

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

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



0000	1	#ZDUMP	START	0
	2		PRINT	ON,NODATA
	3	*	@SYS	EXP-N
	214+		PRINT	ON
	215	*	@FXD	EXP-N
	620+		PRINT	ON
	621	*	@SPF	EXP-N
	1084+		PRINT	ON
	1085	*	@CAN	EXP-N
	1188+		PRINT	ON
	1189	*	@B@E	EXP-N
	2089+		PRINT	ON
	2090	*	@WKA	EXP-N
	2160+		PRINT	ON

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	08/01/22	PAGE	3
		2162		*****				
		2163	*	5703-XM1 COPYRIGHT IBM CORP. 1970				*
		2164	*	REFER TO INSTRUCTIONS ON COPY RIGHT NOTICE, 120-2083				*
		2165	*					*
		2166		*****				*
		2167	*	*STATUS -				*
		2168	*	VERSION 1 MODIFICATION 0				*
		2169	*					*
		2170	*	*FUNCTION -				*
		2171	*	ZDUMPV IS DESIGNED TO INTERPRET AND PRINT THE PSUEDO MACHINE				*
		2172	*	CODE INSTRUCTIONS GENERATED FOR EACH BASIC STATEMENT.				*
		2173	*					*
		2174	*	*ENTRY POINTS -				*
		2175	*	* ZDUMPV HAS ONLY ONE ENTRY POINT				*
		2176	*	* THE CALLING SEQUENCE IS				*
		2177	*	B ZDUMPV				*
		2178	*					*
		2179	*	*INPUT -				*
		2180	*	* VIRTUAL MEMORY - CONTAINS THE PSUEDO MACHINE CODE GENERATED				*
		2181	*	BY THE BASIC COMPILER.				*
		2182	*	* LOW LINE NUMBER - 2 BYTES, CONTAINS THE FIRST LINE NUMBER				*
		2183	*	THE DUMP BEGINS AT				*
		2184	*	* HIGH LINE NUMBER - 2 BYTES, CONTAINS THE LAST LINE NUMBER TO				*
		2185	*	BE DUMPED.				*
		2186	*					*
		2187	*	*OUTPUT -				*
		2188	*	* VIRTUAL MEMORY DUMP, ON THE SYSTEM PRINTER.				*
		2189	*	* EACH LINE REFLECTS A PMC INSTRUCTION AND CONTAINS				*
		2190	*	* THE INSTRUCTION VIRTUAL ADDRESS				*
		2191	*	* A MNEMONIC AND OPERAND				*
		2192	*	* THE ACTUAL INSTRUCTION				*
		2193	*					*
		2194	*	*EXTERNAL REFERENCES -				*
		2195	*	\$XIND1 - SYSTEM EXECUTION INDICATOR				*
		2196	*	DL4ICS - 4-TRACK LIOCS				*
		2197	*	SDISK - SYSTEM DISK IOCR				*
		2198	*	CVBHEX - BINARY TO HEXADECIMAL EBCDIC CONVERSION				*
		2199	*	DPRINT - MATRTX PRINTER IOCS				*
		2200	*	C2DEC5 - BINARY TO DECIMAL CONVERSION ROUTINE				*
		2201	*	ZUTMON - F.E. UTILITY AID PROGRAM				*
		2202	*	C2DVAL - DECIMAL OUTPUT VALUE PARAMETER FOR 02DEC5				*
		2203	*					*
		2204	*	*EXITS, NORMAL -				*
		2205	*	* ZDUMPV HAS 1 NORMAL EXIT				*
		2206	*	ZUTMON - AFTER DUMP COMPLETION				*
		2207	*					*
		2208	*	*EXITS, ERROR -				*
		2209	*	ZUTMON AFTER ERROR MESSAGE HAS BEEN PRINTED (SEE				*
		2210	*	ERROR PROCEDURES)				*
		2211	*					*
		2212	*	*TABLES/WORK AREAS -				*
		2213	*	* PSUEDO OP CODE TABLE - 6-BYTE ENTRIES, CONTAINS				*
		2214	*	* CORE ADDRESS OF PROCESS ROUTINE, 2 BYTES				*
		2215	*	* INSTRUCTION LENGTH, 1 BYTE				*
		2216	*	* MNEMONIC, 3 BYTES				*
		2217	*	* OUTPUT FORMAT BUFFER - 65 BYTES, CONTAINS THE FORMATTED OUTPUT				*

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22	PAGE 4
		2218	*	LINE.		*
		2219	*	* BUFFER 2 - 256 BYTES, FOR VIRTUAL MEMORY SECTOR.		*
		2220	*	* THE CONSTANTS AND WORK AREAS RESIDE AT THE END OF EXECUTABLE		*
		2221	*	CODE.		*
		2222	*			*
		2223	*	*ATTRIBUTES -		*
		2224	*	NONE		*
		2225	*			*
		2226	*	*CHARACTER CODE DEPENDENCY -		*
		2227	*	NONE		*
		2228	*			*
		2229	*	*NOTES -		*
		2230	*	ERROR PROCEDURES		*
		2231	*	* ON AN ERROR CONDITION AN INTERNAL TEXT MESSAGE IS PRINTED ON		*
		2232	*	THE MATRIX PRINTER.		*
		2233	*	* THE MESSAGE IS FOLLOWED BY A RETURN TO THE UTILITY AID		*
		2234	*	PROGRAM ZUTMON.		*
		2235	*	* ERROR CONDITIONS TESTED, AND ASSOCIATED CODES ARE LISTED		*
		2236	*	BELOW:		*
		2237	*	* @@M550 - NO BASIC PROGRAM IN VIRTUAL MEMORY		*
		2238	*	* @@M551 - INVALID PSUEDO INSTRUCTION ENCOUNTERED		*
		2239	*			*
		2240	*	REGISTER USAGE		*
		2241	*	* BOTH REGISTERS ARE USED DURING PROGRAM EXECUTION		*
		2242	*	* THE REGISTERS ARE NOT SAVED OR RESTORED		*
		2243	*			*
		2244	*	SAVED/RESTORED AREAS		*
		2245	*	N/A		*
		2246	*			*
		2247	*	MODIFICATION CONSIDERATIONS		*
		2248	*	N/A		*
		2249	*			*
		2250	*	REQUIRED MODULES		*
		2251	*	@SYSEQ - COMMON SYSTEM EQUATES		*
		2252	*	@FXDEQ - SYSTEM NUCLEUS ADDRESSES AND INDICATORS		*
		2253	*	@CANEQ - SYSTEM LOCATION EQUATES		*
		2254	*	\$B\$EQU - COMPILER FIXED EQUATES		*
		2255	*	\$B\$EQU - COMPILER SYSTEM EQUATES		*
		2256	*	DL4ICS - 4-TRACK LIOCS		*
		2257	*	C2DEC5 - BINARY TO DECIMAL CONVERSION		*
		2258	*	CVBHEX - BINARY TO HEXADECIMAL CONVERSION		*
		2259	*	ZUTMON - UTILITY AID PROGRAM		*
		2260	*			*
		2261	*	OTHER		*
		2262	*	CVBHEX AND ZUTMON ARE NOT ASSEMBLED WITH ZDUMPV, BUT CERTAIN		*
		2263	*	CORE ADDRESS EQUATES ARE REQUIRED.		*
		2264	*	* ZUTMON - UTILITY MONITOR ENTRY		*
		2265	*	* ZDU1LN - LOW LINE NUMBER PARAMETER CADDR		*
		2266	*	* ZDU2LN - HIGH LINE NUMBER PARAMETER VALUE CADDR		*
		2267	*	* CVBHEX - ENTRY CADDR TO CVBHEX		*
		2268	*	THE PROGRAMS OR PARAMETERS MUST REMAIN IN CORE FOLLOWING THE		*
		2269	*	CALL TO ZDUMPV.		*
		2270	*			*
		2271	*	*****		*

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22 PAGE 5
			2273		*****	
			2274		*****	
			2275	*	*	
			2276	*	ZDUMPV - VIRTUAL MEMORY DUMP WITH MNEMONICS	*
			2277	*	*	
			2278		*****	
			2279		*****	
			2280	*		
			2281	*	ZDUMPV ENTRY AND SET BASE	
			2282	*		
			2283	*	HDR #ZDUMP.0	
			2284		*****	
			2285	*	PROGRAM HEADER FOR DISK LOAD	
			2286		*****	
			2287	*\$ZDUM EQU	X'1BA4' DISK ADDR OF #ZDUMP	
			2288	*\$ZDU EQU	X'1100' CORE LOAD ADDRESS OF #ZDUMP	
			2289	*\$@ZDU EQU	008 SECTOR COUNT OF #ZDUMP	
1100			2290	ORG	\$\$\$ZDU CORE LOAD ADDRESS	
			2291	\$\$\$\$\$ EQU	* FIRST LOCATION IN PROGRAM	
1100	7BE9C4E4D4D7		1105	2292	DC CL6'#ZDUMP' PROGRAM NAME	
1106	5A		1106	2293	DC IL1'090' PROGRAM NUMBER OF #ZDUMP	
			1107	2294	#ZDUM EQU * ENTRY POINT TO PROGRAM	
			2295		*** END OF EXPANSION ***	
			1107	2297	ZDUMPV EQU * ROUTINE ENTRY	
1107	C0 87 116B		2298	B	ZDU010 BR AROUND THE ERROR TEXT	
			2299	*	MTEXT @@M550=@PRETR,	
			2300	*	@M551=@PRETR,	
			2301	*	PATCH 20,1	
			2302		*****	
			2303	*	PPL'S AND TEXT FOR MESSAGES	
			2304		*****	
110B	C0		110B	2305	@M550 DC AL1(@PRETR) PRINT CONTROL FUNCTION	
110C	23		110C	2306	DC IL1'35' LENGTH OF MESSAGE	
110D	110B		110E	2307	DC AL(@CADDR)(@M550) ADDR OF MESSAGE	
			2308	*		
110F	C0		110F	2309	@M551 DC AL1(@PRETR) PRINT CONTROL FUNCTION	
1110	26		1110	2310	DC IL1'38' LENGTH OF MESSAGE	
1111	110F		1112	2311	DC AL(@CADDR)(@M551) ADDR OF MESSAGE	
			2312	*		
			1113	2313	@T550 EQU * LEFT BYTE OF MESSAGE	
1113	D5D640C2C1E2C9C3		1135	2314	DC CL035'NO BASIC PROGRAM IN VIRTUAL MEMORY '	
			2315	*		
			1136	2316	@T551 EQU * LEFT BYTE OF MESSAGE	
1136	C9D5E5C1D3C9C440		115B	2317	DC CL038'INVALID PSEUDO INSTRUCTION ENCOUNTERED'	
			2318	*		
			2319	*	PATCH AREA FOR MESSAGES	
			2320	*		
115C			116A	2321	\$\$\$001 DS CL15 MSG EXPANSION PATCH AREA	
			2322		*** END OF EXPANSION ***	
			2323	*		
			2324	*	TEST FOR PMC IN VIRTUAL MEMORY	
			2325	*		
116B	3D 00 03D0		2326	ZDU010 CLI	\$XIND1,ZDUNUL IS IND ZERO ?	
116F	F2 01 10		2327	JNE	ZDU030 NO, CONTINUE DUMP...	
			2328	*		

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22 PAGE 6
					2329	*	PRINT ERROR MESSAGE AND EXIT TO MONITOR	
					2330	*		
					2331	*ZDU020	PRNT @@M550 PRINT MSG	
1172	C0	87	0707		2332	ZDU020	B \$\$PRNT PRINT ON MATRIX PRINTER	
1176	110B			1177	2333	DC	AL2(@@M550) PPL ADDRESS	
					2334	***	END OF EXPANSION ***	
					2336	*	PRNT \$WAITF WAIT FOR COMPLETION	
1178	C0	87	0707		2337	B	\$\$PRNT PRINT ON MATRIX PRINTER	
117C	057F			117D	2338	DC	AL2(\$WAITF) PPL ADDRESS	
					2339	***	END OF EXPANSION ***	
					2341	B	ZUTMON TO MONITOR ENTRY	
					2342	*		
					2343	*	TEST FOR LONG PRECISION	
					2344	*		
1182	38	40	03D0		2345	ZDU030	TBN \$XIND1,\$XPREC IS PREC LONG ?	
1186	F2	90	40		2346	JF	ZDU050 NO, CONTINUE DUMP	
					2347	*		
					2348	*	CHANGE PRECISION SENSITIVE INSTRUCTIONS TO LONG PRECISION LENGTHS	
					2349	*		
1189	3C	0B	1313		2350	ZDU040	MVI ZDU505+@Q,B@LILP+B@LDWA SET LNG TO ADD AS LONG PKD	
118D	0C	03	1327 144C		2351		MVC ZDU510+@INST4,ZDUIN1(ZDUIL1) SET MOVE INST	
1193	3C	0B	132C		2352		MVI ZDU520,B@LILP+2 SET NO. BYTES TO CVRT	
1197	0C	04	1336 1451		2353		MVC ZDU530+@INST5,ZDUIN2(ZDUIL2) SET MOVE INST	
119D	3C	22	13C3		2354		MVI ZDU920+@Q,B@LELP*2+B@LDWA SET INCR COUNT	
11A1	3C	10	13D5		2355		MVI ZDU925+@Q,B@LELP SET INCR LNG	
11A5	0C	03	13E6 1455		2356		MVC ZDU940+@INST4,ZDUIN3(ZDUIL3) SET MOVE INST	
11AB	3C	12	13EB		2357		MVI ZDU950,B@LELP+2 SET LNG TO UNPKD LONG	
11AF	0C	04	13F5 145A		2358		MVC ZDU960+@INST5,ZDUIN4(ZDUIL4) SET MOVE INST	
11B5	3C	30	1338		2359		MVI ZDU540+@Q,ZDUL51 BFR LNG TO PACKED LONG	
11B9	3C	3E	13D9		2360		MVI ZDU928+@Q,ZDUL65 BFR LNG TO UNPKD LONG	
11BD	3C	09	13B8		2361		MVI ZDU915+@Q,B@LILP SET LONG UNPKD LNG	
11C1	3C	09	1433		2362		MVI ZDU990+@Q,B@LILP SET LONG UNPKD LNG	
11C5	3C	09	131A		2363		MVI ZDU507+@Q,B@LILP SET LONG LNG	
					2364	*		
					2365	*	READ A SECTOR OF VIRTUAL MEMORY	
					2366	*		
11C9	C0	87	1700		2367	ZDU050	B DL4ICS READ VM PAGE	
11CD	14E2			11CE	2368	DC	AL(@CADDR)(ZDUGET) ADDR DISK PARAM LIST	
11CF	C0	87	0025		2369	B	\$DISKN WAIT FOR COMPLETION	
11D3	057F			11D4	2370	DC	AL(@CADDR)(\$WAITF) WAIT PARAM	
11D5	C2	02	1F00		2371	LA	ZDUBF2,@XR OP CODE PT = 1ST BYTE BFR	
					2372	*		
					2373	*	CLEAR PRINT BUFFER TO BLANKS	
					2374	*		
11D9	3C	40	14DD		2375	ZDU060	MVI ZDUBFE,B@BLNK LAST BYTE = BLANK	
11DD	0C	40	14DC 14DD		2376		MVC ZDUBFE-1(ZDUBFL),ZDUBFE PROPAGATE THROUGH FIELD	
					2377	*		
					2378	*	IS BYTE AT THE OP CODE POINTER AN OP CODE	
					2379	*		
11E3	BD	02	00		2380	ZDU070	CLI 0(,@XR),B@CSVC IS THE OP CODE IN RANGE	
11E6	F2	82	0C		2381		JL ZDU075 * BETWEEN THE SVC AND THE	
11E9	BD	70	00		2382		CLI 0(,@XR),B@CEOF * EOF OP CODES ? IF NOT	
11EC	F2	84	06		2383		JH ZDU075 * PRINT AN ERROR MSG	
11EF	B8	01	00		2384		TBN 0(,@XR),ZDUMSK IS OP CODE BYTE AN ODD NO.	

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 08/01/22 PAGE 7

11F2 F2 90 10	2385	JF	ZDU080	NO, PROCESS OP CODE
	2386	*		
	2387	*	PRINT ERROR MESSAGE AND EXIT TO THE MONITOR	
	2388	*		
11F5 C0 87 0707	2389	*ZDU075 PRNT	@M551	PRINT ERROR MSG
11F9 110F	2390	ZDU075 B	\$\$PRNT	PRINT ON MATRIX PRINTER
	2391	DC	AL2(@M551)	PPL ADDRESS
	2392	***	END OF EXPANSION ***	
	2394	*	PRNT \$WAITF	WAIT FOR COMPLETION
11FB C0 87 0707	2395	B	\$\$PRNT	PRINT ON MATRIX PRINTER
11FF 057F	2396	DC	AL2(\$WAITF)	PPL ADDRESS
	2397	***	END OF EXPANSION ***	
1201 C0 87 0F08	2399	B	ZUTMON	TO MONITOR ENTRY
	2400	*		
	2401	*	DETERMINE BRANCH TABLE INDEX	
	2402	*		
1205 C2 01 14E2	2403	ZDU080 LA	ZDUBRT-6,@BR	ADDR BRANCH TABLE
1209 2C 00 1460 00	2404	MVC	ZDUBTI,ZDUOPD(1,@XR)	SHIFT OP CODE TO 2 BYTE HLD
120E 36 01 1460	2405	A	ZDUBTI,@BR	ADD OP CODE TO TBL ADDR 3
1212 36 01 1460	2406	A	ZDUBTI,@BR	* TIMES TO OBTAIN THE CORRECT
1216 36 01 1460	2407	A	ZDUBTI,@BR	* ENTRY FOR THAT OP CODE
	2408	*		
	2409	*	MOVE OP CODE MNEMONIC TO PRINT BUFFER AND BRANCH TO PROCESS ROUTINE	
	2410	*		
121A 1C 02 14AD 04	2411	ZDU090 MVC	ZDUPMN,ZDU4TD(ZDUMNL,@BR)	MOVE MNEMONIC TO PRINT BFR
121F 1C 00 145E 05	2412	MVC	ZDUILN,ZDU5TD(ZDULCL,@BR)	SAVE INST LNG
1224 75 01 01	2413	L	ZDU1TD(,@BR),@BR	LOAD BR ADDR
1227 D0 87 00	2414	B	ZDU0TD(,@BR)	BRANCH TO PROC ROUTINE



#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22	PAGE 8
				2416		*****			
				2417		*			*
				2418		* ONE BYTE INSTRUCTION PROCESSING ROUTINE			*
				2419		*			*
				2420		*****			
				2421		*			
122A	3D	00	145C	2422	ZDU100	CLI	ZDUPSW,ZDUNUL IS PRINT SW OFF ?		
122E	C0	81	13C6	2423		BE	ZDU923 YES, INCR TO NEXT OP CODE		
1232	2C	00	1463 00	2424		MVC	ZDUCI2,ZDUOPD(ZDULN1,@XR) MOVE OP CODE TO CONVERSION BFR		
1237	C0	87	0DB9	2425		B	CVBHEX CONVERT BFR		
123B	03			123B 2426		DC	XL1 '03' BYTES TO CVRT		
123C	1461			123D 2427		DC	AL(@CADDR)(ZDUCBI) CONVERSION BFR IN ADDR		
123E	1475			123F 2428		DC	AL(@CADDR)(ZDUCBO) CONVERSION BFR OUT ADDR		
1240	0C	01	14BC 147A	2429		MVC	ZDUPOP,ZDUCO5(ZDUEL2) MOVE EBCDIC OP CODE TO PRINT BFR		
1246	3C	20	14DF	2430		MVI	ZDULNG,ZDUL35 SET PRINT BUFFER LNG		
124A	F2	87	7E	2431		J	ZDU450 COMPLETE PRINT BFR		

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	08/01/22	PAGE	9
					2433	*****					
					2434	*					*
					2435	* TWO BYTE INSTRUCTION PROCESSING ROUTINE					*
					2436	*					*
					2437	*****					
					2438	*					
124D	3D	00	145C		2439	ZDU200 CLI	ZDUPSW,ZDUNUL			IS PRINT SW OFF ?	
1251	C0	81	13C6		2440		BE ZDU923			YES, INCR TO NEXT OP CODE	
1255	2C	01	1464 01		2441		MVC ZDUCI3,ZDU1PD(ZDULN2,@XR)			MOVE INST TO CONVERSION BFR	
125A	C0	87	0DB9		2442		B CVBHEX			CONVERT BFR	
125E	04			125E	2443		DC XL1'04'			BYTES TO CONVERT	
125F	1461			1260	2444		DC AL(@CADDR)(ZDUCBI)			CONVERSION BFR IN ADDR	
1261	1475			1262	2445		DC AL(@CADDR)(ZDUCBO)			CONVERSION BFR OUT ADDR	
1263	0C	03	14BE 147C		2446		MVC ZDUPO1,ZDUCO7(ZDUEL4)			EBCDIC INST TO PRINT BFR	
1269	0C	01	14B0 147C		2447		MVC ZDUP1O,ZDUCO7(ZDUOL2)			EBCDIC OPERAND TO PRINT BFR	
126F	3C	22	14DF		2448		MVI ZDULNG,ZDUL37			SET PRINT BUFFER LNG	
1273	F2	87	55		2449		J ZDU450			COMPLETE PRINT BFR	

