

1401 DATA PROCESSING SYSTEM
DIAGNOSTIC FUNCTION TEST

READ-PUNCH RELEASE

A. PURPOSE OF TEST

1. TO TEST THE START READ FEED -READ RELEASE- CIRCUITRY BY UTILIZING MAXIMUM PROCESSING TIME -31 MS- BETWEEN SUCCESSIVE READ CYCLES. DURING THIS PART OF THE TEST, CARDS SHOULD FEED AT MAXIMUM SPEED -800 CARDS A MINUTE-. ON 1401-G SYSTEM THE MAXIMUM TIME OF 56 MS IS USED.
2. TO TEST THE START PUNCH FEED -PUNCH RELEASE- CIRCUITRY BY UTILIZING MAXIMUM PROCESSING TIME -59.5 MS- BETWEEN SUCCESSIVE PUNCH CYCLES. DURING THIS PART OF THE TEST, CARDS SHOULD FEED AT MAXIMUM SPEED -250 CARDS A MINUTE-.

B. LOADING PROCEDURE

1. WHEN RUNNING TEST FROM CARDS:
 - A. ALLOW 1401 TO HALT WITH I STAR AT 440
 - B. PLACE BLANK CARDS IN READ FEED
 - C. DEPRESS START AND PROGRAM HALTS AT I STAR 572 WITH 50 CARDS COUNTED INTO STACKER 1.
 - D. CLEAR READ FEED, PLACE THE 50 BLANK CARDS IN THE READ HOPPER AND PRESS START.
 - E. READ CHECK STOP WITH I STAR AT 579
 - F. CLEAR READ FEED, PLACE CARDS IN PUNCH HOPPER AND RESTART AT 600
 - G. PUNCH CHECK STOP WITH I STAR AT 799
 - H. END OF TEST RESTART AT 348
2. WHEN RUNNING FROM TAPE:
 - A. ENTER A 1 IN 1279
 - B. FOLLOW PROCEDURE FOR RUNNING TEST FROM CARDS.

C. PROGRAM CONTROL

1. SENSE SWITCHES

- G ON IF SYSTEM IS 1401-G
IF SENSE SWITCHES ARE NOT ON SYSTEM, ENTER A WM IN 859 FOR 1401-G SYSTEMS
- B ON TO REPEAT FOR SCOPING
OFF TO CONTINUE

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D. TEST PROCEDURE

A CARD COUNTER IS SET TO 003 ADVANCED BY -1-, AND TESTED FOR EVERY DETAIL CARD UNTIL IT REACHES 50. IMMEDIATELY AFTER EACH READ INSTRUCTION, DELAY INSTRUCTIONS -TWO MOVE AND ZERO SUPPRESS- AND A START READ FEED INSTRUCTION ARE EXECUTED. THESE INSTRUCTIONS ARE CALCULATED TO USE UP APPROXIMATELY 9.8 MILLISECOND OF PROCESSING TIME. IF SS G IS ON 4 MOVE ZERO SUPPRESS INSTRUCTIONS DELAY 21 MS.

AFTER THE START READ FEED INSTRUCTION, THREE MORE MOVE AND ZERO SUPPRESS INSTRUCTIONS AND A BRANCH INSTRUCTION ARE EXECUTED. THESE INSTRUCTIONS, PLUS THE INSTRUCTIONS EXECUTED AFTER THE BRANCH UP TO THE NEXT READ INSTRUCTION, ARE CALCULATED TO USE UP APPROXIMATELY 20.8 MILLISECOND OF PROCESSING TIME. IF SS G IS ON 5 MOVE ZERO SUPPRESS INSTRUCTIONS DELAY 34.8 MS. SINCE THE PROCESSING TIME UTILIZED BETWEEN SUCCESSIVE READ CYCLES IS WITHIN THE MAXIMUM 31 MILLISECOND ALLOWED FOR 1401, OR 55.6 MS FOR THE 1401-G, CARDS SHOULD FEED CONTINUOUSLY. IF AUDIBLE INTERRUPTION IS DETECTED, THE MAXIMUM SPEED OF 800 CARDS A MINUTE IS NOT MAINTAINED AND A FAILURE OF THE START READ FEED CIRCUITRY IS NORMALLY INDICATED.

