

PRACTICE PROBLEMS

H-200

EASYCODER

PROBLEM # 1

200	201	202	203	204	205	206	207	208	209	210	211
6	5	4	3	3	2	2	A	B	C	D	E
212	213										
F	G										

- a) Set Item Marks, Word Marks, and Record Marks, in such a way that 201-203, 204, 205-208, and 209-212 are words, 201-203 and 204-212 are Items, and 200-213 is a Record.

Then - Indicate the High and Low order positions of the Words, Items, and Record thus formed:

HI

LOW

WORDS

ITEMS

RECORD

- b) Write the necessary instructions to establish Words, Items and Records of above problem.

PROBLEM # 2

1. Identify the location to be addressed in each of the words below and place a wordmark in the proper position:

a)

250	251	251
A	B	C

b)

030	031
7	7

c)

375	376	377	378
X	X	X	X

d)

610	611	612	613	614	615
O	U	T	P	U	T

e)

700
M

PROBLEM # 3

SW, CI, A, S

		Number				Quant			Check				Amt	
306	307	308	309	310	311	312	313	314	315	316	317	318	319	Memory Location
0	4	3	<u>A</u>	2	<u>3</u>	D	5	6	8	<u>2</u>	4	6	R	
WD1			WD2				WD3			WD4				

Write Program to:

a) Set word marks in locations to establish word limites as indicated.

Clear item marks .

Add word 2 to word 4 .

Subtract word 1 from word 3 .

Show contents of the memory locations at the completion of the program.

b) Repeat same problem using relative addressing but after adding word 2 to word 4, double word 2.

PROBLEM # 4

SW, SI, C, B, A, S

	NUMBER	AMT	CODE
Memory Layout	XXX	XXXXX	XXX
			Δ
			980

Set word marks.

Compare number with code.

If code is greater add number to amount. If overflow, branch to error; otherwise, halt.

If code is equal to or less than number, subtract number from amount and repeat instructions.

If zero balance results from subtract, set record mark in code and halt.

Flow chart and code above problem.

PROBLEM # 5

Add the unknown value in locations 660 - 662 to itself until the total is greater than the value 2000. Keep count of the number of iterations and store the count in locations 700 - 705.

PROBLEM # 6

SW, SI, LCA, EXM

A	B	C	D	E	F	G	H	I	J	K	L	M	N
△					△					△			
200					205					210			

O	P	Q
	△	
	215	

Set the appropriate word marks, etc. and show the instructions to perform the following:

- 1) Move 200 - 204 to 300 - 304
- 2) Move 205 - 211 to 360 - 366
- 3) Move 212 - 216 to 560 - 564
- 4) Move 200 - 216 to 700 - 716

Assume B-field punctuation is to be ignored and cleared.

PROBLEM # 7

LITERALS

A 4 digit field is stored in location ACCT TO ACCT-3. A quantity of 100 is stored in location QUANT through QUANT-2.

Write the instructions necessary, using literals where possible.

Add 80 to TOTAL (3 digit field).

Move heading - FINANCIAL REPORT - to area

Print through PRINT + 15.

Compare account number to ACCT #9999. If not equal add .40 to location INPUT (INPUT is A operand of instruction, the op code of which is in location READ) and halt.

If equal, move address of quantity 100 to A operand of ADD instruction to replace address of quantity 80.

Branch back to the beginning.

PROBLEM # 8

PDT, PCB, SW, SI, CW

Name	Amount	Code	Unused
1	10	20	25

Read the above card into memory locations 101-126.
Set punctuation needed to delimit each card field.
There is a word mark already set in location 105 which
must be cleared.

PROBLEM # 9

Read a deck of cards with same layout as in problem #6.
The last card has a code of 99999.

PROBLEM # 10

PCB, PDT, MCW

Ident. Number	# of Items	Price Per Item	Cde	Unused
1	20	30	40 45	80

Clear all punctuation in the card read-in area, locations 301-345.

Read the above card into memory.

Move Ident Number and Price Per Item to a Punch Area (601-631)
so that the output card will contain Ident No. in col. 1 - 20 and
Price Per Item in col. 21-30. Punch out card.

PROBLEM # 11

PROBLEM: CONVERT CARDS TO TAPE

Cust. #	Product Code	Quantity	Total Quantity To Date	Unused
1	12 13	16 17	26 27 49	80

Read card deck with above format.

Write each card on tape

Lost card (DUMMY) will have all 9's in the customer # field.
At this point rewind tape and halt.

PROBLEM # 12

PCB, PDT, SW, SI, LCA, A, S, ZA, B

NAME	# OF ITEMA	# OF ITEMB	# OF ITEM C	ADJ	UNUSED
1	10	15	20	30	80

Read in a deck of cards with the above format for each card. The last card has ZZZZZZZZZZ in col. 1-10

Add ITEMA and ITEMB and ITEM C and Subtract ADJ from the Total

Punch out a card with the identical format with the result (Total) in col. 31-40.

Branch back to read the next card.

PROBLEM # 13

PCB, PDT, SW, SI, LCA, A,S,B, BCC, BCE, C, H

Name	Cde	AMTA	AMTB	AMTC	AMTD	Unused	
1	10	11	20	30	35	40	80

Read card deck with above format.