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22	PAGE 10
				2451		*****			
				2452		*			*
				2453		* THREE BYTE INSTRUCTION PROCESSING ROUTINE			*
				2454		*			*
				2455		*****			*
				2456		*			
1276	3D	00	145C	2457	ZDU300	CLI	ZDUPSW,ZDUNUL	IS PRINT SW OFF ?	
127A	C0	81	13C6	2458		BE	ZDU923	YES, INCR TO NEXT OP CODE	
127E	2C	02	1465 02	2459		MVC	ZDUCI4,ZDU2PD(ZDULN3,@XR)	INST TO CONVERSION BFR	
1283	C0	87	0DB9	2460		B	CVBHEX	CONVERT BFR	
1287	05			1287 2461		DC	XL1 '05'	BYTES TO CONVERT	
1288	1461			1289 2462		DC	AL(@CADDR)(ZDUCBI)	CONVERSION BFR IN	
128A	1475			128B 2463		DC	AL(@CADDR)(ZDUCBO)	CONVERSION BFR OUT	
128C	0C	05	14C0 147E	2464		MVC	ZDUPO2,ZDUCO9(ZDUEL6)	EBCDIC INST TO PRINT BFR	
1292	0C	03	14B2 147E	2465		MVC	ZDUP2O,ZDUCO9(ZDUOL4)	EBCDIC OPERAND TO PRINT BFR	
1298	3C	24	14DF	2466		MVI	ZDULNG,ZDUL39	SET PRINT BUFFER LNG	
129C	F2	87	2C	2467		J	ZDU450		

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22 PAGE 11
					2469	*****	*****	
					2470	*	*	
					2471	* FOUR BYTE INSTRUCTION PROCESSING ROUTINE	*	
					2472	*	*	
					2473	*****	*****	
					2474	*		
129F	3D	00	145C		2475	ZDU400 CLI	ZDUPSW,ZDUNUL IS PRINT SW OFF ?	
12A3	C0	81	13C6		2476	BE	ZDU923 YES, INCR TO NEXT OP CODE	
12A7	2C	03	1466 03		2477	MVC	ZDUCI5,ZDU3PD(ZDULN4,@XR) INST TO CONVERSION BFR	
12AC	C0	87	0DB9		2478	B	CVBHEX CONVERT BFR	
12B0	06			12B0	2479	DC	XL1'06' BYTES TO CONVERT	
12B1	1461			12B2	2480	DC	AL(@CADDR)(ZDUCBI) CONVERSION BFR IN	
12B3	1475			12B4	2481	DC	AL(@CADDR)(ZDUCBO) CONVERSION BFR OUT	
12B5	0C	07	14C2 1480		2482	MVC	ZDUPO3,ZDUCOB(ZDUEL8) EBCDIC INST TO PRINT BFR	
12BB	0C	03	14B2 147E		2483	MVC	ZDUP20,ZDUCO9(ZDUOL4) EBCDIC OPERAND TO PRINT BFR	
12C1	0C	01	14B5 1480		2484	MVC	ZDUP30,ZDUCOB(ZDUOL2) EBCDIC OPERAND TO PRINT BFR	
12C7	3C	26	14DF		2485	MVI	ZDULNG,ZDUL41 SET PRINT BUFFER LNG	
					2486	*		
					2487	* MOVE THE VADDR TO THE PRINT BUFFER AND PRINT THE BUFFER		
					2488	*		
12CB	0C	03	14A8 1478		2489	ZDU450 MVC	ZDUPVA,ZDUCO3(ZDUEVA) VADDR TO PRINT BFR	
					2490	* PRNT	ZDUPPL PRINT BFR	
12D1	C0	87	0707		2491	B	\$\$PRNT PRINT ON MATRIX PRINTER	
12D5	14DE			12D6	2492	DC	AL2(ZDUPPL) PPL ADDRESS	
					2493	*** END OF	EXPANSION ***	
					2495	* PRNT	\$WAITF WAIT	
12D7	C0	87	0707		2496	B	\$\$PRNT PRINT ON MATRIX PRINTER	
12DB	057F			12DC	2497	DC	AL2(\$WAITF) PPL ADDRESS	
					2498	*** END OF	EXPANSION ***	
12DD	3D	80	0496		2500	CLI	\$CISUS,@NOP IF INTERRUPT IS PRESENT	
12E1	3C	87	0496		2501	MVI	\$CISUS,@UCB * RESTORE MASK AND	
12E5	C0	81	0F08		2502	BE	ZUTMON * RETURN TO ZUTMON	
12E9	0E	01	1462 145E		2503	ALC	ZDUCI1,ZDUILN(ZDUICL) INCR VM PT BY INST LNG	
12EF	36	02	145E		2504	A	ZDUILN,@XR INCR OP CODE PT BY INST LNG	
12F3	C0	00	12FE		2505	ZDU460 BC	ZDU470,*-* BRANCH TO CLEAR PRINT BFR TO	
12F4					2506	ORG	ZDU460+@Q * BLANKS IF NOT IN A 'NEXT'	
12F4	87			12F4	2507	DC	AL1(@UCB) * INST ROUTINE	
12F7					2508	ORG	ZDU460+@INST4 RESTORE LOC CTR	
12F7	3A	07	12F4		2509	SBN	ZDU460+@Q,ZDUBMK SET BRANCH SW OFF	
12FB	F2	87	B9		2510	J	ZDU915 COMPLETE 'NXT' PROCESSING	
12FE	C0	00	1306		2511	ZDU470 BC	ZDU480,*-* BRANCH TO CLEAR PRINT BUFFER	
12FF					2512	ORG	ZDU470+@Q * TO BLANKS IF NOT IN A 'EOP'	
12FF	87			12FF	2513	DC	AL1(@UCB) * INST ROUTINE	
1302					2514	ORG	ZDU470+@INST4 RESTORE LOCATION CTR	
1302	C0	87	134E		2515	B	ZDU620 PROCESS EOP INST	
1306	C0	00	11D9		2516	ZDU480 BC	ZDU060,*-* BRANCH TO CLEAR PRINT BUFFER	
1307					2517	ORG	ZDU480+@Q * TO BLANKS IF NOT IN A 'EOF'	
1307	87			1307	2518	DC	AL1(@UCB) * INST ROUTINE	
130A					2519	ORG	ZDU480+@INST4 RESTORE LOCATION CTR	
130A	C0	87	136E		2520	B	ZDU710 PROCESS EOF INST	

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	08/01/22	PAGE 12
					2522	*****				
					2523	*				*
					2524	* PROCESS EMBEDDED VALUES IN PMC				*
					2525	*				*
					2526	*****				
					2527	*				
130E	3D	00	145C		2528	ZDU500	CLI ZDUPSW,ZDUNUL			IS PRINT SW OFF ?
1312	3C	00	145E		2529	ZDU505	MVI ZDUILN,*-*			SET LNG TO INCR PTS,
1313					2530		ORG ZDU505+@Q			* INITIALLY SET TO
1313	07			1313	2531		DC AL1(B@LISP+B@LDWA)			* SHORT PREC LNG
1316					2532		ORG ZDU505+@INST4			RESTORE LOC CTR
1316	F2	81	AD		2533		JE ZDU923			YES, INCR TO NEXT OP CODE
1319	3C	00	145E		2534	ZDU507	MVI ZDUILN,*-*			SET LNG TO INCR PTS,
131A					2535		ORG ZDU507+@Q			* INITIALLY SET FOR A
131A	05			131A	2536		DC AL1(B@LISP)			* SHORT PREC LNG
131D					2537		ORG ZDU507+@INST4			RESTORE LOC CT
131D	0C	0A	14B5	1448	2538		MVC ZDUPWA,ZDUDES(ZDUWAL)			DESCRIPTOR TO PRINT BFR
1323	2C	00	0000	00	2539	ZDU510	MVC *-*,*-*(@VQ,@XR)			VALUE TO CONVERSION BFR,
1324					2540		ORG ZDU510+@Q			* INITIALLY SET TO MOVE
1324	04			1324	2541		DC AL1(B@LISP-1)			* A SHORT PRECISION
1325	1467			1326	2542		DC AL(@CADDR)(ZDUCI6)			* PACKED ARITHMETIC
1327	04			1327	2543		DC AL1(ZDUPSD)			* VALUE
1328	C0	87	0DB9		2544		B CVBHEX			CONVERT BFR
132C				132C	2545	ZDU520	DS CL1			BYTES IN BFR,
132C					2546		ORG *-1			* INITIALLY SET FOR A SHORT
132C	07			132C	2547		DC AL1(B@LISP+2)			* PREC PKD VALUE
132D	1461			132E	2548		DC AL(@CADDR)(ZDUCBI)			CONVERSION BFR IN
132F	1475			1330	2549		DC AL(@CADDR)(ZDUCBO)			CONVERSION BFR OUT
1331	0C	00	0000	0000	2550	ZDU530	MVC *-*,*-*(@VQ)			EBCDIC VALUE TO PRINT BFR,
1332					2551		ORG ZDU530+@Q			* INITIALLY SET TO MOVE A SHORT
1332	09			1332	2552		DC AL1(B@LISP*2-1)			* PRECISION PACKED ARITHMETIC
1333	14BE			1334	2553		DC AL(@CADDR)(ZDUPSP)			* VALUE IN
1335	1482			1336	2554		DC AL(@CADDR)(ZDUCOF)			* EBCDIC
1337	3C	00	14DF		2555	ZDU540	MVI ZDULNG,*-*			SET PRINT BUFFER LNG
1338					2556		ORG ZDU540+@Q			* INITFOR A PACKED SHORT
1338	28			1338	2557		DC AL1(ZDUL43)			* VALUE DISP
133B					2558		ORG			
133B	C0	87	12CB		2559		B ZDU450			COMPLETE PRINT BFR

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	08/01/22	PAGE 13
				2561		*****				
				2562		*				*
				2563		* END OF PAGE PROCESSING ROUTINE				*
				2564		*				*
				2565		*****				*
				2566		*				
133F	3D	00	145C	2567	ZDU600	CLI	ZDUPSW,ZDUNUL		IS PRINT SW OFF ?	
1343	F2	81	0C	2568		JE	ZDU630		YES, GO TO NEXT PAGE	
1346	3B	07	12FF	2569	ZDU610	SBF	ZDU470+@Q,ZDUBMK		SET BR SW ON	
134A	C0	87	122A	2570		B	ZDU100		PROCESS AS 1 BYTE INST	
134E	3A	07	12FF	2571	ZDU620	SBN	ZDU470+@Q,ZDUBMK		SET BR SW OFF	
1352	0E	00	14E4 14E5	2572	ZDU630	ALC	ZDUINN(1),ZDUPIN		INCR PG NO. TO READ	
1358	0C	00	1461 14E4	2573		MVC	ZDUCI1-1(1),ZDUINN		INCR VM PT PAGE	
135E	3C	00	1462	2574		MVI	ZDUCI1,ZDUNUL		ZERO VM PT DISP	
1362	C0	87	11C9	2575		B	ZDU050		READ NEXT VM PAGE IN	

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22		PAGE 14
			2577		*****			
			2578		*			*
			2579		* END OF PSUEDO MACHINE CODE PROCESSING ROUTINE			*
			2580		*			*
			2581		*****			
			2582		*			
1366	3B 07 1307		2583	ZDU700 SBF	ZDU480+@Q,ZDUBMK	SET BR SW ON		
136A	C0 87 122A		2584	B	ZDU100	PROCESS AS 1 BYTE INST		
136E	C0 87 0F08		2585	ZDU710 B	ZUTMON	RETURN TO MONITOR		

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22 PAGE 15
			2587		*****	
			2588		*	*
			2589		* STATEMENT HEADER PROCESSING ROUTINE	*
			2590		*	*
			2591		*****	
			2592		*	
1372	2D	01 0F05 02	2593	ZDU800	CLC ZDU1LN,ZDU2PD(ZDULNL,@XR)	IS LINE NO. GT LOW LINE NO. ?
1377	F2	84 4C	2594		JH ZDU923	NO, INCR TO NEXT OP CODE
137A	3C	01 145C	2595		MVI ZDUPSW,ZDUSWO	SET PRINT SW ON
137E	2D	01 0F07 02	2596		CLC ZDU2LN,ZDU2PD(ZDULNL,@XR)	GT THAN HIGH NO ?
1383	C0	82 0F08	2597		BL ZUTMON	YES, EXIT TO MONITOR
1387	34	02 139E	2598		ST ZDU820+@OP1,@XR	SAVE PT
138B	E2	02 01	2599		LA ZDU1PD(,@XR),@XR	INCR BY LNG OF OPERAND
138E	C0	87 17BC	2600		B C2DEC5	
1392	C2	02 17FA	2601		LA C2DVAL,@XR	1ST BYTE DEC NO.
1396	2C	03 14A2 00	2602		MVC ZDUPLN,ZDUOPD(ZDULLN,@XR)	MOVE DEC NO. TO PRINT BFR
139B	C2	02 0000	2603	ZDU820	LA *-*,@XR	RESTORE PT
139F	C0	87 1276	2604		B ZDU300	PROCESS AS 3 LNG INST



## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22 PAGE 16
					2606	*****	*****	
					2607	*	*	
					2608	* THE 'DWA' OP CODE PROCESSING ROUTINE	*	
					2609	*	*	
					2610	*****	*****	
					2611	*		
13A3	2C 00 145B 01				2612	ZDU900 MVC	ZDUCNT,1(1,@XR)	SAVE OPERAND LNG
13A8	3D 00 145C				2613	CLI	ZDUPSW,ZDUNUL	IS PRINT SW OFF ?
13AC	F2 81 83				2614	JE	ZDU990	YES, PROCESS NEXT OP CODE
13AF	3B 07 12F4				2615	ZDU910 SBF	ZDU460+@Q,ZDUBMK	SET BRANCH SW OFF
13B3	C0 87 124D				2616	B	ZDU200	PROCESS AS A 3 BYTE INST
13B7	3D 00 145B				2617	ZDU915 CLI	ZDUCNT,*-*	IS THE LNG PKD ?
13B8					2618	ORG	ZDU915+@Q	* INITIALLY SET FOR THE SHORT
13B8	05			13B8	2619	DC	AL1(B@LISP)	* PREC LNG
13BB					2620	ORG	ZDU915+@INST4	RESTORE LOC COUNTER
13BB	C0 81 130E				2621	BE	ZDU500	YES, PROC EMBEDDED VALUES
13BF	F2 87 12				2622	J	ZDU925	PROCESS WORK AREA
13C2	3C 00 145E				2623	ZDU920 MVI	ZDUILN,*-*	SET LNG TO INCREMENT POINTERS,
13C3					2624	ORG	ZDU920+@Q	* INITIALLY SET TO TWICE THE
13C3	12			13C3	2625	DC	AL1(B@LESP*2+B@LDWA)	* LNG OF A SHORT UNPKD VALUE
13C6					2626	ORG	ZDU920+@INST4	RESTORE LOC CTR
13C6	0E 01 1462 145E				2627	ZDU923 ALC	ZDUCI1,ZDUILN(ZDUICL)	INCR VM PT BY INST LNG
13CC	36 02 145E				2628	A	ZDUILN,@XR	INCR OP CODE PT
13D0	C0 87 11E3				2629	B	ZDU070	PROCESS NEXT OP CODE
13D4	3C 00 145E				2630	ZDU925 MVI	ZDUILN,*-*	SET LNG TO INCREMENT POINTERS.
13D5					2631	ORG	ZDU925+@Q	* INITIALLY SET TO THE LENGTH
13D5	08			13D5	2632	DC	AL1(B@LESP)	* OF A UNPKD SHORT PREC VALUE
13D8					2633	ORG	ZDU925+@INST4	RESTORE LOC CTR
13D8	3C 00 14DF				2634	ZDU928 MVI	ZDULNG,*-*	SET PRINT BUFFER LENGTH
13D9					2635	ORG	ZDU928+@Q	* INIT SET FOR A UNPKD SHORT
13D9	2E			13D9	2636	DC	AL1(ZDUL49)	* VALUE CONTENT
13DC					2637	ORG		
					2638	*		
					2639	* MOVE UNPACKED VALUE TO CONVERSION BUFFER		
					2640	*		
13DC	0C 0A 14B5 1448				2641	ZDU930 MVC	ZDUPWA,ZDUDES(ZDUWAL)	DESCRIPTOR TO PRINT BFR
13E2	2C 00 0000 00				2642	ZDU940 MVC	*-*,*-*(@VQ,@XR)	MOVE THE EMBEDDED UNPACKED
13E3					2643	ORG	ZDU940+@Q	* VALUE TO THE CONVERSION BFR.
13E3	07			13E3	2644	DC	AL1(B@LESP-1)	* INITIALLY SET TO MOVE A
13E4	146A			13E5	2645	DC	AL(@CADDR)(ZDUCIA)	* SHORT PRECION UNPACKED
13E6	07			13E6	2646	DC	AL1(ZDUUSD)	* A VALUE
					2647	*		
					2648	* CONVERT BUFFER TO EBCDIC		
					2649	*		
13E7	C0 87 0DB9				2650	B	CVBHEX	CONVERT BFR
13EB				13EB	2651	ZDU950 DS	CL1	BYTES IN BUFFER TO CONVERT,
13EB					2652	ORG	*-1	* INITIALLY SET TO CONTAIN A
13EB	0A			13EB	2653	DC	AL1(B@LESP+2)	* SHORT UNPKD LNG + VADDR LNG
13EC	1461			13ED	2654	DC	AL(@CADDR)(ZDUCBI)	COMVERSION BFR IN
13EE	1475			13EF	2655	DC	AL(@CADDR)(ZDUCBO)	CONVERSION BFR OUT
					2656	*		
					2657	* MOVE THE EBCDIC DATA TO THE PRINT BUFFER		
					2658	*		
13F0	0C 00 0000 0000				2659	ZDU960 MVC	*-*,*-*(@VQ)	MOVE THE EBCDIC UNPACKED VALUE
13F1					2660	ORG	ZDU960+@Q	* FROM THE CONVERSION OUT
13F1	0F			13F1	2661	DC	AL1(B@LESP*2-1)	* BUFFER TO THE PRINT BUFFER,

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	08/01/22	PAGE 17
13F2	14CA			13F3	2662	DC	AL(@CADDR)(ZDUPSU)			* INITIALLY SET TO MOVE A SHORT
13F4	1488			13F5	2663	DC	AL(@CADDR)(ZDUCOG)			* PREC UNPKD VALUE
13F6	0C 03 14A8 1478				2664	MVC	ZDUPVA,ZDUCO3(ZDUEVA)			VADDR TO PRINT BFR
					2665	*				
					2666	*	PRINT THE PRINT BUFFER AND UPDATE THE POINTERS			
					2667	*				
13FC	C0 87 0707				2668	*ZDU970 PRNT	ZDUPPL			PRINT BFR
1400	14DE			1401	2669	ZDU970 B	\$\$PRNT			PRINT ON MATRIX PRINTER
					2670	DC	AL2(ZDUPPL)			PPL ADDRESS
					2671	***	END OF EXPANSION ***			
					2673	*	PRNT \$WAITF			WAIT
1402	C0 87 0707				2674	B	\$\$PRNT			PRINT ON MATRIX PRINTER
1406	057F			1407	2675	DC	AL2(\$WAITF)			PPL ADDRESS
					2676	***	END OF EXPANSION ***			
1408	3D 80 0496				2678	CLI	\$CISUS,@NOP			IF INTERRUPT IS PRESENT
140C	3C 87 0496				2679	MVI	\$CISUS,@UCB			* RESTORE MASK AND
1410	C0 81 0F08				2680	BE	ZUTMON			* RETURN TO ZUTMON
1414	0E 01 1462 145E				2681	ALC	ZDUCI1,ZDUILN(ZDUICL)			INCR VM PT
141A	36 02 0F05				2682	A	ZDU1LN,@XR			INCR OP CODE PT
					2683	*				
					2684	*	RECYCLE LOOP ONCE AND THEN PROCESS THE NEXT OP CODE			
					2685	*				
141E	C0 00 142A				2686	ZDU980 BC	ZDU985,*-*			BR SW CAN DIRECT CONTROL TO GO
141F					2687	ORG	ZDU980+@Q			* PROC NEXT OP CODE OR RECYCLE
141F	80			141F	2688	DC	AL1(@NOP)			* THE ABOVE LOOP ONCE
1422					2689	ORG	ZDU980+@INST4			RESTORE LOC CTR
1422	3A 07 141F				2690	SBN	ZDU980+@Q,ZDUBMK			SET BR SW ON
1426	C0 87 13E2				2691	B	ZDU940			RECYCLE LOOP ONCE
142A	3B 07 141F				2692	ZDU985 SBF	ZDU980+@Q,ZDUBMK			SET BR SW OFF
142E	C0 87 11D9				2693	B	ZDU060			PROCESS NEXT OP CODE
1432	3D 00 145B				2694	ZDU990 CLI	ZDUCNT,*-*			IS THE VALUE IN THE OPERAND ?
1433					2695	ORG	ZDU990+@Q			* A PACKED VALUE LNG. INITIALLY
1433	05			1433	2696	DC	AL1(B@LISP)			* SET FOR SHORT PKD VALUE
1436					2697	ORG	ZDU990+@INST4			RESTORE LOC COUNTER
1436	C0 81 130E				2698	BE	ZDU500			YES, PROC EMIEDOED VALUES
143A	C0 87 13C2				2699	B	ZDU920			PROC WORK AREA VALUES

