

	*				RBL00012
	*	* COPYRIGHT INTERDATA, INC. JUNE, 1973			RBL00013
	*				RBL00014
	*	* REVISED BY : J. PRATT			RBL00015
	*				RBL00016
	*				RBL00030
	*	* SPECIAL VERSION OF REL LOADER FOR			RBL00040
	*	* USE IN SELF-RELOCATING BOOTSTRAP TAPES			RBL00050
	*	* A FAST-FORMAT VERSION OF THIS PROGRAM			RBL00060
	*	* IS LOADED AT 80 BY THE FF LOADER			RBL00070
	*	* THIS PROGRAM THEN LOADS M16-FORMAT RELOCATABLE			RBL00080
	*	* PROGRAM INTO THE TOP OF MEMORY.			RBL00090
	*				RBL00100
0000	R0	EQU	0		RBL00110
0001	R1	EQU	1		RBL00120
0002	R2	EQU	2		RBL00130
0003	R3	EQU	3		RBL00140
0004	BYTE	EQU	4		RBL00150
0005	PICK	EQU	5		RBL00160
0006	SEQNUM	EQU	6		RBL00170
0007	ONE	EQU	7		RBL00180
0008	TWO	EQU	8		RBL00190
0009	FOUR	EQU	9		RBL00200
000A	A	EQU	10		RBL00210
000B	B	EQU	11		RBL00220
000C	C	EQU	12		RBL00230
000D	D	EQU	13		RBL00240
000E	E	EQU	14		RBL00250
000F	R15	EQU	15		RBL00260
0078	BINDV	EQU	X'78'		RBL00270
0400	PLENTH	EQU	X'400'	LENGTH OF REL LOADER	RBL00280
0080		ORG	X'80'	LOADED HERE BY FF LDR	RBL00290
0080	C8A0	LOADX	LHI A,X'400'	STARTS HERE:	RBL00300
	0400				
0084	C8B0		LHI B,-1	LOCATE TOP OF CORE	RBL00310
	FFFF				
0088	48CA	TOPS	LH C,0(A)		RBL00320
	0000				
008C	40BA		STH B,0(A)		RBL00330
	0000				
0090	48DA		LH D,0(A)		RBL00340
	0000				
0094	4330		BZ TOPF		RBL00350
	00A4				
0098	40CA		STH C,0(A)		RBL00360
	0000				
009C	CAA0		AHI A,X'400'		RBL00370
	0400				
00A0	4230		BNZ TOPS		RBL00380
	0088				
00A4	CBA0	TOPF	SHI A,PLENTH	ADJUST FOR LDR-LENGTH	RBL00390
	0400				
00A8	40A0		STH A,LOC	SET BIAS/LOC FOR	RBL00400
	0260				
00AC	40A0		STH A,BIAS	REL LOADER	RBL00410
	013C				

00B0	0766	CONT	XHR	SEQNUM,SEQNUM	ZERO SEQ	RBL00420
00B2	C870		LHI	ONE,1	ESTABLISH OTHER	RBL00430
	0001					
00B6	C880		LHI	TWO,2	PROGRAM-CONSTANTS	RBL00440
	0002					
00BA	C890		LHI	FOUR,4		RBL00450
	0004					
00BE	0B67	NEXT	SHR	SEQNUM,ONE	READ NEXT RECORD	RBL00460
00C0	4120	REREC	BAL	R2,INPUT		RBL00470
	01BC					
00C4	07CC		XHR	C,C		RBL00480
00C6	C8A0		LHI	A,106		RBL00490
	006A					
00CA	47CA	CKIT	XH	C,BUFF(A)	COMPUTE CHECKSUM	RBL00500
	0266					
00CE	0BA8		SHR	A,TWO		RBL00510
00D0	4310		BNM	CKIT		RBL00520
	00CA					
00D4	C7C0		XHI	C,-1		RBL00530
	FFFF					
00D8	4230		BNZ	CERR		RBL00540
	0124					
00DC	4560		CLH	SEQNUM,BUFF		RBL00550
	0266					
00E0	4230		BNE	SERR		RBL00560
	0124					
00E4	C850		LHI	PICK,BUFF+4	ADJUST ITEM-POINTERS	RBL00570
	026A					
00E8	C840		LHI	BYTE,12		RBL00580
	000C					
00EC	C550	LOOP	CLHI	PICK,BUFF+108	TEST IF RECORD DONE	RBL00590
	02D2					
00F0	4380		BNL	NEXT		RBL00600
	00BE					
00F4	48A5		LH	A,0(PICK)		RBL00610
	0000					
00F8	4110		BAL	R1,EXTR	FETCH COMD ITEM	RBL00620
	01A8					
00FC	0AAA		AHR	A,A		RBL00630
00FE	48BA		LH	B,JUMP(A)		RBL00640
	0104					
0102	030B		BR	B		RBL00650
						RBL00660
0104	00BE	* JUMP	DC	NEXT,END,CHAIN,FLIP		RBL00670
	0132					
	0124					
	0124					
010C	0124		DC	LDX,LDL,RFIN,DFIN		RBL00680
	013E					
	0124					
	0124					
0114	014E		DC	UNAB,UNRL,DUAB,DURL		RBL00690
	0156					
	0170					
	0188					
011C	0124		DC	RBCD,DBCD,EITM,LABEL		RBL00700

