

NO. 2125637
 SHEET 0
 OF 18

DIAGNOSTIC TEST

TITLE 1620 SPECIAL INSTRUCTIONS DIAGNOSTIC TEST - CU05
MACH. TYPE 1620 **BY** J.H.M. **APPR.** G.I.A. **DATE** 4-11-62

ENGINEERING CHANGE HISTORY

E/C NO.	DATE	SHEETS AFFECTED
404618	5-15-61	1-18
404675	4-11-62	2A, 3A, 6, 6A, 7, 8, 9, 10, 12, 14, 15, 16, 17, 17A, 18

E/C NO.	404618	404675				
DATE	5-15-61	4-11-62				

1620 DIAGNOSTICS

CU05

SPECIAL INSTRUCTIONS

A. SCOPE:

This test is essentially a fault detection test designed to check for the proper operation of the special instructions Transfer Numeric Strip, Transfer Numeric Fill and Move Flag.

B. SET UP:

Suggested setting of 1620 switches:

1. Check Switches set to STOP.
2. Sense Switches set OFF.

The sense switches have the following functions in this test:

Sense Switch #1	ON	Bypass error type out
	OFF	Type out routine number on error
Sense Switch #2	ON	Loop in routine
	OFF	Continue to next routine
Sense Switch #3	ON	Stop on error
	OFF	Bypass Halt in error routine
Sense Switch #4	ON	Repeat Test
	OFF	Halt

NORMAL LOAD

This test is designed to be used with a 1620-1622 system. The cards must be run in the 1622 by using the LOAD key. Depressing the 1620 START key will initiate the loading of the instructions.

If these features are to be used with a 1620-1621 system, then the instructions to load the test instructions must be inserted in the 1620.

These are:

36 00096 00300
49 00828

PRODUCE NEW TAPE

1. Load tape in paper tape reader and ready reader.
2. Insert the following instructions in 1620:

PN 2125637
EC 404618

PRODUCE NEW TAPE (cont'd)

36 14960 90300
35 14960 90200
37 15201 00300
39 15201 00200
48

3. Release and start.

C. TEST METHOD:

The test is comprised of a group of routines (15) to check the various aspects of these three special instructions.

Routine 001 types the setting of the sense switches, the name of the test, and reads in the data for checking Transfer Numeric Strip.

Routines 002-005 check the Transfer Numeric Strip circuits. The zone data of the numeric fields read in in the alpha mode in routine 001 is removed. Routines 002 and 003 remove the zone data from positive fields. The addressed position of the Q field in routine 002 is odd; while the addressed position of the Q field in routine 003 is even. Routines 004 and 005 remove the zone data from negative fields; the addressed position of the Q fields being odd and even respectively.

Routines 006-009 check the Transfer Numeric Fill Circuits. Zone data for ten digit numeric fields is added. Routines 006 and 007 add zone data to positive fields. The addressed Q field for routine 006 is an odd memory memory location and for routine 007 it is an even position. A test is made to determine that a flag bit is not inserted in the high order position of the P field. Routines 008 and 009 add zone data to negative fields. The addressed Q field in routine 008 is odd and in routine 009 it is even. Flag bits should not be inserted in the high order position of the P field.

Routines 010-013 check the Move Flag circuits. The flag conditions of the Q addressed position is moved to the flag position of the P address, leaving the Q address without a flag. The four conditions, moving a flag to a no flag position, flag to flag position, no flag to flag, and no flag to no flag, are checked by the routines 010-013 respectively.

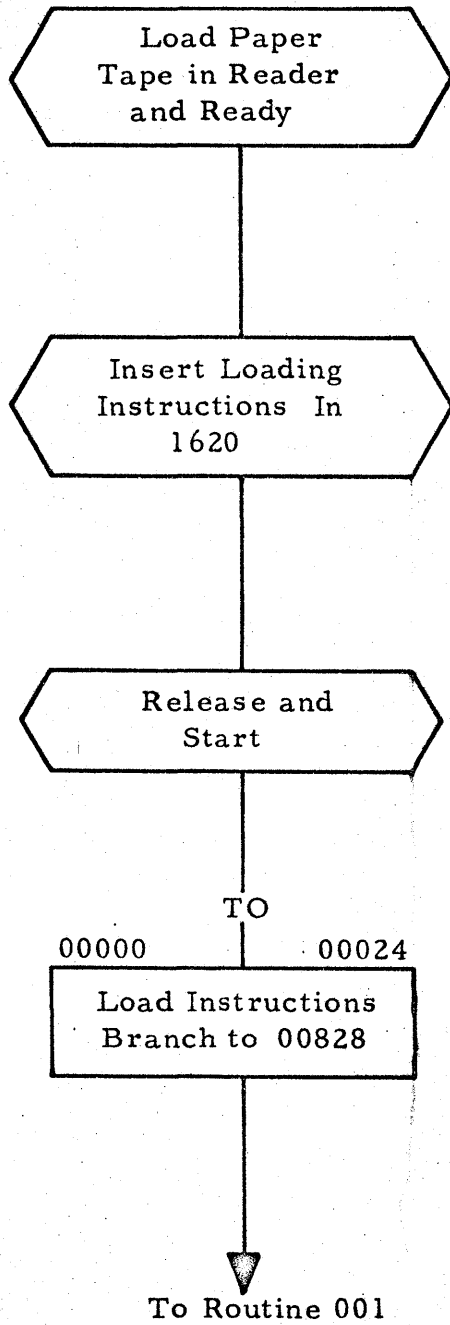
Routine 014 is the repeat routine, and routine 015 is the test completed routine.

Error typeouts consist of an "H" followed by the routine number and a statement of the error that occurred or the field that is in question. Comparing the typed field with the compare data will indicate what caused the error type out.

The complete normal typeout information will be as follows:

SW 1 OFF SW 2 OFF SW 3 OFF SW 4 OFF SET SENSE SWS FOR
CU05. SPECIAL INSTS TEST. THEN START.
START ROUTINES. ETOS FOLLOW.
TEST COMPLETED. IF SW 1 OFF AND NO ROUTINE NOS TYPED,
TEST PERFORMED PROPERLY.