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22 PAGE 18
				2701		*****	*****	
				2702		*****	*****	
				2703		*	*	
				2704		*	ZDUMPV EQUATES, CONSTANTS, AND WORK AREAS	*
				2705		*	*	
				2706		*****	*****	
				2707		*****	*****	
				2708		*		
				2709		*	ZDUMPV EQUATES REFERENCING CONSTANTS	
				2710		*		
	0001	2711	ZDUMSK EQU	X'01'			TEST FOR ODD NO.	
	0000	2712	ZDUNUL EQU	0			TEST FOR NULL BYTE	
	0001	2713	ZDUSWO EQU	1			SET PRINT SW ON	
	0001	2714	ZDULCL EQU	1			INST LNG CODE LENGTH	
	0002	2715	ZDUTLN EQU	2			LENGTH OF TIL INDEX	
	0002	2716	ZDUICL EQU	2			LNG INST LNG SAVE AREA	
	0002	2717	ZDULNL EQU	2			LINE NO. LENGTH	
	0004	2718	ZDULLN EQU	4			LNG OF A DEC LINE NO.	
	0004	2719	ZDUIL1 EQU	4			LNG OF INST TO MOVE	
	0004	2720	ZDUIL3 EQU	4			LNG OF INST TO MOVE	
	0005	2721	ZDUIL4 EQU	5			LNG OF INST TO MOVE	
	0005	2722	ZDUIL2 EQU	5			LNG OF INST TO MOVE	
	0007	2723	ZDUBMK EQU	X'07'			MASK FOR BR SW	
	000D	2724	ZDUNVC EQU	X'0D'			NEGATIVE SIGN BYTE	
	000F	2725	ZDUPVC EQU	X'0F'			POSITIVE SIGN BYTE	
	0041	2726	ZDUBFL EQU	65			PRINT BFR LNG	
	1F00	2727	ZDUBF2 EQU	X'1F00'			CADDR CORE INPUT AREA	
	0F08	2728	ZUTMON EQU	X'0F08'			ADDR MONITOR	
	0DB9	2729	CVBHEX EQU	X'0DB9'			CADDR OF CONVERSION RTN	
	0F05	2730	ZDU1LN EQU	X'0F05'			LINE NO. 1 SAVE AREA	
	0F07	2731	ZDU2LN EQU	X'0F07'			LINE NO. 2 SAVE AREA	
		2732	*					
	0001	2733	ZDULN1 EQU	1			LENGTH OF 1 BYTE INST	
	0002	2734	ZDULN2 EQU	2			LENGTH OF 2 BYTE INST	
	0003	2735	ZDULN3 EQU	3			LENGTH OF 3 BYTE INST	
	0004	2736	ZDULN4 EQU	4			LEMGTH OF 4 BYTE INST	
		2737	*					
	0002	2738	ZDUEL2 EQU	2			EBCDIC LNG 1 BYTE INST	
	0004	2739	ZDUEL4 EQU	4			EBCDIC LNG 2 BYTE INST	
	0006	2740	ZDUEL6 EQU	6			EBCDIC LNG 3 BYTE INST	
	0008	2741	ZDUEL8 EQU	8			EBCDIC LNG 4 BYTE INST	
	0012	2742	ZDUELP EQU	B@LILP*2			EBCDIC LNG LONG PREC PKD	
	0020	2743	ZDUELU EQU	B@LELP*2			EBCDIC LNG LONG PREC UNPKD	
	0002	2744	ZDUOL2 EQU	2			EBCDIC LNG INST LNG 2 OPERAND	
	0004	2745	ZDUOL4 EQU	4			EBCDIC LNG INST LUG 3 OPERAND	
	0006	2746	ZDUOL6 EQU	6			EBCDIC LNG INST LNG 4 OPERAND	
	0004	2747	ZDUEVA EQU	4			EBCDIC LNG VADDR	
	0003	2748	ZDUMNL EQU	3			LENGTH OF EBCDIC MNEMONIC	
	000B	2749	ZDUWAL EQU	11			EBCDIC LNG WORK AREA DESCIP	
		2750	*					
	0000	2751	ZDU0TD EQU	0			DISP IN BR TBL OF 0	
	0001	2752	ZDU1TD EQU	1			DISP IN BR TBL OF 1	
	0004	2753	ZDU4TD EQU	4			DISP IN BR TBL OF 4	
	0005	2754	ZDU5TD EQU	5			DISP IN BR TBL OF 5	
		2755	*					
	0000	2756	ZDUOPD EQU	0			PT DISP OF ZERO	

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15,	MOD 00	08/01/22	PAGE	19
				0001	2757	ZDU1PD	EQU 1					PT DISP OF 1
				0002	2758	ZDU2PD	EQU 2					PT DISP OF 2
				0003	2759	ZDU3PD	EQU 3					PT DISP OF 3
				0004	2760	ZDU4PD	EQU 4					PT DISP OF 4
				0004	2761	ZDUPSD	EQU B@LISP-1					PT DISP FOR PKD SHORT
				0008	2762	ZDUPLD	EQU B@LILP-1					PT DISP FOR PKD LONG
				0007	2763	ZDUUSD	EQU B@LESP-1					PT DISP FOR UNPKD SHORT
				000F	2764	ZDUULD	EQU B@LELP-1					PT DISP FOR UNPKD LONG

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC OBJECT CODE ADDR STMT SOURCE STATEMENT VER 15, MOD 00 08/01/22 PAGE 20

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                2766 *
                2767 * ZDUMPV CONSTANTS
                2768 *
143E 5CE6D6D9D240C1D9 1448 2769 ZDUDES DC      CL11 '*WORK AREA*'      WORK AREA DESCRIPTOR

                2771 * INSTRUCTION TO MOVE PACKED LONG VALUE TO CVRT BFR
1449 08                1449 2772          DC      AL1(B@LILP-1)      BYTES IN VALUE
144A 146B              144B 2773          DC      AL(@CADDR)(ZDUCIB)  ADDR IN CVRT BFR
144C 08                144C 2774 ZDUIN1 DC      AL1(ZDUPLD)          PT DISP
                2775 * INSTRUCTION TO MOVE PACKED LONG VALUE TO PRINT BFR
144D 11                144D 2776          DC      AL1(B@LILP*2-1)    BYTES IN VALUE
144E 14CC              144F 2777          DC      AL(@CADDR)(ZDUPLP)  ADDR PRINT BFR
1450 148A              1451 2778 ZDUIN2 DC      AL(@CADDR)(ZDUCOH)    ADDR OUT CVRT BFR
                2779 * INSTRUCTION TO MOVE UNPACKED LONG VALUE TO CVRT BFR
1452 0F                1452 2780          DC      AL1(B@LELP-1)      BYTES IN VALUE
1453 1472              1454 2781          DC      AL(@CADDR)(ZDUCIG)  ADDR IN CVRT BFR
1455 0F                1455 2782 ZDUIN3 DC      AL1(ZDUULD)          PT DISP
                2783 * INSTRUCTION TO MOVE UNPACKED LONG VALUE TO PRINT BFR
1456 1F                1456 2784          DC      AL1(B@LELP*2-1)    BYTES IN VALUE
1457 14DA              1458 2785          DC      AL(@CADDR)(ZDUPLU)  ADDR PRINT VALUE
1459 1498              145A 2786 ZDUIN4 DC      AL(@CADDR)(ZDUCOJ)    ADDR OUT CVRT BFR
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## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	08/01/22	PAGE 21
					2788	*				
					2789	*	ZDUMPV WORK AREAS			
					2790	*				
145B				145B	2791	ZDUCNT	DS CL1			LNG OF EMBEDDED WORK AREA
145C				145C	2792	ZDUPSW	DS CL1			PRINT SWITCH WHICH IS
145C					2793		ORG *-1			* INITALLY SET
145C	00			145C	2794		DC XL1'00'			* TO ZERO (OFF)
145D				145E	2795	ZDUILN	DS CL2			VIRTUAL MEMORY INSTRUCTION
145D					2796		ORG *-2			* LENGTH, INITIALLY SET TO
145D	0000			145E	2797		DC XL2'0000'			* ZERO
145F				1460	2798	ZDUBTI	DS CL2			WORK AREA TO FIGURE THE
145F					2799		ORG ZDUBTI-1			* THE BRANCH TABLE INDEX,
145F	0000			1460	2800		DC XL2'00'			* INITIALLY SET TO ZERO
1461				1461	2801	ZDUCBI	EQU *			CONVERSION IN BUFFER ADDR
1461				1474	2802		DS CL20			CONVERSION IN BUFFER,
1461					2803		ORG ZDUCBI			* THE FIRST
1461	56			1461	2804		DC AL1(@VENTA)			* TWO BYTES CONTAIN THE VADDR
1462	00			1462	2805		DC XL1'00'			* OF THE 1ST BYTE OF PMC
1475					2806		ORG ZDUCBI+20			RESTORE LOC CTR
1475				1475	2807	ZDUCBO	EQU *			CONVERSION OUT BUFFER ADDR
1475				149C	2808		DS CL40			CONVERSION OUT BUFFER
149D				149D	2809	ZDUBF1	EQU *			CADDR OF OUTPUT PRINT BUFFER
149D				14DD	2810		DS CL65			CORE OUTPUT BFR

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	08/01/22	PAGE	22
					2812	*					
					2813	*	ZDUMPV PARAMETER LISTS				
					2814	*					
				14DE	2815	ZDUPPL	EQU *				ADDR PRINT LIST
14DE	C0			14DE	2816		DC XL1 'C0 '				OPERATION CODE
14DF				14DF	2817	ZDULNG	DS CL1				LENGTH OF PRINT BUFFER
14E0	149D			14E1	2818		DC AL (@CADDR) (ZDUBF1)				CADDR OF OUTPUT BFR
					2819	*					
				14E2	2820	ZDUGET	EQU *				ADDR DISK PARAM LIST
14E2	01			14E2	2821		DC AL1 (@DGET)				READ CODE
14E3	07			14E3	2822		DC AL1 (@DVBCY)				BASE CYL FOR VM
14E4				14E4	2823	ZDUINN	DS CL1				SECTOR DISP FROM THE BASE
14E4					2824		ORG ZDUINN				* CYL, INITIALLY SET
14E4	56			14E4	2825		DC AL1 (@VENTA)				* TO 1ST PAGE OF VM
14E5	01			14E5	2826	ZDUPIN	DC XL1 '01 '				SECTOR CNT
14E6	1F00			14E7	2827		DC AL (@CADDR) (ZDUBF2)				ADDR CORE INPUT AREA



## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22 PAGE 23
		2829		*****	
		2830		*	*
		2831		* ZDUMPV EQUATES REFERENCING PROGRAM	*
		2832		*	*
		2833		*****	
		2834		*	
	14DD	2835	ZDUBFE EQU	ZDUBF1+64	LAST BYTE PRINT BFR
		2836		*	
		2837		* CONVERSION BUFFER IN DISPLACEMENT EQUATES	
		2838		*	
	1462	2839	ZDUCI1 EQU	ZDUCBI+1	DISP IN CONV BFR OF VADDR
	1463	2840	ZDUCI2 EQU	ZDUCBI+2	DISP IN CONV BFR OF 1 BYTE INST
	1464	2841	ZDUCI3 EQU	ZDUCBI+3	DISP IN CONV BFR OF 2 BYTE INST
	1465	2842	ZDUCI4 EQU	ZDUCBI+4	DISP IN CONV BFR OF 3 BYTE INST
	1466	2843	ZDUCI5 EQU	ZDUCBI+5	DISP IN CONV BFR OF 4 BYTE INST
	1467	2844	ZDUCI6 EQU	ZDUCBI+6	DISP IN CONV BFR OF PKD SHORT
	146A	2845	ZDUCIA EQU	ZDUCBI+9	DISP IN CONY BFR OF UNPKD SHORT
	146B	2846	ZDUCIB EQU	ZDUCBI+10	DISP IN CONV BFR OF PKD LONG
	1472	2847	ZDUCIG EQU	ZDUCBI+17	CVRT IN BFR DISP FOR UNPKD LONG
		2848		*	
		2849		* CONVERSION BUFFER OUT DISPLACEMENT EQUATES	
		2850		*	
	1478	2851	ZDUCO3 EQU	ZDUCBO+3	CVRT OUT BFR DISP - VADDR
	147A	2852	ZDUCO5 EQU	ZDUCBO+5	CVRT OUT BFR DISP - INST LNG 1
	147C	2853	ZDUCO7 EQU	ZDUCBO+7	CVRT OUT BFR DISP - INST LNG 2
	147E	2854	ZDUCO9 EQU	ZDUCBO+9	CVRT OUT BFR DISP - INST LNG 3
	1480	2855	ZDUCOB EQU	ZDUCBO+11	CVRT OUT BFR DISP - INST LNG 4
	1482	2856	ZDUCOF EQU	ZDUCBO+13	CVRT OUT BFR DISP - PKD SHORT
	1488	2857	ZDUCOG EQU	ZDUCBO+19	CVRT OUT BFR DISP - UNPKD SHORT
	148A	2858	ZDUCOH EQU	ZDUCBO+21	CVRT OUT BFR DISP - PKD LONG
	1498	2859	ZDUCOJ EQU	ZDUCBO+35	CVRT OUT BFR DISP - UNPKD LONG
		2860		*	
		2861		* PRINT BUFFER DISPLACEMENT EQUATES	
		2862		*	
	14A2	2863	ZDUPLN EQU	ZDUBF1+5	PRINT BFR DISP FOR LINE NO.
	14A8	2864	ZDUPVA EQU	ZDUBF1+11	PRINT BFR DISP FOR VADDR
	14AD	2865	ZDUPMN EQU	ZDUBF1+16	PRINT BFR DISP FOR MNEMONIC
	14B0	2866	ZDUP10 EQU	ZDUBF1+19	PRINT BFR DISP FOR 1 BYTE OPND
	14B2	2867	ZDUP20 EQU	ZDUBF1+21	PRINT BFR DISP FOR 2 BYTE OPND
	14B5	2868	ZDUP30 EQU	ZDUBF1+24	PRINT BFR DISP FOR 3 BYTE OPND
	14B5	2869	ZDUPWA EQU	ZDUBF1+24	PRINT BFR DISP FOR DESCRIPTER
	14BC	2870	ZDUPOP EQU	ZDUBF1+31	PRINT BFR DISP FOR OP CODE
	14BE	2871	ZDUPO1 EQU	ZDUBF1+33	PRINT BFR DISP FOR 1 BYTE OPND
	14C0	2872	ZDUPO2 EQU	ZDUBF1+35	PRINT BFR DISP FOR 2 BYTE OPND
	14C2	2873	ZDUPO3 EQU	ZDUBF1+37	PRINT BFR DISP FOR 3 BYTE OPND
	14BE	2874	ZDUPSP EQU	ZDUBF1+33	PRINT BFR DISP FOR PKD SHORT
	14CA	2875	ZDUPSU EQU	ZDUBF1+45	PRINT BFR DISP FOR UNPKD SNORT
	14CC	2876	ZDUPLP EQU	ZDUBF1+47	PRINT BFR DISP FOR PKD LONG
	14DA	2877	ZDUPLU EQU	ZDUBF1+61	PRINT BFR DISP FOR UNPKD LONG
		2878		*	
		2879		* PRINT BUFFER LENGTH EQUATES	
		2880		*	
	0020	2881	ZDUL35 EQU	32	PRINT BFR LNG FOR 1 BYTE INST
	0022	2882	ZDUL37 EQU	34	PRINT BFR LNG FOR 2 BYTE INST
	0024	2883	ZDUL39 EQU	36	PRINT BFR LNG FOR 3 BYTE INST
	0026	2884	ZDUL41 EQU	38	PRINT BFR LNG FOR 4 BYTE INST



[illegible]

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22 PAGE 25
			2890		*****	
			2891		*****	
			2892	*		*
			2893	*	ZDUMPV BRANCH ADDRESS LOOK-UP TABLE	*
			2894	*		*
			2895		*****	
			2896		*****	
			2897	*		
		14E8	2898	ZDUBRT EQU *	CADDR BRANCH TABLE	
			2899	*		
14E8	122A		14E9	2900	DC AL(@CADDR)(ZDU100)	ADDR SVC PROCESSING ROUTINE
14EA	E2E5C3		14EC	2901	DC CL3'SVC'	MNEMONIC FOR SUPERVISOR CALL
14ED	01		14ED	2902	DC AL1(B@LSVC)	LENGTH OF THE SVC INSTRUCTION
			2903		*****	
14EE	122A		14EF	2904	DC AL(@CADDR)(ZDU100)	ADDR HLT PROCESSING ROUTINE
14F0	C8D3E3		14F2	2905	DC CL3'HLT'	MNEMONIC FOR HALT INSTR.
14F3	01		14F3	2906	DC AL1(B@LHLT)	LENGTH OF THE HLT INSTRUCTION
			2907		*****	
14F4	122A		14F5	2908	DC AL(@CADDR)(ZDU100)	ADDR ADD PROCESSING ROUTINE
14F6	C1C4C4		14F8	2909	DC CL3'ADD'	MNEMONIC FOR ADD INSTR.
14F9	01		14F9	2910	DC AL1(B@LADD)	LENGTH OF THE ADD INSTRUCTION
			2911		*****	
14FA	122A		14FB	2912	DC AL(@CADDR)(ZDU100)	ADDR SUB PROCESSING ROUTINE
14FC	E2E4C2		14FE	2913	DC CL3'SUB'	MNEMONIC FOR SUBTRACT INSTR.
14FF	01		14FF	2914	DC AL1(B@LSUB)	LENGTH OF THE SUB INSTRUCTION
			2915		*****	
1500	122A		1501	2916	DC AL(@CADDR)(ZDU100)	ADDR MPY PROCESSING ROUTINE
1502	D4D7E8		1504	2917	DC CL3'MPY'	MNEMONIC FOR MULTIPLY INSTR.
1505	01		1505	2918	DC AL1(B@LMPY)	LENGTH OF THE MPY INSTRUCTION
			2919		*****	
1506	122A		1507	2920	DC AL(@CADDR)(ZDU100)	ADDR DIV PROCESSING ROUTINE
1508	C4C9E5		150A	2921	DC CL3'DIV'	MNEMONIC FOR DIVIDE INSTR.
150B	01		150B	2922	DC AL1(B@LDIV)	LENGTH OF THE DIV INSTRUCTION
			2923		*****	
150C	122A		150D	2924	DC AL(@CADDR)(ZDU100)	ADDR PWR PROCESSING ROUTINE
150E	D7E6D9		1510	2925	DC CL3'PWR'	MNEMONIC FOR POWER OF INSTR.
1511	01		1511	2926	DC AL1(B@LPWR)	LENGTH OF THE PWR INSTRUCTION
			2927		*****	
1512	122A		1513	2928	DC AL(@CADDR)(ZDU100)	ADDR NEQ PROCESSING ROUTINE
1514	D5C5C7		1516	2929	DC CL3'NEG'	MNEMONIC FOR NEGATATE INSTR.
1517	01		1517	2930	DC AL1(B@LNEG)	LENGTH OF THE NEG INSTRUCTION
			2931		*****	
1518	1276		1519	2932	DC AL(@CADDR)(ZDU300)	ADDR FN0 PROCESSING ROUTINE
151A	C6D5F0		151C	2933	DC CL3'FN0'	MNEMONIC FOR FN0 INSTR.
151D	03		151D	2934	DC AL1(B@LFN0)	LENGTH OF THE FN0 INSTRUCTION
			2935		*****	
151E	1276		151F	2936	DC AL(@CADDR)(ZDU300)	ADDR FN1 PROCESSING ROUTINE
1520	C6D5F1		1522	2937	DC CL3'FN1'	MNEMONIC FOR FN1 INSTR.
1523	03		1523	2938	DC AL1(B@LFN1)	LENGTH OF THE FN1 INSTRUCTION
			2939		*****	
1524	1276		1525	2940	DC AL(@CADDR)(ZDU300)	ADDR FCI PROCESSING ROUTINE
1526	C6C3C9		1528	2941	DC CL3'FCI'	MNEMONIC FOR FCI INSTR.
1529	03		1529	2942	DC AL1(B@LFCI)	LENGTH OF THE FCI INSTRUCTION
			2943		*****	
152A	1276		152B	2944	DC AL(@CADDR)(ZDU300)	ADDR MF1 PROCESSING ROUTINE
152C	D4C6F1		152E	2945	DC CL3'MF1'	MNEMONIC FOR MF1 INSTR.

