

TEST

TEST 5 ROTATE&SHIFT
MD-11-DOE-A

EP-DOE-A-DL-A

NOV 1976

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FICHE 1 OF 1

MADE IN U.S.A.

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.REN %

11-DOBA
11-DOCA
11-DODA
11-DOEA
11-DOFA
11-DOGA
11-DOHA
11-DOIA
11-DOJA
11-DOKA
11-DOLA

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DOAA TO DOLA-D
PRODUCT NAME: FIRST LEVEL 1-12
DATE CREATED: 17 MARCH 1970
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: JOHN HITTELL

THIS GROUP OF TESTS CONSIST OF:

PROCESSOR TEST	MAINDEC
TEST 1 BRANCH	11-DOAA
2 CON BRANCH	11-DOBA
3 UNARY	11-DOCA
4 UNARY AND BINARYS	11-DODA
5 ROTATE/SHIFT	11-DOEA
6 COMPARE	11-DOFA
7 COMPARE NOT	11-DOGA
8 MOVE	11-DOHA
9 BIS, BIC AND BIT	11-DOIA
10 ADD	11-DOJA
11 SUBTRACT	11-DOKA
12 JMP	11-DOLA

1. ABSTRACT

THIS IS A GROUP OF 12 TESTS THAT INCREMENTALLY TEST AND ISOLATE SIMPLE MALFUNCTIONS OF THE PDP 11. THE TESTS SHOULD BE RUN IN THE INDICATED NUMERICAL SEQUENCE. THE SEQUENCE IS 1. BRANCH 2. CONDITIONAL BRANCH 3. UNARY 4. UNARY AND BINARYS 5. ROTATE/SHIFT 6. COMPARE (EQUALITY) 7. COMPARE (NON EQUALITY) 8. MOVE 9. BIT SET, CLEAR AND TEST 10. ADD 11. SUBTRACT 12. JUMP

THERE IS A SECOND GROUP OF TESTS FOR MORE COMPLEX MALFUNCTIONS.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11/20 STANDARD COMPUTER

2.2 STORAGE

2.2.1 PROGRAM STORAGE - THE PROGRAMS USE ALL OF A 4KW MEMORY WITH THE EXCEPTION OF 17500 TO 17776 (WHICH IS RESERVED FOR THE BOOT AND ABSOLUTE LOADER).

3. LOADING PROCEDURE

3.1 METHOD

PROCEDURE FOR NORMAL ABSOLUTE TAPES SHOULD BE FOLLOWED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTING

ALL PROGRAMS START AT ADDRESS 200.

4.2 STARTING ADDRESS OR ADDRESSES

(A) 200 = START AND RESTART ADDRESS

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY. (BOTTOM 4K)
SET SWITCH REGISTER TO STARTING ADDRESS. (200)
LOAD ADDRESS.
PRESS START.
THE PROGRAM WILL LOOP, AND RING A BELL AFTER A FIXED NUMBER OF ITERATIONS.

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5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

5.1.1 NO SWITCHES ARE USED

5.1.3

5.2 SUBROUTINE ABSTRACTS

5.2.1 BEGIN SA 200

5.2.2 SCOPE

IS A "NOP" THAT IS PLACED BETWEEN EACH SUBTEST
IN THE INSTRUCTION SECTION. IF A SCOPE LOOP IS NEEDED,
INSERT ; BRANCH TO THE PREVIOUS SCOPE LOCATION
AT THE CURRENT SCOPE LOCATION. (NOTE NOP=240)

5.2.3 HLT

INDICATES THE UNIQUE ADDRESS THAT TAGS THE
FAILING SUBTEST. THE INCORRECT DATA AT THE
TIME OF THE FAILURE MAY OR MAY NOT BE
DISPLAYED IN REGISTER ZERO, WHICH IS THE DATA
REGISTER ON A HALT.

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 LOADING AND STARTING AT 200 STARTS THE TEST. IF
AN ERROR IS DETECTED, THERE WILL BE A HALT.
WHEN A HALT OCCURS AND IT IS NECESSARY TO SCOPE ON
IT, PLACE INSERT A BRANCH INSTRUCTION IN THE
SCOPE LOCATION FOLLOWING THE HALT. THE BRANCH
INSTRUCTION SHOULD BRANCH YOU TO THE PREVIOUS
SCOPE LOCATION.

6. ERRORS

6.1 ALL ERRORS WILL CAUSE A HALT.

6.2 ERROR RECOVERY

ON TRAP ERRORS - RESTART AT 200.
DEPRESS CONTINUE TO CONTINUE TEST

7. RESTRICTIONS

7.1 STARTING RESTRICTION

NONE

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7.2 OPERATIONAL RESTRICTION

NONE

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8. MISCELLANEOUS

IF A HALT OCCURS IN THE TRAP OR INTERRUPT VECTOR AREA, REGISTER SIX SHOULD BE EXAMINED TO DETERMINE ITS CONTENTS, THEN USE REGISTER SIX CONTENTS AS AN ADDRESS TO DETERMINE THE LOCATION THE PROGRAM WAS AT, WHEN THE INTERRUPT OR TRAP OCCURRED. (MEMORY AS SPECIFIED BY R6 CONTAINS THE PC OF THE INSTRUCTION FOLLOWING THE INSTRUCTION WHERE THE TRAP OCCURED)

8.1 EXECUTION TIME

TIME BETWEEN BELLS

FOR TAPE 1	5	MINUTES
FOR TAPE 2	2.5	MINUTES
FOR TAPE 3	3	MINUTES
FOR TAPE 4	6	MINUTES
FOR TAPE 5	5	MINUTES
FOR TAPE 6	6	MINUTES
FOR TAPE 7	5	MINUTES
FOR TAPE 8	6	MINUTES
FOR TAPE 9	3	MINUTES
FOR TAPE 10	4	MINUTES
FOR TAPE 11	2	MINUTES
FOR TAPE 12	4	MINUTES

9. PROGRAM DESCRIPTION

- TEST 1 THIS IS A TEST OF THE UNCONDITIONAL BRANCH INSTRUCTION, IT PROVES THAT A LONG PROGRAM CAN BE LOADED AND THE INSTRUCTIONS CAN BE EXECUTED THROUGHOUT MEMORY.
- TEST 2 THIS IS A CONDITIONAL BRANCH TEST USING ALL OF THE CONDITIONAL BRANCH INSTRUCTIONS. IT TESTS THAT ALL COMBINATIONS OF CONDITION CODES ARE RESPONDED TO CORRECTLY. (THE CONDITION CODES ARE MANIPULATED WITH THE MICRO-PROGRAM OPERATIONS.)
- TEST 3 THIS IS A TEST OF THE UNARY INSTRUCTIONS AND THEIR EFFECTS UPON THE CONDITION CODES ONLY. MOSTLY REGISTER OPERATIONS.
- TEST 4 THIS IS A COMBINED USE OF UNARY AND BINARY INSTRUCTIONS TESTING THE RESULTS AND THE CONDITION CODES.
- TEST 5 THIS TEST ROTATE AND SHIFT INSTRUCTION, BOTH THE REGISTERS AND MEMORY LOCATIONS, WORD AND BYTE, ARE TESTED.
- TEST 6 THIS IS A TEST OF THE COMPARE INSTRUCTIONS FOR

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EQUALITY. ALL CONDITIONAL BRANCHES THAT WILL
BRANCH ON ANY FORM OF EQUALITY ARE ALSO TESTED.
BOTH WORD AND BYTE OPERATIONS ARE USED.

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TEST 7 COMPARE NOT. THIS IS A TEST OF THE COMPARE INSTRUCTIONS WHERE NO VALUES ARE EQUAL. HERE BRANCHES FOR NOT EQUAL, GREATER THAN AND LESS THAN, ETC., ARE TESTED.

TEST 8 CHECKS THE MOVE INSTRUCTION BOTH TO MEMORY AND REGISTERS.

TEST 9 CHECK THE BIS, BIC AND BIT INSTRUCTION BOTH TO MEMORY AND TO REGISTERS.

TEST 10 TESTS THE ADD INSTRUCTION.

TEST 11 TESTS THE SUBTRACT INSTRUCTION.

TEST 12 TEST OF THE JUMP INSTRUCTION IN MOST MODES.

NOTE THAT STACK OPERATION AND INSTRUCTIONS THAT USE THEM ARE NOT TESTED IN THIS GROUP OF TEST.

- 10. LISTING
- 11. FLOW CHART(S)

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;SET DATA TO ONES, CLEAR C AND ROTATE ON SHIFT

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304					
305		000000	N=0		
306	000200	000240	SCOPE		
307	000202	000257	CCC		: CLEAR C
308	000204	005000	CLR	%N	: CLEAR %N
309	000206	006000	ROR	%N	: SHIFT OR ROTATE
310	000210	001401	BEQ	.+4	: TEST FOR ZEROS
311	000212	000000	HLT		: %N NOT EQUAL TO ZERO
312	000214	103001	BCC	.+4	
313	000216	000000	HLT		; C NOT CLEARED
314	000220	102001	BVC	.+4	
315	000222	000000	HLT		; V NOT CLEARED
316	000224	000240	SCOPE		
317	000226	000257	CCC		: CLEAR C
318	000230	005000	CLR	%N	: CLEAR %N
319	000232	106000	RORB	%N	: SHIFT OR ROTATE
320	000234	001401	BEQ	.+4	: TEST FOR ZEROS
321	000236	000000	HLT		: %N NOT EQUAL TO ZERO
322	000240	103001	BCC	.+4	
323	000242	000000	HLT		; C NOT CLEARED
324	000244	102001	BVC	.+4	
325	000246	000000	HLT		; V NOT CLEARED
326	000250	000240	SCOPE		
327	000252	000257	CCC		: CLEAR C
328	000254	005000	CLR	%N	: CLEAR %N
329	000256	006100	ROL	%N	: SHIFT OR ROTATE
330	000260	001401	BEQ	.+4	: TEST FOR ZEROS
331	000262	000000	HLT		: %N NOT EQUAL TO ZERO
332	000264	103001	BCC	.+4	
333	000266	000000	HLT		; C NOT CLEARED
334	000270	102001	BVC	.+4	
335	000272	000000	HLT		; V NOT CLEARED
336	000274	000240	SCOPE		
337	000276	000257	CCC		: CLEAR C
338	000300	005000	CLR	%N	: CLEAR %N
339	000302	106100	ROLB	%N	: SHIFT OR ROTATE
340	000304	001401	BEQ	.+4	: TEST FOR ZEROS
341	000306	000000	HLT		: %N NOT EQUAL TO ZERO
342	000310	103001	BCC	.+4	
343	000312	000000	HLT		; C NOT CLEARED
344	000314	102001	BVC	.+4	
345	000316	000000	HLT		; V NOT CLEARED
346	000320	000240	SCOPE		
347	000322	000257	CCC		: CLEAR C
348	000324	005000	CLR	%N	: CLEAR %N
349	000326	006200	ASR	%N	: SHIFT OR ROTATE
350	000330	001401	BEQ	.+4	: TEST FOR ZEROS
351	000332	000000	HLT		: %N NOT EQUAL TO ZERO
352	000334	103001	BCC	.+4	
353	000336	000000	HLT		; C NOT CLEARED
354	000340	102001	BVC	.+4	
355	000342	000000	HLT		; V NOT CLEARED
356	000344	000240	SCOPE		
357	000346	000257	CCC		: CLEAR C
358	000350	005000	CLR	%N	: CLEAR %N
359	000352	106200	ASRB	%N	: SHIFT OR ROTATE

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360	000354	001401	BEQ	.+4	;TEST FOR ZEROS
361	000356	000000	HLT		;%N NOT EQUAL TO ZERO
362	000360	103001	BCC	.+4	
363	000362	000000	HLT		;C NOT CLEARED
364	000364	102001	BVC	.+4	
365	000366	000000	HLT		;V NOT CLEARED
366	000370	000240	SCOPE		
367	000372	005000	CLR	%N	;CLEAR %N
368	000374	005100	COM	%N	;SET %N TO ALL ONES, SET "C"
369	000376	006000	ROR	%N	;SHIFT OR ROTATE
370	000400	005100	COM	%N	;ONES TO ZERO
371	000402	001401	BEQ	.+4	;TEST FOR ZERO
372	000404	000000	HLT		;%N NOT EQUAL TO ZERO
373	000406	000240	SCOPE		
374	000410	005000	CLR	%N	;DATA=000000
375	000412	005100	COM	%N	;DATA=177777, SET C
376	000414	006000	ROR	%N	
377	000416	102001	BVC	.+4	
378	000420	000000	HLT		;V SHOULD NOT BE SET
379	000422	000240	SCOPE		
380	000424	000240	SCOPE		
381	000426	005000	CLR	%N	;CLEAR %N
382	000430	005100	COM	%N	;SET %N TO ALL ONES, SET "C"
383	000432	106000	RORB	%N	;SHIFT OR ROTATE
384	000434	005100	COM	%N	;ONES TO ZERO
385	000436	001401	BEQ	.+4	;TEST FOR ZERO
386	000440	000000	HLT		;%N NOT EQUAL TO ZERO
387	000442	000240	SCOPE		
388	000444	005000	CLR	%N	;DATA=000000
389	000446	005100	COM	%N	;DATA=177777, SET C
390	000450	106000	RORB	%N	
391	000452	102001	BVC	.+4	
392	000454	000000	HLT		;V SHOULD NOT BE SET
393	000456	000240	SCOPE		
394	000460	000240	SCOPE		
395	000462	005000	CLR	%N	;CLEAR %N
396	000464	005100	COM	%N	;SET %N TO ALL ONES, SET "C"
397	000466	006100	ROL	%N	;SHIFT OR ROTATE
398	000470	005100	COM	%N	;ONES TO ZERO
399	000472	001401	BEQ	.+4	;TEST FOR ZERO
400	000474	000000	HLT		;%N NOT EQUAL TO ZERO
401	000476	000240	SCOPE		
402	000500	005000	CLR	%N	;DATA=000000
403	000502	005100	COM	%N	;DATA=177777, SET C
404	000504	006100	ROL	%N	
405	000506	102001	BVC	.+4	
406	000510	000000	HLT		;V SHOULD NOT BE SET
407	000512	000240	SCOPE		
408	000514	000240	SCOPE		
409	000516	005000	CLR	%N	;CLEAR %N
410	000520	005100	COM	%N	;SET %N TO ALL ONES, SET "C"
411	000522	106100	ROLB	%N	;SHIFT OR ROTATE
412	000524	005100	COM	%N	;ONES TO ZERO
413	000526	001401	BEQ	.+4	;TEST FOR ZERO
414	000530	000000	HLT		;%N NOT EQUAL TO ZERO
415	000532	000240	SCOPE		

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416	000534	005000	CLR	%N	;DATA=000000
417	000536	005100	COM	%N	;DATA=177777, SET C
418	000540	106100	ROLB	%N	
419	000542	102001	BVC	.+4	
420	000544	000000	HLT		;V SHOULD NOT BE SET
421	000546	000240	SCOPE		
422	000550	000240	SCOPE		
423	000552	005000	CLR	%N	;CLEAR %N
424	000554	005100	COM	%N	;SET %N TO ALL ONES, SET "C"
425	000556	006200	ASR	%N	;SHIFT OR ROTATE
426	000560	005100	COM	%N	;ONES TO ZERO
427	000562	001401	BEQ	.+4	;TEST FOR ZERO
428	000564	000000	HLT		;%N NOT EQUAL TO ZERO
429	000566	000240	SCOPE		
430	000570	005000	CLR	%N	;DATA=000000
431	000572	005100	COM	%N	;DATA=177777, SET C
432	000574	006200	ASR	%N	
433	000576	102001	BVC	.+4	
434	000600	000000	HLT		;V SHOULD NOT BE SET
435	000602	000240	SCOPE		
436	000604	000240	SCOPE		
437	000606	005000	CLR	%N	;CLEAR %N
438	000610	005100	COM	%N	;SET %N TO ALL ONES, SET "C"
439	000612	106200	ASRB	%N	;SHIFT OR ROTATE
440	000614	005100	COM	%N	;ONES TO ZERO
441	000616	001401	BEQ	.+4	;TEST FOR ZERO
442	000620	000000	HLT		;%N NOT EQUAL TO ZERO
443	000622	000240	SCOPE		
444	000624	005000	CLR	%N	;DATA=000000
445	000626	005100	COM	%N	;DATA=177777, SET C
446	000630	106200	ASRB	%N	
447	000632	102001	BVC	.+4	
448	000634	000000	HLT		;V SHOULD NOT BE SET
449	000636	000240	SCOPE		
450		000001	N=N+1		;TEST N
451	000640	000240	SCOPE		
452	000642	000257	CCC		;CLEAR C
453	000644	005001	CLR	%N	;CLEAR %N
454	000646	006001	ROR	%N	;SHIFT OR ROTATE
455	000650	001401	BEQ	.+4	;TEST FOR ZEROS
456	000652	000000	HLT		;%N NOT EQUAL TO ZERO
457	000654	103001	BCC	.+4	
458	000656	000000	HLT		;C NOT CLEARED
459	000660	102001	BVC	.+4	
460	000662	000000	HLT		;V NOT CLEARED
461	000664	000240	SCOPE		
462	000666	000257	CCC		;CLEAR C
463	000670	005001	CLR	%N	;CLEAR %N
464	000672	106001	RORB	%N	;SHIFT OR ROTATE
465	000674	001401	BEQ	.+4	;TEST FOR ZEROS
466	000676	000000	HLT		;%N NOT EQUAL TO ZERO
467	000700	103001	BCC	.+4	
468	000702	000000	HLT		;C NOT CLEARED
469	000704	102001	BVC	.+4	
470	000706	000000	HLT		;V NOT CLEARED
471	000710	000240	SCOPE		