- For Each Card:
- 1) If Code = A, Add AMTA to Grand Total
 ≠ A, Subtract AMTA from G. Total
 - 2) If AMTB is Negative, Add AMTC to G. Total
 If AMTB is Positive, Subtract AMTC from G. Total
 - 3) If AMTC is zero, Subtract AMTD from Grand Total
 If AMTC is non-zero, add AMTD to Grand Total
 - 4) Write Each Card on Tape

Last card (Dummy) will have all 9's in the Name Field.
At this point, punch out the Grand Total, Rewind tape and Halt.

PROBLEM # 14

TAPE TO PRINT

TAPE LAYOUT

ACCT #	NAME	AMT
(6)	(20)	(5)

1 Item/Record
31 Character/Record

PRINT LAYOUT

10	25	75
Acct #	Name	Amt.
xxxxxxx	xxx--x	\$xxx.xx
6	20	

Problem: Print out each item. The last record on magnetic tape has an account no. of 9's.

PROBLEM # 15

TAPE TO PRINT USING INDEXING

TAPE LAYOUT

ACCT #	NAME	AMT
(6)	(20)	(5)

5 Items/Record
31 Characters/Record

PRINT LAYOUT

Acct #	Name	AMT
xxxxxxx 6	xxx---x 20	\$xxx. xx

Problem: Print out each item, using double buffering and indexed addressing.

The last item on tape has an account no. of 9's.

PROBLEM # 16

PCB, PDT, SW, SI, LCA

Read a card into location 101. Columns 22-26 contain item number, column 40-50 contain name, and column 57-62 contain an address.

1. Punch a card containing the item number in col. 1-5
2. Print a line: Name pp. 10-20, Address pp. 37-42, and Item Number in pp. 82-86. Space to HOF after print.
3. Assume that there may already be punctuation in the punch and print areas.

PROBLEM # 17

PDT, PCB, LCA, MCE, B, C.

Ident #	Qty.	Max. Value	Approx. Cost	Total On Hand	Total Value	% of Sales	Date
5	12	20	35	40	55	60	66

Read in the above tape containing records of the format shown,

Print out a line for each record, suppressing zeros and performing other editing functions as shown below. Numbers refer to print positions.

Ident.	Qty.	Max. Value	App. Cost	Total O. H.	% of Sales
xxxxx 5	xxx 12	x, xxx, xx cr 25	xxxx. 45	xxxx. 55	xx, xxx% 65

Date

xx-xx-xx

75

On a break on the Ident. # Control, print out a total line:

App. Cost	Total on Hand
\$xx, xxx.	\$xx, xxx. **
45	58

Illustrate masks used and indicate the low order positions of each in memory. Any memory areas may be used for the input - output areas. Headings need not be printed.

PROBLEM # 18

HA, EXT

- 1) A six-bit character is located in memory at loc. 300. Show the instructions and the bit configuration necessary to transfer this character to loc. 400, reversing all bits (e. g. change all 0's to 1's and all 1 bits to 0's).
- 2) Show the instructions necessary to transfer the word in locations 200-205 to 300-305, moving only the numeric low-order four bits of each character and eliminating all zones. Show the character and configurations which should first be placed at 300-305.

PROBLEM # 19

SCR, LCR, CSM

- 1) Show the instructions necessary to store the A-address register contents into the B-address register.
- 2) Show the instructions necessary to load the co-seq. register with the address located at 500-502 and then branch to that location, in such a way that you can return to the instruction following the branch.

PROBLEM # 20

CARD TO TAPE MAKING USE OF DOUBLE BUFFERING AND INDEXING

Card Layout

Permit #	Model	Make of Car	Prov.	Unused
1	10	11 14	15 18 19	21 22 - 80

Tape Layout

Permit #	Model	Make of Car	Prov.
(10)	(4)	(4)	(3)

10 Items/Record
21 char./Item

Problem:

Convert the cards to tape.
Last card has a permit # of 9's.

PROBLEM #21

UPDATE PROBLEM

Transaction Tape Layout

Part Prod. #	Quantity
(10)	(10)

10 Items/Record

Master Tape Layout

Part Prod. #	Description	Bal.	Min. Bal.	EC Order Quant.
(10)	(30)	(10)	(4)	(6)

5 Items/Record

Problem:

Update the master file with transaction file
ON MATCH, SUBTRACT QUANTITY FROM BALANCE
ON NO MATCH, BYPASS TRANSACTION
There can be more than one transaction for any one master
LAST ITEM ON BOTH FILES HAS A PART PROD. # OF 9's.

