

REPRODUCTION
 PUNCH-FEED-READ RELEASE

A. PURPOSE OF TEST

1. THAT AT LEAST 57 MS OF DELAY EXISTS FROM THE EARLIEST TIME A 9R OPERATION CAN BE GIVEN UNTIL A 4R OPERATION CAN BE SUCCESSFULLY GIVEN TO COMPLETE THE PFR RELEASE.
2. THAT AT 61 MS OF DELAY, THE PFR RELEASE OPERATION CANNOT BE SUCCESSFULLY COMPLETED.

B. LOADING PROCEDURES.

1. WHEN RUNNING TEST FROM CARDS:

- A. MAKE SURE PUNCH FEED IS EMPTY WHEN TEST STARTS
- B. ALLOW 1401 TO STOP WITH A PUNCH OP SET UP.
- C. PLACE APPROXIMATELY 260 PREPUNCHED CARDS (SAY RIPPLE PUNCHED) IN THE PUNCH FEED.
- D. TURN OFF ALL CHECK STOP SWITCHES.
- E. DEPRESS START KEY.
- F. WHEN MACHINE HALTS AT END OF TEST:

1. WITH NON-PROCESS KEYS, RUN CARDS OUT OF PUNCH.
2. TO REPEAT TEST, PLACE CARDS IN PUNCH FEED, TURN SENSE SWITCH "D" ON, AND DEPRESS START KEY.
3. TO CONTINUE WITH NEXT TEST BLOCK, LEAVE SENSE SWITCH "D" OFF, TURN ON CHECK STOP SWITCHES AND SENSE SWITCHES AS REQUIRED BY NEXT TEST, AND DEPRESS START KEY.

2. WHEN RUNNING TEST FROM TAPE:

- A. MANUALLY ENTER A 1 IN 1272 AND 1279.
- B. FOLLOW PROCEDURE FOR RUNNING TEST FROM CARDS.

C. PROGRAM CONTROL.

1. SENSE SWITCHES

- D ON TO REPEAT TEST
OFF TO CONTINUE
- E ON TO STOP ON ERROR
OFF TO PRINT ERROR

D. TEST PROCEDURE

THIS TEST WILL RUN APPROXIMATELY 250 PRE-PUNCHED CARDS FROM THE PUNCH SIDE. WHEN THE MACHINE OPERATES CORRECTLY, APPROXIMATELY 100 CARDS WILL GO INTO THE 4 POCKET.

DATE	10-10-61	6-29-63	17. 10. 63				
ENG. CHG. NO.	110378E	117628	TA 1976				

REPRODUCTION

D. (CONTINUED)

THEN AN OVEREXTENSION WILL OCCUR. AFTER THE FIRST OVEREXTENSION, AN OVEREXTENSION OCCURS ON EVERY OTHER CARDS, AND ANOTHER 100 CARDS WILL FEED. OF THESE CARDS, APPROXIMATELY 50 WILL NOT SELECT, AND APPROXIMATELY 50 WILL SELECT INTO POCKET 4. (EVERY TIME AN OVEREXTENSION OCCURS, A CARD WILL NOT SELECT), WHEN THE MACHINE OPERATES AS STATED, ERROR PRINTOUTS DO NOT OCCUR. (AN ERROR PRINTOUT WILL ALWAYS CONTAIN THE WORD "ERROR".)

BECAUSE OF THE NATURE OF THE TEST, ALL CHECK STOP SWITCHES MUST BE OFF.

E. STOPS

STORAGE ADDRESS REGISTER

659	HALT - END OF TEST
706	ERROR WITH SENSE E ON
710	ERROR WITH SENSE E ON

F. PRINTOUTS

ALL ERRORS AUTOMATICALLY PRINTOUT.

G. COMMENTS

THIS TEST IS DESIGNED TO PROVIDE TWO SPECIFIC DELAYS TO PRODUCE TWO SEPARATE CONDITIONS.

THE FIRST CONDITION IS THAT AT LEAST 57 MS OF DELAY EXISTS FROM THE EARLIEST TIME A 9R OPERATION CAN BE EXECUTED UNTIL A 4R OPERATION IS GIVEN. THE MACHINE IS OPERATING CORRECTLY IF THE CARD THAT IS RELEASED BY THE 9R INSTRUCTION IS READ CORRECTLY BY THE 4R INSTRUCTION. (THIS CONDITION INSURES THAT THE CUSTOMER IS GUARANTEED 56 MS OF COMPUTE TIME WHEN HE PROPERLY USES THE RELEASE INSTRUCTION WITH THE READ INSTRUCTION.) IF AN OVEREXTENSION OCCURS IN ERROR (PUNCH CHECK AND POSSIBLE VALIDITY CHECK), THE PRINTER WILL PRINTOUT "OVEREXTENDED-ERROR". SUCH AN ERROR CAN BE CAUSED BY FAULTY CIRCUITRY OR BY THE PUNCH RUNNING TOO FAST.

