

DIAGNOSTIC FUNCTION TEST  
REPRODUCTION

RD-PCH-PR-SPEED TEST

A. PURPOSE OF TEST

TO PROVIDE A CONVENIENT CHECK OF THE OPERATING SPEEDS OF THE 1401, 1402, AND 1403.

B. LOADING PROCEDURE.

1. TO BE RUN FROM CARDS, PLACE THE TEST DECK IN THE FILE FEED FOLLOWED BY BLANK OR SCRAP CARDS TO BE COUNTED. PLACE SOME BLANK CARDS IN THE PUNCH FEED. BE SURE THAT ALL SENSE SWITCHES ARE TURNED OFF, EXCEPT FOR SENSE SWITCH F. IF THE SYSTEM HAS THE ADVANCED PROGRAMMING FEATURE SENSE SWITCH F SHOULD BE TURNED ON, OTHERWISE, IT SHOULD BE OFF. DEPRESS THE START RESET SWITCH, THEN THE LOAD KEY.

AFTER THE PROGRAM CARDS HAVE BEEN ENTERED, THE MACHINE WILL REMAIN IN THE MAIN LOOP WAITING FOR AN OPERATION TO BE SELECTED FOR COUNTING.

2. TO BE RUN FROM TAPES, PLACE A 3 IN 578 AND PLACE BLANK CARDS IN READER AND PUNCH. TEST RUNS FROM THIS POINT IN SAME MANNER AS IT DOES FOR CARDS.

C. PROGRAM CONTROL

1. SENSE SWITCHES (FOR MACHINES WITHOUT SENSE SWITCHES SEE NOTE BELOW).

- B ON - START READ COUNT.  
OFF - END READ COUNT.
- C ON - START PUNCH COUNT.  
OFF - END PUNCH COUNT.
- D ON - START PRINT COUNT.  
OFF - END PRINT COUNT.
- E ON - START CYCLE COUNT.  
OFF - END CYCLE COUNT.
- F ON - FOR ADVANCED PROGRAM MACHINES  
OFF - FOR NON-ADV. PROGRAM MACHINES.
- G ON - BRANCH TO END OF TEST  
OFF - CONTINUE IN PROGRAM LOOP

NOTE: TO RUN ON MACHINES WITHOUT SENSE SWITCHES, SUBSTITUTE "UNCONDITIONAL BRANCHES" FOR THE OPERATION TO BE SELECTED. USE THE START AND STOP KEY TO BEGIN AND END THE COUNT.

|               |         |         |          |  |  |  |  |
|---------------|---------|---------|----------|--|--|--|--|
| DATE          | 2-5-62  | 6-29-63 | 17-10-63 |  |  |  |  |
| ENG. CHG. NO. | 110378G | 117628  | TA 1976  |  |  |  |  |

REPRODUCTION

D. TEST PROCEDURE

THE PROGRAM CONTAINS VARIOUS LOOPS UNDER THE CONTROL OF SENSE SWITCHES. THE INDIVIDUAL LOOPS CONTAIN AN OPERATION, AN ADD AND A BRANCH BACK TO REPEAT THE OPERATION. STARTING AND STOPPING THE OPERATION IS UNDER CONTROL OF A SENSE SWITCH SO THAT THE RUNNING TIME CAN BE TIMED AGAINST AN EXTERNAL REFERENCE.