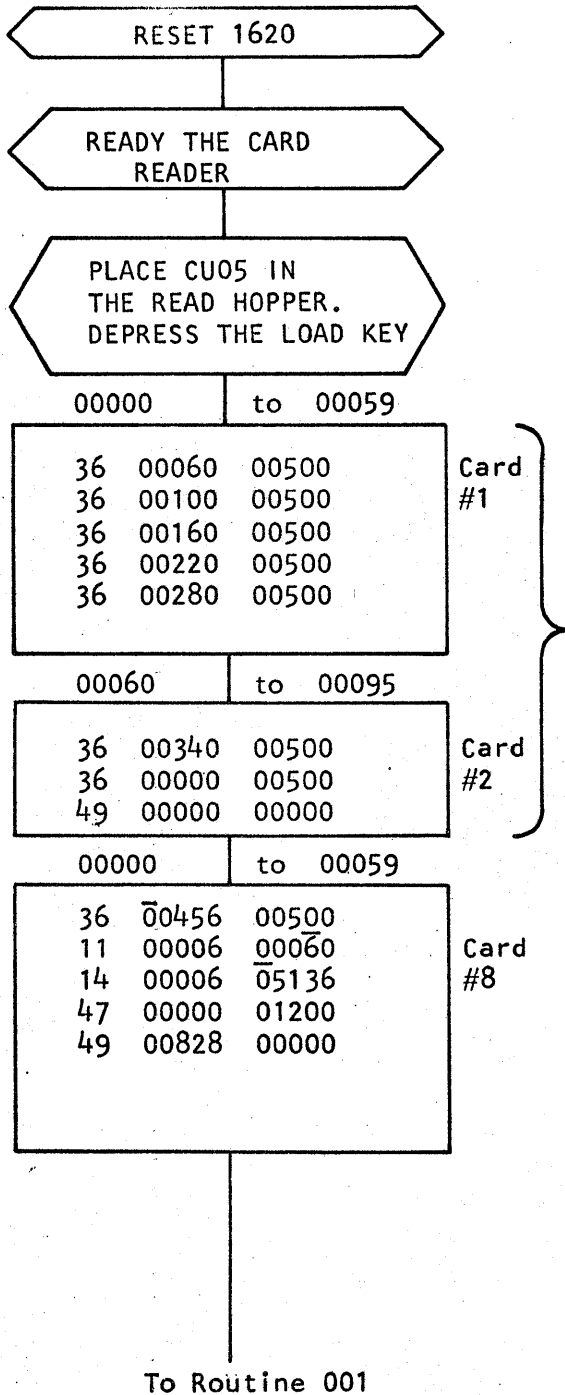
1620 DIAGNOSTICS
GU05
SPECIAL INSTRUCTIONS
FLOW CHART



Loading Instructions are:
36 00096 00300
49 00828

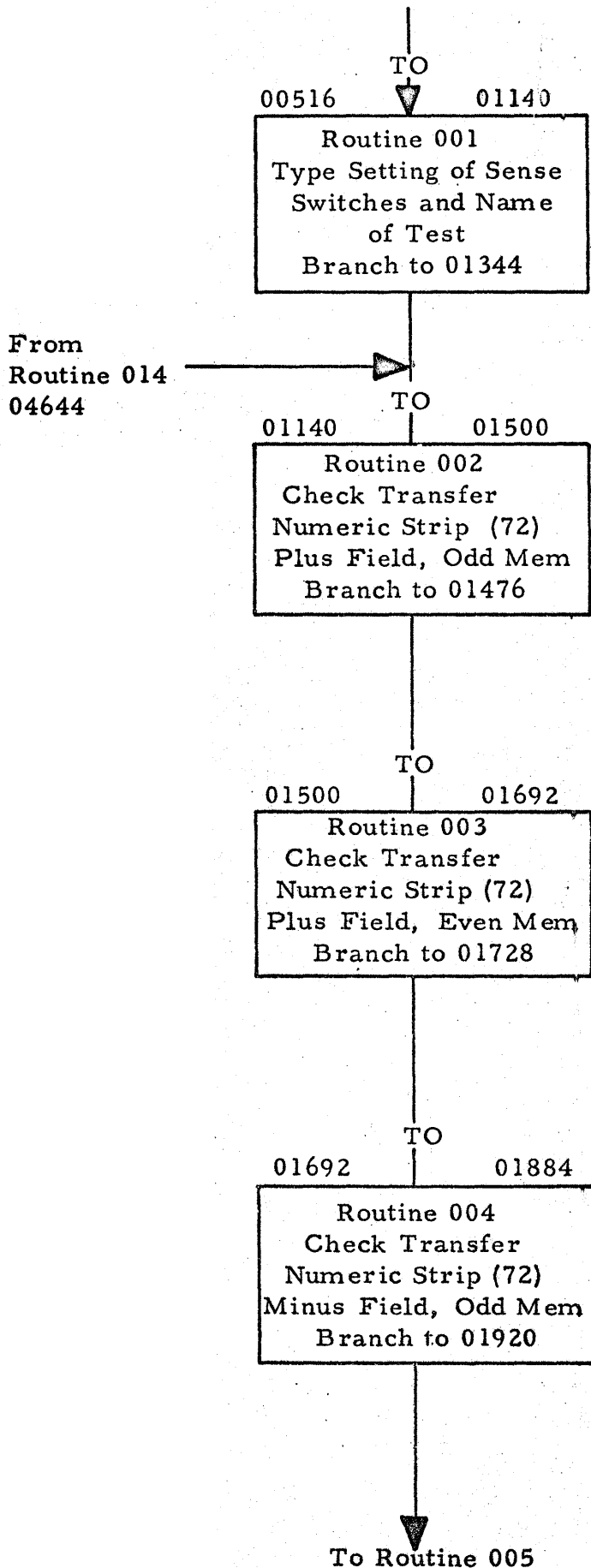
PN 2125637
EC 404618

CU05 FLOW CHART
WITH 1622 I/O



First and second Load Cards load the math tables and Program Load Card. (Cards 3 through 7 contain the math tables.)