IN ORDER TO CHECK FOR 56 MS OF DELAY EXACTLY - RATHER THAN 57 MS, MANUALLY CHANGE THE 3 IN LOCATIONS 573 AND 576 TO A 0 (ZERO). THIS CHANGE REDUCES THE ZERO SUPPRESS DELAY BY 90 CYCLES, WHICH IS APPROXIMATELY 1 MS. (ACTUALLY 87 CYCLES IS VERY NEARLY 1 MS, BEING $11.54 \text{ PS} \times 87 = 1.00398 \text{ MS}$)

THE SECOND CONDITION IS THAT 61 MS OF DELAY EXISTS FROM THE EARLIEST TIME A 9R OPERATION CAN BE EXECUTED UNTIL A 4R OPERATION IS GIVEN. THE MACHINE IS OPERATING CORRECTLY IF THE CARD THAT IS RELEASED BY THE 9R INSTRUCTION IS NOT READ CORRECTLY BY THE 4R INSTRUCTION. AN OVEREXTENSION WILL OCCUR, CAUSING PUNCH AND POSSIBLE VALIDITY CHECKS. HOWEVER, THE TEST IS DESIGNED TO ANTICIPATE THIS RESULT AS NORMAL. MOREOVER, IF THE PUNCH IS RUNNING TOO SLOW AND AN OVEREXTENSION DOES NOT OCCUR, THE PRINTER WILL PRINTOUT "DID NOT DETECT OVEREXTENSION--ERROR".

DATE	10-10-61	6-29-63	17. 10. 63				
ENG. CHG. NO.	110378E	117628	TA 1976				

REPRODUCTION

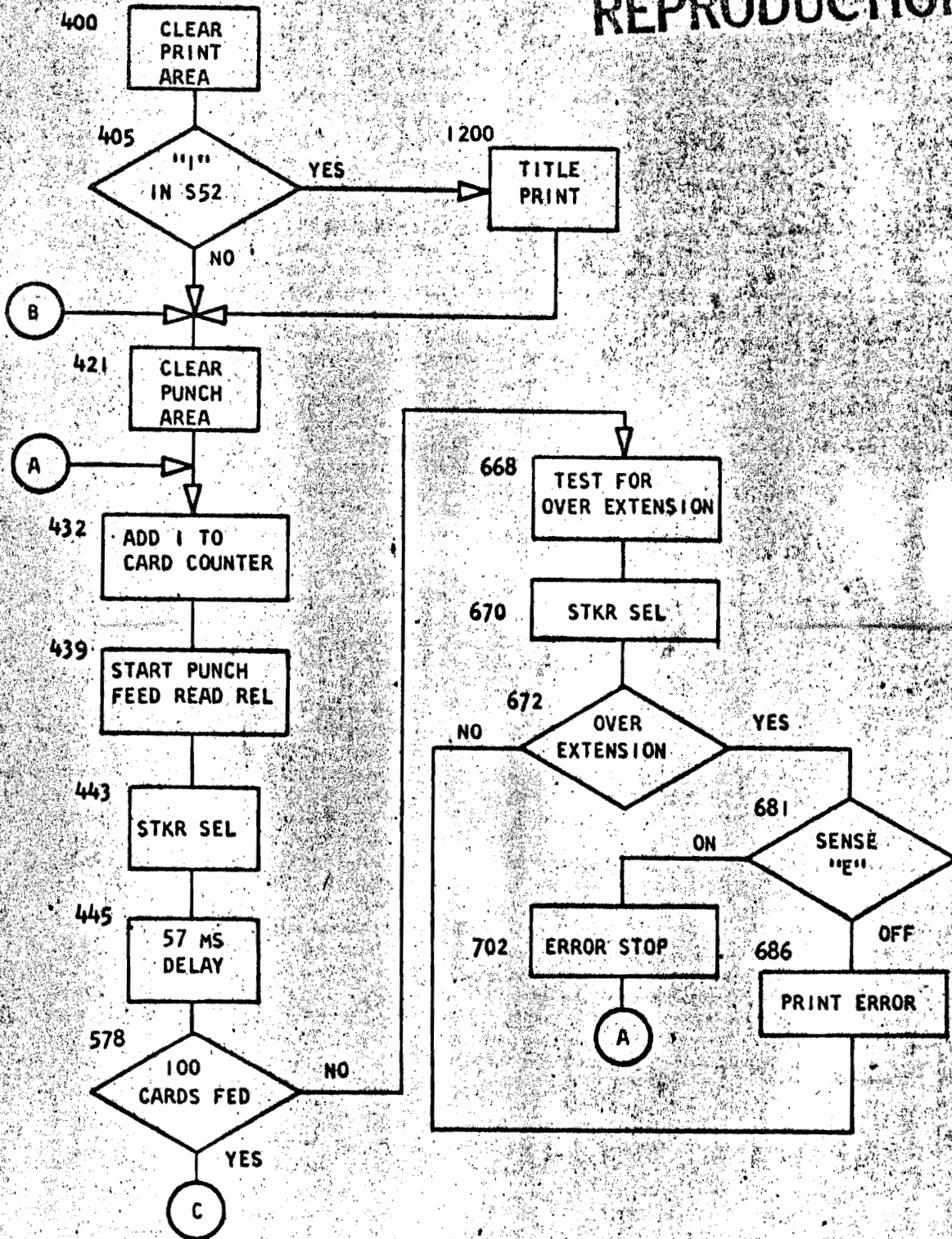
G. (CONTINUED)