THE TEST BEGINS BY CLEARING THE PUNCH AREA AND THEN RUNS CARDS INTO BOTH THE READ AND PUNCH FEEDS. IT THEN ADVANCES TO A MAIN LOOP WHICH CONSISTS OF CLEARING THE PRINT AREA, SENSE SWITCHES B,C,D AND E OFF AND A BRANCH BACK TO COMPLETE THE LOOP. TURNING SENSE SWITCH B ON INITIATES A READ AND COUNT LOOP. TURNING IT OFF TERMINATES IT. TURNING SENSE SWITCH C ON INITIATES A PUNCH AND COUNT LOOP. TURNING IF OFF TERMINATES IT. TURNING SENSE SWITCH D ON INITIATES A COUNT AND PRINT LOOP. TURNING IT OFF TERMINATES IT. TURNING SENSE SWITCH E ON INITIATES A LOOP THAT IS DESIGNED TO CHECK FOR PROPER DURATION OF 1401 CYCLES. THE LOOP CONSISTS OF AN ADD 5 FOR AN AMOUNT ACCUMULATION. THIS IS FOLLOWED BY A BRANCH ON SENSE SWITCH F, WHICH WHEN TURNED ON WILL BYPASS A NO OP. THE PURPOSE OF THIS IS TO CORRECT FOR THE NUMBER OF CYCLES TAKEN FOR I-B STAR TRANSFER CYCLES ON ADVANCE PROGRAM MACHINES. MACHINES WITHOUT THE ADVANCED PROGRAMMING FEATURE SHOULD BE RUN WITH SWITCH F OFF. A CLEAR OP FOLLOWS IN ORDER TO COMPLETE THE LOOP WITH THE PROPER NUMBER OF PROCESS CYCLES. THE TOTAL ACCUMULATED BY RUNNING THIS TEST FOR ONE (1) MINUTE SHOULD BE 347,500 WHICH WAS CHOSEN BECAUSE IT IS THE FREQUENCY OF THE BASIC 1401 OSCILLATOR. (347,500 CYCLES PER SECOND). CAUTION--IT MUST BE CONSIDERED THAT AN ERROR OF ONE (1) SECOND WOULD RESULT IN THE TOTAL BEING OFF BY 5,790.

TURNING SENSE SWITCH G ON INITIATES A BRANCH TO END OF TEST.

E. STOPS

718 IN STORAGE ADDRESS REGISTER; HALT TO SET SENSE SWITCHES.

737 IN STORAGE ADDRESS REGISTER; HALT TO RESET SENSE SWITCHES FOR NEXT TEST.

F. PRINTOUTS

AFTER EACH TEST, THE ACUTAL SPEED WILL BE PRINTED BY THE 1403 PRINTER.

