

Exercise Tapes (Ron 2.1)							2019-10-25 09:00 Jack Ghiselli					Original by Ron Williams
OBJECT							SOURCE					
Loc	End	length	op	a	b	d	Label:	op	A	B	D	Comments
* Card #01 (RW)												
1	7	7	,	008	015		BOOT1	SW	BOOT2	BOOT3		* Set WMs in Card1
8	14	7	,	022	029		BOOT2	SW	BOOT4	BOOT5		
15	21	7	,	036	040		BOOT3	SW	BOOT6	CDDATA		
22	28	7	L	079	200		BOOT4	MLCWA	79	200		* Move Card #0 Instr to Memory 161-200
29	35	7	,	168	175		BOOT5	SW	BOOT6	BOOT7		
36	39	4	B	161			BOOT6	B	CLR01			
40	39						* Instructions in Card #01					
40	46	7	,	179	183		CLR01	SW	CLR04	CLR05		
47	53	7	,	187	195		CLR02	SW	CLR06	CLR07		
54	57	4	,	199			CLR03	SW	CLR08			
58	61	4	/	I99			CLR04	CS	3999			* Clear Storage (200-3999)
62	65	4	H	182			CLR05	SBR	CLR04+3			* Adjust CS Instruction
66	73	8	B	179	200	R	CLR06	BCE	CLR05	200	R	* Q: Loop if CS not finished
74	77	4	1	001			CLR07	R	1			* Read next Card, Branch to 1
78	79	2		"bR"			CLR08	DCW	"bR"			* Data (Space, R)
80	80	1		"W"			CLR09	DC	W			
* Card #02												* Use WMs from First Card
1	7	7	L	066	359			MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	340	341			SW	MEM2	MEM3		
15	21	7	,	345	352			SW	MEM4	MEM5		
22	28	7	,	353	357			SW	MEM6	MEM7		
29	35	7	,	358	359			SW	MEM8	MEM9		
36	39	4	1	001				R	1			* Read next Card, Branch to 1
40	39											
40	46	7	L	902	N00		START	MLCWA	GRPMK	BUFGM		* Groupmark/WM marks buffer end (2500)
47	47	1	M					MLC				* Chain Last Data Character (2499)
48	51	4	M	M99				MLC	BUFEND			* Propagate to Fill Tape Buffer (1500-2498)
52	58	7	N	111	111		HALT	NOP	111	111		
59	59	1	.					HALT				* Period is 0-3-8 Punch
60	63	4	S	964			GO	S	TP4ERRS			* Zero Counters
64	64	1	S					S				* Zero Counters
65	65	1	S					S				* Zero Counters
66	66	1	S					S				* Zero Counters
* Card #03												
1	7	7	L	068	388			MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	361	362			SW	MEM2	MEM3		
15	21	7	,	363	364			SW	MEM4	MEM5		
22	28	7	,	369	374			SW	MEM6	MEM7		
29	35	7	,	379	384			SW	MEM8	MEM9		
36	39	4	1	001				R	1			* Read next Card, Branch to 1
40	39											
40	40	1	S					S				* Zero Counters
41	41	1	S					S				* Zero Counters
42	42	1	S					S				* Zero Counters
43	43	1	S					S				* Zero Counters
44	48	5	B	393		B	DOTAPES	BSS	TAPE1	B		* Go Write Tape 1 if SS B
49	53	5	B	476		C	DOTP2	BSS	TAPE2	C		* Go Write Tape 2 if SS C
54	58	5	B	559		D	DOTP3	BSS	TAPE3	D		* Go Write Tape 3 if SS D
59	63	5	B	642		E	DOTP4	BSS	TAPE4	E		* Go Write Tape 4 if SS E
64	68	5	B	721		G	DOTP5	BSS	ENDREEL	G		* REWIND and HALT IF SS=G
* Card #04												
1	7	7	L	077	426			MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	393	397			SW	MEM2	MEM3		
15	21	7	,	402	410			SW	MEM4	MEM5		
22	28	7	,	415	420			SW	MEM6	MEM7		
29	35	7	,	001	001			SW	MEM8	MEM9		
36	39	4	1	001				R	1			* Read next Card, Branch to 1
40	39											
40	43	4	B	364				B	DOTAPES			* Loop
44	47	4	S	904			TAPE1	S	CTR			* Zero Counter
48	52	5	B	721		G	WT1	BSS	ENDREEL	G		
53	60	8	M	%U1	V00	W		WT	%U1	BUFFER		* Write Tape 1000 chars. % = 0-4-8 Punch

61	65	5	B	467		K		B	ENDREEL1	K			* BRANCH IF END OF REEL
66	70	5	B	446		L		B	WT1ERR	L			* BRANCH IF TAPE WRITE ERROR
71	77	7	A	906	915			A	ONE	TP1RECS			* Count Records Written
