

OPTIONS NODECK,LIST,XREF,NOREL,OBJ(P)

THE LIST OF OPTIONS USED DURING THIS ASSEMBLY IS-- NODECK,LIST,XREF,NOREL,OBJ

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE	2
0000			1	#KLIST	START 0				
			2		PRINT ON,NODATA				
			3	*	@SYS EXP-N				
			214+		PRINT ON				
			215	*	@ERM EXP-N				
			837+		PRINT ON				
			838	*	@DIR EXP-N				
			958+		PRINT ON				
			959	*	@FXD EXP-N				
			1364+		PRINT ON				
			1365	*	@CAN EXP-N				
			1468+		PRINT ON				
			1469	*	@VOL EXP-N				
			1507+		PRINT ON				
			1508	*	@HDW EXP-N				
			1693+		PRINT ON				
			1694	*	@SPF EXP-N				
			2157+		PRINT ON				
			2158	*					
		0920	2159	DCDOUT	EQU X'0920'			FOR DATA RECORDER TEMP HJS 2021	

#KLIST -- MAINLINE LIST ROUTINE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE	4
		2162		*****				
		2163	*	5703-XM1	COPYRIGHT IBM CORP. 1970			*
		2164	*		REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083			*
		2165	*					*
		2166		*****				
		2167	*	STATUS				*
		2168	*	VERSION 1 MODIFICATION 0				*
		2169	*					*
		2170	*	FUNCTION				*
		2171	*	* KLISTN WILL 'LIST' THE WORK FILE TO CARD, PRINTER OR CRT.				*
		2172	*	THE WORK FILE MAY CONTAIN A BASIC, KEYBOARD GENERATED DATA OR				*
		2173	*	PROGRAM GENERATED DATA FILE.				*
		2174	*	* A LINE NUMBER LIST MAY BE INCLUDED IN ORDER TO SELECT LINES TO				*
		2175	*	BE LISTED.				*
		2176	*	* THE NO NOM PARAMETER MAY BE USED TO SUPPRESS PUNCHING OF THE				*
		2177	*	LINE NUMBER FOR A KEYBOARD DATA FILE.				*
		2178	*	* WHEN BASIC OR KEYBOARD DATA FILES ARE LISTED TO THE CRT, THE				*
		2179	*	FILE THE MAY BE ROLLED-UP OR DOWN TO SUIT THE USERS NEEDS.				*
		2180	*					*
		2181	*	ENTRY POINTS				*
		2182	*	KLISTN				*
		2183	*	* THIS ROUTINE IS CALLED BY ECMAN WITH \$XRSV CONTAINING				*
		2184	*	A POINTER TO THE INPUT LINE BUFFER.				*
		2185	*					*
		2186	*	INPUT				*
		2187	*	* \$XCSV CONTAINS A POINTER TO THE INPUT LINE BUFFER				*
		2188	*					*
		2189	*	OUTPUT				*
		2190	*	* THE WORK FILE IS LISTED TO THE SPECIFIED DEVICE				*
		2191	*	CRT - CRT				*
		2192	*	PRINTER - MATRIX PRINTER				*
		2193	*	CARD - 5496 DATA RECORDER				*
		2194	*					*
		2195	*	EXTERNAL REFERENCES				*
		2196	*	\$XRSV - AREA FOR HOLDING CURRENT CONTENTS OF @XR.				*
		2197	*	\$CAERR - AREA CONTANING ERRO MESSAGE INDICATOR.				*
		2198	*	\$KEYCD - INPUT DEVICE INDICATOR				*
		2199	*	\$INDR1 - NUCLEUS INDICATOR BYTE.				*
		2200	*	\$INDR3 - NUCLEUS INDICATOR BYTE.				*
		2201	*	\$CAERK - ENTRY TO ERROR PROGRAM.				*
		2202	*	\$CARPL - ENTRY TO RELOAD #GFIDI				*
		2203	*	\$ERSK - ERROR PROGRAM STACK.				*
		2204	*	\$ERRCT - COUNT OF STACKED ERROR MESSAGE.				*
		2205	*	\$ERRPG - INDICATOR FOR ERROR STACK.				*
		2206	*	\$CRTIN - CRT INDICATOR BYTE CONTAINED IN NUCLUES.				*
		2207	*					*
		2208	*	EXITS, NORMAL				*
		2209	*	\$CARPL				*
		2210	*	* FOR LIST FUNCTIONS TO ETHER CARD OR PRINTER OR SYSTEM				*
		2211	*	* FOR LIST FUNCTIONS DIRECTED TO THE CRT. THE INQUIRY REQUEST				*
		2212	*	SWITCH MUST BE ACTIVATED.				*
		2213	*					*
		2214	*	EXITS, ERROR				*
		2215	*	\$CAERK				*
		2216	*	* ALL SYNTAX ERRORS ENCOUNTERED OR EXECUTION ERRORS ARE				*
		2217	*	HANDLED WITH THE FOLLOWING CALLING SEQUENCE:				*

#KLIST -- MAINLINE LIST ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 04/06/21 PAGE 5

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2218 *          B          $CAERK
2219 *      * WHEN MULTIPLE ERROR ARE ENCOUNTERED A STCK IS BUILT
2220 *          A LOCATION $$ERSK BEFORE EXITING TO THE ERROR PROGRAM.
2221 *
2222 *TABLES/WORK AREAS
2223 *      * A SYNTACTIC TABLE IS USED DURING THE SYNTAX CHECKING PHASE
2224 *          OF KLISTN
2225 *          *** S Y N T A X   T A B L E ***
2226 *      * LOCATION ** LENGTH ** DESCRIPTION
2227 *          0          1          LENGTH - 1 OF KEYWORD
2228 *          1          1          INDICATOR FOR KEYWORD
2229 *          2          VARIABLE    EBCDIC REPRESENTATION OF KEYWORD
2230 *
2231 *      * HEX 'FF' DESIGNATES THE END OF THE TABLE
2232 *      * THERE IS ONE DRON FOR EACH KEYWORD ALLOWABLE
2233 *      * THE LIST CONTROL BLOCK (LCB) IS CREATED FROM THE PARAMETERS
2234 *      * SPECIFIED IN THE LIST COMMAND
2235 *          *** L C B ***
2236 *      * LOCATION ** LENGTH ** DESCRIPTION
2237 *          00          1          -CONDITION CODE
2238 *          0 = GO
2239 *          1 = LINE LIST EXHAUSTED
2240 *          2 = BEGINNING OF FILE
2241 *          3 = END CF FLE
2242 *          01          2          -BEGINNING LINE NUMBER
2243 *          A LINE NUMBER LOOP
2244 *          03          2          -LINE NUMBER INCREMENT
2245 *          +1 ROLL-UP
2246 *          PRINT OR PUNCH
2247 *          -1 ROLL DOWN
2248 *          05          1          -PRINT OPTION
2249 *          C0 ROLL-UP OR PRINT
2250 *          4F ROLL-DOWN
2251 *          06          1          -LENGTH OF CURRENT LINE
2252 *          07          2          -ADDRESS OF BUFFER CONTAINING LINE
2253 *          TO BE PRINTED
2254 *          09          1          -CURRENT MODE (CRT)
2255 *          ROLL-DOWN
2256 *          ROLL-UP
2257 *          0A          2          -CURRENT LINE BEING PROCESSED
2258 *          0C          1          -CURRENT SEGMENT OF A LINE BEING
2259 *          DISPLAYED: SEGMENT IS 64 BYTES
2260 *          LONG (CRT)
2261 *          0D          1          -MAXIMUM NUMBER OF SEGMENTS IN THE
2262 *          CURRENT LINE (CRT)
2263 *          0E          1          -MODE CHANGE INDICATOR
2264 *          ON  = CHANGE FROM RU TO RD
2265 *          RD TO RU
2266 *          OFF = NO CHNAGE
2267 *          0F          2          -LINE NUMBER OF FIRST LINE IN
2268 *          WORK FILE
2269 *          11          1          -INITIAL CALL INDICATOR
2270 *          12          2          -LAST LINE OF THE CURRENT LINE
2271 *          NUMBER LOOP
2272 *      * WHEN THE CRT IS THE OUTPUT DEVICE SPECIFIED:
2273 *          THE FOLLOWING TABLE IS BUILT.  THERE ARE 14 ROWS IN THE TABLE

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#KLIST -- MAINLINE LIST ROUTINE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 04/06/21 PAGE 6
		2274	*	CORRESPONDIKG TO THE 14 LINES USED ON THE CKT.	*
		2275	*		*
		2276	*	* LOCATION ** LENGTH ** DESCRIPTION	*
		2277	*	0 1 -CURRENT MODE FOR THIS LINE (LCB)	*
		2278	*	1 2 -CURRENT LINE NUMBER (LCB)	*
		2279	*	3 1 -CURRENT SEGMENT OF A LINE BEING	*
		2280	*	DISPLAYED ON THE CRT (LCB)	*
		2281	*	4 1 -MAXIMUM NUMBER OF SEGMENTS IN	*
		2282	*	THE CURRENT LINE	*
		2283	*	* TOTAL LENGTH/ROW 5	*
		2284	*	* TOTAL BYTES 70	*
		2285	*		*
		2286	*	* ALL OTHER CONSTANTS ARE GROUPED WHERE THEY ARE NEEDED.	*
		2287	*		*
		2288	*	*ATTRIBUTES	*
		2289	*	* RELOCATABLE, NON-REUSABLE	*
		2290	*		*
		2291	*	*CHARACTER CODE DEPENDENCY	*
		2292	*	* KLISTN RELIES ON THE EBCDIC REPRESENTATION OF THE KEYWORDS	*
		2293	*	TO BE THE KEYWORDS DESCRIBED IN THE FUNCTIONAL SPECIFICATIONS.	*
		2294	*	CHANGES CAN BE MADE BY MODIFYING THE INTERNAL SYNTAX TABLE.	*
		2295	*		*
		2296	*	*NOTES	*
		2297	*	ERROR PROCEDURES	*
		2298	*	PLACE ERROR CODE AT \$CAERR OR AT \$\$ERSK AND EXIT VIA \$CAERK	*
		2299	*		*
		2300	*	RESISTER USAGE	*
		2301	*	INDEX REGISTER XR1 IS USED AS A TABLE POINTER	*
		2302	*	DURNG THE SYNTACTIC PHASE OF KLISTN. DURING EXECUTION	*
		2303	*	IT IS USED A BASE REGISTER	*
		2304	*		*
		2305	*	INDEX REGISTER XR2 POINTS TO THE SYSTEM COMMAND DURING	*
		2306	*	THE SYNTACTIC PHASE. DURING EXECUTION IT IS USED AS A	*
		2307	*	GENERAL PURPOSE WORK REGISTER	*
		2308	*		*
		2309	*	SAVED/RESTORED AREAS	*
		2310	*	N/A	*
		2311	*		*
		2312	*	MODIFICATION CONSIDERATION	*
		2313	*	N/A	*
		2314	*		*
		2315	*	REQUIRED MODULES	*
		2316	*	@SYSEQ - COMMON SYSTEM EQUATES	*
		2317	*	@FXDEQ - NUCLEUS ADDRESSES AND INDICATOR VALUE EQUATES	*
		2318	*	@HLTEQ - HALT EQUATES	*
		2319	*	@NDWEQ - HARDWARE EQUATES	*
		2320	*	@WKAEQ - WORK AREA EQUATES	*
		2321	*	@CANEQ - FIXED LOCATIONS OUTSIDE OF THE NUCLELUS	*
		2322	*	@CY0EQ - CYLINDER ZERO EQUATES	*
		2323	*	DCDOUT - DATA RECORDER INTERFACE MODULE	*
		2324	*	DL4ICS - 4-SURFACE LOGICAL IOCR	*
		2325	*	GRABIT - WORK FILE LINE RETRIEVAL ROUTINE	*
		2326	*	C2DEC5 - BINARY TO DECIMAL CONVERSION ROUTINE	*
		2327	*	GFINDN - SET-UP WORK-FILE BLOCK FOR GRABIT	*
		2328	*	DLPRNT - LIST OUTPUT INTERFACE	*
		2329	*	SDLIST - DATA FILE CONVERSION ROUTINE	*

#KLIST -- MAINLINE LIST ROUTINE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE	7
		2330	*		C4BIN2 - DECIMAL TO BINARY CONVERSION ROUTINE				*
		2331	*		SLLIST - LINE-NUMBER LIST CONVERSION ROUTINE				*
		2332	*		SCKOUT - OUTPUT DEVICE VALIDATOR				*
		2333	*		SCANIT - SCAN FOR DELIMITERS				*
		2334	*						*
		2335	*	OTHER					*
		2336	*	N/A					*
		2337	*						*
		2338	*	*****					

#KLIST -- MAINLINE LIST ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE	8
					2340	*****					
					2341	*	PHASE ONE OF KLISTN PERFORMS THE FOLLOWING FUNCTIONS:				
					2342	*	1) SYNTACTIC ANALYSIS				
					2343	*	2) SEMANTIC VALIDATION				
					2344	*	3) LIST CONTROL BLOCK INTIALIZATION				
					2345	*	4) CONTROL <LINE-NUMBER-LIST> PROCESSING				
					2346	*	5) RECOGNIZE THE COMPLETION OF THE LIST FUNCTION				
					2347	*	AND RETURN TO THE SYSTEM VIA \$CARPL				
					2348	*****					
					2349	*					
					2350	*	L I S T E X E C U T I V E R O U T I N E				
					2351	*					
					2352	*****					
					2353	*	HDR #KLIST,1				
					2354	*****					
					2355	*	PROGRAM HEADER FOR DISK LOAD				*
					2356	*****					
					2357	*#\$KCLI EQU	X'0400'				DISK ADDR AF #KLIST
					2358	*#\$KCLI EQU	X'0C00'				CORE LOAD ADDRESS OF #KLIST
					2359	*#\$@KLI EQU	017				SECTOR CNT OF #KLIST
0C00					2360		ORG \$\$\$KLI				CORE LOAD ADDRESS
				0C00	2361	\$\$\$\$\$ EQU	*				FIRST LOCATION IN PROGRAM
0C00	7BD2D3C9E2E3			0C05	2362	DC	CL6'#KLIST'				PROGRAM NAME
0C06	1D			0C06	2363	DC	IL1'029'				PROGRAM NUMBER OF #KLIST
				0C07	2364	#KLIS EQU	*				ENTRY POINT TO PROGRAM
					2365	***	END OF EXPANSION ***				
				0C07	2366	KLISTN EQU	*				ENTRY
0C07	35 02 03C7				2367	L	\$XRSAB,@XR				PICK UP ADDRESS INTO LINE
0C0B	C0 87 1C61				2368	B	SCANIT				SCAN TO PARAMETER
0C0F	3C 80 1A2C				2369	MVI	GFI200+@Q,@NOP				SWITCH FOR BLOCKS NOT CONTIGUOUS
0C13	3C 87 1C3B				2370	MVI	SLLIND,SLLRET				SET SPECIAL RETURN FOR SLLIST
0C17	C0 87 1B72				2371	B	SLLIST				CONVERT LINE NUMBER LIST
0C1B	C0 82 0D51				2372	BL	KLI061				GO TO ERROR EXIT
0C1F	BD 6B 00				2373	CLI	0(,@XR),@COMMA				'LIST' FOLLOWED BY A COMMA ?
0C22	3C 11 03CD				2374	MVI	\$CAERR,@E131				SET INVALID PARAM ERROR CODE
0C26	C0 81 0D51				2375	BE	KLI061				YES, TAKE ERROR EXIT
0C2A	BD 1E 00				2376	CLI	@ZERO(,@XR),@EOS				END OF STATEMENT ?
0C2D	C0 81 0DB5				2377	BE	KLI072				NO --- CONTINUE
				0C31	2378	KLI015 EQU	*				
					2379	*	SYNTACTIC SCAN OF INPUT LINE				
0C31	3C 01 1C7E				2380	MVI	SCAMMA,SCACOM				SET COMMA SKIP OPTION
0C35	C0 87 1C61				2381	B	SCANIT				GET TO KEYWORD
0C39	BD 1E 00				2382	KLI017 CLI	0(,@XR),@EOS				END OF STATEMENT ?
0C3C	F2 81 84				2383	JE	KLI050				GO CHECK INDICATORS
0C3F	C2 01 0D58				2384	LA	KLIBRY,@BR				TABLE ADDRESS
0C43	34 02 03C7				2385	ST	\$XRSAB,@XR				SAVE CURRENT POINTER
0C47	1C 00 0C61 00				2386	KLI019 MVC	KLI020+@Q(1),0(,@BR)				SETUP
0C4C	1C 00 0C62 00				2387	MVC	KLI020+@D1(1),0(,@BR)				DISPLACEMENT TO END OF KEYWORD
0C51	34 01 0C64				2388	ST	KLI020+@DOP2,@BR				STORE ROW INDEX
0C55	1E 00 0C64 00				2389	ALC	KLI020+@DOP2(1),0(,@BR)				INCREMENT TO END OR KEYWORD
0C5A	0E 00 0C64 0E54				2390	ALC	KLI020+@DOP2(1),KLITWO				BUMP TO END OF KEYWORD
					2391	*					
0C60	8D 00 00 0000				2392	KLI020 CLC	*-*(@VQ,@XR),*-*				KEYWORD FOUND IN TABLE ?
0C65	F2 81 12				2393	JE	KLI030				YES --- CHECK STATUS
0C68	35 01 0C64				2394	L	KLI020+@DOP2,@BR				END OF ROW
0C6C	36 01 0FCC				2395	A	KLIPL1,@BR				GET TO NEXT ROW

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ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE	9
	0C70	7D	FF	00	2396	CLI	0(, @BR), KLIBFF				END OF TABLE ?
	0C73	C0	01	0C47	2397	BNE	KLI019				CONTINUE SEARCH
	0C77	F2	87	CF	2398	J	KLI060				ERROR EXIT
				0C7A	2400	KLI030	EQU *				KEYWORD FOUND
	0C7A	78	80	01	2401	TBN	KLIBD1(, @BR), KLIMK6				DUPLICATE PARAMETER
	0C7D	F2	90	07	2402	JF	KLI035				NO --- CHECK MASK
	0C80	3C	13	03CD	2403	MVI	\$CAERR, @@E134				DUPLICATE PARAMETERS
	0C84	F2	87	CA	2404	J	KLI061				GO TO ERROR EXIT
				0C87	2406	KLI035	EQU *				CHECK FOR CONFLICTING
	0C87	1C	00	0C99 01	2407	MVC	KLI037+@Q(1), KLIBD1(, @BR)				MOVE MASK TO TEST
	0C8C	1C	00	0CA0 01	2408	MVC	KLI039+@Q(1), KLIBD1(, @BR)				MOVE MASK TO SET
	0C91	7A	80	01	2409	SBN	KLIBD1(, @BR), KLIMK6				TURN-ON DUPLICATE
	0C94	3C	15	03CD	2410	MVI	\$CAERR, @@E136				CONFLICTING PARAMETERS
	0C98	39	00	0D57	2411	KLI037	TBF KLIDVT, *-*				*
	0C9C	F2	90	B2	2412	JF	KLI061				YES --- JUMP
	0C9F	3A	00	0D57	2413	KLI039	SBN KLIDVT, *-*				*
	0CA3	3B	FF	0C61	2414	SBF	KLI020+@Q, KLIBFF				SET LENGTH TO ZERO
	0CA7	36	02	0C62	2415	A	KLI020+@D1, @XR				BUMP @XR TO END
	0CAB	36	02	0FCC	2416	A	KLIPL1, @XR				GET TO NEXT PARAMETER
	0CAF	BD	1E	00	2417	CLI	0(, @XR), @EOS				END OF STATEMENTS ?
	0CB2	F2	81	0E	2418	JE	KLI050				GO CHECK INDICATORS
	0CB5	C0	87	1C61	2419	B	SCANIT				SCAN
	0CB9	F2	81	8D	2420	JE	KLI060				INVALID PARAMETER
	0CBC	F2	82	92	2421	JL	KLI061				DANGLING DELIMITER
	0CBF	C0	87	0C39	2422	B	KLI017				CONTINUE SYNTAX CHECK
				2423	*		CHECK INDICATORS AND EXIT				
				0CC3	2424	KLI050	EQU *				END OF STATEMENT PROCESSING
	0CC3	D2	02	00	2425	LA	0(, @BR), @XR				GET OUT OF \$\$INLN
	0CC6	3C	3B	03CD	2426	MVI	\$CAERR, @@E249				SET ERROR CODE
	0CCA	38	0F	0D57	2427	TBN	KLIDVT, KLIMK5				CRT SPECIFIED ?
	0CCE	F2	10	AE	2428	JT	KLI070				GO DO CRT
	0CD1	3C	85	148B	2429	MVI	DLPTYP, DLPMPR				SET PRINTER INDICATOR
	0CD5	38	02	0D57	2430	TBN	KLIDVT, KLIMK1				PRINTER SDECIFIED ?
	0CD9	F2	90	48	2431	JF	KLI055				PRINTER SPECIFIED
	0CDC	38	80	03DD	2432	TBN	\$CONFIG, \$BIGCD				IS 129 CONFIGURED ?
	0CE0	F2	90	07	2433	JF	KLI052				JUMP IF NOT
	0CE3	3C	50	18B9	2434	MVI	SDLWID, KLBCW				SET CARD WIDTH = 80 1-4
	0CE7	F2	87	04	2435	J	KLI053				CONTINUE 1-4
	0CEA	3C	60	18B9	2436	KLI052	MVI SDLWID, KLICWD				SET CARD WIDTH = 96 1-4
	0CEE	38	01	03C3	2437	KLI053	TBN \$KEYCD, \$CARDI				CARD INPUT ? 1-4
	0CF2	F2	90	07	2438	JF	KLI054				NO, CONTINUE PROCESSING 1-4
	0CF5	38	08	03E0	2439	TBN	\$DBGUF, \$CALLI				PROCEDURE IN PROGRESS ? 1-4
	0CF9	F2	90	55	2440	JF	KLI061				NO, ERROR
				2441	*						
				2442	*		SINCE THE OUTPUT IS TO BE TO CARDS, THE CARD OUTPUT ROUTINE, DCDOUT,				
				2443	*		MUST NOW BE LOADED INTO CORE. IT IS READ IN OVER DEPRES, IN THE				
				2444	*		NUCLEUS, SINCE THE KEYBOARD IS LOCKED (EXCEPT FOR THE IR SWITCH, AND				
				2445	*		ITS CODE IS NOT OVERLAID). THEREFORE THE INDICATOR \$IOYES AT \$KEYCD				
				2446	*		MUST BE SET OFF TO RELOAD THE KEYBOARD ROUTINE.				
				2447	*						
	0CFC	3B	02	03C3	2448	KLI054	SBF \$KEYCD, \$IOYES				SET INDICATOR TO RELOAD DPRS 1-4
	0D00	C0	87	051A	2449	B	\$LOADR				LOAD
	0D04	0D79		0D05	2450	DC	AL(@CADDR)(KLIDCD)				* DCDOUT
	0D06	38	14	0D57	2451	TBN	KLIDVT, KLIMK2				NO-NUM SPECIFIED ?

#KLIST -- MAINLINE LIST ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 10
	0D0A	F2	90	2E	2452	JF	KLI057			NO, GO TEST FILE TYPE
	0D0D	38	40	03D4	2453	TBN	\$INDR1,\$KEYDT			IS FILE KEY/CARD-GEN-DATA ?
	0D11	F2	90	35	2454	JF	KLI060			IF NOT - ERROR
	0D14	38	01	03D4	2455	TBN	\$INDR1,\$PROCI			IS FILE A PROCEDURE FILE 1-4
	0D18	F2	10	2E	2456	JT	KLI060			YES --- ERROR 1-4
	0D1B	0C	01	0FDB 0FD7	2457	MVC	KLIMAG,KLIPL5			SET MAGIC ADDER
	0D21	F2	87	91	2458	J	KLI072			CONTINUE ---
	0D24	3C	15	03CD	2459	KLI055 MVI	\$CAERR,@E136			INVALID PARAMETERS
	0D28	38	14	0D57	2460	TBN	KLIDVT,KLIMK2			NUM --- NO-NUM
	0D2C	F2	10	22	2461	JT	KLI061			INVALID SPECIFICATION
	0D2F	0C	00	18B9 03C0	2462	MVC	SDLWID(1),\$RMRGN			SET RIGHT MARGIN VALUE
	0D35	0F	00	18B9 03C1	2463	SLC	SDLWID(1),\$LMRGN			COMPUTE WIDTH
	0D3B	38	20	03D4	2464	KLI057 TBN	\$INDR1,\$PGMDT			IS FILE PGM-GENERATED ?
	0D3F	F2	90	73	2465	JF	KLI072			IF NOT, BRANCH TO OUTPUT PHASE
	0D42	38	04	0D57	2466	TBN	KLIDVT,KLIMK3			NUM OR NONUM SPECIFIED ?
	0D46	F2	90	6C	2467	JF	KLI072			IF NOT, BRANCH TO OUTPUT PHASE
					2468	*	RESET @XR			
	0D49	3C	11	03CD	2469	KLI060 MVI	\$CAERR,@E131			INVALID PARAMETER
	0D4D	35	02	03C7	2470	L	\$XRSAB,@XR			BACK-UP
	0D51	C0	87	0469	2471	KLI061 B	\$CAERK			GO TO ERROR ROUTINE
	0D55	0000			0D56 2472	KLIZRO DC	IL2'0'			CONSTANT ZERO
	0D57				0D57 2473	KLIDVT DS	CL1			OUTPUT DEVICE TYPE
	0D57				2474	ORG	*-1			RESET LOCATION COUNTER
	0D57	00			0D57 2475	DC	IL1'0'			INITIALIZE
					0002 2476	KLIMK1 EQU	X'02'			SYNTACTIC MASK FOR CARD
					0014 2477	KLIMK2 EQU	X'14'			SYNTACTIC MASK FOR NONUM
					0004 2478	KLIMK3 EQU	X'04'			SYNTACTIC MASK FOR NUM
					0001 2479	KLIMK4 EQU	X'01'			SYNTACTIC MASK FOR PRINTER
					000F 2480	KLIMK5 EQU	X'0F'			SYNTACTIC MASK FOR CRT
					2481	*				SYNTACTIC MASK FOR NULL
					0080 2482	KLIMK6 EQU	X'80'			SYNTACTIC MASK FOR USED LORD
					0000 2483	KLIBD0 EQU	0			DISPLACEMENT TO LENGTH
					0001 2484	KLIBD1 EQU	1			DISPLACEMENT TO MASK
					0003 2485	KLIBD3 EQU	3			INCREMENT TO ROW (1)
					00FF 2486	KLIBFF EQU	X'FF'			END OF TABLE INDICATOR
					0D58 2488	KLIBRY EQU	*			KEYWORD TABLE
	0D58	03			0D58 2489	DC	IL1'3'			LENTGH-1 OF CARD
	0D59	02			0D59 2490	DC	AL1(KLIMK1)			MASK FOR CARD
	0D5A	C3C1D9C4			0D5D 2491	DC	CL4'CARD'			KEYWORD CARD
	0D5E	02			0D5E 2492	DC	IL1'2'			LENGTH-1 OF NUM
	0D5F	04			0D5F 2493	DC	AL1(KLIMK3)			MASK FOR NUM
	0D60	D5E4D4			0D62 2494	DC	CL3'NUM'			
	0D63	04			0D63 2495	DC	IL1'4'			LENGTH-1 OR NONUM
	0D64	14			0D64 2496	DC	AL1(KLIMK2)			MASK FOR NONUM
	0D65	D5D6D5E4D4			0D69 2497	DC	CL5'NONUM'			
	0D6A	06			0D6A 2498	DC	IL1'6'			LENGTH-1 OF PRINTER
	0D6B	01			0D6B 2499	DC	AL1(KLIMK4)			MASK FOR PRINTER
	0D6C	D7D9C9D5E3C5D9			0D72 2500	DC	CL7'PRINTER'			
	0D73	02			0D73 2501	DC	IL1'2'			LENGTH-1 OF CRT
	0D74	0F			0D74 2502	DC	AL1(KLIMK5)			MASK FOR CRT
	0D75	C3D9E3			0D77 2503	DC	CL3'CRT'			
	0D78	FF			0D78 2504	DC	IL1'-1'			END OF TABLE
					2505	*				
					2506	*****				

#KLIST -- MAINLINE LIST ROUTINE

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 11
				2508	*			
				2509	* EQUATES AND DPL TO LOAD DCDOUT (#KLIVR)			
				2510	*			
			2004	2511	KLICDA EQU X'2004'			RELATIVE DISK ADDRESS OF #KLOVR
			0001	2512	KLICDL EQU 1			LENGTH OF #KLOVR
			0920	2513	KLICDC EQU \$\$PRES+X'90'			CORE LOAD ADDRESS
				2514	*			
				2515	*LIDCD \$DPL FUNC-@DGET,DADDR-KLICDA,CNT-KLICDL,CADDR-KLICDC			
			0D79	2516	+KLIDCD EQU *			DISK PARAMETER LIST
0D79	01		0D79	2517	+	DC	AL1(@DGET)	REQUESTED FUNCTION
0D7A	2004		0D7B	2518	+	DC	AL2(KLICDA)	DISK ADDRESS
0D7C	01		0D7C	2519	+	DC	AL1(KLICDL)	SECTOR COUNT
0D7D	0920		0D7E	2520	+	DC	AL2(KLICDC)	BUFFER ADDRESS
				2521	***	END OF EXPANSION	***	
				2522	*			

#KLIST -- MAINLINE LIST ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 04/06/21 PAGE 12

				0D7F 2524		USING KLI070,@BR	
				0D7F 2525	KLI070	EQU *	CRT SPECIFICATION
0D7F	C2	01	0D7F	2526		LA KLI070,@BR	SET UP BASE
0D83	3C	1B	148B	2527		MVI DLPTYP,DLPCRT	SET CRT INDICATION
0D87	C0	87	1AA1	2528		B SCKDEV	CHECK OUTPUT DEVICE
0D8B	3C	08	0D57	2529		MVI KLIDVT,KLICRT	SET CRT AS OUTPUT DEVICE
0D8F	38	20	03D4	2530		TBN \$INDR1,\$PGMDT	PGM GENERATED FILE ?
0D93	D0	10	3E	2531		BT KLI074(,@BR)	
0D96	3A	02	03D6	2532		SBN \$INDR3,\$LIST	ACCEPT ROLL-DOWN
0D9A	0F	01	1A64 1A64	2533		SLC GFILNO(@CADDR),GFILNO	ASK FOR LINE ZERO
0DA0	3C	01	1401	2534		MVI GRSCTR,KLI2BF	SET DOUBLE BUFFER OPTION
0DA4	C0	87	19FD	2535		B GFINDN	RETRIEVE BUFFER FROM DISK
0DA8	C0	87	127F	2536		B GRABIT	RETRIEVE FIRST LINE NUMBER
0DAC	0C	01	0FC5 1190	2537		MVC KLIFLF(@CADDR),GRLINE	FIRST LINE IN FILE
0DB2	F2	87	08	2538		J KLI074	CONTINUE
				0DB5 2540	KLI072	EQU *	PROCESS LINE NUMBER LIST
0DB5	C2	01	0D7F	2541		LA KLI070,@BR	SET UP BASE REGISTER
0DB9	C0	87	1AA1	2542		B SCKDEV	CHECK OUTPUT DEVICE
0DBD	75	02	D7	2543	KLI074	L KLIXR1(,@BR),@XR	CURRENT POINTER INTO SLLINE
0DC0	BD	FF	00	2544		CLI @ZERO(,@XR),@SCTS-1	NULL LINE-NUMBER-LIST ?
0DC3	D0	81	67	2545		BE KLI075(,@BR)	YES --- CALL OUTPUT PROCESSOR
0DC6	3C	50	03CD	2546		MVI \$CAERR,@E335	SET ILLEGAL WITH LINE NO
0DCA	38	20	03D4	2547		TBN \$INDR1,\$PGMDT	PGM GENERATED TILE ?
0DCE	C0	10	0469	2548		BT \$CAERK	YES --- GO TO ERROR ROUTINE
				0DD2 2549	KLI073	EQU *	
0DD2	2C	01	0FB7 01	2550		MVC KLIBLN(@CADDR),@B1(,@XR)	LINENO(1) --> BEGINNING LINE
0DD7	BD	60	02	2551		CLI KLITNO(,@XR),@MINUS	RANGE SPECIFIED ?
0DDA	D0	01	B9	2552		BNE KLI080(,@BR)	NO --- GO SET STOP = START
0DDD	2C	01	0FC8 04	2553		MVC KLISLN(@CADDR),KLIFOR(,@XR)	MOVE STOP LINE
0DE2	5E	01	D7 D3	2554		ALC KLIXR1(@CADDR,@BR),KLIFIV(,@BR)	BUMP I --- I = I + 5.
0DE6	0C	01	0FC0 0FB7	2555	KLI075	MVC KLICLN(@CADDR),KLIBLN	SET CURRENT TO START
0DEC	38	1B	148B	2556		TBN DLPTYP,DLPCRT	CRT SPECIFIED ?
0DF0	D0	90	79	2557		BF KLI076(,@BR)	NO --- GO TO OUTPUT PROCESSOR
0DF3	1C	01	0FC8 D1	2558		MVC KLISLN(@CADDR),KLIMAX(,@BR)	SET MAX LINE NUMBER
0DF8	D0	87	DE	2559	KLI076	B KLI100(,@BR)	LIST OUTPUT FUNCTION
0DFB	38	1B	148B	2560		TBN DLPTYP,DLPCRT	CRT SPECIFIED ?
0DFF	F2	10	43	2561		JT KLI090	GO WAIT FOR LAST LINE TO LIST
0E02	75	02	D7	2562		L KLIXR1(,@BR),@XR	PICK UP INDEX INTO SLLINE
0E05	BD	FF	00	2563		CLI @ZERO(,@XR),@SCTS-1	END OF LINE LIST ?
0E08	D0	01	53	2564		BNE KLI073(,@BR)	RETURN TO LOOP
0E0B	39	03	0FDD	2565		TBF KLINDC,KLONGL+KLIASK	ANY ERRORS DETECTED ?
0E0F	F2	10	33	2566		JT KLI090	GO WAIT FOR LAST LINE TO LIST
0E12	38	02	0FDD	2567		TBN KLINDC,KLONGL	TRUNCATED LINES
0E16	F2	90	0C	2568		JF KLI078	EXIT TO ERROR ROUTINE
0E19	7C	9F	D8	2569		MVI KLICD1(,@BR),@E570	SWITCH ERROR MESSAGES
0E1C	7C	A0	DB	2570		MVI KLICD2(,@BR),@E571	*
0E1F	0F	00	0FDD 0FCC	2571		SLC KLINDC,KLIPL1(1)	DECREMENT COUNT
0E25	1C	05	1C05 DD	2572	KLI078	MVC \$\$ERSK+KLITLG(KLISIX),KLIER2(,@BR)	MOVE ERROR TO STACK
0E2A	0C	00	03CF 0FDD	2573		MVC \$ERRCT(1),KLINDC	MOVE COUNT VALUE
0E30	3C	30	03CE	2574		MVI \$ERRPG,\$ERSTK	TURN ON STACK INDICATOR
0E34	C0	87	0469	2575		B \$CAERK	YES --- GO TO ERROR ROUTINE
0E38	0C	01	0FC8 0FB7	2576	KLI080	MVC KLISLN(@CADDR),KLIBLN	
0E3E	5E	01	D7 D5	2577		ALC KLIXR1(@CADDR,@BR),KLITWO(,@BR)	I = I + 2.
0E42	D0	87	67	2578		B KLI075(,@BR)	CONTINUE
0E45	C0	87	1461	2579	KLI090	B DLPRNT	GO WAIT FOR LAST LINE TO LIST

#KLIST -- MAINLINE LIST ROUTINE

ERR		LOC	OBJECT CODE		ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00		04/06/21	PAGE	13
0E49		057F			0E4A	2580	DC	AL2(\$WAITF)	WAIT FUNCTIONOM PARM LIST				
0E4B		C0	87	04A1		2581	B	\$CARPL	RETURN TO SYSTEM				

#KLIST -- MAINLINE LIST ROUTINE

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 14
				2583	*****				
				2584	*	C O N S T A N T S A N D W O R K A R E A S			*
				2585	*****				
			0D51	2586	SCKERR EQU	KLI061			CRT ERROR
0E4F	270F		0E50	2587	KLIMAX DC	IL2'9999'			MAXIMUM LINE NUMBER
0E51	0005		0E52	2588	KLIFIV DC	IL2'5'			LENGH OF LINE NUMBER RANGE
0E53	0002		0E54	2589	KLITWO DC	IL2'2'			LENGTH OF LINE-NUMBER
0E55			0E56	2590	KLIXR1 DS	CL2			INDEX FOR SLLINE - 1
0E55				2591	ORG	*-2			RESET LOCATION COUNTER
0E55	1957		0E56	2592		DC	AL2(SLLINE)		BEGINNING OF AREA
0E57	A0		0E57	2593	KLICD1 DC	AL1(@@E571)			DISABLED LINES ENCOUNTERED
0E58	A0		0E58	2594		DC	AL1(\$\$\$NLN)		NO LINE NUMBER INDICATOR
0E59			0E59	2595	KLIER1 DS	CL1			FILLER
0E5A	9F		0E5A	2596	KLICD2 DC	AL1(@@E570)			TRUNCATED LINES-ENCOUNTERED
0E5B	A0		0E5B	2597		DC	AL1(\$\$\$NLN)		NO LINE NUMBER INDICATOR
0E5C			0E5C	2598	KLIER2 DS	CL1			FILLER
				2599	*				

#KLIST -- MAINLINE LIST ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 15
				0E5D	2601	KLI100	EQU *			LIST OUTPUT SECTION
	0E5D	34	08	1078	2602		ST KLI400+@OP1,@ARR			SAVE RETURN ADDRESS
	0E61	34	01	1074	2603		ST KLI399+@OP1,@BR			SAVE BASE
	0E65	C2	01	0EE0	2604		LA KLI135,@BR			SET BASE REGISTER
				0EE0	2605		USING KLI135,@BR			
	0E69	7C	0E	FC	2606		MVI KLICTR(,@BR),KLI14			SET ROW COUNT
	0E6C	5C	01	F2 F9	2607		MVC KLIXRJ(@CADDR,@BR),KLIMN5(,@BR)			SET MINUS 5 TO INTIAL J
	0E70	7C	01	E2	2608		MVI KLIMLS(,@BR),@B1			INITIALIZE FIELD
	0E73	7C	01	E1	2609		MVI KLICLO(,@BR),@B1			INITIALIZE FIELD
	0E76	35	02	0FD0	2610		L KLCLST,@XR			CRT VECTOR ADDRESS
	0E7A	9C	04	04 E2	2611	KLI104	MVC KLIFOR(KLITLG,@XR),KLIMLS(,@BR)			INITIALIZE VECTOR
	0E7E	E2	02	05	2612		LA KLITLG(,@XR),@XR			BUMP TO NEXT ROW
	0E81	5F	00	FC EC	2613		SLC KLICTR(@B1,@BR),KLIPL1(,@BR)			REDUCE COUNT
	0E85	C0	01	0E7A	2614		BNZ KLI104			CONTINUE TO INITIALIZE
	0E89	38	20	03D4	2615		TBN \$INDR1,\$PGMDT			PROGRAM GENERATED FILE ?
	0E8D	C0	10	106D	2616		BT KLI380			OUTPUT PROGRAM GENERATED FILE
	0E91	C0	87	1079	2617	KLI105	B KLI500			LINE RETRIEVAL ROUTINE
	0E95	7D	00	D5	2618		CLI KLITYP(,@BR),@ZERO			GO CONDITION ?
	0E98	C0	01	1071	2619		BNE KLI399			NO --- RETURN
	0E9C	38	08	0D57	2620		TBN KLIDVT,KLICRT			CRT SPECIFIED ?
	0EA0	C0	90	0FF3	2621		BF KLI210			CRT NOT SPECIFIED
	0EA4	7D	00	D5	2622	KLI106	CLI KLITYP(,@BR),@ZERO			GO CONDITION ?
	0EA7	C0	01	104B	2623		BNE KLI250			GO WAIT FOR INTERRUPT
	0EAB	7B	04	DE	2624	KLI110	SBF KLIMOD(,@BR),\$CRTPU			
	0EAE	5C	00	48 DE	2625		MVC KLI150+@Q(@B1,@BR),KLIMOD(,@BR)			SET BIT PATTERN
	0EB2	5D	00	E2 E1	2626	KLI120	CLC KLIMLS(1,@BR),KLICLO(,@BR)			CRT SEGMENTS EXHAUSTED ?
	0EB6	F2	84	0F	2627		JH KLI125			NO
	0EB9	5E	01	E0 D9	2628		ALC KLICLN(@CADDR,@BR),KLIINC(,@BR)			BUMP LINE NUMBER
	0EBD	C0	87	1079	2629		B KLI500			RETRIEVE LINE ROUTINE
	0EC1	7D	00	D5	2630		CLI KLITYP(,@BR),@ZERO			GO CONDITION ?
	0EC4	C0	01	104B	2631		BNE KLI250			STOP CONDITION
				0EC8	2632	KLI125	EQU *			CHECK MODE
	0EC8	78	02	DE	2633		TBN KLIMOD(,@BR),\$CRTDN			MODE EQUAL ROLL-DOWN ?
	0ECB	D0	10	B8	2634		BT KLI185(,@BR)			YES --- MODE ROLL-DOWN
	0ECE	7C	C0	DA	2635		MVI KLIOPT(,@BR),@PRINT+@RETRN			SET PRINTER INDICATOR
	0ED1	5E	01	F2 F7	2636		ALC KLIXRJ(@CADDR,@BR),KLIPL5(,@BR)			J = J + 1;
	0ED5	5D	01	F2 EA	2637		CLC KLIXRJ(@CADDR,@BR),KLIMXJ(,@BR)			J > MAX ?
	0ED9	F2	04	04	2638		JNH KLI135			CONTINUE
	0EDC	5F	01	F2 F2	2639		SLC KLIXRJ(@CADDR,@BR),KLIXRJ(,@BR)			0 --> J
	0EE0	5C	00	F5 E1	2640	KLI135	MVC KLIYWK(1,@BR),KLICLO(,@BR)			SET UP LINES OUTPUT
	0EE4	7C	00	FC	2641	KLI136	MVI KLICTR(,@BR),@ZERO			CLEAR MULITIPLY COUNTER
	0EE7	C2	02	0000	2642		LA @ZERO,@XR			CLEAR PRODUCT ACCUMULATOR
	0EEB	4C	01	DD 118C	2643		MVC KLIBUF(@CADDR,@BR),KLIBF@			RESET BUFFER ADDRESS
	0EF0	5D	00	FC F5	2644	KLI140	CLC KLICTR(1,@BR),KLIYWK(,@BR)			MULTIPLICATION COMPLETE ?
	0EF4	D0	02	21	2645		BNL KLI145(,@BR)			YES --- EXIT
	0EF7	76	02	F4	2646		A KLIC64(,@BR),@XR			MULTIPLICAND EQUAL 64
	0EFA	5E	00	FC EC	2647		ALC KLICTR(1,@BR),KLIPL1(,@BR)			INCREMENT COUNT
	0EFE	D0	87	10	2648		B KLI140(,@BR)			CONTINUE
					2649	*				
					2650	*	PRODUCT IS IN @XR			
					2651	*				
	0F01	76	02	DD	2652	KLI145	A KLIBUF(,@BR),@XR			COMPLETE LOCATION II BUFFER
	0F04	74	02	DD	2653		ST KLIBUF(,@BR),@XR			STORE BUFFER ADDRESS IN LCB
	0F07	5E	00	E1 EC	2654		ALC KLICLO(1,@BR),KLIPL1(,@BR)			BUMP LINES OUTPUT FIELD
	0F0B	75	02	F2	2655		L KLIXRJ(,@BR),@XR			INDEX J
	0F0E	76	02	F0	2656		A KLCLST(,@BR),@XR			COMPLTE ROW IN TABLE

#KLIST -- MAINLINE LIST ROUTINE

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0F11 9C 00 00 DE          2657      MVC      KLISTM(1,@XR),KLIMOD(,@BR)  MOVE MODE TO TABLE (J)
0F15 9C 01 02 E0          2658      MVC      KLISTL(@CADDR,@XR),KLICLN(,@BR)  MOVE CURRENT LINE TO TAN
0F19 9C 00 03 E1          2659      MVC      KLISTO(1,@XR),KLICLO(,@BR)  MOVE SEGMENTS %TM TO TABLE
0F1D 9C 00 04 E2          2660      MVC      KLISTS(1,@XR),KLIMLS(,@BR)  MOVE MAX SEGMENTS TO TABLE (J)
0F21 C0 87 1461          2661      B          DLPRNT          CRT INTERFACE ROUTINE
0F25 0FBA                0F26 2662      DC          AL2(KLIOPT)          DLPRNT PARAMETER LIST
                        0F27 2663 KLI150 EQU      *
0F27 38 00 03D3          2664      TBN      $CRTIN,*-*          MODE CHANGE
0F2B C0 10 0EA4          2665      BT          KLI106          NO CHANGE CONTINUE OUTPUT
0F2F 38 08 03D3          2666      TBN      $CRTIN,$CRTSP          ROLL-STOP ?
0F33 C0 10 0EA4          2667      BT          KLI106          YES --- CONTINUE
0F37 78 02 DE            2668      TBN      KLIMOD(,@BR),$CRTDN          MODE EQUAL ROLL-DOWN ?
0F3A D0 10 A6            2669      BT          KLI182(,@BR)          YES GO DECREMENT J
0F3D 5E 01 F2 F7          2670      ALC      KLIXRJ(@CADDR,@BR),KLIPL5(,@BR)  J = J + 1;
0F41 5D 01 F2 EA          2671      CLC      KLIXRJ(@CADDR,@BR),KLIMXJ(,@BR)  J > MAX ?
0F45 F2 04 04            2672      JNH      KLI160          NO ---
0F48 5F 01 F2 F2          2673      SLC      KLIXRJ(@CADDR,@BR),KLIXRJ(,@BR)  0 --> J
0F4C 5C 01 D9 EE          2674 KLI160 MVC      KLIINC(@CADDR,@BR),KLIMN1(,@BR)  SET INCREMENT TO -1
                        2675 *
0F50 75 02 F2            2676 KLI170 L          KLIXRJ(,@BR),@XR          PICK UP INDEX J
0F53 76 02 F0            2677      A          KLCLST(,@BR),@XR          COMPUTE DISPLACEMENT
0F56 6C 01 E0 02          2678      MVC      KLICLN(@CADDR,@BR),KLISTL(,@XR)  TABLE(J) --> CURR. LINE
0F5A 6C 00 E2 04          2679      MVC      KLIMLS(,@BR),KLISTS(,@XR)  TABLE(J) --> MAX SEGMENTS
0F5E 7C 01 E3            2680      MVI      KLICHG(,@BR),KLIMON          TURN ON MODE CHANGE
0F61 4C 00 DE 03D3        2681      MVC      KLIMOD(,@BR),$CRTIN          SET NEW MODE
0F66 6C 00 A0 03          2682      MVC      KLI180+@Q(1,@BR),KLISTO(,@XR)  SAVE LINES OUTPUT FIELD
0F6A 7B 04 DE            2683      SBF      KLIMOD(,@BR),$CRTPU          SET OFF POP BIT
0F6D 6D 00 DE 00          2684      CLC      KLIMOD(,@BR),KLISTM(,@XR)  OLD MODE : NEW MODE ?
0F71 F2 01 6C            2685      JNE      KLI190          REVERSE FIELDS
0F74 6D 00 A0 04          2686 KLI175 CLC      KLI180+@Q(1,@BR),KLISTS(,@XR)  ALL SEGMENTS OUTPUT ?
0F78 F2 02 04            2687      JNL      KLI180          NO --- CONTINUE
0F7B C0 87 1079          2688      B          KLI500          LINE RETRIEVAL ROUTINE
0F7F 7C 00 E1            2689 KLI180 MVI      KLICLO(,@BR),*-*          MOVE FIELD TO LCB
0F82 C0 87 0EAB          2690      B          KLI110          BACK TO MAINLINE

0F86 5F 01 F2 F7          2692 KLI182 SLC      KLIXRJ(@CADDR,@BR),KLIPL5(,@BR)  J = J - 1;
0F8A F2 02 04            2693      JNM      KLI183          J < 0 ? --- NO
0F8D 5C 01 F2 EA          2694      MVC      KLIXRJ(@CADDR,@BR),KLIMXJ(,@BR)  YES ---
0F91 5C 01 D9 EC          2695 KLI183 MVC      KLIINC(@CADDR,@BR),KLIPL1(,@BR)  SET INCREMENT TO +1
0F95 D0 87 70            2696      B          KLI170(,@BR)
0F98 5F 01 F2 F7          2697 KLI185 SLC      KLIXRJ(@CADDR,@BR),KLIPL5(,@BR)  J = J - 1;
0F9C D0 02 C3            2698      BNM      KLI186(,@BR)          CONIINLE
0F9F 5C 01 F2 EA          2699      MVC      KLIXRJ(@CADDR,@BR),KLIMXJ(,@BR)  J = 13;
0FA3 5C 00 F5 E2          2700 KLI186 MVC      KLIYWK(1,@BR),KLIMLS(,@BR)  COMPUTE
0FA7 5F 00 F5 E1          2701      SLC      KLIYWK(1,@BR),KLICLO(,@BR)  DISPLACEMENT
0FAB 5F 00 F5 EC          2702      SLC      KLIYWK(1,@BR),KLIPL1(,@BR)  BUMP
0FAF 7C 4F DA            2703      MVI      KLIOPT(,@BR),@RLDWN          SET ROLL-DOWN INDICATOR
0FB2 D0 87 04            2704      B          KLI136(,@BR)          RETURN

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#KLIST -- MAINLINE LIST ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 17
					2706	*****				
					2707	****	L I S T C O N T R O L B L O C K			****
					2708	*****				
				0FB5	2709	KLILCB EQU *	L I S T C O N T R O L			
	0FB5			0FB5	2710	KLITYP DS CL1	FILE CONDITION CODE			
	0FB6			0FB7	2711	KLIBLN DS CL2	STARTING LINE NUMBER			
	0FB6				2712	ORG *-2	RESET LOCATION COUNTER			
	0FB6	0000		0FB7	2713	DC IL(@CADDR)'0'	SET TO MINIMUM LINENO			
	0FB8			0FB9	2714	KLIINC DS CL2	LINE INCREMENT VALUE			
	0FB8				2715	ORG KLIINC-1	RESET LOCATION COUNTER			
	0FB8	0001		0FB9	2716	DC IL2'1'	SET INTIAL VALUE			
	0FBA			0FBA	2717	KLIOPT DS CL1	PPL CONTROL CHARACTER			
	0FBA				2718	ORG *-1	RESET LOCATION COUNTER			
	0FBA	C0		0FBA	2719	DC XL1'C0'	ROLL-UP INDICATOR			
					2720	*	* 4F -- ROLL-DOWN			
					2721	*	* C0 -- ROLL-UP OR PRINT			
	0FBB			0FBB	2722	KLIFLL DS CL1	LENGTH OF CURRENT LINE			
	0FBC			0FBD	2723	KLIBUF DS CL2	BUFFER ADDRESS			
	0FBE			0FBE	2724	KLIMOD DS CL1	CRT MODE			
	0FBE				2725	ORG *-1	RESET			
	0FBE	05		0FBE	2726	DC IL1'05'	SET TO LP			
	0FBF			0FC0	2727	KLICLN DS CL2	CURRENT LINE NUMBER			
	0FC1			0FC1	2728	KLICLO DS CL1	CRT LINES OUTPUT			
	0FC2			0FC2	2729	KLIMLS DS CL1	MAXIMUM CRT LINE SEGMENTS			
	0FC3			0FC3	2730	KLICHG DS CL1	MODE CHANGE INDICATOR			
	0FC3				2731	ORG *-1	RESET LOCATION COUNTER			
	0FC3	01		0FC3	2732	DC IL1'01'	SET MODE CHANGE ON			
	0FC4			0FC5	2733	KLIFLF DS CL2	FIRST LINE NUMBER IN WORK FILE			
	0FC6			0FC6	2734	KLIICI DS CL1	INTIAL CALL INDICATOR			
	0FC7			0FC8	2735	KLISLN DS CL2	STOP LINE NUMBER			
	0FC7				2736	ORG *-2	RESET LOCATION COUNTER			
	0FC7	270F		0FC8	2737	DC IL(@CADDR)'9999'	SET TO MAXIMUM LINENO			
					2738	*				
					2739	*****				
					2740	*	C O N S T A N T S A N D W O R K A R E A S			
					2741	*****				
					2742	*				
	0FC9	0041		0FCA	2743	KLIMXJ DC IL2'65'	MAXIMUM INDEX VALUE FOR J			
	0FCB	0001		0FCC	2744	KLIPL1 DC IL2'+1'	CONSTANT PLUS ONE			
	0FCD	FFFF		0FCE	2745	KLIMN1 DC IL2'-1'	MINUS ONE			
	0FCF	0D7F		0FD0	2746	KLCLST DC AL2(KLITAB)	ADDRESS OR CRT TAKE			
	0FD1			0FD2	2747	KLIXRJ DS CL2	INDEX J			
	0FD3	0040		0FD4	2748	KLIC64 DC IL2'64'	CONSTANT 64			
	0FD5			0FD5	2749	KLIYWK DS CL1	WORK AREA			
	0FD6	0005		0FD7	2750	KLIPL5 DC IL2'+5'	INCREMENT FOR J			
	0FD8	FFFB		0FD9	2751	KLIMN5 DC IL2'-5'	INTIAL SETTINS			
	0FDA			0FDB	2752	KLIMAG DS CL2	NUM --- NONUM PARAMETER			
	0FDA				2753	ORG KLIMAG-1	RESET LOCATION COUNTER			
	0FDA	0000		0FDB	2754	DC IL2'0'	SET INITIAL VALUE			
	0FDC			0FDC	2755	KLICTR DS CL1	MULTIPLY COUNTER			
	0FDC				2756	ORG *-1	RESET LOCATION COUNTER			
	0FDC	0E		0FDC	2757	DC IL1'14'	TABLE ROW COUNT			
	0FDD			0FDD	2758	KLINDC DS CL1	CARD READER INDICATOR			
	0FDD				2759	ORG KLINDC	RESET LOCATION COUNTER			
	0FDD	00		0FDD	2760	DC IL1'0'	INITIALIZE			
	0FDE			0FDF	2761	KLIICT DS XL2	INTIT 14 LINE COUNTER			

#KLIST -- MAINLINE LIST ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 18
0FE0	AF	00	04	03	2763	KLI190	SLC	KLISTS(,@XR),KLISTO(,@XR)	CLO = MAX -CLO	
0FE4	6C	00	A0	04	2764		MVC	KLI180+@Q(1,@BR),KLISTS(,@XR)		
0FE8	5E	00	A0	EC	2765		ALC	KLI180+@Q(1,@BR),KLIPL1(,@BR)	CLO = CLO 0 1	
0FEC	9C	00	04	E2	2766		MVC	KLISTS(,@XR),KLIMLS(,@BR)	RESTORE VECTOR ENTRY	
0FF0	D0	87	94		2767		B	KLI175(,@BR)	BACK TO MAINLINE	
					0FF3	2769	KLI210	EQU	*	
0FF3	38	02	0D	57	2770		TBN	KLIDVT,KLICDO	CARD OUTPUT	
0FF7	F2	90	40		2771		JF	KLI220	NO ---	
0FFA	5E	01	DD	FB	2772		ALC	KLIBUF(@CADDR,@BR),KLIMAG(,@BR)	INCREMENT FOR NUM-NONUM	
0FFE	38	80	03	DD	2773		TBN	\$CONFIG,\$BIGCD	IS 129 CONFIGURED ?	1-4
1002	F2	90	06		2774		JF	KLI21A	JUMP IF NOT	1-4
1005	7D	50	DB		2775		CLI	KLIFLL(,@BR),KLICBW	LENGTH GREATER THAN 80 ?	1-4
1008	F2	87	03		2776		J	KLI21B	CONTINUE	1-4
					2777	*				1-4
100B	7D	60	DB		2778	KLI21A	CLI	KLIFLL(,@BR),KLICWD	LENGTH GREATER THAN 96 ?	1-4
100E	F2	04	03		2779	KLI21B	JNH	KLI212	NO --- CONTINUE	1-4
1011	7A	02	FD		2780		SBN	KLINDC(,@BR),KLONGL	SET LONG LINE INDICATOR	
1014	75	02	DD		2781	KLI212	L	KLIBUF(,@BR),@XR	PICK-UP BUFFER ADDRESS	
1017	BD	5C	00		2782		CLI	0(,@XR),C' '*	LINE DISABLED ?	
101A	F2	01	07		2783		JNE	KLI214	NO	
101D	7A	01	FD		2784		SBN	KLINDC(,@BR),KLIASK	SET DISABILITY INDICATOR	
1020	5E	01	DD	EC	2785		ALC	KLIBUF(,@BR),KLIPL1(,@BR)	BUMP OUTPUT AREA ADDRESS	
					1024	2786	KLI214	EQU	*	
1024	C0	87	09	20	2787		B	DCDOUT	CARD IOCS	
1028	0FBA				1029	2788	DC	AL2(KLIOPT)	PPL FOR CARD IOCS	
102A	C0	87	09	20	2789		B	DCDOUT	CARD IOCS	
102E	057F				102F	2790	DC	AL2(\$WAITF)	WAIT FUNCTION CODE	
1030	74	02	DD		2791		ST	KLIBUF(,@BR),@XR	REINSTATE BUFFER ADDRESS	
1033	38	01	0D	57	2792		TBN	KLIDVT,KLIPRT	PRINTER	
1037	F2	90	06		2793		JF	KLI230	GO BUMP LINENO	
103A	C0	87	14	61	2794	KLI220	B	DLPRNT	PRINT LINE	
103E	0FBA				103F	2795	DC	AL2(KLIOPT)	DLPRNT PARAMETER LIST	
1040	5E	01	E0	D9	2796	KLI230	ALC	KLICLN(@CADDR,@BR),KLIINC(,@BR)	BUMP CURRENT LINE NUMBER	
1044	C0	87	0E	91	2797		B	KLI105	RETRIEVE NEXT LINE	
1048	7C	02	D5		2798	KLI245	MVI	KLITYP(,@BR),KLIBOF	BEGINNING OF FILE	
104B	3A	08	03	D3	2799	KLI250	SBN	\$CRTIN,\$CRTSP	SET STOP WITH	
104F	38	08	03	D3	2800	KLI260	TBN	\$CRTIN,\$CRTSP	CHECK MODE	
1053	C0	10	10	4F	2801		BT	KLI260	LOOP ON INDICATOR	
1057	3C	40	15	78	2802		MVI	DCRCNT,KLICRL	SET COUNT	1-4
105B	38	04	03	D3	2803		TBN	\$CRTIN,\$CRTPU	POPUF MODE	
105F	D0	90	47		2804		BF	KLI150(,@BR)	NO --- CONTINUE	
1062	3C	01	15	78	2805		MVI	DCRCNT,@B1	SET COUNTER TO INITIAL VALUE	
1066	3B	04	03	D3	2806		SBF	\$CRTIN,\$CRTPU	TURN OFF POP INDICATOR	
106A	D0	87	47		2807		B	KLI150(,@BR)	CHECK FOR MODE CHANGE	
					2808	*				
					106D	2809	KLI380	EQU	*	PROGRAM GENERATED FILE
106D	C0	87	19	CA	2810	KLI387	B	SDLPGM	CONVERT AND OUTPUT FILE	
1071	C2	01	00	00	2811	KLI399	LA	*-*,@BR	RESTORE BASE REGISTER	
					1075	2812	KLI400	EQU	*	RESTORE AND RETURN
1075	C0	87	00	00	2813		B	*-*	RETURN TO EXECUTIVE	

#KLIST -- MAINLINE LIST ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 19
				109A	2815		USING KLI505,@BR			INFORM ASSEMBLER
				1079	2816	KLI500	EQU *			LINE RETRIEVAL SUBROUTINE
	1079	C2	02	0FB5	2817		LA KLILCB,@XR			
				0FB5	2818		USING KLILCB,@XR			
	107D	34	01	116F	2819		ST KLI540+@OP1,@BR			SAVE BASE REGISTER
	1081	C2	01	109A	2820		LA KLI505,@BR			SET UP BASE REG
	1085	74	08	E0	2821		ST KLI541+@OP1(,@BR),@ARR			SAVE RETURN REGISTER
	1088	9D	01	0B F4	2822		CLC KLICLN(,@XR),KLIEOF(,@BR)			PAST END OF FILE ?
	108C	D0	84	E1	2823		BH KLI560(,@BR)			YES --- EXIT
	108F	B8	01	0E	2824		TBN KLICHG(,@XR),KLIMON			MODE CHANGE ON ?
	1092	D0	90	37	2825		BF KLI510(,@BR)			NO --- CONTINUE
	1095	2C	01	1A64 0B	2826		MVC GFILNO(@CADDR),KLICLN(,@XR)			SET-UP CURRENT LINE
				109A	2827	KLI505	EQU *			
	109A	C0	87	19FD	2828		B GFINDN			RETRIEVE LINE
	109E	38	01	0FBE	2829		TBN KLIMOD,\$CRTUP			MODE ROLL UP
	10A2	D0	10	37	2830		BT KLI510(,@BR)			YES SO CHECK RANGE
	10A5	0D	01	0FC0 0FC5	2831		CLC KLICLN,KLIFLF			BEGINNING OF FILE ?
	10AB	3C	02	0FB5	2832		MVI KLITYP,KLIBOF			SET V BOF INDICATOR
	10AF	D0	82	D2	2833		BL KLI540(,@BR)			BEGINNING OF FILE
	10B2	8D	01	00 1A64	2834		CLC @ZERO(@CADDR,@XR),GFILNO			DOES BLOCK CONTAIN RECORD ?
	10B7	D0	04	45	2835		BNH KLI515(,@BR)			RETURN TO MAINLINE
	10BA	C2	02	1D04	2836		LA GFINTY-4,@XR			SET UP F I T ADDRESS
	10BE	E2	02	04	2837	KLI504	LA KLIFOR(,@XR),@XR			BUMP TO ENTRY (1)
	10C1	8D	01	06 1A64	2838		CLC KLISIX(@CADDR,@XR),GFILNO			CHECK REQUESTED LINE ?
	10C6	D0	82	24	2839		BL KLI504(,@BR)			CONTINUE SEARCH
	10C9	2C	01	1A64 02	2840		MVC GFILNO(@CADDR),KLITNO(,@XR)			POP LAST BLOCK NUMBER
	10CE	D0	87	00	2841		B KLI505(,@BR)			RETURN
				10D1	2842	KLI510	EQU *			
	10D1	C2	02	0FB5	2843		LA KLILCB,@XR			RESET CONSTANT BASE
	10D5	BC	00	0E	2844		MVI KLICHG(,@XR),KLIMOF			SET MODE CHANGE OFF
	10D8	AD	01	0B 13	2845		CLC KLICLN(@CADDR,@XR),KLISLN(,@XR)			CURRENT : STOP ?
	10DC	D0	84	E8	2846		BH KLI570(,@BR)			CURRENT EXIT
				10DF	2847	KLI515	EQU *			
	10DF	3C	40	0CFB	2848		MVI KLISHF,@BLANK			SET INTIAL BLANK
	10E3	0C	F3	0CFA 0CFB	2849		MVC GRTEXT+KLITXE(KLI244),KLISHF			SET FIELD TO BLANKS
	10E9	C0	87	127F	2850		B GRABIT			LINE RETRIEVAL ROUTINE
	10ED	1D	01	1190 F4	2851		CLC GRLINE(@CADDR),KLIEOF(,@BR)			END OF FILE ?
	10F2	D0	81	E1	2852		BE KLI560(,@BR)			YES ---
	10F5	8D	01	00 0FC0	2853		CLC @ZERO(@CADDR,@XR),KLICLN			CURRENT : NEXT FILE LINENO ?
	10FA	C2	02	0FB5	2854		LA KLILCB,@XR			RESET CONSTANT BASE
	10FE	D0	04	45	2855		BNH KLI515(,@BR)			SET NEXT LINE
	1101	B8	02	09	2856		TBN KLIMOD(,@XR),\$CRTDN			ROLL-DOWN ?
	1104	D0	10	74	2857		BT KLI516(,@BR)			YES --- CONTINUE
	1107	6D	01	F6 0B	2858		CLC GRLINE(@CADDR,@BR),KLICLN(,@XR)			LINE LISTED ?
	110B	D0	82	45	2859		BL KLI515(,@BR)			YES --- RETRIEVE NEXT LINE
				110E	2860	KLI516	EQU *			
	110E	9C	01	0B F6	2861		MVC KLICLN(@CADDR,@XR),GRLINE(,@BR)			POP FILE TO CURRENT
	1112	4C	01	EF 13B5	2862		MVC KLIWRK(@CADDR,@BR),GRTEND			PICK UP END ADDRESS
	1117	5F	01	EF F2	2863		SLC KLIWRK(@CADDR,@BR),KLIBF@(,@BR)			COMPUTE LINE LENGTH
	111B	38	01	03D4	2864		TBN \$INDR1,\$PROCI			PROCEDURE ?
	111F	F2	10	07	2865		JT KLI503			YES --- CONTINUE
	1122	38	40	03D4	2866		TBN \$INDR1,\$KEYDT			KEYBOARD DATA FILE ?
	1126	D0	10	F7	2867		BT KLI580(,@BR)			YES --- GO CONVERT
	1129	78	80	F0	2868	KLI503	TBN GRTYPE(,@BR),KLIDIS			LINE DISABLED ?
	112C	D0	90	A8	2869		BF KLI517(,@BR)			LINE NOT DISABLED
	112F	0C	F3	0CFB 0CFA	2870		MVC KLISHF(KLI244),GRTEXT+KLITXE			SHIFT LINE ONE BYTE

1-4

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#KLIST -- MAINLINE LIST ROUTINE

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1135	3C 5C 0C07		2871	MVI	GRTEXT,@ASTER	INDICATE DISABILITY
1139	6E 01 EF 17		2872	ALC	KLIWRK(@CADDR,@BR),KLIPL1(@XR)	BUMP LINE LENGTH
113D	2E 01 13B5 17		2873	ALC	GRTEND(@CADDR),KLIPL1(@XR)	NEW EOS ADDRESS
		1142	2874	KLI517 EQU	*	
1142	9C 00 06 EF		2875	MVC	KLIFLL(1,@XR),KLIWRK(@BR)	MOVE LINE LENGTH TO LCB
1146	9C 01 08 F2		2876	MVC	KLIBUF(@CADDR,@XR),KLIFB(@BR)	SET BUFFER ADDRESS IN LCB
114A	38 08 0D57		2877	KLI520 TBN	KLIDVT,KLICRT	DEVICE EQUAL CRT ?
114E	BC 00 00		2878	MVI	KLITYP(@XR),@ZERO	GO CONDITION
1151	D0 90 D2		2879	BF	KLI540(@BR)	NO --- SKIP CRT SET-UP
1154	BC 40 06		2880	MVI	KLIFLL(@XR),KLICRL	SET CRT LENGTH
1157	BC 00 0C		2881	MVI	KLICLO(@XR),@ZERO	INITIALIZE LCB FIELD
115A	BC 00 0D		2882	MVI	KLIMLS(@XR),@ZERO	INITIALIZE LCB FIELD
115D	8E 00 0D 0FCC		2883	KLI530 ALC	KLIMLS(1,@XR),KLIPL1	COMPUTE QUOTIENT
1162	6F 01 EF 1F		2884	SLC	KLIWRK(@CADDR,@BR),KLIC64(@XR)	DIVIDE LENGTH / 64
1166	D0 04 D2		2885	BNP	KLI540(@BR)	FINISHED ?
1169	D0 87 C3		2886	B	KLI530(@BR)	NO ---
116C	C2 01 0000		2888	KLI540 LA	*-*,@BR	RESTORE BASE REG
1170	35 02 13B5		2889	L	GRTEND,@XR	PICK UP ADDRESS OF EOS
1174	BC 40 00		2890	MVI	@ZERO(@XR),@BLANK	SET IT TO BLANK
1177	C0 87 0000		2891	KLI541 B	*-*	RETURN
117B	3C 03 0FB5		2893	KLI560 MVI	KLITYP,KLIEFI	SET END OF FILE INDICATOR
117F	D0 87 D2		2894	B	KLI540(@BR)	RETURN
1182	BC 01 00		2895	KLI570 MVI	KLITYP(@XR),KLILLE	LINE LIST EXHAUSTED
1185	D0 87 D2		2896	B	KLI540(@BR)	RETURN
1188		1189	2898	KLIWRK DS	CL2	WORK AREA
118A		118A	2899	GRTYPE DS	CL1	LINE TYPE CODE
118B	0C07	118C	2900	KLIFB@ DC	AL2(GRTEXT)	ADDRESS OF LINE
118D	2710	118E	2901	KLIEOF DC	XL2'2710'	EOF INDICATOR
118F		1190	2902	GRLINE DS	CL2	CURRENT LINE NUMBER
			2903	*		
		1191	2904	KLI580 EQU	*	HANDELING OF KEYBOARD DATA FILE
1191	C0 87 1657		2905	B	SDLIST	CONVERT DATA FILE
1195	4C 01 F2 18AD		2906	MVC	KLIFB(@CADDR,@BR),SDLOT@	RESET BUFFER ADDRESS(DATA)
119A	4C 01 EF 18A3		2907	MVC	KLIWRK(@BR),SDLSAV	PICK UP ENDING ADDRESS
119F	4F 01 EF 18AD		2908	SLC	KLIWRK(@BR),SDLOT@	ADDRESS OF BEGINNING OF DATA
11A4	8C 01 08 18AD		2909	MVC	KLIBUF(@XR),SDLOT@	SETUP BUFFER ADDRESS IN LCB
11A9	78 80 F0		2910	TBN	GRTYPE(@BR),KLIDIS	LINE DISABLED
11AC	F2 90 0E		2911	JF	KLI581	NO --- CONTINUE
11AF	0C F3 06FB 06FA		2912	MVC	SDLBUF+KLI244(KLI244),SDLBUF+KLITXE	SHIFT RIGHT 1 BYTE
11B5	3C 5C 0607		2913	MVI	SDLBUF,@ASTER	INDICATE DISABILITY
11B9	6E 01 EF 17		2914	ALC	KLIWRK(@CADDR,@BR),KLIPL1(@XR)	BUMP LINE LENGTH
		11BD	2915	KLI581 EQU	*	VARIABLE LABEL
11BD	9C 00 06 EF		2916	MVC	KLIFLL(@XR),KLIWRK(@BR)	MOVE LINE LENGTH TO LCB
			2917	*		
11C1	D0 87 B0		2918	B	KLI520(@BR)	RETURN TO MAINLINE PROCESSING

#KLIST -- MAINLINE LIST ROUTINE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 21
		2920		*****		
		2921	*		EQUATES	
		2922		*****		
	0000	2923	KLISTM	EQU	0	DISPLACEMENT MODE (J)
	0002	2924	KLISTL	EQU	2	DISPLACEMENT OF LINE (J)
	0006	2925	KLISIX	EQU	6	LENTGH OF ERROR STACK ENTRY
	0003	2926	KLISTO	EQU	3	DISPLACEMENT OF LINES OUTPUT (J)
	0004	2927	KLISTS	EQU	4	DISPLACEMENT OF MAX LINE (J)
	0001	2928	KLIASK	EQU	01	INDICATOR FOR DISABLED LINES
	0002	2929	KLONGL	EQU	02	INDICATOR FOR TRUNCATED LINES
	000E	2930	KLI14	EQU	14	CRT VECTOR ROW COUNT
	0080	2931	KLISYS	EQU	X'80'	SYSTEM PRINTER
	0004	2932	KLIKEY	EQU	4	LENGTH OF KEYWORD CARD
	00F4	2933	KLI244	EQU	244	LENGTH OF LINE BUFFER
	00F3	2934	KLITXE	EQU	243	MAXIMUM MOVE LENGTH
	0080	2935	KLIDIS	EQU	X'80'	ENABLED LINE INDICATOR
	0040	2936	KLICRL	EQU	64	CRT PHYSICAL LINE LENGTH
	0002	2937	KLITNO	EQU	2	DISPLACEMENT OF DASH IN LIST
	0004	2938	KLIFOR	EQU	4	NEXT LINE LIST
	0002	2939	KLIBOF	EQU	2	BEGINNING OF FILE INDICATOR
	0003	2940	KLIEFI	EQU	3	END OF FILE CODE
	0001	2941	KLILLE	EQU	1	LINE LIST EXHAUSTED
	0005	2942	KLITLG	EQU	5	TABLE LENGTH
	00C0	2943	KLIPPP	EQU	X'C0'	PRINT CONTROL CHARACTER
	0000	2944	KLIMOF	EQU	0	MODE CHANGE OFF
	0001	2945	KLI2BF	EQU	1	DOUBLE BUFFER OPTION
	0001	2946	KLINIT	EQU	1	INTIAL CALL INDICATOR
	0001	2947	KLIMON	EQU	1	MODE CHANGE ON
	0008	2948	KLICRT	EQU	8	CRT BIT FOR DEVICE SPEC
	0001	2949	KLIPRT	EQU	1	PRINTER
	0004	2950	KLIBMP	EQU	4	INCREMENT FOR @XR
	0002	2951	KLICDO	EQU	2	CARD OPTION
	0060	2952	KLICWD	EQU	@CARDL	LOGICAL WIDTH FOR CARD OUTPUT
	0050	2953	KLIBCW	EQU	80	LOG WIDTH FOR LARGE CARD OUT 1-4
	0003	2954	KLITHR	EQU	3	
		2955	*			
	0D7F	2956	KLITAB	EQU	KLI070	
	0C07	2957	GRTEXT	EQU	KLISTN	
	0CFB	2958	KLISHF	EQU	GRTEXT+244	END OF INPUT LINE BUFFER
	1C00	2959	GFIBF2	EQU	\$\$FITS-@SCTS	SECOND BUFFER ADDR
	1B00	2960	GFIBF1	EQU	GFIBF2-@SCTS	FIRST BUFFER ADDR
	0EA4	2961	DLIBUF	EQU	KLI106	LINE PRINTER BUFFER
	0607	2962	SDLBUF	EQU	\$\$INLN	

[illegible]

DL4ICS - FOUR TRACK LOGICAL IOCR

ERR LOC	OBJECT CODE	ADDR STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 23
2980+			*****			*
2981+	*	5703-XM1	COPYRIGHT IBM CORP. 1970			*
2982+	*		REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083			*
2983+	*					*
2984+			*****			*
2985+	*	STATUS				*
2986+	*	VERSION 1	MODIFICATION 0			*
2987+	*					*
2988+	*	FUNCTION				*
2989+	*		* DL4ICS WILL CONVERT A RELATIVE DISK ADDRESS TO A PHYSICAL			*
2990+	*		DISK ADDRESS AND CALL \$DISKN TO PERFORM THE SPECIFIED FUNCTION			*
2991+	*		* THE DISK ADDRESS IS A ONE BYTE CYLINDER ADDRESS AND A ONE BYTE			*
2992+	*		SECTOR DISPLACEMENT RELATIVE TO SECTOR 0 ON A CYLINDER			*
2993+	*		BOUNDARY			*
2994+	*		* WHEN MORE THAN 1 SECTOR IS PROCESSED, DL4ICS WILL MAKE MULTIPLE			*
2995+	*		CALLS TO \$DISKN TO CROSS CYLINDER BOUNDARIES IF REQUIRED.			*
2996+	*		* IF 1 SECTOR ONLY IS TO BE PROCESSED, THE USER MAY OVERLAY THE			*
2997+	*		UNUSED CODE BY ORGING HIS NEXT MODULE AT DL4SPT			*
2998+	*					*
2999+	*	ENTRY POINTS				*
3000+	*	DL4ICS -	ENTRY TO PROCESS A 4 SURFACE FILE. THE CALLING			*
3001+	*		SEQUENCE IS AS FOLLOWS			*
3002+	*		DSKL4 DPL			*
3003+	*		WHERE DPL IS THE LABEL OF A SIX BYTE DISK PARAMETER			*
3004+	*		LIST AS DESCRIBED FOR \$DJSKN EXCEPT FOR THE SECTOR			*
3005+	*		ADDRESS BYTE.			*
3006+	*					*
3007+	*	INPUT				*
3008+	*		* INPUT TO DL4ICS IS THE ADDRESS OF THE DPL TO BE PROCESSED.			*
3009+	*					*
3010+	*	OUTPUT				*
3011+	*		* N/A			*
3012+	*					*
3013+	*	EXTERNAL REFENECES				*
3014+	*		\$DISKN - ENTRY TO SYSTEM DISK ROUTINE			*
3015+	*					*
3016+	*	EXITS, NORMAL				*
3017+	*		* NORMAL RETURN IS TO THE 1ST INSTRUCTION FOLLOWING THE TWO BYTE			*
3018+	*		ADDRESS POINTING TO THE DPL.			*
3019+	*					*
3020+	*	EXITS, ERROR				*
3021+	*		* N/A			*
3022+	*					*
3023+	*	TABLES/WORK AREAS				*
3024+	*		* N/A			*
3025+	*					*
3026+	*	ATTRIBUTES				*
3027+	*		* RELOCATABLE			*
3028+	*		* REUSABLE			*
3029+	*					*
3030+	*	CHARACTER CODE DEPENDENCY				*
3031+	*		* THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR			*
3032+	*		INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.			*
3033+	*					*
3034+	*	NOTES				*
3035+	*		ERROR PROCEDURES			*

DL4ICS - FOUR TRACK LOGICAL IOCR

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 24
		3036+	*	N/A			*
		3037+	*	REGISTER USAGE			*
		3038+	*	@BR IS SAVED AND RESTORED ON EXIT, @XR IS NOT USED. @ARR IS			*
		3039+	*	USED TO PROVIDE THE ADDRESS OF THE PARAMETER. THE @ARR IS			*
		3040+	*	INCREMENTED BT TWO AND SAVED AS THE RETURN ADDRESS.			*
		3041+	*	SAVED/RESTORED AREAS			*
		3042+	*	N/A			*
		3043+	*	MODIFICATION CONSIDERATIONS			*
		3044+	*	N/A			*
		3045+	*	REQUIRED MODULES			*
		3046+	*	@SYSEQ - SYSTEM SOFTWARE EQUATES			*
		3047+	*	@FXDEQ - SYSTEM NUCLEUS EQUATES			*
		3048+	*	OTHER			*
		3049+	*	N/A			*
		3050+	*	*****			*

DL4ICS - FOUR TRACK LOGICAL IOCR

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 25
				1200	3052+	DL4ICS	EQU *	ENTRY TO DL4ICS
				1204	3053+		USING DL4010,@BR	ESTABLISH BASE REGISTER USAGE
1200	34	01	1270		3054+		ST DL4900+@OP1,@BR	SAVE BASE REGISTER FOR EXIT
				1204	3055+	DL4010	EQU *	BASE ADDRESSABILITY
1204	C2	01	1204		3056+		LA DL4010,@BR	ESTABLISH BASE
1208	76	08	78		3057+		A DL4C01(,@BR),@ARR	BUMP TO HIGH END OF ADDR
120B	74	08	14		3058+		ST DL4020+@DOP2(,@BR),@ARR	SET UP MOVE INSTRUCTION
120E	76	08	78		3059+		A DL4C01(,@BR),@ARR	BUMP TO RETURN ADDR
1211	74	08	70		3060+		ST DL4920+@OP1(,@BR),@ARR	SAVE RETURN ADDR
					3061+*			
1214	4C	01	1D 0000		3062+	DL4020	MVC DL4030+@DOP2(@DADDR,@BR),*-*	MOVE DPL ADDR INTO MOVE
1219	5E	01	1D 7A		3063+		ALC DL4030+@DOP2(@CADDR,@BR),DL4C05(,@BR)	BUMP TO RIGHT END
121D	4C	05	76 0000		3064+	DL4030	MVC DL4DPL(@DPLNG,@BR),*-*	MOVE USER DPL TO WORK AREA
					3065+*			
1222	7C	00	5E		3066+	DL4035	MVI DL4100+@Q(,@BR),@ZERO	CLEAR TRACK, DISK SET INST
1225	7C	80	67		3067+		MVI DL4200+@Q(,@BR),@NOP	TURN OFF TWICE INDICATOR
					3068+*			
1228	7D	60	73		3069+	DL4040	CLI DL4SCD(,@BR),DL4E96	TEST IF DISPLACEMENT OVER 95 ?
122B	F2	82	0B		3070+		JL DL4050	JUMP IF NOT OVER 95
122E	5E	00	72 78		3071+		ALC DL4CYL(1,@BR),DL4C01(,@BR)	INCREMENT CYLINDER COUNT
1232	5F	00	73 25		3072+		SLC DL4SCD(1,@BR),DL4C96(,@BR)	DECREMENT DISP BY 96
1236	D0	87	24		3073+		B DL4040(,@BR)	GO BACK CHECK FOR NEXT CYLINDER
					3074+*			
1239	7D	30	73		3075+	DL4050	CLI DL4SCD(,@BR),DL4E48	TEST IF DISP ON NEXT DISK ?
123C	F2	82	07		3076+		JL DL4060	JUMP IF NOT OVER 48
123F	7A	01	5E		3077+		SBN DL4100+@Q(,@BR),DL4EFD	TURN ON BIT FOR FIXED DISK
1242	5F	00	73 36		3078+		SLC DL4SCD(1,@BR),DL4C48(,@BR)	DECREMENT DISP 1 DISK
1246	7D	01	74		3079+	DL4060	CLI DL4SCT(,@BR),DL4E01	IS SECTOR COUNT GREATER THEN 1 ?
1249	F2	84	33		3080+		JH DL4SPT	GO TO SPLIT CALL
124C	7D	18	73		3081+	DL4070	CLI DL4SCD(,@BR),DL4E24	DISPLACEMENT OVER 23 ?
124F	F2	82	07		3082+		JL DL4080	JUMP NOT OVER 24
1252	7A	80	5E		3083+		SBN DL4100+@Q(,@BR),DL4ETB	SET TRACK BIT ON
1255	5F	00	73 49		3084+		SLC DL4SCD(1,@BR),DL4C24(,@BR)	DECR DISP TO NEXT TRACK
1259	5E	00	73 73		3085+	DL4080	ALC DL4SCD(1,@BR),DL4SCD(,@BR)	SHIFT LEFT 1 PLACE
125D	5E	00	73 73		3086+		ALC DL4SCD(1,@BR),DL4SCD(,@BR)	SHIFT LEFT 1 PLACE
1261	7A	00	73		3087+	DL4100	SBN DL4SCD(,@BR),*-*	SET TRACK, DISK BIT
					3088+*			
1264	C0	87	0025		3089+		B \$DISKN	GO PERFORM DISK I/O
1268	1275			1269	3090+		DC AL2(DL4LST)	ADDR OF DISK PARAM LIST
					3091+*			
126A	F2	00	3C		3092+	DL4200	JC DL4600,*-*	BRANCH OR NOP IF TWICE SET
					3093+*			
126D	C2	01	0000		3094+	DL4900	LA *-* ,@BR	RESTORE OLD BASE TO RETURN
1271	C0	87	0000		3095+	DL4920	B *-*	RETURN TO CALLER
					3096+*			
				1275	3097+	DL4LST	EQU *	LEFT END OF DPL
				127A	3098+	DL4DPL	DS CL(@DPLNG)	DPL SAVE AREA
				1276	3099+	DL4CYL	EQU DL4LST+@DCYL	CYLINDER COUNT BYTE
				1277	3100+	DL4SCD	EQU DL4LST+@DSAD	DISPLACEMENT SECTOR COUNT
				0060	3101+	DL4E96	EQU 96	TWO DISK SECTOR COUNT PER CYL
				0030	3102+	DL4E48	EQU 48	ONE DISK SECTOR COUNT PER CYL
				0018	3103+	DL4E24	EQU 24	TRACK SECTOR COUNT
				0001	3104+	DL4E01	EQU 01	VALUE TO TEST SECTOR COUNT
				0001	3105+	DL4EFD	EQU 01	VALUE TO SET FIXED DISK BIT
				0080	3106+	DL4ETB	EQU X'80'	VALUE TO SET TRACK BIT
127B	0001			127C	3107+	DL4C01	DC IL2'1'	VALUE TO INCR TO CYLINDER

DL4ICS - FOUR TRACK LOGICAL IOCR

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 26
127D	0005			127E	3108+DL4C05	DC	IL2'5'			
				1229	3109+DL4C96	EQU	DL4040+@Q			DISP TO RIGHT END OF DPL
				124D	3110+DL4C24	EQU	DL4070+@Q			VALUE TO DECR DISPLACEMENT
				1278	3111+DL4SCT	EQU	DL4LST+@DCNT			VALUE OF 1 TRACK
				123A	3112+DL4C48	EQU	DL4050+@Q			POINTER TO DPL SECTOR COUNT
										VALUE TO DECR DISP BY 1 DISK
127F	5C	00	14	74	3114+DL4500	MVC	DL4WRK(1,@BR),DL4SCT(@BR)			PICKUP SECTOR COUNT
				127F	3115+DL4SPT	EQU	DL4500			POSSIBLE OVERLAY REFERENCE
1283	5E	00	14	73	3116+	ALC	DL4WRK(1,@BR),DL4SCD(@BR)			BUMP BY DISPLACEMENT
1287	7D	30	14		3117+	CLI	DL4WRK(@BR),DL4E48			TEST FOR CYLINDER OVERLAP
128A	D0	04	48		3118+	BNH	DL4070(@BR)			BRANCH BACK IF NO OVERLAY
128D	5F	00	14	36	3119+	SLC	DL4WRK(1,@BR),DL4C48(@BR)			DECREMENT WORK BY 48
1291	5F	00	74	14	3120+	SLC	DL4SCT(1,@BR),DL4WRK(@BR)			SUBTRACT WORK FROM COUNT
1295	7C	87	67		3121+	MVI	DL4200+@Q(@BR),@UCB			SET TWICE SWITCH
1298	5C	00	13	73	3122+	MVC	DL4SAV(1,@BR),DL4SCD(@BR)			SAVE SECTOR DISP IN WORK AREA
129C	78	01	5E		3123+	TBN	DL4100+@Q(@BR),DL4EFD			DISK BIT ON IN Q CODE ?
129F	D0	90	48		3124+	BF	DL4070(@BR)			BRANCH NOT ON
12A2	5E	00	13	36	3125+	ALC	DL4SAV(1,@BR),DL4C48(@BR)			BUMP TO NEXT DISK
12A6	D0	87	48		3126+	B	DL4070(@BR)			RETURN TO CALL I/O
					3127+*					
12A9	5C	00	73	13	3128+DL4600	MVC	DL4SCD(1,@BR),DL4SAV(@BR)			PICKUP NEXT HALF OF I/O
12AD	5E	00	75	74	3129+	ALC	DL4LST+@DBFR1(1,@BR),DL4SCT(@BR)			BUMP CORE ADDRESS
12B1	5E	00	73	74	3130+	ALC	DL4SCD(1,@BR),DL4SCT(@BR)			
12B5	5C	00	74	14	3131+	MVC	DL4SCT(1,@BR),DL4WRK(@BR)			MOVE IN NEW SECTOR COUNT
12B9	D0	87	1E		3132+	B	DL4035(@BR)			RETURN FOR SECOND PASS
					3133+*					
				1218	3134+DL4WRK	EQU	DL4020+@DOP2			1 BYTE WORK AREA FOR SPLIT CALL
				1217	3135+DL4SAV	EQU	DL4020+@DOP2-1			1 BYTE WORK AREA FOR SPLIT CALL
				12BC	3136+DL4END	EQU	*			DEFINE END OF CODE
					3137+***			END OF DL4ICS		***
				3138	*					
127F				3139		ORG	DL4SPT			OVERLAY END OF DL4ICS

GRABIT -- RETRIEVE FILE STATEMENTS

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 04/06/21 PAGE 27

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3141 *****
3142 *      G R A B I T
3143 *****
135D 3144      USING GRABSE,@BR
127F 3145 GRABIT EQU *          ENTRY POINT TO ROUTINE
127F 3146      ST      GRASBR,@BR    SAVE CALLING PROG'S BASE REG.
1283 C2 01 135D 3147      LA      GRABSE,@BR    LOAD LOCAL BASE TO BASE REG.
1287 34 08 1300 3148      ST      GRASAR,@ARR    SAVE RETURN ADDR.
128B 7D 00 A7   3149      CLI     GRWHAT(,@BR),GRAEFI    IS FUNC REQ'D INITIALIZATION ?
128E F2 81 13   3150      JE      GRA100        YES, GO TO INITIALIZATION RTN
3151 * THE ADDRESS OF THE NEXT SEGMENT IN THE CURRENT BUFFER IS INITLZ'D
3152 * AND MAINTAINED IN THE NEXT INST, WHICH LOADS IT TO THE @XR.
1291 C2 02 0000 3153 GRA020 LA      *-*,@XR    LOAD NEXT STMT CADDR TO @XR
1295 7D 01 A7   3154      CLI     GRWHAT(,@BR),GRAEFR    IS FUNC REQ'D RETURN TEXT ?
1298 F2 81 87   3155      JE      GRA300        YES, GO RETURN STMT ROUTINE
129B 7D 02 A7   3156      CLI     GRWHAT(,@BR),GRAEFS    IS FUNC REQ'D SKIP STATEMENT
129E F2 81 35   3157      JE      GRA200        YES, GO TO SKIP STMT ROUTINE
12A1 F2 87 38   3158      J       GRA210        GO TO SKIP SEGMENT RTN
3159 *
3160 *          INITIALIZATION ROUTINE
3161 *
12A4 75 02 A0   3162 GRA100 L      GRBFRA(,@BR),@XR    LOAD 1ST BFR ADDR TO DB
12A7 74 02 A6   3163      ST      GRANCA(,@BR),@XR    PROPAGATE IT TO NEXT BFR DPL
12AA 5C 01 A3 9D 3164      MVC     GRANDA(@DADDR,@BR),GRSRDA(,@BR)  INITLZ NEXT BRF DADDR
12AE 7C FF AC   3165      MVI     GRASIZ(,@BR),GRAEBS    INITLZ BUFFER SIZE COUNTER
12B1 5C 00 9E A4 3166      MVC     GRACSC(1,@BR),GRSCTR(,@BR)  INITLZ SCTR COUNT IN DPL
12B5 C0 87 0025 3167      B       $DISKN        WAIT FOR FIRST DATA BLOCKS TO
12B9 057F       12BA 3168      DC      AL2($WAITF)    * GET INTO CORE
12BB 7C 97 B5   3169      MVI     GRAERR+@Q(,@BR),@@E550    SET ERR CODE TO SPECIFY WRKFILE
12BE 5E 01 A6 A9 3170      ALC     GRANCA(@CADDR,@BR),GRASSZ(,@BR)  SET CADDR OF NEXT BFR
12C2 BD 00 00   3171 GRA140 CLI     GRAELK(,@XR),GRAELN    IS 1ST DB LINK CODE = 0 ?
12C5 F2 81 07   3172      JE      GRA150        YES, GO INCR TO NEXT LOGICAL DB
12C8 7C 02 A3   3173      MVI     GRANDA(,@BR),GRAEDB    SET DADDR OF NEXT DB
12CB 6E 00 A3 00 3174      ALC     GRANDA(1,@BR),GRAELK(,@XR) *
12CF 5E 00 A3 AB 3175 GRA150 ALC     GRANDA(1,@BR),GRANPB(,@BR)  INCR TO NEXT BFR DADDR
12D3 F2 87 2E   3176      J       GRA260        GO ACCESS FIRST STATEMENT
3177 *
3178 *          ACCESS NEXT STATEMENT OR NEXT SEGMENT ROUTINE
3179 *
12D6 BD 75 07   3180 GRA200 CLI     GRAEDT(,@XR),GRAEET    END-OF-FILE RECORD ?
12D9 F2 81 16   3181      JE      GRA230        YES, RESET OR TO THIS RECORD
12DC 6F 00 AC 02 3182 GRA210 SLC     GRASIZ(1,@BR),GRAES1(,@XR)  DECR BFR CT BY SEGMENT LENGTH
12E0 B6 02 02   3183      A       GRAES1(,@XR),@XR    INCR OR BY SEGMENT LENGTH
12E3 7D 00 AC   3184 GRA220 CLI     GRASIZ(,@BR),@ZERO    IS BUFFER EMPTY ?
12E6 D0 82 B4   3185      BL      GRAERR(,@BR)    GONE NEG, GO TO BAD ERR
12E9 F2 81 15   3186      JE      GRA250        YES, GO TO GET NEXT BFR
12EC BD 80 01   3187      CLI     GRAES0(,@XR),@SNUL    IS SEGMENT NULL ?
12EF F2 81 0F   3188      JE      GRA250        YES, GO TO GET NEXT BFR
12F2 34 02 1294 3189 GRA230 ST      GRA020+@OP1,@XR    SAVE CADDR OF NEXT SEG.IN INST.
12F6 E2 02 06   3190      LA      GRAEDL(,@XR),@XR    POINT @XR TO LINE NUMBER
12F9 C2 01 0000 3191 GRA240 LA      *-*,@BR    RESTORE THE BASE REGISTER
12FD C0 87 0000 12FC 3192 GRASBR EQU    GRA240+@OP1    * STORED IN INST AT GRA240
3193 GRA245 B      *-*          RETURN TO USER
1300 3194 GRASAR EQU    GRA245+@OP1    * TO CADDR SAVED IN GRA245
1301 D0 87 67   3195 GRA250 B      GRA500(,@BR)    ACCESS NEXT BUFFER
1304 BD 80 01   3196 GRA260 CLI     GRAES0(,@XR),@SNUL    IS 1ST SEG. NULL ?

