

ROS1 3803-2 MICROCODE LISTING

PN 1846377 EC 734110

PAGE 1

LOC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT
000000 2 START

F01MAY72 9/04/73
00000030

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6 ***** 00000070
7 * * 00000080
8 * 3803-2 MICROPROGRAM LISTING ROS1 (ALU1) * 00000090
9 * * 00000100
10 * ROS2 AND DATAFLOW CONTROL * 00000110
11 * * 00000120
12 * P/N 1846377 SYSTEM EC 734110 * 00000130
13 * CARD ASSEMBLY 88236252 MODULE EC 734087 * 00000140
14 * * 00000150
15 * © COPYRIGHT INTERNATIONAL BUSINESS MACHINES CORP. 1973 * 00000160
16 * * 00000170
17 ***** 00000180

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22 ***** 00000230
23 ***** BRANCH CONDITIONS ***** 00000240
24 ***** 00000250
25 * * 00000260
26 * DBUS - ACTIVE ANYTIME THE RESULT OF AN ALU OP EQUALS * 00000270
27 * ALL ZERO. * 00000280
28 * NALCO - NO ALU CARRY OUT IS ACTIVE AFTER ADD OPS RESULTING * 00000290
29 * IN NO CARRY OUT. * 00000300
30 * ALUR - ALU ERROR IS ACTIVE WHEN ALU2 HAS HAD ANY ERROR * 00000310
31 * CONDITION DESCRIBED IN SENSE BYTE 12. WHEN THE * 00000320
32 * ERROR OCCURS, ALU2 WILL BE TRAPPED AT LOC 0, STAT D * 00000330
33 * WILL BE SET, AND THIS BRANCH WILL BE MADE ACTIVE. * 00000340
34 * MIFTR - MULTIPLE INTERFACE FEATURE WILL BE ACTIVE IF THE * 00000350
35 * MIS OR SEVEN TRK FEATURES ARE INSTALLED. THIS BRANCH * 00000360
36 * DIFFERS FROM OTHER BOC'S SINCE HARDWARE WILL ALWAYS * 00000370
37 * FORCE PAGE 4 INTO THE HI-ORDER IC LO ORDER IC * 00000380
38 * WILL BE REPLACED FROM THE BOC MICROWORD AS IS DONE * 00000390
39 * NORMALLY. * 00000400
40 * BOPE - BUS OUT PARITY ERROR WILL BE ACTIVE ANYTIME THE * 00000410
41 * CHANNEL BUS OUT REG CONTAINS BAD PARITY. * 00000420

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
42	*				NCUEA	- NOT CONTROL UNIT END ON A INTERFACE WILL BE ACTIVE	*	00000430
43	*					WHEN HARDWARE IS NOT HOLDING A CUE FOR INTERFACE	*	00000440
44	*					A.	*	00000450
45	*				SELO	- SELECT OUT WILL BE ACTIVE ANYTIME THE SELECT OUT	*	00000460
46	*					CHANNEL TAG IS ACTIVE.	*	00000470
47	*				DFLER	- DATA FLOW ERROR WILL BE ACTIVE WHEN DATA FLOW CIRCUIT	*	00000480
48	*					HAVE FOUND AN ERROR CONDITION(E.G.ENVELOPE CHECK).	*	00000490
49	*				CLOCKB	- ALTERNATES WHEN WRITE LOGIC IS WRITING A SUBGROUP IN	*	00000500
50	*					GCR OR EVERY OTHER DATA BYTE IN PE OR NRZI	*	00000510
51	*				ADROUT	- ACTIVE ANYTIME ADDRESS OUT FROM THE CHANNEL IS UP	*	00000520
52	*					AND THE INTERFACE IS ENABLED.	*	00000530
53	*				CMDOUT	- ACTIVE ANYTIME COMMAND OUT FROM THE CHANNEL IS UP.	*	00000540
54	*					AND THE INTERFACE IS ENABLED.	*	00000550
55	*				STATA	- ACTIVE WHEN ALU1'S BIT 4 IN THE STAT REGISTER	*	00000560
56	*					(NOT LSR) IS ON.	*	00000570
57	*				STATB	- ACTIVE WHEN ALU2'S BIT 5 IN THE STAT REGISTER	*	00000580
58	*					(NOT LSR) IS ON.	*	00000590
59	*				SELRST	- SELECTIVE RESET IS ACTIVE WHEN THE CHANNEL ISSUES	*	00000600
60	*					A SELECTIVE RESET(OP-IN UP,OP-OUT DOWN, SUPPRESS	*	00000610
61	*					OUT UP). IN ADDITION, IF ALU1 FORCES A HARD ERROR	*	00000620
62	*					(XFR TO HDWERR), HARDWARE WILL FORCE ALU1 IC TO	*	00000630
63	*					0 AND ENABLE THIS BOC(360 ONLY)	*	00000640
64	*				SVCOUT	- ACTIVE ANYTIME SERVICE OUT FROM THE CHANNEL IS UP	*	00000650
65	*					AND THE INTERFACE IS ENABLED.	*	00000660
66	*				SCB	- SWITCHED TO CHANNEL B(MIS ONLY) IS ACTIVE ONLY	*	00000670
67	*					WHEN THE CONTROL UNIT INTERFACE IS SWITCHED TO	*	00000680
68	*					CHANNEL B.	*	00000690
69	*				PWRRST	- POWER ON RESET IS ACTIVE ON INITIAL POWER UP AND	*	00000700
70	*					WHEN A RESET IS INITIATED VIA THE CE PANEL	*	00000710
71	*					MACHINE RESET PUSHBUTTON	*	00000720
72	*				DREG0	- ACTIVE IF D BUS BIT 0 IS PRESENT	*	00000730
73	*				DREG1	- ACTIVE IF D BUS BIT 1 IS PRESENT	*	00000740
74	*				DREG2	- ACTIVE IF D BUS BIT 2 IS PRESENT	*	00000750
75	*				DREG3	- ACTIVE IF D BUS BIT 3	*	00000760
76	*				DREG4	- ACTIVE IF D BUS BIT 4	*	00000770
77	*				DREG5	- ACTIVE IF D BUS BIT 5	*	00000780
78	*				DREG6	- ACTIVE IF D BUS BIT 6	*	00000790
79	*				DREG7	- ACTIVE IF D BUS BIT 7	*	00000800
80	*				OPRIN	- ACTIVE WHEN OP-IN TO CHANNEL IS UP NOT TO BE	*	00000810
81	*					CONFUSED WITH CTI BIT 7(MICRO-PGM OP-IN)	*	00000820
82	*				SUPO	- ACTIVE WHEN SUPPRESS OUT FROM CHANNEL IS UP	*	00000830
83	*				STATC	- ACTIVE WHEN ALU2'S BIT 6 IN STAT REG IS SET	*	00000840
84	*				STATD	- ACTIVE WHEN ALU2'S BIT 7 IN STAT REG IS SET	*	00000850
85	*				NGENR	- ACTIVE WHEN A GENERAL RESET FOR EITHER INTERFACE	*	00000860
86	*					IS NOT PRESENT	*	00000870
87	*				ISEL	- ACTIVE WHEN CHANNEL HAS INITIATED AN INITIAL	*	00000880
88	*					SELECTION SEQUENCE OR WHEN A POLL IS RECEIVED	*	00000890
89	*					IN RESPONSE TO REQUEST IN	*	00000900
90	*				NCUEB	- NOT CONTROL UNIT END ON B INTERFACE WILL BE ACTIVE	*	00000910
91	*					WHEN HARDWARE IS NOT HOLDING A CUE FOR INTF B.	*	00000920
92	*				OVERRUN-	WILL BE ACTIVE ON READ AND WRITE OP WHEN DATA	*	00000930
93	*					FLOW HAS DETECTED AN OVERRUN CONDITION	*	00000940
94	*				ALLONES-	DATA FLOW IS WRITING ENDING ONES IN GCR ORPE	*	00000950
95	*					OR HAS WRITTEN LAST DATA BYTE IN NRZI	*	00000960

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				96	*****		00000970
				98	*****		00000990
				99	***** TRANSFER DECODES *****		00001000
				100	*****		00001010
				101	*		00001020
				102	*		00001030
				103	*		00001040
				104	*		00001050
				105	*		00001060
				106	*		00001070
				107	*		00001080
				108	*		00001090
				109	*		00001100
				110	*		00001110
				111	*		00001120
				112	*		00001130
				113	*		00001140
				114	*		00001150
				115	*		00001160
				116	*		00001170
				117	*		00001180
				118	*		00001190
				119	*		00001200
				120	*		00001210
				121	*		00001220
				122	*		00001230
				123	*		00001240
				124	*		00001250
				125	*		00001260
				126	*		00001270
				127	*		00001280
				128	*		00001290
				129	*		00001300
				130	*		00001310
				131	*		00001320
				132	*		00001330
				133	*		00001340
				134	*		00001350
				135	*		00001360
				136	*		00001370
				137	*		00001380
				138	*		00001390
				139	*		00001400
				140	*		00001410
				141	*		00001420
				142	*		00001430
				143	*		00001440
				144	*		00001450
				145	*		00001460
				146	*		00001470
				147	*		00001480
				148	*		00001490
				149	*		00001500

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	FO1MAY72	9/04/73
150					*****		00001510
151					*****		00001520
152					***** LOCAL STORE REGISTER(LSR) *****		00001530
153					***** LAYOUT *****		00001540
154					*****		00001550
155					***** LSRO ***** LSR16 *****		00001560
156					*****		00001570
157					* DESC: CONTAINS CURRENT COMMAND * DESC: USED AS LINK REGISTER FOR		00001580
158					* RELATIVE TO SIO/TIO * SUBROUTINE RETURNS		00001590
159					* X'3F' FOR IDLESCAN * USUALLY SERV OUT RESPONSE		00001600
160					* * RETURN FOR STATUS AND		00001610
161					* * SERVICE SUBROUTINES		00001620
162					* * * * *		00001630
163					* SYMBOLIC=CURCOMM * SYMBOLIC=LINK1		00001640
164					* * * * *		00001650
165					* BIT 0* * BIT 0*		00001660
166					* THRU*** COMMAND CODE * THRU*** LO-IC LINK ADDRESS		00001670
167					* BIT 7* * BIT 7*		00001680
168					* * * * *		00001690
169					*****		00001700
170					***** LSR1 ***** LSR17 *****		00001710
171					*****		00001720
172					* DESC: USED TO CONTAIN AN IMAGE * DESC: USED AS A LINK REGISTER		00001730
173					* OF THE HARDWARE CHANNEL * FOR SUBROUTINE RETURNS		00001740
174					* TAG REG. THE ALU MODIFIES * USUALLY CMD OUT RESPONSE		00001750
175					* THIS LSR AND XFR'S IT * FOR STATUS AND SERVICE		00001760
176					* TO THE HARDWARE REG TO * SUBROUTINES		00001770
177					* CHANGE CHANNEL INBOUND TAG * * * * *		00001780
178					* STATES. * * * * *		00001790
179					* * * * *		00001800
180					* SYMBOLIC=CTIMAGE * SYMBOLIC=LINK2		00001810
181					* * * * *		00001820
182					* BIT0=HOLDA * BIT 0*		00001830
183					* THE CHAINING/HOLD INTFC A * THRU*** LO-IC LINK ADDRESS		00001840
184					* BIT IS USED TO PREVENT * BIT 7*		00001850
185					* METER AND INTERFACE DISABL * * * * *		00001860
186					* BIT1=HOLDB * * * * *		00001870
187					* SAME FUNCTION AS BIT 0 EX- * * * * *		00001880
188					* CEPT FOR B INTERFACE * * * * *		00001890
189					* BIT2=HOLDINT * * * * *		00001900
190					* IF ACTIVE,HARDWARE WILL * * * * *		00001910
191					* HOLD THE CURRENT INTERFACE * * * * *		00001920
192					* SWITCH POSITION AND WILL * * * * *		00001930
193					* ENABLE SHORT BUSY TO THE * * * * *		00001940
194					* OPPOSITE INTERFACE. * * * * *		00001950
195					* BIT3=CUBUSY * * * * *		00001960
196					* NOTIFIES HARDWARE TO MAIN- * * * * *		00001970
197					* TAIN THE INTERFACE SWITCH * * * * *		00001980
198					* CONNECTION AND PRESENT A * * * * *		00001990
199					* SHORT BUSY SEQUENCE IF * * * * *		00002000
200					* SELECTED BY CHANNEL. ALU1 * * * * *		00002010
201					* IS NOT SUBJECT TO INIT SEL * * * * *		00002020
202					* TRAP WHILE THIS BIT IS * * * * *		00002030
203					* ACTIVE. * * * * *		00002040

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
204	*			BIT4=SVCIN	*		*	00002050
205	*			USED TO RAISE OR DROP SERV-	*		*	00002060
206	*			IN TO THE CHANNEL	*		*	00002070
207	*			BITS5=STSIN	*		*	00002080
208	*			USED TO RAISE OR DROP	*		*	00002090
209	*			STATUS-IN TO THE CHANNEL.	*		*	00002100
210	*			BIT6=ADDIN	*		*	00002110
211	*			USED TO RAISE OR DROP	*		*	00002120
212	*			ADDRESS-IN TO THE CAHNNEL.	*		*	00002130
213	*			BIT7=OPIN	*		*	00002140
214	*			USED TO RAISE OR DROP OP-IN*	*		*	00002150
215	*			TO THE CHANNEL. THE ACTUAL*	*		*	00002160
216	*			OP-IN LINE IS INTERLOCKED *	*		*	00002170
217	*			WITH THE SELECT SIGNAL SO *	*		*	00002180
218	*			THAT OP-IN CAN ONLY BE	*		*	00002190
219	*			RAISED IF THE CONTROLLER	*		*	00002200
220	*			IS SELECTED.	*		*	00002210
221	*				*		*	00002220
222	*			*****	*		*	00002230
223	*			***** LSR2 ***** LSR18 *****	*		*	00002240
224	*			*****	*		*	00002250
225	*			DESC: USED TO CONTAIN AN IMAGE	*	DESC: USED AS A LINK REGISTER	*	00002260
226	*			OF THE HARDWARE ALU1'A'	*	FOR SUBROUTINE RETURNS	*	00002270
227	*			CROSSOVER REG. THE CROSS-	*	USUALLY A HALT I/O DURING	*	00002280
228	*			OVER REG IS USED BY HARD-	*	STATUS AND SERVICE	*	00002290
229	*			WARE FOR DATA FLOW CONTROL*	*	SUBROUTINES.	*	00002300
230	*				*		*	00002310
231	*			SYMBOLIC=XOUTA	*	SYMBOLIC=LINK3	*	00002320
232	*				*		*	00002330
233	*			BIT0=CONTROL	*	BIT 0*	*	00002340
234	*			INDICATES CONTROL COMMAND	*	THRU*** LO-IC LINK ADDRESS	*	00002350
235	*			TO DATA FLOW	*	BIT 7*	*	00002360
236	*			BIT1=FOUR BITS OF	*		*	00002370
237	*			T MODE 1 SET	*		*	00002380
238	*			BIT=FROM CHANNEL	*		*	00002390
239	*			BIT5=WRITE	*		*	00002400
240	*			BIT6=MODE6250	*		*	00002410
241	*			INDICATES 6250BPI TO ROS2	*		*	00002420
242	*			BIT7=NRZMODE	*		*	00002430
243	*			INDICATES NRZI WAS LAST	*		*	00002440
244	*			MODE SET TO ROS2	*		*	00002450
245	*				*		*	00002460
246	*			*****	*		*	00002470
247	*			***** LSR3 ***** LSR19 *****	*		*	00002480
248	*			*****	*		*	00002490
249	*			DESC: CONTAINS CURRENT DEVICE	*	DESC: USED AS A LINK REGISTER	*	00002500
250	*			ADDRESS RELATIVE TO THE	*	FOR DIAGNOSTIC AND SENSE	*	00002510
251	*			LAST COMMAND RECEIVED.	*	SUBROUTINE RETURNS.	*	00002520
252	*				*		*	00002530
253	*			SYMBOLIC=CURADDR	*	SYMBOLIC=LINK4	*	00002540
254	*			BIT 0*	*	BIT 0*	*	00002550
255	*			THRU*** CONTROLLER-DEVICE	*	THRU*** LO-IC LINK ADDRESS	*	00002560
256	*			BIT 7* ADDRESS	*	BIT 7*	*	00002570
257	*			*****	*		*	00002580

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
258					***** LSR4 *****	***** LSR20 *****	00002590
259					*****	*****	00002600
260					DESC: SCRATCH REGISTER USED BY	DESC: USED TO CONTAIN AN IMAGE	00002610
261					VARIOUS ROUTINES.	OF THE HARDWARE ALU1 'B'	00002620
262						CROSSOVER REG. THE 'B'	00002630
263						CROSSOVER IS USED TO KICKOFF	00002640
264						ALU2 AND CONTAINS THE INDEX	00002650
265						VALUE FOR SELECTING ALU2	00002660
266						ROUTINES.	00002670
267							00002680
268					SYMBOLIC=WORK1	SYMBOLIC=XOUTBIM	00002690
269							00002700
270					BIT 0*	BIT 0*	00002710
271					THRU*** SCRATCH DATA	THRU*** ALU2 ROUTINE INDEX	00002720
272					BIT 7*	BIT 7*	00002730
273							00002740
274					*****	*****	00002750
275					***** LSR5 *****	***** LSR21 *****	00002760
276					*****	*****	00002770
277					DESC: USED HOLD ANY STATUS THAT	DESC: HOLDS ALU1 CATASTROPHIC	00002780
278					IS PENDING TO BE PRESENTED	ERROR DATA UNTIL A SENSE	00002790
279					TO CHANNEL	OP IS PERFORMED	00002800
280							00002810
281					SYMBOLIC=PNDSTS	SYMBOLIC=ALU1ERR	00002820
282							00002830
283					BIT 0=NOT USED	BIT 0=B BUS PARITY OR LSR ADDRESS	00002840
284						ERROR	00002850
285					BIT 1=STATUS MODIFIER	BIT 1=SPARE	00002860
286							00002870
287					BIT 2=CUE	BIT 2=XFR-LOIC ERROR	00002880
288					CONTROL UNIT END		00002890
289					BIT 3=BUSY	BIT 3=INST DECODE HI IC-BOC ERROR	00002900
290							00002910
291					BIT 4=CHANEND	BIT 4=MICROPROGRAM DETECTED ERROR	00002920
292					CHANNEL END		00002930
293					BIT 5=DEVEND	BIT 5=D BUSY PARITY ERROR	00002940
294					DEVICE END		00002950
295					BIT 6=UNITCHK	BIT 6=SPARE	00002960
296					UNIT CHECK		00002970
297					BIT 7=UNITXC	BIT 7=BOC ERROR	00002980
298					UNITEXCEPTION		00002990
299							00003000
300					*****	*****	00003010
301					***** LSR6 *****	***** LSR22 *****	00003020
302					*****	*****	00003030
303							00003040
304					DESC: CONTAINS DEVICE ADDRESS	DESC: HOLDS ALU2 CATASTROPHIC	00003050
305					FOR WHICH ALU1 IS HOLDING	ERROR DATA UNTIL A SENSE	00003060
306					PENDING STATUS.	OP IS PERFORMED.	00003070
307							00003080
308					SYMBOLIC=PNDADDR	SYMBOLIC=ALU2ERR	00003090
309							00003100
310					BIT 0*	BIT 0*	00003110
311					THRU***DEVICE ADDRESS	THRU***SAME AS ALU1ERR(LSR21)	00003120

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
312	*			BIT 7*	* BIT 7* EXCEPT DATA IS FOR ALU2.	*	00003130
313	*					*	00003140
314	*			*****	*****	*	00003150
315	*			***** LSR7 *****	***** LSR23 *****	*	00003160
316	*			*****	*****	*	00003170
317	*			DESC: CONTAINS ALU1'S SENSE	DESC: SCRATCH REGISTER USED BY	*	00003180
318	*			DATA FOR SENSE BYTE 0	VARIOUS ROUTINES	*	00003190
319	*					*	00003200
320	*			SYMBOLIC=SNSSTS2	SYMBOLIC=WORK2	*	00003210
321	*					*	00003220
322	*			BIT 0=CMDREJ	BIT 0*	*	00003230
323	*			COMMAND REJECT	THRU*** SCRATCH DATA	*	00003240
324	*			BIT 1=INTREQ	BIT 7*	*	00003250
325	*			INTERVENTION REQUIRED		*	00003260
326	*			BIT 2=BUSOC		*	00003270
327	*			BUS OUT CHECK		*	00003280
328	*			BIT 3=EQUIPCK		*	00003290
329	*			EQUIPMENT CHECK		*	00003300
330	*			BIT 4=DATAACK		*	00003310
331	*			DATA CHECK		*	00003320
332	*			BIT 5=OVERUN		*	00003330
333	*			OVERRUN		*	00003340
334	*			BIT 6=WDCNT0		*	00003350
335	*			WORK COUNT 0		*	00003360
336	*			BIT 7=RDNOISE		*	00003370
337	*			READ NOISE(PE OR RLC)		*	00003380
338	*					*	00003390
339	*			*****	*****	*	00003400
340	*			***** LSR8 *****	***** LSR24 *****	*	00003410
341	*			*****	*****	*	00003420
342	*			DESC: USED AS IMAGE LSR FOR	DESC: USED AS A LINK REGISTER	*	00003430
343	*			HARDWARE ALU1 STAT REG	FOR SUBROUTINE RETURN	*	00003440
344	*				IN THE DIAGNOSTIC DMR	*	00003450
345	*				ROUTINE.	*	00003460
346	*					*	00003470
347	*			SYMBOLIC=STATIMG	SYMBOLIC=LINKS	*	00003480
348	*					*	00003490
349	*			BIT 0=STOP	BIT 0*	*	00003500
350	*			INDICATES CMD OUT RESPONSE	THRU*** LO-IC LINK ADDRESS	*	00003510
351	*			TO SERVICE IN.	BIT 7*	*	00003520
352	*			BIT 1=SENSE		*	00003530
353	*			NOTIFIES DATA FLOW TO GATE		*	00003540
354	*			OUT THEIR SENSE DATA		*	00003550
355	*			BIT 2=NOT USED		*	00003560
356	*					*	00003570
357	*			BIT 3=DIAGMODE		*	00003580
358	*			INDICATES TO DATA FLOW		*	00003590
359	*			THAT DIAGNOSTIC MODE IS		*	00003600
360	*			IN EFFECT.		*	00003610
361	*			BIT4 =STATA		*	00003620
362	*			USED BY ALU1 AS A DIRECT		*	00003630
363	*			BRANCH CONDITION		*	00003640
364	*			BIT 5=STATB		*	00003650
365	*			USED BY ALU2 AS A DIRECT		*	00003660

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
366	*				BRANCH CONDITION	*		* 00003670
367	*				BIT 6=USED BY ALU2 AS A DIRECT	*		* 00003680
368	*				BRANCH CONDITION	*		* 00003690
369	*				BIT 7=STATD	*		* 00003700
370	*				USED BY ALU2 AS A DIRECT	*		* 00003710
371	*				BRANCH CONDITION	*		* 00003720
372	*				*****	*		* 00003730
373	*				***** LSR9 ***** LSR25 *****	*		* 00003740
374	*				*****	*		* 00003750
375	*				DESC: USED TO HOLD FLAGS	*		* 00003760
376	*				PERTAINING TO THE CHANNEL	*		* 00003770
377	*				INTERFACE AND ETC.	*		* 00003780
378	*					*		* 00003790
379	*				SYMBOLIC=FLAGS	*		* 00003800
380	*					*		* 00003810
381	*				BIT 0=CONCON	*		* 00003820
382	*				SET IF CONTINGENT CONN-	*		* 00003830
383	*				ECTION IS BEING MAINTAINED.	*		* 00003840
384	*				BIT 1=CUEA	*		* 00003850
385	*				SET IF CONTROL UNIT END	*		* 00003860
386	*				CONDITION WAS FOUND FOR	*		* 00003870
387	*				INTERFACE A.	*		* 00003880
388	*				BIT 2=INTFB	*		* 00003890
389	*				SET IF INTERFACE B IS	*		* 00003900
390	*				SELECTING.	*		* 00003910
391	*				BIT 3=CUEB	*		* 00003920
392	*				SET IF CONTROL UNIT END	*		* 00003930
393	*				CONDITION WAS FOUND FOR	*		* 00003940
394	*				INTERFACE B.	*		* 00003950
395	*				BIT 4=RESETOK	*		* 00003960
396	*				SET IF A GENERAL RESET TO	*		* 00003970
397	*				ALL DEVICES HAS BEEN PER-	*		* 00003980
398	*				FORMED. PREVENTS RESETTING	*		* 00003990
399	*				ALL DEVICES TWICE WHEN A	*		* 00004000
400	*				GENERAL RESET IS ISSUED TO	*		* 00004010
401	*				AN MIS MACHINE ON A SINGLE	*		* 00004020
402	*				CPU.	*		* 00004030
403	*				BIT 5=STATPNDG	*		* 00004040
404	*				SET IF CONTROLLER IS	*		* 00004050
405	*				PRESENTING PENDING STATUS	*		* 00004060
406	*				WHEN PENDING STATUS IS	*		* 00004070
407	*				BEING HELD. CHANNEL MUST	*		* 00004080
408	*				ACCEPT PENDING STATUS	*		* 00004090
409	*				BEFORE CONTROLLER IS FREE.	*		* 00004100
410	*				FOR OTHER OPS.	*		* 00004110
411	*				BIT 6=STACK	*		* 00004120
412	*				SET IF CHANNEL RESPONDS TO	*		* 00004130
413	*				STATUS IN WITH CMD OUT.	*		* 00004140
414	*				DEPENDING ON THE STATUS	*		* 00004150
415	*				THIS FLAG MAY OR MAY NOT	*		* 00004160
416	*				BE SET.	*		* 00004170
417	*				BIT 7=CHAIN	*		* 00004180
418	*				SET IF CHANNEL RESPONDS	*		* 00004190
419	*				TO STATUS IN WITH SERV OUT	*		* 00004200

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
420	*			*	AND SUPPRESS OUT IS UP	*	00004210
421	*			*		*	00004220
422	*****			*****		*****	00004230
423	*****			*****	LSR10 ***** LSR26 *****	*****	00004240
424	*****			*****		*****	00004250
425	*			*	DESC: UPPER FOUR BITS ARE USED	*	00004260
426	*			*	AS FLAGS LOWER FOUR BITS	*	00004270
427	*			*	ARE IMAGE FOR THE REQUEST	*	00004280
428	*			*	IN TAGS REG IN HARDWARE	*	00004290
429	*			*	(MIST)	*	00004300
430	*			*		*	00004310
431	*			*	SYMBOLIC=FLAGS1 AND REQTAGS	*	00004320
432	*			*		*	00004330
433	*			*	BIT 0=BNRZI	*	00004340
434	*			*	USED TO INDICATE A NRZI	*	00004350
435	*			*	MODE SET(X'CB') WAS THE	*	00004360
436	*			*	LAST RECIEVED ON B INTF	*	00004370
437	*			*		*	00004380
438	*			*	BIT 1=ANRZI	*	00004390
439	*			*	USED TO INDICATE A NRZI	*	00004400
440	*			*	MODE SET(X'CB')S AS THE	*	00004410
441	*			*	LAST RECIEVED ON A INTF	*	00004420
442	*			*	BIT 2=CURFLAG	*	00004430
443	*			*	INDICATES CONTROL UNIT IS	*	00004440
444	*			*	RESERVED TO THE CURRENT	*	00004450
445	*			*	INTERFACE.	*	00004460
446	*			*	BIT 3=ALLOWDSE	*	00004470
447	*			*	INDICATES DATA SECURITY	*	00004480
448	*			*	ERASE CAN BE EXECUTED SINC	*	00004490
449	*			*	AN ERASE HAS JUST BEEN	*	00004500
450	*			*	PERFORMED.	*	00004510
451	*			*	BIT 4=SUPREQA	*	00004520
452	*			*	IMAGE BIT FOR SUPPRESSIBLE	*	00004530
453	*			*	REQUEST-IN FOR INTF A.	*	00004540
454	*			*	BIT 5=IMAGE BIT FOR NON-SUPPRESS-	*	00004550
455	*			*	SIBLE REQUEST-IN FOR A.	*	00004560
456	*			*	BIT 6=SUPREQB	*	00004570
457	*			*	IMAGE BIT FOR SUPPRESSIBLE	*	00004580
458	*			*	REQUEST-IN FOR INTF B.	*	00004590
459	*			*	BIT 7=REQINB	*	00004600
460	*			*	IMAGE BIT FOR NON-SUPP-	*	00004610
461	*			*	RESSIBLE REQUEST-IN FOR B.	*	00004620
462	*			*		*	00004630
463	*****			*****		*****	00004640
464	*****			*****	LSR11 ***** LSR27 *****	*****	00004650
465	*****			*****		*****	00004660
466	*			*	DESC: USED AS THE ALU1 FRU REG	*	00004670
467	*			*	AN HOLDS THE ALU FAILURE	*	00004680
468	*			*	FLAGS.	*	00004690
469	*			*		*	00004700
470	*			*	SYMBOLIC=FLAGS2	*	00004710
471	*			*		*	00004720
472	*			*	BIT 0=FORCEUC	*	00004730
473	*			*	SET ON AN INITIAL ALU	*	00004740

