

SYSTEMS ENGINEERING LABORATORIES PROGRAM LIBRARY

SOFTWARE DESCRIPTION

CATALOG NO. 300015D

DOCUMENTATION REV* N/A

DATE Nov 7, 1969

PROGRAM TITLE: 810A/B General Source Update

PURPOSE: To provide a convenient means of updating source programs stored on magnetic tape (7-track) or paper tape.

CONFIGURATION: Basic 810A/B Computer

SOFTWARE ENVIRONMENT: Stand Alone

PROGRAM LANGUAGE: 810 Assembly

SIZE: 02562

TIMING: N/A

*This is used when the program description only is revised and does not reflect any change to the listing, tape, etc.

REASON FOR CHANGE: Increase capability

USE:

This program must be loaded above the BTC locations (1060, 1061) if magnetic tapes are to be used. It is assumed that the magnetic tapes are connected to BTC #1.

Three parameters are required in order to perform the functions provided in this program. They are:

- 1) CD - The peripheral Control Device
- 2) ID - The peripheral Input Device
- 3) OD - The peripheral Output Device

These may be one of the following:

- 1) KB - ASR-33 Keyboard
- 2) TT - ASR-33 paper tape reader/punch
- 3) PT - High-Speed Paper Tape Reader/Punch
- 4) CD - Card Reader
- 5) LP - Line Printer
- 6) M0 through M7 - Magnetic tape unit 0 through 7 respectively.

Upon initial execution of the program, the program will request the control device parameter by typing "CD" on the ASR-33 Keyboard. The reply must be either CD for Card Reader or KB for Keyboard. If the Keyboard is selected as the Control Device, the program will request the Input Device parameter by typing "ID", and the Output Device by typing "OD". The reply may be any one of the above.

When the card reader (CD) is selected as the control device the first card must be of the form:

ID=XX, OD=YY

"XX" and "YY" may be any of the above I/O designators.

Note

All control cards start in column 1 and do not allow embedded blanks.

The following functions are available:

- 1) COPY - Allows for copying records or files from one device to another
- 2) ADVF - Skips files on magnetic tape
- 3) DELE - Skips records on input device
- 4) REWD - Rewinds magnetic tape
- 5) INSE - Insert records from the input device
- 6) WEOF - Write end of file on magnetic tape

Three additional commands are available for program control. They are:

- 1) QUIT - Terminates update run
- 2) SEQN - Resets sequence counter
- 3) / - Returns control to the ASR-33 Keyboard

The following describes in detail the functions listed above. In all cases, the control information starts in column one and does not accept embedded blanks.

1. COPYXXXX or COPY00YYFILES

XXXX = 0001 to 9999

YY = 01 to 99

COPYXXXX will copy XXXX decimal records (card images) from the input device to the output device.

COPY00YY will copy YY decimal files from the input device (magnetic tape only) to the output device.

If Sense Switch 1 is set, the end of file will not be copied to the output device. In either case, "EOF" will be typed on the Keyboard indicating that a file has been copied.

Note

Note that when copying from magnetic tape to any other peripheral type, if SSW 1 is not set, a garbage record will be output whenever an end of file is encountered on the input tape.

When copying records, a card image with \$EOF in the first four columns will be interpreted as an end of file. This is especially useful in copying

a card deck of undetermined length to magnetic tape. This will output an end of file as described above.

2. ADVFXX or ADVFXX,YY

XX = M0 through M7 to designate tape unit 0 through 7.

YY = Number of files (decimal) to be advanced (skipped)

As each file is being skipped, "FILE SKIPPED" will be logged on the Keyboard. This may be suppressed by setting sense switch #2.

Note

"FILE SKIPPED" is logged just prior to issuing the Advance File instruction to the tape controller. Therefore, the tape will be in motion after the message is logged until an end of file mark is sensed.

3. DELEXXXX

XXXX = Number of records (decimal) to be skipped on input device.

4. REWDXX

XX = M0 through M7 to designate rewinding tape unit 0 through 7 respectively.

5. INSE

Will cause subsequent inputs from the control device to be output to the output device until encountering an input with a / in column one.

Essentially, the occurrence of an INSE in the control stream converts the control device to the input device until a / is encountered which will then return the control device to the status of supplying control information.

6. WEOF

Causes an end of file to be written on the output device (magnetic tape only).

7. QUIT

Terminates the update run with a halt condition.

8. SEQN

Causes the sequence counter to be reset. All operations at the record level are cumulative. That is, to copy three files of ten records would require COPY0010, COPY0020, COPY0030. To copy or delete an additional 25 would require a COPY0055 or DELE0055 unless the command were preceded by a SEQN command, which would then accept a COPY0025 or DELE0025. This is of primary use when working with multiprogram files such as the machine coded library.

9. / (Slash)

Causes the update program to request new I/O parameters. This should not be confused with the / (slash) as interpreted by input stream which acts as a terminator for records being inserted as described under INSE.

Three error messages are provided:

- 1) INVL - An invalid command has been input.
- 2) SEQC - The number of records specified on a COPY or DELE command is less than that already processed.
- 3) CARD - The I/O parameter card contains an invalid peripheral or is not of the proper format.
ERR

Example

* CD	Output on Keyboard by Update
CD	Parameter input via Keyboard by operator to specify card reader input, for control information.
ID=MO,OD=M1	Input device is magnetic tape unit 0, Output device is magnetic tape unit 1.
COPY0003FILES	Copies 3 files from magnetic tape 0 to 1.
* EOF	
* EOF	
* EOF	
COPY0029	Copy 29 records from magnetic tape unit 0 to 1.
INSE	Takes input data from control device
LAA ABC	Inserted in output file
STA DEF	Inserted in output file
/	Terminates inputs from control device
DELE0031	Deletes sequence numbers 30 and 31 from input file
COPY9999	Copies until reading an end of file
* EOF	
/	Returns to Update for new parameters
* CD	
KB	Assign Keyboard as control device
* ID	
M1	Assign magnetic tape 1 as input device
* OD	
LP	Assign line printer as output device
REWDM1	Rewind magnetic tape unit 1
SEQN	Reset sequence counter
COPY0050	List first 50 records on magnetic tape 1
ADVFM1,02	Skip to beginning of third file
* Program type outs	