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GRABIT -- RETRIEVE FILE STATEMENTS

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 04/06/21 PAGE 28

1307	D0	81	B4		3197	BE	GRAERR(,@BR)	YES, GO TO BAD ERR
130A	B9	02	03		3198	TBF	GRAES2(,@XR),GRAETP	PRIMARY SEGMENT
130D	C0	10	12F2		3199	BT	GRA230	YES, SAVE LOCATION
1311	7D	01	A7		3200	CLI	GRWHAT(,@BR),GRAEFR	ACTION REQ'D = RETURN TEXT ?
1314	D0	81	B4		3201	BE	GRAERR(,@BR)	YES, GO TO BAD ERR
1317	7D	04	A7		3202	CLI	GRWHAT(,@BR),GRAEFG	ACTION REQ'D = SKIP SEGMENT ?
131A	C0	81	12F2		3203	BE	GRA230	YES, GO SAVE LOCATION
131E	C0	87	12DC		3204	B	GRA210	NO, GO SKIP THIS SEGMENT
					3205	*		
					3206	*	RETURN TEXT ROUTINE	
					3207	*		
1322	2C	01	1190 06		3208	GRA300 MVC	GRLINE,GRAEDL(GRAELL,@XR)	SET BINARY LINE NO.IN O/P FIELD
1327	2C	00	118A 07		3209	MVC	GRTYPE,GRAEDT(1,@XR)	SET TYPE CODE IN OUTPUT FIELD
132C	4C	01	58 140B		3210	MVC	GRTEND(@CADDR,@BR),GRATXT	INITLZ TEXT O/P CADDR IN INST.
1331	BD	75	07		3211	CLI	GRAEDT(,@XR),GRAEET	END OF FILE STATEMENT ?
1334	F2	01	08		3212	JNE	GRA303	NO - GO RESET SEGMENT SWITCH
1337	3C	1C	0C07		3213	MVI	GRTEXT,@EOF	MOVE EOF CODE TO GRTEXT
133B	C0	87	12F2		3214	B	GRA230	GO GET OUT
133F	7C	87	01		3216	GRA303 MVI	GRA310+@Q(,@BR),@UCB	INITLZ BRANCH FOR ONLY SEGMENT
1342	BD	00	03		3217	CLI	GRAES2(,@XR),@SONLY	IS IT AN ONLY SEGMENT ?
1345	F2	81	03		3218	JE	GRA305	YES, BYPASS BRANCH RESET
1348	7C	80	01		3219	MVI	GRA310+@Q(,@BR),@NOP	SET FOR MORE SEGMENTS
134B	6F	00	AC 02		3220	GRA305 SLC	GRASIZ(1,@BR),GRAES1(,@XR)	DECR BFR CT BY SEG LENGTH
134F	9F	00	02 B0		3221	SLC	GRAES1(1,@XR),GRAPSG(,@BR)	DECR SEG CT BY SDF-HDR LENGTH
1353	6C	00	B3 02		3222	MVC	GRASEG(1,@BR),GRAES1(,@XR)	MOVE TEXT LENGTH TO TEXT CTR
1357	E2	02	07		3223	LA	GRAELP(,@XR),@XR	INCR TO TYPE CODE
135A	F2	87	2A		3224	J	GRA317	GO TEST FILE TYPE
135D	C0	87	12E3		3225	GRA310 B	GRA220	GO ACCESS NEXT STATEMENT
135D					3226	ORG	GRA310	* UNLESS CURRENT STATEMENT
135D	C0	87	12E3		3227	BC	GRA220,@UCB	* HAS MORE SEGMENTS
1361	6C	00	24 00		3228	MVC	GRASVC(,@BR),@ZERO(1,@XR)	SAVE CURR CHAR IN RESTORE INST
1365	D0	87	67		3229	B	GRA500(,@BR)	ACCESS NEXT BUFFER
1368	BD	02	03		3230	CLI	GRAES2(,@XR),@SLAST	LAST SEGMENT ?
136B	F2	01	03		3231	JNE	GRA313	NO, GO RESET SEG COUNTER
136E	7C	87	01		3232	MVI	GRA310+@Q(,@BR),@UCB	RESET BRANCH OUT
1371	6F	00	AC 02		3233	GRA313 SLC	GRASIZ(1,@BR),GRAES1(,@XR)	DECR BUFFER COUNTER
1375	9F	00	02 B2		3234	SLC	GRAES1(1,@XR),GRASSG(,@BR)	DECR SEG COUNT BY SDF LENGTH
1379	6C	00	B3 02		3235	MVC	GRASEG(1,@BR),GRAES1(,@XR)	MOVE TEXT LNG TO SEG COUNTER
137D	E2	02	04		3236	LA	GRAELS(,@XR),@XR	INCR @XR PAST SECONDARY SDF
1380	BC	00	00		3237	GRA315 MVI	@ZERO(,@XR),*-*	RESTORE CHAR SAVED IN Q-CODE
				1381	3238	GRASVC EQU	GRA315+@Q	SAVED CHAR HOLD AREA
1383	5E	01	58 AB		3239	GRA316 ALC	GRTEND(@CADDR,@BR),GRABOA(,@BR)	INCR RECEIVING CADDR
				1387	3240	GRA317 EQU	*	MOVE TEXT TO GRTEXT
1387	38	80	03D4		3241	TBN	\$INDR1,\$BASIC	IS FILE TYPE = BASIC ?
138B	F2	90	24		3242	JF	GRA350	NO, BYPASS REPITION CODE CHECK
138E	BD	1B	01		3243	CLI	GRAENC(,@XR),GRAEMR	IS CHAR REF A REPITION CODE ?
1391	F2	84	1E		3244	JH	GRA350	NO, GO RETURN REF'D CHAR
1394	5C	01	3E 58		3245	MVC	GRATND(@CADDR,@BR),GRTEND(,@BR)	SET RCV'G CADDR IN INSTR
1398	2C	00	0000 00		3246	GRA320 MVC	*-*,@ZERO(1,@XR)	RETURN REPEATED CHAR TO OUTPUT
				139B	3247	GRATND EQU	GRA320+@OP1	* ADDR SUPPLIED
139D	9F	00	01 AB		3248	SLC	GRAENC(1,@XR),GRAONE(,@BR)	DECR. REPITION COUNTER
13A1	F2	01	07		3249	JNZ	GRA330	IF <> 0, GO INCR O/P CADDR
13A4	5C	01	58 3E		3250	MVC	GRTEND(@CADDR,@BR),GRATND(,@BR)	RESTORE NEW O/P CADDR
13A8	F2	87	0C		3251	J	GRA360	GO INCR @XR
13AB	5E	01	3E AB		3252	GRA330 ALC	GRATND(@CADDR,@BR),GRABOA(,@BR)	INCR O/P CADDR IN INSTR

GRABIT -- RETRIEVE FILE STATEMENTS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 29
	13AF	D0	87 3B		3253	B	GRA320(,@BR)	GO MOVE CHAR TO OUTPUT
	13B2	2C	00 0000 01		3254	GRA350 MVC	*-*,GRAENC(1,@XR)	MOVE NON-REPEAT CHAR TO OUTPUT
				13B5	3255	GRTEND EQU	GRA350+@OP1	* ADDR SUPPLIED
	13B7	E2	02 01		3256	GRA360 LA	GRAENC(,@XR),@XR	INCR @XR TO NEXT CHAR.
	13BA	5F	00 B3 AB		3257	SLC	GRASEG(1,@BR),GRABOA(,@BR)	DECR BFR SPACE CTR
	13BE	D0	81 00		3258	BZ	GRA310(,@BR)	NO MORE TEXT IN SEG, CHK MORE
	13C1	D0	87 26		3259	B	GRA316(,@BR)	MORE TEXT, GO INCR RECV CADDR
					3260	*		
					3261	*	ACCESS NEXT BUFFER ROUTINE	
					3262	*		
	13C4	74	08 9A		3263	GRA500 ST	GRA5SA(,@BR),@ARR	
	13C7	C0	87 0025		3264	B	\$DISKN	WAIT FOR PRIOR READ TO COMPLETE
	13CB	057F		13CC	3265	DC	AL2(\$WAITF)	*
				13CD	3266	GRA600 EQU	*	
					3267	*		
					3268	*	DL4ICS BEING USED - ACCESS NEXT DATA BLOCK	
					3269	*		
	13CD	75	02 A0		3270	L	GRBFRA(,@BR),@XR	SAVE CURR BFR STARTING CADDR
	13D0	5C	04 A0 A6		3271	MVC	GRBFRA(GRAEDS,@BR),GRANCA(,@BR)	MOVE NEXT DPL TO CURR DPI
	13D4	74	02 A6		3272	ST	GRANCA(,@BR),@XR	RESTORE NEXT BFR STARTING CADDR
	13D7	75	02 A0		3273	L	GRBFRA(,@BR),@XR	POINT EN TO CURR BFR CADDR
	13DA	BD	00 00		3274	CLI	GRAELK(,@XR),GRAELN	NEXT LOGICAL DB = NEXT PHYS DB ?
	13DD	F2	81 07		3275	JE	GRA620	YES, GO INCR SCTR DISP.
	13E0	7C	02 A3		3276	MVI	GRANDA(,@BR),GRAEDB	SET DADDR OF NEXT DB
	13E3	6E	00 A3 00		3277	ALC	GRANDA(1,@BR),GRAELK(,@XR)	*
	13E7	5E	00 A3 AB		3278	GRA620 ALC	GRANDA(1,@BR),GRANPB(,@BR)	INCR SCTR DISP FOR NEXT PHYS D
	13EB	C0	87 1200		3279	GRA640 B	DL4ICS	GO READ NEXT DB
	13EF	13FE		13F0	3280	DC	AL2(GRANPL)	* CADDR OF DPL
	13F1	7C	FF AC		3281	GRA660 MVI	GRASIZ(,@BR),GRAEBS	RE-INITLZ BFR SPACE COUNT
	13F4	C0	87 0000		3282	GRA680 B	*-*	RETURN TO
				13F7	3283	GRA5SA EQU	GRA680+@OP1	* CADDR SUPPLIED
				13F8	3284	GRACPL EQU	*	DPL FOR CURRENT BUFFER
	13F8	02		13F8	3285	GRACFN DC	AL1(@DPUT)	WRITE FUNCTION CODE
	13F9			13FA	3286	GRSRDA DS	CL2	RELATIVE DADDR OF CURR. BFR
				13F9	3287	GRACCA EQU	GRSRDA-@B1	CYLINDER BYTE OF DISK ADDR.
	13F9				3288	ORG	*-2	* INITIALIZED TO THE
	13F9	0503		13FA	3289	DC	AL2(@WSTBL)	* 1ST DB OF THE WORK FILE
	13FB			13FB	3290	GRACSC DS	CL1	SECTOR COUNT
	13FC	1B00		13FD	3291	GRBFRA DC	AL2(GRBF1)	CADDR OF CURRENT BUFFER
				13FE	3292	GRANPL EQU	*	DPL FOR NEXT BUFFER
	13FE	01		13FE	3293	DC	AL1(@DGET)	READ FUNCTION CODE
	13FF			1400	3294	GRANDA DS	CL2	RELATIVE DADDR OF NEXT BFR.
	1401			1401	3295	GRSCTR DS	CL1	SECTOR COUNT
	1401				3296	ORG	*-1	* INITIALIZE TO 1
	1401	01		1401	3297	DC	XL1'01'	
	1402			1403	3298	GRANCA DS	CL2	CADDR OF NEXT BUFFER
	1404			1404	3299	GRWHAT DS	CL1	USER SPEC'D FUNCTION CODE
	1404				3300	ORG	*-1	SET TO ZERO FOR
	1404	00		1404	3301	DC	XL1'00'	* INITIALIZATION CALL
	1405	0100		1406	3302	GRASSZ DC	XL2'0100'	SECTOR SIZE
	1407	0001		1408	3303	GRANPB DC	XL2'01'	DISP TO NEXT PHYS BFR DADDR
				0002	3304	GRAEDB EQU	2	DB DADDR ADJUSTMENT FACTOR
	1409			1409	3305	GRASIZ DS	CL1	BUFFER SPACE COUNTER
	140A	0C07		140B	3306	GRATXT DC	AL2(GRTEXT)	ADDRESS OF TEXT OUTPUT AREA
	140C	0007		140D	3307	GRAPSG DC	XL2'07'	SIZE OF PRIMARY SEG. HEADER
	140E	0004		140F	3308	GRASSG DC	XL2'04'	SIZE OF 2NDARY SEG. HEADER

GRABIT -- RETRIEVE FILE STATEMENTS

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 30
		1408	3309	GRAONE EQU	GRANPB	DECR FACTOR FOR REPITITION CTR
		1408	3310	GRABOA EQU	GRANPB	INCR FACTOR FOR NEXT TEXT CHAR
		1408	3311	GRANXC EQU	GRANPB	CYL ADJ FACTOR
1410		1410	3312	GRASEG DS	CL1	SEGMENT TEXT COUNTER
		0000	3313	GRAEFI EQU	X'00'	INITIALIZATION FUNC. CODE
		0003	3314	GRAEFW EQU	X'03'	WRITE BACK ONLY FUNC. CODE
		0001	3315	GRAEFR EQU	X'01'	RETURN TEXT FUNC. CODE
		0002	3316	GRAEFS EQU	X'02'	SKIP STATEMENT FUNC. CODE
		0004	3317	GRAEFG EQU	X'04'	SKIP SEGMENT FUNC. CODE
		00FF	3318	GRAEBS EQU	X'FF'	BUFFER TEXT AREA SIZE
		0001	3319	GRAESC EQU	X'01'	SCTR COUNT IF DL4ICS USED
		0000	3320	GRAELK EQU	X'00'	DISP TO LINK CODE WITHIN DB
		0000	3321	GRAELN EQU	X'00'	LINK CODE TO NEXT PHYS DB
		0001	3322	GRAEXA EQU	X'01'	ADJ TO '@' EQU'S FOR @XR ADDR
		0006	3323	GRAEDL EQU	@SBLN+GRAEXA	DISP TO STMT BINARY LINE NO.
		0007	3324	GRAEDT EQU	@STYPE+GRAEXA	DISP TO STMT TYPE CODE
		0002	3325	GRAELL EQU	X'02'	LENGTH OF BINARY LINE NUMBER
		0075	3326	GRAEET EQU	@EOFTC	TYPE CODE OF END-OF-FILE STMT
		0001	3327	GRAES0 EQU	@SDF0+GRAEXA	DISP TO SDF0 - NULL INDR
		0002	3328	GRAES1 EQU	@SDF1+GRAEXA	DISP TO SDF1 - LENGTH
		0003	3329	GRAES2 EQU	@SDF2+GRAEXA	DISP TO SDF2 - SEGMENTATION CDE
		0002	3330	GRAETP EQU	X'02'	MASK FOR A PRIMARY SEGMENT
		0007	3331	GRAELP EQU	X'07'	LENGTH OF PRIMARY SEG.
		0004	3332	GRAELS EQU	X'04'	LENGTH OF SECONDARY SEG.
		001B	3333	GRAEMR EQU	27	MAX. REPITITION CODE
		0001	3334	GRAENC EQU	X'01'	DISP TO NEXT TEXT CHARACTER
		0001	3335	GRAEDC EQU	X'01'	DISP TO CYL IN DADDR
		135D	3336	GRABSE EQU	GRA310	BASE ADDRESS OF GRABIT
		0005	3337	GRAEDS EQU	X'05'	LNG OF DPL DADDR, SCTR-CT.
		0006	3338	GRAEW2 EQU	6	SECOND CYL OF WORK FILE
			3339	*		
			3340	*	ERROR ROUTINE	
			3341	*		
1411	3C 98 03CD		3342	GRAERR MVI	\$CAERR,@E551	SET BAD FILE ERROR CODE
			3343	*		THE ABOVE ERROR CODE IS INITIALLY SET FOR A SAVED FILE,
			3344	*		BUT IS MODIFIED TO THE WORK FILE IF DL4ICS IS USED
1415	3A 04 03D6		3345	SBN	\$INDR3,\$ERHRD	SET INDR FOR HARD ERROR
1419	C0 87 0469		3346	B	\$CAERK	GO TO ERRPGM INTERFACE

GRABIT -- RETRIEVE FILE STATEMENTS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 31
					3348	*	\$C2D5	
					3349	+	*****	
					3350	+	SERIALLY REUSABLE SUBROUTINE TO CONVERT A 2 BYTE BINARY VALUE TO	*
					3351	+	A 5 BYTE POSITIVE DECIMAL NUMBER.	*
					3352	+	ON ENTRY @XR POINTS TO THE LEFT BYTE OF THE BINARY VALUE.	*
					3353	+	ON RETURN C2DVAL IS THE RIGHT BYTE OF THE 5 BYTES DECIMAL VALUE	*
					3354	+	WITH LEADING ZEROS WHICH MAY BE MODIFIED BY THE USER IN ANY WAY	*
					3355	+	IN IT'S LOCATION.	*
					3356	+	THE 2 BYTES BINARY VALUE IS NOT ALTERED.	*
					3357	+	@XR IS NOT ALTERED.	*
					3358	+	@BR IS SAVED AND RESTORED AT EXIT.	*
					3359	+	*****	
				141D	3361	+C2DEC5	EQU *	MODULE ENTRY POINT
				141D	3362	+	USING C2DEC5,@BR	BASE ADDRESS SPECIFICATION
141D	34	01	1451		3363	+	ST C2D050+@OP1,@BR	SAVE @BR
1421	C2	01	141D		3364	+	LA C2DEC5,@BR	LOAD BASE REGISTER
1425	74	08	38		3365	+	ST C2D052+@OP1(,@BR),@ARR	SAVE RETURN ADDRESS
					3366	+	INITIALIZE DECIMAL INCREMENTER AND DECIMAL SUM TO 1 AND 0 RESP.	
1428	54	90	43 39		3367	+	ZAZ C2D903(C2D903-C2D901,@BR),C2D901(C2D902-C2D901,@BR)	
142C	7C	01	17		3368	+	MVI C2D030+@D1(,@BR),@B1	INITIALIZE DISP TO BYTE 1
142F	7C	01	16		3369	+C2D020	MVI C2D030+@Q(,@BR),@B1	INIT TEST TO BIT 7
					3370	+		
1432	B8	00	00		3371	+C2D030	TBN *-*(,@XR),*-*	TEST IF THIS BIT IS OFF
1435	F2	90	04		3372	+	JF C2D040	* BR AROUND SUM INCREMENT
					3373	+	INCREMENT DECIMAL SUM BY DECIMAL VALUE OF THIS TESTED BIT	
1438	56	04	3E 43		3374	+	AZ C2DVAL(C2D903-C2DVAL,@BR),C2D903(C2D903-C2DVAL,@BR)	
					3375	+	DOUBLE DECIMAL VALUE OF INCREMENT TO VALUE OF NEXT BIT	
143C	56	04	43 43		3376	+C2D040	AZ C2D903(C2D903-C2DVAL,@BR),C2D903(C2D903-C2DVAL,@BR)	
1440	5E	00	16 16		3377	+	ALC C2D030+@Q(1,@BR),C2D030+@Q(,@BR)	SHIFT BIT MASK LEFT ONE
1444	D0	20	15		3378	+	BNOL C2D030(,@BR)	CONTINUE LOOP UNLESS ALL BITS
					3379	+		* TESTED
1447	5F	00	17 13		3380	+	SLC C2D030+@D1(1,@BR),C2D020+@Q(,@BR)	DECR DISP TO BYTE 0
144B	D0	81	12		3381	+	BZ C2D020(,@BR)	FALL THROUGH IF UNDERFLOW
144E	C2	01	0000		3382	+C2D050	LA *-*,@BR	RESTORE @BR
1452	C0	87	0000		3383	+C2D052	B *-*	RETURN TO CALLING PROGRAM
					3384	+		
					3385	+	*** WORK AREA	
					3386	+		
1456	F1			1456	3387	+C2D901	DC DL1'1'	INIT WORK AREA
				1457	3388	+C2D902	EQU *	FIST BYTE OF DECIMAL VALUE
1457				145B	3389	+C2DVAL	DS CL5	5 BYTES DECIMAL VALUE
145C				1460	3390	+C2D903	DS CL5	DECIMAL INCREMENTER
					3391	+	***	
							END OF C4DEC5	***

DLPRNT -- LIST OUTPUT INTERFACE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 32
		3393		*****			
		3394	*	5703-XM1	COPYRIGHT IBM CORP. 1970		*
		3395	*		REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083		*
		3396	*				*
		3397		*****			
		3398	*	STATUS			*
		3399	*	VERSION 1 MODIFICATION 0			*
		3400	*				*
		3401	*	FUNCTION			*
		3402	*	* DLPRNT PROVIDES FOR DEVICE INDEPENDENCE FOR OUTPUT FROM			*
		3403	*	LIST ORIENTED PROGRAMS.			*
		3404	*	* FOR CRT OUTPUT, ROLL SPEED AND POP FEATURES ARE SUPPORTED.			*
		3405	*	IN ADDITION DLPRNT WILL FLASH COMMAND LIGHT 13 WHEN IN			*
		3406	*	STOP MODE.			*
		3407	*	* IF A 50LMP MATRIX PRINTER IS TO BE USED, ALL PRINTED LINES			*
		3408	*	ARE ANALYZED FOR LENGTH TO PROVIDE MAXIMUM LINE THROUGHPUT.			*
		3409	*	THIS IS DONE BY PRINTING RIGHT ONLY AS FAR AS REQUIRED TO			*
		3410	*	PRINT THE NEXT LINE FROM RIGHT TO LEFT. THE 50LMP I/O			*
		3411	*	INTERFACE IS SUPPLIED BY DLPRNT.			*
		3412	*	* OUTPUT MAY BE DIRECTED TO THE CRT, THE MATRIX PRINTER, OR			*
		3413	*	THE CURRENT SYSTEM OUTPUT DEVICE(S).			*
		3414	*				*
		3415	*	ENTRY POINTS			*
		3416	*	DLPRNT HAS ONE ENTRY POINT. THIS ENTRY POINT IS USED WHEN A			*
		3417	*	LINE IS TO BE PRINTED FOLLOWED BY A NORMAL CARRIER RETURN.			*
		3418	*	THE CALLING SEQUENCE IS:			*
		3419	*				*
		3420	*	B DLPRNT			*
		3421	*	DC AL2(PPLA)			*
		3422	*	WHERE PPLA IS A TWO BYTE ADDRESS OF THE LEFT BYTE OF A PRINT			*
		3423	*	PARAMETER LIST.			*
		3424	*				*
		3425	*	INPUT			*
		3426	*	* BEFORE USING DLPRNT THE ONE BYTE INDICATOR, DLPTYP, MUST			*
		3427	*	BE SET TO INDICATE WHICH DEVICE IS TO BE USED FOR OUTPUT.			*
		3428	*	THE CORRESPONDING VALUES AND THEIR FUNCTION FOLLOWS:			*
		3429	*	DLPMPR - MATRIX PRINTER IS TO BE USED FOR OUTPUT.			*
		3430	*	DLPCRT - THE DISPLAY STATION IS TO BE USED FOR OUTPUT.			*
		3431	*	ROLL SPEED AND POP FUNCTIONS WILL BE CONTROLLED.			*
		3432	*	DLPSPT - THE SYSTEM PRINTER(S) IS TO BE USED FOR OUTPUT.			*
		3433	*	THIS IS THE DEFAULT VALUE.			*
		3434	*	* A 244 BYTE BUFFER MUST BE ALLOCATED FOR DLPRNTS USE STARTING			*
		3435	*	AT LOCATION DLIBUF.			*
		3436	*	* A FOUR BYTE PRINT PARAMETER LIST (PPL) MUST BE PASSED VIA			*
		3437	*	A TWO BYTE COME ADDRESS FOLLOWING THE CALL. THIS PPL IS OF			*
		3438	*	THE SAME FORMAT AS THE PPL SENT TO DPRINT WITH THE FOLLOWING			*
		3439	*	RESTRICTIONS:			*
		3440	*	* ONLY 'PRINT AND RETURN' CONTROL CODES ARE ALLOWED FOR			*
		3441	*	PRINTING.			*
		3442	*	* WAIT FUNCTIONS SHOULD NOT BE USED EXCEPT AFTER THE LAST			*
		3443	*	LINE HAS BEEN PRINTED. IT IS THEN REQUIRED TO TERMINATE			*
		3444	*	DLPRNT'S FUNCTION.			*
		3445	*	OUTPUT			*
		3446	*	UPON COMPLETION THE GENERAL REGISTERS AND PPL WILL BE THE SAME			*
		3447	*	AS AT ENTRY, THE LINE TO BE PRINTED WILL BE PRINTED (OR BUFFERED			*
		3448	*	IN THE CASE OF THE LINE PRINTER). THE CALLING PROGRAM MAY			*

DLPRNT -- LIST OUTPUT INTERFACE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 33
		3449	*	MODIFY THE LINE UPON RETURN.			*
		3450	*				*
		3451	*	EXTERNAL REFERENCES			*
		3452	*	\$PRDEV - SYSTEM PRINTER INDICATOR.			*
		3453	*	DLIBUF - LOCATION OF BUFFER.			*
		3454	*	\$\$PLYN - ENTRY TO DSPLYN.			*
		3455	*	\$\$PRNT - ENTRY TO DPRINT.			*
		3456	*	\$CRTIN - ROLL INDICATORS.			*
		3457	*	\$IOIND - LINE PRINTER INDICATOR.			*
		3458	*	\$UNMSK - ENTRY TO UNMASK INQUIRY REQUEST.			*
		3459	*	\$\$PSIO - LOCATION OF CONTROL BYTE IN DPRINT SIG.			*
		3460	*	\$\$PCNT - LOCATION OF COUNT BYTE IN DPRINT I/O LIST.			*
		3461	*				*
		3462	*	EXITS, NORMAL			*
		3463	*	EXIT IS TO THE CALLING PROGRAM FOLLOWING THE PPL ADDRESS.			*
		3464	*				*
		3465	*	EXITS, ERROR			*
		3466	*	N/A			*
		3467	*				*
		3468	*	TABLES/WORK AREAS			*
		3469	*	N/A			*
		3470	*				*
		3471	*	ATTRIBUTES			*
		3472	*	RELOCATABLE			*
		3473	*	REUSABLE			*
		3474	*				*
		3475	*	CHARACTER CODE DEPENDENCY			*
		3476	*	N/A			*
		3477	*				*
		3478	*	NOTES			*
		3479	*	ERROR PROCEDURES			*
		3480	*	N/A			*
		3481	*				*
		3482	*	REGISTER USAGE			*
		3483	*	REGISTERS 1 AND 2 ARE USED FOR BASE ADDRESSING.			*
		3484	*				*
		3485	*	SAVED/RESTORED AREAS			*
		3486	*	N/A			*
		3487	*				*
		3488	*	MODIFICATION CONSIDERATIONS			*
		3489	*	DLPRNT DIRECTLY MODIFIES DPRINT WHEN USING THE LINE PRINTER			*
		3490	*	FUNCTION. CARE MUST BE TAKEN WHEN MODIFYING EITHER DLPRNT OR			*
		3491	*	DPRINT.			*
		3492	*				*
		3493	*	REQUIRED MODULES			*
		3494	*	@SYSEQ - GENERAL SYSTEM EQUATES			*
		3495	*	@FXDEQ - NUCLEUS LOCATION EQUATES			*
		3496	*	@HDWEQ - HARDWARE VALUE EQUATES			*
		3497	*	@CANEQ - TRANSCIENT LOCATION EQUATES			*
		3498	*				*
		3499	*	OTHER			*
		3500	*	N/A			*
		3501	*	*****			*

DLPRNT -- LIST OUTPUT INTERFACE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 04/06/21 PAGE 34

				149A 3503	USING	DLPBSE,@BR	BASE SPECIFICATION
				1461 3504	DLPRNT EQU	*	ENTRY
1461	34	01	156B	3505	ST	DLP480+@OP1,@BR	SAVE BR
1465	C2	01	149A	3506	LA	DLPBSE,@BR	LOAD BASE REG
1469	74	02	D5	3507	ST	DLP500+@OP1(,@BR),@XR	SAVE XR
146C	76	08	ED	3508	A	DLPONE(,@BR),@ARR	CALCULATE PPL ADDR POINTER
146F	34	08	147C	3509	ST	DLP100+@OP1,@ARR	GET PARM ADDR
1473	76	08	ED	3510	A	DLPONE(,@BR),@ARR	CALCULATE RETURN ADDR
1476	74	08	DD	3511	ST	DLP520+@OP1(,@BR),@ARR	SAVE RETURN ADDR
1479	35	02	0000	3512	DLP100 L	*-*,@XR	XR POINTS TO PPL
147D	6C	03	EA 03	3513	MVC	DLPWK2+@PDATA(@PPLNG,@BR),@PDATA(,@XR)	MOVE IN PPL
1481	7C	20	0F	3514	MVI	DLPEXT-1(,@BR),X'20'	INITIALIZE DSPLYN ADDR *****
1484	4E	00	0F 043B	3515	ALC	DLPEXT-1(1,@BR),\$EXFTR	GET DSPLYN ADDR
1489	F2	87	00	3516	J	*-*	GO TO CORRECT INTERFACE
				148B 3517	DLPTYP EQU	*-1	I/O DEVICE INDR LOCATION
148B				3518	ORG	DLPTYP	SET INSTR CNTR
148B	00			148B 3519	DC	AL1(DLPSPT)	SET DEFAULT TO SYSTEM PRINTER
				148C 3520	DLPBSD EQU	*	DISPLACEMENT BASE
				3521	**		
				148C 3522	DLPSPI EQU	*	SYSTEM PRINTER INTERFACE
148C	3D	07	044A	3523	CLI	\$PRDEV-1,X'07'	SYSPRINT = MATRIX PRINT *****
1490	F2	81	7E	3524	JE	DLPNPT	DO LINE PRINTER INTERFACE
1493	5C	01	00 10	3525	MVC	DLP120+@OP1(@CADDR,@BR),DLPEXT(,@BR)	GET DSPLYN ADDR
1497	C0	87	0000	3526	DLP120 B	*-*	GO TO DSPLYN
149B	1581			149C 3527	DC	AL2(DLPWK2)	PPL ADDRESS
149D	3D	00	044B	3528	CLI	\$PRDEV,X'00'	IS PRINTER REQUIRED TOO *****
14A1	F2	81	6D	3529	JE	DLPNPT	DO LINE PRINTER INTERFACE
14A4	F2	87	C1	3530	J	DLP480	EXIT INTERFACE
				149A 3531	DLPBSE EQU	DLP120+@OP1	BASE ADDRESS

DLPRNT -- LIST OUTPUT INTERFACE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 35
				14A7	3533	DLPTIF	EQU *			ENTRY
	14A7	C0	87 0000		3534		B *-*			GO TO DSPLYN
	14A9				3535		ORG *-2			INITIALIZE ADDR
	14A9	2004		14AA	3536	DLPEXT	DC AL2(\$\$PLYN)			DSPLYN ENTRY ADDR
	14AB	1581		14AC	3537		DC AL2(DLPWK2)			PPL ADDRESS
	14AD	7D FF E7			3538		CLI DLPWK2+@PCTRL(,@BR),@PWAIT			WAIT FUNCTION ?
	14B0	F2 81 57			3539		JE DLP360			GO TURN OFF CMD LIGHTS
	14B3	71 11 E2			3540	DLP140	LIO DLPK13(,@BR),@KEYBD+@CMLON			TURN ON CMD LITE 13
	14B6	38 08 03D3			3541		TBN \$CRTIN,\$CRTSP			IN STOP MODE?
	14BA	F2 90 1D			3542		JF DLP240			NO ? CONTINUE ROLL
	14BD	F2 80 09			3543	DLP160	JC DLP180,@NOP			JUMP IF LIGHT ON
	14C0	71 10 E2			3544		LIO DLPK13(,@BR),@KEYBD+@CMOFF			TURN POP LITE OFF
	14C3	7C 87 24			3545		MVI DLP160+@Q(,@BR),@UCB			SET FOR TURN ON
	14C6	F2 87 03			3546		J DLP200			GO DO TIME OUT
	14C9	7C 80 24			3547	DLP180	MVI DLP160+@Q(,@BR),@NOP			SET TO TURN OFF
	14CC	5C 01 E0 E1			3548	DLP200	MVC DLPLPC(2,@BR),DLPLIN(,@BR)			SET UP TIME COUNT
	14D0	5F 01 E0 ED			3549	DLP220	SLC DLPLPC(2,@BR),DLPONE(,@BR)			DECREMENT TIME COUNT
	14D4	D0 84 36			3550		BH DLP220(,@BR)			LOOP UNTIL TIME OUT
	14D7	D0 87 19			3551		B DLP140(,@BR)			GO TEST STOP MODE
	14DA	38 04 03D3			3552	DLP240	TBN \$CRTIN,\$CRTPU			POP UP INDR ON ?
	14DE	F2 90 07			3553		JF DLP260			SKIP LINE CNT INITIALIZATION
	14E1	3B 04 03D3			3554		SBF \$CRTIN,\$CRTPU			SET POP INDR OFF
	14E5	7C 00 DE			3555		MVI DLPCNT(,@BR),@ZERO			ZERO LINES DISPLAYED CNT
	14E8	7D 0D DE			3556	DLP260	CLI DLPCNT(,@BR),DLPMAX			HAVE MAX NO. OF LINES BEEN ?
					3557	*				* DISPLAYED ?
	14EB	F2 01 04			3558		JNE DLP280			JUMP IF NOT
	14EE	3A 08 03D3			3559		SBN \$CRTIN,\$CRTSP			SET ROLL STOP INDR
	14F2	F2 04 0E			3560	DLP280	JNH DLP320			JUMP IF MAX LINES NOT DISPLAYED
	14F5	5C 01 E0 E1			3561		MVC DLPLPC(2,@BR),DLPLIN(,@BR)			SET UP TIMING LOOP
	14F9	5F 01 E0 ED			3562	DLP300	SLC DLPLPC(2,@BR),DLPONE(,@BR)			DECREMENT COUNT
	14FD	D0 84 5F			3563		BH DLP300(,@BR)			BRANCH IF TIME NOT UP
	1500	F2 87 04			3564		J DLP340			GO EXIT
	1503	5E 00 DE ED			3565	DLP320	ALC DLPCNT(1,@BR),DLPONE(,@BR)			BUMP LINE COUNT
	1507	F2 87 5E			3566	DLP340	J DLP480			GO EXIT
	150A	C0 87 0B44			3567	DLP360	B \$\$COFF			TURN OFF CMD LIGHTS
	150E	F2 87 57			3568		J DLP480			GO EXIT

DLPRNT -- LIST OUTPUT INTERFACE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 36
				1511	3570	DLPNPT	EQU *	ENTRY
1511	38 80	03D2			3571	TBN	\$IOIND,\$LNPTR	LINE PRINTER AVAILABLE
1515	F2 10	0F			3572	JT	DLP400	JUMP IF YES
1518	C0 87	0707			3573	DLP380	B \$\$PRNT	DO NORMAL PRINT IF NOT
151C	1581			151D	3574	DC	AL2(DLPWK2)	PPL ADDR
151E	C0 87	0707			3575	B	\$\$PRNT	WAIT FOR OP COMPLETION
1522	057F			1523	3576	DC	AL2(\$WAITF)	WAIT PPL ADDRESS
1524	F2 87	41			3577	J	DLP480	GO EXIT
1527	7D FF	E7			3578	DLP400	CLI DLPWK2+@PCTRL(,@BR),@PWAIT	IS THIS A WAIT FUNCTION ?
152A	F2 01	03			3579	JNE	DLP420	JUMP IF NO
152D	7C 00	E8			3580	MVI	DLPWK2+@PRCNT(,@BR),@ZERO	ZERO NEXT LINE CNT
1530	7D FF	E3			3581	DLP420	CLI DLPWK1(,@BR),@PWAIT	IS THERE A LINE TO PRINT ?
1533	F2 01	59			3582	JNE	DLP480	JUMP IF YES
1536	C0 87	0707			3583	B	\$\$PRNT	INSURE PRINT HEAD IS AT LEFT
153A	158D			153B	3584	DC	AL2(DLPRTN)	* MARGIN
153C	5C 01	E4 E8			3585	DLP440	MVC DLPWK1+@PRCNT(2,@BR),DLPWK2+@PRCNT(,@BR)	SET NEXT PPL
1540	5C 01	E8 F4			3586	MVC	DLPWK2+@PRCNT(2,@BR),DLPRTN+@PRCNT(,@BR)	SET CARRIER RTN
1544	7D FF	E3			3587	CLI	DLPWK1(,@BR),@PWAIT	WAS THIS A WAIT FUNCTION ?
1547	D0 81	7E			3588	BE	DLP380(,@BR)	DO CARRIER RETURN IF YES
154A	C2 02	0EA4			3589	LA	DLIBUF,@XR	POINT XR TO BUFFER
154E	BC 40	F3			3590	MVI	DLPBLN-1(,@XR),@BLANK	SET BLANK FOR CLEAR BUF
1551	AC F2	F2 F3			3591	MVC	DLPBLN-2(DLPBLN-1,@XR),DLPBLN-1(,@XR)	CLEAR BUF TO BLNKS
1555	5C 00	CD E4			3592	MVC	DLP460+@DD2(1,@BR),DLPWK1+@PRCNT(,@BR)	SET DATA CNT
1559	5F 00	CD ED			3593	SLC	DLP460+@DD2(1,@BR),DLPONE(,@BR)	GET TRUE DISPLACMENT
155D	5C 01	CC CD			3594	MVC	DLP460+@D1(2,@BR),DLP460+@DD2(,@BR)	SET 0 AND DI VALUES
1561	75 01	EA			3595	L	DLPWK2+@PDATA(,@BR),@BR	BR POINTS TO DATA
1564	9C 00	00 00			3596	DLP460	MVC *-*(@VQ,@XR),*-*(,@BR)	MOVE DATA TO BUFFER
					3597	*		
1568	C2 01	0000			3598	DLP480	LA *-*,@BR	RESTORE BR
156C	C2 02	0000			3599	DLP500	LA *-*,@XR	RESTORE XR
1570	C0 87	048D			3600	B	\$UNMSK	GO CHECK FOR INQUIRY REQUEST
1574	C0 87	0000			3601	DLP520	B *-*	RETURN

DLPRNT -- LIST OUTPUT INTERFACE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 37
		3603			*****	
		3604			* CONSTANTS, WORK AREAS AND EQUATES	
		3605			*****	
		3606			*	
		0085	3607	DLPMPR EQU	DLPNPT-DLPBSD	MATRIX PRINTER INDR VALUE
		0000	3608	DLPSPY EQU	DLPSPY-DLPBSD	SYSTEM PRINTER INDR VALUE
		001B	3609	DLPCRT EQU	DLPTIF-DLPBSD	CRT INOR VALUE
1578		1578	3610	DCRCNT DS	CL1	DISPLAYED LINE CNTR
		1578	3611	DLPCNT EQU	DCRCNT	COMMUNICATIONS LABEL
1578			3612	ORG	DLPCNT	SET INST CNTR
1578 01		1578	3613	DC	XL1'01'	INITIAL VALUE
1579		157A	3614	DLPLPC DS	CL2	TIMING LOOP CNTR
157B 3B		157B	3615	DLPLIN DC	XL1'3B'	INITIAL LOOP CNT
157C 0D		157C	3616	DLPK13 DC	AL1(@CKY13)	CMD LIGHT 13 CONTROL
		000D	3617	DLPMAX EQU	13	MAX LINES TO BE DISPLAYED
		157D	3618	DLPWK1 EQU	*	CURRENT PPL
157D FFFF		157E	3619	DC	2XL1'FF'	CTRL AND DATA CNT
157F 0EA4		1580	3620	DC	AL2(DLIBUF)	BUFFER ADDR
		1581	3621	DLPWK2 EQU	*	NEXT PPL
1581		1584	3622	DS	CL(@PPLNG)	
1585 01		1585	3623	DLPNDX DC	AL1(@INDEX)	INDEX PPL
1586 0001		1587	3624	DLPONE DC	XL2'0001'	CONSTANT OF ONE
1588		1588	3625	DLPRES DS	CL1	RESIDUAL CNT
1589 0000		158A	3626	DLPWTH DC	XL2'00'	WIDTH OF PRINT LINE
158B		158B	3627	DLPNXT DS	CL1	NEXT LINE CNT
158C		158C	3628	DLPREM DS	CL1	ADDITIONAL CNT FOR NEXT LINE
		158D	3629	DLPRTN EQU	*	ADDR OF RETURN PPL
158D 8080		158E	3630	DC	2AL1(@RETRN)	RETURN CARRIER PPL
		0001	3631	DLPPNT EQU	X'01'	LINE PRINTER CONTROL BYTE

DLPRNT -- LIST OUTPUT INTERFACE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 38
					3633		*****	
					3634		* THIS ROUTINE PRINTS THE CURRENT LINE IN THE CORRECT DIRECTION AND	
					3635		* SETS UP THE NEXT LINE CNT.	
					3636		*****	
				157D	3637		USING DLPBS2,@BR	NEW BASE VALUE
				158F	3638	DLPPRT	EQU *	ENTRY TO PRINT
158F	C2	01	157D		3639		LA DLPBS2,@BR	LOAD BASE REGISTER
1593	C0	87	0707		3640		B \$\$PRNT	WAIT FOR PRINTER READY
1597	057F			1598	3641		DC AL2(\$WAITF)	WAIT PPL
1599	3C	80	0476		3642		MVI \$CIMSK,@NOP	MASK IR FOR THIS FUNCTION
159D	4C	00	0D 03C0		3643		MVC DLPWTH(1,@BR),\$RMGRN	SET RIGHT MARGIN VALUE
15A2	4F	00	0D 03C1		3644		SLC DLPWTH(1,@BR),\$LMRGN	CALCULATE WIDTH
15A7	5C	00	0E 05		3645		MVC DLPNXT(1,@BR),DLPWK2+@PRCNT(,@BR)	SET NEXT LINE CNT
15AB	7C	00	0B		3646		MVI DLPRES(,@BR),@ZERO	ZERO RESIDUAL CNT
15AE	5D	00	01 0D		3647		CLC DLPWK1+@PRCNT(1,@BR),DLPWTH(,@BR)	CNT > WIDTH ?
15B2	F2	04	10		3648		JNH DLP540	JUMP IF NO
15B5	5C	00	0B 01		3649		MVC DLPRES(1,@BR),DLPWK1+@PRCNT(,@BR)	SAVE CNT
15B9	5F	00	0B 0D		3650		SLC DLPRES(1,@BR),DLPWTH(,@BR)	CALCULATE RESIDUAL CNT
15BD	5C	00	01 0B		3651		MVC DLPWK1+@PRCNT(1,@BR),DLPRES(,@BR)	SET CNT TO WIDTH
15C1	5C	00	0E 0B		3652		MVC DLPNXT(1,@BR),DLPRES(,@BR)	SET NEXT LINE CNT = RESIDUAL
15C5	0D	00	03C1 03C2		3653	DLP540	CLC \$LMRGN(1),\$PRPOS	ARE WE AT LEFT MARGIN ?
15CB	F2	01	19		3654		JNE DLPPRL	JUMP TO PRINT LEFT IF NOT
					3655	*		
					3656	*	SET UP FOR PRINT RIGHT OPERATION	
					3657	*		
15CE	5D	00	01 0E		3658		CLC DLPWK1+@PRCNT(1,@BR),DLPNXT(,@BR)	CNT > NEXT CNT ?
15D2	F2	02	24		3659		JNL DLP560	JUMP IF CURRENT CNT > NEXT CNT
					3660	*		* NEXT LINE
15D5	5C	00	01 0D		3661		MVC DLPWK1+@PRCNT(1,@BR),DLPWTH(,@BR)	SET CURRENT CNT TO MAX
15D9	5D	00	0E 0D		3662		CLC DLPNXT(1,@BR),DLPWTH(,@BR)	NEXT LINE LESS THAN WIDTH ?
15DD	F2	02	19		3663		JNL DLP560	JUMP IF NOT
15E0	5C	00	01 0E		3664		MVC DLPWK1+@PRCNT(1,@BR),DLPNXT(,@BR)	SET CURRENT CNT TO
					3665	*		* NEXT LINE CNT
15E4	F2	87	12		3666		J DLP560	GO DO PRINTING
					3667	*		
					3668	*	SET UP FOR PRINT LEFT OPERATION	
					3669	*		
				15E7	3670	DLPPRL	EQU *	ENTRY TO PRINT LEFT
15E7	3C	01	07CE		3671		MVI \$\$PSIO,DLPPNT	SET DPRINT FOR LINE MODE
15EB	4C	00	01 03C2		3672		MVC DLPWK1+@PRCNT(1,@BR),\$PRPOS	SET CURRENT PRINT POSITION
15F0	4F	00	01 03C1		3673		SLC DLPWK1+@PRCNT(1,@BR),\$LMRGN	GET RETURN PRINT CNT
15F5	5F	00	01 0A		3674		SLC DLPWK1+@PRCNT(1,@BR),DLPONE(,@BR)	SET UP FOR HARDWARE
					3675	*		
					3676	*	DO THE PRINT OPERATION	
					3677	*		
15F9	7C	40	00		3678	DLP560	MVI DLPWK1+@PCTRL(,@BR),@PRINT	SET NO CARRIER RETURN
					3679	*		* PRINT LENGTH = WIDTH
15FC	C0	87	0707		3680		B \$\$PRNT	GO PRINT THE LINE
1600	157D			1601	3681		DC AL2(DLPWK1)	PPL ADDR
1602	3C	00	07CE		3682		MVI \$\$PSIO,@ZERO	RESET SIO CTRL FOR NORMAL OPS
1606	3C	00	07E9		3683		MVI \$\$PCNT,@ZERO	SET DPRINT PPL CNT ZERO
160A	C0	87	0707		3684		B \$\$PRNT	INDEX A LINE
160E	1585			160F	3685		DC AL2(DLPNDX)	INDEX PPL ADDRESS
				149A	3686		USING DLPBSE,@BR	USE MAINLINE BASE VALUE
1610	C2	01	149A		3687		LA DLPBSE,@BR	RESTORE MAINLINE BR
1614	7D	00	EE		3688		CLI DLPRES(,@BR),@ZERO	ANY RESIDUAL DATA ?

DLPRNT -- LIST OUTPUT INTERFACE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 39
	1617	D0	81	A2	3689	BE	DLP440(,@BR)			EXIT TO MAINLINE IF NOT
					3690	*				
				157D	3691	USING	DLPBS2,@BR			USE PRINT BASE ADDR
161A	C2	01	157D		3692	LA	DLPBS2,@BR			SET BR
161E	7C	F4	0F		3693	MVI	DLPREM(,@BR),DLPBLN			SET REMAINDER TO BUF LENGTH
1621	5F	00	0F	0B	3694	SLC	DLPREM(1,@BR),DLPRES(,@BR)			GET REMAINDER FOR BLANK CNT
1625	C2	02	0EA4		3695	LA	DLIBUF,@XR			XR POINTS TO BUFFER
1629	74	02	B7		3696	ST	DLP580+@DOP2(,@BR),@XR			SET MOVE INSTR TO BUF ADDR
162C	5E	01	B7	0D	3697	ALC	DLP580+@DOP2(@CADDR,@BR),DLPWTH(,@BR)			POINT TO RESIDUAL
1630	8C	00	00	0000	3698	DLP580 MVC	0(1,@XR),*-*			MOVE A BYTE OF RESIDUAL DATA
1635	E2	02	01		3699	LA	1(,@XR),@XR			INCREMENT DATA POINTER
1638	5E	01	B7	0A	3700	ALC	DLP580+@DOP2(@CADDR,@BR),DLPONE(,@BR)			INCREMENT DATA ADDR
163C	5F	00	0B	0A	3701	SLC	DLPRES(1,@BR),DLPONE(,@BR)			DECREMENT RESIDUAL CNT
1640	D0	84	B3		3702	BH	DLP580(,@BR)			DO IT AGAIN TILL DONE
1643	BC	40	00		3703	DLP600 MVI	0(,@XR),@BLANK			SET REMAINING BLANKS
1646	E2	02	01		3704	LA	1(,@XR),@XR			INCREMENT
1649	5F	00	0F	0A	3705	SLC	DLPREM(1,@BR),DLPONE(,@BR)			REMAINDER ?
164D	D0	84	C6		3706	BH	DLP600(,@BR)			SET ANOTHER BLANK
1650	5C	00	01	0E	3707	MVC	DLPWK1+@PRCNT(1,@BR),DLPNXT(,@BR)			SET NEXT CNT
1654	D0	87	12		3708	B	DLPprt(,@BR)			GO FINISH LINE
				157D	3710	DLPBS2 EQU	DLPWK1			BASE VALUE FOR PRINT OP
				00F4	3711	DLPBLN EQU	244			LENGTH OF PRINT BUFFER

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 40
			3713		*****			
			3714	*	5703-XM1	COPYRIGHT IBM CORP. 1970		*
			3715	*		REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083		*
			3716	*				*
			3717		*****			
			3718	*	STATUS			*
			3719	*	VERSION 1 MODIFICATION 0			*
			3720	*				*
			3721	*	FUNCTION			*
			3722	*	* SDLIST WILL CONVERT THE CONTENTS OF THE WORK FILE FROM			*
			3723	*	INTERNAL FLOATING POINT REPRESENTATION TO THE 'SHORTEST'			*
			3724	*	EXTERNAL REPRESENTATION. THIS ROUTINE IS USED TO CONVERT			*
			3725	*	EITHER KEYBOARD OR PROGRAM GENERATED FILES FOR LISTING			*
			3726	*	PURPOSES.			*
			3727	*	* FOR LISTING PROGRAM GENERATED FILES, SDLIST ALSO WILL OUTPUT			*
			3728	*	THE FILE TO THE SPECIFIED OUTPUT DEVICE.			*
			3729	*	* CHARACTER STRINGS ARE ALSO OUTPUT VIA SDLIST.			*
			3730	*				*
			3731	*	ENTRY POINTS			*
			3732	*	SDLIST HAS TWO(2) ENTRY POINTS. ONE ENTRY POINT IS USED WHEN			*
			3733	*	THE WORK FILE CONTAINS A KEYBOARD DATA FILE.			*
			3734	*	B	SDLIST	CONVERT KEYBOARD DATA FILE	*
			3735	*				*
			3736	*	TO OUTPUT A PROGRAM GENERATED FILE, THE FOLLOWING ENTRY POINT			*
			3737	*	IS USED.			*
			3738	*	B	SDLPGM	OUTPUT PGD FILE	*
			3739	*				*
			3740	*	THE ENTIRE FILE WILL BE OUTPUT BY SDLIST			*
			3741	*	FOR PROGRAM GENERATED FILES THE CONSTANT SDLWID SHOULD			*
			3742	*	CONTAIN THE LOGICAL WIDTH			*
			3743	*				*
			3744	*	INPUT			*
			3745	*	* FOR KEYBOARD DATA FILES THE LINE TO SE CONVERTED MUST BE			*
			3746	*	AT THE ADDRESS POINTED BY GTTEXT			*
			3747	*	* FOR PROGRAM GENERATED FILES DL4ICS IS USED TO ACCESS EACH			*
			3748	*	SECTOR OF THE WORK FILE.			*
			3749	*				*
			3750	*	OUTPUT			*
			3751	*	* EACH CONVERTED LINE IS PLACED IN THE LOCATION POINTED TO BY			*
			3752	*	SDLBUF WHICH IS DEFINIED BY THE CALLING PROGRAM. FOR PGD'S			*
			3753	*	THE PROPER OUTPUT DEVICE IS DETERMINED AND DLPRNT (PRINTER OR			*
			3754	*	CRT) OR DCDOUT IS CALLED TO OUTPUT THE LINE.			*
			3755	*	XR1 AND XR2 ARE SAVED AND RESTORED.			*
			3756	*				*
			3757	*	EXTERNAL REFERENCES			*
			3758	*	* \$INDR1 - CHECK PRECISION OF WORK FILE & PGD INDICATOR			*
			3759	*	* \$XRSV - REGISTER STORAGE AREA			*
			3760	*				*
			3761	*	EXITS, NORMAL			*
			3762	*	CONTROL IS RETURNED TO THE BYTE FOLLOWING THE CALL TO SDLIST			*
			3763	*	IN THE CALLING PROGRAM			*
			3764	*				*
			3765	*	EXITS, ERROR			*
			3766	*	NONE			*
			3767	*				*
			3768	*	TABLES/WORKAREAS			*

SDLIST -- LIST DATA FILES

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE	41
		3769	*	NONE				*
		3770	*					*
		3771	*	*ATTRIBUTES				*
		3772	*	SDLIST IS REUSABLE				*
		3773	*					*
		3774	*	*CHARACTER CODE DEPENDENCY				*
		3775	*	N/A				*
		3776	*					*
		3777	*	*NOTES				*
		3778	*	ERROR PROCEDURES				*
		3779	*	NONE				*
		3780	*					*
		3781	*	REGISTER USAGE				*
		3782	*	XR1 IS USED AS A POINTER TO THE OUTPUT AREA				*
		3783	*	XR2 IS USED AS A POINTER TO THE INPUT AREA				*
		3784	*	- AS A BASE REGISTER				*
		3785	*					*
		3786	*	SAVED RESTORED AREA				*
		3787	*	NONE				*
		3788	*					*
		3789	*	MODIFICATION CONSIDERATIONS				*
		3790	*	NONE				*
		3791	*					*
		3792	*	REQUIRED MODULES				*
		3793	*	@SYSEQ - COMMON SYSTEM EQUATES				*
		3794	*	@FXDEQ - LOCATION OF INDICATORS WITHIN THE NUCLEUS				*
		3795	*	DCDOUT - CARD PUNCH IOCR				*
		3796	*	DLPRNT - CRT/PRINTER INTERFACE ROUTINE				*
		3797	*	C2DEC5 - BINARY TO DECIMAL CONVERSION ROUTINE				*
		3798	*					*
		3799	*	OTHER				*
		3800	*	N/A				*
		3801	*					*
		3802	*	*****				*

SDLIST -- LIST DATA FILES

ERR LOC		OBJECT CODE		ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00		04/06/21	PAGE	42
				1657	3804	SDLIST	EQU *					
1657	34	02	181A		3805		ST SDL089+@OP1,@XR			SAVE @XR		
165B	34	01	181E		3806		ST SDL090+@OP1,@BR			SAVE BASE RESISTER		
165F	34	08	1822		3807		ST SDL091+@OP1,@ARR			SAVE RETURN ADDRESS		
				1663	3808	SDL001	EQU *					
1663	3C	40	0705		3809		MVI SDLBUF+SDLEND,@BLANK			SET LAST FIELD TO BLANKS		
1667	0C	FE	0704	0705	3810		MVC SDLBUF+SDLED1(SDLMAX),SDLBUF+SDLEND			SET FIELD TO BLANKS		
166D	C2	02	118F		3811		LA GRLINE-1,@XR			BINARY LINE %UNSER		
1671	C0	87	141D		3812		B C2DEC5			CONVERT STATEMENT NUMBER		
1675	0C	03	060A	145B	3813		MVC SDLBUF+3(SDLFOR),C2DVAL			NOVE STATEMENT NUMBER		
167B	C2	01	060C		3814		LA SDLBUF+SDLLNG,@BR			POINTER TO OUTPUT AREA		
167F	C2	02	0C07		3815		LA SDLBF@,@XR			SET-UP INPUT ADRESS		

SDLIST -- LIST DATA FILES

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21		PAGE 43
			1683	3817	SDL005	EQU *	CHECK ALPHA OR FLOATING POINT		
1683	3C	00 19FA		3818		MVI SDLSMN,@ZERO	INIT MINUS SIGN IND OFF 1-5		
1687	B8	40 00		3819		TBN @ZERO(,@XR),SDLTYP	ALPHA DATA ? 1-5		
168A	C0	10 18D1		3820		BT SDL250	GO TO ALPHA OUTPUT 1-5		
168E	B8	10 00		3821		TBN @ZERO(,@XR),SDLMIN	MINUS SIGN ?		
1691	F2	90 0A		3822		JF SDL010	NO		
1694	3C	60 19FA		3823		MVI SDLSMN,@MINUS	SET ON MINUS SIGN INDICATOR		
1698	7C	60 00		3824		MVI @ZERO(,@BR),@MINUS	MOVE MINUS SIGN		
169B	D2	01 01		3825		LA @B1(,@BR),@BR	BUMP POINTER TO NEXT SPACE		
169E	38	02 03D4		3826	SDL010	TBN \$INDR1,\$PRESN	SHORT PRECISION ?		
16A2	3C	03 18A9		3827		MVI SDLCTR,SDLSRT-1	SET SHORT PREC CTR 1-3		
16A6	F2	90 04		3828		JF SDL025	IF SHORT, JUMP OVER LONG 1-3		
16A9	3C	07 18A9		3829		MVI SDLCTR,SDLONG-1	SET LONG PREC CTR 1-3		

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 44
				16AD	3831	SDL025	EQU *	
	16AD	34 01	18A3		3832		ST SDLSAV,@BR	SAVE BEGINNING ADDRESS
	16B1	68 03 00 00			3833		MVX 0(SDLNUM,@BR),0(,@XR)	MOVE FIRST DIGIT
	16B5	7A F0 00			3834		SBN 0(,@BR),SDLEBC	SET ZONE MASK
	16B8	D2 01 01			3835		LA @B1(,@BR),@BR	ADVANCE OUTPUT PRINTER
	16BB	3C 87 16CE			3836		MVI SDL035+@Q,@UCB	SET SW -- VALUE = ZERO
	16BF	B9 0F 00			3837		TBF 0(,@XR),SDLDZR	LEADING ZERO ?
	16C2	F2 10 04			3838		JT SDL030	JUMP IF YES
	16C5	3C 80 16CE			3839		MVI SDL035+@Q,@NOP	ELSE, SET -- VALUE = NOT ZERO
	16C9	C0 87 1823			3840	SDL030	B SDL100	GET NEXT CHARACTER
	16CD	F2 00 11			3841	SDL035	JC SDL037,*-*	JUMP IF VALUE = ZERO
	16D0	68 02 00 00			3842		MVX @ZERO(SDLZON,@BR),@ZERO(,@XR)	MOVE FIRST DIGIT
	16D4	68 03 01 00			3843		MVX @B1(SDLNUM,@BR),@ZERO(,@XR)	MOVE SECOND DIGIT
	16D8	7A F0 00			3844		SBN @ZERO(,@BR),SDLEBC	
	16DB	7A F0 01			3845		SBN @B1(,@BR),SDLEBC	TURN ON ZONE FOR DIGIT
	16DE	D2 01 02			3846		LA SDLTWO(,@BR),@BR	BUMP POINTER
	16E1	0F 00 18A9 18A7			3847	SDL037	SLC SDLCTR(@B1),SDLPL1	DECREMENT PRECISION COUNTER
	16E7	C0 01 16C9			3848		BNZ SDL030	NOT ZERO -- CONTINUE
	16EB	C0 87 1823			3849		B SDL100	BUMP @XR PAST EXPONENT
	16EF	3D 87 16CE			3850		CLI SDL035+@Q,@UCB	WAS VALUE OF THIS ITEM = ZERO ?
	16F3	F2 81 EB			3851		JE SDL066	YES -- EXIT
	16F6	2C 00 18A5 00			3852		MVC SDLEXP(1),0(,@XR)	MOVE EXPONENT
	16FB	36 01 18A1			3853	SDL040	A SDLMN1,@BR	REDUCE POINTER BY ONE
	16FF	7D F0 00			3854		CLI @ZERO(,@BR),SDLZRO	CHARACTER ZERO ?
	1702	F2 01 07			3855		JNE SDL050	NO -- EXIT
	1705	7C 40 00			3856		MVI @ZERO(,@BR),@BLANK	BLANK OUT ZERO
	1708	C0 87 16FB			3857		B SDL040	CONTINUE CHECKING

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 45
				170C	3859	SDL050	EQU *	
	170C	34 02	17E0		3860		ST SDL065+@OP1,@XR	SAVE INPUT POINTER
				17B1	3861		USING SDL060,@XR	INFORM ASSEMBLER
	1710	C2 02	17B1		3862		LA SDL060,@XR	SET UP BASE
	1714	D2 01	01		3863		LA @B1(,@BR),@BR	BUMP INPUT POINTER
	1717	B4 01	EB		3864		ST SDLLST(,@XR),@BR	SAVE ENDING ADDRESS
	171A	BC 87	0E		3865		MVI SDL062+@Q(,@XR),@UCB	ASSUME VALUE > 1
	171D	B4 01	03		3866		ST SDL060+@OP1(,@XR),@BR	ONE POSITION TO THE RIGHT
	1720	B4 01	05		3867		ST SDL060+@OP2(,@XR),@BR	SET UP SHIFT FROM POSITION
	1723	AF 00	05 F6		3868		SLC SDL060+@OP2(1,@XR),SDLPL1(,@XR)	REDUCE FOR MOVE
	1727	AC 01	09 F2		3869		MVC SDL061+@OP1(@CADDR,@XR),SDLSAV(,@XR)	SET POINT POSITION
	172B	AF 01	EB F2		3870		SLC SDLLST(@CADDR,@XR),SDLSAV(,@XR)	COMPUTE SIGNIFICANCE
	172F	AC 00	01 EB		3871		MVC SDL060+@Q(1,@XR),SDLLST(,@XR)	* OF DIGITS TO SHIFT
	1733	AF 00	01 F6		3872		SLC SDL060+@Q(1,@XR),SDLPL1(,@XR)	MANTISSE LENGTH
	1737	3D 80	18A5		3873		CLI SDLEXP,SDLC80	CHECK EXPONENT
	173B	F2 84	17		3874		JH SDL053	INTEGER AND FRANCTION

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 46
					3876	*	THIS CODE HANDLES FRACTIONS	7F 123000	.0123	
				173E	3877	SDL052	EQU *	VARIABLE LABEL		
173E	3C	80	18A9		3878		MVI SDLCTR,SDLC80			
1742	AF	00	F8 F4		3879		SLC SDLCTR(, @XR), SDLEXP(, @XR) COMPOTE EXCESS 10**0			
1746	AE	00	03 F8		3880		ALC SDL060+@OP1(1, @XR), SDLCTR(, @XR) INCREASE SHIFT			
174A	BC	80	0E		3881		MVI SDL062+@Q(, @XR), @NOP SET SWITCH			
174D	AC	00	F4 F8		3882		MVC SDLEXP(@B1, @XR), SDLCTR(, @XR) MOVE EXPONENT			
1751	C0	87	18BA		3883		B SDL200 GO CHECK PRECISION EXPONENT			
				1755	3884	SDL053	EQU *			
1755	AF	00	F4 F7		3885		SLC SDLEXP(, @XR), SDLMOD(, @XR) COMPUTE EXPONENT MODULO 80			
1759	AE	00	09 F4		3886		ALC SDL061+@OP1(1, @XR), SDLEXP(, @XR) * POSTION OF POINT			
				175D	3887	SDL054	EQU *			
175D	AF	00	01 F4		3888		SLC SDL060+@Q(1, @XR), SDLEXP(, @XR) * RIGHT FOR POINT			
1761	AD	00	EB F4		3889		CLC SDLLST(1, @XR), SDLEXP(, @XR) CHECK SIGNIFICANCE EXPONENT			
1765	F2	84	49		3890		JH SDL060 FIXED POINT			
1768	F2	81	72		3891		JE SDL065 INTEGER -- EXIT			
					3893		ALC SDLLST(@CADDR, @XR), SDLPL2(, @XR) COMPUTE CHOICE POINT			
176B	AE	01	EB EE		3894		CLC SDLLST(@B1), SDLEXP			
176F	0D	00	189C 18A5		3895		JNH SDL055			
1775	F2	04	09		3896		MVI @ZERO(, @BR), SDLZRO SET LOW ORDER ZERO			
177B	D2	01	01		3897		LA 1(, @BR), @BR ADJUST OUTPUT POINTER			
177E	F2	87	5C		3898		J SDL065 EXIT			
					3900	SDL055	MVI @ZERO(, @BR), SDLEXE MOVE E VALUE			
1784	AF	00	F4 EB		3901		SLC SDLEXP(, @XR), SDLLST(, @XR) COMPUTE EXPONENT			
1788	AE	00	F4 EE		3902		ALC SDLEXP(, @XR), SDLPL2(, @XR) ADJUST			
178C	C2	02	18A4		3903	SDL056	LA SDLCON, @XR SET UP INPUT			
1790	C0	87	141D		3904		B C2DEC5 CONVERT TO EBCDIC			
1794	3D	F0	145A		3905		CLI C2DVAL-1, SDLZRO ZERO ?			
1798	F2	81	0B		3906		JE SDL057			
179B	4C	01	02 145B		3907		MVC SDLTWO(@CADDR, @BR), C2DVAL MOVE 2 DIGITS			
17A0	D2	01	03		3908		LA SDLTHR(, @BR), @BR BUMP TO LAST ENTRY			
17A3	F2	87	37		3909		J SDL065 EXIT			
					3911	SDL057	MVC @B1(@B1, @BR), C2DVAL MOVE 1 DIGIT			
17AB	D2	01	02		3912		LA SDLTWO(, @BR), @BR BUMP TO LAST ENTRY			
17AE	F2	87	2C		3913		J SDL065 EXIT			

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 47
	17B1	0C	00	0000	0000	3915	SDL060 MVC	*-*(@VQ), *-*		SHIFT RIGHT
	17B7	3C	4B	0000		3916	SDL061 MVI	*-*,SDLPNT		SET DECIMAL POINT
	17BB	D2	01	01		3917	LA	1(,@BR),@BR		INCREMENT POINTER
	17BE	F2	00	1C		3918	SDL062 JC	SDL065, *-*		GREATER THAN ONE -- JUMP
	17C1	B5	01	09		3919	L	SDL061+@OP1(,@XR),@BR		PICK UP BEGIN ADDRESS
	17C4	D2	01	01		3920	SDL063 LA	@B1(,@BR),@BR		BUMP TO NEXT POSITION
	17C7	BD	00	F4		3921	CLI	SDLEXP(,@XR),@ZERO		HAVE ENOUGH 0 BEEN INSERTED ?
	17CA	F2	81	0A		3922	JE	SDL064		YES -- EXIT
	17CD	7C	F0	00		3923	MVI	0(,@BR),SDLZRO		SET ZERO
	17D0	AF	00	F4 F6		3924	SLC	SDLEXP(,@XR),SDLPL1(,@XR)		REDUCE EXPONENT
	17D4	E0	87	13		3925	B	SDL063(,@XR)		CONTINUE
	17D7	B5	01	03		3926	SDL064 L	SDL060+@OP1(,@XR),@BR		GET TO END OF DATA
	17DA	D2	01	01		3927	LA	1(,@BR),@BR		BUMP TO BLANK
	17DD	C2	02	0000		3928	SDL065 LA	*-*,@XR		RESTORE INPUT POINTER
					17E1	3929	SDL066 EQU	*		
	17E1	38	20	03D4		3930	TBN	\$INDR1,\$PGMDT		PROGRAM GENERATED ?
	17E5	C0	10	1958		3931	BT	SDL300		YES -- GO OUTPUT
	17E9	34	02	03C7		3932	ST	\$XRSAB,@XR		SAVE POINTER FOR TEST
	17ED	0D	00	03C7 13B5		3933	CLC	\$XRSAB,GRTEND		END OF LINE ?
	17F3	F2	82	08		3934	JL	SDL075		CONTINUE EXECUTION
	17F6	34	01	18A3		3935	ST	SDLSAB,@BR		CURRENT POINTER
	17FA	C0	87	1817		3936	B	SDL089		EXIT
					17FE	3937	SDL075 EQU	*		
	17FE	7C	6B	00		3938	MVI	@ZERO(,@BR),@COMMA		MOVE COMMA TO OUTPUT FIELD
	1801	D2	01	01		3939	LA	@B1(,@BR),@BR		BUMP OUTPUT POINTER
	1804	34	01	18A3		3940	ST	SDLSAB,@BR		SAVE ADDRESS
	1808	C0	87	1823		3941	B	SDL100		GET NEXT CHARACTER
	180C	C0	87	1683		3942	B	SDL005		CHECK TYPE OF DATA
	1810	7C	F0	00		3943	SDL080 MVI	@ZERO(,@BR),SDLZRO		SET TO ZERO
	1813	C0	87	17E1		3944	B	SDL066		CONTINUE OUTPUT
	1817	C2	02	0000		3946	SDL089 LA	*-*,@XR		RESTORE @XR
	181B	C2	01	0000		3947	SDL090 LA	*-*,@BR		RESTORE BASE REGISTER
	181F	C0	87	0000		3948	SDL091 B	*-*		RETURN

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 48
				1823	3950	SDL100	EQU *			GET NEXT CHARACTER
	1823	34 08	1868		3951		ST SDL105+@OP1,@ARR			SAVE RETURN ADDRESS
	1827	E2 02	01		3952		LA @B1(,@XR),@XR			INCREMENT POINTER
	182A	34 02	03C7		3953		ST \$XRSAV,@XR			SAVE CURRENT POINTER
	182E	0F 01	03C7 18AB		3954		SLC \$XRSAV,SDLED@(@CADDR)			COMPUTE CURRENT BUFFER LENGTH
	1834	F2 01	2E		3955		JNZ SDL105			END OF BUFFER ?
	1837	C0 87	1200		3956		B DL4ICS			RETRIEVE DISK BLOCK
	183B	18B2		183C	3957		DC AL2(SDLDPL)			ADDRESS OF DPL
	183D	C0 87	0025		3958		B \$DISKN			SO ISSUE WAIT
	1841	057F		1842	3959		DC AL2(\$WAITF)			WAIT FUNCTION
	1843	C2 02	1B00		3960		LA GFIBF1,@XR			INPUT POINTER
	1847	0E 00	18B4 18A7		3961		ALC SDLDPL+@DSAD(1),SDLPL1			BUMP SECTOR COUNT
	184D	38 20	03D4		3962	SDL102	TBN \$INDR1,\$PGMDT			PROGRAM GENERATED ? 1-2
	1851	F2 90	11		3963		JF SDL105			IF NOT, JUMP OVER EOS CHECK 1-2
	1854	BD 1C	00		3964		CLI 0(,@XR),@EOF			IS FIRST BYTE EOF ? 1-2
	1857	F2 01	0B		3965		JNE SDL105			IF NOT, JUMP TO CONTINUE 1-2
	185A	36 01	18A1		3966		A SDLMN1,@BR			DECR POINTER OVER COMMA 1-2
	185E	BC 1C	01		3967		MVI 1(,@XR),@EOF			SET NEXT BYTE TO EOF ALSO 1-2
	1861	C0 00	1958		3968	SDL104	BC SDL300,*-*			GO OUTPUT -- FINISHED 1-3
	1862				3969		ORG SDL104+@Q			INIT 1-3
	1862	80		1862	3970		DC AL1(@NOP)			* TO NOP 1-3
	1865				3971		ORG *+2			1-3
	1865	C0 87	0000		3972	SDL105	B *-*			RETURN

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 49
				1869	3974	SDL150	EQU *			SDLIST OUTPUT INTERFACE
1869	34	08	189A		3975		ST SDL180+@OP1,@ARR			SAVE RETURN ADDRESS
186D	3D	02	0D57		3976		CLI KLIDVT,KLIMK1			CARD OUTPUT ONLY ?
1871	F2	81	0D		3977		JE SDL170			YES, GO PUNCH CARDS
1874	C0	87	1461		3978		B DLPRNT			PRINTER -- CRT INTERFACE
1878	18AE			1879	3979		DC AL2(SDLPPL)			PRINTER PARAMETER LIST
187A	38	02	0D57		3980	SDL160	TBN KLIDVT,KLIMK1			CARD OUTPUT ?
187E	F2	90	16		3981		JF SDL180			NO -- CONTINUE
1881	C0	87	0920		3982	SDL170	B DCDOUT			GO OUTPUT CARD
1885	18AE			1886	3983		DC AL2(SDLPPL)			PRINT PARAMETER LIST
1887	C0	87	0920		3984		B DCDOUT			ISSUE WAIT FUNCTION
188B	057F			188C	3985		DC AL(@CADDR)(\$WAITF)			WAIT FUNCTION ADDRESS
188D	3C	40	0666		3986		MVI SDLBUF+KLICWD-1,@BLANK			SET BUFFER TO BLANKS - ONLY IF
1891	0C	5D	0665	0666	3987		MVC SDLBUF+KLICWD-2,SDLBUF+KLICWD-1(KLICWD-2) *			PUNCHING
1897	C0	87	0000		3988	SDL180	B *-*			RETURN

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 50
	189B		189C	3990	SDLLST DS	CL2	SAVE AREA FOR LENGTH
	189D		189D	3991	SDLACT DS	CL1	COUNT OF ALPHA CHARACTERS
	189E	0002	189F	3992	SDLPL2 DC	IL2'2'	PLUS 2
	18A0	FFFF	18A1	3993	SDLMN1 DC	IL2'-1'	MINUS ONE
	18A2		18A3	3994	SDLSAV DS	CL2	BEGINNING OF DATA
	18A4	00	18A4	3995	SDLCON DC	IL1'0'	HEADER FOR EXPONENT
	18A5		18A5	3996	SDLEXP DS	CL1	EXPONENT
	18A6	0001	18A7	3997	SDLPL1 DC	IL2'1'	PLUS ONE
	18A8	80	18A8	3998	SDLMOD DC	XL1'80'	MODULO FOR EXPONENT
	18A9		18A9	3999	SDLCTR DS	CL1	PRECISION INDICATOR
	18AA	1C00	18AB	4000	SDLED@ DC	AL(@CADDR)(GFIBF1+256)	END OF BUFFER (PGD)
	18AC	0607	18AD	4001	SDLOT@ DC	AL2(SDLBUF)	ADDRESS OF OUTPUT BUFFER
			00FD	4002	SDLED1 EQU	253	
			00FE	4003	SDLEND EQU	254	
			0012	4004	SDLC18 EQU	18	MAXIMUM COUNT
			007D	4005	SDLQUO EQU	X'7D'	QUOTE
			0C07	4006	SDLBF@ EQU	GRTEXT	LINE BUFFER ADDRESS
			0004	4007	SDLSRT EQU	4	SHORT PRECISION LENGN
			0010	4008	SDLMIN EQU	X'10'	STATUS BYTE MINUS SIGN
			0002	4009	SDLZON EQU	02	ZONE TO NUMERIC
			0006	4010	SDLBEG EQU	6	LENGTH OF SDF INFO
			0003	4011	SDLNUM EQU	03	NUMERIC TO NUMERIC
			00F0	4012	SDLEBC EQU	X'F0'	ZONED DECIMAL REPRESENTATION
			0002	4013	SDLTWO EQU	2	INCREMENT
			0008	4014	SDLONG EQU	8	LONG PRECISION
			000F	4015	SDLDZR EQU	X'0F'	MASK FOR LEADING ZERO
			00F0	4016	SDLZRO EQU	X'F0'	BITS OFF INDICATE ZERO DIGIT
			004B	4017	SDLPNT EQU	C'.'	DECIMAL POINT
			00C5	4018	SDLEXE EQU	C'E'	EXPONENT
			0003	4019	SDLTHR EQU	3	DISPLACEMENT OF THREE
			0080	4020	SDLC80 EQU	X'80'	10**0
			0004	4021	SDLFOR EQU	4	DISPLACEMENT OF FOUR
			00FF	4022	SDLMAX EQU	255	MAXIMUM LINE SIZE
			0005	4023	SDLLNG EQU	5	LENGTH OF SDF INFO
			0040	4024	SDLTYP EQU	X'40'	ALPHA INDICATOR
			0007	4025	SDLLNE EQU	7	BYPASS SDF INFO ET AL
			4026	*			
			4027	*DLPPL \$PPL	FUNC-@PRETR,CADDR-SDLBUF		
	18AE	C0	18AE	4028+	SDLPPL EQU	*	PRINTER PARAMETER LIST
	18AF	00	18AF	4029+	DC	AL1(@PRETR)	REQUESTED FUNCTION
	18B0	0607	18AF	4030+	DC	AL1(*-*)	SECTOR COUNT
			18B1	4031+	DC	AL2(SDLBUF)	DATA ADDRESS
			4032+	***	END OF EXPANSION ***		
			4033	*			
			4034	*DLDPL \$DPL	FUNC-@DGET,DADDR-@WSTBL,CNT-SDLONE,CADDR-GFIBF1		
	18B2	01	18B2	4035+	SDLDPL EQU	*	DISK PARAMETER LIST
	18B3	0503	18B2	4036+	DC	AL1(@DGET)	REQUESTED FUNCTION
	18B5	01	18B4	4037+	DC	AL2(@WSTBL)	DISK ADDRESS
	18B6	1B00	18B5	4038+	DC	AL1(SDLONE)	SECTOR COUNT
			18B7	4039+	DC	AL2(GFIBF1)	BUFFER ADDRESS
			4040+	***	END OF EXPANSION ***		
			4041	*			
	18B8		0001	4042	SDLONE EQU	1	ONE
	18B8		18B9	4043	SDLWID DS	CL2	LOGICAL WIDTH
	18B8			4044	ORG	*-2	RESET LOCATION COUNTER
	18B8	0040	18B9	4045	DC	IL2'64'	INITIALIZE

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE	51
	18BA	BD	02 F4	4047	SDL200	CLI	SDLEXP(,@XR),SDLTWO				EXP > TWO(2) = FLOATING
	18BD	E0	04 00	4048		BNH	SDL060(,@XR)				CHOOSE FIXED
	18C0	7C	C5 00	4049		MVI	0(,@BR),SDLEXE				SET EXPONENT
	18C3	7C	60 01	4050		MVI	1(,@BR),C'-'				SET MINUS SIGN
	18C6	AE	00 F4 EB	4051		ALC	SDLEXP(,@XR),SDLLST(,@XR)				VALUE FOR PRINTING
	18CA	D2	01 01	4052		LA	1(,@BR),@BR				PTR = PTR + 1;
	18CD	C0	87 178C	4053		B	SDL056				CONTINUE --

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 52
				18D1	4055	SDL250	EQU *			OUTPUT ALPHA STRING
18D1	3C	12	189D		4056		MVI SDLACT,SDLC18			SET MAXIMUM LIMIT
					4057	*	@BR - POINTS TO OUTPUT AREA			
					4058	*	@XR - POINTS TO INPUT LINE BUFFER			
					4059	*				
18D5	7C	7D	00		4060		MVI @ZERO(,@BR),SDLQUO			MOVE BEGINNING QUOTE
18D8	D2	01	01		4061		LA @B1(,@BR),@BR			POINTER + 1 --> POINTER
18DB	34	01	1924		4062		ST SDL270+@OP1,@BR			SAVE CURRENT LOCATION
18DF	C0	87	1823		4063	SDL251	B SDL100			GET NEXT CHARACTER
18E3	BD	40	00		4064		CLI @ZERO(,@XR),@BLANK			CHARACTER BLANK ?
18E6	F2	01	3F		4065		JNE SDL280			NO
18E9	7C	40	00		4066		MVI @ZERO(,@BR),@BLANK			MOVE A BLANK TO BUFFER
18EC	D2	01	01		4067		LA @B1(,@BR),@BR			POINTER + 1 --> POINTER
18EF	0F	00	189D 18A7		4068		SLC SDLACT(@B1),SDLPL1			DECREMENT COUNT
18F5	F2	81	29		4069		JZ SDL270			EXIT
18F8	C0	87	18DF		4070		B SDL251			CONTINUE
18FC	C0	87	1823		4071	SDL255	B SDL100			AT NEXT CHARACTER
1900	BD	40	00		4072		CLI @ZERO(,@XR),@BLANK			CHARACTER BLANK
1903	F2	01	22		4073		JNE SDL280			LEAVE SWITCH ON
1906	F2	00	08		4074	SDL256	JC SDL257,*-*			SWITCH
1909	34	01	1924		4075		ST SDL270+@OP1,@BR			SAVE CURRENT ADDRESS
190D	3C	87	1907		4076		MVI SDL256+@Q,@UCB			SET SWITCH ON
1911	7C	40	00		4077	SDL257	MVI @ZERO(,@BR),@BLANK			MOVE A BLANK TO BUFFER
1914	D2	01	01		4078		LA @B1(,@BR),@BR			POINTER + 1 --> POINTER
1917	0F	00	189D 18A7		4079		SLC SDLACT(@B1),SDLPL1			DECREMENT COUNT
191D	C0	01	18FC		4080		BNZ SDL255			CONTINUE
1921	C2	01	0000		4081	SDL270	LA *-*,@BR			RESTORE POINTER
1925	F2	87	25		4082		J SDL285			GO TO WINDUP
				1928	4083	SDL280	EQU *			
1928	3C	80	1907		4084		MVI SDL256+@Q,@NOP			TURN SWITCH FOR OFR
192C	6C	00	00 00		4085		MVC @ZERO(@B1,@BR),@ZERO(,@XR)			MOVE CHARACTER TO OUTPUT
1930	D2	01	01		4086		LA @B1(,@BR),@BR			BUMP POINTER
1933	0F	00	189D 18A7		4087		SLC SDLACT(@B1),SDLPL1			DECREMENT COUNT
1939	BD	7D	00		4088		CLI @ZERO(,@XR),SDLQUO			CHARACTER QUOTE ?
193C	F2	01	06		4089		JNE SDL281			NO --
193F	7C	7D	00		4090		MVI @ZERO(,@B1),SDLQUO			MOVE QUOTE
1942	D2	01	01		4091		LA @B1(,@BR),@BR			BUMP POINTER
1945	3D	00	189D		4092	SDL281	CLI SDLACT,@ZERO			COUNT EQUAL ZERO ?
1949	C0	01	18FC		4093		BNE SDL255			NO -- CONTINUE
194D	7C	7D	00		4094	SDL285	MVI @ZERO(,@BR),SDLQUO			MOVE ENDING QUOTE
1950	D2	01	01		4095		LA @B1(,@BR),@BR			BUMP COUNTER
1953	C0	87	17E1		4096		B SDL066			GO CHECK FILE TYPE

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 53
				4098	*			
				4099	*		PROGRAM GENERATED FILES	
				4100	*			
1957				1957	4101	DS	CL1	EOS FOR SLLINE
				1958	4102	SDL300 EQU	*	HANDLE OUT PGM GENERATED LINE
1958	34	01	19FC		4103	ST	SDLWRK,@BR	SAVE CURRENT POSITION
195C	0F	01	19FC 18AD		4104	SLC	SDLWRK(@CADDR),SDLOT@	COMPUTE CURRENT LENGTH
1962	0D	01	19FC 18B9		4105	CLC	SDLWRK(@CADDR),SDLWID	GREATER THAN LOGICAL WIDTH ?
1968	F2	04	4A		4106	JNH	SDL340	CONTINUE -- CONVERSION
196B	34	01	19FC		4107	ST	SDLWRK,@BR	COMPUTE CURRENT POSITION
196F	3D	00	19FA		4108	CLI	SDLSMN,@ZERO	MINUS SIGN INDICATOR ON ?
1973	F2	81	06		4109	JE	SDL305	NO -- GO COMPUTE LENGTH
1976	0E	00	19FC 18A7		4110	ALC	SDLWRK(1),SDLPL1	INCR NUMBER OF PLACES BY ONE
197C	0F	01	19FC 18A3		4111	SDL305 SLC	SDLWRK(@CADDR),SDLSAV	COMPUTE LENGTH
1982	0C	00	1995 19FC		4112	MVC	SDL310+@Q(1),SDLWRK	SET-UP LENGTH
1988	0C	00	19B1 19FC		4113	MVC	SDL330+@Q(1),SDLWRK	*
198E	0C	00	19A1 19FC		4114	MVC	SDL320+@Q(1),SDLWRK	SET UP LENGTH
1994	1C	00	12D9 00		4115	SDL310 MVC	SDLHLD(1),0(,@BR)	MOVE OVERFLOW
1999	36	01	18A1		4116	A	SDLMN1,@BR	DECREMENT POINTER
199D	7C	40	01		4117	MVI	1(,@BR),@BLANK	SET BLANK
19A0	5C	00	00 01		4118	SDL320 MVC	0(@VQ,@BR),1(,@BR)	SET FIELD TO BLANKS
19A4	C0	87	1869		4119	B	SDL150	OUTPUT LINE
19A8	C2	01	0607		4120	LA	SDLBUF,@BR	BEGINNING OF BUFFER
19AC	36	01	19FC		4121	A	SDLWRK,@BR	INDEX INTO BUFFER
19B0	4C	00	00 12D9		4122	SDL330 MVC	0(@VQ,@BR),SDLHLD	MOVE FIELD TO BUFFER
19B5	BD	1C	01		4123	SDL340 CLI	1(,@XR),@EOF	END OF FILE ?
19B8	C0	01	17FE		4124	BNE	SDL075	NO -- CONTINUE
19BC	0C	00	18AF 19FC		4125	MVC	SDLPPL+@PRCNT,SDLWRK	SET PPL LENGTH
19C2	C0	87	1869		4126	B	SDL150	OUTPUT DATA
19C6	C0	87	1817		4127	B	SDL089	EXIT --
				19CA	4128	SDLPGM EQU	*	PGM DATA FILE ENTRY POINT
19CA	34	08	1822		4129	ST	SDL091+@OP1,@ARR	SAVE RETURN ADDRESS
19CE	C2	02	1BFF		4130	LA	GFIBF1+255,@XR	INITIALIZATION VALUE
19D2	C0	87	1823		4131	B	SDL100	INITIALIZE BUFFER
19D6	3C	87	1862		4132	MVI	SDL104+@Q,@UCB	SET BC AFTER FIRST TIME 1-3
19DA	3C	00	1C00		4133	MVI	GFIBF1+@SCTS@ZERO	SET BUFFER END + 1 = 0 1-3
19DE	BD	1C	00		4134	CLI	@ZERO(,@XR),@EOF	TEST FOR AN EMPTY FILE ?
19E1	F2	01	08		4135	JNE	SDL345	BR IF NOT EMPTY FILE
19E4	3C	2F	03CD		4136	MVI	\$CAERR,@E226	SET EMPTY FILE ERROR MSG #
19E8	C0	87	0469		4137	B	\$CAERK	BR TO ERROR ROUTINE
19EC	C2	01	0607		4138	SDL345 LA	SDLBUF,@BR	SET-UP OUTPUT ADDRESS
19F0	0C	00	18AF 18B9		4139	MVC	SDLPPL+@PRCNT,SDLWID	SET FINAL WIDTH
19F6	C0	87	1683		4140	B	SDL005	GO -- CONTINUE
				12D9	4142	SDLHLD EQU	GRABIT+90	LINE OVERFLOW AREA
19FA				19FA	4143	SDLSMN DS	XL1	IND FOR MINUS SIGN, X'60' --> ON
19FB				19FC	4144	SDLWRK DS	CL2	COMPUTED LINE LENGTH

SDLIST -- LIST DATA FILES

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 54
4146				*****			
4147	*	5703-XM1		COPYRIGHT IBM CORP. 1970			*
4148	*			REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083			*
4149	*						*
4150				*****			
4151	*			*STATUS			*
4152	*			VERSION 1 MODIFICATION 0			*
4153	*						*
4154	*			*FUNCTION			*
4155	*			SCKOUT, ENTERED AT SCKOUT, WILL CHECK THE NEXT PARAMETER FOR THE			*
4156	*			'CRT' OR 'PRINTER' PARAMETER AND SET THE APPROPRIATE INDICATORS			*
4157	*			FOR DLPRNT. SCKOUT, ENTERED AT SCKDEV, WILL TEST THE NUCLEUS			*
4158	*			INDICATORS FOR THE SPECIFIED OUTPUT DEVICE AND, IF NO ERRORS ARE			*
4159	*			FOUND, WILL RETURN TO THE USER WITH THE APPROPRIATE OUTPUT DEVICE			*
4160	*			READY.			*
4161	*						*
4162	*			*ENTRY POINTS			*
4163	*			SCKOUT HAS THE FOLLOWING TWO ENTRY POINTS:			*
4164	*			* SCKOUT - ENTRY TO CHECK THE NEXT PARAMETER FOR THE 'CRT' OR			*
4165	*			'PRINTER' SPECIFICATION			*
4166	*			* SCKDEV - ENTRY TO CHECK AND MAKE READY THE SPECIFIED OUTPUT			*
4167	*			DEVICE.			*
4168	*						*
4169	*			*INPUT			*
4170	*			INPUT TO SCKOUT (ENTRY POINT SCKOUT) IS THE INPUT LINE BUFF WITH			*
4171	*			@XR POINTING TO THE FIRST CHARACTER TO BE TESTED. THERE IS NO			*
4172	*			INPUT TO SCKOUT AT ENTRY POINT SCKDEV.			*
4173	*						*
4174	*			*OUTPUT			*
4175	*			THERE IS NO OUTPUT FROM SCKOUT.			*
4176	*						*
4177	*			*EXTERNAL REFERENCES			*
4178	*			* SCANIT - ENTRY TO DELIMITER SCAN ROUTINE			*
4179	*			* SCAMMA - SCANIT INDICATOR SET TO ALLOW A COMMA			*
4180	*			* \$CAERR - ERROR CODE SAVE AREA			*
4181	*			* \$CAERK - EXIT TO LOAD #ERRPG, THE ERROR PROGRAM			*
4182	*			* DLPTYP - DLPRNT INDICATOR FOR OUTPUT DEVICE			*
4183	*			* \$IOIND - NUCLEUS INDICATOR WHICH TELLS WHETHER OR NOT THE			*
4184	*			PRINTER IS DOWN (\$MPDWN) AND WHETHER OR NOT THE CRT IS PRESENT			*
4185	*			ON THE SYSTEM (\$CRTAV), AND CONTAINS THE COMMAND KEYS ONLY IND			*
4186	*			* \$KEYCD - NUCLEUS INDICATOR TO GIVE INPUT MODE			*
4187	*			* \$CRTIN - NUCLEUS INDICATOR CONCERNING CRT			*
4188	*			* \$EXFTR - CORE EXPANSION FACTOR			*
4189	*			* \$\$PYCD - ENTRY TO CLEAR CRT AND LIGHT COMMAND INDICATORS			*
4190	*			* \$\$PRES - ENTRY TO ENABLE KEYBOARD TO DEPRESS			*
4191	*						*
4192	*			*EXIT, NORMAL			*
4193	*			NORMAL EXIT FROM SCKOUT (AT BOTH ENTRY POINTS) IS TO THE BYTE			*
4194	*			FOLLOWING THE BRANCH TO SCKOUT OR SCKDEV. UPON EXIT FROM SCKOUT,			*
4195	*			THE PSR WILL BE SET HIGH TO INDICATE A VALID PARAMETER AND ZERO			*
4196	*			TO INDICATE THAT NEITHER 'CRT' NOR 'PRINTER' WAS FOUND. IF			*
4197	*			SCKDEV RETURNS TO THE BYTE FOLLOWING THE BRANCH, THIS INDICATES			*
4198	*			THAT NO ERRORS ARE ENCOUNTERED.			*
4199	*						*
4200	*			*EXIT, ERROR			*
4201	*			ERROR EXIT FROM SCKOUT (ENTRY POINT SCKOUT) IS TO THE BYTE			*

SDLIST -- LIST DATA FILES

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 04/06/21 PAGE 55
4202	*			FOLLOWING THE BRANCH TO SCKOUT, WITH THE ERR CODE SET IN \$CAERR,	*
4203	*			THE PSR SET LOW, AND @XR POINTING TO THE FIRST INVALID CHARACTER.	*
4204	*			ERROR EXIT FROM SCKOUT (ENTRY PT SCKDEV) IS TO THE USER-DEFINED	*
4205	*			LABEL, \$CKERR, WITH THE ERROR CODE SET IN \$CAERR AND @XR POINTS	*
4206	*			OUTSIDE THE INPUT LINE BUFFER (USER VALUE DESTROYED).	*
4207	*				*
4208	*			*TABLES/WORKAREAS	*
4209	*			NONE	*
4210	*				*
4211	*			*ATTRIBUTES	*
4212	*			RELOCATABLE AND RE-ENTERABLE	*
4213	*				*
4214	*			*CHARACTER CODE DEPENDENCY	*
4215	*			NONE	*
4216	*				*
4217	*			*NOTES	*
4218	*			ERROR PROCEDURES	*
4219	*			UPON DETECTING AN ERROR, SCKOUT SETS THE APPROPRIATE ERR CODE	*
4220	*			IN \$CAERR AND RETURNS EITHER TO THE BYTE FOLLOWING THE BRANCH	*
4221	*			TO SCKOUT OR TO THE USER-DEFINED LABEL, \$CKERR.	*
4222	*				*
4223	*			REGISTER USAGE	*
4224	*			REGISTER 2 (@XR) IS USED TO SCAN ACROSS THE INPUT LINE BUFFER.	*
4225	*			REGISTER 4 (@PSR) IS SET TO INDICATE THE CONDITION FOUND IN	*
4226	*			SCKOUT (ENTRY POINT SCKOUT).	*
4227	*				*
4228	*			SAVED/RESTORED AREAS	*
4229	*			NONE	*
4230	*				*
4231	*			MODIFICATION CONSIDERATIONS	*
4232	*			NONE	*
4233	*				*
4234	*			REQUIRED MODULES	*
4235	*			* @SYSEQ - COMMON SYSTEM EQUATES	*
4236	*			* @FXDEQ - FIXED CORE LOCATIONS INSIDE NUCLEUS	*
4237	*			* @ERMEQ - ERROR MESSAGE EQUATES (SELECTED ERROR CODES)	*
4238	*			* @CANEQ - FIXED CORE LOCATIONS OUTSIDE NUCLEUS	*
4239	*			* \$CANIT - DELIMITER SCAN ROUTINE	*
4240	*			* DLPNT - ROUTINE TO PRINT THE CURRENT LINE	*
4241	*				*
4242	*			OTHER	*
4243	*			NONE	*
4244	*				*
4245	*			*****	*

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 56
				19FD	4247	SCKOUT	EQU *			BEGINNING OF SCKOUT SUBROUTINE
	19FD	34	08	1A90	4248	ST	SCK460+@OP1,@ARR			SAVE RETURN ADDRESS
	1A01	34	02	1A84	4249	ST	SCK440+@OP1,@XR			SAVE XR POINTER
	1A05	3C	01	1C7E	4250	MVI	SCAMMA,SCACOM			SET SCANIT INDR TO ALLOW COMMA
				4251	*					
				4252	*		TEST FOR 'CRT' OR 'PRINTER'			
				4253	*					
	1A09	8D	02	02	1A93	4254	CLC	SCK001-1(SCK001,@XR),SCKCCR	IS 'CRT' SPECIFIFD ?	
	1A0E	F2	81	0F	4255	JE	SCK100		YES, PROCESS CRT PARAMETER	
				4256	*					
	1A11	8D	06	06	1A9A	4257	CLC	SCK002-1(SCK002,@XR),SCKCMP	IS 'PRINTER' SPECIFIED ?	
	1A16	F2	81	11	4258	JE	SCK150		YES, PROCESS 'PRINTER' PARAM	
				4259	*					
				4260	*		NEITHER CRT NOR PRINTER SPECIFIED			
				4261	*					
	1A19	35	04	1A9C	4262	L	SCK003,@PSR		SET PSR TO BRANCH ZERO	
	1A1D	F2	87	69	4263	J	SCK450		BRANCH TO RETURN	
				4264	*					
				4265	*		CALL SCANIT AND CHECK DELIMITER AFTER PARAM			
				4266	*					
	1A20	3C	87	1A3F	4267	SCK100	MVI	SCK300+@Q,@UCB	SET SW TO PROCESS 'CRT'	
	1A24	E2	02	03	4268	LA	SCK001(,@XR),@XR		INDR XR PAST 'CRT'	
	1A27	F2	87	03	4269	J	SCK200		JUMP TO CALL SCANIT	
				4270	*					
	1A2A	E2	02	07	4271	SCK150	LA	SCK002(,@XR),@XR	INCR XR PAST 'PRINTER'	
				4272	*					
	1A2D	C0	87	1C61	4273	SCK200	B	SCANIT	BYPASS BLANKS AND A COMMA	
	1A31	C0	82	0469	4274	BL	\$CAERK		CALL ERR PROG IF DANGLING COMMA	
	1A35	F2	84	06	4275	JH	SCK300		IF CHARS SCANNED, SET DLPRNT SW	
				4276	*					
	1A38	BD	1E	00	4277	CLI	@ZERO(,@XR),@EOS		ELSE, IS PARAM FOLLOWED BY EOS ?	
	1A3B	F2	01	31	4278	JNE	SCK410		NO, SET 'INV PARAM' ERROR	
				4279	*					
	1A3E	F2	80	15	4280	SCK300	JC	SCK350,@NOP	NOP IF PRINTER -- UCB IF CRT	

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 57
				4282	*					
				4283	*		PRINTER SPECIFIED			
				4284	*					
1A41	3D	1B	148B	4285		CLI	DLPTYP,DLPCRT			WAS CRT SPECIFIED BEFORE ?
1A45	F2	81	2E	4286		JE	SCK420			YES, SET 'CONFLICTING PARAM' ERR
				4287	*					
1A48	3D	85	148B	4288		CLI	DLPTYP,DLPMPR			WAS PRINTER SPECIFIED BEFORE ?
1A4C	F2	81	2E	4289		JE	SCK430			YES, SET 'DUPLICATING PARAM' ERR
				4290	*					
1A4F	3C	85	148B	4291		MVI	DLPTYP,DLPMPR			SET SW FOR MATRIX PRINTER
1A53	F2	87	12	4292		J	SCK400			RETURN TO CALLING PGM
				4293	*					
				4294	*		CRT SPECIFIED			
				4295	*					
1A56	3D	1B	148B	4296	SCK350	CLI	DLPTYP,DLPCRT			WAS CRT SPECIFIED BEFORE
1A5A	F2	81	20	4297		JE	SCK430			YES SET 'DUPLICATE PARAM' ERR
				4298	*					
1A5D	3D	85	148B	4299		CLI	DLPTYP,DLPMPR			WAS PRINTER SPECIFIED BEFORE ?
1A61	F2	81	12	4300		JE	SCK420			YES, SET 'CONFLICTING PARAM' ERR
				4301	*					
1A64	3C	1B	148B	4302		MVI	DLPTYP,DLPCRT			SET SW FOR CRT
1A68	35	04	1A9E	4303	SCK400	L	SCK004,@PSR			SET SW FOR BRANCH HIGH
1A6C	F2	87	1A	4304		J	SCK450			RETURN TO CALLING PROGRAM
				4305	*					
				4306	*		SET ERROR CODES			
				4307	*					
1A6F	3C	11	03CD	4308	SCK410	MVI	\$CAERR,@E131			SET 'INV PARAM' ERROR CODE
1A73	F2	87	0B	4309		J	SCK440			RETURN
				4310	*					
1A76	3C	15	03CD	4311	SCK420	MVI	\$CAERR,@E136			SET 'CONFLICTING PARAM' ERR CODE
1A7A	F2	87	04	4312		J	SCK440			RETURN
				4313	*					
1A7D	3C	13	03CD	4314	SCK430	MVI	\$CAERR,@E134			SET 'DUPLICATE PARAM' ERR CODE
				4315	*					
1A81	C2	02	0000	4316	SCK440	LA	*-*,@XR			RESTORE XR VALUE
1A85	35	04	1AA0	4317		L	SCK005,@PSR			SET PSR TO BL TO IND ERROR
				4318	*					
				4319	*		EXIT			
				4320	*					
1A89	3C	80	1A3F	4321	SCK450	MVI	SCK300+@Q,@NOP			SET CRT OR POINTER INDR OFF
1A8D	C0	87	0000	4322	SCK460	B	*-*			RETURN TO CALLING PROGRAM
				4323	*					
				4324	*		EQUATES USED IN SCKOUT			
				4325	*					
			0003	4326	SCK001	EQU	3			LENGTH OF 'CRT' PARAMETER
			0007	4327	SCK002	EQU	7			LENGTH OF 'PRINTER' PARAMETER
				4328	*					
				4329	*		CONSTANTS USED IN SCOUT			
				4330	*					
1A91	C3D9E3		1A93	4331	SCKCCR	DC	CL(SCK001)'CRT'			CRT PARAMETER IMAGE
1A94	D7D9C9D5E3C5D9		1A9A	4332	SCKCMP	DC	CL(SCK002)'PRINTER'			PRINTER PARAMETER IMAGE
1A9B	0081		1A9C	4333	SCK003	DC	XL2'81'			PRINTER CODE FOR BRANCH ON ZERO
1A9D	0084		1A9E	4334	SCK004	DC	XL2'84'			PSR CODE FOR BRANCH HIGH
1A9F	0082		1AA0	4335	SCK005	DC	XL2'82'			PSR CODE FOR BRANCH LOW
				4336	*					