G. COMMENTS

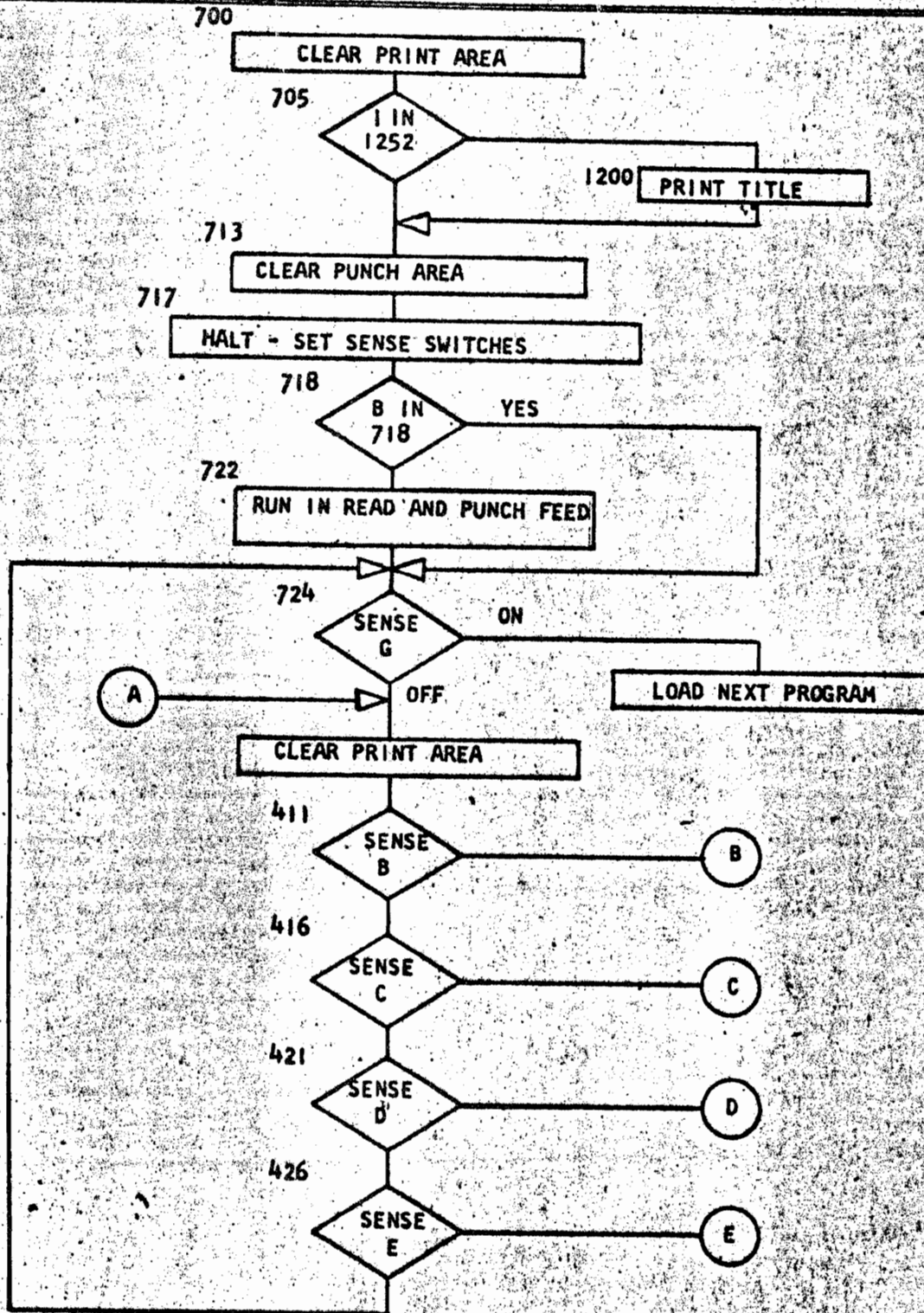
CHECKING SPEEDS:

EXAMPLE: TO CHECK READ FEED, USE A WATCH OR WALL CLOCK WITH A SECOND HAND. AT A REFERENCE POINT IN TIME, TURN SENSE B ON. AFTER ONE MINUTE OF OPERATION, TURN IT OFF. THE NUMBER OF CARDS FED WILL PRINT OUT AND THE PROGRAM WILL RETURN TO THE MAIN LOOP.

THE 1401 SPEED CHECK IS DESIGNED PRIMARILY TO CHECK FOR PROPER CLOCK OPERATION. A CIRCUIT FAILURE COULD OCCUR SUCH THAT A TRIGGER WOULD REMAIN ON FOR AN EXTRA OSCILLATOR PULSE WITH NO APPARENT MACHINE MALFUNCTION OTHER THAN A RELEASE OVER EXTENSION DUE TO INCREASED PROCESS TIME.

|              |         |         |            |  |  |  |  |
|--------------|---------|---------|------------|--|--|--|--|
| DATE         | 2-5-62  | 6-29-63 | 17. 10. 63 |  |  |  |  |
| NO. CHG. NO. | 110378G | 117628  | TA 1976    |  |  |  |  |