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
474	*				FAILURE. WILL BE RESET * BIT 7*	*	00004750
475	*				ONCE THE UNIT CHECK HAS	*	00004760
476	*				BEEN PRESENTED TO CHANNEL.*	*	00004770
477	*				BIT 1=ALUFAIL	*	00004780
478	*				SET WHEN AN ALU FAILURE	*	00004790
479	*				OCCUR. ONLY RESET ON SENSE*	*	00004800
480	*				OPS.	*	00004810
481	*				BIT 2=A64 INTFA=6250	*	00004820
482	*				BIT3 =B64 INTFB=6250		00004830
483	*				*****		00004840
484	*				***** LSR12 ***** LSR28 *****		00004850
485	*				*****		00004860
486	*				DESC: CONTAINS DIAGNOSTIC FLAGS * DESC: USED AS SCRATCH REG BY	*	00004870
487	*				RECEIVED ON SET DIAGNOSE * SEVEN TRK MODE ROUTINE	*	00004880
488	*				COMMAND.	*	00004890
489	*					*	00004900
490	*				SYMBOLIC=SETDIA1	*	00004910
491	*					*	00004920
492	*				BIT 0=DIAWRT - READ CH BUFFER * BIT 0*	*	00004930
493	*				SET DIAGNOSTIC MODE FOR * THRU*** SCRATCH DATA	*	00004940
494	*				WRITE OR READ OP * BIT 7*	*	00004950
495	*				BIT 1=IBGMSR	*	00004960
496	*				READ OP- DO IBG MEASURE	*	00004970
497	*				BIT 2=INHPOST OR RDACC	*	00004980
498	*				READ OP- DO READ ACCESS	*	00004990
499	*				MEASUREMENT	*	00005000
500	*				WRITE OP-INHIBIT PE POST-	*	00005010
501	*				AMBLE ON NEXT	*	00005020
502	*				WRITE OP.	*	00005030
503	*				BIT 3=GDT	*	00005040
504	*				DO GO-DOWN-TIMING USING	*	00005050
505	*				COUNT IN SETCNT1 AND	*	00005060
506	*				SET CNT2 REGS.	*	00005070
507	*				BIT 4=INHPRE OR RDSTOP	*	00005080
508	*				WRITE OP-INHIBIT PE PRE-	*	00005090
509	*				NEXT WRITAMBLE ON NEXT	*	00005100
510	*				WRITE OP	*	00005110
511	*				READ OP-DO READ STOP	*	00005120
512	*				MEASUREMENT	*	00005130
513	*				BIT 5=DMR OR LWROP	*	00005140
514	*				WRITE OP- DO WRITE IN LWR	*	00005150
515	*				MODE.	*	00005160
516	*				READ OP- DO DIAGNOSTIC	*	00005170
517	*				READ AND MEASURE*	*	00005180
518	*				BIT 6=TUBOMSK	*	00005190
519	*				WRITE OP-MASK TUBO IN ALU2*	*	00005200
520	*				WITH SETCNT1 BYTE*	*	00005210
521	*				DURING NXT WRITE *	*	00005220
522	*				BIT 7=CHGSTS	*	00005230
523	*				EXECUTE NEXT COMMAND UP TO*	*	00005240
524	*				THE POINT OF RAISING MOVE *	*	00005250
525	*				TO DEVICE. ALLOWS CHANG-	*	00005260
526	*				ING DEV STS WITHOUT MOVING*	*	00005270
527	*				TAPE.	*	00005280

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
528	*			*		*	00005290
529	*****			*****		*****	00005300
530	*****	LSR13		*****	LSR29	*****	00005310
531	*****			*****		*****	00005320
532	*	DESC:		* DESC:	CONTAINS ALU1 FRU IDENTIFIER*		00005330
533	*	RECEIVED ON SET		* FOR ALU	CATASTROPHIC ERROR	*	00005340
534	*	COMMAND		* DURING	IDLE	*	00005350
535	*			*		*	00005360
536	*	SYMBOLIC=SETDIA2		* SYMBOLIC=FRUREG		*	00005370
537	*			*		*	00005380
538	*	BIT 0=BLKDC		* BIT 4*		*	00005390
539	*	THIS FLAG WILL BE USED TO		* THRU***	SEQUENCE INDICATOR	*	00005400
540	*	BLOCK A UNIT CHECK DUE TO		* BIT 7*		*	00005410
541	*	DATA CHECK FROM HARDWARE.		*		*	00005420
542	*	USEFUL TO CHAIN DIAG WRITE*		*		*	00005430
543	*	OP.		*		*	00005440
544	*	BIT 1=DEVBSY		*		*	00005450
545	*	THIS FLAG WILL GIVE IMME-		*		*	00005460
546	*	DIATE DEV END DURING CHAIN-		*		*	00005470
547	*	ED REWIND/DSE OPS.		*		*	00005480
548	*	BIT 2=BLKINTS		*		*	00005490
549	*	THIS FLAG WILL BLOCK THE		*		*	00005500
550	*	RAISING OF SUPPRESSIBLE		*		*	00005510
551	*	REQUEST-IN.		*		*	00005520
552	*	BIT 3=SETCUB		*		*	00005530
553	*	WILL FORCE A SHORT BUSY		*		*	00005540
554	*	SEQUENCE IN A CHAIN OF		*		*	00005550
555	*	COMMANDS.		*		*	00005560
556	*	BIT 4=SPARE		*		*	00005570
557	*	BIT 5=SPARE		*		*	00005580
558	*	BIT 6=TEST DISCONNECT IN		*		*	00005590
559	*	BIT 7=LOOP FORMAT		*		*	00005600
560	*****			*****		*****	00005610
561	*****	LSR14		*****	LSR30	*****	00005620
562	*****			*****		*****	00005630
563	*	DESC: HOLDS HI ORDER COUNT FOR		* DESC: FRUSAV		*	00005640
564	*	GO-DOWN-TIMING OR GO-UP		*		*	00005650
565	*	COUNT IN TACHS FOR DMR OR		*		*	00005660
566	*	MASK FOR TUBO		*		*	00005670
567	*	SYMBOLIC=SETCNT1		*		*	00005680
568	*			*		*	00005690
569	*	BIT 0*		*		*	00005700
570	*	THRU*** GO OR GUP COUNT		*		*	00005710
571	*	BIT 7*		*		*	00005720
572	*			*		*	00005730
573	*****			*****		*****	00005740
574	*****	LSR15		*****	LSR31	*****	00005750
575	*****			*****		*****	00005760
576	*	DESC:HOLD LO-ORDER COUNT FOR		* DESC: FORMAT		*	00005770
577	*	GO DOWN-TIME OR GO-DOWN-		*		*	00005780
578	*	COUNT FOR DMR.		*		*	00005790
579	*			*		*	00005800
580	*	SYMBOLIC=SETCNT2		*		*	00005810
581	*			*		*	00005820

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
				582	* BIT 0*	*		00005830
				583	* THRU*	*		00005840
				584	* BIT 7*** GDT COUNT	*		00005850
				585	* *	*		00005860
				586	*	*		00005870
				587	*****	*****		00005880
				588	* BRANCH ON CONDITIONS FOR ***BOC***			00005890
000000				589	#DBUS EQU X'00'	D BUS EQUAL ZERO		00005900
000001				590	#NALCO EQU X'01'	NOT ALU CARRY OUT		00005910
000002				591	#ALUR EQU X'02'	SET ON ANY ALU ERRORS		00005920
000003				592	#MIFTR EQU X'03'	MIS FEATURE		00005930
000004				593	#BOPE EQU X'04'	BUS OUT PARITY EVEN		00005940
000005				594	#NCUEA EQU X'05'	NOT CU END CHAN A		00005950
000006				595	#SELO EQU X'06'	SELECTLOUT A OR B		00005960
000007				596	#DFLER EQU X'07'	DATA FLOW ERROR		00005970
000007				597	#CLOCKB EQU X'07'	CLOCK		00005980
000008				598	#ADROUT EQU X'08'	ADDRESS OUT A OR B		00005990
000009				599	#CMDOUT EQU X'09'	COMMAND OUT A OR B		00006000
00000A				600	#STAT A EQU X'0A'	STAT A ALU 1		00006010
00000B				601	#STAT B EQU X'0B'	STAT B ALU 2		00006020
00000C				602	#SELRST EQU X'0C'	SELECTIVE RESET		00006030
00000D				603	#SVCOUT EQU X'0D'	SERVICE OUT		00006040
00000E				604	#SCB EQU X'0E'	SWITCHED TO CHAN B (MIS)		00006050
00000F				605	#PWRRST EQU X'0F'	POWER ON RESET		00006060
				606	*****	*****		00006070
000010				607	#DREG0 EQU X'10'	D REG 0		00006080
000011				608	#DREG1 EQU X'11'	D REG 1		00006090
000012				609	#DREG2 EQU X'12'	D REG 2		00006100
000013				610	#DREG3 EQU X'13'	D REG 3		00006110
000014				611	#DREG4 EQU X'14'	D REG 4		00006120
000015				612	#DREG5 EQU X'15'	D REG 5		00006130
000016				613	#DREG6 EQU X'16'	D REG 6		00006140
000017				614	#DREG7 EQU X'17'	D REG 7		00006150
000018				615	#OPRIN EQU X'18'	OPERATIONAL IN		00006160
000019				616	#SUPO EQU X'19'	SUPPRESS OUT		00006170
00001A				617	#STATC EQU X'1A'	ALU 2 STAT C		00006180
00001B				618	#STATD EQU X'1B'	ALU 2 STATD		00006190
00001C				619	#NGENR EQU X'1C'	NOT GENERAL RESET FOR CH A OR B		00006200
00001D				620	#ISEL EQU X'1D'	INITIAL SELECTION		00006210
00001E				621	#NCUEB EQU X'1E'	NOT CU END FOR CHAN B (MIS)		00006220
00001F				622	#OVERRUN EQU X'1F'	DATA FLOW DETECTED OVERRUN		00006230
00001F				623	#ALLONES EQU X'1F'	END OF DATA BEING WRITTEN		00006240
				624	*****EQUATE STATEMENTS *****			00006250
				625	* ALU 1 TRANSFER ADDRESSES			00006260
000005				626	RSTCOMTD EQU X'05'	RESET DEV COMMITTED LATCH		00006270
000006				627	LSR EQU X'06'	SELECT HI LSRS		00006280
000011				628	HDWERR EQU X'11'	FORCE ALU ERRORS		00006290
000012				629	CLEAR EQU X'12'	RESET SENSE DATA TO DATA FLOW		00006300
000024				630	TUADR EQU X'24'	TAPE UNIT ADR SELECTION		00006310
000021				631	AR EQU X'21'	ALU INPUT REGISTER		00006320
000060				632	CBI EQU X'60'	CHANNEL BUS IN		00006330
000050				633	CTI EQU X'50'	CHANNEL TAGS IN		00006340
000022				634	IC EQU X'22'	INSTRUCTION COUNTER		00006350
000082				635	INH P EQU X'82'	INHIBIT B BUS PARITY		00006360

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
000084				636	HDWR EQU X'84'	HARDWARE ERRORS ALU 1		00006370
0000A0				637	CBO EQU X'A0'	CHANNEL BUS OUT		00006380
000090				638	XINA EQU X'90'	CROSSOVER REGISTER INPUT A		00006390
000088				639	XINB EQU X'88'	CROSSOVER REGISTER INPUT B		00006400
000042				640	XOUTA EQU X'42'	CROSSOVER REGISTER OUTPUT A		00006410
000041				641	XOUTB EQU X'41'	CROSSOVER REGISTER OUTPUT B		00006420
000028				642	STAT EQU X'28'	GLITCHLESS CTRL REG		00006430
000048				643	MIST EQU X'48'	MIS INTERFACE TAGS		00006440
000044				644	PING EQU X'44'	HARDWARE ERROR RESET		00006450
000014				645	TIP EQU X'14'	TRANSFER TRACK IN ERROR		00006460
000009				646	CUREA EQU X'09'	RESET CU END IN CHANNEL A		00006470
00000A				647	CUREB EQU X'0A'	RESET CU END IN CHANNEL B		00006480
000081				648	EXT EQU X'81'	MOVE ERRORS OF ALU2 TO ALU1		00006490
				649	* USE EXCLUSIVE OR OF STAT C AND D TO DECODE CU IDENT OR ALU ERRORS.			00006500
				651	* **** ALU1 ****			00006520
				653	* REGISTER DEFINITIONS			00006540
000000				654	R0 EQU X'00'	LSR 0		00006550
000001				655	R1 EQU X'01'	LSR 1		00006560
000002				656	R2 EQU X'02'	LSR 2		00006570
000003				657	R3 EQU X'03'	LSR 3		00006580
000004				658	R4 EQU X'04'	LSR 4		00006590
000005				659	R5 EQU X'05'	LSR 5		00006600
000006				660	R6 EQU X'06'	LSR 6		00006610
000007				661	R7 EQU X'07'	LSR 7		00006620
000008				662	R8 EQU X'08'	LSR 8		00006630
000009				663	R9 EQU X'09'	LSR 9		00006640
00000A				664	R10 EQU X'0A'	LSR 10		00006650
00000B				665	R11 EQU X'0B'	LSR 11		00006660
00000C				666	R12 EQU X'0C'	LSR 12		00006670
00000D				667	R13 EQU X'0D'	LSR 13		00006680
00000E				668	R14 EQU X'0E'	LSR 14		00006690
00000F				669	R15 EQU X'0F'	LSR 15		00006700
000010				670	R16 EQU X'10'	LSR 16		00006710
000011				671	R17 EQU X'11'	LSR 17		00006720
000012				672	R18 EQU X'12'	LSR 18		00006730
000013				673	R19 EQU X'13'	LSR 19		00006740
000014				674	R20 EQU X'14'	LSR 20		00006750
000015				675	R21 EQU X'15'	LSR 21		00006760
000016				676	R22 EQU X'16'	LSR 22		00006770
000017				677	R23 EQU X'17'	LSR 23		00006780
000018				678	R24 EQU X'18'	LSR 24		00006790
000019				679	R25 EQU X'19'	LSR 25		00006800
00001A				680	R26 EQU X'1A'	LSR 26		00006810
00001B				681	R27 EQU X'1B'	LSR 27		00006820
00001C				682	R28 EQU X'1C'	LSR 28		00006830
00001D				683	R29 EQU X'1D'	LSR 29		00006840
00001E				684	R30 EQU X'1E'	LSR 30		00006850
00001F				685	R31 EQU X'1F'	LSR 31		00006860
000000				686	CURCOMM EQU X'00'	CURRENT COMMAND RELATIVE TO LAST SIO/TIO		00006870
000001				687	CTIMAGE EQU X'01'	CHANNEL TAG IMAGE REGISTER		00006880
000002				688	XOUTAIM EQU X'02'	CROSSOVER REGISTER A OUTPUT IMAGE REG		00006890
000003				689	CURADDR EQU X'03'	CURRENT DEVICE ADDRESS RELATIVE TO LAST COMMAND		00006900
000004				690	WORK1 EQU X'04'	SCRATCH REGISTER1		00006910
000005				691	PNDSTS EQU X'05'	PENDING STATUS REGISTER		00006920

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
000006				692	PNDADDR	EQU X'06' PENDING STATUS DEVICE ADDRESS REG		00006930
000007				693	SNSSTS2	EQU X'07' SENSE STATUS REG 2		00006940
000008				694	STATIMG	EQU X'08' STAT REGISTER IMAGE REG		00006950
000009				695	FLAGS	EQU X'09' FLAGS REGISTER FOR ALU1		00006960
00000A				696	FLAGS1	EQU X'0A' UPPER FOUR BITS ARE FLAGS		00006970
00000A				697	REQTAGS	EQU X'0A' REQUEST IN TAGS REG FOR A AND B INTFCES		00006980
00000B				698	FLAGS2	EQU X'0B' THIRD FLAGS REG		00006990
00000C				699	SETDIA1	EQU X'0C' SET DIAGNOSE REG 1		00007000
00000D				700	SETDIA2	EQU X'0D' SET DIAGNOSE REG 2		00007010
00000E				701	SETCNT1	EQU X'0E' SET COUNT REG 1		00007020
00000F				702	SETCNT2	EQU X'0F' SET COUNT REG 2		00007030
000010				703	LINK1	EQU X'10' LINK REGISTER 1		00007040
000011				704	LINK2	EQU X'11' LINK REGISTER 2		00007050
000012				705	LINK3	EQU X'12' LINK REGISTER 3		00007060
000013				706	LINK4	EQU X'13' LINK REGISTER 4		00007070
000014				707	XOUTBIM	EQU X'14' CROSSOVER REGISTER B OUTPUT IMAGE REG		00007080
000015				708	ALU1ERR	EQU X'15' ALU1 HARDWARE DETECTED ERRORS		00007090
000016				709	ALU2ERR	EQU X'16' ALU2 HARDWARE DETECTED ERRORS		00007100
000017				710	WORK2	EQU X'17' WORK REGISTER 2		00007110
000018				711	LINK5	EQU X'18' WORK REGISTER 2		00007120
000019				712	LINK6	EQU X'19' WORK REGISTER 2		00007130
00001A				713	SEVMODA	EQU X'1A' SEVEN TRACK MODE REG A		00007140
00001B				714	SEVMODB	EQU X'1B' SEVEN TRACK MODE REG B		00007150
00001C				715	WORK4	EQU X'1C' WORK REGISTER		00007160
00001D				716	FRUREG	EQU X'1D' ALU1 FRU REG		00007170
00001E				717	FRUSAV	EQU X'1E' FRU SAVE LSR		00007180
00001F				718	FORMAT	EQU X'1F' USED FOR FORMAT CONTROL		00007190
				719	*****	THESE LSR EQUATES ARE USED BY LOGICAL MACROS ONLY*****		00007200
				720	*****	AND SHOULD NOT BE CODED *****		00007210
000000				721	#R0	EQU X'00' LSR 0		00007220
000001				722	#R1	EQU X'01' LSR 1		00007230
000002				723	#R2	EQU X'02' LSR 2		00007240
000003				724	#R3	EQU X'03' LSR 3		00007250
000004				725	#R4	EQU X'04' LSR 4		00007260
000005				726	#R5	EQU X'05' LSR 5		00007270
000006				727	#R6	EQU X'06' LSR 6		00007280
000007				728	#R7	EQU X'07' LSR 7		00007290
000008				729	#R8	EQU X'08' LSR 8		00007300
000009				730	#R9	EQU X'09' LSR 9		00007310
00000A				731	#R10	EQU X'0A' LSR 10		00007320
00000B				732	#R11	EQU X'0B' LSR 11		00007330
00000C				733	#R12	EQU X'0C' LSR 12		00007340
00000D				734	#R13	EQU X'0D' LSR 13		00007350
00000E				735	#R14	EQU X'0E' LSR 14		00007360
00000F				736	#R15	EQU X'0F' LSR 15		00007370
000000				737	#R16	EQU X'00' LSR 16		00007380
000001				738	#R17	EQU X'01' LSR 17		00007390
000002				739	#R18	EQU X'02' LSR 18		00007400
000003				740	#R19	EQU X'03' LSR 19		00007410
000004				741	#R20	EQU X'04' LSR 20		00007420
000005				742	#R21	EQU X'05' LSR 21		00007430
000006				743	#R22	EQU X'06' LSR 22		00007440
000007				744	#R23	EQU X'07' LSR 23		00007450
000008				745	#R24	EQU X'08' LSR 24		00007460

LQC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
000009				746	#R25	EQU X'09'	LSR 25	00007470
00000A				747	#R26	EQU X'0A'	LSR 26	00007480
00000B				748	#R27	EQU X'0B'	LSR 27	00007490
00000C				749	#R28	EQU X'0C'	LSR 28	00007500
00000D				750	#R29	EQU X'0D'	LSR 29	00007510
00000E				751	#R30	EQU X'0E'	LSR 30	00007520
00000F				752	#R31	EQU X'0F'	LSR 31	00007530
000000				753	#CURCOMM	EQU X'00'	CURRENT COMMAND RELATIVE TO LAST	00007540
000001				754	#CTIMAGE	EQU X'01'	CHANNEL TAG IMAGE REGISTER	00007550
000002				755	#XOUTAIM	EQU X'02'	CROSSOVER REGISTER A OUTPUT IMAGE REG	00007560
000003				756	#CURADDR	EQU X'03'	CURRENT DEVICE ADDRESS RELATIVE TO LAST COMMAND	00007570
000004				757	#WORK1	EQU X'04'	SCRATCH REGISTER1	00007580
000005				758	#PNDSTS	EQU X'05'	PENDING STATUS REGISTER	00007590
000006				759	#PNDADDR	EQU X'06'	PENDING STATUS DEVICE ADDRESS REG	00007600
000007				760	#SNSSTS2	EQU X'07'	SENSE STATUS DEV 2	00007610
000008				761	#STATIMG	EQU X'08'	STAT REGISTER IMAGE REG	00007620
000009				762	#FLAGS	EQU X'09'	FLAGS REGISTER FOR ALU1	00007630
00000A				763	#FLAGS1	EQU X'0A'	UPPER FOUR BITS ARE FLAGS	00007640
00000A				764	#REQTAGS	EQU X'0A'	REQUEST IN TAGS REG FOR A AND B INTFCES	00007650
00000B				765	#FLAGS2	EQU X'0B'	THIRD FLAGS REG	00007660
00000C				766	#SETDIA1	EQU X'0C'	SET DIAGNOSE REG 1	00007670
00000D				767	#SETDIA2	EQU X'0D'	SET DIAGNOSE REG 2	00007680
00000E				768	#SETCNT1	EQU X'0E'	SET COUNT REG 1	00007690
00000F				769	#SETCNT2	EQU X'0F'	SET COUNT REG 2	00007700
000000				770	#LINK1	EQU X'00'	LINK REGISTER 1	00007710
000001				771	#LINK2	EQU X'01'	LINK REGISTER 2	00007720
000002				772	#LINK3	EQU X'02'	LINK REGISTER 3	00007730
000003				773	#LINK4	EQU X'03'	LINK REGISTER 4	00007740
000004				774	#XOUTBIM	EQU X'04'	CROSSOVER REGISTER B OUTPUT IMAGE REG	00007750
000005				775	#ALU1ERR	EQU X'05'	ALU1 HARDWARE DETECTED ERRORS	00007760
000006				776	#ALU2ERR	EQU X'06'	ALU2 HARDWARE DETECTED ERRORS	00007770
000007				777	#WORK2	EQU X'07'	WORK REGISTER 2	00007780
000008				778	#LINK5	EQU X'08'	WORK REGISTER 2	00007790
000009				779	#LINK6	EQU X'09'	WORK REGISTER 2	00007800
00000A				780	#SEVMODA	EQU X'0A'	SEVEN TRACK MODE REG A	00007810
00000B				781	#SEVMODB	EQU X'0B'	SEVEN TRACK MODE REG B	00007820
00000C				782	#WORK4	EQU X'0C'	WORK REGISTER	00007830
00000D				783	#FRUREG	EQU X'0D'	ALU1 FRU REG	00007840
				784	*****	XOUTA	DATA FLOW MASK EQUATES *****	00007850
000004				785	WRITE	EQU X'04'	BIT INDICATES WRITE COMMAND TO DF	00007860
000002				786	MODE64	EQU X'02'	BIT INDICATES 6250 LAST MODE SET TO ALU2	00007870
0000AC				787	SAGC1	EQU X'AC'		00007880
000082				788	FORMT01	EQU X'82'		00007890
000081				789	FORMT10	EQU X'81'		00007900
000080				790	FORMT00	EQU X'80'		00007910
00008C				791	FORMT11	EQU X'8C'		00007920
00009C				792	TM64	EQU X'9C'		00007930
000092				793	TMO	EQU X'92'		00007940
000088				794	MARK1	EQU X'88'		00007950
000084				795	MARK2	EQU X'84'		00007960
000090				796	FORMTM	EQU X'90'	CALL FOR TAPE MARK	00007970
000040				797	ALOWEND	EQU X'40'	ALLOW EOD ME	00007980
000001				798	NRZMODE	EQU X'01'</		

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72 9/04/73
000080				800	***** STAT REGISTER EQUATES *****	00008010
000040				801	STOP EQU X'80' BIT INDICATES STOP DATA XFER TO CHANNEL	00008020
000020				802	SENSE EQU X'40' BIT INDICATES TO DF A SENSE OP IS IN PROGRESS	00008030
000010				803	CONTROL EQU X'20' INDICATES CONTROL CMD TO DATA FLOW	00008040
000008				804	DIAGMODE EQU X'10' BIT INDICATES TO DF DIAG MODE IS IN EFFECT	00008050
000004				805	SETSTAT A EQU X'08' SET STAT A	00008060
000002				806	SETSTAT B EQU X'04' SET STAT B	00008070
000001				807	SETSTAT C EQU X'02' SET STAT C	00008080
				808	SETSTAT D EQU X'01' SET STAT D	00008090
000080				810	***** CHANNEL TAG REGISTER EQUATES *****	00008110
000040				811	HOLDA EQU X'80' CHAINING/HOLD INTFCE A TO PREVENT METER DISABLE	00008120
000020				812	HOLDB EQU X'40' CHAINING/HOLD INTFCE B TO PREVENT METER DISABLE	00008130
000010				813	HOLDINT EQU X'20' HOLD PRESENT INTERFACE AND BUSY OUT THE OTHER	00008140
000008				814	CUBUSY EQU X'10' SET CONTROL UNIT BUSY TO BOTH INTERFACES	00008150
000004				815	SVCIN EQU X'08' SET SERVICE IN TAG	00008160
000002				816	STSIN EQU X'04' SET STATUS IN TAG	00008170
000001				817	ADDIN EQU X'02' SET ADDRESS IN TAG	00008180
				818	OPIN EQU X'01' SET OP IN TAG	00008190
000080				820	***** FLAGS REGISTER EQUATES *****	00008210
000040				821	CONCON EQU X'80' CONTINGENT CONNECTION FLAG	00008220
000020				822	CUEA EQU X'40' SET CONTROL UNIT END FLAG FOR INTF A	00008230
000010				823	INTFB EQU X'20' SET INTF B SELECTING FLAG	00008240
000008				824	CUEB EQU X'10' SET CONTROL UNIT END FLAG FOR INTF B	00008250
000004				825	RESETOK EQU X'08' SET UNTAGGED INTERRUPT FLAG	00008260
000002				826	STATPNDG EQU X'04' SET STATUS PENDING FLAG	00008270
000001				827	STACK EQU X'02' SET STACK FLAG	00008280
				828	CHAIN EQU X'01' SET CHAIN FLAG	00008290
000080				830	***** STAT IMAGE REGISTER EQUATES *****	00008310
				831	* THESE EQUATES ARE THE SAME AS THE STAT REGISTER EQUATES	00008320
000004				833	***** REQUEST IN TAG REGISTER EQUATES *****	00008340
000008				834	REQINA EQU X'04' SET NON-SUPPRESSIBLE REQUEST IN - CHAN A	00008350
000001				835	SUPREQA EQU X'08' SET NON-SUPPRESSIBLE REQUEST IN - CHAN A	00008360
000002				836	REQINB EQU X'01' SET NON-SUPPRESSIBLE REQUEST IN - CHAN B	00008370
000080				837	SUPREQB EQU X'02' SET NON-SUPPRESSIBLE REQUEST IN - CHAN B	00008380
000040				838	BNRZI EQU X'80' SET INTERFACE B NRZI FLAG	00008390
000020				839	ANRZI EQU X'40' SET INTERFACE A NRZI FLAG	00008400
000010				840	CURFLAG EQU X'20' SET CU RESERVED FLAG	00008410
				841	ALLOWDSE EQU X'10' SET ALLOW DATA SECURITY ERASE FLAG	00008420
000080				843	***** SENSE STATUS REGISTER 1 EQUATES *****	00008440
000040				844	NOISE EQU X'80' SET SENSE DATA NOISE BIT	00008450
000040				845	REJTU EQU X'40' SET SENSE DATA REJECT TAPE UNIT	00008460
000001				846	NSUBSYS EQU X'40' IDENTIFIER FOR 3803 CONTROL UNIT	00008470
000001				847	CURSVD EQU X'01' CONTROL UNIT RESERVED IN SENSE	00008480
000001				848	NOTCOMP EQU X'01' SET SENSE DATA NOT COMPATIBLE BIT	00008490
000080				850	***** SENSE STATUS REGISTER 2 EQUATES *****	00008510
000040				851	CMDREJ EQU X'80' SET SENSE DATA COMMAND REJECT BIT	00008520
000020				852	INTREQ EQU X'40' SET SENSE DATA INTERVENTION REQUIRED	00008530
				853	BUSOC EQU X'20' SET SENSE DATA BUS OUT CHECK	00008540