* Card #05													
1	7	7	L	075	462				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	434	442				SW	MEM2	MEM3		
15	21	7	,	446	453				SW	MEM4	MEM5		
22	28	7	,	458	001				SW	MEM6	MEM7		
29	35	7	,	001	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	46	7	A	906	904			WT1A	A	ONE	CTR		
47	54	8	B	397	903	0			BCE	WT1	CTRHI	0	* Loop until 10X
55	58	4	B	369					B	DOTP2			* Next Tape
59	65	7	A	906	922			WT1ERR	A	ONE	TP1ERRS		* Count Write Errors
66	70	5	U	%U1		B			BSP	1			* Backspace Tape
71	75	5	U	%U1		E			SKP	1			* Skip and Erase Tape (3 inches)
* Card #06													
1	7	7	L	074	497				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	467	472				SW	MEM2	MEM3		
15	21	7	,	476	480				SW	MEM4	MEM5		
22	28	7	,	485	493				SW	MEM6	MEM7		
29	35	7	,	001	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	43	4	B	427					B	WT1A			* Retry Write
44	48	5	U	%U1		B		ENDREEL1	BSP	1			* Backspace Tape
49	52	4	B	721					B	ENDREEL			
53	56	4	S	904				TAPE2	S	CTR			* Zero Counter
57	61	5	B	721		G		WT2	BSS	ENDREEL	G		
62	69	8	M	%U2	V00	W			WT	%U2	BUFFER		* Write Tape 1000 chars. % = 0-4-8 Punch
70	74	5	B	550		K			B	ENDREEL2	K		* BRANCH IF END OF REEL
* Card #07													
1	7	7	L	077	535				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	503	510				SW	MEM2	MEM3		
15	21	7	,	517	525				SW	MEM4	MEM5		
22	28	7	,	529	001				SW	MEM6	MEM7		
29	35	7	,	001	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	44	5	B	529		L			B	WT2ERR	L		* BRANCH IF TAPE WRITE ERROR
45	51	7	A	906	929				A	ONE	TP2RECS		* Count Records Written
52	58	7	A	906	904			WT2A	A	ONE	CTR		
59	66	8	B	480	903	0			BCE	WT2	CTRHI	0	* Loop until 10X
67	70	4	B	374					B	DOTP3			* Next Tape
71	77	7	A	906	936			WT2ERR	A	ONE	TP2ERRS		* Count Write Errors
* Card #08													
1	7	7	L	071	567				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	541	546				SW	MEM2	MEM3		
15	21	7	,	550	555				SW	MEM4	MEM5		
22	28	7	,	559	563				SW	MEM6	MEM7		
29	35	7	,	001	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	44	5	U	%U2		B			BSP	2			* Backspace Tape
45	49	5	U	%U2		E			SKP	2			* Skip and Erase Tape (3 inches)
50	53	4	B	510					B	WT2A			* Retry Write
54	58	5	U	%U2		B		ENDREEL2	BSP	2			* Backspace Tape
59	62	4	B	721					B	ENDREEL			
63	66	4	S	904				TAPE3	S	CTR			* Zero Counter
67	71	5	B	721		G		WT3	BSS	ENDREEL	G		
* Card #09													
1	7	7	L	071	599				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	576	581				SW	MEM2	MEM3		
15	21	7	,	586	593				SW	MEM4	MEM5		
22	28	7	,	001	001				SW	MEM6	MEM7		

29	35	7	,	001	001				SW	MEM8	MEM9			
36	39	4	1	001					R	1			* Read next Card, Branch to 1	
40	39													
40	47	8	M	%U3	V00	W			WT	%U3	BUFFER		* Write Tape 1000 chars. % = 0-4-8 Punch	
48	52	5	B	633		K			B	ENDREEL3	K		* BRANCH IF END OF REEL	
53	57	5	B	612		L			B	WT3ERR	L		* BRANCH IF TAPE WRITE ERROR	
58	64	7	A	906	943				A	ONE	TP3RECS		* Count Records Written	
65	71	7	A	906	904			WT3A	A	ONE	CTR			
* Card #10														
1	7	7	L	077	637				MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	608	612				SW	MEM2	MEM3			
15	21	7	,	619	624				SW	MEM4	MEM5			
22	28	7	,	629	633				SW	MEM6	MEM7			
