학번 __201804744__   출석번호 __113__   이름 __남아리__

Relocatable Program for a SIC (Fig 3.6)

Line	Loc	Label	Op	Operand	Object code
5	0000	COPY	START	0000	
10	0000	FIRST	STL	RETADR	140033
15	0003	CLOOP	JSUB	RDREC	481039
20	0006		LDA	LENGTH	000036
25	0009		COMP	ZERO	280030
30	000C		JEQ	ENDFIL	300015
35	000F		JSUB	WRREC	481061
40	0012		J	CLOOP	3C0003
45	0015	ENDFIL	LDA	EOF	00002A
50	0018		STA	BUFFER	0C0039
55	001B		LDA	THREE	00002D
60	001E		STA	LENGTH	0C0036
65	0021		JSUB	WRREC	481061
70	0024		LDL	RETADR	080033
75	0027		RSUB		4C0000
80	002A	EOF	BYTE	C'EOF'	**454F46**
85	002D	THREE	WORD	3	**000003**
90	0030	ZERO	WORD	0	**000000**
95	0033	RETADR	RESW	1	
100	0036	LENGTH	RESW	1	
105	0039	BUFFER	RESB	4096	
110	.				
115	.		SUBROUTINE TO READ RECORD INTO BUFFER		
120	.				
125	1039	RDREC	LDX	ZERO	040030
130	103C		LDA	ZERO	000030
135	103F	RLOOP	TD	INPUT	E0105D
140	1042		JEQ	RLOOP	30103F
145	1045		RD	INPUT	D8105D
150	1048		COMP	ZERO	280030
155	104B		JEQ	EXIT	301057
160	104E		STCH	BUFFER,X	548039
165	1051		TIX	MAXLEN	2C105E
170	1054		JLT	RLOOP	38103F
175	1057	EXIT	STX	LENGTH	100036
180	105A		RSUB		**4C0000**
185	105D	INPUT	BYTE	X'F1'	**F1**
190	105E	MAXLEN	WORD	4096	**001000**
195	.				
200	.		SUBROUTINE TO WRITE RECORD FROM BUFFER		
205	.				
210	1061	WRREC	LDX	ZERO	040030
215	1064	WLOOP	TD	OUTPUT	E01079
220	1067		JEQ	WLOOP	301064
225	106A		LDCH	BUFFER,X	508039
230	106D		WD	OUTPUT	DC1079
235	1070		TIX	LENGTH	2C0036
240	1073		JLT	WLOOP	381064
245	1076		RSUB		**4C0000**
250	1079	OUTPUT	BYTE	X'05'	**05**
255			END	FIRST	

(handwritten annotations: 16, 33, −1E, 15 near lines 50–70; 안바꿔도 OK next to 002A/002D/0030; 1110 0000 0000 E 0 0; FFC; 57, −39, 1E, 16 near RDREC block; 1000 ↓ 8; 7A, −61, 19; 3.8=24; 24+1=25; 25→19(16); 1111 1110 0000 F E 0; 1079+1 = 107A BYTE)

Object Program

```
HCOPY     00000000107A
T000000 1E FFC 140033 481039 000036 280030 300015 481061 3C0003 00002A 0C0039 00002D
T00001E 15 E00 0C0036 481061 080033 4C0000 454F46 000003 000000
T001039 1E FFC 040030 000030 E0105D 30103F D8105D 280030 301057 548039 2C105E 38103F
T001057 0A 800 100036 4C0000 F1 001000
T001061 19 FE0 040030 E01079 301064 508039 DC1079 2C0036 381064 4C0000 05
E 000000
```

Program Linking (Fig 3.8)

```
0000        PROGA      START      0
                       EXTDEF     LISTA, ENDA
                       EXTREF     LISTB, ENDB, LISTC, ENDC
                          .
                          .
0020        REF1       LDA        LISTA
0023        REF2       +LDT       LISTB+4
0027        REF3       LDX        #ENDA-LISTA
                          .
                          .
0040        LISTA      EQU        *
                          .
                          .
0054        ENDA       EQU        *
0054        REF4       WORD       ENDA-LISTA+LISTC
0057        REF5       WORD       ENDC-LISTC-10
005A        REF6       WORD       ENDC-LISTC+LISTA-1
005D        REF7       WORD       ENDA-LISTA-(ENDB-LISTB)
0060        REF8       WORD       LISTB-LISTA
                       END        REF1
```

Handwritten annotations (PROGA):
ni xbpe 40
00 000011 0010 23
                ─── 1D
xbpe 0320 1D
0111 0111 0001 ⟨7710004⟩
· 04 050 014

REF4: 54-40   000014
REF5: 0-A   FFFFF6
REF6: 40-1   00003E
REF7: 000014
REF8: -40 EC0   FFFFC0

```
0000        PROGB      START      0
                       EXTDEF     LISTB, ENDB
                       EXTREF     LISTA, ENDA, LISTC, ENDC
                          .
                          .
0036        REF1       +LDA       LISTA
003A        REF2       LDT        LISTB+4
003D        REF3       +LDX       #ENDA-LISTA
                          .
                          .
0060        LISTB      EQU        *
                          .
                          .
0070        ENDB       EQU        *
0070        REF4       WORD       ENDA-LISTA+LISTC
0073        REF5       WORD       ENDC-LISTC-10
0076        REF6       WORD       ENDC-LISTC+LISTA-1
0079        REF7       WORD       ENDA-LISTA-(ENDB-LISTB)
007C        REF8       WORD       LISTB-LISTA
                       END
```

Handwritten annotations (PROGB):
REF1: 60   0310 0000
REF2: -3D   7720 027
REF3: 23   0510 0000

REF4: 000000
REF5: -10 → -A   FFFFF6
REF6: FFFFFF
REF7: -10   FFFFF0
REF8: 000060

```
0000        PROGC      START      0
                       EXTDEF     LISTC, ENDC
                       EXTREF     LISTA, ENDA, LISTB, ENDB
                          .
                          .
0018        REF1       +LDA       LISTA
001C        REF2       +LDT       LISTB+4
0020        REF3       +LDX       #ENDA-LISTA
                          .
                          .
0030        LISTC      EQU        *
                          .
                          .
0042        ENDC       EQU        *
0042        REF4       WORD       ENDA-LISTA+LISTC
0045        REF5       WORD       ENDC-LISTC-10
0048        REF6       WORD       ENDC-LISTC+LISTA-1
004B        REF7       WORD       ENDA-LISTA-(ENDB-LISTB)
004E        REF8       WORD       LISTB-LISTA
                       END
```

Handwritten annotations (PROGC):
REF1: 0310 0000
REF2: 7710 0004
REF3: 0510 0000

REF4: 000030
REF5: 12 → 12-A   000008
REF6: 12-1 =11   000011
REF7: 000000
REF8: 000000

Object Program of PROGA

HPROGA 000000000063

DLISTA 000040 ENDA 000054

RLISTB ENDB LISTC ENDC

:

T 000020 0A 03201D 771/0000 4050014 -----------------------------------

:

T 000054 0F 000014 FFFFF6 00003F 000014 FFFFC0 ---------------------------

M 000024 05 +LISTB

M 000054 06 +LISTC

M 000057 06 +ENDC

M 000057 06 −LISTC

M 00005A 06 +ENDC

M 00005A 06 −LISTC

M 00005A 06 +PROGA

M 00005D 06 −ENDB

M 00005D 06 +LISTB

M 000060 06 +LISTB

M 000060 06 −PROGA

E000020