

# KG11-A

CYCLIC REDUNDANCY CHECK  
MD-11-DZKGA-A

EP DZKGA A DL A

OCT 1976

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**digital**

FICHE 1 OF 1

Made in U.S.A.

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## IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZKGA-A-D  
PRODUCT NAME: KG11A - CYCLIC REDUNDANCY CHECK TEST  
DATE CREATED: 21 MAY 76  
MAINTAINER: DIAGNOSTIC GROUP  
AUTHOR: D.K. MACOMBER  
NOTE: THIS PROGRAM OBSOLETE MD-11-DBK

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ABSTRACT.

THIS PROGRAM TESTS THE LOGIC OF THE CYCLIC REDUNDANCY CHECK  
 DEVICE (KG11A).

REQUIREMENTS.

A STANDARD PDP-11 (WITH OR WITHOUT A HARDWARE SWITCH REGISTER)  
 AND A KG11

LOADING--STORAGE.

LOADING PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

DEVICE ADDRESS CHANGE.

\*\*\*\*\*

TO CHANGE THE DEVICE ADDRESS (WHICH WAS LOADED AS 170700),  
 CHANGE THE CONTENTS OF THE LOCATION "DEVADR" SHOWN ON  
 PAGE 24. SET THIS LOCATION TO THE ADDRESS OF THE CSR  
 DESIRED. THEN START (OR RESTART) AS GIVEN IN OPERATION BELOW.

OPERATION.

1. THIS PROGRAM MAY BE OPERATED IN TWO MODES.
  - A. FULL TEST MODE.  
 THIS IS THE MAIN BODY OF THE PROGRAM AND SHOULD  
 BE USED TO ACCEPT OR DIAGNOSE A DEVICE.  
 TO RUN: START AT LOC. 200 WITH SWR15 SET.  
 (DETAIL ON PAGE 5.)
  - B. SELECT TEST MODE  
 THIS IS A SUBPROGRAM TO ALLOW THE OPERATOR TO RUN  
 A SELECT INSTRUCTION ON A SELECT DATA WORD.  
 TO RUN: START AT LOC. 204 WITH SWR15 SET.  
 SELECT INSTRUCTION ON SWRS-3.  
 SELECT DATA WORD ON SWR11-6.  
 (DETAIL ON PAGE 6.)

SWITCH REGISTER.  
-----

IF THE DIAGNOSTIC IS RUN ON A CPU WITHOUT A SWITCH REGISTER THEN A SOFTWARE SWITCH REGISTER IS USED WHICH ALLOWS THE USER THE SAME SWITCH OPTIONS AS THE HARDWARE SWITCH REGISTER. IF THE HARDWARE SWITCH REGISTER DOES NOT EXIST OR IF ONE DOES AND IT CONTAINS ALL ONES (177777) THEN THE SOFTWARE SWITCH REGISTER (LOC. 176) IS USED.

## CONTROL:

THIS PROGRAM ALSO SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH REGISTER (LOC. 176) FROM THE TTY. THIS CAN BE ACCOMPLISHED BY DOING THE FOLLOWING:

- 1) TYPE CONTROL G (<G>); THIS WILL ALLOW THE TTY TO ENTER DATA INTO LOC. 176 AT SELECTED POINTS WITHIN THE PROGRAM.
- 2) THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW= (XXXXXX IS THE OCTAL CONTENTS OF THE SOFTWARE SWITCH REGISTER.)
- 3) AFTER THE ''NEW='' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE OF THE FOLLOWING AT THE TTY:
  - A) TYPE A NUMBER TO BE LOADED INTO LOC. 176 FOLLOWED BY A <CR>. (ONLY NUMBERS BETWEEN 0-7 WILL BE ACCEPTED AND ONLY 6 NUMBERS WILL BE ALLOWED)  
IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH REGISTER CONTENTS WILL NOT BE CHANGED.
  - B) IF A CONTROL U (<U>) IS DEPRESSED THEN THE PROGRAM WILL SEND YOU BACK TO STEP 2.

1. SWR15 SET, HALT ON ERROR.  
RESET, BYPASS ERROR.
2. SWR14 SET, SCOPE LOOP ON ERROR.  
RESET, BYPASS ERROR.
3. SWR13 SET, INHIBIT PRINTOUTS DURING SCOPE LOOP.  
RESET, ALLOW PRINTOUTS DURING SCOPE LOOP.
4. SWR12 SET, INHIBIT TRACE TRAPPING.  
RESET, ALLOW TRACE TRAPPING.
5. SWR11 SET, INHIBIT ITERATIONS.  
RESET, ALLOW ITERATIONS.
6. SWR11 - SWR6 AND SWR5 - SWR0 ARE DEFINED IN THE  
SELECT TEST MODE SECTION ON PG. 6 & 7.

FULL TEST MODE.

1. START OR RESTART.
  - A. ZERO THE SWR
  - B. LOAD 200 AND START
2. PROGRAM ACTION.
  - A. WHENEVER THE PROGRAM IS STARTED, OR RESTARTED, THE TTY WILL TYPE: KGI1A.
  - B. IF THE SOFTWARE SWITCH REGISTER IS SELECTED THEN THE FOLLOWING WILL BE TYPED:  
SWR=XXXXXX NEW=(REFER TO SWITCH REGISTER SECTION FOR OPERATOR ACTIONS)
  - C. IF THERE ARE NO ERRORS DETECTED, THE PROGRAM WILL LOOP INDEFINITELY AND WILL RING THE TTY BELL ONCE FOR EACH PASS. TRACE TRAP IS EFFECTIVE AND EACH SUBTEST IS BEING ITERATED 100 TIMES.
  - D. IF AN ERROR OCCURS, A ONE LINE ERROR MESSAGE WILL BE TYPED ON THE TTY AND THE PROGRAM WILL HALT. (SEE THE ERROR SECTION ON PAGE 8.)
3. OPERATER CONTROL VIA THE SWR.

(REFER TO SECTION ON SWITCH REGISTER SETTINGS FOR SOFTWARE SWITCH REGISTER.)

  - A. SWR15 SET. (NORMAL)  
HALT ON ERROR AFTER ERROR MESSAGE IS TYPED.  
  
SWR15 RESET.  
TYPE THE ERROR MESSAGE AND CONTINUE TO THE NEXT ITERATION OF THE CURRENT TEST OR TO THE NEXT SUBTEST.
  - B. SWR12 SET.  
INHIBIT TRACE TRAP.  
  
SWR12 RESET (NORMAL)  
ALLOW TRACE TRAP.
  - C. SWR11 SET.  
INHIBIT ITERATIONS  
  
SWR11 RESET (NORMAL)  
ALLOW ITERATIONS

SELECT TEST MODE.

1. START OR RESTART.
  - A. RESET SWR15 THRU SWR0.
  - B. LOAD ADDRESS 204
  - C. SELECT THE INSTRUCTION TO BE TESTED FROM THE LIST OF INSTRUCTIONS ON PAGE NN OF THE PROGRAM LISTING. SET SWRS THRU SWRD TO THE "I" NUMBER GIVEN WITH SAID INSTRUCTION.
  - D. SELECT THE DATA WORD TO BE TESTED FROM THE LIST OF DATA WORDS GIVEN ON PAGES NN AND NN OF THE PROGRAM LISTING. SET SWR11 THRU SWR6 TO THE "D" NUMBER GIVEN WITH THE SAID DATA WORD.
  - E. START.
  - F. \*\*\*\*REFER TO SECTION ON SWITCH SETTINGS FOR SOFTWARE SWITCH REGISTER ACTION.

## SPECIAL NOTES ON C. AND D. ABOVE.

1. THE SELECTED INSTRUCTION AND/OR THE SELECTED DATA MAY BE CHANGED WHILE THE PROGRAM IS RUNNING.
2. IF SWR11 THRU SWR6 ARE ALL RESET, THEN THE SELECTED INSTRUCTION WILL RUN ON ALL DATA WORDS.
3. IF SWRS THRU SWRD ARE ALL RESET THEN ALL INSTRUCTIONS WILL BE RUN ON THE SELECTED DATA WORD.
4. IF SWR11 THRU SWR6 AND SWRS THRU SWRD ARE ALL RESET, THEN ALL INSTRUCTIONS WILL BE RUN ON ALL DATA WORDS.