SEL 300015D

* FILE SKIPPED

* FILE SKIPPED

COPY0001FILE

List third file

REWDM1

Rewind magnetic tape unit 1

QUIT

Terminate update

* Program type outs

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0001      *      300015D  810A/810B GENERAL SOURCE UPDATE      NOV, 7, 1969
0002      *
0003 00000 00000000      REL
0004 00000 00000003 STRT CLA
0005 00001 03101047      STA  SEQC
0006 00002 03100303      STA  SEQN
0007 00003 03100302      STA  SEQF
0008 00004 11100045      BRU  C00
0009 00005 01077777 AID LAA  =-1
0010 00006 25100000      CALL H$WR      TYPE ID
0011 00007 35401021      DAC  MG2
0012 00010 00000002      DATA 2
0013 00011 01000001      LAA  =1
0014 00012 25100000      CALL H$WR      INPUT ID NUMBER
0015 00013 35400671      DAC  ID
0016 00014 00000002      DATA 2
0017 00015 02100671      LBA  ID      FIRST CHARACTER
0018 00016 01100672      LAA  ID+1
0019 00017 00001016      LSL  8      2ND CHARACTER
0020 00020 00001014      FRL  8
0021 00021 12100514      SPB  CHEK      SEE IF LEGAL ID
0022 00022 11100005      BRU  AID      ERROR EXIT
0023 00023 03100671      STA  ID
0024 00024 01077777 A0D LAA  =-1
0025 00025 25100000      CALL H$WR      TYPE 00
0026 00026 35401023      DAC  MG3
0027 00027 00000002      DATA 2
0028 00030 01000001      LAA  =1
0029 00031 25100000      CALL H$WR      INPUT 2 CHAR 00
0030 00032 35400673      DAC  0D
0031 00033 00000002      DATA 2
0032 00034 02100673      LBA  0D
0033 00035 01100674      LAA  0D+1
0034 00036 00001016      LSL  8
0035 00037 00001014      FRL  8
0036 00040 12100514      SPB  CHEK      OBTAIN LOGICAL DEVICE NO
0037 00041 11100024      BRU  A0D      ERROR EXIT
0038 00042 00000002      NEG
0039 00043 03100673      STA  0D
0040 00044 11100111      BRU  SET

```

*D
*D
*D

*D

0041	00045	0107777	COD	LAA	=-1			
0042	00046	25100000		CALL	H\$NR	TYPE	CD	
0043	00047	35401025		DAC	MG4			
0044	00050	00000002		DATA	2			
0045	00051	01000001		LAA	=1			
0046	00052	25100000		CALL	H\$NR			
0047	00053	35400675		DAC	CD	INPUT	CD	
0048	00054	00000002		DATA	2			
0049	00055	02100675		LBA	CD			
0050	00056	01100676		LAA	CD+1			
0051	00057	00001016		LSL	8			
0052	00060	00001014		FRL	8			
0053	00061	12100514		SPB	CHEK			
0054	00062	11100045		BRU	COD	ERROR	EXT	
0055	00063	03100675		STA	CD			
0056	00064	15000001		CMA	=1	IS CD	THE KEYBOARD	*D
0057	00065	11100067		BRU	CRCD	NØ		*D
0058	00066	11100005		BRU	AID			*D
0059	00067	12100611	CRCD	SPB	H\$NR	READ A	CARD	*D
0060	00070	02100702		LBA	CARD+3	GET	ID	*D
0061	00071	01100703		LAA	CARD+4			*D
0062	00072	03100672		STA	ID+1			*D
0063	00073	00001016		LSL	8			*D
0064	00074	00001014		FRL	8			*D
0065	00075	12100514		SPB	CHEK	ID	ØK	*D
0066	00076	11100263		BRU	CØER			*D
0067	00077	03100671		STA	ID			*D
0068	00100	02100710		LBA	CARD+9	GET	ØD	*D
0069	00101	01100711		LAA	CARD+10			*D
0070	00102	03100674		STA	ØD+1			*D
0071	00103	00001016		LSL	8			*D
0072	00104	00001014		FRL	8			*D
0073	00105	12100514		SPB	CHEK	IS ØD	Ø K	*D
0074	00106	11100263		BRU	CØER			*D
0075	00107	00000002		NEG				*D
0076	00110	03100673		STA	ØD			*D
0077	00111	15077773	SET	CMA	=-5	IS IT	TTY PUNCH	*D
0078	00112	11100117		BRU	AGN	NØ	KEEP GOING	AG 5/15/68
0079	00113	11101106		BRU	AB	YES, GØ	ØUTPUT LEADER	AG 5/15/68
0080	00114	15077776		CMA	=-2	IS IT	H.S, PUNCH	AG 5/15/68
0081	00115	11100117		BRU	AGN	NØ,	KEEP GOING	AG 5/15/68

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0082 00116 11101106      BRU  AB          YES, GO  OUTPUT LEADER          AG 5/15/68
0083                                     *
0084                                     * HEAD CONTROL CARD FROM CONTROL DEVICE
0085                                     *
0086 00117 01100675  AGN  LAA  CD
0087 00120 12100611      SPB  H$WR
0088 00121 01100677      LAA  CARD
0089 00122 15101051      CMA  SL$H      CHECK FOR /                      *D
0090 00123 11100125      BRU  N$SL      NOT A SLASH (/)                  *D
0091 00124 11100045      BRU  C$D       YES GET NEW PARAMETERS          *D
0092 00125 15100301  N$SL CMA  SEQZ      IS RESEQUENCING WANTED          *D
0093 00126 11100130      BRU  N$L       CHECK FOR OTHER POSSIBILITIES   *D
0094 00127 11100255      BRU  R$TA      INPUT WAS AN 'S'  RESET SEQUENCE COUNTER *D
0095 00130 15101040  N$L  CMA  C          IS COL1 A'C' IE COPY
0096 00131 11100337      BRU  N$C
0097 00132 11100134      BRU  **2
0098 00133 11100337      BRU  N$C
0099 00134 01100707      LAA  CARD+8    COLUMN 7                      *D
0100 00135 15100306      CMA  F         IF F  IT IS A FILE COPY        *D
0101 00136 11100147      BRU  N$TF      NOT A FILE COPY                *D
0102 00137 11100141      BRU  **2       IT IS A FILE COPY              *D
0103 00140 11100147      BRU  N$TF
0104 00141 12100531      SPB  CNVT
0105 00142 11100153      BRU  ER
0106 00143 03100302      STA  SEQF      NUMBER OF FILES TO COPY        *D
0107 00144 01077777      LAA  =177777  PAD NUMBER OF RECORDS TO BE COPIED *D
0108 00145 03101050      STA  SEQD
0109 00146 11100165      BRU  R$GN
0110 00147 01100677  N$TF LAA  CARD
0111 00150 12100531      SPB  CNVT      GO TO CONVERT 4 CHARACTER INPUT TO BINARY
0112 00151 11100153      BRU  **2       ERROR
0113 00152 11100161      BRU  $K
0114 00153 01077777  ER  LAA  =-1
0115 00154 05100000      CALL H$WR      TYPE ERROR MSG
0116 00155 05401027      DAC  $G5
0117 00156 00000004      DATA 4
0118 00157 00000000      HLI
0119 00160 11100117      BRU  AGN
0120 00161 03101050  $K  STA  SEQD      SAVE DESIRED SEQUENCE NO
0121 00162 15101047      CMA  SEQC
0122 00163 11100153      BRU  ER        A LESS

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0123	00164	11100153	BRU	ER	=		
0124	00165	01100671	RAGN	LAA	ID	>	READ CARD
0125	00166	12100611		SPB	H\$WR		
0126	00167	02100677		LBA	CARD		*D
0127	00170	01100700		LAA	CARD+1		*D
0128	00171	00001016		LSL	8		*D
0129	00172	00001014		FRL	8		*D
0130	00173	04100277		STB	C1C2		*D
0131	00174	02100701		LBA	CARD+2		*D
0132	00175	01100702		LAA	CARD+3		*D
0133	00176	00001016		LSL	8		*D
0134	00177	00001014		FRL	8		*D
0135	00200	01100277		LAA	C1C2		*D
0136	00201	15100304		CMA	DEØF	'SE'	*D
0137	00202	11100211		BRU	NEØF	NØ	*D
0138	00203	11100205		BRU	**2	YES	*D
0139	00204	11100211		BRU	NEØF	NØ	*D
0140	00205	00000006		IAB		FOUND \$E	*D
0141	00206	15100305		CMA	DEØF+1	CHECK FOR 'ØF'	*D
0142	00207	11100211		BRU	NEØF		*D
0143	00210	11100272		BRU	TEØF	ØF READ	*D
0144	00211	01100673	NEØF	LAA	ØD	TYPE AND GO BACK FOR CONTROL INFO	*D
0145	00212	12100611		SPB	H\$WR	WRITE RECORD	
0146	00213	14101047		IMS	SEQC		
0147	00214	01101050		LAA	SEQD		
0148	00215	15101047		CMA	SEQC		
0149	00216	00000033		NØP		A LESS	
0150	00217	11100117		BRU	AGN	=	
0151	00220	11100165		BRU	RAGN	CURRENT LESS DESIRED	
0152	00221	14100303	ØF	IMS	SEQN		*D
0153	00222	01100302		LAA	SEQF	NUMBER OF FILES TO BE COPIED	*D
0154	00223	15100303		CMA	SEQN		*D
0155	00224	00000033		NØP			*D
0156	00225	11100242		BRU	DNE		*D
0157	00226	00130401	SØCK	SNS	1		*D
0158	00227	11100165		BRU	RAGN	DØN'T COPY ØF	*D
0159	00230	01100674		LAA	ØD+1		*D
0160	00231	00001216		LSL	10		*D
0161	00232	00000023		SAN		IS THE ØUTPUT DEVICE MAG TAPE	*D
0162	00233	11100237		BRU	NØT	TAPE	*D
0163	00234	01100673		LAA	ØD	WRITE ØF ØN MAG TAPE	*D

0164	00235	55100000		CALL	E\$0F7	ITE E0F 0N MAG TAPE	*D
0165	00236	11100165		BRU	RAGN	M0RE DATA	*D
0166	00237	01100673	NTPE	LAA	0D	N0T MAG TAPE 0UTPUT WHATS THERE AS E0F	*D
0167	00240	12100611		SPB	H\$WR		*D
0168	00241	11100236		BRU	NTPE-1	M0RE DATA	*D
0169	00242	00130401	DNE	SNS	1		*D
0170	00243	11100255		BRU	RSTA		*D
0171	00244	01100674		LAA	0D+1		*D
0172	00245	00001216		LSL	10		*D
0173	00246	00000023		SAN		IS 0UTPUT T0 MAG TAPE	*D
0174	00247	11100253		BRU	**4		*D
0175	00250	01100673		LAA	0D		*D
0176	00251	55100000		CALL	E\$0F7		*D
0177	00252	11100255		BRU	RSTA	D0NE GET AN0THER C0MMAND	*D
0178	00253	01100673		LAA	0D		*D
0179	00254	12100611		SPB	H\$WR		*D
0180	00255	00000003	RSTA	CLA			*D
0181	00256	03101050		STA	SEQD		*D
0182	00257	03101047		STA	SEQC		*D
0183	00260	03100303		STA	SEQN		*D
0184	00261	03100302		STA	SEQF		*D
0185	00262	11100117		BRU	AGN		*D
0186	00263	01077777	CDER	LAA	=-1		*D
0187	00264	55100000		CALL	H\$WR		*D
0188	00265	55400310		DAC	MG7		*D
0189	00266	00000010		DATA	8		*D
0190	00267	00000000		HLT			*D
0191	00270	01100675		LAA	CD		*D
0192	00271	11100067		BRU	CRCD		*D
0193	00272	01077777	TE0F	LAA	=-1		*D
0194	00273	55100000		CALL	H\$WR		*D
0195	00274	55400334		DAC	MG9		*D
0196	00275	00000003		DATA	3		*D
0197	00276	11100242		BRU	DNE		*D
0198	00277	00000001	C102	BSS	1		*D
0199	00300	00000254	C0MA	DATA	'254		*D
0200	00301	00000323	SEQ2	DATA	'323	'S'	*D
0201	00302	00000001	SEQF	BSS	1		*D
0202	00303	00000001	SEQN	BSS	1		*D
0203	00304	00122305	DE0F	DATA	'0E0F'		*D
0203	00305	00147706					*D


```

0225 00354 01101050      LAA SEQD      HAVE WE READ ALL RECORDS NOT REQUIRED
0226 00355 15101047      CMA SEQC
0227 00356 00000033      NOP          SEQD LESS THAN SEQC-NOT POSSIBLE
0228 00357 11100117      BRU AGN      = YES
0229 00360 11100351      BRU DELR     READ ANOTHER RECORD
0230
0231          *
0232          * TEST TO SEE IF COL 1 IS AN I TO INSERT
0233          *
0233 00361 15101046 NOD CMA I
0234 00362 11100376      BRU NOI
0235 00363 11100365      BRU **2
0236 00364 11100376      BRU NOI
0237 00365 01100675 AGGG LAA CD
0238 00366 12100611      SPB H$WR
0239 00367 01100677      LAA CARD
0240 00370 15101051      CMA SLSH     IS IT A /
0241 00371 11100373      BRU **2     NO
0242 00372 11100117      BRU AGN     YES
0243 00373 01100673      LAA 0D      NO
0244 00374 12100611      SPB H$WR    WRITE ON OUTPUT DEVICE
0245 00375 11100365      BRU AGGG
0246 00376 15101037 NOI CMA W
0247 00377 11100411      BRU NOW
0248 00400 11100402      BRU **2     WRITE END OF FILE
0249 00401 11100411      BRU NOW
0250 00402 01100673      LAA 0D
0251 00403 15077772      CMA =-6
0252 00404 00000033      NOP
0253 00405 11100407      BRU **2
0254 00406 11100117      BRU AGN
0255 00407 05100000      CALL E$OF7  WRITE END OF FILE
0256 00410 11100117      BRU AGN
0257 00411 15101043 NOW CMA A
0258 00412 11100506      BRU ERI
0259 00413 11100420      BRU G0TA
0260 00414 15101044      CMA R
0261 00415 11101071      BRU NOR
0262 00416 11100466      BRU G0TR
0263 00417 11101071      BRU NOR
0264 00420 12100471 G0TA SPB A0R
0265 00421 03100307      STA TMP

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MDL: 2/6/69 *C
MDL: 2/6/69 *C
MDL: 2/6/69 *C
MDL: 2/6/69 *C
MDL: 2/6/69 *C
MDL: 2/6/69 *C
MDL: 2/6/69 *C

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STORE TAPE UNIT NO.

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*D
*D

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0266	00422	55100000	CALL	A\$DE7		*D
0267	00423	12100456	SPB	SS2T	CHECK IF LOGGING EOF SKIPPED IS WANTED	*D
0268	00424	01100705	LAA	CARD+6		*D
0269	00425	15100300	CMA	C0MA	MORE THAN ONE FILE	*D
0270	00426	11100117	BRU	AGV	NO	*D
0271	00427	11100431	BRU	**2	YES	*D
0272	00430	11100117	BRU	AGV		*D
0273	00431	01100706	LAA	CARD+7	SHUFFLE CARD COLUMNS TO USE CNVT	*D
0274	00432	03100705	STA	CARD+6		*D
0275	00433	01100707	LAA	CARD+8		*D
0276	00434	03100706	STA	CARD+7		*D
0277	00435	01000260	LAA	=1260		*D
0278	00436	03100703	STA	CARD+4	ZERO THOUSANDS POSITION	*D
0279	00437	03100704	STA	CARD+5	ZERO HUNDREDS POSITION	*D
0280	00440	12100531	SPB	CNVT		*D
0281	00441	11100153	BRU	ER		*D
0282	00442	03101050	STA	SEQD	STORE NO OF FILES	*D
0283	00443	00000003	CLA			*D
0284	00444	03101047	STA	SEQC		*D
0285	00445	14101047	ADF	IMS	SEQC	*D
0286	00446	01101050	LAA	SEQD		*D
0287	00447	15101047	CMA	SEQC		*D
0288	00450	00000033	N0P			*D
0289	00451	11100255	BRU	RSTA		*D
0290	00452	01100307	LAA	TMP		*D
0291	00453	55100000	CALL	A\$DE7	ADVANCE ONE FILE	*D
0292	00454	12100456	SPB	SS2T	CHECK IF LOGGING EOF SKIPPED IS WANTED	*D
0293	00455	11100445	BRU	ADF		*D
0294	00456	00000000	SS2T	***	**	*D
0295	00457	00130402	SNS	2		*D
0296	00460	11300456	BRU*	SS2T		*D
0297	00461	01077777	LAA	=-1	LOG ON TTY	*D
0298	00462	55100000	CALL	H\$WR		*D
0299	00463	35400320	DAC	MG8		*D
0300	00464	00000014	DATA	12		*D
0301	00465	11300456	BRU*	SS2T		*D
0302	00466	12100471	G0TR	SPB	A0R	MDL: 2/6/69 *C
0303	00467	55100000	CALL	R\$WD7		MDL: 2/6/69 *C
0304	00470	11100117	BRU	AGV		MDL: 2/6/69 *C
0305	00471	00000000	A0R	HLT		MDL: 2/6/69 *C
0306	00472	01100703	LAA	CARD+4		MDL: 2/6/69 *C