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
000010				854	EQUIPCK	EQU X'10' SET SENSE DATA EQUIPMENT CHECK		00008550
000008				855	DATAACK	EQU X'08' SET SENSE DATA DATA CHECK		00008560
000004				856	OVERUN	EQU X'04' SET SENSE DATA OVERRUN		00008570
000002				857	WDCNT0	EQU X'02' SET SENSE DATA WORD COUNT ZERO		00008580
000001				858	RDNOISE	EQU X'01' READ NOISE BIT (PE ONLY)		00008590
				860	*****	PENDING STATUS REGISTER EQUATES *****		00008610
000020				861	CUE	EQU X'20' SET STATUS BIT FOR CONTROL UNIT END		00008620
000010				862	BUSY	EQU X'10' SET STATUS BIT FOR DEVICE BUSY		00008630
000008				863	CHANEND	EQU X'08' SET STATUS BIT FOR CHANNEL END		00008640
000004				864	DEVEND	EQU X'04' SET STATUS BIT FOR DEVICE END		00008650
000002				865	UNITCHK	EQU X'02' SET STATUS BIT FOR UNIT CHECK		00008660
000001				866	UNITEXC	EQU X'01' SET STATUS BIT FOR UNIT EXCEPTION		00008670
				868	*****	TAPE UNIT ADDRESS REG EQUATES *****		00008690
000020				869	BINTFC	EQU X'20' B INTERFACE TAG		00008700
000010				870	SWSEL	EQU X'10' SWITCH SELECT TAG		00008710
000000				871	DEVO	EQU X'00' DEVICE ADDRESS 0		00008720
				873	*****	TAPE UNIT SENSE BYTE ZERO *****		00008740
				874	*		*	00008750
000080				875	BACKWARD	EQU X'80' . BACKWARD SENSE BIT		00008760
000040				876	NFP	EQU X'40' . NOT FILE PROTECT SENSE BIT		00008770
000020				877	EOT	EQU X'20' . END OF TAPE SENSE BIT		00008780
000010				878	BOT	EQU X'10' . BEGINNING OF TAPE SENSE BIT		00008790
000008				879	WRSTATUS	EQU X'08' . WRITE STATUS BIT		00008800
000004				880	START	EQU X'04' . START BIT		00008810
000002				881	DEVCHK	EQU X'02' . DEVICE CHECK BIT		00008820
000001				882	NOTBUSY	EQU X'01' . NOT BUSY BIT		00008830
				883	*		*	00008840
				884	*****	TAPE UNIT SENSE BYTE ONE *****		00008850
				885	*		*	00008860
000010				886	NOTPE	EQU X'10' . OTHER THAN 1600 BPI		00008870
				887	*		*	00008880
				889	***	FLAGS2 REGISTER EQUATES		00008900
000080				890	FORCEUC	EQU X'80' FORCE UNIT CHECK FLAG		00008910
000040				891	ALUFAIL	EQU X'40' ALU HARD ERROR FLAG		00008920
000020				892	A64	EQU X'20' 6400 FLG INTF A		00008930
000010				893	B64	EQU X'10' 6400 FLG INTF B		00008940
				894	*****			00008950
				895	*	SET DIAGNOSE REGISTER EQUATES	*	00008960
				896	*****		*	00008970
000080				897	DIAWRT	EQU X'80' SET DIAG WRT FLAG (ELDORA ONLY)		00008980
000040				898	VEL	EQU X'40' SET VELOCITY FLAG (ELDORA ONLY)		00008990
000004				899	LWROP	EQU X'04' SET LOOP WRITE TO READ FLAG		00009000
000080				900	BLKDC	EQU X'80' SET BLOCK DATA CHECK FLAG		00009010
000010				901	SETCUB	EQU X'10' SET CONTROL UNIT BUSY FLAG		00009020
000040				902	DEVBSY	EQU X'40' SET DEVICE BUSY TEST FLAG		00009030
000020				903	BLKINTS	EQU X'20' SET BLOCK INTERRUPTS FLAG		00009040
000010				904	GDT	EQU X'10' SET GOT FLAG		00009050
000040				905	IBGMSR	EQU X'40' SET IBG MEASURE FLAG		00009060
000004				906	DMR	EQU X'04' SET DIAG MEASURE AND READ		00009070
000002				907	FORCERR	EQU X'02' SET FORCE HARDWARE ERRS FLAG		00009080

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000008				908	INHPRE EQU X'08' INHIBIT PE PREAMBLE		00009090
000020				909	INHPOST EQU X'20' INHIBIT PE POSTAMBLE		00009100
000001				910	TAPSLIP EQU X'01' SET TAPE SLIP FLAG		00009110
000020				911	RDACC EQU X'20' SET READ ACCESS FLAG		00009120
000001				912	CHGSTS EQU X'01' CHANGE DEVICE STATUS		00009130
000002				913	TUBOMSK EQU X'02' SET TU BUS OUT MASK		00009140
000008				914	RDSTOP EQU X'08' DO READ STOP MEASUREMENT		00009150
				915	*****EXTRA EQUATES*****		00009160
0000FF				916	ONES EQU X'FF' ALL ONES BYTE		00009170
000000				917	ZERO EQU X'00' ALL ZEROES BYTE		00009180
000001				918	BUMP1 EQU X'01' BUMP BY ONE CONSTANT		00009190
000080				919	ALUERR EQU X'80' ALU ERROR SENSE BIT		00009200
000080				921	CNT40 EQU X'80' FLAG TO INDICATE WHETHER TO ADD 1 OR 40		00009220
000010				922	#CNT40 EQU X'10' BR ON DREG		00009230
000040				923	SNSON EQU X'40' FLAG TO TURN ON SENSE IN STATIMG		00009240
000020				924	SNSOFF EQU X'20' FLAG TO TURN OFF SENSE IN STATIMG		00009250
				926	*****ALU2 ROS ENTRY BRANCH TABLE*****		00009270
				927	*****ALU2 ROS ENTRY BRANCH TABLE*****		00009280
				928	*****ALU2 ROS ENTRY BRANCH TABLE*****		00009290
				929	* ALU2 IS ALWAYS SLAVED TO ALU1. ANY OPERATION EXECUTED BY ALU2 *		00009300
				930	* MUST ALWAYS BE INITIATED BY ALU1 VIA A XOUTB. THE XOUTB BY ALU1 *		00009310
				931	* TRAPS ALU2 TO LOCATION 000. ALU2,BEGINNING EXECUTION AT 000, *		00009320
				932	* FETCHES AN INDEX BYTE FROM ALU1 AND MOVES IT TO THE INSTRUCTION *		00009330
				933	* COUNTER. THE INDEX BYTE WILL POINT TO ONE OF THE BRANCH INSTRUCT- *		00009340
				934	* IONS IN THE BRANCH TABLE. THE SELECTED BRANCH INST WILL BE *		00009350
				935	* EXECUTED AND THE DESIRED ROUTINE WILL BE ENTERED. WHEN THE *		00009360
				936	* SELECTED ROUTINE COMPLETES, STAT D WILL BE SET INDICATING TO *		00009370
				937	* ALU1 THAT THE DESIRED FUNCTION HAS BEEN COMPLETED. ALU2 WILL THEN *		00009380
				938	* BE HELD AT LOCATION 000 UNTIL ACTUATED BY ALU1 VIA XOUTB TRAP *		00009390
				939	*****		00009400
000005				941	NDXTST3 EQU 5 GO DO ALU 2 CHECKOUT		00009420
000006				942	NDXDES EQU 6 HIO NOT OPRTING--GO DESELECT TU		00009430
000007				943	NDXPOLL EQU 7 GO POLL DEVICE FOR STATUS		00009440
000008				944	NDXGRST EQU 8 GO DO GENERAL RESET		00009450
000009				945	NDXSRST EQU 9 GO DO SELECTIVE RESET		00009460
00000A				946	NDXSDE EQU 10 GO SET DEVICE END		00009470
00000B				947	NDXABRT EQU 11		00009480
00000C				948	NDXDMR EQU 12 GO DO DIAG MEASERE		00009490
00000D				949	NDXAXESS EQU 13 GO GET READ ACCESS TIME		00009500
00000E				950	NDXFLAGS EQU 14 BRING IN FLAG BYTE		00009510
00000F				951	NDXSNSR EQU 15		00009520
000010				952	NDXFLAG2 EQU 16 GET TUBO MASK (SET FLAGS #3)		00009530
000035				953	NDXFSF EQU X'35' GO DO FORWARD SPACE FILE		00009540
000031				954	NDXERS EQU X'31' GO DO ERASE TO END OF TAPE(EOT)		00009550
000037				955	NDXFSR EQU X'37' GO DO FORWARD SPACE RECORD		00009560
000033				956	NDXRDF EQU X'33' GO DO READ FORWARD		00009570
00003C				957	NDXBFS EQU X'3C' GO DO BACKSPACE FILE		00009580
00003E				958	NDXBSR EQU X'3E' GO DO BACKSPACE RECORD		00009590
00003A				959	NDXRDB EQU X'3A' GO DO READ BACKWARD		00009600
000013				960	NDXWRT EQU X'13' GO DO WRITE OPERATION		00009610
000020				961	NDXWTM EQU X'20' GO DO WRITE TAPE MARK		00009620

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT
000022				962	NDXERG	EQU X'22' .
00002F				963	NDXRWD	EQU X'2F' .
000029				964	NDXRWU	EQU X'29' .
0000EB				965	NDXSTS	EQU X'EB' .
0000D6				966	NDXSNS	EQU X'D6' .
0000EA				967	NDXADR	EQU X'EA' .

GO 40 ERASE RECORD GAP
GO DO REWIND
GO DO REWIND UNLOAD
GO DO INITIAL STATUS
GO DO SENSE OP

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00009630
00009640
00009650
00009660
00009670
00009680

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000000				969	BEGIN CSECT		00009700
				970	*/** ALU1: BEGIN */		00009710
				971	*** POWER ON RESET IS CHECKED FIRST TO INSURE THAT LSRS HAVE GOOD		00009720
				972	*** PARITY PRIOR TO THE ENSUING ALU OPS.		00009730
000000				973	STEP0001 EQU *		00009740
000000	2FF5			975	CHKRSTS BOC PWRRST,MODEREGS		00009750
000001	3C04			978	BOC NGENR,NORESETS		00009760
000002	C1F0			981	AND CTIMAGE,X'F0'		00009770
000003	4150			984	XFR CTIMAGE,CTI		00009780
				987	***** ALU FAIL CHECK *****		00009800
				988	* EACH TIME ALU1 IS TRAPPED TO LOC 0, THE ALU HARDWARE ERROR REGS ARE*		00009810
				989	* TESTED FOR A FAILURE. THE TWO EXCEPTIONS ARE:		00009820
				990	* 1. POWER ON RESET		00009830
				991	* 2. A PRIOR FAILURE THAT HAS NOT BEEN CLEARED BY A SENSE OP		00009840
				992	* ONCE A FAILURE HAS BEEN DETECTED, THE ALU ERROR REGS ARE SAVED IN		00009850
				993	* LSRS AND WILL REMAIN UNTIL A SENSE OP IS ISSUED. THE ALUFAIL FLAG		00009860
				994	* PREVENTS OVERLAYING THE LSRS WHEN THEY ARE HOLDING PRIOR ERROR DATA		00009870
				995	* THE FIRST SIO/TIO (OTHER THAN SENSE) SUBSEQUENTLY ISSUED TO THE		00009880
				996	*CONTROLLER AFTER AN ALU FAILURE WILL BE UNIT CHECKED. SUCCEEDING		00009890
				997	* SIO/TIO'S WILL RECEIVE AVAILABE STATUS IF THE ONLINE PROGRAM CHOOSES*		00009900
				998	* TO IGNORE THE INITIALLY UNIT CHECKED SIO/TIO.		00009910
				999	*****		00009920
000004	0200			1002	NORESETS STO XOUTAIM,0		00009940
000005	C89F			1005	AND STATIMG,ONES-CONTROL-SENSE RESET LCONTROLS		00009950
000006	DB40			1008	ANDM FLAGS2,ALUFAIL		00009960
000007	310B			1011	BOC DREG1,ANYMOR		00009970
000008	5681			1014	XFR ALU2ERR,EXT		00009980
000009	5584			1017	XFR ALU1ERR,HDWR		00009990
00000A	2220			1020	BOC ALUR,HNDLERR		00010000
00000B	2225			1023	ANYMOR BOC ALUR,CLEARIT		00010010
00000C	140B			1026	SETABRT STO XOUTBIM,NDXABRT		00010020
00000D	CAFO			1029	AND REQTAGS,ONES-15		00010030
00000E	4A48			1032	XFR REQTAGS,MIST		00010040
00000F	2E15			1035	BOC SCB,MIFTR12	***	00010050
000010	8180			1038	SETHOLDA ORI CTIMAGE,HOLDA		00010060
000011	3D2A			1041	CHKISEL BOC ISEL,INSELCHK		00010070
000012	5441			1044	XFR XOUTBIM,XOUTB		00010080
000013	3C17			1047	BOC NGENR,CKSELRST		00010090
000014				1049	STEP0005 EQU *		00010100
000014	6354			1051	EXECSRST BU GENRESET		00010110
000015	8140			1054	MIFTR12 ORI CTIMAGE,HOLDB		00010120
000016	6011			1057	BU CHKISEL		00010130
000017	2C19			1061	CKSELRST BOC SELRST,SELRTNO		00010150
000018	6513			1064	GODOALU BU ALUCHECK		00010160
000019	14EA			1068	SELRTNO STO XOUTBIM,NDXADR		00010180
00001A	4642			1071	XFR PNDADDR,XOUTA		00010190
00001B	5441			1074	XFR XOUTBIM,XOUTB		00010200
00001C	4624			1077	XFR PNDADDR,TUADR		00010210
00001D	3B1F			1080	ZZZ BOC STATD,MOVEON2		00010220
00001E	601D			1083	BU ZZZ		00010230

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
00001F	6362			1086	MOVEON2 BU	SELRESET		00010240
000020	1D00			1090	HNDLERR STO	FRUREG,0		00010260
000021	5E21			1093	XFR	FRUSAV,AR		00010270
000022	5006			1096	XFRH	LSR		00010280
000023	8D00			1099	ORI	FRUREG,0		00010290
000024	4006			1102	XFR	LSR		00010300
000025	8BC0			1105	CLEARIT ORI	FLAGS2,ALUFail+FORCEUC OTHERWISE SET FAIL FLAGS		00010310
000026	2C19			1108	BOC	SELRST,SELRTNO		00010320
000027	4012			1111	XFR	CLEAR		00010330
000028	4012			1114	XFR	CLEAR		00010340
000029	600C			1117	BU	SETABRT		00010350
				1120	*****			00010370
				1121	* WHEN INSELCHK IS REACHED WE HAVE BEEN TRAPPED FOR INITIAL SELECTION *			00010380
				1122	* OR A POLL. IF ADDRESS OUT IS UP--INITIAL SELECTION IS INDICATED. *			00010390
				1123	*****			00010400
00002A	2895			1126	INSELCHK BOC	ADROUT,SIORTN		00010420
00002B	D906			1129	ANDM	FLAGS,STATPNDG+STACK		00010430
00002C	202E			1132	BOC	DBUS,POLLED		00010440
00002D	6032			1135	BU	INTFCHK		00010450
				1138	*****			00010470
				1139	* POLL ACCEPTED. IF STATUS IS PENDING OR STACKED THE PENDING ADDRESS *			00010480
				1140	* REG IS USED TO VERIFY THE CORRECT CHANNEL. OTHERWISE THE			00010490
				1141	* CONTROL UNIT ADDRESS FOR THE CHANNEL POLLING IS MOVED FROM CHANNEL *			00010500
				1142	* BUS OUT TO THE PENDING ADDRESS REG. IF STATUS IS DUE TO A SECURITY *			00010510
				1143	* DEVICE END OR DEVICE END DUE TO A PRIME, ALU2 WILL BE SPINNING *			00010520
				1144	* WAITING TO CLEAR THE DEV END CONDITION IF CHANNEL ACCEPTES STATUS. *			00010530
				1145	*****			00010540
00002E	43A0			1150	POLLED XFR	CURADDR,CBO		00010580
00002F	C60F			1153	AND	PNDADDR,X'OF'		00010590
000030	4321			1156	XFR	CURADDR,AR		00010600
000031	8600			1159	ORI	PNDADDR,ZERO		00010610
000032	4660			1163	INTFCHK XFR	PNDADDR,CBI		00010630
000033	8103			1166	ORI	CTIMAGE,ADDIN+OPIN		00010640
000034	4150			1169	XFR	CTIMAGE,CTI		00010650
000035	C1FD			1172	AND	CTIMAGE,ONES-ADDIN		00010660
				1174	*** IF MIS GO	CHECK FOR PROPER INTERFACE POLLING		00010670
000036				1175	MIFTR00 EQU	*		00010680
000036	D920			1178	NOTBOTH ANDM	FLAGS,INTFB		00010700
000037	203A			1181	BOC	DBUS,NOTBINT		00010710
000038	2E3C			1184	BOC	SCB,NOTAINT		00010720
				1187	* GO TO MAP 13-080			00010740
000039	6039			1189	WRONGCHN BU	WRONGCHN		00010750
						INTF B INTERRUPTING AND CHAN A SLCTG		

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
00003A	2E39			1193	NOTBINT BOC SCB,WRONGCHN	BRANCH IF B SELECTING	00010770
00003B	603F			1196	BU NOTBINT1	CONTINUE ALL IS OK	00010780
00003C	D910			1200	NOTAINT ANDM FLAGS,CUEB	MASK FOR CONTROL UNIT END B	00010800
00003D	2042			1203	BOC DBUS,MOVEOUT	BR IF OOF	00010810
00003E	6041			1206	BU DOACUE	GO SET CUE IN STATUS	00010820
				1209	*** CHECK TO SEE IF CONTROL UNIT	END SHOULD BE ADDED TO STATUS	00010840
00003F	D940			1211	NOTBINT1 ANDM FLAGS,CUEA	MASK FOR CONTROL UNIT END A	00010850
000040	2042			1214	BOC DBUS,MOVEOUT	BRANCH IF OFF	00010860
000041	8520			1218	DOACUE ORI PNDSTS,CUE	SET CUE IN STATUS	00010880
000042				1221	MOVEOUT EQU *		00010900
000042	105A			1223	SETLINK STO LINK1,SRETURN0	ACCEPTED STATUS RETURN	00010910
000043	115B			1226	STO LINK2,SRETURN1	STACK STATUS RETURN	00010920
000044	12C8			1229	STO LINK3,PRETURN0	HALTI/O RETURN NOT OPERATING	00010930
000045	2960			1232	CMOUP BOC CMDOUT,RSTADDIN	WAIT COMMAND OUT RISE	00010940
000046	28C8			1235	BOC ADROUT,PRETURN0	BRANCH IF HIO	00010950
000047	6045			1238	BU CMOUP	WAIT	00010960

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				1241	*****		00010980
				1242	* ENTRY TO THIS SUBROUTINE IS FROM: CONTINIT AND CLEANIT AND MODELINK *		00010990
				1243	* PRIOR TO PRESENTING INITIAL STATUS TO CHANNEL. IF CHAINING IS NOT IN*		00011000
				1244	* EFFECT THE FIRST TWO DIAGNOSTIC FLAG BYTES WILL BE CLEARED AND BYTE0*		00011010
				1245	* PASSED TO ALU2.		00011020
				1246	*****		00011030
000048	6291			1249	TERMATE BU TERMSTAT	U.C. ON SIO RETURN	00011050
000049	63D7			1252	GRETURNO BU CHEKSNS	RETURN FOR MODE CMDS	00011060
00004A	1360			1256	GODODIAO STO LINK4,STATRTN-BEGIN	SET CTL AND BURST CMD RETURNS	00011080
00004B	D901			1259	GODODIA ANDM FLAGS,CHAIN	MASK FOR CHAIN FLAG	00011090
00004C	3753			1262	BOC DREG7,ALU2DIA	BRANCH IF ON	00011100
00004D	F08B			1265	XOM CURCOMM,X'8B'	MASK FOR LWR COMMAND	00011110
00004E	2053			1268	BOC DBUS,ALU2DIA	BRANCH IF SO	00011120
00004F	F00B			1271	XOM CURCOMM,X'0B'	MASK FOR DIAG WRT	00011130
000050	2053			1274	BOC DBUS,ALU2DIA	BRANCH IF SO	00011140
000051	0C00			1277	STO SETDIA1,0	CLEAR FLAG BYTE ONE	00011150
000052	0D00			1280	STO SETDIA2,0	CLEAR FLAG BYTE TWO	00011160
000053	4C42			1283	ALU2DIA XFR SETDIA1,XOUTA	MOVE FIRST FLAG BYTE TO ALU2	00011170
000054	8801			1286	ORI STATIMG,SETSTATD	SET STATD TO INDICATE SNS RESET	00011180
000055	4828			1289	XFR STATIMG,STAT	SET TO HARDWARE	00011190
000056	C8FE			1292	AND STATIMG,ONES-SETSTATD	RESET STAT D IN IMAGE REG	00011200
000057	170E			1295	STO WORK2,NDXFLAGS	FETCH ALU2 SET DIAGNOSE INDEX	00011210
000058	5741			1298	XFR WORK2,XOUTB	KICK ALU2 OFF TO FETCH BYTE	00011220
000059	5322			1301	XFR LINK4,IC	RETURN TO INITIAL STATUS	00011230

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72 9/04/73
				1307	***** STATUS SUBROUTINE *****	00011280
				1308	* THE STATUS ROUTINE HANDLES INTERLOCKING OF INTERFACE LINES AND	* 00011290
				1309	* BRANCHES TO THE APPROPRIATE SUBROUTINE DEPENDING ON THE CHANNEL	* 00011300
				1310	* RESPONSE TO STATUS IN. THE INTERFACE WILL ALSO BE MONITORED FOR A	* 00011310
				1311	* HIO CONDITION AND THE LINK RETURN WILL BE EXECUTED IF HIO SHOULD	* 00011320
				1312	* OCCUR. IF THE CHANNEL ERRONEOUSLY STACKS CLEAN INITIAL STATUS A	* 00011330
				1313	* HANG WILL OCCUR IN THE INTFERR LOOP	* 00011340
				1314	*****	00011350
00005A	62C5			1317	SRETURN0 BU TERMACC RETURN FOR ACCEPTED STATUS	00011370
00005B	62BF			1320	SRETURN1 BU TERMSTAK RETURN FOR STACKED STATUS	00011380
00005C	6185			1323	SRETURN2 BU SENSE0 RETURN TO SENSE ROUTINE	00011390
00005D	623B			1326	SRETURN4 BU CONTSERV RETURN FOR SERVICE	00011400
00005E	623C			1329	SRETURN5 BU CONTSTAK RETURN TO STACK	00011410
00005F	65A3			1332	SRETURN6 BU CLEANGO RETURN FOR ACCEPTED STATUS	00011420
000060				1335	STATRTN EQU * DEFINE ENTRY POINT	00011440
000060	4150			1337	RSTADDIN XFR CTIMAGE,CTI RESET ADDRESS-IN TO HDWE	00011450
000061				1339	STATRTN1 EQU * DEFINE ENTRY POINT	00011460
				1340	* GO TO MAP 13-100	00011470
000061	2890			1342	SVCOUTUP BOC ADROUT,HIOLINK HALT I/O LINK	00011480
				1344	* GO TO MAP 13-100	00011490
000062	2D61			1346	CMDOUTUP BOC SVCOUT,SVCOUTUP SVC OUT UP WAIT FOR DROP	00011500
000063	2961			1349	BOC CMDOUT,SVCOUTUP CMD OUT UP WAIT FOR DROP	00011510
000064	2D61			1352	BOC SVCOUT,SVCOUTUP	00011520
000065	2D61			1355	BOC SVCOUT,SVCOUTUP	00011530
000066	4560			1358	XFR PNDSTS,CBI MOVE STATUS TO BUS IN	00011540
000067	8104			1361	ORI CTIMAGE,STSIN MASK STATUS IN TAG UP	00011550
000068	4150			1364	XFR CTIMAGE,CTI RAISE STATUS IN	00011560
000069	C1FB			1367	AND CTIMAGE,ONES-STSin MASK STATUS IN DOWN	00011570
00006A				1369	INTFERR EQU * RETURN FOR STACKED CLEAN INIT STS	00011580
				1370	* GO TO MAP 13-110	00011590
00006A	2891			1372	WATESUM BOC ADROUT,HIOLINK1 HALT I/O LINK	00011600
				1374	* GO TO MAP 13-110	00011610
00006B	296F			1376	BOC CMDOUT,STAKLINK STACK LINK	00011620
				1378	* GO TO MAP 13-110	00011630
00006C	2D7D			1380	BOC SVCOUT,TAKELINK ACCEPT LINK	00011640
				1382	* GO TO MAP 13-110	00011650
00006D	606A			1384	BU WATESUM	00011660
				1387	*****	00011680
				1388	*THE STAKLINK OCCURS WHENEVER COMMAND OUT ANSWERS STATUS IN. THE STACK*	00011690
				1389	*FLAG IS SET FOR NON-STACKABLE STATUS AND LINK2 RETURN EXECUTED.	* 00011700
				1390	* CHAINING IS RESET FOR ALL STATUS EXCEPT A CHANNEL END ALONE (CONTROL*	00011710
				1391	* CMD INITIAL STATUS)	* 00011720
				1392	*****	00011730
00006E	4150			1395	STAKDISC XFR CTIMAGE,CTI RESET OP IN RAISE CUB	00011750
00006F	C9FE			1399	STAKLINK AND FLAGS,ONES-CHAIN RESET CHAIN BIT	00011770
000070	F504			1402	XOM PNDSTS,DEVEND MASK FOR DEV END ALONE STATUS	00011780
000071	207A			1405	BOC DBUS,NOSTACK BRANCH IF SO	00011790
000072	F506			1408	XOM PNDSTS,DEVEND+UNITCHK IS STATUS READY DROP ON REW/DSE	00011800

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
000073	207A			1411	BOC	DBUS,NOSTACK	BRANCH IF YES TO PREVENT STACK	00011810
000074	F510			1414	XOM	PNDSTS,BUSY	MASK FOR BUSY ALONE IN STATUS	00011820
000075	207A			1417	BOC	DBUS,NOSTACK	BRANCH IF IT IS TO PREVENT STACK	00011830
000076	F520			1420	XOM	PNDSTS,CUE	IS IT CUE ALONE	00011840
000077	207A			1423	BOC	DBUS,NOSTACK	BR IF SO	00011850
000078	8902			1426	ORI	FLAGS,STACK	SET STACK BIT	00011860
000079	5122			1429	STOPLINK	XFR LINK2,IC	XFR LINK TO IC	00011870
00007A	62C1			1432	NOSTACK	BU TERMSTK1	GO RESET CHAN TAGS	00011880
				1435	*****	*****	*****	00011900
				1436	*****	*****	*****	00011910
				1437	*****	*****	*****	00011920
				1438	*****	*****	*****	00011930
				1439	*****	*****	*****	00011940
				1440	*****	*****	*****	00011950
				1441	*****	*****	*****	00011960
00007B	4150			1444	TAKEDISC	XFR CTIMAGE,CTI	RESET OP IN RAISE CUB	00011980
00007C	607E			1447	BU	SKIPSUPO	SKIP CHAINING CHECK	00011990
00007D	3987			1451	TAKELINK	BOC SUPO,SECHAIN	CHAIN INDICATION	00012010
00007E	C9F0			1454	SKIPSUPO	AND FLAGS,CUEA+CUEB+INTFB+CONCON	RESET CHAIN,STATUS PENDING,	00012020
				1456	*		AND STACK FLAGS	00012030
00007F	CAEF			1458	AND	FLAGS1,ONES-ALLOWDSE	RESET ALLOW DAT SEC ERS FLAG	00012040
				1461	* GO TO MAP 13-130			00012060
000080	D520			1463	TAKELIN1	ANDM PNDSTS,CUE	DID WE PRESENT CONTROL UNIT END	00012070
				1465	* GO TO MAP 13-130			00012080
000081	2086			1467	BOC	DBUS,SERVLINK	BRANCH IF NOT	00012090
				1470	*** A CUE WAS PRESENTED--DETERMINE	THE SELECTING CHANNEL AND RESET		00012110
				1471	*** THE CORRESPONDING CUE FLAG			00012120
000082	2E85			1473	MIFTR01	BOC SCB,CUERSTB	BRANCH IF SWITCHED TO CHNL B	00012130
000083	C9BF			1476	RSTCUEA	AND FLAGS,ONES-CUEA	RESET CUE A FLAG	00012140
000084	6086			1479	BU	SERVLINK	GO BACK AND DO EXIT	00012150
000085	C9EF			1482	CUERSTB	AND FLAGS,ONES-CUEB	RESET CUE B FLAG	00012160
				1485	* GO TO MAP 13-130			00012180
000086	5022			1487	SERVLINK	XFR LINK1,IC	XFR LINK TO IC	00012190
				1490	* GO TO MAP 13-130			00012210
000087	8901			1492	SECHAIN	ORI FLAGS,CHAIN	SET CHAIN FLAG	00012220
				1494	* GO TO MAP 13-130			00012230
000088	8120			1496	ORI	CTIMAGE,HOLDINT	RAISE HOLD INTERFACE BIT	00012240
				1498	* GO TO MAP 13-130			00012250
000089	F017			1500	XOM	CURCOMM,X'17'	IS LAST COMMAND ERASE	00012260
				1502	* GO TO MAP 13-130			00012270
00008A	208E			1504	BOC	DBUS,ENABLDSE	BRANCH IF SO	00012280
				1506	* GO TO MAP 13-130			00012290
00008B	CAEF			1508	AND	FLAGS1,ONES-ALLOWDSE	RESET DSE BIT	00012300
				1510	* GO TO MAP 13-130			00012310
00008C	C9F1			1512	SKIPIT	AND FLAGS,CHAIN+CUEB+CUEA+INTFB+CONCON	RESET OTHER FLAGS	00012320
				1514	* GO TO MAP 13-130			00012330