IT MUST BE RECOGNIZED, OF COURSE, THAT THE AUDIBLE INTERRUPTION MAY BE CAUSED BY FAILURE IN OTHER PHASES OF THE LOOP RESULTING IN A DELAY IN EXCESS OF 31 MILLISECOND. THIS CONDITION IS INTENTIONALLY FORCED BY THE PROGRAM WHEN THE CARD COUNTER REACHES 50 BY EXECUTING AN EXTRA 8 MILLI-SECONDS DELAY BEFORE THE NEXT READ INSTRUCTION. THIS EXTRA DELAY CAUSES A LATE READ INSTRUCTION AND THE MACHINE SHOULD THEREFORE STOP WITH THE READ CHECK ERROR LIGHT ON AND THE INCORRECTLY-READ CARD IN THE STACKER, AND THE I STAR AT LOCATION 579.

IF THE READ CHECK STOP FAILS TO OCCUR THE PROGRAM HALTS WITH THE I STAR AT 581.

TO PROCEED WITH THE SECOND PART OF THIS TEST, PERFORM A NON-PROCESS RUNOUT, RESET THE ERROR CONDITION AND PRESS START KEY.

THE PROCEDURE FOR START PUNCH FEED -PUNCH RELEASE- IS MUCH THE SAME AS FOR THE START READ FEED -READ RELEASE- EXCEPT THAT THE DELAY INSTRUCTIONS ARE CALCULATED TO USE UP APPROXIMATELY 58.5 MILLISECOND OF PROCESSING TIME. SINCE THE PROCESSING TIME UTILIZED BETWEEN SUCCESSIVE PUNCH CYCLES IS WITHIN THE MAXIMUM 59.5 MILLISECOND ALLOWED, CARDS SHOULD BE PUNCHED CONTINUOUSLY AT THE MAXIMUM RATE OF 250 CARDS A MINUTE. IF AUDIBLE INTERRUPTION IS DETECTED, THIS SPEED IS NOT MAINTAINED AND A FAILURE OF THE START PUNCH FEED CIRCUITRY IS NORMALLY INDICATED.

WHEN THE CARD COUNTER REACHES 50 IN THIS PART OF THE TEST, AN EXTRA 8 MILLISECOND DELAY IS EXECUTED TO FORCE A PUNCH CHECK ERROR STOP CONDITION. THIS DELAY CAUSES A LATE PUNCH INSTRUCTION AND THE MACHINE SHOULD THEREFORE STOP WITH THE PUNCH CHECK ERROR LIGHT ON AND THE I STAR AT LOCATION 799 INDICATING THE END OF THE TEST.

IF THE PUNCH CHECK STOP FAILS TO OCCUR, THE PROGRAM HALTS WITH THE I STAR AT 801.