472	000712	000257	CCC		; CLEAR C
473	000714	005001	CLR	%N	; CLEAR %N
474	000716	006101	ROL	%N	; SHIFT OR ROTATE
475	000720	001401	BEQ	.+4	; TEST FOR ZEROS
476	000722	000000	HLT		; %N NOT EQUAL TO ZERO
477	000724	103001	BCC	.+4	
478	000726	000000	HLT		; C NOT CLEARED
479	000730	102001	BVC	.+4	
480	000732	000000	HLT		; V NOT CLEARED
481	000734	000240	SCOPE		
482	000736	000257	CCC		; CLEAR C
483	000740	005001	CLR	%N	; CLEAR %N
484	000742	106101	ROLB	%N	; SHIFT OR ROTATE
485	000744	001401	BEQ	.+4	; TEST FOR ZEROS
486	000746	000000	HLT		; %N NOT EQUAL TO ZERO
487	000750	103001	BCC	.+4	
488	000752	000000	HLT		; C NOT CLEARED
489	000754	102001	BVC	.+4	
490	000756	000000	HLT		; V NOT CLEARED
491	000760	000240	SCOPE		
492	000762	000257	CCC		; CLEAR C
493	000764	005001	CLR	%N	; CLEAR %N
494	000766	006201	ASR	%N	; SHIFT OR ROTATE
495	000770	001401	BEQ	.+4	; TEST FOR ZEROS
496	000772	000000	HLT		; %N NOT EQUAL TO ZERO
497	000774	103001	BCC	.+4	
498	000776	000000	HLT		; C NOT CLEARED
499	001000	102001	BVC	.+4	
500	001002	000000	HLT		; V NOT CLEARED
501	001004	000240	SCOPE		
502	001006	000257	CCC		; CLEAR C
503	001010	005001	CLR	%N	; CLEAR %N
504	001012	106201	ASRB	%N	; SHIFT OR ROTATE
505	001014	001401	BEQ	.+4	; TEST FOR ZEROS
506	001016	000000	HLT		; %N NOT EQUAL TO ZERO
507	001020	103001	BCC	.+4	
508	001022	000000	HLT		; C NOT CLEARED
509	001024	102001	BVC	.+4	
510	001026	000000	HLT		; V NOT CLEARED
511	001030	000240	SCOPE		
512	001032	005001	CLR	%N	; CLEAR %N
513	001034	005101	COM	%N	; SET %N TO ALL ONES, SET "C"
514	001036	006001	ROR	%N	; SHIFT OR ROTATE
515	001040	005101	COM	%N	; ONES TO ZERO
516	001042	001401	BEQ	.+4	; TEST FOR ZERO
517	001044	000000	HLT		; %N NOT EQUAL TO ZERO
518	001046	000240	SCOPE		
519	001050	005001	CLR	%N	; DATA=000000
520	001052	005101	COM	%N	; DATA=177777, SET C
521	001054	006001	ROR	%N	
522	001056	102001	BVC	.+4	
523	001060	000000	HLT		; V SHOULD NOT BE SET
524	001062	000240	SCOPE		
525	001064	000240	SCOPE		
526	001066	005001	CLR	%N	; CLEAR %N
527	001070	005101	COM	%N	; SET %N TO ALL ONES, SET "C"

528	001072	106001	RORB	%N	:SHIFT OR ROTATE
529	001074	005101	COM	%N	:ONES TO ZERO
530	001076	001401	BEQ	.+4	:TEST FOR ZERO
531	001100	000000	HLT		:%N NOT EQUAL TO ZERO
532	001102	000240	SCOPE		
533	001104	005001	CLR	%N	:DATA=000000
534	001106	005101	COM	%N	:DATA=177777, SET C
535	001110	106001	RORB	%N	
536	001112	102001	BVC	.+4	
537	001114	000000	HLT		:V SHOULD NOT BE SET
538	001116	000240	SCOPE		
539	001120	000240	SCOPE		
540	001122	005001	CLR	%N	:CLEAR %N
541	001124	005101	COM	%N	:SET %N TO ALL ONES, SET "C"
542	001126	006101	ROL	%N	:SHIFT OR ROTATE
543	001130	005101	COM	%N	:ONES TO ZERO
544	001132	001401	BEQ	.+4	:TEST FOR ZERO
545	001134	000000	HLT		:%N NOT EQUAL TO ZERO
546	001136	000240	SCOPE		
547	001140	005001	CLR	%N	:DATA=000000
548	001142	005101	COM	%N	:DATA=177777, SET C
549	001144	006101	ROL	%N	
550	001146	102001	BVC	.+4	
551	001150	000000	HLT		:V SHOULD NOT BE SET
552	001152	000240	SCOPE		
553	001154	000240	SCOPE		
554	001156	005001	CLR	%N	:CLEAR %N
555	001160	005101	COM	%N	:SET %N TO ALL ONES, SET "C"
556	001162	106101	ROLB	%N	:SHIFT OR ROTATE
557	001164	005101	COM	%N	:ONES TO ZERO
558	001166	001401	BEQ	.+4	:TEST FOR ZERO
559	001170	000000	HLT		:%N NOT EQUAL TO ZERO
560	001172	000240	SCOPE		
561	001174	005001	CLR	%N	:DATA=000000
562	001176	005101	COM	%N	:DATA=177777, SET C
563	001200	106101	ROLB	%N	
564	001202	102001	BVC	.+4	
565	001204	000000	HLT		:V SHOULD NOT BE SET
566	001206	000240	SCOPE		
567	001210	000240	SCOPE		
568	001212	005001	CLR	%N	:CLEAR %N
569	001214	005101	COM	%N	:SET %N TO ALL ONES, SET "C"
570	001216	006201	ASR	%N	:SHIFT OR ROTATE
571	001220	005101	COM	%N	:ONES TO ZERO
572	001222	001401	BEQ	.+4	:TEST FOR ZERO
573	001224	000000	HLT		:%N NOT EQUAL TO ZERO
574	001226	000240	SCOPE		
575	001230	005001	CLR	%N	:DATA=000000
576	001232	005101	COM	%N	:DATA=177777, SET C
577	001234	006201	ASR	%N	
578	001236	102001	BVC	.+4	
579	001240	000000	HLT		:V SHOULD NOT BE SET
580	001242	000240	SCOPE		
581	001244	000240	SCOPE		
582	001246	005001	CLR	%N	:CLEAR %N
583	001250	005101	COM	%N	:SET %N TO ALL ONES, SET "C"

584	001252	106201	ASRB	XN	:SHIFT OR ROTATE
585	001254	005101	COM	XN	:ONES TO ZERO
586	001256	001401	BEQ	.+4	:TEST FOR ZERO
587	001260	000000	HLT		:XN NOT EQUAL TO ZERO
588	001262	000240	SCOPE		
589	001264	005001	CLR	XN	:DATA=000000
590	001266	005101	COM	XN	:DATA=177777, SET C
591	001270	106201	ASRB	XN	
592	001272	102001	BVC	.+4	
593	001274	000000	HLT		:V SHOULD NOT BE SET
594	001276	000240	SCOPE		
595		000002	N=N+1		:TEST N
596	001300	000240	SCOPE		
597	001302	000257	CCC		:CLEAR C
598	001304	005002	CLR	XN	:CLEAR XN
599	001306	006002	ROR	XN	:SHIFT OR ROTATE
600	001310	001401	BEQ	.+4	:TEST FOR ZEROS
601	001312	000000	HLT		:XN NOT EQUAL TO ZERO
602	001314	103001	BCC	.+4	
603	001316	000000	HLT		:C NOT CLEARED
604	001320	102001	BVC	.+4	
605	001322	000000	HLT		:V NOT CLEARED
606	001324	000240	SCOPE		
607	001326	000257	CCC		:CLEAR C
608	001330	005002	CLR	XN	:CLEAR XN
609	001332	106002	RORB	XN	:SHIFT OR ROTATE
610	001334	001401	BEQ	.+4	:TEST FOR ZEROS
611	001336	000000	HLT		:XN NOT EQUAL TO ZERO
612	001340	103001	BCC	.+4	
613	001342	000000	HLT		:C NOT CLEARED
614	001344	102001	BVC	.+4	
615	001346	000000	HLT		:V NOT CLEARED
616	001350	000240	SCOPE		
617	001352	000257	CCC		:CLEAR C
618	001354	005002	CLR	XN	:CLEAR XN
619	001356	006102	ROL	XN	:SHIFT OR ROTATE
620	001360	001401	BEQ	.+4	:TEST FOR ZEROS
621	001362	000000	HLT		:XN NOT EQUAL TO ZERO
622	001364	103001	BCC	.+4	
623	001366	000000	HLT		:C NOT CLEARED
624	001370	102001	BVC	.+4	
625	001372	000000	HLT		:V NOT CLEARED
626	001374	000240	SCOPE		
627	001376	000257	CCC		:CLEAR C
628	001400	005002	CLR	XN	:CLEAR XN
629	001402	106102	ROLB	XN	:SHIFT OR ROTATE
630	001404	001401	BEQ	.+4	:TEST FOR ZEROS
631	001406	000000	HLT		:XN NOT EQUAL TO ZERO
632	001410	103001	BCC	.+4	
633	001412	000000	HLT		:C NOT CLEARED
634	001414	102001	BVC	.+4	
635	001416	000000	HLT		:V NOT CLEARED
636	001420	000240	SCOPE		
637	001422	000257	CCC		:CLEAR C
638	001424	005002	CLR	XN	:CLEAR XN
639	001426	006202	ASR	XN	:SHIFT OR ROTATE

640	001430	001401	BEQ	.+4	;TEST FOR ZEROS
641	001432	000000	HLT		;XN NOT EQUAL TO ZERO
642	001434	103001	BCC	.+4	
643	001436	000000	HLT		;C NOT CLEARED
644	001440	102001	BVC	.+4	
645	001442	000000	HLT		;V NOT CLEARED
646	001444	000240	SCOPE		
647	001446	000257	CCC		;CLEAR C
648	001450	005002	CLR	XN	;CLEAR XN
649	001452	106202	ASRB	XN	;SHIFT OR ROTATE
650	001454	001401	BEQ	.+4	;TEST FOR ZEROS
651	001456	000000	HLT		;XN NOT EQUAL TO ZERO
652	001460	103001	BCC	.+4	
653	001462	000000	HLT		;C NOT CLEARED
654	001464	102001	BVC	.+4	
655	001466	000000	HLT		;V NOT CLEARED
656	001470	000240	SCOPE		
657	001472	005002	CLR	XN	;CLEAR XN
658	001474	005102	COM	XN	;SET XN TO ALL ONES, SET "C"
659	001476	006002	ROR	XN	;SHIFT OR ROTATE
660	001500	005102	COM	XN	;ONES TO ZERO
661	001502	001401	BEQ	.+4	;TEST FOR ZERO
662	001504	000000	HLT		;XN NOT EQUAL TO ZERO
663	001506	000240	SCOPE		
664	001510	005002	CLR	XN	;DATA=000000
665	001512	005102	COM	XN	;DATA=177777, SET C
666	001514	006002	ROR	XN	
667	001516	102001	BVC	.+4	
668	001520	000000	HLT		;V SHOULD NOT BE SET
669	001522	000240	SCOPE		
670	001524	000240	SCOPE		
671	001526	005002	CLR	XN	;CLEAR XN
672	001530	005102	COM	XN	;SET XN TO ALL ONES, SET "C"
673	001532	106002	RORB	XN	;SHIFT OR ROTATE
674	001534	005102	COM	XN	;ONES TO ZERO
675	001536	001401	BEQ	.+4	;TEST FOR ZERO
676	001540	000000	HLT		;XN NOT EQUAL TO ZERO
677	001542	000240	SCOPE		
678	001544	005002	CLR	XN	;DATA=000100
679	001546	005102	COM	XN	;DATA=17777, SET C
680	001550	106002	RORB	XN	
681	001552	102001	BVC	.+4	
682	001554	000000	HLT		;V SHOULD NOT BE SET
683	001556	000240	SCOPE		
684	001560	000240	SCOPE		
685	001562	005002	CLR	XN	;CLEAR XN
686	001564	005102	COM	XN	;SET XN TO ALL ONES, SET "C"
687	001566	006102	ROL	XN	;SHIFT OR ROTATE
688	001570	005102	COM	XN	;ONES TO ZERO
689	001572	001401	BEQ	.+4	;TEST FOR ZERO
690	001574	000000	HLT		;XN NOT EQUAL TO ZERO
691	001576	000240	SCOPE		
692	001600	005002	CLR	XN	;DATA=000000
693	001602	005102	COM	XN	;DATA=177777, SET C
694	001604	006102	ROL	XN	
695	001606	102001	BVC	.+4	

696	001610	000240	HLT		;V SHOULD NOT BE SET
697	001612	000240	SCOPE		
698	001614	000240	SCOPE		
699	001616	005002	CLR	%N	:CLEAR %N
700	001620	005102	COM	%N	:SET %N TO ALL ONES, SET "C"
701	001622	106102	ROLB	%N	:SHIFT OR ROTATE
702	001624	005102	COM	%N	:ONES TO ZERO
703	001626	001401	BEQ	.+4	:TEST FOR ZERO
704	001630	000000	HLT		:%N NOT EQUAL TO ZERO
705	001632	000240	SCOPE		
706	001634	005002	CLR	%N	:DATA=000000
707	001636	005102	COM	%N	:DATA=177777, SET C
708	001640	106102	ROLB	%N	
709	001642	102001	BVC	.+4	
710	001644	000000	HLT		;V SHOULD NOT BE SET
711	001646	000240	SCOPE		
712	001650	000240	SCOPE		
713	001652	005002	CLR	%N	:CLEAR %N
714	001654	005102	COM	%N	:SET %N TO ALL ONES, SET "C"
715	001656	006202	RSR	%N	:SHIFT OR ROTATE
716	001660	005102	COM	%N	:ONES TO ZERO
717	001662	001401	BEQ	.+4	:TEST FOR ZERO
718	001664	000000	HLT		:%N NOT EQUAL TO ZERO
719	001666	000240	SCOPE		
720	001670	005002	CLR	%N	:DATA=000000
721	001672	005102	COM	%N	:DATA=177777, SET C
722	001674	006202	RSR	%N	
723	001676	102001	BVC	.+4	
724	001700	000000	HLT		;V SHOULD NOT BE SET
725	001702	000240	SCOPE		
726	001704	000240	SCOPE		
727	001706	005002	CLR	%N	:CLEAR %N
728	001710	005102	COM	%N	:SET %N TO ALL ONES, SET "C"
729	001712	106202	RSRB	%N	:SHIFT OR ROTATE
730	001714	005102	COM	%N	:ONES TO ZERO
731	001716	001401	BEQ	.+4	:TEST FOR ZERO
732	001720	000000	HLT		:%N NOT EQUAL TO ZERO
733	001722	000240	SCOPE		
734	001724	005002	CLR	%N	:DATA=000000
735	001726	005102	COM	%N	:DATA=177777, SET C
736	001730	106202	RSRB	%N	
737	001732	102001	BVC	.+4	
738	001734	000000	HLT		;V SHOULD NOT BE SET
739	001736	000240	SCOPE		
740		000003	N=N+1		:TEST N
741	001740	000240	SCOPE		
742	001742	000257	CCC		:CLEAR C
743	001744	005003	CLR	%N	:CLEAR %N
744	001746	006003	ROR	%N	:SHIFT OR ROTATE
745	001750	001401	BEQ	.+4	:TEST FOR ZEROS
746	001752	000000	HLT		:%N NOT EQUAL TO ZERO
747	001754	103001	BCC	.+4	
748	001756	000000	HLT		;C NOT CLEARED
749	001760	102001	BVC	.+4	
750	001762	000000	HLT		;V NOT CLEARED
751	001764	000240	SCOPE		

752	001766	000257	CCC		:CLEAR C
753	001770	005003	CLR	%N	:CLEAR %N
754	001772	106003	RORB	%N	:SHIFT OR ROTATE
755	001774	001401	BEQ	.+4	:TEST FOR ZEROS
756	001776	000000	HLT		:%N NOT EQUAL TO ZERO
757	002000	103001	BCC	.+4	
758	002002	000000	HLT		:C NOT CLEARED
759	002004	102001	BVC	.+4	
760	002006	000000	HLT		:V NOT CLEARED
761	002010	000240	SCOPE		
762	002012	000257	CCC		:CLEAR C
763	002014	005003	CLR	%N	:CLEAR %N
764	002016	006103	ROL	%N	:SHIFT OR ROTATE
765	002020	001401	BEQ	.+4	:TEST FOR ZEROS
766	002022	000000	HLT		:%N NOT EQUAL TO ZERO
767	002024	103001	BCC	.+4	
768	002026	000000	HLT		:C NOT CLEARED
769	002030	102001	BVC	.+4	
770	002032	000000	HLT		:V NOT CLEARED
771	002034	000240	SCOPE		
772	002036	000257	CCC		:CLEAR C
773	002040	005003	CLR	%N	:CLEAR %N
774	002042	106103	ROLB	%N	:SHIFT OR ROTATE
775	002044	001401	BEQ	.+4	:TEST FOR ZEROS
776	002046	000000	HLT		:%N NOT EQUAL TO ZERO
777	002050	103001	BCC	.+4	
778	002052	000000	HLT		:C NOT CLEARED
779	002054	102001	BVC	.+4	
780	002056	000000	HLT		:V NOT CLEARED
781	002060	000240	SCOPE		
782	002062	000257	CCC		:CLEAR C
783	002064	005003	CLR	%N	:CLEAR %N
784	002066	006203	RSR	%N	:SHIFT OR ROTATE
785	002070	001401	BEQ	.+4	:TEST FOR ZEROS
786	002072	000000	HLT		:%N NOT EQUAL TO ZERO
787	002074	103001	BCC	.+4	
788	002076	000000	HLT		:C NOT CLEARED
789	002100	102001	BVC	.+4	
790	002102	000000	HLT		:V NOT CLEARED
791	002104	000240	SCOPE		
792	002106	000257	CCC		:CLEAR C
793	002110	005003	CLR	%N	:CLEAR %N
794	002112	106203	RSRB	%N	:SHIFT OR ROTATE
795	002114	001401	BEQ	.+4	:TEST FOR ZEROS
796	002116	000000	HLT		:%N NOT EQUAL TO ZERO
797	002120	103001	BCC	.+4	
798	002122	000000	HLT		:C NOT CLEARED
799	002124	102001	BVC	.+4	
800	002126	000000	HLT		:V NOT CLEARED
801	002130	000240	SCOPE		
802	002132	005003	CLR	%N	:CLEAR %N
803	002134	005103	COM	%N	:SET %N TO ALL ONES, SET "C"
804	002136	006003	ROR	%N	:SHIFT OR ROTATE
805	002140	005103	COM	%N	:ONES TO ZERO
806	002142	001401	BEQ	.+4	:TEST FOR ZERO
807	002144	000000	HLT		:%N NOT EQUAL TO ZERO