	0124						
	0124						
	0124						
		*					
0124	C8B0	ERRD	LHI	B,X'0F'			RBL00710
	000F						RBL00720
0128	9A7B		WDR	ONE,B			RBL00730
012A	C200		LPSW	**4			RBL00740
	012E						
012E	8000		DC	X'8000',REREC			RBL00750
	00C0						
		*					
0124		CERR	EQU	ERRD			RBL00760
0124		SERR	EQU	ERRD			RBL00770
0124		CHAIN	EQU	ERRD	THESE ITEMS ARE		RBL00780
0124		LDX	EQU	ERRD			RBL00790
0124		FLIP	EQU	ERRD	NOT FOUND IN THE		RBL00800
0124		RFIN	EQU	ERRD	RELOCATABLE		RBL00810
0124		DFIN	EQU	ERRD	VERSION OF THE		RBL00820
0124		RBCD	EQU	ERRD	REL AND GENERAL		RBL00830
0124		DBCD	EQU	ERRD	LOADERS, AND SO		RBL00840
0124		EITM	EQU	ERRD	RESULT IN ERROR-		RBL00850
0124		LABEL	EQU	ERRD	STOPS HERE.		RBL00860
		*					RBL00870
0132	07CC	END	XHR	C,C	END OF PROGRAM,		RBL00880
0134	9A7C		WDR	ONE,C	DISPLAY 00 AND		RBL00890
0136	C200		LPSW	**4	HALT. ON RESTART.		RBL00900
	013A						RRL00910
013A	8000		DC	X'8000'	GO TO ORG OF		RBL00920
013C	0000	BIAS	DC	0	LOADED PROGRAM		RBL00930
		*					
013E	4120	L0L	BAL	R2,WORD	FETCH LOAD-LOC		RBL00940
	0190						RBL00950
0142	4AD0		AH	D,BIAS			RBL00960
	013C						
0146	40D0		STH	D,LOC			RBL00970
	0260						
014A	4300		B	LOOP			RBL00980
	00EC						
014E	4120	UNAB	BAL	R2,WORD	FETCH ONE HW		RBL00990
	0190						
0152	4300		B	UNRX			RBL01000
	015E						
0156	4120	UNRL	BAL	R2,WORD	IF REL, ADD BIAS		RBL01010
	0190						
015A	4AD0		AH	D,BIAS			RBL01020
	013C						
015E	48C0	UNRX	LH	C,LOC	FETCH LOAD-LOC		RBL01030
	0260						
0162	40DC		STH	D,0(C)	STORE TEXT		RBL01040
	0000						
0166	0AC8		AHR	C,TWO	AND BUMP LOC		RBL01050
0168	40C0		STH	C,LOC			RBL01060
	0260						
016C	4300		B	LOOP			RBL01070
	00EC						