FOR FURTHER TESTING, IF IT IS DESIRED TO INCREASE THE DELAY BY 1 MS., MANUALLY CHANGE THE 1 IN 595 TO A 4, AND MANUALLY CHANGE THE 2 IN 598 TO A 5. THIS CHANGE WILL RESULT IN 62 MS RATHER THAN 61 MS OF DELAY. AN ADDITIONAL MILLISECOND OF DELAY CAN BE OBTAINED BY CHANGING THE 4 IN 595 TO A 7 AND BY CHANGING THE 5 IN 598 TO AN 8. ALSO, PROVISION HAS BEEN MADE TO ALLOW THE NO-OP IN 600-606 TO BE CHANGED TO A ZERO SUPPRESS OPERATION FOR EVEN MORE DELAY. HOWEVER, THIS DELAY SHOULD NEVER BE NEEDED.

DATE	10-10-61	6-29-63	17. 10. 63				
ENG. CHG. NO.	110378E	117628	TA 1976				

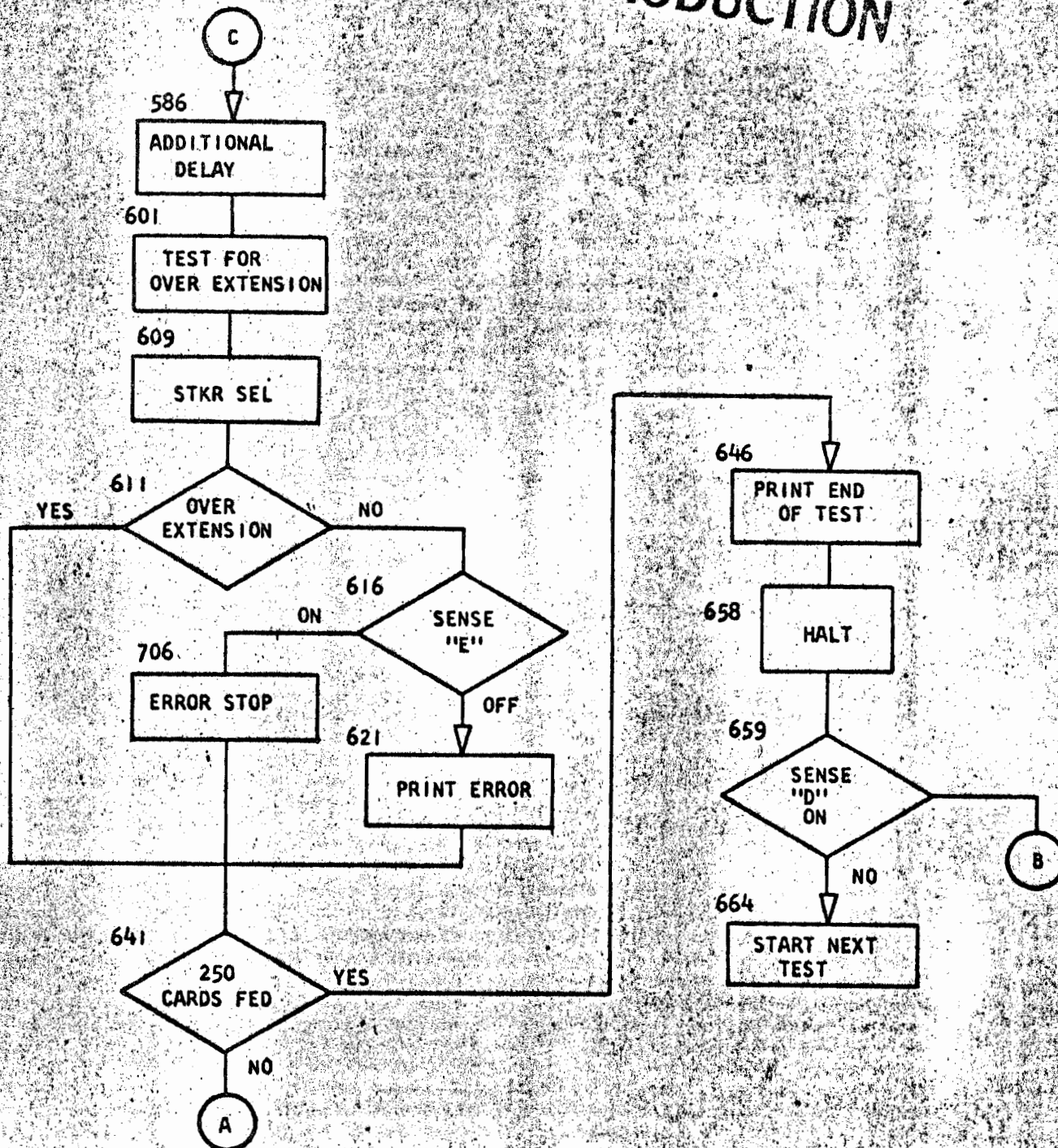
PUNCH FEED-READ RELEASE OVER EXTENSION
 FLOW CHART