Key Punch	Card Code	Central Processor Code	Octal	High Speed Printer	Key Punch	Card Code	Central Processor Code	Octal	High Speed Printer
0	0	000000	00	0	0̄ or -	X, 0 or X ⁽¹⁾	100000	40	-
1	1	000001	01	1	J	X, 1	100001	41	J
2	2	000010	02	2	K	X, 2	100010	42	K
3	3	000011	03	3	L	X, 3	100011	43	L
4	4	000100	04	4	M	X, 4	100100	44	M
5	5	000101	05	5	N	X, 5	100101	45	N
6	6	000110	06	6	O	X, 6	100110	46	O
7	7	000111	07	7	P	X, 7	100111	47	P
8	8	001000	10	8	Q	X, 8	101000	50	Q
9	9	001001	11	9	R	X, 9	101001	51	R
	8, 2	001010	12	'		X, 8, 2	101010	52	#
#	8, 3	001011	13	=	\$	X, 8, 3	101011	53	\$
@	8, 4	001100	14	:	*	X, 8, 4	101100	54	*
Space	Blank	001101	15	Blank		X, 8, 5	101101	55	"
	8, 6	001110	16	> (2)		X, 8, 6	101110	56	≠ (2)
&	8, 7	001111	17	&	- or 0̄	X or X, 0 ⁽¹⁾	101111	57	1/2 or ! (2) (3)
0 or &	R, 0 or R ⁽¹⁾	010000	20	+		8, 5	110000	60	< (2)
A	R, 1	010001	21	A	/	0, 1	110001	61	/
B	R, 2	010010	22	B	S	0, 2	110010	62	S
C	R, 3	010011	23	C	T	0, 3	110011	63	T
D	R, 4	010100	24	D	U	0, 4	110100	64	U
E	R, 5	010101	25	E	V	0, 5	110101	65	V
F	R, 6	010110	26	F	W	0, 6	110110	66	W
G	R, 7	010111	27	G	X	0, 7	110111	67	X
H	R, 8	011000	30	H	Y	0, 8	111000	70	Y
I	R, 9	011001	31	I	Z	0, 9	111001	71	Z
	R, 8, 2	011010	32	:		0, 8, 2	111010	72	⊙
.	R, 8, 3	011011	33	.	,	0, 8, 3	111011	73	,
□	R, 8, 4	011100	34)	%	0, 8, 4	111100	74	(
	R, 8, 5	011101	35	%		0, 8, 5	111101	75	⊕
	R, 8, 6	011110	36	■		0, 8, 6	111110	76	⊖ (2)
& or &	R or R, 0 ⁽¹⁾	011111	37	? (2)		0, 8, 7	111111	77	⊘ (2)

(1) Special Code (for use with H-400/1400 and H-800/1800 cards). The second (alternative) card code is equivalent to the stated central processor code when control character 26 is coded in a card read or punch PCB instruction.

(2) Indicates symbol which will be printed by a printer which has a 63-character drum (Type 222 printers).

(3) The exclamation point replaces the one-half symbol on a type roll containing the Mark II character font.

APPENDIX B

TABLES

Table I. Character Correspondence Table

COBOL CHARACTER SET	HIGH-SPEED PRINTER SET	KEY PUNCH CHARACTER SET	CARD CODE	MACHINE CODE	OCTAL
0	0	0	0	000000	00
1	1	1	1	000001	01
2	2	2	2	000010	02
3	3	3	3	000011	03
4	4	4	4	000100	04
5	5	5	5	000101	05
6	6	6	6	000110	06
7	7	7	7	000111	07
8	8	8	8	001000	10
9	9	9	9	001001	11
'	'	'	8, 2	001010	12
=	=	#	8, 3	001011	13
:	:	@	8, 4	001100	14
Δ	space	space	blank	001101	15 = space
¢	non-printing		8, 6	001110	16 = >
&	&		8, 7	001111	17 = &
+	+		*R (or R-0)	010000	20 = +
A	A	A	R, 1	010001	21
B	B	B	R, 2	010010	22
C	C	C	R, 3	010011	23
D	D	D	R, 4	010100	24
E	E	E	R, 5	010101	25
F	F	F	R, 6	010110	26
G	G	G	R, 7	010111	27
H	H	H	R, 8	011000	30
I	I	I	R, 9	011001	31
;	;		R, 8, 2	011010	32
.	.		R, 8, 3	011011	33 = .
))		R, 8, 4	011100	34 =)
%	%		R, 8, 5	011101	35
■	■		R, 8, 6	011110	36
Δ non-printing?	Δ non-printing?	?	*R, 0 (or R)	011111	37 = ?
-	-	-	*X (or X-0) :	100000	40 = -
J	J	J	X, 1	100001	41
K	K	K	X, 2	100010	42
L	L	L	X, 3	100011	43
M	M	M	X, 4	100100	44
N	N	N	X, 5	100101	45
O	O	O	X, 6	100110	46
P	P	P	X, 7	100111	47
Q	Q	Q	X, 8	101000	50
R	R	R	X, 9	101001	51
#	#		X, 8, 2	101010	52
\$	\$	\$	X, 8, 3	101011	53
*	*	*	X, 8, 4	101100	54
"	"		X, 8, 5	101101	55
↓ non-printing	↓ non-printing		X, 8, 6	101110	56
? non-printing	? non-printing	?	*X, 0 (or X)	101111	57 = 1/2
◇ non-printing	◇ non-printing		8, 5	110000	60 = <
/	/	/	0, 1	110001	61 = /
S	S	S	0, 2	110010	62
T	T	T	0, 3	110011	63
U	U	U	0, 4	110100	64
V	V	V	0, 5	110101	65
W	W	W	0, 6	110110	66
X	X	X	0, 7	110111	67
Y	Y	Y	0, 8	111000	70
Z	Z	Z	0, 9	111001	71
@	@		0, 8, 2	111010	72
,	,	,	0, 8, 3	111011	73 = ,
((%	0, 8, 4	111100	74
CR	CR		0, 8, 5	111101	75
□ non-printing	□ non-printing		0, 8, 6	111110	76 = □
⊗ non-printing	⊗ non-printing	¢	0, 8, 7	111111	77 = ¢

CORE TO PRINTER BIT REVERSAL

CORE TO PRINTER BIT REVERSAL

*See the SOURCE-COMPUTER, paragraph of the ENVIRONMENT DIVISION.