808	002146	000240	SCOPE		
809	002150	005003	CLR	%N	;DATA=000000
810	002152	005103	COM	%N	;DATA=177777, SET C
811	002154	006003	ROR	%N	
812	002156	102001	BVC	.+4	
813	002160	000000	HLT		;V SHOULD NOT BE SET
814	002162	000240	SCOPE		
815	002164	000240	SCOPE		
816	002166	005003	CLR	%N	;CLEAR %N
817	002170	005103	COM	%N	;SET %N TO ALL ONES, SET "C"
818	002172	106003	RORB	%N	;SHIFT OR ROTATE
819	002174	005103	COM	%N	;ONES TO ZERO
820	002176	001401	BEQ	.+4	;TEST FOR ZERO
821	002200	000000	HLT		;%N NOT EQUAL TO ZERO
822	002202	000240	SCOPE		
823	002204	005003	CLR	%N	;DATA=000000
824	002206	005103	COM	%N	;DATA=177777, SET C
825	002210	106003	RORB	%N	
826	002212	102001	BVC	.+4	
827	002214	000000	HLT		;V SHOULD NOT BE SET
828	002216	000240	SCOPE		
829	002220	000240	SCOPE		
830	002222	005003	CLR	%N	;CLEAR %N
831	002224	005103	COM	%N	;SET %N TO ALL ONES, SET "C"
832	002226	006103	ROL	%N	;SHIFT OR ROTATE
833	002230	005103	COM	%N	;ONES TO ZERO
834	002232	001401	BEQ	.+4	;TEST FOR ZERO
835	002234	000000	HLT		;%N NOT EQUAL TO ZERO
836	002236	000240	SCOPE		
837	002240	005003	CLR	%N	;DATA=000000
838	002242	005103	COM	%N	;DATA=177777, SET C
839	002244	006103	ROL	%N	
840	002246	102001	BVC	.+4	
841	002250	000000	HLT		;V SHOULD NOT BE SET
842	002252	000240	SCOPE		
843	002254	000240	SCOPE		
844	002256	005003	CLR	%N	;CLEAR %N
845	002260	005103	COM	%N	;SET %N TO ALL ONES, SET "C"
846	002262	106103	ROLB	%N	;SHIFT OR ROTATE
847	002264	005103	COM	%N	;ONES TO ZERO
848	002266	001401	BEQ	.+4	;TEST FOR ZERO
849	002270	000000	HLT		;%N NOT EQUAL TO ZERO
850	002272	000240	SCOPE		
851	002274	005003	CLR	%N	;DATA=000000
852	002276	005103	COM	%N	;DATA=177777, SET C
853	002300	106103	ROLB	%N	
854	002302	102001	BVC	.+4	
855	002304	000000	HLT		;V SHOULD NOT BE SET
856	002306	000240	SCOPE		
857	002310	000240	SCOPE		
858	002312	005003	CLR	%N	;CLEAR %N
859	002314	005103	COM	%N	;SET %N TO ALL ONES, SET "C"
860	002316	006203	RSR	%N	;SHIFT OR ROTATE
861	002320	005103	COM	%N	;ONES TO ZERO
862	002322	001401	BEQ	.+4	;TEST FOR ZERO
863	002324	000000	HLT		;%N NOT EQUAL TO ZERO

864	002326	000240	SCOPE		
865	002330	005003	CLR	%N	;DATA=000000
866	002332	005103	COM	%N	;DATA=177777, SET C
867	002334	006203	ASR	%N	
868	002336	102001	BVC	.+4	
869	002340	000000	HLT		;V SHOULD NOT BE SET
870	002342	000240	SCOPE		
871	002344	000240	SCOPE		
872	002346	005003	CLR	%N	;CLEAR %N
873	002350	005103	COM	%N	;SET %N TO ALL ONES, SET "C"
874	002352	106203	ASRB	%N	;SHIFT OR ROTATE
875	002354	005103	COM	%N	;ONES TO ZERO
876	002356	001401	BEQ	.+4	;TEST FOR ZERO
877	002360	000000	HLT		;%N NOT EQUAL TO ZERO
878	002362	000240	SCOPE		
879	002364	005003	CLR	%N	;DATA=000000
880	002366	005103	COM	%N	;DATA=177777, SET C
881	002370	106203	ASRB	%N	
882	002372	102001	BVC	.+4	
883	002374	000000	HLT		;V SHOULD NOT BE SET
884	002376	000240	SCOPE		
885		000004	N=N+1		;TEST N
886	002400	000240	SCOPE		
887	002402	000257	CCC		;CLEAR C
888	002404	005004	CLR	%N	;CLEAR %N
889	002406	006004	ROR	%N	;SHIFT OR ROTATE
890	002410	001401	BEQ	.+4	;TEST FOR ZEROS
891	002412	000000	HLT		;%N NOT EQUAL TO ZERO
892	002414	103001	BCC	.+4	
893	002416	000000	HLT		;C NOT CLEARED
894	002420	102001	BVC	.+4	
895	002422	000000	HLT		;V NOT CLEARED
896	002424	000240	SCOPE		
897	002426	000257	CCC		;CLEAR C
898	002430	005004	CLR	%N	;CLEAR %N
899	002432	106004	RORB	%N	;SHIFT OR ROTATE
900	002434	001401	BEQ	.+4	;TEST FOR ZEROS
901	002436	000000	HLT		;%N NOT EQUAL TO ZERO
902	002440	103001	BCC	.+4	
903	002442	000000	HLT		;C NOT CLEARED
904	002444	102001	BVC	.+4	
905	002446	000000	HLT		;V NOT CLEARED
906	002450	000240	SCOPE		
907	002452	000257	CCC		;CLEAR C
908	002454	005004	CLR	%N	;CLEAR %N
909	002456	006104	ROL	%N	;SHIFT OR ROTATE
910	002460	001401	BEQ	.+4	;TEST FOR ZEROS
911	002462	000000	HLT		;%N NOT EQUAL TO ZERO
912	002464	103001	BCC	.+4	
913	002466	000000	HLT		;C NOT CLEARED
914	002470	102001	BVC	.+4	
915	002472	000000	HLT		;V NOT CLEARED
916	002474	000240	SCOPE		
917	002476	000257	CCC		;CLEAR C
918	002500	005004	CLR	%N	;CLEAR %N
919	002502	106104	ROLB	%N	;SHIFT OR ROTATE

920	002504	001401	BEQ	.+4	;TEST FOR ZEROS
921	002506	000000	HLT		;XN NOT EQUIV. TO ZERO
922	002510	103001	BCC	.+4	
923	002512	000000	HLT		;C NOT CLEARED
924	002514	102001	BVC	.+4	
925	002516	000000	HLT		;V NOT CLEARED
926	002520	000240	SCOPE		
927	002527	000257	CCC		;CLEAR C
928	002530	005104	CLR	XN	;CLEAR XN
929	002532	106204	ASR	XN	;SHIFT OR ROTATE
930	002534	001401	BEQ	.+4	;TEST FOR ZEROS
931	002536	000000	HLT		;XN NOT EQUAL TO ZERO
932	002538	103001	BCC	.+4	
933	002540	000000	HLT		;C NOT CLEARED
934	002542	102001	BVC	.+4	
935	002544	000000	HLT		;V NOT CLEARED
936	002546	000240	SCOPE		
937	002548	000257	CCC		;CLEAR C
938	002550	005004	CLR	XN	;CLEAR XN
939	002552	106204	ASRB	XN	;SHIFT OR ROTATE
940	002554	001401	BEQ	.+4	;TEST FOR ZEROS
941	002556	000000	HLT		;XN NOT EQUAL TO ZERO
942	002560	103001	BCC	.+4	
943	002562	000000	HLT		;C NOT CLEARED
944	002564	102001	BVC	.+4	
945	002566	000000	HLT		;V NOT CLEARED
946	002570	000240	SCOPE		
947	002572	005004	CLR	XN	;CLEAR XN
948	002574	005104	COM	XN	;SET XN TO ALL ONES, SET "C"
949	002576	006004	ROR	XN	;SHIFT OR ROTATE
950	002600	005104	COM	XN	;ONES TO ZERO
951	002602	001401	BEQ	.+4	;TEST FOR ZERO
952	002604	000000	HLT		;XN NOT EQUAL TO ZERO
953	002606	000240	SCOPE		
954	002610	005004	CLR	XN	;DATA=000000
955	002612	005104	COM	XN	;DATA=177777, SET C
956	002614	006004	ROR	XN	
957	002616	102001	BVC	.+4	
958	002620	000000	HLT		;V SHOULD NOT BE SET
959	002622	000240	SCOPE		
960	002624	000240	SCOPE		
961	002626	005004	CLR	XN	;CLEAR XN
962	002630	005104	COM	XN	;SET XN TO ALL ONES, SET "C"
963	002632	106004	RORB	XN	;SHIFT OR ROTATE
964	002634	005104	COM	XN	;ONES TO ZERO
965	002636	001401	BEQ	.+4	;TEST FOR ZERO
966	002640	000000	HLT		;XN NOT EQUAL TO ZERO
967	002642	000240	SCOPE		
968	002644	005004	CLR	XN	;DATA=000000
969	002646	005104	COM	XN	;DATA=177777, SET C
970	002650	106004	RORB	XN	
971	002652	102001	BVC	.+4	
972	002654	000000	HLT		;V SHOULD NOT BE SET
973	002656	000240	SCOPE		
974	002660	000240	SCOPE		
975	002662	005004	CLR	XN	;CLEAR XN

976	002664	005104	COM	%N	;SET %N TO ALL ONES, SET "C"
977	002666	006104	RCL	%N	;SHIFT OR ROTATE
978	002670	005104	COM	%N	;ONES TO ZERO
979	002672	001401	BEQ	.+4	;TEST FOR ZERO
980	002674	000000	HLT		;%N NOT EQUAL TO ZERO
981	002676	000240	SCOPE		
982	002700	005004	CLR	%N	;DATA=000000
983	002702	005104	COM	%N	;DATA=177777, SET C
984	002704	006104	ROL	%N	
985	002706	102001	BVC	.+4	
986	002710	000000	HLT		;V SHOULD NOT BE SET
987	002712	000240	SCOPE		
988	002714	000240	SCOPE		
989	002716	005004	CLR	%N	;CLEAR %N
990	002720	005104	COM	%N	;SET %N TO ALL ONES, SET "C"
991	002722	106104	ROLB	%N	;SHIFT OR ROTATE
992	002724	005104	COM	%N	;ONES TO ZERO
993	002726	001401	BEQ	.+4	;TEST FOR ZERO
994	002730	000000	HLT		;%N NOT EQUAL TO ZERO
995	002732	000240	SCOPE		
996	002734	005004	CLR	%N	;DATA=000000
997	002736	005104	COM	%N	;DATA=177777, SET C
998	002740	106104	ROLB	%N	
999	002742	102001	BVC	.+4	
1000	002744	000000	HLT		;V SHOULD NOT BE SET
1001	002746	000240	SCOPE		
1002	002750	000240	SCOPE		
1003	002752	005004	CLR	%N	;CLEAR %N
1004	002754	005104	COM	%N	;SET %N TO ALL ONES, SET "C"
1005	002756	006204	ASR	%N	;SHIFT OR ROTATE
1006	002760	005104	COM	%N	;ONES TO ZERO
1007	002762	001401	BEQ	.+4	;TEST FOR ZERO
1008	002764	000000	HLT		;%N NOT EQUAL TO ZERO
1009	002766	000240	SCOPE		
1010	002770	005004	CLR	%N	;DATA=000000
1011	002772	005104	COM	%N	;DATA=177777, SET C
1012	002774	006204	ASR	%N	
1013	002776	102001	BVC	.+4	
1014	003000	000000	HLT		;V SHOULD NOT BE SET
1015	003002	000240	SCOPE		
1016	003004	000240	SCOPE		
1017	003006	005004	CLR	%N	;CLEAR %N
1018	003010	005104	COM	%N	;SET %N TO ALL ONES, SET "C"
1019	003012	106204	ASRB	%N	;SHIFT OR ROTATE
1020	003014	005104	COM	%N	;ONES TO ZERO
1021	003016	001401	BEQ	.+4	;TEST FOR ZERO
1022	003020	000000	HLT		;%N NOT EQUAL TO ZERO
1023	003022	000240	SCOPE		
1024	003024	005004	CLR	%N	;DATA=000000
1025	003026	005104	COM	%N	;DATA=177777, SET C
1026	003030	106204	ASRB	%N	
1027	003032	102001	BVC	.+4	
1028	003034	000000	HLT		;V SHOULD NOT BE SET
1029	003036	000240	SCOPE		
1030		000005	N=N+1		;TEST N
1031	003040	000240	SCOPE		

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1032	003042	000357	CCC		; CLEAR C
1033	003044	005005	CLR	%N	; CLEAR %N
1034	003046	006005	ROR	%N	; SHIFT OR ROTATE
1035	003050	001401	BEQ	.+4	; TEST FOR ZEROS
1036	003052	000000	HLT		; %N NOT EQUAL TO ZERO
1037	003054	103001	BCC	.+4	
1038	003056	000000	HLT		; C NOT CLEARED
1039	003060	102001	BVC	.+4	
1040	003062	000000	HLT		; V NOT CLEARED
1041	003064	000240	SCOPE		
1042	003066	000257	CCC		; CLEAR C
1043	003070	005005	CLR	%N	; CLEAR %N
1044	003072	106005	RORB	%N	; SHIFT OR ROTATE
1045	003074	001401	BEQ	.+4	; TEST FOR ZEROS
1046	003076	000000	HLT		; %N NOT EQUAL TO ZERO
1047	003100	103001	BCC	.+4	
1048	003102	000000	HLT		; C NOT CLEARED
1049	003104	102001	BVC	.+4	
1050	003106	000000	HLT		; V NOT CLEARED
1051	003110	000240	SCOPE		
1052	003112	000257	CCC		; CLEAR C
1053	003114	005005	CLR	%N	; CLEAR %N
1054	003116	006105	ROL	%N	; SHIFT OR ROTATE
1055	003120	001401	BEQ	.+4	; TEST FOR ZEROS
1056	003122	000000	HLT		; %N NOT EQUAL TO ZERO
1057	003124	103001	BCC	.+4	
1058	003126	000000	HLT		; C NOT CLEARED
1059	003130	102001	BVC	.+4	
1060	003132	000000	HLT		; V NOT CLEARED
1061	003134	000240	SCOPE		
1062	003136	000257	CCC		; CLEAR C
1063	003140	005005	CLR	%N	; CLEAR %N
1064	003142	106105	ROLB	%N	; SHIFT OR ROTATE
1065	003144	001401	BEQ	.+4	; TEST FOR ZEROS
1066	003146	000000	HLT		; %N NOT EQUAL TO ZERO
1067	003150	103001	BCC	.+4	
1068	003152	000000	HLT		; C NOT CLEARED
1069	003154	102001	BVC	.+4	
1070	003156	000000	HLT		; V NOT CLEARED
1071	003150	000240	SCOPE		
1072	003162	000257	CCC		; CLEAR C
1073	003164	005005	CLR	%N	; CLEAR %N
1074	003166	006205	ASR	%N	; SHIFT OR ROTATE
1075	003170	001401	BEQ	.+4	; TEST FOR ZEROS
1076	003172	000000	HLT		; %N NOT EQUAL TO ZERO
1077	003174	103001	BCC	.+4	
1078	003176	000000	HLT		; C NOT CLEARED
1079	003200	102001	BVC	.+4	
1080	003202	000000	HLT		; V NOT CLEARED
1081	003204	000240	SCOPE		
1082	003206	000257	CCC		; CLEAR C
1083	003210	005005	CLR	%N	; CLEAR %N
1084	003212	106205	ASRB	%N	; SHIFT OR ROTATE
1085	003214	001401	BEQ	.+4	; TEST FOR ZEROS
1086	003216	000000	HLT		; %N NOT EQUAL TO ZERO
1087	003220	103001	BCC	.+4	

1088	003222	000000	HLT		;C NOT CLEARED
1089	003224	102001	BVC	.+4	
1090	003226	000000	HLT		;V NOT CLEARED
1091	003230	000240	SCOPE		
1092	003232	005005	CLR	%N	;CLEAR %N
1093	003234	005105	COM	%N	;SET %N TO ALL ONES, SET "C"
1094	003236	006005	ROR	%N	;SHIFT OR ROTATE
1095	003240	005105	COM	%N	;ONES TO ZERO
1096	003242	001401	BEQ	.+4	;TEST FOR ZERO
1097	003244	000000	HLT		;%N NOT EQUAL TO ZERO
1098	003246	000240	SCOPE		
1099	003250	005005	CLR	%N	;DATA=000000
1100	003252	005105	COM	%N	;DATA=177777, SET C
1101	003254	006005	ROR	%N	
1102	003256	102001	BVC	.+4	
1103	003260	000000	HLT		;V SHOULD NOT BE SET
1104	003262	000240	SCOPE		
1105	003264	000240	SCOPE		
1106	003266	005005	CLR	%N	;CLEAR %N
1107	003270	005105	COM	%N	;SET %N TO ALL ONES, SET "C"
1108	003272	106005	RORB	%N	;SHIFT OR ROTATE
1109	003274	005105	COM	%N	;ONES TO ZERO
1110	003276	001401	BEQ	.+4	;TEST FOR ZERO
1111	003300	000000	HLT		;%N NOT EQUAL TO ZERO
1112	003302	000240	SCOPE		
1113	003304	005005	CLR	%N	;DATA=000000
1114	003306	005105	COM	%N	;DATA=177777, SET C
1115	003310	106005	RORB	%N	
1116	003312	102001	BVC	.+4	
1117	003314	000000	HLT		;V SHOULD NOT BE SET
1118	003316	000240	SCOPE		
1119	003320	000240	SCOPE		
1120	003322	005005	CLR	%N	;CLEAR %N
1121	003324	005105	COM	%N	;SET %N TO ALL ONES, SET "C"
1122	003326	006105	ROL	%N	;SHIFT OR ROTATE
1123	003330	005105	COM	%N	;ONES TO ZERO
1124	003332	001401	BEQ	.+4	;TEST FOR ZERO
1125	003334	000000	HLT		;%N NOT EQUAL TO ZERO
1126	003336	000240	SCOPE		
1127	003340	005005	CLR	%N	;DATA=000000
1128	003342	005105	COM	%N	;DATA=177777, SET C
1129	003344	006105	ROL	%N	
1130	003346	102001	BVC	.+4	
1131	003350	000000	HLT		;V SHOULD NOT BE SET
1132	003352	000240	SCOPE		
1133	003354	000240	SCOPE		
1134	003356	005005	CLR	%N	;CLEAR %N
1135	003360	005105	COM	%N	;SET %N TO ALL ONES, SET "C"
1136	003362	106105	ROLB	%N	;SHIFT OR ROTATE
1137	003364	005105	COM	%N	;ONES TO ZERO
1138	003366	001401	BEQ	.+4	;TEST FOR ZERO
1139	003370	000000	HLT		;%N NOT EQUAL TO ZERO
1140	003372	000240	SCOPE		
1141	003374	005005	CLR	%N	;DATA=000000
1142	003376	005105	COM	%N	;DATA=177777, SET C
1143	003400	106105	ROLB	%N	