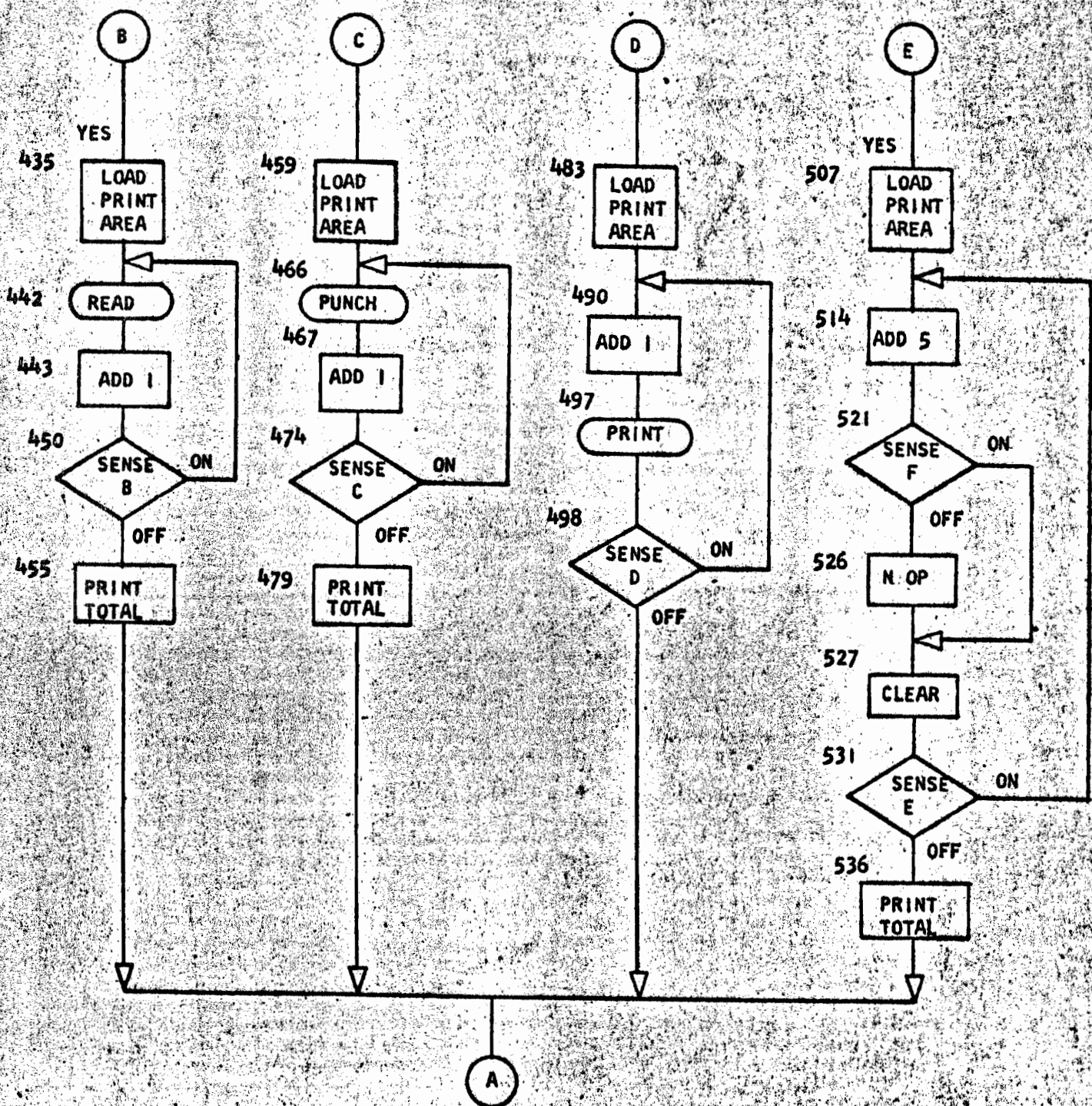
# REPRODUCTION DIAGNOSTIC FUNCTION TEST



|               |         |         |            |  |  |  |  |
|---------------|---------|---------|------------|--|--|--|--|
| DATE          | 2-5-62  | 6-29-63 | 17. 10. 63 |  |  |  |  |
| ENG. CHG. NO. | 110378G | 117628  | TA 1976    |  |  |  |  |

REPRODUCTION  
DIAGNOSTIC FUNCTION TEST

PART NO. 451634  
SHEET 4 of 7  
BLOCK NO. 1000B



|              |         |         |            |  |  |  |  |
|--------------|---------|---------|------------|--|--|--|--|
| DATE         | 2-5-62  | 6-29-63 | 17. 10. 63 |  |  |  |  |
| NO. CHG. NO. | 110378G | 117628  | TA 1976    |  |  |  |  |