SDLIST -- LIST DATA FILES

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 58
				1AA1	4338	SCKDEV	EQU *			PORTION OF SCKOUT TO READY CRT
	1AA1	34	08	1B01	4339		ST SCK650+@OP1,@ARR			SAVE RETURN ADDRESS
	1AA5	3C	01	03D3	4340		MVI \$CRTIN,\$CRTUP			SET CRT IN ROLL-UP MODE
					4341	*				
	1AA9	3D	1B	148B	4342		CLI DLPTYP,DLPCRT			WAS CRT THE SPECIFIED PARAMETER
	1AAD	F2	81	15	4343		JE SCK475			YES, CHECK FOR ITS EXISTENCE
					4344	*				
	1AB0	3D	85	148B	4345		CLI DLPTYP,DLPMPR			ELSE, WAS PRINTER SPECIFIED
	1AB4	F2	01	47	4346		JNE SCK650			NO, RETURN TO USER
					4347	*				
	1AB7	38	01	03D2	4348		TBN \$IOIND,\$MPDWN			ELSE, IS PRINTER DOWN ?
	1ABB	F2	90	40	4349		JF SCK650			NO, RETURN TO USER
					4350	*				
	1ABE	3C	96	03CD	4351		MVI \$CAERR,@E549			SET ERR CODE FOR PRINTER DOWN
	1AC2	F2	87	19	4352		J SCK550			DESTROY YR AND EXIT
					4353	*				
	1AC5	38	02	03D2	4354	SCK475	TBN \$IOIND,\$CRTAV			IS CRT ON THE SYSTEM ?
	1AC9	F2	90	0E	4355		JF SCK500			NO, SET ERROR CODE
					4356	*				
	1ACC	38	01	03C3	4357		TBN \$KEYCD,\$CARDI			IS CRT SPECIFIED FROM CARDS?
	1AD0	F2	90	13	4358		JF SCK600			IF NOT, SKIP ERROR ROUTINE
					4359	*				
	1AD3	3C	3A	03CD	4360		MVI \$CAERR,@E248			SET ERROR CODE - 'CRT SPECIFIED
					4361	*				* WHEN I/O IS FROM CARD READER'
	1AD7	F2	87	04	4362		J SCK550			SET PSR AND EAT
					4363	*				
	1ADA	3C	38	03CD	4364	SCK500	MVI \$CAERR,@E241			SET ERR CODE-CRT NOT ON SYSTEM
					4365	*				
	1ADE	C2	02	1AA1	4366	SCK550	LA SCKDEV,@XR			INCR XR TO AVOID SYNTAX ERROR
	1AE2	C0	87	0D51	4367		B SCKERR			RETURN TO CALLING PROGRAM
					4368	*				
					4369	*				
					4370	*				
	1AE6	3A	08	03D2	4371	SCK600	SBN \$IOIND,\$CMDKY			SET CMND KEYS ONLY INDR ON
					4372	*				SCKCL LITE
	1AEA	0E	00	1AF2 043B	4373	SCKCL0	ALC SCKCL1+@D1(1),\$EXFTR			CALCULATE ENTRY ADDRESS
	1AF0	C0	87	2200	4374	SCKCL1	B \$\$PYCD			CLEAR CRT / LIGHT CMND INDRS
	1AF4	0F	00	1AF2 043B	4375		SLC SCKCL1+@D1(1),\$EXFTR			INITIALIZE ENTRY ADDRESS
					4377		B \$\$PRES			ENABLE KEYBOARD ENTRY TO DEDRES
					4378	*				
	1AFE	C0	87	0000	4379	SCK650	B *-*			RETURN TO CALLING PROGRAM
					4380	SCKEND	EQU *			END OF ROUTINE
	19FD				4381		ORG SCKOUT			OVERLAY UNUSED PORTION
					4382	*				

GFINON -- GRABBIT BUFFER PRIMER

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 59
4384				*****			
4385	*	5703-XM1		COPYRIGHT IBM CORP. 1970			*
4386	*			REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083			*
4387	*						*
4388				*****			
4389	*			*STATUS			*
4390	*			VERSION 1 MODIFICATION 0			*
4391	*						*
4392	*			*FUNCTION			*
4393	*			GFINDN IS DESIGNED FOR USE WITH GRABIT IN ACCESSING A GIVEN LINE			*
4394	*			IN THE WORK FILE. THE LINE NUMBER SUPPLIED TO GFILNO IS SEARCHED			*
4395	*			ON THROUGH THE FIT. THE DB CONTAINING THIS NUMBER ALONG WITH			*
4396	*			THE NEXT LOGICAL DB ARE READ INTO CORE, AND GRABIT IS INITIALIZED			*
4397	*			AND CALLED. CONTROL IS THEN RETURNED TO THE CALLING PROGRAM.			*
4398	*						*
4399	*			*ENTRY POINTS			*
4400	*			GFINDN - ENTERED VIA A BRANCH. GFILNO MUST BE PRIMED WITH THE			*
4401	*			LINE NUMBER TO BE SEARCHED FOR.			*
4402	*						*
4403	*			*INPUT			*
4404	*			INPUT TO GFINDN IS THE LINE NUMBER SUPPLIED INTO GFILNO FOR THE			*
4405	*			SEARCH TO BE MADE.			*
4406	*						*
4407	*			*OUTPUT			*
4408	*			OUTPUT IS THE PRIMED BUFFERS FOR GRABIT, WHICH CONTAIN THE DB			*
4409	*			WHICH CONTAINS THE SPECIFIED LINE NUMBER AND THE NEXT LOGICAL			*
4410	*			DB. (DATA BLOCK)			*
4411	*						*
4412	*			*EXTERNAL REFERENCES			*
4413	*			\$\$FITS - CORE ADDRESS OF THE FILE INDEX TABLE (FIT)			*
4414	*			DL4ICS - FOUR TRACK LOGICAL DISK IOCS			*
4415	*			GRABIT - DISK FILE LINE RETRIEVER			*
4416	*			GRSRDA - DADDR SAVE AREA PRIMED FOR GRABIT			*
4417	*			GRWHAT - GRABIT INDR			*
4418	*			GRAFRA - BUFFER ADDR FOR GRABIT			*
4419	*						*
4420	*			*EXITS, NORMAL			*
4421	*			NEXT SEQUENTIAL INSTRUCTION AFTER CALL FROM USING PROGRAM.			*
4422	*						*
4423	*			*EXITS, ERROR			*
4424	*			N/A			*
4425	*						*
4426	*			*TABLES/WORK AREAS			*
4427	*			WORK AREAS AND DPL'S ARE LOCATED AT END OF MODULE.			*
4428	*						*
4429	*			*ATTRIBUTES			*
4430	*			REUSABLE			*
4431	*						*
4432	*			*CHARACTER CODE DEPMENCY			*
4433	*			CHARACTER CODE DEPENDENCY CLASS - A			*
4434	*			THE OPERATION OF THIS MOMLE DOES NOT DEPEND UPON A PAATICULAO			*
4435	*			INTERNAL REPRESENTATION OR THE EXTERNAL CNANATTEN SET.			*
4436	*						*
4437	*			*NOTES			*
4438	*			ERROR PROCEDURES			*
4439	*			N/A			*

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 60
		4440	*				*
		4441	*	REGISTER USAGE			*
		4442	*	INDEX REGISTER 1 (@BR) IS SAVED AND RESTORED AND USED AS A			*
		4443	*	BASE REGISTER DURING EXECUTION. INDEX REGISTER 2 (@XR) IS			*
		4444	*	NOT SAVED OR RESTORED BUT IT IS USED TO INDEX THROUGH FIT			*
		4445	*	IT SEARCHING FOR LINE NUMBER.			*
		4446	*				*
		4447	*	SAVED/RESTORED AREAS			*
		4448	*	N/A			*
		4449	*				*
		4450	*	MODIFICATION CONSIDERATIONS			*
		4451	*	\$FINDN IS INTERDEPENDENT WITH GRABIT (IE. WHEN PRIMING			*
		4452	*	SPECIFIC FIELDS IN GRABIT). ALSO, NOTE 'OTHER'.			*
		4453	*				*
		4454	*	REQUIRED MODULES			*
		4455	*	@SYSEQ - COMMON SYSTEM SOFTWARE EQUATES			*
		4456	*	@CANEQ - COMMON CORE LOCATION EQUATES OUTSIDE NUCLEUS			*
		4457	*	DL4ICS - FOUR TRACK LOGICAL DISK IOCS			*
		4458	*	GRABIT - FILE LINE RETRIEVER			*
		4459	*				*
		4460	*	OTHER			*
		4461	*	GFINDN CAN BE FORCED TO DETECT THAT FIT DB'S ARE NEVER CON-			*
		4462	*	TIGUOUS BY MOVING A @NOP TO LABEL GFI200 PLUS @Q.			*
		4463	*				*
		4464	*	*****			*

GFINON -- GRABBIT BUFFER PRIMER

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 61
			4466		*****			
			4467		*			*
			4468		* GFINON MODULE EQUATES			*
			4469		*			*
			4470		*****			
			0001	4472	GFICT1 EQU 1			COUNT CODE 1
			0002	4473	GFICT2 EQU 2			COUNT CODE 2
				4474	*			
			0000	4475	GFIDS0 EQU 0			DISPLACEMENT OF 0
			0001	4476	GFIDS1 EQU 1			DISPLACEMENT OF 1
			0002	4477	GFIDS2 EQU 2			DISPLACEMENT OF 2
			0003	4478	GFIDS3 EQU 3			DISPLACEMENT OF 3
			0004	4479	GFIDS4 EQU 4			DISPLACEMENT OF 4
			0005	4480	GFIDS5 EQU 5			DISPLACEMENT OF 5
			0008	4481	GFIDS8 EQU 8			DISPLACEMENT OF 8
				4482	*			
			0001	4483	GFILN1 EQU 1			LENGTH CODE 1
			0002	4484	GFILN2 EQU 2			LENGTH OF 2
				4485	*			
			1B00	4486	GRBFR1 EQU GFIBF1			ADDR OF FIRST CORE BUFFER
				4487	*			
			1D00	4488	GFITAD EQU \$\$FITS			ADDR OF FIT IN CORE
				4489	*			
			1D08	4490	GFINTY EQU GFITAD+GFIDS8			ADDR FIRST ENTRY IN FIT
				4491	*			
			0003	4492	GFIDTA EQU 3			ADDR FIRST FIT DATA SECTOR
				4493	*			
			4494		*****			

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE	62
					4496	*****	*****				
					4497	*					*
					4498	*	INIT REGS FOR GCLEAR AND SAVE REGS FOR CALLING ROUTINE				*
					4499	*					*
					4500	*****	*****				*
					4501	*					
					4502	*GFINDN	ENTER BASE=GFIBSE,EXIT=GFIND,@BR,,@ARR				
				1A08	4503	USING	GFIBSE,@BR				BASE ADDRESS SPECIFICATION
				19FD	4504	GFINDN	EQU *				MODULE ENTRY POINT
19FD	34	01	1A5E		4505	ST	GFIND0+@OP1,@BR				SAVE @BR
1A01	C2	01	1A08		4506	LA	GFIBSE,@BR				LOAD BASE REGISTER
1A05	74	08	5A		4507	ST	GFIND2+@OP1(,@BR),@ARR				SAVE RETURN ADDRESS
					4509	*					
					4510	*	SEARCH FILE INDEX TABLE FOR NUMBER IN GFLINO				
					4511	*					
				1A08	4512	GFIBSE	EQU *				
1A08	C2	02	1D08		4513	LA	GFINTY,@XR				LOAD XR WITH ADDR OF FIRST
					4514	*					* ENTRY IN FIT
1A0C	E2	02	04		4515	GFI100	LA GFIDS4(,@XR),@XR				INDEX TO NEXT FIT ENTRY
					4516	*					
1A0F	9D	01	02 5C		4517	GFI150	CLC GFIDS2(GFILN2,@XR),GFILNO(,@BR) THIS DB CONTAIN NUMBER				
					4518	*					* IN GFILNO ?
1A13	D0	82	04		4519	BL	GFI100(,@BR)				NO, CHECK NEXT FIT ENTRY
					4521	*****	*****				*
					4522	*					*
					4523	*	READ DATA BLOCKS INTO CORE BUFFERS				*
					4524	*					*
					4525	*****	*****				*
					4526	*					
1A16	7C	03	60		4527	MVI	GFIRED+@DSAD(,@BR),GFIDTA INIT DPL FOR 1ST DATA SECTOR				
1A19	6E	00	60 00		4528	ALC	GFIRED+@DSAD(GFILN1,@BR),@ZERO(,@XR) DISP FROM 1ST SECTOR				
1A1D	7C	02	61		4529	MVI	GFIRED+@DCNT(,@BR),GFICT2 INIT DPL SECTOR COUNT				
					4530	*					
					4531	*	CHECK IF DB'S ARE CONTINUOUS				
					4532	*					
1A20	6C	00	5D 04		4533	MVC	GFIWRK(GFILN1,@BR),GFIDS4(,@XR) COMPUTE IF DB'S ARE				
1A24	6F	00	5D 00		4534	SLC	GFIWRK(GFILN1,@BR),@ZERO(,@XR) * CONTIGUOUS ON DISK				
1A28	7D	01	5D		4535	CLI	GFIWRK(,@BR),GFICT1 ARE DB'S CONTIGUOUS FOR READ ?				
1A2B	F2	81	10		4536	GFI200	JC GFI500,@BE YES, DB'S ARE CONTIGUOUS				
					4537	*					
					4538	*****	*****				*

GFINON -- GRABBIT BUFFER PRIMER

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 63
				4540		*****				
				4541	*					*
				4542	*		PROCESSING OF NON-CONTIGUOUS DATA BLOCKS			*
				4543	*					*
				4544		*****				
				4545	*					
1A2E	7C	03	66	4546		MVI	GFIRAD+@DSAD(,@BR),GFIDTA	MODIFY	SECTOR	ADDR
1A31	6E	00	66 04	4547		ALC	GFIRAD+@DSAD(GFILN1,@BR),GFIDS4(,@XR)			
				4549	*	DSKL4	GFIRAD	READ	SECOND	DB
1A35	C0	87	1200	4550		B	DL4ICS	PERFORM	RELATIVE	DISK OP
1A39	1A6C			1A3A 4551		DC	AL2(GFIRAD)	DPL	ADDRESS	
				4552	***	END OF	EXPANSION	***		
				4553	*					
1A3B	7C	01	61	4554		MVI	GFIREDD+@DCNT(,@BR),GFICT1	MODIFY	DPL	SECTOR COUNT
				4556	*	GF1500	DSKL4 WIRED	READ	DB(S)	
1A3E	C0	87	1200	4557		GF1500	B DL4ICS	PERFORM	RELATIVE	DISK OP
1A42	1A66			1A43 4558		DC	AL2(GFIREDD)	DPL	ADDRESS	
				4559	***	END OF	EXPANSION	***		
				4561		*****				
				4562	*					*
				4563	*		INITIALIZATION FOR GRABIT			*
				4564	*					*
				4565		*****				
				4566	*					
1A44	1C	01	13FA 60	4567		MVC	GRSRDA(@CADDR),GFIREDD+@DSAD(,@BR)	PRIME	GRABIT	DISK ADDR
1A49	3C	00	1404	4568		MVI	GRWHAT,@ZERO	PRIME	GRWHAT	FOR GRABIT
1A4D	0C	01	13FD 1A6B	4569		MVC	GRBFRA(@CADDR),GFIBR1	PRIME	GRABIT	
				4570	*					
1A53	C0	87	127F	4571		B	GRABIT	GET	NEXT	STATEMENT
				4572	*					
1A57	3C	01	1404	4573		MVI	GRWHAT,GFICT1	SET	GRABIT	FUNCTION CODE
				4575		*****				
				4576	*					*
				4577	*		END OF ROUTINE PROCESSING			*
				4578	*					*
				4579		*****				
				4580	*					
				4581	*	GFIND	EXIT @BR,,RETURN			
1A5B	C2	01	0000	4582		GFIND0	LA *-*,@BR	RESTORE	@BR	
1A5F	C0	87	0000	4583		GFIND2	B *-*	RETURN	TO	CALING PROGRAM
				4584	***	END OF	EXPANSION	***		

GFINON -- GRABBIT BUFFER PRIMER

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 04/06/21 PAGE 64
			4586		*****	
			4587	*		*
			4588	*	DATA CONSTANTS, BUFFERS, AND WORK AREAS	*
			4589	*		*
			4590		*****	
			4591	*		
1A63			1A64	4592	GFILNO DS CL2	INPUT AREA FOR LINE NUMBER TO
				4593	*	* BE SEARCHED FOR
1A65			1A65	4594	GFIWRK DS CL1	USED TO COMPUTE IF DB'S ARE
				4595	*	* CONTIGUOUS IN CORE
				4596	*	DPL MODIFIED FOR READING OF DATA BLOCKS
				4597	*	
				4598	*GFIREDDPL	FUNC=@DGET,DADDR=@WSFIT,CADDR=GFIBF1
			1A66	4599	GFIREDEQU	* DISK PARAMETER LIST
1A66 01			1A66	4600	DC	AL1(@DGET) REQUESTED FUNCTION
1A67 0500			1A68	4601	DC	AL2(@WSFIT) DISK ADDRESS
1A69 00			1A69	4602	DC	AL1(*-*) SECTOR COUNT
1A6A 1B00			1A6B	4603	DC	AL2(GFIBF1) BUFFER ADDRESS
				4604	*** END OF EXPANSION ***	
			1A6B	4606	GFIBR1 EQU	GFIREDD+@DBFR2 ADDR OF FIRST BUFFER
				4607	*	
				4608	*GFIRAD DPL	FUNC=@DGET,DADDR=@WSFIT,CNT=@B1,CADDR=GFIBF2
			1A6C	4609	GFIRADEQU	* DISK PARAMETER LIST
1A6C 01			1A6C	4610	DC	AL1(@DGET) REQUESTED FUNCTION
1A6D 0500			1A6E	4611	DC	AL2(@WSFIT) DISK ADDRESS
1A6F 01			1A6F	4612	DC	AL1(@B1) SECTOR COUNT
1A70 1C00			1A71	4613	DC	AL2(GFIBF2) BUFFER ADDRESS
				4614	*** END OF EXPANSION ***	
			1A71	4616	GFIBR2 EQU	GFIRAD+@DBFR2 ADDR OF SECOND BUFFER
				4617	*	
1B02				4618	ORG	SCKEND SET COUNTER BEHIND SCKDEV
			1957	4619	SLLINE EQU	SDL300-1 LINE NUMBER LIST OVERLAY
				4620	*	
				4621	*	\$C4BD

C4BIN2 - CONVERT DECIMAL TO BINARY ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 65
					4623+	*		*
					4624+		INITIALIZATION	*
					4625+			*
				1B02	4626+	C4BIN2 EQU *	ENTRY POINT	
				1B02	4627+	USING C4BIN2,@BR	BASE VALUE	
					4628+	*		
1B02	34	01	1B64		4629+	ST C4B800+@OP1,@BR	SAVE CALLERS BASE REGISTER	
1B06	C2	01	1B02		4630+	LA C4BIN2,@BR	LOAD BASE VALUE	
					4631+	*		
1B0A	74	08	66		4632+	ST C4B850+@OP1(,@BR),@ARR	SAVE RETURN ADDRESS	
					4633+	*		
1B0D	74	02	6E		4634+	ST C4BSAV(,@BR),@XR	SAVE VALUE OF POINTER	
1B10	3C	0C	03CD		4635+	MVI \$CAERR,@E122	SET ERROR CODE IN CASE	
1B14	5C	01	6A 6B		4636+	MVC C4BVAL(C4BLVL,@BR),C4BINI(,@BR)	INIT VALUE TO ZERO	
1B18	3C	04	1B71		4637+	C4B100 MVI C4B900,4	INITLZ CHAR. COUNT	
					4638+	*		
					4639+	*** DETERMINE IF CHAR NUMERIC AND DECR CHAR COUNT		
					4640+	*		
1B1C	F2	80	32		4641+	C4B200 JC C4B600,@NOP	SET TO UCB IF IMBEDDED BLANKS	
					4642+	*	* ALLOWED	
1B1F	BD	F0	00		4643+	C4B300 CLI 0(,@XR),C4BLOW	THIS CHAR NUMERIC ?	
1B22	F2	82	35		4644+	JL C4B700	NO, GOTO RETURN	
					4645+	*		
1B25	5F	00	6F 4E		4646+	SLC C4B900(1,@BR),C4B590+@D1(,@BR)	DECR CHAR COUNT	
1B29	F2	82	35		4647+	JL C4B800	BR TO ERROR EXIT IF TOO MANY	
					4648+	*		
					4649+	*** MULTIPLY PREVIOUS VALUE BY TEN		
					4650+	*		
1B2C	5E	01	6A 6A		4651+	ALC C4BVAL(C4BLVL,@BR),C4BVAL(,@BR)	DOUBLE PREVIOUS VALUE	
1B30	5C	01	68 6A		4652+	MVC C4BWRK(C4BLVL,@BR),C4BVAL(,@BR)	SAVE DOUBLE VALUE	
1B34	5E	01	6A 6A		4653+	ALC C4BVAL(C4BLVL,@BR),C4BVAL(,@BR)	QUADRUPLE PREVIOUS VALUE	
1B38	5E	01	6A 6A		4654+	ALC C4BVAL(C4BLVL,@BR),C4BVAL(,@BR)	OCTUPLE PREVIOUS VALUE	
1B3C	5E	01	6A 68		4655+	ALC C4BVAL(C4BLVL,@BR),C4BWRK(,@BR)	ADD IN SAVED DOUBLE	
					4656+	*		
					4657+	*** ADD IN VALUE OF THIS CHAR AND INCR POINTER		
					4658+	*		
1B40	68	03	6C 00		4659+	MNN C4BCHR(,@BR),0(,@XR)	FETCH NEMERIC VALUE OF NEW CHAR	
1B44	5E	01	6A 6C		4660+	ALC C4BVAL(C4BLVL,@BR),C4BCHR(,@BR)	INCR VALU BY THIS CHAR	
					4661+	*		
1B48	E2	02	01		4662+	LA @B1(,@XR),@XR	INCR POINTER TO NEXT CHAR	
1B4B	D0	87	1A		4663+	B C4B200(,@BR)	GOTO DO IT AGAIN	
					4664+	*		*
					4665+		ROUTINE TO SCAN BLANKS	*
					4666+	*		*
1B4E	E2	02	01		4667+	C4B590 LA @B1(,@XR),@XR	INCR POINTER TO NEXT CHAR	
1B51	BD	40	00		4668+	C4B600 CLI 0(,@XR),@BLANK	IS THIS CHAR A BLANK ?	
1B54	D0	01	1D		4669+	BNE C4B300(,@BR)	RETURN IF NOT	
1B57	D0	87	4C		4670+	B C4B590(,@BR)	GET NEXT CHAR IF YES	

C4BIN2 - CONVERT DECIMAL TO BINARY ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 66
					4672+*					
					4673+***	ENDING ROUTINE				
					4674+*					
	1B5A	74	02 68		4675+C4B700	ST	C4BLEN(,@BR),@XR		PLACE VALUE OF POINTER	
	1B5D	5F	01 68 6E		4676+	SLC	C4BLEN(2,@BR),C4BSAV(,@BR)		SUBTRACT ENTERING VALUE	
					4677+*					
	1B61	C2	01 0000		4678+C4B800	LA	*-*,@BR		RESTORE CALLERS BR	
					4679+*					
	1B65	C0	87 0000		4680+C4B850	B	*-*		RETURN TO CALLING ROUTINE	
					4681+*				*	
					4682+*		WORK AREA AND CONSTANT		*	
					4683+*				*	
	1B69			1B6A	4684+C4BWRK	DS	CL2		SAVE AREA FOR DOUBLED VALUE	
					4685+*					
				1B6B	4686+C4BYT1	EQU	*		FIRST BYTE OF BINARY VALUE	
	1B6B			1B6C	4687+C4BVAL	DS	CL2		SAVE AREA FOR BINARY VALUE	
					4688+*					
	1B6D	00		1B6D	4689+C4BINI	DC	XL1'00'		INITIALIZE WA TO ZERO	
					4690+*					
	1B6E			1B6E	4691+C4BCHR	DS	CL1		SAVE AREA FOR EACH NEW CHAR	
	1B6E				4692+	ORG	*-1		INITIALIZE	
	1B6E	00		1B6E	4693+	DC	XL1'00'		* TO ZERO	
					4694+*					
	1B6F			1B70	4695+C4BSAV	DS	CL2		SAVE AREA FOR XR	
					4696+*					
	1B71			1B71	4697+C4B900	DS	CL1		SAVE AREA FOR CHAR COUNTER	
					4698+*				*	
					4699+*		EQUATES FOR C4BIN2		*	
					4700+*				*	
				1B6A	4701+C4BLEN	EQU	C4BWRK		ON RETURN WILL CONTAIN COUNT	
					4702+*				* @XR INCREMENTED BY	
				0004	4703+C4BCHC	EQU	4		NUMBER OF CHAR TO CONVERT	
					4704+*					
				00F0	4705+C4BLOW	EQU	C'0'		LOWEST NUMERIC CHARACTER	
					4706+*					
				0002	4707+C4BLVL	EQU	C4BVAL-C4BWRK		LENGTH OF BINARY VALUE	
					4708+*					
				1B1D	4709+C4BLNK	EQU	C4B200+@Q		LOCATION OF IMBEDDED BLANK IND	
					4710+*					
				0087	4711+C4BSPC	EQU	@UCB		MOVED TO C4BLNK TO ALLOW BLANKS	
					4712+*					
				1B19	4713+C4BNMC	EQU	C4B100+@Q		LOCATION OF CONVERSION COUNT	
					4714+*					
				0080	4715+C4BNOP	EQU	@NOP		CHANGED IF IMBEDDED BLANK OK	
	1B72				4716+C4END	EQU	*		DEFINE END OF CODE	
					4717+***		END OF C4BIN2		***	

SLLIST -- MODULE PROLOGUE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 67
4719				*****			
4720	*	5703-XM1		COPYRIGHT IBM CORP. 1970			*
4721	*			REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE 120-2083			*
4722	*						*
4723				*****			
4724	*			*STATUS			*
4725	*			VERSION 1 MODIFICATION 0			*
4726	*						*
4727	*			*FUNCTION			*
4728	*			SLLIST SCANS ACROSS A LINE NUMBER LIST, CHECKING THE SYNTAX OF			*
4729	*			THE LIST AND CONVERTING THE DECIMAL LINE NUMBERS TO BINARY.			*
4730	*			THESE CONVERTED LINE NUMBERS ARE SAVED IN A BUFFER, SLLINE WHICH			*
4731	*			CONTAINS A TWO-BYTE ENTRY FOR EACH LINE NUMBER AND A ONE-BYTE			*
4732	*			LINE NUMBER RANGE INDICATOR (THE EBCDIC CODE FOR A DASH) BETWEEN			*
4733	*			LINE NUMBERS OF A RANGE. A CARRIAGE RETURN CODE TERMINATES			*
4734	*			SLLINE.			*
4735	*						*
4736	*			*ENTRY POINTS			*
4737	*			* THE ENTRY POINT IS SLLIST. THE BASE REGISTER IS SAVED ON ENTRY			*
4738	*			AND RESTORED BEFORE EXIT TO THE CALLING ROUTINE.			*
4739	*			* THE CALLING SEQUENCE IS AS FOLLOWS:			*
4740	*			B SLLIST			*
4741	*						*
4742	*			*INPUT			*
4743	*			THE INPUT TO SLLIST IS A LINE NUMBER LIST WHICH WILL BE SYNTAX			*
4744	*			CHECKED AND CONVERTED. SLLIST EXPECTS @XR TO POINT TO THE FIRST			*
4745	*			CHARACTER TO BE TESTED.			*
4746	*						*
4747	*			*OUTPUT			*
4748	*			THE OUTPUT FROM SLLIST IS THE BUFFER, SLLINE, WHICH CONTAINS THE			*
4749	*			CONVERTED LINE NUMBER LIST TERMINATED BY A CARRIAGE-RETURN CODE.			*
4750	*						*
4751	*			*EXTERNAL REFERENCES			*
4752	*			* \$CAERR - NUCLEUS LOCATION FOR ERROR CODE.			*
4753	*			* SCANIT - ENTRY TO DELIMITER SCAN ROUTINE.			*
4754	*			* C4BIN2 - ENTRY TO ROUTINE TO CONVERT DECIMAL TO BINARY.			*
4755	*						*
4756	*			*EXITS, NORMAL			*
4757	*			NORMAL EXIT IS TO THE FIRST INSTRUCTION FOLLOWING THE BRANCH TO			*
4758	*			SLLIST. THE @PSR WILL BE SET TO THE 'BRANCH NOT LOW' CONDITION			*
4759	*			TO INDICATE A GOOD RETURN.			*
4760	*						*
4761	*			*EXITS, ERROR			*
4762	*			ERROR EXIT IS ALSO MADE TO THE FIRST INSTRUCTION FOLLOWING THE			*
4763	*			BRANCH TO SLLIST. IN THIS CASE @PSR IS SET TO 'BRANCH LOW' AND			*
4764	*			\$CAERR CONTAINS THE APPROPRIATE ERROR CODE.			*
4765	*						*
4766	*			*TABLES/WORKAREAS			*
4767	*			SLLIST CREATES A BUFFER, SLLINE, WHICH HAS A MAXIMUM LENGTH OF			*
4768	*			210 BYTES, IS DEFINED BY THE USER, AND CONTAINS THE BINARY			*
4769	*			REPRESENTATION OF THE NUMBERS IN THE LINE-NUMBER LIST. SINGLE			*
4770	*			LINE NUMBERS REQUIRE A TWO-BYTE ENTRY AND LINE NUMBER RANGES			*
4771	*			EACH REQUIRE FIVE BYTES (TWO BYTES FOR THE LOW LIMIT LINE NUMBER,			*
4772	*			ONE BYTE FOR THE EBCDIC CODE FOR A DASH, AND TWO BYTES FOR THE			*
4773	*			HIGH LIMIT LINE NUMBER). AN EOS CODE TERMINATES SLLINE			*
4774	*						*

SLLIST -- MODULE PROLOGUE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 68
		4775	*	*ATTRIBUTES			*
		4776	*	* SLLIST IS RELOCATABLE			*
		4777	*				*
		4778	*	*CHARACTER CODE DEPENDENCY			*
		4779	*	* THE OPERATION OF THIS MODULE DOES NOT DEPEND ON ANY PARTICULAR			*
		4780	*	* INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.			*
		4781	*				*
		4782	*	*NOTES			*
		4783	*	* ERROR PROCEDURES			*
		4784	*	* SLLIST RETURNS TO THE CALLING ROUTINE WITH THE @PSR SET TO			*
		4785	*	* 'BRANCH LOW' IF AN ERROR CONDITION IS ENCOUNTERED.			*
		4786	*	* THE APPROPRIATE ERROR CODE WILL BE SET IN \$CAERR.			*
		4787	*				*
		4788	*	* REGISTER USAGE			*
		4789	*	* UPON ENTRY TO SLLIST, REGISTER 2 (@XR) MUST BE POINTING TO			*
		4790	*	* THE 1ST LINE NUMBER TO BE CHECKED. UPON RETURN FROM SLLIST			*
		4791	*	* @XR WILL BE POINTING TO THE INVALID CHARACTER IF AN ERROR IS			*
		4792	*	* DETECTED. TO THE CARRIAGE RETURN CHARACTER IF THE LIST IS			*
		4793	*	* GOOD, OR TO THE NEXT CHARACTER FOLLOWING A VALID LIST IF			*
		4794	*	* SLLIND IS SET TO RETURN (SLLRET MOVED TO SLLIND).			*
		4795	*	* REGISTER 1 (@BR) IS SAVED UPON ENTRY TO SLLIST AND IS USED			*
		4796	*	* BY SLLIST TO CONTAIN THE CURRENT ADDRESS BEING REFERENCED IN			*
		4797	*	* SLLINE.			*
		4798	*	* UPON ENTRY TO SLLIST, REGISTER 8 (@ARR) IS STORED AS THE			*
		4799	*	* RETURN ADDRESS TO THE CALLING ROUTING AFTER CHECKING IS			*
		4800	*	* COMPLETED.			*
		4801	*				*
		4802	*	* SAVE RESTORED AREAS			*
		4803	*	* NONE			*
		4804	*				*
		4805	*	* MODIFICATION CONSIDERATIONS			*
		4806	*	* NONE			*
		4807	*				*
		4808	*	* REQUIRED MODULES			*
		4809	*	* THE FOLLOWING EQUATE MODULES ARE USED IN SLLIST:			*
		4810	*	* @SYSEQ - COMMON S(STEM ELVES			*
		4811	*	* @FXDEQ - NUCLEUS FIXED ADDRESS EQUATES			*
		4812	*	* @ERMEQ - ERROR MESSAGE EQUATES (SELECTED ERROR CODES)			*
		4813	*	* THE FOLLOWING SOURCE MODULES ARE ALSO USED IN SLLIST:			*
		4814	*	* SCANIT - DELIMITER SCAN ROUTINE			*
		4815	*	* C4BIN2 - ROUTINE TO CONVERT DECIMAL TO BINARY			*
		4816	*				*
		4817	*	* OTHER			*
		4818	*	* IF THE CALLING ROUTINE DESIRES THAT A LINE-NUMBER LIST BE			*
		4819	*	* CONSIDERED VALID IF IT IS FOLLOWED BY ANOTHER PARAMETER,			*
		4820	*	* SLLRET SHOULD BE MOVED TO SLLRET BEFORE CALLING SLLIST.			*
		4821	*				*
		4822	*	*****			*

SLLIST -- MODULE PROLOGUE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 04/06/21 PAGE 69
				1B72	4824	SLLIST EQU *	ENTRY POINT TO THIS SUBROUTINE	
					4825	*		
1B72	34	01	1C5A		4826	ST	SLL220+@OP1,@BR	SAVE BASE REGISTER
1B76	34	08	1C5E		4827	ST	SLL230+@OP1,@ARR	SAVE RETURN ADDRESS
1B7A	C2	01	1955		4828	LA	SLLINE-SLLLN2,@BR	INITIALIZE SLLINE POINTER
					4829	*		
1B7E	C0	87	1B02		4830	SLL100 B	C4BIN2	CONVERT LINE NO. TO BINARY
1B82	F2	82	CA		4831	JL	SLL210	IF ERROR IN C4BIN2,
					4832	*		* CALL ERROR PROG.
1B85	F2	81	AC		4833	JZ	SLL180	CHECK FOR EOS IF NO NUMBER FOUND
					4834	*		
					4835	*	INTEGER WAS FOUND	
					4836	*		
1B88	4C	01	03 1B6C		4837	MVC	SLL003(,@BR),C4BVAL(SLLLN2)	MOVE INTEGER TO BFR
1B8D	F2	80	07		4838	SLL110 JC	SLL115,@NOP+*-*	UCB EXCEPT FOR FIRST LINE NO.
1B90	3C	87	1B8E		4839	MVI	SLL110+@Q,@UCB	SET OFF 'FIRST' INDR
1B94	F2	87	11		4840	J	SLL120	GO CHECK FOR DELIMITERS
1B97	5D	01	01 03		4841	SLL115 CLC	SLL001(,@BR),SLL003(SLLLN2,@BR)	THIS INTG > LAST INTG ?
1B9B	F2	82	0A		4842	JL	SLL120	YES, GO CHECK FOR DELIMITERS
1B9E	3C	87	1C2E		4843	MVI	SLL165+@Q,@UCB	SET SW TO TAKE ERR IF VALID INTG
1BA2	0C	01	1C47 1B70		4844	MVC	SLL200+@OP1(SLLLN2),C4BSAV	SET PTR TO THIS NUMBER
1BA8	D2	01	02		4845	SLL120 LA	SLL002(,@BR),@BR	POINT BR PTR TO THIS ENTRY
1BAB	C0	87	1C61		4846	B	SCANIT	BYPASS BLANKS
1BAF	BD	60	00		4847	CLI	0(,@XR),SLLDSH	CHAR AFTER INTG = '-' ?
1BB2	F2	01	55		4848	JNE	SLL150	NO, CHECK FOR COMMA
					4849	*		
					4850	*	LINE NUMBER FOLLOWED BY A DASH	
					4851	*		
1BB5	E2	02	01		4852	LA	1(,@XR),@XR	POINT XR PAST DASH
1BB8	0C	01	1BDB 1B70		4853	MVC	SLL125+@OP1,C4BSAV(@REGL)	SAVE PTR TO FIRST NO. IN RANGE
1BBE	C0	87	1C61		4854	B	SCANIT	BYPASS BLANKS
1BC2	C0	87	1B02		4855	B	C4BIN2	CONVERT NO. TO BINARY
1BC6	F2	82	86		4856	JL	SLL210	ERR IF MORE THAN 4 DIGITS FOUND
1BC9	F2	01	17		4857	JNZ	SLL130	JUMP IF INTG FOUND AFTER DASH
					4858	*		
1BCC	BD	1E	00		4859	CLI	0(,@XR),@EOS	IS THIS AN OPEN RANGE ?
1BCF	F2	81	06		4860	JE	SLL125	YES, SET OPEN RANGE ERR CODE
1BD2	BD	6B	00		4861	CLI	0(,@XR),@COMMA	IS THIS AN OPEN RANGE ?
1BD5	F2	01	65		4862	JNE	SLL195	NO, INV CHAR IN LINE NO. ERROR
					4863	*		
1BD8	C2	02	0000		4864	SLL125 LA	*-*,@XR	RESTORE XR TO FIRST NO. IN RANGE
1BDC	3C	0D	03CD		4865	MVI	\$CAERR,@E123	ERR, UNBALANCED LINE NO. SERIES
1BE0	F2	87	70		4866	J	SLL215	ERROR EXIT
					4867	*		
					4868	*	MOVE DASH AND HIGH LIMIT TO SLLINE	
					4869	*		
1BE3	7C	60	02		4870	SLL130 MVI	SLL002(,@BR),SLLDSH	SET DASH IN SLLINE
1BE6	4C	01	04 1B6C		4871	MVC	SLL003+1(,@BR),C4BVAL(SLLLN2)	MOVE IN HIGH LIMIT OF RANGE
1BEB	5D	01	01 04		4872	CLC	SLL001(,@BR),SLL003+1(SLLLN2,@BR)	HIGH LIMIT > LOW LIMIT ?
1BEF	F2	82	11		4873	JL	SLL140	YES, GO INCR POINTER
1BF2	3D	87	1C2E		4874	CLI	SLL165+@Q,@UCB	OUT OF ORDER PAIR FOUND ALRDY ?
1BF6	F2	81	0A		4875	JE	SLL140	YES, DON'T SET SWITCH AGAIN
1BF9	3C	87	1C2E		4876	MVI	SLL165+@Q,@UCB	ELSE, SET SW TO TAKE ERR EXIT
1BFD	0C	01	1C47 1B70		4877	MVC	SLL200+@OP1(SLLLN2),C4BSAV	SET PTR TO SECOND NO. IN RANGE
1C03	D2	01	03		4878	SLL140 LA	SLL003(,@BR),@BR	INCR PTR TO NEXT ENTRY
1C06	C0	87	1C61		4879	B	SCANIT	BYPASS BLANKS

SLLIST -- MODULE PROLOGUE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 04/06/21 PAGE 70

1C0A	BD	6B	00	4880	SLL150	CLI	0(,@XR),@COMMA	INTG FOLLOWED BY COMMA ?
1C0D	F2	01	10	4881		JNE	SLL160	NO, TEST FOR A BLANK
				4882	*			
				4883	*		LINE NUMBER FOLLOWED BY COMMA	
				4884	*			
1C10	E2	02	01	4885		LA	1(,@XR),@XR	PT XR PAST COMMA
1C13	C0	87	1C61	4886		B	SCANIT	BYPASS BLANKS
1C17	BD	1E	00	4887		CLI	0(,@XR),@EOS	COMMA FOLLOWED BY EOS ?
1C1A	F2	81	36	4888		JE	SLL215	YES ERR - DANGLING COMMA
1C1D	F2	87	0D	4889		J	SLL165	ELSE, GO CHECK INTG ASCENDING
				4890	*			
1C20	3D	00	1CA1	4891	SLL160	CLI	SCACNT,@ZERO	WERE ANY DELIMITERS FOUND ?
1C24	F2	01	06	4892		JNZ	SLL165	YES, GO CHECK FOR PROPER ORDER
1C27	BD	1E	00	4893		CLI	0(,@XR),@EOS	ELSE, IS XR REF AN EOS
1C2A	F2	01	10	4894		JNE	SLL195	NO, ERR - INV CHAR IN LINE NO.
1C2D	F2	80	14	4895	SLL165	JC	SLL200,@NOP+*-*	UCB IF THIS INTG < LAST INTG
1C30	C0	87	1B7E	4896		B	SLL100	CHECK NEXT INTG
				4897	*			
				4898	*		INTEGER NOT FOUND BY C4BIN2	
				4899	*			
1C34	7C	FF	02	4900	SLL180	MVI	SLL002(,@BR),@SCTS-1	MOVE AN 'EOS' TO SLLINE
1C37	BD	1E	00	4901		CLI	SLL000(,@XR),@EOS	IS NEXT CHAR IN INP LINE EOS ?
1C3A	F2	81	1A	4902	SLL190	JC	SLL220,@BE+*-*	IF YES OR SLLIND IS ON, RETURN
				4903	*			
1C3D	3C	0B	03CD	4904	SLL195	MVI	\$CAERR,@@E120	SET ERR CODE FOR 'NON-NUMERIC
				4905	*			* CHAR IN LINE NO. OR INTG'
1C41	F2	87	0B	4906		J	SLL210	RESTORE XR, SET PSR AND RETURN
				4907	*			
				4908	*		ERROR EXIT	
				4909	*			
1C44	C2	02	0000	4910	SLL200	LA	*-*,@XR	PT XR TO CORRECT LINE NUMBER
1C48	3C	0E	03CD	4911		MVI	\$CAERR,@@E124	SET ERROR CODE FOR PARAMS NOT
1C4C	F2	87	04	4912		J	SLL215	* IN ASCENDING ORDER
1C4F	35	02	1B70	4913	SLL210	L	C4BSAV,@XR	RETURN POINTER TO FIRST OF NO
1C53	35	04	1C60	4914	SLL215	L	SLLBLW,@PSR	SET PSR TO BRANCH LOW
				4915	*			
				4916	*		RETURN TO CALLING PROGRAM	
				4917	*			
1C57	C2	01	0000	4918	SLL220	LA	*-*,@BR	RESTORE CALLERS BASE REGISTER
1C5B	C0	87	0000	4919	SLL230	B	*-*	RETLRN

SLLIST -- MODULE PROLOGUE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 71
		0000	4921	SLL000	EQU 0			DISP OF '0' FOR XR OR PTR
		0001	4922	SLL001	EQU 1			DISP OF '1' FOR XR OR PTR
		0002	4923	SLL002	EQU 2			DISP OF '2' FOR XR OR PTR
		0003	4924	SLL003	EQU 3			DISP OF '3' FOR PTR TO SLLINE
		0002	4925	SLLLN2	EQU 2			BINARY LENGTH OF TWO BYTES
		0060	4926	SLLDSH	EQU C'-'			HYPHEN SEPARATING RANGES
			4927	*				
		1C3B	4928	SLLIND	EQU SLL190+@Q			LOC FOR SETTING SLLRET
		0087	4929	SLLRET	EQU X'87'			CODE FOR RETURN IF NOT EOS
			4930	*				
			4931	*				CONSTANTS AND SAVE AREAS
			4932	*				
1C5F	0082	1C60	4933	SLLBLW	DC XL2'82'			PSR CODE TO BRANCH LOW
			4934	*				
			4935	*	\$CANI			

SCANIT - DELIMETER SCAN MODULE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	04/06/21	PAGE 72
4937+				*****			*
4938+	*	5703-XM1		COPYRIGHT IBM CORP. 1970			*
4939+	*			REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083			*
4940+	*						*
4941+	*			*****			*
4942+	*			STATUS			*
4943+	*			VERSION 1 MODIFICATION 0			*
4944+	*						*
4945+	*			FUNCTION			*
4946+	*			THE FUNCTION OF SCANIT IS TO SCAN PAST VALID DELIMITERS AND			*
4947+	*			RETURN A POINTER TO THE FIRST CHARACTER THAT'S NOT A DELIMITER.			*
4948+	*						*
4949+	*			ENTRY POINTS			*
4950+	*			* THE ENTRY POINT IS SCANIT.			*
4951+	*			* THE CALLING SEQUENCE IS AS FOLLOWS:			*
4952+	*			B SCANIT			*
4953+	*			WITH REGISTER 2 (@XR) POINTING TO THE FIRST CHARACTER TO BE			*
4954+	*			EXAMINED.			*
4955+	*						*
4956+	*			INPUT			*
4957+	*			NONE			*
4958+	*						*
4959+	*			OUTPUT			*
4960+	*			NONE			*
4961+	*						*
4962+	*			EXTERNAL REFERENCES			*
4963+	*			\$CAERR - ERROR CODE SAVE AREA			*
4964+	*						*
4965+	*			EXITS, NORMAL			*
4966+	*			NORMAL EXIT FROM SCANIT IS TO THE BYTE FOLLOWING THE BRANCH TO			*
4967+	*			SCANIT IN THE CALLING ROUTINE. THE PSR (REGISTER 4) WILL CONTAIN			*
4968+	*			A ZERO IF NO DELIMITERS WERE FOUND OR A HIGH CONDITION IF ONE OR			*
4969+	*			MORE DELIMITERS WERE SCANNED.			*
4970+	*						*
4971+	*			EXITS, ERROR			*
4972+	*			ERROR EXIT FROM SCANIT IS TO THE BYTE FOLLOWING THE BRANCH TO			*
4973+	*			SCANIT IN THE CALLING ROUTINE. THE PSR WILL CONTAIN A LOW			*
4974+	*			CONDITION.			*
4975+	*						*
4976+	*			TABLES/WORKAREAS			*
4977+	*			* SCACNT - AREA CONTAINING NUMBERS OF DELIMITERS SCANNED			*
4978+	*			* SCAMMA - LOC WHERE SCACOM MAY BE MOVED IF ONE COMMA IS ALSO			*
4979+	*			TO BE CONSIDERED A DELIMITER. MOVING SCACOF BACK INTO SCAMMA			*
4980+	*			INDICATES THAT ONLY BLANKS SHOULD BE CONSIDERED DELIMITERS.			*
4981+	*						*
4982+	*			ATTRIBUTES			*
4983+	*			RELOCATABLE AND RE-USABLE			*
4984+	*						*
4985+	*			CHARACTER CODE DEPENDENCY			*
4986+	*			THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR			*
4987+	*			INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.			*
4988+	*						*
4989+	*			NOTES			*
4990+	*			ERROR PROCEDURES			*
4991+	*			THE ONLY ERROR CONDITION DETECTED BY SCANIT IS THE CASE WHERE			*
4992+	*			A CARRIAGE-RETURN CODE FOLLOWS A COMMA. UPON RETURN TO THE			*

SCANIT - DELIMETER SCAN MODULE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 04/06/21 PAGE 73

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4993+*      CALLING ROUTINE, @PSR WILL BE SET TO A LOW CONDITION, THE      *
4994+*      ERROR CODE IS SET IN $CAERR, AND MG WILU BE POINTING TO THE      *
4995+*      CARRIAGE-RETURN CHARACTER.                                       *
4996+*                                                                *
4997+*      REGISTER USAGE                                                    *
4998+*      REGISTER 2 (@XR) IS USED AS A POINTER ACROSS THE AREA BEING      *
4999+*      SCANNED FOR DELIMITERS.                                           *
5000+*                                                                *
5001+*      SAVED/RESTORED AREAS                                              *
5002+*      UPON ENTRY TO SCANIT, REGISTER 8 (@ARR) IS SAVED AND USED AS      *
5003+*      THE RETURN ADDRESS.                                               *
5004+*                                                                *
5005+*      MODIFICATION CONSIDERATIONS                                       *
5006+*      NONE                                                                *
5007+*                                                                *
5008+*      REQUIRED MODULES                                                    *
5009+*      * @SYSEQ - COMMON SYSTEM EQUATES                                  *
5010+*      * @FXDEQ - FIXED NUCLEUS ADDRESSES EQUATES                       *
5011+*                                                                *
5012+*      OTHER                                                                *
5013+*      SCANIT IS INITIALIZED TO BYPASS BLANKS ONLY. IF SCACOM IS          *
5014+*      MOVED TO SCAMMA, ONE COMMA WILL BE SCANNED ALONG WITH BLANKS.      *
5015+*      THE INSTRUCTION TO DO THIS IS AS FOLLOWS:                        *
5016+*      MVI    SCAMMA,SCACOM                                              *
5017+*                                                                *
5018+*      TO DROP THE COMMA FROM ITS DELIMITER STATUS, SCACOF SHOULD BE      *
5019+*      MOVED TO SCAMMA, USING THE FOLLOWING INSTRUCTION:                  *
5020+*      MVI    SCAMMA,SCACOF                                              *
5021+*                                                                *
5022+*****
5024+*
5025+*      EQUATES USED IN THIS SUBROUTINE
5026+*
0001 5027+SCAINC EQU    1          TO INCREMENT POINTER
0001 5028+SCACOM EQU   @BNE        SWITCH TO ALLOW SCANNING COMMA
0087 5029+SCACOF EQU   @UCB        SWITCH TO SET OFF THE INDICATON
5030+*      * FOR SCANNING A COMMA
1C61 5031+SCANIT EQU   *          ENTRY POINT TO THIS SUBROUTINE
1C61 34 08 1C9D      5032+      ST    SCA500+@OP1,@ARR        SAVE RETURN ADDRESS
1C65 34 02 1C9F      5033+      ST    SCASVE,@XR              SAVE POINTER VALUE
1C69 3C 04 03CD      5034+      MVI   $CAERR,@@E110           SET ERROR CODE
1C6D F2 87 03        5035+      J     SCA200                  GO TO PROCESS
1C70 E2 02 01        5036+SCA100 LA    SCAINC(,@XR),@XR        INCREMENT POINTER TO NEXT CHAR
1C73 BD 40 00        5037+SCA200 CLI   0(,@XR),@BLANK         IS THIS CHAR BLANK ?
1C76 C0 81 1C70      5038+      BE    SCA100                  YES, FETCH NEXT ONE
1C7A BD 6B 00        5039+      CLI   0(,@XR),@COMMA          IS IT A COMMA ?
1C7D F2 87 10        5040+SCA250 JC    SCA400,@UCB            UCS TO RETURN -- OR NOP IF
5041+*      * SCAMMA IS ACTIVE AND CHAR
1C80 E2 02 01        5042+SCA300 LA    SCAINC(,@XR),@XR        INCREMENT POINTER TO NEXT CHAR
1C83 BD 40 00        5043+      CLI   0(,@XR),@BLANK         IS THIS CHAR A BLANK ?
1C86 C0 81 1C80      5044+      BE    SCA300                  YES, FETCH NEXT ONE
1C8A BD 1F 00        5045+      CLI   0(,@XR),@EOS+1          IS THIS EOS ?
1C8D F2 82 0A        5046+      JL    SCA500                  IF NOT, SKIP ERROR ROUTINE
1C90 34 02 1CA1      5047+SCA400 ST    SCACNT,@XR             SAVE NEW POINTER VALUE

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SCANIT - DELIMETER SCAN MODULE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	04/06/21	PAGE 74
	1C94	0F 01 1CA1	1C9F		5048+	SLC	SCACNT(2),SCASVE			SET PSR TO EQUAL IF POINTER
					5049+*					* NOT ADVANCED
	1C9A	C0 87 0000			5050+SCA500	B	*-*			YES, RETURN
				1C7E	5051+SCAMMA	EQU	SCA250+@Q			TO SET SCAN COMMA INDICATOR
					5052+*					
					5053+*		SAVE AREA			
					5054+*					
				1C9E	5055+SCASV1	EQU	*			FIRST BYTE OF SCASVE
1C9E				1C9F	5056+SCASVE	DS	CL2			ORIGINAL POINTER VALUE SAVE
1CA0				1CA1	5057+SCACNT	DS	CL2			SAVE AREA FOR TOTAL CHAR SCAN
					5058+***		END OF SCANIT			***
					5059 *					
					5060 *****					
					5061 * PATCH AREA 2					
					5062 *****					
					5063 *					
					5064 * CALCULATE AREA LEFT IN THIS SECTOR					
					5065 *					
1D00				1CA2	5066 \$\$\$L2	EQU	*			START OF PATCH AREA 2
					5067	ORG	*,256,0			SET LOC CNTR TO NEXT SECTOR
				1D00	5068 \$\$\$T2	EQU	*			DEFINE ADDR OF SCTR BNDRY
1CA2					5069	ORG	\$\$\$L2			SET LOC CNTR TO START
					5070 *					* OF PATCH AREA
1CA2				1CFF	5071 \$\$\$T2	DS	CL(\$\$\$T2-\$\$\$L2)			PATCH AREA
					5072 *****					
				FFFF	5073		END			

TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY = 0

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$\$\$\$\$	001	0C00	2361	
\$\$\$\$\$1	060	11FF	2975	
\$\$\$\$\$2	094	1CFF	5071	
\$\$\$\$L1	001	11C4	2970	2973 2975
\$\$\$\$L2	001	1CA2	5066	5069 5071
\$\$\$\$T1	001	1200	2972	2975
\$\$\$\$T2	001	1D00	5068	5071
\$\$\$CMD	001	0020	1403	
\$\$\$DAT	001	0040	1402	
\$\$\$EPL	001	0091	1399	
\$\$\$ERN	001	0080	1453	
\$\$\$FUN	001	0010	1404	
\$\$\$NLN	001	00A0	1449	2594 2597
\$\$\$STD	001	0081	1398	
\$\$BNLN	001	0605	1379	1381
\$\$CDBS	001	08C0	1429	
\$\$CDND	001	0666	1388	
\$\$CDRD	001	0890	1427	1429
\$\$CKEY	001	0603	1377	
\$\$CKFF	001	0B3D	1409	
\$\$COFF	001	0B44	1408	3567
\$\$CSNS	001	209C	1438	
\$\$DATB	001	0BBF	1410	
\$\$EOSA	001	0AFE	1407	
\$\$ERSK	001	1C00	1448	2572*
\$\$FITS	001	1D00	1456	2959 4488
\$\$FLIB	001	06FF	1455	
\$\$ILEN	001	0601	1373	1375 1379
\$\$ILHD	001	0600	1371	1373
\$\$INLN	001	0607	1386	1388 1390 2962
\$\$INND	001	06FA	1390	
\$\$KBDT	001	09E1	1397	1401
\$\$KBSN	001	09E2	1401	1406
\$\$KLD1	001	0600	1461	
\$\$KLD2	001	0700	1463	
\$\$KLD3	001	0C00	1465	
\$\$LPOS	001	09EB	1406	
\$\$PCNT	001	07E9	1422	3683*
\$\$PLYN	001	2004	1436	3536
\$\$PRES	001	0890	1395	1397 1407 1408 1409 1410 1427 2513 4377
\$\$PRFL	001	2143	1440	
\$\$PRNT	001	0707	1416	1417 1421 1422 3573 3575 3583 3640 3680 3684
\$\$PRTN	001	0782	1417	
\$\$PSIO	001	07CE	1421	3671* 3682*
\$\$PYCD	001	2200	1442	4374
\$\$PYMP	001	2000	1434	1436 1438 1440 1442
\$\$SLIB	001	1C00	1451	
\$\$TPCD	001	0606	1381	1386
\$\$UPAR	001	0602	1375	1377
\$\$WSPB	001	1E00	1454	
\$\$XIND	001	06FF	1452	1455
\$\$ZERO	001	0000	0967	0968 0970 0971 0972 0976 1434
\$#TALT	001	0075	1481	
\$#TBIS	001	00FC	1493	
\$#TCET	001	0069	1480	
\$#TCYL	001	005C	1479	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$#THAD	001	00F2	1485	
\$#THEL	001	0004	1505	
\$#THVT	001	00F0	1484	
\$#TIDR	001	00FF	1495	
\$#TLAD	001	00FE	1494	
\$#TLBL	001	0008	1476	
\$#TLIB	001	00F8	1490	
\$#TLIF	001	0010	1503	
\$#TLSZ	001	00F7	1489	
\$#TOID	001	005B	1478	
\$#TPAD	001	00F6	1488	
\$#TPFL	001	0008	1504	
\$#TPSZ	001	00F4	1487	
\$#TPTF	001	00F3	1486	
\$#TRES	001	00D7	1497	
\$#TSUS	001	00EF	1483	
\$#TSYM	001	0080	1500	
\$#TSYS	001	00FA	1492	
\$#TUSE	001	00A8	1482	
\$#TVOL	001	0002	1475	
\$#TVTC	001	000A	1477	
\$#TWAL	001	00D7	1496	
\$#TWF1	001	0020	1502	
\$#TWRK	001	00F9	1491	
\$#TWR1	001	0040	1501	
\$ABORT	001	0010	1080	
\$BASIC	001	0080	1138	3241
\$BIGCD	001	0080	1214	2432 2773
\$BLDPL	001	0579	1347	1349
\$BLNOE	001	0569	1337	
\$BLOAD	001	0522	1328	1330 1333 1346 1347
\$BLRTN	001	0550	1336	1337
\$BRSAV	001	03C5	1025	1026
\$BSADR	001	0587	1352	1354
\$BUFPT	001	03E3	1233	1234
\$CABLD	001	04B4	1306	1307
\$CAERK	001	0469	1283	1286 2471 2548 2575 3346 4137 4274
\$CAERR	001	03CD	1031	1033 2374* 2403* 2410* 2426* 2459* 2469* 2546* 3342* 4136* 4308* 4311* 4314* 4351* 4360* 4364* 4635* 4865* 4904* 4911* 5034*
\$CAIPL	001	049D	1302	1304
\$CALLI	001	0008	1223	2439
\$CARDI	001	0001	0994	2437 4357
\$CARPL	001	04A1	1304	1306 2581
\$CIENT	001	0483	1293	1294
\$CIEXT	001	0480	1292	1293
\$CIMSK	001	0476	1289	1292 3642*
\$CISUS	001	0496	1297	1302
\$CLBFR	001	0010	1181	
\$CMDKY	001	0008	1093	4371
\$CMODE	001	0002	1143	
\$CONFIG	001	03DD	1206	1216 2432 2773
\$CRPOS	001	03E2	1232	1233
\$CRTAD	001	044D	1271	1272
\$CRTAV	001	0002	1087	4354
\$CRTDN	001	0002	1111	2633 2668 2856
\$CRTIN	001	03D3	1108	1115 2664 2666 2681 2799* 2800 2803 2806* 3541 3552 3554* 3559*

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S Y M B O L	L E N	V A L U E	D E F N	R E F E R E N C E S	VER 15, MOD 00 04/06/21 PAGE 77											
\$CRTNO	001	0004	1090	4340*												
\$CRTPU	001	0004	1112	2624	2683	2803	2806	3552	3554							
\$CRTSP	001	0008	1113	2666	2799	2800	3541	3559								
\$CRTUP	001	0001	1110	2829	4340											
\$CRUSH	001	0080	1219													
\$CSDPL	001	050E	1318	1319												
\$C0001	001	0464	1275	1281												
\$DATE	001	043A	1256	1257												
\$DBGUF	001	03E0	1218	1227	2439											
\$DBLOK	001	0001	1168													
\$DFDET	001	03E8	1239	1240												
\$DISKN	001	0025	0970	3089	3167	3264	3958									
\$DKERR	001	0008	1149													
\$DKSIZ	001	03D7	1193	1201	1242											
\$DK100	001	0001	1195													
\$DK200	001	0002	1196													
\$DK400	001	0004	1197													
\$DK600	001	0008	1198													
\$DK800	001	0010	1199													
\$DPLSV	001	0449	1267	1269												
\$DTNMB	001	0040	1014													
\$DTRDR	001	0040	1102													
\$ENDNU	001	0600	1361	1371	1395	1416	1452	1461	1463	1465						
\$ERDPL	001	046F	1286	1288												
\$ERFIL	001	0040	1041													
\$ERHRD	001	0004	1173	3345												
\$ERKEY	001	0080	1045													
\$ERLOG	001	0345	0975													
\$ERMAD	001	0472	1288	1289												
\$ERPND	001	0004	1146													
\$ERRCT	001	03CF	1047	2573*												
\$ERRPG	001	03CE	1035	2574*												
\$ERSFL	001	0035	1040													
\$ERSTK	001	0030	1038	2574												
\$ER050	001	0363	0976													
\$ER1N2	001	0050	1043													
\$EXADR	001	0517	1321	1323												
\$EXCMD	001	0001	1075													
\$EXFTR	001	043B	1257	1262	3515	4373	4375									
\$FCIND	001	0010	1153													
\$FDIND	001	0040	1160													
\$FEARR	001	0004	0968													
\$FEMAP	001	0588	1354	1355												
\$FILIB	001	03DA	1204	1205												
\$FITIN	001	0010	1129													
\$FUIND	001	0020	1158													
\$GUFIO	001	0583	1351	1352												
\$GUFIR	001	0008	1003													
\$HISTE	001	042E	1254	1255												
\$HIST1	001	0435	1255	1256												
\$HRDER	001	0020	1099													
\$INDR1	001	03D4	1115	1141	2453	2455	2464	2530	2547	2615	2864	2866	3241	3826	3930	
				3962												

[illegible]

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$INLNO	001	03CF	1033	1035 1047 1054
\$INRPT	001	0020	1011	
\$IOIND	001	03D2	1082	1108 3571 4348 4354 4371*
\$IOPGS	001	0010	1222	
\$IOYES	001	0002	0997	2448
\$IPLDV	001	05FF	1358	1361
\$IRKEY	001	0020	1221	
\$KEYBD	001	03E1	1227	1232
\$KEYCD	001	03C3	0991	1025 2437 2448* 4357
\$KEYDT	001	0040	1135	2453 2866
\$KE090	001	00DE	0971	
\$KE130	001	01D5	0972	
\$KYBSY	001	0010	1008	
\$LDRTN	001	0571	1346	
\$LEVEL	001	03DF	1216	1218
\$LIST	001	0002	1170	2532
\$LMRGN	001	03C1	0986	0988 2463 3644 3653 3673
\$LNPTR	001	0080	1105	3571
\$LOADB	001	054A	1330	
\$LOADR	001	051A	1323	1326 2449
\$LPRIO	001	03EA	1240	
\$LPROS	001	03E5	1235	1237
\$LPRP3	001	03E4	1234	1235
\$MOUNT	001	0020	1184	
\$MPDWN	001	0001	1084	4348
\$NEXTB	001	03E6	1237	1238
\$NEXTL	001	03E7	1238	1239
\$NOENB	001	0008	1176	
\$NOLST	001	0004	1000	
\$NUCBS	001	03C0	0983	0984
\$NWRKF	001	0080	1189	
\$NWRKR	001	0040	1186	
\$PASWD	001	042D	1253	1254
\$PAUSD	001	04BA	1307	1309
\$PAUSE	001	0002	1077	
\$PGMDT	001	0020	1132	2464 2530 2547 2615 3930 3962
\$PGMST	001	0010	1096	
\$PKERT	001	0419	1251	1253
\$PLST1	001	0454	1272	1273
\$PLST2	001	045B	1273	1274
\$PLST3	001	0462	1274	1275
\$PRDEV	001	044B	1269	1271 3523 3528
\$PRESN	001	0002	1120	3826
\$PROCI	001	0001	1117	2455 2864
\$PRPOS	001	03C2	0988	0991 3653 3672
\$PSDBR	001	04FA	1312	
\$PSDXR	001	04F2	1311	1312
\$PSTEP	001	0004	1078	
\$PSTMT	001	0008	1079	
\$PTCH1	001	03F5	1242	1246
\$READY	001	0080	1162	
\$REORD	001	0040	1220	
\$RLOAD	001	051E	1326	1328
\$RMRGN	001	03C0	0984	0986 2462 3643
\$RSTR	001	04D6	1309	1311 1313 1318
\$RUNIT	001	0001	1056	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$SFAID	001	050D	1314	
\$SPRNT	001	0465	1281	1283
\$SRTRN	001	04FE	1313	1314
\$STEPT	001	0002	1057	
\$SWPCR	001	0511	1319	1321
\$TABLN	001	03CB	1028	1031
\$TFLOW	001	0008	1063	
\$TRACE	001	0004	1058	
\$TRALL	001	0010	1064	
\$TROVR	001	054E	1333	1336
\$TRUNK	001	0080	1016	
\$TRVAR	001	0020	1065	
\$UNMSK	001	048D	1294	1297 3600
\$USRDR	001	03DC	1205	1206
\$VMDEF	001	0080	1069	
\$VOLF1	001	03FE	1248	1249
\$VOLF2	001	040E	1250	
\$VOLID	001	03F6	1246	1247 1251
\$VOLR1	001	03F6	1247	1248
\$VOLR2	001	0406	1249	1250
\$WAITF	001	057F	1349	1351 2580 2790 3168 3265 3576 3641 3959 3985
\$WFDEF	001	0040	1263	
\$WFLOK	001	0008	1126	
\$WFNME	001	0443	1262	1267
\$WSIND	001	0004	1123	
\$XIND1	001	03D0	1054	1073
\$XIND2	001	03D1	1073	1082
\$XIND3	001	03D8	1201	1204
\$XPREC	001	0040	1066	
\$XRSAB	001	03C7	1026	1028 2367 2385* 2470 3932* 3933 3953* 3954*
\$ZTRAD	001	05A2	1355	
\$12K	001	0004	1210	
\$16CKY	001	0008	1212	
\$16K	001	0002	1209	
\$22IMP	001	0001	1207	
###BL	001	0000	2018	
###CK	001	0000	2146	
###CN	001	0000	2114	
###CO	001	0000	1906	
###CS	001	0000	1966	
###DR	001	0000	1710	
###ER	001	0000	1910	
###FS	001	0000	2006	
###IN	001	0000	2150	
###PW	001	0000	2154	
###RS	001	0000	1986	
###SA	001	0000	1974	
###SS	001	0000	1970	
###VU	001	0600	1930	
###0T	001	0700	1702	
###1T	001	0000	1706	
###BCO	001	0600	1718	
###BOV	001	0800	1990	
###DPR	001	0700	1726	
###DRE	001	0889	1742	
###DSP	001	2800	1762	

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###ECM 001 0C00 2022
###EFK 001 0C00 2042
###ERR 001 0C00 2014
###EXM 001 0C00 1902
###FIL 001 0E00 1982
###FIS 001 0E00 1978
###FML 001 0200 2110
###FMS 001 0200 1950
###GRA 001 0889 1874
###GUF 001 0C00 2010
###INL 001 0600 2090
###INS 001 0600 1714
###KAL 001 0C00 1878
###KCA 001 0C00 2094
###KCH 001 0C00 1846
###KCN 001 0C00 1962
###KCT 001 0C00 1814
###KDE 001 0C00 1810
###KDI 001 0D00 1890
###KDN 001 0C00 1798
###KDO 001 0E00 1894
###KED 001 0C00 1734
###KEN 001 0C00 1738
###KEX 001 0C00 1758
###KGO 001 0C00 1730
###KHE 001 0C00 1914
###KKE 001 0C00 2142
###KLI 001 0C00 1818
###KLL 001 0920 2118
###KLO 001 0C00 1822
###KME 001 0D00 1802
###KMO 001 0C00 1746
###KNA 001 0C00 1858
###KOV 001 0E00 1778
###KPA 001 0C00 1754
###KPO 001 0C00 1842
###KPR 001 0C00 1866
###KRE 001 0C00 1786
###KRL 001 0700 1882
###KRM 001 0C00 1750
###KRN 001 0700 1770
###KRO 001 0D00 1774
###KRS 001 0C00 2098
###KRU 001 0C00 1794
###KRV 001 0800 1886
###KSA 001 0C00 1830
###KSE 001 0E00 1870
###KSO 001 0C20 1922
###KSS 001 0C00 1854
###KSV 001 0980 1850
###KSY 001 0C00 1862
###KWI 001 0C00 1790
###KWR 001 0C00 1782
###LOA 001 0600 1722
###MIP 001 0C00 1918
###SDS 001 0C00 2030

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
####SFF	001	0E00	2034	
####SFL	001	0F00	2026	
####SFO	001	1500	1998	
####SFS	001	0C00	1994	
####SPA	001	0C00	1834	
####SPO	001	0806	1838	
####SPS	001	0C00	1826	
####STR	001	1600	2002	
####TDC	001	1000	1806	
####TSY	001	1000	1766	
####TVK	001	0FC0	1942	
####UAL	001	0C00	1958	
####UAT	001	0900	2054	
####UCD	001	0900	2062	
####UCN	001	0C00	2046	
####UCP	001	0700	2050	
####UDE	001	0C00	2066	
####UDI	001	0C00	2070	
####UEX	001	0C00	1954	
####UIN	001	0C00	2058	
####UPA	001	0C00	2038	
####UPO	001	0C00	2106	
####UPT	001	0C00	2102	
####VCR	001	2000	1898	
####VLO	001	0600	1934	
####VOD	001	0600	1938	
####VVM	001	0000	1946	
####VXI	001	0600	1926	
####ZDU	001	1100	2078	
####ZLB	001	1100	2122	
####ZLO	001	1100	2082	
####ZLV	001	0F00	2138	
####ZL1	001	0F00	2126	
####ZL2	001	0F00	2130	
####ZL3	001	0C00	2134	
####ZTR	001	1000	2074	
####ZUT	001	0C00	2086	
##BLN	001	18D4	2017	
##CKT	001	2118	2145	
##CNF	001	2000	2113	
##COR	001	0800	1905	
##CSA	001	1000	1965	
##DRT	001	0000	1709	
##ERM	001	0928	1909	
##FSP	001	1880	2005	
##INV	001	212C	2149	
##PWR	001	2300	2153	
##RSP	001	1780	1985	
##SAV	001	1180	1973	
##SSA	001	1128	1969	
##VUF	001	0B08	1929	
##0TR	001	0000	1701	
##1TR	001	0080	1705	
##@#BL	001	0001	2019	
##@#CK	001	0004	2147	
##@#CN	001	0001	2115	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
#\$@#CO	001	003A	1907	
#\$@#CS	001	003A	1967	
#\$@#DR	001	0008	1711	
#\$@#ER	001	0032	1911	
#\$@#FS	001	0030	2007	
#\$@#IN	001	003A	2151	
#\$@#PW	001	00C0	2155	
#\$@#RS	001	0030	1987	
#\$@#SA	001	0108	1975	
#\$@#SS	001	0001	1971	
#\$@#VU	001	0002	1931	
#\$@#0T	001	0018	1703	
#\$@#1T	001	0018	1707	
#\$@BCO	001	0018	1719	
#\$@BOV	001	0018	1991	
#\$@DPR	001	0005	1727	
#\$@DRE	001	0001	1743	
#\$@DSP	001	0004	1763	
#\$@ECM	001	0006	2023	
#\$@EFK	001	0002	2043	
#\$@ERR	001	0003	2015	
#\$@EXM	001	0003	1903	
#\$@FIL	001	0009	1983	
#\$@FIS	001	0009	1979	
#\$@FML	001	0052	2111	
#\$@FMS	001	0052	1951	
#\$@GRA	001	0003	1875	
#\$@GUF	001	0010	2011	
#\$@INL	001	0010	2091	
#\$@INS	001	0010	1715	
#\$@KAL	001	000F	1879	
#\$@KCA	001	000C	2095	
#\$@KCH	001	000C	1847	
#\$@KCN	001	0010	1963	
#\$@KCT	001	0009	1815	
#\$@KDE	001	0010	1811	
#\$@KDI	001	0005	1891	
#\$@KDN	001	0010	1799	
#\$@KDO	001	000C	1895	
#\$@KED	001	000E	1735	
#\$@KEN	001	0006	1739	
#\$@KEX	001	0003	1759	
#\$@KGO	001	0002	1731	
#\$@KHE	001	000C	1915	
#\$@KKE	001	0006	2143	
#\$@KLI	001	0011	1819	
#\$@KLL	001	0001	2119	
#\$@KLO	001	0008	1823	
#\$@KME	001	0003	1803	
#\$@KMO	001	0004	1747	
#\$@KNA	001	0008	1859	
#\$@KOV	001	0009	1779	
#\$@KPA	001	0005	1755	
#\$@KPO	001	000D	1843	
#\$@KPR	001	0009	1867	
#\$@KRE	001	0002	1787	

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#\$@KRL	001	0004	1883	
#\$@KRM	001	0003	1751	
#\$@KRN	001	0003	1771	
#\$@KRO	001	000A	1775	
#\$@KRS	001	000A	2099	
#\$@KRU	001	0003	1795	
#\$@KRV	001	000D	1887	
#\$@KSA	001	0011	1831	
#\$@KSE	001	0004	1871	
#\$@KSO	001	000D	1923	
#\$@KSS	001	000B	1855	
#\$@KSV	001	0002	1851	
#\$@KSY	001	000F	1863	
#\$@KWI	001	0002	1791	
#\$@KWR	001	0002	1783	
#\$@LOA	001	0013	1723	
#\$@MIP	001	000D	1919	
#\$@SDS	001	0004	2031	
#\$@SFF	001	0008	2035	
#\$@SFL	001	0005	2027	
#\$@SFO	001	0003	1999	
#\$@SFS	001	0011	1995	
#\$@SPA	001	0004	1835	
#\$@SPO	001	0003	1839	
#\$@SPS	001	0001	1827	
#\$@STR	001	0002	2003	
#\$@TDC	001	0003	1807	
#\$@TSY	001	0003	1767	
#\$@TVK	001	0001	1943	
#\$@UAL	001	0011	1959	
#\$@UAT	001	000C	2055	
#\$@UCD	001	000B	2063	
#\$@UCN	001	0009	2047	
#\$@UCP	001	000F	2051	
#\$@UDE	001	000E	2067	
#\$@UDI	001	0008	2071	
#\$@UEX	001	000E	1955	
#\$@UIN	001	000F	2059	
#\$@UPA	001	0004	2039	
#\$@UPO	001	0005	2107	
#\$@UPT	001	0012	2103	
#\$@VCR	001	0008	1899	
#\$@VLO	001	0002	1935	
#\$@VOD	001	0016	1939	
#\$@VVM	001	0030	1947	
#\$@VXI	001	0002	1927	
#\$@ZDU	001	0008	2079	
#\$@ZLB	001	0002	2123	
#\$@ZLO	001	000C	2083	
#\$@ZLV	001	0006	2139	
#\$@ZL1	001	0007	2127	
#\$@ZL2	001	000D	2131	
#\$@ZL3	001	000A	2135	
#\$@ZTR	001	0001	2075	
#\$@ZUT	001	0014	2087	
#\$BCOM	001	0080	1717	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
#\$BOLV	001	1780	1989	
#\$DPRI	001	014C	1725	
#\$DREA	001	0200	1741	
#\$DSPL	001	0240	1761	
#\$ECMA	001	1900	2021	
#\$EFKE	001	1990	2041	
#\$ERRP	001	18C0	2013	
#\$EXMS	001	07D4	1901	
#\$FILN	001	1724	1981	
#\$FIST	001	1700	1977	
#\$FMLN	001	1E00	2109	
#\$FMST	001	0D00	1949	
#\$GRAP	001	0690	1873	
#\$GUFU	001	1880	2009	
#\$INLN	001	1C84	2089	
#\$INST	001	0020	1713	
#\$KALL	001	06A4	1877	
#\$KCAL	001	1CC4	2093	
#\$KCHA	001	053C	1845	
#\$KCND	001	0F80	1961	
#\$KCTL	001	03BC	1813	
#\$KDEL	001	035C	1809	
#\$KDIS	001	0744	1889	
#\$KDNT	001	0300	1797	
#\$KDOV	001	0780	1893	
#\$KEDI	001	0188	1733	
#\$KENA	001	01C4	1737	
#\$KEXT	001	0234	1757	
#\$KGOS	001	0180	1729	
#\$KHEL	001	0A30	1913	
#\$KKEY	001	2100	2141	
#\$KLIS	001	0400	1817	
#\$KLLA	001	2004	2117	
#\$KLOG	001	0444	1821	
#\$KMER	001	030C	1801	
#\$KMOU	001	0204	1745	
#\$KNAM	001	05C0	1857	
#\$KOVN	001	0290	1777	
#\$KPAS	001	0220	1753	
#\$KPOO	001	0508	1841	
#\$KPRT	001	063C	1865	
#\$KREA	001	02BC	1785	
#\$KRLA	001	0700	1881	
#\$KRMO	001	0214	1749	
#\$KRNU	001	0280	1769	
#\$KROV	001	028C	1773	
#\$KRSU	001	1D24	2097	
#\$KRUN	001	02CC	1793	
#\$KRVL	001	0710	1885	
#\$KSAV	001	0488	1829	
#\$KSET	001	0680	1869	
#\$KSOV	001	0AC8	1921	
#\$KSSP	001	0594	1853	
#\$KSVL	001	058C	1849	
#\$KSYM	001	0600	1861	
#\$KWID	001	02C4	1789	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
#\$KWRI	001	02B4	1781	
#\$LOAD	001	0100	1721	
#\$MIPP	001	0A80	1917	
#\$SDSY	001	192C	2029	
#\$SFFI	001	193C	2033	
#\$SFLO	001	1918	2025	
#\$SFOV	001	1844	1997	
#\$SFSY	001	1800	1993	
#\$SPAC	001	04CC	1833	
#\$SPOV	001	04DC	1837	
#\$SPSY	001	0484	1825	
#\$STRO	001	1850	2001	
#\$TDCK	001	0350	1805	
#\$TSYK	001	0250	1765	
#\$TVKB	001	0BAC	1941	
#\$UALL	001	0F00	1957	
#\$UATR	001	1A38	2053	
#\$UCDI	001	1AD8	2061	
#\$UCNF	001	19B8	2045	
#\$UCPL	001	19DC	2049	
#\$UDEL	001	1B24	2065	
#\$UDIS	001	1B5C	2069	
#\$UEXL	001	0EA8	1953	
#\$UINI	001	1A88	2057	
#\$UPAC	001	1980	2037	
#\$UPOV	001	1D24	2105	
#\$UPTF	001	1D5C	2101	
#\$VCRT	001	07B4	1897	
#\$VLOA	001	0B80	1933	
#\$VODK	001	0B88	1937	
#\$VVMR	001	0C00	1945	
#\$VXIT	001	0B00	1925	
#\$ZDUM	001	1BA4	2077	
#\$ZLBM	001	2008	2121	
#\$ZLOA	001	1BC4	2081	
#\$ZLVR	001	20B0	2137	
#\$ZL1M	001	2010	2125	
#\$ZL2M	001	2030	2129	
#\$ZL3M	001	2088	2133	
#\$ZTRA	001	1B9C	2073	
#\$ZUTM	001	1C14	2085	
##DNEA	001	0001	0888	
##DNEF	001	0003	0889	
##DNER	001	0005	0890	
##DNE1	001	0004	0887	
##DNHC	001	0000	0884	
##DNHR	001	0003	0886	
##DNHY	001	0001	0885	
##DPEA	001	0009	0862	
##DPEN	001	0007	0861	
##DPER	001	000B	0863	
##DPE1	001	0004	0860	
##DPHC	001	0000	0858	
##DPHR	001	0003	0859	
##DUEA	001	0009	0873	
##DUED	001	0012	0878	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
##DUEF	001	000B	0874	
##DUEH	001	002B	0879	
##DUEI	001	000C	0875	
##DUEL	001	000F	0877	
##DUEN	001	0007	0872	
##DUER	001	0031	0880	
##DUES	001	000D	0876	
##DUE1	001	000C	0871	
##DUHA	001	0001	0867	
##DUHB	001	0003	0868	
##DUHC	001	0004	0869	
##DUHR	001	000B	0870	
##LAAA	001	0002	0899	
##LAHC	001	0001	0898	
##LN	001	0001	0927	
##LNE	001	0006	0933	
##LNEF	001	0002	0931	
##LNEZ	001	0002	0932	
##LNH	001	0004	0930	
##LNHY	001	0001	0928	
##LNHZ	001	0002	0929	
##LP	001	0004	0903	
##LPE	001	000C	0908	
##LPEN	001	0008	0905	
##LPEZ	001	0002	0906	
##LPH	001	0004	0907	
##LPHZ	001	0003	0904	
##LU	001	0002	0912	
##LUE	001	0032	0923	
##LUED	001	0003	0920	
##LUEF	001	0002	0916	
##LUEH	001	0019	0921	
##LUEI	001	0001	0917	
##LUEL	001	0002	0919	
##LUEN	001	0008	0915	
##LUES	001	0001	0918	
##LUEZ	001	0006	0922	
##LUH	001	000C	0914	
##LUHZ	001	0007	0913	
##MNHM	001	002A	0956	
##MPHM	001	0055	0941	
##MUEG	001	0020	0948	
##MUEK	001	0040	0947	
##MUEP	001	0080	0946	
##MUER	001	0008	0950	
##MUEV	001	0002	0952	
##MUEX	001	0010	0949	
##MUE0	001	0004	0951	
##MUHM	001	000A	0945	
##RN	001	0000	0847	
##RP	001	0001	0848	
##R1	001	0007	0850	
##R2	001	0005	0849	
#KLIS	001	0C07	2364	
#KLIST	001	0000	0001	
@@E001	001	0000	0749	0751

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E003	001	0001	0751	0753
@@E004	001	0002	0753	0755
@@E005	001	0003	0755	0757
@@E006	001	0004	0757	0759
@@E007	001	0005	0759	0761
@@E008	001	0006	0761	0763
@@E009	001	0007	0763	0765
@@E010	001	0008	0765	0767
@@E011	001	0009	0767	0769
@@E012	001	000A	0769	0771
@@E013	001	000B	0771	0773
@@E014	001	000C	0773	0775
@@E015	001	000D	0775	0777
@@E016	001	000E	0777	0779
@@E017	001	000F	0779	0781
@@E018	001	0010	0781	0783
@@E019	001	0011	0783	0785
@@E020	001	0012	0785	0787
@@E021	001	0013	0787	0789
@@E023	001	0014	0789	0791
@@E024	001	0015	0791	0793
@@E025	001	0016	0793	0795
@@E026	001	0017	0795	0797
@@E027	001	0018	0797	0799
@@E028	001	0019	0799	0801
@@E029	001	001A	0801	0803
@@E030	001	001B	0803	0805
@@E031	001	001C	0805	0807
@@E032	001	001D	0807	0809
@@E035	001	001E	0809	0811
@@E036	001	001F	0811	0813
@@E037	001	0020	0813	0815
@@E038	001	0021	0815	0817
@@E039	001	0022	0817	0819
@@E040	001	0023	0819	0821
@@E041	001	0024	0821	0823
@@E042	001	0025	0823	0825
@@E043	001	0026	0825	0827
@@E044	001	0027	0827	0829
@@E045	001	0028	0829	0831
@@E046	001	0029	0831	0833
@@E060	001	002A	0833	0835
@@E080	001	002B	0835	
@@E100	001	0000	0221	0223
@@E101	001	0001	0223	0225
@@E102	001	0002	0225	0227
@@E103	001	0003	0227	0229
@@E110	001	0004	0229	0231 5034
@@E112	001	0005	0231	0233
@@E113	001	0006	0233	0235
@@E114	001	0007	0235	0237
@@E115	001	0008	0237	0239
@@E116	001	0009	0239	0241
@@E117	001	000A	0241	0243
@@E120	001	000B	0243	0245 4904
@@E122	001	000C	0245	0247 4635

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E123	001	000D	0247	0249 4865
@@E124	001	000E	0249	0251 4911
@@E129	001	000F	0251	0253
@@E130	001	0010	0253	0255
@@E131	001	0011	0255	0257 2374 2469 4308
@@E133	001	0012	0257	0259
@@E134	001	0013	0259	0261 2403 4314
@@E135	001	0014	0261	0263
@@E136	001	0015	0263	0265 2410 2459 4311
@@E137	001	0016	0265	0267
@@E138	001	0017	0267	0269
@@E139	001	0018	0269	0271
@@E142	001	0019	0271	0273
@@E143	001	001A	0273	0275
@@E150	001	001B	0275	0277
@@E151	001	001C	0277	0279
@@E160	001	001D	0279	0281
@@E162	001	001E	0281	0283
@@E163	001	001F	0283	0285
@@E164	001	0020	0285	0287
@@E200	001	0021	0287	0289
@@E205	001	0022	0289	0291
@@E210	001	0023	0291	0293
@@E211	001	0024	0293	0295
@@E212	001	0025	0295	0297
@@E213	001	0026	0297	0299
@@E215	001	0027	0299	0301
@@E216	001	0028	0301	0303
@@E217	001	0029	0303	0305
@@E220	001	002A	0305	0307
@@E221	001	002B	0307	0309
@@E222	001	002C	0309	0311
@@E223	001	002D	0311	0313
@@E225	001	002E	0313	0315
@@E226	001	002F	0315	0317 4136
@@E227	001	0030	0317	0319
@@E228	001	0031	0319	0321
@@E229	001	0032	0321	0323
@@E230	001	0033	0323	0325
@@E232	001	0034	0325	0327
@@E234	001	0035	0327	0329
@@E237	001	0036	0329	0331
@@E240	001	0037	0331	0333
@@E241	001	0038	0333	0335 4364
@@E242	001	0039	0335	0337
@@E248	001	003A	0337	0339 4360
@@E249	001	003B	0339	0341 2426
@@E250	001	003C	0341	0343
@@E251	001	003D	0343	0345
@@E252	001	003E	0345	0347
@@E253	001	003F	0347	0349
@@E254	001	0040	0349	0351
@@E255	001	0041	0351	0353
@@E256	001	0042	0353	0355
@@E300	001	0043	0355	0357
@@E301	001	0044	0357	0359

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E302	001	0045	0359	0361
@@E303	001	0046	0361	0363
@@E304	001	0047	0363	0365
@@E305	001	0048	0365	0367
@@E308	001	0049	0367	0369
@@E310	001	004A	0369	0371
@@E315	001	004B	0371	0373
@@E316	001	004C	0373	0375
@@E320	001	004D	0375	0377
@@E325	001	004E	0377	0379
@@E330	001	004F	0379	0381
@@E335	001	0050	0381	0383 2546
@@E338	001	0051	0383	0385
@@E340	001	0052	0385	0387
@@E350	001	0053	0387	0389
@@E351	001	0054	0389	0391
@@E352	001	0055	0391	0393
@@E360	001	0056	0393	0395
@@E361	001	0057	0395	0397
@@E362	001	0058	0397	0399
@@E371	001	0059	0399	0401
@@E380	001	005A	0401	0403
@@E390	001	005B	0403	0405
@@E400	001	005C	0405	0407
@@E410	001	005D	0407	0409
@@E415	001	005E	0409	0411
@@E417	001	005F	0411	0413
@@E420	001	0060	0413	0415
@@E430	001	0061	0415	0417
@@E432	001	0062	0417	0419
@@E433	001	0063	0419	0421
@@E450	001	0064	0421	0423
@@E451	001	0065	0423	0425
@@E460	001	0066	0425	0427
@@E461	001	0067	0427	0429
@@E464	001	0068	0429	0431
@@E465	001	0069	0431	0433
@@E466	001	006A	0433	0435
@@E467	001	006B	0435	0437
@@E469	001	006C	0437	0439
@@E470	001	006D	0439	0441
@@E471	001	006E	0441	0443
@@E473	001	006F	0443	0445
@@E474	001	0070	0445	0447
@@E475	001	0071	0447	0449
@@E476	001	0072	0449	0451
@@E477	001	0073	0451	0453
@@E478	001	0074	0453	0455
@@E479	001	0075	0455	0457
@@E480	001	0076	0457	0459
@@E481	001	0077	0459	0461
@@E482	001	0078	0461	0463
@@E483	001	0079	0463	0465
@@E484	001	007A	0465	0467
@@E485	001	007B	0467	0469
@@E486	001	007C	0469	0471

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E487	001	007D	0471	0473
@@E488	001	007E	0473	0475
@@E489	001	007F	0475	0477
@@E490	001	0080	0477	0479
@@E491	001	0081	0479	0481
@@E492	001	0082	0481	0483
@@E493	001	0083	0483	0485
@@E494	001	0084	0485	0487
@@E495	001	0085	0487	0489
@@E496	001	0086	0489	0491
@@E497	001	0087	0491	0493
@@E498	001	0088	0493	0495
@@E500	001	0089	0495	0497
@@E501	001	008A	0497	0499
@@E530	001	008B	0499	0501
@@E531	001	008C	0501	0503
@@E535	001	008D	0503	0505
@@E540	001	008E	0505	0507
@@E541	001	008F	0507	0509
@@E542	001	0090	0509	0511
@@E543	001	0091	0511	0513
@@E544	001	0092	0513	0515
@@E545	001	0093	0515	0517
@@E546	001	0094	0517	0519
@@E547	001	0095	0519	0521
@@E548	001	FFFF	0725	
@@E549	001	0096	0521	0523 4351
@@E550	001	0097	0523	0525 3169
@@E551	001	0098	0525	0527 3342
@@E552	001	0099	0527	0529
@@E553	001	009A	0529	0531
@@E554	001	009B	0531	0533
@@E555	001	009C	0533	0535
@@E556	001	009D	0535	0537
@@E558	001	009E	0537	0539
@@E570	001	009F	0539	0541 2569 2596
@@E571	001	00A0	0541	0543 2570 2593
@@E572	001	00A1	0543	0545
@@E573	001	00A2	0545	0547
@@E574	001	00A3	0547	0549
@@E575	001	FFFF	0727	
@@E578	001	00A4	0549	0551
@@E579	001	FFFF	0729	
@@E580	001	FFFF	0731	
@@E585	001	00A5	0551	0553
@@E595	001	FFFF	0733	
@@E597	001	FFFF	0735	
@@E598	001	FFFF	0737	
@@E600	001	00A6	0553	0555
@@E601	001	00A7	0555	0557
@@E602	001	00A8	0557	0559
@@E603	001	00A9	0559	0561
@@E604	001	00AA	0561	0563
@@E606	001	00AB	0563	0565
@@E607	001	00AC	0565	0567
@@E608	001	00AD	0567	0569

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E609	001	00AE	0569	0571
@@E610	001	00AF	0571	0573
@@E611	001	00B0	0573	0575
@@E612	001	00B1	0575	0577
@@E613	001	00B2	0577	0579
@@E614	001	00B3	0579	0581
@@E700	001	00B4	0581	0583
@@E701	001	00B5	0583	0585
@@E710	001	00B6	0585	0587
@@E712	001	00B7	0587	0589
@@E713	001	00B8	0589	0591
@@E714	001	00B9	0591	0593
@@E715	001	00BA	0593	0595
@@E716	001	00BB	0595	0597
@@E717	001	00BC	0597	0599
@@E718	001	00BD	0599	0601
@@E720	001	00BE	0601	0603
@@E721	001	00BF	0603	0605
@@E723	001	00C0	0605	0607
@@E724	001	00C1	0607	0609
@@E725	001	00C2	0609	0611
@@E726	001	00C3	0611	0613
@@E727	001	00C4	0613	0615
@@E728	001	00C5	0615	0617
@@E729	001	00C6	0617	0619
@@E730	001	00C7	0619	0621
@@E732	001	00C8	0621	0623
@@E752	001	00C9	0623	0625
@@E753	001	00CA	0625	0627
@@E754	001	00CB	0627	0629
@@E755	001	00CC	0629	0631
@@E756	001	00CD	0631	0633
@@E757	001	00CE	0633	0635
@@E758	001	00CF	0635	0637
@@E759	001	00D0	0637	0639
@@E760	001	00D1	0639	0641
@@E761	001	00D2	0641	0643
@@E762	001	00D3	0643	0645
@@E763	001	00D4	0645	0647
@@E764	001	00D5	0647	0649
@@E765	001	00D6	0649	0651
@@E766	001	00D7	0651	0653
@@E767	001	00D8	0653	0655
@@E768	001	00D9	0655	0657
@@E769	001	00DA	0657	0659
@@E770	001	00DB	0659	0661
@@E771	001	00DC	0661	0663
@@E772	001	00DD	0663	0665
@@E773	001	00DE	0665	0667
@@E774	001	00DF	0667	0669
@@E775	001	00E0	0669	0671
@@E776	001	00E1	0671	0673
@@E777	001	00E2	0673	0675
@@E778	001	00E3	0675	0677
@@E779	001	00E4	0677	0679
@@E780	001	00E5	0679	0681

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E781	001	00E6	0681	0683
@@E782	001	00E7	0683	0685
@@E783	001	00E8	0685	0687
@@E784	001	00E9	0687	0689
@@E785	001	00EA	0689	0691
@@E786	001	00EB	0691	0693
@@E790	001	00EC	0693	0695
@@E791	001	00ED	0695	0697
@@E792	001	00EE	0697	0699
@@E793	001	00EF	0699	0701
@@E794	001	00F0	0701	0703
@@E795	001	00F1	0703	0705
@@E796	001	00F2	0705	0707
@@E797	001	00F3	0707	0709
@@E798	001	00F4	0709	0711
@@E800	001	FFFF	0739	
@@E801	001	FFFF	0741	
@@E802	001	FFFF	0743	
@@E803	001	FFFF	0745	
@@E804	001	FFFF	0747	
@@E900	001	00F5	0711	0713
@@E901	001	00F6	0713	0715
@@E902	001	00F7	0715	0717
@@E903	001	00F8	0717	0719
@@E905	001	00F9	0719	0721
@@E906	001	00FA	0721	0723
@@E910	001	00FB	0723	
@ALTFL	001	0001	1544	
@ARR	001	0008	0016	2602 2821 3057* 3058 3059* 3060 3148 3263 3365 3508* 3509 3510* 3511 3807 3951 3975 4129 4248 4339 4507 4632 4827 5032
@ASIGN	001	007C	0071	
@ASTER	001	005C	0069	2871 2913
@BCRDL	001	0050	0088	
@BE	001	0081	0043	4536 4902
@BF	001	0090	0052	
@BH	001	0084	0041	
@BKSPC	001	0010	1641	
@BL	001	0082	0042	
@BLANK	001	0040	0065	2848 2890 3590 3703 3809 3856 3986 4064 4066 4072 4077 4117 4668 5037 5043
@BM	001	0082	0054	
@BNE	001	0001	0046	5028
@BNH	001	0004	0044	
@BNL	001	0002	0045	
@BNM	001	0002	0057	
@BNOL	001	0020	0050	
@BNOZ	001	0008	0049	
@BNP	001	0004	0056	
@BNZ	001	0001	0058	
@BOL	001	00A0	0048	
@BOZ	001	0088	0047	
@BP	001	0084	0053	
@BR	001	0001	0013	2384* 2386 2387 2388 2389 2394* 2395* 2396 2401 2407 2408 2409 2425 2524 2526* 2531 2541* 2543 2545 2552 2554 2554 2557 2558 2559 2562 2564 2569 2570 2572 2577 2577 2578 2603 2604* 2605 2606 2607 2607 2608 2609 2611 2613 2613 2618 2622 2624 2625

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				2625	2626	2626	2628	2628	2630	2633	2634	2635	2636	2636	2637
				2637	2639	2639	2640	2640	2641	2643	2644	2644	2645	2646	2647
				2647	2648	2652	2653	2654	2654	2655	2656	2657	2658	2659	2660
				2668	2669	2670	2670	2671	2671	2673	2673	2674	2674	2676	2677
				2678	2679	2680	2681	2682	2683	2684	2686	2689	2692	2692	2694
				2694	2695	2695	2696	2697	2697	2698	2699	2699	2700	2700	2701
				2701	2702	2702	2703	2704	2764	2765	2765	2766	2767	2772	2772
				2775	2778	2780	2781	2784	2785	2785	2791	2796	2796	2798	2804
				2807	2811*	2815	2819	2820*	2821	2822	2823	2825	2830	2833	2835
				2839	2841	2846	2851	2852	2855	2857	2858	2859	2861	2862	2863
				2863	2867	2868	2869	2872	2875	2876	2879	2884	2885	2886	2888*
				2894	2896	2906	2907	2908	2910	2914	2916	2918	3053	3054	3056*
				3057	3058	3059	3060	3062	3063	3063	3064	3066	3067	3069	3071
				3071	3072	3072	3073	3075	3077	3078	3078	3079	3081	3083	3084
				3084	3085	3085	3086	3086	3087	3094*	3114	3114	3116	3116	3117
				3118	3119	3119	3120	3120	3121	3122	3122	3123	3124	3125	3125
				3126	3128	3128	3129	3129	3130	3130	3131	3131	3132	3144	3146
				3147*	3149	3154	3156	3162	3163	3164	3164	3165	3166	3166	3169
				3170	3170	3173	3174	3175	3175	3182	3184	3185	3191*	3195	3197
				3200	3201	3202	3210	3216	3219	3220	3221	3222	3228	3229	3232
				3233	3234	3235	3239	3239	3245	3245	3248	3250	3250	3252	3252
				3253	3257	3257	3258	3259	3263	3270	3271	3271	3272	3273	3276
				3277	3278	3278	3281	3362	3363	3364*	3365	3367	3367	3368	3369
				3374	3374	3376	3376	3377	3377	3378	3380	3380	3381	3382*	3503
				3505	3506*	3507	3508	3510	3511	3513	3514	3515	3525	3525	3538
				3540	3544	3545	3547	3548	3548	3549	3549	3550	3551	3555	3556
				3561	3561	3562	3562	3563	3565	3565	3578	3580	3581	3585	3585
				3586	3586	3587	3588	3592	3592	3593	3593	3594	3594	3595	3595*
				3596	3598*	3637	3639*	3643	3644	3645	3645	3646	3647	3647	3649
				3649	3650	3650	3651	3651	3652	3652	3658	3658	3661	3661	3662
				3662	3664	3664	3672	3673	3674	3674	3678	3686	3687*	3688	3689
				3691	3692*	3693	3694	3694	3696	3697	3697	3700	3700	3701	3701
				3702	3705	3705	3706	3707	3707	3708	3806	3814*	3824	3825	3825*
				3832	3833	3834	3835	3835*	3842	3843	3844	3845	3846	3846*	3853*
				3854	3856	3863	3863*	3864	3866	3867	3896	3897	3897*	3900	3907
				3908	3908*	3911	3912	3912*	3917	3917*	3919*	3920	3920*	3923	3926*
				3927	3927*	3935	3938	3939	3939*	3940	3943	3947*	3966*	4049	4050
				4052	4052*	4060	4061	4061*	4062	4066	4067	4067*	4075	4077	4078
				4078*	4081*	4085	4086	4086*	4091	4091*	4094	4095	4095*	4103	4107
				4115	4116*	4117	4118	4118	4120*	4121*	4122	4138*	4503	4505	4506*
				4507	4517	4519	4527	4528	4529	4533	4534	4535	4546	4547	4554
				4567	4582*	4627	4629	4630*	4632	4634	4636	4636	4646	4646	4651
				4651	4652	4652	4653	4653	4654	4654	4655	4655	4659	4660	4660
				4663	4669	4670	4675	4676	4676	4678*	4826	4828*	4837	4841	4841
				4845	4845*	4870	4871	4872	4872	4878	4878*	4900	4918*		

