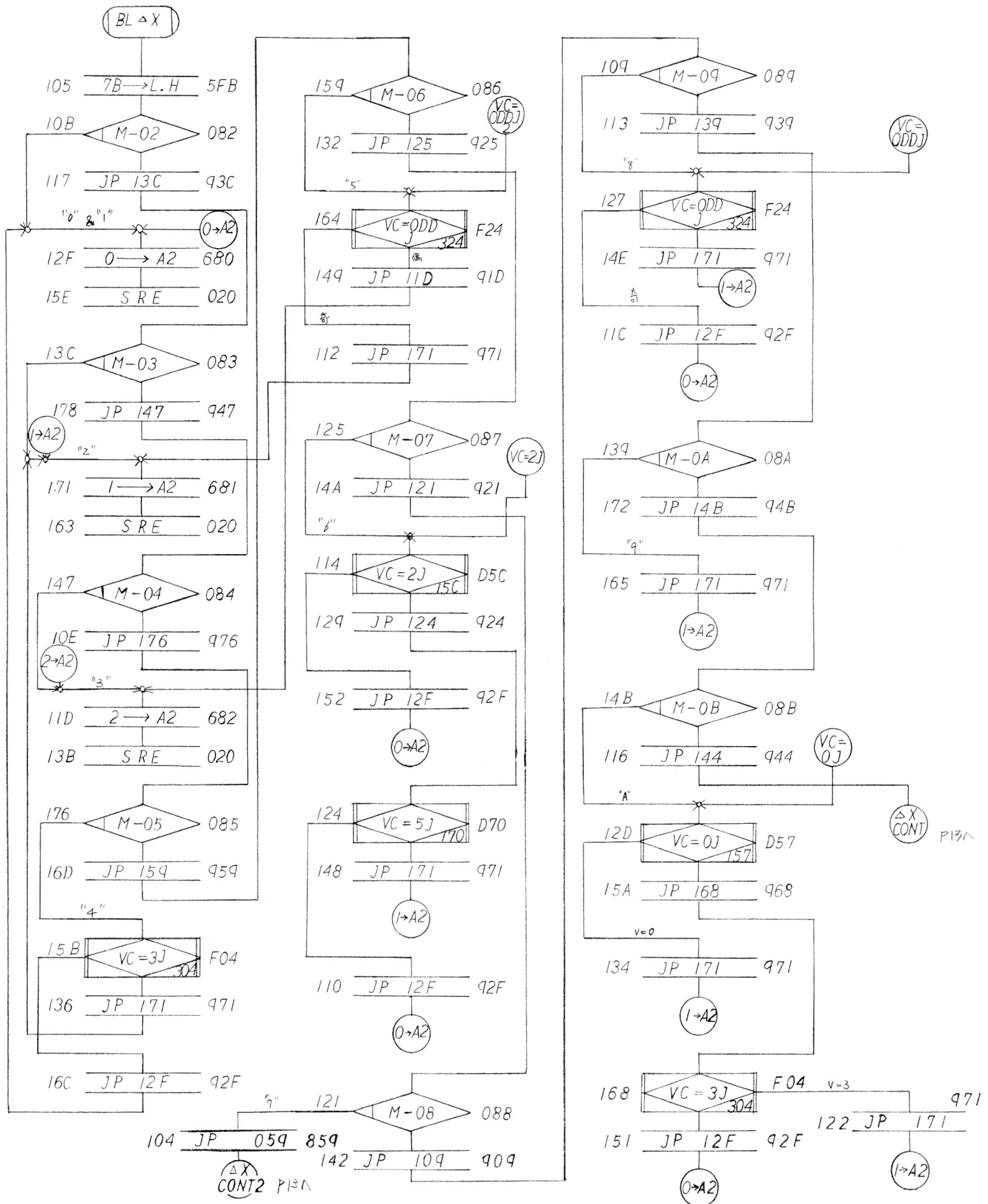




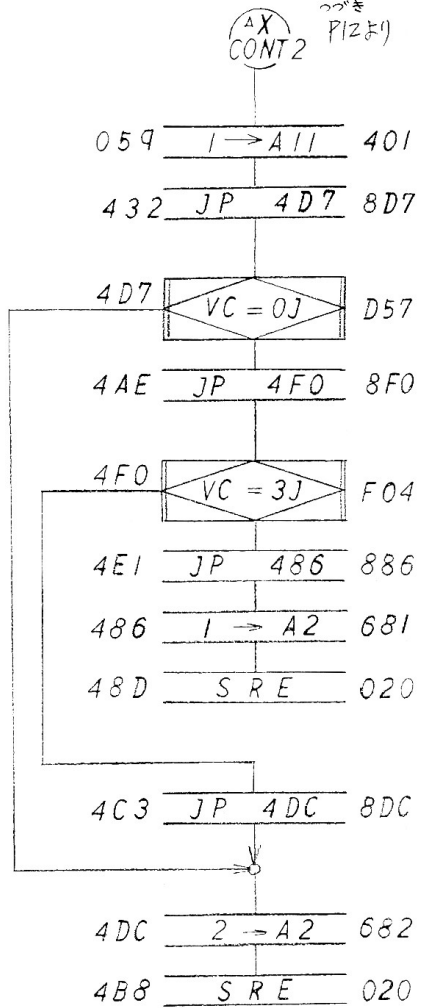


|                       | N  | +Y | +X |   |   | 0 | 1 | 2 | 3 | 4 | 5 |
|-----------------------|----|----|----|---|---|---|---|---|---|---|---|
| ピッチャー<br>投球           | 0  | 1  | 0  | L | X | 0 | → |   |   |   |   |
|                       | 1  | 1  | 0  | H | Y | 1 | 0 | 1 | 0 | 1 | 0 |
| ファール<br>⑤-2<br>(左)    | 2  | 0  | 1  | L | X | 1 | → |   |   |   |   |
|                       | 3  | 0  | 0  | H | Y | 1 | 0 | 1 | 0 | 1 | 0 |
| ①-4<br>(左)            | 3  | 0  | 0  | H | X | 2 | → |   |   |   |   |
|                       | 4  | 0  | 1  | L | Y | 1 | → |   |   |   |   |
| ⑤-3<br>(右)            | 4  | 0  | 1  | L | X | 1 | 1 | 1 | 0 |   |   |
|                       | 5  | 0  | 0  | H | Y | 2 | → |   |   |   |   |
| ②-4<br>(3ゴロ)          | 5  | 0  | 0  | H | X | 2 | 1 | 2 | 1 | 2 | 1 |
|                       | 6  | 0  | 1  | L | Y | 1 | → |   |   |   |   |
| ④-3<br>(ライト)          | 6  | 0  | 1  | L | X | 1 | 1 | 0 | 1 | 1 | 0 |
|                       | 7  | 0  | 0  | H | Y | 2 | → |   |   |   |   |
| ②-3<br>(レフト)          | 7  | 0  | 0  | H | X | 2 | 1 | 1 | 2 | 1 | 1 |
|                       | 8  | 0  | 1  | L | Y | 1 | → |   |   |   |   |
| ②-2<br>(ライト)          | 8  | 0  | 1  | L | X | 1 | 0 | 1 | 0 | 1 | 0 |
|                       | 9  | 0  | 0  | H | Y | 2 | → |   |   |   |   |
| ③-4<br>(レフト)          | 9  | 0  | 0  | H | X | 1 | → |   |   |   |   |
|                       | A  | 0  | 1  | L | Y | 1 | → |   |   |   |   |
| ④-4<br>(ライト)          | A  | 0  | 1  | L | X | 1 | 0 | 0 | 1 | 0 | 0 |
|                       | B  | 0  | 1  | H | Y | 2 | → |   |   |   |   |
| ④-2<br>(2ゴロ)          | C  | 0  | 1  | L | X | 1 | 0 | 0 | 0 |   |   |
|                       | D  | 0  | 0  | H | Y | 2 | → |   |   |   |   |
| ①-3<br>(セーフ)          | D  | 0  | 0  | H | X | 1 | 0 | 1 | 0 | 1 | 0 |
|                       | E  | 0  | 0  | L | Y | 1 | → |   |   |   |   |
| ⑤-4<br>(セーフ)          | E  | 0  | 0  | L | X | 1 | 0 | 0 | 0 | 0 | 0 |
|                       | F  | 0  | 0  | H | Y | 2 | → |   |   |   |   |
| ①-2<br>(STゴロ)         | F  | 0  | 0  | H | X | 1 | 0 | 0 | 1 | 0 | 0 |
|                       | 10 | 0  | 0  | L | Y | 1 | → |   |   |   |   |
| ③-3<br>(セーフ)          | 11 | 0  | 0  | H | X | 0 | → |   |   |   |   |
|                       | 12 | 0  | 1  | L | Y | 0 | → |   |   |   |   |
| 3rd → 1st<br>ST → 2nd | 13 | 1  | 1  | X | 1 | → |   |   |   |   |   |
|                       | 14 | 1  | 1  | Y | 1 | 1 | 0 | 1 | 1 | 0 |   |
| 2nd → 1st             | 15 | 1  | 1  | X | 1 | → |   |   |   |   |   |
|                       | 16 | 1  | 1  | Y | 1 | 0 | 0 | 1 | 0 | 0 |   |
| ST → 1st              | 17 | 1  | 1  | X | 1 | → |   |   |   |   |   |
|                       | 18 | 1  | 1  | Y | 1 | 0 | 0 | 1 | 0 | 0 |   |
| ランナー<br>打者 3塁         | 19 | 1  | 1  | X | 1 | 0 | 0 | 1 | 0 | 0 |   |
|                       | 20 | 1  | 1  | Y | 1 | 0 | 0 | 1 | 0 | 0 |   |
| ランナー<br>1塁, 2塁        | 21 | 1  | 1  | X | 1 | 0 | 0 | 1 | 0 | 0 |   |
|                       | 22 | 1  | 1  | Y | 1 | 0 | 0 | 0 | 0 | 0 |   |
| ランナー<br>1塁, 2塁        | 23 | 1  | 1  | X | 1 | 0 | 0 | 1 | 0 | 0 |   |
|                       | 24 | 1  | 1  | Y | 0 | 0 | 0 | 0 | 0 | 0 |   |