APPENDIX B. TABLES

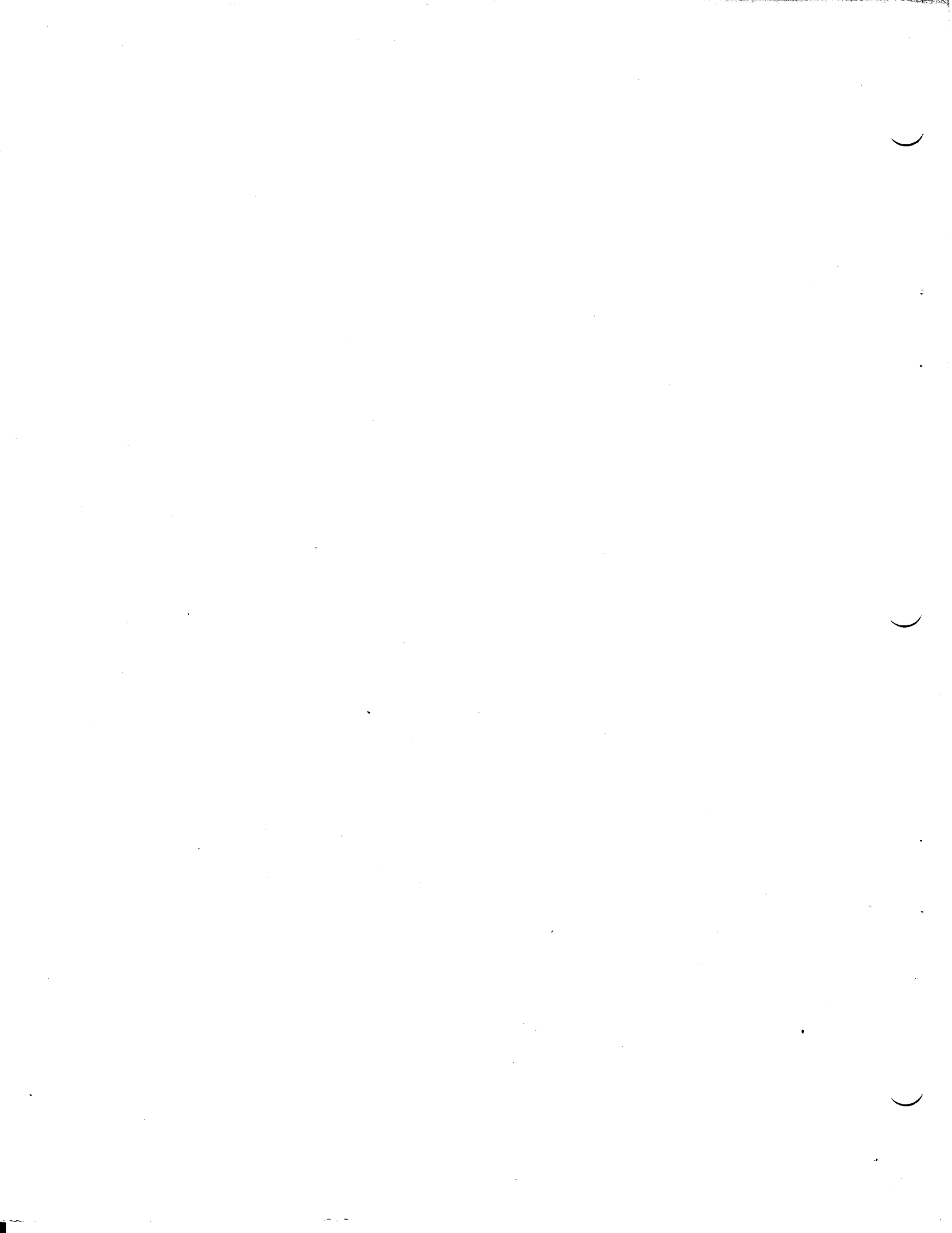
Table II. Octal-Decimal Conversion Table