@BT 001 0010 0051

@BZ 001 0081 0055

@BZ37B 001 00F2 1654

@B1 001 0001 0063

				2550	2608	2609	2613	2625	2805	3287	3368	3369	3825	3835	3843*
				3845*	3847	3863	3882	3894	3911	3911*	3920	3939	3952	4061	4067
				4068	4078	4079	4085	4086	4087	4090	4091	4095	4612	4662	4667
@CADDR	001	0002	0142	2450	2533	2537	2550	2553	2554	2555	2558	2576	2577	2607	2628
				2636	2637	2639	2643	2658	2670	2671	2673	2674	2678	2692	2694
				2695	2697	2699	2713	2737	2772	2796	2826	2834	2838	2840	2845
				2851	2853	2858	2861	2862	2863	2872	2873	2876	2884	2906	2914
				3063	3170	3210	3239	3245	3250	3252	3525	3697	3700	3869	3870

[illegible]

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@DEREQ	001	0010	1566	
@DERIN	001	0040	1564	
@DERMA	001	0020	1565	
@DERNR	001	0004	1568	
@DERR	001	0000	1539	
@DERSC	001	0001	1570	
@DERTC	001	0002	1569	
@DFCR	001	0006	1525	
@DFDR	001	0004	1526	
@DGET	001	0001	0134	2517 3293 4036 4600 4610
@DHARD	001	0000	1553	
@DLNCT	001	000F	1639	
@DLNLG	001	0040	1638	
@DOLAR	001	005B	0068	
@DOP2	001	0004	0028	2388* 2389* 2390* 2394 3058* 3062* 3063* 3134 3135 3696* 3697* 3700*
@DPLNG	001	0006	0132	3064 3098
@DPOS	001	0000	0133	
@DPUT	001	0002	0135	3285
@DREAD	001	0001	1529	
@DSAD	001	0002	0127	3100 3961* 4527* 4528* 4546* 4547* 4567
@DSBCY	001	0004	0106	
@DSBSY	001	0092	1634	
@DSCS1	001	0000	0107	
@DSEEK	001	0000	1528	
@DSIVF	001	0003	0138	
@DSPIN	001	0002	0131	
@DTRSZ	001	0018	0085	
@DUNSF	001	0080	1571	
@DVBCY	001	0007	0108	
@DVERY	001	0003	1534	
@DVRFY	001	0031	0136	
@DVST1	001	0002	1540	
@DVST2	001	0003	1541	
@DWAIT	001	00FF	0137	
@DWBCY	001	0005	0103	
@DWBIT	001	0002	1530	
@DWSIZ	001	00C0	0105	
@DWTB1	001	0003	0104	
@DZERO	001	00F0	0064	
@D1	001	0002	0026	2387* 2415 3368* 3380* 3594* 4373* 4375* 4646
@EOF	001	001C	0077	3213 3964 3967 4123 4134
@EOFTC	001	0075	0162	3326
@EOS	001	001E	0076	2376 2382 2417 4277 4859 4887 4893 4901 5045
@ER37B	001	00F0	1655	
@FDDBC	001	0000	0195	
@FDE1	001	000C	0200	
@FDFNA	001	000B	0198	
@FDHLN	001	0002	0208	
@FDLNC	001	0002	0193	
@FDNSC	001	0003	0210	
@FDSD	001	0000	0206	
@FLACE	001	0009	0197	
@FLDBC	001	0001	0196	
@FLDIN	001	0012	1627	
@FLENT	001	0004	0201	
@FLFNA	001	0002	0199	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@FLHLN	001	0002	0209	
@FLLNC	001	0002	0194	
@FLNSC	001	0001	0211	
@FLSD	001	0001	0207	
@HDRLN	001	0007	0092	1416
@HSTAD	001	0009	1551	
@HSTEN	001	0007	1550	
@HSTPE	001	0006	1549	
@HSTQR	001	0001	1547	
@HSTSN	001	0005	1548	
@HSTVI	001	000F	1552	
@IAR	001	0010	0017	
@ID37B	001	0040	1691	
@INDEX	001	0001	0156	0157 3623
@INST3	001	0003	0032	
@INST4	001	0004	0033	
@INST5	001	0005	0034	
@INST6	001	0006	0035	
@IP37B	001	00C0	1690	
@I1IAR	001	00C0	0020	
@KCMDK	001	0020	1601	
@KELOK	001	001B	1600	
@KENAB	001	001E	1598	
@KEXIT	001	001F	1599	
@KEYBD	001	0010	1618	3540* 3544*
@KFUNK	001	0010	1621	
@KHARD	001	0011	1626	
@KLEAR	001	000D	1622	
@LINSZ	001	00F4	0084	1390
@LO37B	001	00F0	1659	
@MAPEN	001	0005	0089	
@MINCR	001	2000	0083	
@MINUS	001	0060	0080	2551 3823 3824
@NOP	001	0080	0040	2369 3067 3219 3543 3547 3642 3839 3881 3970 4084 4280 4321 4641 4715 4838 4895
@NORFL	001	0000	1546	
@NTRDY	001	00A0	1683	
@NUMBR	001	007B	0070	
@OPD2	001	0004	0029	
@OP1	001	0003	0027	2602* 2603* 2819* 2821* 3054* 3060* 3189* 3192 3194 3247 3255 3283 3363* 3365* 3505* 3507* 3509* 3511* 3525* 3531 3805* 3806* 3807* 3860* 3866* 3869* 3880* 3886* 3919 3926 3951* 3975* 4062* 4075* 4129* 4248* 4249* 4339* 4505* 4507* 4629* 4632* 4826* 4827* 4844* 4853* 4877* 5032* 3867* 3868*
@OP2	001	0005	0031	
@OVRUN	001	0004	1576	
@PBUSY	001	00E2	1588	
@PCAR	001	00E6	1585	
@PCNT	001	0003	1520	
@PCTRL	001	0000	0149	3538 3578 3678*
@PCYL	001	0001	1518	
@PC37B	001	00F2	1675	
@PDAR	001	00E4	1584	
@PDATA	001	0003	0151	3513 3513* 3595
@PD37B	001	0080	1689	
@PERR	001	00E0	1591	
@PFLAG	001	0000	1517	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@PFORM	001	00E1	1589	
@PGCSZ	001	0020	0082	0083
@PLITE	001	00E2	1590	
@PLNGH	001	0004	1581	
@PMGCK	001	0020	1592	
@PN37B	001	00F0	1674	
@PPLNG	001	0004	0148	3513 3622
@PRCNT	001	0001	0150	3580* 3585 3585* 3586 3586* 3592 3645 3647 3649 3651* 3658 3661* 3664* 3672* 3673* 3674* 3707* 4125* 4139*
@PRETR	001	00C0	0154	4029
@PRINT	001	0040	0152	0154 2635 3678
@PRITY	001	0080	1625	
@PSAD	001	0002	1519	
@PSIOQ	001	00E0	1587	
@PSIOR	001	0000	1586	
@PSNSQ	001	00E2	1593	
@PSR	001	0004	0015	4262* 4303* 4317* 4914*
@PWAIT	001	00FF	0158	3538 3578 3581 3587
@P1IAR	001	0020	0018	
@P2IAR	001	0040	0019	
@Q	001	0001	0024	2369* 2386* 2407* 2408* 2414* 2625* 2682* 2686 2764* 2765* 3066* 3067* 3077* 3083* 3109 3110 3112 3121* 3123 3169* 3216* 3219* 3232* 3238 3369* 3377 3377* 3380 3545* 3547* 3836* 3839* 3850 3865* 3871* 3872* 3881* 3888* 3969 4076* 4084* 4112* 4113* 4114* 4132* 4267* 4321* 4709 4713 4839* 4843* 4874 4876* 4928 5051
@RD37B	001	00F1	1669	
@REGL	001	0002	0012	4853
@RETRN	001	0080	0153	0154 2635 3630
@RLDWN	001	004F	0159	2703
@RTCNT	001	0003	1583	
@RTRNC	001	0080	0161	
@RT37B	001	0005	1682	
@SBLN	001	0005	0170	3323
@SBLNL	001	0002	0184	
@SCTSZ	001	0100	0100	2544 2563 2959 2960 4133* 4900
@SDFLN	001	0007	0090	
@SDF0	001	0000	0166	3327
@SDF1	001	0001	0167	3328
@SDF2	001	0002	0168	3329
@SDF3	001	0003	0169	
@SECCY	001	0030	0086	
@SIST	001	0001	0181	
@SKCTL	001	0000	1533	
@SLASH	001	0061	0067	
@SLAST	001	0002	0183	3230
@SMIDL	001	0003	0182	
@SNSB0	001	0000	1557	
@SNSB1	001	0001	1558	
@SNSB2	001	0002	1559	
@SNSB3	001	0003	1560	
@SNULL	001	0080	0173	3187 3196
@SN37B	001	00F2	1663	
@SONLY	001	0000	0180	3217
@SPINA	001	00A0	1542	
@SPINB	001	00B0	1543	
@STEXT	001	0007	0172	

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@STYPE	001	0006	0171	3324											
@SYCNT	001	0002	1582												
@TBCNT	001	0000	0160												
@TBLEF	001	0010	0155	0157											
@TBLIX	001	0011	0157												
@TJ37B	001	0040	1680												
@TYPAM	001	0002	1624												
@TYPO	001	001C	1623												
@UCB	001	0087	0039	3121	3216	3227	3232	3545	3836	3850	3865	4076	4132	4267	4711
				4839	4843	4874	4876	5029	5040						
@UPARW	001	005A	0078												
@VADDR	001	0002	0141												
@VENTA	001	0056	0113												
@VMDDV	001	00FE	0114												
@VMFD1	001	0000	0109												
@VMFD2	001	0001	0110												
@VMRS3	001	0002	0112												
@VMTRL	001	0001	0111												
@VOLID	001	0006	0091												
@VQ	001	0001	0025	2392	3596	3915	4118	4122							
@WA37B	001	00FF	1688												
@WSFIT	001	0500	0101	4601	4611										
@WSTBL	001	0503	0102	3289	4037										
@XR	001	0002	0014	2367*	2373	2376	2382	2385	2392	2415*	2416*	2417	2425*	2470*	2543*
				2544	2550	2551	2553	2562*	2563	2610*	2611	2612	2612*	2642*	2646*
				2652*	2653	2655*	2656*	2657	2658	2659	2660	2676*	2677*	2678	2679
				2682	2684	2686	2763	2763	2764	2766	2781*	2782	2791	2817*	2818
				2822	2824	2826	2834	2836*	2837	2837*	2838	2840	2843*	2844	2845
				2845	2853	2854*	2856	2858	2861	2872	2873	2875	2876	2878	2880
				2881	2882	2883	2884	2889*	2890	2895	2909	2914	2916	3153*	3162*
				3163	3171	3174	3180	3182	3183	3183*	3187	3189	3190	3190*	3196
				3198	3208	3209	3211	3217	3220	3221	3222	3223	3223*	3228	3230
				3233	3234	3235	3236	3236*	3237	3243	3246	3248	3254	3256	3256*
				3270*	3272	3273*	3274	3277	3371	3507	3512*	3513	3589*	3590	3591
				3591	3596	3599*	3695*	3696	3698	3699	3699*	3703	3704	3704*	3805
				3811*	3815*	3819	3821	3833	3837	3842	3843	3852	3860	3861	3862*
				3864	3865	3866	3867	3868	3868	3869	3869	3870	3870	3871	3871
				3872	3872	3879	3879	3880	3880	3881	3882	3882	3885	3885	3886
				3886	3888	3888	3889	3889	3893	3893	3901	3901	3902	3902	3903*
				3919	3921	3924	3924	3925	3926	3928*	3932	3946*	3952	3952*	3953
				3960*	3964	3967	4047	4048	4051	4051	4064	4072	4085	4088	4123
				4130*	4134	4249	4254	4257	4268	4268*	4271	4271*	4277	4316*	4366*
				4513*	4515	4515*	4517	4528	4533	4534	4547	4634	4643	4659	4662
				4662*	4667	4667*	4668	4675	4847	4852	4852*	4859	4861	4864*	4880
				4885	4885*	4887	4893	4901	4910*	4913*	5033	5036	5036*	5037	5039
				5042	5042*	5043	5045	5047							
@ZERO	001	0000	0062	2376	2544	2563	2618	2622	2630	2641	2642	2834	2853	2878	2881
				2882	2890*	3066	3184	3228	3237*	3246	3555	3580	3646	3682	3683
				3688	3818	3819	3821	3824*	3842	3842*	3843	3844*	3854	3856*	3896*
				3900*	3921	3938*	3943*	4060*	4064	4066*	4072	4077*	4085	4085*	4088
				4090*	4092	4094*	4108	4133	4134	4277	4528	4534	4568	4891	
@4K	001	0010	1642												
C2DEC5	001	141D	3361	3362	3364	3812	3904								
C2DVAL	005	145B	3389	3374	3374	3374*	3376	3376	3813	3905	3907	3911			
C2D020	003	142F	3369	3380	3381										
C2D030	003	1432	3371	3368*	3369*	3377	3377*	3378	3380*						

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
C2D040	004	143C	3376	3372
C2D050	004	144E	3382	3363*
C2D052	004	1452	3383	3365*
C2D901	001	1456	3387	3367 3367 3367
C2D902	001	1457	3388	3367
C2D903	005	1460	3390	3367 3367* 3374 3374 3374 3376 3376 3376 3376*
C4BCHC	001	0004	4703	
C4BCHR	001	1B6E	4691	4659* 4660
C4BINI	001	1B6D	4689	4636
C4BIN2	001	1B02	4626	4627 4630 4830 4855
C4BLEN	002	1B6A	4701	4675* 4676*
C4BLNK	003	1B1D	4709	
C4BLOW	001	00F0	4705	4643
C4BLVL	002	0002	4707	4636 4651 4652 4653 4654 4655 4660
C4BNMC	004	1B19	4713	
C4BNOP	001	0080	4715	
C4BSAV	002	1B70	4695	4634* 4676 4844 4853 4877 4913
C4BSPC	001	0087	4711	
C4BVAL	002	1B6C	4687	4636* 4651 4651* 4652 4653 4653* 4654 4654* 4655* 4660* 4707 4837
C4BWRK	002	1B6A	4684	4871 4652* 4655 4701 4707
C4BYT1	001	1B6B	4686	
C4B100	004	1B18	4637	4713
C4B200	003	1B1C	4641	4663 4709
C4B300	003	1B1F	4643	4669
C4B590	003	1B4E	4667	4646 4670
C4B600	003	1B51	4668	4641
C4B700	003	1B5A	4675	4644
C4B800	004	1B61	4678	4629* 4647
C4B850	004	1B65	4680	4632*
C4B900	001	1B71	4697	4637* 4646*
C4END	001	1B72	4716	
DCDOUT	001	0920	2159	2787 2789 3982 3984
DCRCNT	001	1578	3610	2802* 2805* 3611
DLIBUF	003	0EA4	2961	3589 3620 3695
DLPBLN	001	00F4	3711	3590* 3591 3591 3591* 3693
DLPBSD	001	148C	3520	3607 3608 3609
DLPBSE	004	149A	3531	3503 3506 3686 3687
DLPBS2	001	157D	3710	3637 3639 3691 3692
DLPCNT	001	1578	3611	3555* 3556 3565* 3612
DLPCRT	001	001B	3609	2527 2556 2560 4285 4296 4302 4342
DLPEXT	002	14AA	3536	3514* 3515* 3525
DLPK13	001	157C	3616	3540 3544
DLPLIN	001	157B	3615	3548 3561
DLPLPC	002	157A	3614	3548* 3549* 3561* 3562*
DLPMAX	001	000D	3617	3556
DLPMPR	001	0085	3607	2429 4288 4291 4299 4345
DLPNDX	001	1585	3623	3685
DLPNPT	001	1511	3570	3524 3529 3607
DLPNXT	001	158B	3627	3645* 3652* 3658 3662 3664 3707
DLPONE	002	1587	3624	3508 3510 3549 3562 3565 3593 3674 3700 3701 3705
DLPPNT	001	0001	3631	3671
DLPPRL	001	15E7	3670	3654
DLPPRT	001	158F	3638	3582 3708
DLPREM	001	158C	3628	3693* 3694* 3705*
DLPRES	001	1588	3625	3646* 3649* 3650* 3651 3652 3688 3694 3701*

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
DLPRNT	001	1461	3504	2579 2661 2794 3978
DLPRTN	001	158D	3629	3584 3586
DLPSPI	001	148C	3522	3608
DLPSPT	001	0000	3608	3519
DLPTIF	001	14A7	3533	3609
DLPTYP	001	148B	3517	2429* 2527* 2556 2560 3518 4285 4288 4291* 4296 4299 4302* 4342
				4345
DLPWK1	001	157D	3618	3581 3585* 3587 3592 3647 3649 3651* 3658 3661* 3664* 3672* 3673*
				3674* 3678* 3681 3707* 3710
DLPWK2	001	1581	3621	3513* 3527 3537 3538 3574 3578 3580* 3585 3586* 3595 3645
DLPWTH	002	158A	3626	3643* 3644* 3647 3650 3661 3662 3697
DLP100	004	1479	3512	3509*
DLP120	004	1497	3526	3525* 3531
DLP140	003	14B3	3540	3551
DLP160	003	14BD	3543	3545* 3547*
DLP180	003	14C9	3547	3543
DLP200	004	14CC	3548	3546
DLP220	004	14D0	3549	3550
DLP240	004	14DA	3552	3542
DLP260	003	14E8	3556	3553
DLP280	003	14F2	3560	3558
DLP300	004	14F9	3562	3563
DLP320	004	1503	3565	3560
DLP340	003	1507	3566	3564
DLP360	004	150A	3567	3539
DLP380	004	1518	3573	3588
DLP400	003	1527	3578	3572
DLP420	003	1530	3581	3579
DLP440	004	153C	3585	3689
DLP460	004	1564	3596	3592* 3593* 3594 3594*
DLP480	004	1568	3598	3505* 3530 3566 3568 3577
DLP500	004	156C	3599	3507*
DLP520	004	1574	3601	3511*
DLP540	006	15C5	3653	3648
DLP560	003	15F9	3678	3659 3663 3666
DLP580	005	1630	3698	3696* 3697* 3700* 3702
DLP600	003	1643	3703	3706
DL4CYL	001	1276	3099	3071*
DL4C01	002	127C	3107	3057 3059 3071
DL4C05	002	127E	3108	3063
DL4C24	003	124D	3110	3084
DL4C48	003	123A	3112	3078 3119 3125
DL4C96	003	1229	3109	3072
DL4DPL	006	127A	3098	3064*
DL4EFD	001	0001	3105	3077 3123
DL4END	001	12BC	3136	
DL4ETB	001	0080	3106	3083
DL4E01	001	0001	3104	3079
DL4E24	001	0018	3103	3081
DL4E48	001	0030	3102	3075 3117
DL4E96	001	0060	3101	3069
DL4ICS	001	1200	3052	3279 3956 4550 4557
DL4LST	001	1275	3097	3090 3099 3100 3111 3129*
DL4SAV	005	1217	3135	3122* 3125* 3128
DL4SCD	001	1277	3100	3069 3072* 3075 3078* 3081 3084* 3085 3085* 3086 3086* 3087* 3116
				3122 3128* 3130*

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
DL4SCT	001	1278	3111	3079 3114 3120* 3129 3130 3131*
DL4SPT	004	127F	3115	3080 3139
DL4WRK	005	1218	3134	3114* 3116* 3117 3119* 3120 3131
DL4010	001	1204	3055	3053 3056
DL4020	005	1214	3062	3058* 3134 3135
DL4030	005	121D	3064	3062* 3063*
DL4035	003	1222	3066	3132
DL4040	003	1228	3069	3073 3109
DL4050	003	1239	3075	3070 3112
DL4060	003	1246	3079	3076
DL4070	003	124C	3081	3110 3118 3124 3126
DL4080	004	1259	3085	3082
DL4100	003	1261	3087	3066* 3077* 3083* 3123
DL4200	003	126A	3092	3067* 3121*
DL4500	004	127F	3114	3115
DL4600	004	12A9	3128	3092
DL4900	004	126D	3094	3054*
DL4920	004	1271	3095	3060*
GFIBF1	001	1B00	2960	3960 4000 4039 4130 4133* 4486 4603
GFIBF2	001	1C00	2959	2960 4613
GFIBR1	001	1A6B	4606	4569
GFIBR2	001	1A71	4616	
GFIBSE	001	1A08	4512	4503 4506
GFICT1	001	0001	4472	4535 4554 4573
GFICT2	001	0002	4473	4529
GFIDS0	001	0000	4475	
GFIDS1	001	0001	4476	
GFIDS2	001	0002	4477	4517
GFIDS3	001	0003	4478	
GFIDS4	001	0004	4479	4515 4533 4547
GFIDS5	001	0005	4480	
GFIDS8	001	0008	4481	4490
GFIDTA	001	0003	4492	4527 4546
GFILNO	002	1A64	4592	2533 2533* 2826* 2834 2838 2840* 4517
GFILN1	001	0001	4483	4528 4533 4534 4547
GFILN2	001	0002	4484	4517
GFINDN	001	19FD	4504	2535 2828
GFIND0	004	1A5B	4582	4505*
GFIND2	004	1A5F	4583	4507*
GFINTY	001	1D08	4490	2836 4513
GFIRAD	001	1A6C	4609	4546* 4547* 4551 4616
GFIREF	001	1A66	4599	4527* 4528* 4529* 4554* 4558 4567 4606
GFITAD	001	1D00	4488	4490
GFIIWRK	001	1A65	4594	4533* 4534* 4535
GFII100	003	1A0C	4515	4519
GFII150	004	1A0F	4517	
GFII200	003	1A2B	4536	2369*
GFII500	004	1A3E	4557	4536
GRABIT	001	127F	3145	2536 2850 4142 4571
GRABOA	002	1408	3310	3239 3252 3257
GRABSE	004	135D	3336	3144 3147
GRACCA	002	13F9	3287	
GRACFN	001	13F8	3285	
GRACPL	001	13F8	3284	
GRACSC	001	13FB	3290	3166*
GRAEBS	001	00FF	3318	3165 3281

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
GRAEDB	001	0002	3304	3173 3276
GRAEDC	001	0001	3335	
GRAEDL	001	0006	3323	3190 3208
GRAEDS	001	0005	3337	3271
GRAEDT	001	0007	3324	3180 3209 3211
GRAEET	001	0075	3326	3180 3211
GRAEFG	001	0004	3317	3202
GRAEFI	001	0000	3313	3149
GRAEFR	001	0001	3315	3154 3200
GRAEFS	001	0002	3316	3156
GRAEFW	001	0003	3314	
GRAELK	001	0000	3320	3171 3174 3274 3277
GRAELL	001	0002	3325	3208
GRAELN	001	0000	3321	3171 3274
GRAELP	001	0007	3331	3223
GRAELS	001	0004	3332	3236
GRAEMR	001	001B	3333	3243
GRAENC	001	0001	3334	3243 3248* 3254 3256
GRAERR	004	1411	3342	3169* 3185 3197 3201
GRAESC	001	0001	3319	
GRAES0	001	0001	3327	3187 3196
GRAES1	001	0002	3328	3182 3183 3220 3221* 3222 3233 3234* 3235
GRAES2	001	0003	3329	3198 3217 3230
GRAETP	001	0002	3330	3198
GRAEW2	001	0006	3338	
GRAEXA	001	0001	3322	3323 3324 3327 3328 3329
GRANCA	002	1403	3298	3163* 3170* 3271 3272*
GRANDA	002	1400	3294	3164* 3173* 3174* 3175* 3276* 3277* 3278*
GRANPB	002	1408	3303	3175 3278 3309 3310 3311
GRANPL	001	13FE	3292	3280
GRANXC	002	1408	3311	
GRAONE	002	1408	3309	3248
GRAPSG	002	140D	3307	3221
GRASAR	004	1300	3194	3148*
GRASBR	004	12FC	3192	3146*
GRASEG	001	1410	3312	3222* 3235* 3257*
GRASIZ	001	1409	3305	3165* 3182* 3184 3220* 3233* 3281*
GRASSG	002	140F	3308	3234
GRASSZ	002	1406	3302	3170
GRASVC	003	1381	3238	3228*
GRATND	005	139B	3247	3245* 3250 3252*
GRATXT	002	140B	3306	3210
GRA020	004	1291	3153	3189*
GRA100	003	12A4	3162	3150
GRA140	003	12C2	3171	
GRA150	004	12CF	3175	3172
GRA200	003	12D6	3180	3157
GRA210	004	12DC	3182	3158 3204
GRA220	003	12E3	3184	3225 3227
GRA230	004	12F2	3189	3181 3199 3203 3214
GRA240	004	12F9	3191	3192
GRA245	004	12FD	3193	3194
GRA250	003	1301	3195	3186 3188
GRA260	003	1304	3196	3176
GRA300	005	1322	3208	3155
GRA303	003	133F	3216	3212

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
GRA305	004	134B	3220	3218
GRA310	004	135D	3225	3216* 3219* 3226 3232* 3258 3336
GRA313	004	1371	3233	3231
GRA315	003	1380	3237	3238
GRA316	004	1383	3239	3259
GRA317	001	1387	3240	3224
GRA320	005	1398	3246	3247 3253
GRA330	004	13AB	3252	3249
GRA350	005	13B2	3254	3242 3244 3255
GRA360	003	13B7	3256	3251
GRA5SA	004	13F7	3283	3263*
GRA500	003	13C4	3263	3195 3229
GRA600	001	13CD	3266	
GRA620	004	13E7	3278	3275
GRA640	004	13EB	3279	
GRA660	003	13F1	3281	
GRA680	004	13F4	3282	3283
GRBFRA	002	13FD	3291	3162 3270 3271* 3273 4569*
GRBFR1	001	1B00	4486	3291
GRLINE	002	1190	2902	2537 2851 2858 2861 3208* 3811
GRSCTR	001	1401	3295	2534* 3166
GRSRDA	002	13FA	3286	3164 3287 4567*
GRTEND	005	13B5	3255	2862 2873* 2889 3210* 3239* 3245 3250* 3933
GRTEXT	001	0C07	2957	2849* 2870 2871* 2900 2958 3213* 3306 4006
GRTYPE	001	118A	2899	2868 2910 3209*
GRWHAT	001	1404	3299	3149 3154 3156 3200 3202 4568* 4573*
KLCLST	002	0FD0	2746	2610 2656 2677
KLIASK	001	0001	2928	2565 2784
KLIBCW	001	0050	2953	2434 2775
KLIBD0	001	0000	2483	
KLIBD1	001	0001	2484	2401 2407 2408 2409*
KLIBD3	001	0003	2485	
KLIBF@	002	118C	2900	2643 2863 2876 2906*
KLIBFF	001	00FF	2486	2396 2414
KLIBLN	002	0FB7	2711	2550* 2555 2576
KLIBMP	001	0004	2950	
KLIBOF	001	0002	2939	2798 2832
KLIBRY	001	0D58	2488	2384
KLIBUF	002	0FBD	2723	2643* 2652 2653* 2772* 2781 2785* 2791* 2876* 2909*
KLICDA	001	2004	2511	2518
KLICDC	001	0920	2513	2520
KLICDL	001	0001	2512	2519
KLICDO	001	0002	2951	2770
KLICD1	001	0E57	2593	2569*
KLICD2	001	0E5A	2596	2570*
KLICHG	001	0FC3	2730	2680* 2824 2844*
KLICLN	002	0FC0	2727	2555* 2628* 2658 2678* 2796* 2822 2826 2831 2845 2853 2858 2861*
KLICLO	001	0FC1	2728	2609* 2626 2640 2654* 2659 2689* 2701 2881*
KLICRL	001	0040	2936	2802 2880
KLICRT	001	0008	2948	2529 2620 2877
KLICTR	001	0FDC	2755	2606* 2613* 2641* 2644 2647*
KLICWD	001	0060	2952	2436 2778 3986* 3987 3987 3987*
KLIC64	002	0FD4	2748	2646 2884
KLIDCD	001	0D79	2516	2450
KLIDIS	001	0080	2935	2868 2910
KLIDVT	001	0D57	2473	2411 2413* 2427 2430 2451 2460 2466 2529* 2620 2770 2792 2877

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
				3976 3980
KLIEFI	001	0003	2940	2893
KLIEOF	002	118E	2901	2822 2851
KLIER1	001	0E59	2595	
KLIER2	001	0E5C	2598	2572
KLIFIV	002	0E52	2588	2554
KLIFLF	002	0FC5	2733	2537* 2831
KLIFLL	001	0FBB	2722	2775 2778 2875* 2880* 2916*
KLIFOR	001	0004	2938	2553 2611* 2837
KLIIIC	001	0FC6	2734	
KLIICT	002	0FDF	2761	
KLIIINC	002	0FB9	2714	2628 2674* 2695* 2715 2796
KLIKEY	001	0004	2932	
KLILCB	001	0FB5	2709	2817 2818 2843 2854
KLILLE	001	0001	2941	2895
KLIMAG	002	0FDB	2752	2457* 2753 2772
KLIMAX	002	0E50	2587	2558
KLIMK1	001	0002	2476	2430 2490 3976 3980
KLIMK2	001	0014	2477	2451 2460 2496
KLIMK3	001	0004	2478	2466 2493
KLIMK4	001	0001	2479	2499
KLIMK5	001	000F	2480	2427 2502
KLIMK6	001	0080	2482	2401 2409
KLIMLS	001	0FC2	2729	2608* 2611 2626 2660 2679* 2700 2766 2882* 2883*
KLIMN1	002	0FCE	2745	2674
KLIMN5	002	0FD9	2751	2607
KLIMOD	001	0FBE	2724	2624* 2625 2633 2657 2668 2681* 2683* 2684 2829 2856
KLIMOF	001	0000	2944	2844
KLIMON	001	0001	2947	2680 2824
KLIMXJ	002	0FCA	2743	2637 2671 2694 2699
KLINDC	001	0FDD	2758	2565 2567 2571* 2573 2759 2780* 2784*
KLINIT	001	0001	2946	
KLIOPT	001	0FBA	2717	2635* 2662 2703* 2788 2795
KLIPL1	002	0FCC	2744	2395 2416 2571 2613 2647 2654 2695 2702 2765 2785 2872 2873
				2883 2914
KLIPL5	002	0FD7	2750	2457 2636 2670 2692 2697
KLIPPP	001	00C0	2943	
KLIPRT	001	0001	2949	2792
KLISHF	001	0CFB	2958	2848* 2849 2870*
KLISIX	001	0006	2925	2572 2838
KLISLN	002	0FC8	2735	2553* 2558* 2576* 2845
KLISTL	001	0002	2924	2658* 2678
KLISTM	001	0000	2923	2657* 2684
KLISTN	001	0C07	2366	2957
KLISTO	001	0003	2926	2659* 2682 2763
KLISTS	001	0004	2927	2660* 2679 2686 2763* 2764 2766*
KLISYS	001	0080	2931	
KLITAB	001	0D7F	2956	2746
KLITHR	001	0003	2954	
KLITLG	001	0005	2942	2572* 2611 2612
KLITNO	001	0002	2937	2551 2840
KLITWO	002	0E54	2589	2390 2577
KLITXE	001	00F3	2934	2849* 2870 2912
KLITYP	001	0FB5	2710	2618 2622 2630 2798* 2832* 2878* 2893* 2895*
KLIWRK	002	1189	2898	2862* 2863* 2872* 2875 2884* 2907* 2908* 2914* 2916
KLIXRJ	002	0FD2	2747	2607* 2636* 2637 2639 2639* 2655 2670* 2671 2673 2673* 2676 2692*

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SYMBOL	LEN	VALUE	DEFN	REFERENCES	VER 15, MOD 00 04/06/21 PAGE 105						
				2694*	2697*	2699*					
KLIXR1	002	0E56	2590	2543	2554*	2562	2577*				
KLIIYWK	001	0FD5	2749	2640*	2644	2700*	2701*	2702*			
KLIZRO	002	0D56	2472								
KLII015	001	0C31	2378								
KLII017	003	0C39	2382	2422							
KLII019	005	0C47	2386	2397							
KLII020	005	0C60	2392	2386*	2387*	2388*	2389*	2390*	2394	2414*	2415
KLII030	001	0C7A	2400	2393							
KLII035	001	0C87	2406	2402							
KLII037	004	0C98	2411	2407*							
KLII039	004	0C9F	2413	2408*							
KLII050	001	0CC3	2424	2383	2418						
KLII052	004	0CEA	2436	2433							
KLII053	004	0CEE	2437	2435							
KLII054	004	0CFC	2448	2438							
KLII055	004	0D24	2459	2431							
KLII057	004	0D3B	2464	2452							
KLII060	004	0D49	2469	2398	2420	2454	2456				
KLII061	004	0D51	2471	2372	2375	2404	2412	2421	2440	2461	2586
KLII070	001	0D7F	2525	2428	2524	2526	2541	2956			
KLII072	001	0DB5	2540	2377	2458	2465	2467				
KLII073	001	0DD2	2549	2564							
KLII074	003	0DBD	2543	2531	2538						
KLII075	006	0DE6	2555	2545	2578						
KLII076	003	0DF8	2559	2557							
KLII078	005	0E25	2572	2568							
KLII080	006	0E38	2576	2552							
KLII090	004	0E45	2579	2561	2566						
KLII100	001	0E5D	2601	2559							
KLII104	004	0E7A	2611	2614							
KLII105	004	0E91	2617	2797							
KLII106	003	0EA4	2622	2665	2667	2961					
KLII110	003	0EAB	2624	2690							
KLII120	004	0EB2	2626								
KLII125	001	0EC8	2632	2627							
KLII135	004	0EE0	2640	2604	2605	2638					
KLII136	003	0EE4	2641	2704							
KLII14	001	000E	2930	2606							
KLII140	004	0EF0	2644	2648							
KLII145	003	0F01	2652	2645							
KLII150	001	0F27	2663	2625*	2804	2807					
KLII160	004	0F4C	2674	2672							
KLII170	003	0F50	2676	2696							
KLII175	004	0F74	2686	2767							
KLII180	003	0F7F	2689	2682*	2686	2687	2764*	2765*			
KLII182	004	0F86	2692	2669							
KLII183	004	0F91	2695	2693							
KLII185	004	0F98	2697	2634							
KLII186	004	0FA3	2700	2698				</			

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
KLI214	001	1024	2786	2783
KLI220	004	103A	2794	2771
KLI230	004	1040	2796	2793
KLI244	001	00F4	2933	2849 2870 2912 2912*
KLI245	003	1048	2798	
KLI250	004	104B	2799	2623 2631
KLI260	004	104F	2800	2801
KLI380	001	106D	2809	2616
KLI387	004	106D	2810	
KLI399	004	1071	2811	2603* 2619
KLI400	001	1075	2812	2602*
KLI500	001	1079	2816	2617 2629 2688
KLI503	003	1129	2868	2865
KLI504	003	10BE	2837	2839
KLI505	001	109A	2827	2815 2820 2841
KLI510	001	10D1	2842	2825 2830
KLI515	001	10DF	2847	2835 2855 2859
KLI516	001	110E	2860	2857
KLI517	001	1142	2874	2869
KLI520	004	114A	2877	2918
KLI530	005	115D	2883	2886
KLI540	004	116C	2888	2819* 2833 2879 2885 2894 2896
KLI541	004	1177	2891	2821*
KLI560	004	117B	2893	2823 2852
KLI570	003	1182	2895	2846
KLI580	001	1191	2904	2867
KLI581	001	11BD	2915	2911
KLONGL	001	0002	2929	2565 2567 2780
SCACNT	002	1CA1	5057	4891 5047* 5048*
SCACOF	001	0087	5029	
SCACOM	001	0001	5028	2380 4250
SCAINC	001	0001	5027	5036 5042
SCAMMA	003	1C7E	5051	2380* 4250*
SCANIT	001	1C61	5031	2368 2381 2419 4273 4846 4854 4879 4886
SCASVE	002	1C9F	5056	5033* 5048
SCASV1	001	1C9E	5055	
SCA100	003	1C70	5036	5038
SCA200	003	1C73	5037	5035
SCA250	003	1C7D	5040	5051
SCA300	003	1C80	5042	5044
SCA400	004	1C90	5047	5040
SCA500	004	1C9A	5050	5032* 5046
SCKCCR	003	1A93	4331	4254
SCKCLO	006	1AEA	4373	
SCKCL1	004	1AF0	4374	4373* 4375*
SCKCMP	007	1A9A	4332	4257
SCKDEV	001	1AA1	4338	2528 2542 4366
SCKEND	001	1B02	4380	4618
SCKERR	004	0D51	2586	4367
SCKOUT	001	19FD	4247	4381
SCK001	001	0003	4326	4254 4254 4268 4331
SCK002	001	0007	4327	4257 4257 4271 4332
SCK003	002	1A9C	4333	4262
SCK004	002	1A9E	4334	4303
SCK005	002	1AA0	4335	4317
SCK100	004	1A20	4267	4255

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SCK150	003	1A2A	4271	4258
SCK200	004	1A2D	4273	4269
SCK300	003	1A3E	4280	4267* 4275 4321*
SCK350	004	1A56	4296	4280
SCK400	004	1A68	4303	4292
SCK410	004	1A6F	4308	4278
SCK420	004	1A76	4311	4286 4300
SCK430	004	1A7D	4314	4289 4297
SCK440	004	1A81	4316	4249* 4309 4312
SCK450	004	1A89	4321	4263 4304
SCK460	004	1A8D	4322	4248*
SCK475	004	1AC5	4354	4343
SCK500	004	1ADA	4364	4355
SCK550	004	1ADE	4366	4352 4362
SCK600	004	1AE6	4371	4358
SCK650	004	1AFE	4379	4339* 4346 4349
SDLACT	001	189D	3991	4056* 4068* 4079* 4087* 4092
SDLBEG	001	0006	4010	
SDLBF@	001	0C07	4006	3815
SDLBUF	001	0607	2962	2912 2912* 2913* 3809* 3810 3810* 3813* 3814 3986* 3987 3987* 4001 4031 4120 4138
SDLCON	001	18A4	3995	3903
SDLCTR	001	18A9	3999	3827* 3829* 3847* 3878* 3879* 3880 3882
SDLC18	001	0012	4004	4056
SDLC80	001	0080	4020	3873 3878
SDLDPL	001	18B2	4035	3957 3961*
SDLDZR	001	000F	4015	3837
SDLEBC	001	00F0	4012	3834 3844 3845
SDLED@	002	18AB	4000	3954
SDLED1	001	00FD	4002	3810*
SDLEND	001	00FE	4003	3809* 3810
SDLEXE	001	00C5	4018	3900 4049
SDLEXP	001	18A5	3996	3852* 3873 3879 3882* 3885* 3886 3888 3889 3894 3901* 3902* 3921 3924* 4047 4051*
SDLFOR	001	0004	4021	3813
SDLHLD	001	12D9	4142	4115* 4122
SDLIST	001	1657	3804	2905
SDLLNE	001	0007	4025	
SDLLNG	001	0005	4023	3814
SDLLST	002	189C	3990	3864* 3870* 3871 3889 3893* 3894 3901 4051
SDLMAX	001	00FF	4022	3810
SDLMIN	001	0010	4008	3821
SDLMN1	002	18A1	3993	3853 3966 4116
SDLMOD	001	18A8	3998	3885
SDLNUM	001	0003	4011	3833 3843
SDLONE	001	0001	4042	4038
SDLONG	001	0008	4014	3829
SDLOT@	002	18AD	4001	2906 2908 2909 4104
SDLPGM	001	19CA	4128	2810
SDLPL1	002	18A7	3997	3847 3868 3872 3924 3961 4068 4079 4087 4110
SDLPL2	002	189F	3992	3893 3902
SDLPNT	001	004B	4017	3916
SDLPPL	001	18AE	4028	3979 3983 4125* 4139*
SDLQUO	001	007D	4005	4060 4088 4090 4094
SDLSAV	002	18A3	3994	2907 3832* 3869 3870 3935* 3940* 4111
SDLSMN	001	19FA	4143	3818* 3823* 4108

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SDLSRT	001	0004	4007	3827
SDLTHR	001	0003	4019	3908
SDLTWO	001	0002	4013	3846 3907* 3912 4047
SDLTYP	001	0040	4024	3819
SDLWID	002	18B9	4043	2434* 2436* 2462* 2463* 4105 4139
SDLWRK	002	19FC	4144	4103* 4104* 4105 4107* 4110* 4111* 4112 4113 4114 4121 4125
SDLZON	001	0002	4009	3842
SDLZRO	001	00F0	4016	3854 3896 3905 3923 3943
SDL001	001	1663	3808	
SDL005	001	1683	3817	3942 4140
SDL010	004	169E	3826	3822
SDL025	001	16AD	3831	3828
SDL030	004	16C9	3840	3838 3848
SDL035	003	16CD	3841	3836* 3839* 3850
SDL037	006	16E1	3847	3841
SDL040	004	16FB	3853	3857
SDL050	001	170C	3859	3855
SDL052	001	173E	3877	
SDL053	001	1755	3884	3874
SDL054	001	175D	3887	
SDL055	003	1781	3900	3895
SDL056	004	178C	3903	4053
SDL057	005	17A6	3911	3906
SDL060	006	17B1	3915	3861 3862 3866* 3867* 3868* 3871* 3872* 3880* 3888* 3890 3926 4048
SDL061	004	17B7	3916	3869* 3886* 3919
SDL062	003	17BE	3918	3865* 3881*
SDL063	003	17C4	3920	3925
SDL064	003	17D7	3926	3922
SDL065	004	17DD	3928	3860* 3891 3898 3909 3913 3918
SDL066	001	17E1	3929	3851 3944 4096
SDL075	001	17FE	3937	3934 4124
SDL080	003	1810	3943	
SDL089	004	1817	3946	3805* 3936 4127
SDL090	004	181B	3947	3806*
SDL091	004	181F	3948	3807* 4129*
SDL100	001	1823	3950	3840 3849 3941 4063 4071 4131
SDL102	004	184D	3962	
SDL104	004	1861	3968	3969 4132*
SDL105	004	1865	3972	3951* 3955 3963 3965
SDL150	001	1869	3974	4119 4126
SDL160	004	187A	3980	
SDL170	004	1881	3982	3977
SDL180	004	1897	3988	3975* 3981
SDL200	003	18BA	4047	3883
SDL250	001	18D1	4055	3820
SDL251	004	18DF	4063	4070
SDL255	004	18FC	4071	4080 4093
SDL256	003	1906	4074	4076* 4084*
SDL257	003	1911	4077	4074
SDL270	004	1921	4081	4062* 4069 4075*
SDL280	001	1928	4083	4065 4073
SDL281	004	1945	4092	4089
SDL285	003	194D	4094	4082
SDL300	001	1958	4102	3931 3968 4619
SDL305	006	197C	4111	4109
SDL310	005	1994	4115	4112*

CROSS REFERENCE

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SDL320	004	19A0	4118	4114*						
SDL330	005	19B0	4122	4113*						
SDL340	003	19B5	4123	4106						
SDL345	004	19EC	4138	4135						
SLLBLW	002	1C60	4933	4914						
SLLDSH	001	0060	4926	4847	4870					
SLLIND	003	1C3B	4928	2370*						
SLLINE	001	1957	4619	2592	4828					
SLLIST	001	1B72	4824	2371						
SLLLN2	001	0002	4925	4828	4837	4841	4844	4871	4872	4877
SLLRET	001	0087	4929	2370						
SLL000	001	0000	4921	4901						
SLL001	001	0001	4922	4841	4872					
SLL002	001	0002	4923	4845	4870*	4900*				
SLL003	001	0003	4924	4837*	4841	4871*	4872	4878		
SLL100	004	1B7E	4830	4896						
SLL110	003	1B8D	4838	4839*						
SLL115	004	1B97	4841	4838						
SLL120	003	1BA8	4845	4840	4842					
SLL125	004	1BD8	4864	4853*	4860					
SLL130	003	1BE3	4870	4857						
SLL140	003	1C03	4878	4873	4875					
SLL150	003	1C0A	4880	4848						
SLL160	004	1C20	4891	4881						
SLL165	003	1C2D	4895	4843*	4874	4876*	4889	4892		
SLL180	003	1C34	4900	4833						
SLL190	003	1C3A	4902	4928						
SLL195	004	1C3D	4904	4862	4894					
SLL200	004	1C44	4910	4844*	4877*	4895				
SLL210	004	1C4F	4913	4831	4856	4906				
SLL215	004	1C53	4914	4866	4888	4912				
SLL220	004	1C57	4918	4826*	4902					
SLL230	004	1C5B	4919	4827*						

TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY = 0

OL105 I THE CODE LENGTH OF #KLIST IS 7424 DECIMAL.
OL103 I TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS 29
NAME-#KLIST,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-R,CATEGORY-000

START ADDRESS	CATEGORY	NAME AND ENTRY	CODE LENGTH HEXADECIMAL	DECIMAL	
0C00	0	#KLIST	1D00	7424	
OL100	I	THE TOTAL CORE USED BY #KLIST IS 7424 DECIMAL.			
OL101	I	THE START CONTROL ADDRESS OF THIS MODULE IS 0C00.			
OL104	I	TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS 30			
		NAME-#KLIST,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-O			
21D8	C0	87 1350	7685	B	I\$UNLK * BUFFER PAGE 1-3
21DC	F2	87 0D	7686	J	SFG295 GO TO GENERAL SFGETR EXIT
			7687	*	
21DF	3C	BD 0CBC	7688	SFG285 MVI	I\$ERRC,@@E718 SET ERROR CODE

SFGETR - PROLOGUE - VM GET ROUTINE

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 91
	21E3	D0 87 D3		7689	B	SFG282(,@BR)		GO UNLOCK BUFFER	1-3
				7690	*				
				7691	*	DISK FILE - GO TO NEXT PAGE OF SFGETR			
				7692	*				
	21E6	C0 87 12B1		7693	SFG290 B	I\$CALL		EXEC PART 2 OF SFGETR - DISK	
	21EA	2200	21EB	7694	DC	AL(@VADDR)(V\$XSGT+B@BLSZ)	*	FILE DATA ACCESS	
				7695	*				
				7696	*	GENERAL EXIT FROM SFGETR			
				7697	*				
	21EC	1C 01 144A FA		7698	SFG295 MVC	I\$VADR,SFGVD2(@VADDR,@BR)		UNLOCK	
	21F1	C0 87 1350		7699	B	I\$UNLK		* DIRECTORY 2	
	21F5	C0 87 12D3		7700	B	I\$RTRN		RETURN TO CALLER	
				7701	*				
				7702	*	CONSTANTS, WORKAREAS & EQUATES			
				7703	*				
	21F9	0100	21FA	7704	SFGVD2 DC	AL(@VADDR)(V\$SFD2)		VADDR OF VM DIRECTORY 2	
				7705	*				
	21FB		21FC	7706	SFGCBA DS	CL(@CADDR)		SAVE FLD FOR CORE BFR ADDR	
				7707	*				
			00FF	7708	SFGNFM EQU	X'FF'		NOT FIRST CARD FILE ACCESS MASK	
			00FF	7709	SFGCBP EQU	X'FF'		DISP. TO CARD BUFFER POINTER	
			0040	7710	SFGICR EQU	SFG255-SFG227		DISP. TO BLANK TRANSPARENT	
			003D	7711	SFGBLK EQU	SFG250-SFG227		DISP. TO BLANK DEAMITER	
			003A	7712	SFGRST EQU	SFG245-SFG227		DISP. TO BLANK RESET	
				7713	*				
				7714	*	END OF SFGETR - PART 1			
				7715	*				

SFGETR - PROLOGUE - VM GET ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 31/05/21 PAGE 92

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2200          7717      ORG    *,B@LVPG,0          PLACE AT A PAGE BOUNDARY
          2200 7718 SFGBS2 EQU    *          ESTABLISH BASE
          2200 7719          USING SFGBS2,@BR      * REGISTER USAGE
          7720 *-----
          7721 *          UPON ENTRY TO PART 2:
          7722 *
          7723 *          1. A DISK BEEN SET FOR INPUT IS TO BE ACCESSED.
          7724 *          2. D2 HAS BEEN LOCKED IN CORE WITH THE MODIFY
          7725 *          INDR SET ON.
          7726 *          3. @XR POINTS TO THE CURRENT D2 ENTRY.
          7727 *-----
          7728 *
          7729 *          TEST IF CURRENT SEGMENT EMPTY
          7730 *
2200 9D 01 0D E2 7731          CLC    @$D2LC(@$L2LC,@XR),SFGZRO(@BR) THIS SEGMENT = ZERO ?
2204 F2 01 06    7732          JNE    SFG450          YES, BYPASS NEXT SEGMENT ACCESS
          7733 *
          7734 *          CALL PART 3 OF SFGETR TO ACCESS NEXT SEGMENT
          7735 *
2207 C0 87 12B1 7736          B      I$CALL          EXECUTE PART 3 OF SFGETR TO
220B 2300        220C 7737          DC    AL(@VADDR)(V$XSGT+2*B@BLSZ) * ACCESS NEXT SEGMENT
          7738 *
          7739 *          ACCESS CURRENT BUFFER PAGE AND CHECK FOR EOS
          7740 *
220D 7C 05 E8    7741 SFG450 MVI    SFGCNL(,@BR),I@LPFS      SET DATA ITEM LNG TO SHORT PREC
2210 7C 80 B0    7742          MVI    SFG575+@Q(,@BR),@NOP    SET PREC ADJ. SWITCH FOR SHORT
2213 B8 20 01    7743          TBN    @$D2IO(,@XR),@$M2FP    LONG PRECISION ?
2216 F2 90 07    7744          JF     SFG470          NO, BYPASS ADD TO LONG PRECISION
2219 7C 87 B0    7745          MVI    SFG575+@Q(,@BR),@UCB    SET PREC ADJ. SWITCH FOR LONG
221C 5E 00 E8 E3 7746          ALC    SFGCNL(,@BR),SFGDLS(1,@BR) INCR DATA ITEM LNG TO LONG PRC
2220 6C 01 E6 0D 7747 SFG470 MVC    SFGSDF(,@BR),@$D2LC(@$L2LC,@XR) SAVE SDF COUNT
2224 74 02 76    7748          ST     SFGD2P(,@BR),@XR      SAVE D2 ENTRY POINTER
2227 6C 01 34 05 7749          MVC    SFGVCB(,@BR),@$D2CP(@$L2CP,@XR) SET UP VADDR OF CURRENT
222B 6E 00 33 02 7750          ALC    SFGVCB-1(,@BR),@$D2VB(@$L2VB,@XR) * DATA ITEM IN VM BUFFER
222F C0 87 1330 7751          B      I$LDXR          ACCESS AND POINT
2233          2234 7752 SFGVCB DS    CL(@VADDR)          * @XR TO IT
2235 BD 1C 00    7753          CLI    @ZERO(,@XR),@EOF      END OF FILE ?
2238 F2 81 95    7754          JE     SFG690          YES, GO SET ERROR CODE
          7755 *
          7756 *          DETERMINE LENGTH OF DATA ITEM & PLACE IT IN STACK
          7757 *
223B 4C 01 70 0D4E 7758          MVC    SFGMTA(@CADDR,@BR),I$STAK INITIALIZE MOVE TO ADDRESS
2240 B8 40 00    7759          TBN    @ZERO(,@XR),B@DTYP    CHARACTER CONSTANT ?
2243 F2 90 03    7760          JF     SFG500          NO, NUM LNG ALREADY SET. BYPASS
2246 7C 13 E8    7761          MVI    SFGCNL(,@BR),I@LCRV    SET DATA ITEM LENGTH FOR CHAR.
          7762 *
2249 5C 01 EA E8 7763 SFG500 MVC    SFGPCL(,@BR),SFGCNL(2,@BR) INIT FOR FULL DATA ITEM MOVE
224D 5D 01 E6 E8 7764          CLC    SFGSDF(,@BR),SFGCNL(2,@BR) ALL OF DATA ITEM IN BUFFER
2251 F2 02 04    7765          JNL    SFG520          YES, GO SET UP MOVE
2254 5C 01 EA E6 7766          MVC    SFGPCL(,@BR),SFGSDF(2,@BR) NO, RESET MOVE LNG FOR PARTIAL
          7767 *
2258 7C FF EC    7768 SFG520 MVI    SFGMLQ(,@BR),SFGMS1      SET MOVE LENGTH FOR PART OF
225B 5E 00 EC EA 7769          ALC    SFGMLQ(,@BR),SFGPCL(1,@BR) * DATA ITEM IN CURRENT BUFFER
225F 5C 00 6E EC 7770          MVC    SFG550+@Q(,@BR),SFGMLQ(1,@BR) SET IN MOVE INSTRUCTION
          7771 *
2263 76 02 EC    7772          A      SFGMLQ(,@BR),@XR      INCR @XR TO END OR BFR DATA

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SFGETR - PROLOGUE - VM GET ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 31/05/21 PAGE 93

2266	74 02 72	7773 *				
		7774 *	ST	SFGMFA(, @BR), @XR	SET CADDR IN MOVE FROM CADDR	
		7775 *				
2269	5E 00 70 EC	7776 *	ALC	SFGMTA(, @BR), SFGMLQ(1, @BR)	INCR MOVE TO CADDR	
		7777 *				
226D	0C 00 0000 0000	7778 SFG550 MVC		*-*(@VQ), *-*	MOVE DATA FROM BUFFER TO STACK	
		2270 7779 SFGMTA EQU		SFG550+@OP1	* MOVE TO STACK ADDRESS	
		2272 7780 SFGMFA EQU		SFG550+@OP2	* MOVE FROM BUFFER ADDRESS	
		7781 *				
		7782 *		UPDATE D2 ENTRY POINTERS & CHECK IF ALL OF		
		7783 *		DATA ITEM MOVED		
		7784 *				
2273	C2 02 0000	7785 SFG555 LA		*-*, @XR	POINT @XR BACK TO D2 ENTRY	
		2276 7786 SFGD2P EQU		SFG555+@OP1	* D2 ENTRY CADDR_SAVE AREA	
2277	9E 01 05 EA	7787	ALC	@\$D2CP(@\$L2CP, @XR), SFGPCL(, @BR)	INCR BFR PT BY MOVE LNG	
227B	9F 01 0D EA	7788	SLC	@\$D2LC(@\$L2LC, @XR), SFGPCL(, @BR)	INCR SDF COUNT BY MOV LNG	
227F	5F 00 E8 EA	7789	SLC	SFGCNL(, @BR), SFGPCL(1, @BR)	DECR REQ'D BY ACTUAL LENGTH	
2283	F2 81 1F	7790	JZ	SFG570	BYPASS BFR REFILL IF DIFRNCE = 0	
		7791 *				
		7792 *		ONLY PART OF THE DATA ITEM WAS IN THE CURRENT		
		7793 *		SEGMENT, ACCESS NEXT SEGMENT.		
		7794 *		POINT @XR TO NEW SEGMENT.		
		7795 *		REDO MOVE PROCESSING FOR SECOND PART OF DATA ITEM		
		7796 *		MOVE.		
		7797 *				
2286	C0 87 12B1	7798	B	I\$CALL	EXECUTE PART 3 OF SFGETR TO	
228A	2300	228B 7799	DC	AL(@VADDR)(V\$XSGT+2*B@BLSZ)	* ACCESS NEXT SEGMENT	
		7800 *				
228C	6C 01 E6 0D	7801	MVC	SFGSDF(, @BR), @\$D2LC(@\$L2LC, @XR)	SET NEW SEG CT IN SAVEFLD	
2290	6C 01 9D 05	7802	MVC	SFGVNB(, @BR), @\$D2CP(@\$L2CP, @XR)	SET UP VADDR OF NEW	
2294	6E 00 9C 02	7803	ALC	SFGVNB-1(, @BR), @\$D2VB(@\$L2VB, @XR)	* SEGMENT	
2298	C0 87 1330	7804	B	I\$LDXR	ACCESS & POINT @XR AT IT	
229C		229D 7805 SFGVNB DS		CL(@VADDR)	VADDR OF NEW SEGMENT	
229E	5E 00 70 E4	7806	ALC	SFGMTA(, @BR), SFGONE(1, @BR)	INCR MOVE TO ADDR ROR NEXT MOV	
22A2	D0 87 49	7807	B	SFG500(, @BR)	SO MOVE REST OF DATA ITEM	
		7808 *				
		7809 *		ENTIRE DATA ITEM MOVED TO STACK. SET CORRECT		
		7810 *		PRECISION IF NUMERIC.		
		7811 *				
22A5	35 02 0D4E	7812 SFG570 L		I\$STAK, @XR	POINT @XR TO STACKED DATA ITEM	
22A9	B8 40 00	7813	TBN	I@STAT(, @XR), B@DTYP	CHARACTER ITEM ?	
22AC	F2 10 25	7814	JT	SFG695	YES, GO TO RETURN	
		7815 *				
22AF	F2 80 11	7816 SFG575 JC		SFG585, @NOP	JUMP IF FILE PREC = LONG	
22B2	F2 87 1F	7817	JC	SFG695, I@PRSW	JUMP TO EXIT IF RUN PREC = SHORT	
		7818 *				
		7819 *		CHANGE PRECISION FROM SHORT TO LONG		
		7820 *				
22B5	BA 20 00	7821	SBN	I@STAT(, @XR), B@PREC	SET PREC = LONG	
22B8	AC 00 08 04	7822	MVC	I@PEXL(, @XR), I@PEXS(@B1, @XR)	MOVE EXP TO LONG POSITION	
22BC	AF 03 07 07	7823	SLC	I@PEXL-1(, @XR), I@PEXL-1(SFGELS, @XR)	SET EXTRA DIGITS = 0	
22C0	F2 87 11	7824	J	SFG695	EXIT	
		7825 *				
22C3	F2 80 0E	7826 SFG585 JC		SFG695, @UCB-I@PRSW+@NOP	JUMP TO EXIT IF RUN PREC = LONG	
		7827 *				
		7828 *		CHANGE PRECISION FROM LONG TO S4ORT		

SFGETR - PROLOGUE - VM GET ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE	94
					7829	*					
	22C6	BB	20 00		7830	SBF	I@STAT(,@XR),B@PREC			SET PREC = SHORT	
	22C9	AC	00 04 08		7831	MVC	I@PEXS(,@XR),I@PEXL(1,@XR)			MOVE EXP TO SHORT POSITION	
	22CD	F2	87 04		7832	J	SFG695			JUMP TO EXIT	
					7833	*					
					7834	*	SET END OF FILE ERROR CODE				
					7835	*					
	22D0	3C	B9 0CBC		7836	SFG690	MVI I\$ERRC,@@E714			SET EOF CODE	
					7837	*					
					7838	*	RETURN TO PART 2 OF SFGETR				
					7839	*					
	22D4	1C	01 144A 9D		7840	SFG695	MVC I\$VADR,SFGVNB(@VADDR,@BR)			MOVE BUFFER PAGE	1-5
	22D9	C0	87 1350		7841	B	I\$UNLK			UNLOCK PAGE	1-5
	22DD	C0	87 12D3		7842	B	I\$RTRN			EXIT	
					7843	*					
					7844	*	PART 2 - CONSTANTS, WORKAREAS & EQUATES				
					7845	*					
	22E1	0000		22E2	7846	SFGZRO	DC XL(@\$L2CP)'0'			ZERO	
	22E3	04		22E3	7847	SFGDLS	DC AL1(I@LPFL-I@LPFS)			DIFFERENCE IN PRECISION LENGTHS	
	22E4	01		22E4	7848	SFGONE	DC XL1'1'			ONE	
					7849	*					
				00FF	7850	SFGMS1	EQU X'FF'			MINUS 1	
				0004	7851	SFGELS	EQU I@LPFL-I@LPFS			LNG LONG PREC EXTRA SIGNIFICNCE	
					7852	*					
	22E5			22E6	7853	SFGSDF	DS CL(@\$L2LC)			SDF COUNT WORKAREA	
	22E7			22E8	7854	SFGCNL	DS CL(@CADDR)			ACTUAL LENGTH OF DATA ITEM	
	22E7				7855	ORG	SFGCNL-1			* INITIALIZE TO	
	22E7	0000		22E8	7856	DC	XL(@CADDR)'0'			* ZERO	
	22E9			22EA	7857	SFGPCL	DS CL(@CADDR)			BUFFER LNG OF DATA ITEM	
	22EB			22EC	7858	SFGMLQ	DS CL(@CADDR)			PHYS. MOVE LNG & DISPLACEMENT	
	22EB				7859	ORG	SFGMLQ-1			* INITIALIZE TO	
	22EB	0000		22EC	7860	DC	XL(@CADDR)'0'			* ZERO	
					7861	*					
					7862	*	END OF SFGETR - PART 2				
					7863	*					

SFGETR - PROLOGUE - VM GET ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 31/05/21 PAGE 95

2300			7865	ORG	*,B@LVPG,0	PLACE AT A PAGE BOUNDARY
			2300 7866	SFGBS3 EQU	*	ESTABLISH BASE
			2300 7867	USING	SFGBS3,@BR	* REGISTER USAGE
			7868	*	-----	
			7869	*	UPON ENTRY TO PART 3:	
			7870	*		
			7871	*	1. D2 HAS BEEN LOCKED IN CORE WITH THE	
			7872	*	MODIFY INDICATOR SET ON.	
			7873	*	2. @XR POINTS TO THE CURRENT D2 ENTRY	
			7874	*	3. THE CURRENT D2 ENTRY VM BUFFER POINTERS	
			7875	*	MUST BE SET TO THE FIRST DATA ITEM IN THE	
			7876	*	NEXT(FIRST) SEGMENT OR BUFFER.	
			7877	*	-----	
			7878	*		
			7879	*	CHECK FOR MORE SEGMENTS IN CURRENT BUFFER	
			7880	*		
2300	BD 00 05		7881	SFG750 CLI	@\$D2CB(,@XR),@ZERO	ANY SPACE LEFT IN CURR BFR ?
2303	F2 01 52		7882	JNE	SFG830	YES, GO ACCESS BUFFER
2306	BD 00 04		7883	CLI	@\$D2CS(,@XR),@ZERO	INITIAL FILL-UP CALL ?
2309	F2 81 00		7884	JE	SFG760	YES, GO TO GET SFLOAD
230C	AD 00 03 04		7885	SFG760 CLC	@\$D2BS(,@XR),@\$D2CS(@\$L2CS,@XR)	MORE VM BUFFERS ?
2310	F2 84 32		7886	JH	SFG810	YES, GO CHECK DATA FILE TYPE
			7887	*		
			7888	*	VM BUFFERS MUST BE REFILLED. WRITE OUT INTERPRETER	
			7889	*	AND ACCESS & EXECUTE SFLOAD.	
			7890	*		
2313	74 01 1E		7891	SFG780 ST	SFGWPL(,@BR),@BR	SET UP DPL TO WRITE OUT
2316	7C E3 1E		7892	MVI	SFGWPL(,@BR),SFGDWL	* INTERPRETER
			7893	*SFG785 DISK	@ZERO	GO WRITE IT OUT
2319	C0 87 0025		7894	SFG785 B	\$DISKN	PERFORM PHYSICAL DISK OP
231D	0000	231E	7895	DC	AL2(@ZERO)	DPL ADDRESS
			7896	***	END OF EXPANSION ***	
		231E	7898	SFGWPL EQU	SFG785+5	ADDRESS OF WRITE DPL
231F	74 01 34		7899	ST	SFGRPL(,@BR),@BR	SET UP DPL TO READ IN
2322	7C E9 34		7900	MVI	SFGRPL(,@BR),SFGDRL	* #SFLOA
2325	3C 01 0D58		7901	MVI	I\$WRK1-1,@DGET	SET INPUT INDR FOR #SFLOA
2329	74 01 3A		7902	ST	SFGSBR(,@BR),@BR	SAVE BASE REGISTER
232C	74 02 3E		7903	ST	SFGSXR(,@BR),@XR	SAVE D2 POINTER
			7904	*SFG790 BLOAD	@ZERO	GO EXECUTE #SFLOA
232F	C0 87 0522		7905	SFG790 B	\$BLOAD	LOAD AND EXECUTE WORK AREA PGM
2333	0000	2334	7906	DC	AL2(@ZERO)	DPL ADDRESS
			7907	***	END OF EXPANSION ***	
		2334	7909	SFGRPL EQU	SFG790+5	ADDRESS OF READ DPL
			7910	*		
			7911	*	RETURN FROM \$SFLOA	
			7912	*		
2335	0444	2336	7913	DC	AL(@CADDR)(\$DPLSV-5)	CADDR OF DPL TO RELOAD INTERP
2337	C2 01 0000		7914	SFG795 LA	*-*,@BR	RESTORE BASE REGISTER
		233A	7915	SFGSBR EQU	SFG795+@OP1	CADDR OF @BR SAVE AREA
233B	C2 02 0000		7916	SFG800 LA	*-*,@XR	RESTORE D2 POINTER
		233E	7917	SFGSXR EQU	SFG800+@OP1	CADDR OF D2 POINTER SAVE AREA
			7918	*	DISK \$WAITF	WAIT FOR INTERPRETER
233F	C0 87 0025		7919	B	\$DISKN	PERFORM PHYSICAL DISK OP
2343	057F	2344	7920	DC	AL2(\$WAITF)	DPL ADDRESS

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7921 *** END OF EXPANSION ***
7923 *
7924 * DETERMINE DATA FILE TYPE
7925 *
2345 B8 80 01 7926 SFG810 TBN @$D2IO(,@XR),@$M2FI PROG-GENERATED DATA FILE ?
2348 F2 90 0A 7927 JF SFG825 NO, GO HANDLE KEYBOARD DATA FILE
234B BC 00 05 7928 MVI @$D2CB(,@XR),@ZERO SET BYTE POINTER TO ZERO
234E 9C 01 0D F0 7929 MVC @$D2LC(@$L2LC,@XR),SFGSSZ(,@BR) SET SEG COUNT TO MAX.
2352 F2 87 5E 7930 J SFG900 GO TO EXIT

2355 7C 01 05 7932 SFG825 MVI @$D2CB(,@BR),@B1 SET BYTE POINTER TO 1ST SDF
7933 *
7934 * KEYBOARD DATA FILE - CHECK FIRST/NEXT SDF
7935 *
2358 74 02 3E 7936 SFG830 ST SFGSXR(,@BR),@XR SAVE D2 ENTRY POINTER
235B 6C 01 68 05 7937 MVC SFGCBV(,@BR),@$D2CP(@VADDR,@XR) SET UP VADDR OF
235F 6E 00 67 02 7938 ALC SFGCBV-1(,@BR),@$D2VB(@$L2VB,@XR) * CURRENT BUFFER
2363 C0 87 1330 7939 B I$LDXR ACCESS & PT @XR TO NEXT SDF
2367 2368 7940 SFGCBV DS CL(@VADDR) VADDR OF CURRENT BUFFER
7941 *
2369 BD 80 00 7942 CLI @SDF0(,@XR),@SNULL IS THE NEXT SEGMENT NULL ?
236C F2 01 0A 7943 JNE SFG840 NO, GO CHECK SEGMENT TYPE
7944 *
236F 75 02 3E 7945 L SFGSXR(,@BR),@XR RESTORE D2 ENTRY POINTER
2372 9E 00 04 F1 7946 ALC @$D2CS(@$L2CS,@XR),SFGPAF(,@BR) NULL, INCR PT TO NEXT PAGE
2376 D0 87 0C 7947 B SFG760(,@BR) GO ACCESS NEXT BUFFER
7948 *
7949 * TEST NEXT SEGMENT TYPE AND USAGE STATUS
7950 *
2379 6C 06 FA 06 7951 SFG840 MVC SFGSHD(SFGHDL,@BR),SFGDEH(,@XR) MOVE SEG HDR TO SAVE AREA
237D 75 02 3E 7952 L SFGSXR(,@BR),@XR RESTORE D2 ENTRY POINTER
2380 78 02 F6 7953 TBN SFGLEH+@SDF2(,@BR),@SLAST PRIMARY SEGMENT ?
2383 F2 90 0E 7954 JF SFG860 YES, GO CHECK IF DISABLED
7955 *
7956 * SECONDARY SEGMENT
7957 *
2386 F2 80 14 7958 SFG850 JC SFG870,@NOP JUMP IF LINE DISABLED
2389 9E 00 05 F2 7959 ALC @$D2CB(@$L2CB,@XR),SFGSSL(,@BR) INCR CURR PT BY HDR LNG
238D 5F 00 F5 F2 7960 SLC SFGLEH+@SDF1(1,@BR),SFGSSL(,@BR) DECR SEG CT BY HDR LNG
2391 F2 87 1B 7961 J SFG890 GO SET ADJ SEG CT IN D2 ENTRY
7962 *
7963 * PRIMARY SEGMENT
7964 *
2394 78 80 FA 7965 SFG860 TBN SFGLEH+@STYPE(,@BR),B@SDMK STATEMENT DISABLED ?
2397 F2 90 0A 7966 JF SFG880 NO, BYPASS BYPASS OF SEG
239A 7C 87 87 7967 MVI SFG850+@Q(,@BR),@UCB SET SWITCH FOR 2NDARY SEGMENTS
239D 9E 01 05 F5 7968 SFG870 ALC @$D2CP(@$L2CP,@XR),SFGLEH+@SDF1(,@BR) INCR CURR PT BY LNG
23A1 D0 87 00 7969 B SFG750(,@BR) GO ACCESS THE NEXT SEGMENT
7970 *
23A4 7C 80 87 7971 SFG880 MVI SFG850+@Q(,@BR),@NOP RESET DISABLED SWITCH
23A7 9E 00 05 F3 7972 ALC @$D2CB(@$L2CB,@XR),SFGPSL(,@BR) INCR CURR PT BY HDR LNG
23AB 5F 00 F5 F3 7973 SLC SFGLEH+@SDF1(1,@BR),SFGPSL(,@BR) DECR SEG CT BY HDR LNG
23AF 9C 01 0D F5 7974 SFG890 MVC @$D2LC(@$L2LC,@XR),SFGLEH+@SDF1(,@BR) SET SEG CT IN ENTRY
7975 *
7976 * ALL DONE - GO AWAY

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      23B3 C0 87 12D3      7977 *
      7978 SFG900 B      I$RTRN      RETURN TO PART 2 OF SFGETR
      7979 *
      7980 *      SYNTAX CHECK THE ENTIRE CARD
      7981 *
      23B7 74 02 FA      7982 SFG920 ST      SFGSB2(,@BR),@XR      SAVE THE BUFFER POINTER
      7983 *
      23BA C0 87 12B1      7984      B      I$CALL      GO SYNTAY CWECK FOR
      23BE 2E00      23BF 7985      DC      AL(@VADDR)(V$CDSY)      * VALID DATA ITEMS
      7986 *
      23C0 75 02 FA      7987      L      SFGSB2(,@BR),@XR      RESTORE THE BUFFER POINTER
      23C3 F2 87 16      7988      J      SFG940      JUMP TO CONFIGURE 2ND PASS      1-3
      7989 *
      7990 *      CONVERT AND STACK THE NEXT DATA ITEM UNLESS AN ERROR HAS OCCURED
      7991 *
      23C6 F2 80 07      7992 SFG930 JC      SFG935,@NOP      JOMP FIRST PASS      1-3
      23C9 74 02 FA      7993      ST      SFGSB2(,@BR),@XR      SAVE XR(BUFFER CADDR)      1-3
      23CC 9C 00 FE F9      7994      MVC      SFGXRD(@CADDR-1,@XR),SFGSB2-1(,@BR) SET TRUE BUFR CADR 1-3
      7995 *
      23D0 C0 87 12B1      7996 SFG935 B      I$CALL      SO CONVERT AND STACK NEXT
      23D4 3100      23D5 7997      DC      AL(@VADDR)(V$CDCV)      * DATA ITEM
      7998 *
      23D6 7C 80 C7      7999      MVI      SFG930+@Q(,@BR),@NOP      FORCE SAVE BUFFER CADDR      1-3
      23D9 F2 87 03      8000      J      SFG945      JUMP TO RETURN TO CALLER      1-3
      8001 *
      23DC 7C 87 C7      8002 SFG940 MVI      SFG930+@Q(,@BR),@UCB      FORCE NO SAVE OR BUFR ADDR      1-3
      8003 *
      23DF C0 87 12D3      8004 SFG945 B      I$RTRN      RETURN TO CALLER      1-3
      8005 *
      8006 *      PART 3 - DISK PARAMETER LISTS.
      8007 *
      8008 *      WRITE OUT INTERPRETER
      8009 *
      8010 *SFGPLW DPL      FUNC-@DPUT,DADDR-#@VSFI,CNT=##@VSL,CADDR-#$$INS
      23E3 02      23E3 8011 SFGPLW EQU      *      DISK PARAMETER LIST
      23E4 09A1      23E5 8012      DC      AL1(@DPUT)      REQUESTED FUNCTION
      23E6 0F      23E6 8013      DC      AL2(##@VSFI)      DISK ADDRESS
      23E7 0600      23E6 8014      DC      AL1(##@VSL)      SECTOR COUNT
      23E8 8015      DC      AL2(##$INS)      BUFFER ADDRESS
      8016 *** END OF EXPANSION ***

      00E3 8018 SFGDWL EQU      SFGPLW-SFGBS3      DISP. TO WRITE DPL
      8019 *
      8020 *      READ IN SFLOAD
      8021 *
      8022 *SFGPLR DPL      FUNC-@DGET,DADDR-#@SFLO,CNT-##@SFL,CADDR-#$$SFL
      23E9 01      23E9 8023 SFGPLR EQU      *      DISK PARAMETER LIST
      23EA 0499      23E9 8024      DC      AL1(@DGET)      REQUESTED FUNCTION
      23EC 05      23EB 8025      DC      AL2(##@SFLO)      DISK ADDRESS
      23ED 0F00      23EC 8026      DC      AL1(##@SFL)      SECTOR COUNT
      23EE 8027      DC      AL2(##$SFL)      BUFFER ADDRESS
      8028 *** END OF EXPANSION ***

      00E9 8030 SFGDRL EQU      SFGPLR-SFGBS3      DISP TO READ DPL
      8031 *
      8032 *      PART 3 - CONSTANTS, RORKAREAS AND EQUATES.

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ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE	98
					8033	*					
	23EF	0100		23F0	8034	SFGSSZ DC	AL(@\$L2LC)(B@BLSZ)			MAX SEGMENT COUNT	
	23F1	01		23F1	8035	SFGPAF DC	XL(@\$L2CS)'1'				
	23F2	04		23F2	8036	SFGSSL DC	XL(@\$L2CB)'4'			LENGTH OF 2NDARY SEG. HDR.	
	23F3	07		23F3	8037	SFGPSL DC	XL(@\$L2CB)'7'			LENGTH OF PRIMARY SEG. HDR.	
					8038	*					
				0F00	8039	SFGSA0 EQU	\$\$KLD1+X'0900'			CORE LOAD ADOR OF #SFLOAD	
				0007	8040	SFGHDL EQU	@STEXT			SEGMENT HEADER LENGTH	
				0006	8041	SFGDEH EQU	SFGHDL-1			DISP TO RIGHT END OF SEG. HDR.	
					8042	*					
	23F4			23F4	8043	SFGLEH EQU	*			LEFT END OF HEADER SAVE AREA	
				23FA	8044	SFGSHD DS	CL(SFGHDL)			SEGMENT HEADER SAVE AREA	
				23FA	8045	SFGSB2 EQU	SFGSHD			SAVE AREA FOR CARD SBR ADDRESS	
				00FE	8046	SFGXRD EQU	X'FE'			BUFFER CADDR DISP INTO BFR	1-3
					8047	*					
					8048	*	END OF SFGETR PART 3				
					8049	*					

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	2400				8051		ORG *,B@LVP,0			PLACE MODULE AT PAGE BOUNDARY
				2400	8052		USING SFRBS1,@BR			ESTABLISH BASE REGISTER
				2400	8053	SFRBS1	EQU *			IT ON FIRST BYTE OF PAGE
					8054	*				
					8055	*				
					8056	*				TERMINATION ENTRY TO CLOSE ALL DATA FILES
				2400	8057	SFRCAL	EQU *			
	2400	7C	80	73	8058		MVI SFR900+@Q(,@BR),@NOP			SET SW FOR CLOSE ALL LOOP
	2403	7C	80	17	8059		MVI SFR110+@Q(,@BR),@NOP			SET SW FOR CLOSE ALL INITIALIZED
	2406	3A	1E	03E4	8060		SBN \$LPRP3,@KENAB			SET MATRIX PRINTER MODE 1-3
					8061	*				
					8062	*				ENTRY TO CLOSE A SPECIFIED DATA FILE
					8063	*				
				240A	8064	SFRCLS	EQU *			
	240A	7C	87	50	8065		MVI SFR140+@Q(,@BR),@UCB			SET SWITCH FOR CLOSE
					8066	*				
					8067	*				ENTRY TO RESET A SPECIFIED FILE
					8068	*				
				240D	8069	SFRSET	EQU *			
					8070	*				
					8071	*				ACCESS DIRECTORY 2 & REFERENCE SPECIFIED FILE
					8072	*				
	240D	C0	87	1330	8073	SFR100	B I\$LDXR			GET VM DIRECTORY 2 AND
	2411	0100			2412	8074	SFRVD2 DC			* POINT @XR TO IT
	2413	74	02	84	8075		ST SFRI XR(,@BR),@XR			SAVE POINTER TO D2 RECORD
					8076	*				
					8077	*				SET TO FIRST ENTRY IF CLOSE ALL
					8078	*				
	2416	F2	87	03	8079	SFR110	JC SFR115,@UCB			JUMP IF NOT CLOSE ALL
	2419	BC	02	01	8080		MVI @\$D2CF(,@XR),@XR			SET DISPLACEMENT TO 1ST ENTRY
					8081	*				
	241C	B6	02	01	8082	SFR115	A @\$D2CF(,@XR),@XR			INCR @XR TO SPECIFIED FILE
					8083	*				
					8084	*				DETERMINE IF THE FILE IS INPUT OR OUTPUT
					8085	*				
	241F	BD	00	00	8086	SFR130	CLI @\$D2DC(,@XR),@ZERO			THIS FILE ACTIVE ?
	2422	F2	81	4D	8087		JE SFR900			NO, GO CHECK IF CLOSE ALL
	2425	B8	08	01	8088		TBN @\$D2IO(,@XR),@\$M2CI			CURRENT USAGE - INPUT ?
	2428	F2	10	24	8089		JT SFR140			YES, BYPASS CLOSE CALL TO SFPUT
	242B	B8	04	01	8090		TBN @\$D2IO(,@XR),@\$M2CO			CURRENT USAGE - OUTPUT ?
	242E	F2	90	41	8091		JF SFR900			NO, NOT ACTIVE. GO CHK CLOSE ALL
	2431	BA	02	01	8092		SBN @\$D2IO(,@XR),@\$M2EF			SET END OF FILE INDR
	2434	74	02	4B	8093		ST SFR135+@OP1(,@BR),@XR			SAVE D2 ENTRY POINTER
	2437	35	02	0D4E	8094		L I\$STAK,@XR			MOVE AN END OF FILE CODE
	243B	BC	1C	00	8095		MVI I@STAT(,@XR),@EOF			* TO THE STACK
	243E	C0	87	1354	8096		B I\$LOCK			LOCK D2 IN CORE
	2442	C0	87	12B1	8097		B I\$CALL			CALL SFPUTR TO EMPTY THE
	2446	1D00			2447	8098	DC AL(@VADDR)(V\$XSPT)			* FILE BUFFER(S)
	2448	C2	02	0000	8099	SFR135	LA *-*,@XR			RESTORE D2 ENTRY POINTER
	244C	BB	02	01	8100		SBF @\$D2IO(,@XR),@\$M2EF			SET THE END OF FILE INDR OFF
					8101	*				
					8102	*				CHECK IF RESET OR CLOSE
					8103	*				
	244F	F2	80	0F	8104	SFR140	JC SFR300,@NOP			JUMP IF CLOSE

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					8106	*				
					8107	*	RESET REQUIRED			
					8108	*				
2452	AF	01	05 05		8109	SFR200	SLC @SD2CP(, @XR), @SD2CP(@\$L2CP, @XR)			CLEAR CURRENT POINTER
2456	AF	01	09 09		8110		SLC @SD2DD(@\$L2DD, @XR), @SD2DD(, @XR)			CLEAR DISK DISP
245A	AF	01	0D 0D		8111		SLC @SD2LC(@\$L2LC, @XR), @SD2LC(, @XR)			CLEAR SPF COUNT
245E	F2	87	11		8112		J SFR900			GO CHECK IF CLOSE ALL
					8113	*				
					8114	*	CLOSE REQUIRED			
					8115	*				
2461	BB	0C	01		8116	SFR300	SBF @SD2IO(, @XR), @\$M2CI+@\$M2CO			SET CURRENT USAGE OFF
2464	B8	40	00		8117		TBN @SD2DC(, @XR), @\$MBSD			SCRATCH DISK FILE ?
2467	D0	10	52		8118		BT SFR200(, @BR)			YES, GO CLEAR CURRENT POINTER'S
246A	AF	01	01 01		8119		SLC @SD2IO(, @XR), @SD2IO(@\$L2DC+@\$L2IO, @XR)			CLEAR ENTRY EXCEPT
246E	AF	0B	0F 0F		8120		SLC @SD2EE(, @XR), @SD2EE(@\$L2E-@\$D2CS, @XR)			* FOR VM BFR BSE&SIZ
					8121	*				
					8122	*	SPECIFIED FILE HAS SEEN CLOSED OR RESET AS REQUIRED.			
					8123	*	IF CLOSE ALL CONTINUE TILL ALL 8 ENTRIES CLOSED			
					8124	*				
2472	F2	87	17		8125	SFR900	JC SFR995, @UCB			JUMP TO RETURN IF NOT CLOSE ALL
2475	5F	00	AB AA		8126		SLC SFRNOE(, @BR), SFRONE(1, @BR)			DECR NO. OF ENTRIES COUNTER
2479	F2	81	10		8127		JZ SFR995			JUMP TO RETURN IF ZERO.
247C	1C	01	144A 12		8128		MVC I\$VADR, SFRVD2(@VADDR, @BR)			RESTORE VADDR OF D2 TO PG.RTN.
2481	C2	02	0000		8129	SFR950	LA *-*, @XR			RESTORE POINTER TO D2 RECORD
				2484	8130	SFR1XR	EQU SFR950+@OP1			SAVE AREA FOR D2 RCD POINTER
2485	9E	00	01 AC		8131		ALC @SD2CF(, @XR), SFRX10(1, @BR)			INCR FILE PT TO NEXT ENTRY
2489	D0	87	1C		8132		B SFR115(, @BR)			GO INCR @XR TO NEXT ENTRY & CHK
					8133	*				
					8134	*	FUNCTION COMPLETE - RESTORE ROUTINE & EXIT			
					8135	*				
248C	7C	80	50		8136	SFR995	MVI SFR140+@Q(, @BR), @NOP			SET RTN FOR RESET FUNCTION
248F	3B	1E	03E4		8137		SBF \$LPRP3, @KENAB			RESET MATRIX PRINT MODE 1-3
2493	1C	01	144A 12		8138		MVC I\$VADR, SFRVD2(@VADDR, @BR)			SPECIFY DIRECTORY 2
2498	C0	87	1349		8139		B I\$MDFY			SET PAGE TO MODIFIED
249C	7C	87	17		8140		MVI SFR110+@Q(, @BR), @UCB			RESET JUMP CONDITION 1-5
249F	7C	87	73		8141		MVI SFR900+@Q(, @BR), @UCB			RESET JUMP CONDITION 1-5
24A2	C0	87	1350		8142		B I\$UNLK			UNLOCK PAGE
24A6	C0	87	12D3		8143		B I\$RTRN			RETURN TO CALLER
					8144	*				
					8145	*	CONSTANTS, WORKAREAS & EQUATES			
					8146	*				
24AA	01			24AA	8147	SFRONE	DC XL1'1'			SIMPLY ONE
					8148	*				
24AB				24AB	8149	SFRNOE	DS CL1			NUMBER OF D2 ENTRIES COUNTER
24AB					8150		ORG SFRNOE			* INITIALIZE TO MAXIMUM
24AB	0C			24AB	8151		DC AL1(@\$MBEN)			* NUMBER OF D2 ENTRIES
24AC	10			24AC	8152	SFRX10	DC XL1'10'			D2 ENTRY LENGTH

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				8154		*****				
				8155	*					*
				8156	*		LINE PRINTER CLOSE OUT ROUTINE			*
				8157	*					*
				8158		*****				
				2400	8159		USING SFRBS1,@BR			SET BASE REGISTER USAGE 1-4
24AD	F1	E2	00		8160		APL @PBUSY			LOOP PRINTER BUSY 1-4
24B0	3D	00	03E3		8161		CLI \$BUFPT,@ZERO			IS LINE PRINTER BUFFER EMPTY 1-4
24B4	F2	81	13		8162		JE SFR997			JUMP IF BUFFER EMPTY 1-4
24B7	74	02	C6		8163	SFRLPR	ST SFR996+@OP1(,@BR),@XR			SAVE XR 1-4
24BA	D2	02	E5		8164		LA SF1000(,@BR),@XR			XR = CADDR PPL 1-4
24BD	C0	87	12B1		8165		B I\$CALL			BRANCH TO CALL ROUTINE 1-4
24C1	2800			24C2	8166		DC AL(@VADDR)(V\$SPRT)			MATRIX PRINTER PAGE 1-4
24C3	C2	02	0000		8167	SFR996	LA *-*,@XR			RESTORE XR 1-4
24C7	F2	87	07		8168		J SFR998			GO RESTORE TRUE POSITION 1-4
24CA	38	01	03E4		8169	SFR997	TBN \$LPRP3,@INDEX			IS DUMMY PRT POSITION IN USE 1-4
24CE	F2	90	06		8170		JF SFR999			JUMP IF NOT 1-4
24D1	0C	00	03C2 03E5		8171	SFR998	MVC \$PRPOS(1),\$LPROS			RESTORE TRUE PRINT POSITION 1-4
24D7	3C	00	03E4		8172	SFR999	MVI \$LPRP3,@ZERO			RESET LINE PRINTER FLAGS 1-4
24DB	F1	E2	00		8173		APL @PBUSY			LOOP IF PRINTER BUSY 1-4
24DE	D1	E0	B7		8174		TIO SFRLPR(,@BR),@PERR			BRANCH IF PRINTER UNIT CHECK 1-4
24E1	C0	87	12D3		8175		B I\$RTRN			RETURN TO CALLER 1-4
					8176	*				1-4
24E5	80			24E5	8177	SF1000	DC XL1'80'			PPL - FORCE CARRAGE RETURN 1-4
					8178	*				
					8179	*****	END SFRSET			*****

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

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		8181		*****	
		8182	*	5703-XM1 COPYRIGHT IBM CORP. 1970	*
		8183	*	REFER TO INSTRUCTIONS ON COPY RIGHT NOTICE, 120-2083	*
		8184	*		*
		8185		*****	
		8186	*	*STATUS	*
		8187	*	VERSION 1 MODIFICATION 0	*
		8188	*		*
		8189	*	*FUNCTION	*
		8190	*	DFKEYN IS DIVIDED INTO TWO SECTIONS PERFORMING TWO GENERAL	*
		8191	*	FUNCTIONS:	*
		8192	*	* CALL SECTION	*
		8193	*	THE CALL SECTION ENABLES AND UNLOCKS THE KEYBOARD IN	*
		8194	*	PREPARATION FOR LINE INPUT. IT THEN SETS THE INTERRUPT	*
		8195	*	ADDRESS WHICH IS ENTERED ON THE KEYBOARD INTERRUPT LEVEL WHEN	*
		8196	*	A KEY IS DEPRESSED.	*
		8197	*	* INTERRUPT SECTION	*
		8198	*	THE INTERRUPT SECTION SAVES THE SYSTEM STATUS (BR, XR & PSR)	*
		8199	*	AND HANDLES THE INPUT FROM THE KEYBOARD. UPON COMPLETION OF	*
		8200	*	THE INPUT LINE, \$KYBSY IS SET TO ZERO INDICATING THAT THE	*
		8201	*	LINE IS COMPLETE. THEN THE KEYBOARD IS LOCKED.	*
		8202	*	THE INPUT FROM THE KEYBOARD IS CLASSIFIED AND HANDLED AS	*
		8203	*	FOLLOWS:	*
		8204	*	* DATA KEYS -- THE CHARACTER REPRESENTATION IS PLACED IN	*
		8205	*	THE INPUT LINE BUFFER AND PRINTED ON THE	*
		8206	*	SYSTEM PRINTER.	*
		8207	*	* CMD KEYS -- IF THE CRT IS AVAILABLE, DSPLYN IS CALLED	*
		8208	*	TO SET THE FUNCTION FOR KEYS 12-16.	*
		8209	*	AN INDICATOR IS PLACED IN THE INPUT LINE	*
		8210	*	BUFFER (SPECIFIED LOCATION) FOR COMMAND	*
		8211	*	KEYS 1-11.	*
		8212	*	* FUNCTION KEYS -- AS FOLLOWS	*
		8213	*	TAB - IF THE CURRENT POSITION IN THE LINE BUFFER IS	*
		8214	*	POINTING WITHIN AN EXISTING LINE, THE OLD	*
		8215	*	CHARACTER IS PRINTED. IF NOT, A BLANK IS PRINTED	*
		8216	*	THIS POSITIONS THE CARRIER ONE SPACE TO THE RIGHT	*
		8217	*	IF THE KEY IS HELD DOWN, THE TYPOMATIC FEATURE IS	*
		8218	*	ACTIVATED, REPEATING THE ABOVE FUNCTION UNTIL	*
		8219	*	KEY IS RELEASED.	*
		8220	*	BACKSPACE - IF THE SYSTEM PRINTER IS THE MATRIX PRINTER	*
		8221	*	AND IF THIS WAS THE FIRST BACKSPACE FOR THE	*
		8222	*	CURRENT LINE, THE CARRIAGE IS INDEXED AND	*
		8223	*	BACKSPACED ONE POSITION. OTHERWISE, THE INDEX	*
		8224	*	FEATURE IS NOT EXECUTED. IF THE KEY IS HELD DOWN	*
		8225	*	THE TYPOMATIC FEATURE IS ACTIVATED AND THE ABOVE	*
		8226	*	FUNCTION IS REPEATED UNTIL THE KEY IS RELEASED.	*
		8227	*	RETURN - THE CARRIAGE IS RETURNED ON THE SYSTEM PRINTER	*
		8228	*	AND \$KYBSY SET TO ZERO INDICATING THE LINE IS	*
		8229	*	COMPLETE. THE KEYBOARD IS THEN LOCKED.	*
		8230	*	ERASE - THE CARRIAGE IS RETURNED ON THE SYSTEM PRINTER	*
		8231	*	ALLOWING THE LINE TO BE RE-ENTERED.	*
		8232	*	INQUIRY REQUEST - THE CURRENT OPERATION IS ABORTED.	*
		8233	*	THIS KEY IS NEVER LOCKED.	*
		8234	*	NOTE: THE ENTER(+) AND PROGRAM START KEYS ARE IGNORED	*
		8235	*		*
		8236	*	*ENTRY POINTS	*

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 103
		8237	*	ENTRY TO DFKEYN IS VIA THE VIRTUAL MEMORY PAGING ROUTINE.	*
		8238	*	THE CALLING SEQUENCE IS:	*
		8239	*	B I\$CALL	*
		8240	*	DC AL(@CADDR)(V\$SKEY)	*
		8241	*	WHERE V\$SKEY IS THE VIRTUAL ADDR OF THE VIRTUAL MEMORY KEYBOARD	*
		8242	*	INPUT IOCR. THE CALL TO DFKEYN INCLUDES THE PASSING IN @XR OF	*
		8243	*	THE ADDRESS OF THE INPUT DATA BUFFER.	*
		8244	*		*
		8245	*	*INPUT	*
		8246	*	INPUT TO THE VIRTUAL MEMORY IOCR IS THE ADDRESS IN @XR OF THE	*
		8247	*	INPUT LINE BUFFER AND THE INPUT DATA.	*
		8248	*		*
		8249	*	*OUTPUT	*
		8250	*	THE OUTPUT FROM THIS ROUTINE IS AN EBCDIC CHARACTER TO THE SYSTEM	*
		8251	*	PRINTER AND THE LINE BUFFER.	*
		8252	*		*
		8253	*	*EXTERNAL REFERENCES	*
		8254	*	\$BRSAB - COMMON SAVE AREA FOR BASE REGISTER	*
		8255	*	\$CIENT - NUCLEUS ENTRY FOR INTERRUPTS	*
		8256	*	\$PRDEV - INDICATOR FOR CURRENT I/O DEVICE	*
		8257	*	\$KEYCD - THUNCATED LINE INDICATOR (\$TRUNK)	*
		8258	*	\$IOIND - HARD I/O ERROR INDICATOR (\$HRDER) SYSTEM STATUS	*
		8259	*	\$INDR2 - ERROR PENDING INDICATOR (\$ERPND)	*
		8260	*	\$HIST1 - ERROR HISTORY LOG	*
		8261	*	\$PLYN - ENTRY TO CRT IOCS	*
		8262	*	I\$CALL - VIRTUAL MEMORY PAGING ROUTINE	*
		8263	*	* INDICATORS FOR VM ROUTINE	*
		8264	*	I\$LDBR	*
		8265	*	I\$LOCK	*
		8266	*	I\$LDXR	*
		8267	*	I\$VADR	*
		8268	*	I\$UNLK	*
		8269	*	I\$RTRN	*
		8270	*	V\$SKEY - VIRTUAL ADDRESS OF DFKEYN	*
		8271	*	V\$SPRT - VIRTUAL ADDRESS OF DFPRNT	*
		8272	*		*
		8273	*	*EXITS, NORMAL	*
		8274	*	EXIT IS TO THE CALLING PROGRAM VIA A BRANCH TO THE VIRTUAL MEMORY	*
		8275	*	PAGING ROUTINE.	*
		8276	*	B I\$RTRN	*
		8277	*		*
		8278	*	*EXITS, ERROR	*
		8279	*	A DATA PARITY ERROR WILL BE RETRIED ONCE. THE SUCCESSIVE PARITY	*
		8280	*	ERRORS WILL CAUSE A SYSTEM GENERATED HARD HALT.	*
		8281	*		*
		8282	*	*TABLES/WORKAREAS	*
		8283	*	DEPTBL - KEYBOARD TABLE CONTAINING THE EBCDIC CHARACTER CODES	*
		8284	*	ARRANGED SUCH THAT AN INDEX VALUE IS SENSED FROM THE	*
		8285	*	KEYBOARD AND USED AS A DISPLACEMENT INTO THE TABLE TO	*
		8286	*	FETCH THE PROPER EBCDIC VALUE. THE TABLE IS INITIALIZED	*
		8287	*	TO KEYBOARD TYPE KB1, BUT MAY BE CHANGED TO REFLECT	*
		8288	*	THE CONFIGURATION RECORD.	*
		8289	*		*
		8290	*	*ATTRIBUTES	*
		8291	*	NATURALLY RELOCATABLE	*
		8292	*		*