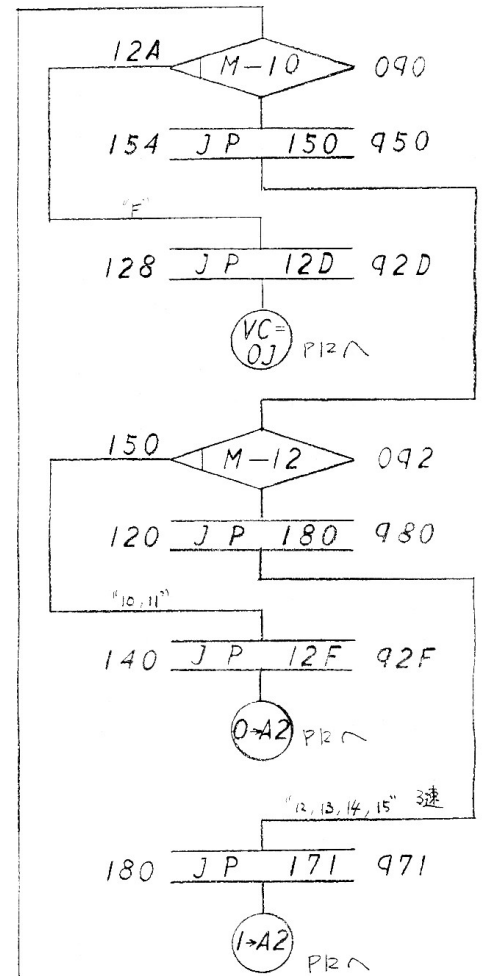
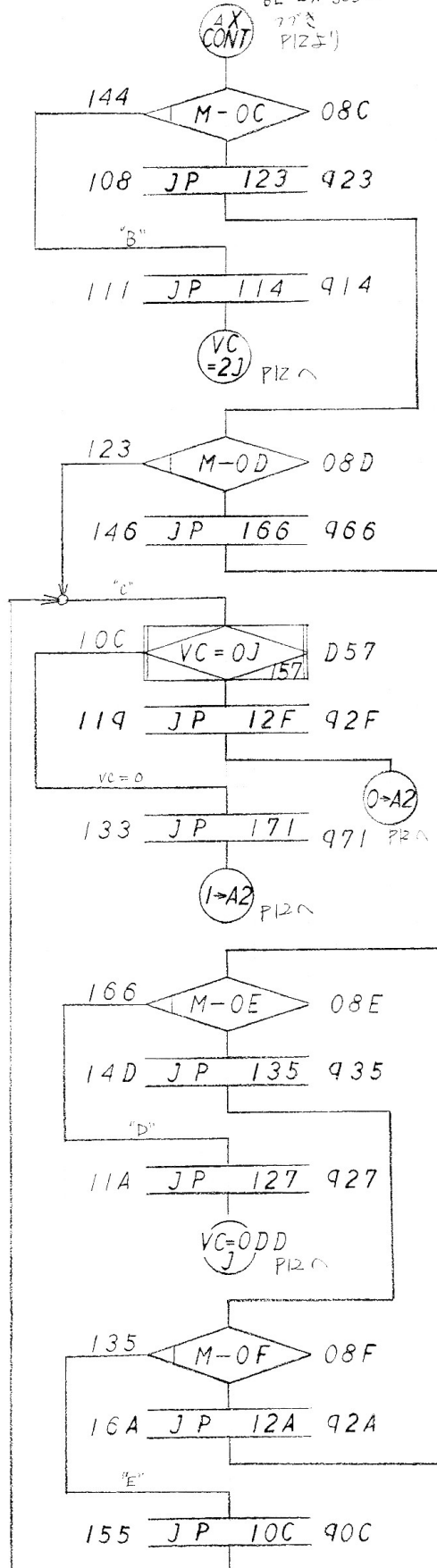