29	35	7	,	001	001				SW	MEM8	MEM9			
36	39	4	1	001					R	1			* Read next Card, Branch to 1	
40	39													
40	47	8	B	563	903	0			BCE	WT3	CTRHI	0	* Loop until 10X	
48	51	4	B	379					B	DOTP4			* Next Tape	
52	58	7	A	906	950			WT3ERR	A	ONE	TP3ERRS		* Count Write Errors	
59	63	5	U	%U3		B			BSP	3			* Backspace Tape	
64	68	5	U	%U3		E			SKP	3			* Skip and Erase Tape (3 inches)	
69	72	4	B	593					B	WT3A			* Retry Write	
73	77	5	U	%U3+E408		B		ENDREEL3	BSP	3			* Backspace Tape	
* Card #11														
1	7	7	L	077	675				MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	642	646				SW	MEM2	MEM3			
15	21	7	,	651	659				SW	MEM4	MEM5			
22	28	7	,	664	669				SW	MEM6	MEM7			
29	35	7	,	001	001				SW	MEM8	MEM9			
36	39	4	1	001					R	1			* Read next Card, Branch to 1	
40	39													
40	43	4	B	721					B	ENDREEL				
44	47	4	S	904				TAPE4	S	CTR			* Zero Counter	
48	52	5	B	721		G		WT4	BSS	ENDREEL	G			
53	60	8	M	%U4	V00	W			WT	%U4	BUFFER		* Write Tape 1000 chars. % = 0-4-8 Punch	
61	65	5	B	716		K			B	ENDREEL4	K		* BRANCH IF END OF REEL	
66	70	5	B	695		L			B	WT4ERR	L		* BRANCH IF TAPE WRITE ERROR	
71	77	7	A	906	957				A	ONE	TP4RECS		* Count Records Written	
* Card #12														
1	7	7	L	075	711				MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	683	691				SW	MEM2	MEM3			
15	21	7	,	695	702				SW	MEM4	MEM5			
22	28	7	,	707	001				SW	MEM6	MEM7			
29	35	7	,	001	001				SW	MEM8	MEM9			
36	39	4	1	001					R	1			* Read next Card, Branch to 1	
40	39													
40	46	7	A	906	904			WT4A	A	ONE	CTR			
47	54	8	B	646	903	0			BCE	WT4	CTRHI	0	* Loop until 10X	
55	58	4	B	384					B	DOTP5			* Next Tape	
59	65	7	A	906	964			WT4ERR	A	ONE	TP4ERRS		* Count Write Errors	
66	70	5	U	%U4		B			BSP	4			* Backspace Tape	
71	75	5	U	%U4		E			SKP	4			* Skip and Erase Tape (3 inches)	
* Card #13														
1	7	7	L	073	745				MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	716	721				SW	MEM2	MEM3			
15	21	7	,	726	731				SW	MEM4	MEM5			
22	28	7	,	736	741				SW	MEM6	MEM7			
29	35	7	,	001	001				SW	MEM8	MEM9			
36	39	4	1	001					R	1			* Read next Card, Branch to 1	
40	39													
40	43	4	B	676					B	WT4A			* Retry Write	
44	48	5	U	%U4		B		ENDREEL4	BSP	4			* Backspace Tape	
49	53	5	B	755		B		ENDREEL	BSS	RWD1	B		* Rewind Tape 1	
54	58	5	B	769		C		ENDR02	BSS	RWD2	C		* Rewind Tape 2	
59	63	5	B	783		D		ENDR03	BSS	RWD3	D		* Rewind Tape 3	
64	68	5	B	797		E		ENDR04	BSS	RWD4	E		* Rewind Tape 4	

69	73	5	B	†01		F	ENDR05	BSS	PRINT	F		* SS=F MEANS PRINT TOTALS	
* Card #14													
1	7	7	L	076	782			MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	751	755			SW	MEM2	MEM3			
15	21	7	,	760	765			SW	MEM4	MEM5			
22	28	7	,	769	774			SW	MEM6	MEM7			
29	35	7	,	779	001			SW	MEM8	MEM9			
36	39	4	1	001				R	1			* Read next Card, Branch to 1	
40	39												
40	44	5	B	345		G	GOHALT	BSS	HALT	G		* SS=G MEANS HALT	
45	48	4	B	353				B	GO			* ELSE KEEP GOING	
49	53	5	U	%U1		M	RWD1	WTM	1			* Write Tape Mark	
54	58	5	U	%U1		R		RWD	%U1			* Rewind The Tape	
59	62	4	B	726				B	ENDR02				
63	67	5	U	%U2		M	RWD2	WTM	2			* Write Tape Mark	
68	72	5	U	%U2		R		RWD	%U2			* Rewind The Tape	
73	76	4	B	731				B	ENDR03				
* Card #15 (Modif)													