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 104
		8293	*	CHARACTER CODE DEPENDENCY			*
		8294	*	THE OPERATION OF THIS MODULE DEPENDS UPON AN INTERNAL			*
		8295	*	REPRESENTATION OF THE EXTERNAL CHARACTER SET WHICH IS EQUIVALENT			*
		8296	*	TO THE ONE USED AT ASSEMBLY TIME, THE CODING HAS BEEN ARRANGED			*
		8297	*	SC THAT REDEFINITION OF CHARACTER CONSTANTS, BY REASSEMBLY, WILL			*
		8298	*	RESULT IN A CORRECT MODULE FOR THE NEW DEFINITIONS.			*
		8299	*				*
		8300	*	NOTES			*
		8301	*	ERROR PRJCEDURES			*
		8302	*	UPON DETECTION OF A DATA REGISTER PARITY ERROR, THE SYSTEM WILL			*
		8303	*	HALT INDICATING TO THE USER THAT A PARITY ERROR SAS OCCURRED.			*
		8304	*	TO CONTINUE, OR RETRY THE CHARACTER, THE START SWITCH MUST BE			*
		8305	*	PRESSED. THE ERROR IS LOGGED IN THE COUNT LOG ON DISK.			*
		8306	*	IF ANOTHER IS DETECTED, THE HISTORY LOG IS UPDATED AND A HARD			*
		8307	*	HALT EXECUTED.			*
		8308	*				*
		8309	*	RESISTER USAGE			*
		8310	*	* THE @XR IS USED FOR PASSING THE ADDRESS OF THE INPUT DATA			*
		8311	*	BUFFER.			*
		8312	*	* THE @XR IS ALSO USED AS A BASE REGISTER FOR PAGE 3			*
		8313	*	* THE @BR IS USED AS A BASE REGISTER FOR PAGE 2.			*
		8314	*	* BOTH PliAR AND IliAR ARE USED FOR BRANCHING BETWEEN PROGRAM			*
		8315	*	AND INTERRUPT LEVEL.			*
		8316	*	* THE RESISTERS ARE SAVED AND RESTORED.			*
		8317	*				*
		8318	*	SAVED/RESTORED AREAS			*
		8319	*	N/A			*
		8320	*				*
		8321	*	MODIFICATION CONSIDERATIONS			*
		8322	*	N/A			*
		8323	*				*
		8324	*	REQUIRED MODULES			*
		8325	*	FFPRNT - VIRTUAL MEMORY MATRIX PRINTER IOCR			*
		8326	*	@SYSE0 - GENERAL SYSTEM ELATES			*
		8327	*	@HDWEQ - HARDWARE VALUE EQUATES			*
		8328	*	@FXDEQ - NUCLEUS LOCATION EQUATES			*
		8329	*	@CANEQ - COMMON CORE LOCATION-MKFTS			*
		8330	*	@CY0EQ - CYLINDER ZERO EQUATES			*
		8331	*	@HLTEQ - HALT CODE EQUATES			*
		8332	*				*
		8333	*	OTHER			*
		8334	*	N/A			*
		8335	*				*
		8336	*	*****			*

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 105
					8338		*****			
					8339	*	PAGE 1			*
					8340		*****			
	2500				8341	ORG	*,256,0			
				2500	8342	USING	DFKEYN,@BR			INITIAL BASE REG FOR PAGE 1
				2700	8343	USING	DFKBS3,@XR			BASE VALUE FOR PAGE 3
					8344	*				
				2500	8345	DFKEYN EQU	*			ENTRY TO ENABLE INPUT
	2500	34	01	03C5	8346	ST	\$BRSAV,@BR			SAVE PAGE 1 ADDRESS
	2504	74	01	68	8347	ST	DFK100+@OP1(,@BR),@BR			SET DFK100 TO
	2507	7C	65	68	8348	MVI	DFK100+@OP1(,@BR),DFKDIO			* BRANCH TO ITSELF
	250A	C0	87	1329	8349	B	I\$LDBR			LOAD PAGE 2 USING BR
	250E	2600			250F	8350	DC	AL2(V\$SKEY+DFKBS2-DFKEYN)		VADDR FOR PAGE 2
	2510	C0	87	1354	8351	B	I\$LOCK			LOCK PAGE 2
				2600	8352	USING	DFKBS2,@BR			BASE VALUE FOR PAGE 2
	2514	7C	20	BC	8353	MVI	DFKP10-1(,@BR),X'20'			INITIALIZE DSPLYN ADDR
	2517	4E	00	BC 043B	8354	ALC	DFKP10-1(1,@BR),\$EXFTR			CALCULATE DSPLYN ENTRY ADDRESS
	251C	74	02	28	8355	ST	DFKLMG(,@BR),@XR			SAVE INPUT LINE ADDRESS
	251F	74	02	26	8356	ST	DFKSTN(,@BR),@XR			SET STARTING DATA ADDRESS
	2522	74	02	2A	8357	ST	DFKRMG(,@BR),@XR			SET STARTING ADDR IN RIGHT ADDR
	2525	4C	00	1F 03C0	8358	MVC	DFKNPS(1,@BR),\$RMGRN			RIGHT JUSTIFY RIGHT MRGN VALUE
	252A	4F	00	1F 03C1	8359	SLC	DFKNPS(1,@BR),\$LMGRN			CALCULATE PRINTER WIDTH
	252F	5E	01	2A 1F	8360	ALC	DFKRMG(@CADDR,@BR),DFKNPS(,@BR)			CALC RIGHT MARGIN ADDR
	2533	D2	02	03	8361	LA	DFKNTR-DFKBS2(,@BR),@XR			PUT INTERRUPT ADDR IN XR
	2536	74	02	15	8362	ST	DFKIAR(,@BR),@XR			SAVE INTERRUPT ADDR FOR LOAD
	2539	7C	00	1F	8363	MVI	DFKNPS(,@BR),@ZERO			SET NO LINE POSITION CHANGE
	253C	D2	02	53	8364	LA	DFKENT-DFKBS2(,@BR),@XR			LOAD MAINLINE ENTRY ADDR
	253F	74	02	32	8365	ST	DFKROS(,@BR),@XR			SAVE MAINLINE ADDR FOR PliAR
	2542	35	02	03C5	8366	L	\$BRSAV,@XR			POINT XR TO PAGE 1
	2546	E2	02	65	8367	LA	DFK100-DFKEYN(,@XR),@XR			XR = HALT ADDRESS
	2549	74	02	30	8368	ST	DFKRET(,@BR),@XR			SAVE MAINLINE RETURN ADDRESS
	254C	E2	02	5B	8369	LA	DFKTBL-DFK100(,@XR),@XR			XR = DATA TABLE ADDRESS
	254F	74	02	17	8370	ST	DFKBLE(,@BR),@XR			SAVE DATA TABLE ADDRESS
	2552	C0	87	1330	8371	B	I\$LDXR			READ IN PAGE 3 USING XR
	2556	2700			2557	8372	DC	AL2(V\$SKEY+DFKBS3-DFKEYN)		VADDR FOR PAGE 3
	2558	C0	87	1354	8373	B	I\$LOCK			LOCK PAGE 3
	255C	74	02	15	8374	ST	DFKIAR(,@BR),@XR			SAVE PAGE 3 ADDRESS
	255F	75	C0	15	8375	L	DFKIAR(,@BR),@IliAR			LOAD INTERRUPT ADDRESS
	2562	F3	10	1E	8376	SIO	@KENAB,@KEYBD			ENABLE, UNLOCK KEYBOARD
				0065	8377	DFKDIO EQU	*-DFKEYN			DISPLACEMENT TO DFK100
	2565	C0	87	0000	8378	DFK100 B	*-*			WAIT FOR LINE
	2569	1C	01	144A 3C	8379	DFK120 MVC	I\$VADR(@VADDR),DFKPG3(,@BR)			SET PAGE 3 VADDR
	256E	C0	87	1350	8380	B	I\$UNLK			UNLOCK PAGE 3
	2572	1C	01	144A 3A	8381	MVC	I\$VADR(@VADDR),DFKPG2(,@BR)			SET PAGE 2 VADDR
	2577	C0	87	1350	8382	B	I\$UNLK			UNLOCK PAGE 2
	257B	75	02	28	8383	L	DFKLMG(,@BR),@XR			RESTORE XR TO DATA ADDRESS
	257E	C0	87	12D3	8384	DFK140 B	I\$RTRN			RETURN TO CALLING PGM
					8385		*****			

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ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 106
	25C0				8387	ORG	DFKEYN+256-64			PLACE DATA TABLE TO END OF PAGE
				25C0	8388	DFKTBL EQU	*			FIRST BYTE OF DATA TABLE
	25C0	F0		25C0	8389	DC	CL1'0'			0
	25C1	F1		25C1	8390	DC	CL1'1'			1
	25C2	F2		25C2	8391	DC	CL1'2'			2
	25C3	F3		25C3	8392	DC	CL1'3'			3
	25C4	F4		25C4	8393	DC	CL1'4'			4
	25C5	F5		25C5	8394	DC	CL1'5'			5
	25C6	F6		25C6	8395	DC	CL1'6'			6
	25C7	F7		25C7	8396	DC	CL1'7'			7
	25C8	F8		25C8	8397	DC	CL1'8'			8
	25C9	F9		25C9	8398	DC	CL1'9'			9
	25CA	C1		25CA	8399	DC	CL1'A'			A
	25CB	C2		25CB	8400	DC	CL1'B'			B
	25CC	C3		25CC	8401	DC	CL1'C'			C
	25CD	C4		25CD	8402	DC	CL1'D'			D
	25CE	C5		25CE	8403	DC	CL1'E'			E
	25CF	C6		25CF	8404	DC	CL1'F'			F
	25D0	5D		25D0	8405	DC	XL1'5D')
	25D1	5A		25D1	8406	DC	AL1(@UPARW)			UP ARROW
	25D2	7C		25D2	8407	DC	XL1'7C'			@
	25D3	78		25D3	8408	DC	XL1'78'			#
	25D4	58		25D4	8409	DC	XL1'58'			\$
	25D5	6C		25D5	8410	DC	XL1'6C'			%
	25D6	4A		25D6	8411	DC	XL1'4A'			CENTS SIGN
	25D7	50		25D7	8412	DC	XL1'50'			&
	25D8	70		25D8	8413	DC	XL1'70'			'
	25D9	4D		25D9	8414	DC	XL1'4D'			(
	25DA	C7		25DA	8415	DC	CL1'G'			G
	25DB	C8		25DB	8416	DC	CL1'H'			H
	25DC	C9		25DC	8417	DC	CL1'I'			I
	25DD	D1		25DD	8418	DC	CL1'J'			J
	25DE	D2		25DE	8419	DC	CL1'K'			K
	25DF	D3		25DF	8420	DC	CL1'L'			L
	25E0	D4		25E0	8421	DC	CL1'M'			M
	25E1	D5		25E1	8422	DC	CL1'N'			N
	25E2	D6		25E2	8423	DC	CL1'O'			O
	25E3	D7		25E3	8424	DC	CL1'P'			P
	25E4	D8		25E4	8425	DC	CL1'Q'			Q
	25E5	D9		25E5	8426	DC	CL1'R'			R
	25E6	E2		25E6	8427	DC	CL1'S'			S
	25E7	E3		25E7	8428	DC	CL1'T'			T
	25E8	E4		25E8	8429	DC	CL1'U'			U
	25E9	E5		25E9	8430	DC	CL1'V'			V
	25EA	E6		25EA	8431	DC	CL1'W'			W
	25EB	E7		25EB	8432	DC	CL1'X'			X
	25EC	E8		25EC	8433	DC	CL1'Y'			Y
	25ED	E9		25ED	8434	DC	CL1'Z'			Z
	25EE	60		25EE	8435	DC	XL1'60'			-
	25EF	7E		25EF	8436	DC	XL1'7E'			= (EQUAL SIGN)
	25F0	4E		25F0	8437	DC	CL1'+'			+ (PLUS)
	25F1	4B		25F1	8438	DC	CL1'.'			PERIOD
	25F2	5C		25F2	8439	DC	CL1'*'			; (SEMICOLON)
	25F3	5C		25F3	8440	DC	CL1'*'			*
	25F4	6B		25F4	8441	DC	CL1','			COMMA
	25F5	4B		25F5	8442	DC	CL1'.'			PERIOD

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 107
	25F6	61	25F6	8443	DC	XL1'61'			/
	25F7	6F	25F7	8444	DC	XL1'6F'			?
	25F8	4F	25F8	8445	DC	XL1'4F'			LOGICAL 'OR'
	25F9	40	25F9	8446	DFKLKA	DC	CL1' '		BLANK
	25FA	7A	25FA	8447	DC	XL1'7A'			COLON
	25FB	7F	25FB	8448	DC	XL1'7F'			NOT EQUAL
	25FC	4C	25FC	8449	DC	XL1'4C'			LESS NAN
	25FD	6E	25FD	8450	DC	XL1'6E'			> (GREATER THAN)
	25FE	6D	25FE	8451	DC	XL1'6D'			UNDER SCORE
	25FF	5F	25FF	8452	DC	XL1'5F'			LOGICAL 'NOT'
				8453	*****				
			0039	8454	DFKLNK EQU	DFKLKA-DFKTBL			DISP OF BLANK IN TABLE
				8455	*****				

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 108
				8457	*****	
				8458	* PAGE 2	*
				8459	*	*
				8460	* ONCE THE KEYBOARD HAS BEEN UNLOCKED, ALL KEYBOARD INTERRUPTS	*
				8461	* WILL ENTER AT DFKNTR. THE INTERRUPT WILL BE SERVICED AND THE	*
				8462	* LEVEL EXITED.	*
				8463	*****	
2600				8464	ORG DFKEYN+256	PLACE PAGE 2
			2600	8465	DFKBS2 EQU *	PAGE 2 BASE ADDRESS
2600	F3 10 19			8466	DFK160 SIO DFKEYL,@KEYBD	EXIT LEVEL, LOCK KEYBOARD
				8467	*	
			2603	8468	DFKNTR EQU *	INTERRUPT ENTRY UDR
2603	75 20 32			8469	L DFKROS(,@BR),@PLIAR	LOAD PLIAR WITH PROCESSOR ENTRY
2606	70 10 1D			8470	SNS DFKNSK(,@BR),@KEYBD	SENSE KEYBOARD DATA
2609	5D 01 1D 34			8471	CLC DFKNSK(@REGL,@BR),DFKIRK(,@BR)	IS IT INQUIRY REQUEST ?
260D	D0 01 00			8472	BNE DFK160(,@BR)	GO EXIT LEVEL IF NOT
2610	C0 87 0483			8473	B \$CIENT	GO CHECK MASK STATUS
				8474	*****	

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 31/05/21 PAGE 109

```
      8476 *****
      8477 *   CONSTANTS AND WORK AREAS FOR KEYBOARD IOCR   *
      8478 *****
      8479 *
2614 0000      2615 8480 DFKIAR DC      AL2(*-*)           INTERRUPT ENTRY ADDR
2616 0000      2617 8481 DFKBLE DC      AL2(*-*)           ADDR OF DATA TABLE
2618 0483      2619 8482 DFKIET DC      AL2($CIENT)         ADDR OF CI ENTRY
261A 10        261A 8483          DC      AL1(@KEYBD)        SIO Q BYTE
261B 1E        261B 8484          DC      AL1(@KENAB)        SID R BYTE - ENABLE KEYBOARD
261C          261C 8485 DFKATA DS      CL1                 DATA BYTE
261D          261D 8486 DFKNSK DS      CL1                 SENSE BYTE
261E 0000      261F 8487 DFKNPS DC      XL2'000'           LINE POSITION CHANGE
2620 0001      2621 8488 DFKC01 DC      XL2'0001'          CONSTANT 1
2622 00        2622 8489          DC      XL1'00'          INDEX PPL CNT BYTE
                2621 8490 DFKIST EQU    DFKC01             OBR ENTRY
                2623 8491 DFKPPL EQU    *                 PRINT PPL
2623 40        2623 8492          DC      XL1'40'          PRINT COMMAND
2624          2624 8493 DFKCNT DS      CL1                 PRINT COUNT
2625 0000      2626 8494          DC      AL2(*-*)          INITIAL PRINT DOSTION
                2626 8495 DFKSTN EQU    DFKPPL+@PDATA      ADDR OF CURRENT POS IN LINE BUF
2627 0000      2628 8496 DFKLMG DC      AL2(*-*)          ADDR OF LEFT POS OF LINE BUFFER
2629 0000      262A 8497 DFKRMG DC      AL2(*-*)          ADDR OF RIGHT MARGIN IN LINE
262B          262C 8498 DFKIME DS      CL2                 100 MS LOOP CNTR
262D 15B3      262E 8499 DFKMCT DC      IL2'5555'          INITIAL CNT FOR 100 MS
262F          2630 8500 DFKRET DS      CL2                 INTERRUPT RETURN ADDR
2631 0000      2632 8501 DFKROS DC      AL2(*-*)          MAINLINE ENTRY ADDRESS
2633 11        2633 8502          DC      AL1(DFKRKY)        I R KEY CODE
2634 10        2634 8503 DFKIRK DC      AL1(@KFUNK)         FUNCTION KEY CODE
2635          2636 8504 DFKXRS DS      CL(@CADDR)          PAGE 3 ADDR SAVE AREA
2637 0004      2638 8505 DFKXDP DC      AL2(DFK120-DFK100)  INCREMENT TO JUMP HPL
2639 2600      263A 8506 DFKPG2 DC      AL2(V$SKEY+DFKBS2-DFKEYN) VADDR FOR PAGE 2
263B 2700      263C 8507 DFKPG3 DC      AL2(V$SKEY+DFKBS3-DFKEYN) VADDR FOR PAGE 3
      8508 *****
```

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 110
				8510		*****				
				8511	*	EQUATES USED FOR KEYBOARD IOCR				*
				8512		*****				
				8513	*					
	0001			8514	DFK001	EQU	1			ONE
	0005			8515	DFKTAB	EQU	X'05'			TAB KEY
	0016			8516	DFKBSP	EQU	X'16'			BACKSPACE KEY
	0013			8517	DFKRTN	EQU	X'13'			RETURN KEY
	0003			8518	DFKERS	EQU	X'03'			ERASE KEY
	0040			8519	DFKSPC	EQU	X'40'			SPACE BAR
	0011			8520	DFKRKY	EQU	X'11'			IQUIRY REQUEST KEY
	0002			8521	DFKEMS	EQU	X'02'			ENTER MINUS KEY
	0010			8522	DFKACK	EQU	X'10'			BACK SPACE CTRL
	0011			8523	DFKKIX	EQU	X'11'			BACKSPACE &INDX CTRL
	001D			8524	DFKEUD	EQU	X'1D'			EXIT, UNLOCK, DISABLE CTRL
	0018			8525	DFKLOK	EQU	X'18'			LOCK KEYBOARD CTRL
	0012			8526	DFKENB	EQU	X'12'			ENABLE INTERRUPTS CTRL
	001C			8527	DFKULK	EQU	X'1C'			UNLOCK KEYBOARD CTRL
	0019			8528	DFKEXL	EQU	X'19'			EXIT LEVEL, LOCK KEYBOARD CTRL
	0040			8529	DFKDTK	EQU	X'40'			DATA KEY FUNCTION BIT
				8530		*****				

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 31/05/21 PAGE 111

```
      8532 *****
263D 75 C0 19      8533 DFK180 L    DFKIET(,@BR),@I1IAR    RESTORE INTERRUPT ADDR TO NUC
2640 F3 10 18      8534      SIO    DFKLOK,@KEYBD        LOCK KEYBOARD
2643 5E 01 30 38    8535      ALC    DFKRET(@CADDR,@BR),DFKXDP(,@BR)  DON'T DO HALT
2647 F2 87 03      8536      J      DFKNAB              DON'T UNLOCK KEYBOARD
      264A 8537 DFKXIT EQU    *              ENTRY TO EXIT DEPRES
264A F3 10 1C      8538      SIO    DFKULK,@KEYBD        UNLOCK KEYBOARD
      264D 8539 DFKNAB EQU    *              ENTRY TO ENABLE
264D F3 10 12      8540      SIO    DFKENB,@KEYBD        ENABLE INTERRUPTS
2650 75 20 30      8541      L      DFKRET(,@BR),@P1IAR    RETURN TO INTERRUPTED PROGRAM
      8542 *
      2653 8543 DFKENT EQU    *              ENTRY TO PROCESS INTERRUPT DATA
2653 D0 FF 96      8544      BC     DFKDLP(,@BR),X'FF'      UPDATE LINE POSITION
2656 78 80 1D      8545      TBN    DFKNSK(,@BR),@PRITY    TEST FOR PARITY ERROR
2659 E0 10 BB      8546      BT     DFKROR(,@XR)          JUMP IF PARITY ERROR
265C BC 87 BC      8547      MVI    DFK520+@Q(,@XR),@UCB    SET PARITY INDR OFF
265F 78 10 1D      8548      TBN    DFKNSK(,@BR),@KFUNK    FUNCTION KEY ?
2662 E0 10 00      8549      BT     DFK350(,@XR)          JUMP IF YES
2665 78 40 1D      8550      TBN    DFKNSK(,@BR),DFKDTK    DATA KEY ?
2668 D0 90 4A      8551      BF     DFKXIT(,@BR)          NO -- GO EXIT
266B D0 87 DD      8552      B      DFKTST(,@BR)          GO CHK CMND KEY ONLY, RI MRGN
266E BC 80 51      8553      MVI    DFK380+@Q-DFKBS3(,@XR),@NOP SET BACKSPACE INEX OFF
2671 5C 00 7C 1C    8554 DFK200 MVC    DFK220+@OPD2(1,@BR),DFKATA(,@BR) SET DATA TBL DISP
2675 75 02 17      8555      L      DFKBLE(,@BR),@XR        *** LOAD XR WITH TABLE ADDR
2678 2C 00 0000 00 8556 DFK220 MVC    *-*(1),*-(,@XR)      MOVE DATA CHAR TO LINE BUFFER
267D D0 87 83      8557      B      DFKRT1(,@BR)          PRINT AND UPDATE POSITION
2680 D0 87 4A      8558      B      DFKXIT(,@BR)          GO EXIT
      8559 *****
```

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 31/05/21 PAGE 112

```
8561 *****
8562 * THIS ROUTINE UPDATES ALL LINE BUFFER ADDRESSES IN DFKEYN BY THE *
8563 * VALUE PLACED IN 'DFKNPS'. IT CHECKS FOR MARGIN REQUIREMENTS. IF *
8564 * THE RIGHT MARGIN IS HIT, A CARRIAGE RETURN AND EOS ARE GENERATED. *
8565 * IF LEFT MARGIN IS HIT, NOTHING IS UPDATED. TWO ENTRY POINTS ARE *
8566 * PROVIDED: B DFKRT1(,@BR) PRINTS 1 CHAR AND UPDATES POSITION *
8567 * B DFKDLP(,@BR) UPDATER POSITION AND TEST RT MARGIN *
8568 *****
2683 8569 DFKRT1 EQU *
2683 7C 01 1F 8570 MVI DFKNPS(,@BR),DFK001 SET CHARACTER COUNT TO 1
2686 74 08 AB 8571 ST DFK260+@OP1(,@BR),@ARR SAVE RETURN ADDRESS
2689 5C 00 24 1F 8572 MVC DFKCNT(1,@BR),DFKNPS(,@BR) SET PRINT COUNT
268D D2 02 23 8573 LA DFKPPL(,@BR),@XR XR = PPL ADDRESS
2690 D0 87 AC 8574 B DFKPRT(,@BR) GO PRINT CHARACTER ON SYS PRINT
2693 F2 87 03 8575 J DFK240 GO UPDATE POSITION
8576 *
2696 8577 DFKDLP EQU * ENTRY TO UPDATE POSITION
2696 74 08 AB 8578 ST DFK260+@OP1(,@BR),@ARR SAVE RETURN ADDRESS
2699 5E 01 26 1F 8579 DFK240 ALC DFKPPL+@PDATA(@CADDR,@BR),DFKNPS(,@BR) UPDATE DATA ADDR
269D 5C 01 7B 26 8580 MVC DFK220+@OP1(@CADDR,@BR),DFKSTN(,@BR) UPDATE POS ADDR
26A1 9C 01 81 26 8581 MVC DFK480-DFKBS3+@OP1(@CADDR,@XR),DFKSTN(,@BR)
26A5 7C 00 1F 8582 MVI DFKNPS(,@BR),@ZERO ZERO LINE POSITION INCREMENT
26A8 C0 87 0000 8583 DFK260 B *-* RETURN
8584 *****
```

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 113
					8586	*****				
					8587	*	THIS ROUTINE DETERMINES WHICH DEVICE(S) IS TO BE USED FOR OUTPUT.	*		
					8588	*	IT THEN CALL THE CORRECT IOCS. INPUT IS THE ADDRESS OF THE PPL	*		
					8589	*	STORED IN XR. UPON EXIT XR IS RESTORED TO PAGE 3 BASE ADDRESS.	*		
					8590	*****				
				26AC	8591	DFKPRT EQU *	ENTRY TO INTERFACE			
26AC	74	08	DC		8592	ST	DFK320+@OP1(,@BR),@ARR	SAVE RETURN ADDRESS		
26AF	74	02	BF		8593	ST	DFKP20(,@BR),@XR	SET PPL ADDRESS FOR DSPLYN		
26B2	1D	00	044A BC		8594	CLC	\$PRDEV-1(1),DFKP10-1(,@BR)	TEST FOR CRT USE		
26B7	F2	01	0E		8595	JNE	DFK280	SKIP CRT IF NOT IN USE		
26BA	C0	87	2004		8596	B	\$\$PLYN	GO TO CRT IOCS		
				26BD	8597	DFKP10 EQU *-1	ADDR OF DSPLYN ENTRY			
26BE	0000			26BF	8598	DFKP20 DC	AL2(*-*)	PPL ADDRESS		
26C0	1D	01	044B BD		8599	CLC	\$PRDEV(@CADDR),DFKP10(,@BR)	IS PRINTER USED TOO ?		
26C5	F2	81	0E		8600	JE	DFK300	SKIP PRINTER OP IF NOT		
26C8	3A	1E	03E4		8601	DFK280 SBN	\$LPRP3,@KENAB	FORCE MATRIX PRINT MODE	1-3	
26CC	C0	87	12B1		8602	B	I\$CALL	GO TO DFPRNT		
26D0	2800			26D1	8603	DC	AL2(V\$SPRT)	VADDR OF DFPRNT		
26D2	3B	1E	03E4		8604	SBF	\$LPRP3,@KENAB	RESET MATRIX PTR. FLAGS	1-3	
26D6	75	02	36		8605	DFK300 L	DFKXRS(,@BR),@XR	RESTORE PAGE 3 ADDRESS		
26D9	C0	87	0000		8606	DFK320 B	*-*	RETURN TO CALLING ROUTINE		
					8607	*****				

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 114
					8609	*****	*****			
				26DD	8610	DFKTST EQU *	ENTRY TO TEST RIGHT MARGIN			
	26DD	74	08	ED	8611	ST DFK340+@OP1(,@BR),@ARR	SAVE RETURN ADDRESS			
	26E0	5D	01	26 2A	8612	CLC DFKPPL+@PDATA(@CADDR,@BR),DFKRMG(,@BR)	AT RIGHT MARGIN ?			
	26E4	E0	02	72	8613	BNL DFK440(,@XR)	DO CARRIER RETURN IF YES			
	26E7	F3	10	1C	8614	SIO DFKULK,@KEYBD	UNLOCK KEYBOARD			
	26EA	C0	87	0000	8615	DFK340 B *-*	RETURN TO CALLING ROUTINE			
					8616	*****	*****			

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 115
				8618		*****				
				8619	*	PAGE 3				*
				8620	*					*
				8621	*	THIS ROUTINE CHOOSES THE DESIRED ROUTINE PER REQUEST.				*
				8622		*****				
2700				8623	ORG	DFKBS2+256	PLACE PAGE 3			
				2700 8624	DFKBS3 EQU	*	BASE ADDRESS FOR PAGE 3			
				2700 8625	DFK350 EQU	*	ENTRY FOR FNCT KEY PROCESSING			
2700	7D	11	1C	8626	CLI	DFKNSK-1(,@BR),DFKRKY	INQUIRY REQUEST ?			
2703	D0	81	3D	8627	BE	DFK180(,@BR)	GO EXIT			
2706	7D	16	1C	8628	CLI	DFKNSK-1(,@BR),DFKBSP	BACKSPACE KEY ?			
2709	F2	81	41	8629	JE	DFKSPB	JUMP YES			
270C	7D	13	1C	8630	CLI	DFKNSK-1(,@BR),DFKRTN	RETURN KEY ?			
270F	F2	81	66	8631	JE	DFK460	JUMP YES			
2712	7D	03	1C	8632	CLI	DFKNSK-1(,@BR),DFKERS	ERASE KEY ?			
2715	F2	81	71	8633	JE	DFKERA	JUMP YES			
2718	D0	87	DD	8634	B	DFKTST(,@BR)	CHECK FOR RIGHT MARGIN			
271B	7D	40	1C	8635	CLI	DFKNSK-1(,@BR),DFKSPC	SPACE BAR ?			
271E	F2	81	7C	8636	JE	DFKSPA	JUMP YES			
2721	7D	02	1C	8637	CLI	DFKNSK-1(,@BR),DFKEMS	ENTER MINUS KEY ?			
2724	F2	81	8B	8638	JE	DFK500	DO FORMS INDEV IF YES			
2727	7D	05	1C	8639	CLI	DFKNSK-1(,@BR),DFKTAB	TAB KEY ?			
272A	D0	01	4A	8640	BNE	DFKXIT(,@BR)	EXIT IF NO			
				8641	*	CONTINUE				

DFKEYN - VIRTUAL MEMORY KEYBOARD ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 31/05/21 PAGE 116
				8643		*****		
				8644	*		ENTRY FOR TAB OPERATIONS	
272D	BC	80	51	8645		MVI DFK380+@Q(,@XR),@NOP	SET BACK SPACE INDR OFF	
2730	D0	87	83	8646		B DFKRT1(,@BR)	GO PRINT ONE CHARACTER	
				8647	*		CONTINUE TO TEST TYPO.	
				8648		*****		
				2733 8649	DFKATC EQU *		ENTRY TO TEST TYPAMATIC	
2733	79	02	1D	8650		TBF DFKNSK(,@BR),@TYPAM	TYPAMATIC MODE ?	
2736	D0	10	4A	8651		BT DFKXIT(,@BR)	EXIT IF NO	
2739	F3	10	18	8652		SIO DFKLOK,@KEYBD	RESET BAIL FOR TYPO	
273C	5C	01	2C 2E	8653		MVC DFKIME(2,@BR),DFKMCT(,@BR)	INITIALIZE TIMING LOOP	
2740	5F	01	2C 21	8654	DFK360	SLC DFKIME(2,@BR),DFKC01(,@BR)	DECREMENT COUNTER	
2744	E0	84	40	8655		BH DFK360(,@XR)	LOOP FOR 100 MS	
2747	70	10	1D	8656		SNS DFKNSK(,@BR),@KEYBD	SENSE DATA	
274A	E0	87	00	8657		B DFK350(,@XR)	RETURN FOR CONTINUED TYPO	
				8658		*****		

DFKEYN - MATRIX PRINTER ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 117
					8660	*****	*****			
				274D	8661	DFKSPB EQU *	ENTRY TO HANDLE BACKSPACE			
274D	BC	10	70		8662	MVI DFKPL1+@PCTRL(,@XR),DFKACK	SET BACKSPACE CTRL			
2750	F2	80	06		8663	DFK380 JC DFK400,@NOP	JUMP IF NOT FIRST BACKSPACE			
2753	BC	11	70		8664	MVI DFKPL1+@PCTRL(,@XR),DFKKIX	SET BACKSPACE ANC INDE			
2756	BC	87	51		8665	MVI DFK380+@Q(,@XR),@UCB	SET INDEX INDR OFF			
2759	5D	01	26	28	8666	DFK400 CLC DFKSTN(@CADDR,@BR),DFKLMG(,@BR)	TEST LEFT MARGIN			
275D	F2	81	0D		8667	JE DFK420	JUMP TO NOT BACKSPACE			
2760	E2	02	70		8668	LA DFKPL1(,@XR),@XR	XR = PPL ADDRESS			
2763	D0	87	AC		8669	B DFKPRT(,@BR)	GO DO BACKSPACE			
2766	5F	01	26	21	8670	SLC DFKSTN(@CADDR,@BR),DFKC01(,@BR)	SET NEW POSITION			
276A	D0	87	96		8671	B DFKDLP(,@BR)	GO UPDATE LINE POSITION			
276D	E0	87	33		8672	DFK420 B DFKATC(,@XR)	GO TEST TYPAMATIC			
					8673	*****	*****			
				2770	8674	DFKPL1 EQU *	1ST BYTE OF BACKSPACE PPL			
2770				2770	8675	DS CL1	CONTROL BYTE			
2771	00			2771	8676	DC XL1'00'	COUNT BYTE			
					8677	*****	*****			

DFKEYN - MATRIX PRINTER ROUTINE

```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT      VER 15, MOD 00  31/05/21  PAGE 118

      2772 78 02 1D      8679 *****
      2775 E0 10 33      8680 DFK440 TBN   DFKNSK(,@BR),@TYPAM      TYPO BIT ON
      2778 E2 02 A3      8681          BT    DFKATC(,@XR)          YES, GO SENSE AGAIN
      277B D0 87 AC      8682 DFK460 LA    DFKPL2(,@XR),@XR        XR = PPL ADDRESS
      277E 3C 1E 0000     8683          B     DFKPRT(,@BR)          RETURN CARRIAGE
      2782 5C 01 26 28     8684 DFK480 MVI   *-*,@EOS              MOVE EOS TO CURRENT LOCATION
      2786 D0 87 3D      8685          MVC   DFKSTN-DFKBS2(@CADDR,@BR),DFKLMG(,@BR)  SET NEW POSITION
      2786 D0 87 3D      8686          B     DFK180(,@BR)          GO EXIT LEVEL - LOCK KEYBOARD
      2786 D0 87 3D      8687 *****

      2789 B4 02 A8      2789 8688 DFKERA EQU   *                  ENTRY FOR ERASE DEY
      278C AE 01 A8 B1    8689          ST    DFKPL3+@PDATA(,@XR),@XR  SET PAGE ADDR IN PPL
      2790 E2 02 A5      8690          ALC   DFKPL3+@PDATA(@CADDR,@XR),DFKMSD(,@XR)  CALC DATA ADDR
      2793 D0 87 AC      8691          LA    DFKPL3(,@XR),@XR        XR = PPL ADDRESS
      2796 5C 01 26 28     8692          B     DFKPRT(,@BR)          PRINT ERASED MESSAGE & RETURN
      279A D0 87 4A      8693          MVC   DFKSTN-DFKBS2(@CADDR,@BR),DFKLMG(,@BR)  SET NEW POSITION
      279A D0 87 4A      8694          B     DFKXIT(,@BR)          GO EXIT LEVEL
      279A D0 87 4A      8695 *****

      279D 7C 39 1C      279D 8696 DFKSPA EQU   *                  ENTRY FOR SPACE BAR KEY
      27A0 D0 87 71      8697          MVI   DFKATA-DFKBS2(,@BR),DFKLNK  MOVE IN DISP OF BLANK
      27A0 D0 87 71      8698          B     DFK200(,@BR)          BRANCH TO HANDLE DATA KEYS
      27A0 D0 87 71      8699 *****

      27A3 8080      27A3 8700 DFKPL2 EQU   *                  ADDR OF RETURN PPL
      27A4 8701      27A4 8701          DC    XL2'8080'            RETURN CARRIAGE PPL
      27A5 8702 DFKPL3 EQU   *                  FIRST BYTE 'ERASE' PPL
      27A5 C0      27A5 8703          DC    XL1'C0'              PRINT & RETURN CTRL
      27A6 07      27A6 8704          DC    AL1(DFKSG1)            COUNT BYTE
      27A7 0000      27A8 8705          DC    AL2(*-*)            ADDR OF MESSAGE 'ERASE'
      27A9 40C5D9C1E2C5C4 27A9 8706 DFKSG1 EQU   *                  START OF MESSAGE
      27AF 8707      27AF 8707          DC    CL7' ERASED'        MESSAGE
      0007 8708 DFKSGL EQU   *-DFKSG1            LENGTH OF MESSAGE
      27B0 00A9      27B1 8709 DFKMSD DC    AL2(DFKSG1-DFKBS3)      DISP TO ERASE MESSAGE
      27B2 D2 02 21      8710 *****
      27B5 D0 87 AC      8711 DFK500 LA    DFKC01(,@BR),@XR        POINT XR TO INDEX PPL
      27B8 D0 87 4A      8712          B     DFKPRT(,@BR)          INDEX A LINE
      27B8 D0 87 4A      8713          B     DFKXIT(,@BR)          GO EXIT
      27B8 D0 87 4A      8714 *****
```

DFKEYN - ERP SECTION

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 119
					8716		*****			
				27BB	8717	DFKROR EQU	*			ENTRY TO ERP
27BB	F2	87	07		8718	DFK520 JC	DFK540,@UCB			JUMP IF 1ST ERROR
27BE	3A	20	03D2		8719	SBN	\$IOIND,\$HRDER			SET HARD ERROR INDR
27C2	E0	87	7E		8720	B	DFK480(,@XR)			GO EXIT - HARD ERROR
					8721	*				
27C5	1C	07	0435 21		8722	DFK540 MVC	\$HIST1(#HISLN),DFKIST(,@BR)			SET UP HISTORY ENTRY
27CA	BC	80	BC		8723	MVI	DFK520+@Q(,@XR),@NOP			SET PARITY INDR
27CD	F0	00	00		8724	HPL	*-*,*-*			WAIT ON FIRST ERROR
27CE					8725	ORG	*-2			PLACE ERROR CODE
27CE	2040			27CF	8726	DC	AL2(@HKBER)			WAIT CODE
27D0	3A	04	03D5		8727	SBN	\$INDR2,\$ERPND			SET ERROR PENDING INDR
27D4	D0	87	4A		8728	B	DFKXIT(,@BR)			GO RETRY CHARACTER
					8729		*****			

DFPRNT - MATRIX PRINTER ROUTINE

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 31/05/21 PAGE 120

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8731 *****
8732 * THIS IOCR IS USED FOR ALL MATRIX PRINTER FUNCTIONS. *
8733 * IT IS ALSO USED BY DLFPRT 'LINE PRINTER ROUTINE' FOR IOCR OPERATION *
8734 * AVAILABLE FUNCTIONS INCLUDE... *
8735 * PRINT ONLY *
8736 * PRINT AND RETURN CARRIAGE *
8737 * RETURN CARRIAGE ONLY *
8738 * BACKSPACE *
8739 * INDEX AND BACKSPACE *
8740 * CHANGES TO DFPRNT MAY DIRECTLY AFFECT IT'S INTERFACE WITH DLFPRT *
8741 *****
2800 8742 ORG *,256,0
2800 8743 USING DFPASE,@BR SET BASE REG
2800 8744 DFP100 EQU * ENTRY TO PRINTER IOCR
2800 1C 01 144A FD 8745 MVC I$VADR,DFPPCH(@CADDR,@BR) VM PATCH PAGE ENTRY ADDR 1-5
2805 C0 87 1358 8746 DFP100 B I$CVAD LOAD PATCH PAGE 1-5
2809 4C 01 11 144C 8747 MVC DFP101+@OP1(@CADDR,@BR),I$CADR MOVE CADDR TO BRANCH 1-5
280E C0 87 0000 8748 DFP101 B *-* BRANCH TO PATCH PAGE 1-5
8749 * 1-5
2812 1C 01 144A FD 8750 DFP102 MVC I$VADR,DFPPCH(@CADDR,@BR) VM PATCH PAGE ENTRY ADDR 1-5
2817 3C 39 144A 8751 MVI I$VADR,DFPX39 ADD DISP X'39' 1-5
281B D0 87 05 8752 B DFP100(,@BR) BRANCH TO LOAD PAGE 1-5
281E 4D00 281F 8753 DFP105 DC AL(@VADDR)(V$LPRT) LINE PRINTER PAGE
2820 E0 87 00 8754 B 0(,@XR) BRANCH TO LINE PRINTER ROUTINE
2823 F1 E2 00 2823 8755 DFP115 EQU * MATRIX PRINTER ROUTINE
2826 78 40 F5 8756 APL @PBUSY WAIT FOR PRINTER NOT BUSY 1-4
2829 F2 10 11 8757 TBN DFPIST+@PCTRL(,@BR),@PRINT DOE THIS OP PRINT
282C 7C 00 F6 8758 JT DFP120 JUMP IF YES
282F 78 10 DE 8759 MVI DFPIST+@PRCNT(,@BR),@ZERO SET PPL CNTR BYTE TO ZERO
2832 F2 90 3D 8760 TBN DFPPCF+@PCTRL(,@BR),@TBLEF TAB LEFT OPERATION ?
2835 1F 00 03C2 E7 8761 JF DFP180 GO DO OP IF NOT
283A F2 87 55 8762 SLC $PRPOS(1),DFP001(,@BR) SET NEW CURRENT POSITION
8763 J DFP240 GO DO OP
8764 *
8765 * PRINTING IS REQUIRED - SET UP PRINT PCF
8766 *
283D 71 E4 F8 8767 DFP120 LIO DFPIST+@PDATA(,@BR),@PDAR LOAD DATA LSR WITH DATA ADDR
2840 4E 00 F6 03C2 8768 ALC DFPIST+@PRCNT(1,@BR),$PRPOS ADD CURRENT POSITION
2845 4F 00 F6 03C0 8769 SLC DFPIST+@PRCNT(1,@BR),$RMGRN SUBTRACT RIGHT MARGIN VALUE
284A F2 84 06 8770 JH DFP140 JUMP IF RIGHT MARGIN HIT
284D 7C 00 F6 8771 MVI DFPIST+@PRCNT(,@BR),@ZERO SET COUNT BYTE TO ZERO
2850 F2 87 0F 8772 J DFP160 GO SET NEW PRINT POSITION
2853 5F 00 DF F6 8773 DFP140 SLC DFPPCF+@PRCNT(1,@BR),DFPIST+@PRCNT(,@BR) SET CNT TO HIT
8774 * * MARGIN
2857 7A 80 DE 8775 SBN DFPPCF+@PCTRL(,@BR),@RETRN SET CARRIAGE TO RETURN
285A 5C 00 E5 DF 8776 MVC DFPORK(1,@BR),DFPPCF+@PRCNT(,@BR) RIGHT JUSTIFY CNT
285E 5E 01 F8 E5 8777 ALC DFPIST+@PDATA(@CADDR,@BR),DFPORK(,@BR) ADD CNT TO DATA
8778 * * ADDRESS IN LIST
2862 1E 00 03C2 DF 8779 DFP160 ALC $PRPOS(1),DFPPCF+@PRCNT(,@BR) UPDATE HEAD POSITION
2867 5F 00 DF E7 8780 SLC DFPPCF+@PRCNT(1,@BR),DFP001(,@BR) SET PCF CNT = CNT-1...
8781 * * THIS IS HARDWARE REQUIREMENT
286B F2 02 04 8782 JNL DFP180 JUMP IF SOMETHING TO PRINT
286E 5C 01 DF E9 8783 MVC DFPPCF+@PRCNT(2,@BR),DFPETN(,@BR) SET CARRIER RTRN ONLY
2872 78 80 DE 8784 DFP180 TBN DFPPCF+@PCTRL(,@BR),@RETRN OP FOR CARRIAGE RETURN
2875 F2 90 1A 8785 JF DFP240 JUMP IF NO
2878 4C 00 E1 03C2 8786 DFP200 MVC DFPPCF+@RTCNT(1,@BR),$PRPOS SET CURRENT POS IN

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DFPRNT - MATRIX PRINTER ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 121
					8787	*	* CARRIAGE RETURN CNT			
287D	4F	00	E1 03C1		8788	SLC	DFPPCF+@RTCNT(1,@BR), \$LMRGN			SUBTRACT LEFT MARGIN VALUE
2882	F2	84	03		8789	JH	DFP220			JUMP IF NO
2885	7C	01	DE		8790	MVI	DFPPCF+@PCTRL(,@BR),@INDEX			SET OP TO INDEY ONLY
2888	0C	00	03C2 03C1		8791	DFP220 MVC	\$PRPOS(1), \$LMRGN			SET CURRENT POS TO LEFT MARGIN
288E	5F	00	E1 E7		8792	SLC	DFPPCF+@RTCNT(1,@BR), DFP001(,@BR)			SET HARDWARE COUNT
2892	74	01	DD		8793	DFP240 ST	DFPAPC(,@BR),@BR			SET PAGE ADDR IN PCF ADDR BYTE
2895	5E	01	DD EB		8794	ALC	DFPAPC(@CADDR,@BR), DFPCFD(,@BR)			ADD DISP TO GET TRUE ADDR
				2899	8795	DFP250 EQU	*			LINE PRINTER I/O ENTRY 1-4
2899	71	E6	DD		8796	LIO	DFPAPC(,@BR),@PCAR			LOAD CONTROL LSR WITH NORMAL PCF
289C	F3	E0	00		8797	DFP260 SIO	@PSIOR,@PSIOQ			START THE PRINT OPERATION
289F	E0	00	B3		8798	DFP270 BC	RETURN-DLFPRT(,@XR), *-*			RETURN TO LINE PRINTER RTN. 1-4
28A0					8799	ORG	DFP270+@Q			* INITIALIZE 1-4
28A0	80			28A0	8800	DC	AL1(@NOP)			* TO NOT BRANCH 1-4
28A2					8801	ORG	DFP270+@INST3			* TO LINE PRINTER RTN. 1-4
28A2	F2	80	07		8802	DFP280 JC	DFP320,@NOP			JUMP TO ERP IF ERP IN PROCESS
					8803	*				
					8804	*****				

DFPRNT - MATRIX PRINTER ROUTINE

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8806 *****
8807 * THIS ROUTINE WAITS FOR THE OPERATION TO COMPLETE AND CHECKS *
8808 * FOR ERRORS. FORMS CHECKS WILL CAUSE A SOFT HALT. UNIT CHECKS *
8809 * WILL CAUSE ENTRY TO THE ERP. *
8810 *****
28A5 8811 DFPRCK EQU * ENTRY TO CHECK FOR ERRORS
28A5 5C 01 ED EE 8812 MVC DFPRCT(DFPRCL,@BR),DFPERC(@BR) INITILIZE RETRY COUNTER
28A9 7C 87 A3 8813 MVI DFP280+@Q-DFPASE(@BR),@UCB SET ERP IN PROCESS INDR
28AC F1 E2 00 8814 DFP320 APL @PBUSY WAIT FOR NOT BUSY
28AF 7C 00 9E 8815 MVI DFP260+2(@BR),@ZERO SET MATRIX PRINT
28B2 D1 E1 CD 8816 DFP340 TIO DFP360(@BR),@PFORM TEST FOR END OF FORMS
28B5 71 E2 E3 8817 LIO DFPOFF(@BR),@PLITE TURN END OF FORMS LAMP OFF
28B8 D1 E0 00 8818 DFP335 TIO *-*(@BR),@PERR BRANCH TO ERP IF UNIT CHECK 1-4
28B8 8819 ORG DFP335 * INITIALIZE DFP335 1-4
28B8 E1 E0 CD 8820 TIO DLFRPE-DLFPRT(@XR),@PERR * TO BRANCH TO 1-4
28B8 8821 ORG DFP335 * DFPRNT ERP 1-4
28B8 D1 E0 D3 8822 TIO DFPRPE(@BR),@PERR * ENTRY TO LOAD ERP SECTION 1-4
28BA 8823 DFP333 EQU *-1 LAST BYTE OF TIO INST. 1-4
28BB E0 00 00 8824 DFP330 BC *-*(@XR),*-* BRANCH TO LINE PRINTER RTN. 1-4
28BC 8825 ORG DFP330+@Q * INITIALIZE 1-4
28BC 80 28BC 8826 DC AL1(@NOP) * TO NOT BRANCH 1-4
28BD 8827 ORG DFP330+@D1 * INITIALIZE FOR 1-4
28BD 25 28BD 8828 DC AL1(DLF100-DLFPRT) * RETURN TO DLFPRT ENTRY 1-4
28BE 8829 ORG DFP330+@INST3 * TO LINE PRINTER ROUTINE 1-4
28BE 1C 01 144A FD 8830 MVC I$VADR,DFPPCH(@VADDR,@BR) VM PATCH PAGE 1-5
28C3 3C 00 144A 8831 MVI I$VADR,@ZERO SET DISP = 0 1-5
28C7 D0 87 05 8832 B DFP100(@BR) BRANCH TO LOAD PAGE 1-5
28CA D0 87 12 8833 DFP300 B DFP102(@BR) BRANCH TO LOAD PATCH PAGE 1-5
8834 *
8835 *****
8836 *
28CD 71 E2 E7 8837 DFP360 LIO DFPITE(@BR),@PLITE TURN ON FORMS INDR LAMP
28D0 D0 87 B2 8838 B DFP340(@BR) GO TEST FORMS AGAIN
8839 *
28D3 8840 DFPRPE EQU * ENTRY TO LOAD ERP SECTUIN
28D3 C0 87 1330 8841 B I$LDXR LOAD ERP PAGE USING XR
28D7 2900 28D8 8842 DC AL2(V$SPRT+DFPNDX-DFPRNT) PRINTER ERROR IOCR VADDR
28D9 E0 87 00 8843 B 0(@XR) EXECUTE ERP
8844 *****

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ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 123
			8846		*****				
			8847		* CONSTANT AND EQUATE AREA FOR DPRINT				*
			8848		*****				
			2800	8849	DFPASE EQU	DFPRNT			BASE VALUE FOR CALL SECTION
			0002	8850	DFPRCL EQU	2			NUMBER OF RETRY COUNTERS
28DC			28DD	8851	DFPAPC DS	CL(@CADDR)			ADDRESS OF NRML PCF
			28DE	8852	DFPPCF EQU	*			LEFT BYTE OF PCF
28DE			28DF	8853		DS CL2			CTRL AND CNT BYTES
28E0	11		28E0	8854		DC XL1'11'			RETURN CARRIAGE INDEX CMND
28E1			28E2	8855		DS CL2			COUNT & INDEX
			28E2	8856	DFPPCO EQU	*-1			LAST BYTE OF CCF
28E3	00		28E3	8857	DFPOFF DC	XL1'00'			TURN OFF INDR LAMP CTRL
28E4	0000		28E5	8858	DFPORK DC	XL2'0000'			WORK AREA
28E6	0001		28E7	8859	DFP001 DC	XL2'0001'			CONSTANT OF ONE
28E8	8080		28E9	8860	DFPETN DC	2AL1(@RETRN)			CARRIER RETURN CTRL
28EA	00DE		28EB	8861	DFPCFD DC	AL2(DFPPCF-DFPASE)			DISPLACEMENT OF PCF IN PAGE
			8862	*					
28EC			28ED	8863	DFPRCT DS	CL(DFPRCL)			ERROR COUNT
28EE	03		28EE	8864	DFPERC DC	XL1'03'			RETRY COUNT
28EF	00F9		28F0	8865	DFPYCD DC	AL2(DFPSYC-DFPASE)			DISPLACEMENT OF SYNC PCF IN PAGE
28F1	00000000		28F4	8866	DFPDSV DC	XL4'00'			SAVE AREA FOR CNT AND DATA ADDR
			28F5	8867	DFPIST EQU	*			
28F5			28F8	8868		DS CL4			PRINT PARAMETER LIST (PPL)
28F5				8869		ORG DFPIST			RESET INSTR CNTR
28F5	00000000		28F8	8870		DC XL4'00'			SET INITIAL LIST TO ZERO
			28F9	8871	DFPSYC EQU	*			LEFT BYTE OF SYNC CHECK PCF
28F9	0520		28FA	8872		DC XL2'0520'			RETURN AND INDEX, TAB RIGHT
28FB			28FB	8873		DS CL1			
28FC	5309		28FD	8874	DFPPCH DC	AL2(V\$PCH2+DFP100-DFPASE+@DOP2)			PATCH PAGE 2 1-5
			0039	8875	DFPX39 EQU	X'39'			DISP = X'39' 1-5
			28E7	8876	DFPITE EQU	DFP001			FORMS INDR LIGHT CTRL
			0001	8877	DFPYCT EQU	1			DISPLACEMENT CYNK CK CNTR
			8878	*					
			8879	*	THE FOLLOWING EQUATES ARE FOR THE LINE PRINTER MODULE (DLFPRT)				
			8880	*					
			28F5	8881	DLFIST EQU	DFPIST			
			28E5	8882	DLFORK EQU	DFPORK			
			28F4	8883	DLFDSV EQU	DFPDSV			
			28E7	8884	DLF001 EQU	DFP001			
			28DE	8885	DLFPCF EQU	DFPPCF			

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      8887 *****
      8888 * THIS ROUTINE DETERMINES THE ERROR AND BRANCHES TO THE PROPER ERP *
      8889 *****
2900      8890      ORG      *,256,0
      2800 8891      USING DFPASE,@BR      SET BASE REGS
      2900 8892      USING DFPNDX,@XR
      2900 8893 DFPNDX EQU      *      ENTRY TO ERP SECTION
2900 38 01 03E4      8894      TBN      $LPRP3,@INDEX      TEST DUMMY PRINT POS. USED      1-3
2904 F2 90 0A      8895      JF      DFP378      JUMP NO
2907 0C 00 03C2 03E5      8896      MVC      $PRPOS(1),$LPROS      RESTORE CORRECT POSITION
290D 3B 01 03E4      8897      SBF      $LPRP3,@INDEX      RESET DUMMY POS. FLAG      1-3
      2911 8898 DFP378 EQU      *      ENTRY SENSE ERROR
2911 B0 E2 D9      8899      SNS      DFPRSN(,@XR),@PSNSQ      SENSE ERROR BYTES
2914 38 04 03D5      8900      TBN      $INDR2,$ERPND      HAS LOG ENTRY BEEN SET UP
2918 F2 10 0C      8901      JT      DFP380      JUMP IF YES
291B 2C 07 0435 DD      8902      MVC      $HIST1(#HISLN),DFPOGE(,@XR)      MOVE LOG TO NUCLEUS
2920 3A 04 03D5      8903      SBN      $INDR2,$ERPND      SET ENTRY PENDING INDR
2924 F0 00 00      8904      HPL      *-*,*-*      SOFT HALT ON INITIAL ERROR
2925      8905      ORG      *-2      PLACE HALT CODE
2925 0070      2926 8906      DC      AL2(@HPRER)      DISPLAY CODE '123'
2927 1E 00 0434 E7      8907 DFP380 ALC      $HISTE+@HSTPE(1),DFP001(,@BR)      ADD ONE TO RETRY COUNTER
292C B8 20 D9      8908      TBN      DFPRSN(,@XR),@PMGCK      MARGIN CHECK
292F F2 10 07      8909      JT      DFPMCK      JUMP IF YES
      2932 8910 DFPSCK EQU      *      ENTRY FOR SYNC C?.
      8911 *
      8912 * LINE PRINTER MODE ONLY
2932 38 40 03E4      8913      TBN      $LPRP3,@PRINT      LINE PRINTER ERROR      1-3
2936 F2 90 0F      8914      JF      DFPSC2      JUMP IF NOT PRINT OP
      2939 8915 DFPMCK EQU      *      ENTRY FOR MARGIN CHECK
2939 5F 00 ED E7      8916      SLC      DFPRCT-DFPGCT(1,@BR),DFP001(,@BR)      DECREMENT RETRY CNT
293D F2 81 72      8917      JZ      DFP400      JUMP IF NO MORE RETRIES
2940 4C 00 FB 03C1      8918      MVC      DFPSYC+@SYCNT(1,@BR),$LMRGN      SET CNT TO HARD LEFT MARGIN
2945 F2 87 0B      8919      J      DFP420      GO DO FIRST PART OF SYNC CHK
      2948 8920 DFPSC2 EQU      *
2948 5F 00 EC E7      8921      SLC      DFPRCT-DFPYCT(1,@BR),DFP001(,@BR)      DECREMENT CYNC CNT
294C F2 81 63      8922      JZ      DFP400      JUMP IF NO MORE TRYs
294F 5C 02 F8 F4      8923      MVC      DFPIST+@PDATA(@CADDR+1,@BR),DFPDSV(,@BR)      RESTORE ORIGINAL
      8924 *      * COUNT AND DATA ADDR
2953 B4 01 D5      8925 DFP420 ST      DFPASY(,@XR),@BR      SET PAGE ADDR IN PCF ADDR
2956 9E 01 D5 F0      8926      ALC      DFPASY(@CADDR,@XR),DFPYCD(,@BR)      CALC PCF ADDR
295A B1 E6 D5      8927      LIO      DFPASY(,@XR),@PCAR      LOAD CONTROL LSR WITH SYNC SCF
295D 7A 80 F9      8928      SBN      DFPSYC+@PCTRL(,@BR),@RETRN      SET CHAIN BIT ON
2960 1C 00 03C2 FB      8929      MVC      $PRPOS(1),DFPSYC+@SYCNT(,@BR)      SET UP NEW HEAD POSITION
2965 5F 00 FB E7      8930      SLC      DFPSYC+@SYCNT(1,@BR),DFP001(,@BR)      SUBTRACT 1
2969 F2 02 03      8931      JNL      DFP440      JUMP IF NOT NEG
296C 7B 80 F9      8932      SBF      DFPSYC+@PCTRL(,@BR),@RETRN      SET CHAIN BIT OFF
296F 38 40 03E4      8933 DFP440 TBN      $LPRP3,@PRINT      CHECK IF ENTRY FROM LINE PTR 1-3
2973 F2 90 39      8934      JF      DLF450      JUMP NOT
2976 3A 01 03E4      8935      SBN      $LPRP3,@INDEX      SET DUMMY PRINT POS. FLAG      1-3
297A 0C 00 03E5 03C2      8936      MVC      $LPROS(1),$PRPOS      SET LINE PRINTER PRINT POSITION
2980 6C 00 BD D3      8937      MVC      DFP330+@D1(1,@BR),DFPEXT(,@XR)      SET DLRPRT ERROR ENTRY 1-4
2984 2C 01 144A D2      8938      MVC      I$VADR,DFPLBU(2,@XR)      GET LINE PRINTER BUFFER ADDR 1-4
2989 C0 87 1354      8939      B      I$LOCK      GET LINE PRINTER BUFFER      1-4
298D 4C 01 E5 144C      8940      MVC      DLFORK(2,@BR),I$CADR      SAVE BUFFER CADDR ADDR      1-4
2992 C0 87 1330      8941      B      I$LDXR
2996 4D00      2997 8942      DC      AL(@VADDR)(V$LPRT)      LINE PRINTER PAGE

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2998	B9 04 D9		8943	TBF	DFPRSN(, @XR), DFPVCK	TEST VERTICLE CYCLE CHECK	1-4
299B	F2 90 11		8944	JF	DLF450	IF VERTICAL CYCLE CHK	1-4
299E	9C 01 DE E5		8945	MVC	BUFRWK-DLFPRT(2, @XR), DLFORK(, @BR)	GET BUFFER ADDR	1-4
29A2	8C 01 DF 03EA		8946	MVC	DLFBPT-DLFPRT(2, @XR), \$LPRI	RESTORE BUF PTR & PDAR	1-4
29A7	2C 00 03E3 DF		8947	MVC	\$BUFPT(1), DLFBPT-DLFPRT(, @XR)	RESTORE BUFFER POINTER	1-4
29AC	BC 80 89		8948	MVI	DLF350-DLFPRT+@Q(, @XR), @NOP	FORCE ERROR CHECK	
		29AF	8949	EQU	*		
29AF	D0 87 9C		8950	B	DFP260(, @BR)	GO TO MATRIX PRINTER	
			8952		*****		
			8953		* MATRIX PRINTER HARD FAILURE ROUTINE		*
			8954		*****		
29B2	3A 21 03D2		8955	DFP400 SBN	\$IOIND, \$MPDOWN+\$HRDER	SET MAT4IX PRINTER DOWN INDR	
29B6	3C 00 0434		8956	MVI	\$HISTE+@HSTPE, @ZERO	SET HARD ERROR INDR	
29BA	38 40 03E4		8957	TBN	\$LPRP3, @PRINT	ENTRY FROM LINE PTR.	1-3
29BE	F2 90 0D		8958	JF	DFP480	JUMP IF NOT	
29C1	C0 87 1330		8959	B	I\$LDXR	LOAD PAGE	
29C5	4D00	29C6	8960	DC	AL2(V\$LPRT)	LINE PRINTER PAGE	
29C7	3C 00 03E3		8961	MVI	\$BUFPT, @ZERO	RESET LINE PTR. BUFFER PTR.	1-3
29CB	E0 87 B3		8962	B	RETURN-DLFPRT(, @XR)	GO TO LINE PRINTER PAGE	
		29CE	8963	DFP480 EQU	*		
29CE	D0 87 CA		8964	B	DFP300(, @BR)	RETURN TO MATRIX PRINTER	
			8965		*****		
29D1	4F00	29D2	8966	DFPLBU DC	AL2(V\$LPRB)	LINE PRINTER BUFFER VADDR	1-4
29D3	88	29D3	8967	DFPEXT DC	AL1(DLF350-DLFPRT)	DISPLACEMENT TO DLFPRT ERROR	1-4
29D4		29D5	8968	DFPASY DS	CL(@CADDR)	ADDR OF ERP PCF	
29D6	E0	29D6	8969	DC	AL1(@PSIOQ)	HISTORY LOG SIO Q BYTE	
29D7	00	29D7	8970	DFPIOR DC	AL1(@PSIOR)	HISTORY LOG SIO R BYTE	
29D8		29D9	8971	DFPRSN DS	CL2	ERROR SENSE BYTES	
29DA	00000001	29DD	8972	DFPERR DC	XL4'00000001'	ERROR INFO	
		29DD	8973	DFPOGE EQU	*-1	LAST BYTE OF HISTORY LOG	
		0000	8974	DFPGCT EQU	0	DISPLACEMENT MARGIN CK CNT	
		0004	8975	DFPVCK EQU	X'04'	PRINTER VERTICAL CYCLE CK.	1-4
			8976		*****		
			8977		* TEMP !!!		
33FF			8978	ORG	X'33FF'	T E M P ! ! !	
			8979		* ABOVE END ON IMG_0107 BELOW STARTS AT IMG_0201		
			8980		* TEMP !!!		

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		8982		*****			
		8983	*	5703-XM1 COPYRIGHT IBM CORP. 1970			*
		8984	*	REFER TO INSTRUCTIONS ON COPY RIGHT NOTICE, 120-2083			*
		8985	*				*
		8986		*****			*
		8987	*	*STATUS			*
		8988	*	VERSION 1 MODIFICATION 0			*
		8989	*				*
		8990	*	*FUNCTION -			*
		8991	*	* FZSPRIT EXECUTION CAUSES DATA OUTPUT AND/OR CARRIER/CURSOR			*
		8992	*	POSITIONING ON THE SYSTEM PRINT DEVICE UNDER CONTROL OF CODES			*
		8993	*	DEVELOPED FROM THE FORMAT SPECIFIED IN A BASIC PROGRAM 'PRINT'			*
		8994	*	STATEMENT.			*
		8995	*	* THE FOLLOWING ACTIONS ARE PERFORMED, DEPENDING ON THE CODE			*
		8996	*	STORED IN INTERPRETER PARAMETER I\$PARM -			*
		8997	*	* CODE X'01' - PRINT AND NO SPACE.			*
		8998	*	THE DATA ELEMENT AT THE TOP OF THE RUN?TIME STACK IS CON-			*
		8999	*	VERTED TO OUTPUT FORMAT AND PRINTED. IF THE ELEMENT IS			*
		9000	*	ARITHMETIC, THE CARRIER/CURSOR IS RETURNED TO THE START OF			*
		9001	*	THE NEXT LINE (BEFORE PRINTING) WHEN THE CURRENT LINE CAN-			*
		9002	*	NOT CONTAIN THE FORMATTED VALUE. THE CARRIER/CURSOR IS			*
		9003	*	LEFT POSITIONED AT THE END OF THE PRINTED VALUE.			*
		9004	*	* CODE X'02' - PRINT AND SPACE FULL ZONE.			*
		9005	*	THE DATA ELEMENT AT THE TOP OF THE RUN-TIME STACK IS CON-			*
		9006	*	VERTED TO OUTPUT FORMAT AND PRINTED. IF THE ELEMENT IS			*
		9007	*	ARITHMETIC, THE CARRIER/CURSOR IS RETURNED TO THE START OF			*
		9008	*	THE NEXT LINE (BEFORE PRINTING) WHEN THE CURRENT LINE CAN-			*
		9009	*	NOT CONTAIN THE FORMATTED VALUE. IF THE ELEMENT IS A			*
		9010	*	CHARACTER REFERENCE, THE CARRIER/CURSOR IS RETURNED TO THE			*
		9011	*	START OF THE NEXT LINE (BEFORE PRINTING) WHEN THE CURRENT			*
		9012	*	LINE DOES NOT CONTAIN A FULL PRINT ZONE (18 SPACES). AT			*
		9013	*	THE END OF PRINTING, THE CARRIER/CURSOR IS SPACED TO THE			*
		9014	*	END OF THE FULL PRINT ZONE.			*
		9015	*	* CODE X'03' - PRINT AND SPACE PACKED ZONE.			*
		9016	*	THE DATA ELEMENT AT THE TOP OF THE RUN-TIME STACK IS CON-			*
		9017	*	VERTED TO OUTPUT FORMAT AND PRINTED. IF THE ELEMENT IS			*
		9018	*	ARITHMETIC, THE CARRIER/CURSOR IS RETURNED TO THE START OF			*
		9019	*	THE NEXT LINE (BEFORE PRINTING) WHEN THE CURRENT LINE CAN			*
		9020	*	NOT CONTAIN THE FORMATTED VALUE. AFTER AN ARITHMETIC ELE-			*
		9021	*	MENT IS PRINTED, THE CARRIER/CURSOR IS SPACED TO THE END			*
		9022	*	OF THE PACKED PRINT ZONE DEFINED IN FUNCTIONAL SPECIF1-			*
		9023	*	CATIONS. AFTER A CHARACTER ELEMENT IS PRINTED, THE			*
		9024	*	CARRIER/CURSOR IS LEFT POSITIONED AT THE END OF THE			*
		9025	*	PRINTED ELEMENT.			*
		9026	*	* CODE X'04' - PRINT AND RETURN CARRIER/CURSOR.			*
		9027	*	THE DATA ELEMENT AT THE TOP OF THE RUN-TIME STACK IS CON-			*
		9028	*	VERTED TO OUTPUT FORMAT AND PRINTED. IF THE ELEMENT IS			*
		9029	*	ARITHMETIC, THE CARRIER/CURSOR IS RETURNED TO THE START OF			*
		9030	*	THE NEXT LINE (BEFORE PRINTING) WHEN THE CURRENT LINE CAN-			*
		9031	*	NOT CONTAIN THE FORMATTED VALUE. AFTER THE ELEMENT IS			*
		9032	*	PRINTED, THE CARRIER/CURSOR IS RETURNED TO THE START OF			*
		9033	*	THE NEXT LINE.			*
		9034	*	* CODE X'05' - SPACE FULL ZONE.			*
		9035	*	THE CARRIER/CURSOR IS SPACED 18 CHARACTERS. IF NO MORE			*
		9036	*	THAN 18 CHARACTERS REMAIN IN THE CURRENT LINE, THE			*
		9037	*	CARRIER/CURSOR IS RETURNED TO THE START OF THE NEXT LINE.			*

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		9038	*	* CODE X'06' - SPACE PACKED ZONE.	*
		9039	*	THE CARRIER/CURSOR IS SPACED 3 CHARACTERS, IF NO MORE	*
		9040	*	THAN 3 CHARACTERS REMAIN IN THE CURRENT LINE, THE	*
		9041	*	CARRIER/CURSOR IS RETURNED TO THE START OF THE NEXT LINE.	*
		9042	*	* CODE X'07' - RETURN CARRIER/CURSOR,	*
		9043	*	THE CARRIER/CURSOR IS RETURNED. TO THE START OF THE NEXT	*
		9044	*	LINE.	*
		9045	*	* CODE X'08' - RETURN CARRIER/CURSOR ON CONDITION.	*
		9046	*	WHEN THE CURRENT LINE DOES NOT CONTAIN MORE THAN 18 CHAR-	*
		9047	*	ACTERS, THE CARRIER/CURSOR IS RETURNED TO THE START OF THE	*
		9048	*	NEXT LINE.	*
		9049	*	* WHEN REQUIRED, ELEMENT CONVERSION AND OUTPUT ARE PERFORMED IN	*
		9050	*	THE RUN-TIME STACK, SO TWAT THE STACKED ELEMENT IS NOT RECOVER-	*
		9051	*	ABLE. AFTER PRINTING, ARITHMETIC ELEMENT OUTPUT FORMAT DEPENDS	*
		9052	*	ON THE MAGNITUDE AND FRACTIONAL CHARACTERISTICS OF THE VALUE.	*
		9053	*	CHARACTER REFERENCE FORMATTING INVOLVES TRUNCATION OF TRAILING	*
		9054	*	BLANKS. CHARACTER CONSTANTS (LITERALS) ARE PRINTED AS SPECI-	*
		9055	*	FIED IN THE 'PRINT' STATEMENT.	*
		9056	*	* EITHER THE MATRIX PRINTER OR THE CRT (OR BOTH) MAY BE USED FOR	*
		9057	*	OUTPUT, DEPENDING ON THE CURRENT DEFINITION OF THE SYSTEM PRINT	*
		9058	*	DEVICE. CRT OUTPUT IS BASED ON A FIXED DISPLAY WIDTH OF 64	*
		9059	*	CHARACTERS, WHILE PRINTER LINE WIDTH IS BASED ON THAT ASSIGNED	*
		9060	*	THROUGH THE 'WIDTH' SYSTEM COMMAND.	*
		9061	*		*
		9062	*	*ENTRY POINTS	*
		9063	*	THIS ROUTINE HAS A SINGLE ENTRY POINT - FZSPRT - WHOSE FUNCTION	*
		9064	*	IS DEFINED ABOVE. CALLING SEQUENCE IS -	*
		9065	*	B I\$CALL	*
		9066	*	DC AL2(V\$XSPR)	*
		9067	*	WHERE THE ADDRESS CONSTANT PARAMETER DEFINES THE VIRTUAL ADDRESS	*
		9068	*	OF ENTRY POINT FZSPRT. EXECUTION IS SUBJECT TO INPUT CONDITIONS	*
		9069	*	DESCRIBED BELOW.	*
		9070	*		*
		9071	*	*INPUT	*
		9072	*	* #ISPARM - 2 BYTES, FOR THE PRINT CONTROL PARAMETER. THIS CON-	*
		9073	*	TAINS A CONTROL CODE, AS INDICATED UNDER 'FUNCTION', IN THE	*
		9074	*	RIGHTMOST BYTE.	*
		9075	*	* I\$STAK - 2 BYTES, FOR THE RUN-TIME STACK POINTER. FOR THOSE	*
		9076	*	CONTROL CODES SPECIFYING A DATA ELEMENT (SEE 'FUNCTION') THIS	*
		9077	*	CONTAINS, THE CORE ADDR OF THE FIRST AVAILABLE STACK LOCATION.	*
		9078	*	* RUN-TIME STACK - THIS CONTAINS AN UNPACKED FLOATING POINT VALUE	*
		9079	*	OR CHARACTER ELEMENT IN THE TOP STACK POSITION FOR CONTROL	*
		9080	*	CODES SPECIFYING DATA OUTPUT (SEE 'FUNCTION').	*
		9081	*	* I\$SLLC - 1 BYTE, FOR THE LENGTH CODE DEFINING THE LAST STACKED	*
		9082	*	DATA ELEMENT. WHEN DATA OUTPUT IS SPECIFIED, THIS IS USED TO	*
		9083	*	DETERMINE THE TYPE OF DATA ITEM (ARITHMETIC OR CHARACTER) CON-	*
		9084	*	TAINED IN THE TOP STACK POSITION.	*
		9085	*	* \$PRPOS - 1 BYTE, FOR THE MATRIX PRINTER CARRIER POSITION	*
		9086	*	INDICATORS. THIS CONTAINS THE CARRIER POSITION, RELATIVE TO	*
		9087	*	THE HARDWARE LEFT MARGIN AS 0, OF THE MATRIX PRINTER CARRIER.	*
		9088	*	* \$RMRGN - 1 BYTE, FOR THE MATRIX PRINTER SOFTWARE RIGHT MARGIN	*
		9089	*	INDICATOR.	*
		9090	*	* \$CRPOS - 1 BYTE, FOR THE CRT CURSOR POSITION INDICATOR. THIS	*
		9091	*	CONTAINS THE CURSOR POSITION, RELATIVE TO THE LEFT CRT MARGIN	*
		9092	*	AS 0, OF THE CRT CURSOR.	*
		9093	*	* \$PRDEV - 2 BYTES, FOR THE SYSTEM PRINT DEVICE INDICATOR.	*

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9094 * * $EXFTR - 1 BYTE, FOR THE SYSTEM CORE EXTENSION FACTOR. *
9095 * * * * *
9096 *OUTPUT *
9097 * * PRINTED OUTPUT AND/OR CARRIER/CURSOR CONTROL - AS SPECIFIED BY *
9098 * THE CODE IN I$PARM, THE TYPE OF DATA ELEMENT IN THE STACK, AND *
9099 * THE CURRENTLY DEFINED SYSTEM PRINT DEVICE(S). *
9100 * * I$PARM - 2 BYTES, FOR THE PRINT CONTROL PARAMETER, THIS INPUT *
9101 * CONTROL CODE IS DESTROYED DURING EXECUTION. *
9102 * * RUN-TIME STACK - WHEN A DATA ELEMENT HAS BEEN PRINTED, THE *
9103 * STACKED ELEMENT HAS BEEN CONVERTED IN PLACE TO OUTPUT FORMAT. *
9104 * * $PRPOS - 1 BYTE, FOR THE MATRIX PRINTER CARRIER POSITION *
9105 * INDICATOR. THIS HAS BEEN MODIFIED TO INDICATE THE CURRENT *
9106 * CARRIER POSITION AFTER PRINTED OUTPUT WHEN THE MATRIX PRINTER *
9107 * IS A SYSTEM PRINT DEVICE. *
9108 * * $CRPOS - 1 BYTE, FOR THE CRT CURSOR POSITION INDICATOR. THIS *
9109 * HAS BEEN MODIFIED TO INDICATE CURRENT CURSOR POSITION AFTER *
9110 * DISPLAYED OUTPUT WHEN THE CRT IS A SYSTEM PRINT DEVICE. *
9111 * * * * *
9112 *EXTERNAL REFERENCES *
9113 * * VSSPRT - VIRTUAL ENTRY ADDRESS FOR DFPRNT, V.M. MATRIX PRT IOCS. *
9114 * * DSPLYN - ENTRY POINT FOR THE SYSTEM CRT IOCS (LABEL DSPLYN IS *
9115 * REFERENCED INDIRECTLY USING I$CSXA TO BUILD A CODE ADDRESS). *
9116 * * I$CALL - ENTRY POINT FOR PAGING MODULE V.M. PROGRAM CALL RTN. *
9117 * * I$RTRN - ENTRY POINT FOR PAGING MODULE V.M. RETURN CONTROL RTN. *
9118 * * I$CSXA - CORE ADDRESS OF 1ST BYTE IN CORE EXTENSION PAST 8K. *
9119 * * I$PARM - 2 BYTES, FOR THE INTERPRETER COMMUNICATIONS PARAMETER. *
9120 * * I$STAK - 2 BYTES, FOR THE RUN-TIME STACK POINTER. *
9121 * * I$SLLC - 1 BYTE, FOR LENGTH CODE (L-1) OF LAST STACKED ELEMENT. *
9122 * * I$WRK1 - 2 BYTES, FOR INTERPRETER COMMON WORK AREA 1. *
9123 * * I$WRK2 - 2 BYTES, FOR INTERPRETER COMMON WORK AREA 2. *
9124 * * $PRPOS - 1 BYTE, FOR MATRIX PRINTER CARRIER POSITION INDICATOR. *
9125 * * $RMGRN - 1 BYTE, FOR POSITION OF SOFTWARE RIGHT PRINTER MARGIN. *
9126 * * $CRPOS - 1 BYTE, FOR CRT CURSOR POSITION INDICATOR. *
9127 * * $PRDEV - 2 BYTES, FOR THE SYSTEM PRINT DEVICE INDICATOR. *
9128 * * $EXFTR - 1 BYTE, FOR THE SYSTEM CORE EXTENSION FACTOR. *
9129 * * * * *
9130 *EXITS, TONAL *
9131 * CONTROL IS ALWAYS PASSED TO THE PAGING ROUTINE AT ENTRY POINT *
9132 * I$RTRN (IPGRTN) FOR A RETURN TO THE CALLING PROGRAM. *
9133 * * * * *
9134 *EXITS, ERROR *
9135 * N/A *
9136 * * * * *
9137 *TABLES/WORKAREAS *
9138 * * FZSPRT BRANCH DISPLACEMENT TABLE - USED TO DIRECT OUTPUT OPERA- *
9139 * TIONS FOR SPECIFIC ELEMENT TYPE - CONTROL CODE COMBINATIONS. *
9140 * * NUMBER OF TABLE ENTRIES - 16 *
9141 * * TABLE ENTRY LENGTH - 1 BYTE *
9142 * * ENTRY FORMAT - SINGLE BYTE DISPLACEMENT WITHIN AN FZSPRT *
9143 * VIRTUAL PAGE FOR THE INTERNAL ENTRY POINT ASSOCIATED WITH *
9144 * EACH ELEMENT-CONTROL COMBINATION. *
9145 * * RUN-TIME STACK - THE FIRST 20 AVAILABLE STACK LOCATIONS *
9146 * (INCLUDING LOCATIONS CONTAINING AN ELEMENT TO BE CONVERTED) ARE *
9147 * USED AS THE 'PRINT' OUTPUT BUFFER. *
9148 * * * * *
9149 *ATTRIBLIES *

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ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 129
		9150	*	* REUSABLE			*
		9151	*	* NATURALLY RELOCATABLE			*
		9152	*				*
		9153	*	*CHARACTER CODE DEPENDENCY			*
		9154	*	OPERATION OR THIS MODULE DEPENDS UPON THE FOLLOWING PROPER-			*
		9155	*	TIES QF THE INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.			*
		9156	*	* MOST CODING HAS BEEN ARRANGED SO THAT REDEFINITION OF CHAR-			*
		9157	*	ACTER CONSTANTS, BY REASSEMBLY, WILL RESULT IN A CORRECT			*
		9158	*	MODULE FOR THE NEW DEFINITION.			*
		9159	*	* NUMERIC CHARACTERS 0 THROUGH 9 ARE PRESUMED TO BE CODED SUCH			*
		9160	*	THAT THE HIGH ORDER FOUR BITS CONTAIN A SIGN ZONE WITH X'F'			*
		9161	*	DEFINING A POSITIVE DIGIT.			*
		9162	*	THE SPECIFIC INSTRUCTIONS (INSTRUCTION SEQUENCES) WHICH REQUIRE			*
		9163	*	MODIFICATION IF THESE PROPERTIES OF THE CHARACTER SET ARE CHANGED			*
		9164	*	MAY OF IDENTIFIED BY -			*
		9165	*	* THE 4 INSTRUCTIONS BEGINNING AT LABEL FZS035.			*
		9166	*	* THE SINGLE INSTRUCTION IDENTIFIED BY LABEL FZS410.			*
		9167	*	* THE SINGLE INSTRUCTION IDENTIFIED BY LABEL FZS435.			*
		9168	*				*
		9169	*	*NOTES			*
		9170	*	ERROR PROCEDURES			*
		9171	*	FZSPRT UTILIZES OUTPUT IOCS ROUTINES DFPRNT (MATRIX PRINTER)			*
		9172	*	AND DSPLYN (CRT), AND IS SUBJECT TO THE ERP'S INHERENT IN			*
		9173	*	THESE PROGRAMS. FZSPRT OTHERWISE CONTAINS NO ERROR CONDITION			*
		9174	*	TESTS.			*
		9175	*				*
		9176	*	REGISTER USAGE			*
		9177	*	* REGISTER @BR IS TO CONTAIN THE CORE PAGE BASE ADDRESS			*
		9178	*	ESTABLISHED THROUGH PAGING MODULE CONTROL FOR THE PAGE WHICH			*
		9179	*	INCLUDES FZSPRT, AND IS RESTORED THROUGH THE PAGING MODULE.			*
		9180	*	* REGISTER @XR IS NOT SAVED, IT IS USED IN FZSPRT FOR GENERAL			*
		9181	*	PURPOSE INDEXING OPERATIONS.			*
		9182	*				*
		9183	*	SAVED/RESTORED AREAS			*
		9184	*	N/A			*
		9185	*				*
		9186	*	MODIFICATION CONSIDERATIONS			*
		9187	*	N/A			*
		9188	*				*
		9189	*	REQUIRED MODULES			*
		9190	*	* @SYSEQ - COMMON SYSTEM EQUATES.			*
		9191	*	* @FXDEQ - SYSTEM NUCLEUS ADDRESSES AND INDICATOR EQUATES.			*
		9192	*	* \$V\$EQU - VIRTUAL MEMORY FIXED ADDRESS EQUATES.			*
		9193	*	* \$B@EQU - COMPILER PARAMETER AND CONSTANT EQUATES.			*
		9194	*	* \$I@EQU - INTERPRETER FIXED LOCATION ADDRESS EQUATES.			*
		9195	*	* \$I@SEQ - INTERPRETER PARAMETER EQUATES (FOR STD. PREC. ONLY).			*
		9196	*	* \$I@LEQ - INTERPRETER PARAMETER EQUATES (FOR LONG PREC. ONLY).			*
		9197	*				*
		9198	*	OTHER			*
		9199	*	N/A			*
		9200	*	*****			*

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 130
			9202	*****		
			9203	* START OF PRINT STATEMENT EXECUTION MODULE		*
			9204	*****		
			9205	*		
			9206	* ESTABLISH ADDRESSABILITY FOR PRINT ROUTINE 1ST VM PAGE		
			9207	*		
			9208	*FZSP1B VPAGE 0		
3400			9209	ORG *,256,0	SET STARTING ADDRESS	
			3400 9210	FZSP1B EQU *	START OF PROGRAM CODING	
3301			9211	ORG *-255	RESET IAR TO PAGE	
3400			9212	ORG *,256,0	* BOUNDARY ADDRESS	
			3400 9213	USING *,@BR	SET PAGE BASE ADDRESS	
3400			9214	ORG FZSP1B	RESET STARTING ADDRESS	
			9215	*** END OF EXPANSION ***		
			9216	*		
			9217	* ENTER FZSPRT - ACCESS THE STACKED DATA ELEMENT		
			9218	*		
			3400 9219	FZSPRT EQU *	FZSPRT ENTRY POINT	
3400 35 02 0D4E			9220	L I\$STAK,@XR	LOAD THE STACK POINTER	
			9221	*		
			9222	* INITIALIZE AND TEST FOR CARRIER CONTROL (ONLY) PARAMETER		
			9223	*		
3404 7C 00 C7			9224	FZS010 MVI FZSCNT(,@BR),@ZERO	CLEAR DATA CHARACTER COUNTER	
			9225	*		
3407 3D 05 0D57			9226	CLI I\$PARM,B@PRSL	IF CARRIER CONTROL ONLY,	
340B D0 02 A4			9227	BNL FZS180(,@BR)	* GO PERFORM THE OPERATION	
			9228	*		
			9229	* TEST FOR CHARACTER ELEMENT PROCESSING		
			9230	*		
340E 3D 12 0BA1			9231	FZS020 CLI I\$SLLC,I@LCRV-1	IF STACK CONTAINS CHAR ELEMENT	
3412 D0 81 73			9232	BE FZS130(,@BR)	* GO ESTABLISH CHARACTER OUTPUT	
			9233	*		
			9234	*****		

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 31/05/21 PAGE 131
				9236		*****	*****	
				9237	*	ARITHMETIC	ELEMENT CONVERSION TO OUTPUT FORMAT	*
				9238		*****	*****	
				9239	*			
				9240	*	PROCESS THE SIGN OF THE STACKED ARITHMETIC VALUE		
				9241	*			
3415	7C	40	6E	9242	FZS030	MVI	FZS120+@Q(,@BR),B@BLNK	SET SIGN CHARACTER TO BLANK
3418	B8	F0	07	9243	FZS035	TBN	I@SIGN(,@XR),B@ZPOS	IF STACKED VALUE IS POSITIVE
341B	F2	10	06	9244		JT	FZS040	* SKIP PAST MINUS PROCESSING
341E	7C	60	6E	9245		MVI	FZS120+@Q(,@BR),B@MINS	SET SIGN CHARACTER TO MINUS
3421	BA	F0	07	9246		SBN	I@SIGN(,@XR),B@ZPOS	MAKE STACKED VALUE POSITIVE
3424	7C	01	C7	9247	FZS040	MVI	FZSCNT(,@BR),@B1	SET CHARACTER COUNT FOR SIGN
				9248	*			
				9249	*	TEST FOR A ZERO VALUE (CATEGORIZED AS AN INTEGER) - A ZERO VALUE IS		
				9250	*	LEFT IN THE STACK IN THE FORM 'S0', WHERE 'S' IS THE SIGN POSITION		
				9251	*			
3427	BD	F0	01	9252	FZS050	CLI	I@MANL(,@XR),B@DEC0	IF MOST SIGNIFICANT DIGIT NOT
342A	F2	01	07	9253		JNE	FZS060	* ZERO, GO ESTABLISH FORMAT
342D	5E	00	C7 DF	9254		ALC	FZSCNT(,@BR),FZSBN1(1,@BR)	INCR CHAR COUNT FOR ZERO DIGIT
3431	F2	87	39	9255		J	FZS120	* AND GO SET FOR ARITH OUTPUT
				9256	*			
				9257	*	VALUE NOT ZERO - TEST MAGNITUDE FOR OUTPUT IN E- OR F-FORMAT		
				9258	*			
3434	BD	81	00	9259	FZS060	CLI	I@DEXP(,@XR),B@NXZR+1	IF VALUE LESS THAN 1E+0, OR
3437	F2	82	28	9260		JL	FZS110	* GREATER THAN OR EQUAL TO
343A	BD	86	00	9261		CLI	I@DEXP(,@XR),B@NXZR+I@APRC	* 1E+6 (1E+11 FOR LONG PREC),
343D	F2	84	22	9262		JH	FZS110	* GO CONVERT TO E OR F FORMAT
				9263	*			
				9264	*	POSSIBLE I-FORMAT - TEST FOR A FRACTIONAL COMPONENT		
				9265	*			
3440	6C	00	56 00	9266	FZS070	MVC	FZS090+@Q(,@BR),I@DEXP(1,@XR)	ESTABLISH THE NUMBER OF
3444	5F	00	56 E0	9267		SLC	FZS090+@Q(,@BR),FZSNXZ(1,@BR)	* INTEGER DIGIT POSITIONS
3448	7C	07	4D	9268		MVI	FZS080+@D1(,@BR),I@PREC	SET DISP FOR MANTISSA RH BYTE
				9269	*			
				9270	*			
344B	BD	F0	00	9271	FZS080	CLI	*-*(,@XR),B@DEC0	IF FRACTIONAL DIGIT, GO CONVERT
344E	F2	01	11	9272		JNE	FZS110	* THE VALUE FOR E- OR F-FORMAT
3451	5F	00	4D DF	9273		SLC	FZS080+@D1(,@BR),FZSBN1(1,@BR)	DECR THE MANTISSA POINTER
3455	7D	00	4D	9274	FZS090	CLI	FZS080+@D1(,@BR),*-*	IF MORE FRACTIONAL POSITIONS
3458	D0	84	4B	9275		BH	FZS080(,@BR)	* REMAIN, GO REPEAT LOOP
				9276	*			
				9277	*	NO FRACTIONAL COMPONENT - VALUE IS LEFT IN THE STACK IN THE FORM		
				9278	*	'S123' (I-FORMAT) WHERE 'S' IS THE SIGN POSITION		
				9279	*			
345B	5E	00	C7 4D	9280	FZS100	ALC	FZSCNT(,@BR),FZS080+@D1(1,@BR)	INCR CHAR COUNT FOR DIGITS
345F	F2	87	0B	9281		J	FZS120	* AND GO SET FOR ARITH OUTPUT
				9282	*			
				9283	*	VALUE CANNOT BE HANDLED USING I-FORMAT - ROUND AND CONVERT VALUE,		
				9284	*	LEAVING IN STACK IN THE FORM 'S123.45' (F-FORMAT) OR 'S1.239E+9'		
				9285	*	(E-FORMAT) WHERE 'S' IS THE SIGN POSITION.		
				9286	*			
3462	C0	87	12B1	9287	FZS110	B	I\$CALL	LINK TO ROUND AND CONVERT THE
3466	3500			3467 9288		DC	AL(@VADDR)(FZS300)	* VALUE TO E- OR F-FORMAT
				9289	*			
3468	4E	00	C7 0D56	9290		ALC	FZSCNT(,@BR),I\$PARM-1(1)	INCR CHAR COUNT FROM CONVERSION
				9291	*			

[illegible]

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 133
		9300		*****	
		9301		* CHARACTER ELEMENT CONVERSION TO OUTPUT FORMAT	*
		9302		*****	
		9303		*	
		9304		* DETERMINE THE TYPE OF CHARACTER ELEMENT IN THE STACK	
		9305		*	
3473	B8 20 00	9306	FZS130 TBN	I@STAT(,@XR),B@CTYP	IF ELEMENT IS A STRING SEGMENT
3476	F2 10 1C	9307	JT	FZS160	* GO ESTABLISH SEGMENT PARAMS
		9308		*	
		9309		* ELEMENT IS FROM A CHARACTER REFERENCE - LEAVE ELEMENT IN STACK IN	
		9310		* THE FORM 'REFERENCE' (NO TRAILING BLANKS)	
		9311		*	
3479	1E 00 0D57 E1	9312	FZS140 ALC	I\$PARM,FZSCAJ(1,@BR)	ADJUST OUTPUT CONTROL PARAMETER
		9313		*	* FOR CHARACTER REFERENCE
347E	7C 13 8A	9314	MVI	FZS155+@D1(,@BR),I@LCRF+1	SET DISP FOR BYTE AFTER ELEMENT
3481	5F 00 8A DF	9315	FZS150 SLC	FZS155+@D1(,@BR),FZSBN1(1,@BR)	DECR THE ELEMENT POINTER
3485	F2 81 29	9316	JE	FZS190	BRANCH IF ALL CHARS ARE BLANKS
3488	BD 40 00	9317	FZS155 CLI	*-(,@XR),B@BLNK	TEST ELEMENT CHAR FOR BLANK
348B	D0 81 81	9318	BE	FZS150(,@BR)	* AND REPEAT LOOP UNTIL RIGHT-
		9319		*	* MOST NON-BLANK CHAR IS FOUND
348E	5C 00 C7 8A	9320	FZS941 MVC	FZSCNT(,@BR),FZS155+@D1(1,@BR)	SET CHAR COUNT FOR NUMBER
		9321		*	* OF SIGNIFICANT ELEMENT CHARS
3492	F2 87 0C	9322	J	FZS170	GO SET FOR CHARACTER OUTPUT
		9323		*	
		9324		* ELEMENT IS A CHARACTER STRING SEGMENT - LEAVE ELEMENT IN STACK IN	
		9325		* THE FORM 'SEGMENT' (TRAILING BLANKS ALLOWED)	
		9326		*	
3495	1E 00 0D57 E2	9327	FZS160 ALC	I\$PARM,FZSSAJ(1,@BR)	ADJUST OUTPUT CONTROL PARAMETER
		9328		*	* FOR CHARACTER STRING SEGMENT
349A	BB E0 00	9329	SBF	I@STAT(,@XR),X'FF'-B@CCNT	SET CHAR COUNT EQUAL TO COUNT
349D	6C 00 C7 00	9330	MVC	FZSCNT(,@BR),I@STAT(1,@XR)	* FIELD IN ELEMENT STATUS BYTE.
		9331		*	
		9332		* ADJUST OUTPUT AREA POINTER FOR THE CHARACTER ELEMENT	
		9333		*	
34A1	E2 02 01	9334	FZS170 LA	@B1(,@XR),@XR	INCR POINTER PAST STATUS BYTE
		9335		*	
		9336		*****	

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 134
					9338	*****	*****			
					9339	*	OUTPUT OPERATION INTERFACE ROUTINE			*
					9340	*****	*****			
					9341	*				
					9342	*	PAD THE CONVERTED DATA FIELD WITH BLANKS TO A FULL PRINT ZONE			
					9343	*				
34A4	7C	11	B2		9344	FZS180	MVI FZS190+@Q(,@BR),I@LFPZ-1	SET LENGTH OF FIELD TO BE		
34A7	5F	00	B2 C7		9345		SLC FZS190+@Q(,@BR),FZSCNT(1,@BR)	* PADDED - BYPASS PADDING		
34AB	F2	82	07		9346		JL FZS200	* OPERATION IF LENGTH - 0		
34AE	BC	40	12		9347		MVI I@LFPZ(,@XR),B@BLNK	PROPAGATE BLANKS TO FILL		
34B1	AC	00	11 12		9348	FZS190	MVC I@LFPZ-1(,@XR),I@LFPZ(@VQ,@XR)	* THE FIELD TO FULL ZONE		
					9349	*				
					9350	*	CONVERT THE OUTPUT PARAMETER TO AN ENTRY POINT DISPLACEMENT			
					9351	*				
34B5	34	02	0D59		9352	FZS200	ST I\$WRK1,@XR	SAVE THE PRINT FIELD POINTER		
34B9	D2	02	E4		9353		LA FZSCAT-1(,@BR),@XR	LOAD CONTROL ADDRESS TABLE BASF		
34BC	4C	00	C5 0D57		9354		MVC FZS210+@OPD2(,@BR),I\$PARM(1)	SET THE TABLE DISPLACEMENT		
34C1	2C	00	0D57 00		9355	FZS210	MVC I\$PARM,*-(1,@XR)	MOVE ENTRY PT DISP TO PARAMETER		
					9356	*				
					9357	*	ESTABLISH THE DATA FIELD CHARACTER COUNT PARAMETER			
					9358	*				
34C6	3C	00	0D56		9359	FZS230	MVI I\$PARM-1,*-	MOVE DATA FIELD COUNT TO PARAM		
					9360	*				
					9361	*	ESTABLISH POSSIBLE CORE ENTRY ADDRESS FOR THE CRT IOCR			
					9362	*				
34CA	1C	01	0D5B E4		9363		MVC I\$WRK2,FZSPDA(@CADDR,@BR)	SET BASE CRT ENTRY CORE ADDRESS		
34CF	0E	00	0D5A 043B		9364		ALC I\$WRK2-1,\$EXFTR(1)	ADJUST CADDR FOR CORE EYTENSION		
					9365	*				
					9366	*	OUTPUT THE DATA FIELD AS SPECIFIED BY CONTROL PARAMETER			
					9367	*				
34D5	C0	87	12B1		9368	FZS240	B I\$CALL	LINK TO OUTPUT THE DATA FIELD		
34D9	3600			34DA	9369		DC AL(@VADDR)(FZS600)	OUTPUT RIN VIRTUAL ADDRESS		
					9370	*				
					9371	*	RETURN CONTROL TO THE INTERPRETER CALLING ROUTINE			
					9372	*				
34DB	C0	87	12D3		9373	FZS260	B I\$RTRN	RETURN TO INTERPRETER		
					9374	*				
					9375	*****	*****			

[illegible]


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ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT                                VER 15, MOD 00  31/05/21  PAGE 136

          9391 *****
          9392 * OUTPUT CONTROL PARAMETER FUNCTION ADDRESS TABLE                      *
          9393 *****
          9394 *
          9395 * DISPLACEMENT ENTRIES IN THE FOLLOWING TABLE REFERENCE THE MATRIX
          9396 * PRINTER OUTPUT ROUTINE (3RD VM PAGE), BUT ARE USED ALSO IN CON-
          9397 * JUNCTION WITH THE CRT OUTPUT ROUTINE (4TH VM PAGE).  THUS, 4TH PAGE
          9398 * DISPLACEMENTS MUST BE KEPT IDENTICAL WITH 3RD PAGE DISPLACEMENTS
          9399 * WHICH ARE REFERENCED IN THE TABLE (E.G, FOR CODE 9, FZS860-FZS810
          9400 * MUST BE KEPT IDENTICAL TO FZS660-FZS610).
          9401 *
          34E5 9402 FZSCAT EQU *                                CONTROL ADDR TABLE ADDRESS
          9403 *
          34E5 00      34E5 9404      DC      AL1(FZS610-FZS610)      CODE 1 - PRT ARITH, NO SPACE
          34E6 18      34E6 9405      DC      AL1(FZS620-FZS610)      CODE 2 - PRT ARITH, SPACE FULL
          34E7 1E      34E7 9406      DC      AL1(FZS630-FZS610)      CODE 3 - PRT ARITH, SPACE PACK
          34E8 4D      34E8 9407      DC      AL1(FZS650-FZS610)      CODE 4 - PRT ARITH, RTRN CARR
          9408 *
          34E9 59      34E9 9409      DC      AL1(FZS660-FZS610)      CODE 5 - SPACE FULL
          34EA 5F      34EA 9410      DC      AL1(FZS670-FZS610)      CODE 6 - SPACE PACKED
          34EB 73      34EB 9411      DC      AL1(FZS680-FZS610)      CODE 7 - RETURN CARRIER
          34EC 79      34EC 9412      DC      AL1(FZS690-FZS610)      CODE 8 - RETURN CARR ON COND
          9413 *
          34ED 00      34ED 9414      DC      AL1(FZS610-FZS610)      CODE 9 - PRI CHAR, NO SPACE
          34EE 82      34EE 9415      DC      AL1(FZS695-FZS610)      CODE 10 - PRT CHAR, SPACE FULL
          34EF 00      34EF 9416      DC      AL1(FZS610-FZS610)      CODE 11 - PRT CHAR, SPACE PACK
          34F0 4D      34F0 9417      DC      AL1(FZS650-FZS610)      CODE 12 - PRT CHAR, RTRN CARR
          9418 *
          34F1 00      34F1 9419      DC      AL1(FZS610-FZS610)      CODE 13 - PRT STRING, NO SPACE
          34F2 88      34F2 9420      DC      AL1(FZS700-FZS610)      CODE 14 - PRT STRING, SPACE LNG
          34F3 00      34F3 9421      DC      AL1(FZS610-FZS610)      CODE 15 - PRT STRING, SPACE PKD
          34F4 4D      34F4 9422      DC      AL1(FZS650-FZS610)      CODE 16 - PRT STRING, RTRN CARR
          9423 *
          9424 *****
          9425 * PRINT EXECUTION ROUTINE EQUATES (1ST VM PAGE)                      *
          9426 *****
          9427 *
          0000 9428 FZSPAL EQU      0                                DISP FOR OUTPUT AREA LEFT BYTE
          9429 *
          34C7 9430 FZSCNT EQU      FZS230+@Q                        DATA CHARACTER COUNTER
          9431 *
          9432 *****