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0307 00473 15101042      CMA  M                      MDL 2/6/69 *C
0308 00474 11100506      BRU  ERI                      MDL 2/6/69 *C
0309 00475 11100477      BRU  ++2                      MDL 2/6/69 *C
0310 00476 11100506      BRU  ERI                      MDL 2/6/69 *C
0311 00477 00000003      CLA                      MDL 2/6/69 *C
0312 00500 03101047      STA  SEQC                     MDL 2/6/69 *C
0313 00501 01100704      LAA  CARD+5                   MDL 2/6/69 *C
0314 00502 02000017      LBA  =17                      MDL 2/6/69 *C
0315 00503 00000027      ABA                      MDL 2/6/69 *C
0316 00504 05000006      AMA  =6                      MDL 2/6/69 *C
0317 00505 11300471      BRU* A0R
0318 00506 01077777      ERI  LAA  =-1                 OUTPUT ERROR MESSAGE TO TTY      AG 5/15/68
0319 00507 55100000      CALL H$WR
0320 00510 35401033      DAC  MG6                      WRITE INVL
0321 00511 00000004      DATA 4
0322 00512 00000000      HLT
0323 00513 11100117      BRU  AGN
0324
0325      *
0326      * ENTER WITH 2 FULL ASCII CHARACTERS IN B REGISTER AND COMPARE WITH TABL
0327      * TO OBTAIN L01
0328      * TO OBTAIN LOGICAL DEVICE NO-EXIT WITH POSITIVE LOG DEV NO IN A
0329      *
0329 00514 00000000      CHEK *** **
0330 00515 00000006      IAB
0331 00516 02077761      LBA  =TABL-LAST
0332 00517 15501071      CMA  LAST,1
0333 00520 11100522      BRU  ++2
0334 00521 11100525      BRU  ++4
0335 00522 00000026      IBS
0336 00523 11100517      BRU  *-4
0337 00524 11300514      BRU* CHEK                     NOT FOUND IN TABLE - ERROR EXIT
0338 00525 00000006      IAB                          FOUND-CALCULATE LOGICAL DEVICE NO
0339 00526 06077760      SMA  =TABL-LAST-1
0340 00527 14100514      IMS  CHEK
0341 00530 11300514      BRU* CHEK
0342
0343      *
0344      * CONVERT 4 FULL ASCII CHARACTERS IN CARD+1 TO CARD+4 TO BINARY + EXIT
0345      * WITH ANSWER IN A REG
0346      *
0346 00531 00000000      CNVT *** **
0347 00532 01100703      LAA  CARD+4                   COLUMN 5. (FIRST DECADE)      AG 5/15/68

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J348	00233	12100267	SPB	CHKL	CHECK LIMITS	
J349	00234	11300231	BRU*	CVNT	ERROR EXIT	
J350	00235	00000006	IAB			
J351	00236	070001750	MPY	=1000		
J352	00237	04100703	STB	CARD+4	STORE CONVERTED DECADE	AG 5/15/68
J353	00240	01100704	LAA	CARD+2	COLUMN 6 (SECOND DECADE)	AG 5/15/68
J354	00241	12100267	SPB	CHKL		
J355	00242	11300231	BRU*	CVNT		
J356	00243	00000006	IAB			
J357	00244	07000144	MPY	=100		
J358	00245	04100704	STB	CARD+2	STORE CONVERTED DECADE	AG 5/15/68
J359	00246	01100705	LAA	CARD+6	COLUMN 7 (THIRD DECADE)	AG 5/15/68
J360	00247	12100267	SPB	CHKL		
J361	00250	11300231	BRU*	CVNT	ERROR	
J362	00251	00000006	IAB			
J363	00252	07000012	MPY	=10		
J364	00253	04100705	STB	CARD+6	STORE CONVERTED DECADE	AG 5/15/68
J365	00254	01100706	LAA	CARD+7	COLUMN 8 (FOURTH DECADE)	AG 5/15/68
J366	00255	12100267	SPB	CHKL		
J367	00256	11300231	BRU*	CVNT	ERROR	
J368	00257	03100706	STA	CARD+7	STORE CONVERTED DECADE	AG 5/15/68
J369	00260	02077774	LBA	=-4		
J370	00261	00000003	CLA		CALCULATE SECON NO IN BINARY	
J371	00262	02500707	AMA	CARD+8,1	ADD TO GET BINARY NUMBER	AG 5/15/68
J372	00263	00000026	IBS			
J373	00264	11100262	BRU	*-2		
J374	00265	14100231	IMS	CVNT		
J375	00266	11300231	BRU*	CVNT		
J376			*			
J377			*	ENTER WITH A REGISTER CONTAINING FULL ASCII NO EXIT WITH BINARY		
J378			*	IN A		
J379	00267	00000000	CHKL	*** **		
J380	00270	15000271	UMA	=1271		
J381	00271	11100277	BRU	CK	A LESS	
J382	00272	11100274	BRU	*+2	A =	
J383	00273	11300267	BRU*	CHKL A >		
J384	00274	01000011	LAA	=9		
J385	00275	14100267	EXT	IMS	CHKL	
J386	00276	11300267	BRU*	CHKL		
J387	00277	15000270	CK	UMA	=1270	
J388	00279	11100203	BRU	CKK		

0389	00601	01000010	LAA	=8	=271	
0390	00602	11100575	BRU	EXT		
0391	00603	15000260	CKK	CMA	=1260	
0392	00604	11300567	BRU*	CHKL	A	LESS
0393	00605	11100606	BRU	**+1	A	=
0394	00606	02000007	LBA	=7	A	>
0395	00607	00000027	ABA			
0396	00610	11100575	BRU	EXT		
0397			*			
0398			*	CALL H,WR	ENTER WITH LOG DEV NO	IN A
0399			*			
0400	00611	00000000	H\$WR	***	**	
0401	00612	03100651	STA	H\$3	SAVE LOGICAL DEVICE NUMBER	AG 5/15/68
0402	00613	15000000	CMA	=0	IS IT OUTPUT	AG 5/15/68
0403	00614	11100630	BRU	H\$4	YES	AG 5/15/68
0404	00615	00000033	NOP		NO	AG 5/15/68
0405	00616	55100000	H\$5	CALL H\$WR	CALL I/O HANDLER	AG 5/15/68
0406	00617	35400677	DAC	CARD		
0407	00620	00000120	DATA	80		
0408	00621	00000022	SAZ		END OF FILE	*D
0409	00622	11100624	BRU	**+2		*D
0410	00623	11100221	BRU	E0F		*D
0411	00624	12100652	SPB	CHE	CHECK FOR SPACES	AG 5/15/68
0412	00625	11300611	BRU*	H\$WR	NOT ALL SPACES, EXIT	AG 5/15/68
0413	00626	01100651	LAA	H\$3	LOGICAL DEVICE NUMBER	AG 5/15/68
0414	00627	11100616	BRU	H\$5	ALL SPACES, INPUT AGAIN	AG 5/15/68
0415	00630	02000000	H\$4	LBA	=0	AG 5/15/68
0416	00631	15077773	CMA	=-5	IS IT TTY PAPER TAPE	AG 5/15/68
0417	00632	11100642	BRU	H\$7	NO	AG 5/15/68
0418	00633	11100637	BRU	H\$8	YES, SUPPRESS TRAILING SPACES	AG 5/15/68
0419	00634	15077776	CMA	=-2	IS IT KEYBOARD OR H.S.P.T.	AG 5/15/68
0420	00635	11100642	BRU	H\$7	NO	AG 5/15/68
0421	00636	00000033	NOP			AG 5/15/68
0422	00637	12100652	H\$8	SPB	CHE	CHECK FOR SPACES
0423	00640	11100642	BRU	**+2	GO SUPPRESS TRAILING SPACES	AG 5/15/68
0424	00641	11300611	BRU*	H\$WR	ALL SPACES EXIT	AG 5/15/68
0425	00642	16000120	H\$7	AMB	=80	JUST OUTPUT SIGNIFICANT DATA
0426	00643	04100647	STB	H\$9		AG 5/15/68
0427	00644	01100651	LAA	H\$3	LOGICAL DEVICE NUMBER	AG 5/15/68
0428	00645	55100000	CALL	H\$WR	I/O HANDLER	AG 5/15/68
0429	00646	35400677	DAC	CARD		AG 5/15/68

J503	01112	00000003	DEL		AG 5/15/68
J504	01113	00000017	STA	CARD+50.1	AG 5/15/68
J505	01114	00000026	TRG		AG 5/15/68
J506	01115	01100013	BRG	*-2	AG 5/15/68
J507	01116	011000573	AB2	LAA AD	AG 5/15/68
J508	01117	00100000	CALL	HEBR	AG 5/15/68
J509	01120	004000677	JAG	CARD	AG 5/15/68
J510	01121	000000120	DATA	RJ	AG 5/15/68
J511	01122	113000110	BRG*	MJTL	AG 5/15/68
J512	01123	70400000	END		
ERRORS:	0000	0000			

OUTPUT DEVICE
OUTPUT LEADER

...EXTERNALS...

A\$DE7	266	291							
E\$DF7	164	176	255						
H\$WR	10	14	25	29	42	46	115	187	194
	298	319	405	428	508				
R\$WD7	303								

G0TA	259	*	264							
G0TR	262	*	302							
H\$3	401		413	427	*	432				
H\$4	403	*	415							
H\$5	* 405		414							
H\$6	* 435		445							
H\$7	417		420	*	425					
H\$8	418	*	422							
H\$9	426	*	430							
H\$WR	59		87	125	145	167	179	223	238	244
	* 400		412	424	431					
I	233	*	466							
ID	15		17	18	23	62	67	124	222	* 448
LAST	332	*	485							
M	307	*	462							
MG1	* 452									
MG2	11	*	454							
MG3	26	*	455							
MG4	43	*	456							
MG5	116	*	457							
MG6	320	*	458							
MG7	188	*	206							
MG8	* 207		299							
MG9	195	*	208							
NE0F	137		139	142	*	144				
N0C	96		98	* 212						
N0D	213		215	* 233						
N0I	234		236	* 246						
N0L	93	*	95							
N0R	261		263	* 486						
N0SL	90	*	92							
N0TF	101		103	* 110						
N0W	247		249	* 257						
NTPE	162	*	166	158						
0U	30		32	33	39	70	76	144	159	163
	166		171	175	178	243	250	* 449	490	507
0K	113	*	120							
0UTL	496		499	* 501	511					
0VER	492		495	* 497						
Q	* 465		486							
R	260	*	464							

RAGN	109	*	124	151	158	162				
RSTA	94		170	177	* 180	289				
SEQC	5		121	146	148	182	219	224	226	284
	282		287	312	* 467					
SEQD	108		120	147	181	218	225	282	286	* 468
SEQF	7		106	153	184	* 201				
SEQN	6		152	154	183	* 202				
SEQZ	92	*	200							
SET	40	*	77							
SLSH	89		240	* 459						
SS2T	267		292	* 294	296	301				
SSCK	* 157									
STRT	* 4		498							
TABL	* 470									
TEOF	143	*	193							
TMP	* 202		262	290						
W	246	*	459							

```

0001 * H$WR FOR CARDS PAPER TAPE LINE PRINTER TELETYPE MAGNETIC TAPE
0002 * CALL H$WR
0003 * CALLING SEQUENCE
0004 * DAC BA
0005 * DATA WC
0006 *
0007 * WHERE BA IS BASE ADDRESS
0008 * WC IS WORD COUNT
0009 *
0010 * A REGISTER CONTAINS LOGICAL DEVICE NUMBER
0011 * IF POSITIVE INPUT
0012 * NEGATIVE OUTPUT
0013 *

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```

0014 * LOGICAL DEVICE NUMBERS
0015 * LOGICAL DEV. NO INPUT OUTPUT
0016 * 1 KEYBOARD KEYBOARD
0017 * 2 PAPER TAPE H,S. PAPER TAPE H,S.
0018 * 3 CARD READER CARD READER
0019 * 4 SPARE LINE PRINTER
0020 * 5 PAPER TAPE (TELETYPE) PAPER TAPE OUT (TELETYPE)
0021 *
0022 * 6 MAGNETIC TAPE MAGNETIC TAPE
0023 *
0024 *