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E. STOPS

STORAGE ADDRESS REGISTER

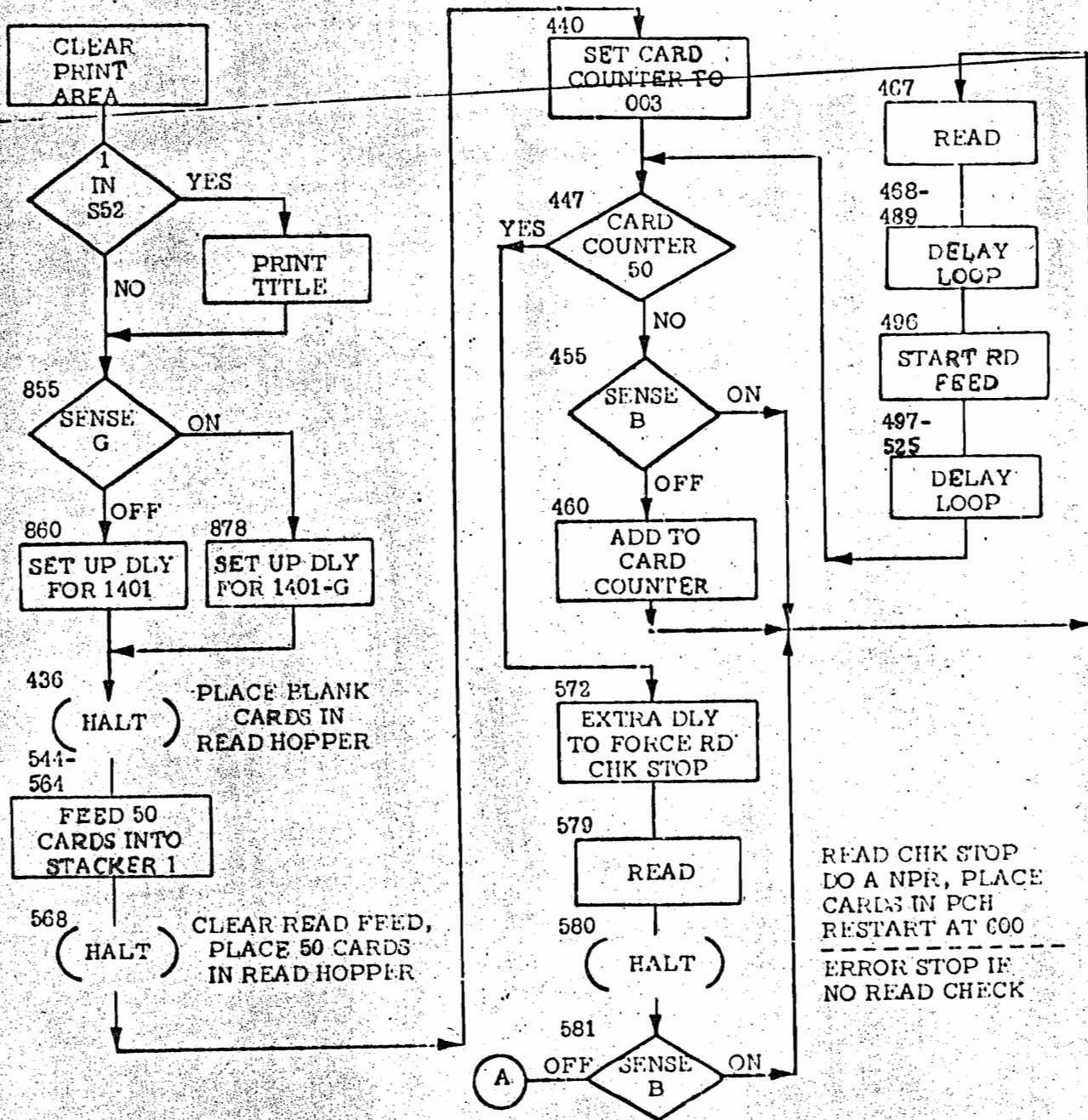
- 440 HALT TO PLACE BLANK CARDS IN READ FEED.
- 572 HALT TO REMOVE 50 CARDS FROM STACKER 1. CLEAR READ FEED, PLACE 50 CARDS IN READ HOPPER AND PRESS START.
- 579 READ CHECK STOP. RUNOUT READ FEED, CLEAR ERROR AND PRESS START KEY.
- 581 ERROR STOP - NO READ CHECK STOP
- 799 PUNCH CHECK STOP. END OF TEST. RUNOUT PUNCH FEED, CLEAR ERROR AND PRESS START TO FEED NEXT TEST.
- 801 ERROR STOP - NO PUNCH CHECK STOP