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
00008D	6080			1516	BU	TAKELIN1	F01MAY72	9/04/73 00012340
00008E	8A10			1520	ENABLDSE	ORI	FLAGS1,ALLOWDSE	SET THE ALLOW DSE BIT
00008F	608C			1523	BU	SKIPIT	RETURN	00012360 00012370
1527	*****							00012400
1528	* HIO LINK IS ENTERED IF ADDRESS OUT IS UP OR RISE WHILE THE STATRTN						*	00012410
1529	* ISBEING EXECUTED. RETURN IS VIA LINK 3 WHICH IS SET UP BY THE						*	00012420
1530	* STATRTN CALLER						*	00012430
1531	*****							00012440
000090	5222			1534	HIOLINK	XFR	LINK3,IC	GO HANDLE HIO
								00012460
000091	E111			1538	HIOLINK1	XO	CTIMAGE,OPIN+CUBUSY	RESET OP IN RAISE CUB
000092	2D7B			1541	BOC		SVCOUT,TAKEDISC	BRANCH IF STATUS ACCEPTED
000093	296E			1544	BOC		CMDOUT,STAKDISC	BRANCH IF STATUS REJECTED
000094	6090			1547	BU		HIOLINK	OTHERWISE GO TO HIO NOT OPERATING
								00012480 00012490 00012500 00012510
1550	***** SIO ROUTINE *****							00012530
1551	* THE START IO ROUTINE CHECKS FOR SHORT BUSY CONDITIONS. IF NONE FOUND*						*	00012540
1552	* IT BRANCHES TO THE NO SHORT ROUTINE TO ANSWER THE SIO.						*	00012550
1553	*****							00012560
000095	43A0			1556	SIORTN	XFR	CURADDR,CBO	FETCH CURRENT ADDRESS
000096	44A0			1559		XFR	WORK1,CBO	ADDRESS TO SCRATCH AREA
000097	12C8			1562		STO	LINK3,PRETRNO	SET HIO LINK FOR NOT OPERATING
000098	5441			1565		XFR	XOUTBIM,XOUTB	TRAP ALU2 TO LOC 0
000099	D986			1568		ANDM	FLAGS,STATPNDG+STACK	+CONCON MASK FOR PENDING OR STACKED
				1570	*			STATUS AND CONTINGENT CONN. FLAGS
00009A	20AA			1572		BOC	DBUS,NOSHORT	BRANCH IF ALL ARE OFF
00009B	359E			1575		BOC	DREG5,NOTCONT	BRANCH IF STACK
00009C	369E			1578		BOC	DREG6,NOTCONT	BRANCH IF STATUS PENDING
00009D	0500			1581		STO	PNDSTS,0	CONT CONN--CLEAR THE STAUS REG
00009E	4621			1584	NOTCONT	XFR	PNDADDR,AR	MOVE PEND ADDRESS TO AREG
00009F	F400			1587		XOM	WORK1,0	TEST FOR MATCH
0000A0	20AA			1590		BOC	DBUS,NOSHORT	BRANCH IF MATCH
				1592	*****			00012710
1593	*THE SHORTBUSY ROUTINE USES THE UPROGRAM TO MANIPULATE BUS IN AND						*	00012720
1594	*TAGS IN FOR A SHORT BUSY SEQUENCE. CUE IS SET IN THE STATUS.						*	00012730
1595	*****							00012740
0000A1	8110			1597	SHORTBSY	ORI	CTIMAGE,CUBUSY	SET UP CUB BIT IN CTI IMAGE REG
0000A2	4150			1600		XFR	CTIMAGE,CTI	MOVE TO CHANNEL TAG IN REG
0000A3	8520			1603		ORI	PNDSTS,CUE	POST CUE WITH STATUS
0000A4	6296			1606		BU	TERMSTA2	GO RESET CUE LATCH FOR SELECTING
				1608	*			INTERFACE
								00012790
1610	*****							00012810
1611	*THE NOSHORT RTN ANSWERS ADDRESS OUT AND INITIALIZES ALU 2 TO ASSEMBLE*						*	00012820

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
				1612	*TU STATUS. VARIOUS FLAGS AND REGISTERS ARE INITIALIZED AND A CHECK		*	00012830
				1613	*IS MADE TO SEE IF A HIO WAS RECEIVED BY HARDWARE AFTER OP-IN WAS		*	00012840
				1614	*RAISED.		*	00012850
				1615	*****		*	00012860
0000A5	8920			1618	BFLAG ORI	FLAGS,INTFB	SET INTERFACE B FLAG IN FLAG REG	00012880
0000A6	8420			1621	ORI	WORK1,BINTFC	SET INTERFACE B BIT IN SELECT ADDR	00012890
0000A7	8804			1624	ORI	STATIMG,SETSTATB	RAISE STAT B FOR ALU2	00012900
0000A8	D916			1627	ANDM	FLAGS,STATPNDG+STACK	+CUEB MASK FOR PENDING STATUS	00012910
0000A9	60B5			1630	BU	CHKPNDG	RETURN TO SELECT DEVICE	00012920
0000AA	8101			1634	NOSHORT ORI	CTIMAGE,OPIN	MASK OP IN UP	00012940
0000AB	4150			1637	XFR	CTIMAGE,CTI	RAISE OP IN	00012950
0000AC	0800			1640	STO	STATIMG,0	CLEAR THE STATIMAGE REG	00012960
0000AD	0600			1643	STO	PNDADDR,0	CLEAR CURRENT ADDRESS REG FOR MASK	00012970
0000AE	4321			1646	XFR	CURADDR,AR	XFR SELECT ADDRESS TO ALU INPUT REG	00012980
0000AF	8600			1649	ORI	PNDADDR,0	MOVE ADDRESS TO PNDG ADDRESS REG	00012990
0000B0	C40F			1652	STRIPADD AND	WORK1,X'0F'	STRIP HIGH ORDER	00013000
0000B1	4442			1655	XFR	WORK1,XOUTA	GIVE ALU 2 ADDRESS	00013010
				1658	*** DETERMINE WHICH CHANNEL IS SELECTING AND INITIALIZE THE STAT REG,			00013030
				1659	*** TU ADDRESS REG AND FLAGS REG.			00013040
0000B2	2EA5			1661	MIFTR03 BOC	SCB,BFLAG	IS B SELECTING	00013050
0000B3	C9DF			1664	SETSWSEL AND	FLAGS,ONES-INTFB	RESET B FLAG	00013060
0000B4	D946			1667	ANDM	FLAGS,STATPNDG+STACK	+CUEA ANY STATUS BEING HELD	00013070
0000B5	20B8			1670	CHKPNDG BOC	DBUS,SETADDR	BRANCH IF NONE PENDING	00013080
0000B6	35B9			1673	BOC	DREG5,STRTALU2	BRANCH IF STATUS PENDING	00013090
0000B7	8802			1676	ORI	STATIMG,SETSTATC	SET SHORT INIT SEL TO ALU2	00013100
0000B8	14EB			1680	SETADDR STO	XOUTBIM,NDXSTS	FETCH ALU2'S STATUS RTN INDEX	00013120
0000B9	4828			1683	STRTALU2 XFR	STATIMG,STAT	SET STATS TO HDWE	00013130
0000BA	4424			1686	XFR	WORK1,TUADR	SET ADDRESS REG	00013140
0000BB	5441			1689	XFR	XOUTBIM,XOUTB	TRAP ALU 2	00013150
0000BC	8102			1692	ORI	CTIMAGE,ADDIN	MASKADDRESS IN UP	00013160
0000BD	4360			1695	XFR	CURADDR,CBI	RAISE ADDRESS ON BUS IN	00013170
0000BE	28C7			1699	ADROUTUP BOC	ADROUT,SELOUTUP	WAIT FOR ADDRESS OUT FALL	00013190
0000BF	4150			1702	SETADRIN XFR	CTIMAGE,CTI	RAISE ADDR IN	00013200
				1705	*****			00013220
				1706	*ASSEMBLE DATA FLOW MASK WHILE SYSTEM BRINGS UP CMD OUT.		*	00013230
				1707	*****			00013240
0000C0	D901			1710	MASEMBLE ANDM	FLAGS,CHAIN	SET UP FLAGS FOR TEST	00013260
0000C1	20C9			1713	BOC	DBUS,RSTDIAG	IS CHAIN FLAG ON?	00013270
0000C2	DC80			1716	ANDM	SETDIA1,DIAWRT	MASK TO TEST DIAG WRT BIT	00013280
0000C3	20CB			1719	BOC	DBUS,CHKFTR	BRANCH IF DIAG MODE OFF	00013290
0000C4	8810			1722	ORI	STATIMG,DIAGMODE	SET DIAG MODE BIT IN STAT REG	00013300
0000C5	4828			1725	XFR	STATIMG,STAT	SET STATS TO HDWE	00013310
0000C6	648B			1728	BU	SETSEV	GO CHECK NRZI	00013320

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
0000C7	26BE			1732	SELOUTUP BOC	SELO,ADROUTUP	BRANCH IF NOT HIO	00013340
0000C8	6344			1735	PRETURN BU	HIONOP	GO TO HIO NOT OPERATING	00013350
0000C9	0C00			1739	RSTDIAG	STO SETDIA1,0	RESET DIAG MODE BITS	00013370
0000CA	0D00			1742		STO SETDIA2,0		00013380
0000CB	648B			1746	CHKFTR	BU SETSEV	BRANCH SEVEN TK FEAT ***	00013400
0000CC	DA40			1750	CHKNRZ	ANDM REOTAGS,ANRZI	CHECK FOR NRZI FLAG	00013420
0000CD	20CF			1753		BOC DBUS,CMDWAIT0	BRANCH IF NRZI BIT OFF	00013430
0000CE	8201			1756		ORI XOUTAIM,NRZMODE	SET XOUTA IMAGE NRZ BIT	00013440
0000CF	DB20			1759	CMDWAIT0	ANDM FLAGS2,A64	WASS LAST MODE SET 6400	00013450
0000D0	20D2			1762		BOC DBUS,CMDWAIT	BR	00013460
0000D1	8202			1765		ORI XOUTAIM,MODE64	SET 6400 FOR ALU2	00013470
				1768	*****			00013490
				1769	* WAIT FOR AND PROCESS COMMAND OUT. DETERMINE WHETHER OPERATION			* 00013500
				1770	* CAN PROCEED.			* 00013510
				1771	*****			00013520
0000D2	28C8			1774	* GO TO MAP 13-140			00013550
				1776	CMDWAIT	BOC ADROUT,PRETURN0	HALT IO NOT OPERATING	00013560
0000D3	29DA			1778	* GO TO MAP 13-140			00013570
				1780		BOC CMDOUT,CMDWAIT1	FIRST COMMAND OUT	00013580
0000D4	60D2			1782	* GO TO MAP 13-140			00013590
				1784		BU CMDWAIT	WAIT	00013600
				1787	*****			00013620
				1788	*THE COMPARER HANDLES BUS OUT CHECKS DURING COMMAND TRANSFER.			* 00013630
				1789	*****			00013640
0000D5	8720			1791	CMDPARER	ORI SNSSTS2,BUSOC	POST BUS OUT CHECK	00013650
0000D6	D906			1794	CMDPAR0	ANDM FLAGS,STATPNDG+STACK	TEST FOR STATUS PENDING OR STACK	00013660
0000D7	20E6			1797		BOC DBUS,CMDPAR1	BRANCH IF NO	00013670
0000D8	8510			1800		ORI PNDSTS,BUSY	POST BUSY IN STATUS	00013680
0000D9	60DE			1803		BU CMDWAIT4	GO TO STORE LINKS	00013690
0000DA	C1FD			1806	CMDWAIT1	AND CTIMAGE,ONES-ADDIN	MASK ADDR IN DOWN	00013700
0000DB	24D5			1809		BOC BOPE,CMDPARER	BRANCH IF CMD PAR ERR	00013710
0000DC	40A0			1814	CMDPAREX	XFR CURCOMM,CBO	MOVE CMD TO LSR	00013740
				1817	*** IF MIS AVAILABLE GO CHECK TO SEE IF CONTINGENT CONNECTION FLAG			00013760
				1818	*** IS TO BE RESET			00013770
0000DD	2312			1820		BOC MIFTR,MIFTR04	BRANCH IF MIS AVAILABLE	00013780
0000DE	4150			1823	CMDWAIT4	XFR CTIMAGE,CTI	DROP ADDRESS IN	00013790
0000DF	D904			1826		ANDM FLAGS,STATPNDG	STATUS PNDING	00013800
0000E0	20E5			1829		BOC DBUS,CMDPROC	NO, GO TO CMD PROCESS	00013810
0000E1	9000			1833	CMDWAIT3	ORM CURCOMM,ZERO	IS IT TEST IO	00013830
0000E2	20E4			1836		BOC DBUS,PENDLINK	IF YES SEND STATUS	00013840
0000E3	8510			1839		ORI PNDSTS,BUSY	IF NO POST BUSY	00013850

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
0000E4	6291			1842	PENDLINK	BU TERMSTAT	GO TO RAISE STATUS IN		00013860
0000E5	6100			1846	CMDPROC	BU COMDECOD	GO DECODE THE CMD		00013880
0000E6	0502			1849	CMDPAR1	STO PNDSTS,UNITCHK	POST A UNIT CHECK		00013890
0000E7	8904			1852		ORI FLAGS,STATPNDG	POST STATUS PNDG FLAG		00013900
0000E8	CB7F			1855		AND FLAGS2,ONES-FORCEUC	RESET FORCE UNIT CHECK FLAG		00013910
0000E9	140B			1858		STO XOUTBIM,NDXABRT	BRT LOAD ALU2 INIT ADDRESS		00013920
0000EA	5441			1861		XFR XOUTBIM,XOUTB	TRAP ALU2 TO PREVENT DE RESET		00013930
0000EB	4150			1864		XFR CTIMAGE,CTI	DROP ADDRESS-IN		00013940
0000EC	6291			1867		BU TERMSTAT	GO TO STORE LINKS		00013950
0000ED	0502			1871	DOITNOW	STO PNDSTS,UNITCHK	IMAGE UNIT CHK		00013970
0000EE	8904			1874		ORI FLAGS,STATPNDG	SET FLAG		00013980
0000EF	4150			1877		XFR CTIMAGE,CTI	DROP ADDR IN		00013990
0000F0	1348			1880		STO LINK4,TERMATE	LOAD LINK RETURN		00014000
0000F1	604B			1883		BU GODODIA			00014010
0000F2	0000			1886		STO CURCOMM,0	POWER ON RESET		00014020
0000F3	1F00			1889		STO FORMAT,0	POWER ON RESET		00014030
0000F4	1800			1892		STO LINK5,0	POWER ON RESET		00014040
0000F5				1894	STEP0002	EQU *			00014050
0000F5	1A90			1896	MODEREFS	STO SEVMODA,X'90'			00014060
0000F6				1898	STEP0003	EQU *			00014070
0000F6	1B90			1900		STO SEVMODB,X'90'			00014080
0000F7				1902	STEP0004	EQU *			00014090
0000F7	6014			1904		BU EXECSRST			00014100

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000100				1908	ORG BEGIN+X'100'		00014130
				1909	***** COMMAND DECODE *****		00014140
				1910	* THE COMMAND WILL BE DECODED IF THEIR IS NO STATUS PENDING OR	*	00014150
				1911	* STACKED. EACH COMMAND(EXCEPT MODE TYPE) WILL BE CHECKED FOR	*	00014160
				1912	* DISCRETE CODES AND COMMAND REJECTED IF NOT RECOGNIZED.	*	00014170
				1913	*****		00014180
000100	9000			1916	COMDECODE ORM CURCOMM,0 MASK COMMAND CODE FOR TESTING		00014200
000101	3718			1919	BOC DREG7,IS6ON BRANCH IF BIT 7 ON TO CHK BIT 6		00014210
000102	3639			1922	BOC DREG6,READTYPE BRANCH IF BIT 6 ON (READ CMD)		00014220
000103	353B			1925	BOC DREG5,CHKRDB BRANCH IF BIT 5 ON		00014230
000104	2041			1928	BOC DBUS,DOTESTIO CHECK FOR TEST I/O		00014240
000105	6108			1931	BU COMREJCT GO REJECT COMMAND		00014250
				1935	*****		00014280
				1936	*COMMAND MUST BE CONTROL SINCE BITS 5,6,AND 7 ARE PRESENT.	*	00014290
				1937	*****		00014300
000106	F097			1940	CKDSE XOM CURCOMM,X'97' MASK FOR DATA SECURITY ERASE CMD		00014320
000107	2023			1943	BOC DBUS,DODSE BRANCH IF IT IS		00014330
				1946	***** COMMAND REJECT *****		00014350
				1947	* COMMAND REJECT WILL BE BRANCHED INTO BY SEVERAL COMMAND DECODE	*	00014360
				1948	* ROUTINES. SENSE DATA WILL BE CLEARED AND COMMAND REJECT WILL BE	*	00014370
				1949	* POSTED IN SENSE BYTE 0	*	00014380
				1950	*****		00014390
000108	13D0			1953	COMREJCT STO LINK4,RTNCOMR SET OPENERS RETURN		00014410
000109	64D5			1956	BU OPENERS GO CHECK DEV STATUS		00014420
00010A	3006			1960	CONTCMD BOC DREG0,CKDSE BRANCH IF HI ORDER BIT IS ON		00014440
00010B	3108			1963	BOC DREG1,COMREJCT COMMAND REJECT IF BIT 1 IS ON		00014450
00010C	3414			1967	BOC DREG4,COMTESTA BRANCH IF CMD IS 00XX1111		00014470
00010D	3320			1970	BOC DREG3,COMTESTB BRANCH IF CMD IS 00X10111		00014480
00010E	322F			1973	BOC DREG2,DOBKSPBL IF 1, MUST BE BACKSPACE BLOCK		00014490
				1976	*****		00014510
				1977	*REWIND IS DECODED AT THIS POINT. CAN WE PERFORM IT? MAKE TESTS	*	00014520
				1978	*****		00014530
00010F	142F			1981	DOREWIND STO XOUTBIM,NDXRWD EMIT ALU2 BRANCH ADDRESS ***		00014550
000110	8808			1984	ORI STATIMG,SETSTATA SET RWD INDICATOR FOR CONTEND		00014560
000111	4828			1987	XFR STATIMG,STAT SET STATA IN HDWE		00014570
000112	1037			1990	DORWD1 STO LINK1,CONTINIT LINK TO CONTROL INIT STATUS		00014580
000113	6228			1993	BU TUTEST GO TO TU STATUS TEST		00014590
000114	3329			1997	COMTESTA BOC DREG3,COMTESTC BRANCH IF CMD IS 00X11111		00014610
000115	3233			2000	BOC DREG2,DOBAKFIL IF=1, MUST BE BACKSPACE FILE		00014620

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000116	1429			2003	* COMMAND IS 00001111 OR REWIND UNLOAD		00014640
000117	6112			2005	DORUNLOD STO XOUTBIM,NDXRWU	EMIT ALU2 BRANCH ADDRESS ***	00014650
				2008	BU DORWD1		00014660
000118	3649			2012	IS6ON BOC DREG6,IS5ON		00014680
000119	F001			2015	WRTCHECK XOM CURCOMM,X'01'	CHECK FOR DISCRETE CMD	00014690
00011A	201C			2018	BOC DBUS,ITSOK	BRANCH IF IT IS	00014700
00011B	6108			2021	BU COMREJCT	OTHERWISE REJECT COMMAND	00014710
00011C	8204			2025	ITSOK ORI XOUTAIM,WRITE	ADD WRITE TO DATA FLOW MASK	00014730
00011D	1413			2028	STO XOUTBIM,NDXWRT	EMIT ALU2 BRANCH ADDRESS ***	00014740
00011E	1079			2031	STO LINK1,CLEANIT	LINK TO CLEAN INITIAL STAUTS RTN	00014750
00011F	621E			2034	BU PROTEST		00014760
000120	3235			2038	COMTESTB BOC DREG2,DOFORBLK	IF 1 MUST BE FORWARD SPACE BLOCK	00014780
				2040	* COMMAND IS 00010111 OR ERASE GAP		00014790
000121	1422			2042	DOERG STO XOUTBIM,NDXERG	EMIT ALU2 BRANCH ADDRESS ***	00014800
000122	612B			2045	BU DOWTM1		00014810
000123	DA10			2049	DODSE ANDM FLAGS1,ALLOWDSE	MASK TO TEST ALLOW DSE FLAG BIT	00014830
000124	2008			2052	BOC DBUS,COMREJCT	BRANCH IF OFF TO CMD REJECT	00014840
000125	1431			2055	STO XOUTBIM,NDXERS	EMIT ALU2 BRANCH ADDRESS ***	00014850
000126	8808			2058	ORI STATIMG,SETSTATA	SET DSE INDICATOR FOR CONTENT	00014860
000127	4828			2061	XFR STATIMG,STAT	SET TO HDWE	00014870
000128	612B			2064	BU DOWTM1	GO SET DF MASK	00014880
000129	3237			2068	COMTESTC BOC DREG2,DOFORFIL	IF 1, MUST BE FSF	00014900
00012A	1420			2071	* COMMAND IS 00011111 OR WRITE TAPE MARK		00014920
00012B	8204			2073	DOWTM STO XOUTBIM,NDXWTM	EMIT ALU2 BRANCH ADDRESS ***	00014930
00012C	8820			2076	DOWTM1 ORI XOUTAIM,WRITE	ADD WRITE AND CONTROL TO DF MASK	00014940
00012D	1037			2079	ORI STATIMG,CONTROL	SET RETURN TO CONTROL COMMANDS	00014950
00012E	621E			2082	STO LINK1,CONTINIT	LINK TO CONTROL INITIAL STATUS	00014960
				2085	BU PROTEST	GO TO TEST FILE PROTECT	00014970
00012F	143E			2088	* COMMAND IS 00100111 OR BACKSPACE RECORD		00014990
000130	8820			2090	DOBKSPBL STO XOUTBIM,NDXBSR	EMIT ALU2 BRANCH ADDRESS ***	00015000
000131	1037			2093	DOCONTRL ORI STATIMG,CONTROL	SET CONTROL BIT IN DATA FLOW MASK	00015010
000132	6145			2096	STO LINK1,CONTINIT	SET RETURN TO CONTROL COMMANDS	00015020
				2099	BU DOREAD2	GO SET READ BACK MASK BIT	00015030
000133	143C			2102	* COMMAND IS 00101111 OR BACKSPACE FILE		00015050
000134	6130			2104	DOBAKFIL STO XOUTBIM,NDXBSF	EMIT ALU2 BRANCH ADDRESS ***	00015060
				2107	BU DOCONTRL	GO SET DF MASK BITS	00015070
000135	1437			2110	* COMMAND IS 00110111 OR FORWARD SPACE RECORD		00015090
000136	6130			2112	DOFORBLK STO XOUTBIM,NDXFSR	EMIT ALU2 BRANCH ADDRESS ***	00015100
				2115	BU DOCONTRL	GO SET DF CONTROL BIT	00015110

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000137	1435			2118	* COMMAND IS 00111111 OR FORWARD SPACE FILE		00015130
000138	6130			2120	DOFORFIL STO XOUTBIM,NDXFSF	EMIT ALU2 BRANCH ADDRESS ***	00015140
				2123	BU DOCONTRL	GO SET DF CONTROL BIT	00015150
				2126	*****		00015170
				2127	*SEPARATE READ TYPE COMMANDS BY FURTHER DECODING	*	00015180
				2128	*****		00015190
000139	F002			2130	READTYPE XOM CURCOMM,X'02'	TEST FOR READ CODE	00015200
00013A	2043			2133	BOC DBUS,DOROAD	BRANCH IF READ	00015210
00013B	F00C			2136	CHKRDB XOM CURCOMM,X'0C'	TEST FOR READ BACKWARD	00015220
00013C	2046			2139	BOC DBUS,DORDBACK	BRANCH IF READ BACKWARD	00015230
00013D	F004			2142	XOM CURCOMM,X'04'	TEST FOR SENSE CODE	00015240
00013E	207F			2145	BOC DBUS,DOSENSE	BRANCH IF SENSE	00015250
00013F	231C			2148	BOC MIFTR,CHKRSRV	BRANCH IF MIS AVAILABLE	*** 00015260
				2150	* IF COMMAND OP CODE WAS NONE OF THE ABOVE, IT IS INVALID AND WILL		00015270
				2151	* BE REJECTED		00015280
000140	6108			2153	BU COMREJCT	GO REJECT COMMAND	00015290
000141	1091			2157	DOTESTIO STO LINK1,TERMSTAT	EMIT LINK TO TERMINAL STATUS RTN	00015310
000142	622A			2160	BU TUTEST1	TEST TU STATUS	00015320
000143	1433			2164	DOROAD STO XOUTBIM,NDXRDF	EMIT ALU2 BRANCH ADDRESS ***	00015340
000144	1079			2167	DOROAD1 STO LINK1,CLEANIT	LINK TO CLEAN INITIAL ROUTINE	00015350
				2169	*OROAD2 ORI XOUTAIM,RDRDB	ADD RD OR RDB BIT TO DF MASK	00015360
000145	6228			2171	DOROAD2 BU TUTEST	GO TO TEST TU STATUS	00015370
000146	143A			2175	DORDBACK STO XOUTBIM,NDXRDB	EMIT ALU2 BRANCH ADDRESS ***	00015390
				2177	* AND XOUTAIM,ONES-DATCON	RESET DATA CONVERT IF SEV TRK	00015400
000147	6144			2179	BU DOROAD1	GO TO READ INITIALIZE	00015410

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				2182	***** MODE COMMAND DECODE *****		00015430
				2183	* DECODE MODETYPE COMMANDS FURTHER AND PERFORM FUNCTION REQUIRED.		* 00015440
				2184	* SET CHANNEL END-DEVICE END IN INITIAL STATUS. REQ TIE AND SET		* 00015450
				2185	* DIAGNOSE COMMANDS WILL LINK TO THE WRITE ROUTINE TO FETCH THE FIRST		* 00015460
				2186	* BYTE OF DATA. THE 7 TRK FEATURE WILL BE CHECKED TO SEE IF IT IS		* 00015470
				2187	* PRESENT. ALL MODE TYPE COMMAND ARE VALID. ANY NOT SPECIFICALLY		* 00015480
				2188	* RECOGNIZED TO PERFORM A FUNCTION WILL BE TREATED AS SENSE RESET		* 00015490
				2189	* NO-OPS.		* 00015500
				2190	*****		00015510
				2191	*****		00015520
000148	6579			2194	GOSETDIA BU DOSETDIA GO EXECUTE SET DIAGNOSE CMD		00015540
000149	350A			2198	IS5ON BOC DREG5,CONTCMD		00015560
00014A	3154			2201	MODETYPE BOC DREG1,CKHIMODE	BRANCH TO CHECK HI MODES(X1XXX011)	00015570
00014B	F00B			2204	XOM CURCOMM,X'0B'	MASK FOR DIAGNOSTIC MODE SET	00015580
00014C	206C			2207	BOC DBUS,DODIAMS	BRANCH IF YES	00015590
00014D	F01B			2210	XOM CURCOMM,X'1B'	MASK FOR TRACK IN ERROR MODE SET	00015600
00014E	2070			2213	BOC DBUS,DOTIEMS	BRANCH IF IT IS	00015610
00014F	F003			2216	XOM CURCOMM,X'03'	MASK FOR NO-OP COMMAND	00015620
000150	205E			2219	BOC DBUS,ISNOOP	BRANCH IF IT IS	00015630
000151	F08B			2222	XOM CURCOMM,X'8B'	MASK FOR LWR COMMAND	00015640
000152	206E			2225	BOC DBUS,DOLWR	BRANCH IF IT IS	00015650
000153	647D			2228	BU CHK7TK	BRANCH TO CHECK 7 TRACK	00015660
000154	F0CB			2232	CKHIMODE XOM CURCOMM,X'CB'	MASK FOR NRZI MODE SET	00015680
000155	2069			2235	BOC DBUS,DONRZMS	BRANCH IF IT IS	00015690
000156	F0C3			2238	XOM CURCOMM,X'C3'	MASK FOR PE MODE SET	00015700
000157	2064			2241	BOC DBUS,DOPEMS	BRANCH IF IT IS	00015710
000158	F0D3			2244	XOM CURCOMM,X'D3'	MASK FOR 6250 MODE SET	00015720
000159	2060			2247	BOC DBUS,DO64MS	BR IF SO	00015730
00015A	F04B			2250	XOM CURCOMM,X'4B'	MASK FOR SET DIAGNOSE CMD	00015740
00015B	2070			2253	BOC DBUS,DOTIEMS	BRANCH IF IT IS	00015750
00015C	3067			2256	BOC DREG0,MODELINK	BR IF NONE OF ABOVE AND MODE 2 SET	00015760
00015D	647D			2259	ANY7TK BU CHK7TK	BRANCH	00015770
00015E	101B			2263	ISNOOP STO LINK1,TRETURN3	SET NO-OP RETURN	00015790
00015F	622A			2266	BU TUTEST1	GO CHECK TU STATUS	00015800
000160	2E7A			2270	DO64MS BOC SCB,DO64B		00015820
000161	8B20			2273	DO64A ORI FLAGS2,A64	SET ITF A FLG	00015830
000162	CABF			2276	AND FLAGS1,ONES-ANRZI	RESET A NRZ FLG	00015840
000163	6167			2279	BU MODELINK		00015850
000164	2E77			2283	DOPEMS BOC SCB,DOPEB	BRANCH IF MIS AVAILABLE	00015870
000165	CABF			2286	DOPEA AND FLAGS1,ONES-ANRZI	RESET THE NRZI FLAG FOR INTF A	00015880
000166	CBDF			2289	DOPEA2 AND FLAGS2,ONES-A64	RESET 6250 FLG	00015890
000167	1019			2292	MODELINK STO LINK1,TRETURN2	SET TU TEST ROUTINE RETURN	00015900
000168	6228			2295	BU TUTEST	GO TO TEST THE DEV	00015910
000169	2E7D			2299	DONRZMS BOC SCB,DONRZB	BRANCH IF MIS AVAILABLE	00015930
00016A	8A40			2302	DONRZA ORI FLAGS1,ANRZI	SET NRZI MODE FLAG FOR INTF A	00015940
00016B	6166			2305	BU DOPEA2	GO SET RETURN	00015950