## 2. PROGRAM ACTION

- A. IF THERE ARE NO ERRORS THE PROGRAM WILL LOOP THE SELECTED INSTRUCTION (SWR5-0) USING THE SELECTED DATA (SWR11-6). TRACE TRAP IS EFFECTIVE.
- B. IF AN ERROR OCCURS, A ONE LINE ERROR MESSAGE WILL BE TYPED ON THE TTY AND THE PROGRAM WILL HALT. (SEE THE ERROR SECTION ON PAGE 8.)

(REFER TO SWITCH SETTING SECTION FOR USE OF SOFTWARE SWITCH REGISTER)

## 3. OPERATER CONTROL VIA THE SWR.

(REFER TO SECTION ON SWITCH SETTING'S FOR SOFTWARE SWITCH REGISTER DYNAMIC CHANGING.)

- A. SWR15 SET. (NORMAL)  
HALT ON ERROR AFTER ERROR MESSAGE IS TYPED.  
  
SWR15 RESET.  
TYPE THE ERROR MESSAGE AND CONTINUE TESTING THE SELECTED INSTRUCTION (SWR5-0) USING THE SELECTED DATA (SWR11-6)
- B. SWR12 SET.  
INHIBIT TRACE TRAP.  
  
SWR12 RESET. (NORMAL)  
ALLOW TRACE TRAP.
- C. SWR11 THRU SWR6.  
SELECTED DATA WORD.
- D. SWR5 THRU SWR0.  
SELECTED INSTRUCTION.



ERRORS  
-----

## 1. ERROR MESSAGE

\*\*\*ROUTINE CHECKS FOR THE DYNAMIC CHANGING OF THE SOFTWARE SWITCH REGISTER REFER TO SWITCH SETTING SECTION FOR OPERATOR ACTION.  
TESTX IXX DXX SXXXXXX HXXXXXX

TESTX (X = A OR B)  
THIS IS THE NAME (TAG) OF THE TEST THAT WAS IN USE AT THE TIME OF THE ERROR.  
TESTA IS ON PAGE 27 OF THE PROG. LIST.  
TESTB IS ON PAGE 28 OF THE PROG. LIST.

IXX (XX = A NUMBER FROM 01 THRU 57)

THIS IS THE NAME/NUMBER (TAG) OF THE INSTRUCTION IN USE AT THE TIME OF THE ERROR.  
R1 (INST. POINTER) POINTS AT THIS INSTRUCTION.  
THE INSTRUCTION TABLE IS ON PAGE 18 OF THE PROG. LIST.

DXX (XX = A NUMBER FROM 01 THRU 77)

THIS IS THE NAME/NUMBER (TAG) OF THE DATA WORD IN USE AT THE TIME OF THE ERROR.  
R2 (DATA WORD POINTER) POINTS AT THIS DATA WORD.  
THE DATA WORD TABLE IS ON PG. 20 OF THE PROG. LIST.

SXXXXXX (XXXXXX = ANY 6 DIGIT, 16 BIT, OCTAL NUMBER)  
THIS IS THE SIMULATED (GOOD) BCC WORD.

HXXXXXX (XXXXXX = ANY 6 DIGIT, 16 BIT, OCTAL NUMBER)  
THIS IS THE HARDWARE (BAD) BCC WORD.

DONE BIT: S\5 (EACH X CAN =0 OR 1)  
THIS IS THE STATUS OF THE DONE BIT (BIT 7 OF THE CSR).  
THE FIRST NUMBER (X\5) IS WHAT THE DONE BIT SHOULD BE (GOOD). THE SECCND NUMBER (\5) IS WHAT THE DONE BIT ACTUALLY WAS.

## 2. OPTIONS AFTER A HALT ON ERROR.

\*\*\*IF THE SOFTWARE SWITCH REGISTER IS USED THEN THE OPERATOR CAN CHANGE THE SWREG LOCATION BY TYPING A 1G AND THEN CONTINUING.\*\*\*

A. SCOPE LOOP. SEE SCOPE LOOP SECTION.

B. BYPASS THIS ERROR AND CONTINUE TO THE NEXT ITERATION OR SUBTEST.

1. RESET SWR14 AND SWR15.

2. CONTINUE.

C. UTILIZE SELECT TEST MODE (PAGE 6)

SCOPE LOOP

\*\*\*ROUTINE CHECKS FOR IG FUNCTION.\*\*\*

## 1. SET UP.

- A. SET SWR14.
- B. RESET SWR15.
- C. CONTINUE.

## 2. PROGRAM ACTION.

THE PROGRAM WILL SCOPE LOOP ON THE FAILING TEST FOR AS LONG AS SWR14 IS SET, AND SWR15 IS RESET.

## 3. OPERATOR CONTROL VIA THE SWR.

- A. SWR13 SET.  
INHIBIT ERROR TYPEOUTS.

SWR13 RESET.  
ALLOW ERROR TYPEOUTS.

- B. SWR12 SET.  
INHIBIT TRACE TRAPS.

SWR12 RESET.  
ALLOW TRACE TRAPS.

K01

.MAIN. MACY11 27(732) 25-MAR-76 08:43 PAGE 10  
DZKGAA.P11

FORCED ERROR TYPEOUT.  
-----

IN THE EVENT OF AN UNEXPECTED OR ILLEGAL TRAP, OR AT ANY TIME THE OPERATOR DEEMS IT USEFUL, THE PROGRAM CAN BE HALTED (IF IT HASN'T ALREADY) AND A TYPEOUT CAN BE OBTAINED AS TO THE STATUS OF THE PROGRAM.

THIS TYPEOUT IS THE SAME ONE USED IN THE EVENT OF AN ACTUAL ERROR. (SEE ERROR MESSAGE ON PG. 8.)

1. HALT THE PROGRAM
2. START AT LOC. 210. (SWR SETTINGS ARE IMMATERIAL.)

THE TYPEOUT WILL BE MADE AND THE PROGRAM WILL HALT. THE PROGRAM CAN NOW BE RESTARTED. (SEE OPERATION, PG. 3.)

.ENDR

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```

.LIST SEQ
.ENABLE ABS

;KG11A CYCLIC REDUNDANCY CHECK DEVICE TEST.
;COPYRIGHT 1976, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754.

;PROGRAM OBSOLETES MD-11-D8K
;RELEASED 21 MAY 76 BY SAM CARPENTER
;SUPPORTS THE SOFTWARE SWITCH REGISTER LOC.176
;ALSO SUPPORTS THE DYNAMIC LOADING OF LOC. 176