0170	C8E0 014E	DUAB	LHI	E,UNAB	IF FULLWORD, DO	RBL01080
0174	4120 0190	DUAB1	BAL	R2,WORD	THE SAME FOR FIRST	RBL01090
0178	48C0 0260		LH	C,LOC	HW THEN CALL	RBL01100
017C	40DC 0000		STH	D,0(C)	UNRL/UNAB FOR SECOND	RBL01110
0180	0AC8		AHR	C,TWO	HW.	RBL01120
0182	40C0 0260		STH	C,LOC		RBL01130
0186	030E		BR	E		RBL01140
0188	C8E0 0156	DURL	LHI	E,UNRL		RBL01150
018C	4300 0174		B	DUAB1		RBL01160
		*				RBL01170
0190	08C9	WORD	LHR	C,FOUR	FETCH ONE HALF-WORD	RBL01180
0192	48A5 0000	WORD1	LH	A,0(PICK)	TO REG D.	RBL01190
0196	4110 01A8		BAL	R1,EXTR		RBL01200
019A	CDD0 0004		SLHL	D,4		RBL01210
019E	06DA		OHR	D,A		RBL01220
01A0	0BC7		SHR	C,ONE		RBL01230
01A2	4230 0192		BNZ	WORD1		RBL01240
01A6	0302		BR	R2		RBL01250
		*				RBL01260
01A8	CCA4 0000	EXTR	SRHL	A,0(BYTE)	EXTRACT A 4-BIT	RBL01270
01AC	C4A0 000F		NHI	A,15	ITEM FROM A	RBL01280
01B0	0B49		SHR	BYTE,FOUR		RBL01290
01B2	0311		BNMR	R1		RBL01300
01B4	C840 000C		LHI	BYTE,12	BUMP ITEM-POINTERS	RBL01310
01B8	0A58		AHR	PICK,TWO		RBL01320
01BA	0301		BR	R1		RBL01330
		*				RBL01340
		*				RBL01350
0002		RTN	EQU	R2		RBL01360
000D		DEV	EQU	D		RBL01370
000A		AC1	EQU	A		RBL01380
0001		DAT	EQU	R1		RBL01390
000E		CBA	EQU	E		RBL01400
000C		ZERO	EQU	C		RBL01410
		*				RBL01420
01BC	07CC	INPUT	XHR	ZERO,ZERO		RBL01430
01BE	D3D0 0078		LB	DEV,BINDV	FETCH DEVICE-ADDRESS	RBL01440
01C2	C830 0232		LHI	R3,SENSE	STATUS CHECK ROUTINE ADDRESS	RBL01450
01C6	080D		LHK	R0,DEV	DEVICE ADDRESS	RBL01460
01C8	0407		NHK	R0,ONE	TTY - SELECT WRITE	RBL01465

01CA	4230		BNZ	IN		RBL01470
	023A					
01CE	DED0		OC	DEV,TWRT	AND OUTPUT X-ON	RBL01480
	0262					
01D2	4240		BTC	4,*-4	REPEAT IF FSYN	RBL01490
	01CE					
01D6	01F3		BALR	R15,R3	CHECK STATUS	RBL01500
01D8	DAD0		WD	DEV,XON	WRITE X-ON	RBL01510
	0264					
01DC	4240		BTC	4,*-4	REPEAT IF FSYN	RBL01520
	01D8					
01E0	DED0	IN1	OC	DEV,BINDV+1	START DEVICE IN	RBL01530
	0079					
01E4	4240		BTC	4,IN1		RBL01540
	01E0					
01E8	07EE		XHR	CBA,CBA		RBL01550
01EA	C8A0		LHI	AC1,LDRSKP	SET LDR-SKP MODE	RBL01560
	01FA					
01EE	01F3	READIT	BALR	R15,R3	CHECK STATUS	RBL01570
01F0	9BD1		RDR	DEV,DAT	ACCEPT A BYTE	RBL01580
01F2	4240		BTC	4,*-2		RBL01590
	01F0					
01F6	9A71		WDR	ONE,DAT		RBL01600
01F8	030A		BR	AC1		RBL01610
		*				RBL01620
01FA	C510	LDRSKP	CLHI	DAT,X'F0'	SKIP LEADER UNTIL	RBL01630
	00F0					
01FE	4230		BNE	READIT	A F0 IS FOUND. THEN	RBL01640
	01EE					
0202	C8A0	NOLDR	LHI	AC1,DATRED	SELECT DATA-READ MODE	RBL01650
	020A					
0206	4300		B	READIT	START READING	RBL01660
	01EE					
020A	D21E	DATRED	STB	DAT,BUFF(CBA)	MOVE A BYTE TO BUFFER	RBL01670
	0266					
020E	0AE7		AHR	CBA,ONE	BUMP COUNTER/INDEX	RBL01680
0210	C5E0		CLHI	CBA,108	AND TEST IF DONE YET.	RBL01690
	006C					
0214	4280		BL	READIT		RBL01700
	01EE					
0218	080D		LHR	R0,DEV	DEVICE ADDRESS	RBL01710
021A	0407		NHR	R0,ONE	TTY OR HSPTRP ?	RBL01715
021C	0232		BNZR	RTN	HSPTRP	RBL01720
021E	DED0	DTRD2	OC	DEV,TWRT	TTY WRITE	RBL01730
	0262					
0222	4240		BTC	4,*-4		RBL01740
	021E					
0226	01F3		BALR	R15,R3	CHECK STATUS	RBL01750
0228	DAD0		WD	DEV,XOFF		RBL01760
	0265					
022C	4240		BTC	4,*-4		RBL01770
	0228					
0230	0302		BR	RTN		RBL01780
		*				RBL01790
0232	9DD1	SENSE	SSR	DEV,DAT	SENSE STATUS	RBL01800
0234	42F0		BTC	15,*-2		RBL01810