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
00016C	8C80			2309	DODIAMS	ORI SETDIA1,DIAWRT	SET THE DIAG MODE FLAG	F01MAY72 9/04/73
00016D	6167			2312	BU	MODELINK	GO SET RETURN	00015970
								00015980
00016E	8C04			2316	DOLWR	ORI SETDIA1,LWROP	SET LOOP WRITE TO READ FLAG	00016000
00016F	611C			2319	BU	ITSOK	RETURN TO WRITE ROUTINE	00016010
000170	1079			2323	DOTIEMS	STO LINK1,CLEANIT	SET TU TEST ROUTINE RETURN	00016030
000171	6228			2326	BU	TUTEST	GO TEST DRIVE STATUS	00016040
000172	F04B			2330	DOTIEMS1	XOM CURCOMM,X'4B'	MASK FORSET DIAGNOSE CMD	00016060
000173	2048			2333	BOC	DBUS,GOSETDIA	BRANCH IF IT IS	00016070
000174	42A0			2336	XFR	XOUTAIM,CBO	FETCH TIE BYTE	00016080
000175	4150			2339	XFR	CTIMAGE,CTI	RESET SERVICE IN	00016090
000176	6700			2342	BU	SCREENTI		00016100
000177	CA7F			2347	DOPEB	AND FLAGS1,ONES-BNRZI	RESET B INTF NRZI FLAG	00016130
000178	CBEF			2350	DOPEB2	AND FLAGS2,ONES-B64	RESET 6250 B FLG	00016140
000179	6167			2353	BU	MODELINK	RETURN TO SET STATUS IN	00016150
00017A	8B10			2358	DO64B	ORI FLAGS2,B64	SET 6250 FLG	00016180
00017B	CA7F			2361	AND	FLAGS1,ONES-BNRZI	RESET NRZI FLG	00016190
00017C	6167			2364	BU	MODELINK		00016200
00017D	8A80			2368	DONRZB	ORI FLAGS1,BNRZI	SET NRZI FOR B INTF	00016220
00017E	6178			2371	BU	DOPEB2 K	RETURN TO RAISE STATUS	00016230

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
2375	***** SENSE OP *****					00016260	
2376	*THIS ROUTINE CONTROLS THE SENSE OPERATION.					* 00016270	
2377	*THE SENSE BYTES WHICH ARE ASSEMBLED BY ALU2 ARE PASSED VIA THE XOVER					* 00016280	
2378	*REGISTERS . WHEN A BYTE OF SENSE INFO DOES NOT APPLY THEN THE XOVER					* 00016290	
2379	*WILL CONTAIN ZEROS. SENSE BYTES 2, 3, 4 13, 14, AND 17 ARE GATED BY					* 00016300	
2380	*BITS SET IN ALU1 XOVER REG XOUTA AND THE SENSE STAT TURNED ON.					* 00016310	
2381	*****					00016320	
00017F	13D1			2384	DOSENSE STO LINK4,RTNSSENS	SET OPENERS RETURN	00016340
000180	64D5			2387	BU OPENERS	GO CHECK DEVICE STATUS	00016350
000181	0500			2391	SENSEOK STO PNDSTS,ZERO	CLEAR REG OF OLD STATUS	00016370
000182	105C			2394	STO LINK1,SRETURN2	RETURN TO SENSE0	00016380
000183	116A			2397	STO LINK2,WATESUM	SET UP IN CASE OF INTERFACE ERR	00016390
000184	6060			2400	BU STATRTN	GO PRESENT STATUS	00016400
000185	4150			2404	SENSE0 XFR CTIMAGE,CTI	DROP STATUS IN	00016420
000186	14D6			2407	STO XOUTBIM,NDXSNS	LOAD INDEX FOR ALU2 ***	00016430
000187	5441			2410	XFR XOUTBIM,XOUTB	START ALU2 OFF	00016440
000188	138A			2413	STO LINK4,SENSE1	RETURN TO SENSE1	00016450
000189	61E8			2416	BU PULL2	GO GET 1ST 2 BYTES	00016460
2419	* SENSE BYTES 0 AND 1					00016480	
00018A	04FE			2422	SENSE1 STO WORK1,X'FE'	TRANSFER	00016500
00018B	4721			2425	XFR SNSSTS2,AR	SENSE STATUS 2 TO	00016510
00018C	C400			2428	AND WORK1,0	WORK1 WITHOUT	00016520
00018D	4F90			2431	XFR SETCNT2,XINA	THE NOISE	00016530
00018E	4F21			2434	XFR SETCNT2,AR	BIT IF	00016540
00018F	8400			2437	ORI WORK1,0	ON	00016550
000190	2097			2440	BOC DBUS,TSTERRS		00016560
000191	D701			2443	CHKNOIS ANDM SNSSTS2,RDNOISE	SET NOISE	00016570
000192	2094			2446	BOC DBUS,SENSE2	IN BYTE 1	00016580
000193	8E80			2449	ORI SETCNT1,NOISE	IF ON	00016590
000194	139B			2452	SENSE2 STO LINK4,SENSE3	RETURN TO SENSE3	00016600
000195	0F00			2455	STO SETCNT2,0	CLEAR THIS REG (HOLDS FLAGS FOR SNS)	00016610
000196	61CF			2458	BU SNSEVEN	GO SHIP 2 BYTES	00016620
000197	DB40			2462	TSTERRS ANDM FLAGS2,ALUFAIL	MASK ALU FAIL FLAG	00016640
000198	2091			2465	BOC DBUS,CHKNOIS	BRANCH IF OFF	00016650
000199	8420			2468	ORI WORK1,BUSOC	OTHERWISE SET BUS OUT CHK	00016660
00019A	6191			2471	BU CHKNOIS	RETURN	00016670
2474	* SENSE BYTES 2 AND 3					00016690	
00019B	8840			2477	SENSE3 ORI STATIMG,SENSE	RESET SENSE TO DF	00016710
00019C	0200			2480	STO XOUTAIM,0	CLEAR XOUTAIM (HOLDS CNT TO	00016720
00019D	8F40			2483	ORI SETCNT2,SNSON	GATE BYTES FROM DF	00016730
00019E	13A0			2486	STO LINK4,SENSE4	RETURN TO SENSE 4	00016740
00019F	61CE			2489	BU SNSEVEN1	GO BUMP ONE THEN SHIP EM	00016750
2492	* SENSE BYTES 4 AND 5					00016770	

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0001A0	0F00			2495	SENSE4	STO SETCNT2,0	CLEAR REG FOR TEST	00016790
0001A1	5521			2498		XFR ALU1ERR,AR	DO WE	00016800
0001A2	5621			2501		XFR ALU2ERR,AR	HAVE AN	00016810
0001A3	9F00			2504		ORM SETCNT2,0	ERROR	00016820
0001A4	20A7			2507		BOC DBUS,SENSE5	BR IF NOT	00016830
0001A5	8480			2510		ORI WORK1,ALUERR	SET ON IF SO	00016840
0001A6	CB3F			2513		AND FLAGS2,ONES-ALUFAIL	FORCEUC RESET ALU FAIL FLAGS	00016850
0001A7	0F20			2516	SENSE5	STO SETCNT2,SNSOFF	SET FLAG TO TURN SNS OFF	00016860
0001A8	8E40			2519		ORI SETCNT1,NSUBSYS	SET BIT TO INDICATE 3803	00016870
0001A9	13AB			2522		STO LINK4,SENSE6	RETURN TO SENSE 6	00016880
0001AA	61CE			2525		BU SNSEVEN1	GO BUMP ON THEN SHIP 2 MORE	00016890
				2528	*	SENSE BYTES 6 AND 7		00016910
0001AB	13AD			2531	SENSE6	STO LINK4,SENSE7	RETURN TO SENSE 7	00016930
0001AC	61CE			2534		BU SNSEVEN1	GO TO BUMP XOUTAIM TO CLEAR BITS 6-7	00016940
				2537	*	SENSE BYTES 8 AND 9		00016960
0001AD	8E08			2540	SENSE7	ORI SETCNT1,X'08'	SET HIGH DENSITY BIT ON	00016980
0001AE	DA20			2543		ANDM FLAGS1,CURFLAG	ARE WE RESERVED	00016990
0001AF	20B1			2546		BOC DBUS,SENSE8	BR IF NOT	00017000
0001B0	8E01			2549		ORI SETCNT1,CURSVD	TELL THE WORLD IF SO	00017010
0001B1	13B5			2552	SENSE8	STO LINK4,SENSE9	RETURN TO SENSE 9	00017020
0001B2	0F40			2555		STO SETCNT2,NSON	TRN ON CONTROL BIT	00017030
0001B3	020F			2558		STO XOUTAIM,15	LOAD GATES FOR HARDWARE	00017040
0001B4	61CF			2561		BU SNSEVEN	GO SHIP 'EM	00017050
				2564	*	SENSE BYTES 10 AND 11		00017070
0001B5	5521			2567	SENSE9	XFR ALU1ERR,AR	GET ALU1 ERRORS	00017090
0001B6	8E00			2570		ORI SETCNT1,0	IF SO	00017100
0001B7	13B9			2573		STO LINK4,SENSEA	RETURN TO SENSEA	00017110
0001B8	61C6			2576		BU SENSEDS	GO SHIP 'EM	00017120
				2579	*	SENSE BYTES 12 AND 13		00017140
0001B9	0FC0			2582	SENSEA	STO SETCNT2,NSON+CNT40	DO SENSE AND ADD 40 WHEN APPLIES	00017160
0001BA	5660			2585		XFR ALU2ERR,CBI	SEND ALU 2 ERRORS	00017170
0001BB	13BE			2588		STO LINK4,SENSEB	RETURN TO SENSE B	00017180
0001BC	0220			2591		STO XOUTAIM,X'20'	INIT LSR	00017190
0001BD	61D0			2594		BU SNSEVEN2	GO SHIP 'EM	00017200
				2597	*	SENSE BYTES 14 AND 15		00017220
0001BE	0F20			2600	SENSEB	STO SETCNT2,SNSOFF	TURN SENSE OFF WHEN APPLIES	00017240
0001BF	13C2			2603		STO LINK4,SENSEC	RETURN TO SENSEC	00017250
0001C0	A240			2606		ADD XOUTAIM,X'40'	BUMP GATES FOR HARDWARE	00017260
0001C1	61CF			2609		BU SNSEVEN	GO SHIP 'EM	00017270
				2612	*	SENSE BYTES 16 AND 17		00017290
0001C2	0FC0			2615	SENSEC	STO SETCNT2,NSON+CNT40	TURN SENSE ON AND ADD 40	00017310
0001C3	13C5			2618		STO LINK4,SENSED	RETURN TO SENSE D	00017320

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
0001C4	61CF			2621	BU SNSEVEN	GO SHIP 'EM		00017330
				2624 *	SENSE BYTES 18 AND 19			00017350
0001C5	13C9			2627	SENSED STO LINK4,SENSEE	LOAD LINK RETURN		00017370
0001C6	C8BF			2630	SENSEDS AND STATIMG,ONES-SENSE	RESET SENSE IN REG		00017380
0001C7	0F00			2633	STO SETCNT2,0	CLEAR FLAGS OUT		00017390
0001C8	61CF			2636	BU SNSEVEN	GO SHIP 'EM		00017400
				2639 *	SENSE BYTES 20 AND 21			00017420
0001C9	13CB			2642	SENSEE STO LINK4,SENSEF	RETURN TO SENSE F		00017440
0001CA	61CF			2645	BU SNSEVEN	GO SHIP 'EM SOME MORE		00017450
				2648 *	SENSE BYTES 22 AND 23			00017470
0001CB	5D21			2650	SENSEF XFR FRUREG,AR	GET ALU 1 FRU REG		00017480
0001CC	8400			2653	ORI WORK1,0	IN REG TO SEND		00017490
0001CD	13F5			2656	STO LINK4,CANCEL1	THATS ALL - RETURN TO CANCEL		00017500
				2659	*****			00017520
0001CE	A201			2660 *	ENTRY TO SEND WORK1 AND SETCNT1	TO CHANNEL		00017530
0001CF	4460			2662	SNSEVEN1 ADD XOUTAIM,1	BUMP GATES		00017540
0001D0	8808			2665	SNSEVEN XFR WORK1,CBI	SET ON CHANNEL BUS IN		00017550
0001D1	4242			2668	SNSEVEN2 ORI STATIMG,SETSTATA	SET STAT A ON		00017560
0001D2	4828			2671	EXIT XFR XOUTAIM,XOUTA	THIS WILL SET CONTROLS		00017570
0001D3	1001			2674	XFR STATIMG,STAT	TO HARDWARE		00017580
0001D4	118B			2677	STO LINK1,BRETURN2	SET UP		00017590
0001D5	128B			2680	STO LINK2,CANCEL	RETURN		00017600
0001D6	620A			2683	STO LINK3,CANCEL	LINKAGE		00017610
				2686	BU SERVTRN	GO DO SERVICE		00017620
				2688	*****			00017630
				2690	*****			00017650
				2691 *	RETURN AFTER SENDING THE EVEN SENSE BYTE			00017660
				2692	*****			00017670
0001D7	DF40			2695	SNSODD ANDM SETCNT2,SNSON	SET SENSE ON		00017690
0001D8	20E0			2698	BOC DBUS,SNSODD2	BR IF NOT		00017700
0001D9	8840			2701	ORI STATIMG,SENSE	SET SENSE GATE FOR HDWE		00017710
0001DA	9F00			2704	ORM SETCNT2,0	ADD ONE OR 40		00017720
0001DB	30E4			2707	BOC CNT40,SNSODD3	BR IF ADD 40		00017730
0001DC	A201			2710	ADD XOUTAIM,1	BUMP ONE		00017740
0001DD	C8F7			2713	SNSODD1 AND STATIMG,ONES-SETSTATA	RESET STAT A		00017750
0001DE	4E60			2716	XFR SETCNT1,CBI	SET ODD SENSE BYTE ON CBI		00017760
0001DF	61D1			2719	BU EXIT	RETURN TO PULL 2		00017770
0001E0	DF20			2723	SNSODD2 ANDM SETCNT2,SNSOFF	TURN OFF SENSE		00017790
0001E1	20DD			2726	BOC DBUS,SNSODD1	BR IF NOT		00017800
0001E2	C8BF			2729	AND STATIMG,ONES-SENSE	DO IT IF OS		00017810
0001E3	61DD			2732	BU SNSODD1	CONTINUE ON		00017820
0001E4	A240			2736	SNSODD3 ADD XOUTAIM,X'40'	BUMP GATE		00017840
0001E5	61DD			2739	BU SNSODD1	CONTINUE SOME MORE		00017850

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0001E6	4150			2743	SNSLINK	XFR CTIMAGE,CTI	RESET SERVICE IN	F01MAY72 9/04/73
0001E7	2AD7			2746		BOC STATA,SNSODD	IF A ON GO TO SNS ODD	00017870
0001E8	3AEC			2749	PULL2	BOC STATC,PULLAB	BR IF ALU2 DONE WITH	00017880
0001E9	3BF6			2752		BOC STATD,CLEARAB	1ST 2 SENSE BYTES	00017890
0001EA	28F5			2755		BOC ADROUT,CANCEL1	BR IF HIO	00017900
0001EB	61E8			2758		BU PULL2	WAIT SOME MORE	00017910
								00017920
0001EC	4490			2762	PULLAB	XFR WORK1,XINA	GET EVEN SENSE BYTE FROM ALU2	00017940
0001ED	4E88			2765		XFR SETCNT1,XINB	GET EVEN SENSE BYTE FROM ALU2	00017950
0001EE	8801			2768	NOTPULL	ORI STATIMG,SETSTATD	SET D TO IND	00017960
0001EF	4828			2771		XFR STATIMG,STAT	GOT 'EM	00017970
0001F0	28F5			2774	PULLAB1	BOC ADROUT,CANCEL1	WAIT TO ASSURE	00017980
0001F1	3BF3			2777		BOC STATD,PULLAB2	ALU2 HAS SEEN D.	00017990
0001F2	3AF0			2780		BOC STATC,PULLAB1	ON	00018000
0001F3	C8FE			2783	PULLAB2	AND STATIMG,ONES-SETSTATD	THEN RESET IT	00018010
0001F4	5322			2786		XFR LINK4,IC	RETURN WITH 2 BYTES FROM ALU2	00018020
0001F5	628B			2790	CANCEL1	BU CANCEL	POINT SO EXIT	00018040
0001F6	0400			2794	CLEARAB	STO WORK1,0	CLEAR WORK1	00018060
0001F7	0E00			2797		STO SETCNT1,0	CLEAR COUNT REG 2	00018070
0001F8	61EE			2800		BU NOTPULL	RETURN TO DO ONLY ALU1	00018080

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000200				2804	ORG BEGIN+X'200'		00018110
				2805	***** SERVICE ROUTINE *****		00018120
				2806	*SERVICE IN SBR TESTS FOR ALL OUT TAGS DOWN, RAISES SERVICE IN AND *		00018130
				2807	*LINKS TO ADDRESSES STORED IN LNK 1 2 AND 3 WHEN A TAG IS RECEIVED IN *		00018140
				2808	*REPLY		00018150
				2809	*****		00018160
000200	65E1			2812	DMRRTN1 BU DMRLNK RETURN TO DMR ROUTINE		00018180
000201	61E6			2815	BRETURN2 BU SNSLINK RETURN TO SENSE OP		00018190
000202	6583			2818	BRETURN4 BU DIALINK RETURN TO SET DIAGNOSE		00018200
000203	1082			2822	WRTBGN STO LINK1,WRTFST SET SERVICE SUBRTN RETURN		00018220
000204	117E			2825	STO LINK2,WCOSTOP SET STOP LINK		00018230
000205	127F			2828	STO LINK3,WCOHIO SET HIO LINK		00018240
000206	CCFB			2831	AND SETDIA1,ONES-LWROP RESET BIT FOR NEXT OPERATION		00018250
000207	8702			2834	ORI SNSSTS2,WDCNT0 SET WORD COUNT ZERO ON		00018260
000208	4560			2837	XFR PNDSTS,CBI CLEAR BUS IN		00018270
000209	C400			2840	AND WORK1,ZERO CLEAR WORK REG 1		00018280
00020A	380C			2844	SERVRTN BOC OPRIN,SERVRTN0 BRANCH IF OP IN STILL UP(NO HIO)		00018300
00020B	5222			2847	HIOCLK XFR LINK3,IC RETURN TO HIO ENTRY		00018310
00020C	8108			2851	SERVRTN0 ORI CTIMAGE,SVCIN MASK SERVICE IN UP		00018330
00020D	280B			2854	SERVRTN1 BOC ADROUT,HIOCLK TEST FOR HALT I/O		00018340
00020E	2D0D			2857	BOC SVCOUT,SERVRTN1 WAIT FOR TAG TO FALL		00018350
00020F	290D			2860	BOC CMDOUT,SERVRTN1 WAIT FOR TAG TO FALL		00018360
000210	390D			2863	BOC SUPO,SERVRTN1 BRANCH TO SUPPRESS DATA		00018370
000211	4150			2866	XFR CTIMAGE,CTI RAISE SERVICE IN		00018380
000212	C1F7			2869	AND CTIMAGE,ONES-SVCIN MASK SERVICE IN DOWN		00018390
000213	280B			2872	* GO TO MAP 13-170		00018410
				2874	SERVRTN2 BOC ADROUT,HIOCLK TEST FOR HALT I/O		00018420
				2876	* GO TO MAP 13-170		00018430
000214	2917			2878	BOC CMDOUT,WHOA STOPLINK TO PROGRAM		00018440
				2880	* GO TO MAP 13-170		00018450
000215	2D36			2882	BOC SVCOUT,TUTRTN SERVICE OUT RESPONSE TO SERVICE IN		00018460
				2884	* GO TO MAP 13-170		00018470
000216	6213			2886	BU SERVRTN2 WAIT		00018480
				2889	*** COMMAND OUT RESPONSE TO SERVICE IN SAYS STOP		00018500
000217	4150			2891	WHOA XFR CTIMAGE,CTI DROP SERVICE IN		00018510
000218	5122			2894	XFR LINK2,IC LINK TO PROGRAM		00018520
				2898	***** TEST TAPE UNIT *****		00018550
				2899	*THIS ROUTINE DETERMINES WHETHER THE TU STATUS PERMITS THE INITIATION *		00018560
				2900	*OF THE COMMAND. IT THEN LINKS TO THE PROPER INITIAL STATUS ROUTINE *		00018570
				2901	*****		00018580
000219	1349			2904	TRETURN2 STO LINK4,GRETURN0 SET MODE RETURN		00018600

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
00021A	604B			2907	BU	GODODIA	RETURN TO PRESENT MODE STATUS	00018610
00021B	63DA			2910	TRETURN3	BU BSTWAIT2	NO-OP RETURN	00018620
00021C	60E6			2913	TRETURN0	BU CMDPAR1	GO TO TERM UCK RTN	00018630
00021D	60ED			2916	SNSRESET	BU DOITNOW		00018640
				2919	***	PROTEST IS ENTERED ONLY BY WRITE TYPE COMMANDS TO CHECK FOR		00018660
				2920	***	FILE PROTECT		00018670
00021E	13D2			2922	PROTEST	STO LINK4,RTNPROT	SET OPENERS RETURN	00018680
00021F	64D5			2925	BU	OPENERS	GO CHECK DEVICE STATUS	00018690
000220	3A2C			2929	PROTEST1	BOC STATC,TUTESTIT	BRANCH IF NOT READY	00018710
000221	DC04			2933	CHKLWR	ANDM SETDIA1,LWROP	MASK FOR LOOP WRITE TO READ OP	00018730
000222	2025			2936	BOC	DBUS,CHKNEP	BRANCH IF OFF	00018740
000223	8802			2939	ORI	STATIMG,SETSTATC	OTHERWISE SET STAT FOR ALU2	00018750
000224	4828			2942	XFR	STATIMG,STAT	SET TO HARDWARE	00018760
000225	D440			2946	CHKNEP	ANDM WORK1,NFP	TEST FOR NOT FILE PROTECT	00018780
000226	312C			2949	BOC	DREG1,TUTESTIT	BRANCH IF NOT FP	00018790
000227	6400			2952	BU	COMREJC1	GO TO COMMAND REJECT ROUTINE	00018800
000228	13D3			2956	TUTEST	STO LINK4,RTNTUTST	SET OPENERS RETURN	00018820
000229	64D5			2959	BU	OPENERS	GO CHECK DEVICE STATUS	00018830
00022A	13D4			2963	TUTEST1	STO LINK4,RTNTUTS1	SET OPENERS RETURN	00018850
00022B	64D5			2966	BU	OPENERS	GO CHECK DEVICE STATUS	00018860
00022C	DB80			2970	TUTESTIT	ANDM FLAGS2,FORCEUC	MASK FOR ALU FAILURE	00018880
00022D	301C			2973	BOC	DREG0,TRETURN0	BRANCH IF SO TO SET UNIT CHECK	00018890
00022E	0700			2976	STO	SNSSTS2,ZERO	RESET SENSE	00018900
00022F	4012			2979	XFR	CLEAR	RESET DATA FLOW SENSE	00018910
000230	4012			2982	XFR	CLEAR	RESET DATA FLOW SENSE	00018920
000231	3A1D			2985	BOC	STATC,SNSRESET	BR ON UC	00018930
000232	5022			2988	XFR	LINK1,IC	TETURN	00018940
000233	3A1C			2992	TUTEST2	BOC STATC,TRETURN0	GO TO TERMINAL UNIT CHECK ROUTINE.	00018960
000234	DB80			2995	ANDM	FLAGS2,FORCEUC	IS FORCE UNIT CHK FLAG ON	00018970
000235	301C			2998	BOC	DREG0,TRETURN0	BR IF SO	00018980
000236	5022			3002	TUTRTN	XFR LINK1,IC	LINK TO STATUS HANDLING ROUTINE	00019000
				3006	*****	CONTROL COMMANDS *****		00019030
				3007	*****	*****		00019040
				3008	*CONTINIT	ROUTINE HANDLES THE PRESENTATION OF INITIAL STATUS FOR ALL *		00019050
				3009	*ACCEPTED	CONTROL IMMEDIATE COMMANDS.		00019060
				3010	*****	*****		00019070
000237	0508			3013	CONTINIT	STO PNDSTS,CHANEND	EMIT CHANNEL END STATUS	00019090
000238	105D			3016	STO	LINK1,SRETURN4	EMIT ACCEPT RETURN	00019100
000239	115E			3019	STO	LINK2,SRETURN5	EMIT STACK RETURN	00019110
00023A	604A			3022	BU	GODODIA0	GO TO PRESENT STATUS	00019120