;TRAP CATCHER (LOC. 0 TO LOC. 776)*****

.REPT 30
.+2
HALT ;TRAPPED TO PREVIOUS ADDRESS.
.ENDR

.REPT 30
.+2
HALT ;TRAPPED TO PREVIOUS ADDRESS.
.ENDR

.REPT 30
.+2
HALT ;TRAPPED TO PREVIOUS ADDRESS.
.ENDR

.REPT 30
.+2
HALT ;TRAPPED TO PREVIOUS ADDRESS.
.ENDR

.REPT 30
.+2
HALT ;TRAPPED TO PREVIOUS ADDRESS.
.ENDR

.REPT 10
.+2
HALT ;TRAPPED TO PREVIOUS ADDRESS.
.ENDR

```

# MO1

.MAIN. MACY11 27(732) 25-MAR-76 08:43 PAGE 12  
DZKGA.P11

454					
455		000014		.=14	
456	000014	003654		TRTRTN	
457	000016	000340		340	
458		000030		.=30	
459	000030	002776		ERR	
460	000032	000340		340	
461		000034		.=34	
462	000034	003642		SCORCD	
463	000036	000340		340	
464					
465					
466					
467		000176			
468	000176	000000		.=176	
469				SWREG: 0	
470					
471					
472		000200			
473	000200	000167	001452	NORMAL: JMP	IDENT
474		000204			
475	000204	000167	001476	SELECT: JMP	INTA
476		000210			
477	000210	000167	002734	FORERR: JMP	FORCER
478					
479					

;;SOFTWARE SWITCH REGISTER\*\*\*\*\*

;;SOFTWARE SWITCH REGISTER

;;PROGRAM STARTS\*\*\*\*\*

479  
480  
481 001000 001000  
482 001002 000402  
483 001004 003716  
484 001006 001002  
485 001010 003716  
486 001012 001402  
487 001014 003716  
488 001016 002002  
489 001016 003716  
490 001020 002402  
491 001022 003716  
492 001024 003002  
493 001026 003716  
494 001030 003402  
495 001032 003716  
496 001034 004002  
497 001036 003716  
498 001040 000403  
499 001042 003672  
500 001044 001003  
501 001046 003672  
502 001050 001403  
503 001052 003572  
504 001054 002003  
505 001056 003672  
506 001060 002403  
507 001062 003672  
508 001064 003003  
509 001066 003672  
510 001070 003403  
511 001072 003672  
512 001074 004003  
513 001076 003672  
514 001100 000401  
515 001102 004026  
516 001104 001001  
517 001106 004026  
518 001110 001401  
519 001112 004026  
520 001114 002001  
521 001116 004026  
522 001120 002401  
523 001122 004026  
524 001124 003001  
525 001126 004026  
526 001130 003401  
527 001132 004026  
528 001134 004001  
529 001136 004026  
530 001140 000405  
531 001142 004164  
532 001144 001005  
533 001146 004164

: INSTRUCTION TABLE

. = 1000  
I01: 000402 ;LRC8 1 STEP.  
SMLRCF  
I02: 001002 ;LRC8 2 STEPS.  
SMLRCF  
I03: 001402 ;LRC8 3 STEPS.  
SMLRCF  
I04: 002002 ;LRC8 4 STEPS.  
SMLRCF  
I05: 002402 ;LRC8 5 STEPS.  
SMLRCF  
I06: 003002 ;LRC8 6 STEPS.  
SMLRCF  
I07: 003402 ;LRC8 7 STEPS.  
SMLRCF  
I10: 004002 ;LRC8 10 STEPS.  
SMLRCF  
I11: 000403 ;LRC16 1 STEP.  
SMLRCC  
I12: 001003 ;LRC16 2 STEPS.  
SMLRCC  
I13: 001403 ;LRC16 3 STEPS.  
SMLRCC  
I14: 002003 ;LRC16 4 STEPS.  
SMLRCC  
I15: 002403 ;LRC16 5 STEPS.  
SMLRCC  
I16: 003003 ;LRC16 6 STEPS.  
SMLRCC  
I17: 003403 ;LRC16 7 STEPS.  
SMLRCC  
I20: 004003 ;LRC16 10 STEPS.  
SMLRCC  
I21: 000401 ;CRC16 1 STEP.  
SMC16C  
I22: 001001 ;CRC16 2 STEPS.  
SMC16C  
I23: 001401 ;CRC16 3 STEPS.  
SMC16C  
I24: 002001 ;CRC16 4 STEPS.  
SMC16C  
I25: 002401 ;CRC16 5 STEPS.  
SMC16C  
I26: 003001 ;CRC16 6 STEPS.  
SMC16C  
I27: 003401 ;CRC16 7 STEPS.  
SMC16C  
I30: 004001 ;CRC16 10 STEPS.  
SMC16C  
I31: 000405 ;CCITT 1 STEP.  
SMCITC  
I32: 001005 ;CCITT 2 STEPS.  
SMCITC

001150 001405  
001152 004164  
001154 002005  
001156 004164  
001160 002405  
001162 004164  
001164 003005  
001166 004164  
001170 003405  
001172 004164  
001174 004005  
001176 004164  
001200 000400  
001202 004314  
001204 001000  
001206 004314  
001210 001400  
001212 004314  
001214 002000  
001216 004314  
001220 002400  
001222 004314  
001224 003000  
001226 004314  
001230 000102  
001232 003710  
001234 000112  
001236 003702  
001240 000103  
001242 003664  
001244 000113  
001246 003556  
001250 000101  
001252 004020  
001254 000111  
001256 004012  
001260 000105  
001262 004156  
001264 000115  
001266 004150  
001270 000100  
001272 004306  
001274 000102  
001276 003710  
001300 000102  
001302 003710  
001304 000102  
001306 003710  
001310 000102  
001312 003710  
001314 000102  
001316 003710  
001320 000102  
001322 003710

I33: 001405 ;CCITT 3 STEPS.  
SMCITC  
I34: 002005 ;CCITT 4 STEPS.  
SMCITC  
I35: 002405 ;CCITT 5 STEPS.  
SMCITC  
I36: 003005 ;CCITT 6 STEPS.  
SMCITC  
I37: 003405 ;CCITT 7 STEPS.  
SMCITC  
I40: 004005 ;CCITT 10 STEPS.  
SMCITC  
I41: 000400 ;CRC12 1 STEP.  
SMC128  
I42: 001000 ;CRC12 2 STEPS.  
SMC128  
I43: 001400 ;CRC12 3 STEPS.  
SMC128  
I44: 002000 ;CRC12 4 STEPS.  
SMC128  
I45: 002400 ;CRC12 5 STEPS.  
SMC128  
I46: 003000 ;CRC12 6 STEPS.  
SMC128  
I47: 000102 ;LRC8 ONE BYTE DATA.  
SMLRCE  
I50: 000112 ;LRC8 TWO BYTE DATA.  
SMLRCD  
I51: 000103 ;LRC16 ONE BYTE DATA.  
SMLRCB  
I52: 000113 ;LRC16 TWO BYTE DATA.  
SMLRCA  
I53: 000101 ;CRC16 ONE BYTE DATA.  
SMC16B  
I54: 000111 ;CRC16 TWO BYTE DATA.  
SMC16A  
I55: 000105 ;CCITT ONE BYTE DATA.  
SMCITB  
I56: 000115 ;CCITT TWO BYTE DATA  
SMCITA  
I57: 000100 ;CRC12 ONE BYTE DATA.  
SMC12A  
I60: 000102 ;RESERVED.  
SMLRCE  
I61: 000102 ;RESERVED.  
SMLRCE  
I62: 000102 ;RESERVED.  
SMLRCE  
I63: 000102 ;RESERVED.  
SMLRCE  
I64: 000102 ;RESERVED.  
SMLRCE  
I65: 000102 ;RESERVED  
SMLRCE

001324	000102
001326	003710
001330	000102
001332	003710
001334	000102
001336	003710
001340	000102
001342	003710
001344	000102
001346	003710
001350	000102
001352	003710
001354	000102
001356	003710
001360	000102
001362	003710
001364	000102
001366	003710
001370	000102
001372	003710

166:	000102	:RESERVED
	SMLRCE	
167:	000102	:RESERVED
	SMLRCE	
170:	000102	:RESERVED
	SMLRCE	
171:	000102	:RESERVED
	SMLRCE	
172:	000102	:RESERVED
	SMLRCE	
173:	000102	:RESERVED
	SMLRCE	
174:	000102	:RESERVED
	SMLRCE	
175:	000102	:RESERVED
	SMLRCE	
176:	000102	:RESERVED
	SMLRCE	
177:	000102	:RESERVED
	SMLRCE	



609		
610		
611	001374	000001
612	001376	000002
613	001400	000004
614	001402	000010
615	001404	000020
616	001406	000040
617	001410	000100
618	001412	000200
619	001414	000400
620	001416	001000
621	001420	002000
622	001422	004000
623	001424	010000
624	001426	020000
625	001430	040000
626	001432	100000
627	001434	177776
628	001436	177775
629	001440	177773
630	001442	177767
631	001444	177757
632	001446	177737
633	001450	177677
634	001452	177577
635	001454	177377
636	001456	176777
637	001460	175777
638	001462	173777
639	001464	167777
640	001466	157777
641	001470	137777
642	001472	077777

:DATA WORD TABLE

001:	000001
002:	000002
003:	000004
004:	000010
005:	000020
006:	000040
007:	000100
010:	000200
011:	000400
012:	001000
013:	002000
014:	004000
015:	010000
016:	020000
017:	040000
020:	100000
021:	177776
022:	177775
023:	177773
024:	177767
025:	177757
026:	177737
027:	177677
030:	177577
031:	177377
032:	176777
033:	175777
034:	173777
035:	167777
036:	157777
037:	137777
040:	077777

052525  
 125252  
 031463  
 146314  
 070707  
 107070  
 007417  
 170360  
 041045  
 136732  
 154321  
 023456  
 133333  
 044444  
 000000  
 177777  
 000000  
 111111  
 022222  
 133333  
 044444  
 155555  
 066666  
 177777  
 101010  
 111111  
 121212  
 131313  
 141414  
 151515  
 161616

041:  
 042:  
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 125252  
 031463  
 146314  
 070707  
 107070  
 007417  
 170360  
 041045  
 136732  
 154321  
 023456  
 133333  
 044444  
 000000  
 177777  
 000000  
 111111  
 022222  
 133333  
 044444  
 155555  
 066666  
 177777  
 101010  
 111111  
 121212  
 131313  
 141414  
 151515  
 161616