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22 PAGE 26
	152F	03		152F	2946	DC	AL1(B@LMF1)	LENGTH OF THE MF1 INSTRUCTION
					2947	*****	*****	*****
	1530	1276		1531	2948	DC	AL(@CADDR)(ZDU300)	ADDR MF2 PROCESSING ROUTINE
	1532	D4C6F2		1534	2949	DC	CL3'MF2'	MNEMONIC FOR MF2 INSTR.
	1535	03		1535	2950	DC	AL1(B@LMF2)	LENGTH OF THE MF2 INSTRUCTION
					2951	*****	*****	*****
	1536	1276		1537	2952	DC	AL(@CADDR)(ZDU300)	ADDR MF3 PROCESSING ROUTINE
	1538	D4C6F3		153A	2953	DC	CL3'MF3'	MNEMONIC FOR MF3 INSTR.
	153B	03		153B	2954	DC	AL1(B@LMF3)	LENGTH OF THE MF3 INSTRUCTION
					2955	*****	*****	*****
	153C	1276		153D	2956	DC	AL(@CADDR)(ZDU300)	ADDR MSM PROCESSING ROUTINE
	153E	D4E2D4		1540	2957	DC	CL3'MSM'	MNEMONIC FOR MSM INSTR.
	1541	03		1541	2958	DC	AL1(B@LMSM)	LENGTH OF THE MSM INSTRUCTION
					2959	*****	*****	*****
	1542	1276		1543	2960	DC	AL(@CADDR)(ZDU300)	ADDR STF PROCESSING ROUTINE
	1544	E2E3C6		1546	2961	DC	CL3'STF'	MNEMONIC FOR STF INSTR.
	1547	03		1547	2962	DC	AL1(B@LSTF)	LENGTH OF THE STF INSTRUCTION
					2963	*****	*****	*****
	1548	1276		1549	2964	DC	AL(@CADDR)(ZDU300)	ADDR SF1 PROCESSING ROUTINE
	154A	E2C6F1		154C	2965	DC	CL3'SF1'	MNEMONIC FOR SF1 INSTR
	154D	03		154D	2966	DC	AL1(B@LSF1)	LENGTH OF THE SF1 INSTRUCTION
					2967	*****	*****	*****
	154E	1276		154F	2968	DC	AL(@CADDR)(ZDU300)	ADDR SF2 PROCESSING ROUTINE
	1550	E2C6F2		1552	2969	DC	CL3'SF2'	MNEMONIC FOR SF2 INSTR
	1553	03		1553	2970	DC	AL1(B@LSF2)	LENGTH OF THE SF2 INSTRUCTION
					2971	*****	*****	*****
	1554	122A		1555	2972	DC	AL(@CADDR)(ZDU100)	ADDR USF PROCESSING ROUTINE
	1556	E4E2C6		1558	2973	DC	CL3'USF'	MNEMONIC FOR USF INSTR.
	1559	01		1559	2974	DC	AL1(B@LUSF)	LENGTH OF THE USF INSTRUCTION
					2975	*****	*****	*****
	155A	1276		155B	2976	DC	AL(@CADDR)(ZDU300)	ADDR STC PROCESSING ROUTINE
	155C	E2E3C3		155E	2977	DC	CL3'STC'	MNEMONIC FOR STC INSTR.
	155F	03		155F	2978	DC	AL1(B@LSTC)	LENGTH OF THE STC INSTRUCTION
					2979	*****	*****	*****
	1560	1276		1561	2980	DC	AL(@CADDR)(ZDU300)	ADDR SC1 PROCESSING ROUTINE
	1562	E2C3F1		1564	2981	DC	CL3'SC1'	MNEMONIC FOR SC1 INSTR.
	1565	03		1565	2982	DC	AL1(B@LSC1)	LENGTH OF THE SC1 INSTRUCTION
					2983	*****	*****	*****
	1566	124D		1567	2984	DC	AL(@CADDR)(ZDU200)	ADDR USC PROCESSING ROUTINE
	1568	E4E2C3		156A	2985	DC	CL3'USC'	MNEMONIC FOR USC INSTR.
	156B	02		156B	2986	DC	AL1(B@LUSC)	LENGTH OF THE USC INSTRUCTION
					2987	*****	*****	*****
	156C	1276		156D	2988	DC	AL(@CADDR)(ZDU300)	ADDR SD0 PROCESSING ROUTINE
	156E	E2C4F0		1570	2989	DC	CL3'SD0'	MNEMONIC FOR STACK DOPE VECTOR
	1571	03		1571	2990	DC	AL1(B@LSD0)	LENGTH OF THE SD0 INSTRUCTION
					2991	*****	*****	*****
	1572	1276		1573	2992	DC	AL(@CADDR)(ZDU300)	ADDR SD1 PROCESSING ROUTINE
	1574	E2C4F1		1576	2993	DC	CL3'SD1'	MNEMONIC FOR STACK D/V-REDIM 1
	1577	03		1577	2994	DC	AL1(B@LSD1)	LENGTH OF THE SD1 INSTRUCTION
					2995	*****	*****	*****
	1578	1276		1579	2996	DC	AL(@CADDR)(ZDU300)	ADDR SD2 PROCESSING ROUTINE
	157A	E2C4F2		157C	2997	DC	CL3'SD2'	MNEMONIC FOR STACK D/V-REDIM 2
	157D	03		157D	2998	DC	AL1(B@LSD2)	LENGTH OF THE SD2 INSTRUCTION
					2999	*****	*****	*****
	157E	1276		157F	3000	DC	AL(@CADDR)(ZDU300)	ADDR STA PROCESSING ROUTINE
	1580	E2E3C1		1582	3001	DC	CL3'STA'	MNEMONIC FOR STACK VIRTUAL ADDR

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22 PAGE 27
	1583	03	1583	3002	DC AL1(B@LSTA)	LENGTH OF THE STA INSTRUCTION
				3003	*****	
	1584	1276	1585	3004	DC AL(@CADDR)(ZDU300)	ADDR SA1 PROCESSING ROUTINE
	1586	E2C1F1	1588	3005	DC CL3'SA1'	MNEMONIC - STACK ARITH VCTR ADDR
	1589	03	1589	3006	DC AL1(B@LSA1)	LENGTH OF THE SA1 INSTRUCTION
				3007	*****	
	158A	1276	158B	3008	DC AL(@CADDR)(ZDU300)	ADDR SA2 PROCESSING ROUTINE
	158C	E2C1F2	158E	3009	DC CL3'SA2'	MNEMONIC - STACK ARITH MATX ADDR
	158F	03	158F	3010	DC AL1(B@LSA2)	LENGTH OF THE SA2 INSTRUCTION
				3011	*****	
	1590	1276	1591	3012	DC AL(@CADDR)(ZDU300)	ADDR SB1 PROCESSING ROUTINE
	1592	E2C2F1	1594	3013	DC CL3'SB1'	MNEMONIC FOR STCK CHAR ARRAY ADR
	1595	03	1595	3014	DC AL1(B@LSB1)	LENGTH OF THE SB1 INSTRUCTION
				3015	*****	
	1596	124D	1597	3016	DC AL(@CADDR)(ZDU200)	ADDR STX PROCESSING ROUTINE
	1598	E2E3E7	159A	3017	DC CL3'STX'	MNEMONIC FOR STACK EXEC CNTL CDE
	159B	02	159B	3018	DC AL1(B@LSTX)	LENGTH OF THE STX INSTRUCTION
				3019	*****	
	159C	124D	159D	3020	DC AL(@CADDR)(ZDU200)	ADDR CSA PROCESSING ROUTINE
	159E	C3E2C1	15A0	3021	DC CL3'CSA'	MNEMONIC FOR COMPUTE STACK ADDR.
	15A1	02	15A1	3022	DC AL1(B@LCSA)	LENGTH OF THE CSA INSTRUCTION
				3023	*****	
	15A2	122A	15A3	3024	DC AL(@CADDR)(ZDU100)	ADDR CMF PROCESSING ROUTINE
	15A4	C3D4C6	15A6	3025	DC CL3'CMF'	MNEMONIC FOR CMP FIELD VALUES
	15A7	01	15A7	3026	DC AL1(B@LCMF)	LENGTH OF THE CMF INSTRUCTION
				3027	*****	
	15A8	122A	15A9	3028	DC AL(@CADDR)(ZDU100)	ADDR CMC PROCESSING ROUTINE
	15AA	C3D4C3	15AC	3029	DC CL3'CMC'	MNEMONIC FOR CMP CHAR FIELDS
	15AD	01	15AD	3030	DC AL1(B@LCMC)	LENGTH OF THE CMC INSTRUCTION
				3031	*****	
	15AE	129F	15AF	3032	DC AL(@CADDR)(ZDU400)	ADDR BRC PROCESSING ROUTINE
	15B0	C2D9C3	15B2	3033	DC CL3'BRC'	MNEMONIC FOR BR ON CONDITION
	15B3	04	15B3	3034	DC AL1(B@LBRC)	LENGTH OF THE BRC INSTRUCTION
				3035	*****	
	15B4	1276	15B5	3036	DC AL(@CADDR)(ZDU300)	ADDR BRA PROCESSING ROUTINE
	15B6	C2D9C1	15B8	3037	DC CL3'BRA'	MNEMONIC FOR BR UNCONDITIAALLY
	15B9	03	15B9	3038	DC AL1(B@LBRA)	LENGTH OF THE BRA INSTRUCTION
				3039	*****	
	15BA	1276	15BB	3040	DC AL(@CADDR)(ZDU300)	ADDR BRD PROCESSING ROUTINE
	15BC	C2D9C4	15BE	3041	DC CL3'BRD'	MNEMONIC FOR BRANCH & DELETE
	15BF	03	15BF	3042	DC AL1(B@LBRD)	LENGTH OF THE BRD INSTRUCTION
				3043	*****	
	15C0	1276	15C1	3044	DC AL(@CADDR)(ZDU300)	ADDR BNX PROCESSING ROUTINE
	15C2	C2D5E7	15C4	3045	DC CL3'BNX'	MNEMONIC FOR BR & SKIP EXEC
	15C5	03	15C5	3046	DC AL1(B@LBNX)	LENGTH OF THE BNX INSTRUCTION
				3047	*****	
	15C6	122A	15C7	3048	DC AL(@CADDR)(ZDU100)	ADDR BRS PROCESSING ROUTINE
	15C8	C2D9E2	15CA	3049	DC CL3'BRS'	MNEMONIC FOR BR TO STACKED ADDR
	15CB	01	15CB	3050	DC AL1(B@LBRS)	LENGTH OF THE BRS INSTRUCTION
				3051	*****	
	15CC	1276	15CD	3052	DC AL(@CADDR)(ZDU300)	ADDR FOR PROCESSING ROUTINE
	15CE	C6D6D9	15D0	3053	DC CL3'FOR'	MNEMONIC BEGIN 'FOR' LOOP
	15D1	03	15D1	3054	DC AL1(B@LFOR)	LENGTH OF THE FOR INSTRUCTION
				3055	*****	
	15D2	1276	15D3	3056	DC AL(@CADDR)(ZDU300)	ADDR NXT PROCESSING ROUTINE
	15D4	D5E7E3	15D6	3057	DC CL3'NXT'	MNEMONIC FOR CONTINUE 'FOR' LOOP

## #ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22 PAGE 28
	15D7	03		15D7	3058	DC	AL1(B@LNXT)	LENGTH OF THE NXT INSTRUCTION
					3059	*****	*****	*****
	15D8	1276		15D9	3060	DC	AL(@CADDR)(ZDU300)	ADDR GET PROCESSING ROUTINE
	15DA	C7C5E3		15DC	3061	DC	CL3'GET'	MNEMONIC FOR INPUT DATA ELEMENT
	15DD	03		15DD	3062	DC	AL1(B@LGET)	LENGTH OF THE GET INSTRUCTION
					3063	*****	*****	*****
	15DE	124D		15DF	3064	DC	AL(@CADDR)(ZDU200)	ADDR PUT PROCESSING ROUTINE
	15E0	D7E4E3		15E2	3065	DC	CL3'PUT'	MNEMONIC FOR OUTPUT DATA ELEMENT
	15E3	02		15E3	3066	DC	AL1(B@LPUT)	LENGTH OF THE PUT INSTRUCTION
					3067	*****	*****	*****
	15E4	124D		15E5	3068	DC	AL(@CADDR)(ZDU200)	ADDR INI PROCESSING ROUTINE
	15E6	C9D5C9		15E8	3069	DC	CL3'INI'	MNEMONIC FOR INITIATE DATA INPUT
	15E9	02		15E9	3070	DC	AL1(B@LINI)	LENGTH OF THE INI INSTRUCTION
					3071	*****	*****	*****
	15EA	124D		15EB	3072	DC	AL(@CADDR)(ZDU200)	ADDR ADF PROCESSING ROUTINE
	15EC	C1C4C6		15EE	3073	DC	CL3'ADF'	MNEMONIC FOR ACTIVATE DATA FILE
	15EF	02		15EF	3074	DC	AL1(B@LADF)	LENGTH OF THE ADF INSTRUCTION
					3075	*****	*****	*****
	15F0	122A		15F1	3076	DC	AL(@CADDR)(ZDU100)	ADDR RSR PROCESSING ROUTINE
	15F2	D9E2D9		15F4	3077	DC	CL3'RSR'	MNEMONIC - RESTORE DATA FILE PTR
	15F5	01		15F5	3078	DC	AL1(B@LRSR)	LENGTH OF THE RSR INSTRUCTION
					3079	*****	*****	*****
	15F6	122A		15F7	3080	DC	AL(@CADDR)(ZDU100)	ADDR RST PROCESSING ROUTINE
	15F8	D9E2E3		15FA	3081	DC	CL3'RST'	MNEMONIC - RESET DATA FILE PTR
	15FB	01		15FB	3082	DC	AL1(B@LRST)	LENGTH OF THE RST INSTRUCTION
					3083	*****	*****	*****
	15FC	122A		15FD	3084	DC	AL(@CADDR)(ZDU100)	ADDR CLS PROCESSING ROUTINE
	15FE	C3D3E2		1600	3085	DC	CL3'CLS'	MNEMONIC FOR CLS
	1601	01		1601	3086	DC	AL1(B@LCLS)	LENGTH OF THE CLS INSTRUCTION
					3087	*****	*****	*****
	1602	124D		1603	3088	DC	AL(@CADDR)(ZDU200)	ADDR PRS PROCESSING ROUTINE
	1604	D7D9E2		1606	3089	DC	CL3'PRS'	MNEMONIC FOR PRINT & SPACE CARR.
	1607	02		1607	3090	DC	AL1(B@LPRS)	LENGTH OF THE PRS INSTRUCTION
					3091	*****	*****	*****
	1608	124D		1609	3092	DC	AL(@CADDR)(ZDU200)	ADDR PRU PROCESSING ROUTINE
	160A	D7D9E4		160C	3093	DC	CL3'PRU'	MNEMONIC FOR PRINT USING IMAGE
	160D	02		160D	3094	DC	AL1(B@LPRU)	LENGTH OF THE PRU INSTRUCTION
					3095	*****	*****	*****
	160E	1372		160F	3096	DC	AL(@CADDR)(ZDU800)	ADDR STH PROCESSING ROUTINE
	1610	E2E3C8		1612	3097	DC	CL3'STH'	MNEMONIC FOR STATEMENT HEADER
	1613	03		1613	3098	DC	AL1(B@LSTH)	LENGTH OF THE STH INSTRUCTION
					3099	*****	*****	*****
	1614	1372		1615	3100	DC	AL(@CADDR)(ZDU800)	ADDR IMH PROCESSING ROUTINE
	1616	C9D4C8		1618	3101	DC	CL3'IMH'	MNEMONIC FOR IMAGE HEADER
	1619	03		1619	3102	DC	AL1(B@LIMH)	LENGTH OF THE IMH INSTRUCTION
					3103	*****	*****	*****
	161A	133F		161B	3104	DC	AL(@CADDR)(ZDU600)	ADDR EOP PROCESSING ROUTINE
	161C	C5D6D7		161E	3105	DC	CL3'EOP'	MNEMONIC FOR END OF PMC PAGE
	161F	01		161F	3106	DC	AL1(B@LEOP)	LENGTH OF THE EOP INSTRUCTION
					3107	*****	*****	*****
	1620	1276		1621	3108	DC	AL(@CADDR)(ZDU300)	ADDR DCA PROCESSING ROUTINE
	1622	C4C3C1		1624	3109	DC	CL3'DCA'	MNEMONIC - DEFINE CONSTANT ADDR
	1625	03		1625	3110	DC	AL1(B@LDCA)	LENGTH OF THE DCA INSTRUCTION
					3111	*****	*****	*****
	1626	1276		1627	3112	DC	AL(@CADDR)(ZDU300)	ADDR DDL PROCESSING ROUTINE
	1628	C4C4D3		162A	3113	DC	CL3'DDL'	MNEMONIC - DEFINE DATA LINKAGE

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22 PAGE 29
162B	03		162B	3114	DC AL1(B@LDDL)	LENGTH OF THE DDL INSTRUCTION
				3115	*****	
162C	13A3		162D	3116	DC AL(@CADDR)(ZDU900)	ADDR DWA PROCESSING ROUTINE
162E	C4E6C1		1630	3117	DC CL3'DWA'	MNEMONIC - DEFINE WORK AREA
1631	02		1631	3118	DC AL1(B@LDWA)	LENGTH OF THE DWA INSTRUCTION
				3119	*****	
1632	1366		1633	3120	DC AL(@CADDR)(ZDU700)	ADDR EOF PROCESSING ROUTINE
1634	C5D6C6		1636	3121	DC CL3'EOF'	MNEMONIC FOR END OF PROGRAM PMC
1637	01		1637	3122	DC AL1(B@LEOF)	LENGTH OF THE EOF INSTRUCTION
				3123	*****	
				3124	*****	

#ZDUMP -- VIRTUAL MEMORY DUMP WITH MNEMONICS

ERR LOC		OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22 PAGE 30
				3126	*****	
				3127	* PATCH AREA #2 *	
				3128	*****	
				3129	*	
				3130	*** CALCULATE AREA LEFT IN THIS SECTOR	
				3131	*	
1700			1638	3132	\$\$\$\$L2 EQU * START OF PATCH AREA 2	
				3133	ORG *,256,0 SET LOC COUNTER TO NEXT SECTOR	
			1700	3134	\$\$\$\$T2 EQU * DEFINE ADDR OF SCTR BOUNDARY	
1638				3135	ORG \$\$\$L2 SET LOC COUNTER TO START OF	
				3136	* * PATCH AREA	
1638			16FF	3137	\$\$\$\$\$2 DS CL(\$\$\$\$T2-\$\$\$L2) PATCH AREA	
				3138	*	
				3139	* \$DL4P	



## DL4ICS - FOUR TRACK LOGICAL IOCR

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00 08/01/22 PAGE 31
		3141+		*****	*
		3142+	*	5703-XM1 COPYRIGHT IBM CORP. 1970	*
		3143+	*	REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083	*
		3144+	*		*
		3145+		*****	*
		3146+	*	STATUS	*
		3147+	*	VERSION 1 MODIFICATION 0	*
		3148+	*		*
		3149+	*	FUNCTION	*
		3150+	*	DL4ICS WILL CONVERT A RELATIVE DISK ADDRESS TO A PHYSICAL	*
		3151+	*	DISK ADDRESS AND CALL \$DISKN TO PERFORM THE SPECIFIED FUNCTION	*
		3152+	*	THE DISK ADDRESS IS A ONE BYTE CYLINDER ADDRESS AND A ONE BYTE	*
		3153+	*	SECTOR DISPLACEMENT RELATIVE TO SECTOR 0 ON A CYLINDER	*
		3154+	*	BOUNDARY	*
		3155+	*	WHEN MORE THAN 1 SECTOR IS PROCESSED, DL4ICS WILL MAKE MULTIPLE	*
		3156+	*	CALLS TO \$DISKN TO CROSS CYLINDER BOUNDARIES IF REQUIRED.	*
		3157+	*	IF 1 SECTOR ONLY IS TO BE PROCESSED, THE USER MAY OVERLAY THE	*
		3158+	*	UNUSED CODE BY ORGING HIS NEXT MODULE AT DL4SPT	*
		3159+	*		*
		3160+	*	ENTRY POINTS	*
		3161+	*	DL4ICS - ENTRY TO PROCESS A 4 SURFACE FILE. THE CALLING	*
		3162+	*	SEQUENCE IS AS FOLLOWS	*
		3163+	*	DSKL4 DPL	*
		3164+	*	WHERE DPL IS THE LABEL OF A SIX BYTE DISK PARAMETER	*
		3165+	*	LIST AS DESCRIBED FOR \$DISKN EXCEPT FOR THE SECTOR	*
		3166+	*	ADDRESS BYTE.	*
		3167+	*		*
		3168+	*	INPUT	*
		3169+	*	INPUT TO DL4ICS IS THE ADDRESS OF THE DPL TO BE PROCESSED.	*
		3170+	*		*
		3171+	*	OUTPUT	*
		3172+	*	N/A	*
		3173+	*		*
		3174+	*	EXTERNAL REFENECES	*
		3175+	*	\$DISKN - ENTRY TO SYSTEM DISK ROUTINE	*
		3176+	*		*
		3177+	*	EXITS, NORMAL	*
		3178+	*	NORMAL RETURN IS TO THE 1ST INSTRUCTION FOLLOWING THE TWO BYTE	*
		3179+	*	ADDRESS POINTING TO THE DPL.	*
		3180+	*		*
		3181+	*	EXITS, ERROR	*
		3182+	*	N/A	*
		3183+	*		*
		3184+	*	TABLES/WORK AREAS	*
		3185+	*	N/A	*
		3186+	*		*
		3187+	*	ATTRIBUTES	*
		3188+	*	RELOCATABLE	*
		3189+	*	REUSABLE	*
		3190+	*		*
		3191+	*	CHARACTER CODE DEPENDENCY	*
		3192+	*	THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR	*
		3193+	*	INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.	*
		3194+	*		*
		3195+	*	NOTES	*
		3196+	*	ERROR PROCEDURES	*



DL4ICS - FOUR TRACK LOGICAL IOCR

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	VER 15, MOD 00	08/01/22	PAGE 32	
		3197+	*	N/A				*
		3198+	*					*
		3199+	*	REGISTER USAGE				*
		3200+	*	@BR IS SAVED AND RESTORED ON EXIT, @XR IS NOT USED. @ARR IS				*
		3201+	*	USED TO PROVIDE THE ADDRESS OF THE PARAMETER. THE @ARR IS				*
		3202+	*	INCREMENTED BT TWO AND SAVED AS THE RETURN ADDRESS.				*
		3203+	*					*
		3204+	*	SAVED/RESTORED AREAS				*
		3205+	*	N/A				*
		3206+	*					*
		3207+	*	MODIFICATION CONSIDERATIONS				*
		3208+	*	N/A				*
		3209+	*					*
		3210+	*	REQUIRED MODULES				*
		3211+	*	@SYSEQ - SYSTEM SOFTWARE EQUATES				*
		3212+	*	@FXDEQ - SYSTEM NUCLEUS EQUATES				*
		3213+	*					*
		3214+	*	OTHER				*
		3215+	*	NONE				*
		3216+	*	*****				*