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1144	003402	102001	BVC	.+4	
1145	003404	000000	HLT		;V SHOULD NOT BE SET
1146	003406	000240	SCOPE		
1147	003410	000240	SCOPE		
1148	003412	005005	CLR	%N	;CLEAR %N
1149	003414	005105	COM	%N	;SET %N TO ALL ONES, SET "C"
1150	003416	006205	ASR	%N	;SHIFT OR ROTATE
1151	003420	005105	COM	%N	;ONES TO ZERO
1152	003422	001401	BEQ	.+4	;TEST FOR ZERO
1153	003424	000000	HLT		;%N NOT EQUAL TO ZERO
1154	003426	000240	SCOPE		
1155	003430	005005	CLR	%N	;DATA=000000
1156	003432	005105	COM	%N	;DATA=177777, SET C
1157	003434	006205	ASR	%N	
1158	003436	102001	BVC	.+4	
1159	003440	000000	HLT		;V SHOULD NOT BE SET
1160	003442	000240	SCOPE		
1161	003444	000240	SCOPE		
1162	003446	005005	CLR	%N	;CLEAR %N
1163	003450	005105	COM	%N	;SET %N TO ALL ONES, SET "C"
1164	003452	106205	ASRB	%N	;SHIFT OR ROTATE
1165	003454	005105	COM	%N	;ONES TO ZERO
1166	003456	001401	BEQ	.+4	;TEST FOR ZERO
1167	003460	000000	HLT		;%N NOT EQUAL TO ZERO
1168	003462	000240	SCOPE		
1169	003464	005005	CLR	%N	;DATA=000000
1170	003466	005105	COM	%N	;DATA=177777, SET C
1171	003470	106205	ASRB	%N	
1172	003472	102001	BVC	.+4	
1173	003474	000000	HLT		;V SHOULD NOT BE SET
1174	003476	000240	SCOPE		
1175		000006	N=N+1		;TEST N
1176		000000	N=0		
1177	003500	000240	SCOPE		
1178	003502	005000	CLR	%N	;DATA=000000
1179	003504	005100	COM	%N	;DATA=177777, SET C
1180	003506	000257	CCC		;CLEAR C
1181	003510	006000	ROR	%N	;ROR %N SHOULD HAVE SET C
1182	003512	103401	BCS	.+4	;BRANCH IF CARRY SET
1183	003514	000000	HLT		;CARRY IS NOT SET
1184	003516	102401	BVS	.+4	;BRANCH ON OVERFLOW
1185	003520	000000	HLT		;CHANGE OF CARRY DID NOT SET "V"
1186	003522	000240	SCOPE		
1187	003524	005000	CLR	%N	;DATA=000000
1188	003526	005100	COM	%N	;DATA=177777, SET C
1189	003530	000257	CCC		;CLEAR C
1190	003532	106000	RORB	%N	;RORB %N SHOULD HAVE SET C
1191	003534	103401	BCS	.+4	;BRANCH IF CARRY SET
1192	003536	000000	HLT		;CARRY IS NOT SET
1193	003540	102401	BVS	.+4	;BRANCH ON OVERFLOW
1194	003542	000000	HLT		;CHANGE OF CARRY DID NOT SET "V"
1195		000001	N=N+1		
1196	003544	000240	SCOPE		
1197	003546	005001	CLR	%N	;DATA=000000
1198	003550	005101	COM	%N	;DATA=177777, SET C
1199	003552	000257	CCC		;CLEAR C

1200	003554	006001	ROR	%N	:ROR %N SHOULD HAVE SET C
1201	003556	103401	BCS	+.4	:BRANCH IF CARRY SET
1202	003560	000000	HLT		:CARRY IS NOT SET
1203	003562	102401	BVS	+.4	:BRANCH ON OVERFLOW
1204	003564	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1205	003566	000240	SCOPE		
1206	003570	005001	CLR	%N	:DATA=000000
1207	003572	005101	COM	%N	:DATA=177777, SET C
1208	003574	000257	CCC		:CLEAR C
1209	003576	106001	RORB	%N	:RORB %N SHOULD HAVE SET C
1210	003600	103401	BCS	+.4	:BRANCH IF CARRY SET
1211	003602	000000	HLT		:CARRY IS NOT SET
1212	003604	102401	BVS	+.4	:BRANCH ON OVERFLOW
1213	003606	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1214		000002	N=N+1		
1215	003610	000240	SCOPE		
1216	003612	005002	CLR	%N	:DATA=000000
1217	003614	005102	COM	%N	:DATA=177777, SET C
1218	003616	000257	CCC		:CLEAR C
1219	003620	006002	ROR	%N	:ROR %N SHOULD HAVE SET C
1220	003622	103401	BCS	+.4	:BRANCH IF CARRY SET
1221	003624	000000	HLT		:CARRY IS NOT SET
1222	003626	102401	BVS	+.4	:BRANCH ON OVERFLOW
1223	003630	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1224	003632	000240	SCOPE		
1225	003634	005002	CLR	%N	:DATA=000000
1226	003636	005102	COM	%N	:DATA=177777, SET C
1227	003640	000257	CCC		:CLEAR C
1228	003642	106002	RORB	%N	:RORB %N SHOULD HAVE SET C
1229	003644	103401	BCS	+.4	:BRANCH IF CARRY SET
1230	003646	000000	HLT		:CARRY IS NOT SET
1231	003650	102401	BVS	+.4	:BRANCH ON OVERFLOW
1232	003652	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1233		000003	N=N+1		
1234	003654	000240	SCOPE		
1235	003656	005003	CLR	%N	:DATA=000000
1236	003660	005103	COM	%N	:DATA=177777, SET C
1237	003662	000257	CCC		:CLEAR C
1238	003664	006003	ROR	%N	:ROR %N SHOULD HAVE SET C
1239	003666	103401	BCS	+.4	:BRANCH IF CARRY SET
1240	003670	000000	HLT		:CARRY IS NOT SET
1241	003672	102401	BVS	+.4	:BRANCH ON OVERFLOW
1242	003674	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1243	003676	000240	SCOPE		
1244	003700	005003	CLR	%N	:DATA=000000
1245	003702	005103	COM	%N	:DATA=177777, SET C
1246	003704	000257	CCC		:CLEAR C
1247	003706	106003	RORB	%N	:RORB %N SHOULD HAVE SET C
1248	003710	103401	BCS	+.4	:BRANCH IF CARRY SET
1249	003712	000000	HLT		:CARRY IS NOT SET
1250	003714	102401	BVS	+.4	:BRANCH ON OVERFLOW
1251	003716	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1252		000004	N=N+1		
1253	003720	000240	SCOPE		
1254	003722	005004	CLR	%N	:DATA=000000
1255	003724	005104	COM	%N	:DATA=177777, SET C

1256	003726	000257	CCC		:CLEAR C
1257	003730	006004	ROR	%N	:ROR %N SHOULD HAVE SET C
1258	003732	103401	BCS	.+4	:BRANCH IF CARRY SET
1259	003734	000000	HLT		:CARRY IS NOT SET
1260	003736	102401	BVS	.+4	:BRANCH ON OVERFLOW
1261	003740	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1262	003742	000240	SCOPE		
1263	003744	005004	CLR	%N	:DATA=000000
1264	003746	005104	COM	%N	:DATA=177777, SET C
1265	003750	000257	CCC		:CLEAR C
1266	003752	106004	RORB	%N	:RORB %N SHOULD HAVE SET C
1267	003754	103401	BCS	.+4	:BRANCH IF CARRY SET
1268	003756	000000	HLT		:CARRY IS NOT SET
1269	003760	102401	BVS	.+4	:BRANCH ON OVERFLOW
1270	003762	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1271		000005	N=N+1		
1272	003764	000240	SCOPE		
1273	003766	005005	CLR	%N	:DATA=000000
1274	003770	005105	COM	%N	:DATA=177777, SET C
1275	003772	000257	CCC		:CLEAR C
1276	003774	006005	ROR	%N	:ROR %N SHOULD HAVE SET C
1277	003776	103401	BCS	.+4	:BRANCH IF CARRY SET
1278	004000	000000	HLT		:CARRY IS NOT SET
1279	004002	102401	BVS	.+4	:BRANCH ON OVERFLOW
1280	004004	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1281	004006	000240	SCOPE		
1282	004010	005005	CLR	%N	:DATA=000000
1283	004012	005105	COM	%N	:DATA=177777, SET C
1284	004014	000257	CCC		:CLEAR C
1285	004016	106005	RORB	%N	:RORB %N SHOULD HAVE SET C
1286	004020	103401	BCS	.+4	:BRANCH IF CARRY SET
1287	004022	000000	HLT		:CARRY IS NOT SET
1288	004024	102401	BVS	.+4	:BRANCH ON OVERFLOW
1289	004026	000000	HLT		:CHANGE OF CARRY DID NOT SET "V"
1290		000006	N=N+1		
1291		000000	N=0		
1292	004030	000240	SCOPE		
1293	004032	005000	CLR	%N	:000000
1294	004034	005100	COM	%N	:177777
1295	004036	006300	ASL	%N	:177776
1296	004040	005200	INC	%N	:177777
1297	004042	005100	COM	%N	:000000
1298	004044	001401	BEQ	.+4	
1299	004046	000000	HLT		
1300					
1301	004050	000240	SCOPE		
1302	004052	005000	CLR	%N	:000000
1303	004054	005100	COM	%N	:177777
1304	004056	105200	INCB	%N	:177400
1305	004060	106300	ASLB	%N	:177400 SIGN FILL
1306	004062	105700	TSTB	%N	:BYTE=ZERO
1307	004064	001401	BEQ	.+4	
1308	004066	000000	HLT		:BYTE NOT ZERO, SHFB-1 FAILED
1309	004070	005700	TST	%N	:WORD NEGATIVE
1310	004072	100401	BMI	.+4	
1311	004074	000000	HLT		:SHIFT BYTE CHANGE UPPER BYTE

1312	004076	005100	COM	%N	:000377
1313	004100	105100	COMB	%N	:000000
1314	004102	001401	BEQ	.+4	
1315	004104	000000	HLT		:SHIFT BYTE FAILED
1316		000101	N=N+1		
1317	004106	000240	SCOPE		
1318	004110	005001	CLR	%N	:000000
1319	004112	005101	COM	%N	:177777
1320	004114	006301	ASL	%N	:177776
1321	004116	005201	INC	%N	:177777
1322	004120	005101	COM	%N	:000000
1323	004122	001401	BEQ	.+4	
1324	004124	000000	HLT		
1325					
1326	004126	000240	SCOPE		
1327	004130	005001	CLR	%N	:000000
1328	004132	005101	COM	%N	:177777
1329	004134	105201	INCB	%N	:177400
1330	004136	106301	ASLB	%N	:177400 SIGN FILL
1331	004140	105701	TSTB	%N	:BYTE=ZERO
1332	004142	001401	BEQ	.+4	
1333	004144	000000	HLT		:BYTE NOT ZERO, SHFB-1 FAILED
1334	004146	005701	TST	%N	:WORD NEGATIVE
1335	004150	100401	BMI	.+4	
1336	004152	000000	HLT		:SHIFT BYTE CHANGE UPPER BYTE
1337	004154	005101	COM	%N	:000377
1338	004156	105101	COMB	%N	:000000
1339	004160	001401	BEQ	.+4	
1340	004162	000000	HLT		:SHIFT BYTE FAILED
1341		000002	N=N+1		
1342	004164	000240	SCOPE		
1343	004166	005002	CLR	%N	:000000
1344	004170	005102	COM	%N	:177777
1345	004172	006302	ASL	%N	:177776
1346	004174	005202	INC	%N	:177777
1347	004176	005102	COM	%N	:000000
1348	004200	001401	BEQ	.+4	
1349	004202	000000	HLT		
1350					
1351	004204	000240	SCOPE		
1352	004206	005002	CLR	%N	:000000
1353	004210	005102	COM	%N	:177777
1354	004212	105202	INCB	%N	:177400
1355	004214	106302	ASLB	%N	:177400 SIGN FILL
1356	004216	105702	TSTB	%N	:BYTE=ZERO
1357	004220	001401	BEQ	.+4	
1358	004222	000000	HLT		:BYTE NOT ZERO, SHFB-1 FAILED
1359	004224	005702	TST	%N	:WORD NEGATIVE
1360	004226	100401	BMI	.+4	
1361	004230	000000	HLT		:SHIFT BYTE CHANGE UPPER BYTE
1362	004232	005102	COM	%N	:000377
1363	004234	105102	COMB	%N	:000000
1364	004236	001401	BEQ	.+4	
1365	004240	000000	HLT		:SHIFT BYTE FAILED
1366		000003	N=N+1		
1367	004242	000240	SCOPE		

1368	004244	005003	CLR	%N	:000000
1369	004246	005103	COM	%N	:177777
1370	004250	006303	ASL	%N	:177776
1371	004252	005203	INC	%N	:177777
1372	004254	005103	COM	%N	:000000
1373	004256	001401	BEQ	.+4	
1374	004260	000000	HLT		
1375					
1376	004262	000240	SCOPE		
1377	004264	005003	CLR	%N	:000000
1378	004266	005103	COM	%N	:177777
1379	004270	105203	INCB	%N	:177400
1380	004272	106303	ASLB	%N	:177400 SIGN FILL
1381	004274	105703	TSTB	%N	:BYTE=ZERO
1382	004276	001401	BEQ	.+4	
1383	004300	000000	HLT		:BYTE NOT ZERO, SHFB-1 FAILED
1384	004302	005703	TST	%N	:WORD NEGATIVE
1385	004304	100401	BMI	.+4	
1386	004306	000000	HLT		:SHIFT BYTE CHANGE UPPER BYTE
1387	004310	005103	COM	%N	:000377
1388	004312	105103	COMB	%N	:000000
1389	004314	001401	BEQ	.+4	
1390	004316	000000	HLT		:SHIFT BYTE FAILED
1391		002004	N=N+1		
1392	004320	000240	SCOPE		
1393	004322	005004	CLR	%N	:000000
1394	004324	005104	COM	%N	:177777
1395	004326	005304	ASL	%N	:177776
1396	004330	005204	INC	%N	:177777
1397	004332	005104	COM	%N	:000000
1398	004374	001401	BEQ	.+4	
1399	004336	000000	HLT		
1400					
1401	004340	000240	SCOPE		
1402	004342	005004	CLR	%N	:000000
1403	004344	005104	COM	%N	:177777
1404	004346	105204	INC9	%N	:177400
1405	004350	106304	ASLB	%N	:177400 SIGN FILL
1406	004352	105704	TSTB	%N	:BYTE=ZERO
1407	004354	001401	BEQ	.+4	
1408	004356	000000	HLT		:BYTE NOT ZERO, SHFB-1 FAILED
1409	004360	005704	TST	%N	:WORD NEGATIVE
1410	004362	100401	BMI	.+4	
1411	004364	000000	HLT		:SHIFT BYTE CHANGE UPPER BYTE
1412	004366	005104	COM	%N	:000377
1413	004370	105104	COMB	%N	:000000
1414	004372	001401	BEQ	.+4	
1415	004374	000000	HLT		:SHIFT BYTE FAILED
1416		000005	N=N+1		
1417	004376	000240	SCOPE		
1418	004400	005005	CLR	%N	:000000
1419	004402	005105	COM	%N	:177777
1420	004404	006305	ASL	%N	:177776
1421	004406	005205	INC	%N	:177777
1422	004410	005105	COM	%N	:000000
1423	004412	001401	BEQ	.+4	

1429	004414	000000		HLT		
1430	004416	000240		SCOPE		
1431	004420	005005		CLR	%N	:000000
1432	004422	005105		COM	%N	:177777
1433	004424	105205		INCB	%N	:177400
1434	004426	106305		ASLB	%N	:177400 SIGN FILL
1435	004430	105705		TSTB	%N	:BYTE=ZERO
1436	004432	001401		BEQ	.+4	
1437	004434	000000		HLT		:BYTE NOT ZERO, SHFB-1 FAILED
1438	004436	005705		TST	%N	:WORD NEGATIVE
1439	004440	100401		BMI	.+4	
1440	004442	000000		HLT		:SHIFT BYTE CHANGE UPPER BYTE
1441	004444	005105		COM	%N	:000377
1442	004446	105105		COMB	%N	:000000
1443	004450	001401		BEQ	.+4	
1444	004452	000000		HLT		:SHIFT BYTE FAILED
1445	004454	000006		N=N+1		
1446	004454	000240		SCOPE		
1447	004456	005067	004130	CLR	TEND+10	:000000
1448	004462	005167	004124	COM	TEND+10	:177777
1449	004466	005367	004120	ASL	TEND+10	:177776
1450	004472	005267	004114	INC	TEND+10	:177777
1451	004476	005167	004110	COM	TEND+10	:000000
1452	004502	001401		BEQ	.+4	
1453	004504	000000		HLT		
1454	004506	000240		SCOPE		
1455	004510	005067	004076	CLR	TEND+10	:000000
1456	004514	005167	004072	COM	TEND+10	:177777
1457	004520	105267	004066	INCB	TEND+10	:177400
1458	004524	106367	004062	ASLB	TEND+10	:177400 SIGN FILL
1459	004530	105767	004056	TSTB	TEND+10	:BYTE=ZERO
1460	004534	001401		BEQ	.+4	
1461	004536	000000		HLT		:BYTE NOT ZERO, SHFB-1 FAILED
1462	004540	005767	004046	TST	TEND+10	:WORD NEGATIVE
1463	004544	100401		BMI	.+4	
1464	004546	000000		HLT		:SHIFT BYTE CHANGE UPPER BYTE
1465	004550	005167	004036	COM	TEND+10	:000377
1466	004554	105167	004032	COMB	TEND+10	:000000
1467	004560	001401		BEQ	.+4	
1468	004562	000000		HLT		:SHIFT BYTE FAILED