```

674
675
676
677
678 000000
679 000001
680 000002
681 000003
682 000004
683 000005
684 000006
685 000007
686 000007
687 001572 177570
688 177776
689 104400
690 104000
691 000240
692 177560
693 177562
694 177564
695 177566
696 001000
697 001270
698 001374
699 001570
700 001574 170700
701 001576 000000
702 001600 000000
703 001602 000000
704 001604 000000
705 001606 000000
706 001610 000000
707 001612 000000
708 001614 000000
709 001616 000100
710 001620 000000
711 001622 000000
712 001624 000000
713 001626 000000
714 001630 000000
715 001632 000000
716 001634 000000
717 001636 000000
718 001640 000000
719 001642 000000
720 001644 000000
721 001646 000000
722 001650 000000
723 001652 000000
724 001654 000000

```

::EQUATES, CONSTANTS AND VARIABLES

```

R0=%0
R1=%1
R2=%2
R3=%3
R4=%4
R5=%5
SP=%6
PC=%7
R7=PC
SWR: 177570
PS=177776
SCOPE=TRAF
HLT=EMT
NOP=240
TKCSR= 177560
TKDBR= 177562
TPCSR= 177564
TPDBR= 177566
INTBEG=I01
INTEND=I57
DATBEG=D01
DATEND=D77
DEVADR: 170700
DFLG: 0
DFLGA: 0
EFLG: 0
HBCC: 0
HDONE: 0
IFLG: 0
IFLGA: 0
ITACNT: 0
ITANO: 100
OPSTAT: 0
OTACNT: 0
OTAWKA: 0
OTAWKB: 0
SELFLG: 0
SCORTN: 0
SMBCC: 0
SMBCCA: 0
SMCNT: 0
SMDATA: 0
SMDONE: 0
SMWKA: 0
SMWKB: 0
STCNT: 0
TEWK: 0

```

```

;WORK.
;INSTRUCTION POINTER.
;DATA POINTER.
;DEVICE ADDRESS POINTER (BCC).
;WORK
;SUBROUTINES.
;STACK POINTER
;PC
;SWITCH REGISTER.
;PROCESSOR STATUS
;TTY KEYBOARD STATUS
;TTY KEYBOARD BUFFER
;PRINTER STATUS
;PRINTER BUFFER

```

```

725
726
727
728
729 001656 000005          IDENT:  RESET
730 001660 012706 001000      MOV      #1000,SP      ;SET SP TO 1000.
731 001664 004567 001602      JSR      R5,TYPE      ;TYPE THE PROG. NAME.
732 001670 045536 030507 040461  .ASCII  /+KG11A+/\
733
734 001700 005067 177724      INIT:   .EVEN
735 001704 000402          CLR      SELFLG      ;CLEAR SELFLG (START WAS FROM LOC. 200.)
736 001706 005267 177716      BR      INTB         ;BRANCH.
737 001712 000005          INTA:   INC      SELFLG      ;SET SELFLG (START WAS FROM LOC. 204.)
738 001714 005067 177662      INTB:   RESET
739 001720 012706 001000      CLR      EFLG
740 001724 004767 002532      MOV      #1000,SP
741 001730 016703 177640      JSR      PC,SUSWR    ;CHECK FOR HARDWARE SWITCH REGISTER
742 001734 005723          MOV      DEVA DR,R3  ;R3 ← DEVICE ADDRESS.
743 001736 004567 000012      TST      (R3)+       ;ADJUST R3 TO POINT AT BCC.
744 001742 005767 177662      JSR      R5,OPCHG   ;READ SWR & SET UP PROG. ACCORDINGLY.
745 001746 001434          TST      SELFLG     ;WAS START FROM LOC. 200?
746 001750 000167 000266      BEQ      FULMOD     ;YES - BRANCH.
747
748
749 001754 017767 177612 177636  OPCHG:  MOV      JSWR,OPSTAT  ;STORE SWR.
750 001762 052767 000020 176006      BIS      #20,PS      ;SET "T" BIT IN PS.
751 001770 032767 010000 177622      BIT      #10000,OPSTAT ;INHIBIT TRACE TRAP?
752 001776 001403          BEQ      OPCA       ;NO. - BRANCH
753 002000 042767 000020 175770      BIC      #20,PS      ;YES. - CLEAR "T" BIT IN PS.
754 002006 005767 177616      OPCA:   TST      SELFLG ;SELECT MODE (START WAS FROM 202)?
755 002012 001011          BNE      OPCB       ;YES. - BRANCH.
756 002014 016767 177576 177572      MOV      ITANO,ITACNT ;NO. - SET ITERATE CNT. TO ITERATE NO.
757 002022 032767 004000 177570      BIT      #4000,OPSTAT ;INHIBIT ITERATIONS?
758 002030 001402          BEQ      OPCB       ;NO. - BRANCH.
759 002032 005067 177556      CLR      ITACNT     ;YES. - CLEAR ITERATE COUNTER
760 002036 000205          OPCB:   RTS      R5  ;RETRN.

```