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ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 31/05/21 PAGE 137
					9434	*****	*****	
					9435	*	VIRTUAL MEMORY PRINT E-EXECUTION ROUTINE 2ND VM PAGE -	
					9436	*	* ROUNDS THE ARITHMETIC VALUE IN THE RUN-TIME STACK	
					9437	*	* CONVERTS ARITHMETIC VALUE TO E- OR F-FORMAT FOR OUTPUT	
					9438	*		
					9439	*	INPUT -	
					9440	*	* RUN-TIME STACK - CONTAINS ARITHMETIC VALUE TO BE CONVERTED	
					9441	*	* REGISTER @XR - CONTAINS CORE ADDRESS OF VALUE EXPONENT BYTE	
					9442	*		
					9443	*	OUTPUT -	
					9444	*	* RUN-TIME STACK - CONTAINS CONVERTED ARITHMETIC VALUE	
					9445	*	* REGISTER @XR - CONTAINS CORE ADDRESS OF VALUE SIGN POSITION	
					9446	*	* I\$PARM-1 - 1 BYTE, CONTAINS VALUE CHAR COUNT (NOT INCL SIGN)	
					9447	*****	*****	
					9448	*		
					9449	*	ESTABLISH ADDRESSABILITY FOR PRINT ROUTINE 2ND VM PAGE	
					9450	*		
					9451	*	FZSP2B VPAGE 0	
3500					9452	ORG	*,256,0	SET STARTING ADDRESS
				3500	9453	FZSP2B EQU	*	START OF PROGRAM CODING
3401					9454	ORG	*-255	RESET IAR TO PAGE
3500					9455	ORG	*,256,0	* BOUNDARY ADDRESS
				3500	9456	USING	*,@BR	SET PAGE BASE ADDRESS
3500					9457	ORG	FZSP2B	RESET STARTING ADDRESS
					9458	***	END OF EXPANSION ***	
					9459	*		
					9460	*	CONVERSION ENTRY - ROUND THE ARITHMETIC VALUE FOR E- OR F-FORMAT	
					9461	*		
				3500	9462	FZS300 EQU	*	CONVERSION ROUTINE ENTRY POINT
3500 96 60 07 CC					9463	AZ	I@APRC+1(I@APRC+1,@XR),FZSDC5(1,@BR)	ROUND THE VALUE UP
3504 F2 08 07					9464	JNOZ	FZS310	IF NO OVFLOW SKIP TO CONTINUE,
3507 BC F1 01					9465	MVI	I@MANL(,@XR),B@DEC1	* ELSE SET MOST SIGNIFICANT
350A 9E 00 00 CA					9466	ALC	I@DEXP(,@XR),FZS2B1(1,@BR)	* DIGIT = 1 AND INCR EXPONENT
					9467	*		
					9468	*	TEST MAGNITUDE OF VALUE FOR OUTPUT IN E- OR F-FORMAT	
					9469	*		
350E BD 80 00					9470	FZS310 CLI	I@DEXP(,@XR),B@NXZR	IF VALUE LESS THAN 1E-1, OR
3511 D0 82 4D					9471	BL	FZS400(,@BR)	* GREATER THAN OR EQUAL TO
3514 BD 86 00					9472	CLI	I@DEXP(,@XR),B@NXZR+I@APRC	* 1E+6 (1E+11 FOR LONG PREC),
3517 D0 84 4D					9473	BH	FZS400(,@BR)	* GO CONVERT VALUE TO E-FORMAT
					9475	*****	*****	
					9476	*	F-FORMAT OUTPUT CONVERSION ROUTINE	*
					9477	*****	*****	
					9478	*		
					9479	*	SHIFT FRACTIONAL-COMPONENT RIGHT TO INSERT DECIMAL POINT	
					9480	*		
351A 7C 85 25					9481	FZS320 MVI	FZS330+@Q(,@BR),B@NXZR+I@APRC-1	ESTABLISH LENGTH CODE FOR
351D 6F 00 25 00					9482	SLC	FZS330+@Q(,@BR),I@DEXP(1,@XR)	* FRACTIONAL COMPONENT
3521 F2 82 04					9483	JL	FZS340	BRANCH IF NO FRACTION
3524 AC 00 07 06					9484	FZS330 MVC	I@APRC+1(,@XR),I@APRC(@VQ,@XR)	SHIFT FRACTION RIGHT BY 1
					9485	*		
					9486	*	ESTABLISH F-FORMAT DECIMAL POINT - VALUE IS LEFT IN STACK IN FORM	
					9487	*	'S.123456', S123.456', OR 'S123456.' WHERE 'S' IS THE SIGN POSITION	
					9488	*		
3528 6C 00 36 00					9489	FZS340 MVC	FZS350+@D1(,@BR),I@DEXP(1,@XR)	CALCULATE DISPLACEMENT

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN						
ERR LOC	OBJECT CODE	ADDR STMT	SOURCE STATEMENT	VER 15,	MOD 00	31/05/21 PAGE 138
352C	5E 00 36 CA	9490	ALC FZS350+@D1(,@BR),FZS2B1(1,@BR)	*	FOR THE DECIMAL POINT	
3530	5F 00 36 CD	9491	SLC FZS350+@D1(,@BR),FZS2XZ(1,@BR)	*	IN F-FORMAT FIELD	
3534	BC 4B 00	9492	FZS350 MVI *-*(,@XR),B@DPNT		INSERT THE DECIMAL POINT	
		9493	*			
		9494	* TRUNCATE INSIGNIFICANT ZEROS FROM THE ROUNDED VALUE			
		9495	*			
3537	7C 08 40	9496	FZS360 MVI FZS380+@D1(,@BR),I@APRC+2	SET DISP FOR BYTE AFTER VALUE		
353A	5F 00 40 CA	9497	FZS370 SLC FZS380+@D1(,@BR),FZS2B1(1,@BR)	DECR VALUE CHAR POINTER		
353E	BD F0 00	9498	FZS380 CLI *-*(,@XR),B@DEC0	TEST VALUE CHARACTER FOR ZERO		
3541	D0 81 3A	9499	BE FZS370(,@BR)	*	AND REPEAT UNTIL NON-ZERO	
		9500	*			
		9501	* SET COUNT PARAMETER AND RETURN TO CALLING PAGE			
		9502	*			
3544	1C 00 0D56 40	9503	FZS390 MVC I\$PARM-1,FZS380+@D1(1,@BR)	MOVE DATA CHARACTER COUNT		
		9504	*		* TO THE OUTPUT PARAMETER	
3549	C0 87 12D3	9505	B I\$RTRN	RETURN TO CALLING PAGE		
		9506	*			
		9507	*****			

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN						
ERR LOC	OBJECT CODE	ADDR STMT	SOURCE STATEMENT	VER 15,	MOD 00	31/05/21 PAGE 138
352C	5E 00 36 CA	9490	ALC FZS350+@D1(,@BR),FZS2B1(1,@BR)	*	FOR THE DECIMAL POINT	
3530	5F 00 36 CD	9491	SLC FZS350+@D1(,@BR),FZS2XZ(1,@BR)	*	IN F-FORMAT FIELD	
3534	BC 4B 00	9492	FZS350 MVI *-*(,@XR),B@DPNT		INSERT THE DECIMAL POINT	
		9493	*			
		9494	* TRUNCATE INSIGNIFICANT ZEROS FROM THE ROUNDED VALUE			
		9495	*			
3537	7C 08 40	9496	FZS360 MVI FZS380+@D1(,@BR),I@APRC+2	SET DISP FOR BYTE AFTER VALUE		
353A	5F 00 40 CA	9497	FZS370 SLC FZS380+@D1(,@BR),FZS2B1(1,@BR)	DECR VALUE CHAR POINTER		
353E	BD F0 00	9498	FZS380 CLI *-*(,@XR),B@DEC0	TEST VALUE CHARACTER FOR ZERO		
3541	D0 81 3A	9499	BE FZS370(,@BR)	*	AND REPEAT UNTIL NON-ZERO	
		9500	*			
		9501	* SET COUNT PARAMETER AND RETURN TO CALLING PAGE			
		9502	*			
3544	1C 00 0D56 40	9503	FZS390 MVC I\$PARM-1,FZS380+@D1(1,@BR)	MOVE DATA CHARACTER COUNT		
		9504	*	*	TO THE OUTPUT PARAMETER	
3549	C0 87 12D3	9505	B I\$RTRN	RETURN TO CALLING PAGE		
		9506	*			
		9507	*****			

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 139
				9509		*****				
				9510	*	E-FORMAT OUTPUT CONVERSION ROUTINE				*
				9511		*****				
				9512	*					
				9513	*	SHIFT MANTISSA (EXCEPT MOST SIGNIFICANT DIGIT) RIGHT TO INSERT				
				9514	*	DECIMAL POINT - ESTABLISH E-FORMAT DECIMAL POINT, LEAVING VALUE				
				9515	*	IN STACK IN FORM 'S1.23496' WHERE 'S' IS THE SIGN POSITION				
				9516	*					
354D	AC	04	07	06	9517	FZS400	MVC I@APRC+1(,@XR),I@APRC(I@APRC-1,@XR) SHIFT MANTISSA RIGHT			
3551	BC	4B	02		9518		MVI FZSPAL+2(,@XR),B@DPNT INSERT E-FORMAT DECIMAL POINT			
3554	9F	00	00	CA	9519		SLC I@DEXP(,@XR),FZS2B1(1,@BR) ADJUST EXPONENT TO COMPENSATE			
				9520	*					
				9521	*	TRUNCATE INSIGNIFICANT ZEROS FROM ROUNDED VALUE - KEEP AT LEAST ONE				
				9522	*	DIGIT TO RIGHT OF DECIMAL POINT				
				9523	*					
3558	BB	F0	03		9524	FZS410	SBF FZSPAL+3(,@XR),B@ZPOS FLAG DIGIT AFTER DECIMAL POINT			
355B	7C	08	64		9525		MVI FZS430+@D1(,@BR),I@APRC+2 SET DISP FOR BYTE AFTER VALUE			
355E	5F	00	64	CA	9526	FZS420	SLC FZS430+@D1(,@BR),FZS2B1(1,@BR) DECR VALUE CHAR POINTER			
3562	BD	F0	00		9527	FZS430	CLI *-*(,@XR),B@DEC0 TEST VALUE CHARACTER FOR ZERO			
3565	D0	81	5E		9528		BE FZS420(,@BR) * AND REPEAT UNTIL NON-ZERO			
3568	BA	F0	03		9529	FZS435	SBN FZSPAL+3(,@XR),B@ZPOS RESTORE DIGIT AFTER DEC POINT			
				9530	*					
				9531	*	SET COUNT PARAMETER FOR FORMATTED MANTISSA PLUS 4 BYTE EXPONENT				
				9532	*					
356B	3C	04	0D56		9533	FZS440	MVI I\$PARM-1,FZSLXB SET DATA CHAR CNT FOR EXPONENT			
356F	1E	00	0D56	64	9534		ALC I\$PARM-1,FZS430+@D1(1,@BR) INCR DATA CHAR COUNT FOR VALUE			
				9535	*					
				9536	*	INITIALIZE OUTPUT FORM OF EXPONENT - TEST FOR EXPONENT SIGN				
				9537	*					
3574	5C	03	D6	D1	9538	FZS450	MVC FZSXWK(,@BR),FZSEXB(FZSLXB,@BR) MOVE EXPONENT IMAGE TO			
				9539	*		* EXPONENT WORK AREA			
3578	6C	00	D2	00	9540		MVC FZS2BX(,@BR),I@DEXP(1,@XR) DETERMINE BINARY MAGNITUDE			
357C	5F	00	D2	CD	9541		SLC FZS2BX(,@BR),FZS2XZ(1,@BR) * ASSUMING POSITIVE EXPONENT			
3580	F2	81	29		9542		JE FZS480 BRANCH IF EXPONENT IS ZERO			
3583	F2	84	0A		9543		JH FZS470 BRANCH IF EXPONENT IF POSITIVE			
				9544	*					
				9545	*	NEGATIVE EXPONENT - MODIFY SIGN AND RECOMPUTE BINARY EXPONENT				
				9546	*					
3586	7C	60	D4		9547	FZS460	MVI FZSXWK-FZSLXM(,@BR),B@MINS MAKE EXPONENT SIGN NEGATIVE			
3589	7C	80	D2		9548		MVI FZS2BX(,@BR),B@NXZR DETERMINE BINARY MAGNITUDE			
358C	6F	00	D2	00	9549		SLC FZS2BX(,@BR),I@DEXP(1,@XR) * FOR NEGATIVE EXPONENT			
				9550	*					
				9551	*	CONVERT BINARY EXPONENT MAGNITUDE TO ZONED DECIMAL				
				9552	*					
3590	54	10	D8	CB	9553	FZS470	ZAZ FZSDAC(FZSLXM,@BR),FZSDC1(1,@BR) SET DEC ACCUMULATOR = 1			
3594	7C	01	98		9554		MVI FZS472+@Q(,@BR),@B1 SET BINARY MASK FOR 2**0 BIT			
3597	78	00	D2		9555	FZS472	TBN FZS2BX(,@BR),*-* TEST BINARY EXP MAGNITUDE BIT			
359A	F2	90	04		9556		JF FZS474 * AND BRANCH IF BIT IS ZERO			
359D	56	01	D6	D8	9557		AZ FZSXWK(FZSLXM,@BR),FZSDAC(FZSLXM,@BR) INCR DECIMAL EXP			
35A1	5E	00	98	98	9558	FZS474	ALC FZS472+@Q(,@BR),FZS472+@Q(1,@BR) SHIFT BINARY MASK LEFT			
35A5	56	01	D8	D8	9559		AZ FZSDAC(FZSLXM,@BR),FZSDAC(FZSLXM,@BR) DOUBLE DEC ACCUM			
35A9	D0	08	97		9560		BNOZ FZS472(,@BR) REPEAT LOOP UNTIL ACCUM > 644			
				9561	*					
				9562	*	TEST FOR AND DELETE ANY INSIGNIFICANT ZERO IN THE DECIMAL EXPONENT				
				9563	*					
35AC	7D	F0	D5		9564	FZS480	CLI FZSXWK-1(,@BR),B@DEC0 TEST FOR EXPONENT LEFTMOST ZERO			

[illegible]

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 31/05/21 PAGE 141
			9581	*****		
			9582	* PRINT EXECUTION ROUTINE CONSTANTS (2ND VM PAGE)		
			9583	*****		
			9584	*		
35CA	01	35CA	9585	FZS2B1 DC	IL1'1'	BINARY INTEGER +1
35CB	F1	35CB	9586	FZSDC1 DC	DL1'1'	DECIMAL INTEGER +1
35CC	F5	35CC	9587	FZSDC5 DC	DL1'5'	DECIMAL INTEGER +5
			9588	*		
35CD	80	35CD	9589	FZS2XZ DC	AL1(B@NXZR)	ZERO NORMALIZED EXPONENT
			9590	*		
		0004	9591	FZSLXB EQU	4	LENGTH OF EXPONENT IMAGE
35CE	C54EF0F0	35D1	9592	FZSEXB DC	CL(FZSLXB)'E+00'	EXPONENT IMAGE FOR OUTPUT
			9593	*		
			9594	*****		
			9595	* PRINT EXECUTION ROUTINE WORK AREAS (2ND VM PAGE)		
			9596	*****		
			9597	*		
35D2		35D2	9598	FZS2BX DS	CL1	BINARY EXPONENT MAGNITUDE
35D3		35D6	9599	FZSXWK DS	CL(FZSLXB)	EXPONENT CONSTRUCT AREA
			9600	*		
		0002	9601	FZSLXM EQU	2	LENGTH OF DECMAL EXP MAGNITUDE
35D7		35D8	9602	FZSDAC DS	CL(FZSLXM)	B TO D DECIMAL ACCUMULATOR
			9603	*		
			9604	*****		

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 142
				9606	*****	
				9607	* VIRTUAL MEMORY PRINT EXECUTION ROUTINE (3RD VM PAGE)	*
				9608	* * OUTPUTS FORMATTED DATA ELEMENT TO MATRIX PRINTER	*
				9609	* * CONTROLS PRINTER CARRIER DEPENDING ON SPECIFIED CONTROL CODE	*
				9610	* INPUT -	*
				9611	* * RUN-TIME STACK - CONTAINS FORMATTED ELEMENT, IF PRESENT	*
				9612	* * I\$PARM - 1 BYTE, CONTAINS CONTROL CODE BRANCH DISPLACEMENT	*
				9613	* * I\$PARM-1 - 1 BYTE, CONTAINS FORMATTED ELEMENT CHARACTER COUNT	*
				9614	* * I\$WRK1 - 2 BYTES, CONTAINS CORE ADDR OF PRINT AREA LEFT BYTE	*
				9615	* * I\$WRK2 - 2 BYTES, CONTAINS VALUE FOR \$PRDEV 'CRT ONLY' COND	*
				9616	* * I\$SLLC - 1 BYTE, CONTAINS OUTPUT ELEMENT LENGTH CODE (LNG - 1)	*
				9617	*	*
				9618	* OUTPUT -	*
				9619	* * PRINTED ELEMENT AND/OR CARRIER CONTROL ON MATRIX PRINTER	*
				9620	*****	
				9621	*	
				9622	* ESTABLISH ADDRESSABILITY FOR PRINT ROUTINE (3RD VM PAGE)	
				9623	*	
				9624	*FZSP3B VPAGE 0	
3600				9625	ORG *,256,0	SET STARTING ADDRESS
			3600	9626	FZSP3B EQU *	START OF PROGRAM CODING
3501				9627	ORG *-255	RESET IAR TO PAGE
3600				9628	ORG *,256,0	* BOUNDARY ADDRESS
			3600	9629	USING *,@BR	SET PAGE BASE ADDRESS
3600				9630	ORG FZSP3B	RESET STARTING ADDRESS
				9631	*** END OF EXPANSION ***	
				9632	*	
				9633	* PAGE ENTRY - TEST FOR MATRIX PRINTER ACTIVE ON SYSTEM	
				9634	*	
3600 0D 01 044B 0D5B				9635	FZS600 CLC \$PRDEV,I\$WRK2(@CADDR)	IF PRINTER NOT A SYSTEM PRINT ?
3606 F2 02 BF				9636	JNL FZS740	* DEVICE, GO OUTPUT TO THE CRT
				9637	*	
				9638	* INITIALIZE FOR OUTPUT TO THE MATRIX PRINTER	
				9639	*	
3609 4C 00 6A 03C0				9640	MVC FZS3RM(,@BR),\$RMGRN(1)	SET MP RIGHT MARGIN PARAMETER
				9641	*	
				9642	* INITIALIZE THE ELEMENT PRINT PARAMETER LIST	
				9643	*	
360E 7C 40 F2				9644	MVI FZS3PF(,@BR),@PRINT	SET FUNCTION FOR PRINT ONLY
3611 4C 00 F3 0D56				9645	MVC FZS3PC(,@BR),I\$PARM-1(1)	SET COUNT = ELEMENT CHAR COUNT
3616 4C 01 F5 0D59				9646	MVC FZS3PA(,@BR),I\$WRK1(@CADDR)	SET PRINT AREA CORE ADDRESS
				9647	*	
				9648	* TEST FOR AN ARITHMETIC ELEMENT - RETURN CARRIER IF ARITHMETIC	
				9649	* ELEMENT LENGTH EXCEEDS OUTPUT LINE MARGIN	
				9650	*	
361B 5C 00 DB F3				9651	MVC FZS3CC(,@BR),FZS3PC(1,@BR)	SET PARAM = ELEMENT CHAR CNT
361F 3D 12 0BA1				9652	CLI I\$SLLC,I@LCRV-1	IF CURR ELEMENT IS ARITHMETIC ?
3623 D0 01 D2				9653	BNE FZS760(,@BR)	* LINK TO RETURN CARR ON COND
				9654	*	
				9655	* BRANCH TO APPROPRIATE ROUTINE DEPENDING ON CONTROL CODE	
				9656	*	
3626 4C 00 2D 0D57				9657	MVC FZS605+@D1(,@BR),I\$PARM(1)	MOVE CONTROL DISP TO JUMP INST
362B F2 87 00				9658	FZS605 J *-*	GO EXECUTE CONTROL CODE ROUTINE
				9659	*	
				9660	*****	

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 143
				9662		*****				
				9663	*	OUTPUT ROUTINE FOR PRINT CONTROL CODES 1, 9, 11, 13, 15				*
				9664		*****				
				9665	*					
				9666	*	PRINT THE FORMATTED ELEMENT ONLY (WHEN SIGNIFICANT)				
				9667	*					
362E	7D	00	F3	9668	FZS610	CLI	FZS3PC(,@BR),@ZERO		IF ELEMENT CHAR COUNT NOT ZERO	
3631	F2	81	B8	9669		JE	FZS790		EXIT ROUTINE W/O PRINTING	1-5
3634	1C	01	144A	9670		MVC	I\$VADR,FZSPCH(@VADDR,@BR)		VM PATCH PAGE ENTRY ADDR	1-5
3639	C0	87	1358	9671		B	I\$CVAD		LOAD PATCH PAGE	1-5
363D	4C	01	45 144C	9672		MVC	FZS615+@OP1(@CADDR,@BR),I\$CADR		MOVE CADDR TO BRANCH	1-5
3642	C0	87	0000	9673	FZS615	B	*-*		BRANCH TO PATCH PAGE	1-5
				9674	*					
				9675		*****				
				9676	*	OUTPUT ROUTINE FOR PRINT CONTROL CODE 2				*
				9677		*****				
				9678	*					
				9679	*	ESTABLISH FULL PRINT ZONE OUTPUT FORMAT (ARITHMETIC ELEMENT)				
				9680	*					
3646	7C	12	DB	9681	FZS620	MVI	FZS3CC(,@BR),I@LFPZ		SET PARAM - FULL PRINT ZONE	
3649	F2	87	18	9682		J	FZS636		BRANCH TO TEST LINE CAPACITY	
				9683	*					
				9684		*****				

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 144
		9686		*****	
		9687		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 3	*
		9688		*****	
		9689		*	
		9690		* ESTABLISH PACKED PRINT ZONE OUTPUT FORMAT (ARITHMETIC ELEMENT) -	
		9691		* THIS ZONE WILL BE 6, 9, 12, 15, OR 18 CHARACTERS LONG DEPENDING ON	
		9692		* THE LENGTH OF THE ARITHMETIC ELEMENT TO BE PRINTED.	
		9693		*	
364C	7C 04 DB	9694	FZS630 MVI	FZS3CC(,@BR),2*I@LPPZ-2 SET LENGTH ACCUM TO MINIMUM	
		9695	*	* ELEMENT LENGTH LIMIT (4)	
364F	5D 00 F3 DB	9696	FZS632 CLC	FZS3PC(,@BR),FZS3CC(1,@BR) IF ELEMENT LENGTH WITHIN LIMIT	
3653	F2 04 0A	9697	JNH	FZS634 * BRANCH TO EXIT THIS LOOP	
3656	5E 00 DB F1	9698	ALC	FZS3CC(,@BR),FZS3PZ(1,@BR) ADD PACKED ZONE INCR TO ACCUM	
365A	7D 10 DB	9699	FZS633 CLI	FZS3CC(,@BR),I@LFPZ-2 IF LENGTH ACCUM NOT MAXIMUM	
365D	D0 82 4F	9700	BL	FZS632(,@BR) * GO REPEAT ELEMENT LENGTH TEST	
		9701	*		
3660	5E 00 DB F0	9702	FZS634 ALC	FZS3CC(,@BR),FZS3B2(1,@BR) ADJUST ACCLM TO MAKE PACKED	
		9703	*	* PRINT ZONE FIELD LENGTH	
		9704	*		
		9705	*	* TEST LINE CAPACITY TO CONTAIN CURRENT PRINT ZONE FIELD - WHEN RIGHT	
		9706	*	* MARGIN IS EXCEEDED, LINE HAS CAPACITY FOR THE DATA ELEMENT BUT NOT	
		9707	*	* FOR THE ENTIRE PRINT ZONE ... IN THIS CASE, PRINT ELEMENT ONLY AND	
		9708	*	* RETURN THE CARRIER	
		9709	*		
3664	4E 00 DB 03C2	9710	FZS636 ALC	FZS3CC(,@BR),\$PRPOS(1) ADD PRINT ZONE LNG TO CURRENT	
3669	7D 00 DB	9711	FZS638 CLI	FZS3CC(,@BR),*- * CARRIER POSITION - BRANCH	
366C	F2 84 12	9712	JH	FZS655 * IF RIGHT MARGIN IS EXCEEDED	
		9713	*		
		9714	*	* LINE HAS CAPACITY FOR ENTIRE PRINT ZONE - PRINT ELEMENT AND SPACE	
		9715	*	* TO THE SPECIFIED ZONE POSITION	
		9716	*		
366F	4F 00 DB 03C2	9717	FZS640 SLC	FZS3CC(,@BR),\$PRPOS(1) RESTORE CURRENT PRINT ZONE LNG	
3674	5C 00 F3 DB	9718	MVC	FZS3PC(,@BR),FZS3CC(1,@BR) SET COUNT - CAR PRT ZONE LNG	
3678	F2 87 3E	9719	J	FZS710 GO PRINT ELEMENT AND SPACE CARR	
		9720	*		
		9721		*****	

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 145
		9723		*****	
		9724	*	OUTPUT ROUTINE FOR PRINT CONTROL CODES 4, 12, 16	*
		9725		*****	
		9726	*		
		9727	*	TEST ELEMENT SIGNIFICANCE - RETURN CARRIER ONLY WHEN NOT SIGNIFICANT	
		9728	*		
367B	7D 00 F3	9729	FZS650 CLI	FZS3PC(,@BR),@ZERO	ELEMENT CHAR COUNT IS ZERO ?
367E	F2 81 20	9730	JE	FZS680	* GO RETURN THE CARRIER ONLY
		9731	*		
		9732	*	ELEMENT IS SIGNIFICANT - PRINT ELEMENT AND RETURN CARRIER	
		9733	*		
3681	7C C0 F2	9734	FZS655 MVI	FZS3PF(,@BR),@PRETR	SET PRINT & CARR RETURN FUNC
3684	F2 87 32	9735	J	FZS710	GO PRINT ELEMENT AND RTRN CARR
		9737		*****	
		9738	*	OUTPUT ROUTINE FOR PRINT CONTROL CODE 5	*
		9739		*****	
		9740	*		
		9741	*	ESTABLISH FULL PRINT ZONE SPACING ONLY	
		9742	*		
3687	7C 12 F3	9743	FZS660 MVI	FZS3PC(,@BR),I@LFPZ	SET COUNT FOR FULL PRINT ZONE
368A	F2 87 03	9744	J	FZS675	BRANCH TO EXECUTE SPACING
		9746		*****	
		9747	*	OUTPUT ROUTINE FOR PRINT CONTROL CODE 6	*
		9748		*****	
		9749	*		
		9750	*	ESTABLISH PACKED PRINT ZONE INCREMENT SPACING ONLY	
		9751	*		
368D	7C 03 F3	9752	FZS670 MVI	FZS3PC(,@BR),I@LPPZ	SET COUNT FOR PACKED ZONE INCR
		9753	*		
		9754	*	PRINT CURRENT ZONE SPACE, OR RETURN CARRIER IF END OF LINE IS HIT	
		9755	*		
3690	5C 00 DB F3	9756	FZS675 MVC	FZS3CC(,@BR),FZS3PC(1,@BR)	SET PARAM FOR CURRENT ZONE LNG
3694	D0 87 D2	9757	B	FZS760(,@BR)	LINK TO RETURN CARRIER ON COND
3697	5D 00 DB 6A	9758	CLC	FZS3CC(,@BR),FZS3RM(1,@BR)	IF CARRIER WAS NOT RETURNED
369B	F2 04 1B	9759	JNH	FZS710	* GO PRINT CURRENT ZONE SPACE,
369E	F2 87 2D	9760	J	FZS750	* ELSE EXIT RTN W/0 PRINTING
		9761	*		
		9762		*****	

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 146
		9764		*****			
		9765		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 7			*
		9766		*****			
		9767		*			
		9768		* ESTABLISH CARRIER RETURN ONLY			
		9769		*			
36A1	D2 02 F6	9770	FZS680	LA FZS3CR(,@BR),@XR			LOAD CARRIER RETURN PPL CADDR
36A4	F2 87 15	9771		J FZS720			GO EXECUTE CARRIER RETURN
		9773		*****			
		9774		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 8			*
		9775		*****			
		9776		*			
		9777		* RETURN CARRIER IF FULL PRINT ZONE EXCEEDS LINE CAPACITY			
		9778		*			
36A7	7C 12 DB	9779	FZS690	MVI FZS3CC(,@BR),I@LFPZ			SET PARAM FOR PRINT ZONE
36AA	D0 87 D2	9780		B FZS760(,@BR)			LINK TO RETURN CARRIER ON COND
36AD	F2 87 0F	9781		J FZS730			GO TEST FOR CRT ACTIVE ON SYSTEM
		9783		*****			
		9784		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 10			*
		9785		*****			
		9786		*			
		9787		* RETURN CARRIER IF FULL PRINT ZONE EXCEEDS LINE CAPACITY			
		9788		*			
36B0	7C 12 DB	9789	FZS695	MVI FZS3CC(,@BR),I@LFPZ			SET PARAM FOR FULL PRINT ZONE
36B3	D0 87 D2	9790		B FZS760(,@BR)			LINK TO RETURN CARRIER ON COND
		9791		*			
		9792		*****			

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 147
		9794		*****	
		9795		* OUTPUT ROUTINE FOR PRINT CONTROL CONTROL CODE 14	
		9796		*****	
		9797		*	
		9798		* ESTABLISH FULL PRINT ZONE OUTPUT FORMAT (CHARACTER ELEMENT)	
		9799		*	
36B6	7C 12 F3	9800	FZS700 MVI	FZS3PC(,@BR),I@LFPZ SET COUNT FOR ZONE	
		9801		*	
		9802		* EXECUTE ELEMENT OUTPUT TO THE MATRIX PRINTER	
		9803		*	
36B9	D2 02 F2	9804	FZS710 LA	FZS3PL(,@BR),@XR LOAD DATA OLTOLT CORE ADOR	
36BC	D0 87 E3	9805	FZS720 B	FZS780(,@BR) LINK TO EXECUTE PRINTER OUTPUT	
		9806		*	
		9807		* TEST FOR THE CRT ACTIVE AS A SISTEM PRINT DEVICE	
		9808		*	
36BF	0D 00 044A 0D5A	9809	FZS730 CLC	\$PRDEV-1,I\$WRK2-1(1) IF CRT IS NOT A SYSTEM PRINT	
36C5	F2 82 06	9810	JL	FZS750 * DEVICE, GO EXIT THIS ROUTINE	
		9811		*	
		9812		* CRT ACTIVE - SET UP AND OUTPUT TO CRT USINS CRT LINE WIDTH	
		9813		*	
36C8	C0 87 12B1	9814	FZS740 B	I\$CALL LINK TO EXECUTE PRINT ON CRT	
36CC	3700	36CD 9815	DC	AL(@VADDR)(FZS800) PRINT CRT RTN VIRTUAL ADDRESS	
		9816		*	
		9817		* RETURN TO PTINT ROUTINE 1ST VM PAGE	
		9818		*	
36CE	C0 87 12D3	9819	FZS750 B	I\$RTRN RETURN TO 1ST PRINT RTN PAGE	
		9820		*	
		9821		*****	

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ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 148
		9823		*****	
		9824	*	PRINTER CARRIER RETURN ROUTINE -	*
		9825	*	* RETURNS PRINTER CARRIER WHEN SPECIFIED LENGTH PARAMETER	*
		9826	*	(FZS3CC) EXCEEDS THE CURRENT PRINT LINE CAPACITY.	*
		9827		*****	
		9828	*		
36D2	74 08 EF	9829	FZS760 ST	FZS790+@OP1(,@BR),@ARR STORE RETURN BRANCH ADDRESS	
		9830	*		
		9831	*	TEST LINE CAPACITY TO CONTAIN CURRENT PRINT REGION LENGTH	
		9832	*		
36D5	4E 00 DB 03C2	9833	ALC	FZS3CC(,@BR),\$PRPOS(1) ADD PRINT REGION LENGTH TO CURR	
36DA	7D 00 6A	9834	FZS770 CLI	FZS3RM(,@BR),*-* * CARRIER POSITION - BRANCH IF	
36DD	F2 02 0C	9835	JNL	FZS790 * RIGHT MARGIN NOT EXCEEDED	
		9836	*		
		9837	*	RIGHT MARGIN EXCEEDED - RETURN MATRIX PRINTER CARRIER	
		9838	*		
36E0	D2 02 F6	9839	LA	FZS3CR(,@BR),@XR LOAD CARRIER RETURN PPL CADDR	
		9841		*****	
		9842	*	PRINTER OUTPUT INTERFACE -	*
		9843	*	* EXECUTES MATRIX PRINTER OUTPUT AS SPECIFIED IN PRINT PARAM-	*
		9844	*	ETER LIST REFERENCED BY REGISTER @XR.	*
		9845		*****	
36E3	74 08 EF	9846	FZS780 ST	FZS790+@OP1(,@BR),@ARR STORE RETURN BRANCH ADDRESS	
36E6	C0 87 12B1	9847	B	I\$CALL LINK TO EXECUTE PRINTER IOCR	
36EA	2800	36EB 9848	DC	AL(@VADDR)(V\$SPRT) MATRIX PRINTER IOCR VADDR	
		9849	*		
		9850	*	RETURN TO CALLING ROUTINE	
		9851	*		
36EC	C0 87 0000	9852	FZS790 B	*-* RETURN BRANCH	
		9853		*****	

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ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 149
		9855		*****	
		9856	*	PRINT EXECUTION ROUTINE CONSTANTS (3RD VM PAGE)	*
		9857		*****	
		9858	*		
36F0 02		36F0 9859	FZS3B2 DC	IL1'2'	BINARY INTEGER +2
		9860	*		
36F1 03		36F1 9861	FZS3PZ DC	AL1(I@LPPZ)	LENGTH OF PACKED ZONE INCR
		9863		*****	
		9864	*	PRINT EXECUTION ROUTINE WORK AREAS (3RD VM PAGE)	*
		9865		*****	
		366A 9866	FZS3RM EQU	FZS638+@Q	MATRIX PRINTER RIGHT MARGIN
		36DB 9867	FZS3CC EQU	FZS770+@Q	PRINT AREA CHARACTER COUNT
		9868	*		
		9869	*FZS3PL PPL		
		36F2 9870	FZS3PL EQU	*	PPL ADDRESS
36F2 00		36F2 9871	DC	AL1(*-*)	FUNCTION REQUESTED
36F3 00		36F3 9872	DC	AL1(*-*)	PRINT COUNT
36F4 0000		36F5 9873	DC	AL2(*-*)	DATA ADDRESS
		9874	***	END OF EXPANSION ***	
		9875	*		
		36F2 9876	FZS3PF EQU	FZS3PL+@PCTRL	PRINT FUNCTION PARAMETER
		36F3 9877	FZS3PC EQU	FZS3PL+@PRCNT	PRINT AREA COUNT PARAMETER
		36F5 9878	FZS3PA EQU	FZS3PL+@PDATA	PRINT AREA COUNT PARAMETER
		9879	*		
		9880	*FZS3CR PPL	FUNC-@RETRN,CNT-@RTRNC	
		36F6 9881	FZS3CR EQU	*	PPL ADDRESS
36F6 80		36F6 9882	DC	AL1(@RETRN)	FUNCTION REQUESTED
36F7 80		36F7 9883	DC	AL1(@RTRNC)	PRINT COUNT
36F8 0000		36F9 9884	DC	AL2(*-*)	DATA ADDRESS
		9885	***	END OF EXPANSION ***	
		9886	*		
36FA 5359		36FB 9887	FZSPCH DC	AL2(V\$PCH2+FZS633-@Q-FZSP3B)	PATCH PAGE ENTRY ADDR 1-3
		9888		*****	

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 150
		9890		*****	
		9891	*	VIRTUAL MEMORY PRINT EXECUTION ROUTINE 4TH VM PAGE	*
		9892	*	* OUTPUTS FORMATTED DATA ELEMENT TO CRT DISPLAY UNIT	*
		9893	*	* CONTROLS CRT CURSOR DEPENDING ON SPECIFIED CONTROL CODE	*
		9894	*		*
		9895	*	INPUT -	*
		9896	*	* RUN-TIME STACK - CONTAINS FORMATTED ELEMENT, IF PRESENT	*
		9897	*	* I\$PARM - 1 BYTE, CONTAINS CONTROL CODE BRANCH DISPLACEMENT	*
		9898	*	* I\$PARM-1 - 1 BYTE, CONTAINS FORMATTED ELEMENT CHARACTER COUNT	*
		9899	*	* I\$WRK1 - 2 BYTES, CONTAINS CORE ADDR OF PRINT AREA LEFT BYTE	*
		9900	*	* I@WRK2 - 2 BYTES, CONTAINS VALUE FOR \$PRDEV 'CRT ONLY' COND	*
		9901	*	* ISSLLC - 1 BYTE, CONTAINS OUTPUT ELEMENT LENGTH CODE (LNG - 1)	*
		9902	*		*
		9903	*	OUTPUT -	*
		9904	*	* DISPLAYED ELEMENT AND/OR CURSOR CONTROL ON CRT DISPLAY UNIT	*
		9905		*****	
		9906	*		
		9907	*	ESTABLISH ADDRESSABILITY FOR PRINT ROUTINE (4TH VM PAGE)	
		9908	*		
		9909		*FZSP4B VPAGE 0	
3700		9910		ORG *,256,0 SET STARTING ADDRESS	
		9911	FZSP4B EQU *	START OF PROGRAM CODING	
3601		9912		ORG *-255 RESET IAR TO PAGE	
3700		9913		ORG *,256,0 * BOUNDARY ADDRESS	
		9914		USING *,@BR SET PAGE BASE ADDRESS	
3700		9915		ORG FZSP4B RESET STARTING ADDRESS	
		9916		*** END OF EXPANSION ***	
		9917	*		
		9918	*	PAGE ENTRY - ESTABLISH CRT IOCR EXECUTION CORE ADDRESS	
		9919	*		
3700 4C 01 D7 0D5B		9920	FZS800 MVC	FZS982+@OP1(,@BR),I\$WRK2(@CADDR) SET CRT EXECUTION CADDR	
		9921	*		
		9922	*	INITIALIZE FOR OUTPUT TO THE CRT DISPLAY UNIT	
		9923	*		
3705 7C 40 64		9924		MVI FZS4RM(,@BR),@DLNLG SET CRT RIGHT MARGIN PARAMETER	
		9925	*		
		9926	*	INITIALIZE THE ELEMENT PRINT PARAMETER LIST	
		9927	*		
3708 7C 40 E0		9928		MVI FZS4PF(,@BR),@PRINT SET FUNCTION FOR PRINT ONLY	
370B 4C 00 E1 0D56		9929		MVC FZS4PC(,@BR),I\$PARM-1(1) SET COUNT - ELEMENT CHAR COUNT	
3710 4C 01 E3 0D59		9930		MVC FZS4PA(,@BR),I\$WRK1(@CADDR) SET PRINT AREA CODE ADDRESS	
		9931	*		
		9932	*	TEST FOR AN ARITHMETIC ELEMENT - RETURN CURSOR IF ARITHMETIC	
		9933	*	ELEMENT LENGTH EXCEEDS OUTPUT LINE MARGIN	
		9934	*		
3715 5C 00 C6 E1		9935		MVC FZS4CC(,@BR),FZS4PC(1,@BR) SET PARAM = ELEMENT CHAR CNT	
3719 3D 12 0BA1		9936		CLI I\$SLLC,I@LCRV-1 IF CURR ELEMENT IS ARITHMETIC	
371D D0 01 BD		9937		BNE FZS960(,@BR) * LINK TO RTRN CURSOR ON COND	
		9938	*		
		9939	*	BRANCH TO APPROPRIATE ROUTINE DEPENDING ON CONTROL CODE	
		9940	*		
3720 4C 00 27 0D57		9941		MVC FZS805+@D1(,@BR),I\$PARM(1) MOVE CONTROL DISP TO JUMP INST	
3725 F2 87 00		9942	FZS805 J	*-* GO EXEC CONTROL CODE ROUTINE	
		9943	*		
		9944		*****	

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ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 151
				9946		*****				
				9947	*	OUTPUT ROUTINE FOR PRINT CONTROL CODES 1, 9, 11, 13, 15				*
				9948		*****				
				9949	*					
				9950	*	DISPLAY THE FORMATTED ELEMENT ONLY (WHEN SIGNIFICANT)				
				9951	*					
3728	7D	00	E1	9952	FZS810	CLI	FZS4PC(,@BR),@ZERO		IF ELEMENT CHAR COUNT NOT ZERO	
372B	F2	01	85	9953		JNE	FZS910		* GO DISPLAY ELEMENT ONLY,	
372E	F2	87	88	9954		J	FZS950		* ELSE EXIT RTN W/O DISPLAYING	
				9955	*					
3731	000000000000000000		373F	9956		DC	XL15'00'		PATCH SPACE	1-5
				9958		*****				
				9959	*	OUTPUT ROUTINE FOR PRINT CONTROL CODE 2				*
				9960		*****				
				9961	*					
				9962	*	ESTABLISH FULL PRINT ZONE OUTPUT FORMAT (ARITHMETIC ELEMENT)				
				9963	*					
3740	7C	12	C6	9964	FZS820	MVI	FZS4CC(,@BR),I@LFPZ		SET PARAM = FULL PRINT ZONE	
3743	F2	87	18	9965		J	FZS836		BRANCH TO TEST LINE CAPACITY	
				9966	*					
				9967		*****				

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 152
		9969		*****	
		9970		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 3	*
		9971		*****	
		9972		*	
		9973		* ESTABLISH PACKED PRINT ZONE OUTPUT FORMAT (ARITHMETIC ELEMENT) -	
		9974		* THIS ZONE WILL BE 6, 9, 12, 15, OR 18 CHARACTERS LONG DEPENDING ON	
		9975		* THE LENGTH OF THE ARITHMETIC ELEMENT TO BE PRINTED	
		9976		*	
3746	7C 04 C6	9977	FZS830 MVI	FZS4CC(,@BR),2*I@LPPZ-2	SET LENGTH ACCUN TO MINIMUM
		9978		*	* ELEMENT LENGTH LIMIT (4)
3749	5D 00 E1 C6	9979	FZS832 CLC	FZS4PC(,@BR),FZS4CC(1,@BR)	IF ELEMENT LENGTH WITHIN LIMIT
374D	F2 04 0A	9980		JNH FZS834	* BRANCH TO EXIT THIS LOOP
3750	5E 00 C6 DF	9981		ALC FZS4CC(,@BR),FZS4PZ(1,@BR)	ADD PACKED ZONE INCR TO ACCUM
3754	7D 10 C6	9982		CLI FZS4CC(,@BR),I@LFPZ-2	IF LENGTH ACCUM NOT MAXIMUM
3757	D0 82 49	9983		BL FZS832(,@BR)	* GO REPEAT ELEMENT LENGTH TEST
		9984		*	
375A	5E 00 C6 DE	9985	FZS834 ALC	FZS4CC(,@BR),FZS4B2(1,@BR)	ADJUST ACCUM TO MAKE PACKED
		9986		*	* PRINT ZONE FIELD LENGTH
		9987		*	
		9988		* TEST LINE CAPACITY TO CONTAIN CURRENT POINT ZONE FIELD - WHEN RIGHT	
		9989		* MARGIN IS EXCEEDED, LINE HAS CAPACITY FOR TED DATA ELEMENT BUT NOT	
		9990		* FOR THE ENTIRE PRINT ZONE ... IN THIS CASE, DISPLAY ELMEMENMT ONLY	
		9991		* AND RETURN THE CURSOR.	
		9992		*	
375E	4E 00 C6 03E2	9993	FZS836 ALC	FZS4CC(,@BR),\$CRPOS(1)	ADD PRINT ZONE LNG TO CURRENT
3763	7D 00 C6	9994	FZS838 CLI	FZS4CC(,@BR),*-*	* CURSOR POSITION - BRANCH
3766	F2 82 12	9995		JM FZS855	* IF RIGHT MARGIN IS EXCEEDED
		9996		*	
		9997		* LINE HAS CAPACITY FOR ENTIRE PRINT ZONE - DISPLAY ELEMENT AND SPACE	
		9998		* TO THE SPECIFIED ZONE POSITION	
		9999		*	
3769	4F 00 C6 03E2		FZS840 SLC	FZS4CC(,@BR),\$CRPOS(1)	RESTORE CURRENT PRINT ZONE LNG
376E	5C 00 E1 C6	1		MVC FZS4PC(,@BR),FZS4CC(1,@BR)	SET COUNT = CURR PRT ZONE LNG
3772	F2 87 3E	2		J FZS910	GO DISPLAY ELEM & SPACE CURSOR
		3		*	
		4		*****	

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ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 153
		6		*****	
		7		* OUTPUT ROUTINE FOR PRINT CONTROL CODES 4, 12, 16	*
		8		*****	
		9		*	
		10		* TEST ELEMENT SIGNIFICANCE - RETURN CURSOR NO WHEN NOT SIGNIFICANT	
		11		*	
3775	7D 00 E1	12	FZS850	CLI FZS4PC(,@BR),@ZERO	IF ELEMENT CHAR COUNT IS ZERO
3778	F2 81 20	13		JE FZS880	* GO RETURN THE CURSOR ONLY
		14		*	
		15		* ELEMENT IS SIGNIFICANT - DISPLAY ELEMENT AND RETURN CURSOR	
		16		*	
377B	7C C0 E0	17	FZS855	MVI FZS4PF(,@BR),@PRETR	SET PRINT & CARR RETURN FUNC
377E	F2 87 32	18		J FZS910	GO DISPLAY ELEM AND RTRN CURSOR
		20		*****	
		21		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 5	*
		22		*****	
		23		*	
		24		* ESTABLISH FULL PRINT ZONE SPACING ONLY	
		25		*	
3781	7C 12 E1	26	FZS860	MVI FZS4PC(,@BR),I@LFPZ	SET CO:AT R04 FLU *QM ZONE
3784	F2 87 03	27		J FZS875	BRANCH TO EXEC?TE SPACINS
		29		*****	
		30		* OUTPUT ROUTINE FOR PRINT COHT4OL CODE 6	*
		31		*****	
		32		*	
		33		* ESTABLISH PACKED PRINT ZONE INCREMENT SPACING ONLY	
		34		*	
3787	7C 03 E1	35	FZS870	MVI FZS4PC(,@BR),I@LPPZ	SET COUNT FOR PACKED ZONE INCR
		36		*	
		37		* DISPLAY CURRENT ZONE, OR RETURN CURSOR IF END OF LINE IS HIT	
		38		*	
378A	5C 00 C6 E1	39	FZS875	MVC FZS4CC(,@BR),FZS4PC(1,@BR)	SET PARAM FOR CURRENT ZONE LNG
378E	D0 87 BD	40		B FZS960(,@BR)	LINK TO RETURN CURSOR ON COND
3791	5D 00 C6 64	41		CLC FZS4CC(,@BR),FZS4RM(1,@BR)	IF CURSOS WAS NOT RETURNED
3795	F2 04 1B	42		JNH FZS910	* GO DISPLAY CURR ZONE SPACE
3798	F2 87 1E	43		J FZS950	* ELSE EXIT RTN W/O DISPLAYING
		44		*	
		45		*****	

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 154
		47		*****			
		48		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 7			*
		49		*****			
		50		*			
		51		* ESTABLISH CURSOR RETURN ONLY			
		52		*			
379B	D2 02 C6	53	FZS880	LA FZS4CC(,@BR),@XR			LOAD CURSOR RETURN PPL CADDR
379E	F2 87 15	54		J FZS920			GO EXECUTE CURSOR RETURN
		56		*****			
		57		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 8			*
		58		*****			
		59		*			
		60		* RETURN CURSOR IF FULL PRINT ZONE EXCEEDS LINE CAPACITY			
		61		*			
37A1	7C 12 C6	62	FZS890	MVI FZS4CC(,@BR),I@LFPZ			SET PARAM FOR FULL PRINT ZONE
37A4	D0 87 BD	63		B FZS960(,@BR)			LINK TO RETURN CLRSR ON COND
37A7	F2 87 0F	64		J FZS950			GO EXIT DISPLAY ROUTINE
		66		*****			
		67		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 10			*
		68		*****			
		69		*			
		70		* RETURN CURSOR IF FULL PRINT ZONE EXCEEDS LINE CAPACITV			
		71		*			
37AA	7C 12 C6	72	FZS895	MVI FZS4CC(,@BR),I@LFPZ			SET PARAM FOR FULL PRINT ZONE
37AD	D0 87 BD	73		B FZS960(,@BR)			LINK TO RETURN CURSOS ON COND
		74		*			
		75		*****			

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 155
		77		*****			
		78		* OUTPUT ROUTINE FOR PRINT CONTROL CODE 14			*
		79		*****			
		80		*			
		81		* ESTABLISH FULL PRINT ZONE OUTPUT FORMAT (CHARACTER ELEMENT)			
		82		*			
37B0	7C 12 E1	83	FZS900	MVI FZS4PC(,@BR),I@LFPZ SET COUNT FOR FULL PRINT ZONE			
		84		*			
		85		* EXECUTE ELEMENT OUTPUT TO THE CRT DISPLAY UNIT			
		86		*			
37B3	D2 02 E0	87	FZS910	LA FZS4PL(,@BR),@XR LOAD DATA OUTPUT PPL CORE ADDR			
		88		*			
37B6	D0 87 CE	89	FZS920	B FZS980(,@BR) LINK TO EXECUTE CRT OUTPUT			
		90		*			
		91		* RETURN TO PRINT ROUTINE 3RD VM PAGE			
		92		*			
37B9	C0 87 12D3	93	FZS950	B I\$RTRN RETURN TO 3RD PRINT RTN PAGE			
		94		*			
		95		*****			

FZSPRT - S/3 BASIC INTERPRETER PRINT STATEMENT EXEC RTN

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 156
		97		*****	
		98	*	DISPLAY UNIT CURSOR RETURN ROUTINE -	*
		99	*	* RETURNS CURSOR WHEN SPECIFIED LENGTH PARAMETER (FZS4CC)	*
		100	*	EXCEEDS THE CURRENT CRT DISPLAY LINE CAPACITY.	*
		101		*****	
		102	*		
37BD	74 08 DD	103	FZS960 ST	FZS990+@OP1(,@BR),@ARR STORE RETURN BRANCH ADDRESS	
		104	*		
		105	*	TEST LINE CAPACITY TO CONTAIN CURRENT DISPLAY REGION LENGTH	
		106	*		
37C0	4E 00 C6 03E2	107	ALC	FZS4CC(,@BR),\$CRPOS(1) ADD PRINT REGION LENGTH TO CURR	
37C5	7D 00 64	108	FZS970 CLI	FZS4RM(,@BR),*-*	* CURSOR POSITION - BRANCH IF
37C8	F2 02 0F	109	JNL	FZS990	* RIGHT MARGIN NOT EXCEEDED
		110	*		
		111	*	RIGHT MARGIN EXCEEDED - RETURN DISPLAY UNIT CURSOR	
		112	*		
37CB	D2 02 E4	113	LA	FZS4CR(,@BR),@XR LOAD CURSOR RETURN PPL CADDR	
		114	*		
		115		*****	
		116	*	DISPLAY UNIT OUTPUT INTERFACE -	*
		117	*	* EXECUTES CRT DISPLAY OUTPUT AS SPECIFIED IN PRINT PARAMETER	*
		118	*	* LIST REFERENCED BY REGISTER @XR.	*
		119		*****	
		120	*		
37CE	74 08 DD	121	FZS980 ST	FZS990+@OP1(,@BR),@ARR STORE RETURN BRANCH ADDRESS	
		122	*		
37D1	74 02 D9	123	ST	FZS984(,@BR),@XR STORE PPL CORE ADDRESS	
37D4	C0 87 0000	124	FZS982 B	*-*	LINK TO EXECUTE CRT IOCR
37D8		125	FZS984 DS	CL(@CADDR)	CRT IOCS PARAMETER LIST CADDR
		126	*		
		127	*	RETURN TO CALLING ROUTINE	
		128	*		
37DA	C0 87 0000	129	FZS990 B	*-*	RETURN BRANCH
		130	*		
		131		*****	

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 157
			133	*****	
			134	* PRINT EXECUTION ROUTINE CONSTANTS (4TH VM PAGE)	*
			135	*****	
			136	*	
37DE 02		37DE	137	FZS4B2 DC IL1'2'	BINARY INTEGER +2
			138	*	
37DF 03		37DF	139	FZS4PZ DC AL1(I@LPPZ)	LENGTH OF PACKED ZONE INCR
			140	*	
			141	*****	
			142	* PRINT EXECUTION ROUTINE WORK AREAS (4TH VM PAGE)	*
			143	*****	
			144	*	
		3764	145	FZS4RM EQU FZS838+@Q	CRT DISPLAY RIGHT MARGIN
		37C6	146	FZS4CC EQU FZS970+@Q	PRINT AREA CHARACTER COUNT
			147	*	
			148	*FZS4PL PPL	
		37E0	149	FZS4PL EQU *	PPL ADDRESS
37E0 00		37E0	150	DC AL1(*-*)	FUNCTION REQUESTED
37E1 00		37E1	151	DC AL1(*-*)	PRINT COUNT
37E2 0000		37E3	152	DC AL2(*-*)	DATA ADDRESS
			153	*** END OF EXPANSION ***	
		37E0	155	FZS4PF EQU FZS4PL+@PCTRL	PRINT FUNCTION PARAMETER
		37E1	156	FZS4PC EQU FZS4PL+@PRCNT	PRINT AREA COUNT PARAMETER
		37E3	157	FZS4PA EQU FZS4PL+@PDATA	PRINT AKEA CADDR PARAMETER
			158	*	
			159	*FZS4CR DPL FUNC-@REYRN,CNT=@RTRNC	
		37E4	160	FZS4CR EQU *	PPL ADDRESS
37E4 80		37E4	161	DC AL1(@RETRN)	FUNCTION REQUESTED
37E5 80		37E5	162	DC AL1(@RTRNC)	PRINT COUNT
37E6 0000		37E7	163	DC AL2(*-*)	DATA ADDRESS
			164	*** END OF EXPANSION ***	
			165	*	
			166	*****	
			167	*	
			168	* END OF PRINT EXECUTION ROUTINE CODING *****	
			169	*##### IMG_XXXX - IMG_0517 #####	
4BFF			170	ORG X'4BFF'	TEMP!!!

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 158
		172		*****			
		173	*	5703-XM1 COPYRIGHT IBM CORP. 1970			*
		174	*	REFER TO INSTRUCTIONS ON COPY RIGHT NOTICE, 120-2083			*
		175	*				*
		176		*****			*
		177	*	*STATUS			*
		178	*	VERSION 1 MODIFICATION 0			*
		179	*				*
		180	*	*FUNCTION			*
		181	*	* FZZVMP EXECUTION CAUSES ALL MODIFIED CORE VIRTUAL MEMORY PAGES			*
		182	*	TO BE WRITTEN BACK TO DISK (PUSHED) OR ALL UNLOCKED CORE			*
		183	*	VIRTUAL MEMORY PAGES TO BE LOADED INTO CORE (PULLED).			*
		184	*	* OPERATION OF THIS ROUTINE DEPENDS UPON THE ENTRY POINT SELECTED			*
		185	*	FOR EXECUTION -			*
		186	*	* ENTRY POINT FZZVPS - ALL CORE VIRTUAL MEMORY PAGES REFER-			*
		187	*	ENCED WITH A 'MODIFY' INDICATOR IN THE PAGING MODULE 'LOCK			*
		188	*	AND READ ONLY' INDICATOR TABLE ARE WRITTEN INTO DISK			*
		189	*	VIRTUAL MEMORY. THE 'MODIFY' INDICATOR IS UNSET IN THE			*
		190	*	INDICATOR TABLE. THIS 'PUSH' IS AUTOMATICALLY ADJUSTED			*
		191	*	TO PROCESS AN EXPANDED TABLE AND CORE PAGE REGION FOR			*
		192	*	EXTENDED CORE CONFIGURATIONS.			*
		193	*	* ENTRY POINT FZZVPL - ALL CORE VIRTUAL MEMORY PAGES REFER-			*
		194	*	ENCED WITH A 'LOCK' INDICATOR IN THE PAGING MODULE 'LOCK			*
		195	*	AND READ ONLY' INDICATOR TABLE ARE REPLACED WITH THE			*
		196	*	CORRESPONDING PAGE FROM DISK VIRTUAL MEMORY. THIS 'PULL'			*
		197	*	IS AUTOMATICALLY ADJUSTED TO PROCESS AN EXPANDED TABLE AND			*
		198	*	CORE PAGE REGION FOR EXTENDED CORE CONFIGURATIONS.			*
		199	*				*
		200	*	*ENTRY POINTS			*
		201	*	* ENTRY FZZVPS - FOR PERFORMING THE 'PUSH' OPERATION.			*
		202	*	CALLING SEQUENCE IS			*
		203	*	B IPGCAL			*
		204	*	DC AL2(V\$VMPS)			*
		205	*	WHERE THE ADDRESS CONSTANT PARAMETER DEFINES THE VIRTUAL			*
		206	*	ADDRESS OF ENTRY POINT FZZVPS.			*
		207	*	* ENTRY FZZVPL - FOR PERFORMING THE 'PULL' OPERATION.			*
		208	*	CALLING SEQUENCE IS			*
		209	*	B IPGCAL			*
		210	*	DC AL2(V\$VMPL)			*
		211	*	WHERE THE ADDRESS CONSTANT PARAMETER DEFINES THE VIRTUAL			*
		212	*	ADDRESS OF ENTRY POINT FXXVPL.			*
		213	*	* IN EACH CASE, EXECUTION IS SUBJECT TO THE INPUT CONDITIONS			*
		214	*	DESCRIBED BELOW.			*
		215	*				*
		216	*	*INPUT			*
		217	*	* \$EXFTR - 1 BYTE, FOR THE SYSTEM CORE EXTENSION FACTOR. THIS			*
		218	*	CONTAINS THE NUMBER OF CORE PAGES (256-BYTE REGIONS) AVAILABLE			*
		219	*	FOR GENERAL USE BEYOND THE 8K MINIMUM CONFIGURATION.			*
		220	*	* PAGE INDICATOR TABLE - 10 BYTES (MINIMUM), FOR THE PAGING			*
		221	*	MODULE 'LOCK AND READ ONLY' CORE VIRTUAL MEMORY INDICATORS.			*
		222	*	THIS TABLE, WHICH IS EXPANDED TO (10+\$EXFTE-1) BYTES WHEN			*
		223	*	\$EXFTR IS NON-ZERO, CONTAINS A SINGLE BYTE ENTRY CORRESPONDING			*
		224	*	TO EACH CORE PAGE. BIT 6 (MASK X'02') IN EACH ENTRY INDICATES			*
		225	*	THE MODIFICATION STATUS OF A CORE PAGE (1 = MODIFIED).			*
		226	*	BIT 7 (MASK X'01') IN EACH ENTRY INDICATES THE LOCKED STATUS			*
		227	*	OF A CORE PAGE (1 = LOCKED).			*

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 159
		228	*	* PAGE REFERENCE TABLE - 256 BYTES, FOR THE PAGING MODULE CORE	*		
		229	*	VIRTUAL MEMORY MAP. EACH BYTE IN THIS TABLE IS ASSOCIATED WITH	*		
		230	*	A SPECIFIC VIRTUAL MEMORY PAGE, AND CONTAINS EITHER A VALUE OF	*		
		231	*	ZERO OR THE NUMBER OF THE CORE PAGE CURRENTLY FILLED WITH THAT	*		
		232	*	VIRTUAL MEMORY PAGE.	*		
		233	*		*		
		234	*	*OUTPUT	*		
		235	*	* DISK VIRTUAL MEMORY - FOR ENTRY POINT FZZVPS ONLY, EACH CORE	*		
		236	*	VIRTUAL MEMORY PAGE, FOR WHICH A 'PAGE MODIFY' BIT IS SET IS	*		
		237	*	WRITTEN BACK TO DISK VIRTUAL MEMORY SO THAT DISK V.M. PAGES	*		
		238	*	REFLECT THE CURRENT PROCESSING STATUS.	*		
		239	*	* CORE VIRTUAL MEMORY - FOR ENTRY POINT FZZVPL ONLY, EACH CORE	*		
		240	*	VIRTUAL MEMORY PAGE, FOR WHICH A 'PAGE LOCKED' BIT IS NOT SET,	*		
		241	*	IS REPLACED WITH THE CORRESPONDING DISK VIRTUAL MEMORY PAGE	*		
		242	*	SO THAT CORE V.M. PAGES REFLECT CURRENT DISK STATUS.	*		
		243	*		*		
		244	*	*EXTERNAL REFERENCES	*		
		245	*	* \$DISKN - ENTRY POINT FOR THE SYSTEM PHYSICAL DISK IOCS.	*		
		246	*	* \$WAITF - CORE ADDRESS OF 'WAIT' FUNCTION DISK PARAMETER LIST.	*		
		247	*	* I\$RTRN - ENTRY POINT FOR PAGING MODULE V.M. RETURN CONTROL RTN.	*		
		248	*	* \$EXFTR - 1 BYTE, FOR THE SYSTEM CORE EXTENSION FACTOR.	*		
		249	*	* I\$CSXA - CORE ADDRESS OF 1ST BYTE IN CORE EXTENSION PAST 8K.	*		
		250	*	* ISPLAT - CORE ADDRESS OF PAGE INDICATOR TABLE BASE ENTRY.	*		
		251	*	* I\$PSTB - CORE ADDRESS OF PAGE REFERENCE TABLE BASE ENTRY.	*		
		252	*		*		
		253	*	*EXITS, NORMAL	*		
		254	*	CONTROL IS ALWAYS PASSED TO THE PAGING ROUTINE AT ENTRY POINT.	*		
		255	*	I\$RTRN (IPGRTN) FOR A RETURN TO THE CALLING PROGRAM.	*		
		256	*		*		
		257	*	*EXITS, ERROR	*		
		258	*	N/A	*		
		259	*		*		
		260	*	*TABLES/WORK AREAS	*		
		261	*	* DISK ADDRESS CONVERSION WORK AREAS - TWO 2-BYTE AREAS USED TO	*		
		262	*	CONVERT LOGICAL DISK ADDRESSES TO PHYSICAL (A LA DL4ICS).	*		
		263	*	* DISK PARAMETER LIST - 6 BYTES, FOR VIRTUAL PAGE READ/WRITE	*		
		264	*	OPERATIONS.	*		
		265	*		*		
		266	*	*ATTRIBUTES	*		
		267	*	* REUSABLE	*		
		268	*	* NATURALLY RELOCATABLE	*		
		269	*		*		
		270	*	*CHARACTER CODE DEONENCY	*		
		271	*	THE OPERATION OR THIS MODULE DOES NOT DEPEND UPON A PARTICULAR	*		
		272	*	INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.	*		
		273	*		*		
		274	*	*NOTES	*		
		275	*	ERROR PROCEDURES	*		
		276	*	N/A	*		
		277	*		*		
		278	*	REGISTER USAGE	*		
		279	*	* REGISTER @BR IS TO CONTAIN THE CORE PAGE BASE ADDRESS	*		
		280	*	ESTABLISHED THROUGH PAGING MODULE CONTROL FOR THE PAGE WHICH	*		
		281	*	INCLUDES FZZVMP, AND IS RESTORED THROUGH THE PAGING MODULE.	*		
		282	*	* REGISTER @XR IS NOT SAVED. IT IS USED IN FZZVMP FPR GENERAL	*		
		283	*	PURPOSE INDEXING OPERATIONS.	*		

284	*				*
285	*	SAVED/RESTORED AREAS			*
286	*	N/A			*
287	*				*
288	*	MODIFICATION CONSIDERATIONS			*
289	*	N/A			*
290	*				*
291	*	REQUIRED MODULES			*
292	*	* @SYSEQ - COMMON SYSTEM EQUATES			*
293	*	* @FXDEQ - SYSTEM NUCLEUS ADDRESSES AND INDICATOR EQUATES.			*
294	*	* \$B@EQU - COMPILER PARAMETER AND CONSTANT EQUATES.			*
295	*	* \$I\$EQU - INTERPRETER FIXED LOCATION ADDRESS EQUATES.			*
296	*	* \$I@SEQ - INTERPRETER PARAMETER EQUATES (FOR STD PREC. ONLY)			*
297	*	* \$I@LEQ - INTERPRETER DARANETER EQUATES (FOR LNG PREC. ONLY)			*
298	*				*
299	*	OTHER			*
300	*	N/A			*
301	*	*****			*

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 161
					303	*****				
					304	* START OF VIRTUAL MEMORY PUSH/PULL EXECUTION ROUTINE	*			
					305	*****				
					306	*				
					307	* ESTABLISH VIRTUAL PAGE ADDRESSABILTY				
					308	*				
					309	*FZPGB VPAGE 0				
4C00					310	ORG *,256,0	SET STARTING ADDRESS			
				4C00	311	FZZPGB EQU *	START OF PROGRAM CODING			
4B01					312	ORG *-255	RESET IAR TO PAGE			
4C00					313	ORG *,256,0	WOMAN ADDRESS			
				4C00	314	USING *,@BR	SET PAGE EASE ADDRESS			
4C00					315	ORG FZZPGB	RESET STARTING ADDRESS			
					316	*** END OF EXPANSION ***				
					317	*				
					318	*****				

FZZVMP - S/3 BASIC INTERPRETER V.M. PUSH/PULL EXEC RTN									
ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15,	MOD 00 31/05/21 PAGE 162
					320	*			
					321	*	ENTRY POINT FZZVPS - SET VIRTUAL PAGE PUSH FUNCTION.		
					322	*			
				4C00	323	FZZVPS EQU *	VM PUSH ROUTINE ENTRY POINT		
4C00	7C	02	BD		324	MVI FZZDPL+@DCTRL(,@BR),@DPUT	SET DISK OUTPUT PARAMETER		
4C03	F2	87	03		325	J FZZ005	GO PERFORM THE PUCH OPERATION		
					326	*			
					327	*	ENTRY POINT FZZVPL - SET VIRTUAL PAGE PULL FUNCTION.		
					328	*			
				4C06	329	FZZVPL EQU *	VM PULLH ROUTINE ENTRY POINT		
4C06	7C	01	BD		330	MVI FZZDPL+@DCTRL(,@BR),@DGET	SET DISK OUTPUT PARAMETER		
					332	*			
					333	*	INITIALIZE PUSH/PULL ROUTINE FOR 8K SYSTEM ENVIRONMENT.		
					334	*			
4C09	7C	0A	2B		335	FZZ005 MVI FZZ020+@D1(,@BR),I@NCPG	SET MAX CORE PAGE COUNT FOR 8K		
4C0C	5C	01	BA B5		336	MVC FZZHCA(,@BR),FZZSXA(@CADDR,@BR)	SET HIGH CORE ADDR FOR 8K		
					337	*			
					338	*	TEST FOR CORE AVAILABILITY BEYOND 8K - RE-INITIALIZE IF EXTENDED CORE		
					339	*			
4C10	3D	00	043B		340	CLI \$EXFTR,@ZERO	TEST FOR NULL CORE EXTENSION		
4C14	F2	81	0E		341	JE FZZ010	BRANCH IF ONLY 8K SYSTEM CONFIG.		
					342	*			
4C17	4E	00	2B 043B		343	ALC FZZ020+@D1(,@BR),\$EXFTR(1)	ADD 1 LESS THAN EXTRA NO. OF		
4C1C	5F	00	2B B3		344	SLC FZZ020+@D1(,@BR),FZZBN1(1,@BR)	* PAGES TO CORE PAGE COUNT		
4C20	4E	00	B9 043B		345	ALC FZZHCA-1(,@BR),\$EXFTR(1)	SET EXTENDED SYSTEM HIGH CADDR		
					346	*			
					347	*****			

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ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 163
					349	*				
					350	*	ACCESS A CORE PAGE ENTRY IN THE PAGING MODULE 'LOCK AND READ ONLY'			
					351	*	INDICATOR TABLE			
					352	*				
	4C25	C2	02	15E1	353	FZZ010	LA I\$PLRT-1,@XR		LOAD CORE PAGE INDR TABLE BASE	
	4C29	E2	02	00	354	FZZ020	LA *-*(,@XR),@XR		INCR POINTER TO CORE PAGE ENTRY	
					355	*				
					356	*	TEST FOR PUSH OR PULL FUNCTION EXECUTION			
					357	*				
	4C2C	7D	01	BD	358		CLI FZZDPL+@DCTRL(@BR),@DGET IF DISK PARAM SET FOR INPUT			
	4C2F	F2	81	0C	359		JE FZZ025		* BRANCH TO EXECUTE PAGE PULL	
					360	*				
					361	*	PUSH FUNCTION - TEST THE CURRENTLY REFERENCED CORE PAGE INDICATOR			
					362	*	FOR MODIFY BIT SET ON, AND PUSH THE CORE PAGE ONLY IF MODIFIED			
					363	*				
	4C32	B8	02	00	364		TBN FZZLRT(@XR),FZZMDY		IF CORE PAGE IS NOT MODIFIED	
	4C35	F2	90	6A	365		JF FZZ090		* GO DECREMENT CORE PAGE COUNT	
	4C38	BB	02	00	366		SBF FZZLRT(@XR),FZZMDY		PAGE MODIFIED - SET INDICATOR	
	4C3B	F2	87	06	367		J FZZ030		* OFF AND GO PERFORM PAGE PUSH	
					368	*				
					369	*	PULL FUNCTION - TEST THE CURRENTLY REFERENCED CORE PAGE INDICATOR			
					370	*	FOR LOCK BIT SET ON, AND PULL THE CORE PAGE ONLY IF NOT LOCKED			
					371	*				
	4C3E	B8	01	00	372	FZZ025	TBN FZZLRT(@XR),FZZLOK		IF THE CORE PAGE IS LOCKED	
	4C41	F2	10	5E	373		JT FZZ090		* GO DECREMENT CORE PAGE COUNT	
					374	*				
					375	*	PUSH OR PULL CURRENTLY REFERENCED CORE PAGE - SEARCH THE PAGE			
					376	*	REFERENCE TABLE TO DETERMINE THE ACTUAL VIRTUAL PAGE NUMBER			
					377	*				
	4C44	7C	FF	51	378	FZZ030	MVI FZZ040+@D1(@BR),FZZBM1		SET VIRTUAL PAGE NO. = MINUS 1	
	4C47	C2	02	14CA	379		LA I\$PGTB,@XR		LOAD PAGE REFERENCE TABLE BASE	
	4C4B	5E	00	51 B3	380	FZZ035	ALC FZZ040+@D1(@BR),FZZBN1(1,@BR)		INCREMENT VIRTUAL PAGE NO.	
	4C4F	5D	00	00 2B	381	FZZ040	CLC *-*(@BR),FZZ020+@D1(1,@BR)		COMPARE REF TBL ENTRY W/ CORE	
	4C53	D0	01	4B	382		BNE FZZ035(@BR)		* PAGE NO. AND LOOP IF NO MATCH	
					383	*				
					384	*	*****			

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER	15,	MOD	00	31/05/21	PAGE	164
				386			*****							
				387			* CONVERT VIRTUAL PAGE NUMBER TO A PHYSICAL DISK ADDRESS							*
				388			*****							
				389			*							
				390			* ESTABLISH LOGICAL DISK ADDRESS IN THE DISK PARAMETER LIST							
				391			*							
4C56	7C	07	BE	392		MVI	FZZDPL+@DCYL(,@BR),B@DVCY SET VIRTUAL MEMORY BASE CYL NO.							
4C59	5C	00	BF 51	393		MVC	FZZDPL+@DSAD(,@BR),FZZ040+@D1(1,@BR) SET RELATIVE SECTOR							
				394			* ADDRESS EQUAL VIRT PAGE NO.							
				395			*							
				396			* DETERMINE THE TRACK SECTOR COUNT (= LOGICAL SECTOR ADDRESS, MOD 24).							
				397			* INCREMENT THE CYLINDER/DISK/TRACK INDICATOR DURING EACH PASS THROUGH							
				398			* THE SUBTRACTION (DIVISION) LOOP.							
				399			*							
4C5D	5C	01	BC B8	400		MVC	FZZCNT(,@BR),FZZCDT(@DADDR,@BR) INITLZ CYL/DISK/TRACK CNT							
4C61	5F	01	BC B8	401	FZZ050	SLC	FZZCNT(,@BR),FZZCDT(@DADDR,@BR) INCR CYL/DISK/TRACK COUNT							
4C65	5F	00	BF B6	402		SLC	FZZDPL+@DSAD(,@BR),FZZNST(1,@BR) DECR LOGICAL SECTOR ADDR							
4C69	D0	02	61	403		BNM	FZZ050(,@BR) REPEAT UNTIL SADDR IS NEGATIVE							
4C6C	5E	00	BF B6	404		ALC	FZZDPL+@DSAD(,@BR),FZZNST(1,@BR) RESTORE POSITIVE SADDR							
				405			*							
				406			* THE DISK PARAMETER LIST NOW CONTAINS THE PHYSICAL SECTOR COUNT -							
				407			* THE CYLINDER CORRECTION COUNT CONTAINS THE INCREMENT WITH WHICH TO							
				408			* ADJUST THE LOGICAL CYLINDER ADDRESS, AND BITS 0 AND 1 OF THE DISK/							
				409			* TRACK INDICATOR BYTE ARE SET RESPECTIVELY TO THE CORRECT PHYSICAL							
				410			* DISK AND TRACK STATUS CONDITIONS.							
				411			*							
				412			* CONVERT THE LOGICAL (BASE) CYLINDER ADDRESS TO A PHYSICAL ADDRESS							
				413			*							
4C70	5E	00	BE BB	414		ALC	FZZDPL+@DCYL(,@BR),FZZCNT-1(1,@BR) ADJUST THE CYL ADDR							
				415			*							
				416			* SHIFT SECTOR COUNT 2 BITS LEFT (MULTIPLY BY 4)							
				417			*							
4C74	5E	00	BF BF	418		ALC	FZZDPL+@DSAD(,@BR),FZZDPL+@DSAD(1,@BR) SHIFT COUNT (2X)							
4C78	5E	00	BF BF	419		ALC	FZZDPL+@DSAD(,@BR),FZZDPL+@DSAD(1,@BR) SHIFT COUNT (4X)							
				420			*							
				421			* SET THE SECTOR ADDRESS DISK (REMOVABLE OR FIXED) INDICATOR BIT							
				422			*							
4C7C	78	80	BC	423		TBN	FZZCNT(,@BR),FZZIDM TEST INDICATOR DISK BIT							
4C7F	F2	90	03	424		JF	FZZ060 * AND BRANCH IF NOT EQUAL 1							
4C82	7A	01	BF	425		SBN	FZZDPL+@DSAD(,@BR),FZZSDM SET SADDR FOR FIXED DISK							
				426			*							
				427			* SET THE SECTOR ADDRESS TRACK (UPPER OR LOWER) INDICATOR BIT							
				428			*							
4C85	78	40	BC	429	FZZ060	TBN	FZZCNT(,@BR),FZZITM TEST INDICATOR TRACK BIT							
4C88	F2	90	03	430		JF	FZZ070 * AND BRANCH IF NOT EQUAL 1							
4C8B	7A	80	BF	431		SBN	FZZDPL+@DSAD(,@BR),FZZSTM SET SADDR FOR LOWER TRACK							
				432			*							
				433			*****							

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER	15,	MOD	00	31/05/21	PAGE	165
					435		*****							
					436	*	PERFORM READ/WRITE BETWEEN CORE PAGE AND DISK VIRTUAL MEMORY							*
					437		*****							
					438	*								
					439	*	CALCULATE THE AFFECTED CORE PAGE ACTUAL CORE ADDRESS							
					440	*								
	4C8E	5C	01	C2	BA	441	FZZ070 MVC	FZZDPL+@DBFR2(,@BR),FZZHCA(@CADDR,@BR)	SET	HIGH	CORE	ADDR		
	4C92	5F	00	C1	2B	442	SLC	FZZDPL+@DBFR1(,@BR),FZZ020+@D1(1,@BR)	SUB	CORE	PAGE	NO.		
					443	*								
					444	*	PERFORM THE CORE PAGE - VIRTUAL MEMORY DISK OPERATION							
					445	*								
	4C96	D2	02	BD	446	LA	FZZDPL(,@BR),@XR	LOAD	PARAMETER	LIST	CORE	ADDR		
	4C99	74	02	A1	447	ST	FZZ080(,@BR),@XR	STORE	DPL	CORE	ADOR	FOR	CALL	
	4C9C	C0	87	0025	448	B	\$DISKN	LINK	TO	READ/WRITE	THE	CORE	PAGE	
	4CA0				449	FZZ080 DS	CL(@CADDR)	PARAMETER	LIST	CORE	ADDRESS			
					451	*								
					452	*	SET NEXT CORE PAGE PROCESSING - EXIT IF NO MORE CORE PAGES							
					453	*								
	4CA2	5F	00	2B	B3	454	FZZ090 SLC	FZZ020+@D1(,@BR),FZZBN1(1,@BR)	DECR	THE	CORE	PAGE	NUMBER	
	4CA6	D0	84	25	455	BP	FZZ010(,@BR)	GO	PROCESS	NEW	PAGE	UNLESS	ZERO	
					456	*								
					457	*	EXIT - RETURN TO THE CALLING ROUTINE							
					458	*								
	4CA9	C0	87	0025	459	B	\$DISKN	LINK	TO	WAIT	I/O	COMPLETED		
	4CAD	057F			460	DC	AL(@CADDR)(\$WAITF)	'WAIT'	FUNCTION	PARAM	CADDR			
					461	*								
	4CAF	C0	87	12D3	462	B	I\$RTRN	RETURN	TO	CALLING	ROUTINE			
					463	*								
					464		*****							

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466 *****
467 * VIRTUAL MEMORY PUSH/PULL ROUTINE CONSTANTS *
468 *****
469 *
4CB3 01      4CB3 470 FZZBN1 DC      IL1 '1'          BINARY INTEGER +1
471 *
4CB4 2000    4CB5 472 FZZSXA DC      AL (@CADDR) (I$CSXA)  CORE EXTENSION STARTING ADDRESS
473 *
4CB6 18      4CB6 474 FZZNST DC      AL1 (@DTRSZ)          NO. OF SECTORS PER DISK TRACK
4CB7 FFC0    4CB8 475 FZZCDT DC      XL (@DADDR) 'FFC0'     CYLINDER/DISK/TRACK DECREMENT
477 *****
478 * VIRTUAL MEMORY PUSH/PULL ROUTINE WORK AREAS *
479 *****
480 *
4CB9      4CBA 481 FZZHCA DS      CL (@CADDR)          HIGHEST AVAILABLE CADDR + 1
482 *
4CBB      4CBC 483 FZZCNT DS      CL (@DADDR)          CYLINDER/DISK/TRACK COUNTER
484 *
485 *FZZDPL DPL      CNT-1          VM I/O DISK PARAMETER LIST
4CBBD      4CBD 486 FZZDPL EQU      *          DISK PARAMETER LIST
4CBDD 00      4CBD 487          DC      AL1 (*-*)          REQUESTED FUNCTION
4CBE 00      4CBE 488          DC      AL1 (*-*)          CYLINDER ADDRESS
4CBF 00      4CBF 489          DC      AL1 (*-*)          HEAD/SECTOR/DRIVE/DISK SPEC
4CC0 01      4CC0 490          DC      AL1 (1)          SECTOR COUNT
4CC1 0000    4CC2 491          DC      AL2 (*-*)          BUFFER ADDRESS
492 *** END OF EXPANSION ***

494 *****
495 * VIRTUAL MEMORY PUSH/PULL ROUTINE EQUATES REFERENCING CONSTANTS *
496 *****
497 *
00FF      498 FZZBM1 EQU      X'FF'          BINARY INTEGER -1
499 *
0000      500 FZZLRT EQU      0          DISP FOR PAGE INDR TABLE ENTRY
0001      501 FZZLOK EQU      X'01'        CORE PAGE INDICATOR LOCK MASK
0002      502 FZZMDY EQU      X'02'        CORE PAGE INDICATOR MODIFY MASK
503 *
0080      504 FZZIDM EQU      X'80'        INDICATOR DISK BIT MASK
0040      505 FZZITM EQU      X'40'        INDICATOR TRACE BIT MASK
0001      506 FZZSDM EQU      X'01'        SECTOR ADDR DISK BIT MASK
0080      507 FZZSTM EQU      X'80'        SECTOR ADDR TRACK BIT MASK
508 *
509 *      END OF VIRTUAL MEMORY PUSH/PULL ROUTINE CODING *****
510 *

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DLFPRT - LINE PRINTER ROUTINE

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 167
	512				*****			
	513	*			5703-XM1 COPYRIGHT IBM CORP. 1970			*
	514	*			REFER TO INSTRUCTIONS ON COPY RIGHT NOTICE, 120-2083			*
	515	*						*
	516				*****			*
	517				*STATUS			*
	518	*			VERSION 1 MODIFICATION 0			*
	519	*						*
	520				*FUNCTION			*
	521	*			* DLFPRT EXECUTION CAUSES DATA OUTPUT AND/OR CARRIER POSITIONING			*
	522	*			ON THE SYSTEM PRINT DEVICE UNDER CONTROL OF CODES RECEIVED FROM			*
	523	*			THE CALLING ROUTINE, PRINTING IS DONE BIDIRECTIONALLY			*
	524	*			* THE FOLLOWING ACTIONS ARE PERFORMED DEPENDING ON THE CODE AND			*
	525	*			CARRIER POSITION:			*
	526	*			* INDEX, PRINT AND INDEX & TAB, PRINT AND INDEX			*
	527	*			* INPUT CODES			*
	528	*			* PRINT X'40' WILL CAUSE THE DATA TO BE PRINTED TO			*
	529	*			BE MOVED INTO THE LINE PRINTER BUFFER			*
	530	*			* PRINT & RETRN X'C0' WILL CAUSE THE DATA TO BE MOVED INTO			*
	531	*			THE BUFFER, AND THE CONTENTS PRINTED			*
	532	*			* CARRAGE RETRN X'80' WILL CAUSE AN INDEX IF THE BUFFER IS			*
	533	*			EMPTY OR THE BUFFER PRINTED IF NOT			*
	534	*						*
	535				*ENTRY POINTS			*
	536	*			THIS ROUTINE HAS A SINGLE CALLING ENTRY POINT - DLFPRT - WHOSE			*
	537	*			FUNCTION IS DEFINED ABOVE. THE CALLING SEQUENCE IS:			*
	538	*			B I\$LDXR			*
	539	*			DC AL2(V\$LPRT)			*
	540	*			WHERE THE ADDRESS CONSTANT PARAMETER DEFINES THE VIRTUAL ADDRESS			*
	541	*			OF ENTRY POINT DLFPRT.			*
	542	*						*
	543				*INPUT			*
	544	*			* \$PRPOS - 1 BYTE CARRIER POSITION RELATIVE TO HARDWARE LEFTMGN			*
	545	*			* \$LMRGN - 1 BYTE SOFTWARE LEFT MARGIN INDICATOR			*
	546	*						*
	547				*OUTPUT			*
	548	*			* PRINTED OUTPUT AND CARRIER POSITIONING			*
	549	*			* \$PRPOS - 1 BYTE 'DUMMY' CARRIER POSITION INDICATING WHERE THE			*
	550	*			CARRIER SHOULD BE. SET EQUAL TO \$LMRGN AFTER PRINTING.			*
	551	*			* \$BUFPT - 1 BYTE POINTS AT NEXT AVAIL BYTE IN LINE PRINT BUFFER			*
	552	*			* \$LPRP3 - 1 BYTE LINE PRINTER INDICATORS			*
	553	*			* 3LPRI0 - 2 BYTES ONE FOR BUFFER INCREMENT ONE FOR PDAR DISP.			*
	554	*						*
	555				*EXTERNAL REFERENCES			*
	556	*			* V\$LPRT2 - VIRTUAL ENTRY SECOND PAGE OF LINE PRINTER ROUTINE			*
	557	*			* V\$LPRTB - VIRTUAL ADDRESS OF THE LINE PRINTER BUFFER			*
	558	*			* I\$LDXR - ENTRY POINT FOR PAGING MODULE V.M. LOAD XR ROUTINE			*
	559	*			* \$LPRI0 - ENTRY POINT FOR PAGING MODULE V.M. CONVERT ADDRESS			*
	560	*						*
	561				*EXITS,NORMAL			*
	562	*			EXIT IS TO THE CALLING ROUTINE VIA A BRANCH TO THE V.M. PAGING			*
	563	*			ROUTINE.			*
	564	*						*
	565				*EXITS,ERROR			*
	566	*			NONE			*
	567	*						*

DLFPRT - LINE PRINTER ROUTINE

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	31/05/21	PAGE 168
		568	*	*TABLES/WORKAREAS			*
		569	*	* N/A			*
		570	*				*
		571	*	*ATTRIBLTES			*
		572	*	* NATURALLY RELOCATABLE AND REUSABLE			*
		573	*				*
		574	*	*CHARACTLR CODE DEPENDENCY			*
		575	*	* THE OPERATION OF THIS MODULE DEPENDS UPON AN INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET WHICH IS EQUIVALENT TO THE			*
		576	*	* ONE USED AT ASSEMBLY TIME.			*
		577	*				*
		578	*				*
		579	*	*NOTES			*
		580	*	* ERROR PROCEDLRES			*
		581	*	* IF A PRINTER UNIT CHECK OCCURES. THE LINE IN WHICH THE CHECK			*
		582	*	* OCCURED WILL BE REPRINTED			*
		583	*				*
		584	*	* REGISTER USAGE			*
		585	*	* REGISTER 1 (@BR) IS USED AS A BASE REGISTER FOR DFPRNT			*
		586	*	* REGISTER 2 (@XR) IS USED AS A BASE REGISTER FOR: THE FIRST			*
		587	*	* PAGE OF DLFPRT, LINE PRINTER BUFFER, OR IN THE CASE OF A UNIT			*
		588	*	* CHECK, THE PRINTER ERROR HANDELING ROUTINE 'DFPNDX'.			*
		589	*				*
		590	*	* SAVED/RESTORED AREAS			*
		591	*	* NONE			*
		592	*				*
		593	*	* MODIFICATION CONSIDERATIONS			*
		594	*	* CHANGES TO EITHER DLFPRT OR DFPRNT MAY DIRECTLY AFFECT THE			*
		595	*	* INTERFACE BETWEEN THE TWO MODULES.			*
		596	*				*
		597	*	* REQUIRED MODULES			*
		598	*	* @SYSEQ			*
		599	*	* @FXDEQ			*
		600	*	* @HDWEQ			*
		601	*	* \$V\$EQU			*
		602	*	* \$I\$EQU			*
		603	*	* DFPRNT			*
		604	*				*
		605	*	* OTHER			*
		606	*	* N/A			*
		607	*	*****			*

DLFPRT - LINE PRINTER ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 169
	4D00				609	*****				
					610	ORG	*,256,0			SET STARTING ADDRESS
				2800	611	USING	DFPASE,@BR			SET PAGE BASE ADDRESS - DFPRNT
				4D00	612	USING	DLFPRT,@XR			SET PAGE BASE ADDRESS
					613	*				
				4D00	614	DLFPRT EQU	*			ENTRY BIDIR PRINT
	4D00	7C	87	BC	615	MVI	DFP330+@Q(,@BR),@UCB			SET BRANCH TO LINE PRINTER PAGE
	4D03	B4	02	66	616	ST	DLF155+@OP1(,@XR),@XR			SAVE XR
	4D06	3A	40	03E4	617	SBN	\$LPRP3,@PRINT			SET LINE PRINTER FLAG
	4D0A	2C	01	144A D7	618	MVC	I\$VADR,DLFVD1(@VADDR,@XR)			GET PRINTER BUFFER VADDR
	4D0F	C0	87	1349	619	B	I\$MDFY			LOAD BUFFER & SET PAGE MDFY BIT
	4D13	8C	01	D9 144C	620	MVC	BUFADR(2,@XR),I\$CADR			SAVE BUFFER ADDR
				4D18	621	DLF050 EQU	*			PROCESS PRINTER UNIT CHECK
	4D18	7C	25	BD	622	MVI	DFP330+@D1(,@BR),DENTRY			SET ENTRY DISPLACEMENT
	4D1B	BC	87	A9	623	MVI	DLF360+@Q(,@XR),@UCB			FORCE RETURN ENTRY
	4D1E	6C	02	BA F6	624	MVC	DFP333(3,@BR),DLFEOR(,@XR)			SET DLFPRT ERROR ENTRY
					625	*				
	4D22	D0	87	A2	626	B	DFP280(,@BR)			GO CHECK FOR PREV. ERROR
					628	*****				
					629	*				
					630	*	FIND FUNCTION			
					631	*				
				4D25	632	*****				
					633	DLF100 EQU	*			RETURN FROM ERROR CHECK
	4D25	BC	80	A9	634	MVI	DLF360+@Q(,@XR),@NOP			RESET ENTRY INDICATOR
	4D28	78	40	F5	635	TBN	DLFIST+@PCTRL(,@BR),@PRINT			IS OP A PRINT ?
	4D2B	F2	90	4A	636	JF	DLF170			CHECK IF BUFFER FULL
					637	*****				
					638	*				
					639	*	ENTRY TO FILL BUFFER			
					640	*				
					641	*****				
	4D2E	39	01	03E4	642	TBF	\$LPRP3,@INDEX			TEST DUMMY PRINT
	4D32	F2	90	0A	643	JF	DLF140			SKIP IF IN USE
	4D35	3A	01	03E4	644	SBN	\$LPRP3,@INDEX			SET DUMMY PRINT POS. USED
	4D39	0C	00	03E5 03C2	645	MVC	\$LPROS(1),\$PRPOS			SAVE TRUE POSITION
				4D3F	646	DLF140 EQU	*			UPDATE BUFFER POINTER
					647	*				
					648	*****				
					649	*				
	4D3F	1E	00	03E3 F6	650	ALC	\$BUFPT,DLFIST+@PRCNT(1,@BR)			ADD NEXT COUNT TO BUFFER PTR
	4D44	1E	00	03C2 F6	651	ALC	\$PRPOS(1),DLFIST+@PRCNT(,@BR)			UPDATE HEAD POSITION
					652	*				
					653	*	INCREMENT BUFFER POINTER			
					654	*				
	4D49	2C	01	144A ED	655	MVC	I\$VADR,DLFPCH(@VADDR,@XR)			V.M. PATCH PAGE ENTRY ADDR 1-5
	4D4E	C0	87	1358	656	DLF143 B	I\$CVAD			LOAD PATCH PAGE 1-5
	4D52	8C	01	5A 144C	657	MVC	DLF145+@OP1(@CADDR,@XR),I\$CADR			MOVE CADDR TO BRANCH 1-5
	4D57	C0	87	0000	658	DLF145 B	*-*			1-5
					659	*				
					660	*	MOVE DATA TO BUFFER			
					661	*				
	4D5B	B5	02	D9	662	DLF146 L	BUFADR(,@XR),@XR			XR - BUFFER CADDR
	4D5E	8C	00	00 0000	663	DLF150 MVC	*-*(@VQ,@XR),*-*			MOVE DATA INTO BUFFER
					664	*				

DLFPRT - LINE PRINTER ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 170
	4D63	C2	02	0000	665	DLF155	LA *-*,@XR			RESTORE DLFPRT BASE ADDR
					666	*				
					667	*	TEST FOR CARRAGE RETURN			
					668	*				
	4D67	7D	C0	F5	669		CLI DLFIST+@PCTRL(,@BR),@PRETR			TEST CARRAGE RETURN ON
	4D6A	F2	01	4C	670		JNE DLF175			JUMP TO RETURN IF NO C.R.
				4D6D	671	DLF160	EQU *			LOAD PAGE2 LINE PRINTER
	4D6D	7C	88	BD	672		MVI DFP330+@D1(,@BR),DERROR			SET ERROR ENTRY DISP.
	4D70	2C	01	144A EB	673	DLF165	MVC I\$VADR,DLFVD2(@VADDR,@XR)			VADDR VLPRT2
	4D75	E0	87	93	674		B DLF400(,@XR)			LOAD BASE
				4D78	676	DLF170	EQU *			CHECK IF BUFFER EMPTY
	4D78	3D	00	03E3	677		CLI \$BUFPT,@ZERO			IS BUFFER EMPTY ?
	4D7C	E0	01	6D	678		BNE DLF160(,@XR)			GO TO PRINT EXIT
	4D7F	7C	01	DE	679		MVI DLFPCF(,@BR),@INDEX			SET INDEX ONLY
	4D82	7C	87	A0	680		MVI DFP270+@Q(,@BR),@UCB			FORCE RETURN
	4D85	D0	87	92	681		B DFP240(,@BR)			GO DO I/O
					683	*				
					684	*	NO ERROR, CHECK FOR PREVIOUS ERROR			
					685	*				
	4D88	F2	00	1D	686	DLF350	JC DLF360,*-*			JUMP NO PREVIOUS ERROR
	4D89				687		ORG DLF350+@Q			* INITIALIZE
	4D89	87			688		DC AL1(@UCB)			* TO INDICATE
	4D8B				689		ORG DLF350+@INST3			* NO PREVIOUS PRINTER ERROR
	4D8B	BC	87	89	690		MVI DLF350+@Q(,@XR),@UCB			RESET ERROR INDICATOR
	4D8E	2C	01	144A E3	691	DLF355	MVC I\$VADR,DLFRTY(@VADDR,@XR)			VADDR RETRY ENTRY VLPRT2
				4D93	692	DLF400	EQU *			PREPARE TO EXIT LINE PTR PAGE1
	4D93	3C	80	12B6	693		MVI I\$LBFR,@NOP			FORCE LINE PRINTER UNLOCK
	4D97	C0	87	1358	694		B I\$CVAD			LOAD LINE PRINTER PAGE2
	4D9B	8C	01	A7 144C	695		MVC DLF425+@OP1(@CADDR,@XR),I\$CADR			MOVE CADDR TO BR
	4DA0	C0	87	1354	696		B I\$LOCK			LOCK PAGE VLPRT2 1-5
	4DA4	C0	87	0000	697	DLF425	B *-*			BRANCH TO PAGE2
	4DA8	E0	00	25	699	DLF360	BC DLF100(,@XR),*-*			FORMAT NEXT LINE / GO TO ENTRY
	4DA9				700		ORG DLF360+@Q			* INITIALIZE
	4DA9	80			701		DC AL1(@NOP)			* TO FORMAT
	4DAB				702		ORG DLF360+@INST3			* NEXT LINE TO BE PRINTED
	4DAB	2C	01	144A EF	703		MVC I\$VADR,DLFPC1(@VADDR,@XR)			V.M. PATCH PAGE ENTRY ADDR 1-5
	4DB0	E0	87	4E	704	DLF375	B DLF143(,@XR)			BRANCH TO MV CADDR TO BRANCH 1-5
					706	*****				
					707	***** RETURN TO CALLER *****				
					708	*****				
				4DB3	709	RETURN	EQU *			LINE PRINTER RETURN AREA
	4DB3	0C	00	03C2 03C1	710		MVC \$PRPOS(1),\$LMRGN			SET DUMMY POSITION LEFT MGN
				4DB9	711	DLF175	EQU *			RETURN FROM DLFPRT
	4DB9	7C	80	BC	712		MVI DFP330+@Q(,@BR),@NOP			RESET BRANCH TO LINR PRINTER
	4DBC	7C	80	A0	713		MVI DFP270+@Q(,@BR),@NOP			RESET DFPRNT EXIT
	4DBF	6C	02	BA F3	714		MVC DFP333(3,@BR),DFPEOR(,@XR)			RESTORE DFPRNT ERROR TEST
	4DC3	7C	11	E0	715		MVI DLFPCF+2(,@BR),@TBLIX			RESTORE MATRIX PRINTER END
	4DC6	3B	40	03E4	716		SBF \$LPRP3,@PRINT			RESET LINE PRINTER FLAG
	4DCA	D0	87	CA	717		B DFP300(,@BR)			RETURN TO CALLER
					718	*				
					719	*****				
				4DCD	720	DLFRPE	EQU *			PRINTER UNIT CHECK ENTRY