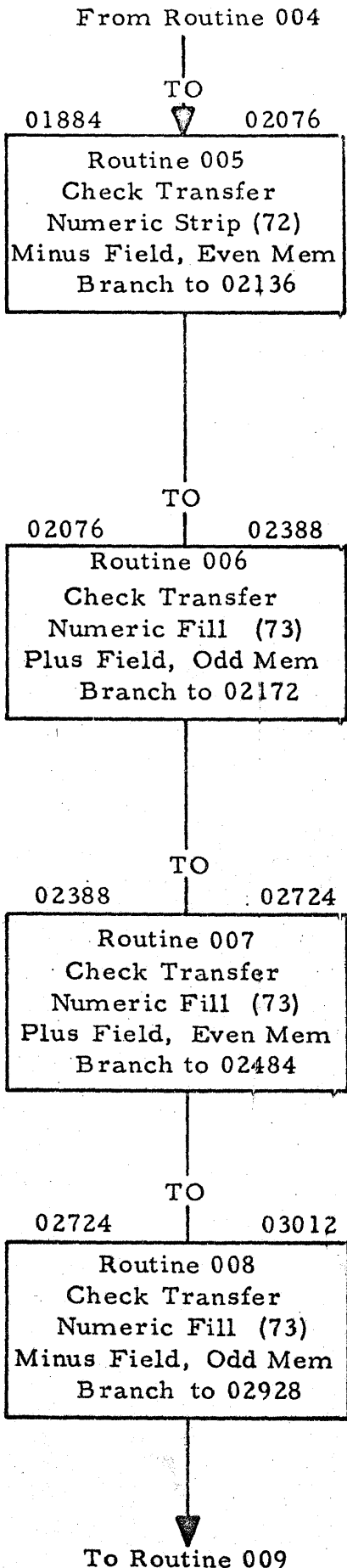
Eighth Load Card contains instructions for loading core storage.



<u>E Cycle Trigs.</u>	<u>Aux. Trigs.</u>
26 Regen Mem (OR-1)	T/C
Test for FM#1	
27 Mem→MDR (OR-1)	FM #1
26 MDR→Mem (OR-1)	First Cycle
FM#1→Set F	
27 Regen Mem	

<u>E Cycle Trigs.</u>	<u>Aux. Trigs.</u>
26 Regen Mem (OR-1)	T/C
Test FM#1	
27 Mem→MDR (OR-2)	FM #1
26 MDR→Mem (OR-1)	First Cycle
FM#1→Set F	
27 Regen Mem (OR-2)	

<u>E Cycle Trigs.</u>	<u>Aux. Trigs.</u>
26 Regen Mem (OR-1)	T/C
Test FM#1	
27 Mem→MDR (OR-2)	FM#1, #2
If EV and 5, set FM#2	
26 MDR→Mem (OR-1)	First Cycle
FM#1 or FM#2→Set F	
27 Regen Mem (OR-2)	