## DL4ICS - FOUR TRACK LOGICAL IOCR

ERR	LOC	OBJECT	CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00 08/01/22 PAGE 33
				1700	3218+	DL4ICS	EQU *	ENTRY TO DL4ICS
				1704	3219+		USING DL4010,@BR	ESTABLISH BASE REGISTER USAGE
1700	34	01	1770		3220+		ST DL4900+@OP1,@BR	SAVE BASE REGISTER FOR EXIT
				1704	3221+	DL4010	EQU *	BASE ADDRESSABILITY
1704	C2	01	1704		3222+		LA DL4010,@BR	ESTABLISH BASE
1708	76	08	78		3223+		A DL4C01(,@BR),@ARR	BUMP TO HIGH END OF ADDR
170B	74	08	14		3224+		ST DL4020+@DOP2(,@BR),@ARR	SET UP MOVE INSTRUCTION
170E	76	08	78		3225+		A DL4C01(,@BR),@ARR	BUMP TO RETURN ADDR
1711	74	08	70		3226+		ST DL4920+@OP1(,@BR),@ARR	SAVE RETURN ADDR
					3227+*			
1714	4C	01	1D 0000		3228+	DL4020	MVC DL4030+@DOP2(@DADDR,@BR),*-*	MOVE DPL ADDR INTO MOVE
1719	5E	01	1D 7A		3229+		ALC DL4030+@DOP2(@CADDR,@BR),DL4C05(,@BR)	BUMP TO RIGHT END
171D	4C	05	76 0000		3230+	DL4030	MVC DL4DPL(@DPLNG,@BR),*-*	MOVE USER DPL TO WORK AREA
					3231+*			
1722	7C	00	5E		3232+	DL4035	MVI DL4100+@Q(,@BR),@ZERO	CLEAR TRACK, DISK SET INST
1725	7C	80	67		3233+		MVI DL4200+@Q(,@BR),@NOP	TURN OFF TWICE INDICATOR
					3234+*			
1728	7D	60	73		3235+	DL4040	CLI DL4SCD(,@BR),DL4E96	TEST IF DISPLACEMENT OVER 95 ?
172B	F2	82	0B		3236+		JL DL4050	JUMP IF NOT OVER 95
172E	5E	00	72 78		3237+		ALC DL4CYL(1,@BR),DL4C01(,@BR)	INCREMENT CYLINDER COUNT
1732	5F	00	73 25		3238+		SLC DL4SCD(1,@BR),DL4C96(,@BR)	DECREMENT DISP BY 96
1736	D0	87	24		3239+		B DL4040(,@BR)	GO BACK CHECK FOR NEXT CYLINDER
					3240+*			
1739	7D	30	73		3241+	DL4050	CLI DL4SCD(,@BR),DL4E48	TEST IF DISP ON NEXT DISK ?
173C	F2	82	07		3242+		JL DL4060	JUMP IF NOT OVER 48
173F	7A	01	5E		3243+		SBN DL4100+@Q(,@BR),DL4EFD	TURN ON BIT FOR FIXED DISK
1742	5F	00	73 36		3244+		SLC DL4SCD(1,@BR),DL4C48(,@BR)	DECREMENT DISP 1 DISK
1746	7D	01	74		3245+	DL4060	CLI DL4SCT(,@BR),DL4E01	IS SECTOR COUNT GREATER THEN 1 ?
1749	F2	84	33		3246+		JH DL4SPT	GO TO SPLIT CALL
174C	7D	18	73		3247+	DL4070	CLI DL4SCD(,@BR),DL4E24	DISPLACEMENT OVER 23 ?
174F	F2	82	07		3248+		JL DL4080	JUMP NOT OVER 24
1752	7A	80	5E		3249+		SBN DL4100+@Q(,@BR),DL4ETB	SET TRACK BIT ON
1755	5F	00	73 49		3250+		SLC DL4SCD(1,@BR),DL4C24(,@BR)	DECR DISP TO NEXT TRACK
1759	5E	00	73 73		3251+	DL4080	ALC DL4SCD(1,@BR),DL4SCD(,@BR)	SHIFT LEFT 1 PLACE
175D	5E	00	73 73		3252+		ALC DL4SCD(1,@BR),DL4SCD(,@BR)	SHIFT LEFT 1 PLACE
1761	7A	00	73		3253+	DL4100	SBN DL4SCD(,@BR),*-*	SET TRACK, DISK BIT
					3254+*			
1764	C0	87	0025		3255+		B \$DISKN	GO PERFORM DISK I/O
1768	1775			1769	3256+		DC AL2(DL4LST)	ADDR OF DISK PARAM LIST
					3257+*			
176A	F2	00	3C		3258+	DL4200	JC DL4600,*-*	BRANCH OR NOP IF TWICE SET
					3259+*			
176D	C2	01	0000		3260+	DL4900	LA *-* ,@BR	RESTORE OLD BASE TO RETURN
1771	C0	87	0000		3261+	DL4920	B *-*	RETURN TO CALLER
					3262+*			
				1775	3263+	DL4LST	EQU *	LEFT END OF DPL
				177A	3264+	DL4DPL	DS CL(@DPLNG)	DPL SAVE AREA
				1776	3265+	DL4CYL	EQU DL4LST+@DCYL	CYLINDER COUNT BYTE
				1777	3266+	DL4SCD	EQU DL4LST+@DSAD	DISPLACEMENT SECTOR COUNT
				0060	3267+	DL4E96	EQU 96	TWO DISK SECTOR COUNT PER CYL
				0030	3268+	DL4E48	EQU 48	ONE DISK SECTOR COUNT PER CYL
				0018	3269+	DL4E24	EQU 24	TRACK SECTOR COUNT
				0001	3270+	DL4E01	EQU 01	VALUE TO TEST SECTOR COUNT
				0001	3271+	DL4EFD	EQU 01	VALUE TO SET FIXED DISK BIT
				0080	3272+	DL4ETB	EQU X'80'	VALUE TO SET TRACK BIT
177B	0001			177C	3273+	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 08/01/22 PAGE 34
177D	0005	177E	3274+DL4C05	DC	IL2'5'	DISP TO RIGHT END OF DPL
		1729	3275+DL4C96	EQU	DL4040+@Q	VALUE TO DECR DISPLACEMENT
		174D	3276+DL4C24	EQU	DL4070+@Q	VALUE OF 1 TRACK
		1778	3277+DL4SCT	EQU	DL4LST+@DCNT	POINTER TO DPL SECTOR COUNT
		173A	3278+DL4C48	EQU	DL4050+@Q	VALUE TO DECR DISP BY 1 DISK
177F	5C 00 14 74		3280+DL4500	MVC	DL4WRK(1,@BR),DL4SCT(,@BR)	PICKUP SECTOR COUNT
		177F	3281+DL4SPT	EQU	DL4500	POSSIBLE OVERLAY REFERENCE
1783	5E 00 14 73		3282+	ALC	DL4WRK(1,@BR),DL4SCD(,@BR)	BUMP BY DISPLACEMENT
1787	7D 30 14		3283+	CLI	DL4WRK(,@BR),DL4E48	TEST FOR CYLINDER OVERLAP
178A	D0 04 48		3284+	BNH	DL4070(,@BR)	BRANCH BACK IF NO OVERLAY
178D	5F 00 14 36		3285+	SLC	DL4WRK(1,@BR),DL4C48(,@BR)	DECREMENT WORK BY 48
1791	5F 00 74 14		3286+	SLC	DL4SCT(1,@BR),DL4WRK(,@BR)	SUBTRACT WORK FROM COUNT
1795	7C 87 67		3287+	MVI	DL4200+@Q(,@BR),@UCB	SET TWICE SWITCH
1798	5C 00 13 73		3288+	MVC	DL4SAV(1,@BR),DL4SCD(,@BR)	SAVE SECTOR DISP IN WORK AREA
179C	78 01 5E		3289+	TBN	DL4100+@Q(,@BR),DL4EFD	DISK BIT ON IN Q CODE ?
179F	D0 90 48		3290+	BF	DL4070(,@BR)	BRANCH NOT ON
17A2	5E 00 13 36		3291+	ALC	DL4SAV(1,@BR),DL4C48(,@BR)	BUMP TO NEXT DISK
17A6	D0 87 48		3292+	B	DL4070(,@BR)	RETURN TO CALL I/O
			3293+*			
17A9	5C 00 73 13		3294+DL4600	MVC	DL4SCD(1,@BR),DL4SAV(,@BR)	PICKUP NEXT HALF OF I/O
17AD	5E 00 75 74		3295+	ALC	DL4LST+@DBFR1(1,@BR),DL4SCT(,@BR)	BUMP CORE ADDRESS
17B1	5E 00 73 74		3296+	ALC	DL4SCD(1,@BR),DL4SCT(,@BR)	
17B5	5C 00 74 14		3297+	MVC	DL4SCT(1,@BR),DL4WRK(,@BR)	MOVE IN NEW SECTOR COUNT
17B9	D0 87 1E		3298+	B	DL4035(,@BR)	RETURN FOR SECOND PASS
			3299+*			
		1718	3300+DL4WRK	EQU	DL4020+@DOP2	1 BYTE WORK AREA FOR SPLIT CALL
		1717	3301+DL4SAV	EQU	DL4020+@DOP2-1	1 BYTE WORK AREA FOR SPLIT CALL
		17BC	3302+DL4END	EQU	*	DEFINE END OF CODE
			3303+***		END OF DL4ICS	***
			3304 *			
			3305 *		\$C2D5	
			3306+*****			
			3307+*		SERIALLY REUSABLE SUBROUTINE TO CONVERT A 2 BYTE BINARY VALUE TO	*
			3308+*		A 5 BYTE POSITIVE DECIMAL NUMBER.	*
			3309+*		ON ENTRY @XR POINTS TO THE LEFT BYTE OF THE BINARY VALUE.	*
			3310+*		ON RETURN C2DVAL IS THE RIGHT BYTE OF THE 5 BYTES DECIMAL VALUE	*
			3311+*		WITH LEADING ZEROS WHICH MAY BE MODIFIED BY THE USER IN ANY WAY	*
			3312+*		IN IT'S LOCATION.	*
			3313+*		THE 2 BYTES BINARY VALUE IS NOT ALTERED.	*
			3314+*		@XR IS NOT ALTERED.	*
			3315+*		@BR IS SAVED AND RESTORED AT EXIT.	*
			3316+*****			
		17BC	3318+C2DEC5	EQU	*	MODULE ENTRY POINT
		17BC	3319+	USING	C2DEC5,@BR	BASE ADDRESS SPECIFICATION
17BC	34 01 17F0		3320+	ST	C2D050+@OP1,@BR	SAVE @BR
17C0	C2 01 17BC		3321+	LA	C2DEC5,@BR	LOAD BASE REGISTER
17C4	74 08 38		3322+	ST	C2D052+@OP1(,@BR),@ARR	SAVE RETURN ADDRESS
			3323+*		INITIALIZE DECIMAL INCREMENTER AND DECIMAL SUM TO 1 AND 0 RESP.	
17C7	54 90 43 39		3324+	ZAZ	C2D903(C2D903-C2D901,@BR),C2D901(C2D902-C2D901,@BR)	
17CB	7C 01 17		3325+	MVI	C2D030+@D1(,@BR),@B1	INITIALIZE DISP TO BYTE 1
17CE	7C 01 16		3326+C2D020	MVI	C2D030+@Q(,@BR),@B1	INIT TEST TO BIT 7
			3327+*			
17D1	B8 00 00		3328+C2D030	TBN	*-(,@XR),*-*	TEST IF THIS BIT IS OFF
17D4	F2 90 04		3329+	JF	C2D040	* BR AROUND SUM INCREMENT

DL4ICS - FOUR TRACK LOGICAL IOCR

ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE	STATEMENT	VER 15, MOD 00	08/01/22	PAGE 35
			3330+*		INCREMENT DECIMAL SUM BY DECIMAL VALUE OF THIS TESTED BIT			
17D7	56 04 3E 43		3331+	AZ	C2DVAL(C2D903-C2DVAL,@BR),C2D903(C2D903-C2DVAL,@BR)			
			3332+*		DOUBLE DECIMAL VALUE OF INCREMENT TO VALUE OF NEXT BIT			
17DB	56 04 43 43		3333+C2D040	AZ	C2D903(C2D903-C2DVAL,@BR),C2D903(C2D903-C2DVAL,@BR)			
17DF	5E 00 16 16		3334+	ALC	C2D030+@Q(1,@BR),C2D030+@Q(,@BR) SHIFT BIT MASK LEFT ONE			
17E3	D0 20 15		3335+	BNOL	C2D030(,@BR) CONTINUE LOOP UNLESS ALL BITS			
			3336+*		* TESTED			
17E6	5F 00 17 13		3337+	SLC	C2D030+@D1(1,@BR),C2D020+@Q(,@BR) DECR DISP TO BYTE 0			
17EA	D0 81 12		3338+	BZ	C2D020(,@BR) FALL THROUGH IF UNDERFLOW			
17ED	C2 01 0000		3339+C2D050	LA	*-*,@BR RESTORE @BR			
17F1	C0 87 0000		3340+C2D052	B	*-* RETURN TO CALLING PROGRAM			
			3341+*					
			3342+***		WORK AREA			
			3343+*					
17F5	F1	17F5	3344+C2D901	DC	DL1'1'			INIT WORK AREA
		17F6	3345+C2D902	EQU	*			FIST BYTE OF DECIMAL VALUE
17F6		17FA	3346+C2DVAL	DS	CL5			5 BYTES DECIMAL VALUE
17FB		17FF	3347+C2D903	DS	CL5			DECIMAL INCREMENTER
			3348+***		END OF C4DEC5			***
			3349 *					
		FFFF	3350		END			

TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY = 0

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 36

SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$\$\$\$\$	001	1100	2291	
\$\$\$\$\$2	200	16FF	3137	
\$\$\$\$L2	001	1638	3132	3135 3137
\$\$\$\$T2	001	1700	3134	3137
\$\$\$CMD	001	0020	1123	
\$\$\$DAT	001	0040	1122	
\$\$\$EPL	001	0091	1119	
\$\$\$ERN	001	0080	1173	
\$\$\$FUN	001	0010	1124	
\$\$\$NLN	001	00A0	1169	
\$\$\$STD	001	0081	1118	
\$\$\$001	015	116A	2321	
\$\$BNLN	001	0605	1099	1101
\$\$CDBS	001	08C0	1149	
\$\$CDND	001	0666	1108	
\$\$CDRD	001	0890	1147	1149
\$\$CKEY	001	0603	1097	
\$\$CKFF	001	0B3D	1129	
\$\$COFF	001	0B44	1128	
\$\$CSNS	001	209C	1158	
\$\$DATB	001	0BBF	1130	
\$\$EOSA	001	0AFE	1127	
\$\$ERSK	001	1C00	1168	
\$\$FITS	001	1D00	1176	
\$\$FLIB	001	06FF	1175	
\$\$ILEN	001	0601	1093	1095 1099
\$\$ILHD	001	0600	1091	1093
\$\$INLN	001	0607	1106	1108 1110
\$\$INND	001	06FA	1110	
\$\$KBDT	001	09E1	1117	1121
\$\$KBSN	001	09E2	1121	1126
\$\$KLD1	001	0600	1181	
\$\$KLD2	001	0700	1183	
\$\$KLD3	001	0C00	1185	
\$\$LPOS	001	09EB	1126	
\$\$PCNT	001	07E9	1142	
\$\$PLYN	001	2004	1156	
\$\$PRES	001	0890	1115	1117 1127 1128 1129 1130 1147
\$\$PRFL	001	2143	1160	
\$\$PRNT	001	0707	1136	1137 1141 1142 2332 2337 2390 2395 2491 2496 2669 2674
\$\$PRTN	001	0782	1137	
\$\$PSIO	001	07CE	1141	
\$\$PYCD	001	2200	1162	
\$\$PYMP	001	2000	1154	1156 1158 1160 1162
\$\$SLIB	001	1C00	1171	
\$\$TPCD	001	0606	1101	1106
\$\$UPAR	001	0602	1095	1097
\$\$WSPB	001	1E00	1174	
\$\$XIND	001	06FF	1172	1175
\$\$ZERO	001	0000	0223	0224 0226 0227 0228 0232 1154
\$ABORT	001	0010	0336	
\$BASIC	001	0080	0394	
\$BIGCD	001	0080	0470	
\$BLDPL	001	0579	0603	0605
\$BLNOE	001	0569	0593	
\$BLOAD	001	0522	0584	0586 0589 0602 0603

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 37

SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$BLRTN	001	0550	0592	0593
\$BRSAV	001	03C5	0281	0282
\$BSADR	001	0587	0608	0610
\$BUFPT	001	03E3	0489	0490
\$CABLD	001	04B4	0562	0563
\$CAERK	001	0469	0539	0542
\$CAERR	001	03CD	0287	0289
\$CAIPL	001	049D	0558	0560
\$CALLI	001	0008	0479	
\$CARDI	001	0001	0250	
\$CARPL	001	04A1	0560	0562
\$CIENT	001	0483	0549	0550
\$CIEXT	001	0480	0548	0549
\$CIMSK	001	0476	0545	0548
\$CISUS	001	0496	0553	0558 2500 2501* 2678 2679*
\$CLBFR	001	0010	0437	
\$CMDKY	001	0008	0349	
\$CMODE	001	0002	0399	
\$CONFIG	001	03DD	0462	0472
\$CRPOS	001	03E2	0488	0489
\$CRTAD	001	044D	0527	0528
\$CRTAV	001	0002	0343	
\$CRTDN	001	0002	0367	
\$CRTIN	001	03D3	0364	0371
\$CRTNO	001	0004	0346	
\$CRTPU	001	0004	0368	
\$CRTSP	001	0008	0369	
\$CRTUP	001	0001	0366	
\$CRUSH	001	0080	0475	
\$CSDPL	001	050E	0574	0575
\$C0001	001	0464	0531	0537
\$DATE	001	043A	0512	0513
\$DBGUF	001	03E0	0474	0483
\$DBLOK	001	0001	0424	
\$DFDET	001	03E8	0495	0496
\$DISKN	001	0025	0226	2369 3255
\$DKERR	001	0008	0405	
\$DKSIZ	001	03D7	0449	0457 0498
\$DK100	001	0001	0451	
\$DK200	001	0002	0452	
\$DK400	001	0004	0453	
\$DK600	001	0008	0454	
\$DK800	001	0010	0455	
\$DPLSV	001	0449	0523	0525
\$DTNMB	001	0040	0270	
\$DTRDR	001	0040	0358	
\$ENDNU	001	0600	0617	1091 1115 1136 1172 1181 1183 1185 1196
\$ERDPL	001	046F	0542	0544
\$ERFIL	001	0040	0297	
\$ERHRD	001	0004	0429	
\$ERKEY	001	0080	0301	
\$ERLOG	001	0345	0231	
\$ERMAD	001	0472	0544	0545
\$ERPND	001	0004	0402	
\$ERRCT	001	03CF	0303	
\$ERRPG	001	03CE	0291	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 38

SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$ERSFL	001	0035	0296	
\$ERSTK	001	0030	0294	
\$ER050	001	0363	0232	
\$ER1N2	001	0050	0299	
\$EXADR	001	0517	0577	0579
\$EXCMD	001	0001	0331	
\$EXFTR	001	043B	0513	0518
\$FCIND	001	0010	0409	
\$FDIND	001	0040	0416	
\$FEARR	001	0004	0224	
\$FEMAP	001	0588	0610	0611
\$FILIB	001	03DA	0460	0461
\$FITIN	001	0010	0385	
\$FUIND	001	0020	0414	
\$GUFIO	001	0583	0607	0608
\$GUFIR	001	0008	0259	
\$HISTE	001	042E	0510	0511
\$HIST1	001	0435	0511	0512
\$HRDER	001	0020	0355	
\$INDR1	001	03D4	0371	0397
\$INDR2	001	03D5	0397	0422
\$INDR3	001	03D6	0422	0449
\$INLNO	001	03CF	0289	0291 0303 0310
\$INRPT	001	0020	0267	
\$IOIND	001	03D2	0338	0364
\$IOPGS	001	0010	0478	
\$IOYES	001	0002	0253	
\$IPLDV	001	05FF	0614	0617
\$IRKEY	001	0020	0477	
\$KEYBD	001	03E1	0483	0488
\$KEYCD	001	03C3	0247	0281
\$KEYDT	001	0040	0391	
\$KE090	001	00DE	0227	
\$KE130	001	01D5	0228	
\$KYBSY	001	0010	0264	
\$LDRTN	001	0571	0602	
\$LEVEL	001	03DF	0472	0474
\$LIST	001	0002	0426	
\$LMRGN	001	03C1	0242	0244
\$LNPTR	001	0080	0361	
\$LOADB	001	054A	0586	
\$LOADR	001	051A	0579	0582
\$LPRIO	001	03EA	0496	
\$LPROS	001	03E5	0491	0493
\$LPRP3	001	03E4	0490	0491
\$MOUNT	001	0020	0440	
\$MPDWN	001	0001	0340	
\$NEXTB	001	03E6	0493	0494
\$NEXTL	001	03E7	0494	0495
\$NOENB	001	0008	0432	
\$NOLST	001	0004	0256	
\$NUCBS	001	03C0	0239	0240
\$NWRKF	001	0080	0445	
\$NWRKR	001	0040	0442	
\$PASWD	001	042D	0509	0510
\$PAUSD	001	04BA	0563	0565



## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 39

SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$PAUSE	001	0002	0333	
\$PGMDT	001	0020	0388	
\$PGMST	001	0010	0352	
\$PKERT	001	0419	0507	0509
\$PLST1	001	0454	0528	0529
\$PLST2	001	045B	0529	0530
\$PLST3	001	0462	0530	0531
\$PRDEV	001	044B	0525	0527
\$PRESN	001	0002	0376	
\$PROCI	001	0001	0373	
\$PRPOS	001	03C2	0244	0247
\$PSDBR	001	04FA	0568	
\$PSDXR	001	04F2	0567	0568
\$PSTEP	001	0004	0334	
\$PSTMT	001	0008	0335	
\$PTCH1	001	03F5	0498	0502
\$READY	001	0080	0418	
\$REORD	001	0040	0476	
\$RLOAD	001	051E	0582	0584
\$RMGRN	001	03C0	0240	0242
\$RSTR	001	04D6	0565	0567 0569 0574
\$RUNIT	001	0001	0312	
\$SFAID	001	050D	0570	
\$SPRNT	001	0465	0537	0539
\$SRTRN	001	04FE	0569	0570
\$STEPT	001	0002	0313	
\$SWPCR	001	0511	0575	0577
\$TABLN	001	03CB	0284	0287
\$TFLOW	001	0008	0319	
\$TRACE	001	0004	0314	
\$TRALL	001	0010	0320	
\$TROVR	001	054E	0589	0592
\$TRUNK	001	0080	0272	
\$TRVAR	001	0020	0321	
\$UNMSK	001	048D	0550	0553
\$USRDR	001	03DC	0461	0462
\$VMDEF	001	0080	0325	
\$VOLF1	001	03FE	0504	0505
\$VOLF2	001	040E	0506	
\$VOLID	001	03F6	0502	0503 0507
\$VOLR1	001	03F6	0503	0504
\$VOLR2	001	0406	0505	0506
\$WAITF	001	057F	0605	0607 2338 2370 2396 2497 2675
\$WFDEF	001	0040	0519	
\$WFLOK	001	0008	0382	
\$WFNME	001	0443	0518	0523
\$WSIND	001	0004	0379	
\$XIND1	001	03D0	0310	0329 2326 2345
\$XIND2	001	03D1	0329	0338
\$XIND3	001	03D8	0457	0460
\$XPREC	001	0040	0322	2345
\$XRSAB	001	03C7	0282	0284
\$ZTRAD	001	05A2	0611	
\$12K	001	0004	0466	
\$16CKY	001	0008	0468	
\$16K	001	0002	0465	



## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 40

SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$22IMP	001	0001	0463	
###BL	001	0000	0945	
###CK	001	0000	1073	
###CN	001	0000	1041	
###CO	001	0000	0833	
###CS	001	0000	0893	
###DR	001	0000	0637	
###ER	001	0000	0837	
###FS	001	0000	0933	
###IN	001	0000	1077	
###PW	001	0000	1081	
###RS	001	0000	0913	
###SA	001	0000	0901	
###SS	001	0000	0897	
###VU	001	0600	0857	
###0T	001	0700	0629	
###1T	001	0000	0633	
###BCO	001	0600	0645	
###BOV	001	0800	0917	
###DPR	001	0700	0653	
###DRE	001	0889	0669	
###DSP	001	2800	0689	
###ECM	001	0C00	0949	
###EFK	001	0C00	0969	
###ERR	001	0C00	0941	
###EXM	001	0C00	0829	
###FIL	001	0E00	0909	
###FIS	001	0E00	0905	
###FML	001	0200	1037	
###FMS	001	0200	0877	
###GRA	001	0889	0801	
###GUF	001	0C00	0937	
###INL	001	0600	1017	
###INS	001	0600	0641	
###KAL	001	0C00	0805	
###KCA	001	0C00	1021	
###KCH	001	0C00	0773	
###KCN	001	0C00	0889	
###KCT	001	0C00	0741	
###KDE	001	0C00	0737	
###KDI	001	0D00	0817	
###KDN	001	0C00	0725	
###KDO	001	0E00	0821	
###KED	001	0C00	0661	
###KEN	001	0C00	0665	
###KEX	001	0C00	0685	
###KGO	001	0C00	0657	
###KHE	001	0C00	0841	
###KKE	001	0C00	1069	
###KLI	001	0C00	0745	
###KLL	001	0920	1045	
###KLO	001	0C00	0749	
###KME	001	0D00	0729	
###KMO	001	0C00	0673	
###KNA	001	0C00	0785	
###KOV	001	0E00	0705	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 41

SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$\$\$KPA	001	0C00	0681	
\$\$\$KPO	001	0C00	0769	
\$\$\$KPR	001	0C00	0793	
\$\$\$KRE	001	0C00	0713	
\$\$\$KRL	001	0700	0809	
\$\$\$KRM	001	0C00	0677	
\$\$\$KRN	001	0700	0697	
\$\$\$KRO	001	0D00	0701	
\$\$\$KRS	001	0C00	1025	
\$\$\$KRU	001	0C00	0721	
\$\$\$KRV	001	0800	0813	
\$\$\$KSA	001	0C00	0757	
\$\$\$KSE	001	0E00	0797	
\$\$\$KSO	001	0C20	0849	
\$\$\$KSS	001	0C00	0781	
\$\$\$KSV	001	0980	0777	
\$\$\$KSY	001	0C00	0789	
\$\$\$KWI	001	0C00	0717	
\$\$\$KWR	001	0C00	0709	
\$\$\$LOA	001	0600	0649	
\$\$\$MIP	001	0C00	0845	
\$\$\$SDS	001	0C00	0957	
\$\$\$SFF	001	0E00	0961	
\$\$\$SFL	001	0F00	0953	
\$\$\$SFO	001	1500	0925	
\$\$\$SFS	001	0C00	0921	
\$\$\$SPA	001	0C00	0761	
\$\$\$SPO	001	0806	0765	
\$\$\$SPS	001	0C00	0753	
\$\$\$STR	001	1600	0929	
\$\$\$TDC	001	1000	0733	
\$\$\$TSY	001	1000	0693	
\$\$\$TVK	001	0FC0	0869	
\$\$\$UAL	001	0C00	0885	
\$\$\$UAT	001	0900	0981	
\$\$\$UCD	001	0900	0989	
\$\$\$UCN	001	0C00	0973	
\$\$\$UCP	001	0700	0977	
\$\$\$UDE	001	0C00	0993	
\$\$\$UDI	001	0C00	0997	
\$\$\$UEX	001	0C00	0881	
\$\$\$UIN	001	0C00	0985	
\$\$\$UPA	001	0C00	0965	
\$\$\$UPO	001	0C00	1033	
\$\$\$UPT	001	0C00	1029	
\$\$\$VCR	001	2000	0825	
\$\$\$VLO	001	0600	0861	
\$\$\$VOD	001	0600	0865	
\$\$\$VVM	001	0000	0873	
\$\$\$VXI	001	0600	0853	
\$\$\$ZDU	001	1100	1005	2290
\$\$\$ZLB	001	1100	1049	
\$\$\$ZLO	001	1100	1009	
\$\$\$ZLV	001	0F00	1065	
\$\$\$ZL1	001	0F00	1053	
\$\$\$ZL2	001	0F00	1057	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 42

SYMBOL	LEN	VALUE	DEFN	REFERENCES
\$\$\$ZL3	001	0C00	1061	
\$\$\$ZTR	001	1000	1001	
\$\$\$ZUT	001	0C00	1013	
\$\$#BLN	001	18D4	0944	
\$\$#CKT	001	2118	1072	
\$\$#CNF	001	2000	1040	
\$\$#COR	001	0800	0832	
\$\$#CSA	001	1000	0892	
\$\$#DRT	001	0000	0636	
\$\$#ERM	001	0928	0836	
\$\$#FSP	001	1880	0932	
\$\$#INV	001	212C	1076	
\$\$#PWR	001	2300	1080	
\$\$#RSP	001	1780	0912	
\$\$#SAV	001	1180	0900	
\$\$#SSA	001	1128	0896	
\$\$#VUF	001	0B08	0856	
\$\$#0TR	001	0000	0628	
\$\$#1TR	001	0080	0632	
\$\$@#BL	001	0001	0946	
\$\$@#CK	001	0004	1074	
\$\$@#CN	001	0001	1042	
\$\$@#CO	001	003A	0834	
\$\$@#CS	001	003A	0894	
\$\$@#DR	001	0008	0638	
\$\$@#ER	001	0032	0838	
\$\$@#FS	001	0030	0934	
\$\$@#IN	001	003A	1078	
\$\$@#PW	001	00C0	1082	
\$\$@#RS	001	0030	0914	
\$\$@#SA	001	0108	0902	
\$\$@#SS	001	0001	0898	
\$\$@#VU	001	0002	0858	
\$\$@#0T	001	0018	0630	
\$\$@#1T	001	0018	0634	
\$\$@BCO	001	0018	0646	
\$\$@BOV	001	0018	0918	
\$\$@DPR	001	0005	0654	
\$\$@DRE	001	0001	0670	
\$\$@DSP	001	0004	0690	
\$\$@ECM	001	0006	0950	
\$\$@EFK	001	0002	0970	
\$\$@ERR	001	0003	0942	
\$\$@EXM	001	0003	0830	
\$\$@FIL	001	0009	0910	
\$\$@FIS	001	0009	0906	
\$\$@FML	001	0052	1038	
\$\$@FMS	001	0052	0878	
\$\$@GRA	001	0003	0802	
\$\$@GUF	001	0010	0938	
\$\$@INL	001	0010	1018	
\$\$@INS	001	0010	0642	
\$\$@KAL	001	000F	0806	
\$\$@KCA	001	000C	1022	
\$\$@KCH	001	000C	0774	
\$\$@KCN	001	0010	0890	

## CROSS REFERENCE

SYMBOL LEN VALUE DEFN REFERENCES VER 15, MOD 00 08/01/22 PAGE 43

##\$@KCT	001	0009	0742	
##\$@KDE	001	0010	0738	
##\$@KDI	001	0005	0818	
##\$@KDN	001	0010	0726	
##\$@KDO	001	000C	0822	
##\$@KED	001	000E	0662	
##\$@KEN	001	0006	0666	
##\$@KEX	001	0003	0686	
##\$@KGO	001	0002	0658	
##\$@KHE	001	000C	0842	
##\$@KKE	001	0006	1070	
##\$@KLI	001	0011	0746	
##\$@KLL	001	0001	1046	
##\$@KLO	001	0008	0750	
##\$@KME	001	0003	0730	
##\$@KMO	001	0004	0674	
##\$@KNA	001	0008	0786	
##\$@KOV	001	0009	0706	
##\$@KPA	001	0005	0682	
##\$@KPO	001	000D	0770	
##\$@KPR	001	0009	0794	
##\$@KRE	001	0002	0714	
##\$@KRL	001	0004	0810	
##\$@KRM	001	0003	0678	
##\$@KRN	001	0003	0698	
##\$@KRO	001	000A	0702	
##\$@KRS	001	000A	1026	
##\$@KRU	001	0003	0722	
##\$@KRV	001	000D	0814	
##\$@KSA	001	0011	0758	
##\$@KSE	001	0004	0798	
##\$@KSO	001	000D	0850	
##\$@KSS	001	000B	0782	
##\$@KSV	001	0002	0778	
##\$@KSY	001	000F	0790	
##\$@KWI	001	0002	0718	
##\$@KWR	001	0002	0710	
##\$@LOA	001	0013	0650	
##\$@MIP	001	000D	0846	
##\$@SDS	001	0004	0958	
##\$@SFF	001	0008	0962	
##\$@SFL	001	0005	0954	
##\$@SFO	001	0003	0926	
##\$@SFS	001	0011	0922	
##\$@SPA	001	0004	0762	
##\$@SPO	001	0003	0766	
##\$@SPS	001	0001	0754	
##\$@STR	001	0002	0930	
##\$@TDC	001	0003	0734	
##\$@TSY	001	0003	0694	
##\$@TVK	001	0001	0870	
##\$@UAL	001	0011	0886	
##\$@UAT	001	000C	0982	
##\$@UCD	001	000B	0990	
##\$@UCN	001	0009	0974	
##\$@UCP	001	000F	0978	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 44

SYMBOL	LEN	VALUE	DEFN	REFERENCES
#\$@UDE	001	000E	0994	
#\$@UDI	001	0008	0998	
#\$@UEX	001	000E	0882	
#\$@UIN	001	000F	0986	
#\$@UPA	001	0004	0966	
#\$@UPO	001	0005	1034	
#\$@UPT	001	0012	1030	
#\$@VCR	001	0008	0826	
#\$@VLO	001	0002	0862	
#\$@VOD	001	0016	0866	
#\$@VVM	001	0030	0874	
#\$@VXI	001	0002	0854	
#\$@ZDU	001	0008	1006	
#\$@ZLB	001	0002	1050	
#\$@ZLO	001	000C	1010	
#\$@ZLV	001	0006	1066	
#\$@ZL1	001	0007	1054	
#\$@ZL2	001	000D	1058	
#\$@ZL3	001	000A	1062	
#\$@ZTR	001	0001	1002	
#\$@ZUT	001	0014	1014	
#\$BCOM	001	0080	0644	
#\$BOLV	001	1780	0916	
#\$DPRI	001	014C	0652	
#\$DREA	001	0200	0668	
#\$DSPL	001	0240	0688	
#\$ECMA	001	1900	0948	
#\$EFKE	001	1990	0968	
#\$ERRP	001	18C0	0940	
#\$EXMS	001	07D4	0828	
#\$FILN	001	1724	0908	
#\$FIST	001	1700	0904	
#\$FMLN	001	1E00	1036	
#\$FMST	001	0D00	0876	
#\$GRAP	001	0690	0800	
#\$GUFU	001	1880	0936	
#\$INLN	001	1C84	1016	
#\$INST	001	0020	0640	
#\$KALL	001	06A4	0804	
#\$KCAL	001	1CC4	1020	
#\$KCHA	001	053C	0772	
#\$KCND	001	0F80	0888	
#\$KCTL	001	03BC	0740	
#\$KDEL	001	035C	0736	
#\$KDIS	001	0744	0816	
#\$KDNT	001	0300	0724	
#\$KDOV	001	0780	0820	
#\$KEDI	001	0188	0660	
#\$KENA	001	01C4	0664	
#\$KEXT	001	0234	0684	
#\$KGOS	001	0180	0656	
#\$KHEL	001	0A30	0840	
#\$KKEY	001	2100	1068	
#\$KLIS	001	0400	0744	
#\$KLLA	001	2004	1044	
#\$KLOG	001	0444	0748	

## CROSS REFERENCE

SYMBOL LEN VALUE DEFN REFERENCES VER 15, MOD 00 08/01/22 PAGE 45

#\$KMER	001	030C	0728
#\$KMOU	001	0204	0672
#\$KNAM	001	05C0	0784
#\$KOVN	001	0290	0704
#\$KPAS	001	0220	0680
#\$KPOO	001	0508	0768
#\$KPRT	001	063C	0792
#\$KREA	001	02BC	0712
#\$KRLA	001	0700	0808
#\$KRMO	001	0214	0676
#\$KRNU	001	0280	0696
#\$KROV	001	028C	0700
#\$KRSU	001	1D24	1024
#\$KRUN	001	02CC	0720
#\$KRVL	001	0710	0812
#\$KSAV	001	0488	0756
#\$KSET	001	0680	0796
#\$KSOV	001	0AC8	0848
#\$KSSP	001	0594	0780
#\$KSVL	001	058C	0776
#\$KSYM	001	0600	0788
#\$KWID	001	02C4	0716
#\$KWRI	001	02B4	0708
#\$LOAD	001	0100	0648
#\$MIPP	001	0A80	0844
#\$SDSY	001	192C	0956
#\$SFFI	001	193C	0960
#\$SFLO	001	1918	0952
#\$SFOV	001	1844	0924
#\$SFSY	001	1800	0920
#\$SPAC	001	04CC	0760
#\$SPOV	001	04DC	0764
#\$SPSY	001	0484	0752
#\$STRO	001	1850	0928
#\$TDCK	001	0350	0732
#\$TSYK	001	0250	0692
#\$TVKB	001	0BAC	0868
#\$UALL	001	0F00	0884
#\$UATR	001	1A38	0980
#\$UCDI	001	1AD8	0988
#\$UCNF	001	19B8	0972
#\$UCPL	001	19DC	0976
#\$UDEL	001	1B24	0992
#\$UDIS	001	1B5C	0996
#\$UEXL	001	0EA8	0880
#\$UINI	001	1A88	0984
#\$UPAC	001	1980	0964
#\$UPOV	001	1D24	1032
#\$UPTF	001	1D5C	1028
#\$VCRT	001	07B4	0824
#\$VLOA	001	0B80	0860
#\$VODK	001	0B88	0864
#\$VVMR	001	0C00	0872
#\$VXIT	001	0B00	0852
#\$ZDUM	001	1BA4	1004
#\$ZLBM	001	2008	1048

## CROSS REFERENCE

SYMBOL LEN VALUE DEFN REFERENCES VER 15, MOD 00 08/01/22 PAGE 46

#\$ZLOA	001	1BC4	1008
#\$ZLVR	001	20B0	1064
#\$ZL1M	001	2010	1052
#\$ZL2M	001	2030	1056
#\$ZL3M	001	2088	1060
#\$ZTRA	001	1B9C	1000
#\$ZUTM	001	1C14	1012
#@#BAD	001	0455	2114
#@#IO1	001	0459	2122
#@#IO2	001	045D	2123
#@#TAT	001	0941	2150
#@#TBA	001	09A1	2154
#@#TFS	001	0941	2148
#@#TSY	001	0941	2152
#@#VFP	001	0700	2140
#@#VLP	001	093D	2143
#@#WDB	001	050C	2135
#@#WFT	001	0500	2133
@@#BA	001	0001	2115
@@#IO	001	0001	2127
@@#SC	001	0002	2124
@@#TA	001	0010	2151
@@#TB	001	0010	2155
@@#TS	001	0005	2153
@@#TW	001	0020	2149
@@#VM	001	0100	2144
@@#WD	001	00BD	2136
@@#WF	001	0003	2134
@@#04	001	0004	2126
@@#08	001	0008	2125
@@BOV	001	0018	2103
@@ECM	001	0006	2117
@@ERR	001	0003	2111
@@GUF	001	0010	2107
@@LDS	001	0002	2113
@@SDS	001	0004	2109
@@SFF	001	0008	2121
@@SFL	001	0005	2119
@@SFO	001	0005	2129
@@SFS	001	0011	2105
@@VSF	001	0010	2157
@@VSL	001	000F	2158
@@VTR	001	0001	2142
#@BOVL	001	0400	2102
#@ECMA	001	0481	2116
#@ERRP	001	0441	2110
#@GUFU	001	0401	2106
#@LDSV	001	044D	2112
#@SDSY	001	04AD	2108
#@SFFI	001	04BD	2120
#@SFLO	001	0499	2118
#@SFOV	001	04C4	2128
#@SFSY	001	0480	2104
#@VSFI	001	09A1	2156
#@VTRL	001	0708	2141
#@WAF1	001	0401	2101

CROSS REFERENCE																
SYMBOL	LEN	VALUE	DEFN	REFERENCES	VER 15, MOD 00 08/01/22 PAGE 47											
#@WAR1	001	0400	2100													
#ZDUM	001	1107	2294													
#ZDUMP	001	0000	0001													
@M550	001	110B	2305	2307	2333											
@M551	001	110F	2309	2311	2391											
@T550	001	1113	2313													
@T551	001	1136	2316													
@ARR	001	0008	0016	3223*	3224	3225*	3226	3322								
@ASIGN	001	007C	0071													
@ASTER	001	005C	0069													
@BCRDL	001	0050	0088													
@BE	001	0081	0043													
@BF	001	0090	0052													
@BH	001	0084	0041													
@BL	001	0082	0042													
@BLANK	001	0040	0065													
@BM	001	0082	0054													
@BNE	001	0001	0046													
@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	2403*	2405*	2406*	2407*	2411	2412	2413	2413*	2414	3219	3220	3222*	
				3223	3224	3225	3226	3228	3229	3229	3230	3232	3233	3235	3237	
				3237	3238	3238	3239	3241	3243	3244	3244	3245	3247	3249	3250	
				3250	3251	3251	3252	3252	3253	3260*	3280	3280	3282	3282	3283	
				3284	3285	3285	3286	3286	3287	3288	3288	3289	3290	3291	3291	
				3292	3294	3294	3295	3295	3296	3296	3297	3297	3298	3319	3320	
				3321*	3322	3324	3324	3325	3326	3331	3331	3333	3333	3334	3334	
				3335	3337	3337	3338	3339*								
@BT	001	0010	0051													
@BZ	001	0081	0055													
@B1	001	0001	0063	3325	3326											
@CADDR	001	0002	0142	1945	1946	1947	2307	2311	2368	2370	2427	2428	2444	2445	2462	



## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 48

SYMBOL	LEN	VALUE	DEFN	REFERENCES
@DADDR	001	0002	0140	3228
@DBFR1	001	0004	0129	3295*
@DBFR2	001	0005	0130	
@DCALK	001	0001	0081	
@DCBCY	001	0009	0115	1774
@DCBT1	001	0050	0117	1777
@DCNT	001	0003	0128	3277
@DCST1	001	0040	0116	1775
@DCTRL	001	0000	0125	
@DCYL	001	0001	0126	3265
@DD2	001	0003	0030	
@DGET	001	0001	0134	2821
@DOLAR	001	005B	0068	
@DOP2	001	0004	0028	3224* 3228* 3229* 3300 3301
@DPLNG	001	0006	0132	3230 3264
@DPOS	001	0000	0133	
@DPUT	001	0002	0135	
@DSAD	001	0002	0127	3266
@DSBCY	001	0004	0106	1712
@DSCS1	001	0000	0107	1713
@DSIVF	001	0003	0138	
@DSPIN	001	0002	0131	
@DTRSZ	001	0018	0085	
@DVBCY	001	0007	0108	1771 2822
@DVRFY	001	0031	0136	
@DWAIT	001	00FF	0137	
@DWBCY	001	0005	0103	1768
@DWSIZ	001	00C0	0105	
@DWTB1	001	0003	0104	1769
@DZERO	001	00F0	0064	
@D1	001	0002	0026	3325* 3337*
@EOF	001	001C	0077	
@EOFTC	001	0075	0162	
@EOS	001	001E	0076	1784
@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	
@FLENT	001	0004	0201	
@FLFNA	001	0002	0199	
@FLHLN	001	0002	0209	
@FLLNC	001	0002	0194	
@FLNSC	001	0001	0211	
@FLSD	001	0001	0207	
@HDRLN	001	0007	0092	1136
@IAR	001	0010	0017	
@INDEX	001	0001	0156	0157
@INST3	001	0003	0032	
@INST4	001	0004	0033	2351* 2356* 2508 2514 2519 2532 2537 2620 2626 2633 2689 2697
@INST5	001	0005	0034	2353* 2358*
@INST6	001	0006	0035	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 49

SYMBOL	LEN	VALUE	DEFN	REFERENCES
@I1IAR	001	00C0	0020	
@LINSZ	001	00F4	0084	1110
@MAPEN	001	0005	0089	
@MINCR	001	2000	0083	
@MINUS	001	0060	0080	
@NOP	001	0080	0040	2500 2678 2688 3233
@NUMBR	001	007B	0070	
@OPD2	001	0004	0029	
@OP1	001	0003	0027	2598* 3220* 3226* 3320* 3322*
@OP2	001	0005	0031	
@PCTRL	001	0000	0149	
@PDATA	001	0003	0151	
@PGCSZ	001	0020	0082	0083
@PPLNG	001	0004	0148	
@PRCNT	001	0001	0150	
@PRETR	001	00C0	0154	2305 2309
@PRINT	001	0040	0152	0154
@PSR	001	0004	0015	
@PWAIT	001	00FF	0158	
@P1IAR	001	0020	0018	
@P2IAR	001	0040	0019	
@Q	001	0001	0024	2350* 2354* 2355* 2359* 2360* 2361* 2362* 2363* 2506 2509* 2512 2517 2530 2535 2540 2551 2556 2569* 2571* 2583* 2615* 2618 2624 2631 2635 2643 2660 2687 2690* 2692* 2695 3232* 3233* 3243* 3249* 3275 3276 3278 3287* 3289 3326* 3334 3334* 3337
@REGL	001	0002	0012	
@RETRN	001	0080	0153	0154
@RLDWN	001	004F	0159	
@RTRNC	001	0080	0161	
@SBLN	001	0005	0170	
@SBLNL	001	0002	0184	
@SCTSZ	001	0100	0100	
@SDFLN	001	0007	0090	
@SDF0	001	0000	0166	
@SDF1	001	0001	0167	
@SDF2	001	0002	0168	
@SDF3	001	0003	0169	
@SECCY	001	0030	0086	
@SIST	001	0001	0181	
@SLASH	001	0061	0067	
@SLAST	001	0002	0183	
@SMIDL	001	0003	0182	
@SNULL	001	0080	0173	
@SONLY	001	0000	0180	
@STEXT	001	0007	0172	
@STYPE	001	0006	0171	
@TBCNT	001	0000	0160	
@TBLEF	001	0010	0155	0157
@TBLIX	001	0011	0157	
@UCB	001	0087	0039	2501 2507 2513 2518 2679 3287
@UPARW	001	005A	0078	
@VADDR	001	0002	0141	1505 1941 1953 1954 1955 1955 1969 1972 1974 1998 1999 2000 2038 2041 2044 2047 2050 2053 2056 2065 2068 2071 2074 2077
@VENTA	001	0056	0113	1772 2027 2804 2825
@VMDDV	001	00FE	0114	
@VMFD1	001	0000	0109	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 50

SYMBOL	LEN	VALUE	DEFN	REFERENCES
@VMFD2	001	0001	0110	
@VMRS3	001	0002	0112	
@VMTRL	001	0001	0111	
@VOLID	001	0006	0091	
@VQ	001	0001	0025	2539 2550 2642 2659
@WSFIT	001	0500	0101	
@WSTBL	001	0503	0102	
@XR	001	0002	0014	2371* 2380 2382 2384 2404 2424 2441 2459 2477 2504* 2539 2593 2596 2598 2599 2599* 2601* 2602 2603* 2612 2628* 2642 2682* 3328
@ZERO	001	0000	0062	3232
B\$ADMK	001	0001	1409	
B\$ADSW	001	159D	1408	
B\$ARMK	001	0001	1394	
B\$ARSW	001	0A45	1393	
B\$BABF	001	1D00	1199	
B\$BCKT	001	1590	1321	
B\$BDPL	001	19E8	1273	
B\$BDSA	001	19EA	1274	
B\$BINO	001	1A6A	1337	
B\$BRLN	001	19F1	1272	
B\$BROP	001	1AF7	1378	
B\$BRVA	001	19EF	1271	
B\$BRVP	001	19EE	1270	
B\$BTAB	001	1996	1269	
B\$CADR	001	1AF9	1379	
B\$CASA	001	0000	1214	
B\$CASC	001	0671	1218	
B\$CASM	001	0608	1216	
B\$CBAS	001	14BB	1344	
B\$CBFA	001	0CBC	1299	
B\$CCGT	001	0600	1224	
B\$CCLS	001	0695	1230	
B\$CCON	001	001F	1297	
B\$CDAT	001	0600	1210	
B\$CDEF	001	0600	1211	
B\$CDIM	001	0673	1212	
B\$CDUM	001	0000	1248	
B\$CEND	001	0600	1246	1247
B\$CEOF	001	0600	1247	
B\$CFOR	001	0600	1219	
B\$CGET	001	06A3	1227	
B\$CGSB	001	0690	1225	
B\$CGTO	001	06B3	1223	
B\$CIFA	001	0600	1221	
B\$CIFC	001	0600	1222	
B\$CIMG	001	0600	1236	
B\$CINP	001	0600	1231	
B\$CLTA	001	0000	1213	
B\$CLTC	001	0669	1217	
B\$CLTM	001	0600	1215	
B\$CMAT	001	0600	1237	
B\$CMGT	001	0665	1238	
B\$CMIN	001	06D3	1239	
B\$CMPR	001	069B	1242	
B\$CMPT	001	069B	1241	
B\$CMPU	001	0600	1243	

CROSS REFERENCE																				
SYMBOL	LEN	VALUE	DEFN	REFERENCES													VER 15, MOD 00	08/01/22	PAGE	51
B\$CMRD	001	06D0	1240																	
B\$CNXT	001	0600	1220																	
B\$CPCT	001	0CA8	1302																	
B\$CPRT	001	0600	1234																	
B\$CPRU	001	0600	1235																	
B\$CPSE	001	06E7	1244																	
B\$CPUT	001	0600	1228																	
B\$CPWA	001	0CA6	1373																	
B\$CRAD	001	150D	1343																	
B\$CRBS	001	1509	1345																	
B\$CREA	001	06CF	1232																	
B\$CREM	001	0000	1209																	
B\$CRMK	001	0001	1421																	
B\$CRSR	001	06E3	1233																	
B\$CRST	001	06A6	1229																	
B\$CRSW	001	0E42	1420																	
B\$CRTN	001	06CF	1226																	
B\$CSBF	001	0600	1196	1210	1211	1212	1215	1216	1217	1218	1219	1220	1221	1222	1223					
				1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235					
				1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1249					
				1250	1251	1252	1253													
B\$CSCN	001	14B0	1318																	
B\$CSMK	001	0007	1424																	
B\$CSSW	001	14BC	1423																	
B\$CSTP	001	06D6	1245																	
B\$CSTR	001	14CC	1342																	
B\$CSXA	001	2000	1202																	
B\$CTYP	001	0A5F	1296																	
B\$CVPD	001	0C5D	1301																	
B\$CVPG	001	0CA5	1300																	
B\$CWRK	001	F500	1370																	
B\$DIST	001	0700	1262																	
B\$DLNK	001	1B37	1368																	
B\$DL4T	001	1A6B	1339																	
B\$DPWA	001	0E46	1374																	
B\$DST2	001	073A	1263																	
B\$ERMK	001	0007	1397																	
B\$ERSW	001	0993	1396																	
B\$FACA	001	0E53	1305																	
B\$FAIS	001	15AC	1322																	
B\$FAIW	001	15A0	1323																	
B\$FCON	001	0A46	1295																	
B\$FORT	001	1B0E	1364																	
B\$FPWA	001	15AC	1375																	
B\$FRMK	001	0007	1415																	
B\$FRSW	001	16CC	1414																	
B\$FSC1	001	0E4C	1306																	
B\$FSC2	001	0E4D	1307																	
B\$FSMK	001	0007	1406																	
B\$FSSW	001	0E5C	1405																	
B\$FSVA	001	0E4F	1308																	
B\$FTND	001	1B0B	1366																	
B\$FTPT	001	1B0D	1365																	
B\$FVME	001	15A2	1327																	
B\$FVMP	001	15A4	1328																	
B\$FVMS	001	15A6	1329																	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 52

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B\$FVPE	001	15A8	1324	
B\$FVPP	001	15AA	1325	
B\$FVPS	001	15AC	1326	
B\$GBSW	001	08AF	1399	
B\$GBWK	001	0001	1400	
B\$GETC	001	0867	1276	
B\$GPTR	001	0878	1278	
B\$GTBF	001	1E00	1200	
B\$IFMK	001	0007	1418	
B\$IFSW	001	16E5	1417	
B\$INVT	001	1B38	1358	
B\$KWMK	001	0001	1412	
B\$KWSW	001	159E	1411	
B\$LBAS	001	185E	1349	
B\$LBSV	001	18E7	1347	
B\$LDRP	001	1A00	1197	
B\$LINE	001	07D0	1264	
B\$LIST	001	1853	1331	
B\$LRTN	001	18EB	1348	
B\$LSTR	001	1862	1346	
B\$LTYP	001	18F2	1332	
B\$MATR	001	18F3	1334	
B\$MBMK	001	0007	1433	
B\$MBSW	001	1903	1432	
B\$MFBK	001	1B8F	1360	
B\$MGMK	001	0007	1430	
B\$MGSW	001	18FF	1429	
B\$MPMK	001	0007	1436	
B\$MPSW	001	1981	1435	
B\$MRMK	001	0007	1427	
B\$MRSW	001	0DDE	1426	
B\$NUMC	001	0873	1277	
B\$NXMK	001	0007	1403	
B\$NXSW	001	071D	1402	
B\$PARP	001	0A41	1285	
B\$PBNL	001	0A01	1291	
B\$PCAD	001	0A40	1286	
B\$PCDL	001	09D3	1290	
B\$PCPG	001	0A35	1289	
B\$PECT	001	0A44	1293	
B\$PERC	001	0A39	1292	
B\$PFAE	001	0033	1283	
B\$PFCL	001	009D	1284	
B\$PFNC	001	094E	1281	
B\$PFWP	001	0015	1282	
B\$PNBY	001	0A41	1287	
B\$PPWA	001	0A35	1372	
B\$PRM1	001	1AF3	1376	
B\$PTBF	001	1F00	1201	
B\$PUTC	001	093A	1280	
B\$PVAD	001	0A43	1288	
B\$RMRK	001	1AE6	1341	
B\$RTRN	001	1AF5	1377	
B\$SABF	001	1C00	1198	
B\$SCAN	001	1514	1320	
B\$SCAT	001	13C8	1315	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 53

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B\$SCON	001	001B	1298	
B\$SCVT	001	12E0	1313	
B\$SDPL	001	07DA	1266	
B\$SFAB	001	0E48	1310	
B\$SFNT	001	143C	1316	
B\$SLDT	001	109C	1312	
B\$SLVT	001	1062	1311	
B\$SNAT	001	131A	1314	
B\$SPAT	001	07E0	1267	
B\$SSTA	001	1BAC	1362	
B\$STAS	001	061B	1251	
B\$STIF	001	0606	1253	
B\$STMA	001	061B	1252	
B\$STML	001	0600	1250	
B\$STRL	001	0600	1249	
B\$SVRB	001	0E46	1309	
B\$SYMB	001	0DBC	1304	
B\$TCD2	001	0001	1382	
B\$TLTH	001	0002	1383	1384
B\$TOD1	001	0000	1381	
B\$TOTB	001	1AF8	1384	
B\$TTAB	001	1AFA	1380	1384
B\$TYPE	001	0739	1265	
B\$WORK	001	15A0	1369	
B\$ZDBN	001	19F2	1336	
B@ABAS	001	0007	1969	
B@ACD1	001	0001	1966	1967
B@ACD2	001	0003	1967	1968
B@AFLG	001	0000	1961	
B@ALLA	001	005C	1786	
B@AMAX	001	0005	1968	1969
B@BLNK	001	0040	1795	2375
B@BLSZ	001	0100	1920	2059 2062 2065 2080 2083
B@BREQ	001	0084	1575	
B@BRHI	001	0088	1576	
B@BRLO	001	0082	1574	
B@BRNE	001	0094	1578	
B@BRNH	001	0098	1579	
B@BRNL	001	0092	1577	
B@CADD	001	0006	1444	
B@CADF	001	0058	1485	
B@CBAS	001	0003	1972	
B@CBNX	001	004A	1478	
B@CBRA	001	0046	1476	
B@CBRC	001	0044	1475	
B@CBRD	001	0048	1477	
B@CBRS	001	004C	1479	
B@CCLS	001	005E	1488	
B@CCMC	001	0042	1474	
B@CCMF	001	0040	1473	
B@CCNT	001	001F	1898	
B@CCSA	001	003E	1472	
B@CDCA	001	006A	1494	
B@CDDL	001	006C	1495	
B@CDIV	001	000C	1447	
B@CDMN	001	0001	1971	1972

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 54

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@CDWA	001	006E	1496	
B@CEOF	001	0070	1497	2382
B@CEOP	001	0068	1493	
B@CFCI	001	0016	1452	
B@CFN0	001	0012	1450	
B@CFN1	001	0014	1451	
B@CFOR	001	004E	1480	
B@CGET	001	0052	1482	
B@CHAR	001	0000	1911	
B@CHLT	001	0004	1443	
B@CIEX	001	00C5	1871	
B@CIMH	001	0066	1492	
B@CINI	001	0056	1484	
B@CIPI	001	00D7	1874	
B@CIS2	001	00E2	1877	
B@CMF1	001	0018	1453	
B@CMF2	001	001A	1454	
B@CMF3	001	001C	1455	
B@CMA	001	006B	1806	
B@CMPY	001	000A	1446	
B@CMSM	001	001E	1456	
B@CNEG	001	0010	1449	
B@CNXT	001	0050	1481	
B@COLN	001	007A	1808	
B@CPMK	001	00FF	1716	1720 1724 1725 1759
B@CPRS	001	0060	1489	
B@CPRU	001	0062	1490	
B@CPUT	001	0054	1483	
B@CPWR	001	000E	1448	
B@CRSR	001	005A	1486	
B@CRST	001	005C	1487	
B@CSA1	001	0036	1468	
B@CSA2	001	0038	1469	
B@CSB1	001	003A	1470	
B@CSC1	001	002A	1462	
B@CSD0	001	002E	1464	
B@CSD1	001	0030	1465	
B@CSD2	001	0032	1466	
B@CSF1	001	0022	1458	
B@CSF2	001	0024	1459	
B@CSTA	001	0034	1467	
B@CSTC	001	0028	1461	
B@CSTF	001	0020	1457	
B@CSTH	001	0064	1491	
B@CSTX	001	003C	1471	
B@CSUB	001	0008	1445	
B@CSVC	001	0002	1442	2380
B@CTYP	001	0020	1896	
B@CUSC	001	002C	1463	
B@CUSF	001	0026	1460	
B@CVAR	001	005B	1785	
B@DAMK	001	0080	1964	
B@DASA	001	00FF	1725	
B@DASC	001	0040	1729	
B@DASM	001	0038	1727	
B@DCGT	001	0050	1735	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 55

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@DCLS	001	0054	1741	
B@DDAT	001	0024	1721	
B@DDEF	001	0034	1722	
B@DDIM	001	0004	1723	
B@DDUM	001	00FF	1759	
B@DEC0	001	00F0	1854	
B@DEC1	001	00F1	1855	
B@DEC2	001	00F2	1856	
B@DEC3	001	00F3	1857	
B@DEC4	001	00F4	1858	
B@DEC5	001	00F5	1859	
B@DEC6	001	00F6	1860	
B@DEC7	001	00F7	1861	
B@DEC8	001	00F8	1862	
B@DEC9	001	00F9	1863	
B@DEND	001	0058	1757	1758
B@DEOF	001	0058	1758	
B@DFOR	001	0028	1730	
B@DGET	001	0040	1738	
B@DGSB	001	0020	1736	
B@DGTO	001	0044	1734	
B@DIFA	001	0048	1732	
B@DIFC	001	004C	1733	
B@DIGS	001	007B	1788	
B@DIMG	001	003C	1747	
B@DINP	001	0000	1742	
B@DIVD	001	0061	1805	
B@DLTA	001	00FF	1724	
B@DLTC	001	0040	1728	
B@DLTM	001	0038	1726	
B@DL01	001	0001	2039	2042
B@DL02	001	0003	2042	2045
B@DL03	001	0005	2045	2048
B@DL04	001	0007	2048	2051
B@DL05	001	0009	2051	2054
B@DL06	001	000B	2054	2057
B@DL07	001	0045	2057	2060
B@DL08	001	0145	2060	2063
B@DL09	001	0245	2063	2066
B@DL10	001	0289	2066	2069
B@DL11	001	02C3	2069	2072
B@DL12	001	02FD	2072	2075
B@DL13	001	0337	2075	2078
B@DL14	001	0371	2078	2081
B@DL15	001	0471	2081	2084
B@DL16	001	0507	2084	
B@DMAT	001	0008	1748	
B@DMGT	001	0044	1749	
B@DMIN	001	0038	1750	
B@DMPR	001	0048	1753	
B@DMPT	001	004C	1752	
B@DMPU	001	0054	1754	
B@DMRD	001	003C	1751	
B@DNXT	001	0044	1731	
B@DPNT	001	004B	1796	
B@DPRT	001	002C	1745	



## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 56

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@DPRU	001	0030	1746	
B@DPSE	001	0050	1755	
B@DPUT	001	0040	1739	
B@DREA	001	000C	1743	
B@DREM	001	00FF	1720	
B@DRSR	001	005C	1744	
B@DRST	001	0050	1740	
B@DRTN	001	005C	1737	
B@DSCY	001	0004	1712	
B@DSIF	001	001C	1761	
B@DSLT	001	0010	1760	
B@DSML	001	0010	1762	
B@DSNS	001	0018	1714	
B@DSS1	001	0000	1713	
B@DSTP	001	0054	1756	
B@DTBN	001	0010	1778	
B@DTB1	001	0050	1777	
B@DTCY	001	0009	1774	
B@DTSN	001	0010	1776	
B@DTS1	001	0040	1775	
B@DTYP	001	0040	1890	
B@DURE	001	0020	1608	
B@DVCY	001	0007	1771	
B@DVC1	001	0056	1772	
B@DWCY	001	0005	1768	
B@DWT1	001	0003	1769	
B@D1MK	001	0080	1962	
B@D2MK	001	00C0	1963	
B@EOST	001	001E	1784	
B@EQUL	001	007E	1810	
B@EXPC	001	00C5	1787	
B@FOFL	001	005C	1789	
B@FVAD	001	0001	1974	
B@GETC	001	0001	1913	
B@GETE	001	00FF	1914	
B@GETS	001	0000	1912	
B@GRTR	001	006E	1807	
B@ICON	001	0050	1869	
B@LADD	001	0001	1513	2910
B@LADF	001	0002	1554	3074
B@LADV	001	0008	1998	2019
B@LBIN	001	0002	1923	1924 1930
B@LBNX	001	0003	1547	3046
B@LBRA	001	0003	1545	3038
B@LBRC	001	0004	1544	3034
B@LBRD	001	0003	1546	3042
B@LBRS	001	0001	1548	3050
B@LCCA	001	0004	1954	
B@LCCC	001	0001	1506	1544
B@LCDV	001	0004	1999	2020
B@LCER	001	0001	1504	1568
B@LCFN	001	0004	1955	
B@LCLN	001	0002	1509	1560 1561 1568
B@LCLS	001	0001	1557	3086
B@LCMC	001	0001	1543	3030
B@LCMF	001	0001	1542	3026

[illegible]