		OCTAL-DECIMAL CONVERSION																																
LOW-ORDER OCTAL DIGIT		DECIMAL INCREMENT																													LOW-ORDER OCTAL DIGIT			
		000	008	016	024	032	040	048	056	064	072	080	088	096	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216			224	232	240
0		000	008	016	024	032	040	048	056	064	072	080	088	096	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216	224	232	240	0	
1		001	009	017	025	033	041	049	057	065	073	081	089	097	105	113	121	129	137	145	153	161	169	177	185	193	201	209	217	225	233	241	1	
2		002	010	018	026	034	042	050	058	066	074	082	090	098	106	114	122	130	138	146	154	162	170	178	186	194	202	210	218	226	234	242	2	
3		003	011	019	027	035	043	051	059	067	075	083	091	099	107	115	123	131	139	147	155	163	171	179	187	195	203	211	219	227	235	243	3	
4		004	012	020	028	036	044	052	060	068	076	084	092	100	108	116	124	132	140	148	156	164	172	180	188	196	204	212	220	228	236	244	4	
5		005	013	021	029	037	045	053	061	069	077	085	093	101	109	117	125	133	141	149	157	165	173	181	189	197	205	213	221	229	237	245	5	
6		006	014	022	030	038	046	054	062	070	078	086	094	102	110	118	126	134	142	150	158	166	174	182	190	198	206	214	222	230	238	246	6	
7		007	015	023	031	039	047	055	063	071	079	087	095	103	111	119	127	135	143	151	159	167	175	183	191	199	207	215	223	231	239	247	7	
0000		0	1	2	3	4	5	6	7	10	11	12	13	14	15	16	17	20	21	22	23	24	25	26	27	30	3000							0000
0200		31	32	33	34	35	36	37	40	41	42	43	44	45	46	47	50	51	52	53	54	55	56	57	60	61	0200							0200
0400		62	63	64	65	66	67	70	71	72	73	74	75	76	77	100	101	102	103	104	105	106	107	110	111	112	0400							0400
0600		113	114	115	116	117	120	121	122	123	124	125	126	127	130	131	132	133	134	135	136	137	140	141	142	143	0600							0600
0800		144	145	146	147	150	151	152	153	154	155	156	157	160	161	162	163	164	165	166	167	170	171	172	173	174	0800							0800
1000		175	176	177	200	201	202	203	204	205	206	207	210	211	212	213	214	215	216	217	220	221	222	223	224	225	1000							1000
1200		226	227	230	231	232	233	234	235	236	237	240	241	242	243	244	245	246	247	250	251	252	253	254	255	256	1200							1200
1400		257	260	261	262	263	264	265	266	267	270	271	272	273	274	275	276	277	300	301	302	303	304	305	306	307	1400							1400
1600		310	311	312	313	314	315	316	317	320	321	322	323	324	325	326	327	330	331	332	333	334	335	336	337	340	1600							1600
1800		341	342	343	344	345	346	347	350	351	352	353	354	355	356	357	360	361	362	363	364	365	366	367	370	371	1800							1800
2000		372	373	374	375	376	377	400	401	402	403	404	405	406	407	410	411	412	413	414	415	416	417	420	421	422	2000							2000
2200		423	424	425	426	427	430	431	432	433	434	435	436	437	440	441	442	443	444	445	446	447	450	451	452	453	2200							2200
2400		454	455	456	457	460	461	462	463	464	465	466	467	470	471	472	473	474	475	476	477	500	501	502	503	504	2400							2400
2600		505	506	507	510	511	512	513	514	515	516	517	520	521	522	523	524	525	526	527	530	531	532	533	534	535	2600							2600
2800		536	537	540	541	542	543	544	545	546	547	550	551	552	553	554	555	556	557	560	561	562	563	564	565	566	2800							2800
3000		567	570	571	572	573	574	575	576	577	600	601	602	603	604	605	606	607	610	611	612	613	614	615	616	617	3000							3000
3200		620	621	622	623	624	625	626	627	630	631	632	633	634	635	636	637	640	641	642	643	644	645	646	647	3200							3200	
3400		650	652	653	654	655	656	657	660	661	662	663	664	665	666	667	670	671	672	673	674	675	676	677	678	3400							3400	
3600		702	703	704	705	706	707	710	711	712	713	714	715	716	717	720	721	722	723	724	725	726	727	730	731	3600							3600	
3800		733	734	735	736	737	740	741	742	743	744	745	746	747	750	751	752	753	754	755	756	757	760	761	762	3800							3800	
4000		764	765	766	767	770	771	772	773	774	775	776	777	1000	1001	1002	1003	1004	1005	1006	1007	1010	1011	1012	1013	1014	4000							4000
4200		1015	1016	1017	1020	1021	1022	1023	1024	1025	1026	1027	1030	1031	1032	1033	1034	1035	1036	1037	1040	1041	1042	1043	1044	1045	4200							4200
4400		1046	1047	1050	1051	1052	1053	1054	1055	1056	1057	1060	1061	1062	1063	1064	1065	1066	1067	1070	1071	1072	1073	1074	1075	1076	4400							4400
4600		1077	1100	1101	1102	1103	1104	1105	1106	1107	1110	1111	1112	1113	1114	1115	1116	1117	1120	1121	1122	1123	1124	1125	1126	1127	4600							4600
4800		1130	1131	1132	1133	1134	1135	1136	1137	1140	1141	1142	1143	1144	1145	1146	1147	1150	1151	1152	1153	1154	1155	1156	1157	1158	4800							4800
5000		1161	1162	1163	1164	1165	1166	1167	1170	1171	1172	1173	1174	1175	1176	1177	1200	1201	1202	1203	1204	1205	1206	1207	1210	1211	5000							5000
5200		1212	1213	1214	1215	1216	1217	1220	1221	1222	1223	1224	1225	1226	1227	1230	1231	1232	1233	1234	1235	1236	1237	1240	1241	5200							5200	
5400		1243	1244	1245	1246	1247	1250	1251	1252	1253	1254	1255	1256	1257	1260	1261	1262	1263	1264	1265	1266	1267	1270	1271	1272	1273	5400							5400
5600		1274	1275	1276	1277	1300	1301	1302	1303	1304	1305	1306	1307	1310	1311	1312	1313	1314	1315	1316	1317	1320	1321	1322	1323	1324	5600							5600
5800		1325	1326	1327	1330	1331	1332	1333	1334	1335	1336	1337	1340	1341	1342	1343	1344	1345	1346	1347	1350	1351	1352	1353	1354	1355	5800							5800
6000		1356	1357	1360	1361	1362	1363	1364	1365	1366	1367	1370	1371	1372	1373	1374	1375	1376	1377	1400	1401	1402	1403	1404	1405	1406	6000							6000
6200		1407	1410	1411	1412	1413	1414	1415	1416	1417	1420	1421	1422	1423	1424	1425	1426	1427	1430	1431	1432	1433	1434	1435	1436	1437	6200							6200
6400		1440	1441	1442	1443	1444	1445	1446	1447	1450	1451	1452	1453	1454	1455	1456	1457	1460	1461	1462	1463	1464	1465	1466	1467	1470	6400							6400
6600		1471	1472	1473	1474	1475	1476	1477	1500	1501	1502	1503	1504	1505	1506	1507	1510	1511	1512	1513	1514	1515	1516	1517	1520	1521	6600							6600
6800		1522	1523	1524	1525	1526	1527	1530	1531	1532	1533	1534	1535	1536	1537	1540	1541	1542	1543	1544	1545	1546	1547	1550	1551	1552	6800							6800
7000		1553	1554	1555	1556	1557	1560	1561	1562	1563	1564	1565	1566	1567	1570	1571	1572	1573	1574	1575	1576	1577	1600	1601	1602	1603	7000							