1	7	7	L	068	811			MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	788	793			SW	MEM2	MEM3			
15	21	7	,	797	802			SW	MEM4	MEM5			
22	28	7	,	807	811			SW	MEM6	MEM7			
29	35	7	,	001	001			SW	MEM8	MEM9			
36	39	4	1	001				R	1			* Read next Card, Branch to 1	
40	39												
40	44	5	U	%U3		M	RWD3	WTM	3			* Write Tape Mark	
45	49	5	U	%U3		R		RWD	%U3			* Rewind The Tape	
50	53	4	B	736				B	ENDR04				
54	58	5	U	%U4		M	RWD4	WTM	4			* Write Tape Mark	
59	63	5	U	%U4		R		RWD	%U4			* Rewind The Tape	
64	67	4	B	741				B	ENDR05				
68	68	1		"0"				DCW	"0"			* WM After last instruction	
* Card #16 (was #19)													
1	7	7	L	061	922			MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	902	903			SW	MEM2	MEM3			
15	21	7	,	906	907			SW	MEM4	MEM5			
22	28	7	,	908	909			SW	MEM6	MEM7			
29	35	7	,	916	001			SW	MEM8	MEM9			
36	39	4	1	001				R	1			* Read next Card, Branch to 1	
40	39												
40	40	1		"9"			BUFDATA	DCW	"9"			* DATA TO FILL BUFFER	
41	41	1		"¥"			GRPMK	DCW	"¥"			* Group Mark = 12-7-8 Punch	
42	41						CTRHI	EQU	*			* High Byte of Counter	
42	43	2		"00"			CTR	DCW	"00"			* Counter	
44	44	1		"0"			ZERO	DC	"0"			* Value 0 (No WM)	
45	45	1		"1"			ONE	DCW	"1"			* Value 1	
46	46	1		"2"			TWO	DCW	"2"			* Value 2	
47	47	1		"3"			THREE	DCW	"3"			* Value 3	
48	54	7		"0000000"			TP1RECS	DCW	"0000000"			* Count of Records Written	
55	61	7		"0000000"			TP1ERRS	DCW	"0000000"			* Count of Write Errors	
* Card #17 (was #20)													
1	7	7	L	074	957			MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	930	937			SW	MEM2	MEM3			
15	21	7	,	944	951			SW	MEM4	MEM5			
22	28	7	,	001	001			SW	MEM6	MEM7			
29	35	7	,	001	001			SW	MEM8	MEM9			
36	39	4	1	001				R	1			* Read next Card, Branch to 1	
40	39												
40	46	7		"0000000"			TP2RECS	DCW	"0000000"			* Count of Records Written	
47	53	7		"0000000"			TP2ERRS	DCW	"0000000"			* Count of Write Errors	
54	60	7		"0000000"			TP3RECS	DCW	"0000000"			* Count of Records Written	
61	67	7		"0000000"			TP3ERRS	DCW	"0000000"			* Count of Write Errors	
68	74	7		"0000000"			TP4RECS	DCW	"0000000"			* Count of Records Written	
* Card#18 (was #21)													
1	7	7	L	075	993			MLCAW	CARD	MEMORY		* Move Card Instr to Memory	
8	14	7	,	965	979			SW	MEM2	MEM3			

15	21	7	,	993	V00				SW	MEM4	MEM5		
22	28	7	,	001	001				SW	MEM6	MEM7		
29	35	7	,	001	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	46	7		"0000000"				TP4ERRS	DCW	"0000000"			* Count of Write Errors
47	60	14		"----TAPE4----b"				PRTHD1	DCW	"----TAPE4----b"			
61	74	14		"WRITESbERRORSb"				PRTHD2	DCW	"WRITESbERRORSb"			
75	75	1		"0"				PRTFLAG	DCW	"0"			
* Card #19 (new)													
1	7	7	L	073	‡34				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	‡09	‡13				SW	MEM2	MEM3		
15	21	7	,	‡20	‡21				SW	MEM4	MEM5		
22	28	7	,	‡28	001				SW	MEM6	MEM7		
29	35	7	,	001	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	47	8	B	‡79	993	1		PRINT	BCE	PRTSTATS	PRTFLAG	1	* Record Mark ‡ = 0-2-8 Punch
48	51	4	,	201					SW	201			* WM to stop Print Area Propagation
52	58	7	M	/61	224				MLC	HD0	224		
59	59	1	2						W				
60	66	7	M	978	257				MLC	PRTHD1	PRTEND		
67	73	7	M	257	243				MLC	PRTEND	PRTEND-14		* Propagate into Print Area