```

```

0025 *****00129400
0026 *****00129500

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```

0027 00000 00000000 REL
0028 00000 >0000005 NAME H$WR,H$WR
0029 00000 >0000000 NAME B$WR,B$WR
0030 00000 >0000541 NAME LINE,LINE
0031 00000 00000006 MTU EQU 6
0032 00000 00000000 B$WR *** **
0033 00001 02100000 LBA B$WR
0034 00002 04100005 STB H$WR
0035 00003 02100734 LBA L025
0036 00004 11100007 BRU *+3
0037 00005 25400000 H$WR DAC 0
0038 00006 02100765 LBA KDEL
0039 00007 04100776 STB BFLG
0040 00010 03100771 STA LDV

```

SAVE RETURN ADDRESS

SAVE LOGICAL DEVICE NUMBER

CKA

0041	00011	00000005		TAB		USE AS INDEX	
0042	00012	01100734	LALU	LAA	LO25		
0043	00013	03100542		STA	F1		CKA
0044	00014	03100535		STA	FC	FIRST CHARACTER INDICATOR	CKA
0045	00015	01300005		LAA*	H5WR		CKA
0046	00016	03100536		STA	BA	ADDRESS OF BLOCK	CKA
0047	00017	14100005		IMS	H5WR		CKA
0048	00020	01300005		LAA*	H5WR	NUMBER OF OUTPUT WORDS	CKA
0049	00021	00000002		NEG			CKA
0050	00022	03100537		STA	NC	NEGATIVE CHARACTER COUNT	CKA
0051	00023	14100005		IMS	H5WR		CKA
0052	00024	00000023		SAN			CKA
0053	00025	11300005		BRU*	H5WR		CKA
0054	00026	01100764		LAA	CEU0	CEU 0,W	
0055	00027	05500176		AMA	UNIT,1		
0056	00030	03100033		STA	CEUL		
0057	00031	01500143		LAA	DATZ,1		
0058	00032	03100034		STA	DATL		
0059	00033	00000033	CEUL	NOP			
0060	00034	00000033	DATL	NOP			
0061	00035	01100734		LAA	LO25	=-2	
0062	00036	03100543		STA	ND	NEG CHARS/WORD	
0063	00037	00000004		TBA			
0064	00040	00000024		SAP		TEST FOR INPUT/OUTPUT	
0065	00041	11100062		BRU	SOUT	OUTPUT	
0066	00042	01100762		LAA	AIP0	AIP 0,W	
0067	00043	05500176		AMA	UNIT,1		
0068	00044	03100115		STA	AIPC		
0069	00045	00000004		TBA			
0070	00046	02100761		LBA	A0P1	A0P 1,W	
0071	00047	00000110		RSA	1		
0072	00050	00000022		SAZ		TEST FOR KEYBOARD INPUT	
0073	00051	11100057		BRU	NTU1		
0074	00052	00170501		MOP	1,W		
0075	00053	00106400	CRTN	DATA	'106400		
0076	00054	00170501		MOP	1,W		
0077	00055	00105000	LNFD	DATA	'105000		
0078	00056	11100060		BRU	*+2		
0079	00057	02100143	NTU1	LBA	DATZ		
0080	00060	04100120		STB	A0PC		
0081	00061	11100075		BRU	INPT	INPUT	

0082	00062	01100763	SØU1	LAA	AØPØ	
0083	00063	05500176		AMA	UNIT,1	
0084	00064	03100124		STA	AØPØ	
0085	00065	01300536	W\$W1	LAA*	BA	GET ONE CHAR FOR OUTPUT
0086	00066	03100221		STA	CØNV	
0087	00067	02100771		LBA	LØV	LØGICAL DEVICE NO.
0088	00070	11500221		BRU	CØNV,1	
0089	00071	01100221	SPBØ	LAA	CØNV	GET CHARACTER
0090	00072	12100123		SPB	ØUTP	
0091	00073	12100103		SPB	TEST	TEST FOR WORD COUNT ZERO
0092	00074	11100065		BRU	W\$W1	NØT
0093	00075	12100114	INPI	SPB	INPC	INPUT ONE CHARACTER
0094	00076	02100771		LBA	LØV	LØGICAL DEVICE NO.
0095	00077	11500221		BRU	CØNV,1	CØNVERT
0096	00100	03300536	STAB	STA*	BA	STØRE CHARACTER
0097	00101	12100103		SPB	TEST	TEST FOR WORD COUNT ZERO
0098	00102	11100075		BRU	INPT	
0099	00103	00000000	TEST	ZZZ	**	
0100	00104	14100537		IMS	NC	NEG. CHARACTER COUNT
0101	00105	11100112		BRU	NØTD.	NØT DØNE
0102	00106	01100542		LAA	F1	
0103	00107	00000023		SAN		TEST FOR MORE I/O
0104	00110	11300542		BRU*	F1	YES
0105	00111	11300005		BRU*	H\$WR	RETURN
0106	00112	14100536	NØTU	IMS	BA	INCREMENT BASE ADDRESS
0107	00113	11300103		BRU*	TEST	RETURN
0108	00114	00000000	INPC	ZZZ	**	INPUT A CHARACTER
0109	00115	00000033	AIPC	NØP		AIP UNIT,W
0110	00116	03100221		STA	CØNV	SAVE CHARACTER
0111	00117	00001016		LSL	Ø	PREPARE FOR OUTPUT
0112	00120	00000033	AØPC	NØP		OUTPUT IF KEYBOARD INPUT
0113	00121	01100221		LAA	CØNV	LAST CHARACTER INPUT
0114	00122	11300114		BRU*	INPC	RETURN
0115	00123	00000000	ØUTP	ZZZ	**	ØUTPUT A CHARACTER
0116	00124	00000033	AØPØ	NØP		AØP UNIT,W
0117	00125	11300123		BRU*	ØUTP	RETURN
0118	00126	Ø7400556		EAC	MAGØ	
0119	00127	Ø7400556		EAC	MAGØ	
0120	00130	Ø7400556		EAC	MAGØ	
0121	00131	Ø7400556		EAC	MAGØ	
0122	00132	Ø7400556		EAC	MAGØ	

0123	00133	37400556	EAC	MAG0
0124	00134	37400556	EAC	MAG0
0125	00135	37400556	EAC	MAG0
0126	00136	00002000	DATA	'2000
0127	00137	00000200	DATA	'200
0128	00140	00000000	DATA	0
0129	00141	00004000	DATA	'4000
0130	00142	00002000	DATA	'2000
0131	00143	00000033	DATA	N0P
0132	00144	00002000	DATA	'2000
0133	00145	00001000	DATA	'1000
0134	00146	00004000	DATA	'4000
0135	00147	00000000	DATA	0
0136	00150	00004000	DATA	'4000
0137	00151	37400574	EAC	MAG1
0138	00152	37400574	EAC	MAG1
0139	00153	37400574	EAC	MAG1
0140	00154	37400574	EAC	MAG1
0141	00155	37400574	EAC	MAG1
0142	00156	37400574	EAC	MAG1
0143	00157	37400574	EAC	MAG1
0144	00160	37400574	EAC	MAG1
0145	00161	00047736	DATA	'47736
0146	00162	00047736	DATA	'47736
0147	00163	00047736	DATA	'47736
0148	00164	00047736	DATA	'47736
0149	00165	00047736	DATA	'47736
0150	00166	00047736	DATA	'47736
0151	00167	00047736	DATA	'47736
0152	00170	00047736	DATA	'47736
0153	00171	00000001	DATA	1
0154	00172	00000005	DATA	5
0155	00173	00000001	DATA	1
0156	00174	00000002	DATA	2
0157	00175	00000001	DATA	1
0158	00176	25400000	DATA	0
0159	00177	00000001	DATA	1
0160	00200	00000002	DATA	2
0161	00201	00000004	DATA	4
0162	00202	00000001	DATA	1
0163	00203	00000001	DATA	1

DATA

N0P CEU - L0B

CKA
CKA
CKA
CKA
CKA
CKA
CKA
CKA
CKA
CKA
CKA

0164	00204	00047736	DATA	147736	NOP	CEU - L08	
0165	00205	00047736	DATA	147736			
0166	00206	00047736	DATA	147736			
0167	00207	00047736	DATA	147736			
0168	00210	00047736	DATA	147736			
0169	00211	00047736	DATA	147736			
0170	00212	00047736	DATA	147736			
0171	00213	00047736	DATA	147736			
0172	00214	11100342	BRU	P0UT	-5	PAPER TAPE OUT-TELETYPE	00139900
0173	00215	11100347	BRU	PR0T	-4	LINE PRINTER OUTPUT	00140000
0174	00216	11100301	BRU	T0T2	-3	CARD PUNCH OUTPUT	
0175	00217	11100342	BRU	P0UT	-2	PAPER TAPE OUT-BRPE	00140200
0176	00220	11100276	BRU	T0UT	-1	KEYBOARD OUTPUT	00140300
0177	00221	25400000	CONV	DAC	0	0	00140400
0178	00222	11100227	BRU	TINP	1	KEYBOARD INPUT	00140500
0179	00223	11100227	BRU	TINP	2	PAPER TAPE INPUT-HSR	00140600
0180	00224	11100403	BRU	CINP	3	CARD READER INPUT	00140700
0181	00225	00000033	NOP		4	SPARE INPUT	00140800
0182	00226	11100227	BRU	TINP	5	PAPER TAPE IN-TELETYPE	00140900
0183	00227	02100270	TINP	LBA	IAD1		
0184	00230	04100542	STB	F1			
0185	00231	00000022	SAZ				
0186	00232	11100234	BRU	**2			
0187	00233	11100075	BRU	INPT		IGNORE ZERO	
0188	00234	15100735	CMA	L067			
0189	00235	11100237	BRU	**2			
0190	00236	11100075	BRU	INPT		IGNORE DELETE	
0191	00237	15100755	CMA	L053			
0192	00240	11100242	BRU	**2			
0193	00241	11100075	BRU	INPT		IGNORE LINE FEED	
0194	00242	15100756	CMA	L052			
0195	00243	11100245	BRU	**2			
0196	00244	11100262	BRU	TCRD		TERMINATE CARD ON CRRG, RETURN	
0197	00245	15100765	CMA	KDEL			
0198	00246	11100100	BRU	STAB			
0199	00247	11100251	BRU	**2		DELETE LINE OF INPUT	
0200	00250	11100100	BRU	STAB			
0201	00251	12100114	SPB	INPC		INPUT CHARACTER	
0202	00252	06100756	SMA	L052			
0203	00253	00000022	SAZ				
0204	00254	11100251	BRU	**3			