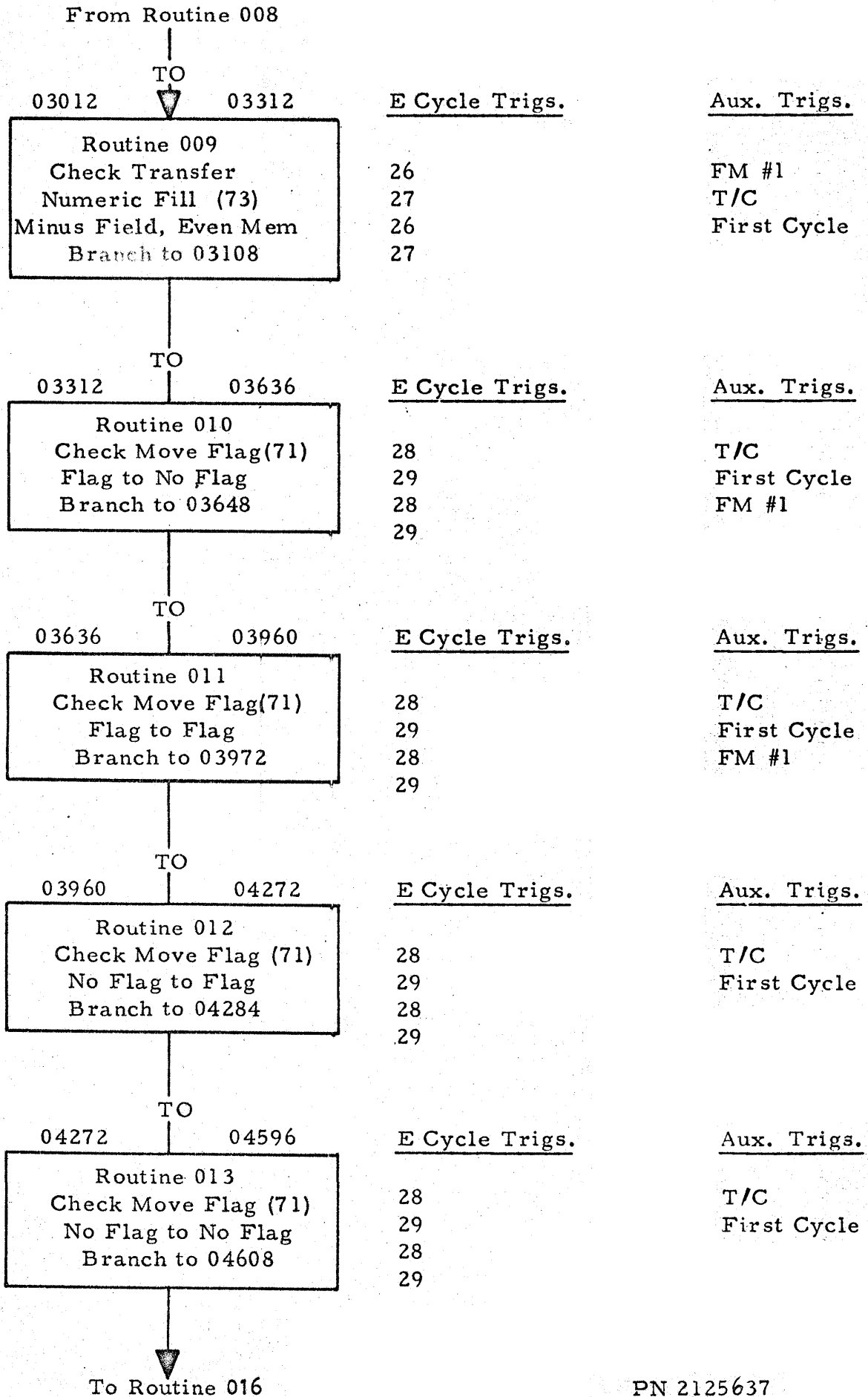


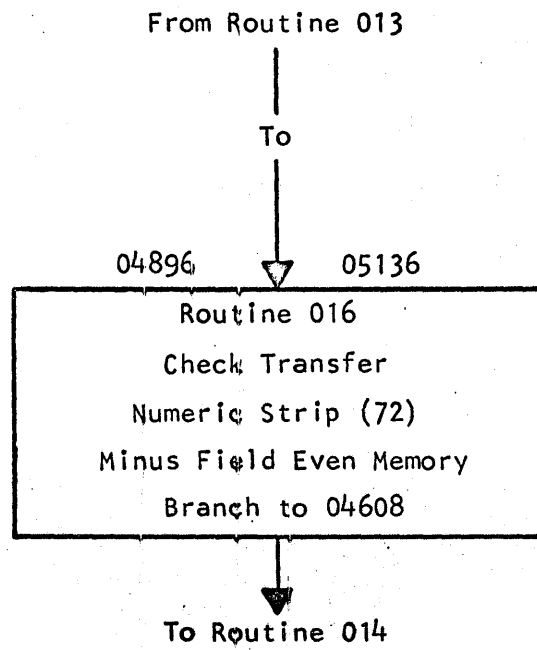
<u>E Cycle Trigs.</u>	<u>Aux. Trigs.</u>
26 Regen Mem (OR-1) Test FM#1	T/C
27 Mem → MDR (OR-2) If EV and 5, set FM#2	FM #1, #2
26 MDR → Mem (OR-1) FM#1 or FM#2 → Set F	First Cycle
27 Regen Mem (OR-2)	

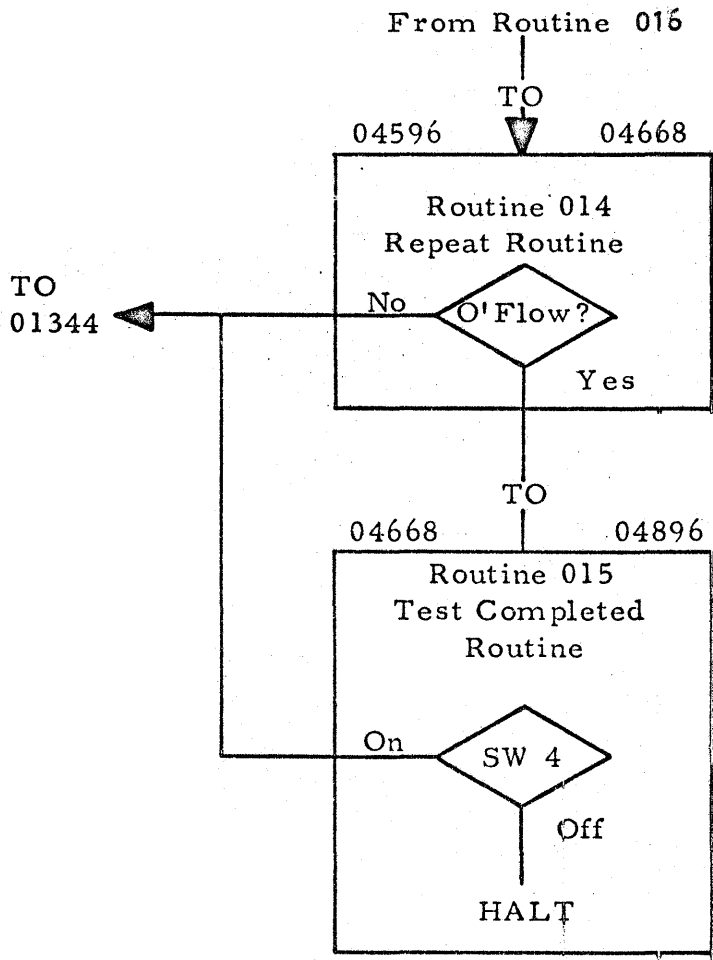
<u>E Cycle Trigs.</u>	<u>Aux. Trigs.</u>
26	FM #1
27	T/C
26	First Cycle
27	