* Card #20 (new)													
1	7	7	L	076	‡71				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	001	‡42				SW	MEM2	MEM3		
15	21	7	,	‡49	‡56				SW	MEM4	MEM5		
22	28	7	,	‡57	‡64				SW	MEM6	MEM7		
29	35	7	,	‡71	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	46	7	M	906	210				MLC	ONE	HD1TP1		* Plug Tape #
47	53	7	M	907	224				MLC	TWO	HD1TP2		* Plug Tape #
54	60	7	M	908	238				MLC	THREE	HD1TP3		* Plug Tape #
61	61	1	2						W				* Print Header Line 1
62	68	7	M	992	257				MLC	PRTHD2	PRTEND		
69	75	7	M	257	243				MLC	PRTEND	PRTEND-14		* Propagate into Print Area
76	76	1	2						W				* Print Header Line 2
* Card #21 (new)													
1	7	7	L	074	/06				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	‡79	‡86				SW	MEM2	MEM3		
15	21	7	,	‡93	/00				SW	MEM4	MEM5		
22	28	7	,	001	001				SW	MEM6	MEM7		
29	35	7	,	001	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	46	7	M	906	993				MLC	ONE	PRTFLAG		* Set Flag: Header has been printed
47	53	7	Z	915	207			PRTSTATS	MVS	TP1RECS	PTP1RECS		* Statistic to Print
54	60	7	Z	922	214				MVS	TP1ERRS	PTP1ERRS		
61	67	7	Z	929	221				MVS	TP2RECS	PTP2RECS		
68	74	7	Z	936	228				MVS	TP2ERRS	PTP2ERRS		
* Card #22 (new)													
1	7	7	L	071	/38				MLCAW	CARD	MEMORY		* Move Card Instr to Memory
8	14	7	,	/14	/21				SW	MEM2	MEM3		
15	21	7	,	/28	/35				SW	MEM4	MEM5		
22	28	7	,	001	001				SW	MEM6	MEM7		
29	35	7	,	001	001				SW	MEM8	MEM9		
36	39	4	1	001					R	1			* Read next Card, Branch to 1
40	39												
40	46	7	Z	943	235				MVS	TP3RECS	PTP3RECS		
47	53	7	Z	950	242				MVS	TP3ERRS	PTP3ERRS		
54	60	7	Z	957	249				MVS	TP4RECS	PTP4RECS		
61	67	7	Z	964	256				MVS	TP4ERRS	PTP4ERRS		
68	71	4	2	746					W	GOHALT			* Print and start next pass
* Card #23 (new)													
1	7	7	L	062	/61				MLCAW	CARD	MEMORY		* Move Card Instr to Memory

8	14	7	,	V00	001				SW	MEM2	MEM3			* SW in Tape Buffer
15	21	7	,	001	001				SW	MEM4	MEM5			
22	28	7	,	001	001				SW	MEM6	MEM7			
29	35	7	,	001	001				SW	MEM8	MEM9			
36	39	4	B	333					B	START				* START THE MAIN PROGRAM
40	39													
40	62	23		"Exer... "				HD0	DCW	"EXERCISE TAPES - RON2.1"				* WM After last instruction
* The NewTapes2 Program in memory														
* Instructions from Card #01														
161	167	7	,	179	183				CLR01	SW	CLR04	CLR05		
168	174	7	,	187	195				CLR02	SW	CLR06	CLR07		
175	178	4	,	199					CLR03	SW	CLR08			* I9I = 15,999
179	182	4	/	I99					CLR04	CS	3999			* Clear Storage (200-3999)
183	186	4	H	182					CLR05	SBR	CLR04+3			* Adjust CS Instruction
187	194	8	B	179	200	R			CLR06	BCE	CLR05	200	R	* Q: Loop if CS not finished
195	198	4	1	001					CLR07	R	1			* Read next Card, Branch to 1
199	200	2		"bR"					CLR08	DCW	"bR"			* Data (Space, R)
201	200													
* MAIN PROGRAM														
* From Card #02														
333	339	7	L	902	N00				START	MLCWA	GRPMK	BUFGM		* Groupmark/WM marks buffer end (2500)
340	340	1	M							MLC				* Chain Last Data Character (2499)
341	344	4	M	M99						MLC	BUFEND			* Propagate to Fill Tape Buffer (1500-2498)
345	351	7	N	111	111				HALT	NOP	111	111		* Futer SW in Tape Buffer, CS 0-199
352	352	1	.							HALT				* Period is 0-3-8 Punch