0205	00255	01100005	LAA	H\$WR			
0206	00256	05100734	AMA	L025			
0207	00257	03100005	STA	H\$WR			
0208	00260	02100771	LBA	L0N			
0209	00261	11100012	BRU	LAL0			
0210	00262	01100736	TCRU	LAA	L003		
0211	00263	03300536	STA*	BA			
0212	00264	14100536	IMS	BA			
0213	00265	14100537	IMS	NC			
0214	00266	11100263	BRU	TCRD+1			
0215	00267	11300005	BRU*	H\$WR			
0216	00270	55400271	IAD1	DAC	**1		
0217	00271	12100114	SPB	INPC			
0218	00272	15100756	CMA	L052			
0219	00273	11100271	BRU	*-2			
0220	00274	11300005	BRU*	H\$WR			
0221	00275	11100271	BRU	*-4			
0222	00276	01100535	T0UT	LAA	FC	FIRST CHARACTER TEST	00146500
0223	00277	00000024	SAP				00146600
0224	00300	11100304	BRU	T0T1		YES	00146700
0225	00301	01100221	T0T2	LAA	C0NV		00146800
0226	00302	00001016	LSL	8			CKA
0227	00303	11100072	BRU	SP30+1			
0228	00304	01100221	T0T1	LAA	C0NV		
0229	00305	15100737	CMA	L117			
0230	00306	11100310	BRU	*+2			
0231	00307	11100316	BRU	NWPG		1= NEW PAGE	
0232	00310	15100740	CMA	L074			
0233	00311	11100313	BRU	*+2			
0234	00312	12100324	TWLN	SPB	CRLF	OUTPUT 2LF,C/R	00148500
0235	00313	12100324	SPB	CRLF		ALL OTHERS=C/R,LF	00147800
0236	00314	11100301	BRU	T0T2		CONVERT AND OUTPUT	00147900
0237	00315	12100546	SPB	CL		CRRG, RET,/ LINE FEED	
0238	00316	14100541	NWPG	IMS	LINE	COUNT DOWN REMAINING LINES	00148100
0239	00317	11100315	BRU	*-2			00148200
0240	00320	12100331	SPB	NPG		OUTPUT 4 JF	00148300
0241	00321	11100073	BRU	SP30+2			
0242			*-----	C/R,LINE FEED	AND BOOKKEEP LINE COUNT		00149700
0243	00322	12100546	SPB	CL		CRRG, RET,/ LINE FEED	
0244	00323	11300324	BRU*	CRLF			00149900
0245	00324	11000000	CRLF	BRU	**		00150000

0246	00325	14100541	IMS	LINE			00150100
0247	00326	11100322	BRU	*-4			00150200
0248	00327	12100331	SPB	NPG	NEW PAGE		00150300
0249	00330	11300324	BRU*	CRLF			00150400
0250	00331	11000000	NPG	BRU	**		00150500
0251	00332	01100741	LAA	L077			00150600
0252	00333	03100541	STA	LINE			00150700
0253	00334	01100742	LAA	L018			00150800
0254	00335	03100544	STA	PAGE			00150900
0255	00336	12100546	SPB	CL	CRRG, RET, / LINE FEED		
0256	00337	14100544	IMS	PAGE			00151100
0257	00340	11100336	BRU	*-2			00151200
0258	00341	11300331	BRU*	NPG			00151300
0259	00342	02100757	P0UT	LBA	L100		00151400
0260	00343	04100542	STB	F1			00151500
0261	00344	11100301	BRU	T0T2			00151600
0262	00345	12100546	P0T1	SPB	CL	CRRG, RET, / LINE FEED	
0263	00346	11300005	BRU*	H\$WR		CKA	
0264	00347	01100535	PR01	LAA	FC		00151900
0265	00350	00000023	SAN				00152000
0266	00351	11100301	BRU	T0T2			
0267	00352	01100760	LAA	L101			00152500
0268	00353	03100542	STA	F1			00152600
0269	00354	03100535	STA	FC			00152700
0270	00355	01100221	LAA	C0VV			00152800
0271	00356	15100743	UMA	L102			
0272	00357	11100361	BRU	**2			00153100
0273	00360	11100400	BRU	PR01			00153200
0274	00361	15100737	UMA	L117			
0275	00362	11100364	BRU	**2			00153900
0276	00363	11100375	BRU	Z00L			00154000
0277	00364	15100740	UMA	L011			
0278	00365	11100367	BRU	**2			00153500
0279	00366	11100372	BRU	TW0L			00153600
0280	00367	00130105	0NEL	CEU	5, W		
0281	00370	00002100	DATA	'2100	FEED LINE, FILL BUFFER		
0282	00371	11100301	BRU	T0T2	START FILLING BUFFER		
0283	00372	00130105	TW0L	CEU	5, W	CKA	
0284	00373	00002000	DATA	'2000	FEED LINE		
0285	00374	11100367	BRU	0NEL			
0286	00375	00130105	Z00L	CEU	5, W	CKA	

0287	00376	00001100	DATA	'1100	PAGE EJECT, FILL BUFFER	
0288	00377	11100301	BRU	T0T2		
0289	00400	00130105	PR01	CEU 5,N		CKA
0290	00401	00000400	DATA	'000400		CKA
0291	00402	11300005	BRU*	H5AR		CKA
0292	00403	01100453	CINP	LAA FRZ9	-9	
0293	00404	03100545	STA	FCNT	SHIFT COUNTER	
0294	00405	02100744	LBA	DZR0	0	
0295	00406	01100221	LAA	C0NV	UNITARY CODED CHAR	
0296	00407	15100454	CMA	06TH	TEST FOR QUESTION MARK	
0297	00410	11100412	BRU	**2	N0	
0298	00411	11100445	BRU	AMB5		MDL 1/13/69 *B
0299	00412	15100754	CMA	L004	TEST FOR ZERO	
0300	00413	11100415	BRU	**2	N0	
0301	00414	11100447	BRU	AMB1	YES	
0302	00415	15100733	CMA	EXCL		
0303	00416	11100420	BRU	**2	N0	
0304	00417	11100446	BRU	AMB4	YES	
0305	00420	00000022	SAZ		TEST FOR SPACE	
0306	00421	11100424	BRU	**3	N0	
0307	00422	02100745	LBA	L035	'20	
0308	00423	11100450	BRU	ST3		
0309	00424	00000416	LSL	4		
0310	00425	00000024	SAP		TEST FOR 12 PUNCH	
0311	00426	15100455	AMB	0STY	'60	
0312	00427	00000116	LSL	1		
0313	00430	00000024	SAP		TEST FOR 11 PUNCH	
0314	00431	15100746	AMB	D022	'40	
0315	00432	00000116	LSL	1		
0316	00433	00000024	SAP		TEST FOR 0 PUNCH	
0317	00434	15100745	AMB	L035	'20	
0318	00435	00000116	LSL	LSL 1		
0319	00436	00000023	SAN		TEST FOR NEXT ROW PUNCH	
0320	00437	11100442	BRU	IMS	N0	
0321	00440	15100747	AMB	D003	ADJUST TOTAL FOR PUNCH	
0322	00441	15100545	AMB	FCNT		
0323	00442	14100545	IMS	IMS FCNT		
0324	00443	11100435	BRU	LSL	N0	
0325	00444	11100450	BRU	ST3	YES	
0326	00445	15000020	AMB	AMB = '20		MDL 1/13/69 *B
0327	00446	15100746	AMB	AMB D022	'40	

0328	00447	16100747	AMBI	AMB	0003	'12			
0329	00450	12100516	STB	SPB	BCDA				
0330	00451	00000004		TBA					
0331	00452	11100100		BRU	STAB				
0332	00453	00177767	FRZY	DATA	-9				
0333	00454	00000000	06TH	DATA	'5000			MDL	1/13/69 *B
0334	00455	00000060	0STY	DATA	48				
0335			*					MDL	1/10/69 *B
0336			*			BCD		MDL	1/10/69 *B
0337			*				ASCII	MDL	1/10/69 *B
0338	00456	00130261	TABL	DATA	'130261	00,01	260,261	MDL	1/10/69 *B
0339	00457	00131263		DATA	'131263	02,03	262,263	MDL	1/10/69 *B
0340	00460	00132265		DATA	'132265	04,05	264,265	MDL	1/10/69 *B
0341	00461	00133267		DATA	'133267	06,07	266,267	MDL	1/10/69 *B
0342	00462	00134271		DATA	'134271	10,11	270,271	MDL	1/10/69 *B
0343	00463	00130275		DATA	'130275	12,13	260,275	MDL	1/10/69 *B
0344	00464	00123672		DATA	'123672	14,15	247,272	MDL	1/10/69 *B
0345	00465	00137300		DATA	'137300	16,17	276,300	MDL	1/10/69 *B
0346	00466	00120257		DATA	'120257	20,21	240,257	MDL	1/10/69 *B
0347	00467	00151724		DATA	'151724	22,23	323,324	MDL	1/10/69 *B
0348	00470	00152726		DATA	'152726	24,25	325,326	MDL	1/10/69 *B
0349	00471	00153730		DATA	'153730	26,27	327,330	MDL	1/10/69 *B
0350	00472	00154732		DATA	'154732	30,31	331,332	MDL	1/10/69 *B
0351	00473	00157254		DATA	'157254	32,33	336,254	MDL	1/10/69 *B
0352	00474	00124243		DATA	'124243	34,35	250,243	MDL	1/10/69 *B
0353	00475	00156242		DATA	'156242	36,37	334,242	MDL	1/10/69 *B
0354	00476	00126712		DATA	'126712	40,41	255,312	MDL	1/10/69 *B
0355	00477	00145714		DATA	'145714	42,43	313,314	MDL	1/10/69 *B
0356	00500	00146716		DATA	'146716	44,45	315,316	MDL	1/10/69 *B
0357	00501	00147720		DATA	'147720	46,47	317,320	MDL	1/10/69 *B
0358	00502	00150722		DATA	'150722	50,51	321,322	MDL	1/10/69 *B
0359	00503	00120644		DATA	'120644	52,53	241,244	MDL	1/10/69 *B
0360	00504	00125335		DATA	'125335	54,55	252,335	MDL	1/10/69 *B
0361	00505	00135700		DATA	'135700	56,57	273,300	MDL	1/10/69 *B
0362	00506	00125701		DATA	'125701	60,61	253,301	MDL	1/10/69 *B
0363	00507	00141303		DATA	'141303	62,63	302,303	MDL	1/10/69 *B
0364	00510	00142305		DATA	'142305	64,65	304,305	MDL	1/10/69 *B
0365	00511	00143307		DATA	'143307	66,67	306,307	MDL	1/10/69 *B
0366	00512	00144311		DATA	'144311	70,71	310,311	MDL	1/10/69 *B
0367	00513	00137656		DATA	'137656	72,73	277,256	MDL	1/10/69 *B
0368	00514	00124733		DATA	'124733	74,75	251,333	MDL	1/10/69 *B

0369	00515	00136337	DATA	136337	76,77	274,357	MDL	1/10/69	*B	
0370	00516	00000000	BCDA	ZZZ	**					
0371	00517	03100533	STA	FSAV						
0372	00520	00000003	CLA							
0373	00521	00001713	FLL	10						
0374	00522	00000006	TAB							
0375	00523	02500456	LBA	TABL,1						
0376	00524	00000024	SAP							
0377	00525	00001013	FLL	8						
0378	00526	00000004	TBA							
0379	00527	00001015	RSL	8						
0380	00530	00000005	TAB							
0381	00531	01100533	LAA	FSAV						
0382	00532	11300516	BRU*	BCDA						
0383	00533	25400000	FSAV	DAC	0					
0384	00534	25400000	SIX	DAC	0				00162500	
0385	00535	25400000	FC	DAC	0				00162700	
0386	00536	25400000	BA	DAC	0				00162800	
0387	00537	25400000	NC	DAC	0				00162900	
0388	00540	25400000	WORD	DAC	0				00163000	
0389	00541	00177720	LINE	DATA	-160				00163100	
0390	00542	25400000	SCN	DAC	0	0			CKA	
0391	00543	25400000	SUN	DAC	0	0			CKA	
0392	00544	25400000	TUN	DAC	0	0			CKA	
0393	00545	00000542	F1	EQU	SCN				CKA	
0394	00545	00000543	WD	EQU	SUN				CKA	
0395	00545	00000544	PAGE	EQU	TUN				CKA	
0396			*							
0397			*							
0398	00545	00000000	FCNT	HLI					00173400	
0399			*-----THIS SUBROUTINE OUTPUTS C/R,LF ON SUN.							00173500
0400	00546	11000000	CL	BRU	**				00148800	
0401	00547	01100053	LAA	CRTN					00148900	
0402	00550	12100123	SPB	0JTP						
0403	00551	01100055	LAA	LNFD						
0404	00552	12100123	SPB	0JTP						
0405	00553	00000003	CLA						00149400	
0406	00554	03100535	STA	FC						
0407	00555	11300546	BRU*	CL					00149600	
0408	00556	01100536	MAG0	LAA	RA					
0409	00557	03100570	STA	ABCD						