0232						
023B	030F		BR	R15	RETURN	RBL01820
023A	0800	IN	LHR	R0,DEV	DEVICE ADDRESS	RBL01830
023C	0409		NHR	R0,FOUR	MT / CAS ?	RBL01835
023E	4330		BZ	IN1	NO	RBL01840
	01E0					
0242	DED0		OC	DEV,BINDV+1	ISSUE READ CMD	RBL01850
	0079					
0246	9DD1		SSR	DEV,DAT		RBL01860
0248	4220		BP	IN	COMMAND IGNORED, RETRY	RBL01870
	023A					
024C	D7D0		RB	DEV,BUFBLK	READ BLOCK	RBL01880
	025C					
0250	9DD1	DTRD1	SSR	DEV,DAT	CHECK STATUS	RBL01890
0252	C410		NHI	DAT,2	WAIT FOR EOM	RBL01900
	0002					
0256	4330		BZ	DTRD1		RBL01910
	0250					
025A	0302		BR	RTN		RBL01920
025C	0266	BUFBLK	DC	BUFF,BUFF+107		RBL01930
	02D1					
0260	0000	LOC	DC	0		RBL01940
0262	98A9	TWRT	DC	X'98A9'		RBL01950
0264	9193	XON	DC	X'9193'		RBL01960
0265		XOFF	EQU	XON+1		RBL01970
0266		BUFF	DS	110		RBL01980
02D4			END			RBL01990

NO ERRORS

A	000A
AC1	000A
B	000B
BIAS	013C
BINDV	0078
BUFBLK	025C
BUFF	0266
BYTE	0004
C	000C
CBA	000E
CERR	0124
CHAIN	0124
CKIT	00CA
CONT	00B0
D	000D
DAT	0001
DATRED	020A
DBCD	0124
DEV	000D
DFIN	0124
DTRD1	0250
DTRD2	021E
DUAB	0170
DUAB1	0174
DURL	0188
E	000E
EITM	0124
END	0132
ERRD	0124
EXTR	01A8
FLIP	0124
FOUR	0009
IN	023A
IN1	01E0
INPUT	01BC
JUMP	0104
LABEL	0124
LDL	013E
LDRSKP	01FA
LDX	0124
LOADX	0080
LOC	0260
LOOP	00EC
NEXT	00BE
NOLDR	0202
ONE	0007
PICK	0005
PLENTH	0400
R0	0000
R1	0001
R15	000F
R2	0002
R3	0003
RBCD	0124
READIT	01EE

REREC	00C0
RFIN	0124
RTN	0002
SENSE	0232
SEQNUM	0006
SERR	0124
TOPF	00A4
TOPS	0088
TWO	0008
TWRT	0262
UNAB	014E
UNRL	0156
UNRX	015E
WORD	0190
WORD1	0192
XOFF	0265
XON	0264
ZERO	000C

* * FRONT END LOADER *	FEL00021 FEL00022 FEL00023
* COPYRIGHT INTERDATA, INC. JUNE, 1973 *	FEL00024 FEL00025
* REVISED BY: J. PRATT *	FEL00026 FEL00027
* *	FEL00030 FEL00040
* DIRECTIONS: * SET LOADER-BIAS TO TOP-OF-CORE + 1 (FOR 8K, 2000) * LOAD THIS TAPE (06-030R02) * AFTER LOADING, THE PROGRAM HALTS. WHEN THE * PROCESSOR IS RESTARTED, AN 8-BIT FRONT-END * IS OUTPUT TO BOUTDV WITH THE FAST-FORMAT LOADER * LOCATED IN THE LAST X'240' BYTES OF CORE. * THIS FRONT-END MAY THEN BE COPIED ONTO THE * FRONT OF A FAST-FORMAT TAPE BY THE FF PUNCHER.	FEL00050 FEL00060 FEL00070 FEL00080 FEL00090 FEL00100 FEL00110 FEL00120