```

761
762 ;FULL TEST MODE. CONTROL THE TESTING OF ALL KG11 INSTRUCTIONS
763 ;IN THE INSTRUCTION TABLE USING ALL DATA WORDS IN THE DATA
764 ;WORD TABLE WITH EACH INSTRUCTION.
765
766 002040 012701 001000 FULMOD: MOV #INTBEG,R1 ;INST. POINTER (R1) SET TO BEGIN OF INST. TABLE.
767 002044 012702 001374 FULA: MOV #DATBEG,R2 ;DATA POINTER (R2) SET TO BEGIN OF DATA TABLE.
768 002050 116167 000001 177562 FULB: MOVB +1(R1),SMCNT ;STEP COUNT (IF ANY) SET FOR SIMULATE.
769 002056 004767 002474 JSR PC,CKSWR ;CHECK FOR CNTL G TO LOAD SWR
770 002062 005067 177546 CLR SMBCC ;SIMULATED BCC SET TO 0.
771 002066 052767 000200 177550 BIS #200,SMDONE ;SET THE SIMULATED DONE BIT.
772 002074 004571 000002 JSR R5,#2(R1) ;SIMULATE INST. (VIA R1) ON DATA (VIA R2).
773 002100 105761 000001 FULC: TSTB +1(R1) ;IS THE INST. A STEP TYPE?
774 002104 001413 BEQ FULF ;NO - BRANCH.
775 002106 031127 004000 BIT (R1),#4000 ;YES. - IS THE INST. I10,I20,I30, OR I40?
776 002112 001005 BNE FULD ;YES. - BRANCH.
777 002114 021167 177104 CMP (R1),I46 ;NO. - IS THE INST. I46?
778 002120 001402 BEQ FULD ;YES. - BRANCH.
779 002122 005067 177516 CLR SMDONE ;NO. - CLEAR THE SIMULATED DONE BIT.
780 002126 004567 000440 FULD: JSR R5,TESTA ;DO TEST A (STEP INST. TEST).
781 002132 000402 BR FULF ;BRANCH.
782 002134 004567 000550 FULE: JSR R5,TESTB ;NO. - DO TEST B (NON-STEP INST. TEST).
783 002140 027767 177426 177452 FULF: CMP JSWR,OPSTAT ;HAS OPERATION STATUS STATUS (SWR) CHANGED?
784 002146 001403 BEQ FULG ;NO. - BRANCH.
785 002150 004567 177600 JSR R5,OPCHG ;YES. - GO SET UP NEW OPERATION STATUS.
786 002154 000731 BR FULMOD ;BRANCH.
787 002156 032767 004000 177434 FULG: BIT #4000,OPSTAT ;NO. - ITERATE?
788 002164 001006 BNE FULH ;NO. - BRANCH
789 002166 005367 177422 DEC ITACNT ;YES. - DECREMENT ITERATE COUNTER. IS IT=0?
790 002172 001342 BNE FULC ;NO. - BRANCH. (KEEP ITERATING).
791 002174 016767 177416 177412 MOV ITANO,ITACNT ;YES. - SET ITERATE CTR. TO ITERATE NUMBER.
792 002202 020227 001570 FULH: CMP R2,#DATEND ;HAVE ALL DATA WORDS BEEN TESTED?
793 002206 001403 BEQ FULI ;YES - BRANCH.
794 002210 062702 000002 ADD #2,R2 ;NO. - ADVANCE DATA POINTER (R2).
795 002214 000715 BR FULB ;BRANCH.
796 002216 020127 001270 FULI: CMP R1,#INTEND ;HAVE ALL INSTS. BEEN TESTED?
797 002222 001403 BEQ FULJ ;YES. - BRANCH.
798 002224 062701 000004 ADD #4,R1 ;NO. - ADVANCE INST. POINTER (R1).
799 002230 000705 BR FULA ;BRANCH.
800 002232 004567 001234 FULJ: JSR R5,TYPE ;YES. PASS COMPLETE. RING TTY BELL.
801 002236 057407 BR FULMOD ;BRANCH.
802 002240 000677
803

```

804									
805									
806									
807									
808	002242	012701	001000			SELMOD:	MOV	#INTBEG,R1	;INST. POINTER (R1) SET TO THE INST.
809	002246	016767	177346	177334			MOV	OPSTAT,IFLG	;SELECTED ON SR BITS 5-0.
810	002254	042767	177700	177326			BIC	#177700,IFLG	
811	002262	016767	177322	177322			MOV	IFLG,IFLGA	
812	002270	001412					BEQ	SELA	
813	002272	000241					CLC		
814	002274	006167	177310				ROL	IFLG	
815	002300	006167	177304				ROL	IFLG	
816	002304	162767	000004	177276			SUB	#4,IFLG	
817	002312	066701	177272				ADD	IFLG,R1	
818	002316	012702	001374			SELA:	MOV	#DATABEG,R2	;DATA POINTER (R2) SET TO THE DATA
819	002322	016767	177272	177246			MOV	OPSTAT,DFLG	;WORD SELECTED ON SR BITS 11-6
820	002330	042767	170077	177240			BIC	#170077,DFLG	
821	002336	016767	177234	177234			MOV	DFLG,DFLGA	
822	002344	001420					BEQ	SELB	
823	002346	000241					CLC		
824	002350	006067	177222				ROR	DFLG	
825	002354	006067	177216				ROR	DFLG	
826	002360	006067	177212				ROR	DFLG	
827	002364	006067	177206				ROR	DFLG	
828	002370	006067	177202				ROR	DFLG	
829	002374	162767	000002	177174			SUB	#2,DFLG	
830	002402	066702	177170				ADD	DFLG,R2	
831	002406	004767	002144			SELB:	JSR	PC,CKSWR	;CHECK FOR CNTL G TO LOAD SWREG
832	002412	116167	000001	177220			MOVB	+1(R1),SMCNT	;STEP COUNT (IF ANY) SET FOR SIMULATE.
833	002420	005067	177210				CLR	SMBCC	;SIMULATED BCC SET TO 0.
834	002424	052767	000200	177212			BIS	#200,SMDONE	;SET THE SIMULATED DONE BIT.
835	002432	004571	000002				JSR	R5,#2(R1)	;SIMULATE INST. (VIA R1) ON DATA (VIA R2).
836	002436	105761	000001				TSTB	+1(R1)	;IS THE INST. A STEP TYPE?
837	002442	001413					BEQ	SELD	;NO. - BRANCH.
838	002444	031127	004000				BIT	(R1),#4000	;YES. - IS THE INST. I10,I20,I30, OR I40?
839	002450	001005					BNE	SELC	;YES. - BRANCH.
840	002452	021167	176546				CMP	(R1),I46	;NO. - IS THE INST. I46?
841	002456	001402					BEQ	SELC	;YES. - BRANCH.
842	002460	005067	177160				CLR	SMDONE	;NO. - CLEAR THE SIMULATED DONE BIT.
843	002464	004567	000102			SELC:	JSR	R5,TESTA	;DO TEST A (STEP INST TEST).
844	002470	000402					BR	SELE	;BRANCH.
845	002472	004567	000212			SELD:	JSR	R5,TESTB	;NO - DO TEST B (NON-STEP INST. TEST).
846	002476	026777	177116	177066		SELE:	CMP	OPSTAT,ASWR	;HAS OPERATION STATUS (SWR SETTINGS) CHANGED?
847	002504	001403					BEQ	SELF	;NO. - BRANCH.
848	002506	004567	177242				JSR	R5,OPCHG	;YES. - GO SET UP NEW OPERATION STATUS.
849	002512	000653					BR	SELMOD	;BRANCH.
850	002514	005767	177060			SELF:	TST	DFLGA	;IS DATA FLAGA NON-ZERO?
851	002520	001010					BNE	SELH	;YES. - DATA POINTER (R2) IS FROZEN. - BRANCH.
852	002522	020227	001570				CMP	R2,#DATEND	;NO. - HAVE ALL DATA WORDS BEEN TESTED?
853	002526	001403					BEQ	SELG	;YES. - BRANCH.
854	002530	062702	000002				ADD	#2,R2	;NO. - ADVANCE DATA POINTER (R2).
855	002534	000724					BR	SELB	;BRANCH.
856	002536	012702	001374			SELG:	MOV	#DATABEG,R2	;DATA POINTER (R2) SET TO BEGIN OF DATA TABLE.
857	002542	005767	177044			SELH:	TST	IFLGA	;IS INST. FLAGA NON-ZERO?
858	002546	001317					BNE	SELB	;YES. - INST. POINTER (R1) IS FROZEN (BRANCH).
859	002550	020127	001270				CMP	R1,#INTEND	;NO. - HAVE ALL INSTS. BEEN TESTED?

860	002554	001403		BEQ	SELI	;YES. - BRANCH.
861	002556	062701	000004	ADD	#4,R1	;NO. - ADVANCE INST. POINTER (R1).
862	002562	000711		BR	SEI B	;BRANCH.
863	002564	012701	001000	SELI:	#INTBEG,R1	;INST. POINTER (R1) SET TO BEGIN OF INST. TABLE.
864	002570	000706		MOV	SELB	;BRANCH.
865				BR		





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901 002710 104400
902 002712 012763 000020 177776
903 002720 011163 177776
904 002724 011263 000002
905 002730 000240
906 002732 016367 177776 176646
907 002740 011367 176640
908 002744 032767 000200 176634
909 002752 001404
910 002754 026767 176624 176652
911 002762 001401
912 002764 104000
913 002766 005767 176610
914 002772 001374
915 002774 000205
  
```

```

;TEST B.
;TEST THE INSTRUCTION POINTED AT BY R1 USING THE DATA WORD
;POINTED AT BY R2. THE RESULT IS STORED IN LOC. "HBCC" TO BE
;COMPARED WITH THE SIMULATED RESULT WHICH HAS BEEN STORED
;IN LOC. "SMBCC".
  
```

```

TESTB: SCOPE ;GO RECORD ENTRY TO THIS TEST.
        MOV #20,-2(R3) ;CLEAR THE BCC.
        MOV (R1),-2(R3) ;MOVE INST. TO CSR.
        MOV (R2),+2(R3) ;MOVE DATA TO TBR (COMPUTE BCC).
        NOP ;PAUSE.
        MOV -2(R3),HDONE ;READ & STORE CSR (DONE BIT)
        MOV (R3),HBCC ;READ & STORE BCC.
        BIT #200,HDONE ;IS DONE BIT = 1?
        BEQ TBA ;NO. - BRANCH. (ERROR)
        CMP HBCC,SMBCC ;HARDWARE BCC = SIMULATED BCC?
        BEQ TBB ;YES. - BRANCH.
        HLT ;NO. - TRAP TO ERROR HANDLER.
TBA: TST EFLG ;IS AN ERROR SCOPE LOOP RUNNING.
TBB: TBA ;YES. - BRANCH.
        RTS R5 ;NO. - RETURN.
  