DLFPRT - LINE PRINTER ROUTINE

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4DCD	C0 87 1330		721	B	I\$LDXR	BR TO FORCE DLFPRT TO BE MOST	
			722	*		* RECENTLY USED PAGE	
4DD1	4D00	4DD2	723	DC	AL2(V\$LPRT)	DLFPRT VADDR	
4DD3	D0 87 D3		724	B	DFPRPE-DFPRNT(,@BR)	GO PROCESS LOAD ERP SECTION	
			725	*			
			726		*****		
4DD6	4F00	4DD7	727	DLFVD1 DC	AL(@VADDR)(V\$LPRB)	LINE PRINTER BUFFER PAGE	
4DD8	0000	4DD9	728	BUFADR DC	XL2'00'	SAVED BUFFER ADDR	
			729	*			
4DDA	0000	4ddb	730	DFPWTB DC	XL2'00'	LINE WIDTH	
4DDC	00	4DDC	731	DFPRES DC	XL1'00'	LINE COUNT	
4DDD	0000	4DDE	732	BUFRWK DC	XL2'00'	BUFFER POINTER	
4DDF	00	4DDF	733	DLFBPT DC	XL1'00'	BUFFER INCREMENT	
			734	*			
4DE0	0025	4DE1	735	DLFMAR DC	AL2(DLF500-VLPRT2)	DISPLACENENT TO FORMAT LINE	
4DE2	4E49	4DE3	736	DLFRTY DC	AL2(V\$LPRT2+DLF700-VLPRT2)	RETRY ENTRY POINT	
			737	*			
4DE4	00	4DE4	738	DFPPOS DC	XL1'00'	CHARACTER POSITION ON LINE	
4DE5	8080C00001	4DE9	739	LPRCMD DC	XL5'8080C00001'	LINE PRINTER CMDS.	
4DEA	4E00	4DEB	740	DLFVD2 DC	AL2(V\$LPRT2)	LINE PRINTER PAGE2	
		004E	741	DLFX4E EQU	X'4E'	VLPRT2 LOCK BIT	1-5
		0053	742	DLFX53 EQU	X'53'	VLPRT3 LOCK BIT	1-5
		0090	743	DLTABL EQU	X'90'	TAB LEFT AND CHAIN	
4DEC	5391	4DED	744	DLFPCH DC	AL2(V\$PCH2+DLF400-@D1-DLFPRT)	PATCH PAGE ENTRY ADDR	1-5
4DEE	53B6	4DEF	745	DLFPC1 DC	AL2(V\$PCH2+DLF175-@DD2-DLFPRT)	PATCH PAGE ENTRY ADDR	1-5
4DF0	00	4DF0	746	DLFSWC DC	XL1'00'	RETURN CARRIAGE SWITCH	1-5
		00A0	747	DLTABR EQU	X'A0'	TAB RIGHT AND CHAIN	
		0088	748	DERROR EQU	DLF350-DLFPRT	ERROR CHECK ENTRY DISP.	
		0025	749	DENTRY EQU	DLF100-DLFPRT	ENTRY RETURN DISP.	
		0001	750	DLFRTN EQU	X'01'	RETURN CARRIAGE INDICATOR	1-5
			751	*			
			752	*	INSTRUCTION MODIFICATION TP DFPRNT AT DFP335		
			753	*			
4DF1	D1 E0 D3		754	TIO	DFPRPE-DFPRNT(,@BR),@PERR	FORCE BRANCH TO DFPRNT ERROR	
		4DF3	755	DFPEOR EQU	*-1	LAST BYTE OF FORCE DFPRNT ERROR	
4DF4	E1 E0 CD		756	TIO	DLFRPE(,@XR),@PERR	FORCE BRANCH TO DLFPRT ERROR	
		4DF6	757	DLFEOR EQU	*-1	LAST BYTE DLFPRT FORCE ERROR	
			758		*****		
			759		*****	END V\$LPRT	*****
			760		*****		

DLFPRT - LINE PRINTER ROUTINE

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 31/05/21 PAGE 172
				762	*****	
				763	*	
				764	ENTRY TO FORMAT PRINT LINE	
				765	*	
				766	*****	
4E00				767	ORG *,256,0 SET STARTING ADDRESS	
			2800	768	USING DFPASE,@BR SET PAGE BASE ADDRESS - DFPRNT	
			4D00	769	USING DLFPRT,@XR SET PAGE BASE ADDRESS	
			4E00	770	VLPRT2 EQU *	
4E00	2C 01 144A D7			771	MVC I\$VADR,DLFVD1(@VADDR,@XR) GET BUFFER ADDR	
4E05	C0 87 1354			772	B I\$LOCK LOCK PRINT BUFFER	
4E09	8C 01 D9 144C			773	MVC BUFADR(2,@XR),I\$CADR SAVE LINE PRINTER BUFFER CADDR	
4E0E	8C 01 DE 144C			774	MVC BUFRWK(2,@XR),I\$CADR SAVE BUFFER ADDRESS	
				775	*****	
				776	*	
				777	DETERMINE ANY MARGIN COMPUTATION REQUIRED	
				778	*	
				779	*****	
4E13	8C 00 DC 03E3			780	MVC DFPRES(1,@XR),\$BUFPT SAVE COUNT	
4E18	8C 00 DB 03C0			781	MVC DFPWTH(1,@XR),\$RMGRN SET RIGHT MARGIN VALUE	
4E1D	8F 00 DB 03C1			782	SLC DFPWTH(1,@XR),\$LMRGN CALCULATE WIDTH	
4E22	F2 87 04			783	J DLF525 CONTINUE	
				784	*	
			4E25	785	DLF500 EQU * FORMAT LINE	
4E25	AE 01 DE DB			786	ALC BUFRWK(2,@XR),DFPWTH(,@XR) GET NEXT PDAR ADDR	
			4E29	787	DLF525 EQU *	
4E29	AD 00 DB DC			788	CLC DFPWTH(1,@XR),DFPRES(,@XR) COMPARE WIDTH TO LINE LNTH	
4E2D	F2 02 0C			789	JNL DLF550 JUMP LENGTH < WIDTH	
				790	*****	
				791	*	
				792	COMPUTE MARGIN AND FORMAT DATA	
				793	*	
				794	*****	
4E30	AF 00 DC DB			795	SLC DFPRES(1,@XR),DFPWTH(,@XR) NEXT LINE = RESIDUAL	
4E34	2C 00 03E3 DB			796	MVC \$BUFPT(1),DFPWTH(,@XR) SET NEW LINE - WIDTH	
4E39	F2 87 08			797	J DLF600 GO TO FORMAT NEXT LINE	
				798	*	
				799	COUNT < WIDTH	
				800	*	
			4E3C	801	DLF550 EQU * \$BUFPT RESIDUAL	
4E3C	2C 00 03E3 DC			802	MVC \$BUFPT(1),DFPRES(,@XR) FORCE LINE PRINT EXIT	
4E41	7C 87 A0			803	MVI DFP270+@Q(,@BR),@UCB	
				804	*	
			4E44	805	DLF600 EQU * FORMAT LINE	
4E44	8C 00 DF 03E3			806	MVC DLFBPT(1,@XR),\$BUFPT SAVE BUFFER POINTER	
			4E49	807	DLF700 EQU * PRINT RETRY ENTRY POINT	
4E49	B1 E4 DE			808	LIO BUFRWK(,@XR),@PDAR SET DATA ADDR	
4E4C	6C 04 E2 E9			809	MVC DFPPCO(5,@BR),LPRCMD(,@XR) SET LINE PRINTER CMDS.	
				810	*	
				811	COMMON MARGIN ENTRY	
				812	*	
4E50	7C 00 9E			813	MVI DFP260-DFPRNT+@D1(,@BR),@ZERO SET TO PRINT RIGHT	
4E53	8C 00 E4 03E5			814	MVC DFPPOS(1,@XR),\$LPROS GET ACTUAL POSITION	
4E58	0C 00 03E5 03C1			815	MVC \$LPROS(1),\$LMRGN SET REFERENCE	
4E5E	0E 00 03E5 03E3			816	ALC \$LPROS(1),\$BUFPT UPDATE PRINT POSITION	
				817	*	

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4E64	1F	00	03E3	E7	818	SLC	\$BUFPT(1),DLF001(,@BR)	COUNT LESS ONE
4E69	4C	00	E1	03E3	819	MVC	DLFPCF+3(1,@BR),\$BUFPT	MOVE DATA COUNT TO PCF
4E6E	2D	00	03C1	E4	820	CLC	\$LMRGN(1),DFPPOS(,@XR)	AT LEFT MARGIN ?
4E73	F2	81	61		821	JE	DLF950	JUM IF AT LEFT MARGIN
					823	*****		
					824	*		
					825	*	CALCULATE TAB	
					826	***	IS PRINT POSITION < HALF OF DATA COUNT ?	
					827	*	TAKE ONE-HALF OF COUNT ROUTINE (DIVIDE)	
					828	*		
					829	*****		
4E76	7C	00	E4		830	MVI	DLFORK-1(,@BR),@ZERO	
4E79	4C	00	E5	03E3	831	MVC	DLFORK(1,@BR),\$BUFPT	MOVE COUNT TO WORK AREA
4E7E	5E	01	E5	E5	832	ALC	DLFORK(2,@BR),DLFORK(,@BR)	ADD THREE TIMES
4E82	5E	01	E5	E5	833	ALC	DLFORK(2,@BR),DLFORK(,@BR)	
4E86	5E	01	E5	E5	834	ALC	DLFORK(2,@BR),DLFORK(,@BR)	
4E8A	58	01	E4	E4	835	MZN	DLFORK-1(,@BR),DLFORK-1(,@BR)	MOVE ZONE NUM
4E8E	58	02	E4	E5	836	MNZ	DLFORK-1(,@BR),DLFORK(,@BR)	DLFORK-1=1/2 NEXT LINE CNT
					837	*		
					838	*	MOVE CARRAGE TO LEFT MARGIN OR TAB	
					839	*		
4E92	8F	00	E4	03C1	840	SLC	DFPPOS(1,@XR),\$LMRGN	PRPOS WITH IN WIDTH
4E97	9D	00	E4	E4	841	CLC	DFPPOS(1,@XR),DLFORK-1(,@BR)	IS PRPOS > 1/2 NEXT LINE
4E9B	F2	82	2E		842	JL	DLF900	SET TO GO TO LEFT MARGIN
					844	*****		
					845	*	DETERMINE TAB DIRECTION	
					846	*****		
4E9E	1E	00	03E3	E7	847	ALC	\$BUFPT(1),DLF001(,@BR)	COUNT PLUS ONE
4EA3	0C	00	03E5	03C1	848	MVC	\$LPROS(1),\$LMRGN	SET POSITION TO LEFT MARGIN
4EA9	7C	01	9E		849	MVI	DFP260-DFPRNT+2(,@BR),@B1	SET TO PRINT LEFT
4EAC	8D	00	E4	03E3	850	CLC	DFPPOS(1,@XR),\$BUFPT	COMPARE PRINT POS. TO LINE LNG
4EB1	F2	81	23		851	JE	DLF950	JUMP EQUAL LINE & POSITION
4EB4	F2	84	10		852	JH	DLF800	JUMP TO TAB LEFT

DLPRT - LINE PRINTER ROUTINE

				854	*					
				855	*	COMPUTE	TAB	RIGHT		
				856	*					
4EB7	2F	00	03E3	E4	857	SLC	\$BUFPT(1),DFPPOS(,@XR)	GET	TAB	DISTANCE
4EBC	8C	00	E4	03E3	858	MVC	DFPPOS(1,@XR),\$BUFPT	SAVE	BUFFER	POINTER
4EC1	7C	A0	DE		859	MVI	DLFPCF(,@BR),DLTABR	SET	TAB	RIGHT
4EC4	F2	87	08		860	J	DLF920	JUMP	TO	SET

DLFPRT - LINE PRINTER ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 175
					862	*				
					863	*	COMPUTE LEFT TAB			
					864	*				
				4EC7	865	DLF800	EQU *			FIND TAB LEFT COUNT
4EC7	8F	00	E4	03E3	866		SLC DFPPOS(1,@XR), \$BUFPT			GET TAB DISTANCE
				4ECC	867	DLF900	EQU *			SET TAB LEFT
4ECC	7C	90	DE		868		MVI DLFPCF(, @BR), DLTABL			SET TAB LEFT OP
				4ECF	869	DLF920	EQU *			HARDWARE REQUIREMENT
4ECF	9F	00	E4	E7	870		SLC DFPPOS(1,@XR), DLF001(, @BR)			ONE LESS
4ED3	6C	00	DF	E4	871		MVC DLFPCF+1(, @BR), DFPPOS(, @XR)			SET TAB COUNT
				4ED7	872	DLF950	EQU *			SET AT LEFT MARGIN INDICATION
4ED7	2C	01	03EA	DF	873		MVC \$LPRIO, DLFBPT(2, @XR)			SAVE PDAR ADDR & BUFR. INCR.
4EDC	74	02	E5		874		ST DLFORK(, @BR), @XR			SAVE XR
4EDF	B5	02	D9		875		L BUFADR(, @XR), @XR			XR = CADDR LINE PRINTER BUFFER
4EE2	74	02	DD		876		ST DFPAPC(, @BR), @XR			SAVE BUFFER ADDR
4EE5	7C	FB	DD		877		MVI DFPAPC(, @BR), DLFCAR			GET DISP. TO COMMANDS
4EE8	9C	04	FF	E2	878		MVC BFPCRO-LPBUFR(5, @XR), DFPPCO(, @BR)			MOVE COMMANDS TO PCAR
4EEC	75	02	E5		879		L DLFORK(, @BR), @XR			RESTORE XR TO VLPRT2
4EEF	3C	00	03E3		880		MVI \$BUFPT, @ZERO			SET BUFFER PTR = 0
4EF3	D0	87	99		881		B DFP250(, @BR)			GO TO DFPRNT TO DO I/O
					882	*				
					883	*****				
					884	*****	END V\$LPR2			*****
					885	*****				

DLFPRT - LINE PRINTER ROUTINE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 176
					887	*****	*****			
					888	*	LINE DRINTER BUFFER AREA			
					889	*****	*****			
4F00					890	ORG	*,256,0			
				4F00	891	USING	LPBUFR,@XR	SET	BASE	FOR
				4F00	892	LPBUFR	EQU *	LINE	PRINTER	BUFFER
4F00				4FFA	893	DS	CL251	LINE	PRINTER	BUFFER
					895	*****	LINE PRINTER COMMANDS PCAR *****			
				4FFB	896	BFPCAR	EQU *	LINE	PRINTER	COMMANDS
4FFB	0000000000			4FFF	897	DC	XL5'00'	LINE	PRINTER	COMMANDS
				4FFF	898	BFPCRO	EQU *-1	LAST	BYTE	OF
				00FB	899	DLFCAR	EQU BFPCAR-LPBUFR	DISPLACEMENT	TO	PCAR
					900	*****	*****			

VLPRT3 - BI-DIRECTIONAL PRINT ROUTINE CORRECTION PAGE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 177
5300				902		ORG	X'5300'			PATCH AREA 1-5
				903			*****			
				904		*				*
				905		*	THIS PAGE 15 USED BY THE BI-DIRECTIONAL PRINT ROUTINES TO CORRECT			*
				906		*	PROBLEMS CONNECTED WITS APAR NUMBERS 968 AND 972. THE ROUTINES			*
				907		*	USING THIS PAGE AND THEIR ENTRY POINTS ARE:			*
				908		*	DFPRNT - VLPRT3, DFPENT			*
				909		*	FZSPRT - VLPRT4			*
				910		*	DLPRT - VLPRT5, VLPRT6			*
				911		*				*
				912			*****			
				5300 913	VLPRT3	EQU	*			DFPRNT INTERFACE 1-5
				5300 914	DFPCHK	EQU	*			1-5
				2800 915			USING DFPASE,@BR			1-5
				4D00 916			USING DLPRT,@XR			1-5
5300	7D	00	F6	917		CLI	DFPIST+@PRCNT(,@BR),@ZERO			ANOTHER LINE TO PRINT 1-5
5303	F2	01	0B	918		JNE	DFPENT			CONTINUE PROCESSING LINE 1-5
5306	F2	87	30	919		J	DFPULK			GO TO UNLOCK ROUTINE 1-5
5309	C0	87	1354	920		B	I\$LOCK			LOCK PAGE VLPRT3 1-5
530D	6C	03	F8 03	921		MVC	DFPIST+@PLNGH-1(@PLNGH,@BR),@PLNGH-1(,@XR)			MOVE THE PRT1-5
				922		*				* PARAMETER LIST TO WRK AREA 1-5
5311	5C	02	F4 F8	923	DFPENT	MVC	DFPDSV(@CADDR+1,@BR),DFPIST+@PDATA(,@BR)			MOVE THE PRT 1-5
				924		*				* CNT AND DATA ADDRESS 1-5
5315	4C	00	FB 03C2	925		MVC	DFPSYC+@SYCNT(1,@BR),\$PRPOS			SAVE HD POSITION FOR SYNC 1-5
531A	5C	01	DF F6	926		MVC	DFPPCF+@PRCNT(2,@BR),DFPIST+@PRCNT(,@BR)			SET CTRL+CNT 1-5
531E	39	1E	03E4	927		TBF	\$LPRP3,@KENAB			TEST FOP MATRIX PRINT MODE 1-5
5322	D0	90	23	928		BF	DFP115(,@BR)			BRANCH IF MATRIX PRINT 1-5
5325	38	80	03D2	929		TBN	\$IOIND,\$LNPTR			IS LINE PRINTER REQUESTED ? 1-5
5329	D0	90	23	930		BF	DFP115(,@BR)			BRANCH IF NOT 1-5
532C	C0	87	1330	931		B	I\$LDXR			BRANCH TO LOAD PAGE 1-5
5330	4D00			5331 932		DC	AL(@VADDR)(V\$LPRT)			LINE PRINTER PAGE 1-5
5332	C0	87	1354	933		B	I\$LOCK			GO LOCK PAGE 1-5
5336	E0	87	00	934		B	@ZERO(,@XR)			BRANCH TO LINE PRINTER LINK 1-5
				935		*				1-5
				5339 936	DFPULK	EQU	*			UNLOCK ALL LINE PRINTER 1-5
				937		*				* ROUTINE PAGES 1-5
5339	7C	80	A3	938		MVI	DFP280+@Q-DFPASE(,@BR),@NOP			SET ERP INDR OFF 1-5
533C	1C	01	144A 1F	939		MVC	I\$VADR,DFP105(2,@BR)			DLPRT VM ADDR 1-5
5341	C0	87	1350	940		B	I\$UNLK			UNLOCK PAGE 1-5
5345	3C	4E	1449	941		MVI	I\$VADR-1,DLFX4E			VLPRT2 VM ADDR 1-5
5349	C0	87	1350	942		B	I\$UNLK			UNLOCK PAGE 1-5
534D	3C	53	1449	943		MVI	I\$VADR-1,DLFX53			VLPRT3 VM ADDR 1-5
5351	C0	87	1350	944		B	I\$UNLK			UNLOCK PAGE 1-5
5355	C0	87	12D3	945		B	I\$RTRN			BRANCH TO CALLING PGM-FZPRNT 1-5
				946		*				1-5
				5359 947	VLPRT4	EQU	*			FZSPRT INTERFACE 1-5
				3600 948		USING	FZSP3B,@BR			1-5
5359	4E	00	DB 03C2	949	FZS991	ALC	FZS3CC(,@BR),\$PRPOS(1)			ADD PRT ZONE LNG TO CURRENT 1-5
535E	5D	00	DB 6A	950		CLC	FZS3CC(,@BR),FZS3RM(1,@BR)			* CARRIER POSITION - BRANCH 1-5
5362	F2	84	03	951		JH	FZS992			* IF RIGHT MGN IS EXCEEDED 1-5
5365	D0	87	B9	952		B	FZS710(,@BR)			BRANCH BACK IF NOT 1-5
5368	38	80	03D2	954	FZS992	TBN	\$IOIND,\$LNPTR			IS LINE PRINTER REQUESTED ? 1-5
536C	F2	90	03	955		JF	FZS993			NO, DON'T SET CARRIAGE RTN 1-5
536F	7C	C0	F2	956		MVI	FZS3PF(,@BR),@PRETR			SET CARRIAGE RETURN INDR 1-5
5372	D2	02	F2	957	FZS993	LA	FZS3PL(,@BR),@XR			LOAD DATA OUTDUT PPL CADDR 1-5

VLPRT3 - BI-DIRECTIONAL PRINT ROUTINE CORRECTION PAGE

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	31/05/21	PAGE 178
5375	C0	87	12B1		958	B	I\$CALL			LINK TO EXECUTE PRINTER IOCR 1-5
5379	2800			537A	959	DC	AL(@VADDR)(V\$SPRT)			MATRIX PRINTER IOCR VADDR 1-5
537B	7C	40	F2		960	MVI	FZS3PF(, @BR), @PRINT			SET INDR TO PRINT ONLY 1-5
537E	0D	00	044A 0D5A		961	CLC	\$PRDEV-1, I\$WRK2-1(1)			IF CRT IS NOT A SYSTEM PRINT 1-5
5384	F2	82	06		962	JL	FZS994			* DEVICE, EXIT ROUTINE 1-5
5387	C0	87	12B1		963	B	I\$CALL			LINK TO EXCUTE PRINT ON CRT 1-5
538B	3700			538C	964	DC	AL(@VADDR)(FZS800)			PRINT CRT RTN VADDR 1-5
538D	C0	87	12D3		965	FZS994 B	I\$RTRN			RETURN TO 1ST PRINT RTN PAGE 1-5
				5391	967	VLPRT5 EQU *				DLFPRT INTERFACE NO. 1 1-5
				2800	968		USING DFPASE, @BR			1-5
				4D00	969		USING DLFPRT, @XR			1-5
5391	5F	01	F2 E7		970	SLC	DLFDSV-2(2, @BR), DLF001(, @BR) COUNT LESS ONE			1-5
5395	BD	01	F0		971	CLI	DLFSWC(, @XR), DLFRTN IS SWITCH SET FOR RTN CARRAGE			1-5
5398	F2	81	04		972	JE	DLF960 YES, DO NOT INCR DATA PTR			1-5
539B	5E	01	F8 F2		973	ALC	DLFIST+@PDATA(2, @BR), DLFDSV-2(, @BR) GET DATA ADDR PTR			1-5
539F	9C	01	62 F8		974	DLF960 MVC	DLF150+@DOP2(2, @XR), DLFIST+@PDATA(, @BR) SET DATA ADDR			1-5
53A3	9C	00	5F F2		975	MVC	DLF150+@VQ(1, @XR), DLFDSV-2(, @BR) GET COUNT FOR MVC			1-5
53A7	8C	00	60 03E3		976	MVC	DLF150+@D1(1, @XR), \$BUFPT MOVE BUFFER DISP. INTO INST.			1-5
53AC	9F	00	60 E7		977	SLC	DLF150+@D1(1, @XR), DLF001(, @BR) DISP. LESS ONE			1-5
53B0	BC	00	F0		978	MVI	DLFSWC(, @XR), X'00' SET CARRAGE RETURN SW OFF			1-5
53B3	E0	87	5B		979	B	DLF146(, @XR) CONTINUE			1-5
					980	*				
				53B6	981	VLPRT6 EQU *				DLFPRT INTERFACE NO. 2 1-5
53B6	7C	40	F5		982	MVI	DLFIST+@PCTRL(, @BR), @PRINT SET PRINT ONLY			1-5
53B9	6C	00	F6 DC		983	MVC	DLFIST+@PRCNT(, @BR), DFPRES(1, @XR) BUF PTR - RESIDUAL			1-5
53BD	6C	00	F2 DC		984	MVC	DLFDSV-2(, @BR), DFPRES(1, @XR) DATA COUNT - RESIDUAL			1-5
53C1	0C	00	03C2 03C1		985	MVC	\$PRPOS(1), \$LMRGN SET DUMMY POSITION-LEFT MGN.			1-5
53C7	BC	01	F0		986	MVI	DLFSWC(, @XR), DLFRTN SET SWITCH FOR RTN CARRIAGE			1-5
53CA	E0	87	25		987	B	DLF100(, @XR) CONTINUE PROCESSING			1-5
					988	*****	***** IMG_0704 - IMG_0709 *****			
				FFFF	989	END				

TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY = 0

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$\$\$CMD	001	0020	0660	
\$\$\$DAT	001	0040	0659	
\$\$\$EPL	001	0091	0656	
\$\$\$ERN	001	0080	0710	
\$\$\$FUN	001	0010	0661	
\$\$\$NLN	001	00A0	0706	
\$\$\$STD	001	0081	0655	
\$\$BNLN	001	0605	0636	0638
\$\$CDBS	001	08C0	0686	
\$\$CDND	001	0666	0645	
\$\$CDRD	001	0890	0684	0686
\$\$CKEY	001	0603	0634	
\$\$CKFF	001	0B3D	0666	
\$\$COFF	001	0B44	0665	
\$\$CSNS	001	209C	0695	
\$\$DATB	001	0BBF	0667	
\$\$EOSA	001	0AFE	0664	
\$\$ERSK	001	1C00	0705	
\$\$FITS	001	1D00	0713	
\$\$FLIB	001	06FF	0712	
\$\$ILEN	001	0601	0630	0632 0636
\$\$ILHD	001	0600	0628	0630
\$\$INLN	001	0607	0643	0645 0647
\$\$INND	001	06FA	0647	
\$\$KBDT	001	09E1	0654	0658
\$\$KBSN	001	09E2	0658	0663
\$\$KLD1	001	0600	0718	7309 8039
\$\$KLD2	001	0700	0720	
\$\$KLD3	001	0C00	0722	
\$\$LPOS	001	09EB	0663	
\$\$PCNT	001	07E9	0679	
\$\$PLYN	001	2004	0693	7108 8596
\$\$PRES	001	0890	0652	0654 0664 0665 0666 0667 0684
\$\$PRFL	001	2143	0697	
\$\$PRNT	001	0707	0673	0674 0678 0679 7107
\$\$PRTN	001	0782	0674	
\$\$PSIO	001	07CE	0678	
\$\$PYCD	001	2200	0699	
\$\$PYMP	001	2000	0691	0693 0695 0697 0699
\$\$SLIB	001	1C00	0708	
\$\$TPCD	001	0606	0638	0643
\$\$UPAR	001	0602	0632	0634
\$\$WSPB	001	1E00	0711	
\$\$XIND	001	06FF	0709	0712
\$\$ZERO	001	0000	0224	0225 0227 0228 0229 0233 0691
\$ABORT	001	0010	0337	
\$BASIC	001	0080	0395	
\$BIGCD	001	0080	0471	7377
\$BLDPL	001	0579	0604	0606
\$BLNOE	001	0569	0594	
\$BLOAD	001	0522	0585	0587 0590 0603 0604 7257 7905
\$BLRTN	001	0550	0593	0594
\$BRSAV	001	03C5	0282	0283 8346* 8366
\$BSADR	001	0587	0609	0611
\$BUFPT	001	03E3	0490	0491 8161 8947* 8961* 0650* 0677 0780 0796* 0802* 0806 0816 0818* 0819 0831 0847* 0850 0857* 0858 0866 0880* 0976

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$CABLD	001	04B4	0563	0564
\$CAERK	001	0469	0540	0543
\$CAERR	001	03CD	0288	0290
\$CAIPL	001	049D	0559	0561
\$CALLI	001	0008	0480	
\$CARDI	001	0001	0251	
\$CARPL	001	04A1	0561	0563
\$CIENT	001	0483	0550	0551 8473 8482
\$CIEXT	001	0480	0549	0550
\$CIMSK	001	0476	0546	0549
\$CISUS	001	0496	0554	0559
\$CLBFR	001	0010	0438	
\$CMDKY	001	0008	0350	
\$CMODE	001	0002	0400	
\$CONFIG	001	03DD	0463	0473 7377
\$CRPOS	001	03E2	0489	0490 9993 0000 0107
\$CRTAD	001	044D	0528	0529
\$CRTAV	001	0002	0344	
\$CRTDN	001	0002	0368	
\$CRTIN	001	03D3	0365	0372
\$CRTNO	001	0004	0347	
\$CRTPU	001	0004	0369	
\$CRTSP	001	0008	0370	
\$CRTUP	001	0001	0367	
\$CRUSH	001	0080	0476	
\$CSDPL	001	050E	0575	0576
\$C0001	001	0464	0532	0538
\$DATE	001	043A	0513	0514
\$DBGUF	001	03E0	0475	0484 6841
\$DBLOK	001	0001	0425	
\$DFDET	001	03E8	0496	0497
\$DISKN	001	0025	0227	7248 7268 7894 7919 0448 0459
\$DKERR	001	0008	0406	
\$DKSIZ	001	03D7	0450	0458 0499
\$DK100	001	0001	0452	
\$DK200	001	0002	0453	
\$DK400	001	0004	0454	
\$DK600	001	0008	0455	
\$DK800	001	0010	0456	
\$DPLSV	001	0449	0524	0526 7264 7913
\$DTNMB	001	0040	0271	
\$DTRDR	001	0040	0359	
\$ENDNU	001	0600	0618	0628 0652 0673 0709 0718 0720 0722 2752
\$ERDPL	001	046F	0543	0545
\$ERFIL	001	0040	0298	
\$ERHRD	001	0004	0430	
\$ERKEY	001	0080	0302	
\$ERLOG	001	0345	0232	
\$ERMAD	001	0472	0545	0546
\$ERPND	001	0004	0403	8727 8900 8903
\$ERRCT	001	03CF	0304	
\$ERRPG	001	03CE	0292	
\$ERSFL	001	0035	0297	
\$ERSTK	001	0030	0295	
\$ER050	001	0363	0233	
\$ER1N2	001	0050	0300	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$EXADR	001	0517	0578	0580
\$EXCMD	001	0001	0332	
\$EXFTR	001	043B	0514	0519 7024 8354 9364 0340 0343 0345
\$FCIND	001	0010	0410	
\$FDIND	001	0040	0417	
\$FEARR	001	0004	0225	
\$FEMAP	001	0588	0611	0612
\$FILIB	001	03DA	0461	0462
\$FITIN	001	0010	0386	
\$FUIND	001	0020	0415	
\$GUFIO	001	0583	0608	0609
\$GUFIR	001	0008	0260	
\$HISTE	001	042E	0511	0512 8907* 8956*
\$HIST1	001	0435	0512	0513 8722* 8902*
\$HRDER	001	0020	0356	8719 8955
\$INDR1	001	03D4	0372	0398
\$INDR2	001	03D5	0398	0423 8727* 8900 8903*
\$INDR3	001	03D6	0423	0450
\$INLNO	001	03CF	0290	0292 0304 0311
\$INRPT	001	0020	0268	
\$IOIND	001	03D2	0339	0365 8719* 8955* 0929 0954
\$IOPGS	001	0010	0479	6841
\$IOYES	001	0002	0254	
\$IPLDV	001	05FF	0615	0618
\$IRKEY	001	0020	0478	
\$KEYBD	001	03E1	0484	0489
\$KEYCD	001	03C3	0248	0282
\$KEYDT	001	0040	0392	
\$KE090	001	00DE	0228	
\$KE130	001	01D5	0229	
\$KYBSY	001	0010	0265	
\$LDRTN	001	0571	0603	
\$LEVEL	001	03DF	0473	0475
\$LIST	001	0002	0427	
\$LMRGN	001	03C1	0243	0245 8359 8788 8791 8918 0710 0782 0815 0820 0840 0848 0985
\$LNPTR	001	0080	0362	0929 0954
\$LOADB	001	054A	0587	
\$LOADR	001	051A	0580	0583
\$LPRIO	001	03EA	0497	8946 0873*
\$LPROS	001	03E5	0492	0494 8171 8896 8936* 0645* 0814 0815* 0816* 0848*
\$LPRP3	001	03E4	0491	0492 8060* 8137* 8169 8172* 8601* 8604* 8894 8897* 8913 8933 8935* 8957 0617* 0642 0644* 0716* 0927
\$MOUNT	001	0020	0441	
\$MPDWN	001	0001	0341	8955
\$NEXTB	001	03E6	0494	0495
\$NEXTL	001	03E7	0495	0496
\$NOENB	001	0008	0433	
\$NOLST	001	0004	0257	
\$NUCBS	001	03C0	0240	0241
\$NWRKF	001	0080	0446	
\$NWRKR	001	0040	0443	
\$PASWD	001	042D	0510	0511
\$PAUSD	001	04BA	0564	0566
\$PAUSE	001	0002	0334	
\$PGMDT	001	0020	0389	
\$PGMST	001	0010	0353	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$PKERT	001	0419	0508	0510
\$PLST1	001	0454	0529	0530
\$PLST2	001	045B	0530	0531
\$PLST3	001	0462	0531	0532
\$PRDEV	001	044B	0526	0528 7016 7023* 7024* 7039* 8594 8599 9635 9809 0961
\$PRESN	001	0002	0377	
\$PROCI	001	0001	0374	
\$PRPOS	001	03C2	0245	0248 8171* 8762* 8768 8779* 8786 8791* 8896* 8929* 8936 9710 9717 9833 0645 0651* 0710* 0925 0949 0985*
\$PSDBR	001	04FA	0569	
\$PSDXR	001	04F2	0568	0569
\$PSTEP	001	0004	0335	
\$PSTMT	001	0008	0336	
\$PTCH1	001	03F5	0499	0503
\$READY	001	0080	0419	
\$REORD	001	0040	0477	
\$RLOAD	001	051E	0583	0585
\$RMGRN	001	03C0	0241	0243 8358 8769 9640 0781
\$RSTR	001	04D6	0566	0568 0570 0575
\$RUNIT	001	0001	0313	
\$SFAID	001	050D	0571	
\$SPRNT	001	0465	0538	0540
\$SRTRN	001	04FE	0570	0571
\$STEPT	001	0002	0314	
\$SWPCR	001	0511	0576	0578
\$TABLN	001	03CB	0285	0288
\$TFLOW	001	0008	0320	
\$TRACE	001	0004	0315	
\$TRALL	001	0010	0321	
\$TROVR	001	054E	0590	0593
\$TRUNK	001	0080	0273	
\$TRVAR	001	0020	0322	
\$UNMSK	001	048D	0551	0554
\$USRDR	001	03DC	0462	0463
\$VMDEF	001	0080	0326	
\$VOLF1	001	03FE	0505	0506
\$VOLF2	001	040E	0507	
\$VOLID	001	03F6	0503	0504 0508
\$VOLR1	001	03F6	0504	0505
\$VOLR2	001	0406	0506	0507
\$WAITF	001	057F	0606	0608 7269 7920 0460
\$WFDEF	001	0040	0520	
\$WFLOK	001	0008	0383	
\$WFNME	001	0443	0519	0524
\$WSIND	001	0004	0380	
\$XIND1	001	03D0	0311	0330
\$XIND2	001	03D1	0330	0339
\$XIND3	001	03D8	0458	0461
\$XPREC	001	0040	0323	
\$XRSAB	001	03C7	0283	0285
\$ZTRAD	001	05A2	0612	
\$12K	001	0004	0467	
\$16CKY	001	0008	0469	
\$16K	001	0002	0466	
\$22IMP	001	0001	0464	
##\$#BL	001	0000	1437	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
###CK	001	0000	1565	
###CN	001	0000	1533	
###CO	001	0000	1325	
###CS	001	0000	1385	
###DR	001	0000	1129	
###ER	001	0000	1329	
###FS	001	0000	1425	
###IN	001	0000	1569	
###PW	001	0000	1573	
###RS	001	0000	1405	
###SA	001	0000	1393	
###SS	001	0000	1389	
###VU	001	0600	1349	
###0T	001	0700	1121	
###1T	001	0000	1125	
###BCO	001	0600	1137	
###BOV	001	0800	1409	
###DPR	001	0700	1145	
###DRE	001	0889	1161	
###DSP	001	2800	1181	
###ECM	001	0C00	1441	
###EFK	001	0C00	1461	
###ERR	001	0C00	1433	
###EXM	001	0C00	1321	
###FIL	001	0E00	1401	
###FIS	001	0E00	1397	
###FML	001	0200	1529	
###FMS	001	0200	1369	3963
###GRA	001	0889	1293	
###GUF	001	0C00	1429	
###INL	001	0600	1509	
###INS	001	0600	1133	7289 8015
###KAL	001	0C00	1297	
###KCA	001	0C00	1513	
###KCH	001	0C00	1265	
###KCN	001	0C00	1381	
###KCT	001	0C00	1233	
###KDE	001	0C00	1229	
###KDI	001	0D00	1309	
###KDN	001	0C00	1217	
###KDO	001	0E00	1313	
###KED	001	0C00	1153	
###KEN	001	0C00	1157	
###KEX	001	0C00	1177	
###KGO	001	0C00	1149	
###KHE	001	0C00	1333	
###KKE	001	0C00	1561	
###KLI	001	0C00	1237	
###KLL	001	0920	1537	
###KLO	001	0C00	1241	
###KME	001	0D00	1221	
###KMO	001	0C00	1165	
###KNA	001	0C00	1277	
###KOV	001	0E00	1197	
###KPA	001	0C00	1173	
###KPO	001	0C00	1261	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$\$\$KPR	001	0C00	1285	
\$\$\$KRE	001	0C00	1205	
\$\$\$KRL	001	0700	1301	
\$\$\$KRM	001	0C00	1169	
\$\$\$KRN	001	0700	1189	
\$\$\$KRO	001	0D00	1193	
\$\$\$KRS	001	0C00	1517	
\$\$\$KRU	001	0C00	1213	
\$\$\$KRV	001	0800	1305	
\$\$\$KSA	001	0C00	1249	
\$\$\$KSE	001	0E00	1289	
\$\$\$KSO	001	0C20	1341	
\$\$\$KSS	001	0C00	1273	
\$\$\$KSV	001	0980	1269	
\$\$\$KSY	001	0C00	1281	
\$\$\$KWI	001	0C00	1209	
\$\$\$KWR	001	0C00	1201	
\$\$\$LOA	001	0600	1141	
\$\$\$MIP	001	0C00	1337	
\$\$\$SDS	001	0C00	1449	
\$\$\$SFF	001	0E00	1453	
\$\$\$SFL	001	0F00	1445	7299 8027
\$\$\$SFO	001	1500	1417	
\$\$\$SFS	001	0C00	1413	
\$\$\$SPA	001	0C00	1253	
\$\$\$SPO	001	0806	1257	
\$\$\$SPS	001	0C00	1245	
\$\$\$STR	001	1600	1421	
\$\$\$TDC	001	1000	1225	
\$\$\$TSY	001	1000	1185	
\$\$\$TVK	001	0FC0	1361	
\$\$\$UAL	001	0C00	1377	
\$\$\$UAT	001	0900	1473	
\$\$\$UCD	001	0900	1481	
\$\$\$UCN	001	0C00	1465	
\$\$\$UCP	001	0700	1469	
\$\$\$UDE	001	0C00	1485	
\$\$\$UDI	001	0C00	1489	
\$\$\$UEX	001	0C00	1373	
\$\$\$UIN	001	0C00	1477	
\$\$\$UPA	001	0C00	1457	
\$\$\$UPO	001	0C00	1525	
\$\$\$UPT	001	0C00	1521	
\$\$\$VCR	001	2000	1317	
\$\$\$VLO	001	0600	1353	
\$\$\$VOD	001	0600	1357	
\$\$\$VVM	001	0000	1365	
\$\$\$VXI	001	0600	1345	
\$\$\$ZDU	001	1100	1497	
\$\$\$ZLB	001	1100	1541	
\$\$\$ZLO	001	1100	1501	
\$\$\$ZLV	001	0F00	1557	
\$\$\$ZL1	001	0F00	1545	
\$\$\$ZL2	001	0F00	1549	
\$\$\$ZL3	001	0C00	1553	
\$\$\$ZTR	001	1000	1493	

CROSS REFERENCE

SYMBOL LEN VALUE DEFN REFERENCES VER 15, MOD 00 31/05/21 PAGE 185

###ZUT	001	0C00	1505
###BLN	001	18D4	1436
###CKT	001	2118	1564
###CNF	001	2000	1532
###COR	001	0800	1324
###CSA	001	1000	1384
###DRT	001	0000	1128
###ERM	001	0928	1328
###FSP	001	1880	1424
###INV	001	212C	1568
###PWR	001	2300	1572
###RSP	001	1780	1404
###SAV	001	1180	1392
###SSA	001	1128	1388
###VUF	001	0B08	1348
##0TR	001	0000	1120
##1TR	001	0080	1124
##@BL	001	0001	1438
##@CK	001	0004	1566
##@CN	001	0001	1534
##@CO	001	003A	1326
##@CS	001	003A	1386
##@DR	001	0008	1130
##@ER	001	0032	1330
##@FS	001	0030	1426
##@IN	001	003A	1570
##@PW	001	00C0	1574
##@RS	001	0030	1406
##@SA	001	0108	1394
##@SS	001	0001	1390
##@VU	001	0002	1350
##@0T	001	0018	1122
##@1T	001	0018	1126
##@BCO	001	0018	1138
##@BOV	001	0018	1410
##@DPR	001	0005	1146
##@DRE	001	0001	1162
##@DSP	001	0004	1182
##@ECM	001	0006	1442
##@EFK	001	0002	1462
##@ERR	001	0003	1434
##@EXM	001	0003	1322
##@FIL	001	0009	1402
##@FIS	001	0009	1398
##@FML	001	0052	1530
##@FMS	001	0052	1370
##@GRA	001	0003	1294
##@GUF	001	0010	1430
##@INL	001	0010	1510
##@INS	001	0010	1134
##@KAL	001	000F	1298
##@KCA	001	000C	1514
##@KCH	001	000C	1266
##@KCN	001	0010	1382
##@KCT	001	0009	1234
##@KDE	001	0010	1230

CROSS REFERENCE

SYMBOL LEN VALUE DEFN REFERENCES VER 15, MOD 00 31/05/21 PAGE 186

#\$@KDI	001	0005	1310	
#\$@KDN	001	0010	1218	
#\$@KDO	001	000C	1314	
#\$@KED	001	000E	1154	
#\$@KEN	001	0006	1158	
#\$@KEX	001	0003	1178	
#\$@KGO	001	0002	1150	
#\$@KHE	001	000C	1334	
#\$@KKE	001	0006	1562	
#\$@KLI	001	0011	1238	
#\$@KLL	001	0001	1538	
#\$@KLO	001	0008	1242	
#\$@KME	001	0003	1222	
#\$@KMO	001	0004	1166	
#\$@KNA	001	0008	1278	
#\$@KOV	001	0009	1198	
#\$@KPA	001	0005	1174	
#\$@KPO	001	000D	1262	
#\$@KPR	001	0009	1286	
#\$@KRE	001	0002	1206	
#\$@KRL	001	0004	1302	
#\$@KRM	001	0003	1170	
#\$@KRN	001	0003	1190	
#\$@KRO	001	000A	1194	
#\$@KRS	001	000A	1518	
#\$@KRU	001	0003	1214	
#\$@KRV	001	000D	1306	
#\$@KSA	001	0011	1250	
#\$@KSE	001	0004	1290	
#\$@KSO	001	000D	1342	
#\$@KSS	001	000B	1274	
#\$@KSV	001	0002	1270	
#\$@KSY	001	000F	1282	
#\$@KWI	001	0002	1210	
#\$@KWR	001	0002	1202	
#\$@LOA	001	0013	1142	
#\$@MIP	001	000D	1338	
#\$@SDS	001	0004	1450	
#\$@SFF	001	0008	1454	
#\$@SFL	001	0005	1446	
#\$@SFO	001	0003	1418	
#\$@SFS	001	0011	1414	
#\$@SPA	001	0004	1254	
#\$@SPO	001	0003	1258	
#\$@SPS	001	0001	1246	
#\$@STR	001	0002	1422	
#\$@TDC	001	0003	1226	
#\$@TSY	001	0003	1186	
#\$@TVK	001	0001	1362	
#\$@UAL	001	0011	1378	
#\$@UAT	001	000C	1474	
#\$@UCD	001	000B	1482	
#\$@UCN	001	0009	1466	
#\$@UCP	001	000F	1470	
#\$@UDE	001	000E	1486	
#\$@UDI	001	0008	1490	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
#\$@UEX	001	000E	1374	
#\$@UIN	001	000F	1478	
#\$@UPA	001	0004	1458	
#\$@UPO	001	0005	1526	
#\$@UPT	001	0012	1522	
#\$@VCR	001	0008	1318	
#\$@VLO	001	0002	1354	
#\$@VOD	001	0016	1358	
#\$@VVM	001	0030	1366	
#\$@VXI	001	0002	1346	
#\$@ZDU	001	0008	1498	
#\$@ZLB	001	0002	1542	
#\$@ZLO	001	000C	1502	
#\$@ZLV	001	0006	1558	
#\$@ZL1	001	0007	1546	
#\$@ZL2	001	000D	1550	
#\$@ZL3	001	000A	1554	
#\$@ZTR	001	0001	1494	
#\$@ZUT	001	0014	1506	
#\$BCOM	001	0080	1136	
#\$BOLV	001	1780	1408	
#\$DPRI	001	014C	1144	
#\$DREA	001	0200	1160	
#\$DSPL	001	0240	1180	
#\$ECMA	001	1900	1440	
#\$EFKE	001	1990	1460	
#\$ERRP	001	18C0	1432	
#\$EXMS	001	07D4	1320	
#\$FILN	001	1724	1400	
#\$FIST	001	1700	1396	
#\$FMLN	001	1E00	1528	
#\$FMST	001	0D00	1368	
#\$GRAP	001	0690	1292	
#\$GUFU	001	1880	1428	
#\$INLN	001	1C84	1508	
#\$INST	001	0020	1132	
#\$KALL	001	06A4	1296	
#\$KCAL	001	1CC4	1512	
#\$KCHA	001	053C	1264	
#\$KCND	001	0F80	1380	
#\$KCTL	001	03BC	1232	
#\$KDEL	001	035C	1228	
#\$KDIS	001	0744	1308	
#\$KDNT	001	0300	1216	
#\$KDOV	001	0780	1312	
#\$KEDI	001	0188	1152	
#\$KENA	001	01C4	1156	
#\$KEXT	001	0234	1176	
#\$KGOS	001	0180	1148	
#\$KHEL	001	0A30	1332	
#\$KKEY	001	2100	1560	
#\$KLIS	001	0400	1236	
#\$KLLA	001	2004	1536	
#\$KLOG	001	0444	1240	
#\$KMER	001	030C	1220	
#\$KMOU	001	0204	1164	

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#\$KNAM	001	05C0	1276	
#\$KOVN	001	0290	1196	
#\$KPAS	001	0220	1172	
#\$KPOO	001	0508	1260	
#\$KPRT	001	063C	1284	
#\$KREA	001	02BC	1204	
#\$KRLA	001	0700	1300	
#\$KRMO	001	0214	1168	
#\$KRNU	001	0280	1188	
#\$KROV	001	028C	1192	
#\$KRSU	001	1D24	1516	
#\$KRUN	001	02CC	1212	
#\$KRVL	001	0710	1304	
#\$KSAV	001	0488	1248	
#\$KSET	001	0680	1288	
#\$KSOV	001	0AC8	1340	
#\$KSSP	001	0594	1272	
#\$KSVL	001	058C	1268	
#\$KSYM	001	0600	1280	
#\$KWID	001	02C4	1208	
#\$KWRI	001	02B4	1200	
#\$LOAD	001	0100	1140	
#\$MIPP	001	0A80	1336	
#\$SDSY	001	192C	1448	
#\$SFFI	001	193C	1452	
#\$SFLO	001	1918	1444	
#\$SFOV	001	1844	1416	
#\$SFSY	001	1800	1412	
#\$SPAC	001	04CC	1252	
#\$SPOV	001	04DC	1256	
#\$SPSY	001	0484	1244	
#\$STRO	001	1850	1420	
#\$TDCK	001	0350	1224	
#\$TSYK	001	0250	1184	
#\$TVKB	001	0BAC	1360	
#\$UALL	001	0F00	1376	
#\$UATR	001	1A38	1472	
#\$UCDI	001	1AD8	1480	
#\$UCNF	001	19B8	1464	
#\$UCPL	001	19DC	1468	
#\$UDEL	001	1B24	1484	
#\$UDIS	001	1B5C	1488	
#\$UEXL	001	0EA8	1372	
#\$UINI	001	1A88	1476	
#\$UPAC	001	1980	1456	
#\$UPOV	001	1D24	1524	
#\$UPTF	001	1D5C	1520	
#\$VCRT	001	07B4	1316	
#\$VLOA	001	0B80	1352	
#\$VODK	001	0B88	1356	
#\$VVMR	001	0C00	1364	
#\$VXIT	001	0B00	1344	
#\$ZDUM	001	1BA4	1496	
#\$ZLBM	001	2008	1540	
#\$ZLOA	001	1BC4	1500	
#\$ZLVR	001	20B0	1556	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
#\$ZL1M	001	2010	1544	
#\$ZL2M	001	2030	1548	
#\$ZL3M	001	2088	1552	
#\$ZTRA	001	1B9C	1492	
#\$ZUTM	001	1C14	1504	
#@#BAD	001	0455	0880	
#@#IO1	001	0459	0888	
#@#IO2	001	045D	0889	
#@#TAT	001	0941	0916	
#@#TBA	001	09A1	0920	
#@#TFS	001	0941	0914	
#@#TSY	001	0941	0918	
#@#VFP	001	0700	0906	
#@#VLP	001	093D	0909	
#@#WDB	001	050C	0901	
#@#WFT	001	0500	0899	
###BA	001	0001	0881	
###IO	001	0001	0893	
###SC	001	0002	0890	
###TA	001	0010	0917	
###TB	001	0010	0921	
###TS	001	0005	0919	
###TW	001	0020	0915	
###VM	001	0100	0910	
###WD	001	00BD	0902	
###WF	001	0003	0900	
###04	001	0004	0892	
###08	001	0008	0891	
###BOV	001	0018	0869	
###ECM	001	0006	0883	
###ERR	001	0003	0877	
###GUF	001	0010	0873	
###LDS	001	0002	0879	
###SDS	001	0004	0875	
###SFF	001	0008	0887	
###SFL	001	0005	0885	7298 8026
###SFO	001	0005	0895	
###SFS	001	0011	0871	
###VSF	001	0010	0923	
###VSL	001	000F	0924	7288 8014
###VTR	001	0001	0908	
#@BOVL	001	0400	0868	
#@CORS	001	0005	0774	
#@ECMA	001	0481	0882	
#@ERRP	001	0441	0876	
#@GUFU	001	0401	0872	
#@LDSV	001	044D	0878	
#@MVSD	001	0001	0782	
#@NERO	001	0003	0776	
#@OBRA	001	0002	0778	
#@PTFL	001	0006	0797	
#@PTFS	001	0001	0796	
#@SDSY	001	04AD	0874	
#@SFFI	001	04BD	0886	
#@SFLO	001	0499	0884	7297 8025
#@SFOV	001	04C4	0894	

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#@SFSY	001	0480	0870	
#@VCNT	001	0002	0794	
#@VLAB	001	0001	0789	
#@VLSD	001	0001	0780	
#@VSFI	001	09A1	0922	7287 8013
#@VTRL	001	0708	0907	
#@WAF1	001	0401	0867	
#@WAR1	001	0400	0866	
#CNDIS	001	0001	0749	
#CNFIG	001	0005	0785	
#CORSV	001	0010	0773	
#DKEXT	001	0002	0756	
#FIGSC	001	0001	0786	
#FMSTD	001	0000	0002	
#HISCT	001	0006	0763	
#HISDX	001	0003	0758	
#HISLN	001	0008	0755	0756 8722 8902
#HISN1	001	0003	0761	
#HISN2	001	0005	0762	
#HISTC	001	0007	0765	
#HISTN	001	0009	0767	
#HISTQ	001	0000	0759	
#HISTR	001	0001	0760	
#HISTS	001	0008	0766	
#HISTV	001	000F	0768	
#HSEND	001	0007	0764	
#HSENT	001	0001	0757	
#IOSDR	001	0019	0784	
#MVSDR	001	000D	0781	
#NEROV	001	009C	0775	
#OBRAD	001	001D	0777	
#PKCNT	001	0002	0742	
#PKMRW	001	002B	0743	
#PKRDD	001	0003	0740	
#PKRTD	001	0003	0739	
#PKRTL	001	0004	0746	
#PKVRD	001	000B	0744	
#PKVWD	001	0007	0745	
#PKWTD	001	0001	0741	
#PTFDA	001	00DC	0795	
#RDWTL	001	0004	0747	
#SDRDK	001	0011	0783	
#VLSDR	001	000C	0779	
#VLTBE	001	0008	0734	
#VOLF1	001	0009	0787	
#VOLNG	001	0006	0732	0734 0756
#VOLOC	001	0005	0733	
#VOLR1	001	0008	0788	
#VTCF1	001	0025	0791	
#VTCF2	001	0027	0793	
#VTCR1	001	0024	0790	
#VTCR2	001	0026	0792	
@\$D1BF	001	0008	2230	6830 6834
@\$D1DC	001	0000	2229	
@\$D1DF	001	001E	2234	
@\$D1DP	001	0016	2233	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@SD1DV	001	000E	2232	
@SD1E1	001	0000	2223	
@SD1FS	001	000A	2231	
@SD1SW	001	001F	2236	6829
@SD2AS	001	0002	2241	
@SD2BS	001	0003	2248	7120 7228 7885
@SD2CB	001	0005	2251	7129 7441* 7442* 7443* 7591 7594* 7881 7928* 7932* 7959* 7972*
@SD2CF	001	0001	2240	6856* 6857 7003 7573 8080* 8082 8131*
@SD2CP	001	0005	2249	7125 7187* 7272 7318 7749 7787* 7802 7937 7968* 8109 8109*
@SD2CS	001	0004	2250	7120 7171 7228 7883 7885 7946* 8120
@SD2CY	001	0006	2252	
@SD2DA	001	0007	2253	
@SD2DC	001	0000	2245	6858 7017 7021 7049 7586 8086 8117
@SD2DD	001	0009	2254	7169 8110 8110*
@SD2EE	001	000F	2257	8120 8120*
@SD2E1	001	0040	2244	6875 6886
@SD2FS	001	000B	2255	7168
@SD2IO	001	0001	2246	7004 7006 7008 7012* 7028 7058 7130 7132 7230 7321 7409 7574 7576 7578 7582* 7743 7926 8088 8090 8092* 8100* 8116* 8119 8119*
@SD2LC	001	000D	2256	7731 7747 7788* 7801 7929* 7974* 8111 8111*
@SD2PN	001	000A	2242	
@SD2SF	001	000B	2243	
@SD2VB	001	0002	2247	7126 7273 7319 7595 7750 7803 7938
@\$L1BF	001	0008	2263	
@\$L1DC	001	0001	2262	
@\$L1DF	001	0008	2265	6808 6834
@\$L1DP	001	0008	2266	
@\$L1DV	001	0006	2267	
@\$L1E	001	0020	2261	6839
@\$L1FS	001	0002	2264	
@\$L2AS	001	0001	2273	
@\$L2BS	001	0001	2280	
@\$L2CB	001	0001	2283	7129 7326 7376 7395 7441 7442 7443 7959 7972 8036 8037
@\$L2CF	001	0002	2272	
@\$L2CP	001	0002	2281	7125 7187 7272 7318 7749 7787 7802 7846 7968 8109
@\$L2CS	001	0001	2282	7171 7885 7946 8035
@\$L2DA	001	0002	2284	
@\$L2DC	001	0001	2277	8119
@\$L2DD	001	0002	2285	7169 8110
@\$L2E	001	0010	2276	6887 8120
@\$L2FS	001	0002	2286	7168 7170 7172
@\$L2HD	001	0040	2271	
@\$L2IO	001	0001	2278	7130 8119
@\$L2LC	001	0002	2287	7731 7747 7788 7801 7853 7929 7974 8034 8111
@\$L2PN	001	0008	2275	
@\$L2SF	001	0002	2274	
@\$L2VB	001	0001	2279	7120 7126 7228 7273 7319 7415 7595 7750 7803 7938
@\$MBCD	001	0020	2301	7049 7586
@\$MBCR	001	0008	2303	7021
@\$MBEN	001	000C	2291	8151
@\$MBND	001	0000	2298	
@\$MBPD	001	0080	2299	
@\$MBPT	001	0010	2302	7017
@\$MBPU	001	0001	2294	
@\$MBSD	001	0040	2300	8117
@\$M2CI	001	0008	2318	7006 7574 7582 8088 8116

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@\$M2CO	001	0004	2319	7004	7012	7576	8090	8116			
@\$M2EF	001	0002	2293	7028	7058	7132	7230	7321	7409	8092	8100
@\$M2FI	001	0080	2307	7578	7926						
@\$M2FO	001	0040	2308	7008							
@\$M2FP	001	0020	2309	7143	7743						
@\$M2FT	001	0010	2312								
@\$M2NS	001	00FF	2292								
@@E001	001	0000	2111	2113							
@@E003	001	0001	2113	2115							
@@E004	001	0002	2115	2117							
@@E005	001	0003	2117	2119							
@@E006	001	0004	2119	2121							
@@E007	001	0005	2121	2123							
@@E008	001	0006	2123	2125							
@@E009	001	0007	2125	2127							
@@E010	001	0008	2127	2129							
@@E011	001	0009	2129	2131							
@@E012	001	000A	2131	2133							
@@E013	001	000B	2133	2135							
@@E014	001	000C	2135	2137							
@@E015	001	000D	2137	2139							
@@E016	001	000E	2139	2141							
@@E017	001	000F	2141	2143							
@@E018	001	0010	2143	2145							
@@E019	001	0011	2145	2147							
@@E020	001	0012	2147	2149							
@@E021	001	0013	2149	2151							
@@E023	001	0014	2151	2153							
@@E024	001	0015	2153	2155							
@@E025	001	0016	2155	2157							
@@E026	001	0017	2157	2159							
@@E027	001	0018	2159	2161							
@@E028	001	0019	2161	2163							
@@E029	001	001A	2163	2165							
@@E030	001	001B	2165	2167							
@@E031	001	001C	2167	2169							
@@E032	001	001D	2169	2171							
@@E035	001	001E	2171	2173							
@@E036	001	001F	2173	2175							
@@E037	001	0020	2175	2177							
@@E038	001	0021	2177	2179							
@@E039	001	0022	2179	2181							
@@E040	001	0023	2181	2183							
@@E041	001	0024	2183	2185							
@@E042	001	0025	2185	2187							
@@E043	001	0026	2187	2189							
@@E044	001	0027	2189	2191							
@@E045	001	0028	2191	2193							
@@E046	001	0029	2193	2195							
@@E060	001	002A	2195	2197							
@@E080	001	002B	2197								
@@E100	001	0000	1583	1585							
@@E101	001	0001	1585	1587							
@@E102	001	0002	1587	1589							
@@E103	001	0003	1589	1591							
@@E110	001	0004	1591	1593							

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E112	001	0005	1593	1595
@@E113	001	0006	1595	1597
@@E114	001	0007	1597	1599
@@E115	001	0008	1599	1601
@@E116	001	0009	1601	1603
@@E117	001	000A	1603	1605
@@E120	001	000B	1605	1607
@@E122	001	000C	1607	1609
@@E123	001	000D	1609	1611
@@E124	001	000E	1611	1613
@@E129	001	000F	1613	1615
@@E130	001	0010	1615	1617
@@E131	001	0011	1617	1619
@@E133	001	0012	1619	1621
@@E134	001	0013	1621	1623
@@E135	001	0014	1623	1625
@@E136	001	0015	1625	1627
@@E137	001	0016	1627	1629
@@E138	001	0017	1629	1631
@@E139	001	0018	1631	1633
@@E142	001	0019	1633	1635
@@E143	001	001A	1635	1637
@@E150	001	001B	1637	1639
@@E151	001	001C	1639	1641
@@E160	001	001D	1641	1643
@@E162	001	001E	1643	1645
@@E163	001	001F	1645	1647
@@E164	001	0020	1647	1649
@@E200	001	0021	1649	1651
@@E205	001	0022	1651	1653
@@E210	001	0023	1653	1655
@@E211	001	0024	1655	1657
@@E212	001	0025	1657	1659
@@E213	001	0026	1659	1661
@@E215	001	0027	1661	1663
@@E216	001	0028	1663	1665
@@E217	001	0029	1665	1667
@@E220	001	002A	1667	1669
@@E221	001	002B	1669	1671
@@E222	001	002C	1671	1673
@@E223	001	002D	1673	1675
@@E225	001	002E	1675	1677
@@E226	001	002F	1677	1679
@@E227	001	0030	1679	1681
@@E228	001	0031	1681	1683
@@E229	001	0032	1683	1685
@@E230	001	0033	1685	1687
@@E232	001	0034	1687	1689
@@E234	001	0035	1689	1691
@@E237	001	0036	1691	1693
@@E240	001	0037	1693	1695
@@E241	001	0038	1695	1697 2708
@@E242	001	0039	1697	1699
@@E248	001	003A	1699	1701
@@E249	001	003B	1701	1703
@@E250	001	003C	1703	1705

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E251	001	003D	1705	1707
@@E252	001	003E	1707	1709
@@E253	001	003F	1709	1711
@@E254	001	0040	1711	1713
@@E255	001	0041	1713	1715
@@E256	001	0042	1715	1717
@@E300	001	0043	1717	1719
@@E301	001	0044	1719	1721
@@E302	001	0045	1721	1723
@@E303	001	0046	1723	1725
@@E304	001	0047	1725	1727
@@E305	001	0048	1727	1729
@@E308	001	0049	1729	1731
@@E310	001	004A	1731	1733
@@E315	001	004B	1733	1735
@@E316	001	004C	1735	1737
@@E320	001	004D	1737	1739
@@E325	001	004E	1739	1741
@@E330	001	004F	1741	1743
@@E335	001	0050	1743	1745
@@E338	001	0051	1745	1747
@@E340	001	0052	1747	1749
@@E350	001	0053	1749	1751
@@E351	001	0054	1751	1753
@@E352	001	0055	1753	1755
@@E360	001	0056	1755	1757
@@E361	001	0057	1757	1759
@@E362	001	0058	1759	1761
@@E371	001	0059	1761	1763
@@E380	001	005A	1763	1765
@@E390	001	005B	1765	1767
@@E400	001	005C	1767	1769
@@E410	001	005D	1769	1771
@@E415	001	005E	1771	1773
@@E417	001	005F	1773	1775
@@E420	001	0060	1775	1777
@@E430	001	0061	1777	1779
@@E432	001	0062	1779	1781
@@E433	001	0063	1781	1783
@@E450	001	0064	1783	1785
@@E451	001	0065	1785	1787
@@E460	001	0066	1787	1789
@@E461	001	0067	1789	1791
@@E464	001	0068	1791	1793
@@E465	001	0069	1793	1795
@@E466	001	006A	1795	1797
@@E467	001	006B	1797	1799
@@E469	001	006C	1799	1801
@@E470	001	006D	1801	1803
@@E471	001	006E	1803	1805
@@E473	001	006F	1805	1807
@@E474	001	0070	1807	1809
@@E475	001	0071	1809	1811
@@E476	001	0072	1811	1813
@@E477	001	0073	1813	1815
@@E478	001	0074	1815	1817

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@@E479	001	0075	1817	1819
@@E480	001	0076	1819	1821
@@E481	001	0077	1821	1823
@@E482	001	0078	1823	1825
@@E483	001	0079	1825	1827
@@E484	001	007A	1827	1829
@@E485	001	007B	1829	1831
@@E486	001	007C	1831	1833
@@E487	001	007D	1833	1835
@@E488	001	007E	1835	1837
@@E489	001	007F	1837	1839
@@E490	001	0080	1839	1841
@@E491	001	0081	1841	1843
@@E492	001	0082	1843	1845
@@E493	001	0083	1845	1847
@@E494	001	0084	1847	1849
@@E495	001	0085	1849	1851
@@E496	001	0086	1851	1853
@@E497	001	0087	1853	1855
@@E498	001	0088	1855	1857
@@E500	001	0089	1857	1859
@@E501	001	008A	1859	1861
@@E530	001	008B	1861	1863
@@E531	001	008C	1863	1865
@@E535	001	008D	1865	1867
@@E540	001	008E	1867	1869
@@E541	001	008F	1869	1871
@@E542	001	0090	1871	1873
@@E543	001	0091	1873	1875
@@E544	001	0092	1875	1877
@@E545	001	0093	1877	1879
@@E546	001	0094	1879	1881
@@E547	001	0095	1881	1883
@@E548	001	FFFF	2087	
@@E549	001	0096	1883	1885
@@E550	001	0097	1885	1887
@@E551	001	0098	1887	1889
@@E552	001	0099	1889	1891
@@E553	001	009A	1891	1893
@@E554	001	009B	1893	1895
@@E555	001	009C	1895	1897
@@E556	001	009D	1897	1899
@@E558	001	009E	1899	1901
@@E570	001	009F	1901	1903
@@E571	001	00A0	1903	1905
@@E572	001	00A1	1905	1907
@@E573	001	00A2	1907	1909
@@E574	001	00A3	1909	1911
@@E575	001	FFFF	2089	
@@E578	001	00A4	1911	1913
@@E579	001	FFFF	2091	
@@E580	001	FFFF	2093	
@@E585	001	00A5	1913	1915
@@E595	001	FFFF	2095	
@@E597	001	FFFF	2097	
@@E598	001	FFFF	2099	

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@@E600	001	00A6	1915	1917	
@@E601	001	00A7	1917	1919	
@@E602	001	00A8	1919	1921	
@@E603	001	00A9	1921	1923	
@@E604	001	00AA	1923	1925	
@@E606	001	00AB	1925	1927	
@@E607	001	00AC	1927	1929	
@@E608	001	00AD	1929	1931	
@@E609	001	00AE	1931	1933	
@@E610	001	00AF	1933	1935	
@@E611	001	00B0	1935	1937	
@@E612	001	00B1	1937	1939	
@@E613	001	00B2	1939	1941	
@@E614	001	00B3	1941	1943	
@@E700	001	00B4	1943	1945	
@@E701	001	00B5	1945	1947	6721
@@E710	001	00B6	1947	1949	6810 6814 6832
@@E712	001	00B7	1949	1951	7010 7580
@@E713	001	00B8	1951	1953	
@@E714	001	00B9	1953	1955	7836
@@E715	001	00BA	1955	1957	7174
@@E716	001	00BB	1957	1959	
@@E717	001	00BC	1959	1961	
@@E718	001	00BD	1961	1963	7688
@@E720	001	00BE	1963	1965	
@@E721	001	00BF	1965	1967	
@@E723	001	00C0	1967	1969	
@@E724	001	00C1	1969	1971	
@@E725	001	00C2	1971	1973	
@@E726	001	00C3	1973	1975	
@@E727	001	00C4	1975	1977	
@@E728	001	00C5	1977	1979	6687
@@E729	001	00C6	1979	1981	
@@E730	001	00C7	1981	1983	
@@E732	001	00C8	1983	1985	6697
@@E752	001	00C9	1985	1987	
@@E753	001	00CA	1987	1989	
@@E754	001	00CB	1989	1991	
@@E755	001	00CC	1991	1993	
@@E756	001	00CD	1993	1995	
@@E757	001	00CE	1995	1997	
@@E758	001	00CF	1997	1999	
@@E759	001	00D0	1999	2001	
@@E760	001	00D1	2001	2003	
@@E761	001	00D2	2003	2005	
@@E762	001	00D3	2005	2007	
@@E763	001	00D4	2007	2009	
@@E764	001	00D5	2009	2011	
@@E765	001	00D6	2011	2013	
@@E766	001	00D7	2013	2015	
@@E767	001	00D8	2015	2017	
@@E768	001	00D9	2017	2019	
@@E769	001	00DA	2019	2021	
@@E770	001	00DB	2021	2023	
@@E771	001	00DC	2023	2025	
@@E772	001	00DD	2025	2027	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@@E773	001	00DE	2027	2029
@@E774	001	00DF	2029	2031 5156
@@E775	001	00E0	2031	2033 5360
@@E776	001	00E1	2033	2035 4802
@@E777	001	00E2	2035	2037 4126
@@E778	001	00E3	2037	2039 4106
@@E779	001	00E4	2039	2041 4117
@@E780	001	00E5	2041	2043
@@E781	001	00E6	2043	2045
@@E782	001	00E7	2045	2047
@@E783	001	00E8	2047	2049
@@E784	001	00E9	2049	2051
@@E785	001	00EA	2051	2053
@@E786	001	00EB	2053	2055
@@E790	001	00EC	2055	2057 5120
@@E791	001	00ED	2057	2059 5231
@@E792	001	00EE	2059	2061
@@E793	001	00EF	2061	2063
@@E794	001	00F0	2063	2065
@@E795	001	00F1	2065	2067 5609
@@E796	001	00F2	2067	2069 5595
@@E797	001	00F3	2069	2071
@@E798	001	00F4	2071	2073
@@E800	001	FFFF	2101	
@@E801	001	FFFF	2103	
@@E802	001	FFFF	2105	
@@E803	001	FFFF	2107	
@@E804	001	FFFF	2109	
@@E900	001	00F5	2073	2075 2704
@@E901	001	00F6	2075	2077 2706
@@E902	001	00F7	2077	2079 2705
@@E903	001	00F8	2079	2081 2707
@@E905	001	00F9	2081	2083
@@E906	001	00FA	2083	2085
@@E910	001	00FB	2085	2703
@ALTFL	001	0001	0963	
@ARR	001	0008	0017	6229 7196 8571 8578 8592 8611 9829 9846 0103 0121
@ASIGN	001	007C	0072	
@ASTER	001	005C	0070	
@BCRDL	001	0050	0089	7379
@BE	001	0081	0044	
@BF	001	0090	0053	
@BH	001	0084	0042	
@BKSPC	001	0010	1060	
@BL	001	0082	0043	
@BLANK	001	0040	0066	6800 7618
@BM	001	0082	0055	
@BNE	001	0001	0047	7604 7605
@BNH	001	0004	0045	
@BNL	001	0002	0046	
@BNM	001	0002	0058	
@BNOL	001	0020	0051	
@BNOZ	001	0008	0050	
@BNP	001	0004	0057	
@BNZ	001	0001	0059	
@BOL	001	00A0	0049	

CROSS REFERENCE																	
SYMBOL	LEN	VALUE	DEFN	REFERENCES										VER 15, MOD 00		31/05/21	PAGE 198
@BOZ	001	0088	0048														
@BP	001	0084	0054														
@BR	001	0001	0014	4097	4105	4105	4106	4107	4116	4116	4117	4118	4119	4125	4126		
				4132	4134	4136	4173	4174	4175	4176	4178	4179	4179	4184	4185		
				4210	4211	4242	4251	4252	4256	4265	4265	4266	4271	4271	4277		
				4278	4295	4299	4299	4303	4304	4308	4319	4325	4325	4330	4330		
				4331	4331	4332	4476	4484	4485	4488	4501	4508	4616	4623	4625		
				4639	4641	4641	4648	4649	4652	4663	4664	4786	4800	4801	4803		
				4817	4823	4824	4828	4829	4830	4831	4832	4832	4833	4842	4843		
				4846	4850	4851	4852	4853	4853	4854	4880	4880	4881	4891	4901		
				4902	4903	4905	4905	4912	4912	4913	4922	4924	4932	4932	4935		
				4977	4980	4982	4983	5095	5109	5114	5119	5121	5126	5128	5129		
				5138	5140	5141	5141	5142	5143	5145	5147	5148	5149	5155	5157		
				5164	5166	5171	5171	5172	5176	5177	5186	5188	5189	5197	5198		
				5199	5204	5205	5206	5216	5222	5230	5232	5236	5353	5359	5361		
				5363	5371	5377	5381	5394	5403	5404	5404	5405	5406	5407	5408		
				5409	5418	5419	5420	5420	5421	5422	5427	5428	5435	5436	5436		
				5437	5437	5439	5580	5587	5592	5595	5596	5607	5608	5609	5611		
				5612	5619	5621	5625	5631	5643	5647	5648	5649	5650	5651	5652		
				5652	5653	5654	5665	5681	5682	5683	5684	5685	5686	5689	5690		
				5695	5696	5697	5726	5736	5737	5740	5741	5741	5742	5742	5747		
				5747	5748	5749	5755	5757	5758	5758	5759	5760	5888	5906	5915		
				5916	5916	5917	6183	6192	6193	6194	6203	6229	6266	6292	6305		
				6306	6307	6316	6338	6355	6368	6377	6390	6400	6421	6438	6663		
				6679	6683	6692	6728	6729	6740	6744	6749	6749	6750	6785	6789		
				6789	6790	6796	6798	6802	6802	6803	6804	6808	6812	6819	6820		
				6821	6822	6826	6829	6836	6836	6837	6840	6843	6847	6848	6850		
				6854	6856	6872	6874	6875	6996	6999	7016	7019	7023	7039	7043		
				7053	7057	7071	7073	7073	7076	7080	7098	7113	7122	7128	7129		
				7130	7131	7136	7137	7138	7143	7145	7152	7159	7160	7163	7165		
				7165	7166	7166	7168	7169	7170	7170	7171	7172	7172	7177	7177		
				7178	7179	7180	7180	7181	7181	7182	7182	7187					

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				8711	8712	8713	8722	8728	8743	8745	8747	8750	8752	8757	8759
				8760	8762	8767	8768	8769	8771	8773	8773	8775	8776	8776	8777
				8777	8779	8780	8780	8783	8783	8784	8786	8788	8790	8792	8792
				8793	8793	8794	8794	8796	8812	8812	8813	8815	8816	8817	8818
				8822	8830	8832	8833	8837	8838	8891	8907	8916	8916	8918	8921
				8921	8923	8923	8925	8926	8928	8929	8930	8930	8932	8937	8940
				8945	8950	8964	9213	9224	9227	9232	9242	9245	9247	9254	9254
				9266	9267	9267	9268	9273	9273	9274	9275	9280	9280	9290	9296
				9312	9314	9315	9315	9318	9320	9320	9327	9330	9344	9345	9345
				9353	9354	9363	9456	9463	9466	9471	9473	9481	9482	9489	9490
				9490	9491	9491	9496	9497	9497	9499	9503	9519	9525	9526	9526
				9528	9534	9538	9538	9540	9541	9541	9547	9548	9549	9553	9553
				9554	9555	9557	9557	9558	9558	9559	9559	9560	9564	9566	9566
				9567	9571	9572	9572	9573	9629	9640	9644	9645	9646	9651	9651
				9653	9657	9668	9670	9672	9681	9694	9696	9696	9698	9698	9699
				9700	9702	9702	9710	9711	9717	9718	9718	9729	9734	9743	9752
				9756	9756	9757	9758	9758	9770	9779	9780	9789	9790	9800	9804
				9805	9829	9833	9834	9839	9846	9914	9920	9924	9928	9929	9930
				9935	9935	9937	9941	9952	9964	9977	9979	9979	9981	9981	9982
				9983	9985	9985	9993	9994	0000	0001	0001	0012	0017	0026	0035
				0039	0039	0040	0041	0041	0053	0062	0063	0072	0073	0083	0087
				0089	0103	0107	0108	0113	0121	0123	0314	0324	0330	0335	0336
				0336	0343	0344	0344	0345	0358	0378	0380	0380	0381	0381	0382
				0392	0393	0393	0400	0400	0401	0401	0402	0402	0403	0404	0404
				0414	0414	0418	0418	0419	0419	0423	0425	0429	0431	0441	0441
				0442	0442	0446	0447	0454	0454	0455	0611	0615	0622	0624	0626
				0635	0650	0651	0669	0672	0679	0680	0681	0712	0713	0714	0715
				0717	0724	0754	0768	0803	0809	0813	0818	0819	0830	0831	0832
				0832	0833	0833	0834	0834	0835	0835	0836	0836	0841	0847	0849
				0859	0868	0870	0871	0874	0876	0877	0878	0879	0881	0915	0917
				0921	0923	0923	0925	0926	0926	0928	0930	0938	0939	0948	0949
				0950	0950	0952	0956	0957	0960	0968	0970	0970	0973	0973	0974
				0975	0977	0982	0983	0984							

@BT 001 0010 0052

@BZ 001 0081 0056

@BZ37B 001 00F2 1073

@B1 001 0001 0064

4236	4352	4675	4950	5253	5468	5774	6829	7072	7078	7149	7155
7166	7180	7181	7182	7188	7190	7353	7426	7634	7642	7660	7822
7932	9247	9334	9554	0849							

@CADDR 001 0002 0143

2657	2684	3501	3502	3503	6468	6469	6470	6471	6472	6473	6474
6475	6476	6677	6692	6731	6740	6765	6792	7016	7019	7023	7039
7086	7102	7178	7199	7225	7243	7264	7279	7457	7706	7758	7854
7856	7857	7858	7860	7913	7994	8360	8504	8535	8579	8580	8581
8599	8612	8666	8670	8685	8690	8693	8745	8747	8750	8777	8794
8851	8923	8926	8968	9363	9387	9635	9646	9672	9920	9930	0125

0336 0441 0449 0460 0472 0481 0657 0695 0923

@CARDL 001 0060 0088

0645 7382 7397* 7398 7398 7398* 7603 7612*

@CC37B 001 0000 1069

@CD37B 001 00F0 1087

@CHARA 001 00C1 0073

@CHARF 001 00C6 0074

@CHARR 001 00D9 0075

@CHARZ 001 00E9 0076

@CKY01 001 0001 1021

@CKY02 001 0002 1022

@CKY03 001 0003 1023

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@CKY04	001	0004	1024	
@CKY05	001	0005	1025	
@CKY06	001	0006	1026	
@CKY07	001	0007	1027	
@CKY08	001	0008	1028	
@CKY09	001	0009	1029	
@CKY10	001	000A	1030	
@CKY11	001	000B	1031	
@CKY12	001	000C	1032	
@CKY13	001	000D	1033	
@CKY14	001	000E	1034	
@CKY15	001	000F	1035	
@CKY16	001	0010	1036	
@CLOFF	001	0010	0095	
@CLON	001	0011	0094	
@CMLON	001	0001	1039	
@CMOFF	001	0000	1038	
@COMMA	001	006B	0067	7621 7651
@CPLUS	001	004E	0080	
@CP37B	001	0004	1100	
@CRERR	001	0090	1055	
@CRPRY	001	0004	1059	
@CRTDS	001	0092	1052	
@CRTQ	001	0090	1054	
@CURSR	001	0040	1056	
@DADDR	001	0002	0141	0400 0401 0475 0483
@DBFR1	001	0004	0130	0442*
@DBFR2	001	0005	0131	0441*
@DBUSY	001	0002	0957	
@DCALK	001	0001	0082	
@DCBCY	001	0009	0116	3330
@DCBT1	001	0050	0118	3333
@DCFLN	001	0004	0941	
@DCNT	001	0003	0129	
@DCRID	001	0001	0955	
@DCST1	001	0040	0117	3331
@DCTRL	001	0000	0126	0324* 0330* 0358
@DCTRW	001	0000	0954	
@DCWID	001	0001	0951	
@DCYL	001	0001	0127	0392* 0414*
@DCYMV	001	0001	0942	
@DD2	001	0003	0031	5742 5742* 5747* 6192* 0745
@DEFLG	001	0002	0964	
@DERCE	001	0020	0994	
@DERD2	001	0008	0986	
@DEREQ	001	0010	0985	
@DERIN	001	0040	0983	
@DERMA	001	0020	0984	
@DERNR	001	0004	0987	
@DERR	001	0000	0958	
@DERSC	001	0001	0989	
@DERTC	001	0002	0988	
@DFCR	001	0006	0944	
@DFDR	001	0004	0945	
@DGET	001	0001	0135	7296 7901 8024 0330 0358
@DHARD	001	0000	0972	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@DLNCT	001	000F	1058	
@DLNLG	001	0040	1057	9924
@DOLAR	001	005B	0069	
@DOP2	001	0004	0029	7436 8874 0974*
@DPLNG	001	0006	0133	
@DPOS	001	0000	0134	
@DPUT	001	0002	0136	7244 7286 8012 0324
@DREAD	001	0001	0948	
@DSAD	001	0002	0128	0393* 0402* 0404* 0418 0418* 0419 0419* 0425* 0431*
@DSBCY	001	0004	0107	3268
@DSBSY	001	0092	1053	
@DSCS1	001	0000	0108	3269
@DSEEK	001	0000	0947	
@DSIVF	001	0003	0139	
@DSPIN	001	0002	0132	
@DTRSZ	001	0018	0086	0474
@DUNSF	001	0080	0990	
@DVBCY	001	0007	0109	3327
@DVERY	001	0003	0953	
@DVRFY	001	0031	0137	
@DVST1	001	0002	0959	
@DVST2	001	0003	0960	
@DWAIT	001	00FF	0138	
@DWBCY	001	0005	0104	3324
@DWBIT	001	0002	0949	
@DWSIZ	001	00C0	0106	
@DWTB1	001	0003	0105	3325
@DZERO	001	00F0	0065	4131 4170 4249 4486 4632 4862 4923 5108 5113 5118 5125 5362
				5376 5383 5403 5659 5896
@D1	001	0002	0027	6194* 7434 7613* 7647 7648* 7654* 7665* 8827 8937* 9268* 9273* 9274
				9280 9314* 9315* 9320 9489* 9490* 9491* 9496* 9497* 9503 9525* 9526*
				9534 9571* 9572 9572* 9657* 9941* 0335* 0343* 0344* 0378* 0380* 0381
				0393 0442 0454* 0622* 0672* 0744 0813* 0976* 0977*
@EOF	001	001C	0078	7135 7753 8095
@EOFTC	001	0075	0163	
@EOS	001	001E	0077	3340 7612 7624 7636 8684
@ER37B	001	00F0	1074	
@FDDBC	001	0000	0196	
@FDE1	001	000C	0201	
@FDFNA	001	000B	0199	
@FDHLN	001	0002	0209	
@FDLNC	001	0002	0194	
@FDNSC	001	0003	0211	
@FDSD	001	0000	0207	
@FLACE	001	0009	0198	
@FLDBC	001	0001	0197	
@FLDIN	001	0012	1046	
@FLENT	001	0004	0202	
@FLFNA	001	0002	0200	
@FLHLN	001	0002	0210	
@FLLNC	001	0002	0195	
@FLNSC	001	0001	0212	
@FLSD	001	0001	0208	
@HCEPK	001	003C	0829	
@HCOPS	001	001C	0836	
@HCOPY	001	081C	0831	

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@HCRHE	001	7858	0852												
@HDNRY	001	1008	0817												
@HDRHE	001	7854	0850												
@HDRLN	001	0007	0093	0673											
@HDRV1	001	7840	0842												
@HDRV2	001	7844	0844												
@HDTRD	001	1040	0813												
@HDTRJ	001	1010	0815												
@HERPG	001	087C	0819												
@HFEHT	001	0804	0834												
@HIPLE	001	006C	0826												
@HKBER	001	2040	0809	8726											
@HKBHE	001	7848	0846												
@HLOGE	001	1844	0821												
@HPRER	001	0070	0811	8906											
@HPRHE	001	784C	0848												
@HSTAD	001	0009	0970												
@HSTEN	001	0007	0969												
@HSTPE	001	0006	0968	8907* 8956*											
@HSTQR	001	0001	0966												
@HSTSN	001	0005	0967												
@HSTVI	001	000F	0971												
@HUNSF	001	1850	0824												
@IAR	001	0010	0018												
@ID37B	001	0040	1110												
@INDEX	001	0001	0157	0158	8169	8790	8894	8897	8935	0642	0644	0679			
@INST3	001	0003	0033	7383	8801	8829	0689	0702							
@INST4	001	0004	0034	6244	9387										
@INST5	001	0005	0035												
@INST6	001	0006	0036												
@IP37B	001	00C0	1109												
@I1IAR	001	00C0	0021	8375* 8533*											
@KCMDK	001	0020	1020												
@KELOK	001	001B	1019												
@KENAB	001	001E	1017	8060	8137	8376	8484	8601	8604	0927					
@KEXIT	001	001F	1018												
@KEYBD	001	0010	1037	8376	8466	8470	8483	8534	8538	8540	8614	8652	8656		
@KFUNK	001	0010	1040	8503	8548										
@KHARD	001	0011	1045												
@KLEAR	001	000D	1041												
@LINSZ	001	00F4	0085	0647											
@LO37B	001	00F0	1078												
@MAPEN	001	0005	0090												
@MINCR	001	2000	0084												
@MINUS	001	0060	0081												
@NOP	001	0080	0041	3842	4118	5199	6243	6307	7153	7593	7627	7742	7816	7826	7958
				7971	7992	7999	8058	8059	8104	8136	8553	8645	8663	8723	8800
				8802	8826	8948	0634	0693	0701	0712	0713	0938			
@NORFL	001	0000	0965												
@NTRDY	001	00A0	1102												
@NUMBR	001	007B	0071												
@OPD2	001	0004	0030	8554*	9354*										
@OP1	001	0003	0028	4271*	5915*	5916*	5917*	6229*	6821*	6854*	7091	7162	7184	7196*	7227*
				7254*	7255*	7317*	7440	7656*	7779	7786	7915	7917	8093*	8130	8163*
				8347*	8348*	8571*	8578*	8580*	8581*	8592*	8611*	8747*	9672*	9829*	9846*
				9920*	0103*	0121*	0616*	0657*	0695*						

CROSS REFERENCE																			
SYMBOL	LEN	VALUE	DEFN	REFERENCES													VER 15, MOD 00	31/05/21	PAGE 203
@OP2	001	0005	0032	4265	4265*	4325*	4880	4880*	4912*	7186	7240*	7241*	7780						
@OVRUN	001	0004	0995																
@PBUSY	001	00E2	1007	8160	8173	8756	8814												
@PCAR	001	00E6	1004	8796*	8927*														
@PCNT	001	0003	0939																
@PCTRL	001	0000	0150	8662*	8664*	8757	8760	8775*	8784	8790*	8928*	8932*	9876	0155	0635				
				0669	0982*														
@PCYL	001	0001	0937																
@PC37B	001	00F2	1094																
@PDAR	001	00E4	1003	8767*	0808*														
@PDATA	001	0003	0152	8495	8579*	8612	8689*	8690*	8767	8777*	8923*	9878	0157	0923	0973*				
				0974															
@PD37B	001	0080	1108																
@PERR	001	00E0	1010	8174	8818	8820	8822	0754	0756										
@PFLAG	001	0000	0936																
@PFORM	001	00E1	1008	8816															
@PGCSZ	001	0020	0083	0084															
@PLITE	001	00E2	1009	8817*	8837*														
@PLNGH	001	0004	1000	0921	0921	0921*													
@PMGCK	001	0020	1011	8908															
@PN37B	001	00F0	1093																
@PPLNG	001	0004	0149																
@PRCNT	001	0001	0151	8759*	8768*	8769*	8771*	8773	8773*	8776	8779	8780*	8783*	9877	0156				
				0650	0651	0917	0926	0926*	0983*										
@PRETR	001	00C0	0155	9734	0017	0669	0956												
@PRINT	001	0040	0153	0155	8757	8913	8933	8957	9644	9928	0617	0635	0716	0960	0982				
@PRITY	001	0080	1044	8545															
@PSAD	001	0002	0938																
@PSIOQ	001	00E0	1006	8797	8969														
@PSIOR	001	0000	1005	8797	8970														
@PSNSQ	001	00E2	1012	8899															
@PSR	001	0004	0016																
@PWAIT	001	00FF	0159	6847															
@P1IAR	001	0020	0019	8469*	8541*														
@P2IAR	001	0040	0020																
@Q	001	0001	0025	4106*	4117*	4118*	4125*	4126*	5199*	5205*	5595*	5609*	6242	6305*	6307*				
				6847*	6874*	7185	7353*	7357	7357*	7381	7435	7593*	7605*	7614*	7627*				
				7742*	7745*	7770*	7967*	7971*	7999*	8002*	8058*	8059*	8065*	8136*	8140*				

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
@SDF3	001	0003	0170	
@SECCY	001	0030	0087	
@SIST	001	0001	0182	
@SKCTL	001	0000	0952	
@SLASH	001	0061	0068	
@SLAST	001	0002	0184	7953
@SMIDL	001	0003	0183	
@SNSB0	001	0000	0976	
@SNSB1	001	0001	0977	
@SNSB2	001	0002	0978	
@SNSB3	001	0003	0979	
@SNULL	001	0080	0174	7942
@SN37B	001	00F2	1082	
@SONLY	001	0000	0181	
@SPINA	001	00A0	0961	
@SPINB	001	00B0	0962	
@STEXT	001	0007	0173	8040
@STYPE	001	0006	0172	7965
@SYCNT	001	0002	1001	8918* 8929 8930* 0925*
@SYLVL	001	0005	2739	
@TBCNT	001	0000	0161	
@TBLEF	001	0010	0156	0158 8760
@TBLIX	001	0011	0158	0715
@TJ37B	001	0040	1099	
@TYPAM	001	0002	1043	8650 8680
@TYPO	001	001C	1042	
@UCB	001	0087	0040	3819 4125 5205 6305 7153 7614 7672 7745 7826 7967 8002 8065
				8079 8125 8140 8141 8547 8665 8718 8813 0615 0623 0680 0688
				0690 0803
@UPARW	001	005A	0079	2722 8406
@VADDR	001	0002	0142	2658 2684 3061 3497 3509 3510 3511 3511 3525 3528 3530 3554
				3555 3556 3594 3597 3600 3603 3606 3609 3612 3621 3624 3627
				3630 3633 4152 4160 4205 4499 4510 4794 4811 4874 5211 5228
				5636 5661 5693 6266 6269 6275 6279 6312 6334 6351 6373 6395
				6417 6434 6451 6671 6682 6703 6711 6728 6729 6730 6743 6744
				6749 6750 6771 6789 6790 6826 6848 6871 6872 6881 6882 6889
				6999 7043 7052 7094 7198 7306 7392 7404 7417 7569 7597 7610
				7677 7682 7684 7694 7698 7704 7737 7752 7799 7805 7840 7937
				7940 7985 7997 8074 8098 8128 8138 8166 8379 8381 8753 8830
				8942 9288 9369 9670 9815 9848 0618 0655 0673 0691 0703 0727
				0771 0932 0959 0964
@VENTA	001	0056	0114	3328 3583 6680 6716
@VMDDV	001	00FE	0115	
@VMFD1	001	0000	0110	
@VMFD2	001	0001	0111	
@VMRS3	001	0002	0113	
@VMTRL	001	0001	0112	
@VOLID	001	0006	0092	
@VQ	001	0001	0026	7183 7354 7433 7778 9348 9484 0663 0975*
@WA37B	001	00FF	1107	
@WSFIT	001	0500	0102	
@WSTBL	001	0503	0103	
@XR	001	0002	0015	4127* 4131 4133 4141 4170 4171 4171 4172 4174 4175 4177 4184
				4186 4186 4192 4194 4195 4196 4196 4211 4243 4272* 4286 4310*
				4326 4326* 4482* 4483 4486 4487 4487 4495 4496 4496 4497 4497
				4500 4508 4622* 4623 4624 4632 4633 4633 4638 4640 4640* 4650*

CROSS REFERENCE															
SYMBOL	LEN	VALUE	DEFN	REFERENCES				VER 15, MOD 00 31/05/21 PAGE 205							
				4651	4660	4661*	4662	4663	4664	4816	4823	4829	4831	4842	4844
				4845	4845	4851	4861	4890	4904	4906	4906*	4921*	4933	4934	4935
				4978*	4979	4981	4983	5099*	5108	5113	5118	5125	5127	5127	5128
				5139	5142*	5145	5146*	5147	5154	5163	5165	5170	5173	5185	5187
				5206	5216	5237	5357*	5358	5362	5370	5375	5375	5376	5381	5382
				5382	5383	5387	5387	5388	5389	5389	5390	5390	5391	5391	5392
				5392	5393	5393	5394	5405	5406	5418	5421	5435	5438	5438*	5443*
				5586*	5591	5593	5593	5594	5602*	5606	5610	5613	5618	5625	5630
				5643	5647	5649	5650	5654	5659	5665	5681	5686	5687	5691	5730*
				5737	5738	5738	5740	5748	5749	5755	5757	5760	5894*	5895	5896
				5897	5897	5915	5918*	5923	5924	5925*	5926	6188*	6192	6193*	6194
				6198*	6199	6240*	6266	6274*	6275	6279	6279*	6280	6291*	6329	6367
				6389	6399*	6455*	6670*	6671	6678*	6679*	6680	6682	6702*	6703	6710*
				6716	6728	6729	6730	6732*	6741*	6742	6743	6744	6799*	6800	6828*
				6829	6830	6834	6839	6839*	6854	6855*	6856	6857	6857*	6858	6863
				6864*	6865	7002*	7003	7003*	7004	7006	7008	7012	7017	7021	7028
				7032*	7033	7049	7057	7058	7064*	7065	7070	7072	7072*	7075	7077
				7077	7078	7078*	7079	7081	7085	7090*	7120	7120	7125	7126	7129
				7130	7131	7132	7134*	7135	7136*	7140*	7141	7149	7149	7150	7154
				7155	7155	7156	7156	7160	7161*	7168	7169	7171	7187	7228	7228
				7230	7255	7266*	7272	7273	7317	7318	7319	7321	7324*	7325	7327
				7333	7333	7334	7338	7339	7346	7347	7348	7354	7356	7363	7364
				7366	7367	7396*	7397	7398	7398	7402*	7408*	7409	7425	7426	7426*
				7433	7440*	7441	7442	7443	7572*	7573	7573*	7574	7576	7578	7582
				7586	7591	7594	7595	7600	7603	7612	7618	7621	7624	7631	7634
				7634*	7636	7639	7642	7656	7660	7660*	7670*	7731	7743	7747	7748
				7749	7750	7753	7759	7772*	7774	7785*	7787	7788	7801	7802	7803
				7812*	7813	7821	7822	7822	7823	7823	7830	7831	7831	7881	7883
				7885	7885	7903	7916*	7926	7928	7929	7936	7937	7938	7942	7945*
				7946	7951	7952*	7959	7968	7972	7974	7982	7987*	7993	7994	8075
				8080	8080	8082	8082*	8086	8088	8090	8092	8093	8094*	8095	8099*
				8100	8109	8									

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B\$ADMK 001 0001 2965
B\$ADSW 001 159D 2964
B\$ARMK 001 0001 2950
B\$ARSW 001 0A45 2949
B\$BABF 001 1D00 2755
B\$BCKT 001 1590 2877
B\$BDPL 001 19E8 2829
B\$BDSA 001 19EA 2830
B\$BINO 001 1A6A 2893
B\$BRLN 001 19F1 2828
B\$BROP 001 1AF7 2934
B\$BRVA 001 19EF 2827
B\$BRVP 001 19EE 2826
B\$BTAB 001 1996 2825
B\$CADR 001 1AF9 2935
B\$CASA 001 0000 2770
B\$CASC 001 0671 2774
B\$CASM 001 0608 2772
B\$CBAS 001 14BB 2900
B\$CBFA 001 0CBC 2855
B\$CCGT 001 0600 2780
B\$CCLS 001 0695 2786
B\$CCON 001 001F 2853
B\$CDAT 001 0600 2766
B\$CDEF 001 0600 2767
B\$CDIM 001 0673 2768
B\$CDUM 001 0000 2804
B\$CEND 001 0600 2802
B\$CEOF 001 0600 2803
B\$CFOR 001 0600 2775
B\$CGET 001 06A3 2783
B\$CGSB 001 0690 2781
B\$CGTO 001 06B3 2779
B\$CIFA 001 0600 2777
B\$CIFC 001 0600 2778
B\$CIMG 001 0600 2792
B\$CINP 001 0600 2787
B\$CLTA 001 0000 2769
B\$CLTC 001 0669 2773
B\$CLTM 001 0600 2771
B\$CMAT 001 0600 2793
B\$CMGT 001 0665 2794
B\$CMIN 001 06D3 2795
B\$CMPR 001 069B 2798
B\$CMPT 001 069B 2797
B\$CMPU 001 0600 2799
B\$CMRD 001 06D0 2796
B\$CNXT 001 0600 2776
B\$CPCT 001 0CA8 2858
B\$CPRT 001 0600 2790
B\$CPRU 001 0600 2791
B\$CPSE 001 06E7 2800
B\$CPUT 001 0600 2784
B\$CPWA 001 0CA6 2929
B\$CRAD 001 150D 2899
B\$CRBS 001 1509 2901