* THIS ROUTINE IS LOADED BY THE 50-SEQUENCE					FEL00140
0000R		RELOC	EQU	*	FEL00150
0080			ORG	X'80'	FEL00160
0080	D350		LB	5,X'78'	FEL00170
	0078			FETCH DEVICE-ADDRESS	
0084	D750		RB	5,BOOTLM	FEL00180
	00CA			READ BLOCK	
0088	4240		BTC	4,HALTB	FEL00190
	00C2			CHECK STATUS	
008C	C810		LHI	1,PLOW	FEL00200
	FDCOR			SET UP REGISTERS FOR	
0090	C830		LHI	3,PHIGH	FEL00210
	FEEBR			BXLE-LOOP	
0094	C820		LHI	2,1	FEL00220
	0001				
0098	0744		XHR	4,4	FEL00230
009A	D361	CHECK	LB	6,0(1)	FEL00240
	0000			GET A BYTE FOR CHECKSUM	
009E	0A46		AHR	4,6	FEL00250
00A0	C110		BXLE	1,CHECK	FEL00260
	009A			BUMP THE CHECKSUM AND DO IT AGAIN ...	
00A4	C540		CLHI	4,CKSUM	FEL00270
	0000				
00A6		CTST	EQU	*-2	FEL00280
00A8	4330		BE	PSTRT	FEL00290
	FDCOR			IF ITS OKAY, TRANSFER	
00AC	C550		CLHI	5,2	FEL00300
	0002			OTHERWISE, STOP HERE	
00B0	4230		BNE	HALTB	FEL00310
	00C2			IF OTHER THAN TTY,	
00B4	DE50		OC	5,TWRTB	FEL00320
	00CE			IF TTY, GO TO WRITE	
00B8	9D56		SSR	5,6	FEL00330
00BA	42F0		BTC	15,*-2	FEL00340
	00B8			MODE, WAIT FOR ZRO STATUS, AND WRITE	
00BE	DA50		WD	5,XOFFB	FEL00350
	00CF			THE X-OFF TO STOP IT.	
00C2	C200	HALTB	LPSW	**4	FEL00360
	00C6				
00C6	8000		DC	X'8000',PSTRT	FEL00370
	FDCOR				
00CA	FDCOR	BOOTLM	DC	PLOW,PHIGH	FEL00380
	FEEBR				
00CE	9893	TWRTB	DC	X'9893'	FEL00390
00CF		XOFFB	EQU	TWRTB+1	FEL00400
0000		CKSUM	EQU	0	FEL00410

* THIS GETS LOADED BY THE BOOTSTRAP LOADER					
FDC0R		ORG	RELOC-X'240'		FEL00430
0000	R0	EQU	0		FEL00440
0001	R1	EQU	1		FEL00450
0002	R2	EQU	2		FEL00460
0003	R3	EQU	3		FEL00470
0004	LOC	EQU	4		FEL00480
0005	LAST	EQU	5		FEL00490
0006	GOTO	EQU	6		FEL00500
0007	SEQNUM	EQU	7		FEL00510
0008	ONE	EQU	8		FEL00520
0009	TWO	EQU	9		FEL00530
000A	A	EQU	10		FEL00540
000B	B	EQU	11		FEL00550
000C	C	EQU	12		FEL00560
000D	D	EQU	13		FEL00570
000E	E	EQU	14		FEL00580
000F	F	EQU	15		FEL00590
0078	BINDV	EQU	X'78'		FEL00600
0104	LENGTH	EQU	260		FEL00610
	*				FEL00620
	*				FEL00630
FDC0R 0B77	CONT	SHR	SEQNUM,SEQNUM	CLEAR SEQNUM	FEL00640
FDC2R C880		LHI	ONE,1	SET CONSTANTS 1,2	FEL00650
0001					FEL00660
FDC6R C890		LHI	TWO,2		FEL00670
0002					
FDCAR 0B78	NEXT	SHR	SEQNUM,ONE	NEXT BLOCK	FEL00680
FDCCR D3D0	INPUT	LB	D,BINDV	PICK UP DEV NO	FEL00690
0078					
FDD0R 080D		LHR	R0,D	DEVICE ADDRESS	FEL00700
FDD2R 0408		NHK	R0,ONE	TTY ?	FEL00705
FDD4R 4330		BZ	IN1-4	YES	FEL00710
FDFCR					
FDD8R 080D		LHR	R0,D	DEVICE ADDRESS	FEL00720
FDDAR C400		NHI	R0,4	MT / CAS ?	FEL00725
0004					
FODER 4330		BZ	IN2	NO - HSPTRP	FEL00730
FE0AR					
FDE2R 9DDE	IN	SSR	D,E		FEL00740
FDE4R C4E0		NHI	E,X'10'	WAIT FOR NMTN	FEL00750
0010					
FDE8R 4330		BZ	IN		FEL00760
FDE2R					
FDECR DED0		OC	D,BINDV+1	ISSUE READ COMMAND	FEL00770
0079					
FDF0R D7D0		RB	D,FFLM	READ A BLOCK	FEL00780
FEE4R					
FDF4R 4240		BTC	4,ERROR	CHECK STATUS	FEL00790
FEC6R					
FDF8R 4300		B	CSUM	CALCULATE CHECKSUM	FEL00800
FE4ER					
FDFCR DED0		OC	D,TWRT	IF TTY, SET WRITE MODE	FEL00810
FEF8R					
FE00R 9DDE	IN1	SSR	D,E	AND OUTPUT XON	FEL00820
FE02R 4290		BTC	9,IN1		FEL00830