OCTAL-DECIMAL CONVERSION PROCEDURE

Consider the decimal number to be converted as a base and an increment. Locate the base (the next lower number which is evenly divisible by 200) in the margin of the lower chart and the increment in the body of the upper chart. The intersection of the row and column thus defined contains the high-order digits of the octal equivalent. The low-order digit appears in the margins of the upper chart opposite the increment. For example, to convert 7958 to octal, the base is 7800 and the increment is 158. Locate 158 in the upper chart and read down this column to the 7800 row below. The high-order octal result is 1742. Then read out to the margin of the upper chart to obtain the low-order digit of 6. Append (do not add) this digit to 1742 for an octal equivalent of 17,426.

To convert an octal number to decimal, locate the high-order digits in the body of the lower chart and the low-order digit in the margin of the upper chart. Then perform the converse of the above operation.



SECTION VI
OPERATING PROCEDURES

GENERATING THE SYMBOLIC PROGRAM

Section II described the process of portraying the desired report format and formulating the input, data, calculation, and output specifications used in producing the printed report. The desired report is laid out on the Honeywell Report Layout chart exactly as it will be printed, as the first step. The report specifications are then written, using the report presentation depicted on the Report Layout chart, and governed by the input data being used and the calculations which must be performed.

After writing of the specifications is completed, the information contained on these sheets is punched into cards. One card is punched for every line entry on each of the specifications sheets used. These cards will compose the specifications source deck used in producing the object program (whose makeup constitutes the second step in using the Honeywell Series 200 Report Generator). This section describes the procedures involved in producing and executing the Series 200 RG object program.

Format of Control Card Specifications

In order to complete the specifications source deck, the programmer must also prepare a control card, since this is required by the Series 200 Report Generator. The same control card can be used for a variety of reports, provided that the same routine will be followed in generating each report. The format of the Control card is presented in Table 6-1, together with an explanation of the entries, column by column.

Table 6-1. Format of Control Card Specifications

Parameter	Columns	Contents	Explanation
CARD ID	1 - 4	CNTL	Identifies this card as the Control card.
MEMORY SIZE	5	One decimal digit, from 1 to 8	Specifies the number of memory banks available in the Series 200 system which is being used for the program. 1 = 4,096 characters of memory; 2 = 8,192 characters of memory, etc.
PRINTED OUTPUT	6 - 8	Blank, or non-blank (any valid character other than a blank)	Blank - implies no printed output. Non-blank - output will be printed.
PERIPHERAL ADDRESSES	9 - 14	See below	These columns are used to designate the addresses assigned to the card reader, card punch, and printer. If these columns are left blank, the RG will use the recommended Series 200 address assignments.

SECTION VI. OPERATING PROCEDURES

Table 6-1 (cont). Format of Control Card Specifications

Parameter	Columns	Contents	Explanation
Card reader	9-10	40 - 47 ₈ or blank	Address assigned to the object-program's card reader. If left blank, the RG will use the Series 200 recommended trunk number, 41 ₈ .
Card punch	11 - 12	00 - 07 ₈ or blank	Address assigned to the object-program's card punch. If left blank, the RG will use the Series 200 recommended trunk number, 01 ₈ .
Printer	13 - 14	00 - 07 ₈ or blank	Address assigned to the object-program printer. If left blank, the RG will use the Series 200 recommended trunk number, 02 ₈ .
DATA INPUT/ OUTPUT	15	0, 1, 2 or 3	0 - data input is on cards, i.e., no tapes are used. 1 - data input is on tape; 2 - tape is used for output only; 3 - tape is used both for input and for output.
Common control unit	16	1 or blank	1 - the generated program will use an integrated control unit. Blank - the generated program will <u>not</u> use an integrated control unit.
TAPE DESCRIPTION	17 - 21	See below	These columns are used to describe the peripheral address assignments, tape drive, and parity (i.e., odd or even) of the input data tape.
I/O trunk	17 - 18	00 - 07 ₈ , 40 - 47 ₈ , or blank	Address to the input data tape; blank-40 ₈ is assumed if input tape is used.
Tape drive	19	0 - 7, or blank	Tape drive on which input data tape is mounted; blank if no input tape is used.
Format of tape output	20	1 or blank	1 - output tape contains spacing control characters and lines (133-character record). Blank - output tape without spacing control characters and lines (132-character record). If column 20 is left blank and a line card in the Output Specifications (L in column 1) requests tape output only (X in column 7) then columns 11, 12, and 15 through 18, inclusive, in the line card must be blank and columns 13 and 14 must contain a 0.
Parity	21	6, 7, or blank	6 - input data tape has odd parity; 7 - input data tape has even parity. If column 21 is left blank, the RG assumes odd parity.

PROBLEM

UPDATE AND SELECT D

Given an Old BRT and a TBT as shown below, code the necessary cards to provide the complete card deck to give the New BRT and Selected Run Tape as indicated below.