REPRODUCTION



DATE	10-10-61	6-29-63	17. 10. 63				
ENG. CHG. NO.	110378E	117628	TA 1976				

REPRODUCTION



DATE	10-10-61	6-29-63	17. 10. 63				
ENG. CHG. NO.	110378E	117628	TA 1976				

REPRODUCTION

PROGRAM LISTING FOR USE WITH FLOW CHART

PCH-FEED READ RELEASE 3502B

INSTRUCTION ADDRESS	OP	A	B	REMARKS
377	377	B	710 5721	USE WHEN TESTS ARE RUN FROM TAPE
385	385	B	588	..
400	400	/	332	START TEST
404	404	/		..
405	405	B	500 5521	BR TO TITLE PRINT ROUTINE IF 1 IN 1252
413	413	/	*99	CLEAR DELAY AREA 1000 TO 1099
417	417	,	*00	SET WM IN 1000
421	421	/	180	CLEAR PUNCH AREA
425	425	M	805 802	SET UP CARD COUNTER
432	432	A	400 802	ADD 1 TO CARD COUNT
439	439	4	R	START PUNCH TO INTERLOCK PROCESSOR
441	441	9	R	START PFR RELEASE
443	443	K	4	STKR SEL
445	445	Z	*86 *87	3 MS DELAY
452	452	Z	*86 *87	3 MS DELAY
459	459	Z	*86 *87	3 MS DELAY
466	466	Z	*86 *87	3 MS DELAY
473	473	Z	*86 *87	3 MS DELAY
480	480	Z	*86 *87	3 MS DELAY
487	487	Z	*86 *87	3 MS DELAY
494	494	Z	*86 *87	3 MS DELAY
501	501	Z	*86 *87	3 MS DELAY
508	508	Z	*86 *87	3 MS DELAY
515	515	Z	*86 *87	3 MS DELAY
522	522	Z	*86 *87	3 MS DELAY
529	529	Z	*86 *87	3 MS DELAY
536	536	Z	*86 *87	3 MS DELAY
543	543	Z	*86 *87	3 MS DELAY
550	550	Z	*86 *87	3 MS DELAY
557	557	Z	*86 *87	3 MS DELAY
564	564	Z	*86 *87	3 MS DELAY
571	571	Z	*30 *31	3 MS DELAY - INCLUDES ALL THE I CYCLES
578	578	B	668 8001	BRANCH UNTIL 100 CARD HAVE FED
586	586	Z	*86 *87	ADDITIONAL 3 MS DELAY
593	593	Z	*19 *20	ADDITIONAL 1 MS DELAY INCLUDES I CYCLES
600	600	N		CAN ADD MS OF DELAY HERE
607	607	4	R	TEST FOR OVER EXTENSION - NO ERROR
609	609	K	4	STKR SEL
611	611	B	634 -	BRANCH ON OVER EXTENSION - NO ERROR
616	616	B	706 E	BRANCH TO STOP IF E IS ON SS
621	621	/	299	CLEAR PRINT AREA
625	625	M	861 250	MOVE DID NOT DETECT OVER EXTENSION
632	632	M		- ERROR TO PR. AREA