0410	00560	03100631	STA	CALH+1	
0411	00561	01100537	LAA	NC	
0412	00562	00000002	NEG		
0413	00563	03100571	STA	ABCD+1	
0414	00564	01100776	LAA	BFLG	
0415	00565	00000024	SAP		IS IT BINARY I/O
0416	00566	11100572	BRU	BRD	YES
0417	00567	55100000	CALL	ASCBCD	TRANSLATE FROM ASCII TO BCD
0418	00570	00000000	ABCD	***	**
0419	00571	00000000		***	**
0420	00572	12100612	BRD	SPB	RDWR
0421	00573	11300005	BRU*	H\$WR	
0422	00574	01100536	MAGI	LAA	BA
0423	00575	03100607	STA	BCD	
0424	00576	01100537	LAA	NC	
0425	00577	00000002	NEG		
0426	00600	03100610	STA	BCD+1	
0427	00601	12100612	SPB	RDWR	
0428	00602	01100776	LAA	BFLG	BINARY I/O
0429	00603	00000024	SAP		YES
0430	00604	11300005	BRU*	H\$WR	NO
0431	00605	00000003	CLA		
0432	00606	55100000	CALL	BCDASC	
0433	00607	00000000	BCD	***	**
0434	00610	00000000		***	**
0435	00611	11300005	BRU*	H\$WR	
0436			*		
0437			* READ OR WRITE ONE MAG RECORD		
0438			*		
0439	00612	00000000	RDWR	***	**
0440	00613	02100772	LBA	CLB\$	
0441	00614	01100776	LAA	BFLG	
0442	00615	00000023	SAN		IS IT BINARY I/O
0443	00616	02100773	LBA	CLH\$	NO
0444	00617	04100630	STB	CALH	YES
0445	00620	01100536	LAA	BA	
0446	00621	03100631	STA	CALH+1	BASE ADDRESS
0447	00622	01100537	LAA	NC	
0448	00623	00000002	NEG		
0449	00624	03100632	STA	CALH+2	
0450	00625	01100775	LAA	M25	

0451	00626	03100774	STA	CNTZ	
0452	00627	01100771	LAA	LDV	
0453	00630	00000000	CALH	*** **	CALL H\$WRM7 OR B\$WRM7
0454	00631	00000000		*** **	DAC BA
0455	00632	00000000		*** **	DATA N
0456	00633	05100000	AGAG	CALL	S\$ST7
0457	00634	00000000		*** **	
0458	00635	01100634	LAA	*-1	
0459	00636	00000024	SAP		IS IT BUSY
0460	00637	11100633	BRU	AGAG	YES
0461	00640	05100000	CALL	ØBWCT	ØBTAIN WØRD CØUNT
0462	00641	00000022	SAZ		IS WØRD CØUNT CØMPLETE
0463	00642	11100661	BRU	ERWC	NØ
0464	00643	01100634	LAA	AGAG+1	NØ
0465	00644	00000016	LSL	5	
0466	00645	00000023	SAN		PARITY ERRØR
0467	00646	11300612	BRU*	RDWR	
0468	00647	14100774	IMS	CNTZ	YES-HAVE WE TRIED 25 TIMES
0469	00650	11100723	BRU	BACK	
0470	00651	02100742	LBA	L018	
0471	00652	12100706	SPB	TYPE	
0472	00653	00150301	DATA	'PARITY ''	
0472	00654	00151311			
0472	00655	00152331			
0472	00656	00120240			
0473	00657	00000000	HLI		
0474	00660	11300612	BRU*	RDWR	
0475	00661	01100634	ERWC	LAA	AGAG+1
0476	00662	00000116		LSL	1
0477	00663	00000023	SAN		E-Ø-F
0478	00664	11100675	BRU	INVL	
0479	00665	02100734	LBA	L025	
0480	00666	12100706	SPB	TYPE	
0481	00667	00142717	DATA	'EOF''	
0481	00670	00143240			
0482	00671	01000000	LAA	=0	*D
0483	00672	11300005	BRU*	4\$WR	*D
0484	00673	00000000	HLI		
0485	00674	11300612	BRU*	RDWR	
0486	00675	02100777	INVL	LBA	M5
0487	00676	12100706	SPB	TYPE	

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0488 00677 J0151305      DATA 'REC. LENG''
0488 00700 00141656
0488 00701 00120314
0488 00702 00142716
0488 00703 00143640
0489 00704 00000000      HLT
0490 00705 11100627      BRU CALH-1
0491                      * TYPEOUT ROUTINE
0492                      *
0493 00706 00000000      TYPE *** **
0494 00707 01101000      LAA CRLL
0495 00710 00170101      AOP 1,N
0496 00711 00001016      LSL 8
0497 00712 00170101      AOP 1,N
0498 00713 01300706      AOUT LAA* TYPE
0499 00714 00170101      AOP 1,N
0500 00715 00001016      LSL 8
0501 00716 00170101      AOP 1,N
0502 00717 14100706      IMS TYPE
0503 00720 00000026      IBS
0504 00721 11100713      BRU ADJT
0505 00722 11300706      BRU* TYPE
0506 00723 01100771      BACK LAA LDN      BACK SPACE RECORD
0507 00724 05100000      CALL B$SP7
0508 00725 05100000      AGAN CALL S$ST7
0509 00726 00000000      *** **
0510 00727 01100726      LAA *-1          IS TAPE BUSY
0511 00730 00000024      SAP
0512 00731 11100725      BRU AGAN        YES
0513 00732 11100627      BRU CALH-1
0514                      *
0515 00733 00006000      EXCL DATA '3000
0516 00734 00177776      L025 DATA -2
0517 00735 00000377      L067 DATA '377
0518 00736 00000240      L003 DATA '240      SPACE
0519 00737 00000261      L117 DATA '261
0520 00740 00000260      L074 DATA '260
0521 00741 00177720      L077 DATA '-50
0522 00742 00177774      L018 DATA -4
0523 00743 00000253      L102 DATA '253
0524 00744 00000740      L011 EQU L074

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00279300

0525 00744 00000000 DZRW DATA 0
 0526 00745 00000020 L032 DATA 16
 0527 00746 00000040 D022 DATA '40
 0528 00747 00000012 D003 DATA '12
 0529 00750 00000247 D018 DATA '247
 0530 00751 00177777 L013 DATA '177777
 0531 00752 00177773 L050 DATA -5
 0532 00753 00177660 L001 DATA -80
 0533 00754 00001000 L004 DATA '001000
 0534 00755 00000212 L053 DATA '212
 0535 00756 00000215 L052 DATA '215
 0536 00757 35400345 L100 DAC P0T1
 0537 00760 35400400 L101 DAC PR01
 0538 00761 00170101 A0P1 A0P 1,W
 0539 00762 00170300 A1P0 A1P 0,W
 0540 00763 00170100 A0P0 A0P 0,W
 0541 00764 00130100 CEU0 CEU 0,W
 0542 00765 00000336 KDEL DATA '336
 0543 00766 00177622 F110 DATA -110
 0544 00767 25401060 FWA DAC '1060
 0545 00770 25401061 BL DAC '1061
 0546 00771 25400000 LDN DAC 0
 0547 00772 55100000 CLB\$ CALL B\$WRM7
 0548 00773 55100000 CLH\$ CALL H\$WRM7
 0549 00774 00000001 CNTZ BSS 1
 0550 00775 00177747 M25 DATA -25
 0551 00776 00000001 BFL4 BSS 1
 0552 00777 00177773 M5 DATA -5
 0553 01000 00106612 CRLL DATA '106612
 0554 01001 70400000 END
 ERRORS 0000 00000

ASR 33 TYPE CODE

00001800
 00006700
 00006600
 00009000
 00009100

DELETE A LINE CODE IS THE 'UP ARROR'

FEC
 FEC
 FEC

00162600

COUNT OF ATTEMPTS TO READ/WRITE MAG TAPE

BINARY FLAG

...EXTERNALS...

ASCBCD	417
B\$SP7	507
B\$WR	29
B\$WRM7	547
BCDASC	432
H\$WR	28
H\$WRM7	548
LINE	30
ØBWCT	461
S\$ST7	456

208

LNFD	*	77	403								
LSL	*	318	324								
M25		450	* 550								
M5		486	* 552								
MAGI		137	138	139	140	141	142	143	144	* 422	
MAGØ		118	119	120	121	122	123	124	125	* 408	
MTU	*	31									
NC		50	100	213	* 387	411	424	447			
NØTD		101	* 106								
NPG		240	248	* 250	258						
NTU1		73	* 79								
NWPG		231	* 238								
Ø6TH		296	* 333								
ØNEL	*	280	285								
ØSTY		311	* 334								
ØUTP		90	* 115	117	402	404					
PAGE		254	256	* 395							
PØT1	*	262	236								
PØUT		172	175	* 259							
PRØ1		273	* 289	537							
PRØT		173	* 264								
RDWR		420	427	* 439	467	474	485				
SCN	*	390	393								
SIX	*	384									
SØUT		65	* 82								
SPBØ	*	89	227	241							
STAB	*	96	196	200	331						
STB		308	325	* 329							
SUN	*	391	394								
TABL	*	338	375								
TCRD		196	* 210	214							
TEST		91	97	* 99	107						
TINP		178	179	182	* 183						
TØT1		224	* 228								
TØT2		174	* 225	236	261	266	282	288			
TØUT		176	* 222								
TUN	*	392	395								
TWLN	*	234									
TWØL		279	* 283								
TYPE		471	480	487	* 493	498	502	505			
UNIT		55	67	83	* 158						

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DATE NOV, 7, 1969

810A/B GENERAL SOURCE UPDATE

300015D

W	74	76	280	283	286	289	495	497	499
	501	536	539	540	541				
W\$W1	* 85	92							
WD	62	* 594							
WORD	* 588								
Z00L	276	* 286							