REPRODUCTION

PROGRAM LISTING FOR USE WITH FLOW CHART

RD-PCH-PR SPEED TEST

1000B

| INSTRUCTION ADDRESS | OP  | A | B        | REMARKS                               |
|---------------------|-----|---|----------|---------------------------------------|
| 377                 | 377 | B | 700 5783 | USE WHEN TESTS ARE RUN FROM TAPE      |
| 385                 | 385 | B | 588      | *,                                    |
| 400                 | 400 | B | 700      | BRANCH TO CONTINUE                    |
| 406                 | 406 | / | 332      | CLEAR PRINT AREA                      |
| 410                 | 410 | / |          | CLEAR PRINT AREA                      |
| 411                 | 411 | B | 435 B    | ON-START RD COUNT SS                  |
| 416                 | 416 | B | 459 C    | ON-START PCH COUNT SS                 |
| 421                 | 421 | B | 483 D    | ON-START PRT COUNT SS                 |
| 426                 | 426 | B | 507 E    | ON START CYCLE COUNT SS               |
| 431                 | 431 | B | 724      | REPEAT CONTINUOUS LOOP                |
| 435                 | 435 | L | 571 266  | LOAD READ CONSTANT                    |
| 442                 | 442 | 1 |          | READ                                  |
| 443                 | 443 | A | 608 252  | ADD 1                                 |
| 450                 | 450 | B | 442 B    | OFF-END RD COUNT SS                   |
| 455                 | 455 | 2 | 406      | PRINT TOTAL READ                      |
| 459                 | 459 | L | 589 266  | LOAD PCH CONSTANT                     |
| 466                 | 466 | 4 |          | PUNCH                                 |
| 467                 | 467 | A | 608 252  | ADD 1                                 |
| 474                 | 474 | B | 466 C    | OFF-END PCH COUNT SS                  |
| 479                 | 479 | 2 | 406      | PRINT TOTAL PUNCHED                   |
| 483                 | 483 | L | 607 266  | LOAD PRINT CONSTANT                   |
| 490                 | 490 | A | 608 252  | ADD 1                                 |
| 497                 | 497 | 2 |          | PRINT                                 |
| 498                 | 498 | B | 490 D    | OFF END PRINT COUNT SS                |
| 503                 | 503 | B | 406      | BRANCH TO CONTINUE                    |
| 507                 | 507 | L | 553 259  | LOAD CYCLES                           |
| 514                 | 514 | A | 615 252  | ADD 5                                 |
| 521                 | 521 | B | 527 F    | ON-FOR ADV PROG SS                    |
| 526                 | 526 | N |          | CYCLE FILL                            |
| 527                 | 527 | / | 831      | CYCLE FILL                            |
| 531                 | 531 | B | 514 E    | OFF-END CYCLE COUNT SS                |
| 536                 | 536 | 2 | 406      | PRINT TOTAL CYCLES                    |
| 540                 | 540 |   |          | CYCLES CONSTANT                       |
| 554                 | 554 |   |          | CARDS READ CONSTANT                   |
| 572                 | 572 |   |          | CARDS PUNCHED CONSTANT                |
| 590                 | 590 |   |          | LINES PRINTED CONSTANT                |
| 608                 | 608 | 1 |          | CONSTANT                              |
| 609                 | 609 |   | 5        | CONSTANT                              |
| 616                 | 616 |   |          | WORD MARK                             |
| 700                 | 700 | / | 332      | CLEAR PRINT AREA                      |
| 704                 | 704 | / |          | *,                                    |
| 705                 | 705 | B | 500 5521 | BR TO TITLE PRINT ROUTINE IF 1 IN 552 |

|               |         |         |            |  |  |  |  |
|---------------|---------|---------|------------|--|--|--|--|
| DATE          | 2-5-62  | 6-29-63 | 17. 10. 63 |  |  |  |  |
| ENG. CHG. NO. | 110378G | 117628  | TA 1976    |  |  |  |  |