353	356	4	S	964					GO	S	TP4ERRS			* Zero Counters
357	357	1	S							S				* Zero Counters
358	358	1	S							S				* Zero Counters
359	359	1	S							S				* Zero Counters
360	359									S				* Zero Counters
360	360	1	S							S				* Zero Counters
361	361	1	S							S				* Zero Counters
362	362	1	S							S				* Zero Counters
363	363	1	S							S				* Zero Counters
364	368	5	B	393		B			DOTAPES	BSS	TAPE1	B		* Go Write Tape 1 if SS B
369	373	5	B	476		C			DOTP2	BSS	TAPE2	C		* Go Write Tape 2 if SS C
374	378	5	B	559		D			DOTP3	BSS	TAPE3	D		* Go Write Tape 3 if SS D
379	383	5	B	642		E			DOTP4	BSS	TAPE4	E		* Go Write Tape 4 if SS E
384	388	5	B	721		G			DOTP5	BSS	ENDREEL	G		* REWIND and HALT IF SS=G
389	388													
* From Card #04														
389	392	4	B	364						B	DOTAPES			* Loop
393	396	4	S	904					TAPE1	S	CTR			* Zero Counter
397	401	5	B	721		G			WT1	BSS	ENDREEL	G		
402	409	8	M	%U1	V00	W				WT	%U1	BUFFER		* Write Tape 1000 chars. %= 0-4-8 Punch
410	414	5	B	467		K				B	ENDREEL1	K		* BRANCH IF END OF REEL
415	419	5	B	446		L				B	WT1ERR	L		* BRANCH IF TAPE WRITE ERROR
420	426	7	A	906	915					A	ONE	TP1RECS		* Count Records Written
427	426													
* From Card #05														
427	433	7	A	906	904				WT1A	A	ONE	CTR		
434	441	8	B	397	903	0				BCE	WT1	CTRHI	0	* Loop until 10X
442	445	4	B	369						B	DOTP2			* Next Tape
446	452	7	A	906	922				WT1ERR	A	ONE	TP1ERRS		* Count Write Errors
453	457	5	U	%U1		B				BSP	1			* Backspace Tape
458	462	5	U	%U1		E				SKP	1			* Skip and Erase Tape (3 inches)
463	462													
* From Card #06														
463	466	4	B	427						B	WT1A			* Retry Write
467	471	5	U	%U1		B			ENDREEL1	BSP	1			* Backspace Tape
472	475	4	B	721						B	ENDREEL			
476	479	4	S	904					TAPE2	S	CTR			* Zero Counter
480	484	5	B	721		G			WT2	BSS	ENDREEL	G		
485	492	8	M	%U2	V00	W				WT	%U2	BUFFER		* Write Tape 1000 chars. %= 0-4-8 Punch
493	497	5	B	550		K				B	ENDREEL2	K		* BRANCH IF END OF REEL
498	497													
* From Card #07														

498	502	5	B	529		L		B	WT2ERR	L				* BRANCH IF TAPE WRITE ERROR
503	509	7	A	906	929			A	ONE	TP2RECS				* Count Records Written
510	516	7	A	906	904			WT2A	A	ONE	CTR			
517	524	8	B	480	903	0			BCE	WT2	CTRHI	0		* Loop until 10X
525	528	4	B	374					B	DOTP3				* Next Tape
529	535	7	A	906	936			WT2ERR	A	ONE	TP2ERRS			* Count Write Errors
536	535								* From Card #08					
536	540	5	U	%U2		B			BSP	2				* Backspace Tape
541	545	5	U	%U2		E			SKP	2				* Skip and Erase Tape (3 inches)
546	549	4	B	510					B	WT2A				* Retry Write
550	554	5	U	%U2		B		ENDREEL2	BSP	2				* Backspace Tape
555	558	4	B	721					B	ENDREEL				
559	562	4	S	904				TAPE3	S	CTR				* Zero Counter
563	567	5	B	721		G		WT3	BSS	ENDREEL	G			
568	567								* From Card #09					
568	575	8	M	%U3	V00	W			WT	%U3	BUFFER			* Write Tape 1000 chars. % = 0-4-8 Punch
576	580	5	B	633		K			B	ENDREEL3	K			* BRANCH IF END OF REEL
581	585	5	B	612		L			B	WT3ERR	L			* BRANCH IF TAPE WRITE ERROR
586	592	7	A	906	943				A	ONE	TP3RECS			* Count Records Written
593	599	7	A	906	904			WT3A	A	ONE	CTR			
600	599								* From Card #10					
600	607	8	B	563	903	0			BCE	WT3	CTRHI	0		* Loop until 10X
608	611	4	B	379					B	DOTP4				* Next Tape