1466	004564	000240		SCOPE		
1467	004566	005067	004110	CLR	TEND+100	:000000
1468	004572	005167	004104	COM	TEND+100	:177777
1469	004576	006367	004100	ASL	TEND+100	:177776
1470	004602	005267	004074	INC	TEND+100	:177777
1471	004606	005167	004070	COM	TEND+100	:000000
1472	004612	001401		BEQ	.+4	
1473	004614	000000		HLT		
1474						
1475	004616	000240		SCOPE		
1476	004620	005067	004056	CLR	TEND+100	:000000
1477	004624	005167	004052	COM	TEND+100	:177777
1478	004630	105267	004046	INCB	TEND+100	:77400
1479	004634	106367	004042	ASLB	TEND+100	:177400 SIGN FILL
1480	004640	105767	004036	TSTB	TEND+100	:BYTE=ZERO
1481	004644	001401		BEQ	.+4	
1482	004646	000000		HLT		:BYTE NOT ZERO, SHFB-1 FAILED
1483	004650	005767	004026	TS7	TEND+100	:WORD NEGATIVE
1484	004654	100401		BMI	.+4	
1485	004656	000000		HLT		:SHIFT BYTE CHANGE UPPER BYTE
1486	004660	005167	004016	COM	TEND+100	:000377
1487	004664	105167	004012	COMB	TEND+100	:000000
1488	004670	001401		BEQ	.+4	
1489	004672	000000		HLT		:SHIFT BYTE FAILED
1490		000000		N=0		
1491	004674	012700	177777	MOV	#-1,%N	
1492	004700	006000		ROR	%N	:ROTATE RIGHT
1493	004702	006000		ROR	%N	:ROTATE RIGHT
1494	004704	006000		ROR	%N	:ROTATE RIGHT
1495	004706	006100		ROL	%N	:ROTATE LEFT
1496	004710	006100		ROL	%N	:ROTATE LEFT
1497	004712	006100		ROL	%N	:ROTATE LEFT
1498	004714	020027	177777	CMR	%N,#-1	:SHOULD BE SAME AS WHEN STARTED
1499	004720	001401		BEQ	.+4	:TEST FOR EQUAL
1500	004722	000000		HLT		:ROTATES BACK TO BACK FAILED
1501	004724	000240		SCOPE		
1502	004726	012700	125252	MOV	#125252,%N	
1503	004732	006000		ROR	%N	:ROTATE RIGHT
1504	004734	006000		ROR	%N	:ROTATE RIGHT
1505	004736	006000		ROR	%N	:ROTATE RIGHT
1506	004740	006100		ROL	%N	:ROTATE LEFT
1507	004742	006100		ROL	%N	:ROTATE LEFT
1508	004744	006100		ROL	%N	:ROTATE LEFT
1509	004746	020027	125252	CMR	%N,#125252	:SHOULD BE SAME AS WHEN STARTED
1510	004752	001401		BEQ	.+4	:TEST FOR EQUAL
1511	004754	000000		HLT		:ROTATES BACK TO BACK FAILED
1512	004756	000240		SCOPE		
1513	004760	012700	125252	MOV	#125252,%N	
1514	004764	006000		ROR	%N	:ROTATE RIGHT
1515	004766	006000		ROR	%N	:ROTATE RIGHT
1516	004770	006000		ROR	%N	:ROTATE RIGHT
1517	004772	006100		ROL	%N	:ROTATE LEFT
1518	004774	006100		ROL	%N	:ROTATE LEFT
1519	004776	006100		ROL	%N	:ROTATE LEFT
1520	005000	020027	125252	CMR	%N,#125252	:SHOULD BE SAME AS WHEN STARTED
1521	005004	001401		BEQ	.+4	:TEST FOR EQUAL


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1522 005006 000000          HLT                   ;ROTATES BACK TO BACK FAILED
1523 005010 000240          SCOPE
1524 005012 012700 107070  MOV          #107070,%N
1525 005016 006000          ROR          %N           ;ROTATE RIGHT
1526 005020 006000          ROR          %N           ;ROTATE RIGHT
1527 005022 006000          ROR          %N           ;ROTATE RIGHT
1528 005024 006100          ROL          %N           ;ROTATE LEFT
1529 005026 006100          ROL          %N           ;ROTATE LEFT
1530 005030 006100          ROL          %N           ;ROTATE LEFT
1531 005032 020027 107070  CMP          %N,#107070    ;SHOULD BE SAME AS WHEN STARTED
1532 005036 001401          BEQ          .+4          ;TEST FOR EQUAL
1533 005040 000000          HLT                   ;ROTATES BACK TO BACK FAILED
1534 005042 000240          SCOPE
1535 005044 012700 070707  MOV          #070707,%N
1536 005050 006000          ROR          %N           ;ROTATE RIGHT
1537 005052 006000          ROR          %N           ;ROTATE RIGHT
1538 005054 006000          ROR          %N           ;ROTATE RIGHT
1539 005056 006100          ROL          %N           ;ROTATE LEFT
1540 005060 006100          ROL          %N           ;ROTATE LEFT
1541 005062 006100          ROL          %N           ;ROTATE LEFT
1542 005064 020027 070707  CMP          %N,#070707    ;SHOULD BE SAME AS WHEN STARTED
1543 005070 001401          BEQ          .+4          ;TEST FOR EQUAL
1544 005072 000000          HLT                   ;ROTATES BACK TO BACK FAILED
1545 005074 000240          SCOPE
1546 005076 012700 125252  MOV          #125252,%N
1547 005102 106000          RORB         %N           ;ROTATE RIGHT
1548 005104 106000          RORB         %N           ;ROTATE RIGHT
1549 005106 106000          RORB         %N           ;ROTATE RIGHT
1550 005110 106100          ROLB        %N           ;ROTATE LEFT
1551 005112 106100          ROLB        %N           ;ROTATE LEFT
1552 005114 106100          ROLB        %N           ;ROTATE LEFT
1553 005116 020027 125252  CMP          %N,#125252    ;SHOULD BE SAME AS WHEN STARTED
1554 005122 001401          BEQ          .+4          ;TEST FOR EQUAL
1555 005124 000000          HLT                   ;ROTATES BACK TO BACK FAILED
1556 005126 000240          SCOPE
1557 005130 012700 107070  MOV          #107070,%N
1558 005134 106000          RORB         %N           ;ROTATE RIGHT
1559 005136 106000          RORB         %N           ;ROTATE RIGHT
1560 005140 106000          RORB         %N           ;ROTATE RIGHT
1561 005142 106100          ROLB        %N           ;ROTATE LEFT
1562 005144 106100          ROLB        %N           ;ROTATE LEFT
1563 005146 106100          ROLB        %N           ;ROTATE LEFT
1564 005150 020027 107070  CMP          %N,#107070    ;SHOULD BE SAME AS WHEN STARTED
1565 005154 001401          BEQ          .+4          ;TEST FOR EQUAL
1566 005156 000000          HLT                   ;ROTATES BACK TO BACK FAILED
1567 005160 000240          SCOPE
1568 005162 012700 000377  MOV          #000377,%N
1569 005166 106000          RORB         %N           ;ROTATE RIGHT
1570 005170 106000          RORB         %N           ;ROTATE RIGHT
1571 005172 106000          RORB         %N           ;ROTATE RIGHT
1572 005174 106100          ROLB        %N           ;ROTATE LEFT
1573 005176 106100          ROLB        %N           ;ROTATE LEFT
1574 005178 106100          ROLB        %N           ;ROTATE LEFT
1575 005202 020027 000377  CMP          %N,#377      ;SHOULD BE SAME AS WHEN STARTED
1576 005206 001401          BEQ          .+4          ;TEST FOR EQUAL
1577 005210 000000          HLT                   ;ROTATES BACK TO BACK FAILED
    
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1578	005212	000240		SCOPE		
1579	005214	012700	177400	MOV	#177400,%N	
1580	005220	106000		RORB	%N	: ROTATE RIGHT
1581	005222	106000		RORB	%N	: ROTATE RIGHT
1582	005224	106000		RORB	%N	: ROTATE RIGHT
1583	005226	106100		ROLB	%N	: ROTATE LEFT
1584	005230	106100		ROLB	%N	: ROTATE LEFT
1585	005232	106100		ROLB	%N	: ROTATE LEFT
1586	005234	020027	177400	CMP	%N,#177400	: SHOULD BE SAME AS WHEN STARTED
1587	005240	001401		BEQ	.+4	: TEST FOR EQUAL
1588	005242	000000		HLT		: ROTATES BACK TO BACK FAILED
1589	005244	000240		SCOPE		
1590		000001		N=N+1		
1591	005246	012701	177777	MOV	#-1,%N	
1592	005252	006001		ROR	%N	: ROTATE RIGHT
1593	005254	006001		ROR	%N	: ROTATE RIGHT
1594	005256	006001		ROR	%N	: ROTATE RIGHT
1595	005260	006101		ROL	%N	: ROTATE LEFT
1596	005262	006101		ROL	%N	: ROTATE LEFT
1597	005264	006101		ROL	%N	: ROTATE LEFT
1598	005266	020127	177777	CMP	%N,#-1	: SHOULD BE SAME AS WHEN STARTED
1599	005272	001401		BEQ	.+4	: TEST FOR EQUAL
1600	005274	000000		HLT		: ROTATES BACK TO BACK FAILED
1601	005276	000240		SCOPE		
1602	005300	012701	125252	MOV	#125252,%N	
1603	005304	006001		ROR	%N	: ROTATE RIGHT
1604	005306	006001		ROR	%N	: ROTATE RIGHT
1605	005310	006001		ROR	%N	: ROTATE RIGHT
1606	005312	006101		ROL	%N	: ROTATE LEFT
1607	005314	006101		ROL	%N	: ROTATE LEFT
1608	005316	006101		ROL	%N	: ROTATE LEFT
1609	005320	020127	125252	CMP	%N,#125252	: SHOULD BE SAME AS WHEN STARTED
1610	005324	001401		BEQ	.+4	: TEST FOR EQUAL
1611	005326	000000		HLT		: ROTATES BACK TO BACK FAILED
1612	005330	000240		SCOPE		
1613	005332	012701	125252	MOV	#125252,%N	
1614	005336	006001		ROR	%N	: ROTATE RIGHT
1615	005340	006001		ROR	%N	: ROTATE RIGHT
1616	005342	006001		ROR	%N	: ROTATE RIGHT
1617	005344	006101		ROL	%N	: ROTATE LEFT
1618	005346	006101		ROL	%N	: ROTATE LEFT
1619	005350	006101		ROL	%N	: ROTATE LEFT
1620	005352	020127	125252	CMP	%N,#125252	: SHOULD BE SAME AS WHEN STARTED
1621	005356	001401		BEQ	.+4	: TEST FOR EQUAL
1622	005360	000000		HLT		: ROTATES BACK TO BACK FAILED
1623	005362	000240		SCOPE		
1624	005364	012701	107070	MOV	#107070,%N	
1625	005370	006001		ROR	%N	: ROTATE RIGHT
1626	005372	006001		ROR	%N	: ROTATE RIGHT
1627	005374	006001		ROR	%N	: ROTATE RIGHT
1628	005376	006101		ROL	%N	: ROTATE LEFT
1629	005400	006101		ROL	%N	: ROTATE LEFT
1630	005402	006101		ROL	%N	: ROTATE LEFT
1631	005404	020127	107070	CMP	%N,#107070	: SHOULD BE SAME AS WHEN STARTED
1632	005410	001401		BEQ	.+4	: TEST FOR EQUAL
1633	005412	000000		HLT		: ROTATES BACK TO BACK FAILED

1634	005414	000240		SCOPE		
1635	005416	012701	070707	MOV	#070707,%N	
1636	005422	006001		ROR	%N	:ROTATE RIGHT
1637	005424	006001		ROR	%N	:ROTATE RIGHT
1638	005426	006001		ROR	%N	:ROTATE RIGHT
1639	005430	006101		ROL	%N	:ROTATE LEFT
1640	005432	006101		ROL	%N	:ROTATE LEFT
1641	005434	006101		ROL	%N	:ROTATE LEFT
1642	005436	020127	070707	CMP	%N #070707	: SHOULD BE SAME AS WHEN STARTED
1643	005442	001401		BEQ	+.4	:TEST FOR EQUAL
1644	005444	000000		HLT		:ROTATES BACK TO BACK FAILED
1645	005446	000240		SCOPE		
1646	005450	012701	125252	MOV	#125252,%N	
1647	005454	106001		RORB	%N	:ROTATE RIGHT
1648	005456	106001		RORB	%N	:ROTATE RIGHT
1649	005460	106001		RORB	%N	:ROTATE RIGHT
1650	005462	106101		ROLB	%N	:ROTATE LEFT
1651	005464	106101		ROLB	%N	:ROTATE LEFT
1652	005466	106101		ROLB	%N	:ROTATE LEFT
1653	005470	020127	125252	CMP	%N #125252	: SHOULD BE SAME AS WHEN STARTED
1654	005474	001401		BEQ	+.4	:TEST FOR EQUAL
1655	005476	000000		HLT		:ROTATES BACK TO BACK FAILED
1656	005500	000240		SCOPE		
1657	005502	012701	107070	MOV	#107070,%N	
1658	005506	106001		RORB	%N	:ROTATE RIGHT
1659	005510	106001		RORB	%N	:ROTATE RIGHT
1660	005512	106001		RORB	%N	:ROTATE RIGHT
1661	005514	106101		ROLB	%N	:ROTATE LEFT
1662	005516	106101		ROLB	%N	:ROTATE LEFT
1663	005520	106101		ROLB	%N	:ROTATE LEFT
1664	005522	020127	107070	CMP	%N #107070	: SHOULD BE SAME AS WHEN STARTED
1665	005526	001401		BEQ	+.4	:TEST FOR EQUAL
1666	005530	000000		HLT		:ROTATES BACK TO BACK FAILED
1667	005532	000240		SCOPE		
1668	005534	012701	000377	MOV	#000377,%N	
1669	005540	106001		RORB	%N	:ROTATE RIGHT
1670	005542	106001		RORB	%N	:ROTATE RIGHT
1671	005544	106001		RORB	%N	:ROTATE RIGHT
1672	005546	106101		ROLB	%N	:ROTATE LEFT
1673	005550	106101		ROLB	%N	:ROTATE LEFT
1674	005552	106101		ROLB	%N	:ROTATE LEFT
1675	005554	020127	000377	CMP	%N #377	: SHOULD BE SAME AS WHEN STARTED
1676	005560	001401		BEQ	+.4	:TEST FOR EQUAL
1677	005562	000000		HLT		:ROTATES BACK TO BACK FAILED
1678	005564	000240		SCOPE		
1679	005566	012701	177400	MOV	#177400,%N	
1680	005572	106001		RORB	%N	:ROTATE RIGHT
1681	005574	106001		RORB	%N	:ROTATE RIGHT
1682	005576	106001		RORB	%N	:ROTATE RIGHT
1683	005600	106101		ROLB	%N	:ROTATE LEFT
1684	005602	106101		ROLB	%N	:ROTATE LEFT
1685	005604	106101		ROLB	%N	:ROTATE LEFT
1686	005606	020127	177400	CMP	%N #177400	: SHOULD BE SAME AS WHEN STARTED
1687	005612	001401		BEQ	+.4	:TEST FOR EQUAL
1688	005614	000000		HLT		:ROTATES BACK TO BACK FAILED
1689	005616	000240		SCOPE		

1690		000002		N=N+1		
1691	005620	012702	177777	MOV	#-1,%N	
1692	005624	006002		ROR	%N	:ROTATE RIGHT
1693	005626	006002		ROR	%N	:ROTATE RIGHT
1694	005630	006002		ROR	%N	:ROTATE RIGHT
1695	005632	006102		ROL	%N	:ROTATE LEFT
1696	005634	006102		ROL	%N	:ROTATE LEFT
1697	005636	006102		ROL	%N	:ROTATE LEFT
1698	005640	020227	177777	CMP	%N,#-1	:SHOULD BE SAME AS WHEN STARTED
1699	005644	001401		BEQ	.+4	:TEST FOR EQUAL
1700	005646	000000		HLT		:ROTATES BACK TO BACK FAILED
1701	005650	000240		SCOPE		
1702	005652	012702	125252	MOV	#125252,%N	
1703	005656	006002		ROR	%N	:ROTATE RIGHT
1704	005660	006002		ROR	%N	:ROTATE RIGHT
1705	005662	006002		ROR	%N	:ROTATE RIGHT
1706	005664	006102		ROL	%N	:ROTATE LEFT
1707	005666	006102		ROL	%N	:ROTATE LEFT
1708	005670	006102		ROL	%N	:ROTATE LEFT
1709	005672	020227	125252	CMP	%N,#125252	:SHOULD BE SAME AS WHEN STARTED
1710	005676	001401		BEQ	.+4	:TEST FOR EQUAL
1711	005700	000000		HLT		:ROTATES BACK TO BACK FAILED
1712	005702	000240		SCOPE		
1713	005704	012702	125252	MOV	#125252,%N	
1714	005710	006002		ROR	%N	:ROTATE RIGHT
1715	005712	006002		ROR	%N	:ROTATE RIGHT
1716	005714	006002		ROR	%N	:ROTATE RIGHT
1717	005716	006102		ROL	%N	:ROTATE LEFT
1718	005720	006102		ROL	%N	:ROTATE LEFT
1719	005722	006102		ROL	%N	:ROTATE LEFT
1720	005724	020227	125252	CMP	%N,#125252	:SHOULD BE SAME AS WHEN STARTED
1721	005730	001401		BEQ	.+4	:TEST FOR EQUAL
1722	005732	000000		HLT		:ROTATES BACK TO BACK FAILED
1723	005734	000240		SCOPE		
1724	005736	012702	107070	MOV	#107070,%N	
1725	005742	006002		ROR	%N	:ROTATE RIGHT
1726	005744	006002		ROR	%N	:ROTATE RIGHT
1727	005746	006002		ROR	%N	:ROTATE RIGHT
1728	005750	006102		ROL	%N	:ROTATE LEFT
1729	005752	006102		ROL	%N	:ROTATE LEFT
1730	005754	006102		ROL	%N	:ROTATE LEFT
1731	005756	020227	107070	CMP	%N,#107070	:SHOULD BE SAME AS WHEN STARTED
1732	005762	001401		BEQ	.+4	:TEST FOR EQUAL
1733	005764	000000		HLT		:ROTATES BACK TO BACK FAILED
1734	005766	000240		SCOPE		
1735	005770	012702	070707	MOV	#070707,%N	
1736	005774	006002		ROR	%N	:ROTATE RIGHT
1737	005776	006002		ROR	%N	:ROTATE RIGHT
1738	006000	006002		ROR	%N	:ROTATE RIGHT
1739	006002	006102		ROL	%N	:ROTATE LEFT
1740	006004	006102		ROL	%N	:ROTATE LEFT
1741	006006	006102		ROL	%N	:ROTATE LEFT
1742	006010	020227	070707	CMP	%N,#070707	:SHOULD BE SAME AS WHEN STARTED
1743	006014	001401		BEQ	.+4	:TEST FOR EQUAL
1744	006016	000000		HLT		:ROTATES BACK TO BACK FAILED
1745	006020	000240		SCOPE		