F. PRINTOUTS

NONE

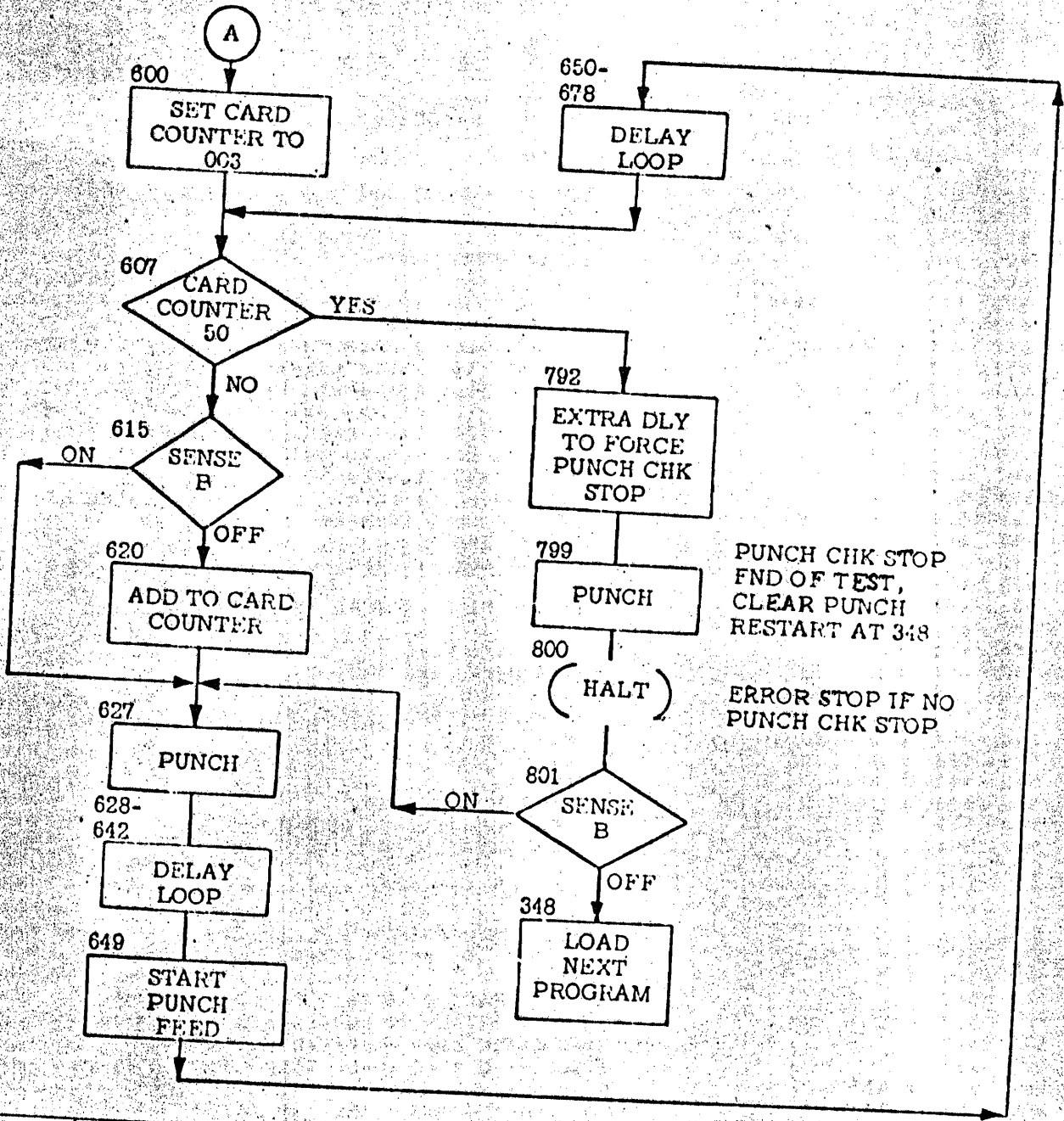
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PART NO. 451445
SHEET 0 OF 2
BLOCK NO. 35000

PROGRAM LISTING FOR USE WITH FLOW CHART

READ PUNCH RELEASE BLOCK 35000

ACT. ADDR	INST ADDR	OP	A	B	REMARKS
377	377	b	393	5791	USE WHEN TESTS ARE RUN FROM TAPE
385	385	b	588		..
393	393	M	388	380	BYPASS 2 DETAIL CARDS ON TAPE
400	400	/	332		CLEAR PRINT AREA
404	404	/			..
405	405	B	500	5521	BR. TO TITLE PRINT IF 1 IN 1252
413	413	/	199		CLEAR PUNCH AREA
417	417	B	855		BR. TO CHECK SYSTEM TYPE
421	421	N			CONSTANT TO CHANGE DELAYS
422	422	M	421	468	SET UP DELAY FOR 1401
429	429	M	421	475	..
436	436	.	536		BR. TO FEED BLANK CARDS AFTER HALT
440	440	L	595	598	SET CARD COUNTER TO 003
447	447	B	572	5975	BR. IF CARD COUNTER 50
455	455	B	467	E	B ON FOR SCOPE LOOP
460	460	A	467	598	ADD 1 TO CARD COUNTER
467	467	I			READ A CARD
468	468	Z	257	332	EXTRA DELAY FOR 1401-G
475	475	Z	257	332	..
482	482	Z	239	332	DLY 9.8 MS FROM READ TO START READ FEED
489	489	Z	239	332	..
496	496	B			START READ FEED
497	497	Z	300	332	EXTRA DELAY FOR 1401-G
504	504	Z	300	332	..
511	511	Z	294	332	DLY 20.8 MS FROM START READ FEED TO READ
518	518	Z	294	332	..
525	525	Z	294	332	..
532	532	B	447		BRANCH
536	536	.	101		DEFINE DELAY FIELDS
540	540	S	592		RESET INITIAL CARD COUNTER
544	544	I			FEED 2 DETAIL CARDS
545	545	I			..
546	546	A	545	592	COUNT OUT 50 CARDS FOR TEST
553	553	I			..
554	554	K	I		SELECT INTO POCKET 1
556	556	B	568	5915	BR. WHEN 50 CARDS ARE FED
564	564	B	546		BRANCH
568	568	.	440		HALT TO REMOVE 50 TEST CARDS
572	572	Z	331	332	EXTRA 8 MS DLY TO FORCE READ CHECK STOP
579	579	I			READ CHECK STOP - RESTART AT 600
580	580	.			ERRCR - NO READ CHECK STOP
581	581	B	467	B	B ON FOR SCOPE LOOP
586	586	B	600		CONTINUE TO PUNCH TEST