DIAGNOSTIC FUNCTION TEST

PART NO. 451634  
 SHEET 6 OF 7  
 BLOCK NO. 10008

REPRODUCTION

713 713 / 180  
 717 717 -  
 718 718 N 724  
 722 722 1  
 723 723 4  
 724 724 B 733 G  
 729 729 B 406  
 783 783 348  
 737 737

CLEAR PUNCH AREA  
 HALT TO SET SENSE SWITCHES  
 \*B724 TO BY-PASS RD-PCH C FOR TA  
 RUN IN READ FEED  
 RUN IN PUNCH FEED  
 BRANCH TO END TEST  
 START CONTINUOUS LOOP SS  
 RESET SENSE SWITCHES FOR NEXT TEST SS  
 WORD MARK

|               |         |         |            |  |  |  |  |  |
|---------------|---------|---------|------------|--|--|--|--|--|
| DATE          | 2-5-62  | 6-29-63 | 17. 10. 63 |  |  |  |  |  |
| ENG. CHG. NO. | 110378G | 117628  | TA 1976    |  |  |  |  |  |

# REPRODUCTION

## TABLE OF UNPRINTABLE CHARACTERS

|                      |        |                 |        |              |        |
|----------------------|--------|-----------------|--------|--------------|--------|
| LP-LEFT PARENTHESIS  | 12 5 8 | SE-SEMICOLON    | 11 6 8 | DE-DELTA     | 11 7 8 |
| WS-WORD SEPARATOR    | 0 5 8  | LT-LESS THAN    | 12 6 8 | PZ-PLUS ZERO | 12 0   |
| TS-TAPE SEGMENT MARK | 0 7 8  | GT-GREATER THAN | 6 8    | TM-TAPE MARK | 7 8    |
| GM-GROUP MARK        | 12 7 8 | MZ-MINUS ZERO   | 11 0   | CO-COLON     | 5 8    |
| RP-RIGHT PARENTHESIS | 11 5 8 | AP-APOSTROPHE   | 0 6 8  |              |        |

|   |  |                      |          |
|---|--|----------------------|----------|
| ,008015,022029,033033N                        | 1001                                       | RD-PCH-PR SPEED TEST | 1000B 0A |
| ,008015,022029,033033N                        | 1001                                       | SET WORDMARK CARD    | 1000B 02 |
| L067367,340344,348349,357361                  | 1001,008012,001100118361080AB348/340080    |                      | 1000B 03 |
| L071415,385400,406410,411416                  | 1001B700S783BS88                           | B700 /332/84358      | 1000B 04 |
| L066449,421426,431435,442443                  | 1001B459C8483D8507EB724L5712661A60R252     |                      | 1000B 05 |
| L065482,455459,466467,474479                  | 1001B44282406L5892664A608252B466C2406      |                      | 1000B 06 |
| L070520,490497,498503,507514                  | 1001L607266A6082522B49008406L553259A615252 |                      | 1000B 07 |
| L065553,526527,531536,540554                  | 1001B527FN/831B514E2406                    | CYCLES               | 1000B 08 |
| L068589,572590,590590,590590                  | 1001                                       | CARDS READ           | 1000B 09 |
| L072629,608609,616616,616616                  | 1001                                       | LINES PRINTED        | 5        |
| L056722,704705,713717,718722                  | 1001/332/BS00S521/180.N7241                |                      | 1000B 11 |
| L072762,724729,733737,737737                  | 100148733GB406.348                         |                      | 1000B 12 |
| L053520,501505,512513,517521                  | 10012,049L0762762/2772713                  |                      | 1000B 13 |
| /333080N                                      |  | CLEAR WORDMARK CARD  | 1000B 14 |
| ,019027,031,038042B031T98GB400L046352BW048S88 |  | RD-PCH-PR SPEED TEST | 1000B 15 |

M

|               |         |         |            |  |  |  |  |
|---------------|---------|---------|------------|--|--|--|--|
| DATE          | 2-5-62  | 6-29-63 | 17. 10. 63 |  |  |  |  |
| ENG. CHG. NO. | 110378G | 117628  | TA 1976    |  |  |  |  |