```

M02

```

916
917
918 ;TRAP SERVICE ROUTINE (CALLED BY PSUEDO-OP HLT)
919 ;ERROR HANDLER. - TYPEOUTS - HALT - SCOPE LOOP.
920 002776 004767 001554 ERR: JSR PC,CKSWR ;CHECK FOR CNTL G TO LOAD SWREG
921 003002 005767 176574 TST EFLG ;FIRST ERR CALL FOR CURRENT TEST?
922 003006 001003 SNE ERA ;NO. - BRANCH.
923 003010 005267 176566 INC EFLG ;YES. - SET ERR FLAG.
924 003014 000404 BR ERB ;BRANCH. (UNCONDITIONAL TYPE OUT).
925 003016 032767 020000 176574 ERA: BIT #20000,OPSTAT ;INHIBIT TYPE OUT?
926 003024 001002 BNE ERC ;YES. - BRANCH.
927 003026 004567 000130 ERB: JSR R5,TYPERR ;NO. - TYPE ERR MESSAGE.
928 003032 032777 100000 176532 ERC: BIT #100000,JSWR ;HALT ON ERR?
929 003040 001401 BEQ ERD ;NO. - BRANCH.
930 003042 000000 HALT ;YES. - HALT HERE AND WAIT FOR OPERATOR.
931 003044 004767 001506 ERD: JSR PC,CKSWR ;CHECK FOR CNTL G TO LOAD SWREG
932 003050 027767 176516 176542 CMP JSWR,OPSTAT ;HAS OPERATION STATUS (SWR) CHANGED?
933 003056 001402 BEQ ERE ;NO. - BRANCH.
934 003060 004567 176670 JSR R5,OPCHG ;YES - GO SET UP NEW OPERATION STATUS.
935 003064 032767 040000 176526 ERE: BIT #40000,OPSTAT ;SCOPE LOOP?
936 003072 001403 BEQ ERF ;NO. - BRANCH.
937 003074 022626 CMP (SP)+,(SP)+ ;YES. - POP STACK
938 003076 000177 176530 JMP @SCORTN ;RETURN (SCOPE LOOP).
939 003102 005067 176474 ERF: CLR EFLG ;CLEAR ERR FLAG.
940 003106 005767 176516 TST SELFLG ;SELECT MODE?
941 003112 001001 BNE ERG ;YES. - BRANCH.
942 003114 000002 RTI ;NO. - RETURN (CONTINUE TESTING).
943 003116 032777 000077 176446 ERG: BIT #77,JSWR ;SWR5-0 = 0?
944 003124 001410 BEQ ERH ;YES. - BRANCH.
945 003126 032777 007700 176436 BIT #7700,JSWR ;NO. - SWR6-11 = 0?
946 003134 001404 BEQ ERH ;YES. - BRANCH.
947 003136 062706 000006 ADD #6,SP ;NO. - POP STACK.
948 003142 000167 177074 JMP SELMOD ;RESTART AT SELMOD.
949 003146 000002 ERH: RTI ;RETURN (CONTINUE TESTING).
950
951
952
953 003150 000005 FORCER: RESET ;FORCE AN ERROR-TYPE TYPEOUT
954 003152 004567 000004 JSR R5,TYPERR ;WHENEVER STARTED FROM LOC.210,
955 003156 000000 FEAT: HALT ;THEN HALT.
956 003160 000776 BR FEAT
957
  
```

```

958
959
960 ;SUBROUTINE - SET UP AND TYPE THE ERROR MESSAGE THAT STARTS AT EMA.
961 003162 105761 000001 TYPERR: TSTB +1(R1)
962 003166 001404 BEQ TEA
963 003170 012767 020101 000214 MOV #20101,EMC
964 003176 000403 BR TEB
965 003200 012767 020102 000204 TEA: MOV #20102,EMC
966 003206 010167 176442 TEB: MOV R1,TEWK
967 003212 162767 000774 176434 SUB #INTBEG-4,TEWK
968 003220 006067 176430 ROR TEWK
969 003224 006067 176424 ROR TEWK
970 003230 042767 177700 176416 SIC #177700,TEWK
971 003236 004567 000306 JSR R5,OTA
972 003242 001654 TEWK
973 003244 003420 EMF
974 003246 000002 2
975 003250 010267 176400 MOV R2,TEWK
976 003254 162767 001372 176372 SUB #DATBEG-2,TEWK
977 003262 006067 176366 ROR TEWK
978 003266 042767 177700 176360 BIC #177700,TEWK
979 003274 004567 000250 JSR R5,OTA
980 003300 001654 TEWK
981 003302 003425 EMH+1
982 003304 000002 2
983 003306 004567 000236 JSR R5,OTA
984 003312 001634 SMBCC
985 003314 003436 EMM
986 003316 000006 6
987 003320 004567 000224 JSR R5,OTA
988 003324 001604 HBCC
989 003326 003447 EMQ+1
990 003330 000006 6
991 003332 112767 000061 000123 MOVB #61,EMX+1
992 003340 032767 000200 176276 BIT #200,SMDONE
993 003346 001003 BNE TEC
994 003350 112767 000060 000105 MOVB #60,EMX+1
995 003356 112767 000061 000101 TEC: MOVB #61,EMY+1
996 003364 032767 000200 176214 BIT #200,HDONE
997 003372 001003 BNE TED
998 003374 112767 000060 000063 MOVB #60,EMY+1
999 003402 004567 000064 TED: JSR R5,TYPE
1000 003406 042524 EMA: .ASCII /TE/
1001 003410 052123 EMB: .ASCII /ST/
1002 003412 020077 EMC: .ASCII /? /
1003 003414 044440 EMD: .ASCII / I /
1004 003416 037477 EME: .ASCII /??/
1005 003420 020040 EMF: .ASCII / /
1006 003422 037504 EMG: .ASCII /D?/

```



1026			
1027			
1028			
1029			
1030			
1031	003472	105767	174066
1032	003476	100375	
1033	003500	121527	000136
1034	003504	001005	
1035	003506	105725	
1036	003510	004567	177756
1037	003514	005015	
1038	003516	000137	
1039	003520	121527	000137
1040	003524	001403	
1041	003526	112567	174034
1042	003530	000757	
1043	003534	105725	
1044	003536	032705	000001
1045	003540	001401	
1046	003544	005205	
1047	003546	000005	

```

:SUBROUTINE - TYPE ON THE TTY THE MESSAGE IMMEDIATELY FOLLOWING
:THE CALL TO THIS SUBROUTINE. UP-ARROW (^) CAUSES A CRLF AND BACK-ARROW
:(^*) CAUSES TERMINATION OF TYPEOUT. RETURN WILL BE TO THE INSTRUCTION
:FOLLOWING THE MESSAGE.
TYPE: TSTB TPCSR
      BPL TYPE
      CMPB (RS),#136
      BNE TPA
      TSTB (RS)^
      JSR RS,TYPE
      005015
      000137
TPA: CMPB (RS),#137
      BEQ TPB
      MOVB (RS)^,TPOBR
      BR TYPE
TPB: TSTB (RS)^
      BIT #1,RS
      BEQ TPC
      INC RS
TPC: RTS