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				3025	*** CHANNEL RESPONDED WITH SERVICE OUT TO STATUS IN OR STATUS WAS		00019140
				3026	*** ACCEPTED		00019150
00023B	0500			3028	CONTSERV STO PNDSTS,ZERO RESET STATUS REGISTER		00019160
				3030	*** ENTRY AT CONTSTAK SAYS THE CHANNEL RESPONDED TO STATUS IN WITH		00019170
				3031	*** COMMAND OUT AND THE CHANNEL END IS STILL PENDING		00019180
00023C	4242			3033	CONSTSTAK XFR XOUTAIM,XOUTA SET DATA FLOW MASK		00019190
00023D	4828			3036	XFR STATIMG,STAT RESET STAT D IF ON		00019200
00023E	CCFB			3039	AND SETDIA1,ONES-LWROP RESET LWR BIT FOR NEXT OPERATION		00019210
00023F	2A4B			3042	BOC STATA,CKCHAIN BRANCH IF REWIND OR DSE		00019220
000240	4828			3046	GODOIT XFR STATIMG,STAT SET STATS TO HDWE		00019240
000241	F01F			3049	XOM CURCOMM,X'1F' CHK FOR WTM		00019250
000242	2066			3052	BOC DBUS,DOWTM64 BR IF SO		00019260
000243	F017			3055	XOM CURCOMM,X'17' ARE WE DS ERG		00019270
000244	2066			3058	BOC DBUS,DOWTM64 BR IF SO		00019280
000245	5441			3061	XFR XOUTBIM,XOUTB TRAP ALU 2 TO PERFORM OP		00019290
000246	C1FE			3064	SKIPALU2 AND CTIMAGE,ONES-OPIN DROP OP IN		00019300
000247	8110			3067	ORI CTIMAGE,CUBUSY RAISE CTL UNIT BUSY		00019310
000248	4150			3070	XFR CTIMAGE,CTI CHANGE TAGS		00019320
000249	3B5C			3073	* GO TO MAP 13-190		00019340
				3075	CTLWAIT BOC STATD,CHKERRS IS ALU 2 FINISHED?		00019350
				3077	* GO TO MAP 13-190		00019360
00024A	6249			3079	BU CTLWAIT WAIT		00019370
00024B	D901			3083	CKCHAIN ANDM FLAGS,CHAIN MASK TO CHECK CHAIN BIT		00019390
00024C	2051			3086	BOC DBUS,CKEOTBOT BRANCH IF NOT CHAINED		00019400
00024D	DD40			3089	ANDM SETDIA2,DEVBSY TEST FOR DEV BSY FLG		00019410
00024E	3150			3092	BOC DREG1,RESETA BRANCH IF ON TO RESET A STAT		00019420
00024F	8801			3095	ORI STATIMG,SETSTATD SET STAT D TO INDICATE CHAING		00019430
000250	C8F7			3098	RESETA AND STATIMG,ONES-SETSTATA RESET STAT A		00019440
000251	CDBF			3102	CKEOTBOT AND SETDIA2,ONES-DEVBSY RST THE DEV BSY DIAG FLAG		00019460
000252	F007			3105	XOM CURCOMM,X'07' MASK FOR REWIND COMMAND		00019470
000253	2057			3108	BOC DBUS,CHKBOT BRANCH IF IT IS TO CHECK BOT		00019480
000254	D420			3111	ANDM WORK1,EOT CMD IS DSE--CHECK EOT		00019490
000255	2040			3114	BOC DBUS,GODOIT BRANCH IF NOT EOT		00019500
000256	6259			3117	BU RSTSTATA GO RESET STAT A EOT IS ON		00019510
000257	D410			3121	CHKBOT ANDM WORK1,BOT MASK TO CHECK BOT		00019530
000258	2040			3124	BOC DBUS,GODOIT BRANCH IF NOT ON		00019540
000259	C8F6			3127	RSTSTATA AND STATIMG,ONES-SETSTATA-SETSTATD OT ON--RESET STATA		00019550
00025A	4828			3130	XFR STATIMG,STAT RESET TO HDWE		00019560
00025B	6246			3133	BU SKIPALU2 GO TO SKIP ALU2 AND HANDLE INTRPT		00019570
00025C	2267			3137	CHKERRS BOC ALUR,BIGPROB WAS EXECUTION ERROR FREE?		00019590
3140					***** CONTROL CMD END *****		00019610
3141					* DETERMINE CONTROL CMD ENDING STATUS---ALU2 IS FINISHED. IF CHANNEL *		00019620
3142					* END IS NOT PENDING AND NO OTHER STATUS IS TO BE PRESENTED, HAVE ALU2*		00019630
3143					* ARM THE DEVICE END PRIME. OTHERWISE SET STATUS PENDING FLAG. CHECK *		00019640
3144					* FOR CATASTROPHIC ERROR IN ALU2 AND SET EQUIPMENT CHECK IF SO. GO TO *		00019650
3145					* TERMSTAT ROUTINE TO PRESENT STATUS IF THERE IS ANY. *		00019660

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				3146	*****		00019670
00025D	3A68			3150	CONTEND BOC STATC,SIGUC	BRANCH IF ALU2 SIGNALLED UNIT CHECK	00019700
00025E	276E			3153	BOC DFLEP,WRTPROB	BRANCH IF DATA FLOW HAD AN ERROR	00019710
00025F	2B6C			3156	CONTEND1 BOC STATB,SIGUX	BRANCH IF ALU2 SIGNALLED UNIT EXCP	00019720
000260	8504			3159	CONTEND2 ORI PNDSTS,DEVEND	SET DEVICE END IN STATUS	00019730
000261	F504			3162	CONTEND3 XOM PNDSTS,DEVEND	IS STATUS DEV END ALONE	00019740
000262	2072			3165	BOC DBUS,ONLYDE	BRANCH IF YES	00019750
000263	2A72			3168	BOC STATA,ONLYDE	BRANCH IF UNCHAINED RWD OR DSE	00019760
000264	8904			3171	ORI FLAGS,STATPNDG	SET STATUS PENDING FLAG	00019770
000265	6291			3174	BU TERMSTAT	GO TO TERMINAL STATUS	00019780
000266	6609			3177	DOWTM64 BU BEGWRTM		00019790
000267	8710			3181	BIGPROB ORI SNSSTS2,EQUIPCK	SET EQUIPMENT CHECK IN SENSE DATA	00019810
000268	8526			3184	SIGUC ORI PNDSTS,DEVEND+UNITCHK+CUE	SET DE,CUE,UC IN STATUS	00019820
000269	C8F7			3187	AND STATIMG,ONES-SETSTATA	RESET STAT IN REG	00019830
00026A	4828			3190	XFR STATIMG,STAT	FOR LATER	00019840
00026B	625F			3193	BU CONTEND1	GO BACK	00019850
00026C	8525			3197	SIGUX ORI PNDSTS,DEVEND+UNITEXC+CUE	SET DE,CUE,UX IN STATUS	00019870
00026D	6260			3200	BU CONTEND2	GO BACK	00019880
00026E	8708			3204	WRTPROB ORI SNSSTS2,DATACK	SET DAT CHECK IN SENSE	00019900
00026F	6268			3207	BU SIGUC	GO SET NIT CHECK	00019910
000270	C508			3211	NOTNOW AND PNDSTS,CHANEND	CLEAR PENDING STATUS REG	00019930
000271	6296			3214	BU TERMSTA2	GO TO TERMINAL STATUS	00019940
000272	140A			3218	ONLYDE STO XOUTBIM,NDXSDE	RT EMIT ALU2 BRANCH ADDRESS	*** 00019960
000273	5441			3221	XFR XOUTBIM,XOUTB	TRAP ALU2 TO SET DE PRIME	00019970
000274	C8FC			3224	AND STATIMG,ONES-SETSTATC-SETSTATD	RESET STATS C AND D	00019980
000275	4828			3227	XFR STATIMG,STAT	SET TO HDWE	00019990
000276	3B8F			3230	DEDUN BOC STATD,CKDEER	BRANCH IF DONE	00020000
000277	3A8F			3233	BOC STATC,CKDEER	BRANCH IF ALU2 HAS PRIMED	00020010
000278	6276			3236	BU DEDUN	GO BACK IF NOT DONE	00020020
				3239	*****		00020040
				3240	*CLEANIT ROUTINE HANDLES THE PRESENTATION OF INITIAL STATUS FOR ALL	*	00020050
				3241	*ACCEPTED NON IMMEDIATE COMMANDS EXCEPT SENSE.	*	00020060
				3242	*****		00020070
000279	0500			3245	CLEANIT STO PNDSTS,ZERO	EMIT CLEAN STATUS	00020090
00027A	105F			3248	STO LINK1,SRETURN6	EMIT ACCEPT RETURN	00020100
00027B	116A			3251	STO LINK2,WATESUM	EMIT STACK RETURN	00020110
00027C	604A			3254	BU GODODIA0	GO SET DIAGNOSTIC FLAGS	00020120
				3257	*		00020140
				3258	***** WRITE ROUTINE *****		00020150
				3259	*****		00020160
				3260	* WRITINIT FETCHES THE FIRST BYTE OF WRITE DATA, CHECKS FOR WORD COUNT*		00020170

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				3261	* ZERO AND TRAPS ALU2 TO EXECUTE THE WRITE OP. IN ADDITION, A RIPPLE	*	00020180
				3262	* PATTERN IS GENERATED FOR OFF LINE MODE. THE PATTERN IS UPDATED AT	*	00020190
				3263	* EACH SERVICE OUT AND XFERRED TO CHAN BUS IN REG. IN OFF LINE MODE	*	00020200
				3264	* THE CHAN BUS IN REG IS WRAPPED AROUND TO CHAN BUS OUT TO PROVIDE	*	00020210
				3265	* RIPPLE WRITE DATA. REQ TIE AND SET DIAGNOSE COMMANDS WILL ALSO USE	*	00020220
				3266	* THIS ROUTINE TO FETCH THE FIRST BYTE OF DATA.	*	00020230
				3267	*****		00020240
00027D	6172			3270	BRETURN1 BU DOTIEMS1		00020260
00027E	63DD			3274	WCOSTOP BU SETUNTCK		00020280
00027F	050E			3278	WC0HIO STO PNDSTS,CHANEND+DEVEND+UNITCHK SET DE,CE,AND UC IN STATUS		00020300
000280	8904			3281	ORI FLAGS,STATPNDG		00020310
000281	6344			3284	BU HIONOP		00020320
000282	C7FD			3288	WRTFST AND SNSSTS2,ONES-WDCNT0		00020340
000283	D0C8			3291	ANDM CURCOMM,X'C8'		00020350
000284	3086			3294	BOC DREG0,BUMPRIP		00020360
000285	347D			3297	BOC DREG4,BRETURN1		00020370
000286	2488			3301	BUMPRIP BOC BOPE,SETFLAG		00020390
000287	660C			3304	BU BEGWRITE		00020400
000288	8720			3307	SETFLAG ORI SNSSTS2,BUSOC		00020410
000289	660C			3310	BU BEGWRITE		00020420
00028A	634D			3314	WRTHIO BU HIOPERG		00020440
00028B	C8B7			3319	CANCEL AND STATIMG,ONES-SENSE-SETSTATA		00020470
00028C	8880			3322	SETSTOP STOP		00020480
00028D	4828			3325	SETSTOP1 XFR STATIMG,STAT		00020490
00028E	63B8			3328	BU BSTWAIT		00020500
00028F	2268			3332	CKDEER BOC ALUR,SIGUC		00020520
000290	2A70			3335	BOC STATA,NOTNOW		00020530

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				3338	***** TERMINAL STATUS *****		00020550
				3339	* TERMINAL STATUS IS USED BY ALL FUNCTIONAL COMMANDS TO PRESENT		* 00020560
				3340	* ENDING STATUS. THE CALLING ROUTINE, UP ON ENTRY, MUST HAVE SET THE		* 00020570
				3341	* PENDING DEVICE ADDRESS REG AND THE PENDING STATUS REG. TERM STAT		* 00020580
				3342	* WILL DETERMINE IF CONTROL UNIT END MUST BE ADDED TO THE STATUS AND		* 00020590
				3343	* THEN WILL PRESENT THE STATUS IN THE APPROPRIATE MANNER. IF THE CHAN-		* 00020600
				3344	* NEL REMAINED CONNECTED STATUS IN WILL BE RAISED IMMEDIATELY. IF NOT		* 00020610
				3345	* AN INTERRUPT CYCLE WILL BE INITIATED WITH THE APPROPRIATE REQUEST-		* 00020620
				3346	* IN DEPENDING ON CHAINING. CONTROL UNIT BUSY WILL BE RESET IF APPLI-		* 00020630
				3347	* CABLE AND HOLD INTERFACE WILL BE SET IF STATUS PENDING OR STACK FLAG		* 00020640
				3348	* IS SET. IF PENDING STATUS IS CLEAN (RWD OR DSE) STATUS WILL NOT BE		* 00020650
				3349	* PRESENTED. THE CHECKING FOR CUE PORTION IS ALSO USED BY IDLESCAN		* 00020660
				3350	* ROUTINE UNDER THE CONTROL OF STATA. A GENERAL RESET WILL BE TERM-		* 00020670
				3351	* INATED BY THIS ROUTINE VIA IDLESCAN.		* 00020680
				3352	*****		00020690
000291	38A0			3355	TERMSTAT BOC OPRIN,TERMSTA1 IS OP-IN UP		00020710
000292	2334			3359	BHERE BOC MIFTR,CHKCONT BRANCH IF MIS AVAILABLE ***		00020730
000293	D986			3363	TERMSTA0 ANDM FLAGS,STATPNDG+STACK+CONCON NEED TO HOLD INTF		00020750
000294	2096			3366	BOC DBUS,TERMSTA2 NO, SKIP TO RESET CUB		00020760
000295	8120			3369	ORI CTIMAGE,HOLDINT RAISE HOLD INTERFACE		00020770
000296				3372	TERMSTA2 EQU *		00020790
000296	C8F5			3374	AND STATIMG,ONES-SETSTATA-SETSTATC (DSE OR RWD SWITCH)		00020800
000297	4828			3377	XFR STATIMG,STAT SET STATS TO HDWE		00020810
000298	C1EF			3380	AND CTIMAGE,ONES-CUBUSY RESET CONTROL UNIT BUSY		00020820
000299	4150			3383	XFR CTIMAGE,CTI XFR CHANNEL TAG IMAGE TO HDWE		00020830
00029A	2329			3387	TERMSTA3 BOC MIFTR,MIFTR05 BRANCH IF MIS AVAILABLE ***		00020850
				3389	* GO TO MAP 13-200		00020860
00029B	25A6			3391	ANYCUEA BOC NCUEA,CHKAFLG BRANCH IF NOT CUE ON A		00020870
				3393	* GO TO MAP 13-200		00020880
00029C	8520			3395	ORI PNDSTS,CUE SET CONTROL UNIT END IN STATUS		00020890
				3397	* GO TO MAP 13-200		00020900
00029D	8940			3399	ORI FLAGS,CUEA SET CONTROL UNIT END IN FLAGS		00020910
				3401	* GO TO MAP 13-200		00020920
00029E	4009			3403	XFR CUEA ATTEMPT TO RESET CUEA		00020930
				3405	* GO TO MAP 13-200		00020940
00029F	629B			3407	BU ANYCUEA GO CHECK RESET		00020950
0002A0	8101			3411	TERMSTA1 ORI CTIMAGE,OPIN RAISE MICROPGM OP IN		00020970
0002A1	28A4			3414	BOC ADROUT,HADHIO BRANCH IF HIO		00020980
0002A2	4150			3417	XFR CTIMAGE,CTI SET TO HARDWARE		00020990
0002A3	3892			3420	BOC OPRIN,BHERE OP IN STILL UP?		00021000
0002A4	C1FE			3423	HADHIO AND CTIMAGE,ONES-OPIN RESET UPGM OP IN		00021010
0002A5	6292			3426	BU BHERE NO, CHANNEL DISCONNECTED		00021020
0002A6	4009			3430	CHKAFLG XFR CUEA RESET GEN RESET LATCH IF ON		00021040
0002A7	D940			3433	ANDM FLAGS,CUEA MASK FOR CUE A FLAG		00021050
0002A8	20AA			3436	BOC DBUS,CHKCHAIN BRANCH IF OFF		00021060
0002A9	8520			3439	CUEPNDG ORI PNDSTS,CUE SET CUE IN STATUS		00021070

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
0002AA	9500			3443	CHKCHAIN ORM PNDSTS,0	STATUS IS CLEAN IF RWD OR DSE	00021090
0002AB	20B2			3446	BOC DBUS,CHEKTIO	BRANCH IF SO TO PREVENT INTERRUPT	00021100
0002AC	38BB			3449	TERMSTA4 BOC OPRIN,STSIMME	BRANCH IF CHANNEL STILL CONNECTED	00021110
0002AD	D901			3452	ANDM FLAGS,CHAIN	MASK TO TEST CHAINING	00021120
0002AE	20B5			3455	BOC DBUS,NOTCHAIN	BRANCH IF CHAIN BIT OFF	00021130
0002AF	233B			3458	BOC MIFTR,MIFTR06	BRANCH IF MIS AVAILABE	\$\$\$ 00021140
0002B0	8A04			3461	SETREQA ORI REQTAGS,REQINA	RAISE NON SUPPRESSIBLE REQ-IN A	00021150
0002B1	62B9			3464	BU GOTOIDLE	GO WAIT FOR POLL	00021160
0002B2	9000			3468	CHEKTIO ORM CURCOMM,0	MASK FOR TIO CMD	00021180
0002B3	20AC			3471	BOC DBUS,TERMSTA4	BRANCH IF IT IS	00021190
0002B4	6304			3474	BU IDLESCAN	OTHERWISE GO LOOK FOR STATUS	00021200
0002B5	DD20			3478	NOTCHAIN ANDM SETDIA2,BLKINTS	MASK FOR DIAGNOSTIC BLOCK INTERRUPT	00021220
0002B6	32BA			3481	BOC DREG2,GODOIDLE	BRANCH IF ON TO BYPASS REQUEST-IN	00021230
0002B7	233F			3484	BOC MIFTR,MIFTR07	BRANCH IF MIS AVAILABE ***	00021240
0002B8	8A08			3487	DOREQA ORI REQTAGS,SUPREQA	RAISE SUPPRESSIBLE REQUEST IN A	00021250
0002B9	4A48			3490	GOTOIDLE XFR REQTAGS,MIST	RAISE REQ-IN TO HARDWARE	00021260
0002BA	6302			3493	GODOIDLE BU IDLEPEND	WAIT FOR POLL	00021270
0002BB	105A			3497	STSIMME STO LINK1,SRETURN0	LOAD STS SUBRTN ACCEPT RETURN	00021290
0002BC	115B			3500	STO LINK2,SRETURN1	LOAD STS SUBRTN STACK RETURN	00021300
0002BD	125B			3503	STO LINK3,SRETURN1	LOAD STS SUBRTN HALT RETURN	00021310
0002BE	6060			3506	BU STATRTN	GO TO STATUS SUBROUTINE	00021320
				3509	*****		00021340
				3510	* TERMSTAK IS ENTERED WHEN ENDING STATUS IN RECEIVES A COMMAND OUT		* 00021350
				3511	* RESPONSE (STACK). INBOUND TAGS WILL BE RESET,BUSY WILL BE REMOVED.		* 00021360
				3512	* FROM THE STATUS (IF APPLICABLE), THE OPPOSITE INTERFACE WILL BE		* 00021370
				3513	* RELEASED FROM PING HOLD (IF APPLICABLE), AND A NORMAL ENDUP EXIT		* 00021380
				3514	*****		00021390
0002BF	8120			3516	TERMSTAK ORI CTIMAGE,HOLDINT	RAISE HOLD INTERFACE	00021400
0002C0	4044			3519	XFR PING	RELEASE THE OTHER INTERFACE	00021410
0002C1	C1FC			3523	TERMSTK1 AND CTIMAGE,ONES-OPIN-ADDIN	RESET OPIN AND ADRESS IN	00021430
0002C2	C5EF			3526	AND PNDSTS,ONES-BUSY	RESET BUSY BIT IN STATUS	00021440
0002C3	C400			3529	GETOFF AND WORK1,ZERO	CLEAR WORK1	00021450
0002C4	62DE			3532	BU CLEANUP	GO TO RAISE REQ-IN	00021460
				3535	*****		00021480
				3536	* TERMACC IS ENTERED WHEN ENDING STATUS IN RECEIVES A SERVICE OUT		* 00021490
				3537	* RESPONSE (STATUS ACCEPTED). IF CHAINING OR CONTINGENT CONNECTION IS		* 00021500
				3538	* INDICATED, THE DEVICE WILL REMAIN COMMITTED. STAT D WILL BE SET TO		* 00021510
				3539	* NOTIFY ALU2 TO CLEAR A DEVICE END PRIME IF APPLICABLE. THE HOLD		* 00021520
				3540	* INTERFACE LINE WILL BE RAISED IF THE RESERVE FLAG,CHAIN FLAG,OR		* 00021530
				3541	* CONTINGENT CONNECTION FLAG IS ON. INBOUND TAGS WILL BE RESET AND		* 00021540
				3542	* CHAN BUS IN WILL BE CLEARED. IF NOT CHAINING EXIT WILL BE TO IDLE		* 00021550
				3543	* TO SCAN FOR STATUS. IF CHAINING, A LOOP HANGING ON SUPPRESS OUT WILL*		00021560
				3544	* BE EFFECTED. IF CHANNEL CALLS CHAIN OFF SUPPRESS OUT WILL DROP		* 00021570
				3545	*****		00021580
0002C5	C1FE			3548	TERMACC AND CTIMAGE,ONES-OPIN	RESET OP IN	00021600
0002C6	0400			3551	STO WORK1,0	CLEAR A WORK REG	00021610

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
0002C7	D981			3554	ANDM	FLAGS,CHAIN+CONCON	MASK TO CHECK CHAIN AND CONT CONN	00021620
0002C8	20CA			3557	BOC	DBUS,CKRESRV	BRANCH IF BOTH OFF	00021630
0002C9	62CC			3560	BU	DROPTAGS	OTHERWISE GET OUT	00021640
0002CA	2343			3564	CKRESRV	BOC MIFTR,MIFTR08	BRANCH IF MIS AVAILABLE	*** 00021660
0002CB	C1DF			3568	RSTHLDIN	AND CTIMAGE,ONES-HOLDINT	RESET HOLD INTERFACE	00021680
0002CC	D504			3572	DROPTAGS	ANDM PNDSTS,DEVEND	MASK FOR DEVICE END	00021700
0002CD	20E2			3575	BOC	DBUS,MOVEON	BRANCH IF NOT	00021710
0002CE	8801			3578	ORI	STATIMG,SETSTATD	NOTIFY ALU2 TO CLEAR DEP	00021720
0002CF	4828			3581	XFR	STATIMG,STAT	XFR STATIMG TO HDWE STAT REG	00021730
0002D0	3BE2			3585	RSTNTDUN	BOC STATD,MOVEON	ALU2 DONE	00021750
0002D1	62D0			3588	BU	RSTNTDUN	NO, GO BACK	00021760
0002D2	9500			3592	DODES	ORM PNDSTS,0	MASK FOR CLEAN STATUS	00021780
0002D3	20D7			3595	BOC	DBUS,DODES1	BRANCH IF SO TO DESELECT	00021790
0002D4	36DE			3598	BOC	DREG6,CLEANUP		00021800
0002D5	D5C7			3601	ANDM	PNDSTS,ONES-CUE-CUBUSY-CHANEND	MASK FOR DES STASTS	00021810
0002D6	20DB			3604	BOC	DBUS,ALLCLEAR	BRANCH IF NONE	00021820
0002D7	1406			3607	DODES1	STO XOUTBIM,NDXDES	RT FETCH ALU2'S DESELECT DEVICE RTN	00021830
0002D8	5441			3610	XFR	XOUTBIM,XOUTB	TRAP ALU2 TO RESET DEV COMMITTED LCH	00021840
0002D9	3BDB			3614	DOITAGN	BOC STATD,ALLCLEAR	BRANCH IF ALU2 COMPLETED	00021860
0002DA	62D9			3617	RSTCMD	BU DOITAGN	GO BACK IF NOT	00021870
0002DB	22DE			3621	ALLCLEAR	BOC ALUR,CLEANUP	TRAP HERE IF ALU2 HDWE ERROR	00021890
0002DC	C400			3624	AND	WORK1,ZERO	CLEAR A WORK REG	00021900
0002DD	4424			3627	XFR	WORK1,TUADR	RESET DEV ADDRESS REG	00021910
0002DE	4460			3630	CLEANUP	XFR WORK1,CBI	CLEAR BUS IN	00021920
0002DF	4150			3633	XFR	CTIMAGE,CTI	RESET CHANNEL TAGS	00021930
0002E0	38E0			3635	* GO TO MAP 13-210			00021940
0002E1	6304			3637	OPINDROP	BOC OPRIN,OPINDROP	WAIT FOR OP IN TO FALL	00021950
				3640	BU	IDLESCAN	GO TO IDLESCAN TO LOOK FOR INTS	00021960
0002E2	22E5			3644	MOVEON	BOC ALUR,CLRBUSIN	ALU2 ERROR TRAP HERE	00021980
0002E3	D981			3647	ANDM	FLAGS,CHAIN+CONCON	MASK TO CHECK CHAIN AND CONT CONN	00021990
0002E4	20D2			3650	BOC	DBUS,DODES	DESELECT DEVICE IF BOTH OFF	00022000
0002E5	D901			3653	CLRBUSIN	ANDM FLAGS,CHAIN	MASK FOR CHAIN	00022010
0002E6	20DE			3656	BOC	DBUS,CLEANUP	BRANCH IF NOT (CONT CONN)	00022020
0002E7	4460			3659	XFR	WORK1,CBI	CLEAR CHAN BUS IN	00022030
0002E8	DD10			3662	ANDM	SETDIA2,CUBUSY	MASK FOR DIAGNOSTIC CU BUSY FLAG	00022040
0002E9	20EC			3665	BOC	DBUS,RLSCHANN	BRANCH IF OFF TO LEAVE CU NOT BUSY	00022050
0002EA	8110			3668	ORI	CTIMAGE,CUBUSY	SET CU BUSY	00022060
0002EB	CDEF			3671	AND	SETDIA2,ONES-CUBUSY	RESET THE FLAG	00022070
0002EC	4150			3674	RLSCHANN	XFR CTIMAGE,CTI	DROP OP IN	00022080
0002ED	39ED			3677	YESCHAIN	BOC SUPO,YESCHAIN	WAIT HERE UNTIL TRAPPED FOR	00022090
				3679	*		ANOTHER SELECTION OR RESET CHAIN	00022100
				3680	*		IF SUPPRESS OUT DROPS	00022110
0002EE	C1DF			3682	AND	CTIMAGE,ONES-HOLDINT		00022120
0002EF	C9FE			3685	AND	FLAGS,ONES-CHAIN	RESET CHAIN BIT WE FELL THRU	00022130
0002F0	CAEF			3688	AND	FLAGS1,ONES-ALLOWDSE		00022140
0002F1	4005			3691	XFR	RSTCOMTD	RESET DEV COMMITTEED LATCH IN SWITCH	00022150

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT
0002F2	62D7			3694	BU	DODES1

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GO TO SCAN FOR STATUS OR SOMETHING	00022160	

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000300				3699	ORG BEGIN+X'300'		00022200
				3700	***** IDLESCAN *****		00022210
				3701	* IDLESCAN SERVES PRIMARILY THREE FUNCTIONS:		* 00022220
				3702	* 1.SCAN FOR CONTROL UNIT ENDS ON BOTH A AND B INTERFACES		* 00022230
				3703	* 2.SCAN FOR DEVICE ENDS OWED DUE TO DE PRIME BITS BEING SET		* 00022240
				3704	* 3.MAINTAIN INTERFACE ENABLE/DISABLE SWITCHES		* 00022250
				3705	*		* 00022260
				3706	* THE PRIOR SEQUENCE DEPICTS THE ACTUAL SCANNING SEQUENCE. THE CONTROL		* 00022270
				3707	* UNIT END LATCH FOR THE LAST SELECTING CHANNEL WILL BE SCANNED FIRST		* 00022280
				3708	* AND THE DEVICE ENDS DUE TO DE PRIMES WILL BE PRESENTED TO INTERFACE		* 00022290
				3709	* A FIRST. IN ALL THE CASES PREV-		* 00022300
				3710	* IOUSLY MENTIONED, A CONTROL UNIT RESERVED WILL RESULT IN ONLY THE		* 00022310
				3711	* RESERVING INTERFACE BEING INTERRUPTED FOR THE DURATION OF THE RESERV		* 00022320
				3712	* ALL STATUS WILL BE HELD FOR THE OPPOSITE INTERFACE AND WILL BE PRES-		* 00022330
				3713	* ENTED UPON THE CONTROLLERS RELEASE.		* 00022340
				3714	* WHEN A DEVICE END HAS BEEN FOUND BY ALU2, ALU1 WILL REQUEST TO		* 00022350
				3715	* PRESENT STATUS TO THE PROPER INTERFACE. IN THE MEANTIME,ALU2 WILL BE		* 00022360
				3716	* SPINNING ON ALU1'S STAT D WHICH INDICATES ALU2 IS TO RELEASE THE		* 00022370
				3717	* DEV END PRIME. STAT D WILL BE SET BY ALU1 ONLY WHEN THE CHANNEL		* 00022380
				3718	* HAS ACCEPTED THE STATUS. SHOULD ALU1 RECEIVE A NON-POLLING INITIAL		* 00022390
				3719	* SELECTION DURING THE INTERIM, ALU2 WILL BE TRAPPED TO LOCATION 0 AND		* 00022400
				3720	* THE INTERRUPTING DE PRIME WILL NOT BE RESET.		00022410
				3721	* AFTER A COMPLETE SCAN HAS BEEN EXECUTED AND NO INTERRUPTABLE STS		* 00022420
				3722	* FOUND, AN ALU CHECKOUT ROUTINE WILL BE ENTERED. UPON COMPLETION OF		* 00022430
				3723	* THE ALU CHECKOUT IDLESCAN WILL BE RE-INVOKED. ANY ERROR IN THE ALU		* 00022440
				3724	* CHECKOUT WILL RESULT IN A MICROCODE FORCED ALU ERROR TRAP		* 00022450
				3725	* BOTH INTERFACE CHAIN HOLD LINES WILL ALSO BE MAINTAINED IN IDLE.		* 00022460
				3726	* IF ANY STATUS IS FOUND(OUTSTANDING OK COMPLETED) THE CHAIN HOLD		* 00022470
				3727	* LINE FOR THE RESPECTIVE INTERFACE WILL REMAIN ON. THE CHAIN HOLD		* 00022480
				3728	* LINES BLOCK DISABLING AN INTERFACE IF THE CONTROLLER IS HOLDING ANY		* 00022490
				3729	* STATUS FOR THAT INTERFACE.		* 00022500
				3730	*****		00022510
000300	4011			3733	TROUBLE XFR HDWERR	FORCE A HARD ERROR	00022530
				3735	* GO TO MAP 13-240		00022540
000301	6301			3737	HANGHERE BU HANGHERE	WAIT FOR SIO TIO OR SUMPIN	00022550
				3739	* GO TO MAP 13-220		00022560
000302	6302			3741	IDLEPEND BU IDLEPEND	WAIT FOR SOMETHING TO HAPPEN	00022570
000303	62B8			3744	DRETURN BU DOREQA	GO DEVICE RESERVED TO A	00022580
000304				3747	IDLESCAN EQU *		3 00022600
000304	C1EF			3749	CHKOPIN AND CTIMAGE,ONES-CUBUSY	RESET CONTROL UNIT BUSY	3 00022610
				3751	* GO TO MAP 13-250		00022620
000305	3805			3753	OPINUP BOC OPRIN,OPINUP	WAIT FOR OP IN FALL	3 00022630
000306	4150			3756	IDLE XFR CTIMAGE,CTI	XFR TO HARDWARE	3 00022640
000307	D906			3759	ANDM FLAGS,STACK+STATPNDG	MASK FOR STACKED AND STS PNDNG	00022650
000308	200A			3762	BOC DBUS,IDLE0	BRANCH IF NOT	00022660
000309	62B5			3765	BU NOTCHAIN	GO RAISE REQ-IN	00022670
00030A	1E01			3769	IDLE0 STO FRUSAV,1	BUMP FRU REG	00022690
00030B	2399			3772	BOC MIFTR,MIFTR17	BRANCH IF MIS	1 00022700
00030C	F506			3775	IDLE1 XOM PNDSTS,UNITCHK+DEVEND	MASK FOR DEP STATUS	1 00022710
00030D	2010			3778	BOC DBUS,SETSPIN	BRANCH IF IT IS	00022720
00030E	8500			3781	ORI PNDSTS,0	MASK LAST STATUS PRESENTED	00022730