<u>E Cycle Trigs.</u>	<u>Aux. Trigs.</u>
26	FM #1
27	T/C
26	First Cycle
27	

<u>E Cycle Trigs.</u>	<u>Aux. Trigs.</u>
26	FM #1
27	T/C
26	First Cycle
27	







1620 DIAGNOSTICS
CU05
SPECIAL INSTRUCTIONS

Mem	00	PPPPP	QQQQQ	OP	DESCRIPTION
Loc	01	23456	78901	TYP	
00096		0000	00000	MT	MULTIPLY TABLE
00108	00	00102	03040	MT	MULTIPLY TABLE
00120	00	20406	08000	MT	MULTIPLY TABLE
00132	30	60902	10040	MT	MULTIPLY TABLE
00144	80	21610	05001	MT	MULTIPLY TABLE
00156	51	02006	02181	MT	MULTIPLY TABLE
00168	42	00704	11282	MT	MULTIPLY TABLE
00180	00	80614	22300	MT	MULTIPLY TABLE
00192	90	81726	30000	MT	MULTIPLY TABLE
00204	00	00005	06070	MT	MULTIPLY TABLE
00216	80	90012	14161	MT	MULTIPLY TABLE
00228	81	51811	24272	MT	MULTIPLY TABLE
00240	02	42822	36352	MT	MULTIPLY TABLE
00252	03	53045	40363	MT	MULTIPLY TABLE
00264	24	84455	32494	MT	MULTIPLY TABLE
00276	65	36048	46546	MT	MULTIPLY TABLE
00288	27	54453	62718	MT	MULTIPLY TABLE
00300	01	23456	78912	AT	ADD TABLE
00312	34	56789	02345	AT	ADD TABLE
00324	67	89013	45678	AT	ADD TABLE
00336	90	12456	78901	AT	ADD TABLE
00348	23	56789	01234	AT	ADD TABLE
00360	67	89012	34578	AT	ADD TABLE
00372	90	12345	68901	AT	ADD TABLE
00384	23	45679	01234	AT	ADD TABLE
00396	56	78#		AT	ADD TABLE
00408				X	
00420				X	
00432				X	
00444				X	
00456				X	
00468				X	
00480			62	X	
00492	63	41596	3 59	X	
00504	56	64634	95545	X	

ROUTINE 001
CHECK SENSE SWITCH SETTINGS

00516	62	03 4	56356	X	ETO
00528	62	465	65353	X	S FOLL
00540	56	6603	0#62	X	OW. #S
00552	66	71	5655	X	W 1 ON
00564		0#626	6 71	X	# SW 1
00576		56464	6 0#	X	OFF #
00588	62	66 7	2 56	X	SW 2 0
00600	55	0#6	266	X	N #SW
00612	72	564	646	X	2 OFF
00624	0#	6266	73	X	#SW 3
00636	56	55 0	#6266	X	ON # SW
00648		73 5	64646	X	3 OFF
00660		0#626	6 74	X	#SW 4
00672		5655	0#62	X	ON # S
00684	66	74	5646	X	W 4 OF
00696	46	0#6	24563	X	F # SET
00708		62455	56245	X	SENSE
00720		62666	2 46	X	SWS F
00732	56	59 4	36470	X	OR CUO
00744	75	23 6	25745	X	5, SPE
00756	43	49415	3 49	X	CIAL I
00768	55	62636	2 63	X	NSTS T
00780	45	62630	3 63	X	EST. T
00792	48	4555	6263	X	HEN ST
00804	41	59630	3 0#	X	ART. #
00816				X	
00828	46	00852	00100	BI	CHECK FOR SW 1 ON
00840	47	00876	00100	BNI	CHECK FOR SW 1 OFF
00852	39	00551	00100	WA	TYPE SW 1 ON
00864	49	00888		B	
00876	39	00569	00100	WA	TYPE SW 1 OFF
00888	46	00912	00200	BI	CHECK FOR SW 2 ON
00900	47	00936	00200	BNI	CHECK FOR SW 2 OFF
00912	39	00589	00100	WA	TYPE SW 2 ON
00924	49	00948		B	
00936	39	00607	00100	WA	TYPE SW 2 OFF
00948	46	00972	00300	BI	CHECK FOR SW 3 ON
00960	47	00996	00300	BNI	CHECK FOR SW 3 OFF
00972	39	00627	00100	WA	TYPE SW 3 ON
00984	49	01008		B	
00996	39	00645	00100	WA	TYPE SW 3 OFF
01008	46	01032	00400	BI	CHECK FOR SW 4 ON
01020	47	01056	00400	BNI	CHECK FOR SW 4 OFF
01032	39	00665	00100	WA	TYPE SW 4 ON
01044	49	01068		B	

01056	39	00683	00100	WA	TYPE SW 4 OFF
01068	39	00703	00100	WA	TYPE SET SWS, NAME OF TEST, THEN START
01080	48			H	HALT
01092	34		00102	K	
01104	39	00491	00100	WA	TYPE START ROUTINES. ETOS FOLLOW
01116	37	01141	00300	RA	READ ALPHA *FOR CARD 1/0 = 5
01128	49	01344		B	

ROUTINE 002
CHECK TRANSFER NUMERIC STRIP
10 DIGITS + TO ODD MEM.

01140				X	READ CARD AREA
01152				X	READ CARD AREA
01164				X	READ CARD AREA
01176				X	READ CARD AREA
01188				X	READ CARD AREA
01200				X	READ CARD AREA
01212				X	READ CARD AREA
01224				X	READ CARD AREA
01236				X	READ CARD AREA
01248				X	READ CARD AREA
01260				X	READ CARD AREA
01272				X	READ CARD AREA
01284				X	READ CARD AREA
01296				X	READ CARD AREA
01308				K	WORKING AREA
01320		0		X	WORKING AREA
01332	#	12345	67890	X	COMPARE DATA
01344	72	01159	01331	TNS	TRANSFER NUMERIC STRIP + FIELD
01356	24	01331	01343	C	CHECK FOR CORRECT RESULTS
01368	47	01416	01200	BNI	CHECK FOR E/Z
01380	49	01476		B	
01392				X	
01404				X	
ERROR ROUTINE					
01416	46	01452	00100	BI	CHECK SW 1
01428	39	01465	00100	WA	TYPE ROUTINE NO.
01440	38	01322	00100	WN	TYPE TNS FIELD
01452	47	01476	00300	BNI	CHECK SW 3
01464	48	70707	2 0#	H	HALT
01476	46	01344	00200	BI	CHECK SW 2
01488	49	01536		B	

ROUTINE 003
 CHECK TRANSFER NUMERIC STRIP
 10 DIGITS + TO EVEN MEMORY

01500				X	WORKING AREA
01512	0		#	X	WORKING AREA
01524		98765	40321	X	COMPARE DATA
01536	72	01179	01522	TNS	TRANSFER NUMERIC STRIP + FIELD
01548	24	01522	01535	C	CHECK FOR CORRECT RESULTS
01560	47	01608	01200	BNI	
01572	49	01668		B	
01584				X	
01596				X	