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0001      * GENERAL MAGNETIC TAPE HANDLER FOR 7 TRACK MAGNETIC TAPE
0002      * CALLING SEQUENCE
0003      * LAA DEV N0
0004      * CALL B$WRM7
0005      * DAC BUF
0006      * DATA N
0007      *
0008      * DEV N0 POSITIVE INPUT
0009      * NEGATIVE OUTPUT
0010      *
0011      * DEV N0 6 = TRANSPORT 0
0012      * 7 = TRANSPORT 1
0013      * ETC TO 7
0014      *
0015      * ASSUMES BTC 1
0016      *
0017      * FOR BCD INPUT/OUTPUT USE
0018      * CALL H$WRM7
0019      * REL
0019 00000 000000000
0020 00000 000000006 TAPE EQU 6
0021 00000 00001060 FWA EQU '1060
0022 00000 50000000 NAME B$WRM7,B$WR READ/WRITE 3 CHAR/WD BINARY
0023 00000 50000020 NAME H$WRM7,H$WR READ/WRITE 1 CHAR/WD BCD
0024 00000 50000040 NAME R$WD7,R$WD REWIND TO LOAD POINT
0025 00000 50000046 NAME B$SP7,B$SP BACKSPACE A RECORD
0026 00000 50000056 NAME E$EF7,E$EF WRITE END OF FILE
0027 00000 50000066 NAME A$DV7,A$DV ADVANCE RECORD
0028 00000 50000076 NAME A$DE7,A$DE ADVANCE TO END OF FILE
0029 00000 50000106 NAME B$EF7,B$EF BACKSPACE TO END OF FILE
0030 00000 50000116 NAME S$ST7,S$ST TEST STATUS
0031 00000 50000144 NAME E$RS7,E$RS ERASE 4 INCHES OF TAPE
0032 00000 50000152 NAME Z$WCT,WCT
0033 00000 00000000 B$WR *** **
0034 00001 03100234 STA LUN0
0035 00002 12100202 SPB Z$TRA
0036 00003 11300000 BRU* B$WR ERROR EXIT
0037 00004 02000103 LBA = '103 CHARACTERS/WORD 3 DENSITY 556 BPI
0038 00005 12100171 SPB SETP SETUP
0039 00006 01300000 LAA* B$WR PICK UP BUFFER
0040 00007 03001060 STA FWA

```

```

0041 00010 14100000      IMS  B$WR
0042 00011 01300000      LAA* B$WR
0043 00012 02000000      LBA  ='100000
0044 00013 00000030      ØBA
0045 00014 03001061      STA  FWA+1          NO OF WORDS AND INITIALIZE BTC
0046 00015 12100222      SPB  WRR
0047 00016 14100000      IMS  B$WR
0048 00017 11300000      BRU* B$WR
0049
0050          *
0051          * READ/WRITE BCD 1 CHARACTER/WORD
0052          *
0052 00020 00000000      H$WR *** **
0053 00021 03100234      STA  LDNO
0054 00022 12100202      SPB  ØTRA          GET TRANSPORT NO
0055 00023 11300020      BRU* H$WR          ERROR EXIT
0056 00024 02000501      LBA  ='501         BCD 1 CHARACTER/WORD DENSITY 556 BPI
0057 00025 12100171      SPB  SETP          SETUP
0058 00026 01300020      LAA* H$WR
0059 00027 03001060      STA  FWA
0060 00030 14100020      IMS  H$WR
0061 00031 01300020      LAA* H$WR
0062 00032 02000000      LBA  ='100000     INITIALIZE BTC BIT
0063 00033 00000030      ØBA
0064 00034 03001061      STA  FWA+1
0065 00035 12100222      SPB  WRR
0066 00036 14100020      IMS  H$WR
0067 00037 11300020      BRU* H$WR
0068
0069          *
0070          * REWIND TO LOAD POINT
0071          *
0071 00040 00000000      R$WD *** **
0072 00041 12100202      SPB  ØTRA          ØBTAIN TRANSPORT NUMBER
0073 00042 11300040      BRU* R$WD          ERROR EXIT
0074 00043 02002501      LBA  ='2501       REWIND TO LOAD POINT - 1 CHARACTER/WORD
0075 00044 12100171      SPB  SETP          REWIND
0076 00045 11300040      BRU* R$WD
0077
0078          *
0079          * BACKSPACE A RECORD
0080          *
0080 00046 00000000      B$SP *** **
0081 00047 12100202      SPB  ØTRA          ØBTAIN TRANSPORT NUMBER

```

```

0082 00050 11300040      BRU* R$WD      ERROR EXIT
0083 00051 02000501      LBA  ='501
0084 00052 12100171      SPB  SETP
0085 00053 00130106      CEU  TAPE,W
0086 00054 00004040      DATA '4040      BACKSPACE A RECORD
0087 00055 11300046      BRU* B$SP
0088
0089      *
0090      * WRITE END OF FILE
0091      *
0091 00056 00000000      E$OF *** **
0092 00057 12100202      SPB  ØTRA      ØBTAIN TRANSPORT
0093 00060 11300056      BRU* E$OF      ERROR EXIT
0094 00061 02000501      LBA  ='501
0095 00062 12100171      SPB  SETP      SET UP FORMAT 0
0096 00063 00130106      CEU  TAPE,W
0097 00064 00005000      DATA '5000
0098 00065 11300056      BRU* E$OF
0099
0100      *
0100      * ADVANCE RECORD
0101      *
0102 00066 00000000      A$DV *** **
0103 00067 12100202      SPB  ØTRA      ØBTAIN TRANSPORT
0104 00070 11300066      BRU* A$DV      ERROR EXIT
0105 00071 02000501      LBA  ='501
0106 00072 12100171      SPB  SETP      SET UP FORMAT 0
0107 00073 00130106      CEU  TAPE,W
0108 00074 00004200      DATA '4200      ADVANCE A RECORD
0109 00075 11300066      BRU* A$DV
0110
0111      *
0111      * ADVANCE TO END OF FILE
0112      *
0113 00076 00000000      A$DE *** **
0114 00077 12100202      SPB  ØTRA      ØBTAIN TRANSPORT
0115 00100 11300076      BRU* A$DE      ERROR EXIT
0116 00101 02000501      LBA  ='501
0117 00102 12100171      SPB  SETP      SET UP FORMAT 0
0118 00103 00130106      CEU  TAPE,W
0119 00104 00004100      DATA '4100
0120 00105 11300076      BRU* A$DE
0121
0122      *
0122      * BACK SPACE TO END OF FILE

```

```

0123
0124 00106 00000000 B$EF *** **
0125 00107 12100202 SPB 0TRA
0126 00110 11300106 BRU* B$EF
0127 00111 02000501 LBA =1501
0128 00112 12100171 SPB SETP SET UP FORMAT ZERO
0129 00113 00130106 CEU TAPE,W
0130 00114 00004020 DATA 14020 BACKSPACE TO END OF FILE
0131 00115 11300106 BRU* B$EF
0132
0133 * TEST STATUS OF I/O
0134 *
0135 00116 00000000 S$ST *** **
0136 00117 01077767 LAA =-9
0137 00120 03100233 STA CNT COUNT OF NO, OF TEU
0138 00121 01000000 LAA =100000
0139 00122 03100126 STA DATA
0140 00123 00000003 CLA
0141 00124 02000001 AGN LBA =1
0142 00125 00130206 TEU TAPE TEST TAPE
0143 00126 00000000 DATA *** **
0144 00127 00000030 0BA YES-SET
0145 00130 00000116 LSL 1 NOT
0146 00131 00000006 IAB SAVE A
0147 00132 01100126 LAA DATA
0148 00133 00000115 RSL 1 GET NEXT TEST
0149 00134 03100126 STA DATA
0150 00135 00000006 IAB RESTORE A
0151 00136 14100233 IMS CNT HAVE WE DONE 9 TEST
0152 00137 11100124 BRU AGN NO
0153 00140 00000616 LSL 6
0154 00141 03300116 STA* S$ST PUT IN USER PROGRAM
0155 00142 14100116 IMS S$ST INCREMENT EXIT
0156 00143 11300116 BRU* S$ST
0157
0158 * ERASE 4 INCHES OF TAPE
0159 *
0160 00144 00000000 E$RS *** **
0161 00145 12100202 SPB 0TRA OBTAIN TRANSPORT NO
0162 00146 11300144 BRU* E$RS
0163 00147 02001501 LBA =1501

```



```

0164 00150 12100171      SPB  SETP
0165 00151 11300144      BRU* EBR5
0166
0167      *
0168      * OBTAIN WORD COUNT EXIT WITH A REGISTER CONTAINING DIFFERENCE BETWEEN
0169      * START ADDRESS AND CURRENT WORD ADDRESS B REG =LENGTH OF RECORD
0170 00152 00000000 WCT  ***  **
0171 00153 01001060      LAA  FWA
0172 00154 03100234      STA  LDN0      SAVE FIRST WORD ADDRESS
0173 00155 01001061      LAA  FWA+1
0174 00156 00000116      LSL  1
0175 00157 00000115      RSL  1
0176 00160 00001060      AMA  FWA
0177 00161 00130106      CEU  TAPE,W
0178 00162 00004004      DATA 14004      GET CURRENT WORD ADDRESS
0179 00163 06001060      SMA  FWA
0180 00164 00000006      IAB
0181 00165 01001060      LAA  FWA
0182 00166 06100234      SMA  LDN0      OBTAIN ACTUAL LENGTH OF RECORD
0183 00167 00000006      IAB
0184 00170 11300152      BRU* WCT
0185
0186      *
0187      * SET UP FOR I/O -- ENTER A REG TRANSPORT NO
0188 00171 00000000 SETP ***  **
0189 00172 00000030      OBA      OR IN TRANSPORT NO
0190 00173 03100175      STA  SETU
0191 00174 00130106      CEU  TAPE,W      NO
0192 00175 00000000 SETU ***  **
0193 00176 11300171      BRU* SETP
0194
0195      *
0196      * ERROR ROUTINE ENTER WITH MINUS NUMBER IN A REG
0197      *
0197 00177 00000000 EROR ***  **
0198 00200 01000000      LAA  =100000
0199 00201 11300177      BRU* EROR
0200
0201      *
0202      * OBTAIN TRANSPORT NO
0203      *
0203 00202 00000000 OTRA ***  **
0204 00203 00000024      SAP

```

```

0205 00204 00000002      NEG
0206 00205 06000006      SMA  =6          OBTAIN TRANSPORT NO
0207 00206 00000023      SAN          IS NO OK
0208 00207 11100213      BRU  PDS
0209 00210 01077777  EREX LAA  =-1
0210 00211 12100177      SPB  EROR
0211 00212 11300202      BRU* 0TRA      ERROR EXIT
0212 00213 15000010  PDS  CMA  =8          IS IT LESS THAN 8
0213 00214 11100217      BRU  OK        YES
0214 00215 11100210      BRU  EREX      NO
0215 00216 11100210      BRU  EREX      NO
0216 00217 00000316  OK  LSL  3
0217 00220 14100202      IMS  0TRA      NORMAL EXT
0218 00221 11300202      BRU* 0TRA
0219
0220      *
0221      * ROUTINE TO WRITE AND READ FROM TAPE
0222      *
0222 00222 00000000  WRR  ***  **
0223 00223 02006000      LBA  =106000    WRITE A RECORD AND INITIALIZE BTC
0224 00224 01100234      LAA  LDNO
0225 00225 00000023      SAN          IS IT INPUT
0226 00226 02004400      LBA  =104400    READ A RECORD AND INITIALIZE BTC
0227 00227 04100231      STB  IO
0228 00230 00130106      CEU  TAPE,W
0229 00231 00000000  IO  ***  **
0230 00232 11300222      BRU* WRR
0231 00233 00000001  CNT  BSS  1          USED AS COUNTER
0232 00234 00000001  LDNO BSS  1          DEVICE NUMBER
0233 00235 70400000      END
ERRORS 0000      00000

```

...EXTERNALS...

A\$DE7	28
A\$DV7	27
B\$EF7	29
B\$SP7	22
B\$WRM7	22
E\$OF7	26
E\$RS7	31
H\$WRM7	23
ØBWCT	32
R\$WD7	24
S\$ST7	30

...SYMBOLICS...

A\$DE	28	*	115	115	120							
A\$DV	27	*	102	104	109							
AGN	* 141		152									
B\$EF	29	*	124	126	131							
B\$SP	25	*	80	87								
B\$WR	22	*	35	36	39	41	42	47	48			
CNT	137		151	* 231								
DATA	139	*	145	147	149							
E\$DF	26	*	91	93	98							
E\$RS	31	*	160	162	165							
EREX	* 209		214	215								
EROR	* 197		199	210								
FWA	* 21		40	45	59	64	171	173	176	179		
	181											
H\$WR	25	*	52	55	58	60	61	66	67			
IØ	227	*	229									
LDNØ	34		53	172	182	224	* 232					
ØK	215	*	216									
ØTRA	35		54	72	81	92	103	114	125	161		
	* 203		211	217	218							
PØS	208	*	212									
R\$WD	24	*	71	73	76	82						
S\$ST	30	*	135	154	155	156						
SETP	38		57	75	84	95	106	117	128	164		
	* 188		193									
SETU	190	*	192									
TAPE	* 20		85	96	107	118	129	142	177	191		
	228											
W	85		96	107	118	129	177	191	228			
WCT	32	*	170	184								
WRR	46		65	* 222	230							