```



# E03

.MAIN. MACY11 271732 25-MAR-76 09:43 PAGE 30  
DZKGR.P11

1074					
1075					;TRAP SERVICE ROUTINE - SCOPE = TRAP.
1076					
1077	003642	011667	175764	SCORCD: MOV	(SP), SCORTN ;SAVE THE STARTING LOC. OF TESTA OR TESTB.
1078	003646	004767	003704	JSR	PC, CKSWR ;CHECK FOR CNTL G TO LOAD SWREG
1079	003652	000002		RTI	;RETURN.
1080					
1081					;TRAP SERVICE ROUTINE - "T" BIT SET =TRAP.
1082					
1083	003654	000002		TRTRTN: RTI	;GOOD BOY, NOW RETURN.
1084					

```

1085 ;SUBROUTINE - SIMULATE ALL MODES OF LRC
1086 003656 012767 000010 175754 SMLRCA: MOV #10,SMCNT ;ENTRY LRC16 DOUBLE BYTE DATA.
1087 003664 062767 000010 175746 SMLRCB: ADD #10,SMCNT ;ENTRY LRC16 SINGLE BYTE DATA.
1088 003672 042767 100000 000070 SMLRCC: BIC #100000,SMLRCJ ;ENTRY STEP LRC16.
1089 003700 000411 BR SMLRCG
1090 003702 012767 000010 175730 SMLRCD: MOV #10,SMCNT ;ENTRY LRC8 DOUBLE BYTE DATA.
1091 003710 062767 000010 175722 SMLRCE: ADD #10,SMCNT ;ENTRY LRC8 SINGLE BYTE DATA.
1092 003716 052767 100000 000044 SMLRCF: BIS #100000,SMLRCJ ;ENTRY STEP LRC8.
1093 003724 005767 175710 SMLRCG: TST SMCNT
1094 003730 001002 BNE SMLRCH
1095 003732 005267 175702 INC SMCNT
1096 003736 016767 175672 175672 SMLRCH: MOV SMBCC,SMBCCA
1097 003744 011267 175672 MOV (R2),SMDATA
1098 003750 016767 175660 175670 SMLRCI: MOV SMBCC,SMWKA
1099 003756 066767 175660 175662 ADD SMDATA,SMWKA
1100 003764 006067 175656 ROR SMWKA
1101 003770 006067 175640 SMLRCJ: ROR SMBCC ;INSTR. MODIFIED: LRC16=ROR LRC8=ROPB.
1102 003774 000241 CLC
1103 003776 006067 175640 ROR SMDATA
1104 004002 005367 175632 DEC SMCNT
1105 004006 001360 BNE SMLRCI
1106 004010 000205 RTS AS
1107

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1108
1109
1110           ;SUBROUTINE - SIMULATE ALL MODES OF CRC16.
1111
1112 004012 012767 000010 175620 SMC16A: MOV      #10,SMCNT      ;ENTRY CRC16 DOUBLE BYTE DATA.
1113 004020 062767 000010 175612 SMC16B: ADD      #10,SMCNT      ;ENTRY CRC16 SINGLE BYTE DATA.
1114 004026 005767 175606 SMC16C: TST      SMCNT          ;ENTRY STEP CRC16.
1115 004032 001002                BNE      SMC16D
1116 004034 005267 175600                INC      SMCNT
1117 004040 016767 175570 175570 SMC16D: MOV      SMBCC,SMBCCA
1118 004046 011267 175570                MOV      (R2),SMDATA
1119 004052 016767 175556 175556 SMC16E: MOV      SMBCC,SMWKA
1120 004060 066767 175556 175550 ADD      SMDATA,SMWKA
1121 004066 000241                CLC
1122 004070 006067 175540                ROR      SMBCC
1123 004074 000241                CLC
1124 004076 006067 175540                ROR      SMDATA
1125 004102 006067 175540                ROR      SMWKA
1126 004106 103014                BCC      SMC16F
1127 004110 012767 120001 175530 MOV      #120001,SMWKA
1128 004116 046767 175512 175522 BIC      SMBCC,SMWKA
1129 004124 042767 120001 175502 BIC      #120001,SMBCC
1130 004132 066767 175510 175474 ADD      SMWKA,SMBCC
1131 004140 005367 175474 SMC16F: DEC      SMCNT
1132 004144 001342                BNE      SMC16E
1133 004146 000205                RTS      R5
1134
1135           ;SUBROUTINE - SIMULATE ALL MODES OF CCITT.
1136
1137 004150 012767 000010 175462 SMCITA: MOV      #10,SMCNT      ;ENTRY CCITT DOUBLE BYTE DATA.
1138 004156 062767 000010 175454 SMCITB: ADD      #10,SMCNT      ;ENTRY CCITT SINGLE BYTE DATA.
1139 004164 005767 175450 SMCITC: TST      SMCNT          ;ENTRY STEP CCITT.
1140 004170 001002                BNE      SMCITD
1141 004172 005267 175442                INC      SMCNT
1142 004176 016767 175432 175432 SMCITD: MOV      SMBCC,SMBCCA
1143 004204 011267 175432                MOV      (R2),SMDATA
1144 004210 016767 175420 175430 SMCITE: MOV      SMBCC,SMWKA
1145 004216 066767 175420 175422 ADD      SMDATA,SMWKA
1146 004224 000241                CLC
1147 004226 006067 175402                ROR      SMBCC
1148 004232 000241                CLC
1149 004234 006067 175402                ROR      SMDATA
1150 004240 006067 175402                ROR      SMWKA
1151 004244 103014                BCC      SMCITF
1152 004246 012767 102010 175372 MOV      #102010,SMWKA
1153 004254 046767 175354 175364 BIC      SMBCC,SMWKA
1154 004262 042767 102010 175344 BIC      #102010,SMBCC
1155 004270 066767 175352 175336 ADD      SMWKA,SMBCC
1156 004276 005367 175336 SMCITF: DEC      SMCNT
1157 004302 001342                BNE      SMCITE
1158 004304 000205                RTS      R5
1159
1160           ;SUBROUTINE - SIMULATE ALL MODES OF CRC12.
1161
1162 004306 012767 000006 175324 SMC12A: MOV      #6,SMCNT      ;ENTRY CRC12 SINGLE BYTE DATA.
1163 004314 005767 175320 SMC12B: TST      SMCNT          ;ENTRY STEP CRC12.

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1164	004320	001002				BNE	SMC12C
1165	004322	005267	175312			INC	SMCNT
1166	004326	016767	175302	175302	SMC12C:	MOV	SMBCC, SMBCCA
1167	004334	011267	175302			MOV	(R2), SMDATA
1168	004340	016767	175270	175300	SMC12D:	MOV	SMBCC, SMWKA
1169	004346	066767	175270	175272		ADD	SMDATA, SMWKA
1170	004354	106367	175254			ASLB	SMBCC
1171	004360	106367	175250			ASLB	SMBCC
1172	004364	006067	175244			ROR	SMBCC
1173	004370	106067	175240			RORB	SMBCC
1174	004374	106067	175234			RORB	SMBCC
1175	004400	042767	160000	175226		BIC	#160000, SMBCC
1176	004406	006067	175234			ROR	SMWKA
1177	004412	103014				BCC	SMC12E
1178	004414	012767	036001	175224		MOV	#36001, SMWKA
1179	004422	046767	175206	175216		BIC	SMBCC, SMWKA
1180	004430	042767	036001	175176		BIC	#36001, SMBCC
1181	004436	066767	175204	175170		ADD	SMWKA, SMBCC
1182	004444	000241			SMC12E:	CLC	
1183	004446	006067	175170			ROR	SMDATA
1184	004452	005367	175162			DEC	SMCNT
1185	004456	001330				BNE	SMC12D
1186	004460	000205				RTS	R5

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1187
1188
1189
1190
1191 004462 013746 000006 SUSWR: MOV @#6, -(SP) ;SAVE VECTORS
1192 004466 013746 000004 MOV @#4, -(SP)
1193 004472 012737 004512 C00004 MOV @#6, @#4 ;SET UP FOR TIMEOUT
1194 004500 022777 177777 175064 CMP #-1, @SWR ;REFERENCE HARDWARE SWITCH REGISTER
1195 004506 001402 BEQ 65$
1196 004510 000404 BR 66$
1197 004512 022626 64$: CMP (SP)+, (SP)+ ;ADJUST STACK