					ERROR ROUTINE
01608	46	01644	00100	BI	CHECK SW 1
01620	39	01657	00100	WA	TYPE ROUTINE NO.
01632	38	01513	00100	WN	TYPE TNS FIELD
01644	47	01668	00300	BNI	CHECK SW 3
01656	48	70707	3 0#	H	HALT
01668	46	01536	00200	BI	CHECK SW 2
01680	49	01728		B	

ROUTINE 004
 CHECK TRANSFER NUMERIC STRIP
 10 DIGITS - TO ODD MEMORY

01692				X	WORKING AREA
01704		0		X	WORKING AREA
01716	#	54321	06789	X	COMPARE DATA
01728	72	01199	01715	TNS	TRANSFER NUMERIC STRIP - FIELD
01740	24	01715	01727	C	CHECK FOR CORRECT RESULTS
01752	47	01800	01200	BNI	CHECK FOR E/Z
01764	49	01860		B	
01776				X	
01788				X	

					ERROR ROUTINE
01800	46	01836	00100	BI	CHECK SW 1
01812	39	01849	00100	WA	TYPE ROUTINE NO.
01824	38	01706	00100	WN	TYPE TNS FIELD
01836	47	01860	00300	BNI	CHECK SW 3
01848	48	70707	4 0#	H	HALT
01860	46	01728	00200	BI	CHECK SW 2
01872	49	01920		B	

ROUTINE 005
CHECK TRANSFER NUMERIC STRIP
10 DIGITS - TO EVEN MEMORY

01884				X	WORKING AREA
01896	0		#	X	WORKING AREA
01908		67890	12340	X	COMPARE DATA
01920	72	01219	01906	TNS	TRANSFER NUMERIC STRIP - FIELD
01932	24	01906	01919	C	CHECK FOR CORRECT RESULTS
01944	47	01992	01200	BNI	CHECK FOR E/Z
01956	49	02052		B	
01968				X	
01980				X	
					ERROR ROUTINE
01992	46	02028	00100	BI	CHECK SW 1
02004	39	02041	00100	WA	TYPE ROUTINE NO.
02016	38	01897	00100	WN	TYPE TNS FIELD
02028	47	02052	00300	BNI	CHECK SW 3
02040	48	70707	5 0#	H	HALT
02052	46	01920	00200	BI	CHECK SW 2
02064	49	02136		B	

ROUTINE 006
CHECK TRANSFER NUMERIC FILL
10 DIGITS + FROM ODD MEMORY

02076		0		X	WORKING AREA
02088				X	WORKING AREA
02100	#	12345	09876	X	NUMERIC FIELD
02112		0717	27374	X	COMPARE DATA
02124	75	70797	87776	X	COMPARE DATA
02136	73	02099	02111	TNF	TRANSFER NUMERIC FILL + FIELD
02148	44	02172	02080	BNF	CHECK FOR NO FLAG
02160	49	02340		B	BRANCH TO ERROR ROUTINE
02172	24	02099	02135	C	CHECK FOR CORRECT RESULTS
02184	47	02208	01200	BNI	CHECK FOR E/Z
02196	49	02268		B	
					ERROR ROUTINE
02208	46	02244	00100	BI	CHECK SW 1
02220	39	02257	00100	WA	TYPE ROUTINE NO.
02232	38	02080	00100	WN	TYPE TNF FIELD
02244	47	02268	00300	BNI	CHECK SW 3
02256	48	70707	6 0#	H	HALT
02268	46	02136	00200	BI	CHECK SW 2
02280	49	02448		B	

02292	49	55624	55963	X	I N S E R T
02304	45	44 4	65341	X	E D F L A
02316	47	57	4649	X	G P F I
02328	45	53440	3 0#	X	E L D . #
02340	46	02376	00100	BI	C H E C K S W 1
02352	39	02257	00100	WA	T Y P E R O U T I N E N O .
02364	39	02293	00100	WA	T Y P E R E M O V E D F L A G P F I E L D
02376	49	02172		B	B R A N C H T O C O M P A R E O F R E S U L T S

ROUTINE 007
CHECK TRANSFER NUMERIC FILL
10 DIGITS + FROM EVEN MEMORY

02388		0		X	W O R K I N G A R E A
02400				X	W O R K I N G A R E A
02412	#6	78901	2345	X	N U M E R I C F I E L D
02424		0767	77879	X	C O M P A R E D A T A
02436	70	71727	37475	X	C O M P A R E D A T A
02448	73	02411	02422	TNF	T R A N S F E R N U M E R I C F I L L + F I E L D
02460	44	02484	02392	BNF	C H E C K F O R N O F L A G
02472	49	02676		B	B R A N C H T O E R R O R R O U T I N E
02484	24	02411	02447	C	C H E C K F O R C O R R E C T R E S U L T S
02496	47	02544	01200	BNI	C H E C K F O R E / Z
02508	49	02604		B	
02520				X	
02532				X	

02544	46	02580	00100	BI	E R R O R R O U T I N E
02556	39	02593	00100	WA	C H E C K S W 1
02568	38	02391	00100	WN	T Y P E R O U T I N E N O .
02580	47	02604	00300	BNI	T Y P E T N F F I E L D
02592	48	70707	7 0#	H	C H E C K S W 3
02604	46	02448	00200	BI	H A L T
02616	49	02784		B	C H E C K S W 2
02628	49	55624	55963	X	
02640	45	44 4	65341	X	I N S E R T
02652	47	57	4649	X	E D F L A
02664	45	53440	3 0#	X	G P F I
02676	46	02712	00100	X	E L D . #
02688	39	02593	00100	BI	C H E C K S W 1
02700	39	02629	00100	WA	C H E C K S W 1
02712	49	02484		WA	T Y P E R O U T I N E N O .
				B	T Y P E I N S E R T E D F L A G P F I E L D
					B R A N C H T O C O M P A R E O F R E S U L T