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
00030F	3601			3784	BOC	DREG6,HANGHERE	BRANCH IF UNIT CHECK IS ON	F01MAY72 9/04/73 00022740
000310	2200			3788	SETSPIN	BOC ALUR,TROUBLE	BRANCH IF ALU2 HAD AN ERR	1 00022760
000311	140B			3792		STO XOUTBIM,NDXABRT	BRT SET ALU2 TO INIT	1 00022780
000312	5441			3795	SETSPIN1	XFR XOUTBIM,XOUTB	TRAP ALU2	00022790
				3798	*	GO TO MAP 13-260		00022810
000313	3B15			3800	SETSPIN2	BOC STATD,CLRSTS	WAIT UNTIL	00022820
				3802	*	GO TO MAP 13-260		00022830
000314	6313			3804		BU SETSPIN2	ALU2 FINISHES	00022840
000315	0500			3808	CLRSTS	STO PNDSTS,ZERO	CLEAR PENDING STATUS REG	00022860
000316	003F			3811		STO CURCOMM,ONES-192	INSURE LST CMD IS NOT TIO FOR CUE	00022870
				3813	*		SEARCH IN TERMSTAT	00022880
000317	2346			3815		BOC MIFTR,MIFTR09	BRANCH IF MIS AVAILABLE	*** 00022890
000318	2A1C			3819	ITRSRVD	BOC STATA,RSTRESET	GO LOOK FOR DEP IF STAT A	1 00022910
000319	8808			3822		ORI STATIMG,SETSTATA	SET 1ST SWITCH ON	00022920
00031A	4828			3825		XFR STATIMG,STAT	SET TO HARDWARE	00022930
00031B	629A			3828		BU TERMSTA3	GO CHECK FOR CUE ON RESERVED INTF	00022940
00031C	C9F7			3833	RSTRESET AND	FLAGS,ONES-RESETOK	RESET THE ALL RESET FLAG	1 00022970

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				3836	*****		00022990
				3837	* DEPRIMES WILL SEARCH ALL DEVICES FOR ANY OUTSTANDING PRIMES AND		* 00023000
				3838	* CHECK THE DEVICE TO SEE IF IT IS STILL BUSY. WHEN A DEVICE IS FOUND		* 00023010
				3839	* NOT BUSY, A CHECK WILL BE MADE TO SEE IF IT IS READY. IF READY, THE		* 00023020
				3840	* CONTROLLER WILL RAISE REQ-IN TO THE APPROPRIATE PATH AND WAIT FOR		* 00023030
				3841	* SELECTION TO PRESENT DEVICE END ALONE. IF NOT READY, DEVICE END,		* 00023040
				3842	* UNIT CHECK WILL BE PRESENTED.		* 00023050
				3843	* DEVICE END PRIMES ARE SET ON ANY CONTROL CMD THAT COMPLETES WITHOUT		* 00023060
				3844	* EXCEPTIONAL STATUS, A TIO TO A BUSY DEVICE(DUE TO SWITCHED), AND		* 00023070
				3845	* REWIND AND DATA SECURITY ERASE COMMANDS AT CHANNEL END TIME.		* 00023080
				3846	* ON INITIAL KICKOFF ALU2'S STATS ACTIVE HAVE THE FOLLOWING MEANING:		* 00023090
				3847	* ALU2 STAT B = ALU2 FOUND A DEVICE END PRIME		* 00023100
				3848	* FOR THE DESIRED INTERFACE(A OR B)		* 00023110
				3849	* ALU2 STAT D = ALU2 DID NOT FIND ANY DEP'S FOR THE		* 00023120
				3850	* DESIRE INTERFACE.		* 00023130
				3851	*		* 00023140
				3852	* IF ALU2 FOUND A PRIME, THEN THE STATS WILL MEAN:		* 00023150
				3853	* ALU1 STAT C = ALU1 HAS SET THE DEVICE ADDRESS PROVIDED		* 00023160
				3854	* BY ALU2 IN THE TU ADDRESS REG ALONG WITH		* 00023170
				3855	* SWITCH SELECT.		* 00023180
				3856	* ALU2 STAT B = ALU2 FOUND DEVICE WAS STILL BUSY BUT HAS		* 00023190
				3857	* ANOTHER DEP FOR ANOTHER DEVICE		* 00023200
				3858	* ALU2 STAT C = ALU2 FOUND DEVICE WAS NOT BUSY BUT READY		* 00023210
				3859	* WAS DROPPED.		* 00023220
				3860	* ALU2 STAT B AND STAT C = ALU2 FOUND DEVICE NOT BUSY		* 00023230
				3861	* AND READY		* 00023240
				3862	* ALU2 STAT D = ALU2 HAS NO MORE DEP'S TO CHECK		* 00023250
				3863	*		* 00023260
				3864	* ALU2 STAT B AND STAT D = ALU2 FOUND LAST DEVICE BUSY		* 00023270
				3865	* AND NO MORE DEP'S		* 00023280
				3866	*		* 00023290
				3867	* IF CONTROLLER IS RESERVED ONLY THE DEP'S FOR THE RESERVED INTERFACE		* 00023300
				3868	* WILL BE SCANNED.		* 00023310
				3869	*****		* 00023320
00031D	0800			3871	DEPRIMES STO STATMG,ZERO	CLEAR ALL STATS	00023330
00031E	0504			3874	STO PNDSTS,DEVEND	SET DEV END IN PENDING STATUS REG	00023340
00031F	1E02			3877	STO FRUSAV,2	BUMP FRU REG	00023350
000320	2359			3880	BOC MIFTR,MIFTR0C	BRANCH IF MIS AVAILABLE ***	00023360
000321	C9DF			3884	DEPRIM1 AND FLAGS,ONES-INTFB	RESET INTF B FLAG	00023380
000322	4828			3888	DEPRIM2 XFR STATMG,STAT	XFR STATS TO HDWE	00023400
000323	1407			3891	STO XOUTBIM,NDXPOLL	BRT EMIT ALU2 BRANCH ADDRESS ***	00023410
000324	5441			3894	XFR XOUTBIM,XOUTB	TRAP ALU2	00023420
000325	2B28			3898	DEPRIM3 BOC STATB,DEPRIM4	BRANCH IF ALU2 FOUND DEP	00023440
000326	3B3A			3901	BOC STATD,DEPRIM7	BR ON STATD	00023450
000327	6325			3904	BU DEPRIM3	GO BACK AND LOOK SOME MORE	00023460
000328	4828			3908	DEPRIM4 XFR STATMG,STAT	SET STATS TO HDWE	00023480
000329	3B3A			3911	BOC STATD,DEPRIM7	BRANCH IF DONE AND BSY DEV	00023490
00032A	3A38			3915	BOC STATC,DEPRIMA	BRANCH IF ALU2 FOUND DEV NOT BUSY	00023510
00032B	4688			3918	XFR PNDADDR,XINB	FETCH DEP ADDRESS FROM ALU2	00023520

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
00032C	4624			3921	XFR	PNDADDR,TUADR	SWITCH SELECT THE DEVICE		00023530
00032D	8802			3924	ORI	STATIMG,SETSTATC	SET STEP ALU2 STAT		00023540
00032E	4828			3927	XFR	STATIMG,STAT	XFR IMAGE TO HDWE		00023550
00032F	C8FD			3930	AND	STATIMG,ONES-SETSTATC	RESET STAT C		00023560
000330	6334			3933	BU	INSDELAY	BRANCH TO INSERT DELAY		00023570
000331	3A35			3937	DEPRIM5	BOC	STATC,DEPRIM6	BRANCH IF ALU2 FOUND DEV NOT BSY	00023590
000332	2B28			3940		BOC	STATB,DEPRIM4	BRANCH IF ALU2 FOUND DEV BUSY	00023600
000333	3B3A			3943		BOC	STATD,DEPRIM7	BRANCH IF ALU2 HAD NO MORE DEP'S	00023610
000334	6331			3946	INSDELAY	BU	DEPRIM5	GO BACK AND LOOK FOR ONE OF THE ABOV	00023620
000335	4828			3950	DEPRIM6	XFR	STATIMG,STAT	SET STATS TO HDWE	00023640
000336	2B38			3953		BOC	STATB,DEPRIMA	BRANCH IF ALU2 FOUND DEV NOT BUSY	00023650
000337	8502			3956		ORI	PNDSTS,UNITCHK	SET UNIT CHECK IN STATUS	00023660
000338				3958	DEPRIMA	EQU	*		00023670
000338	23AA			3960	CHKONA	BOC	MIFTR,MIFTR18	BRANCH IF MIS AVAILABLE	3 00023680
000339	62B5			3963		BU	NOTCHAIN	GO RAISE REQ-IN	3 00023690
00033A	2200			3967	DEPRIM7	BOC	ALUR,TROUBLE	BRANCH IF ALU2 ERROR	00023710
00033B	2B41			3970		BOC	STATB,DOHOLDS	BRANCH IF A DEV BSY TO SET HOLD	00023720
00033C	2361			3973	BMASKED	BOC	MIFTR,MIFTROD	BRANCH IF MIS AVAILABLE	*** 00023730
00033D	4021			3976	SETHOLDS	XFR	CURCOMM,AR	MOVE CHAIN HOLD MASK TO ALU REG	00023740
00033E	C100			3979		AND	CTIMAGE,0	AND OUT CHAIN HOLD BITS	00023750
00033F	4150			3982		XFR	CTIMAGE,CTI	SET NEW CHAIN HOLD STATUS TO HDWE	00023760
000340				3984	STEP0091	EQU	*		00023770
000340	6513			3986	RUNALU	BU	ALUCHECK	GO DO ALU CHECK BEFORE RESCANING	00023780
000341	2379			3990	DOHOLDS	BOC	MIFTR,MIFTR13	BRANCH IF MIS AVAILABLE	00023800
000342	8080			3993	MASKFORA	ORI	CURCOMM,HOLDA	SET INTF A HOLD	00023810
000343	633C			3996		BU	BMASKED	RETURN	00023820
				4001	***** HIO NOT OPERATING *****				00023860
				4002	*THE HIONOP ROUTINE RETURNS THE CU TO IDLE STATUS IF HALT IO OCCURS *				00023870
				4003	*WITH NO OPERATION IN PROGRESS. THE TU IS RELEASED IF NO STS PNDC. *				00023880
				4004	*****				00023890
000344	C804			4007	HIONOP	AND	STATIMG,SETSTATB	CLEAR STAT IMAGE REG	00023910
000345	C1E0			4010	HIONOP2	AND	CTIMAGE,HOLDINT+HOLDA+HOLDB	CLEAR TAGS EXCEPT HOLDS	00023920
000346	C9FE			4013		AND	FLAGS,ONES-CHAIN	RESET CHAIN FLAG	00023930
000347	D986			4016		ANDM	FLAGS,STATPNDG+STACK+CONCON	MASK FOR PENDING STATUS	00023940
000348	204C			4019		BOC	DBUS,HIONOP1	BRANCH IF NO STATUS TO DESELECT	00023950
000349	8120			4022		ORI	CTIMAGE,HOLDINT	RAISE HOLD INTF	00023960
00034A	C400			4025		AND	WORK1,0	CLEAR WORK1	00023970
00034B	62DE			4028		BU	CLEANUP	SKIP DESELECTING THE DEVICE	00023980
00034C	62D7			4032	HIONOP1	BU	DODES1	GO DESELECT THE DEVICE	00024000
				4035	*****				00024020
				4036	***** HIO OPERATING *****				00024030

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72 9/04/73		
				4037	*THE HIOPERG ROUTINE DROPS THE CU OFF LINE, FIRST RAISING CU BUSY TO	* 00024040		
				4038	*PROTECT ALU 1 FROM CHANNEL TRAP.	* 00024050		
				4039	*****	00024060		
00034D	C9FE			4042	HIOPERG AND FLAGS,ONES-CHAIN	RESET THE CHAIN FLAG	00024080	
00034E	4828			4045	XFR STATIMG,STAT	SET STOP IF APPLICABLE	00024090	
00034F	C1C0			4048	AND CTIMAGE,HOLDA+HOLDB	RESET ALL TAGS EXCEPT CHAIN HOLDS	00024100	
000350	8130			4051	ORI CTIMAGE,CUBUSY+HOLDINT	MSET BUSY AND INTF HOLD	00024110	
000351	4150			4054	XFR CTIMAGE,CTI	DROP CHANNEL TAGS	00024120	
000352	2852			4058	NOTYET BOC	ADROUT,NOTYET	WAIT FOR ADDRESS OUT TO FALL	00024140
000353	628C			4061	BU	SETSTOP	GO TO AWAIT ALU 2 COMPLETION	00024150

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
4064					***** RESETS *****		00024170
4065				*	GENERAL AND SELECTIVE RESETS SHARE SOME COMMON FUNCTIONS AND HAVE	*	00024180
4066				*	BEEEN INCORPORATED IN SUCH A MANNER. GENERAL RESET WILL RESET ALL	*	00024190
4067				*	FLAGS AND STATS AND RESERVE BITS THAT APPLY TO THE SELECTING INTER-	*	00024200
4068				*	FACE. SELECTIVE RESET WILL PERFORM THE SAME FUNCTIONS AS GENERAL	*	00024210
4069				*	RESET EXCEPT THE CU RESERVED AND HOLD INTERFACE BITS WILL NOT BE	*	00024220
4070				*	RESET. ALU2 WILL BE ACTUATED FOR THE PROPER RESET AFTER STATB HAS	*	00024230
4071				*	BEEEN SET IN ACCORDANCE WITH THE SELECTING INTERFACE. CONTROL UNIT	*	00024240
4072				*	BUSY WILL BE SET FOR THE DURATION AND WILL BE RESET UPON SATISFACT-	*	00024250
4073				*	ORY COMPLETION BY ALU2.	*	00024260
4074				*		*	00024270
4075					*****		00024280
000354				4077	STEP0006 EQU *		00024300
000354 1408				4079	GENRESET STO XOUTBIM,NDXGRST BRT FETCH ALU2 SEL RESET RTN INDEX		00024310
000355				4081	STEP0007 EQU *		00024320
000355 0600				4083	STO PNDADDR,0 INITIALIZE DEV ADDRESS REG		00024330
000356				4085	STEP0008 EQU *		00024340
000356 0800				4087	STO STATIMG,0 CLEAR STAT IMAGE REG		00024350
000357				4089	STEP0009 EQU *		00024360
000357 1500				4091	STO ALU1ERR,0 CLEAR ALU1 ERROR REG		00024370
000358				4093	STEP0010 EQU *		00024380
000358 1600				4095	STO ALU2ERR,0 CLEAR ALU2 ERROR REG		00024390
000359				4098	STEP0011 EQU *		00024410
000359 2F73				4100	CHKPWON BOC PWRRST,PWRRESET BRANCH IF POWER ON RESET		00024420
00035A CB30				4103	AND FLAGS2,A64+B64 INITIALIZE LSR		00024430
00035B C1C0				4106	AND CTIMAGE,HOLDA+HOLDB RESET ALL TAGS EXCEPT CHAIN HOLDS		00024440
00035C				4109	STEP0049 EQU *		00024460
00035C 2E61				4111	CHKONB BOC SCB,BAGAIN BRANCH IF BSELECTING ***		00024470
00035D 1A90				4114	STO SEVMODA,X'90' INIT SEV MODE REG		00024480
00035E CA80				4117	RSTNRZ AND FLAGS1,BNRZI RESET ALL INTF A FLAGS		00024490
00035F 8B20				4120	ORI FLAGS2,A64 SET ERSET MODE TO 6400		00024500
000360 6369				4123	BU DORESETS GO DO COMMON RESETS		00024510
000361				4125	STEP0050 EQU *		00024520
000361 646B				4127	BAGAIN BU GENRST1 PAGE HOP		00024530
000362 1409				4131	SELRESET STO XOUTBIM,NDXSRST BRT FETCH ALU2 SEL RESET RTN INDEX		00024550
000363 C1E0				4134	AND CTIMAGE,HOLDINT+HOLDA+HOLDB ALL CHNL TAG EXCEPT HOLDS		00024560
000364 8110				4137	ORI CTIMAGE,CUBUSY RAISE CONTROL UNIT BUSY		00024570
000365 CAE0				4140	SELRST2 AND REQTAGS,CURFLAG+ANRZI+BNRZI RESET ALL OF FLAGS1 EXCEP		00024580
				4142	*	CU RESERVED AND RESET REQ-IN A'S	00024590
000366 0800				4144	STO STATIMG,0 CLEAR		00024600
000367 2271				4147	BOC ALUR,ERRRST BRANCH IF SEL RESET IS FOR ALU ERR		00024610
000368 2371				4150	SELRST3 BOC MIFTR,MIFTR10 BRANCH IF MIS AVAILABLE		00024620
000369				4153	STEP0057 EQU *		00024640
000369 4150				4155	DORESETS XFR CTIMAGE,CTI RESET CHANNEL TAGS		00024650
00036A				4157	STEP0058 EQU *		00024660
00036A 4A48				4159	XFR REQTAGS,MIST RESET REQUEST IN'S		00024670
00036B				4161	STEP0059 EQU *		00024680
00036B 4828				4163	DORSTO XFR STATIMG,STAT SET STAT REG FOR ALU2		00024690

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
00036C				4165	STEP0060 EQU *		00024700
00036C	4624			4167	DEVST XFR PNDADDR,TUADR	SET TU ADDRESS REG	00024710
00036D				4169	STEP0061 EQU *	KICK OFF ROS 2, XOUTB=08	00024720
00036D	5441			4171	XFR XOUTBIM,XOUTB	TRAP ALU2 TO DO DESIRED RESET	00024730
00036E				4173	STEP0062 EQU *	IF TCS - GO TO 65, IF NOT GO TO 63	00024740
00036E	2375			4175	BOC MIFTR,MIFTR11	BRANCH IF MIS AVAILABLE	00024750
00036F				4177	STEP0063 EQU *		00024760
00036F	C918			4179	DOFORA AND FLAGS,CUEB+RESETOK	CLEAR FLAGS REG EXCEPT CUEB	00024770
000370				4181	STEP0064 EQU *	NORMAL PATH - GO TO STEP0068	00024780
000370	6396			4183	BU DORST2	GO BACK AND CHECK THE RESET	00024790
000371	8802			4187	ERRRST ORI STATIMG,SETSTATC	INDICATE ALU ERR RESET TO ALU2	00024810
000372	6368			4190	BU SELRST3	RETURN	00024820
				4193	***** POWER ON RESET *****		00024840
				4194	* POWER ON RESET WILL BE EXECUTED ANYTIME THE MACHINE RESET BUTTON IS*		00024850
				4195	* DEPRESSED AND ON INITIAL POWER UP. IF MIS IS INSTALLED THIS ROUTINE *		00024860
				4196	* WILL BE EXECUTED TWICE---ONCE PER INTERFACE. *		00024870
				4197	* VARIOUS LSR'S WILL BE CLEARED AND AN INTERFACE CHECKOUT WILL BE *		00024880
				4198	* MADE. THE CHANNEL OUTBOUND TAGS USED BY THE MICROPROGRAM WILL BE *		00024890
				4199	* CHECKED TO INSURE ALL ARE DOWN. ALL THE INBOUND TAGS(EXCEPT OP-IN) *		00024900
				4200	* WILL BE RAISED---HARDWARE WILL 'AND' THE TAGS AND,IF ALL ARE PRESENT*		00024910
				4201	* FORCE \HE OUTBOUND TAGS AND INITIAL SELECTION. THE CHANNEL BUS IN *		00024920
				4202	* REG WILL BE 'WRAPPED' TO CHANNEL BUS OUT. THE MICRO CODE WILL CHECK *		00024930
				4203	* THE TAGS FOR BEING ACRIVE AND THE BUSSES FOR HOT OR OPEN BITS. IF *		00024940
				4204	* ALL GOES OK A GENERAL RESET FOR THE SELECTING INTERFACE WILL COMPLETE		00024950
				4205	* THE OPERATION. ANY FAILURE WILL HANG IN A BU TRAP AND THE CONTROL *		00024960
				4206	* UNIT WILL REMAIN BUSY. *		00024970
				4207	*****		00024980
000373				4209	PWRRESET EQU *	ENTRY POINT	00025000
000373				4212	STEP0012 EQU *		00025030
				4213	* GO TO MAP 13-280		00025040
000373	2D73			4215	SOFAIL BOC SVCOUT,SOFAIL	ALL CHANNEL OUTBOUND TAGS SHOULD BE	00025050
000374				4217	STEP0013 EQU *		00025060
				4218	* GO TO MAP 13-290		00025070
000374	2974			4220	COFAIL BOC CMDOUT,COFAIL	DOWN AT THIS TIME-- ANDY UP WILL	00025080
000375				4222	STEP0014 EQU *		00025090
				4223	* GO TO MAP 13-300		00025100
000375	2875			4225	AOFAIL BOC ADROUT,AOFail	RESULT IN A BOC TRAP UNTIL THE	00025110
000376				4227	STEP0015 EQU *		00025120
				4228	* GO TO MAP 13-310		00025130
000376	3976			4230	SUPOFAIL BOC SUPO,SUPOFAIL	OUTBOUND TAG FALLS	00025140
000377				4233	STEP0016 EQU *		00025160
000377	01FE			4235	STO CTIMAGE,ONES-OPIN	RAISE ALL INBOARD TAGS EXCEPT	00025170
				4237	*	OP-IN--FORCES SIO TRAP	00025180
000378				4238	STEP0017 EQU *		00025190
000378	4150			4240	XFR CTIMAGE,CTI	SET TO HARDWARE	00025200
000379				4242	STEP0018 EQU *		00025210
000379	0C00			4244	STO SETDIA1,0	CLEAR DIAGNOSE REG 1	00025220
00037A				4246	STEP0019 EQU *		00025230

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
00037A	0A00			4248	STO	REQTAGS,0	CLEAR REQUESTS AND FLAGS	F01MAY72 9/04/73
00037B				4250	STEP0020	EQU *		00025240
00037B	0B30			4252	STO	FLAGS2,A64+B64	INITIALIZE LSR	00025250
								00025260
00037C				4255	STEP0021	EQU *		00025280
00037C	3D7E			4257	BOC	ISEL,SIOISOK	INIT SEL SHOULD BE UP	00025290
				4259	* GO TO MAP	13-320		00025300
00037D	637D			4261	WAITSIO	BU WAITSIO	A HANG HERE INDICATES SIO TRAP FAIL	00025310
00037E				4264	STEP0022	EQU *		00025330
00037E	2980			4266	SIOISOK	BOC CMDOUT,CHKSUPO	SIO RETURN--CMD OUT SHOULD BE UP	00025340
				4268	* GO TO MAP	13-330		00025350
00037F	637F			4270	CMOOFF	BU CMOOFF	TRAP--CMD OUT OFF	00025360
000380				4273	STEP0023	EQU *		00025380
000380	3982			4275	CHKSUPO	BOC SUPO,CHKSVCOU	SUPPRESS OUT SHOULD BE UP	00025390
				4277	* GO TO MAP	13-340		00025400
000381	6381			4279	SUPOFF	BU SUPOFF	TRAP--SUPPRESS OUT OFF	00025410
000382				4282	STEP0024	EQU *		00025430
000382	2D84			4284	CHKSVCOU	BOC SVCOUT,CHKADRO	SERVICE OUT SHOULD BE UP	00025440
				4286	* GO TO MAP	13-350		00025450
000383	6383			4288	SVOOFF	BU SVOOFF	TRAP--SERVICE OUT OFF	00025460
000384				4291	STEP0025	EQU *		00025480
000384	2886			4293	CHKADRO	BOC ADROUT,CHKBIBO	ADDRESS OUT SHOULD BE UP	00025490
				4295	* GO TO MAP	13-360		00025500
000385	6385			4297	ADROFF	BU ADROFF	TRAP--ADDRESS OUT OFF	00025510
000386				4300	STEP0026	EQU *		00025530
000386	0100			4302	CHKBIBO	STO CTIMAGE,0	CLEAR A REG	00025540
000387				4304	STEP0027	EQU *		00025550
000387	638F			4306	BU	RIPWRAP	GO SET ZEROES ACROSS BUSSES	00025560
000388				4308	STEP0034	EQU *		00025570
000388				4309	STEP0042	EQU *		00025580
				4310	* GO TO MAP	13-370		00025590
000388	A1FF			4312	RIPBIBO	ADD CTIMAGE,ONES	BUMP REG BY ONE	00025600
000389				4314	STEP0035	EQU *		00025610
000389				4315	STEP0043	EQU *		00025620
				4316	* GO TO MAP	13-370		00025630
000389	218F			4318	BOC	NALCO,RIPWRAP	BRANCH IF NOT FINISHED	00025640
00038A				4320	STEP0044	EQU *		00025650
00038A	0100			4322	STO	CTIMAGE,0	INSURE TAG IMAGE IS CLEAR	00025660
00038B				4324	STEP0045	EQU *		00025670
00038B	0900			4326	STO	FLAGS,0	CLEAR FLAGS EEG	00025680
00038C				4328	STEP0046	EQU *		00025690
00038C	1D00			4330	REGINIT	STO FRUREG,0	CLEAR FRU REG	3 00025700
00038D				4332	STEP0047	EQU *		00025710
00038D	0000			4334	STO	CURCOMM,0	CLEAR REG 0 PER XFR5	3 00025720
00038E				4336	STEP0048	EQU *		00025730
00038E	635C			4338	BU	CHKONB	RETURN TO RESET	3 00025740
00038F				4342	STEP0028	EQU *		00025770