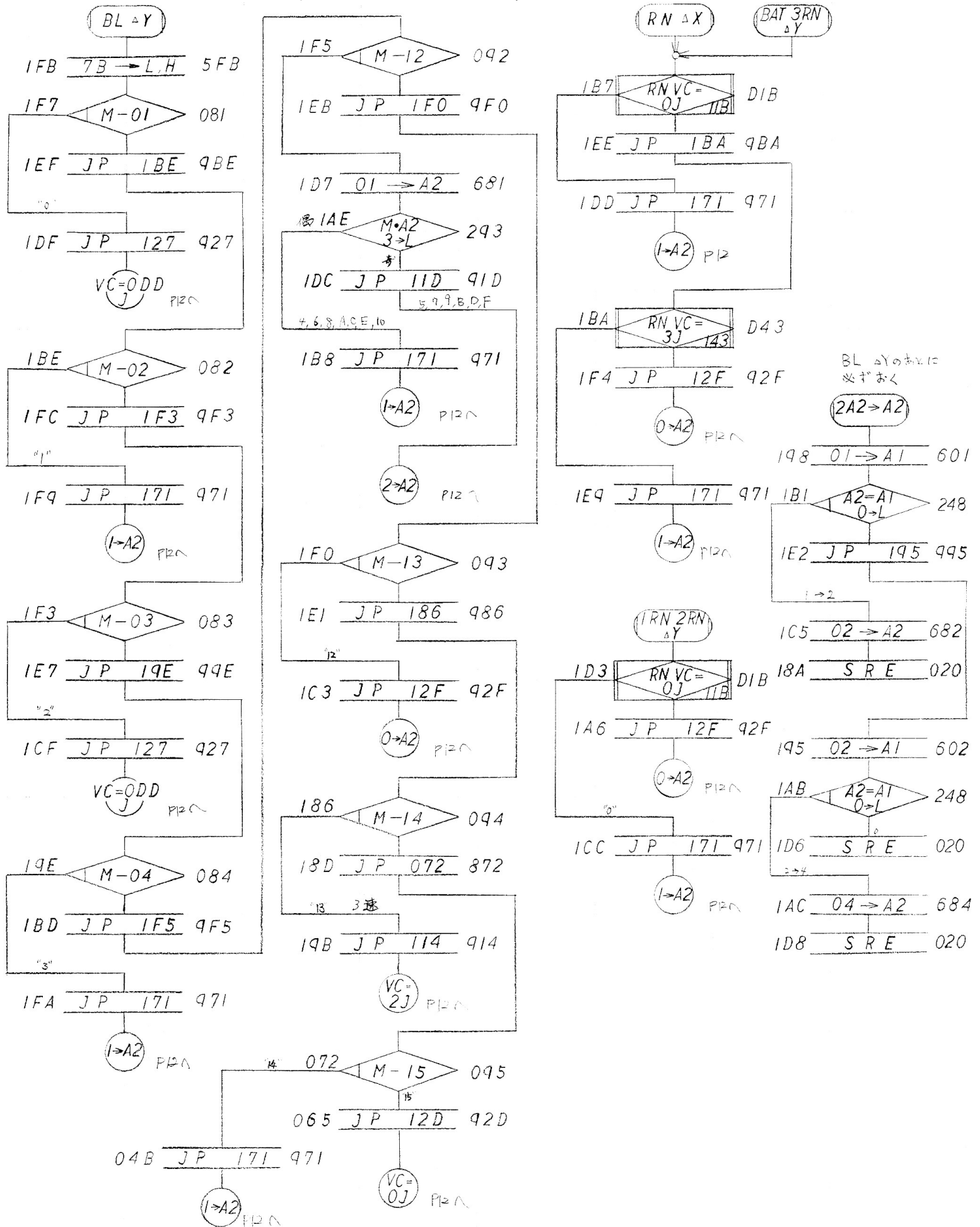
BL ΔX SUB の  
つぎ  
P12より

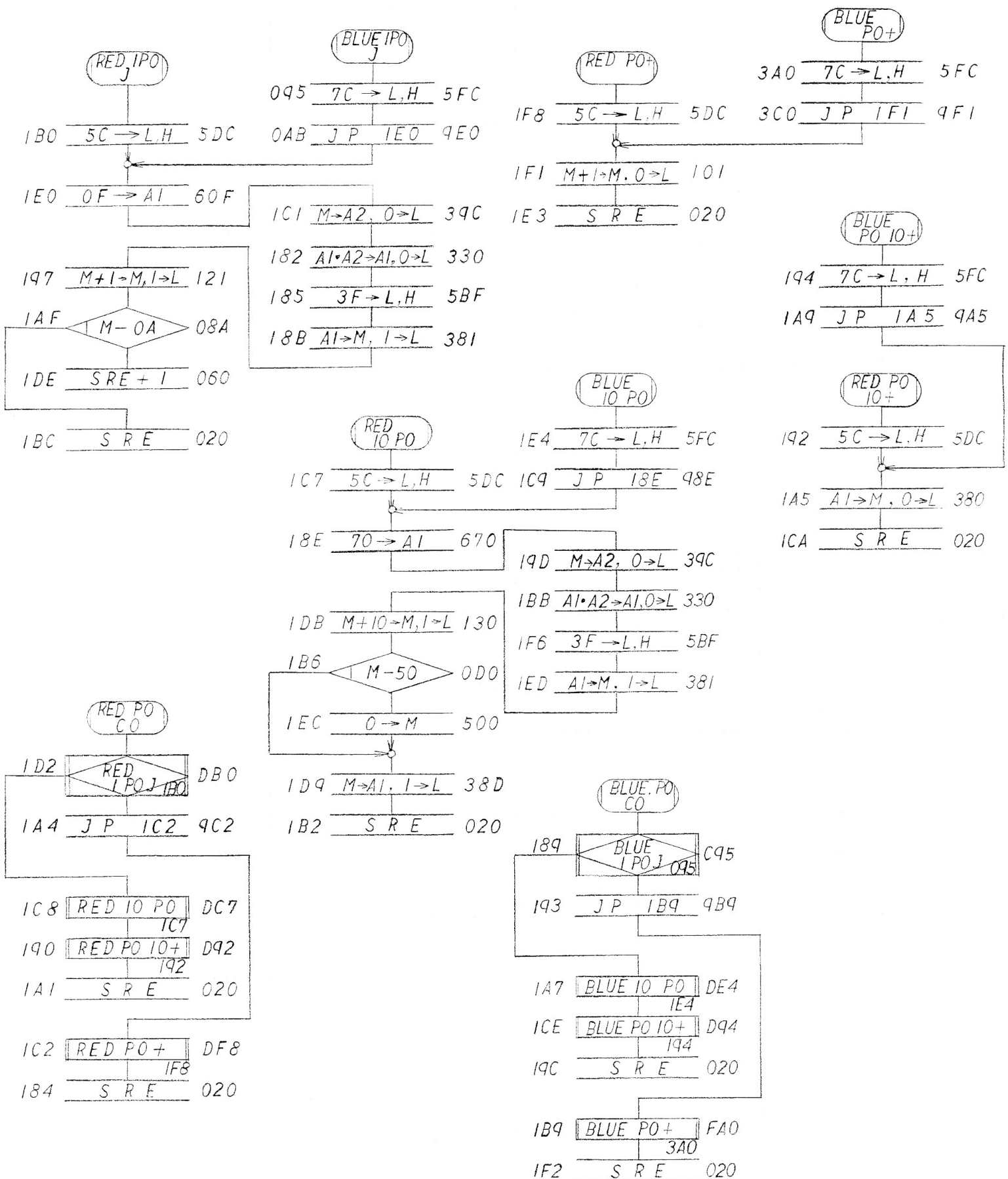


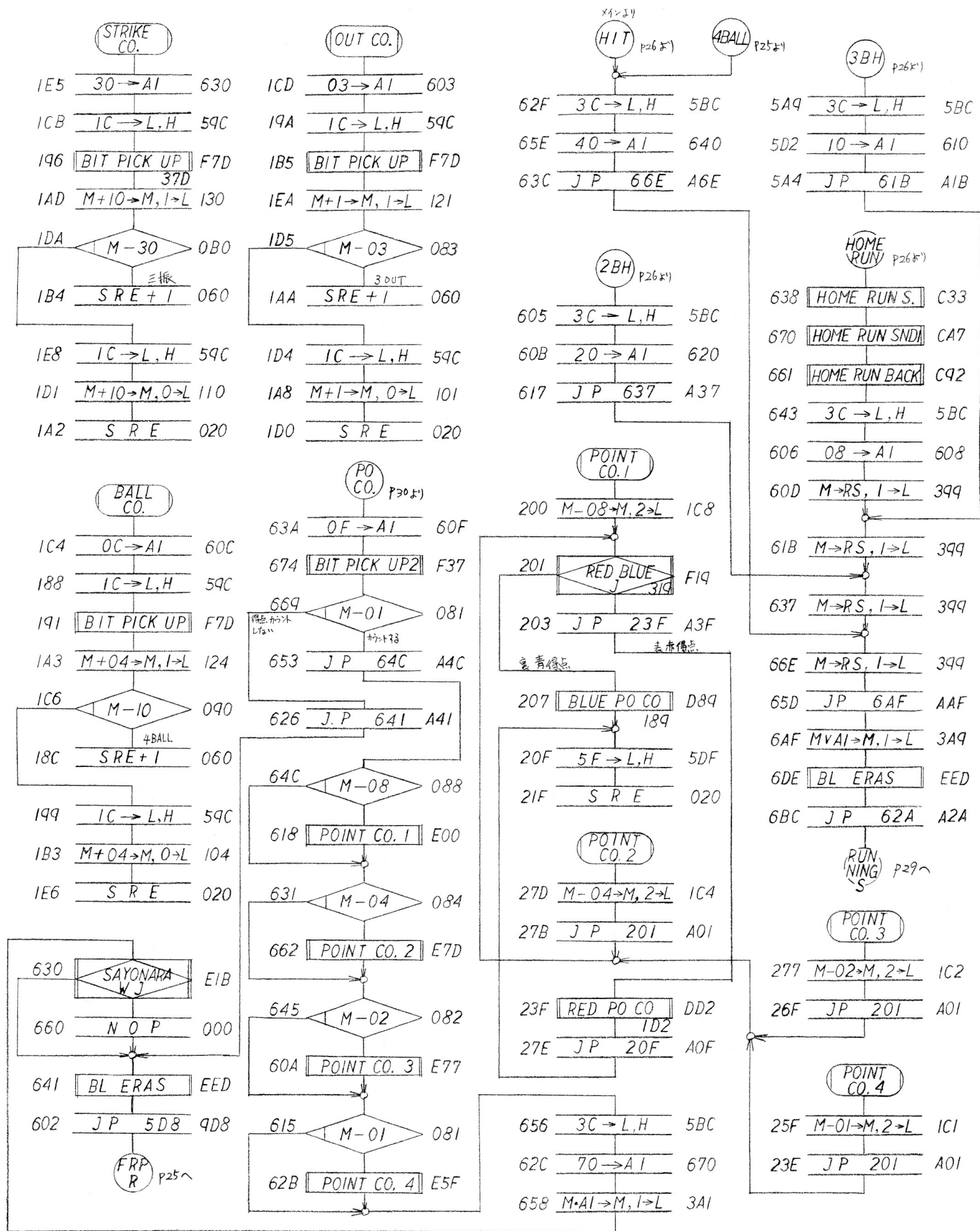
BL ΔX SUB の  
つぎ  
P12より

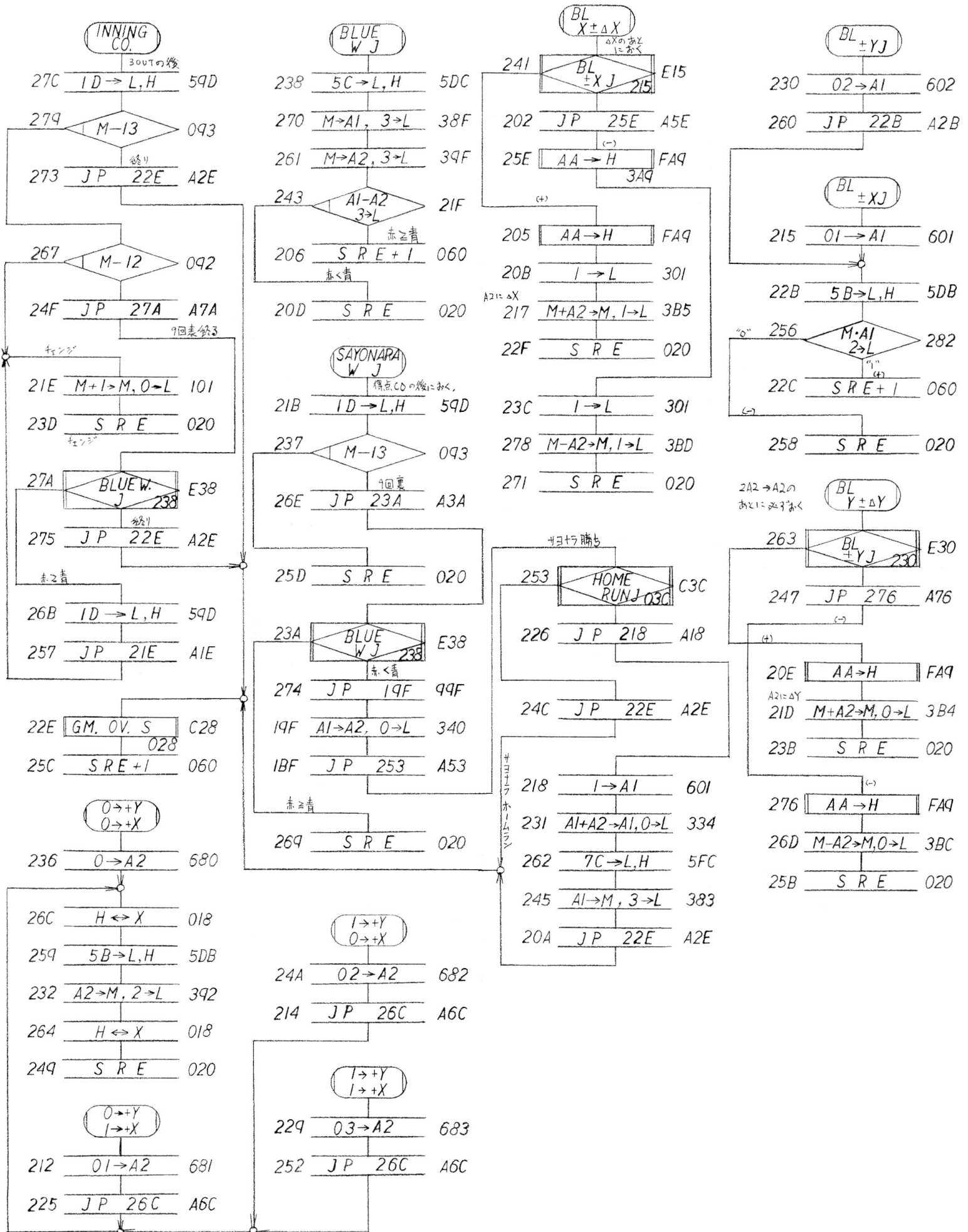


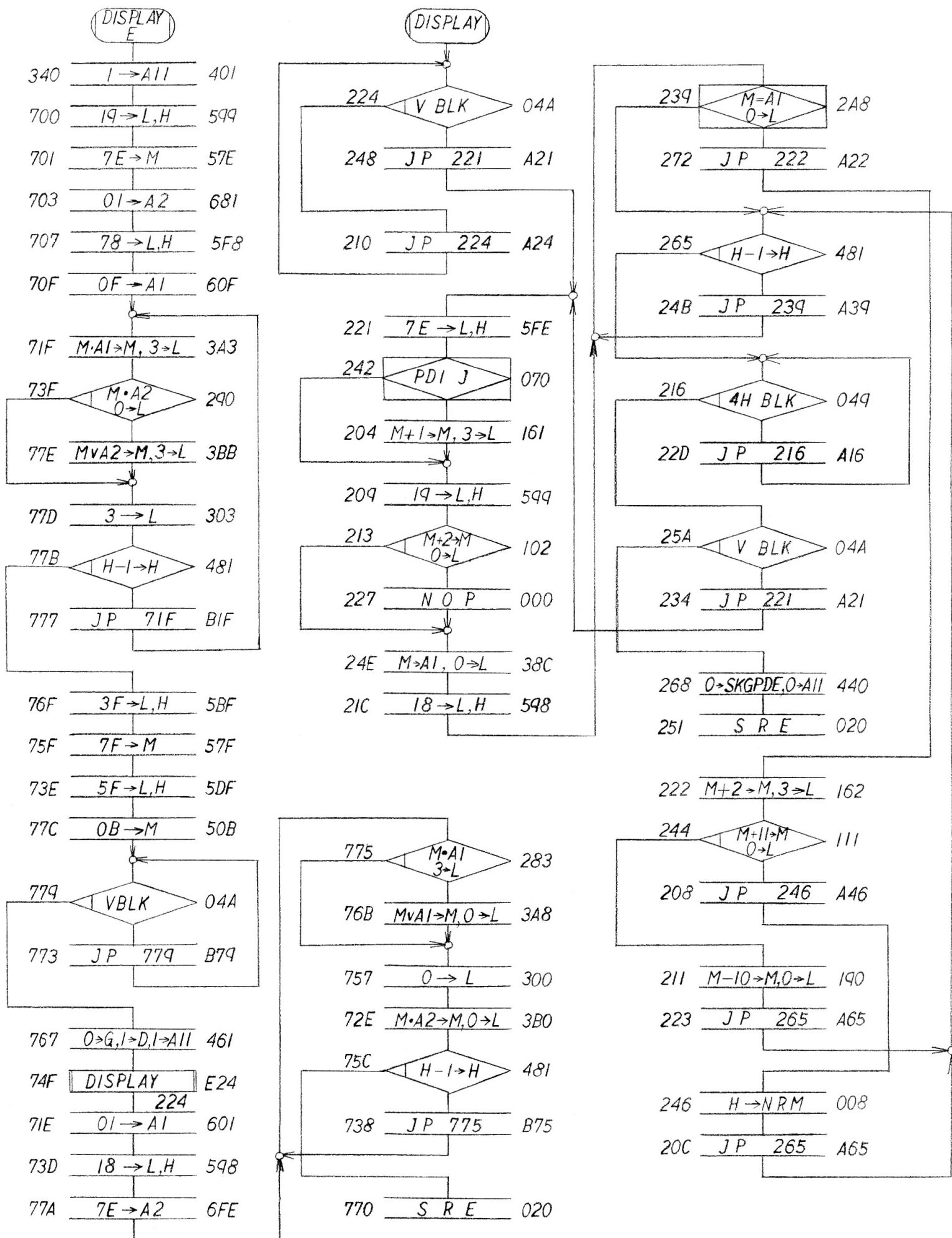
14/31 BALL VELO ΔY SUB, RUNNER VELO SUB



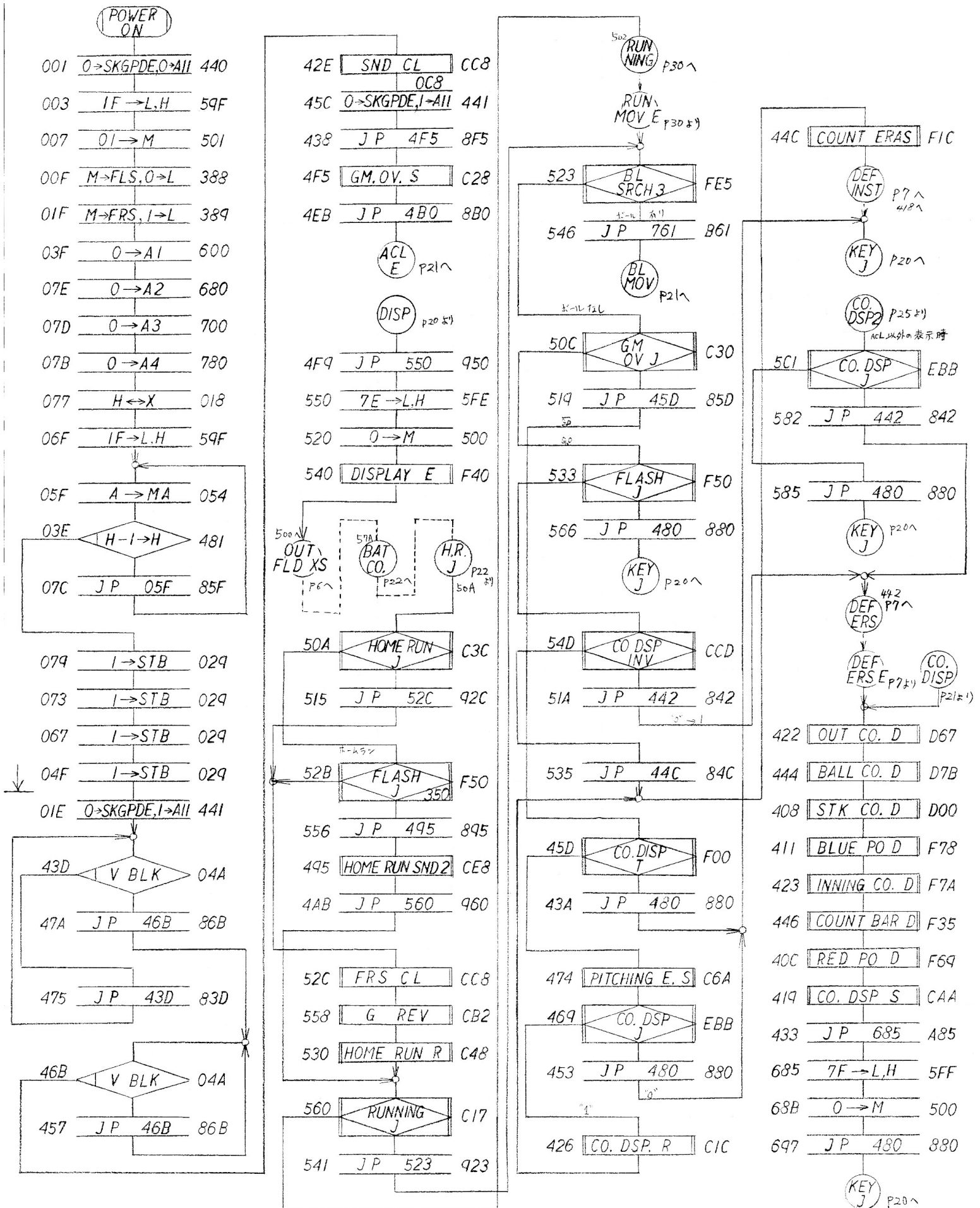




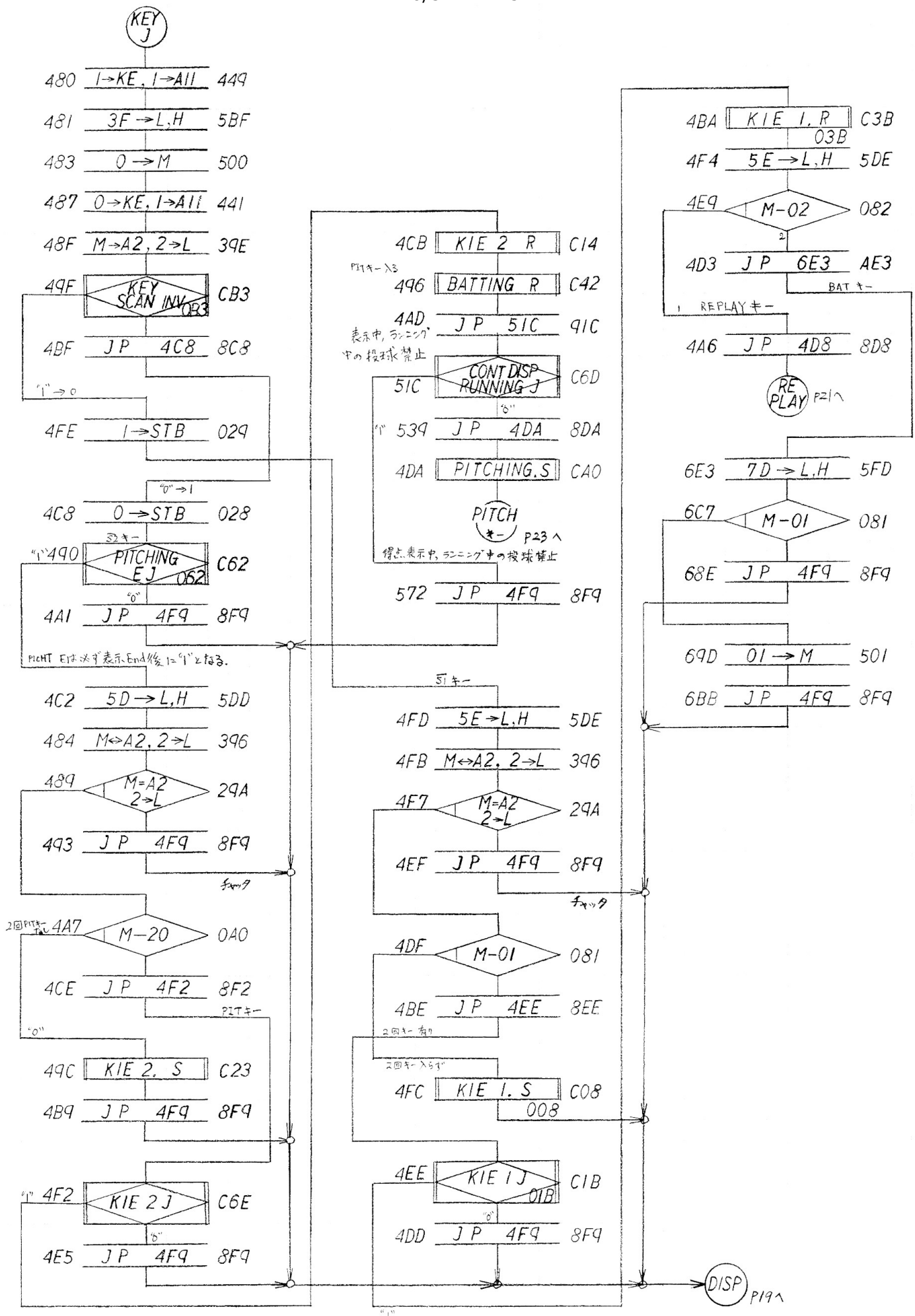


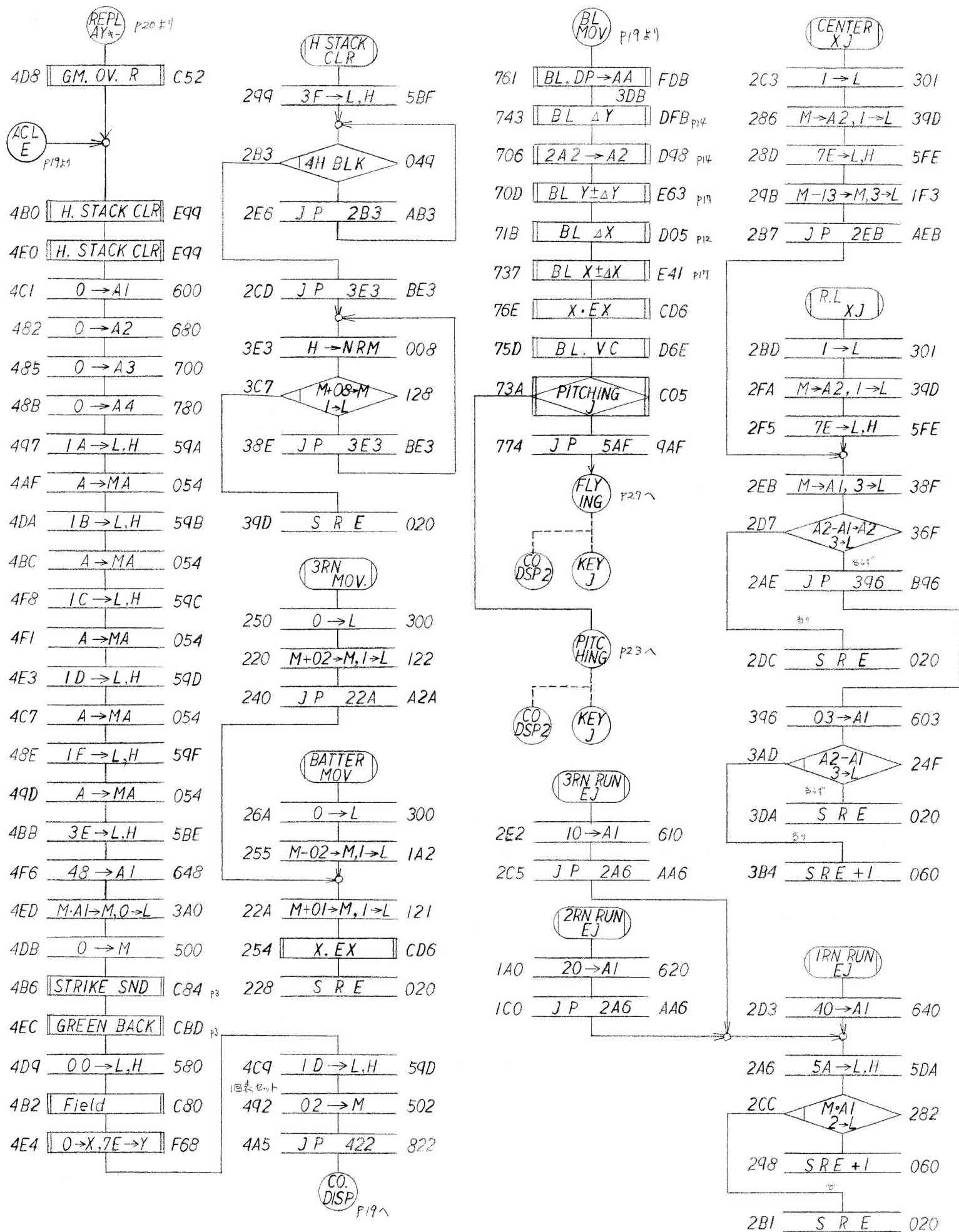


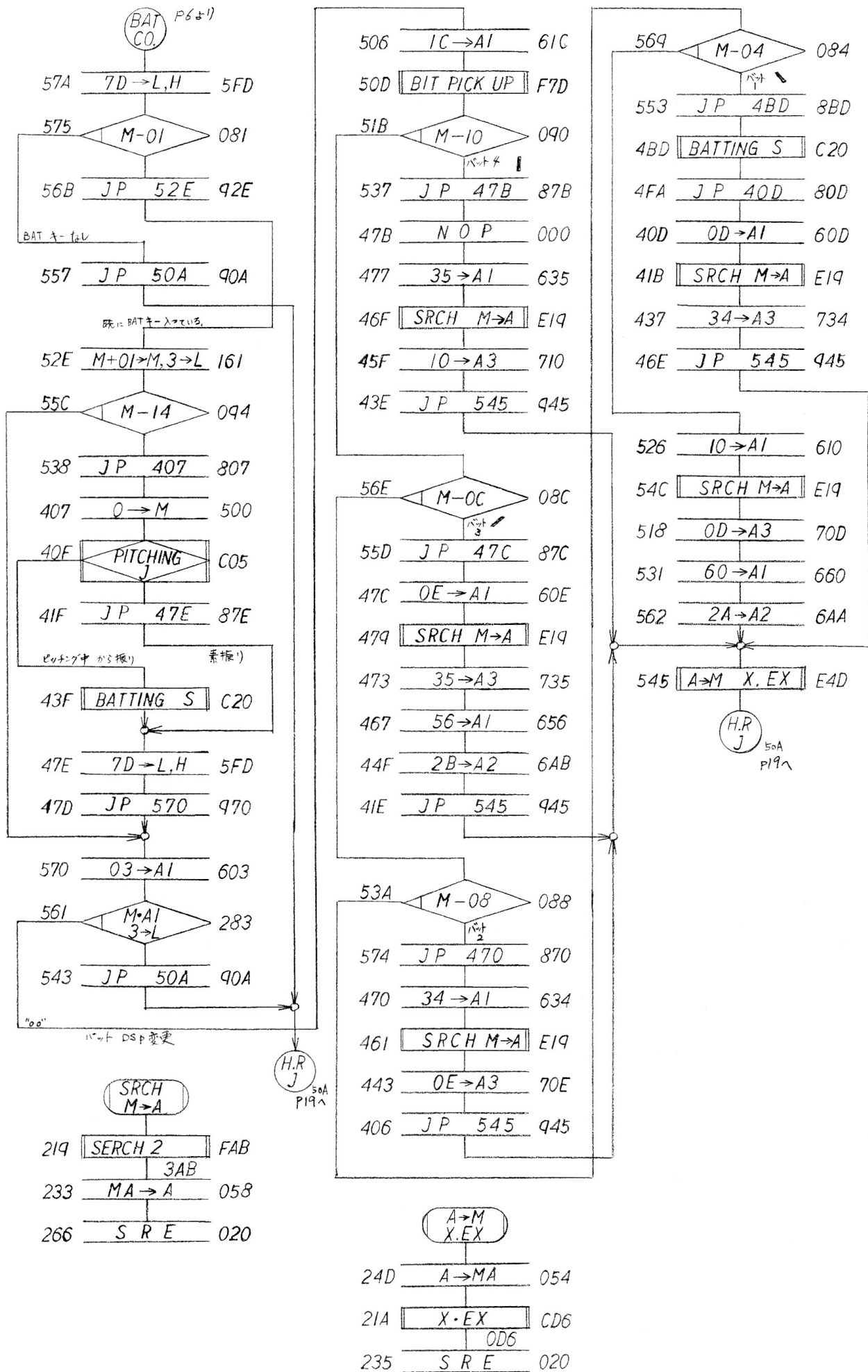


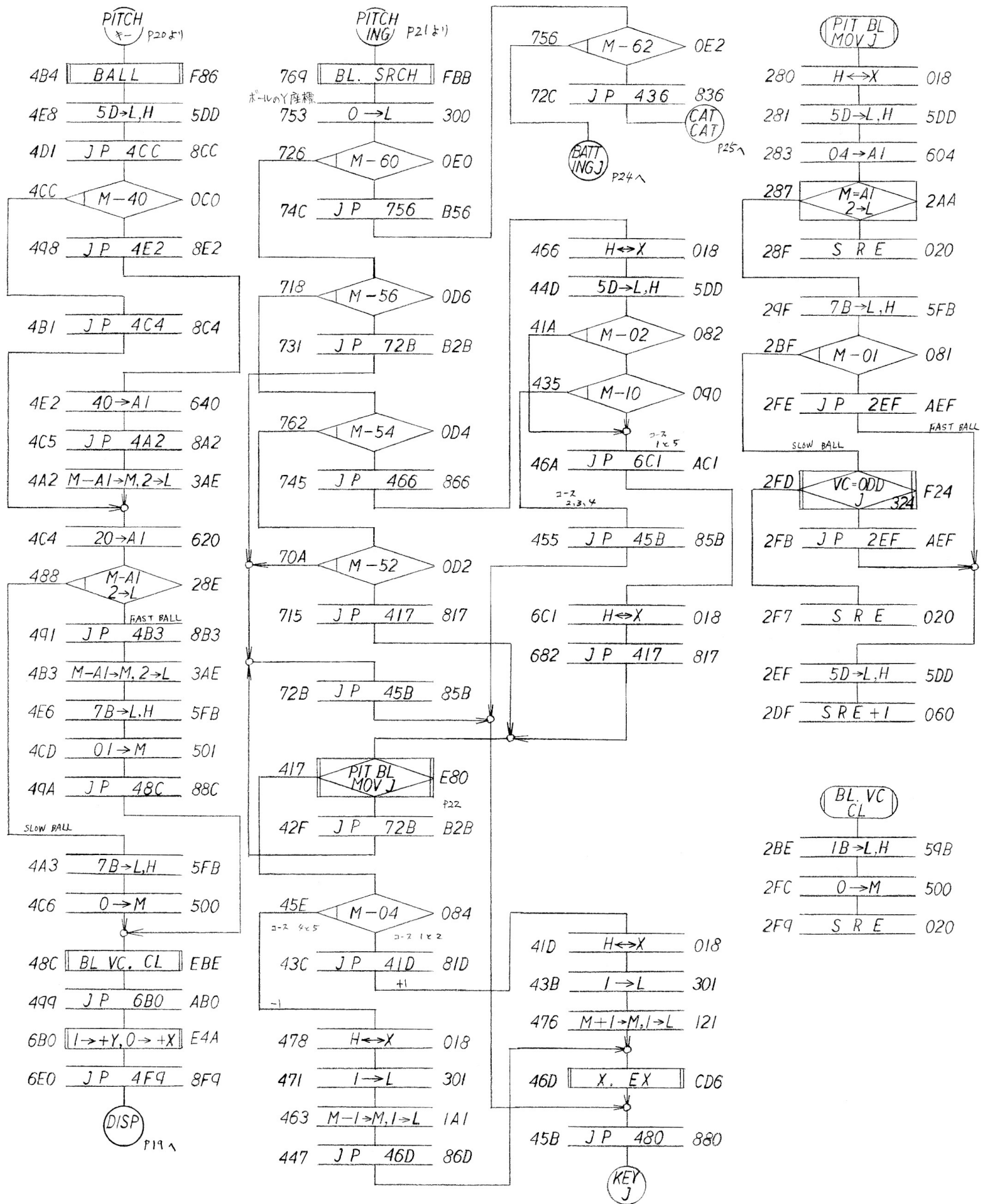


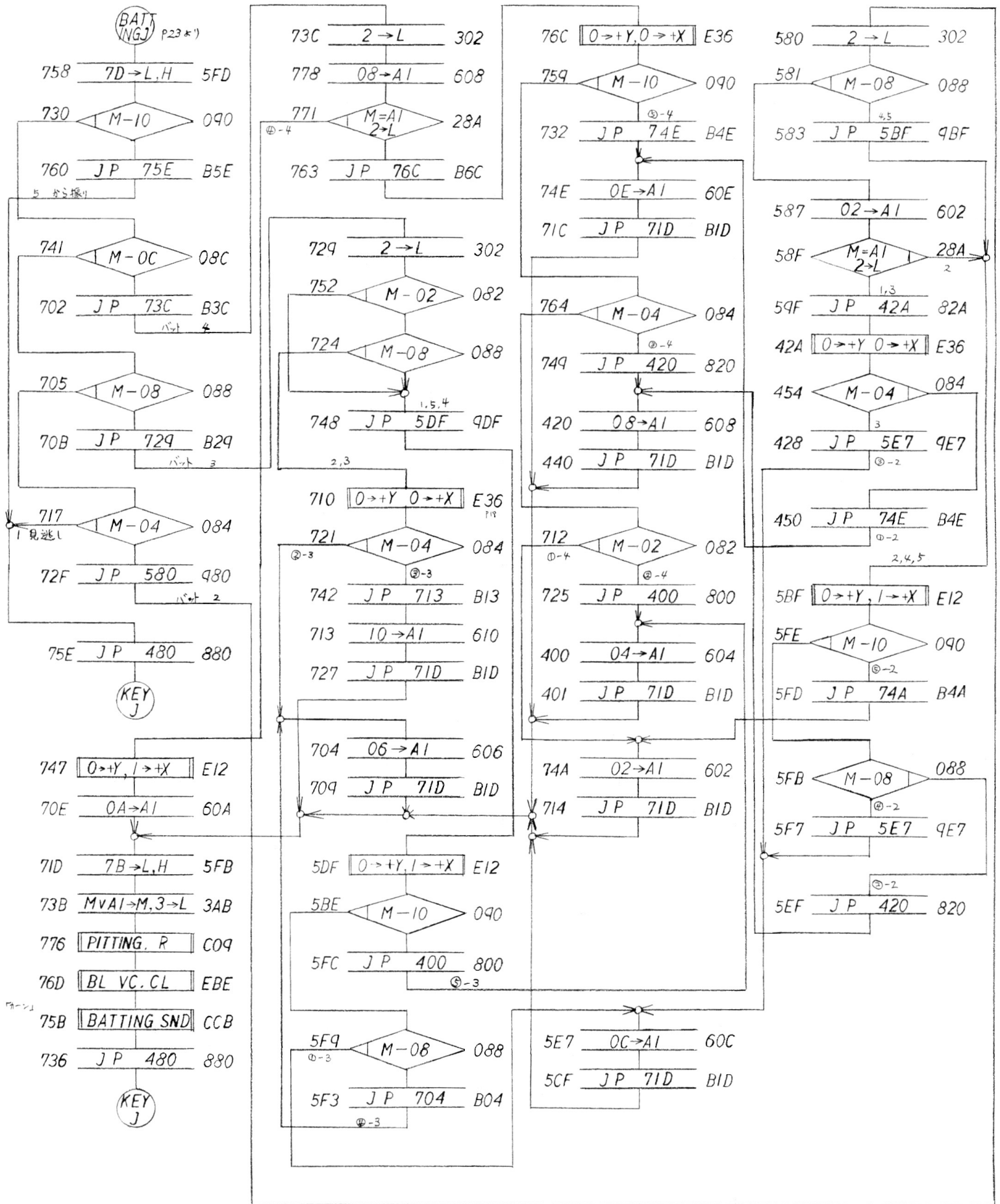


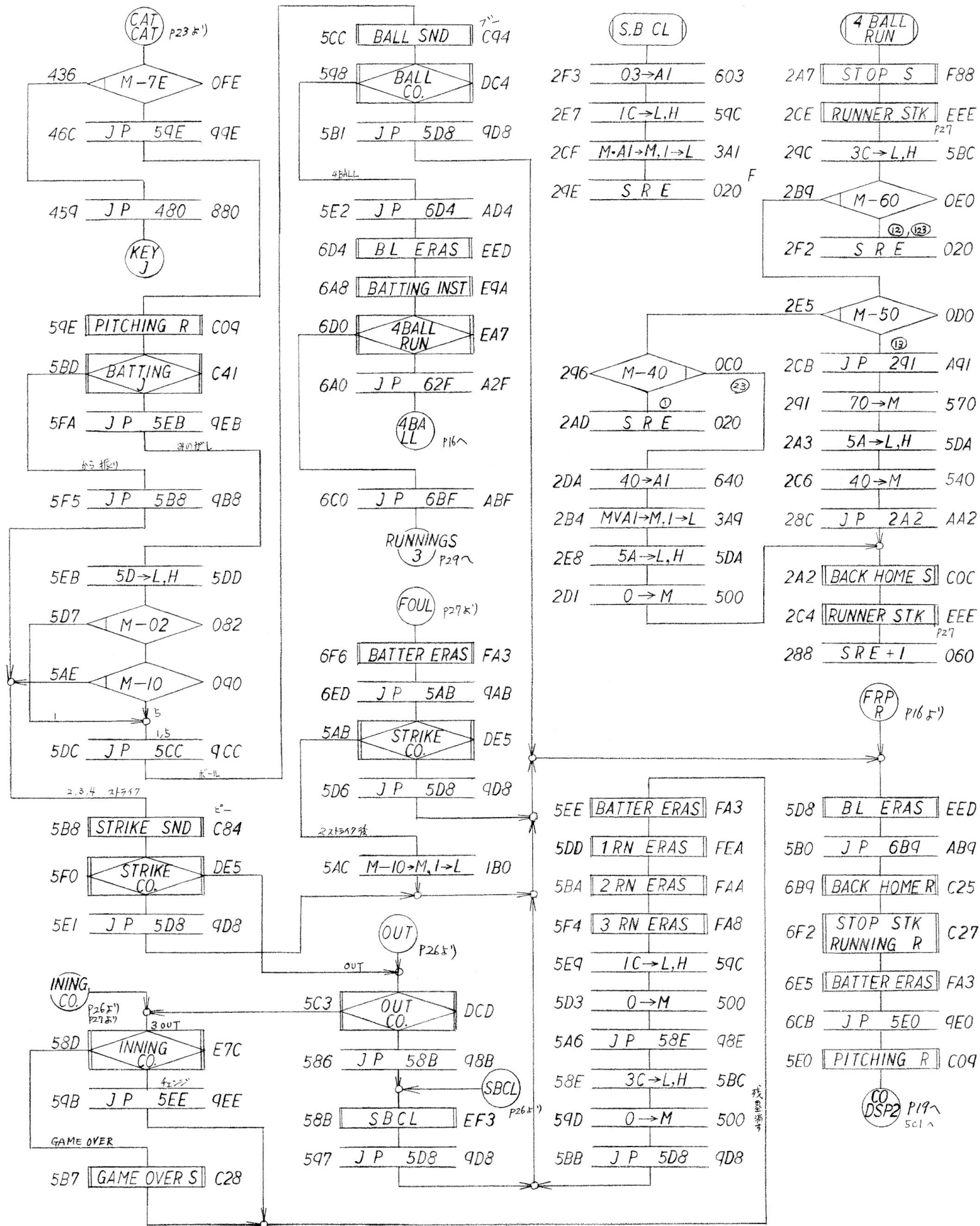




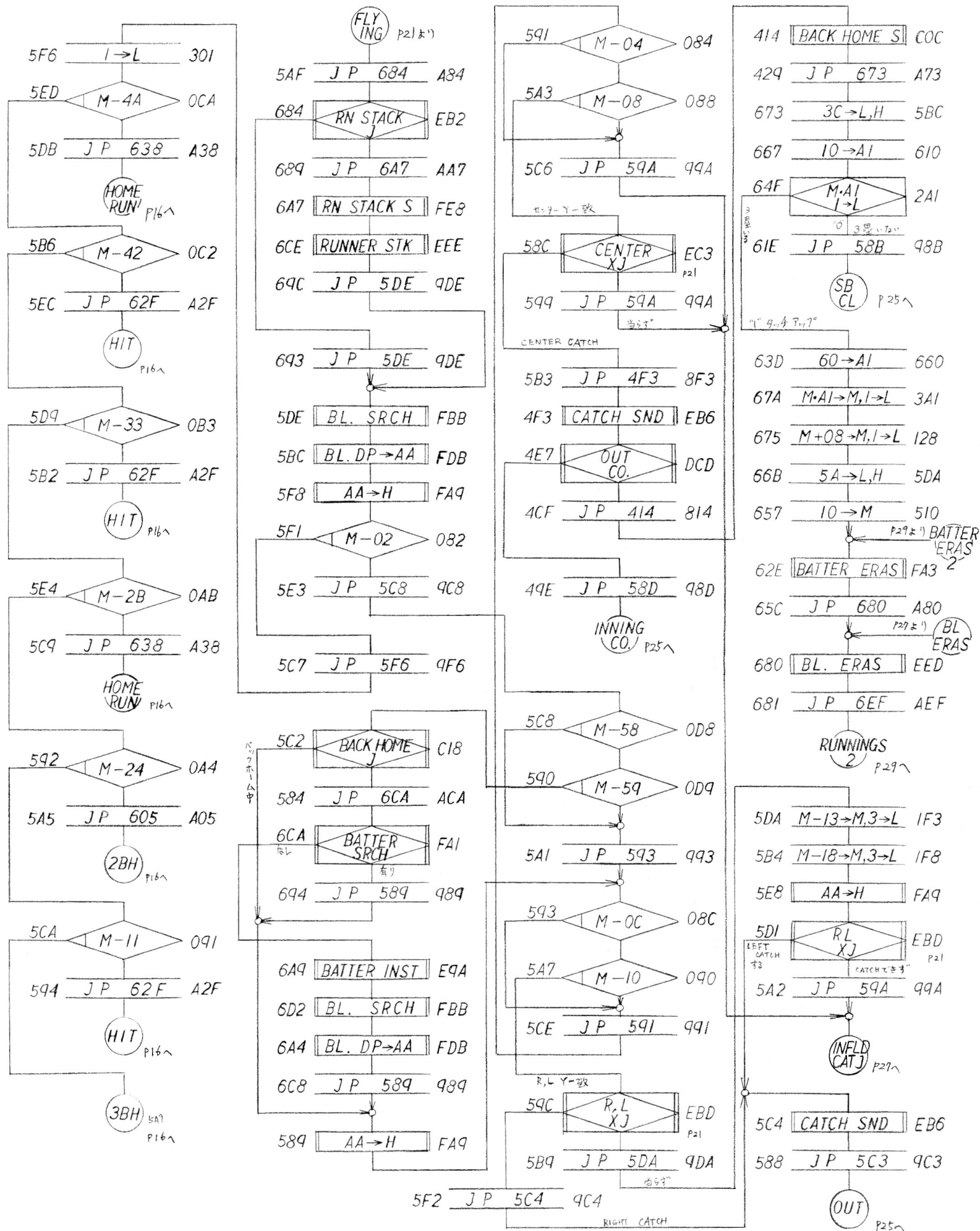


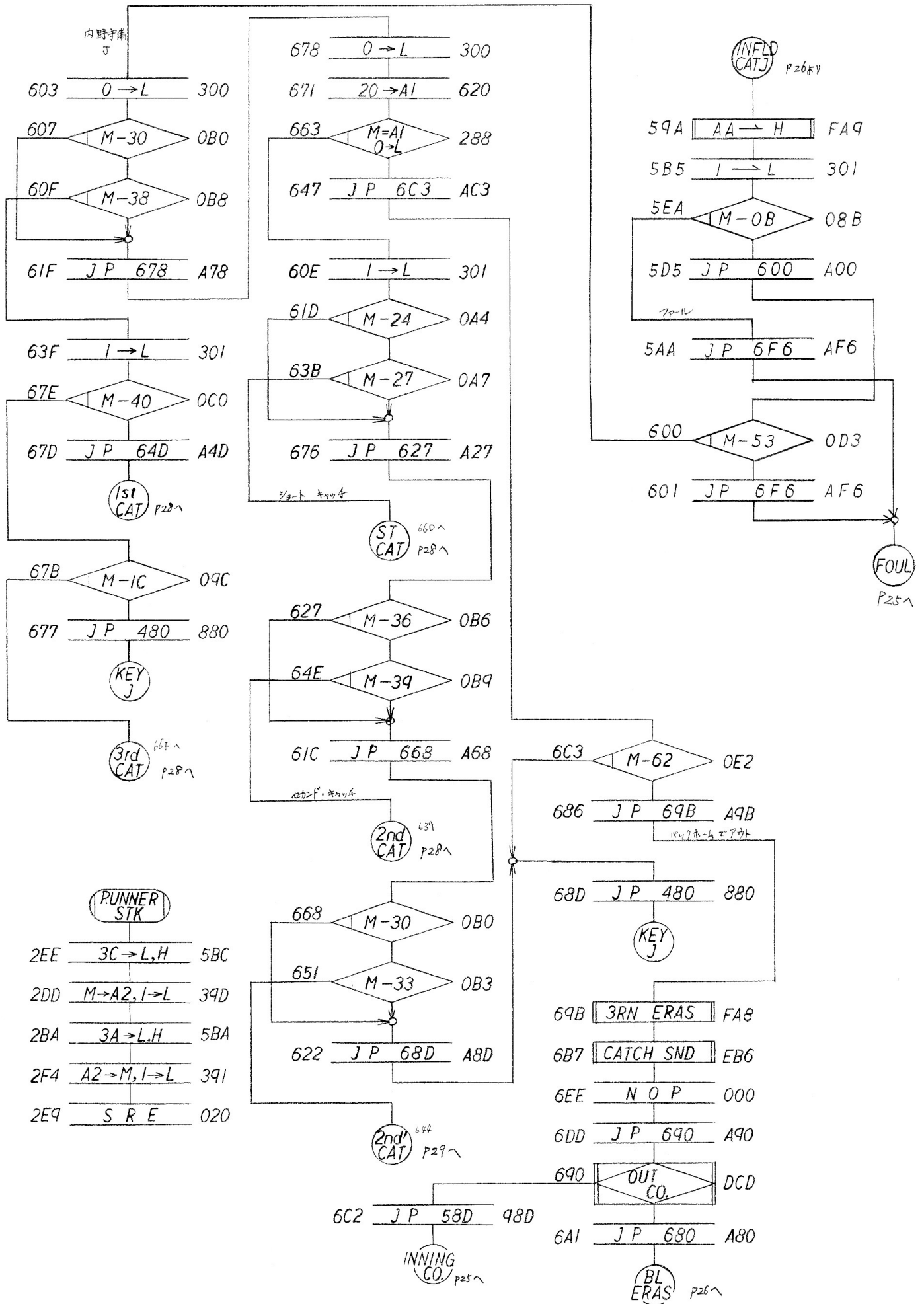




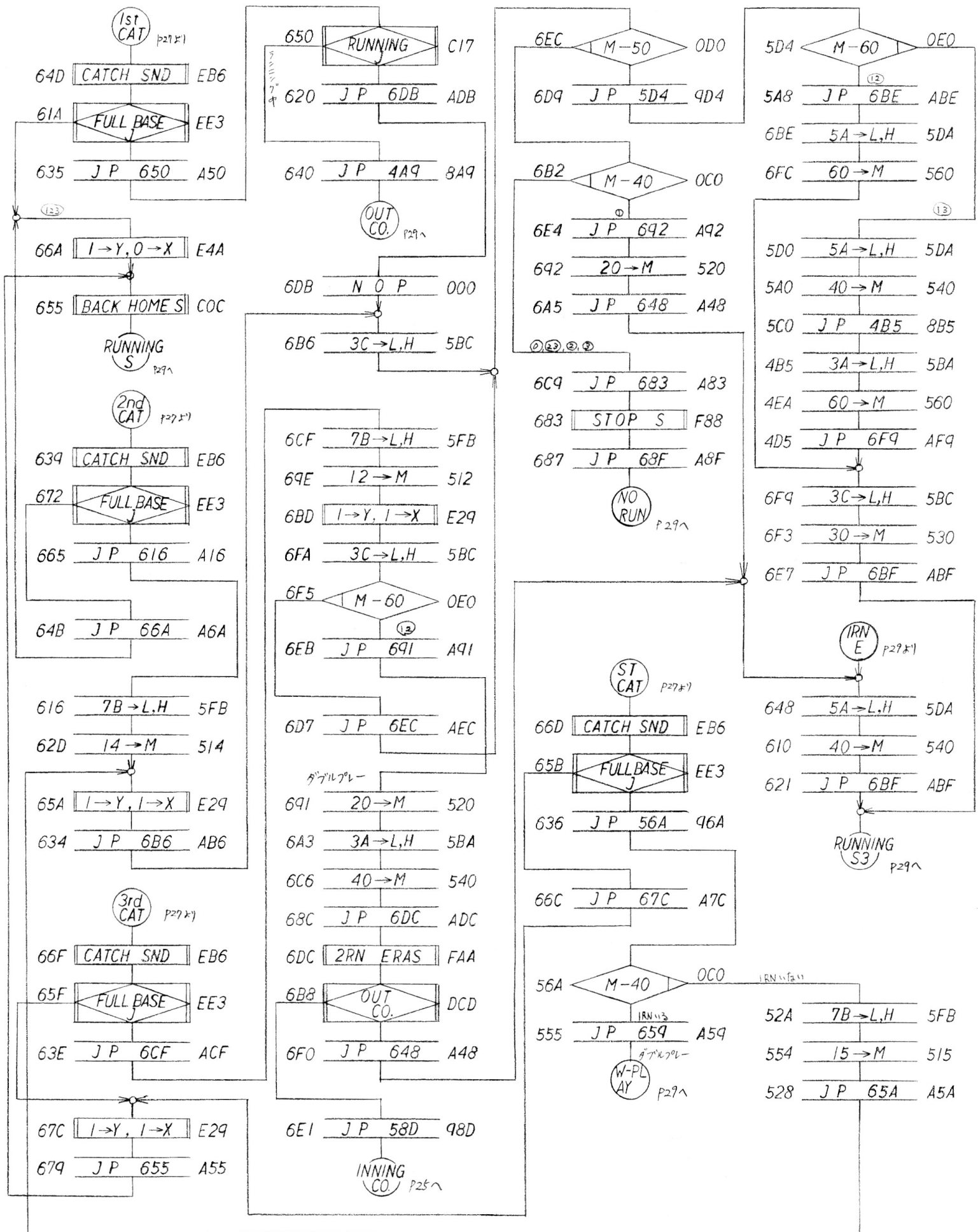


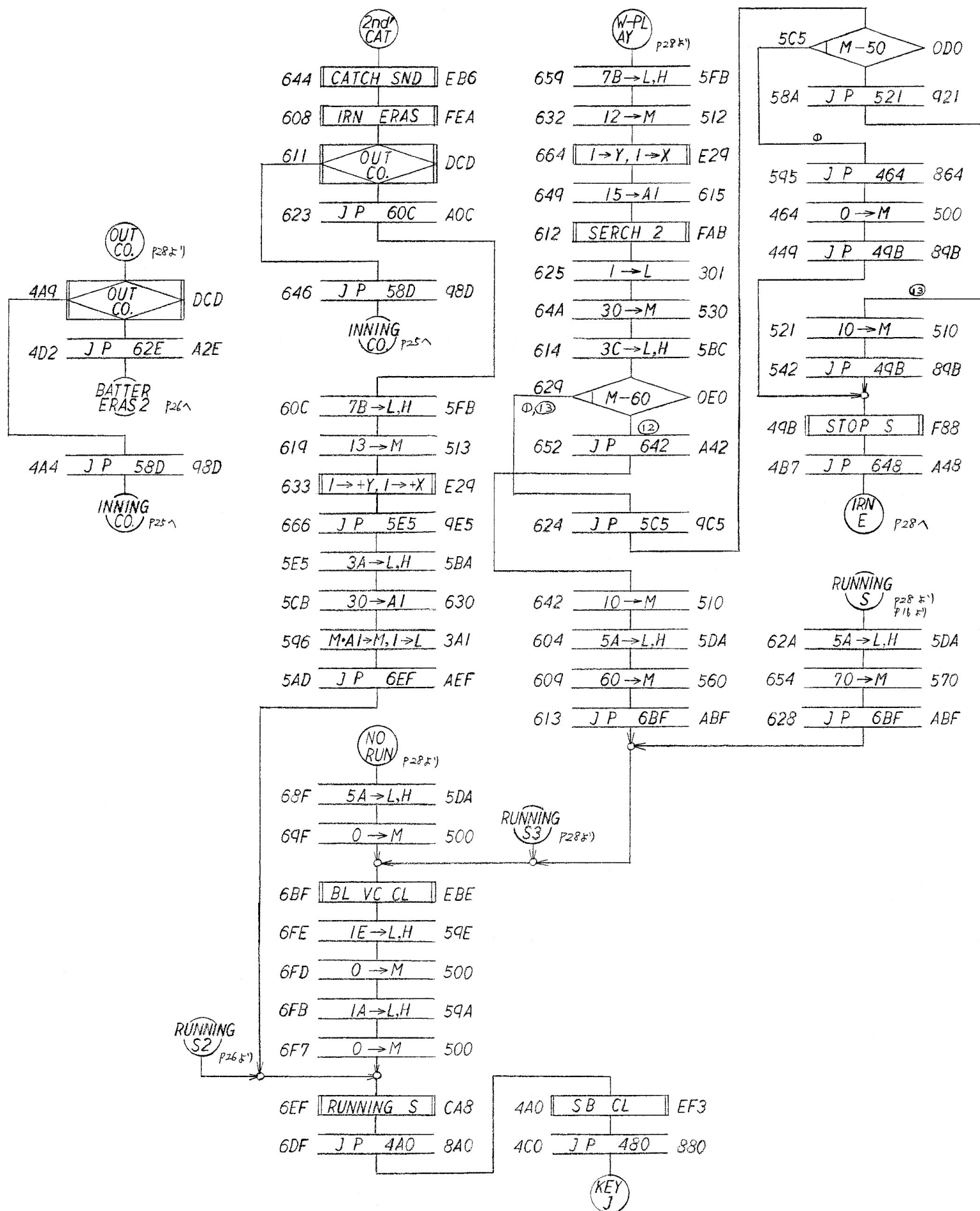


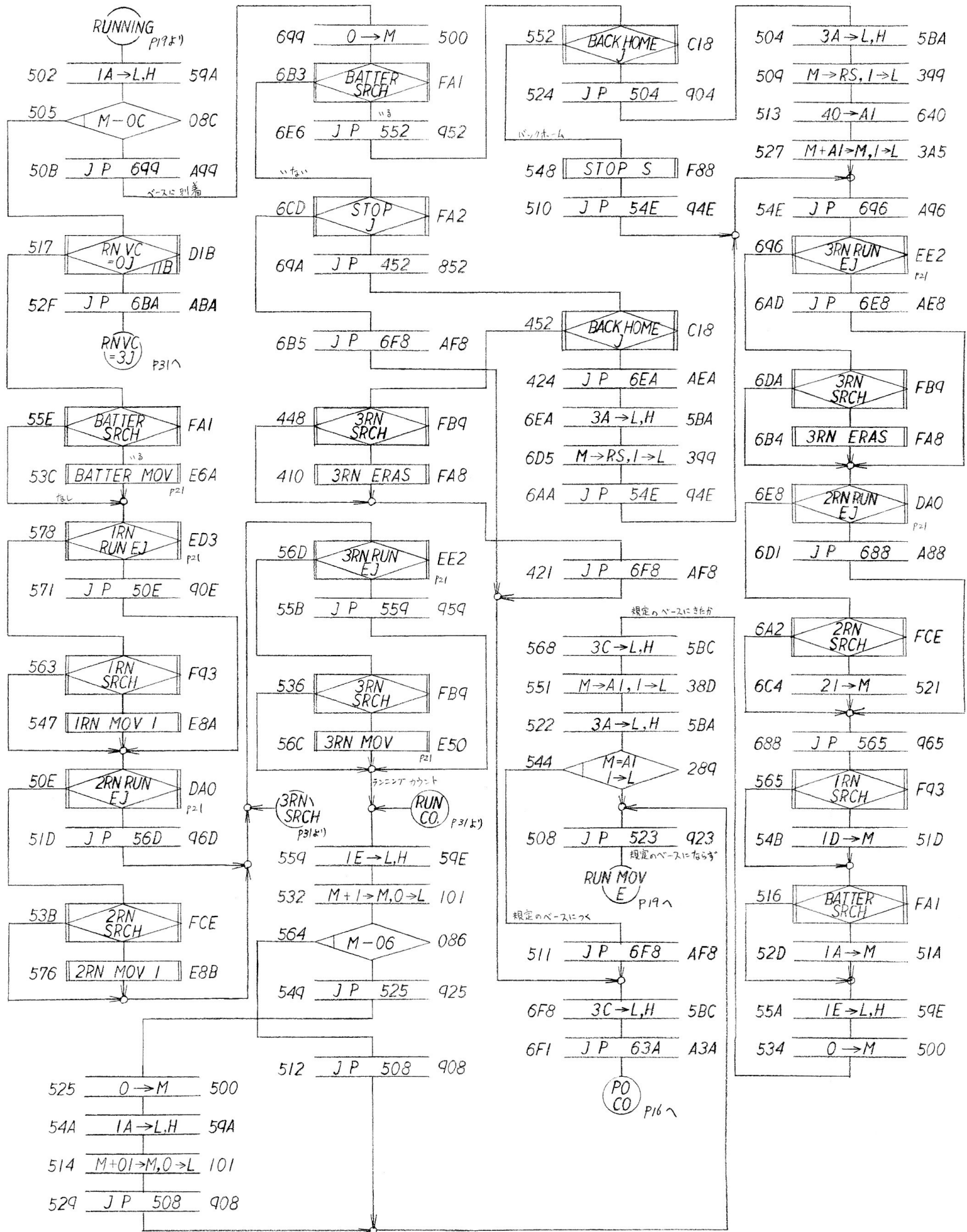


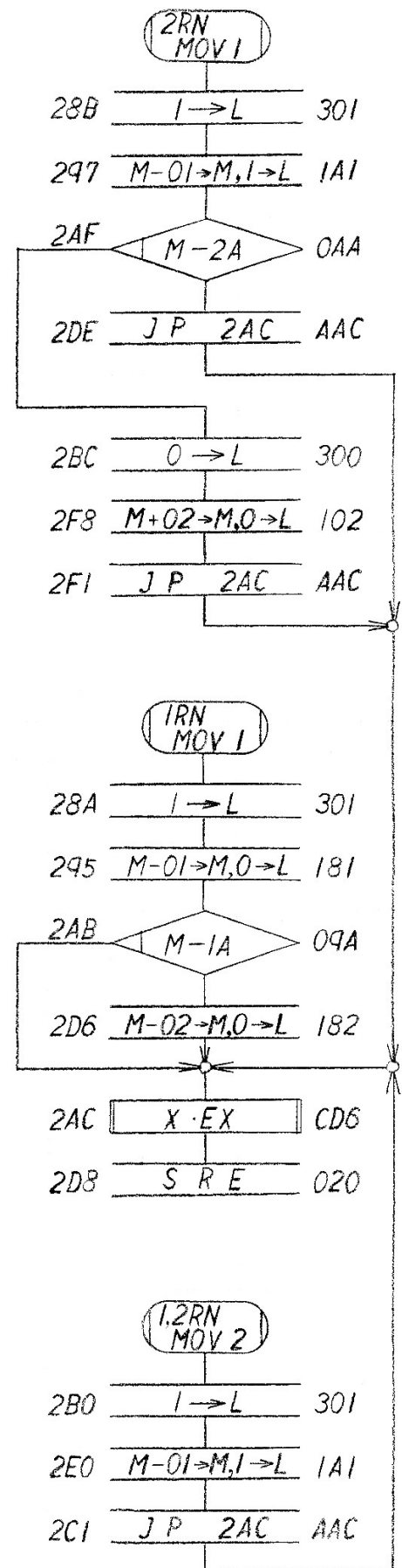
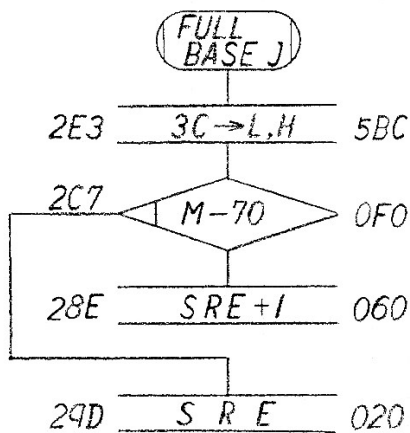
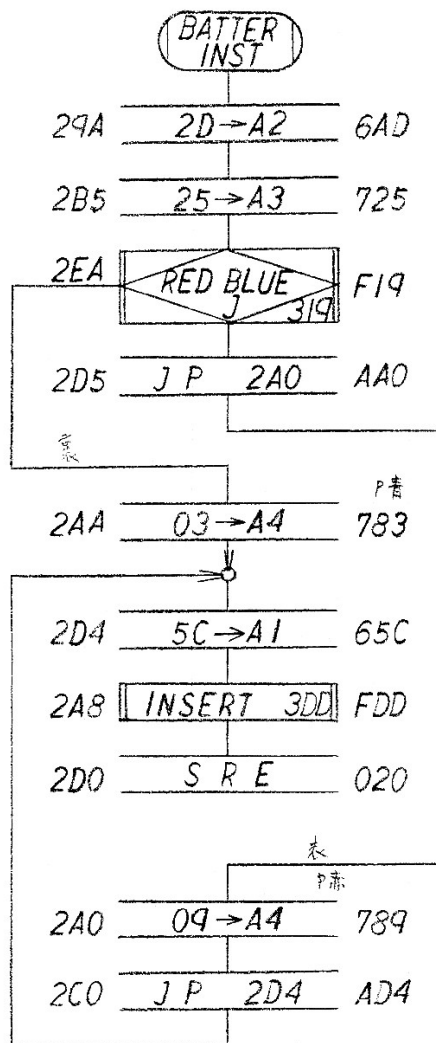
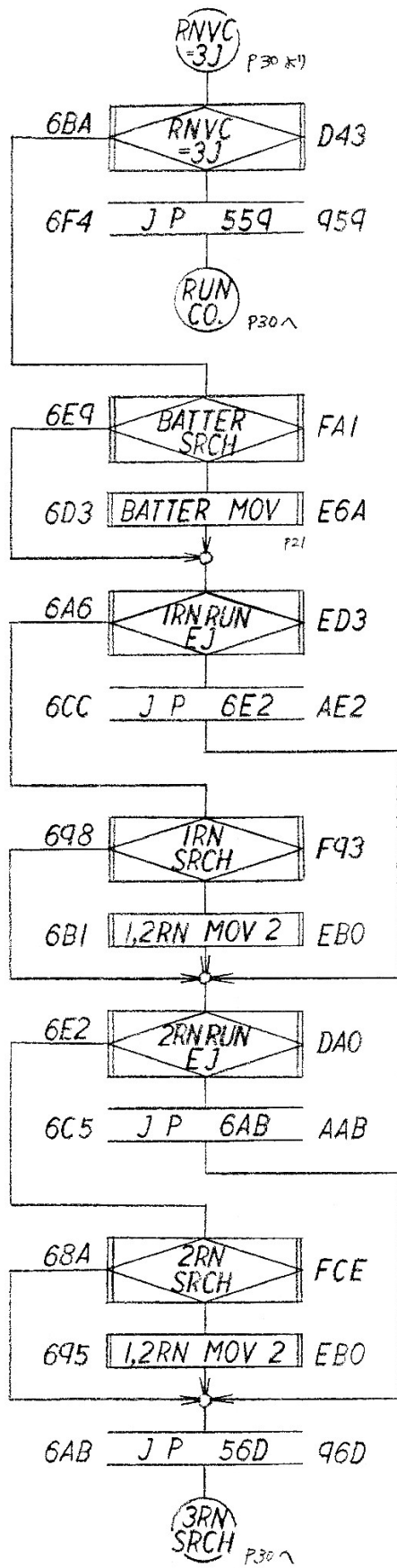












RAM (7 bit (H:L) address x 7 bit data) Mapping

DISP  
↑

| H \ L | 0 ( $1^0X$ ) | 1 ( $2^1X$ )  | 2 ( $4^2X$ )                | 3 ( $8^3X$ )  |
|-------|--------------|---|-----------------------------|---------------|
| 0     |              |   |                             |               |
| 1     |              |   |                             |               |
| 2     |              |   |                             |               |
| 3     |              |   |                             |               |
| 4     |              |   |                             |               |
| 5     |              |   |                             |               |
| 6     |              |   |                             |               |