ROUTINE 008
CHECK TRANSFER NUMERIC FILL
10 DIGITS - FROM ODD MEMORY

02724		0		X	WORKING AREA
02736				X	WORKING AREA
02748	#	98765	01234	X	NUMERIC FIELD
02760		0797	87776	X	COMPARE DATA
02772	75	70717	27354	X	COMPARE DATA
02784	73	02747	02759	TNF	TRANSFER NUMERIC FILL - FIELD
02796	44	02820	02728	BNF	CHECK FOR NO FLAG
02808	49	02964		B	BRANCH TO ERROR ROUTINE
02820	24	02747	02783	C	CHECK FOR CORRECT RESULTS
02832	47	02868	01200	BNI	CHECK FOR E/Z
02844	49	02928		B	
02856				X	
					ERROR ROUTINE
02868	46	02904	00100	BI	CHECK FOR SW 1
02880	39	02917	00100	WA	TYPE ROUTINE NO.
02892	38	02728	00100	WN	TYPE TNF FIELD
02904	47	02928	00300	BNI	CHECK SW 3
02916	48	70707	8 0#	H	HALT
02928	46	02784	00200	BI	CHECK SW 2
02940	49	03072		B	
02952				X	
02964	46	03000	00100	BI	CHECK SW 1
02976	39	02917	00100	WA	TYPE ROUTINE NO.
02988	39	02293	00100	WA	TYPE INSERTED FLAG P FIELD
03000	49	02820		B	BRANCH TO COMPARE RESULT.

ROUTINE 009
CHECK TRANSFER NUMERIC FILL
10 DIGITS - FROM EVEN MEMORY

03012		0		X	WORKING AREA
03024				X	WORKING AREA
03036	#1	06273	8490	X	NUMERIC FIELD
03048		0717	07672	X	COMPARE DATA
03060	77	73787	47950	X	COMPARE DATA
03072	73	03035	03046	TNF	TRANSFER NUMERIC FILL - FIELD
03084	44	03108	03016	BNF	CHECK FOR NO FLAG
03096	49	03264		B	BRANCH TO ERROR ROUTINE
03108	24	03035	03071	C	CHECK FOR CORRECT RESULTS
03120	47	03168	01200	BNI	CHECK FOR E/Z
03132	49	03228		B	
03144				X	
03156				X	

					ERROR ROUTINE
03168	46	03204	00100	BI	CHECK SW 1
03180	39	03217	00100	WA	TYPE ROUTINE NO.
03192	38	03015	00100	WN	TYPE TNF FIELD
03204	47	03228	00300	BNI	CHECK SW 3
03216	48	70707	9 0#	H	HALT
03228	46	03072	00200	BI	CHECK SW 2
03240	49	03324		B	
03252				X	
03264	47	03300	00100	BI	CHECK SW 1
03276	39	03217	00100	WA	TYPE ROUTINE NO.
03288	39	02629	00100	WA	TYPE INSERTED FLAG P FIELD
03300	49	03108		B	BRANCH TO COMPARE OF RESULT

ROUTINE 010
CHECK MOVE FLAG - FLAG TO NO FLAG

03312		76	# 44#	X	WORKING AREA
03324	15	03318	6	TDM	RESTORE P WORKING AREA TO ORIGINAL CONDITION
03336	15	03322	4	TDM	RESTORE Q WORKING AREA TO ORIGINAL CONDITION
03348	71	03318	03322	MF	MOVE FLAG
03360	14	03318	76	CM	CHECK FLAG MOVED TO P FIELD
03372	47	03444	01200	BNI	CHECK FOR E/Z
03384	14	03322	44	CM	CHECK FLAG REMOVED FROM Q FIELD
03396	47	03528	01200	BNI	CHECK FOR E/Z
03408	49	03588		B	
03420				X	
03432				X	

					ERROR ROUTINE
03444	46	03480	00100	BI	CHECK SW 1
03456	39	03493	00100	WA	TYPE ROUTINE NO.
03468	38	03317	00100	WN	TYPE P FIELD
03480	47	03504	00300	BNI	CHECK SW 3
03492	48	70717	0570#	H	HALT
03504	46	03324	00200	BI	CHECK SW 2
03516	49	03384		B	BRANCH TO Q FLAG CHECK
03528	46	03564	00100	BI	CHECK SW 1
03540	39	03577	00100	WA	TYPE ROUTINE NO.
03552	38	03321	00100	WN	TYPE Q FIELD
03564	47	03588	00300	BNI	CHECK SW 3
03576	48	70717	0580#	H	
03588	46	03324	00200	BI	CHECK SW 2
03600	49	03648		B	
03612				X	
03624				X	

ROUTINE 011
MOVE FLAG - FLAG TO FLAG

03636		75	# 11#	X	WORKING AREA
03648	15	03642	5	TDM	RESTORE P WORKING AREA TO ORIGINAL CONDITION
03660	15	03646	1	TDM	RESTORE Q WORKING AREA TO ORIGINAL CONDITION
03672	71	03642	03646	MF	MOVE FLAG
03684	14	03642	75	CM	CHECK FLAG REMAINED IN P FIELD
03696	47	03768	01200	BNI	CHECK FOR E/Z
03708	14	03646	11	CM	CHECK FLAG REMOVED FROM Q FIELD
03720	47	03852	01200	BNI	CHECK FOR E/Z
03732	49	03912		B	
03744				X	
03756				X	
ERROR ROUTINE					
03768	46	03804	00100	BI	CHECK SW 1
03780	39	03817	00100	WA	TYPE ROUTINE NO.
03792	38	03641	00100	WN	TYPE P FIELD
03804	47	03828	00300	BNI	CHECK SW 3
03816	48	70717	1570#	H	HALT
03828	46	03648	00200	BI	CHECK SW 2
03840	49	03708		B	BRANCH TO Q FLAG CHECK
03852	46	03888	00100	BI	CHECK SW 1
03864	39	03901	00100	WA	TYPE ROUTINE NO.
03876	38	03645	00100	WN	TYPE Q FIELD
03888	47	03912	00300	BNI	CHECK SW 3
03900	48	70717	1580#	H	HALT
03912	46	03648	00200	BI	CHECK SW 2
03924	49	03972		B	
03936				X	
03948				X	