2803

CROSS REFERENCE																			
SYMBOL	LEN	VALUE	DEFN	REFERENCES													VER 15, MOD 00	31/05/21	PAGE 207
B\$CREA	001	06CF	2788																
B\$CREM	001	0000	2765																
B\$CRMK	001	0001	2977																
B\$CRSR	001	06E3	2789																
B\$CRST	001	06A6	2785																
B\$CRSW	001	0E42	2976																
B\$CRTN	001	06CF	2782																
B\$CSBF	001	0600	2752	2766	2767	2768	2771	2772	2773	2774	2775	2776	2777	2778	2779				
				2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791				
				2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2805				
				2806	2807	2808	2809												
B\$CSCN	001	14B0	2874																
B\$CSMK	001	0007	2980																
B\$CSSW	001	14BC	2979																
B\$CSTP	001	06D6	2801																
B\$CSTR	001	14CC	2898																
B\$CSXA	001	2000	2758																
B\$CTYP	001	0A5F	2852																
B\$CVPD	001	0C5D	2857																
B\$CVPG	001	0CA5	2856																
B\$CWRK	001	F500	2926																
B\$DIST	001	0700	2818																
B\$DLNK	001	1B37	2924																
B\$DL4T	001	1A6B	2895																
B\$DPWA	001	0E46	2930																
B\$DST2	001	073A	2819																
B\$ERMK	001	0007	2953																
B\$ERSW	001	0993	2952																
B\$FACA	001	0E53	2861																
B\$FAIS	001	15AC	2878																
B\$FAIW	001	15A0	2879																
B\$FCON	001	0A46	2851																
B\$FORT	001	1B0E	2920																
B\$FPWA	001	15AC	2931																
B\$FRMK	001	0007	2971																
B\$FRSW	001	16CC	2970																
B\$FSC1	001	0E4C	2862																
B\$FSC2	001	0E4D	2863																
B\$FSMK	001	0007	2962																
B\$FSSW	001	0E5C	2961																
B\$FSVA	001	0E4F	2864																
B\$FTND	001	1B0B	2922																
B\$FTPT	001	1B0D	2921																
B\$FVME	001	15A2	2883																
B\$FVMP	001	15A4	2884																
B\$FVMS	001	15A6	2885																
B\$FVPE	001	15A8	2880																
B\$FVPP	001	15AA	2881																
B\$FVPS	001	15AC	2882																
B\$GBSW	001	08AF	2955																
B\$GBWK	001	0001	2956																
B\$GETC	001	0867	2832																
B\$GPTR	001	0878	2834																
B\$GTBF	001	1E00	2756																

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
B\$INVT	001	1B38	2914	
B\$KWMK	001	0001	2968	
B\$KWSW	001	159E	2967	
B\$LBAS	001	185E	2905	
B\$LBSV	001	18E7	2903	
B\$LDRP	001	1A00	2753	
B\$LINE	001	07D0	2820	
B\$LIST	001	1853	2887	
B\$LRTN	001	18EB	2904	
B\$LSTR	001	1862	2902	
B\$LTYP	001	18F2	2888	
B\$MATR	001	18F3	2890	
B\$MBMK	001	0007	2989	
B\$MBSW	001	1903	2988	
B\$MFBK	001	1B8F	2916	
B\$MGMK	001	0007	2986	
B\$MGSW	001	18FF	2985	
B\$MPMK	001	0007	2992	
B\$MPSW	001	1981	2991	
B\$MRMK	001	0007	2983	
B\$MRSW	001	0DDE	2982	
B\$NUMC	001	0873	2833	
B\$NXMK	001	0007	2959	
B\$NXSW	001	071D	2958	
B\$PARP	001	0A41	2841	
B\$PBNL	001	0A01	2847	
B\$PCAD	001	0A40	2842	
B\$PCDL	001	09D3	2846	
B\$PCPG	001	0A35	2845	
B\$PECT	001	0A44	2849	
B\$PERC	001	0A39	2848	
B\$PFAE	001	0033	2839	
B\$PFCL	001	009D	2840	
B\$PFNC	001	094E	2837	
B\$PFWP	001	0015	2838	
B\$PNBY	001	0A41	2843	
B\$PPWA	001	0A35	2928	
B\$PRM1	001	1AF3	2932	
B\$PTBF	001	1F00	2757	
B\$PUTC	001	093A	2836	
B\$PVAD	001	0A43	2844	
B\$RMRK	001	1AE6	2897	
B\$RTRN	001	1AF5	2933	
B\$SABF	001	1C00	2754	
B\$SCAN	001	1514	2876	
B\$SCAT	001	13C8	2871	
B\$SCON	001	001B	2854	
B\$SCVT	001	12E0	2869	
B\$SDPL	001	07DA	2822	
B\$SFAB	001	0E48	2866	
B\$SFNT	001	143C	2872	
B\$SLDT	001	109C	2868	
B\$SLVT	001	1062	2867	
B\$SNAT	001	131A	2870	
B\$SPAT	001	07E0	2823	
B\$SSTA	001	1BAC	2918	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
B\$STAS	001	061B	2807	
B\$STIF	001	0606	2809	
B\$STMA	001	061B	2808	
B\$STML	001	0600	2806	
B\$STRL	001	0600	2805	
B\$SVRB	001	0E46	2865	
B\$SYMB	001	0DBC	2860	
B\$TCD2	001	0001	2938	
B\$TLTH	001	0002	2939	2940
B\$TOD1	001	0000	2937	
B\$TOTB	001	1AF8	2940	
B\$TTAB	001	1AFA	2936	2940
B\$TYPE	001	0739	2821	
B\$WORK	001	15A0	2925	
B\$ZDBN	001	19F2	2892	
B@ABAS	001	0007	3525	
B@ACD1	001	0001	3522	3523
B@ACD2	001	0003	3523	3524
B@AFLG	001	0000	3517	
B@ALLA	001	005C	3342	
B@AMAX	001	0005	3524	3525
B@BLNK	001	0040	3351	7363 7397 9242 9317 9347
B@BLSZ	001	0100	3476	3615 3618 3621 3636 3639 7052 7094 7198 7694 7737 7799 8034
B@BREQ	001	0084	3131	
B@BRHI	001	0088	3132	
B@BRLO	001	0082	3130	
B@BRNE	001	0094	3134	
B@BRNH	001	0098	3135	
B@BRNL	001	0092	3133	
B@CADD	001	0006	3000	
B@CADF	001	0058	3041	
B@CBAS	001	0003	3528	
B@CBNX	001	004A	3034	
B@CBRA	001	0046	3032	
B@CBRC	001	0044	3031	
B@CBRD	001	0048	3033	
B@CBRS	001	004C	3035	
B@CCLS	001	005E	3044	
B@CCMC	001	0042	3030	
B@CCMF	001	0040	3029	
B@CCNT	001	001F	3454	9329
B@CCSA	001	003E	3028	
B@CDCA	001	006A	3050	
B@CDDL	001	006C	3051	
B@CDIV	001	000C	3003	
B@CDMN	001	0001	3527	3528
B@CDWA	001	006E	3052	
B@CEOF	001	0070	3053	
B@CEOP	001	0068	3049	
B@CFCI	001	0016	3008	
B@CFN0	001	0012	3006	
B@CFN1	001	0014	3007	
B@CFOR	001	004E	3036	
B@CGET	001	0052	3038	6193
B@CHAR	001	0000	3467	
B@CHLT	001	0004	2999	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@CIEX	001	00C5	3427	
B@CIMH	001	0066	3048	
B@CINI	001	0056	3040	
B@CIPI	001	00D7	3430	
B@CIS2	001	00E2	3433	
B@CMF1	001	0018	3009	
B@CMF2	001	001A	3010	
B@CMF3	001	001C	3011	
B@CMA	001	006B	3362	7425
B@CMPY	001	000A	3002	
B@CMSM	001	001E	3012	
B@CNEG	001	0010	3005	
B@CNXT	001	0050	3037	
B@COLN	001	007A	3364	
B@CPMK	001	00FF	3272	3276 3280 3281 3315
B@CPRS	001	0060	3045	
B@CPRU	001	0062	3046	
B@CPUT	001	0054	3039	
B@CPWR	001	000E	3004	
B@CRSR	001	005A	3042	
B@CRST	001	005C	3043	
B@CSA1	001	0036	3024	
B@CSA2	001	0038	3025	
B@CSB1	001	003A	3026	
B@CSC1	001	002A	3018	
B@CSD0	001	002E	3020	
B@CSD1	001	0030	3021	
B@CSD2	001	0032	3022	
B@CSF1	001	0022	3014	
B@CSF2	001	0024	3015	
B@CSTA	001	0034	3023	
B@CSTC	001	0028	3017	
B@CSTF	001	0020	3013	
B@CSTH	001	0064	3047	
B@CSTX	001	003C	3027	
B@CSUB	001	0008	3001	
B@CSVC	001	0002	2998	
B@CTYP	001	0020	3452	9306
B@CUSC	001	002C	3019	
B@CUSF	001	0026	3016	
B@CVAR	001	005B	3341	
B@DAMK	001	0080	3520	
B@DASA	001	00FF	3281	
B@DASC	001	0040	3285	
B@DASM	001	0038	3283	
B@DCGT	001	0050	3291	
B@DCLS	001	0054	3297	
B@DDAT	001	0024	3277	
B@DDEF	001	0034	3278	
B@DDIM	001	0004	3279	
B@DDUM	001	00FF	3315	
B@DEC0	001	00F0	3410	5608 9252 9271 9498 9527 9564
B@DEC1	001	00F1	3411	4252 4864 4931 5407 9465
B@DEC2	001	00F2	3412	5408 5587
B@DEC3	001	00F3	3413	
B@DEC4	001	00F4	3414	5612

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@DEC5	001	00F5	3415	
B@DEC6	001	00F6	3416	
B@DEC7	001	00F7	3417	
B@DEC8	001	00F8	3418	
B@DEC9	001	00F9	3419	5409 5427
B@DEND	001	0058	3313	3314
B@DEOF	001	0058	3314	
B@DFOR	001	0028	3286	
B@DGET	001	0040	3294	
B@DGSB	001	0020	3292	
B@DGTO	001	0044	3290	
B@DIFA	001	0048	3288	
B@DIFC	001	004C	3289	
B@DIGS	001	007B	3344	
B@DIMG	001	003C	3303	
B@DINP	001	0000	3298	
B@DIVD	001	0061	3361	
B@DLTA	001	00FF	3280	
B@DLTC	001	0040	3284	
B@DLTM	001	0038	3282	
B@DL01	001	0001	3595	3598
B@DL02	001	0003	3598	3601
B@DL03	001	0005	3601	3604
B@DL04	001	0007	3604	3607
B@DL05	001	0009	3607	3610
B@DL06	001	000B	3610	3613
B@DL07	001	0045	3613	3616
B@DL08	001	0145	3616	3619
B@DL09	001	0245	3619	3622
B@DL10	001	0289	3622	3625
B@DL11	001	02C3	3625	3628
B@DL12	001	02FD	3628	3631
B@DL13	001	0337	3631	3634
B@DL14	001	0371	3634	3637
B@DL15	001	0471	3637	3640
B@DL16	001	0507	3640	
B@DMAT	001	0008	3304	
B@DMGT	001	0044	3305	
B@DMIN	001	0038	3306	
B@DMPR	001	0048	3309	
B@DMPT	001	004C	3308	
B@DMPU	001	0054	3310	
B@DMRD	001	003C	3307	
B@DNXT	001	0044	3287	
B@DPNT	001	004B	3352	7334 9492 9518
B@DPRT	001	002C	3301	
B@DPRU	001	0030	3302	
B@DPSE	001	0050	3311	
B@DPUT	001	0040	3295	
B@DREA	001	000C	3299	
B@DREM	001	00FF	3276	
B@DRSR	001	005C	3300	
B@DRST	001	0050	3296	
B@DRTN	001	005C	3293	
B@DSCY	001	0004	3268	
B@DSIF	001	001C	3317	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@DSLT	001	0010	3316	
B@DSML	001	0010	3318	
B@DSNS	001	0018	3270	
B@DSS1	001	0000	3269	
B@DSTP	001	0054	3312	
B@DTBN	001	0010	3334	
B@DTB1	001	0050	3333	
B@DTCY	001	0009	3330	
B@DTSN	001	0010	3332	
B@DTS1	001	0040	3331	
B@DTYP	001	0040	3446	6280 7033 7065 7141 7759 7813
B@DURE	001	0020	3164	
B@DVCY	001	0007	3327	0392
B@DVC1	001	0056	3328	
B@DWCY	001	0005	3324	
B@DWT1	001	0003	3325	
B@D1MK	001	0080	3518	
B@D2MK	001	00C0	3519	
B@EOST	001	001E	3340	
B@EQUL	001	007E	3366	
B@EXPC	001	00C5	3343	
B@FOFL	001	005C	3345	
B@FVAD	001	0001	3530	
B@GETC	001	0001	3469	
B@GETE	001	00FF	3470	
B@GETS	001	0000	3468	
B@GRTR	001	006E	3363	
B@ICON	001	0050	3425	
B@LADD	001	0001	3069	
B@LADF	001	0002	3110	
B@LADV	001	0008	3554	3575
B@LBIN	001	0002	3479	3480 3486
B@LBNX	001	0003	3103	
B@LBRA	001	0003	3101	6761
B@LBRC	001	0004	3100	
B@LBRD	001	0003	3102	
B@LBRS	001	0001	3104	
B@LCCA	001	0004	3510	
B@LCCC	001	0001	3062	3100
B@LCDV	001	0004	3555	3576
B@LCER	001	0001	3060	3124
B@LCFN	001	0004	3511	
B@LCLN	001	0002	3065	3116 3117 3124
B@LCLS	001	0001	3113	
B@LCMC	001	0001	3099	
B@LCMF	001	0001	3098	
B@LCNA	001	0006	3509	
B@LCNN	001	0001	3063	3088 3097 3109 3121
B@LCOP	001	0001	3059	3067 3068 3069 3070 3071 3072 3073 3074 3075 3076 3077 3078 3079 3080 3081 3082 3083 3084 3085 3086 3087 3088 3089 3090 3091 3092 3093 3094 3095 3096 3097 3098 3099 3100 3101 3102 3103 3104 3105 3106 3107 3108 3109 3110 3111 3112 3113 3114 3115 3116 3117 3118 3119 3120 3121 3122 6192
B@LCRV	001	0013	3553	3573
B@LCSA	001	0002	3097	
B@LCVA	001	0002	3061	3075 3076 3077 3078 3079 3080 3081 3082 3083 3084 3086 3087

CROSS REFERENCE															
S Y M B O L	L E N	V A L U E	D E F N	R E F E R E N C E S								V E R 1 5 , M O D 0 0 3 1 / 0 5 / 2 1 P A G E 2 1 3			
				3089	3090	3091	3092	3093	3094	3095	3100	3101	3102	3103	3105
B@LCXX	001	0001	3064	3106	3107	3119	3120								
B@LDAT	001	0004	3223	3096	3108	3110	3114	3115							
B@LDCA	001	0003	3119												
B@LDDL	001	0003	3120												
B@LDDM	001	0004	3483												
B@LDEF	001	0003	3224												
B@LDIM	001	0003	3225												
B@LDIN	001	0004	3482	3483	3484										
B@LDIV	001	0001	3072												
B@LDMN	001	0002	3480	3509	3510	3522	3523	3524	3527	3554	3555				
B@LDSN	001	0004	3484												
B@LDWA	001	0002	3121	6761											
B@LELP	001	0010	3552												
B@LEND	001	0003	3252												
B@LEOF	001	0001	3122												
B@LEOP	001	0001	3118												
B@LERC	001	0003	3124												
B@LESP	001	0008	3551												
B@LESS	001	004C	3353												
B@LET\$	001	005B	3373												
B@LET#	001	007B	3374												
B@LET@	001	007C	3375												
B@LETA	001	00C1	3377												
B@LETB	001	00C2	3379												
B@ETC	001	00C3	3380												
B@ETD	001	00C4	3381												
B@LETE	001	00C5	3382												
B@ETF	001	00C6	3383												
B@ETG	001	00C7	3384												
B@LETH	001	00C8	3385												
B@LETI	001	00C9	3386												
B@LETJ	001	00D1	3387												
B@LETK	001	00D2	3388												
B@LETL	001	00D3	3389												
B@LETM	001	00D4	3390												
B@LETN	001	00D5	3391												
B@LETO	001	00D6	3392												
B@LETP	001	00D7	3393												
B@LETQ	001	00D8	3394												
B@LETR	001	00D9	3395												
B@LETS	001	00E2	3396												
B@LETT	001	00E3	3397												
B@LETU	001	00E4	3398												
B@LETV	001	00E5	3399												

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@LFRT	001	0004	3497	3498
B@LGET	001	0003	3107	
B@LGSB	001	0005	3231	
B@LGTO	001	0004	3230	
B@LHLT	001	0001	3068	
B@LIEX	001	0002	3428	
B@LIFN	001	0003	3491	
B@LILP	001	0009	3550	3568 3569 3570
B@LIMG	001	0001	3242	
B@LIMH	001	0003	3117	
B@LINI	001	0002	3109	
B@LINP	001	0005	3237	
B@LIP1	001	0003	3431	
B@LISP	001	0005	3549	3557 3563 3564 3565
B@LIS2	001	0005	3434	
B@LIVT	001	0001	3507	
B@LKCL	001	0005	3236	
B@LKFR	001	0003	3227	
B@LKGT	001	0003	3233	
B@LKIF	001	0002	3229	
B@LKON	001	0002	3262	
B@LKPT	001	0003	3234	
B@LKPU	001	000A	3241	
B@LKRR	001	0007	3239	
B@LKRT	001	0005	3235	
B@LKTO	001	0002	3256	
B@LLET	001	0003	3226	
B@LL01	001	0002	3594	3595
B@LL02	001	0002	3597	3598
B@LL03	001	0002	3600	3601
B@LL04	001	0002	3603	3604
B@LL05	001	0002	3606	3607
B@LL06	001	0002	3609	3610
B@LL07	001	003A	3612	3613
B@LL08	001	0100	3615	3616
B@LL09	001	0100	3618	3619
B@LL10	001	0044	3621	3622
B@LL11	001	003A	3624	3625
B@LL12	001	003A	3627	3628
B@LL13	001	003A	3630	3631
B@LL14	001	003A	3633	3634
B@LL15	001	0100	3636	3637
B@LL16	001	0096	3639	3640
B@LMAT	001	0003	3243	
B@LMF1	001	0003	3078	
B@LMF2	001	0003	3079	
B@LMF3	001	0003	3080	
B@LMGT	001	0006	3244	
B@LMIN	001	0008	3245	
B@LMPR	001	0008	3248	
B@LMPT	001	0006	3247	
B@LMPU	001	000D	3249	
B@LMPY	001	0001	3071	
B@LMRD	001	0007	3246	
B@LMSM	001	0003	3081	
B@LNEG	001	0001	3074	

CROSS REFERENCE																			
SYMBOL	LEN	VALUE	DEFN	REFERENCES													VER 15, MOD 00	31/05/21	PAGE 215
B@LNEX	001	0004	3228																
B@LNXT	001	0003	3106																
B@LPAR	001	004D	3354																
B@LPRS	001	0002	3114																
B@LPRT	001	0005	3240																
B@LPRU	001	0002	3115																
B@LPSE	001	0005	3250																
B@LPUT	001	0002	3108																
B@LPWR	001	0001	3073																
B@LREA	001	0004	3238																
B@LREM	001	0003	3222																
B@LRSR	001	0001	3111																
B@LRST	001	0001	3112																
B@LRTN	001	0006	3232																
B@LSA1	001	0003	3093																
B@LSA2	001	0003	3094																
B@LSB1	001	0003	3095																
B@LSC1	001	0003	3087																
B@LSDF	001	0004	3477																
B@LSD0	001	0003	3089																
B@LSD1	001	0003	3090																
B@LSD2	001	0003	3091																
B@LSF1	001	0003	3083																
B@LSF2	001	0003	3084																
B@LSKW	001	0002	3493																
B@LSNO	001	0002	3486																
B@LSPT	001	0003	3501	3504															
B@LSTA	001	0003	3092																
B@LSTC	001	0003	3086																
B@LSTE	001	0004	3257																
B@LSTF	001	0003	3082																
B@LSTH	001	0003	3116																
B@LSTP	001	0004	3251																
B@LSTX	001	0002	3096																
B@LSUB	001	0001	3070																
B@LSVC	001	0001	3067																
B@LTHN	001	0004	3258																
B@LTYP	001	0001	3487																
B@LUFN	001	0002	3494																
B@LUSC	001	0002	3088																
B@LUSF	001	0001	3085																
B@LVPG	001	0100	3581	3584	4096	4241	4375	4785	4976	4988	4989	5094	5352	5579	5725				
				5793	6182	6662	6783	6994	7111	7222	7306	7311	7565	7717	7865				
				8051															
B@MINS	001	0060	3360	7348	7366	9245	9547												
B@MULT	001	005C	3357																
B@NAAR	001	001D	3545	3575	3627														
B@NCAR	001	001D	3546	3576	3630														
B@NCRV	001	001D	3544	3573	3624														
B@NDGT	001	000A	3537	3543															
B@NEQL	001	007F	3367																
B@NFRT	001	000A	3496	3498															
B@NICN	001	0006	3539	3541															
B@NIEL	001	0007	3541	3557	3563	3568													

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@NIVT	001	0057	3506	
B@NLDV	001	0122	3543	3565 3570 3621
B@NLRV	001	001D	3542	3564 3569 3612
B@NLTR	001	001D	3536	3542 3543 3544 3545 3546 3547
B@NSKW	001	0004	3492	
B@NSPT	001	0028	3500	
B@NUFN	001	001D	3547	3577 3633
B@NVPG	001	0100	3580	3584
B@NXHI	001	00E3	3461	
B@NXLO	001	001E	3460	4651 4844 5594
B@NXZR	001	0080	3459	3460 3461 4231 4233 4483 4495 4515 4625 4648 4800 4934 4981 5148 5163 5197 5254 5591 5606 5618 5630 5713 5717 5719 5778 5780 5783 5785 5788 5905 5935 7455 9259 9261 9383 9470 9472 9481 9548 9589
B@PLUS	001	004E	3355	
B@POWR	001	005A	3356	
B@PREC	001	0020	3448	7150 7154 7821 7830
B@PROD	001	0023	3557	
B@PRPL	001	0002	3144	7036
B@PRPN	001	0001	3143	
B@PRPR	001	0004	3146	9385
B@PRPS	001	0003	3145	
B@PRRC	001	0007	3149	7030
B@PRRL	001	0008	3150	9384 9385
B@PRSL	001	0005	3147	6367 9226
B@PRSS	001	0006	3148	
B@PTAB	001	0000	3502	
B@PTAD	001	0001	3503	
B@PTSA	001	0002	3504	
B@PUD1	001	0006	3160	
B@PUD2	001	0007	3161	
B@PUI0	001	0001	3154	
B@PUI1	001	0004	3155	
B@PUI2	001	0005	3156	
B@PUNL	001	0002	3158	
B@PUNS	001	0003	3159	
B@PUTM	001	0010	3163	
B@RPAR	001	005D	3358	
B@SADV	001	00E8	3575	3578
B@SAVL	001	0B76	3571	3588
B@SAVS	001	065E	3566	3587
B@SCDV	001	0074	3576	3578
B@SCLN	001	005E	3359	
B@SCRV	001	0227	3573	3587 3588
B@SDMK	001	0080	3488	7965
B@SEXP	001	0004	3441	
B@SFAT	001	0196	3578	3587 3588 3639
B@SFNA	001	003A	3577	3578
B@SFRT	001	0028	3498	
B@SIEL	001	003F	3568	3571
B@SIES	001	0023	3563	3566
B@SIGN	001	0010	3450	
B@SLDL	001	0A32	3570	3571
B@SLDS	001	05AA	3565	3566
B@SLVL	001	0105	3569	3571
B@SLVS	001	0091	3564	3566

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SYMBOL	LEN	VALUE	DEFN	REFERENCES	VER 15, MOD 00	31/05/21	PAGE 217
B@SQUO	001	007D	3365	7070 7075 7079 7081 7327 7631 7639 7642			
B@STAT	001	0000	3440				
B@TASA	001	0012	3175				
B@TASC	001	001E	3181				
B@TASM	001	0018	3177				
B@TASS	001	007B	3182				
B@TCGT	001	0030	3190				
B@TCLS	001	0042	3196				
B@TDAT	001	0006	3171				
B@TDEF	001	0009	3172				
B@TDIM	001	000C	3173				
B@TDUM	001	0078	3214				
B@TEND	001	0072	3212				
B@TEOF	001	0075	3213				
B@TFOR	001	0021	3184				
B@TGET	001	0039	3193				
B@TGSB	001	0033	3191				
B@TGTO	001	002D	3189				
B@TIFA	001	0027	3186				
B@TIFC	001	002A	3187				
B@TIFS	001	007D	3188				
B@TIMG	001	0054	3202				
B@TINP	001	0045	3197				
B@TLTA	001	000F	3174				
B@TLTC	001	001B	3178				
B@TLTM	001	0015	3176				
B@TLTS	001	0079	3179				
B@TMAS	001	007C	3183				
B@TMAT	001	0057	3203				
B@TMGT	001	005A	3204				
B@TMIN	001	005D	3205				
B@TMLS	001	007A	3180				
B@TMPR	001	0066	3208				
B@TMPT	001	0063	3207				
B@TMPU	001	0069	3209				
B@TMRD	001	0060	3206				
B@TNXT	001	0024	3185				
B@TPRT	001	004E	3200				
B@TPRU	001	0051	3201				
B@TPSE	001	006C	3210				
B@TPUT	001	003C	3194				
B@TRAC	001	0080	3444				
B@TREA	001	0048	3198				
B@TREM	001	0003	3170				
B@TRSR	001	004B	3199				
B@TRST	001	003F	3195				
B@TRTN	001	0036	3192				
B@TSTP	001	006F	3211				
B@VMC1	001	0056	3583				
B@VMLB	001	F0CD	3588				
B@VMSB	001	F5E5	3587				
B@VMSZ	001	0000	3584	3586 3587 3588			
B@VMTB	001	0000	3586				
B@ZNEG	001	00D0	3457				
B@ZPOS	001	00F0	3456	4133 4624 4816 4979 5154 5187 5358 5613 5924 7364 7367 9243 9246 9524 9529			

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
BFPCAR	001	4FFB	0896	0899
BFPCRO	001	4FFF	0898	0878*
BUFADR	002	4DD9	0728	0620* 0662 0773* 0875
BUFRWK	002	4DDE	0732	8945* 0774* 0786* 0808
CBFADI	001	0C70	5885	5889
CBFEXP	001	0002	5934	5916 5917 5935
CBFPZD	004	0C70	5894	
CBFSFT	002	0CB1	5935	5916
CBF100	004	0C97	5918	5915* 5916* 5917*
CBF900	004	0CAC	5930	5906
CCZADI	001	04AD	4613	4617
CCZDC1	001	04FB	4675	4641
CCZDFP	004	04AD	4622	
CCZEXP	001	04FA	4670	4625* 4641* 4648 4664
CCZONE	001	0001	4674	4640
CCZSGN	001	04F9	4669	4623* 4663
CCZ020	003	04C2	4638	4649
CCZ100	005	04DF	4660	4639
CCZ900	004	04F5	4665	4652
CENADI	001	0470	4473	4477
CENXZD	004	0470	4482	
CENZRO	001	04AC	4515	4508
CEN100	003	0487	4495	4485
CEN150	003	0498	4500	
CEN200	004	049E	4508	4484
CEN900	004	04A8	4511	4488 4501
DENTRY	001	0025	0749	0622
DERROR	003	0088	0748	0672
DFKACK	001	0010	8522	8662
DFKATA	001	261C	8485	8554 8697*
DFKATC	001	2733	8649	8672 8681
DFKBLE	002	2617	8481	8370* 8555
DFKBSP	001	0016	8516	8628
DFKBS2	001	2600	8465	8350 8352 8361 8364 8506 8623 8685* 8693* 8697*
DFKBS3	001	2700	8624	8343 8372 8507 8553* 8581* 8709
DFKCNT	001	2624	8493	8572*
DFKC01	002	2621	8488	8490 8654 8670 8711
DFKDIO	001	0065	8377	8348
DFKDLP	001	2696	8577	8544 8671
DFKDTK	001	0040	8529	8550
DFKEMS	001	0002	8521	8637
DFKENB	001	0012	8526	8540
DFKENT	001	2653	8543	8364
DFKERA	001	2789	8688	8633
DFKERS	001	0003	8518	8632
DFKEUD	001	001D	8524	
DFKEXL	001	0019	8528	8466
DFKEYN	001	2500	8345	8342 8350 8367 8372 8377 8387 8464 8506 8507
DFKIAR	002	2615	8480	8362* 8374* 8375
DFKIET	002	2619	8482	8533
DFKIME	002	262C	8498	8653* 8654*
DFKIRK	001	2634	8503	8471
DFKIST	002	2621	8490	8722
DFKKIX	001	0011	8523	8664
DFKLLKA	001	25F9	8446	8454
DFKLMG	002	2628	8496	8355* 8383 8666 8685 8693

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
DFKLNK	001	0039	8454	8697
DFKLOK	001	0018	8525	8534 8652
DFKMCT	002	262E	8499	8653
DFKMSD	002	27B1	8709	8690
DFKNAB	001	264D	8539	8536
DFKNPS	002	261F	8487	8358* 8359* 8360 8363* 8570* 8572 8579 8582*
DFKNSK	001	261D	8486	8470* 8471 8545 8548 8550 8626 8628 8630 8632 8635 8637 8639
				8650 8656* 8680
DFKNTR	001	2603	8468	8361
DFKPG2	002	263A	8506	8381
DFKPG3	002	263C	8507	8379
DFKPL1	001	2770	8674	8662* 8664* 8668
DFKPL2	001	27A3	8700	8682
DFKPL3	001	27A5	8702	8689* 8690* 8691
DFKPPL	001	2623	8491	8495 8573 8579* 8612
DFKPRT	001	26AC	8591	8574 8669 8683 8692 8712
DFKP10	001	26BD	8597	8353* 8354* 8594 8599
DFKP20	002	26BF	8598	8593*
DFKRET	002	2630	8500	8368* 8535* 8541
DFKRKY	001	0011	8520	8502 8626
DFKRMG	002	262A	8497	8357* 8360* 8612
DFKROR	001	27BB	8717	8546
DFKROS	002	2632	8501	8365* 8469
DFKRTN	001	0013	8517	8630
DFKRT1	001	2683	8569	8557 8646
DFKSGL	001	0007	8708	8704
DFKSG1	001	27A9	8706	8708 8709
DFKSPA	001	279D	8696	8636
DFKSPB	001	274D	8661	8629
DFKSPC	001	0040	8519	8635
DFKSTN	001	2626	8495	8356* 8580 8581 8666 8670* 8685* 8693*
DFKTAB	001	0005	8515	8639
DFKTBL	001	25C0	8388	8369 8454
DFKTST	001	26DD	8610	8552 8634
DFKULK	001	001C	8527	8538 8614
DFKXDP	002	2638	8505	8535
DFKXIT	001	264A	8537	8551 8558 8640 8651 8694 8713 8728
DFKXRS	002	2636	8504	8605
DFK001	001	0001	8514	8570
DFK100	004	2565	8378	8347* 8348* 8367 8369 8505
DFK120	005	2569	8379	8505
DFK140	004	257E	8384	
DFK160	003	2600	8466	8472
DFK180	003	263D	8533	8627 8686
DFK200	004	2671	8554	8698
DFK220	005	2678	8556	8554* 8580*
DFK240	004	2699	8579	8575
DFK260	004	26A8	8583	8571* 8578*
DFK280	004	26C8	8601	8595
DFK300	003	26D6	8605	8600
DFK320	004	26D9	8606	8592*
DFK340	004	26EA	8615	8611*
DFK350	001	2700	8625	8549 8657
DFK360	004	2740	8654	8655
DFK380	003	2750	8663	8553* 8645* 8665*
DFK400	004	2759	8666	8663

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
DFK420	003	276D	8672	8667
DFK440	003	2772	8680	8613
DFK460	003	2778	8682	8631
DFK480	004	277E	8684	8581* 8720
DFK500	003	27B2	8711	8638
DFK520	003	27BB	8718	8547* 8723*
DFK540	005	27C5	8722	8718
DFPAPC	002	28DD	8851	8793* 8794* 8796 0876* 0877*
DFPASE	001	2800	8849	8743 8813* 8861 8865 8874 8891 0611 0768 0915 0938* 0968
DFPASY	002	29D5	8968	8925* 8926* 8927
DFPCFD	002	28EB	8861	8794
DFPCHK	001	5300	0914	
DFPDSV	004	28F4	8866	8883 8923 0923*
DFPENT	004	5311	0923	0918
DFPEOR	001	4DF3	0755	0714
DFPERC	001	28EE	8864	8812
DFPERR	004	29DD	8972	
DFPETN	001	28E9	8860	8783
DFPEXT	001	29D3	8967	8937
DFPGCT	001	0000	8974	8916*
DFPIOR	001	29D7	8970	
DFPIST	001	28F5	8867	8757 8759* 8767 8768* 8769* 8771* 8773 8777* 8869 8881 8923* 0917 0921* 0923 0926
DFPITE	002	28E7	8876	8837
DFPLBU	002	29D2	8966	8938
DFPMCK	001	2939	8915	8909
DFPNDX	001	2900	8893	8842 8892
DFPOFF	001	28E3	8857	8817
DFPOGE	001	29DD	8973	8902
DFPORK	002	28E5	8858	8776* 8777 8882
DFPPCF	001	28DE	8852	8760 8773* 8775* 8776 8779 8780* 8783* 8784 8786* 8788* 8790* 8792* 8861 8885 0926*
DFPPCH	002	28FD	8874	8745 8750 8830
DFPPCO	001	28E2	8856	0809* 0878
DFPPOS	001	4DE4	0738	0814* 0820 0840* 0841 0850 0857 0858* 0866* 0870* 0871
DFPRCK	001	28A5	8811	
DFPRCL	001	0002	8850	8812 8863
DFPRCT	002	28ED	8863	8812* 8916* 8921*
DFPRES	001	4DDC	0731	0780* 0788 0795* 0802 0983 0984
DFPRNT	001	2800	8744	8842 8849 0724 0754 0813* 0849*
DFPRPE	001	28D3	8840	8822 0724 0754
DFPRSN	002	29D9	8971	8899* 8908 8943
DFPSCK	001	2932	8910	
DFPSC2	001	2948	8920	8914
DFPSYC	001	28F9	8871	8865 8918* 8928* 8929 8930* 8932* 0925*
DFPULK	001	5339	0936	0919
DFPVCK	001	0004	8975	8943
DFPWITH	002	4DDB	0730	0781* 0782* 0786 0788 0795 0796
DFPX39	001	0039	8875	8751
DFPYCD	002	28F0	8865	8926
DFPYCT	001	0001	8877	8921*
DFP001	002	28E7	8859	8762 8780 8792 8876 8884 8907 8916 8921 8930
DFP100	004	2805	8746	8752 8832 8874
DFP101	004	280E	8748	8747*
DFP102	005	2812	8750	8833
DFP105	002	281F	8753	0939

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
DFP115	001	2823	8755	0928 0930
DFP120	003	283D	8767	8758
DFP140	004	2853	8773	8770
DFP160	005	2862	8779	8772
DFP180	003	2872	8784	8761 8782
DFP200	005	2878	8786	
DFP220	006	2888	8791	8789
DFP240	003	2892	8793	8763 8785 0681
DFP250	001	2899	8795	0881
DFP260	003	289C	8797	8815* 8950 0813* 0849*
DFP270	003	289F	8798	8799 8801 0680* 0713* 0803*
DFP280	003	28A2	8802	8813* 0626 0938*
DFP300	003	28CA	8833	8964 0717
DFP320	003	28AC	8814	8802
DFP330	003	28BB	8824	8825 8827 8829 8937* 0615* 0622* 0672* 0712*
DFP333	001	28BA	8823	0624* 0714*
DFP335	003	28B8	8818	8819 8821
DFP340	003	28B2	8816	8838
DFP360	003	28CD	8837	8816
DFP378	001	2911	8898	8895
DFP380	005	2927	8907	8901
DFP400	004	29B2	8955	8917 8922
DFP420	003	2953	8925	8919
DFP440	004	296F	8933	8931
DFP480	001	29CE	8963	8958
DLFBPT	001	4DDF	0733	8946* 8947 0806* 0873
DLFCAR	001	00FB	0899	0877
DLFDSV	004	28F4	8883	0970* 0973 0975 0984*
DLFEOR	001	4DF6	0757	0624
DLFIST	001	28F5	8881	0635 0650 0651 0669 0973* 0974 0982* 0983*
DLFMAR	002	4DE1	0735	
DLFORK	002	28E5	8882	8940* 8945 0830* 0831* 0832 0832* 0833 0833* 0834 0834* 0835 0835*
				0836 0836* 0841 0874* 0879
DLFPCF	001	28DE	8885	0679* 0715* 0819* 0859* 0868* 0871*
DLFPCH	002	4DED	0744	0655
DLFPC1	002	4DEF	0745	0703
DLFPRT	001	4D00	0614	8798 8820 8828 8945* 8946* 8947 8948* 8962 8967 0612 0744 0745
				0748 0749 0769 0916 0969
DLFRPE	001	4DCD	0720	8820 0756
DLFRTN	001	0001	0750	0971 0986
DLFRTY	002	4DE3	0736	0691
DLFSWC	001	4DF0	0746	0971 0978* 0986*
DLFVD1	002	4DD7	0727	0618 0771
DLFVD2	002	4DEB	0740	0673
DLFX4E	001	004E	0741	0941
DLFX53	001	0053	0742	0943
DLF001	002	28E7	8884	0818 0847 0870 0970 0977
DLF050	001	4D18	0621	
DLF100	001	4D25	0633	8828 0699 0749 0987
DLF140	001	4D3F	0646	0643
DLF143	004	4D4E	0656	0704
DLF145	004	4D57	0658	0657*
DLF146	003	4D5B	0662	0979
DLF150	005	4D5E	0663	0974* 0975* 0976* 0977*
DLF155	004	4D63	0665	0616*
DLF160	001	4D6D	0671	0678

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
DLF165	005	4D70	0673	
DLF170	001	4D78	0676	0636
DLF175	001	4DB9	0711	0670 0745
DLF350	003	4D88	0686	8948* 8967 0687 0689 0690* 0748
DLF355	005	4D8E	0691	
DLF360	003	4DA8	0699	0623* 0634* 0686 0700 0702
DLF375	003	4DB0	0704	
DLF400	001	4D93	0692	0674 0744
DLF425	004	4DA4	0697	0695*
DLF450	001	29AF	8949	8934 8944
DLF500	001	4E25	0785	0735
DLF525	001	4E29	0787	0783
DLF550	001	4E3C	0801	0789
DLF600	001	4E44	0805	0797
DLF700	001	4E49	0807	0736
DLF800	001	4EC7	0865	0852
DLF900	001	4ECC	0867	0842
DLF920	001	4ECF	0869	0860
DLF950	001	4ED7	0872	0821 0851
DLF960	004	539F	0974	0972
DLTABL	001	0090	0743	0868
DLTABR	001	00A0	0747	0859
FGSBN1	001	05CF	4950	4832 4853 4905 4932
FGSEVP	004	0500	4793	
FGSFVE	001	05D0	4951	4922
FGSINL	001	0005	4945	4880 4912 4952
FGSINS	006	05F5	4961	4880
FGSITN	001	05FC	4966	4881* 4902 4905*
FGSMNN	010	05E9	4955	4842
FGSMOD	005	05D5	4952	4912
FGSNNL	001	000A	4946	4953 4955 4957
FGSNNN	010	05DF	4953	4823
FGSONE	001	0001	4943	4823 4831 4851 4861 4863* 4890 4904 4957
FGSSFZ	002	0619	4986	4983
FGSTEN	011	05F4	4957	4829 4831 4851
FGSTHR	001	0003	4944	4823 4829 4831 4842 4851 4946
FGSXM1	001	05FB	4965	4828* 4832* 4850* 4853* 4932* 4935
FGS001	004	0600	4978	
FGS004	004	0614	4984	4980 4982
FGS005	004	050C	4802	4824
FGS010	004	0513	4810	4801
FGS100	004	0529	4829	4833
FGS110	004	053B	4842	4817
FGS115	003	054C	4850	4843
FGS120	004	054F	4851	4846 4854
FGS210	005	055D	4861	4830 4852
FGS220	005	057D	4890	4901 4913
FGS250	006	0585	4897	4880* 4912*
FGS260	003	058E	4902	4891
FGS300	004	05A7	4921	4903
FGS305	005	05BF	4933	4924
FGS900	004	05CB	4939	4803
FKSADD	001	0002	4222	4192
FKSARG	008	037C	4345	4251* 4252* 4256* 4277* 4319* 4330 4331*
FKSCNT	008	0093	4367	4890 4904
FKSCNV	008	02A3	4227	4105* 4116* 4211

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
FKSCON	008	0393	4357	4286 4367
FKSDCR	001	02BC	4236	4175 4184
FKSINC	001	038A	4352	4299
FKSINS	006	036F	4341	4265
FKSINT	001	0005	4336	4265
FKSITN	001	0384	4347	4266* 4299* 4303
FKSLGT	004	0200	4105	4115 4124
FKSLOG	003	0219	4125	
FKSLTW	004	020B	4116	
FKSMDY	005	0389	4351	4325
FKSMOD	001	0005	4337	4325 4351
FKSONE	001	0001	4221	4171 4171 4174 4177 4179 4184* 4186* 4192* 4194 4195 4196 4249*
				4250 4286 4308 4331*
FKSRND	001	038B	4353	4308
FKSSFT	001	0002	4223	4195*
FKSSHT	007	0383	4346	4330* 4331
FKSTEN	007	02AB	4232	4105
FKSTNE	008	02BB	4235	4174 4179
FKSTWO	007	02B3	4234	4116
FKS010	003	0212	4118	4107
FKS020	004	021F	4127	4119
FKS025	004	022F	4135	4106* 4117* 4126* 4132
FKS030	005	0236	4141	4134
FKS090	004	0300	4249	4367
FKS095	004	0321	4272	4271*
FKS100	005	0325	4277	4295 4332
FKS120	006	0332	4294	4265* 4325*
FKS150	004	033B	4299	4278
FKS175	005	0358	4319	4304
FKS205	003	024E	4172	4176
FKS210	003	025F	4177	4173 4185
FKS220	004	0270	4186	4178
FKS600	003	028D	4210	4118* 4125*
FKS700	004	0298	4217	4136 4210
FNBBN1	001	08EC	5253	5141
FNBCNT	001	08E0	5246	5138* 5141* 5147* 5148 5197
FNBD C1	001	08EE	5256	5171
FNBDGT	001	08E1	5247	5145* 5171* 5188
FNBF P1	001	08EE	5255	5128
FNBMK1	001	0002	5242	5128
FNBMN1	002	08EB	5252	5142
FNBPWR	004	0800	5099	
FNBSTR	008	08E9	5248	5206* 5216
FNB005	003	0810	5118	
FNB010	003	081D	5125	5109
FNB030	003	082E	5138	5126
FNB200	003	0831	5139	5143
FNB250	004	0841	5145	5140
FNB275	004	0859	5156	5114
FNB300	003	0860	5163	5149
FNB350	004	0871	5171	5177
FNB400	003	088B	5185	5164 5166
FNB500	003	08A6	5205	5155 5186 5189
FNB800	004	08A9	5206	5204
FNB880	003	08D6	5236	5199* 5205* 5230
FNB900	004	08DC	5238	5119 5121 5129 5157 5172 5176 5198 5222 5232 5236

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
FRBACC	001	0001	5450	5421*
FRBBN1	001	09B4	5468	5381
FRBDC1	001	09B5	5469	5421
FRBEVN	001	0001	5449	5375*
FRBEXP	001	0002	5452	5389 5390 5391
FRBFC1	009	09AC	5458	5408* 5420
FRBFC2	007	09B3	5464	5403* 5404 5404* 5405 5406 5409* 5427 5436 5437 5437*
FRBLNG	001	0000	5453	5418* 5435*
FRBNRM	001	09B6	5470	5394
FRBONE	001	0001	5448	5387*
FRBSQR	004	0900	5357	
FRBSUB	009	09A3	5457	5407* 5418 5420* 5435 5436*
FRBTWO	001	0002	5451	
FRB005	003	0911	5362	5359
FRB010	003	0917	5370	
FRB020	004	0927	5381	5371
FRB030	004	0932	5387	5377
FRB100	004	0969	5418	5422 5439
FRB150	003	097B	5427	5419
FRB400	003	097E	5428	
FRB850	004	0993	5443	5428
FRB900	004	0997	5444	5361 5363
FSSADD	001	0003	5704	5643
FSSCOF	007	0B70	5779	5741
FSSCOS	004	0A00	5586	5580
FSSDCO	001	0B67	5773	5747
FSSEQ8	001	0001	5702	
FSSFP1	007	0AC8	5714	5625
FSSHLF	007	0AD6	5718	5665 5681
FSSINP	008	0B66	5769	5737* 5760
FSSINT	001	0003	5705	5647 5649 5649 5650 5652 5652 5715 5716
FSSLOP	001	0B5E	5768	5736* 5758*
FSSMDY	001	0AD8	5720	5686
FSSMN1	001	0B68	5774	5758
FSSMOD	001	0002	5703	5686
FSSOCT	001	0AC0	5709	5587* 5608* 5612* 5643 5654* 5682 5684 5689 5695
FSSONE	001	0001	5701	5686*
FSSRST	008	0B5D	5767	5741* 5757*
FSSSIN	004	0A1A	5602	
FSSSQD	008	0B55	5766	5740* 5748 5749
FSS008	003	0ACE	5716	5650 5652
FSS050	003	0A14	5595	5592
FSS064	003	0ACB	5715	5647 5649
FSS100	003	0A33	5613	5596
FSS150	003	0A36	5618	5611
FSS160	004	0A3C	5620	5595* 5609*
FSS200	004	0A43	5625	5619
FSS205	003	0A4B	5630	
FSS225	004	0A5B	5647	
FSS230	004	0A66	5650	5648 5653
FSS260	004	0A74	5654	5651
FSS300	004	0A81	5665	5631
FSS360	003	0A9D	5687	5696
FSS370	004	0AA0	5688	5697
FSS380	003	0AA4	5689	5685
FSS400	004	0AAD	5692	5690

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
FSS425	004	0AB3	5694	5607 5621
FSS450	003	0AB7	5695	5683
FSS900	004	0B00	5730	5693
FSS905	004	0B17	5741	5742
FSS910	004	0B1F	5747	5759
FSS920	004	0B2F	5755	5742* 5747*
FZSBN1	001	34DF	9381	9254 9273 9315
FZSCAJ	001	34E1	9384	9312
FZSCAT	001	34E5	9402	9353
FZSCNT	004	34C7	9430	9224* 9247* 9254* 9280* 9290* 9320* 9330* 9345
FZSDAC	002	35D8	9602	9553* 9557 9559 9559*
FZSDC1	001	35CB	9586	9553
FZSDC5	001	35CC	9587	9463
FZSEXB	004	35D1	9592	9538
FZSLXB	001	0004	9591	9533 9538 9571 9573 9592 9599
FZSLXM	001	0002	9601	9547* 9553 9557 9557 9559 9559 9602
FZSNXZ	001	34E0	9383	9267
FZSPAL	001	0000	9428	9294* 9518* 9524* 9529*
FZSPCH	002	36FB	9887	9670
FZSPDA	002	34E4	9387	9363
FZSPRT	001	3400	9219	
FZSP1B	001	3400	9210	9214
FZSP2B	001	3500	9453	9457
FZSP3B	001	3600	9626	9630 9887 0948
FZSP4B	001	3700	9911	9915
FZSSAJ	001	34E2	9385	9327
FZSXWK	004	35D6	9599	9538* 9547* 9557* 9564 9566 9566* 9573
FZS010	003	3404	9224	
FZS020	004	340E	9231	
FZS030	003	3415	9242	
FZS035	003	3418	9243	
FZS040	003	3424	9247	9244
FZS050	003	3427	9252	
FZS060	003	3434	9259	9253
FZS070	004	3440	9266	
FZS080	003	344B	9271	9268* 9273* 9274 9275 9280
FZS090	003	3455	9274	9266* 9267*
FZS100	004	345B	9280	
FZS110	004	3462	9287	9260 9262 9272
FZS120	003	346D	9294	9242* 9245* 9255 9281
FZS130	003	3473	9306	9232
FZS140	005	3479	9312	
FZS150	004	3481	9315	9318
FZS155	003	3488	9317	9314* 9315* 9320
FZS160	005	3495	9327	9307
FZS170	003	34A1	9334	9322
FZS180	003	34A4	9344	9227 9296
FZS190	004	34B1	9348	9316 9344* 9345*
FZS2BX	001	35D2	9598	9540* 9541* 9548* 9549* 9555
FZS2B1	001	35CA	9585	9466 9490 9497 9519 9526 9567
FZS2XZ	001	35CD	9589	9491 9541
FZS200	004	34B5	9352	9346
FZS210	005	34C1	9355	9354*
FZS230	004	34C6	9359	9430
FZS240	004	34D5	9368	
FZS260	004	34DB	9373	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
FZS3B2	001	36F0	9859	9702
FZS3CC	003	36DB	9867	9651* 9681* 9694* 9696 9698* 9699 9702* 9710* 9711 9717* 9718 9756* 9758 9779* 9789* 9833* 0949* 0950
FZS3CR	001	36F6	9881	9770 9839
FZS3PA	001	36F5	9878	9646*
FZS3PC	001	36F3	9877	9645* 9651 9668 9696 9718* 9729 9743* 9752* 9756 9800*
FZS3PF	001	36F2	9876	9644* 9734* 0956* 0960*
FZS3PL	001	36F2	9870	9804 9876 9877 9878 0957
FZS3PZ	001	36F1	9861	9698
FZS3RM	003	366A	9866	9640* 9758 9834 0950
FZS300	001	3500	9462	9288
FZS310	003	350E	9470	9464
FZS320	003	351A	9481	
FZS330	004	3524	9484	9481* 9482*
FZS340	004	3528	9489	9483
FZS350	003	3534	9492	9489* 9490* 9491*
FZS360	003	3537	9496	
FZS370	004	353A	9497	9499
FZS380	003	353E	9498	9496* 9497* 9503
FZS390	005	3544	9503	
FZS4B2	001	37DE	0137	9985
FZS4CC	003	37C6	0146	9935* 9964* 9977* 9979 9981* 9982 9985* 9993* 9994 0000* 0001 0039* 0041 0053 0062* 0072* 0107*
FZS4CR	001	37E4	0160	0113
FZS4PA	001	37E3	0157	9930*
FZS4PC	001	37E1	0156	9929* 9935 9952 9979 0001* 0012 0026* 0035* 0039 0083*
FZS4PF	001	37E0	0155	9928* 0017*
FZS4PL	001	37E0	0149	0087 0155 0156 0157
FZS4PZ	001	37DF	0139	9981
FZS4RM	003	3764	0145	9924* 0041 0108
FZS400	004	354D	9517	9471 9473
FZS410	003	3558	9524	
FZS420	004	355E	9526	9528
FZS430	003	3562	9527	9525* 9526* 9534 9572
FZS435	003	3568	9529	
FZS440	004	356B	9533	
FZS450	004	3574	9538	
FZS460	003	3586	9547	
FZS470	004	3590	9553	9543
FZS472	003	3597	9555	9554* 9558 9558* 9560
FZS474	004	35A1	9558	9556
FZS480	003	35AC	9564	9542
FZS490	003	35BB	9571	9565
FZS500	004	35C2	9573	9571* 9572*
FZS510	004	35C6	9577	
FZS600	006	3600	9635	9369
FZS605	003	362B	9658	9657*
FZS610	003	362E	9668	9404 9404 9405 9406 9407 9409 9410 9411 9412 9414 9414 9415 9416 9416 9417 9419 9419 9420 9421 9421 9422
FZS615	004	3642	9673	9672*
FZS620	003	3646	9681	9405
FZS630	003	364C	9694	9406
FZS632	004	364F	9696	9700
FZS633	003	365A	9699	9887
FZS634	004	3660	9702	9697
FZS636	005	3664	9710	9682

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
FZS638	003	3669	9711	9866
FZS640	005	366F	9717	
FZS650	003	367B	9729	9407 9417 9422
FZS655	003	3681	9734	9712
FZS660	003	3687	9743	9409
FZS670	003	368D	9752	9410
FZS675	004	3690	9756	9744
FZS680	003	36A1	9770	9411 9730
FZS690	003	36A7	9779	9412
FZS695	003	36B0	9789	9415
FZS700	003	36B6	9800	9420
FZS710	003	36B9	9804	9719 9735 9759 0952
FZS720	003	36BC	9805	9771
FZS730	006	36BF	9809	9781
FZS740	004	36C8	9814	9636
FZS750	004	36CE	9819	9760 9810
FZS760	003	36D2	9829	9653 9757 9780 9790
FZS770	003	36DA	9834	9867
FZS780	003	36E3	9846	9805
FZS790	004	36EC	9852	9669 9829* 9835 9846*
FZS800	005	3700	9920	9815 0964
FZS805	003	3725	9942	9941*
FZS810	003	3728	9952	
FZS820	003	3740	9964	
FZS830	003	3746	9977	
FZS832	004	3749	9979	9983
FZS834	004	375A	9985	9980
FZS836	005	375E	9993	9965
FZS838	003	3763	9994	0145
FZS840	005	3769	0000	
FZS850	003	3775	0012	
FZS855	003	377B	0017	9995
FZS860	003	3781	0026	
FZS870	003	3787	0035	
FZS875	004	378A	0039	0027
FZS880	003	379B	0053	0013
FZS890	003	37A1	0062	
FZS895	003	37AA	0072	
FZS900	003	37B0	0083	
FZS910	003	37B3	0087	9953 0002 0018 0042
FZS920	003	37B6	0089	0054
FZS941	004	348E	9320	
FZS950	004	37B9	0093	9954 0043 0064
FZS960	003	37BD	0103	9937 0040 0063 0073
FZS970	003	37C5	0108	0146
FZS980	003	37CE	0121	0089
FZS982	004	37D4	0124	9920*
FZS984	002	37D9	0125	0123*
FZS990	004	37DA	0129	0103* 0109 0121*
FZS991	005	5359	0949	
FZS992	004	5368	0954	0951
FZS993	003	5372	0957	0955
FZS994	004	538D	0965	0962
FZZBM1	001	00FF	0498	0378
FZZBN1	001	4CB3	0470	0344 0380 0454
FZZCDT	002	4CB8	0475	0400 0401

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FZZCNT	002	4CBC	0483	0400*	0401*	0414	0423	0429								
FZZDPL	001	4CBD	0486	0324*	0330*	0358	0392*	0393*	0402*	0404*	0414*	0418	0418*	0419	0419*	
				0425*	0431*	0441*	0442*	0446								
FZZHCA	002	4CBA	0481	0336*	0345*	0441										
FZZIDM	001	0080	0504	0423												
FZZITM	001	0040	0505	0429												
FZZLOK	001	0001	0501	0372												
FZZLRT	001	0000	0500	0364	0366*	0372										
FZZMDY	001	0002	0502	0364	0366											
FZZNST	001	4CB6	0474	0402	0404											
FZZPGB	001	4C00	0311	0315												
FZZSDM	001	0001	0506	0425												
FZZSTM	001	0080	0507	0431												
FZZSXA	002	4CB5	0472	0336												
FZZVPL	001	4C06	0329													
FZZVPS	001	4C00	0323													
FZZ005	003	4C09	0335	0325												
FZZ010	004	4C25	0353	0341	0455											
FZZ020	003	4C29	0354	0335*	0343*	0344*	0381	0442	0454*							
FZZ025	003	4C3E	0372	0359												
FZZ030	003	4C44	0378	0367												
FZZ035	004	4C4B	0380	0382												
FZZ040	004	4C4F	0381	0378*	0380*	0393										
FZZ050	004	4C61	0401	0403												
FZZ060	003	4C85	0429	0424												
FZZ070	004	4C8E	0441	0430												
FZZ080	002	4CA1	0449	0447*												
FZZ090	004	4CA2	0454	0365	0373											
I\$ADJX	001	0D56	3717													
I\$ADST	001	0C9D	3672													
I\$BASE	001	0C60	3674													
I\$BRCN	001	117B	3726													
I\$BSET	001	119D	3725													
I\$B1SW	001	0040	3782													
I\$B2SW	001	0020	3784													
I\$CADR	001	144C	3763	6740*	6741	6792	6828	7002	7134	7178	7199*	7227	7240	7241	7279	
I\$CALL	001	12B1	3757	7402	7572	8747	8940	9672	0620	0657	0695	0773	0774			
				4151	4159	4204	4498	4509	4793	4810	5210	5227	5635	5660	5692	
				6268	6311	6333	6350	6372	6394	6433	6450	6870	7037	7051	7093	
				7197	7403	7609	7676	7681	7693	7736	7798	7984	7996	8097	8165	
				8602	9287	9368	9814	9847	0958	0963						
I\$CBM1	001	0D43	3693													
I\$CBN1	001	0D3E	3689													
I\$CBN2	001	0D3F	3690													
I\$CBN3	001	0D40	3691													
I\$CBN4	001	0D41	3692													
I\$CFBS	001	0AE3	3740													
I\$CLFA	001	0D4A	3699													
I\$CLVA	001	0D49	3698	6273	6677											
I\$CL1C	001	0D46	3696	6250	6797											
I\$CL1F	001	0D44	3694	6238	6731											
I\$CL2C	001	0D47	3697													
I\$CL2F	001	0D45	3695													
I\$CPG1	001	1600	3654													
I\$CPUF	001	0A27	3736	7035	7332											
I\$CSCT	001	0D5A	3712													

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SYMBOL	LEN	VALUE	DEFN	REFERENCES	VER 15, MOD 00 31/05/21 PAGE 229										
I\$CSSW	001	0010	3786												
I\$CSXA	001	2000	3653	9387	0472										
I\$CUPF	001	0A85	3738	6241	6733										
I\$CVAD	001	1358	3751	6827	7226	8746	9671	0656	0694						
I\$DATA	001	0D53	3680	6417*											
I\$DAT1	001	0D55	3681	6417											
I\$DMSW	001	0BC1	3734												
I\$ECSW	001	0004	3790												
I\$ERRC	001	0CBC	3679	4135*	4802*	5120*	5156*	5175	5221	5229	5231*	5360*	5620*	6286	6687*
				6697*	6721*	6810*	6814*	6832*	7010*	7174*	7580*	7688*	7836*		
I\$FACT	001	0DD1	3719												
I\$FADD	001	075D	3742	5688	5756										
I\$FATE	001	0DE6	3720	6765											
I\$FATP	001	0DE8	3721	6677*	6678	6692	6702								
I\$FDVD	001	0919	3747												
I\$FMPY	001	082A	3745	4212	5174	5220	5626	5666	5739	5750	5761				
I\$FSUB	001	0751	3743												
I\$FWRK	001	0607	3663	4141*	4192	4194*	4195	4249*	4250	4250*	4251	4256	4277	4286*	4294*
				4308*	4309	4309*	4319	4341	4341*	4660*	4662	4861*	4862*	4863	4863*
				4864*	4890*	4897*	4904*	4922*	4923	4931*	4933	4961	4961*	5170*	5173
				5895*	5905	5914*	5917	5923	5926						
I\$IMCI	001	0DCE	3710												
I\$IMLN	001	0DC6	3706												
I\$IMPT	001	0DCC	3709												
I\$INDR	001	0DC5	3705												
I\$INIT	001	0607	3662												
I\$INTR	001	0C5C	3666												
I\$IRSW	001	0CDE	3686												
I\$I700	001	0E24	3748												
I\$LBFR	001	12B6	3758	0693*											
I\$LDBR	001	1329	3755	8349											
I\$LDXR	001	1330	3756	4873	7391	7416	7596	7751	7804	7939	8073	8371	8841	8941	8959
				0721	0931										
I\$LOCK	001	1354	3753	6791	7000	7571	7602	8096	8351	8373	8939	0696	0772	0920	0933
I\$MDFY	001	1349	3752	7001	7127	7274	7419	7570	7601	8139	0619				
I\$MOD4	001	1308	3749												
I\$NCPG	001	000A	3774												
I\$NDSW	001	0002	3792												
I\$NISW	001	0080	3780												
I\$NPAG	001	0C68	3667												
I\$PARM	001	0D57	3												

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
I\$SDPT	001	0DD0	3711	
I\$SFCT	001	0D5A	3715	
I\$SFFO	001	0D5D	3723	
I\$SICT	001	0D5B	3716	
I\$SLLC	001	0BA1	3730	6233 9231 9652 9936
I\$SLNG	001	0BA2	3729	6711*
I\$SNSW	001	0001	3794	
I\$SSCT	001	0D58	3713	
I\$STAK	001	0D4E	3675	4127 4310 4482 4622 4650 4661 4921 4978 5099 5146 5357 5443 5586 5602 5730 5894 5925 6238* 6240 6250* 6273* 6274 6329* 6710 6731* 6732 6797* 6798* 6799 6803* 6819* 6820* 6821 6822* 7032 7064 7086 7140 7324 7758 7812 8094 9220
I\$STCK	001	0B50	3728	6712
I\$STHA	001	0D51	3685	
I\$STKB	001	0639	3664	
I\$STKI	001	0D4F	3676	
I\$STSW	001	0008	3788	
I\$TFSW	001	0D28	3688	
I\$ULNG	001	0C3A	3733	6282*
I\$UNLK	001	1350	3754	6849 6873 7044 7685 7699 7841 8142 8380 8382 0940 0942 0944
I\$USTK	001	0BB0	3732	6287 6734
I\$VADR	001	144A	3762	6275* 6671* 6682 6703 6730* 6790* 6826* 6848* 6872* 6999* 7043* 7125* 7126* 7225* 7272* 7273* 7569* 7684* 7698* 7840* 8128* 8138* 8379* 8381* 8745* 8750* 8751* 8830* 8831* 8938* 9670* 0618* 0655* 0673* 0691* 0703* 0771* 0939* 0941* 0943*
I\$WRK1	001	0D59	3683	6750* 6792* 6855 6863* 7085* 7086* 7242* 7244* 7326 7901* 9352* 9646 9930
I\$WRK2	001	0D5B	3684	6865* 7243* 9363* 9364* 9635 9809 9920 0961
I\$XAD1	001	0C89	3671	6455
I\$XAD2	001	0C82	3670	6399
I\$XAD3	001	0C7B	3669	6291
I\$XAD4	001	0C74	3668	
I\$XERR	001	0CAB	3673	
I\$XIAR	001	0D4C	3678	6188 6198 6670 6743
I\$XPAG	001	0C61	3677	6742
I@APRC	001	0006	3855	9261 9463 9463* 9472 9481 9484 9484* 9496 9517 9517 9517* 9525
I@APRL	001	000B	3832	
I@APRS	001	0006	3809	3855
I@ASTA	001	0000	3867	
I@ASTL	001	0020	3843	
I@ASTS	001	0000	3820	3867
I@CMEQ	001	0004	3924	
I@CMHI	001	0008	3925	
I@CMLO	001	0002	3923	
I@DEXP	001	0000	3902	4483 4496 4497* 4508* 4651* 4664* 4800 4844* 4934* 4935* 4981 5163 5370 5387 5388* 5392* 5393* 5394* 5591 5594* 5606 5618 5630 9259 9261 9266 9466* 9470 9472 9482 9489 9519* 9540 9549
I@ICBA	001	F500	3869	
I@ICBL	001	F000	3845	
I@ICBS	001	F500	3822	3869
I@IVBA	001	F531	3870	
I@IVBL	001	F049	3846	
I@IVBS	001	F531	3823	3870
I@LCRF	001	0012	3884	3885 7071 7077 7077 7077* 9314
I@LCRV	001	0013	3885	6233 6282 7159 7761 9231 9652 9936
I@LFPZ	001	0012	3954	9344 9347* 9348 9348* 9681 9699 9743 9779 9789 9800 9964 9982

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SYMBOL	LEN	VALUE	DEFN	REFERENCES												VER 15, MOD 00	31/05/21	PAGE 231
I@LPFL	001	0009	3834	0026	0062	0072	0083											
I@LPFS	001	0005	3811	3837	3838	7152	7219	7847	7851									
I@LPFV	001	0005	3857	3814	3815	3857	7145	7219	7741	7847	7851							
I@LPPZ	001	0003	3953	6763														
I@LPSW	001	0080	3842	9694	9752	9861	9977	0035	0139									
I@LSFV	001	0007	3859	5407*	5408*	5409*	5418	5420	5435	5436	5436	5453						
I@LUFL	001	0010	3835	3839														
I@LUFS	001	0008	3812	3816	3858													
I@LUFV	001	0008	3858	3859	3894	3896	3897	3899	3900	4105	4116	4141*	4141*	4171	4174			
				4174	4179	4179	4192	4192	4194	4194*	4195	4195	4211	4227	4235			
				4249*	4250	4250	4250*	4251	4256	4256	4256	4277	4277	4277	4277			
				4286	4286	4286*	4294	4294	4294*	4294*	4308	4308*	4309	4319	4319			
				4319	4319	4326	4341	4341	4341	4341	4341*	4341*	4345	4357	4358			
				4359	4360	4361	4362	4363	4364	4365	4648	4829	4831	4831	4851			
				4851	4861	4861*	4861*	4890	4890	4890*	4890*	4897	4897	4904	4904			
				4904*	4904*	4906	4922	4961	4961	5170	5173	5206	5216	5248	5404			
				5404	5404	5406	5418	5420	5435	5437	5457	5458	5625	5665	5681			
				5737	5738	5740	5741	5748	5749	5755	5757	5760	5766	5767	5769			
				5895	5895*	5897	5923	5926										
I@LXPT	001	0060	3945															
I@MANL	001	0001	3903	4131	4170*	4174*	4638	4983*	5108	5113	5118	5125	5128*	5362	9252			
				9465*														
I@MANR	001	0007	3904	5139	5145	5154	5185	5187*	5237*									
I@NCPG	001	000A	3947	0335														
I@NERR	001	0000	3956	5175	5221	5229	6286											
I@NXPG	001	0020	3944	3945														
I@NXPT	001	0003	3943	3945														
I@PEXL	001	0008	3838	7149	7155*	7156	7156*	7822*	7823	7823*	7831							
I@PEXP	001	0004	3862															
I@PEXS	001	0004	3815	3862	7149*	7155	7822	7831*										
I@PMNR	001	0003	3861															
I@PMN1	001	0000	3881															
I@PMRL	001	0007	3837															
I@PMRS	001	0003	3814	3861														
I@PRCL	001	000F	3831	3835														
I@PRCS	001	0007	3808	3812	3854													
I@PREC	001	0007	3854	4141	4192	4232	4234</											

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
I@SGNS	001	0007	3817	3864
I@SIDX	001	0001	3935	
I@SIGN	001	0007	3864	5358 9243 9246*
I@STAT	001	0000	3878	6280 7033 7065 7070* 7141 7150* 7154* 7327 7334* 7339* 7346 7347*
				7354 7363* 7366* 7813 7821* 7830* 8095* 9306 9329* 9330
I@SVAD	001	0001	3933	6275 6716 6728* 6729 6730
I@UEXP	001	0000	3880	3902
I@UMNR	001	0007	3863	3904
I@UMN1	001	0001	3882	3903
I@UMRL	001	000F	3839	3840
I@UMRS	001	0007	3816	3817 3863
I@XBRC	001	0003	3917	
I@XCNT	001	0001	3915	6329
I@XCOD	001	0001	3916	6199 6367 6389
I@XLNO	001	0002	3913	
I@XOPC	001	0000	3912	3913 3914 3915 3916 3917 6192
I@XVAD	001	0002	3914	6266 6671 6742* 6743* 6744*
I@1SE1	001	0000	3893	3894 3896 4131 4483 4495* 4496 4496* 4497 4497* 4508* 4638 4651*
				4664* 4800 4844* 4934* 4935* 4981 4983* 5108 5128* 5154 5185 5187*
				5237* 5358 5362 5370 5381* 5387 5387* 5388* 5389 5389* 5390 5390*
				5391 5391* 5392 5392* 5393 5393* 5394* 5421* 5591 5594* 5606 5618
				5630 5643* 5691*
I@1SE2	001	0008	3896	3897 3899 5113 5118 5125 5139 5145 5147 5163 5383* 5686*
I@1SE3	001	0010	3899	3900 4170* 4171 4171* 4174* 4179* 4186* 4192* 4194 4196
IBR810	003	1ACF	6438	
IDFADF	001	1A95	6346	6471
IDFBAT	001	1AE0	6467	6193
IDFCLS	001	1AD2	6446	6474
IDFGET	001	1A40	6262	6468
IDFILE	001	1A00	6187	6468 6469 6470 6471 6472 6473 6474 6475 6476
IDFINI	001	1A87	6324	6470
IDFPRS	001	1A9E	6363	6475
IDFPRU	001	1AAD	6385	6476
IDFPUT	001	1A75	6300	6469
IDFRSR	001	1AC0	6413	6472
IDFRST	001	1AC9	6429	6473
IDFSMK	001	000C	6405	6389
IDF010	004	1A04	6192	
IDF020	004	1A0B	6194	6192*
IDF030	004	1A0F	6198	
IDF040	003	1A18	6203	6194*
IDF050	003	1A1B	6229	6306 6368 6390
IDF055	004	1A1E	6233	
IDF060	006	1A25	6238	
IDF065	004	1A2F	6241	6242 6244 6305* 6307*
IDF070	006	1A36	6250	6234
IDF075	004	1A3C	6254	6229* 6246
IDF100	004	1A40	6266	
IDF110	002	1A49	6269	6266*
IDF120	006	1A4A	6273	
IDF130	003	1A59	6279	
IDF140	004	1A66	6286	6281
IDF150	004	1A6E	6291	
IDF200	003	1A75	6305	
IDF220	003	1A84	6316	
IDF300	005	1A87	6329	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
IDF310	004	1A8C	6333	
IDF320	003	1A92	6338	
IDF420	004	1A95	6350	
IDF430	003	1A9B	6355	
IDF500	003	1A9E	6367	
IDF510	004	1AA4	6372	
IDF520	003	1AAA	6377	
IDF600	003	1AAD	6389	
IDF610	004	1AB3	6394	
IDF620	004	1AB9	6399	6316 6338 6355 6377
IDF700	006	1AC0	6417	
IDF710	003	1AC6	6421	
IDF800	004	1AC9	6433	
IDF900	004	1AD2	6450	
IDF910	004	1AD8	6455	6421 6438
IDF990	004	1ADC	6459	6292 6400
IDIBM2	002	1BA3	6759	6679
IDIFNC	001	1B00	6669	
IDIFTE	002	1BA8	6765	6692
IDIFVA	001	0001	6777	6680 6682 6703*
IDILBI	001	1BA4	6761	6728 6740
IDILFI	001	1BA5	6762	6744
IDILPV	001	1BA6	6763	6749
IDIVAD	002	1BAA	6771	6729* 6749* 6750
IDI010	006	1B09	6677	
IDI020	003	1B13	6679	6683
IDI030	004	1B24	6687	
IDI040	005	1B2C	6692	6681
IDI050	004	1B34	6697	
IDI060	004	1B3C	6702	6693
IDI070	004	1B45	6710	
IDI080	003	1B51	6716	
IDI090	004	1B57	6721	
IDI100	004	1B5F	6728	6717
IDI110	005	1B7E	6740	
IDI130	004	1B95	6749	
IDP210	004	1A7E	6311	
LPBUFR	001	4F00	0892	0878* 0891 0899
LPRCMD	005	4DE9	0739	0809
RETURN	001	4DB3	0709	8798 8962
SFACTR	001	1CF6	6888	6796* 6802* 6808 6812 6819
SFADFR	001	1C00	6784	6785
SFAD2D	001	1CF4	6886	6836* 6837 6856
SFAVD1	002	1CEE	6881	6789 6848
SFAVD2	002	1CF0	6882	6790
SFAWK1	002	1CF8	6889	6789* 6826 6829* 6872
SFA0B0	001	00B0	6880	6837 6874
SFA001	001	1CF1	6883	6798 6802 6803
SFA007	001	1CF2	6884	6820
SFA008	001	1CF3	6885	6822
SFA010	004	1C21	6799	6804
SFA020	003	1C37	6808	6801 6875*
SFA030	003	1C44	6812	6809
SFA032	001	1CF5	6887	6836
SFA040	005	1C51	6819	6813
SFA050	005	1C65	6826	6850

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SFA060	003	1C76	6830	6840
SFA065	004	1C7C	6832	6843
SFA070	005	1C83	6834	6821* 6831
SFA075	003	1C8F	6837	6847* 6874*
SFA080	004	1C9B	6841	6838
SFA090	003	1CA5	6847	6842
SFA100	003	1CB4	6854	6835
SFA110	004	1CCC	6864	6854*
SFA115	005	1CDA	6872	6833 6859
SFA120	003	1CE3	6874	6811 6815
SFGBLK	003	003D	7711	7647 7654
SFGBS1	001	2100	7566	7567 7677 7682
SFGBS2	001	2200	7718	7719
SFGBS3	001	2300	7866	7867 8018 8030
SFGBVA	002	214B	7597	7595* 7598 7684
SFGCBA	002	21FC	7706	7600* 7670
SFGCBP	001	00FF	7709	7603
SFGCBV	002	2368	7940	7937* 7938*
SFGCNL	002	22E8	7854	7741* 7746* 7761* 7763 7764 7789* 7855
SFGDEH	001	0006	8041	7951
SFGDLS	001	22E3	7847	7746
SFGDRL	001	00E9	8030	7900
SFGDWL	001	00E3	8018	7892
SFGD2P	004	2276	7786	7748*
SFGELS	001	0004	7851	7823
SFGETR	001	2100	7568	
SFGHDL	001	0007	8040	7951 8041 8044
SFGICR	003	0040	7710	7613 7665
SFGLEH	001	23F4	8043	7953 7960* 7965 7968 7973* 7974
SFGMFA	006	2272	7780	7774*
SFGMLQ	002	22EC	7858	7768* 7769* 7770 7772 7776 7859
SFGMS1	001	00FF	7850	7768
SFGMTA	006	2270	7779	7758* 7776* 7806*
SFGNFM	001	00FF	7708	7591 7594
SFGONE	001	22E4	7848	7806
SFGPAF	001	23F1	8035	7946
SFGPCL	002	22EA	7857	7763* 7766* 7769 7787 7788 7789
SFGPLR	001	23E9	8023	8030
SFGPLW	001	23E3	8011	8018
SFGPSL	001	23F3	8037	7972 7973
SFGRPL	004	2334	7909	7899* 7900*
SFGRST	003	003A	7712	7648
SFGSA0	001	0F00	8039	
SFGSBR	004	233A	7915	7902*
SFGSB2	007	23FA	8045	7982* 7987 7993* 7994
SFGSDF	002	22E6	7853	7747* 7764 7766 7801*
SFGSHD	007	23FA	8044	7951* 8045
SFGSSL	001	23F2	8036	7959 7960
SFGSSZ	002	23F0	8034	7929
SFGSXR	004	233E	7917	7903* 7936* 7945 7952
SFGVCB	002	2234	7752	7749* 7750*
SFGVD2	002	21FA	7704	7569 7698
SFGVNB	002	229D	7805	7802* 7803* 7840
SFGWPL	004	231E	7898	7891* 7892*
SFGXRD	001	00FE	8046	7994*
SFGZRO	002	22E2	7846	7731

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SFG120	004	2126	7580	7577
SFG150	003	212D	7582	7579
SFG200	003	2130	7586	7575
SFG205	004	2142	7595	7592
SFG210	003	215A	7604	7593* 7605*
SFG215	004	2160	7609	7672
SFG220	003	216F	7618	7661
SFG225	003	2172	7619	7613* 7647 7648* 7654* 7665*
SFG227	003	2175	7621	7710 7711 7712
SFG230	003	218A	7634	7640
SFG235	003	219F	7647	7632
SFG240	004	21A8	7651	7656*
SFG245	003	21AF	7654	7712
SFG250	003	21B2	7656	7711
SFG255	003	21B5	7660	7619 7643 7649 7652 7666 7710
SFG260	003	21BB	7665	7622
SFG265	003	21C1	7670	7625
SFG270	003	21C4	7672	7614* 7627*
SFG280	004	21CD	7681	7604
SFG282	005	21D3	7684	7689
SFG285	004	21DF	7688	7637
SFG290	004	21E6	7693	7587
SFG295	005	21EC	7698	7581 7686
SFG450	003	220D	7741	7732
SFG470	004	2220	7747	7744
SFG500	004	2249	7763	7760 7807
SFG520	003	2258	7768	7765
SFG550	006	226D	7778	7770* 7779 7780
SFG555	004	2273	7785	7786
SFG570	004	22A5	7812	7790
SFG575	003	22AF	7816	7742* 7745*
SFG585	003	22C3	7826	7816
SFG690	004	22D0	7836	7754
SFG695	005	22D4	7840	7814 7817 7824 7826 7832
SFG750	003	2300	7881	7969
SFG760	004	230C	7885	7884 7947
SFG780	003	2313	7891	
SFG785	004	2319	7894	7898
SFG790	004	232F	7905	7909
SFG795	004	2337	7914	7915
SFG800	004	233B	7916	7917
SFG810	003	2345	7926	7886
SFG825	003	2355	7932	7927
SFG830	003	2358	7936	7882
SFG840	004	2379	7951	7943
SFG850	003	2386	7958	7967* 7971*
SFG860	003	2394	7965	7954
SFG870	004	239D	7968	7958
SFG880	003	23A4	7971	7966
SFG890	004	23AF	7974	7961
SFG900	004	23B3	7978	7930
SFG920	003	23B7	7982	7677
SFG930	003	23C6	7992	7999* 8002*
SFG935	004	23D0	7996	7992
SFG940	003	23DC	8002	7988
SFG945	004	23DF	8004	8000

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SFPBFR	006	1EC8	7184	7178* 7182*
SFPBS1	001	1D00	6995	6996
SFPBS2	001	1E00	7112	7113
SFPBS3	001	1F00	7223	7224 7292 7302
SFPBS4	001	2000	7312	7313
SFPCBP	002	2094	7393	7319* 7415
SFPCBV	002	2095	7392	7393 7394
SFPCFL	005	20DE	7435	7326* 7371* 7376 7431 7432 7442
SFPCNL	001	1EF2	7204	7145* 7152* 7159* 7166 7177 7188* 7205 7242
SFPCPT	002	20C0	7418	7375 7396 7411* 7420 7427* 7441
SFPCPW	002	20FD	7459	7375* 7376* 7380
SFPCRT	002	1DF0	7108	7023
SFPCXI	004	1DE0	7091	7057*
SFPC01	002	1EFC	7214	7172 7190
SFPDAC	002	20FD	7457	7352* 7356 7358 7358* 7458
SFPDCA	005	20DF	7434	7432*
SFPDEV	002	1DEB	7102	7016* 7019* 7039 7104
SFPDIC	002	1DEB	7104	7071* 7073*
SFPDLS	001	0004	7219	7156
SFPDP1	001	1F7E	7285	7292
SFPDP2	001	1F84	7295	7302
SFPD1D	001	007E	7292	7246
SFPD2D	001	0084	7302	7253
SFPENC	001	0005	7450	7371
SFPEXI	004	20FA	7454	7338
SFPEZR	001	20FB	7455	7339
SFPLEX	001	0004	7448	7338 7450 7454
SFPLXM	001	0002	7449	7352 7356 7356 7358 7358
SFPMPT	002	1DEE	7107	7019
SFPMS1	001	00FF	7220	7179
SFPMVL	006	1EC6	7185	7179* 7180* 7181 7182
SFPNGE	002	20FD	7458	7345* 7346* 7347 7459
SFPONE	001	1DEC	7106	7073
SFPPRT	002	1EF8	7210	7165* 7177* 7180 7187 7188 7211
SFPRT2	002	1F8B	7306	7225
SFPSAO	001	0F00	7309	
SFPSCA	002	1EFA	7213	7199 7279*
SFPSIO	002	1EF6	7218	7130* 7143
SFPSTC	003	208E	7436	7325* 7431*
SFPSTK	006	1ECA	7186	7160* 7181* 7190* 7243
SFPUTR	001	1D00	6998	
SFPVCA	002	20C0	7417	7318* 7415* 7418
SFPVD2	002	1DF2	7109	6999 7043
SFPWK2	002	1EF6	7209	7168* 7170* 7171* 7172* 7218
SFPWRK	001	1EF4	7208	7128* 7129* 7163 7165 7166* 7169* 7170
SFPXR1	004	1E7C	7162	7131* 7136
SFPX01	001	20F5	7452	7427 7443
SFPZD1	001	20F6	7453	7352
SFP050	004	1D26	7010	7007
SFP075	003	1D2D	7012	7009
SFP100	005	1D30	7016	7005
SFP120	003	1D43	7021	7018
SFP130	003	1D54	7028	7020
SFP133	004	1D61	7032	7029
SFP135	004	1D6F	7036	7034
SFP140	004	1D73	7037	7031

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SFP150	005	1D7E	7043	7011 7053 7098
SFP175	003	1D8B	7049	7022
SFP200	003	1D9A	7057	7050
SFP220	004	1DA3	7064	
SFP230	003	1DB3	7072	7076 7080
SFP250	003	1DD0	7081	7074
SFP320	004	1DDD	7090	7059 7066 7091
SFP350	005	1E0D	7125	7121
SFP370	003	1E1B	7128	7123
SFP385	004	1E3F	7140	7133
SFP400	003	1E5F	7152	7144
SFP410	003	1E65	7154	
SFP430	003	1E73	7159	7142
SFP450	003	1E76	7160	7148 7151 7153 7157
SFP460	004	1E79	7161	7162
SFP480	004	1EA5	7174	
SFP490	004	1EA9	7175	7138 7189
SFP5	001	0005	7308	7245* 7246* 7252* 7253*
SFP500	004	1EAD	7177	7164 7167 7192
SFP510	005	1EB1	7178	7173
SFP550	006	1EC5	7183	7184 7185 7186
SFP560	004	1ED6	7190	
SFP580	003	1EE0	7196	7122 7137 7191
SFP590	004	1EEE	7200	7196*
SFP610	005	1F1E	7240	7229 7231
SFP625	006	1F28	7242	7240*
SFP630	006	1F2E	7243	7241*
SFP635	004	1F3E	7248	7245* 7246*
SFP640	004	1F50	7257	7252* 7253*
SFP650	004	1F58	7265	7254*
SFP655	004	1F5C	7266	7255*
SFP675	005	1F66	7272	7236
SFP680	006	1F74	7279	7227*
SFP720	004	204A	7352	7341
SFP725	003	2051	7354	7353* 7357 7357* 7359
SFP730	004	205B	7357	7355
SFP750	003	2066	7363	7340
SFP760	003	2075	7371	7365
SFP785	004	2078	7375	7328
SFP790	003	208A	7380	7378 7379* 7381 7383 7436
SFP800	004	2090	7391	7322
SFP830	004	20AA	7408	7317* 7440
SFP850	004	20B7	7415	7384
SFP865	004	20D5	7431	7421
SFP875	005	20DD	7433	7434 7435
SFP950	004	20F1	7444	7410
SFRBS1	001	2400	8053	8052 8159
SFRCAL	001	2400	8057	
SFRCLS	001	240A	8064	
SFRIXR	004	2484	8130	8075*
SFRLPR	003	24B7	8163	8174
SFRNOE	001	24AB	8149	8126* 8150
SFRONE	001	24AA	8147	8126
SFRSET	001	240D	8069	
SFRVD2	002	2412	8074	8128 8138
SFRX10	001	24AC	8152	8131

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SFR100	004	240D	8073	
SFR110	003	2416	8079	8059* 8140*
SFR115	003	241C	8082	8079 8132
SFR130	003	241F	8086	
SFR135	004	2448	8099	8093*
SFR140	003	244F	8104	8065* 8089 8136*
SFR200	004	2452	8109	8118
SFR300	003	2461	8116	8104
SFR900	003	2472	8125	8058* 8087 8091 8112 8141*
SFR950	004	2481	8129	8130
SFR995	003	248C	8136	8125 8127
SFR996	004	24C3	8167	8163*
SFR997	004	24CA	8169	8162
SFR998	006	24D1	8171	8168
SFR999	004	24D7	8172	8170
SF1000	001	24E5	8177	8164
V\$APWR	001	0800	2366	2511
V\$BFR1	001	5400	2429	2619
V\$BFR2	001	5500	2430	2620
V\$CBNZ	001	0CB2	2438	2518 4499 4510
V\$CCON	001	5120	2445	2616
V\$CDCV	001	3100	2442	2571 7997
V\$CDSY	001	2E00	2441	2568 7985
V\$CFPZ	001	0C70	2436	2517 4811 5636
V\$CNXZ	001	0470	2439	2506 4160
V\$CSSR	001	5100	2444	2615
V\$CZFP	001	04AD	2437	2507 4205 5661
V\$DTLN	001	4600	2451	2603
V\$DTVR	001	4700	2452	2604
V\$FABS	001	1761	2337	2535
V\$FACS	001	1400	2353	2527
V\$FASN	001	1413	2352	2528
V\$FATN	001	1100	2351	2524
V\$FCOS	001	0A00	2348	2513
V\$FCOT	001	0D00	2346	2519
V\$FCSC	001	1725	2350	2534
V\$FDEG	001	17DA	2357	2539
V\$FDET	001	4540	2360	2602
V\$FEXP	001	0500	2344	2508 4794 5228
V\$FHCS	001	1500	2356	2529
V\$FHSN	001	1557	2355	2530
V\$FHTN	001	1593	2354	2531
V\$FINT	001	176C	2338	2536
V\$FLGT	001	0200	2342	2501 4152 4874
V\$FLOG	001	0219	2341	2503 5211
V\$FLTW	001	020B	2343	2502
V\$FRAD	001	17CB	2358	2538
V\$FRND	001	1800	2359	2540
V\$FSEC	001	1700	2349	2533
V\$FSGN	001	17A7	2339	2537
V\$FSIN	001	0A1A	2347	2514
V\$FSQR	001	0900	2340	2512
V\$FTAN	001	0D28	2345	2520
V\$IFCI	001	1B00	2329	2544
V\$IFIO	001	1A00	2331	2543
V\$ISDN	001	1900	2330	2541

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
V\$KBTL	001	1EAC	2473	
V\$KBTS	001	0DAC	2472	
V\$LPRB	001	4F00	2427	2613 8966 0727
V\$LPRT	001	4D00	2425	2611 8753 8942 8960 0723 0932
V\$LPR2	001	4E00	2426	2612 0736 0740
V\$MADD	001	4007	2374	2591
V\$MASN	001	43A0	2372	2598
V\$MCON	001	4324	2379	2596
V\$MIDN	001	4300	2380	2595
V\$MINV	001	4500	2384	2601
V\$MMPY	001	4100	2376	2592
V\$MSMY	001	4264	2377	2594
V\$MSUB	001	4000	2375	2590
V\$MTRN	001	4400	2383	2600
V\$MZER	001	432B	2381	2597
V\$PCH1	001	5200	2465	2617
V\$PCH2	001	5300	2466	2618 8874 9887 0744 0745
V\$SCDI	001	2A00	2422	2562 7610
V\$SCDO	001	2A96	2423	2563 7404
V\$SFA2	001	5000	2407	2614 6871
V\$SFD1	001	0000	2417	2499 6881
V\$SFD2	001	0100	2418	2500 6882 7109 7704 8074
V\$SKEY	001	2500	2421	2557 8350 8372 8506 8507
V\$SPRT	001	2800	2420	2560 8166 8603 8842 9848 0959
V\$VMPL	001	4C06	2459	2610
V\$VMPS	001	4C00	2458	2609
V\$XKAF	001	1C00	2406	2545 6351
V\$XKCA	001	2400	2410	2553
V\$XKCL	001	240A	2409	2554 6451
V\$XKIN	001	2B00	2405	2564 6334
V\$XKLP	001	24AD	2411	
V\$XKRS	001	240D	2408	2555 6434
V\$XMGT	001	3E06	2399	2585
V\$XMIN	001	3D00	2398	2583
V\$XMPL	001	3F06	2402	2588
V\$XMPS	001	3F00	2401	2587
V\$XMPT	001	3E0C	2400	2586
V\$XMPU	001	3F13	2403	2589
V\$XMRD	001	3E00	2397	2584
V\$XSGT	001	2100	2392	2550 7677 7682 7694 7737 7799
V\$XSIN	001	2B6E	2391	2565
V\$XSPR	001	3400	2394	2574 6373 7038
V\$XSPT	001	1D00	2393	2546 6312 7052 7094 7198 7306 8098
V\$XSPU	001	3800	2395	2578 6395
V\$XSRD	001	3300	2390	2573
V\$00E1	001	0000	2499	
V\$01E1	001	0100	2500	
V\$02E1	001	0200	2501	
V\$02E2	001	020B	2502	
V\$02F3	001	0219	2503	
V\$03CC	001	0300	2504	
V\$04CC	001	0400	2505	
V\$04E1	001	0470	2506	
V\$04E2	001	04AD	2507	
V\$05E1	001	0500	2508	
V\$06CC	001	0600	2509	

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V\$07CC	001	0700	2510	
V\$08E1	001	0800	2511	
V\$09E1	001	0900	2512	
V\$10E1	001	0A00	2513	
V\$10E2	001	0A1A	2514	
V\$11CC	001	0B00	2515	
V\$12CC	001	0C00	2516	
V\$12E1	001	0C70	2517	
V\$12E2	001	0CB2	2518	
V\$13E1	001	0D00	2519	
V\$13E2	001	0D28	2520	
V\$14CC	001	0E00	2521	
V\$15CC	001	0F00	2522	
V\$16CC	001	1000	2523	
V\$17E1	001	1100	2524	
V\$18CC	001	1200	2525	
V\$19CC	001	1300	2526	
V\$20E1	001	1400	2527	
V\$20E2	001	1413	2528	
V\$21E1	001	1500	2529	
V\$21E2	001	1557	2530	
V\$21E3	001	1593	2531	
V\$22CC	001	1600	2532	
V\$23E1	001	1700	2533	
V\$23E2	001	1725	2534	
V\$23E3	001	1761	2535	
V\$23E4	001	176C	2536	
V\$23E5	001	17A7	2537	
V\$23E6	001	17CB	2538	
V\$23E7	001	17DA	2539	
V\$24E1	001	1800	2540	
V\$25E1	001	1900	2541	
V\$26E1	001	1A00	2543	
V\$27E1	001	1B00	2544	
V\$28E1	001	1C00	2545	
V\$29E1	001	1D00	2546	
V\$30CC	001	1E00	2547	
V\$31CC	001	1F00	2548	
V\$32CC	001	2000	2549	
V\$33E1	001	2100	2550	
V\$34CC	001	2200	2551	
V\$35CC	001	2300	2552	
V\$36CC	001	2400	2556	
V\$36E1	001	2400	2553	
V\$36E2	001	240A	2554	
V\$36E3	001	240D	2555	
V\$37E1	001	2500	2557	
V\$38CC	001	2600	2558	
V\$39CC	001	2700	2559	
V\$40E1	001	2800	2560	
V\$41CC	001	2900	2561	
V\$42E1	001	2A00	2562	
V\$42E2	001	2A96	2563	
V\$43E1	001	2B00	2564	
V\$43E2	001	2B6E	2565	
V\$44CC	001	2C00	2566	

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V\$45CC	001	2D00	2567	
V\$46E1	001	2E00	2568	
V\$47CC	001	2F00	2569	
V\$48CC	001	3000	2570	
V\$49E1	001	3100	2571	
V\$50CC	001	3200	2572	
V\$51E1	001	3300	2573	
V\$52E1	001	3400	2574	
V\$53CC	001	3500	2575	
V\$54CC	001	3600	2576	
V\$55CC	001	3700	2577	
V\$56E1	001	3800	2578	
V\$57CC	001	3900	2579	
V\$58CC	001	3A00	2580	
V\$59CC	001	3B00	2581	
V\$60CC	001	3C00	2582	
V\$61E1	001	3D00	2583	
V\$62E1	001	3E00	2584	
V\$62E2	001	3E06	2585	
V\$62E3	001	3E0C	2586	
V\$63E1	001	3F00	2587	
V\$63E2	001	3F06	2588	
V\$63E3	001	3F13	2589	
V\$64E1	001	4000	2590	
V\$64E2	001	4007	2591	
V\$65E1	001	4100	2592	
V\$66CC	001	4200	2593	
V\$66E1	001	4264	2594	
V\$67E1	001	4300	2595	
V\$67E2	001	4324	2596	
V\$67E3	001	432B	2597	
V\$67E4	001	43A0	2598	
V\$68E1	001	4400	2600	
V\$69E1	001	4500	2601	
V\$69E2	001	4540	2602	
V\$70E1	001	4600	2603	
V\$71E1	001	4700	2604	
V\$72CC	001	4800	2605	
V\$73CC	001	4900	2606	
V\$74CC	001	4A00	2607	
V\$75CC	001	4B00	2608	
V\$76E1	001	4C00	2609	
V\$76E2	001	4C06	2610	
V\$77CC	001	4D00	2611	
V\$78CC	001	4E00	2612	
V\$79CC	001	4F00	2613	
V\$80E1	001	5000	2614	
V\$81E2	001	5100	2615	
V\$81E3	001	5120	2616	
V\$82E1	001	5200	2617	
V\$83E2	001	5300	2618	
V\$84E1	001	5400	2619	
V\$85E2	001	5500	2620	
V@CDPT	001	0007	2631	
V@CHGH	001	0008	2736	
V@CMIC	001	0002	2632	

CROSS REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
V@CMNI	001	00FF	2629	
V@CMUL	001	0007	2737	
V@CNIX	001	0080	2630	
V@COEX	001	001E	2627	
V@CPLS	001	00F0	2634	
V@CPRC	001	000A	2636	
V@CSQR	001	0003	2734	
V@CSTR	001	0002	2735	
V@CTTA	001	0027	2637	
V@DCAD	001	0002	2657	2658
V@DEXP	001	0000	2662	
V@DMAN	001	000D	2664	2665
V@DMN1	001	0001	2663	
V@DPDF	001	0002	2652	
V@DSAD	001	0001	2653	
V@DSGN	001	000D	2665	
V@DVAD	001	0004	2658	
V@EART	001	0001	2635	
V@ECRT	001	0038	2708	
V@EFUL	001	00F8	2707	
V@EINV	001	00FB	2703	
V@EIPR	001	00F5	2704	
V@ENSV	001	00F7	2705	
V@ENUL	001	0000	2702	
V@ERPC	001	0020	2633	
V@ESAV	001	00F6	2706	
V@FEHN	001	0002	2732	
V@FEPL	001	0091	2728	
V@FERS	001	0003	2731	
V@FPGS	001	0081	2727	
V@FRET	001	0015	2730	
V@FSPC	001	0040	2729	
V@FTAB	001	0000	2733	
V@KADD	001	004E	2718	
V@KCLE	001	006E	2715	
V@KDIV	001	0061	2721	
V@KEMN	001	006C	2713	
V@KEPL	001	006B	2712	
V@KMUL	001	005C	2720	
V@KPER	001	004B	2723	
V@KPST	001	007B	2717	
V@KPWR	001	005A	2722	
V@KSQR	001	006F	2714	
V@KSTO	001	006D	2716	
V@KSUB	001	0060	2719	
V@LAIP	001	0003	2683	2684
V@LDEX	001	0002	2686	
V@LETE	001	0003	2690	
V@LEXP	001	0001	2680	2682
V@LFKO	001	0006	2685	
V@LINI	001	0200	2689	
V@LLKS	001	0010	2682	
V@LMAN	001	000F	2681	2682
V@LNOP	001	0015	2687	
V@LTBE	001	0007	2684	
V@LVPG	001	0100	2688	2689

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V@MCHS	001	00C0	2669		
V@MCRD	001	0010	2645		
V@MDEF	001	0008	2646		
V@MEXC	001	0080	2643		
V@MEXT	001	0004	2672		
V@MICC	001	0010	2628		
V@MIPC	001	0080	2670		
V@MIPL	001	0020	2676		
V@MLST	001	0040	2644		
V@MPND	001	0000	2675		
V@MPOF	001	0080	2673		
V@MPRC	001	0020	2642		
V@MSFU	001	0002	2647		
V@MSTN	001	0004	2641		
V@OALL	001	00F4	2698		
V@ONUL	001	00F0	2694	2695	
V@OPM1	001	00F2	2696	2697	
V@ORTN	001	00F1	2695	2696	
V@OSTK	001	00F3	2697	2698	
V@PEOF	001	0002	2671		
V@PSQ2	001	0014	2674		
VLPRT2	001	4E00	0770	0735	0736
VLPRT3	001	5300	0913		
VLPRT4	001	5359	0947		
VLPRT5	001	5391	0967		
VLPRT6	001	53B6	0981		

```
OL105 I THE CODE LENGTH OF #FMSTD IS 21453 DECIMAL.
OL103 I TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS 46
      NAME-#FMSTD,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-R,CATEGORY-000
```

START ADDRESS	CATEGORY	NAME AND ENTRY	CODE LENGTH HEXADECIMAL	DECIMAL
0200	0	#FMSTD	53CD	21453
OL100	I	THE TOTAL CORE USED BY #FMSTD IS 21453 DECIMAL.		
OL101	I	THE START CONTROL ADDRESS OF THIS MODULE IS 0200.		
OL104	I	TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS 84		
		NAME-#FMSTD,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-O		