1198 004514 012767 000176 175050 65$: MOV #SWREG, SWR ;POINT TO SOFTWARE SWITCH REG
1199 004522 012637 000004 66$: MOV (SP)+, @#4 ;RESTORE VECTORS
1200 004526 012637 000006 MOV (SP)+, @#6
1201 004532 022767 000176 175032 CMP #SWREG, SWR ;IS SWREG USED
1202 004540 001002 BNE 67$
1203 004542 004767 000070 JSR PC, CNTLU ;ALLOW SWREG TO BE LOADED
1204 004546 000207 67$: RTS PC
1205
1206
1207 ;CHECK SWITCH REGISTER ROUTINE. CHECKS FOR IG TO ALLOW CHANGING
1208 ;OF LOC.176.
1209 ;LOCATIONS USED:
1210 004550 000000 TEMPST: .WORD 0
1211 004552 000000 COUNT: .WORD 0
1212 004554 000000 TIB: .WORD 0
1213
1214
1215 004556 022767 000176 175006 CKSWR: CMP #SWREG, SWR ;SOFTWARE SWITCH REGISTER PRESENT
1216 004564 001143 BNE OUT ;NO, GET OUT
1217 004566 105767 172766 TSTB TKCSR ;YES, WAIT FOR
1218 004572 100140 BPL OUT ;READY, GET CHARACTER
1219 004574 016767 172762 177752 MOV TKDBR, TIB ;AND STRIP OFF
1220 004602 042767 177600 177744 BIC #177600, TIB ;THE GARBAGE
1221 004610 022767 000007 177736 CMP #7, TIB ;IS IT A <IG>
1222 004616 001126 BNE OUT
1223 004620 004567 176646 JSR R5, TYPE ;TYPE CNTL G
1224 004624 041536 052116 020114 .ASCII /↑CNTL G↑+ /
1225 004632 057107 137
1226 004636 .EVEN
1227 004636 004567 176706 CNTLU: JSR R5, OTA ;MOVE CONTENTS
1228 004642 000176 SWREG ;OF SWREG TO BE
1229 004644 004667 MSWREG ;TYPED FOLLOWING
1230 004646 000006 6 ;THE MESSAGE SWR=
1231 004650 004567 175616 JSR R5, TYPE ;TYPE THE COMPLETE MESSAGE
1232
1233 004654 051536 051127 075 MSWR: .ASCII /↑SWR=/ ;SWR=
1234 004661 077 037477 037477 .ASCII /????? / ; XXXXXX
1235 004666 077
1236 004667 040 020040 020040 MSWREG: .ASCII / /
1237 004674 040
1238 004675 040 042516 036527 MNEW: .ASCII / NEW= + / ; NEW=
1239 004702 057440
1240
1241 .EVEN
  
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1274
1275
1276
1277 005076 005067 172456      TTIN:  CLR      TKCSR
1278 005102 005067 172454      CLR      TKDBR
1279 005106 005067 177442      CLR      TIB
1280 005112 005267 172442      INC      TKCSR
1281 005116 105767 172436      TTIN1:  TSTB    TKCSR
1282 005122 100375      BPL      TTIN1
1283 005124 016767 172432 177422  MOV      TKDBR,TIB
1284 005132 105767 172426      TTIN2:  TSTB    TPCSR
1285 005136 100375      BPL      TTIN2
1286 005140 116767 177410 172420  MOVB    TIB,TPDBR
1287 005146 090207      RTS      PC
1288
1289
1299      000001      .END

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CKSWR	004556	D56	001526	FEA	003156	I33	001150	PS	= 177776
CNTLU	004636	D57	001530	FORCER	003150	I34	001154	RO	=%000000
COUNT	004552	D60	001532	FORERR	000210	I35	001160	R1	=%000001
DATBEG=	001374	D61	001534	FULA	002044	I36	001164	R2	=%000002
DATEND=	001570	D62	001536	FULB	002050	I37	001170	R3	=%000003
DEVADR	001574	D63	001540	FULC	002100	I40	001174	R4	=%000004
DFLG	001576	D64	001542	FULD	002126	I41	001200	R5	=%000005
DFLGA	001600	D65	001544	FULE	002134	I42	001204	R7	=%000007
D01	001374	D66	001546	FULF	002140	I43	001210	SCOPE	= 104400
D02	001376	D67	001550	FULG	002156	I44	001214	SCORCD	003642
D03	001400	D70	001552	FULH	002202	I45	001220	SCORTN	001632
D04	001402	D71	001554	FULI	002216	I46	001224	SELA	002316
D05	001404	D72	001556	FULJ	002232	I47	001230	SELB	002406
D06	001406	D73	001560	FULMOD	002040	I50	001234	SELC	002464
D07	001410	D74	001562	HBCC	001604	I51	001240	SELD	002472
D10	001412	D75	001564	HDONE	001606	I52	001244	SELE	002476
D11	001414	D76	001566	HLT =	104000	I53	001250	SELECT	000204
D12	001416	D77	001570	IDENT	001656	I54	001254	SELF	002514
D13	001420	EFLG	001602	IFLG	001610	I55	001260	SELFLG	001630
D14	001422	EMA	003406	IFLGA	001612	I56	001264	SELG	002536
D15	001424	EMB	003410	INIT	001700	I57	001270	SELH	002542
D16	001426	EMC	003412	INTA	001706	I60	001274	SELI	002564
D17	001430	EMD	003414	INTB	001712	I61	001300	SELMOD	002242
D20	001432	EME	003416	INTBEG=	001000	I62	001304	SMBCC	001634
D21	001434	EMF	003420	INTEND=	001270	I63	001310	SMBCCA	001636
D22	001436	EMG	003422	ITACNT	001614	I64	001314	SMCITA	004150
D23	001440	EMH	003424	ITANO	001616	I65	001320	SMCITB	004156
D24	001442	EMI	003426	I01	001000	I66	001324	SMCITC	004164
D25	001444	EMJ	003430	I02	001004	I67	001330	SMCITD	004176
D26	001446	EMK	003432	I03	001010	I70	001334	SMCITE	004210
D27	001450	EML	003434	I04	001014	I71	001340	SMCITF	004276
D30	001452	EMM	003436	I05	001020	I72	001344	SMCNT	001640
D31	001454	EMN	003440	I06	001024	I73	001350	SMC12A	004306
D32	001456	EMO	003442	I07	001030	I74	001354	SMC12B	004314
D33	001460	EMP	003444	I10	001034	I75	001360	SMC12C	004326
D34	001462	EMQ	003446	I11	001040	I76	001364	SMC12D	004340
D35	001464	EMR	003450	I12	001044	I77	001370	SMC12E	004444
D36	001466	EMS	003452	I13	001050	MNEW	004675	SMC16A	004012
D37	001470	EMU	003454	I14	001054	MSWR	004654	SMC16B	004020
D40	001472	EMV	003456	I15	001050	MSWREG	004667	SMC16C	004026
D41	001474	EMW	003460	I16	001064	NOP =	000240	SMC16D	004040
D42	001476	EMX	003462	I17	001070	NORMAL	000200	SMC16E	004052
D43	001500	EMY	003464	I20	001074	OPCA	002006	SMC16F	004140
D44	001502	EMZ	003466	I21	001100	OPCB	002036	SMDATA	001642
D45	001504	ERA	003016	I22	001104	OPCHG	001754	SMDONE	001644
D46	001506	ERB	003026	I23	001110	OPSTAT	001620	SMLRCA	003656
D47	001510	ERC	003032	I24	001114	OTA	003550	SMLRCB	003664
D50	001512	ERD	003044	I25	001120	OTACNT	001622	SMLRCC	003672
D51	001514	ERE	003064	I26	001124	OTALA	003562	SMLRCD	003702
D52	001516	ERF	003102	I27	001130	OTAWKA	001624	SMLRCE	003710
D53	001520	ERG	003116	I30	001134	OTAWKB	001626	SMLRCF	003716
D54	001522	ERH	003146	I31	001140	OUT	005074	SMLRCG	003724
D55	001524	ERR	002776	I32	001144	PC	=%000007	SMLRCH	003736

.MAIN. MACY11 27(732) 25-MAR-76 08:43 PAGE 39  
DZKGAA.P11 SYMBOL TABLE

SMLRCI	003750	SWREG	000176	TEC	003356	TKDBR	= 177562	TTIN1	005116
SMLRCJ	003770	TAA	002620	TED	003402	TPA	003520	TTIN2	005132
SMWKA	001646	TAB	002676	TEMPST	004550	TPB	003534	TYPE	003472
SMWKB	001650	TAC	002700	TESTA	002572	TPC	003546	TYPERR	003162
SP	=%000006	TBA	002764	TESTB	002710	TPCSR	= 177564	SREAD	004704
STCNT	001652	TBB	002766	TEWK	001654	TPDBR	= 177566	.	= 005150

ERRORS DETECTED: 0  
DEFAULT GLOBALS GENERATED: 0

\*DZKGAA.DZKGAA/SOL+DZKGAA.P11  
RUN-TIME: 4 8 .9 SECONDS  
RUN-TIME RATIO: 31/13=2.3  
CORE USED: 8K (15 PAGES)