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1746	006022	012702	125252	MOV	#125252,%N	
1747	006026	106002		RORB	%N	; ROTATE RIGHT
1748	006030	106002		RORB	%N	; ROTATE RIGHT
1749	006032	106002		RORB	%N	; ROTATE RIGHT
1750	006034	106102		ROLB	%N	; ROTATE LEFT
1751	006036	106102		ROLB	%N	; ROTATE LEFT
1752	006040	106102		ROLB	%N	; ROTATE LEFT
1753	006042	020227	125252	CMP	%N, #125252	; SHOULD BE SAME AS WHEN STARTED
1754	006046	001401		BEQ	+.4	; TEST FOR EQUAL
1755	006050	000000		HLT		; ROTATES BACK TO BACK FAILED
1756	006052	000240		SCOPE		
1757	006054	012702	107070	MOV	#107070,%N	
1758	006060	106002		RORB	%N	; ROTATE RIGHT
1759	006062	106002		RORB	%N	; ROTATE RIGHT
1760	006064	106002		RORB	%N	; ROTATE RIGHT
1761	006066	106102		ROLB	%N	; ROTATE LEFT
1762	006070	106102		ROLB	%N	; ROTATE LEFT
1763	006072	106102		ROLB	%N	; ROTATE LEFT
1764	006074	020227	107070	CMP	%N, #107070	; SHOULD BE SAME AS WHEN STARTED
1765	006100	001401		BEQ	+.4	; TEST FOR EQUAL
1766	006102	000000		HLT		; ROTATES BACK TO BACK FAILED
1767	006104	000240		SCOPE		
1768	006106	012702	000377	MOV	#000377,%N	
1769	006112	106002		RORB	%N	; ROTATE RIGHT
1770	006114	106002		RORB	%N	; ROTATE RIGHT
1771	006116	106002		RORB	%N	; ROTATE RIGHT
1772	006120	106102		ROLB	%N	; ROTATE LEFT
1773	006122	106102		ROLB	%N	; ROTATE LEFT
1774	006124	106102		ROLB	%N	; ROTATE LEFT
1775	006126	020227	000377	CMP	%N, #377	; SHOULD BE SAME AS WHEN STARTED
1776	006132	001401		BEQ	+.4	; TEST FOR EQUAL
1777	006134	000000		HLT		; ROTATES BACK TO BACK FAILED
1778	006136	000240		SCOPE		
1779	006140	012702	177400	MOV	#177400,%N	
1780	006144	106002		RORB	%N	; ROTATE RIGHT
1781	006146	106002		RORB	%N	; ROTATE RIGHT
1782	006150	106002		RORB	%N	; ROTATE RIGHT
1783	006152	106102		ROLB	%N	; ROTATE LEFT
1784	006154	106102		ROLB	%N	; ROTATE LEFT
1785	006156	106102		ROLB	%N	; ROTATE LEFT
1786	006160	020227	177400	CMP	%N, #177400	; SHOULD BE SAME AS WHEN STARTED
1787	006164	001401		BEQ	+.4	; TEST FOR EQUAL
1788	006166	000000		HLT		; ROTATES BACK TO BACK FAILED
1789	006170	000240		SCOPE		
1790		000003		N=N+1		
1791	006172	012703	177777	MOV	#-1,%N	
1792	006176	006003		ROR	%N	; ROTATE RIGHT
1793	006200	006003		ROR	%N	; ROTATE RIGHT
1794	006202	006003		ROR	%N	; ROTATE RIGHT
1795	006204	006103		ROL	%N	; ROTATE LEFT
1796	006206	006103		ROL	%N	; ROTATE LEFT
1797	006210	006103		ROL	%N	; ROTATE LEFT
1798	006212	020327	177777	CMP	%N, #-1	; SHOULD BE SAME AS WHEN STARTED
1799	006216	001401		BEQ	+.4	; TEST FOR EQUAL
1800	006220	000000		HLT		; ROTATES BACK TO BACK FAILED
1801	006222	000240		SCOPE		

1802	006224	012703	125252	MOV	#125252,%N	
1803	006230	006003		ROR	%N	; ROTATE RIGHT
1804	006232	006003		ROR	%N	; ROTATE RIGHT
1805	006234	006003		ROR	%N	; ROTATE RIGHT
1806	006236	006103		ROL	%N	; ROTATE LEFT
1807	006240	006103		ROL	%N	; ROTATE LEFT
1808	006242	006103		ROL	%N	; ROTATE LEFT
1809	006244	020327	125252	CMP	%N,#125252	; SHOULD BE SAME AS WHEN STARTED
1810	006250	001401		BEQ	.+4	; TEST FOR EQUAL
1811	006252	000000		HLT		; ROTATES BACK TO BACK FAILED
1812	006254	000240		SCOPE		
1813	006256	012703	125252	MOV	#125252,%N	
1814	006262	006003		ROR	%N	; ROTATE RIGHT
1815	006264	006003		ROR	%N	; ROTATE RIGHT
1816	006266	006003		ROR	%N	; ROTATE RIGHT
1817	006270	006103		ROL	%N	; ROTATE LEFT
1818	006272	006103		ROL	%N	; ROTATE LEFT
1819	006274	006103		ROL	%N	; ROTATE LEFT
1820	006276	020327	125252	CMP	%N,#125252	; SHOULD BE SAME AS WHEN STARTED
1821	006302	001401		BEQ	.+4	; TEST FOR EQUAL
1822	006304	000000		HLT		; ROTATES BACK TO BACK FAILED
1823	006306	000240		SCOPE		
1824	006310	012703	107070	MOV	#107070,%N	
1825	006314	006003		ROR	%N	; ROTATE RIGHT
1826	006316	006003		ROR	%N	; ROTATE RIGHT
1827	006320	006003		ROR	%N	; ROTATE RIGHT
1828	006322	006103		ROL	%N	; ROTATE LEFT
1829	006324	006103		ROL	%N	; ROTATE LEFT
1830	006326	006103		ROL	%N	; ROTATE LEFT
1831	006330	020327	107070	CMP	%N,#107070	; SHOULD BE SAME AS WHEN STARTED
1832	006334	001401		BEQ	.+4	; TEST FOR EQUAL
1833	006336	000000		HLT		; ROTATES BACK TO BACK FAILED
1834	006340	000240		SCOPE		
1835	006342	012703	070707	MOV	#070707,%N	
1836	006346	006003		ROR	%N	; ROTATE RIGHT
1837	006350	006003		ROR	%N	; ROTATE RIGHT
1838	006352	006003		ROR	%N	; ROTATE RIGHT
1839	006354	006103		ROL	%N	; ROTATE LEFT
1840	006356	006103		ROL	%N	; ROTATE LEFT
1841	006360	006103		ROL	%N	; ROTATE LEFT
1842	006362	020327	070707	CMP	%N,#070707	; SHOULD BE SAME AS WHEN STARTED
1843	006366	001401		BEQ	.+4	; TEST FOR EQUAL
1844	006370	000000		HLT		; ROTATES BACK TO BACK FAILED
1845	006372	000240		SCOPE		
1846	006374	012703	125252	MOV	#125252,%N	
1847	006400	106003		RORB	%N	; ROTATE RIGHT
1848	006402	106003		RORB	%N	; ROTATE RIGHT
1849	006404	106003		RORB	%N	; ROTATE RIGHT
1850	006406	106103		ROLB	%N	; ROTATE LEFT
1851	006410	106103		ROLB	%N	; ROTATE LEFT
1852	006412	106103		ROLB	%N	; ROTATE LEFT
1853	006414	020327	125252	CMP	%N,#125252	; SHOULD BE SAME AS WHEN STARTED
1854	006420	001401		BEQ	.+4	; TEST FOR EQUAL
1855	006422	000000		HLT		; ROTATES BACK TO BACK FAILED
1856	006424	000240		SCOPE		
1857	006426	012703	107070	MOV	#107070,%N	

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1858	006432	106003		RORB	%N		:ROTATE RIGHT
1859	006434	106003		RORB	%N		:ROTATE RIGHT
1860	006436	106003		RORB	%N		:ROTATE RIGHT
1861	006440	106103		ROLB	%N		:ROTATE LEFT
1862	006442	106103		ROLB	%N		:ROTATE LEFT
1863	006444	106103		ROLB	%N		:ROTATE LEFT
1864	006446	020327	107070	CMP	%N, #107070		: SHOULD BE SAME AS WHEN STARTED
1865	006452	001401		BEQ	.+4		:TEST FOR EQUAL
1866	006454	000000		HLT			:ROTATES BACK TO BACK FAILED
1867	006456	000240		SCOPE			
1868	006460	012703	000377	MOV	#000377,%N		
1869	006464	106003		RORB	%N		:ROTATE RIGHT
1870	006466	106003		RORB	%N		:ROTATE RIGHT
1871	006470	106003		RORB	%N		:ROTATE RIGHT
1872	006472	106103		ROLB	%N		:ROTATE LEFT
1873	006474	106103		ROLB	%N		:ROTATE LEFT
1874	006476	106103		ROLB	%N		:ROTATE LEFT
1875	006500	020327	000377	CMP	%N, #377		: SHOULD BE SAME AS WHEN STARTED
1876	006504	001401		BEQ	.+4		:TEST FOR EQUAL
1877	006506	000000		HLT			:ROTATES BACK TO BACK FAILED
1878	006510	000240		SCOPE			
1879	006512	012703	177400	MOV	#177400,%N		
1880	006516	106003		RORB	%N		:ROTATE RIGHT
1881	006520	106003		RORB	%N		:ROTATE RIGHT
1882	006522	106003		RORB	%N		:ROTATE RIGHT
1883	006524	106103		ROLB	%N		:ROTATE LEFT
1884	006526	106103		ROLB	%N		:ROTATE LEFT
1885	006530	106103		ROLB	%N		:ROTATE LEFT
1886	006532	020327	177400	CMP	%N, #177400		: SHOULD BE SAME AS WHEN STARTED
1887	006536	001401		BEQ	.+4		:TEST FOR EQUAL
1888	006540	000000		HLT			:ROTATES BACK TO BACK FAILED
1889	006542	000240		SCOPE			
1890		000004		N=N+1			
1891	006544	012704	177777	MOV	#-1,%N		
1892	006550	006004		ROR	%N		:ROTATE RIGHT
1893	006552	006004		ROR	%N		:ROTATE RIGHT
1894	006554	006004		ROR	%N		:ROTATE RIGHT
1895	006556	006104		ROL	%N		:ROTATE LEFT
1896	006560	006104		ROL	%N		:ROTATE LEFT
1897	006562	006104		ROL	%N		:ROTATE LEFT
1898	006564	020427	177777	CMP	%N, #-1		: SHOULD BE SAME AS WHEN STARTED
1899	006570	001401		BEQ	.+4		:TEST FOR EQUAL
1900	006572	000000		HLT			:ROTATES BACK TO BACK FAILED
1901	006574	000240		SCOPE			
1902	006576	012704	125252	MOV	#125252,%N		
1903	006602	006004		ROR	%N		:ROTATE RIGHT
1904	006604	006004		ROR	%N		:ROTATE RIGHT
1905	006606	006004		ROR	%N		:ROTATE RIGHT
1906	006610	006104		ROL	%N		:ROTATE LEFT
1907	006612	006104		ROL	%N		:ROTATE LEFT
1908	006614	006104		ROL	%N		:ROTATE LEFT
1909	006616	020427	125252	CMP	%N, #125252		: SHOULD BE SAME AS WHEN STARTED
1910	006622	001401		BEQ	.+4		:TEST FOR EQUAL
1911	006624	000000		HLT			:ROTATES BACK TO BACK FAILED
1912	006626	000240		SCOPE			
1913	006630	012704	125252	MOV	#125252,%N		

1914	006634	006004		ROR	%N		; ROTATE RIGHT
1915	006636	006004		ROR	%N		; ROTATE RIGHT
1916	006640	006004		ROR	%N		; ROTATE RIGHT
1917	006642	006104		ROL	%N		; ROTATE LEFT
1918	006644	006104		ROL	%N		; ROTATE LEFT
1919	006646	006104		ROL	%N		; ROTATE LEFT
1920	006650	020427	125252	CMP	%N, #125252		; SHOULD BE SAME AS WHEN STARTED
1921	006654	001401		BEQ	+.4		; TEST FOR EQUAL
1922	006656	000000		HLT			; ROTATES BACK TO BACK FAILED
1923	006660	000240		SCOPE			
1924	006662	012704	107070	MOV	#107070, %N		
1925	006666	006004		ROR	%N		; ROTATE RIGHT
1926	006670	006004		ROR	%N		; ROTATE RIGHT
1927	006672	006004		ROR	%N		; ROTATE RIGHT
1928	006674	006104		ROL	%N		; ROTATE LEFT
1929	006676	006104		ROL	%N		; ROTATE LEFT
1930	006700	006104		ROL	%N		; ROTATE LEFT
1931	006702	020427	107070	CMP	%N, #107070		; SHOULD BE SAME AS WHEN STARTED
1932	006705	001401		BEQ	+.4		; TEST FOR EQUAL
1933	006710	000100		HLT			; ROTATES BACK TO BACK FAILED
1934	006712	000240		SCOPE			
1935	006714	012704	070707	MOV	#070707, %N		
1936	006720	006004		ROR	%N		; ROTATE RIGHT
1937	006722	006004		ROR	%N		; ROTATE RIGHT
1938	006724	006004		ROR	%N		; ROTATE RIGHT
1939	006726	006104		ROL	%N		; ROTATE LEFT
1940	006730	006104		ROL	%N		; ROTATE LEFT
1941	006732	006104		ROL	%N		; ROTATE LEFT
1942	006734	020427	070707	CMP	%N, #070707		; SHOULD BE SAME AS WHEN STARTED
1943	006740	001401		BEQ	+.4		; TEST FOR EQUAL
1944	006742	000000		HLT			; ROTATES BACK TO BACK FAILED
1945	006744	000240		SCOPE			
1946	006746	012704	125252	MOV	#125252, %N		
1947	006752	106004		RORB	%N		; ROTATE RIGHT
1948	006754	106004		RORB	%N		; ROTATE RIGHT
1949	006756	106004		RORB	%N		; ROTATE RIGHT
1950	006760	106104		ROLB	%N		; ROTATE LEFT
1951	006762	106104		ROLB	%N		; ROTATE LEFT
1952	006764	106104		ROLB	%N		; ROTATE LEFT
1953	006766	020427	125252	CMP	%N, #125252		; SHOULD BE SAME AS WHEN STARTED
1954	006772	001401		BEQ	+.4		; TEST FOR EQUAL
1955	006774	000000		HLT			; ROTATES BACK TO BACK FAILED
1956	006776	000240		SCOPE			
1957	007000	012704	107070	MOV	#107070, %N		
1958	007004	106004		RORB	%N		; ROTATE RIGHT
1959	007006	106004		RORB	%N		; ROTATE RIGHT
1960	007010	106004		RORB	%N		; ROTATE RIGHT
1961	007012	106104		ROLB	%N		; ROTATE LEFT
1962	007014	106104		ROLB	%N		; ROTATE LEFT
1963	007016	106104		ROLB	%N		; ROTATE LEFT
1964	007020	020427	107070	CMP	%N, #107070		; SHOULD BE SAME AS WHEN STARTED
1965	007024	001401		BEQ	+.4		; TEST FOR EQUAL
1966	007026	000000		HLT			; ROTATES BACK TO BACK FAILED
1967	007030	000240		SCOPE			
1968	007032	012704	000377	MOV	#000377, %N		
1969	007036	106004		RORB	%N		; ROTATE RIGHT

1970	007040	106004		RORB	%N		:ROTATE RIGHT
1971	007042	106004		RORB	%N		:ROTATE RIGHT
1972	007044	106104		ROLB	%N		:ROTATE LEFT
1973	007046	106104		ROLB	%N		:ROTATE LEFT
1974	007050	106104		ROLB	%N		:ROTATE LEFT
1975	007052	020427	000377	CMP	%N, #377		:SHOULD BE SAME AS WHEN STARTED
1976	007056	001401		BEQ	.+4		:TEST FOR EQUAL
1977	007060	000000		HLT			:ROTATES BACK TO BACK FAILED
1978	007062	000240		SCOPE			
1979	007064	012704	177400	MOV	#177400, %N		
1980	007070	106004		RORB	%N		:ROTATE RIGHT
1981	007072	106004		RORB	%N		:ROTATE RIGHT
1982	007074	106004		RORB	%N		:ROTATE RIGHT
1983	007076	106104		ROLB	%N		:ROTATE LEFT
1984	007100	106104		ROLB	%N		:ROTATE LEFT
1985	007102	106104		ROLB	%N		:ROTATE LEFT
1986	007104	020427	177400	CMP	%N, #177400		:SHOULD BE SAME AS WHEN STARTED
1987	007108	001401		BEQ	.+4		:TEST FOR EQUAL
1988	007112	000000		HLT			:ROTATES BACK TO BACK FAILED
1989	007114	000240		SCOPE			
1990		000005		N=N+1			
1991	007116	012705	177777	MOV	#-1, %N		
1992	007120	006005		ROR	%N		:ROTATE RIGHT
1993	007122	006005		ROR	%N		:ROTATE RIGHT
1994	007124	006005		ROR	%N		:ROTATE RIGHT
1995	007126	006105		ROL	%N		:ROTATE LEFT
1996	007128	006105		ROL	%N		:ROTATE LEFT
1997	007130	006105		ROL	%N		:ROTATE LEFT
1998	007132	020527	177777	CMP	%N, #-1		:SHOULD BE SAME AS WHEN STARTED
1999	007134	001401		BEQ	.+4		:TEST FOR EQUAL
2000	007136	000000		HLT			:ROTATES BACK TO BACK FAILED
2001	007138	000240		SCOPE			
2002	007140	012705	125252	MOV	#125252, %N		
2003	007142	106005		ROR	%N		:ROTATE RIGHT
2004	007144	106005		ROR	%N		:ROTATE RIGHT
2005	007146	106005		ROR	%N		:ROTATE RIGHT
2006	007148	006105		ROL	%N		:ROTATE LEFT
2007	007150	006105		ROL	%N		:ROTATE LEFT
2008	007152	006105		ROL	%N		:ROTATE LEFT
2009	007154	020527	125252	CMP	%N, #125252		:SHOULD BE SAME AS WHEN STARTED
2010	007156	001401		BEQ	.+4		:TEST FOR EQUAL
2011	007158	000000		HLT			:ROTATES BACK TO BACK FAILED
2012	007160	000240		SCOPE			
2013	007162	012705	125252	MOV	#125252, %N		
2014	007164	006005		ROR	%N		:ROTATE RIGHT
2015	007166	006005		ROR	%N		:ROTATE RIGHT
2016	007168	006005		ROR	%N		:ROTATE RIGHT
2017	007170	006105		ROL	%N		:ROTATE LEFT
2018	007172	006105		ROL	%N		:ROTATE LEFT
2019	007174	006105		ROL	%N		:ROTATE LEFT
2020	007176	020527	125252	CMP	%N, #125252		:SHOULD BE SAME AS WHEN STARTED
2021	007178	001401		BEQ	.+4		:TEST FOR EQUAL
2022	007180	000000		HLT			:ROTATES BACK TO BACK FAILED
2023	007182	000240		SCOPE			
2024	007184	012705	107070	MOV	#107070, %N		
2025	007186	006005		ROR	%N		:ROTATE RIGHT