FE06R	FE00R DAD0		WD	D,XON		FEL00840
FE0AR	FEEAR DED0	IN2	OC	D,BINDV+1	START DEVICE	FEL00850
FE0ER	0079 C8A0		LHI	A,BUFF	SET BUFF POINTER	FEL00860
FE12R	FEECR 4110	IN3	BAL	R1,CHAR		FEL00870
FE16R	FED4R 4330		BZ	IN3	SKIP LEADER	FEL00880
FE1AR	FE12R D2BA	IN31	STB	B,0(A)		FEL00890
FE1ER	0000 0AA8		AHR	A,ONE	READ 260 CHARS	FEL00900
FE20R	C5A0		CLHI	A,BUFF+LENGTH	STARTING AT FIRST	FEL00910
FE24R	FFF0R 4380		BNL	IN32	NON-BLANK	FEL00920
FE28R	FE30R 4110		BAL	R1,CHAR		FEL00930
FE2CR	FED4R 4300		B	IN31		FEL00940
FE30R	FE1AR 080D	IN32	LHR	R0,D	DEVICE ADDRESS	FEL00950
FE32R	0408		NHR	R0,ONE	HSPTRP ?	FEL00955
FE34R	4330		BZ	IN4	NO	FEL00960
FE38R	FE40R DED0		OC	D,STOP	STOP DEVICE	FEL00970
FE3CR	FEE9R 4300		B	CSUM		FEL00980
FE40R	FE4ER DED0	IN4	OC	D,TWRT	IF TTY, SET WRITE MODE	FEL00990
FE44R	FEE8R 9DDE	IN5	SSR	D,E	AND OUTPUT XOFF	FEL01000
FE46R	4290		BTC	9,IN5		FEL01010
FE4AR	FE44R DAD0		WD	D,XOFF		FEL01020
FE4ER	FEEBR D3C0	*	CSUM	LB	C,BUFF	COMPUTE CHECKSUM
FE52R	FE5CR D3B0		LB	B,BUFF+1		FEL01050
FE56R	FEEBR 0ACB		AHR	C,B		FEL01060
FE58R	C8A0		LHI	A,BUFF+4		FEL01070
FE5CR	FEFOR D3BA	CKIT	LB	B,0(A)	CHECKSUM IS ARITHMETIC	FEL01080
FE60R	0000 0ACB		AHR	C,B	SUM OF ALL BYTES EXCEPT	FEL01090
FE62R	0AA8		AHR	A,ONE	THE CHECKSUM AT BUFF+2	FEL01100
FE64R	C5A0		CLHI	A,BUFF+LENGTH		FEL01110
FE68R	FFF0R 4280		BL	CKIT		FEL01120
FE6CR	FE5CR 45C0		CLH	C,BUFF+2		FEL01130
FE70R	FEEER 4230		BNE	ERROR		FEL01140