| 7     |              |   |                             |               |
| 8     |              |   |                             |               |
| 9     |              |   |                             |               |
| A     |              |   |                             |               |
| B     |              |   |                             |               |
| C     |              |   |                             |               |
| D     |              |   |                             |               |
| E     |              |   |                             |               |
| F     |              |   |                             |               |
| 10    |              |   |                             |               |
| 11    |              |   |                             |               |
| 12    |              |   |                             |               |
| 13    |              |   |                             |               |
| 14    |              |   |                             |               |
| 15    |              |   |                             |               |
| 16    |              |   |                             |               |
| 17    |              |   |                             |               |
| 18    |              |   |                             |               |
| 19    | Y            | ⊗   | BALL DP (AA)                | RANDOM CO     |
| 1A    | RUNNER CO2   | 1 2 3 以前の<br>RUNNER   | 1 2 3 ← RUNNER<br>E         |               |
| 1B    | BALL CO      |   | BALL DIRECTION<br>→ Y + X   | BALL VELC. H  |
| 1C    | S B O        | 1 2 3 HOME IN<br>(期待値)  | RED PO<br>10                | BLUE PO<br>10 |
| 1D    | INNING       | CD R N P H R S R R<br>OP N G C T N A P T G E M                          | S F B 4 3 2 1<br>KEY 2 (S2) | BATER<br>MODE |
| 1E    | RUNNER CO    | K S P H A G O K K I G<br>E A T R C H A V I I G<br>Y N E K E R E E A M E | KEY 1 (ST) → B A T<br>R E P | PUDDLE CO     |
| 1F    | SOUND        | 汎用<br>(仮 NEW KEY)   | 汎用                          | TIME CO       |

Data RAM (Flags & Counters)

| H[5:1]                               | L[2:1]           | 3              |          |                                     |      | 2                 |   |                             |     | 1                   |             |                |              |                     |                 | 0            |             |             |     |   |             |        |
|--------------------------------------|------------------|----------------|----------|-------------------------------------|------|-------------------|---|-----------------------------|-----|---------------------|-------------|----------------|--------------|---------------------|-----------------|--------------|-------------|-------------|-----|---|-------------|--------|
|                                      | Registers        | A4[7:1]        |          |                                     |      | A3[7:1]           |   |                             |     | A2[7:2]             |             |                |              |                     |                 | A1[7:1]      |             |             |     |   |             |        |