612	618	7	A	906	950			WT3ERR	A	ONE	TP3ERRS			* Count Write Errors
619	623	5	U	%U3		B			BSP	3				* Backspace Tape
624	628	5	U	%U3		E			SKP	3				* Skip and Erase Tape (3 inches)
629	632	4	B	593					B	WT3A				* Retry Write
633	637	5	U	%U3		B		ENDREEL3	BSP	3				* Backspace Tape
638	637								* From Card #11					
638	641	4	B	721					B	ENDREEL				
642	645	4	S	904				TAPE4	S	CTR				* Zero Counter
646	650	5	B	721		G		WT4	BSS	ENDREEL	G			
651	658	8	M	%U4	V00	W			WT	%U4	BUFFER			* Write Tape 1000 chars. % = 0-4-8 Punch
659	663	5	B	716		K			B	ENDREEL4	K			* BRANCH IF END OF REEL
664	668	5	B	695		L			B	WT4ERR	L			* BRANCH IF TAPE WRITE ERROR
669	675	7	A	906	957				A	ONE	TP4RECS			* Count Records Written
676	675								* From Card #12					
676	682	7	A	906	904			WT4A	A	ONE	CTR			
683	690	8	B	646	903	0			BCE	WT4	CTRHI	0		* Loop until 10X
691	694	4	B	384					B	DOTP5				* Next Tape
695	701	7	A	906	964			WT4ERR	A	ONE	TP4ERRS			* Count Write Errors
702	706	5	U	%U4		B			BSP	4				* Backspace Tape
707	711	5	U	%U4		E			SKP	4				* Skip and Erase Tape (3 inches)
712	711								* From Card #13					
712	715	4	B	676					B	WT4A				* Retry Write
716	720	5	U	%U4		B		ENDREEL4	BSP	4				* Backspace Tape
721	725	5	B	755		B		ENDREEL	BSS	RWD1	B			* Rewind Tape 1
726	730	5	B	769		C		ENDR02	BSS	RWD2	C			* Rewind Tape 2
731	735	5	B	783		D		ENDR03	BSS	RWD3	D			* Rewind Tape 3
736	740	5	B	797		E		ENDR04	BSS	RWD4	E			* Rewind Tape 4
741	745	5	B	†01		F		ENDR05	BSS	PRINT	F			* SS=F MEANS PRINT († = RM = 0-2-8 Punch)
746	745								* From Card #14					
746	750	5	B	345		G		GOHALT	BSS	HALT	G			* SS=G MEANS HALT
751	754	4	B	353					B	GO				* ELSE KEEP GOING
755	759	5	U	%U1		M		RWD1	WTM	1				* Write Tape Mark
760	764	5	U	%U1		R			RWD	%U1				* Rewind The Tape
765	768	4	B	726					B	ENDR02				
769	773	5	U	%U2		M		RWD2	WTM	2				* Write Tape Mark
774	778	5	U	%U2		R			RWD	%U2				* Rewind The Tape
779	782	4	B	731					B	ENDR03				
783	782								* From Card #15 (Modif)					
783	787	5	U	%U3		M		RWD3	WTM	3				* Write Tape Mark
788	792	5	U	%U3		R			RWD	%U3				* Rewind The Tape
793	796	4	B	736					B	ENDR04				
797	801	5	U	%U4		M		RWD4	WTM	4				* Write Tape Mark
802	806	5	U	%U4		R			RWD	%U4				* Rewind The Tape

807	810	4	B	741						B	ENDR05				
811	811	1		"0"						DCW	"0"			* WM After last instruction	
										* From Card #16 (was #19)					
										* DATA					
901	901	1		"9"						BUFDATA	DCW	"9"		* DATA TO FILL BUFFER	
902	902	1		"¥"						GRPMK	DCW	"¥"		* Group Mark = 12-7-8 Punch	
903	902									CTRHI	EQU	*		* High Byte of Counter	
903	904	2		"00"						CTR	DCW	"00"		* Counter	
905	905	1		"0"						ZERO	DC	"0"		* Value 0 (No WM)	
906	906	1		"1"						ONE	DCW	"1"		* Value 1	
907	907	1		"2"						TWO	DCW	"2"		* Value 2	
908	908	1		"3"						THREE	DCW	"3"		* Value 3	
909	915	7		"0000000"						TP1RECS	DCW	"0000000"		* Count of Records Written	
916	922	7		"0000000"						TP1ERRS	DCW	"0000000"		* Count of Write Errors	
923	922									* From Card #17 (was #20)					
923	929	7		"0000000"						TP2RECS	DCW	"0000000"		* Count of Records Written	
930	936	7		"0000000"						TP2ERRS	DCW	"0000000"		* Count of Write Errors	