CROSS REFERENCE																
SYMBOL	LEN	VALUE	DEFN	REFERENCES	VER 15, MOD 00 08/01/22 PAGE 58											
B@LETW	001	00E6	1844													
B@LETX	001	00E7	1845													
B@LETY	001	00E8	1846													
B@LETZ	001	00E9	1847													
B@LEXP	001	0008	1886													
B@LFCI	001	0003	1521	2942												
B@LFNA	001	0002	2000	2021												
B@LFN0	001	0003	1519	2934												
B@LFN1	001	0003	1520	2938												
B@LFOR	001	0003	1549	3054												
B@LFRT	001	0004	1941	1942												
B@LGET	001	0003	1551	3062												
B@LGSB	001	0005	1675													
B@LGTO	001	0004	1674													
B@LHLT	001	0001	1512	2906												
B@LIEX	001	0002	1872													
B@LIFN	001	0003	1935													
B@LILP	001	0009	1994	2012	2013	2014	2350	2352	2361	2362	2363	2742	2762	2772	2776	
B@LIMG	001	0001	1686													
B@LIMH	001	0003	1561	3102												
B@LINI	001	0002	1553	3070												
B@LINP	001	0005	1681													
B@LIPI	001	0003	1875													
B@LISP	001	0005	1993	2001	2007	2008	2009	2531	2536	2541	2547	2552	2619	2696	2761	
B@LIS2	001	0005	1878													
B@LIVT	001	0001	1951													
B@LKCL	001	0005	1680													
B@LKFR	001	0003	1671													
B@LKGT	001	0003	1677													
B@LKIF	001	0002	1673													
B@LKON	001	0002	1706													
B@LKPT	001	0003	1678													
B@LKPU	001	000A	1685													
B@LKRR	001	0007	1683													
B@LKRT	001	0005	1679													
B@LKTO	001	0002	1700													
B@LLET	001	0003	1670													
B@LL01	001	0002	2038	2039												
B@LL02	001	0002	2041	2042												
B@LL03	001	0002	2044	2045												
B@LL04	001	0002	2047	2048												
B@LL05	001	0002	2050	2051												
B@LL06	001	0002	2053	2054												
B@LL07	001	003A	2056	2057												
B@LL08	001	0100	2059	2060												
B@LL09	001	0100	2062	2063												
B@LL10	001	0044	2065	2066												
B@LL11	001	003A	2068	2069												
B@LL12	001	003A	2071	2072												
B@LL13	001	003A	2074	2075												
B@LL14	001	003A	2077	2078												
B@LL15	001	0100	2080	2081												
B@LL16	001	0096	2083	2084												
B@LMAT	001	0003	1687													

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 59

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@LMF3	001	0003	1524	2954
B@LMGT	001	0006	1688	
B@LMIN	001	0008	1689	
B@LMPR	001	0008	1692	
B@LMPT	001	0006	1691	
B@LMPU	001	000D	1693	
B@LMPY	001	0001	1515	2918
B@LMRD	001	0007	1690	
B@LMSM	001	0003	1525	2958
B@LNEG	001	0001	1518	2930
B@LNEX	001	0004	1672	
B@LNXT	001	0003	1550	3058
B@LPAR	001	004D	1798	
B@LPRS	001	0002	1558	3090
B@LPRT	001	0005	1684	
B@LPRU	001	0002	1559	3094
B@LPSE	001	0005	1694	
B@LPUT	001	0002	1552	3066
B@LPWR	001	0001	1517	2926
B@LREA	001	0004	1682	
B@LREM	001	0003	1666	
B@LRSR	001	0001	1555	3078
B@LRST	001	0001	1556	3082
B@LRTN	001	0006	1676	
B@LSA1	001	0003	1537	3006
B@LSA2	001	0003	1538	3010
B@LSB1	001	0003	1539	3014
B@LSC1	001	0003	1531	2982
B@LSDF	001	0004	1921	
B@LSD0	001	0003	1533	2990
B@LSD1	001	0003	1534	2994
B@LSD2	001	0003	1535	2998
B@LSF1	001	0003	1527	2966
B@LSF2	001	0003	1528	2970
B@LSKW	001	0002	1937	
B@LSNO	001	0002	1930	
B@LSPT	001	0003	1945	1948
B@LSTA	001	0003	1536	3002
B@LSTC	001	0003	1530	2978
B@LSTE	001	0004	1701	
B@LSTF	001	0003	1526	2962
B@LSTH	001	0003	1560	3098
B@LSTP	001	0004	1695	
B@LSTX	001	0002	1540	3018
B@LSUB	001	0001	1514	2914
B@LSVC	001	0001	1511	2902
B@LTHN	001	0004	1702	
B@LTYP	001	0001	1931	
B@LUFN	001	0002	1938	
B@LUSC	001	0002	1532	2986
B@LUSF	001	0001	1529	2974
B@LVPG	001	0100	2025	2028
B@MINS	001	0060	1804	
B@MULT	001	005C	1801	
B@NAAR	001	001D	1989	2019 2071
B@NCAR	001	001D	1990	2020 2074

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 60

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@NCRV	001	001D	1988	2017 2068
B@NDGT	001	000A	1981	1987
B@NEQL	001	007F	1811	
B@NFRT	001	000A	1940	1942
B@NICN	001	0006	1983	1985
B@NIEL	001	0007	1985	2001 2007 2012
B@NIFN	001	0018	1934	
B@NIVR	001	0001	1984	1985
B@NIVT	001	0057	1950	
B@NLDV	001	0122	1987	2009 2014 2065
B@NLRV	001	001D	1986	2008 2013 2056
B@NLTR	001	001D	1980	1986 1987 1988 1989 1990 1991
B@NSKW	001	0004	1936	
B@NSPT	001	0028	1944	
B@NUFN	001	001D	1991	2021 2077
B@NVPG	001	0100	2024	2028
B@NXHI	001	00E3	1905	
B@NXLO	001	001E	1904	
B@NXZR	001	0080	1903	1904 1905
B@PLUS	001	004E	1799	
B@POWR	001	005A	1800	
B@PREC	001	0020	1892	
B@PROD	001	0023	2001	
B@PRPL	001	0002	1588	
B@PRPN	001	0001	1587	
B@PRPR	001	0004	1590	
B@PRPS	001	0003	1589	
B@PRRC	001	0007	1593	
B@PRRL	001	0008	1594	
B@PRSL	001	0005	1591	
B@PRSS	001	0006	1592	
B@PTAB	001	0000	1946	
B@PTAD	001	0001	1947	
B@PTSA	001	0002	1948	
B@PUD1	001	0006	1604	
B@PUD2	001	0007	1605	
B@PUI0	001	0001	1598	
B@PUI1	001	0004	1599	
B@PUI2	001	0005	1600	
B@PUNL	001	0002	1602	
B@PUNS	001	0003	1603	
B@PUTM	001	0010	1607	
B@RPAR	001	005D	1802	
B@SADV	001	00E8	2019	2022
B@SAVL	001	0B76	2015	2032
B@SAVS	001	065E	2010	2031
B@SCDV	001	0074	2020	2022
B@SCLN	001	005E	1803	
B@SCRV	001	0227	2017	2031 2032
B@SDMK	001	0080	1932	
B@SEXP	001	0004	1885	
B@SFAT	001	0196	2022	2031 2032 2083
B@SFNA	001	003A	2021	2022
B@SFRT	001	0028	1942	
B@SIEL	001	003F	2012	2015
B@SIES	001	0023	2007	2010

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 61

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@SIGN	001	0010	1894	
B@SLDL	001	0A32	2014	2015
B@SLDS	001	05AA	2009	2010
B@SLVL	001	0105	2013	2015
B@SLVS	001	0091	2008	2010
B@SQUO	001	007D	1809	
B@STAT	001	0000	1884	
B@TASA	001	0012	1619	
B@TASC	001	001E	1625	
B@TASM	001	0018	1621	
B@TASS	001	007B	1626	
B@TCGT	001	0030	1634	
B@TCLS	001	0042	1640	
B@TDAT	001	0006	1615	
B@TDEF	001	0009	1616	
B@TDIM	001	000C	1617	
B@TDUM	001	0078	1658	
B@TEND	001	0072	1656	
B@TEOF	001	0075	1657	
B@TFOR	001	0021	1628	
B@TGET	001	0039	1637	
B@TGSB	001	0033	1635	
B@TGTO	001	002D	1633	
B@TIFA	001	0027	1630	
B@TIFC	001	002A	1631	
B@TIFS	001	007D	1632	
B@TIMG	001	0054	1646	
B@TINP	001	0045	1641	
B@TLTA	001	000F	1618	
B@TLTC	001	001B	1622	
B@TLTM	001	0015	1620	
B@TLTS	001	0079	1623	
B@TMAS	001	007C	1627	
B@TMAT	001	0057	1647	
B@TMGT	001	005A	1648	
B@TMIN	001	005D	1649	
B@TMLS	001	007A	1624	
B@TMPR	001	0066	1652	
B@TMPT	001	0063	1651	
B@TMPU	001	0069	1653	
B@TMRD	001	0060	1650	
B@TNXT	001	0024	1629	
B@TPRT	001	004E	1644	
B@TPRU	001	0051	1645	
B@TPSE	001	006C	1654	
B@TPUT	001	003C	1638	
B@TRAC	001	0080	1888	
B@TREA	001	0048	1642	
B@TREM	001	0003	1614	
B@TRSR	001	004B	1643	
B@TRST	001	003F	1639	
B@TRTN	001	0036	1636	
B@TSTP	001	006F	1655	
B@VMC1	001	0056	2027	
B@VMLB	001	F0CD	2032	
B@VMSB	001	F5E5	2031	

## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 62

SYMBOL	LEN	VALUE	DEFN	REFERENCES
B@VMSZ	001	0000	2028	2030 2031 2032
B@VMTB	001	0000	2030	
B@ZNEG	001	00D0	1901	
B@ZPOS	001	00F0	1900	
CVBHEX	001	0DB9	2729	2425 2442 2460 2478 2544 2650
C2DEC5	001	17BC	3318	2600 3319 3321
C2DVAL	005	17FA	3346	2601 3331 3331 3331* 3333 3333
C2D020	003	17CE	3326	3337 3338
C2D030	003	17D1	3328	3325* 3326* 3334 3334* 3335 3337*
C2D040	004	17DB	3333	3329
C2D050	004	17ED	3339	3320*
C2D052	004	17F1	3340	3322*
C2D901	001	17F5	3344	3324 3324 3324
C2D902	001	17F6	3345	3324
C2D903	005	17FF	3347	3324 3324* 3331 3331 3331 3333 3333 3333 3333*
DL4CYL	001	1776	3265	3237*
DL4C01	002	177C	3273	3223 3225 3237
DL4C05	002	177E	3274	3229
DL4C24	003	174D	3276	3250
DL4C48	003	173A	3278	3244 3285 3291
DL4C96	003	1729	3275	3238
DL4DPL	006	177A	3264	3230*
DL4EFD	001	0001	3271	3243 3289
DL4END	001	17BC	3302	
DL4ETB	001	0080	3272	3249
DL4E01	001	0001	3270	3245
DL4E24	001	0018	3269	3247
DL4E48	001	0030	3268	3241 3283
DL4E96	001	0060	3267	3235
DL4ICS	001	1700	3218	2367
DL4LST	001	1775	3263	3256 3265 3266 3277 3295*
DL4SAV	005	1717	3301	3288* 3291* 3294
DL4SCD	001	1777	3266	3235 3238* 3241 3244* 3247 3250* 3251 3251* 3252 3252* 3253* 3282
DL4SCT	001	1778	3277	3288 3294* 3296*
DL4SPT	004	177F	3281	3245 3280 3286* 3295 3296 3297*
DL4WRK	005	1718	3300	3246
DL4010	001	1704	3221	3280* 3282* 3283 3285* 3286 3297
DL4020	005	1714	3228	3219 3222
DL4030	005	171D	3230	3224* 3300 3301
DL4035	003	1722	3232	3228* 3229*
DL4040	003	1728	3235	3298
DL4050	003	1739	3241	3239 3275
DL4060	003	1746	3245	3236 3278
DL4070	003	174C	3247	3242
DL4080	004	1759	3251	3276 3284 3290 3292
DL4100	003	1761	3253	3248
DL4200	003	176A	3258	3232* 3243* 3249* 3289
DL4500	004	177F	3280	3233* 3287*
DL4600	004	17A9	3294	3281
DL4900	004	176D	3260	3258
DL4920	004	1771	3261	3220*
ZDUBFE	001	14DD	2835	3226*
ZDUBFL	001	0041	2726	2375* 2376 2376*
ZDUBF1	001	149D	2809	2376
				2818 2835 2863 2864 2865 2866 2867 2868 2869 2870 2871 2872
				2873 2874 2875 2876 2877



## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 63

SYMBOL	LEN	VALUE	DEFN	REFERENCES
ZDUBF2	001	1F00	2727	2371 2827
ZDUBMK	001	0007	2723	2509 2569 2571 2583 2615 2690 2692
ZDUBRT	001	14E8	2898	2403
ZDUBTI	002	1460	2798	2404* 2405 2406 2407 2799
ZDUCBI	001	1461	2801	2427 2444 2462 2480 2548 2654 2803 2806 2839 2840 2841 2842
				2843 2844 2845 2846 2847
ZDUCBO	001	1475	2807	2428 2445 2463 2481 2549 2655 2851 2852 2853 2854 2855 2856
				2857 2858 2859
ZDUCIA	001	146A	2845	2645
ZDUCIB	001	146B	2846	2773
ZDUCIG	001	1472	2847	2781
ZDUCI1	001	1462	2839	2503* 2573* 2574* 2627* 2681*
ZDUCI2	001	1463	2840	2424*
ZDUCI3	001	1464	2841	2441*
ZDUCI4	001	1465	2842	2459*
ZDUCI5	001	1466	2843	2477*
ZDUCI6	001	1467	2844	2542
ZDUCNT	001	145B	2791	2612* 2617 2694
ZDUCOB	001	1480	2855	2482 2484
ZDUCOF	001	1482	2856	2554
ZDUCOG	001	1488	2857	2663
ZDUCOH	001	148A	2858	2778
ZDUCOJ	001	1498	2859	2786
ZDUCO3	001	1478	2851	2489 2664
ZDUCO5	001	147A	2852	2429
ZDUCO7	001	147C	2853	2446 2447
ZDUCO9	001	147E	2854	2464 2465 2483
ZDUDES	011	1448	2769	2538 2641
ZDUELP	001	0012	2742	
ZDUELU	001	0020	2743	
ZDUEL2	001	0002	2738	2429
ZDUEL4	001	0004	2739	2446
ZDUEL6	001	0006	2740	2464
ZDUEL8	001	0008	2741	2482
ZDUEVA	001	0004	2747	2489 2664
ZDUGET	001	14E2	2820	2368
ZDUICL	001	0002	2716	2503 2627 2681
ZDUILN	002	145E	2795	2412* 2503 2504 2529* 2534* 2623* 2627 2628 2630* 2681
ZDUIL1	001	0004	2719	2351
ZDUIL2	001	0005	2722	2353
ZDUIL3	001	0004	2720	2356
ZDUIL4	001	0005	2721	2358
ZDUINN	001	14E4	2823	2572* 2573 2824
ZDUIN1	001	144C	2774	2351
ZDUIN2	002	1451	2778	2353
ZDUIN3	001	1455	2782	2356
ZDUIN4	002	145A	2786	2358
ZDULCL	001	0001	2714	2412
ZDULLN	001	0004	2718	2602
ZDULNG	001	14DF	2817	2430* 2448* 2466* 2485* 2555* 2634*
ZDULNL	001	0002	2717	2593 2596
ZDULN1	001	0001	2733	2424
ZDULN2	001	0002	2734	2441
ZDULN3	001	0003	2735	2459
ZDULN4	001	0004	2736	2477
ZDUL35	001	0020	2881	2430



## CROSS REFERENCE

VER 15, MOD 00 08/01/22 PAGE 64

SYMBOL	LEN	VALUE	DEFN	REFERENCES
ZDUL37	001	0022	2882	2448
ZDUL39	001	0024	2883	2466
ZDUL41	001	0026	2884	2485
ZDUL43	001	0028	2885	2557
ZDUL49	001	002E	2886	2636
ZDUL51	001	0030	2887	2359
ZDUL65	001	003E	2888	2360
ZDUMNL	001	0003	2748	2411
ZDUMPV	001	1107	2297	
ZDUMSK	001	0001	2711	2384
ZDUNUL	001	0000	2712	2326 2422 2439 2457 2475 2528 2567 2574 2613
ZDUNVC	001	000D	2724	
ZDUOL2	001	0002	2744	2447 2484
ZDUOL4	001	0004	2745	2465 2483
ZDUOL6	001	0006	2746	
ZDUOPD	001	0000	2756	2404 2424 2602
ZDUPIN	001	14E5	2826	2572
ZDUPLD	001	0008	2762	2774
ZDUPLN	001	14A2	2863	2602*
ZDUPLP	001	14CC	2876	2777
ZDUPLU	001	14DA	2877	2785
ZDUPMN	001	14AD	2865	2411*
ZDUPOP	001	14BC	2870	2429*
ZDUPO1	001	14BE	2871	2446*
ZDUPO2	001	14C0	2872	2464*
ZDUPO3	001	14C2	2873	2482*
ZDUPPL	001	14DE	2815	2492 2670
ZDUPSD	001	0004	2761	2543
ZDUPSP	001	14BE	2874	2553
ZDUPSU	001	14CA	2875	2662
ZDUPSW	001	145C	2792	2422 2439 2457 2475 2528 2567 2595* 2613
ZDUPVA	001	14A8	2864	2489* 2664*
ZDUPVC	001	000F	2725	
ZDUPWA	001	14B5	2869	2538* 2641*
ZDUP10	001	14B0	2866	2447*
ZDUP20	001	14B2	2867	2465* 2483*
ZDUP30	001	14B5	2868	2484*
ZDUSWO	001	0001	2713	2595
ZDUTLN	001	0002	2715	
ZDUULD	001	000F	2764	2782
ZDUUSD	001	0007	2763	2646
ZDUWAL	001	000B	2749	2538 2641
ZDU0TD	001	0000	2751	2414
ZDU010	004	116B	2326	2298
ZDU020	004	1172	2332	
ZDU030	004	1182	2345	2327
ZDU040	004	1189	2350	
ZDU050	004	11C9	2367	2346 2575
ZDU060	004	11D9	2375	2516 2693
ZDU070	003	11E3	2380	2629
ZDU075	004	11F5	2390	2381 2383
ZDU080	004	1205	2403	2385
ZDU090	005	121A	2411	
ZDU1LN	001	0F05	2730	2593 2682
ZDU1PD	001	0001	2757	2441 2599
ZDU1TD	001	0001	2752	2413

## CROSS REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES	VER 15, MOD 00	08/01/22	PAGE	65
ZDU100	004	122A	2422	2570 2584 2900 2904 2908 2912 2916 2920 2924 2928 2972 3024				
				3028 3048 3076 3080 3084				
ZDU2LN	001	0F07	2731	2596				
ZDU2PD	001	0002	2758	2459 2593 2596				
ZDU200	004	124D	2439	2616 2984 3016 3020 3064 3068 3072 3088 3092				
ZDU3PD	001	0003	2759	2477				
ZDU300	004	1276	2457	2604 2932 2936 2940 2944 2948 2952 2956 2960 2964 2968 2976				
				2980 2988 2992 2996 3000 3004 3008 3012 3036 3040 3044 3052				
				3056 3060 3108 3112				
ZDU4PD	001	0004	2760					
ZDU4TD	001	0004	2753	2411				
ZDU400	004	129F	2475	3032				
ZDU450	006	12CB	2489	2431 2449 2467 2559				
ZDU460	004	12F3	2505	2506 2508 2509* 2615*				
ZDU470	004	12FE	2511	2505 2512 2514 2569* 2571*				
ZDU480	004	1306	2516	2511 2517 2519 2583*				
ZDU5TD	001	0005	2754	2412				
ZDU500	004	130E	2528	2621 2698				
ZDU505	004	1312	2529	2350* 2530 2532				
ZDU507	004	1319	2534	2363* 2535 2537				
ZDU510	005	1323	2539	2351* 2540				
ZDU520	001	132C	2545	2352*				
ZDU530	006	1331	2550	2353* 2551				
ZDU540	004	1337	2555	2359* 2556				
ZDU600	004	133F	2567	3104				
ZDU610	004	1346	2569					
ZDU620	004	134E	2571	2515				
ZDU630	006	1352	2572	2568				
ZDU700	004	1366	2583	3120				
ZDU710	004	136E	2585	2520				
ZDU800	005	1372	2593	3096 3100				
ZDU820	004	139B	2603	2598*				
ZDU900	005	13A3	2612	3116				
ZDU910	004	13AF	2615					
ZDU915	004	13B7	2617	2361* 2510 2618 2620				
ZDU920	004	13C2	2623	2354* 2624 2626 2699				
ZDU923	006	13C6	2627	2423 2440 2458 2476 2533 2594				
ZDU925	004	13D4	2630	2355* 2622 2631 2633				
ZDU928	004	13D8	2634	2360* 2635				
ZDU930	006	13DC	2641					
ZDU940	005	13E2	2642	2356* 2643 2691				
ZDU950	001	13EB	2651	2357*				
ZDU960	006	13F0	2659	2358* 2660				
ZDU970	004	13FC	2669					
ZDU980	004	141E	2686	2687 2689 2690* 2692*				
ZDU985	004	142A	2692	2686				
ZDU990	004	1432	2694	2362* 2614 2695 2697				
ZUTMON	001	0F08	2728	2341 2399 2502 2585 2597 2680				

TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY = 0

OL105 I THE CODE LENGTH OF #ZDUMP IS 6144 DECIMAL.  
OL103 I TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS 15  
NAME-#ZDUMP,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-R,CATEGORY-000

START ADDRESS	CATEGORY	NAME AND ENTRY	CODE LENGTH HEXADECIMAL	DECIMAL
1100	0	#ZDUMP	1800	6144
OL100	I	THE TOTAL CORE USED BY #ZDUMP IS 6144 DECIMAL.		
OL101	I	THE START CONTROL ADDRESS OF THIS MODULE IS 1100.		
OL104	I	TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS 25		
		NAME-#ZDUMP,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-O		
		1831 *      SAVED/RESTORED AREAS		

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