ROUTINE 012
MOVE FLAG - NO FLAG TO FLAG

03960		79	# 33#	X	WORKING AREA
03972	15	03966	9	TDM	RESTORE P WORKING AREA TO ORIGINAL CONDITION
03984	15	03970	3	TDM	RESTORE Q WORKING AREA TO ORIGINAL CONDITION
03996	71	03966	03970	MF	MOVE FLAG
04008	14	03966	79	CM	CHECK FLAG REMOVED FROM P FIELD
04020	47	04080	01200	BNI	CHECK FOR E/Z
04032	14	03970	33	CM	CHECK Q FIELD REMAINED THE SAME
04044	47	04164	01200	BNI	CHECK FOR E/Z
04056	49	04224		B	
04068				X	

04080	46	04116	00100	BI	ERROR ROUTINE
04092	39	04129	00100	WA	CHECK SW 1
04104	38	03965	00100	WN	TYPE ROUTINE NO.
04116	47	04140	00300	BNI	TYPE P FIELD
04128	48	70717	2570#	H	CHECK SW 3
04140	46	03972	00200	BI	HALT
04152	49	04032		B	CHECK SW 2
04164	46	04200	00100	BI	BRANCH TO Q FLAG CHECK
04176	39	04213	00100	WA	CHECK SW 1
04188	38	03969	00100	WN	TYPE ROUTINE NO.
04200	47	04224	00300	BNI	TYPE Q FIELD
04212	48	70717	2580#	H	CHECK SW 3
04224	46	03972	00200	BI	HALT
04236	49	04284		B	CHECK SW 2
04248				X	
04260				X	

ROUTINE 013
MOVE FLAG - NO FLAG TO NO FLAG

04272		$\bar{7}8$	$\neq \bar{2}2\neq$	X	WORKING AREA
04284	15	04278	8	TDM	RESTORE P WORKING AREA TO ORIGINAL CONDITION
04296	15	04282	2	TDM	RESTORE Q WORKING AREA TO ORIGINAL CONDITION
04308	71	04278	04282	MF	MOVE FLAG - NO FLAG TO NO FLAG
04320	14	04278	$\bar{7}8$	CM	CHECK FOR NO FLAG IN P FIELD
04332	47	04404	01200	BNI	CHECK FOR E/Z
04344	14	04282	$\bar{2}2$	CM	CHECK FOR NO FLAG IN Q FIELD
04356	47	04488	01200	BNI	CHECK FOR E/Z
04368	49	04548		B	
04380					
04392					

04404	46	04440	00100	BI	ERROR ROUTINE
04416	39	04453	00100	WA	CHECK SW 1
04428	38	04277	00100	WN	TYPE ROUTINE NO.
04440	47	04464	00300	BNI	TYPE P FIELD
04452	48	70717	3570#	H	CHECK SW 3
04464	46	04284	00200	BI	HALT
04476	49	04344		B	CHECK SW 2
04488	46	04524	00100	BI	BRANCH TO Q FLAG CHECK
04500	39	04537	00100	WA	CHECK SW 1
04512	38	04281	00100	WN	TYPE ROUTINE NO.
04524	47	04548	00300	BNI	TYPE Q FIELD
04536	48	70717	3580#	H	CHECK SW 3
04548	46	04284	00200	BI	HALT
04560	49	04932		B	CHECK SW 2
04572				X	
04584				X	

ROUTINE 016

Check Transfer Numeric Strip
9 Digits to Even Memory

04896				X	WORKING AREA
04908		0	≠	X	WORKING AREA
04920		2345	67890	X	COMPARE DATA
04932	72	01237	04918	TNS	TRANSFER NUMERIC STRIP - FIELD
04944	24	04918	04931	C	COMPARE FOR CORRECT RESULTS
04956	47	05004	01200	BNI	BRANCH TO ERROR ROUTINE
04968	49	05064		B	
04980				X	
04992				X	

ERROR ROUTINE

05004	46	05040	00100	BI	CHECK SW1
05016	39	05053	00100	WA	TYPE ROUTINE NO.
05028	38	04910	00100	WN	TYPE COMPARE DATA
05040	47	05064	00300	BNI	CHECK SW 3
05052	48	70717	6 0≠	H	HALT
05064	46	04932	00200	BI	CHECK SW 2
05076	49	04608		B	
05088				X	
05100				X	
05112				X	
05124			E L	X	

ROUTINE 014
REPEAT ROUTINE

04596			000	X	WORKING AREA
04608	46	04620	01400	BI	TURN OFF OVERFLOW
04620	11	04607	01	AM	ADD ONE TO REPEAT CONSTANT
04632	47	01344	01400	BNI	CHECK FOR OVERFLOW
04644	34		00102	K	
04656	49	04836		B	

ROUTINE 015
TEST COMPLETED ROUTINE

04668	63	45626	3 43	X	T E S T C
04680	56	54575	34563	X	O M P L E T
04692	45	4403	4946	X	E D . I F
04704		6266	71	X	S W I
04716	56	4646	4155	X	O F F A N
04728	44	555	6 59	X	D N O R
04740	56	64634	95545	X	O U T I N E
04752		55566	2 63	X	N O S T
04764	68	57454	423	X	Y P E D ,
04776	63	45626	3 57	X	T E S T P
04788	45	59465	65954	X	E R F O R M
04800	45	44 5	75956	X	E D P R O
04812	57	45595	36803	X	P E R L Y .
04824		0#		X	#
04836	39	04669	00100	WA	T Y P E T E S T S C O M P L E T E D
04848	46	01344	00400	RI	C H E C K S W 4
04860					H A L T
04872					
04884				X	
10000	12	34567	89098	X	
10001	76	54032	INMLK	X	
10002	JO	OPQRO	12345	X	
10003	OP	Q-234	56789	X	
10004	+E +L				