2026	107242	006005		ROR	%N		:ROTATE RIGHT
2027	007244	006005		ROR	%N		:ROTATE RIGHT
2028	007246	006105		ROL	%N		:ROTATE LEFT
2029	007250	006105		ROL	%N		:ROTATE LEFT
2030	007252	006105		ROL	%N		:ROTATE LEFT
2031	007254	020527	107070	CMP	%N, #107070		: SHOULD BE SAME AS WHEN STARTED
2032	007260	001401		BEQ	+.4		: TEST FOR EQUAL
2033	007262	000000		HLT			:ROTATES BACK TO BACK FAILED
2034	007264	000240		SCOPE			
2035	007266	012705	070707	MOV	#070707, %N		
2036	007272	006005		ROR	%N		:ROTATE RIGHT
2037	007274	006005		ROR	%N		:ROTATE RIGHT
2038	007276	006005		ROR	%N		:ROTATE RIGHT
2039	007301	006105		ROL	%N		:ROTATE LEFT
2040	007306	006105		ROL	%N		:ROTATE LEFT
2041	007304	006105		ROL	%N		:ROTATE LEFT
2042	007306	020527	070707	CMP	%N, #070707		: SHOULD BE SAME AS WHEN STARTED
2043	007312	001401		BEQ	+.4		: TEST FOR EQUAL
2044	007314	000000		HLT			:ROTATES BACK TO BACK FAILED
2045	007316	000240		SCOPE			
2046	007320	012705	125252	MOV	#125252, %N		
2047	007324	106005		RORB	%N		:ROTATE RIGHT
2048	007326	106005		RORB	%N		:ROTATE RIGHT
2049	007330	106005		RORB	%N		:ROTATE RIGHT
2050	007332	106105		ROLB	%N		:ROTATE LEFT
2051	007334	106105		ROLB	%N		:ROTATE LEFT
2052	007336	106105		ROLB	%N		:ROTATE LEFT
2053	007340	020527	125252	CMP	%N, #125252		: SHOULD BE SAME AS WHEN STARTED
2054	007344	001401		BEQ	+.4		: TEST FOR EQUAL
2055	007346	000000		HLT			:ROTATES BACK TO BACK FAILED
2056	007350	000240		SCOPE			
2057	007352	012705	107070	MOV	#107070, %N		
2058	007356	106005		RORB	%N		:ROTATE RIGHT
2059	007360	106005		RORB	%N		:ROTATE RIGHT
2060	007362	106005		RORB	%N		:ROTATE RIGHT
2061	007364	106105		ROLB	%N		:ROTATE LEFT
2062	007366	106105		ROLB	%N		:ROTATE LEFT
2063	007370	106105		ROLB	%N		:ROTATE LEFT
2064	007372	020527	107070	CMP	%N, #107070		: SHOULD BE SAME AS WHEN STARTED
2065	007376	001401		BEQ	+.4		: TEST FOR EQUAL
2066	007400	000000		HLT			:ROTATES BACK TO BACK FAILED
2067	007402	000240		SCOPE			
2068	007404	012705	000377	MOV	#000377, %N		
2069	007410	106005		RORB	%N		:ROTATE RIGHT
2070	007412	106005		RORB	%N		:ROTATE RIGHT
2071	007414	106005		RORB	%N		:ROTATE RIGHT
2072	007416	106105		ROLB	%N		:ROTATE LEFT
2073	007420	106105		ROLB	%N		:ROTATE LEFT
2074	007422	106105		ROLB	%N		:ROTATE LEFT
2075	007424	020527	000377	CMP	%N, #377		: SHOULD BE SAME AS WHEN STARTED
2076	007430	001401		BEQ	+.4		: TEST FOR EQUAL
2077	007432	000000		HLT			:ROTATES BACK TO BACK FAILED
2078	007434	000240		SCOPE			
2079	007436	012705	177400	MOV	#177400, %N		
2080	007442	106005		RORB	%N		:ROTATE RIGHT
2081	007444	106005		RORB	%N		:ROTATE RIGHT

2082	007446	106005			RORB	%N		; ROTATE RIGHT
2083	007450	106105			ROLB	%N		; ROTATE LEFT
2084	007452	106105			ROLB	%N		; ROTATE LEFT
2085	007454	106105			ROLB	%N		; ROTATE LEFT
2086	007456	020527	177400		CMP	%N, #177400		; SHOULD BE SAME AS WHEN STARTED
2087	007462	001401			BEQ	.+4		; TEST FOR EQUAL
2088	007464	000000			HLT			; ROTATES BACK TO BACK FAILED
2089	007466	000240			SCOPE			
2090		000006			N=N+1			
2091	007470	012737	070707	010604	MOV	#070707, @TEMP		
2092	007476	006037	010604		ROR	@TEMP		; ROTATE RIGHT
2093	007502	006037	010604		ROR	@TEMP		; ROTATE RIGHT
2094	007506	006037	010604		ROR	@TEMP		; ROTATE RIGHT
2095	007512	006137	010604		ROL	@TEMP		; ROTATE LEFT
2096	007516	006137	010604		ROL	@TEMP		; ROTATE LEFT
2097	007522	006137	010604		ROL	@TEMP		; ROTATE LEFT
2098	007526	023727	010604	070707	CMP	@TEMP, #070707		; SHOULD BE SAME AS WHEN STARTED
2099	007534	001401			BEQ	.+4		; TEST FOR EQUAL
2100	007536	000000			HLT			; ROTATES BACK TO BACK FAILED
2101	007540	000240			SCOPE			
2102	007542	012737	070707	010604	MOV	#070707, @TEMP		
2103	007550	106037	010604		RORB	@TEMP		; ROTATE RIGHT
2104	007554	106037	010604		RORB	@TEMP		; ROTATE RIGHT
2105	007560	106037	010604		RORB	@TEMP		; ROTATE RIGHT
2106	007564	106137	010604		ROLB	@TEMP		; ROTATE LEFT
2107	007570	106137	010604		ROLB	@TEMP		; ROTATE LEFT
2108	007574	106137	010604		ROLB	@TEMP		; ROTATE LEFT
2109	007600	023727	010604	070707	CMP	@TEMP, #070707		; SHOULD BE SAME AS WHEN STARTED
2110	007606	001401			BEQ	.+4		; TEST FOR EQUAL
2111	007610	000000			HLT			; ROTATES BACK TO BACK FAILED
2112	007612	000240			SCOPE			
2113	007614	012767	070707	000762	MOV	#070707, TEMP		
2114	007622	006067	000756		ROR	TEMP		; ROTATE RIGHT
2115	007626	006067	000752		ROR	TEMP		; ROTATE RIGHT
2116	007632	006067	000746		ROR	TEMP		; ROTATE RIGHT
2117	007636	006167	000742		ROL	TEMP		; ROTATE LEFT
2118	007642	006167	000736		ROL	TEMP		; ROTATE LEFT
2119	007646	006167	000732		ROL	TEMP		; ROTATE LEFT
2120	007652	026727	000726	070707	CMP	TEMP, #070707		; SHOULD BE SAME AS WHEN STARTED
2121	007660	001401			BEQ	.+4		; TEST FOR EQUAL
2122	007662	000000			HLT			; ROTATES BACK TO BACK FAILED
2123	007664	000240			SCOPE			
2124	007666	012767	107070	000710	MOV	#107070, TEMP		
2125	007674	106067	000704		RORB	TEMP		; ROTATE RIGHT
2126	007700	106067	000700		RORB	TEMP		; ROTATE RIGHT
2127	007704	106067	000674		RORB	TEMP		; ROTATE RIGHT
2128	007710	106167	000670		ROLB	TEMP		; ROTATE LEFT
2129	007714	106167	000664		ROLB	TEMP		; ROTATE LEFT
2130	007720	106167	000660		ROLB	TEMP		; ROTATE LEFT
2131	007724	026727	000654	107070	CMP	TEMP, #107070		; SHOULD BE SAME AS WHEN STARTED
2132	007732	001401			BEQ	.+4		; TEST FOR EQUAL
2133	007734	000000			HLT			; ROTATES BACK TO BACK FAILED
2134	007736	000240			SCOPE			
2135	007740	012700	010604		MOV	@TEMP, %0		
2136	007744	012710	070707		MOV	#070707, @%0		
2137	007750	006010			ROR	%0		; ROTATE RIGHT

2138	007752	006010		ROR	%0		: ROTATE RIGHT
2139	007754	006010		ROR	%0		: ROTATE RIGHT
2140	007756	006110		ROL	%0		: ROTATE LEFT
2141	007760	006110		ROL	%0		: ROTATE LEFT
2142	007762	006110		ROL	%0		: ROTATE LEFT
2143	007764	021027	070707	CMP	%0, #070707		: SHOULD BE SAME AS WHEN STARTED
2144	007770	001401		BEQ	.+4		: TEST FOR EQUAL
2145	007772	000000		HLT			: ROTATES BACK TO BACK FAILED
2146	007774	000240		SCOPE			
2147	007776	012700	010604	MOV	#TEMP, %0		
2148	010002	012710	052525	MOV	#052525, %0		
2149	010006	006010		ROR	%0		: ROTATE RIGHT
2150	010010	006010		ROR	%0		: ROTATE RIGHT
2151	010012	006010		ROR	%0		: ROTATE RIGHT
2152	010014	006110		ROL	%0		: ROTATE LEFT
2153	010016	006110		ROL	%0		: ROTATE LEFT
2154	010020	006110		ROL	%0		: ROTATE LEFT
2155	010022	021027	052525	CMP	%0, #052525		: SHOULD BE SAME AS WHEN STARTED
2156	010026	001401		BEQ	.+4		: TEST FOR EQUAL
2157	010030	000000		HLT			: ROTATES BACK TO BACK FAILED
2158	010032	000240		SCOPE			
2159	010034	012700	010604	MOV	#TEMP, %0		
2160	010040	012710	052525	MOV	#052525, %0		
2161	010044	106010		RORB	%0		: ROTATE RIGHT
2162	010046	106010		RORB	%0		: ROTATE RIGHT
2163	010050	106010		RORB	%0		: ROTATE RIGHT
2164	010052	106110		ROLB	%0		: ROTATE LEFT
2165	010054	106110		ROLB	%0		: ROTATE LEFT
2166	010056	106110		ROLB	%0		: ROTATE LEFT
2167	010060	021027	052525	CMP	%0, #052525		: SHOULD BE SAME AS WHEN STARTED
2168	010064	001401		BEQ	.+4		: TEST FOR EQUAL
2169	010066	000000		HLT			: ROTATES BACK TO BACK FAILED
2170	010070	000240		SCOPE			
2171	010072	012701	010604	MOV	#TEMP, %1		
2172	010076	012701	125252	MOV	#125252, %1		
2173	010102	106001		RORB	%1		: ROTATE RIGHT
2174	010104	106001		RORB	%1		: ROTATE RIGHT
2175	010106	106001		RORB	%1		: ROTATE RIGHT
2176	010110	106101		ROLB	%1		: ROTATE LEFT
2177	010112	106101		ROLB	%1		: ROTATE LEFT
2178	010114	106101		ROLB	%1		: ROTATE LEFT
2179	010116	020127	125252	CMP	%1, #125252		: SHOULD BE SAME AS WHEN STARTED
2180	010122	001401		BEQ	.+4		: TEST FOR EQUAL
2181	010124	000000		HLT			: ROTATES BACK TO BACK FAILED
2182	010126	000240		SCOPE			
2183	010130	012702	010614	MOV	#TEMP+10, %2		
2184		177770		A=-10			
2185	010134	012762	123456 177770	MOV	#123456, A(2)		
2186	010142	006062	177770	ROR	A(2)		: ROTATE RIGHT
2187	010146	006062	177770	ROR	A(2)		: ROTATE RIGHT
2188	010152	006062	177770	ROR	A(2)		: ROTATE RIGHT
2189	010156	006162	177770	ROL	A(2)		: ROTATE LEFT
2190	010162	006162	177770	ROL	A(2)		: ROTATE LEFT
2191	010166	006162	177770	ROL	A(2)		: ROTATE LEFT
2192	010172	026227	177770 123456	CMP	A(2), #123456		: SHOULD BE SAME AS WHEN STARTED
2193	010200	001401		BEQ	.+4		: TEST FOR EQUAL

2194	010202	000000		HLT					; ROTATES BACK TO BACK FAILED
2195	010204	000240		SCOPE					
2196	010206	012702	010614	MOV	#TEMP+10,%2				
2197	010212	012762	123456	MOV	#123456,A(2)				
2198	010220	106062	177770	RORB	A(2)				; ROTATE RIGHT
2199	010224	106062	177770	RORB	A(2)				; ROTATE RIGHT
2200	010230	106062	177770	RORB	A(2)				; ROTATE RIGHT
2201	010234	106162	177770	ROLB	A(2)				; ROTATE LEFT
2202	010240	106162	177770	ROLB	A(2)				; ROTATE LEFT
2203	010244	106162	177770	ROLB	A(2)				; ROTATE LEFT
2204	010250	026227	177770	CMP	A(2),#123456				; SHOULD BE SAME AS WHEN STARTED
2205	010256	001401		BEQ	+.4				; TEST FOR EQUAL
2206	010250	000000		HLT					; ROTATES BACK TO BACK FAILED
2207	010262	000240		SCOPE					
2208	010264	012767	010606	MOV	#TEMP+2,TEMP				
2209	010272	012702	010614	MOV	#TEMP+10,%2				
2210	010276	012772	070707	MOV	#070707,2A(2)				
2211	010304	006072	177770	ROR	2A(2)				; ROTATE RIGHT
2212	010310	006072	177770	ROR	2A(2)				; ROTATE RIGHT
2213	010314	006072	177770	ROR	2A(2)				; ROTATE RIGHT
2214	010320	006172	177770	ROL	2A(2)				; ROTATE LEFT
2215	010324	006172	177770	ROL	2A(2)				; ROTATE LEFT
2216	010330	006172	177770	ROL	2A(2)				; ROTATE LEFT
2217	010334	027227	177770	CMP	2A(2),#070707				; SHOULD BE SAME AS WHEN STARTED
2218	010342	001401		BEQ	+.4				; TEST FOR EQUAL
2219	010344	000000		HLT					; ROTATES BACK TO BACK FAILED
2220	010346	000240		SCOPE					
2221	010350	012772	070707	MOV	#070707,2A(2)				
2222	010356	106072	177770	RORB	2A(2)				; ROTATE RIGHT
2223	010362	106072	177770	RORB	2A(2)				; ROTATE RIGHT
2224	010366	106072	177770	RORB	2A(2)				; ROTATE RIGHT
2225	010372	106172	177770	ROLB	2A(2)				; ROTATE LEFT
2226	010376	106172	177770	ROLB	2A(2)				; ROTATE LEFT
2227	010402	106172	177770	ROLB	2A(2)				; ROTATE LEFT
2228	010406	027227	177770	CMP	2A(2),#070707				; SHOULD BE SAME AS WHEN STARTED
2229	010414	001401		BEQ	+.4				; TEST FOR EQUAL
2230	010416	000000		HLT					; ROTATES BACK TO BACK FAILED
2231	010420	000240		SCOPE					
2232	010422	112767	070707	MOVB	#070707,TEMP+1				
2233	010430	106067	000151	RORB	TEMP+1				; ROTATE RIGHT
2234	010434	106067	000145	RORB	TEMP+1				; ROTATE RIGHT
2235	010440	106067	000141	RORB	TEMP+1				; ROTATE RIGHT
2236	010444	106167	000135	ROLB	TEMP+1				; ROTATE LEFT
2237	010450	106167	000131	ROLB	TEMP+1				; ROTATE LEFT
2238	010454	106167	000125	ROLB	TEMP+1				; ROTATE LEFT
2239	010460	126727	000121	CMPSB	TEMP+1,#070707				; SHOULD BE SAME AS WHEN STARTED
2240	010466	001401		BEQ	+.4				; TEST FOR EQUAL
2241	010470	000000		HLT					; ROTATES BACK TO BACK FAILED
2242	010472	000240		SCOPE					
2243	010474	112767	107070	MOVB	#107070,TEMP+1				
2244	010502	106067	000077	RORB	TEMP+1				; ROTATE RIGHT
2245	010506	106067	000073	RORB	TEMP+1				; ROTATE RIGHT
2246	010512	106067	000067	RORB	TEMP+1				; ROTATE RIGHT
2247	010516	106167	000063	ROLB	TEMP+1				; ROTATE LEFT
2248	010522	106167	000057	ROLB	TEMP+1				; ROTATE LEFT
2249	010526	106167	000053	ROLB	TEMP+1				; ROTATE LEFT