FE74R	FEC6R 4570		CLH	SEGNUM,BUFF		FEL01150
FE78R	FEECR 4230 FEC6R		BNE	ERROR		FEL01160
FE7CR	C8A0	STORE	LHI	A,BUFF+4	STORE DATA	FEL01170
FE80R	FEF0R C570		CLHI	SEGNUM,-1		FEL01180
FE84R	FFFF 4230		BNE	LOOP		FEL01190
FE88R	FE98R 4840		LH	LOC,BUFF+4	IF FIRST BLOCK	FEL01200
FE8CR	FEF0R 4850		LH	LAST,BUFF+6	SET BEG,END,AND	FEL01210
FE90R	FEF2R 4860		LH	GOTO,BUFF+8	TRANSFER ADDRESS	FEL01220
FE94R	FEF4R C8A0		LHI	A,BUFF+10		FEL01230
FE98R	FEF6R 48BA	LOOP	LH	B,0(A)	STORE HALFWORD	FEL01240
FE9CR	0000 40B4 0000		STH	B,0(LOC)		FEL01250
FEA0R	0AA9		AHR	A,TWO		FEL01260
FEA2R	0545		CLHR	LOC,LAST	STOP WHEN LAST	FEL01270
FEA4R	4380		BNL	END	HALFWORD FILLED	FEL01280
FEA8R	FEB6R 0A49		AHR	LOC,TWO		FEL01290
FEAAR	C5A0		CLHI	A,BUFF+LENGTH	READ NEXT BLOCK	FEL01300
FEAER	FFF0R 4280		BL	LOOP	WHEN BUFF EMPTY	FEL01310
FEB2R	FE98R 4300 FDCAR		B	NEXT		FEL01320
FEB6R	0866	END	LHR	GOTO,GOTO		FEL01330
FEB8R	0236		BTCR	3,GOTO		FEL01340
FEBAR	07CC		XHR	C,C	DISPLAY X'00'	FEL01350
FEBCR	9A8C		WDR	ONE,C	FOR NORMAL END	FEL01360
FEBER	C200	HALT	LPSW	**4		FEL01370
FEC2R	FEC2R 8000 FDCOR		DC	X'8000',A(CONT)		FEL01380
FEC6R	C8C0	ERROR	LHI	C,X'F'	DISPLAY X'0F' TO	FEL01390
FECAR	000F 9A8C		WDR	ONE,C	SHOW INPUT ERROR	FEL01400
FEC2R	FEC2R C200		LPSW	**4		FEL01410
FED0R	FED0R 8000 FDCCR		DC	X'8000',A(INPUT)		FEL01420
FED4R	9DDE	CHAR	SSR	D,E	READ ONE CHAR	FEL01430
FED6R	08EE		LHR	E,E		FEL01440
FED8R	4230		BNZ	CHAR		FEL01450

FED4R					
FEDCR 98DB		RDR	D,B		FEL01500
FEDER C4B0		NHI	B,X'FF'		FEL01510
00FF					
FEE2R 0301		BR	R1		FEL01520
	*				FEL01530
FEE4R FEECR	FFLM	DC	BUFF,BUFF+259		FEL01540
FFEFR					
FEE8R 98A9	TWRT	DC	X'98A9'		FEL01550
FEE9R	STOP	EQU	TWRT+1		FEL01560
FEEAR 9193	XON	DC	X'9193'		FEL01570
FEEBR	XOFF	EQU	XON+1		FEL01580
	*				FEL01590
FEECR	BUFF	DS	LENGTH		FEL01600
FFF0R		DS	2		FEL01610