| 19h                                  | Flags & Counters | Random counter |          |                                     |      | Ball data pointer |   |                             |     | (Prohibited to use) |             |                |              |                     |                 | Y coordinate |             |             |     |   |             |        |
|                                      |                  | nnh            |          |                                     |      | 0                 | 0 | H[4:0]                      |     | 0h                  |             |                |              |                     |                 | nnh          |             |             |     |   |             |        |
| (No use)                             |                  |                |          | Base running possible               |      |                   |   | Runners existed             |     |                     |             |                |              | Runner counter 2    |                 |              |             |             |     |   |             |        |
| 0h                                   |                  |                |          | 1RN                                 | 2RN  | 3RN               | 0 | 0                           | 0   | 0                   | 1RN         | 2RN            | 3RN          | 0                   | 0               | 0            | 0           | nnh         |     |   |             |        |
| Ball velocity                        |                  |                |          | Ball direction                      |      |                   |   | (No use)                    |     |                     |             |                |              | Ball counter        |                 |              |             |             |     |   |             |        |
| 0                                    |                  | 0              | V[3:0]   |                                     | Fast | 0                 | 0 | 0                           | 0   | 0                   | +Y          | +X             | 0h           |                     |                 |              |             |             | nnh |   |             |        |
| Blue Point<br>(Binary Coded Decimal) |                  |                |          | Red Point<br>(Binary Coded Decimal) |      |                   |   | Runners at scoring position |     |                     |             |                |              | SBO                 |                 |              |             |             |     |   |             |        |
| 2nd digit[2:0]                       |                  | 1st digit[3:0] |          | 2nd digit[2:0]                      |      | 1st digit[3:0]    |   | 1RN                         | 2RN | 3RN                 | 0           | 0              | 0            | 0                   | 0               | S[1:0]       | B[1:0]      | O[1:0]      |     |   |             |        |
| Bat Swing Position counter           |                  |                |          | Key 2 (S2/)                         |      |                   |   | Flags 1                     |     |                     |             |                |              | Inning & bottom/top |                 |              |             |             |     |   |             |        |
| 0                                    |                  | 0              | BSP[4:0] |                                     | S    | F                 | 5 | 4                           | 3   | 2                   | 1           | CO<br>DSP      | Runn<br>ing  | Pitch<br>ing        | Runner<br>stack | St<br>op     | Batt<br>ing | Home<br>run | 0   | 0 | Inning[3:0] | Bottom |
| Puddle counter                       |                  |                |          | Key 1 (S1/)                         |      |                   |   | Flags 2                     |     |                     |             |                |              | Runner counter      |                 |              |             |             |     |   |             |        |
| nnh                                  |                  |                |          | 0                                   | 0    | 0                 | 0 | 0                           | Bat | Rep                 | Key<br>scan | Pitch<br>ing e | Back<br>home | Game<br>over        | Kie<br>2        | Kie<br>1     | Game        | nnh         |     |   |             |        |
| Time counter                         |                  |                |          | General purpose flags               |      |                   |   | Key/Switch input            |     |                     |             |                |              | Sound               |                 |              |             |             |     |   |             |        |
| nnh                                  |                  |                |          | x                                   | x    | x                 | x | x                           | x   | x                   | nnh         |                |              |                     |                 |              | nnh         |             |     |   |             |        |