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2250 010532 126727 000047 107070      CMPB   TEMP+1,#107070      ; SHOULD BE SAME AS WHEN STARTED
2251 010540 001401                      BEQ    .+4                ; TEST FOR EQUAL
2252 010542 000000                      HLT                               ; ROTATES BACK TO BACK FAILED
2253 010544 000240                      SCOPE
2254 010546 005267 000026      INC    LOOP
2255 010552 001402                      BEQ    .+6
2256 010554 000167 167420      JMP    BEGIN
2257 010560 012737 000207 177566      MOV    #207,#177566      ; RING BELL
2258 010566 105737 177564      TSTB  @#177564
2259 010572 100375                      BPL    -4
2260 010574 000167 167400      JMP    BEGIN
2261 010600 000000
2262 010602 000000
2263 010604 000000
2264 010606 000000
2265 010710 000000      FIN:
2266 010710 000000      LOOP: 0
2267 000001      TEND: 0
                                TEMP: 0
                                . = .+100
                                BUFF: 0
                                .END

```

A = 177770
BEGIN 000200
BUFF 010710
FIN 010574
HLT = 000000

2184*	2185*	2186*	2187*	2188*	2189*	2190*	2191*	2192	2197*	2198*	2199*	2200*
2201*	2202*	2203*	2204	2210*	2211*	2212*	2213*	2214*	2215*	2216*	2217	2221*
2222*	2223*	2224*	2225*	2226*	2227*	2228						
295*	2256	2260										
2266*												
2260*												
258*	311	313	315	321	323	325	331	333	335	341	343	345
351	353	355	361	363	365	372	378	386	392	400	406	414
420	428	434	442	448	456	458	460	466	468	470	476	478
480	486	488	490	496	498	500	506	508	510	517	523	531
537	545	551	559	565	573	579	587	593	601	603	605	611
613	615	621	623	625	631	633	635	641	643	645	651	653
655	662	668	676	682	690	696	704	710	718	724	732	738
746	748	750	756	758	760	766	768	770	776	778	780	786
788	790	796	798	800	807	813	821	827	835	841	849	855
863	869	877	883	891	893	895	901	903	905	911	913	915
921	923	925	931	933	935	941	943	945	952	958	966	972
980	986	994	1000	1008	1014	1022	1028	1036	1038	1040	1046	1048
1050	1056	1058	1060	1066	1068	1070	1076	1078	1080	1086	1088	1090
1097	1103	1111	1117	1125	1131	1139	1145	1153	1159	1167	1173	1183
1185	1192	1194	1202	1204	1211	1213	1221	1223	1230	1232	1247	1242
1249	1251	1259	1261	1268	1270	1278	1280	1287	1289	1299	1308	1311
1315	1324	1333	1336	1340	1349	1358	1361	1365	1374	1383	1386	1390
1399	1408	1411	1415	1424	1433	1436	1440	1449	1458	1461	1465	1473
1482	1485	1489	1500	1511	1522	1533	1544	1555	1566	1577	1588	1600
1611	1622	1633	1644	1655	1666	1677	1688	1700	1711	1722	1733	1744
1755	1766	1777	1788	1800	1811	1822	1833	1844	1855	1866	1877	1888
1900	1911	1922	1933	1944	1955	1966	1977	1988	2000	2011	2022	2033
2044	2055	2066	2077	2088	2100	2111	2122	2133	2145	2157	2169	2181
2194	2206	2219	2230	2241	2252							
2254*	2261*											
297*	305*	308*	309*	318*	319*	328*	329*	338*	339*	348*	349*	358*
359*	367*	368*	369*	370*	374*	375*	376*	381*	382*	383*	384*	388*
389*	390*	395*	396*	397*	398*	402*	403*	404*	409*	410*	411*	412*
416*	417*	418*	423*	424*	425*	426*	430*	431*	432*	437*	438*	439*
440*	444*	445*	446*	450*	453*	454*	463*	464*	473*	474*	483*	484*
493*	494*	503*	504*	512*	513*	514*	515*	519*	520*	521*	526*	527*
528*	529*	533*	534*	535*	540*	541*	542*	543*	547*	548*	549*	554*
555*	556*	557*	561*	562*	563*	568*	569*	570*	571*	575*	576*	577*
582*	583*	584*	585*	589*	590*	591*	595*	598*	599*	608*	609*	618*
619*	628*	629*	638*	639*	648*	649*	657*	658*	659*	660*	664*	665*
666*	671*	672*	673*	674*	678*	679*	680*	685*	686*	687*	688*	692*
693*	694*	699*	700*	701*	702*	706*	707*	708*	713*	714*	715*	716*
720*	721*	722*	727*	728*	729*	730*	734*	735*	736*	740*	743*	744*
753*	754*	763*	764*	773*	774*	783*	784*	793*	794*	802*	803*	804*
805*	809*	810*	811*	816*	817*	818*	819*	823*	824*	825*	830*	831*
832*	833*	837*	838*	839*	844*	845*	846*	847*	851*	852*	853*	858*
859*	860*	861*	865*	866*	867*	872*	873*	874*	875*	879*	880*	881*
885*	888*	889*	898*	899*	908*	909*	918*	919*	928*	929*	939*	939*
947*	948*	949*	950*	954*	955*	956*	961*	962*	963*	964*	968*	969*
970*	975*	976*	977*	978*	982*	983*	984*	989*	990*	991*	992*	996*
997*	998*	1003*	1004*	1005*	1005*	1010*	1011*	1012*	1017*	1018*	1019*	1020*
1024*	1025*	1026*	1030*	1033*	1034*	1043*	1044*	1053*	1054*	1063*	1064*	1073*
1074*	1083*	1084*	1092*	1093*	1094*	1095*	1099*	1100*	1101*	1106*	1107*	1108*
1109*	1113*	1114*	1115*	1120*	1121*	1122*	1123*	1127*	1128*	1129*	1134*	1135*
1136*	1137*	1141*	1142*	1143*	1148*	1149*	1150*	1151*	1155*	1156*	1157*	1162*

LOOP 010600
M = 000006

		1168	1174	1177	1186	1196	1205	1215	1224	1234	1243	1253	1262	1272
		1281	1292	1301	1317	1326	1342	1351	1367	1376	1392	1401	1417	1426
		1442	1451	1466	1475	1501	1512	1523	1534	1545	1556	1567	1578	1589
		1601	1612	1623	1634	1645	1656	1667	1678	1689	1701	1712	1723	1734
		1745	1756	1767	1778	1789	1801	1812	1823	1834	1845	1856	1867	1878
		1889	1901	1912	1923	1934	1945	1956	1967	1978	1989	2001	2012	2023
		2034	2045	2056	2067	2078	2089	2101	2112	2123	2134	2146	2158	2170
		2182	2195	2207	2220	2231	2242	2253						
TEMP	010604	2091*	2092*	2093*	2094*	2095*	2096*	2097*	2098	2102*	2103*	2104*	2105*	2106*
		2107*	2108*	2109	2113*	2114*	2115*	2116*	2117*	2118*	2119*	2120	2124*	2125*
		2126*	2127*	2128*	2129*	2130*	2131	2135	2147	2159	2171	2183	2196	2208*
		2209	2232*	2233*	2234*	2235*	2236*	2237*	2238*	2239	2243*	2244*	2245*	2246*
		2247*	2248*	2249*	2250	2263*								
TEND	010602	1443*	1444*	1445*	1446*	1447*	1452*	1453*	1454*	1455*	1456	1459	1462*	1463*
		1467*	1468*	1469*	1470*	1471*	1476*	1477*	1478*	1479*	1480	1483	1486*	1487*
		2262*												
.	= 010712	260*	261	263	265	267	269	271	273	275	277	279	281	283
		285	287	289	291	294*	310	312	314	320	322	324	330	332
		334	340	342	344	350	352	354	360	362	364	371	377	385
		391	399	405	413	419	427	433	441	447	455	457	459	465
		467	469	475	477	479	485	487	489	495	497	499	505	507
		509	516	522	530	536	544	550	558	564	572	578	586	592
		600	602	604	610	612	614	620	622	624	630	632	634	640
		642	644	650	652	654	661	667	675	681	689	695	703	709
		717	723	731	737	745	747	749	755	757	759	765	767	769
		775	777	779	785	787	789	795	797	799	806	812	820	826
		834	840	848	854	862	868	876	882	890	892	894	900	902
		904	910	912	914	920	922	924	930	932	934	940	942	944
		951	957	965	971	979	985	993	999	1007	1013	1021	1027	1035
		1037	1039	1045	1047	1049	1055	1057	1059	1065	1067	1069	1075	1077
		1079	1085	1087	1089	1096	1102	1110	1116	1124	1130	1138	1144	1152
		1158	1166	1172	1182	1184	1191	1193	1201	1203	1210	1212	1220	1222
		1229	1231	1239	1241	1248	1250	1258	1260	1267	1269	1277	1279	1286
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		1373	1382	1385	1389	1398	1407	1410	1414	1423	1432	1435	1439	1448
		1457	1460	1464	1472	1481	1484	1488	1499	1510	1521	1532	1543	1554
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		1854	1865	1876	1887	1899	1910	1921	1932	1943	1954	1965	1976	1987
		1999	2010	2021	2032	2043	2054	2065	2076	2087	2099	2110	2121	2132
		2144	2156	2168	2180	2193	2205	2218	2229	2240	2251	2255	2259	2265*

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MO4

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DOEA.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

ASL	1295	1320	1345	1370	1395	1420	1445	1469							
ASLB	1305	1330	1355	1380	1405	1430	1455	1479							
ASR	349	425	432	494	570	577	639	715	722	784	860	867	929	1005	1012
ASRB	1074	1150	1157												
	359	439	446	504	584	591	649	729	736	794	874	881	939	1019	1026
BCC	1084	1164	1171												
	312	322	332	342	352	362	457	467	477	487	497	507	602	612	622
	632	642	652	747	757	767	777	787	797	892	902	912	922	932	942
BCS	1037	1047	1057	1067	1077	1087									
BEQ	1182	1191	1201	1210	1220	1229	1239	1248	1258	1267	1277	1286			
	310	320	330	340	350	360	371	385	399	413	427	441	455	465	475
	485	495	505	516	530	544	558	572	586	600	610	620	630	640	650
	661	675	689	703	717	731	745	755	765	775	785	795	806	820	834
	848	862	876	890	900	910	920	930	940	951	965	979	993	1007	1021
	1035	1045	1055	1065	1075	1085	1096	1110	1124	1138	1152	1166	1298	1307	1314
	1323	1332	1339	1348	1357	1364	1373	1382	1389	1398	1407	1414	1423	1432	1439
	1448	1457	1464	1472	1481	1488	1499	1510	1521	1532	1543	1554	1565	1576	1587
	1599	1610	1621	1632	1643	1654	1665	1676	1687	1699	1710	1721	1732	1743	1754
	1765	1776	1787	1799	1810	1821	1832	1843	1854	1865	1876	1887	1899	1910	1921
	1932	1943	1954	1965	1976	1987	1999	2010	2021	2032	2043	2054	2065	2076	2087
	2099	2110	2121	2132	2144	2156	2168	2180	2193	2205	2218	2229	2240	2251	2255
BMI	1310	1335	1360	1385	1410	1435	1460	1484							
BPL	2259														
BVC	314	324	334	344	354	364	377	391	405	419	433	447	459	469	479
	489	499	509	522	536	550	564	578	592	604	614	624	634	644	654
	667	681	695	709	723	737	749	759	769	779	789	799	812	826	840
	854	868	882	894	904	914	924	934	944	957	971	985	999	1013	1027
BVS	1039	1049	1059	1069	1079	1089	1102	1116	1130	1144	1158	1172			
CCC	1184	1193	1203	1212	1222	1231	1241	1250	1260	1269	1279	1288			
	307	317	327	337	347	357	452	462	472	482	492	502	597	607	617
	627	637	647	742	752	762	772	782	792	887	897	907	917	927	937
	1032	1042	1052	1062	1072	1082	1180	1189	1199	1208	1218	1227	1237	1246	1256
CLR	1265	1275	1284												
	308	318	328	338	348	358	367	374	381	388	395	402	409	416	423
	430	437	444	453	463	473	483	493	503	512	519	526	533	540	547
	554	561	568	575	582	589	598	608	618	628	638	648	657	664	671
	678	685	692	699	706	713	720	727	734	743	753	763	773	783	793
	802	809	816	823	830	837	844	851	858	865	872	879	888	898	908
	918	928	938	947	954	961	968	975	982	989	996	1003	1010	1017	1024
	1033	1043	1053	1063	1073	1083	1092	1099	1106	1113	1120	1127	1134	1141	1148
	1155	1162	1169	1178	1187	1197	1206	1216	1225	1235	1244	1254	1263	1273	1282
	1293	1302	1318	1327	1343	1352	1368	1377	1393	1402	1418	1427	1443	1452	1467
CMP	1476														
	1498	1509	1520	1531	1542	1553	1564	1575	1586	1598	1609	1620	1631	1642	1653
	1664	1675	1686	1698	1709	1720	1731	1742	1753	1764	1775	1786	1798	1809	1820
	1831	1842	1853	1864	1875	1886	1898	1909	1920	1931	1942	1953	1964	1975	1986
	1998	2009	2020	2031	2042	2053	2064	2075	2086	2098	2109	2120	2131	2143	2155
	2167	2179	2192	2204	2217	2228									
CMPB	2239	2250													
COM	368	370	375	382	384	389	396	398	403	410	412	417	424	426	431
	438	440	445	513	515	520	527	529	534	541	543	548	555	557	562
	569	571	576	583	585	590	658	650	665	672	674	679	686	688	693
	700	702	707	714	716	721	728	730	735	803	805	810	817	819	824
	831	833	838	845	847	852	859	861	866	873	875	880	948	950	955
	962	964	969	976	978	983	990	992	997	1004	1006	1011	1018	1020	1025
	1093	1095	1100	1107	1109	1114	1121	1123	1128	1135	1137	1142	1149	1151	1156

	1163	1165	1170	1179	1188	1198	1207	1217	1226	1236	1245	1255	1264	1274	1283
	1294	1297	1303	1312	1319	1322	1328	1337	1344	1347	1353	1362	1369	1372	1378
	1387	1394	1397	1403	1412	1419	1422	1428	1437	1444	1447	1453	1462	1468	1471
	1477	1486													
COMB	1313	1338	1363	1388	1413	1438	1463	1487							
HALT	258	262	264	266	268	270	272	274	276	278	280	282	284	286	288
	290	292													
INC	1296	1321	1346	1371	1404	1421	1446	1470	2254						
INCB	1304	1329	1354	1379	1404	1429	1454	1478							
JMP	2256	2260													
MOV	1491	1502	1513	1524	1535	1546	1557	1568	1579	1591	1602	1613	1624	1635	1646
	1657	1668	1679	1691	1702	1713	1724	1735	1746	1757	1768	1779	1791	1802	1813
	1824	1835	1846	1857	1868	1879	1891	1902	1913	1924	1935	1946	1957	1968	1979
	1991	2002	2013	2024	2035	2046	2057	2068	2079	2091	2102	2113	2124	2135	2136
	2147	2148	2159	2160	2171	2172	2183	2185	2196	2197	2208	2209	2210	2221	2257
MOVB	2232	2243													
ROL	329	397	404	474	542	549	619	687	694	764	832	839	909	977	984
	1054	1122	1129	1495	1496	1497	1505	1507	1508	1517	1518	1519	1528	1529	1530
	1539	1540	1541	1595	1596	1597	1606	1607	1608	1617	1618	1619	1628	1629	1630
	1639	1640	1641	1695	1696	1697	1706	1707	1708	1717	1718	1719	1728	1729	1730
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	1939	1940	1941	1995	1996	1997	2006	2007	2008	2017	2018	2019	2028	2029	2030
	2039	2040	2041	2095	2096	2097	2117	2118	2119	2140	2141	2142	2152	2153	2154
	2189	2190	2191	2214	2215	2216									
ROLB	339	411	418	484	556	563	629	701	708	774	846	853	919	991	998
	1064	1136	1143	1550	1551	1552	1561	1562	1563	1572	1573	1574	1583	1584	1585
	1650	1651	1652	1661	1662	1663	1672	1673	1674	1683	1684	1685	1750	1751	1752
	1761	1762	1763	1772	1773	1774	1783	1784	1785	1850	1851	1852	1861	1862	1863
	1872	1873	1874	1883	1884	1885	1950	1951	1952	1961	1962	1963	1972	1973	1974
	1983	1984	1985	2050	2051	2052	2061	2062	2063	2072	2073	2074	2083	2084	2085
	2106	2107	2108	2128	2129	2130	2164	2165	2166	2176	2177	2178	2201	2202	2203
	2225	2226	2227	2236	2237	2238	2247	2248	2249						
ROR	309	369	376	454	514	521	599	659	666	744	804	811	889	949	956
	1034	1094	1101	1181	1200	1219	1238	1257	1276	1492	1493	1494	1503	1504	1505
	1514	1515	1516	1525	1526	1527	1536	1537	1538	1592	1593	1594	1603	1604	1605
	1614	1615	1616	1625	1626	1627	1636	1637	1638	1692	1693	1694	1703	1704	1705
	1714	1715	1716	1725	1726	1727	1736	1737	1738	1792	1793	1794	1803	1804	1805
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	2014	2015	2016	2025	2026	2027	2036	2037	2038	2092	2093	2094	2114	2115	2116
	2137	2138	2139	2149	2150	2151	2186	2187	2188	2211	2212	2213			
RORB	319	383	390	464	528	535	609	673	680	754	818	825	899	963	970
	1044	1108	1115	1190	1209	1228	1247	1266	1285	1547	1548	1549	1558	1559	1560
	1569	1570	1571	1580	1581	1582	1647	1648	1649	1658	1659	1660	1669	1670	1671
	1680	1681	1682	1747	1748	1749	1758	1759	1760	1769	1770	1771	1780	1781	1782
	1847	1848	1849	1858	1859	1860	1869	1870	1871	1880	1881	1882	1947	1948	1949
	1958	1959	1960	1969	1970	1971	1980	1981	1982	2047	2048	2049	2058	2059	2060
	2069	2070	2071	2080	2081	2082	2103	2104	2105	2125	2126	2127	2161	2162	2163
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TST	1309	1334	1359	1384	1409	1434	1459	1483							
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.END	2267														
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DOEP.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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.MLIST	1				
.REM	1				
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DEFAULT GLOBALS GENERATED: 0

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RUN-TIME RATIO: 138.73=2.1
CORE USED: 33K (65 PAGES)