* THIS PUNCHES OUT THE FIRST TWO IN 8-BIT FORM						FEL01630
0000			ORG	X'D0'		FEL01640
0000	C820	STR	LHI	2,PLOW	SET UP TO COMPUTE	FEL01650
	FDCOR					
0004	C830		LHI	3,1	CHECKSUM FOR BOOT LOADER	FEL01660
	0001					
0008	C840		LHI	4,PHIGH		FEL01670
	FEEBR					
000C	0755		XHR	5,5		FEL01680
000E	D362	CSG	LB	6,0(2)		FEL01690
	0000					
00E2	0A56		AHR	5,6		FEL01700
00E4	C120		BXLE	2,CSG		FEL01710
	000E					
00E8	4050		STH	5,CTST		FEL01720
	00A6					
00EC	D310		LB	1,X'7A'	FETCH BOUTDV ADDRESS	FEL01730
	007A					
00F0	0801		LHR	0,1	DEVICE ADDRESS	FEL01740
00F2	C400		NHI	0,4	MT / CAS ?	FEL01745
	0004					
00F6	4230		BNZ	BS3	YES	FEL01750
	0128					
00FA	C820		LHI	2,X'80'		FEL01760
	0080					
00FE	C840		LHI	4,X'CF'	SET UP LIMITS	FEL01770
	00CF					
0102	DE10	BS0	OC	1,X'7B'	START DEVICE	FEL01780
	007B					
0106	9D1F	BS1	SSR	1,15		FEL01790
0108	42F0		BTC	15,*-2		FEL01800
	0106					
010C	DA12		WD	1,0(2)	WRITE A BYTE	FEL01810
	0000					
0110	C120		BXLE	2,BS1		FEL01820
	0106					
0114	C520		CLHI	2,X'100'	IS THIS THE END OF IT	FEL01830
	0100					
0118	4380		BNI	STOPER	OR THE END OF THE FIRST SECTION	FEL01840
	014E					
011C	C820		LHI	2,PLOW		FEL01850
	FDCOR					
0120	C840		LHI	4,PHIGH		FEL01860
	FEEBR					
0124	4300		B	BS1	CONTINUE	FEL01870
	0106					
0128	9D1F	BS3	SSR	1,15	CHECK STATUS	FEL01880
012A	4210		BTC	1,BS3		FEL01890
	0128					
012E	DE10		OC	1,WFM	WRITE A FILE MARK	FEL01900
	0162					
0132	41E0		BAL	E,NMTN	WAIT FOR NO MOTION	FEL01910
	0156					
0136	DE10		OC	1,BKSP	BACK SPACE	FEL01920
	0163					
013A	41E0		BAL	E,NMTN	WA&T FO- NO MOTION	FEL01930

013E	0156 DE10 007B		OC	1,BOUTDV+1	ISSUE WRITE CMD	FEL01940
0142	D610 0164		WB	1,PNCHBT	PUNCH BOOT	FEL01950
0146	D610 0168		WB	1,PNCHFF	PUNCH FF LOADER	FEL01960
014A	41E0 0156		BAL	E,NMTN	WAIT FOR NO MOTION	FEL01970
014E	C200 0152	STOPER	LPSW	*+4		FEL01980
0152	8000 00D0		DC	X'8000',STR		FEL01990
0156	9D1F	NMTN	SSR	1,15	CHECK STATUS	FEL02000
0158	C4E0 0010		NHI	15,X'10'	NMTN ?	FEL02010
015C	4330 0156		BZ	NMTN	WAIT FOR IT	FEL02020
0160	030E		BR	E		FEL02030
0162	B091	WFM	DC	X'B091'		FEL02040
0163		BKSP	EQU	WFM+1		FEL02050
0164	0080 00CF	PNCHBT	DC	X'80',X'CF'		FEL02060
0168	FDCOR FEEBR	PNCHFF	DC	PLOW,PHIGH		FEL02070
007A		BOUTDV	EQU	X'7A'		FEL02080
FDCOR		PLOW	EQU	CONT		FEL02090
FEEBR		PHIGH	EQU	BUFF-1		FEL02100
FDCOR		PSTRT	EQU	PLOW		FEL02110
016C		END	STOPER			FEL02120

NO ERRORS

A	000A
B	000B
BINDV	0078
BKSP	0163
BOOTLM	00CA
BOUADV	007A
BS0	0102
BS1	0106
BS3	0128
BUFF	FE6CR
C	000C
CHAR	FED4R
CHECK	009A
CKIT	FE5CR
CKSUM	0000
CONT	FDC0R
CSG	000E
CSUM	FE4ER
CTST	00A6
D	000D
E	000E
END	FE66R
ERROR	FEC6R
F	000F
FELM	FE64R
GOTO	0006
HALT	FE6ER
HALTB	00C2
IN	FDE2R
IN1	FE00R
IN2	FE0AR
IN3	FE12R
IN31	FE1AR
IN32	FE30R
IN4	FE40R
IN5	FE44R
INPUT	FDCCR
LAST	0005
LENGTH	0104
LOC	0004
LOOP	FE98R
NEXT	FDCAR
NMTN	0156
ONE	0008
PHIGH	FE6BR
PLOW	FDC0R
PNCHBT	0164
PNCHFF	0168
PSTRT	FDC0R
R0	0000
R1	0001
R2	0002
R3	0003
RELOC	0000R
SEQNUM	0007

STOP	FEE9R
STOPER	014E
STORE	FE7CR
STR	0000
TWO	0009
TWRT	FEEBR
TWRTB	00CE
WFM	0162
XOFF	FEEBR
XOFFB	00CF
XON	FEEAR