937	943	7		"0000000"						TP3RECS	DCW	"0000000"		* Count of Records Written	
944	950	7		"0000000"						TP3ERRS	DCW	"0000000"		* Count of Write Errors	
951	957	7		"0000000"						TP4RECS	DCW	"0000000"		* Count of Records Written	
958	957									* From Card #18 (was #21)					
958	964	7		"0000000"						TP4ERRS	DCW	"0000000"		* Count of Write Errors	
965	978	14		"----TAPE4----b"						PRTHD1	DCW	"----TAPE4----b"			
979	992	14		"WRITESbERRORSb"						PRTHD2	DCW	"WRITESbERRORSb"			
993	993	1		"0"						PRTFLAG	DCW	"0"			
										* From Card #19					
										* PRINT ROUTINE					
1001	1008	8	B	#79	993	1				PRINT	BCE	PRTSTATS	PRTFLAG	1	* Record Mark ¥ = 0-2-8 Punch
1009	1012	4		, 201							SW	201			* WM to stop Print Area Propagation
1013	1019	7	M	/61	224						MLC	HD0	224		
1020	1020	1		2							W				
1021	1027	7	M	978	257						MLC	PRTHD1	PRTEND		
1028	1034	7	M	257	243						MLC	PRTEND	PRTEND-14		* Propagate into Print Area
1035	1034									* From Card #20					
1035	1041	7	M	906	210						MLC	ONE	HD1TP1		* Plug Tape #
1042	1048	7	M	907	224						MLC	TWO	HD1TP2		* Plug Tape #
1049	1055	7	M	908	238						MLC	THREE	HD1TP3		* Plug Tape #
1056	1056	1		2							W				* Print Header Line 1
1057	1063	7	M	992	257						MLC	PRTHD2	PRTEND		
1064	1070	7	M	257	243						MLC	PRTEND	PRTEND-14		* Propagate into Print Area
1071	1071	1		2							W				* Print Header Line 2
1072	1071									* From Card #21					
1072	1078	7	M	906	993						MLC	ONE	PRTFLAG		* Set Flag: Header has been printed
1079	1085	7	Z	915	207					PRTSTATS	MVS	TP1RECS	PTP1RECS		* Statistic to Print
1086	1092	7	Z	922	214						MVS	TP1ERRS	PTP1ERRS		
1093	1099	7	Z	929	221						MVS	TP2RECS	PTP2RECS		
1100	1106	7	Z	936	228						MVS	TP2ERRS	PTP2ERRS		
1107	1106									* From Card #22					
1107	1113	7	Z	943	235						MVS	TP3RECS	PTP3RECS		
1114	1120	7	Z	950	242						MVS	TP3ERRS	PTP3ERRS		
1121	1127	7	Z	957	249						MVS	TP4RECS	PTP4RECS		
1128	1134	7	Z	964	256						MVS	TP4ERRS	PTP4ERRS		
1135	1138	4		2 746							W	GOHALT			* Print and start next pass
1139	1138									* From Card #23					
1139	1161	23		"0"						HD0	DCW	"EXERCISE TAPES - RON2.1"		* WM After last instruction	
										* END OF PROGRAM IN MEMORY					
										* PRINTER FORMAT					
201	201	1								HD1	DS		1		* Header Line 1
202	209	8									DS	"----TAPE"			
210	210	1								HD1TP1	DS	"1"			
211	223	13									DS	"----b----TAPE"			
224	224	1								HD1TP2	DS	"2"			
225	237	13									DS	"----b----TAPE"			
238	238	1								HD1TP3	DS	"3"			
239	257	19								PRTEND	DS	"----b----TAPE4----b"			

201	201	1				HD2	DS	1		* Header Line 2
202	215	14					DS	"WRITESbERRORSb"		
216	229	14					DS	"WRITESbERRORSb"		
230	243	14					DS	"WRITESbERRORSb"		
244	257	14					DS	"WRITESbERRORSb"		
201	207	7				PTP1RECS	DS	7		* Statistics
208	214	7				PTP1ERRS	DS	7		
215	221	7				PTP2RECS	DS	7		
222	228	7				PTP2ERRS	DS	7		
229	235	7				PTP3RECS	DS	7		
236	242	7				PTP3ERRS	DS	7		
243	249	7				PTP4RECS	DS	7		
250	256	7				PTP4ERRS	DS	7		
						* TAPE BUFFER FORMAT				
1500	1499		V00			BUFBEG	EQU	1500		* TAPE WRITE BUFFER
1500	2498	999	V00			BUFFER	DS	999		
2499	2499	1	M99			BUFEND	DS	1		* LAST DATA BYTE
2500	2500	1	N00			BUFGM	DS	1		* GROUPMARK/WM