OBRT	TBT	NBRT	SRT
AAAMON	AAAMON ✓	AAAMON	AAAMON
AAACLM	AACLIB ✓	AAACLM	AACLIB
AABEZD <i>DEL</i>	AAFTOR ✓	AABEZD	AAGMER
AAAUPD <i>DEL</i>	AAAT3H ✓	AACLIB <i>TBT (REP)</i>	EXP/DI
AACLIB <i>REP</i>	AAGMER ✓	AAGMER <i>REP</i>	AAECOL
AAAPUN <i>DEL</i>	AAAPAT ✓	AAFTOR <i>REP</i>	AAAT3H
AAGMER	FORMTC ✓	EXP/DI <i>INS</i>	AAAPAT
AAFTOR	AAAI4C	AADS2	AAAI4T
AADS2	EXP/DI ✓	AAECOL	
AADS2F <i>DEL</i>		AAAT3H <i>REP</i>	
AAECOL		AAAPAT <i>INS</i>	
AAECOF <i>DEL</i>		FORMTC <i>INS</i>	
AAAT3H		AAAI4T	
AAAT3T <i>DEL</i>			
AAAI3 <i>DEL</i>			
AAAI3C <i>DEL</i>			
AAAI3T <i>DEL</i>			
AAAI4 <i>DEL</i>			
AAAI4C <i>DEL</i>			
AAAI4T			

PROBLEM

SPT MERGE C

Given SPT's as shown below, code the necessary cards to provide the complete card deck to create an output SPT as indicated below.

SPT #1 (OLD)	SPT #2 (NEW)	OUTPUT SPT (COMBINED)
@FTLMC	AAAUPS	@FTLMC
AAAT3H	AAGMER	AAAT3H
AAAT3T	AAAS4S	AAAT3T <i>DUP 1</i>
@PINM	AAFTOR	@PINM
@PEIM	@PINM	@PEIM
@PRIM	EXP/RI	@PRIM
AAAI3	AAAI4	AAGMER <i>DUP 2</i>
AAAI3C	EXP/CI	AAFTOR <i>DUP 2</i>
AAAI3T	DATAN2	AAAI4 <i>DUP 2</i>
AAAI4		AAAI4C <i>DUP 1</i>
AAAI4C		AAAI4T ✓
AAAI4T		DATAN2 <i>DUP 2</i>
\$CDTP		\$CDTP <i>RWD</i>
\$TPPCH		\$CDTP <i>DUP 1</i>
\$TPPRT		\$TPPRT <i>POS</i>
@CLOSE		\$TPPRT <i>DUP 1</i>
@FEOR		\$TPPCH ✓
@GET		EXP/CI <i>DUP 2</i>
@OPEN		EXP/RI <i>RWD</i>
@PUT		EXP/RI <i>POS</i>
DCA		EXP/RI <i>DUP 2</i>
TIOC		DCA <i>POS</i>
		DCA <i>DUP 1</i>
		TIOC ✓
		TIOC <i>RWD 1</i>
		AAAS4S <i>DUP 2</i>
		@OPEN <i>POS</i>
		@OPEN <i>DUP 1</i>
		@GET <i>RWD</i>
		@GET <i>DUP</i>
		@PUT <i>RWD</i>
		@PUT <i>DUP</i>

PROBLEM

LIBRARY PROCESSOR

Write a Macro Routine to accomplish the following:

1. Sequence check a card file.

No duplicate cards are permitted.

If duplicate cards are in the file, provide the option to either print or punch the card.

On any sequence error, provide the option to either punch the card and continue, or punch the card and Halt, or do not punch the card, and Halt. Maintain a count of cards read, duplicate cards, and error cards.

Set program switches to indicate the type of error, if any, that occurred, so that the main program can perform additional action if desired.

PROVIDE THE OPTION FOR THE PRINT OPTION TO BE ON EITHER THE PRINTER OR THE CONSOLE (7/10/47)

2. Write a Macro Instruction to call the above routine, complete with necessary parameter values.

PROBLEM

1/2 INCH TAPE I/O

Given the following information, code the necessary Macro instructions to process the two files. Give both the DCA and TIOC.

INPUT FILE

Odd Parity

Short Gap

Drive 1

No Alternate Drive

Move Mode

Fixed Length Records

Bannered

Blocked 6

275 Character Items

Double Buffered

Standard Labels, Checked

Label ID = MASTERFILE

OUTPUT FILE

Odd Parity

Long Gap

Drive 3

No Alternate Drive

Locate Mode

Fixed Length Records

Bannered

Blocked 5

375 Character Items

Double Buffered

Standard Labels, Checked

Label ID = YEARTODATE

PROBLEM 1/2 INCH TAPE I/O

PROGRAMMER D. DENNIS DATE JAN 22 PAGE 1 OF 1

CARD NUMBER	TYPE	MARK	LOCATION	OPERATION CODE	OPERANDS		
					14 15	20 21	
1	C		DCA	INFILE, INPUT, <u>SHORT</u> , 1, MOVE, 6, 275, 2, <u>φ</u>	<i>examples on input file</i>		
2	C			INBUFL, INBUFB, INWORK, REWIND, STANDARD,			
3	L			CHECK, MASTERFILE,			
4	C		DCA	OUTFIL, OUTPUT,			
5	C		07	3,			
6	C		12	5, 375, 2, φ, φBUFL, φBUFB,	<i>Good</i>		
7	L		22	STANDARD, CHECK, YEARDATE,			
8	L		TIQC	FIXED,			
9							
11	MACRO CALL			SEQUENCE CHECK, PRINT DUPLICATE CARDS, PUNCH SEQUENCE ERRORS & WAIT			
14	L		CHKSEQ, MACDMMEXIT, ERRSW, PRVSCD, CURRCD, CDWK, SEQERR,				