```

0001      *
0002      * TRANSLATE BUFFER FROM BCD TO FULL ASCII
0003      * IF BIT 0 OF REG ZERO PICK DATA FROM BITS 0-5 ELSE
0004      * PICK DATA FROM BITS 110 TO 15
0005      * IF BIT 1 OF A REG ZERO STORE DATA IN BITS 8 TO 15 ELSE IN 0-7
0006      *
0007      * CALLING SEQUENCE
0008      *   LAA FLAG           A POS LEAVES IN LH 8 BITS
0009      *   CALL BCDA        A NEG LEAVES IN RH 8 BITS
0010      *   DAC BUF
0011      *   DATA N
0012      *
0013 00000 00000000      REL
0014 00000 00000000      NAME BCDASC,BCDA
0015 00000 00000000      BCDA *** **
0016 00001 02100043      LBA RS10
0017 00002 00000024      SAP           OUR WE TO STORE ASCII IN RH 8 BITS
0018 00003 02100045      LBA NOP
0019 00004 04100022      STB SHFT
0020 00005 00000116      LSL 1
0021 00006 02100044      LBA RSL8
0022 00007 00000024      SAP
0023 00010 02100045      LBA NOP
0024 00011 04100033      STB SHF
0025 00012 01300000      LAA* BCDA      BUFFER
0026 00013 03100041      STA IND        FORM INDIRECT WORD
0027 00014 14100000      IMS BCDA
0028 00015 01300000      LAA* BCDA      COUNT OF BUFFER LENGTH
0029 00016 00000002      NEG
0030 00017 03100042      STA CNT
0031 00020 14100000      IMS BCDA      FORM EXIT ADDRESS
0032 00021 01300041      AGN LAA* IND
0033 00022 00000000      SHFT *** **      RSL 8
0034 00023 00000006      IAB
0035 00024 00000003      CLA
0036 00025 00001713      FLL 15      DIVIDE CODE BY TWO
0037 00026 00000006      IAB
0038 00027 02500046      LBA TABL,1    GET TWO CODES
0039 00030 00000024      SAP
0040 00031 00001013      FLL 8

```

0041 00032 00000004 TBA
 0042 00033 00000000 SHF *** **
 0043 00034 03300041 STA* IND
 0044 00035 14100041 IMS IND
 0045 00036 14100042 IMS CNT
 0046 00037 11100021 BRU AGN
 0047 00040 11300000 BRU* BCDA
 0048 00041 00000001 IND BSS 1
 0049 00042 00000001 CNT BSS 1
 0050 00043 00001215 RS1U KSL 10
 0051 00044 00001015 RSLB KSL 8
 0052 00045 00000033 NOP NOP

INDIRECT BUFFER
 COUNT OF NO OF WORDS LEFT IN BUFFER

Address	Op/Label	Op/Label	Hex	Hex	MDL	Date	Flag
0053	*				MDL	1/10/69	*B
0054	*		BCD	ASCII	MDL	1/10/69	*B
0055	*				MDL	1/10/69	*B
0056	00046	00130261	TARL DATA	'130261	00,01	260,261	MDL 1/10/69 *B
0057	00047	00131263	DATA	'131263	02,03	262,263	MDL 1/10/69 *B
0058	00050	00132265	DATA	'132265	04,05	264,265	MDL 1/10/69 *B
0059	00051	00133267	DATA	'133267	06,07	266,267	MDL 1/10/69 *B
0060	00052	00134271	DATA	'134271	10,11	270,271	MDL 1/10/69 *B
0061	00053	00130275	DATA	'130275	12,13	260,275	MDL 1/10/69 *B
0062	00054	00123672	DATA	'123672	14,15	247,272	MDL 1/10/69 *B
0063	00055	00137300	DATA	'137300	16,17	276,300	MDL 1/10/69 *B
0064	00056	00120257	DATA	'120257	20,21	240,257	MDL 1/10/69 *B
0065	00057	00151724	DATA	'151724	22,23	323,324	MDL 1/10/69 *B
0066	00060	00152726	DATA	'152726	24,25	325,326	MDL 1/10/69 *B
0067	00061	00153730	DATA	'153730	26,27	327,330	MDL 1/10/69 *B
0068	00062	00154732	DATA	'154732	30,31	331,332	MDL 1/10/69 *B
0069	00063	00157254	DATA	'157254	32,33	336,254	MDL 1/10/69 *B
0070	00064	00124243	DATA	'124243	34,35	250,243	MDL 1/10/69 *B
0071	00065	00156242	DATA	'156242	36,37	334,242	MDL 1/10/69 *B
0072	00066	00126712	DATA	'126712	40,41	255,312	MDL 1/10/69 *B
0073	00067	00145714	DATA	'145714	42,43	313,314	MDL 1/10/69 *B
0074	00070	00146716	DATA	'146716	44,45	315,316	MDL 1/10/69 *B
0075	00071	00147720	DATA	'147720	46,47	317,320	MDL 1/10/69 *B
0076	00072	00150722	DATA	'150722	50,51	321,322	MDL 1/10/69 *B
0077	00073	00120644	DATA	'120644	52,53	241,244	MDL 1/10/69 *B
0078	00074	00125335	DATA	'125335	54,55	252,335	MDL 1/10/69 *B
0079	00075	00135700	DATA	'135700	56,57	273,300	MDL 1/10/69 *B
0080	00076	00125701	DATA	'125701	60,61	253,301	MDL 1/10/69 *B
0081	00077	00141303	DATA	'141303	62,63	302,303	MDL 1/10/69 *B

0082	00100	00142305	DATA	'142305	64,65	304,305	MDL	1/10/69	*B
0083	00101	00143307	DATA	'143307	66,67	306,307	MDL	1/10/69	*B
0084	00102	00144311	DATA	'144311	70,71	310,311	MDL	1/10/69	*B
0085	00103	00137656	DATA	'137656	72,73	277,256	MDL	1/10/69	*B
0086	00104	00124733	DATA	'124733	74,75	251,333	MDL	1/10/69	*B
0087	00105	00136337	DATA	'136337	76,77	274,337	MDL	1/10/69	*B
0088	00106	00400000	END						
ERRORS	0000	00000							

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...EXTERNALS...
BCDASC

14

...SYMBOLICS...

AGN	*	32		46					
RCDA		14	*	15	25	27		28	31
CNT		30		45	*	49			47
IND		26		32		43	44	*	48
NOP		18		23	*	52			
RS10		16	*	50					
RSL8		21	*	51					
SHF		24	*	42					
SHFT		19	*	33					
TABL		38	*	50					

```

0001      *
0002      * CONVERT FROM ASCII TO BCD
0003      *
0004      *
0005      * CALLING SEQUENCE
0006      * CALL ASBCD
0007      * DAC BUF
0008      * DATA
0009      00000 00000000      REL
0010      00000 50000000      NAME ASCBCD,BEGN
0011      00000 00000000      BEGN *** **
0012      00001 01300000      LAA* BEGN
0013      00002 03100030      STA BUF
0014      00003 14100000      IMS BEGN
0015      00004 01300000      LAA* BEGN      NEG COUNT
0016      00005 00000002      NEG
0017      00006 03100031      STA CNT
0018      00007 14100000      IMS BEGN      MDL 1/27/69 *C
0019      00010 01300030      AGN LAA* BUF
0020      00011 00001216      LSL 10
0021      00012 00001215      RSL 10
0022      00013 00000006      IAB
0023      00014 00000003      CLA
0024      00015 00001713      FLL 15
0025      00016 00000006      IAB
0026      00017 02500032      LBA TABL,1
0027      00020 00000024      SAP
0028      00021 00001013      FLL 8
0029      00022 00000213      FLL 2
0030      00023 04300030      STB* BUF
0031      00024 14100030      IMS BUF
0032      00025 14100031      IMS CNT      HAVE WE FINISHED BUFFER
0033      00026 11100010      BRU AGN
0034      00027 11300000      BRU* BEGN      YES
0035      00030 00000001      BUF BSS 1
0036      00031 00000001      CNT BSS 1
0037      *
0038      *      ASCII      BCD      MDL 1/10/69 *C
0039      *      MDL 1/10/69 *C
0040      00032 00027461      TABL DATA 027461      300,301      57,61      MDL 1/10/69 *C

```

0041	00033	00031063	DATA	'031063	302,303	62,63
0042	00034	00032065	DATA	'032065	304,305	64,65
0043	00035	00033067	DATA	'033067	306,307	66,67
0044	00036	00034071	DATA	'034071	310,311	70,71
0045	00037	00020442	DATA	'020442	312,313	41,42
0046	00040	00021444	DATA	'021444	314,315	43,44
0047	00041	00022446	DATA	'022446	316,317	45,46
0048	00042	00023450	DATA	'023450	320,321	47,50
0049	00043	00024422	DATA	'024422	322,323	51,22
0050	00044	00011424	DATA	'011424	324,325	23,24
0051	00045	00012426	DATA	'012426	326,327	25,26
0052	00046	00013430	DATA	'013430	330,331	27,30
0053	00047	00014475	DATA	'014475	332,333	31,75
0054	00050	00017055	DATA	'017055	334,335	36,55
0055	00051	00015077	DATA	'015077	336,337	32,77
0056	00052	00010052	DATA	'010052	240,241	20,52
0057	00053	00017435	DATA	'017435	242,243	37,35
0058	00054	00025420	DATA	'025420	244,245	53,20
0059	00055	00010014	DATA	'010014	246,247	20,14
0060	00056	00016074	DATA	'016074	250,251	34,74
0061	00057	00026060	DATA	'026060	252,253	54,60
0062	00060	00015440	DATA	'015440	254,255	33,40
0063	00061	00035421	DATA	'035421	256,257	73,21
0064	00062	00005001	DATA	'005001	260,261	12,01
0065	00063	00001003	DATA	'001003	262,263	02,03
0066	00064	00002005	DATA	'002005	264,265	04,05
0067	00065	00003007	DATA	'003007	266,267	06,07
0068	00066	00004011	DATA	'004011	270,271	10,11
0069	00067	00006456	DATA	'006456	272,273	15,56
0070	00070	00037013	DATA	'037013	274,275	76,13
0071	00071	00007072	DATA	'007072	276,277	16,72
0072	00072	00400000	END			
ERRORS	0000	00000				

MDL: 1/10/69 *C

MDL: 1/10/69 *C

MDL: 1/10/69 *C

MDL: 1/10/69 *C

REPLACE JPD SEPT 13 1967 *B

MDL: 1/10/69 *C

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...EXTERNALS...
ASCBCD

10

...SYMBOLICS...

AGN	*	19		33					
BEGN		10	*	11	12	14		15	18
BUF		13		19	30	31	*	35	34
CNT		17		32	*	36			
TABL		26	*	40					