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590 590 0 00
593 593 0 03
596 596 0 00
599 599 Z
600 600 L 595 598
607 607 B 792 5975
615 615 B 627 B
620 620 A 467 598
627 627 4
628 628 Z 310 332
635 635 Z 309 332
642 642 Z 310 332
649 649 9
650 650 Z 331 332
657 657 Z 331 332
664 664 Z 331 332
671 671 Z 331 332
678 678 Z 208 332
685 685 B 607
792 792 Z 331 332
799 799 4
800 800 .
801 801 B 627 B
806 806 D 348
855 855 B 878 G
860 860 M 421 497
867 867 M 421 504
874 874 B 422
878 878 M 599 468
885 885 M 599 475
892 892 M 599 497
899 899 M 599 504
906 906 D 436

INITIAL CARD COUNTER
CONSTANT TO SET CARD COUNTER
CARD COUNTER
CONSTANT TO CHANGE DELAY
SET CARD COUNTER TO 003
BR. IF CARD COUNTER 50
B ON FOR SCOPE LOOP
ADD 1 TO CARD COUNTER
PUNCH
DLY 22 MS FROM PUNCH TO START PUNCH FEED
..
..
START PUNCH FEED
DLY 36.5 MS FROM ST PCH FEED TO PUNCH
..
..
..
..
BRANCH
EXTRA 8 MS
LATE PUNCH CHECK STOP - END OF TEST
ERROR - NO PUNCH CHECK STOP
B ON FOR SCOPE LGCP
REAC IN NEXT TEST
G ON IF 1401-G SYSTEM
SET UP DELAY FOR 1401
..
BRANCH
SET UP DELAY FOR 1401-G
..
..
..
BRANCH
DETAIL CARDS

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ENG. CHG. NO.	11768	110511					

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PART NO 451445
SHEET 8 OF 8
BOOK NO 35000

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	READ PUNCH RELEASE	35000 04
.008015,022029,033033N	1001	SET WORDMARK CARD	35000 02
L067367,340344,348349,3573611001,008012,001100118361087A8344/34008U			35000 03
L069404,377385,373400,4044051001	B3735791BSHA M388380/332/		35000 04
L067439,413417,421422,4294361018S005521/1778855NM421468M421475.536			35000 05
L067474,447455,460467,4684751001L5955988572577584678A46759812257332			35000 06
L068510,482489,496497,5045111001225733272393322239332873003322300332			35000 07
L066544,518525,532536,54054410012294332729433222943328447,10155921			35000 08
L059571,546553,554556,56456810011A5455971K1456859158546.440			35000 09
L056595,579580,581596,59059310123313321.H46788607000003			35000 10
L064627,599600,607615,6206271001000ZL5955988792597586278A4675984			35000 11
L068663,635642,649650,6576641001231033223073322310332923313322331332			35000 12
L072703,671678,685685,68568510012331332233133222083328607			35000 13
L0548050784784,792799,8008011001	Z3313324.86278		35000 14
L072845,0C1001,001001,00100110018348			35000 15
L0648770846946,855860,8678741001	H878GM421497M4215048422		35000 16
L072917,885892,899906,9069061001M599468M599475M599497M5995048436			35000 17
L0475120/98/98,500501,5055121001	2,049L0772772		35000 18
L068548,517521,521521,5215211001/2772413			35000 19
/333080N		CLEAR WORDMARK CARD	35000 20
.019027,031,0380428031198GB400L646352BW048588		READ PUNCH RELEASE	35000 21
			35000 22
			35000 23

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