DATE	10-10-61	6-29-63	17.10.63				
ENG. CHG. NO.	110378E	11762B	TA 1976				

REPRODUCTION

633	633	2		DID NOT DETECT OVER EXTENSION - ERROR
634	634	C	875 802	COMPARE CD COUNT TO 250
641	641	B	432 /	RESTART LOOP IF CARD COUNT NOT 250
646	646	/	299	CLEAR PRINT AREA
650	650	M	872 250	MOVE END OF TEST TO PR AREA
657	657	2		PRINT END OF TEST
658	658	.		HALT
659	659	B	413 0	RESTART TEST IF SENSE SW'D ON SS
664	664	B	348	BRANCH TO NEXT TEST
668	668	4	R	TEST FOR OVER EXTENSION - ERROR
670	670	K	4	STKR SEL
672	672	B	681 -	BRANCH ON OVER EXTENSION - ERROR
677	677	B	432	RESTART LOOP
681	681	B	702 E	BRANCH TO STOP IF E IS ON SS
686	686	/	299	CLEAR PRINT AREA
690	690	M	825 250	MOVE OVER EXTENDED ERROR
697	697	2		PRINT OVER EXTENDED - ERROR
698	698	B	432	RESTART LOOP
702	702	.	432	RESTART LOOP
706	706	.	634	BRANCH TO CHECK CARD COUNT
710	710	B	400 5791	USE WHEN TESTS ARE RUN FROM TAPE
718	718	B	348	
800	800	1	50	INITIAL CARD COUNT
806	806	O	VER EXTENDED - ERROR	PRINT OUT
826	826	D	ID NOT DETECT OVERY	
846	846	X	TEN SION - ERROR	
862	862	E	ND OF TEST	
873	873	2	50	FINAL CARD COUNT
1120	120			TITLE PRINT
1140	140	P	UNC H FEED	
1160	160			READ R
1180	180	E	LEA SE OVEREXTENSION	

DATE	10-10-61	6-29-63	17. 10. 63				
ENG. CHG. NO.	110378E	117628	TA 1976				

DIAGNOSTIC FUNCTION TEST

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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	PCH-FEED READ RELEASE	3502800A
,008015,022029,033033N	1001	SET WORDMARK CARD	3502B 02
L067367,340344,348349,3573611001,008012,00110011B361080AB400/340080			3502B 03
L069404,377385,400404,4054051001	8710S721BS88 /332/		3502B 04
L068440,413417,421425,4324391001BS00S521/+99,+00/180M805802A4008024R			3502B 05
L071479,443445,452459,46647310019RK4Z+86+87Z+86+87Z+86+87Z+86+87Z+86+87			3502B 06
L067514,487494,501508,5155151001Z+86+87Z+86+87Z+86+87Z+86+87Z+86+87			3502B 07
L067549,522529,536543,5505501001Z+86+87Z+86+87Z+86+87Z+86+87Z+86+87			3502B 08
L068585,557564,571578,5865861001Z+86+87Z+86+87Z+86+87Z+30*31B6688001			3502B 09
L067620,593600,607609,6116161001Z+86+87Z+19*20N	4RK48634MB706E		3502B 10
	Z		
L061649,625632,633634,6416461001/299M861250M2C875802B432//299			3502B 11
L054671,657658,659664,6686701001M8722502.8413DB3484RK4			3502B 12
L062701,677681,686690,6976981001B681MB432B702E/299M8252502B432			3502B 13
	Z		
L072741,706710,718718,7187181001.432.6348400S791B348			3502B 14
L072839,806826,826826,8268261001	150OVEREXTENDED - ERRORID NOT DETECT		3502B 15
L072879,840840,846862,8738731001	OVEREXTENSION - ERROR END OF TEST250		3502B 16
L070/39,02/02,/20/40,/40/401001			3502B 17
L072/79,/60/80,/80/80,/80/801001PUNCH FEED	READ R		3502B 18
L070S17,S00S01,S05S12,S13S171001	RELEASE OVEREXTENSION2,049L0772772/2772		3502B 19
L059S44,S25S29,S36S37,S41S451001	40/60/80L/992802/2802413		3502B 20
/333080N	CLEAR WORDMARK CARD		3502B 21
,019027,031,038042B031T98GB400L046352BWO4BS88	TEST FOLLOWS BELOW		3502B 22

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DATE	10-10-61	6-29-63	17. 10. 63				
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