TRAILER Y SHIP NOF EXIT

DO HDGS ~~SMR~~

ITEM = T N EXIT

Y SMR FILE PAYS NO CIR PRINT, PRINT LINE

EDIT FOR PRINTING

PRINT

ADD 1 TO LINKENT

TEST LINKENT } 54 HDGS EXIT

~~PRT~~
EXIT

PRT HDG
CHK HDG

NOF

HDG

~~SMR~~
~~SMR~~ ~~SMR~~

~~SMR~~
~~SMR~~ ~~SMR~~
GO TO PRT FILE

SCR
MOVE 1ST LINE

PRT
CHK HDG.
MOVE 2ND LINE

PRT
CHK HDG

FILE NAME DEPT MO/YR SEX M/S DEP
0-64+XL

MACDEN 01 REV 001

SPT NO 00001

ASSEMBLY REV D01

ERRORS CRD # BEGADD AL MACHINE CHARACTERS R T M LOC S OPCODE OPERA

CRD #	BEGADD	AL	MACHINE	CHARACTERS	R	T	M	LOC	S	OPCODE	OPERA
00010										ADMODE 3	
00020	00000000	RW	000000000020					\$CDCNT	DCW	+0000	
00030	00000006	RW	000000000020					\$DUPCT	DCW	+0000	
00040	00000014	RW	000000000020					\$SEQCT	DCW	+0000	
00050									SETP	%	
...U..	00060	00000022	W	2400000370					SCR	%01+3	
....U.	00070	00000027	W	14000273000000					MCW	: : ,9	
	00080	00000036	W	36000274000005					A	:1: ,9	
...UU.	00090	00000045	W	33000000000000					C	%03,9	
	00100	00000054	W	6500010243					BCT	\$ERR1	
...UU.	00110	00000061	W	14000000000000					MCW	%04,9	
	00120	00000070	W	65000272					B	EXIT	
...UU.	00130	00000074	RW	33000000000000				\$ERR1	C	%03,9	
	00140	00000103	W	6500021545					BCT	\$ERR2	
....U.	00150	00000110	W	14000275000000					MCW	:A: ,9	
	00160	00000117	W	36000274000013					A	:1: ,9	
	00170								COND	\$PCH1,%05	
	00180	00000126	W	64000126000210					PCB	*,00	
....U	00190	00000135	W	64000135000010					PCB	*,00	
...U..	00200	00000144	W	66000000150221					PDT	%07,1	
...U.U	00210	00000153	W	66000000150001					PDT	%07,1	
	00220	00000162	W	65000272					B	EXIT	
	00230	00000166	RW	64000166150110				\$PCH1	PCB	*,15	
...U..	00240	00000175	W	660000001501					PDT	%07,1	
	00250	00000203	W	65000272					B	EXIT	
....U.	00260	00000207	RW	14000276000000				\$ERR2	MCW	:B: ,9	
	00270	00000216	W	36000274000021					A	:1: ,9	
	00280								COND	EXIT,%08,	
	00290								COND	\$HLT,%08,	
	00300								COND	\$PCH2,%08,	
	00310	00000225	W	64000225150110					PCB	*,15	
...U..	00320	00000234	W	660000001501					PDT	%07,1	
...U..	00330	00000242	RW	45000000				\$HLT	H	%09	
	00340	00000246	W	65000272					B	EXIT	
	00350	00000252	RW	64000252150110				\$PCH2	PCB	*,15	
...U..	00360	00000261	W	660000001501					PDT	%07,1	
	00370	00000267	RW	65000000				EXIT	B	000	
		00000273	W	15						DATA	
		00000274	W	01						DATA	
		00000275	W	21						DATA	
		00000276	W	22						DATA	
...F..	00380	00000000								END	
00015	ERRORS							HASH TOTAL	575612		

EXTON BUSINESS FORMS LTD. - MANCHESTER

S OPCODE OPERANDS, VARIANTS AND CONTROL CHARACTERS

```

ADMODE 3
CNT DCW +000000
PCT DCW +000000
DCT DCW +000000
SETP %
SCR %01+3,70
MCW : :,%02
A :1:,$CDCNT
C %03,%04 CHECK HIGH SEQUENC
BCT $ERR1,43
MCW %04,%03
B EXIT
RR1 C %03,%04 CHECK LOW SEQUENC
BCT $ERR2,45
MCW :A:,%02
A :1:,$DUPCT DUPLICATE CARD
COND $PCH1,%05,:1:,2
PCB *,00,02,10 %00
PCB *,00,%0F,10
PDT %07,15,02,21 %00
PDT %07,15,%0F,01
B EXIT
CH1 PCB *,15,01,10
PDT %07,15,01
B EXIT
RR2 MCW :B:,%02 OUT OF SEQUENCE
A :1:,$SEQCT
COND EXIT,%08,:1:,2
COND $HLT,%08,:2:,2
COND $PCH2,%08,:3:,2
PCB *,15,01,10
PDT %07,15,01
LT H %09
B EXIT
CH2 PCB *,15,01,10
PDT %07,15,01
IT B 000
DATA LIT.
DATA LIT.
DATA LIT.
DATA LIT.
END

```

*/