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
00038F				4343	STEP0036 EQU *			00025780
				4344	* GO TO MAP 13-370			00025790
00038F	4160			4346	RIPWRAP XFR CTIMAGE,CBI	MOVE TEST DATA TO BUS IN		00025800
000390				4348	STEP0029 EQU *			00025810
000390				4349	STEP0037 EQU *			00025820
				4350	* GO TO MAP 13-370			00025830
000390	0D00			4352	STO SETDIA2,0	KILL TIME		00025840
000391				4354	STEP0030 EQU *			00025850
000391				4355	STEP0038 EQU *			00025860
				4356	* GO TO MAP 13-370			00025870
000391	44A0			4358	XFR WORK1,CBO	FETCH TEST DTA FROM BUS OUT		00025880
000392				4360	STEP0031 EQU *			00025890
000392				4361	STEP0039 EQU *			00025900
				4362	* GO TO MAP 13-370			00025910
000392	4121			4364	XFR CTIMAGE,AR	MOVE TEST REG TO ALU A REG		00025920
000393				4366	STEP0032 EQU *			00025930
000393				4367	STEP0040 EQU *			00025940
				4368	* GO TO MAP 13-370			00025950
000393	F400			4370	XOM WORK1,0	COMPARE WRAPPED DATA		00025960
000394				4372	STEP0033 EQU *			00025970
000394				4373	STEP0041 EQU *			00025980
				4374	* GO TO MAP 13-370			00025990
000394	2088			4376	BOC DBUS,RIPBIBO	BRANCH IF OK TO CHECK PARITY		00026000
				4379	* GO TO MAP 13-380			00026020
000395	6395			4381	PICKDROP BU PICKDROP	TRAP--BITS PICKED OR DROPPED		00026030
				4385	STEP0068 EQU *			00026060
000396				4386	DORST2 EQU *			1 00026070
000396	2298			4388	BLOWOUT1 BOC ALUR,HRDRST	BRANCH IF ALU ERROR		1 00026080
000397				4390	STEP0069 EQU *			00026090
000397	0700			4392	STO SNSSTS2,0	OTHERWISE CLEAR SENSE		1 00026100
000398				4394	STEP0070 EQU *			00026110
000398	4012			4396	HRDRST XFR CLEAR	RESET SENSE TO DATA FLOW		1 00026120
000399				4398	STEP0071 EQU *			00026130
000399	4012			4400	XFR CLEAR			00026140
00039A				4402	STEP0072 EQU *			00026150
00039A	0500			4404	STO PNDSTS,0	CLEAR PENDING STATUS REG		00026160
00039B				4406	STEP0073 EQU *			00026170
00039B	4560			4408	XFR PNDSTS,CBI	CLEAR BUS IN TO CHANNEL		00026180
00039C				4410	STEP0074 EQU *	NORMALLY BYPASS STEP 75 IN STEP MODE		00026190
				4411	* GO TO MAP 13-190			00026200
00039C	3B9E			4413	DORST3 BOC STATD,DORST4	BRANCH IF ALU2 FINISHED		00026210
00039D				4415	STEP0075 EQU *			00026220
				4416	* GO TO MAP 13-190			00026230
00039D	639C			4418	BU DORST3	GO BACK AND WAIT FOR ALU2		00026240
				4421	STEP0076 EQU *			00026260
00039E	22AF			4423	DORST4 BOC ALUR,HARDWER	TRAP IF ALU HAD ERROR		00026270
00039F				4425	STEP0077 EQU *			00026280
00039F	3CA9			4427	BOC NGENR,DORST5	BRANCH IF NOT GENERAL RESET		00026290
0003A0				4429	STEP0078 EQU *			00026300
0003A0	D908			4431	ANDM FLAGS,RESETOK	MASK RESET FLAG		00026310

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LOC	OBJECT	CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
0003A1					4433	STEP0079	EQU	*		00026320
0003A1	34A9				4435		BOC	DREG4,DORST5	BRANCH IF ON	00026330
0003A2					4437	STEP0080	EQU	*		00026340
0003A2	A601				4439		ADD	PNDADDR,1	BUMP DEV ADDRS	00026350
0003A3					4441	STEP0081	EQU	*		00026360
0003A3	F610				4443		XOM	PNDADDR,16	MASK FOR LAST DEV	00026370
0003A4					4445	STEP0082	EQU	*	GO TO STEP0086 THE 16TH TIME	00026380
0003A4	20A9				4447		BOC	DBUS,DORST5	BRANCH IF SO	00026390
0003A5					4449	STEP0083	EQU	*		00026400
0003A5	2FA7				4451		BOC	PWRRST,DOITONB	BRANCH IF POWER ON TO RESET INTFB	00026410
0003A6	636B				4454		BU	DORST0		00026420
0003A7					4457	STEP0084	EQU	*		00026440
0003A7	E804				4459	DOITONB	XO	STATIMG,SETSTATB	INVERT STAT B TO FORCE INTFB RESET	00026450
0003A8					4461	STEP0085	EQU	*	RETURN TO STEP 59 - REPEAT 15 TIMES	00026460
0003A8	636B				4463		BU	DORST0	GO RESET NEXT DEVICE	00026470
0003A9					4466	STEP0086	EQU	*		00026490
0003A9	0800				4468	DORST5	STO	STATIMG,0	CLEAR THE STAT REG	00026500
0003AA					4470	STEP0087	EQU	*		00026510
0003AA	4828				4472		XFR	STATIMG,STAT	CLEAR HDWE STATS	00026520
0003AB					4474	STEP0088	EQU	*		00026530
0003AB	4824				4476		XFR	STATIMG,TUADR	CLEAR TU ADDRESS REG	00026540
0003AC					4478	STEP0089	EQU	*		00026550
0003AC	8908				4480		ORI	FLAGS,RESETOK	SET ALL DEVICES RESET FLAG	00026560
0003AD					4483	STEP0090	EQU	*		00026580
0003AD	2F40				4485	DORST6	BOC	PWRRST,RUNALU	GO DO ALU CHECK IF POWER ON	00026590
0003AE	6304				4488		BU	IDLESCAN	OTHERWISE GO TO IDLE	00026600
0003AF	4011				4492	HARDWER	XFR	HDWERR	ALU2 ERR IN IDLESCAN	00026620
0003B0	63B0				4494	* GO TO	MAP	13-400		00026630
					4496	YUPHANG	BU	YUPHANG	HDWERR DIDN'T TRAP	00026640

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				4500	***** BURST WAIT *****		
				4501	* BURST WAIT IS USED BY READ, WRITE, AND SENSE OPS TO WAIT FOR ALU2	*	00026670
				4502	* FINISH.	*	00026680
				4503	* ADDRESS OUT WILL BE MONITORED FOR A HIO CONDITION AND IF HIO IS	*	00026690
				4504	* GIVEN OP-IN WILL BE RESET AND THE OPERATION TERMINATED NORMALLY.	*	00026700
				4505	* DATA FLOW ERRORS,ALU2 ERRORS AND UNIT EXCEPTION CONDITION WILL BE	*	00026710
				4506	* SET AS REQUIRED IN ENDING STATUS.	*	00026720
				4507	*****	*	00026730
							00026740
0003B1	3BC0			4510	GOSTOP BOC STATD,BSTDONE		00026760
0003B2	628C			4513	BU SETSTOP	GO SET STOP STAT	00026770
0003B3	5441			4516	LETSREAD XFR XOUTBIM,XOUTB	KICK OFF READ OP	00026780
				4518	* ORI STATIMG,STOP	SET STOP FOR LATER	00026790
0003B4	284D			4520	SVCWATE BOC ADROUT,HIOPERG	BRANCH IF HIO	00026800
0003B5	2DB8			4523	BOC SVCOUT,BSTWAIT	BRANCH IF SERVICE IN OR OUT	00026810
0003B6	3BBC			4526	BOC STATD,NOSVC	BRANCH IF NO SERVICE	00026820
0003B7	63B4			4529	BU SVCWATE	GO BACK AND DO IT AGAIN	00026830
				4532	* GO TO MAP 13-410		00026850
0003B8	284D			4534	BSTWAIT BOC ADROUT,HIOPERG	BRANCH IF HIO ISSUED	00026860
				4536	* GO TO MAP 13-410		00026870
0003B9	3FB1			4538	BOC ALLONES,GOSTOP	BRANCH IF CMD OUT IS UP	00026880
				4540	* GO TO MAP 13-410		00026890
0003BA	3BC0			4542	BSTWAIT1 BOC STATD,BSTDONE	BRANCH IF ALU2 COMPLETED	00026900
				4544	* GO TO MAP 13-410		00026910
0003BB	63B8			4546	BU BSTWAIT	GO BACK AND CHECK FOR FINISH	00026920
0003BC	3AC0			4550	NOSVC BOC STATC,BSTDONE	BRANCH IF ALU HAD ERROR	00026940
0003BD	22DC			4553	BOC ALUR,ALU2HDER	BRANCH IF ALU ERROR	00026950
0003BE	2BC0			4556	BOC STATB,BSTDONE	BRANCH IF UNIT EXCP	00026960
0003BF	8709			4559	ORI SNSSTS2,RDNOISE+DATAACK	NOISE IN SENSE	00026970
0003C0	4828			4562	BSTDONE XFR STATIMG,STAT	SET STOP TO DATA FLOW	00026980
0003C1	22DC			4565	BOC ALUR,ALU2HDER	BRANCH IF ALU2 HAD HDWE ERROR	00026990
0003C2	D00B			4568	ANDM CURCOMM,X'0B'	MASK FOR SENSE TYPE COMMAND	00027000
0003C3	20DA			4571	BOC DBUS,BSTWAIT2	BRANCH IF SO	00027010
0003C4	D001			4574	ANDM CURCOMM,1	MASK FOR WRITE TYPE COMMAND	00027020
0003C5	37D0			4577	BOC DREG7,CHEKB	BRANCH IF SO	00027030
0003C6	DC6C			4581	ANDM SETDIA1,DMR+IBGMSR+RDACC+RDSTOP	CHK DIAGNOSTIC BITS	00027050
0003C7	20D0			4584	BOC DBUS,CHEKB	BRANCH IF OFF	00027060
0003C8	31D7			4587	BOC DREG1,CHEKSNS	BRANCH IF IBG MSR	00027070
0003C9	32D7			4590	BOC DREG2,CHEKSNS	BRANCH IF READ ACCESS	00027080
0003CA	4E88			4594	XFR SETCNT1,XINB	OTHERWISE FETCH MODULO CNT FROM ALU2	00027100
0003CB	4421			4597	XFR WORK1,AR	MOVE ALU1 MODULO TO ALU INPUT REG	00027110
0003CC	EE00			4600	XO SETCNT1,0	COMPARE BOTH MODULO COUNT	00027120
0003CD	20D7			4603	BOC DBUS,CHEKSNS	BRANCH IF SAME	00027130
0003CE	8704			4606	HADOVERN ORI SNSSTS2,OVERUN	SET OVERUN BIT IN SENSE DATA	00027140
0003CF	63DD			4609	BU SETUNTCK	GO SET EQUIP CHK	00027150
0003D0	2BE0			4613	CHEKB BOC STATB,ALU2UNEX	BRANCH IF ALU2 SIGNALLED UX	00027170
0003D1	DD80			4617	CHKUNCHK ANDM SETDIA2,BLKDC	MASK TO CHEK BLOCK DATA CHEK FLAG	00027190
0003D2	30DA			4620	BOC DREG0,BSTWAIT2	BRANCH IF ON TO BYPASS	00027200

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73	
0003D3	28F2			4623	BOC	ADROUT,ENDHIO	BRANCH IF HIO	00027210	
0003D4	3AE2			4626	CHKALU2	STATC,DATCHECK	BRANCH IF ALU2 SIGNALLED UC	00027220	
0003D5	27E2			4629	BOC	DFLER,DATCHECK	BRANCH IF ANY DATA FLOW ERRORS	00027230	
0003D6	3FCE			4633	CHKOVRN	BOC	OVERRUN,HADOVERN	GO SET EQUIP CHK IF OVERRUN	00027250
0003D7	9700			4637	CHEKSNS	ORM	SNSSTS2,0	MASK SENSE DATA FOR ERRORS	00027270
0003D8	20DA			4640	BOC	DBUS,BSTWAIT2	BRANCH IF NO ERRORS	00027280	
0003D9	63DD			4643	BU	SETUNTCK	SENSE ERRORS--SET UNIT CHECK	00027290	
0003DA	850C			4647	BSTWAIT2	ORI	PNDSTS,CHANEND+DEVEND POST CE AND DE IN STATUS	00027310	
0003DB	63DE			4650	BU	SETPNDG	GO SET STS PENDING	00027320	
0003DC	8710			4654	ALU2HDER	ORI	SNSSTS2,EQUIPCK	SET EQUIPMENT CHECK IN SENSE	00027340
0003DD	850E			4657	SETUNTCK	ORI	PNDSTS,CHANEND+DEVEND+UNITCHK SET CE,DE,AND UC IN STATUS	00027350	
0003DE	8904			4660	SETPNDG	ORI	FLAGS,STATPNDG	SET STATUS PENDING FLAG	00027360
0003DF	6291			4663	BU	TERMSTAT	GO TO TERMINAL STATUS	00027370	
0003E0	8501			4667	ALU2UNEX	ORI	PNDSTS,UNITEXC	SET UNIT EXEPTION IN STATUS	00027390
0003E1	63D1			4670	BU	CHKUNCHK	GO LOOK FOR UNIT CHECK	00027400	
0003E2	D204			4674	DATCHECK	ANDM	XOUTAIM,WRITE		00027420
0003E3	35EA			4677	BOC	DREG5,SKIPNOIS	BRANCH IF NOT A READ OP	00027430	
0003E4	D820			4680	ANDM	STATIMG,CONTROL		00027440	
0003E5	32EA			4683	BOC	DREG2,SKIPNOIS	BRANCH IF READ CONTROL CMD	00027450	
0003E6	F00C			4686	XOM	CURCOMM,X'0C'	IS THIS A RDB OP	00027460	
0003E7	20EF			4689	BOC	DBUS,ISLDPT	BR IF SO	00027470	
0003E8	4490			4693	FTCHNOIS	XFR	WORK1,XINA	FETCH NOISE BIT IF APPLICABLE	00027490
0003E9	4421			4696	XFR	WORK1,AR	MOVE TO ALU INPUT REG	00027500	
0003EA	27ED			4700	SKIPNOIS	BOC	DFLER,DODATCK	BRANCH IF DATA FLOW ERROR	3 00027520
0003EB	8700			4703	ORI	SNSSTS2,0	OTHERWISE SET NOISE ONLY	3 00027530	
0003EC	63DD			4706	BU	SETUNTCK	GO SET UNIT CHECK	3 00027540	
0003ED	8708			4709	DODATCK	ORI	SNSSTS2,DATACK	SET NOISE AND DATA CHECK	3 00027550
0003EE	63DD			4712	BU	SETUNTCK	GO SET UNIT CHECK	3 00027560	
0003EF	D410			4715	ISLDPT	ANDM	WORK1,BOT	IS LOAD POINT ON	00027570
0003F0	20E8			4718	BOC	DBUS,FTCHNOIS	BR IF NOT	00027580	
0003F1	63EA			4721	BU	SKIPNOIS	SKIP NOISE THIS TIME	00027590	
0003F2	E111			4725	ENDHIO	XO	CTIMAGE,OPIN+CUBUSY	RESET OP IN RAZE CUB	00027610
0003F3	4150			4728	XFR	CTIMAGE,CTI	SET TO HARDWARE	00027620	
0003F4	63D4			4731	BU	CHKALU2	RETURN TO CHECK UNIT CHK COND	00027630	

LOC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT

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000400      4736      ORG      BEGIN+X'400'      00027670
      4737 ***** COMMAND REJECT ***** 00027680
      4738 * COMMAND REJECT IS ENTERED AFTER OPENERS AND IF AN INVALID OP CODE * 00027690
      4739 * WAS RECEIVED AT CMD OUT TIME. SENSE DATA WILL BE RESET AND CMD RJCT * 00027700
      4740 * SENSE SET UP. THIS ROUTINE WILL NOT BE ENTERED IF OPENERS FINDS ANY * 00027710
      4741 * PENDING STATUS. * 00027720
      4742 ***** 00027730

000400 140F      4745 COMREJC1 STO XOUTBIM,NDXSNSR RT FETCH ALU2 SENSE RESET INDEX 00027750
000401 5441      4748 XFR XOUTBIM,XOUTB KICK OFF ALU2 00027760
000402 8801      4751 ORI STATIMG,SETSTATD SET STATD TO INDICATE SNS RESET 00027770
000403 4828      4754 XFR STATIMG,STAT SET TO HARDWARE 00027780
000404 0700      4757 STO SNSSTS2,0 CLEAR SENSE REG 2 00027790
000405 4012      4760 XFR CLEAR RESET DATA FLOW ERRORS 00027800
000406 4012      4763 XFR CLEAR 00027810
000407 8780      4766 ORI SNSSTS2,CMDREJ POST CMD REJECT 00027820
000408 0502      4769 STO PNDSTS,UNITCHK POST UNIT CHECK 00027830
000409 8904      4772 ORI FLAGS,STATPNDG POST STATUS PENDING 00027840
00040A 60E4      4775 BU PENDLINK 00027850
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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				4778	***** MULTIPLE INTERFACE SWITCH *****		00027870
				4779	* THE VARIOUS POINTS IN BASIC CODE THAT ARE		* 00027880
				4780	* SENSITIVE TO MIS WILL TEST AND, IF THE FEATURE IS INSTALLED,		* 00027890
				4781	* BRANCH TO THE APPROPRIATE POINT IN THIS PAGE. STAT B AND A FLAG		* 00027900
				4782	* NAMED INTFB WILL BE USED THROUGHOUT WHEN MIS IS AVAILABLE. SEVEN		* 00027910
				4783	*		* 00027920
				4784	*****		* 00027930
00040B	62AA			4786	MISRTN1 BU CHKCHAIN MIS RETURN		00027940
00040C	629B			4789	MISRTN2 BU ANYCUEA MIS RETURN		00027950
00040D	62B0			4792	MISRTN3 BU SETREQA MIS RETURN		00027960
00040E	62B8			4795	MISRTN4 BU DOREQA MIS RETURN		00027970
00040F	62CB			4798	MISRTN5 BU RSTHLDIN MIS RETURN		00027980
000410	6321			4801	MISRTN7 BU DEPRIM1 MIS RETURN		00027990
000411	6342			4804	MISRTN0A BU MASKFORA RETURN TO MAINLINE		00028000
				4809	MIFTR04 XOM CURCOMM,0 MASK FOR TIO		00028030
000412	F000			4812	BOC DBUS,CMDWAIT2 BRANCH IF TIO		00028040
000413	201B			4815	XOM CURCOMM,X'03' MASK FOR NOOP		00028050
000414	F003			4818	BOC DBUS,CMDWAIT2 BRANCH IF CMD IS NOOP		00028060
000415	201B			4821	AND FLAGS,ONES-CONCON OTHERWISE RESET CONT CONN FLAG		00028070
000416	C97F			4824	BLOUT43 ANDM FLAGS1,CURFLAG MASK CU RESERVE	4	00028080
000417	DA20			4827	BOC DBUS,NOTRSV BRANCH IF NOT RESERVE	4	00028090
000418	201A			4830	BU CMDWAIT4 BRANCH IF RESERVED	4	00028100
000419	60DE						
00041A	C1DF			4834	NOTRSV AND CTIMAGE,ONES-HOLDINT RESET HOLD INTERFACE	4	00028120
00041B	60DE			4838	CMDWAIT2 BU CMDWAIT4 RETURN TO MAIN LINE		00028140
				4843	CHKRSRV ANDM FLAGS,CHAIN MASK FOR CHAINING	1	00028170
00041C	D901			4846	BOC DBUS,NOTCHANE BRANCH IF NOT CHAINING	1	00028180
00041D	201F			4849	BU COMREJCT OTHERWISE REJECT COMMAND	1	00028190
00041E	6108			4852	NOTCHANE XOM CURCOMM,X'F4' MASK FOR CU RESERVE CM	1	00028200
00041F	F0F4			4855	BOC DBUS,SETRESRV BRANCH IF IT IS	1	00028210
000420	2024			4858	XOM CURCOMM,X'D4' MASK FOR CU RELEASE CMD		00028220
000421	F0D4			4861	BOC DBUS,RSTRESV BRANCH IF IT IS		00028230
000422	2027			4864	BU COMREJCT OTHERWISE RETURN TO DO SENSE		00028240
000423	6108						
000424	8A20			4868	SETRESRV ORI FLAGS1,CURFLAG SET CU RESERVE FLAG		00028260
000425	8120			4871	ORI CTIMAGE,HOLDINT RAISE HOLD INTERFACE		00028270
000426	617F			4874	BU DOSENSE RETURN TO SENSE		00028280
				4878	RSTRESV AND FLAGS1,ONES-CURFLAG RESET CU RESERVE FLAG		00028300
000427	CADF			4881	BU DOSENSE RETURN TO SENSE		00028310
000428	617F						
000429	D920			4885	MIFTR05 ANDM FLAGS,INTFB INTERFACE B SELECTING		00028330
00042A	200C			4888	BOC DBUS,MISRTN2 BRANCH IF OFF TO CHECK CUEA		00028340
				4890	* GO TO MAP 13-500		00028350
00042B	3E30			4892	CHKCUEB BOC NCUEB,CHKBFLG BRANCH IF NOT CUE ON B		00028360
				4894	* GO TO MAP 13-500		00028370
00042C	8520			4896	ORI PNDSTS,CUE SET CONTROL UNIT END IN STATUS		00028380
				4898	* GO TO MAP 13-500		00028390
00042D	8910			4900	ORI FLAGS,CUEB SET CONTROL UNIT END IN FLAGS		00028400

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
00042E	400A			4902	* GO TO MAP 13-500		00028410
				4904	XFR CUREB	ATTEMPT TO RESET CUEB	00028420
00042F	642B			4906	* GO TO MAP 13-500		00028430
				4908	BU CHKCUEB	GO BACK AND CHECK TO INSURE RESET	00028440
000430	400A			4912	CHKBFLG XFR CUREB	RESET GEN RESET IF ON	00028460
000431	D910			4915	ANDM FLAGS,CUEB	MASK TO CHECK CUE B FLAG	00028470
000432	200B			4918	BOC DBUS,MISRTN1	BRANCH IF OFF	00028480
000433	62A9			4921	BU CUEPNDG	OTHERWISE GO SET CUE IN STATUS	00028490
000434	D502			4925	CHKCONT ANDM PNDSTS,UNITCHK	MASK FOR UC IN PENDING STATUS REG	00028510
000435	203A			4928	BOC DBUS,NOTCON	BRANCH IF OFF	00028520
000436	F506			4931	XOM PNDSTS,DEVEND+UNITCHK	CHK MASK FOR DEP UC STATUS(NO CONCON)	00028530
000437	203A			4934	BOC DBUS,NOTCON	BRANCH TO PREVENT CONCON IF SO	00028540
000438	4044			4937	BLOUT46 XFR PING	RESET THE PING LATCH	1 00028550
000439	8980			4940	ORI FLAGS,CONCON	OTHERWISE SET CONTINGENT CONN FLAG	00028560
00043A	6293			4943	NOTCON BU TERMSTAO	RETURN TO RAISE REQ-IN	00028570
00043B	D920			4947	MIFTR06 ANDM FLAGS,INTFB	INTERFACE B SELECTING	00028590
00043C	200D			4950	BOC DBUS,MISRTN3	NO, GO HANDLE A INTF	00028600
00043D	8A01			4953	ORI REQTAGS,REQINB	RAISE NON SUPPESIBLE REQ-IN B	00028610
00043E	62B9			4956	BU GOTOIDLE	GO WAIT FOR POLL	00028620
00043F	D920			4960	MIFTR07 ANDM FLAGS,INTFB	INTERFACE B SELECTING	00028640
000440	200E			4963	BOC DBUS,MISRTN4	NO, GO HANDLE A INTF	00028650
000441	8A02			4967	DOREQB ORI REQTAGS,SUPREQB	RAISE SUPPRESSEBLE REQUEST IN B	00028670
000442	62B9			4970	BU GOTOIDLE	GO SET HARDWARE AND WAIT FOR POLL	00028680
000443	DA20			4974	MIFTR08 ANDM FLAGS1,CURFLAG	MASK TO CHECK CONTROL UNIT RESERVE	00028700
000444	200F			4977	BOC DBUS,MISRTN5	BRANCH IF NOT RESERVED	00028710
000445	62CC			4980	BU DROPTAGS	RESERVED-DONT RESET HOLD INTERFACE	00028720
000446	DA20			4984	MIFTR09 ANDM FLAGS1,CURFLAG	MASK FOR CU RESERVED	00028740
000447	209D			4987	BOC DBUS,IDLE2	BRANCH IF NOT RESERVED	00028750
000448	D920			4990	BLOUT42 ANDM FLAGS,INTFB	MASK INTERFACE B FLAG	3 00028760
000449	20AC			4993	BOC DBUS,ARSVD	BRANCH IF A INTF	3 00028770
00044A	D940			4996	ANDM FLAGS,CUEA	MASK FOR CUE ON A INTF	3 00028780
00044B	314D			4999	BOC DREG1,STSONA	BRANCH IF SO	3 00028790
00044C	254E			5002	BOC NCUEA,NIXASTS	BRANCH IF NOT CUE ON A	3 00028800
00044D	8080			5005	STSONA ORI CURCOMM,HOLDA	SET CHAIN HOLD ON A INTF	3 00028810
00044E	6318			5008	NIXASTS BU ITSRSVD	RETURN	3 00028820
00044F	0F00			5012	MIFTR0A STO SETCNT2,0	CLEAR A WORK REG	00028840
000450	4921			5015	XFR FLAGS,AR	MOVE FLAGS REG TO ALU INPUT REG	00028850
000451	8F00			5018	ORI SETCNT2,0	SET FLAGS INTO WORK REG	00028860
000452	629A			5021	BU TERMSTA3	GO CHECK FOR CUE ON LAST INTERFACE	00028870
000453	4921			5025	MIFTR0B XFR FLAGS,AR	MOVE FLAGS TO ALU INPUT REG	00028890
000454	FF00			5028	XOM SETCNT2,0	MASK FOR SAME FLAGS	00028900
000455	20B1			5031	BOC DBUS,BLOUT44	BRANCH IF SAME	EC732424 00028910
000456	631D			5034	BU DEPRIMES	OTHERWISE GO LOOK FOR DEV ENDS	00028920
000457	E920			5038	IDLE4 XO FLAGS,INTFB	INVERT STATUS OF INTF FLAG	00028940

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
000458	629A			5041	BU	TERMSTA3	GO CHECK FOR CUE ON OPPOSITE INTF		00028950
000459				5044	MIFTR0C	EQU *	GO CHECK RESERVE	1	00028970
000459	4828			5046	BLOUT45	XFR STATIMG,STAT	RESET STAT A	1	00028980
00045A	DA20			5049	ANDM	FLAGS1,CURFLAG	MASK CU RESERVE	1	00028990
00045B	645C			5052	BU	RSVBC	RETURN TO MAINLINE	1	00029000
00045C	2010			5055	RSVBC	BOC DBUS,MISRTN7	BRANCH IF NOT	1	00029010
00045D	2AA7			5058	BOC	STATA,XXX	BRANCH IF NON-RSVD INTF	3	00029020
00045E	D920			5061	ANDM	FLAGS,INTFB	MAKS FOR B INTERFACE	3	00029030
00045F	20A5			5064	BOC	DBUS,YYY	BRANCH IF NOT B INTF	3	00029040
000460	64A3			5067	BU	BLOUT40	OTHERWISE GO SET STAT A ONL	3	00029050
000461	2AA7			5071	MIFTR0D	BOC STATA,XXX	BRANCH IF NON-RSVD INTF	3	00029070
000462	DA20			5074	ANDM	FLAGS1,CURFLAG	MASK FOR CTL UNIT RESERVED	3	00029080
000463	2065			5077	BLOUT41	BOC DBUS,DEPRIM8	BRANCH IF NOT RESERVED	3	00029090
000464	633D			5080	BU	SETHOLDS	OTHERWISE GO SET CHAIN HOLD	3	00029100
000465	D804			5084	DEPRIM8	ANDM STATIMG,SETSTATB	MASK FOR B INTERFACE POLLED		00029120
000466	2068			5087	BOC	DBUS,DEPRIM9	BRANCH IF NOT		00029130
000467	633D			5090	BU	SETHOLDS	GO POLL FOR MTI'S		00029140
000468	8920			5094	DEPRIM9	ORI FLAGS,INTFB	SET B INTERFACE FLAG		00029160
000469	8804			5097	ORI	STATIMG,SETSTATB	SET B INTERFACE STAT		00029170
00046A	6322			5100	BU	DEPRIM2	GO CHECK FOR DE'S ON B INTF		00029180
00046B				5104	STEP0051	EQU *			00029210
00046B	0804			5106	GENRST1	STO STATIMG,SETSTATB	SET B INTERFACE STAT		00029220
00046C				5108	STEP0052	EQU *			00029230
00046C	0920			5110	STO	FLAGS,INTFB	SET B INTERFACE FLAG		00029240
00046D				5112	STEP0053	EQU *			00029250
00046D	1B90			5114	INITSEV	STO SEVMODB,X'90'	SET 7TK RESET MODE SET		00029260
00046E				5116	STEP0054	EQU *			00029270
00046E	8B10			5118	ORI	FLAGS2,B64	SET RESET MODE TO 6400		00029280
00046F				5120	STEP0055	EQU *			00029290
00046F	CA40			5122	AND	FLAGS1,ANRZI	RESET B INTF FLAGS		00029300
000470				5124	STEP0056	EQU *			00029310
000470	6369			5126	BU	DORESETS	GO DO COMMON RESETS		00029320
000471	2E73			5130	MIFTR10	BOC SCB,SELRST1	BRANCH IF SWITCHED TO CHANNEL B		00029340
000472	6369			5133	BU	DORESETS	RETURN TO HANDLE A INTERFACE		00029350
000473	8804			5137	SELRST1	ORI STATIMG,SETSTATB	SET B INTERFACE STAT		00029370
000474	6369			5139	*		CU RESERVED AND RESET REQ-IN B'S		00029380
				5141	BU	DORESETS	RETURN TO FINISH RESET		00029390
000475				5144	STEP0065	EQU *			00029410
000475	2E77			5146	MIFTR11	BOC SCB,DORST1	BRANCH IF SWITCHED TO CHANNEL B		00029420
000476	636F			5149	BU	DOFORA	RETURN TO RESET A INTERFACE		00029430
000477				5152	STEP0066	EQU *			00029450
000477	C968			5154	DORST1	AND FLAGS,CUEA+INTFB+RESETOK	ALL LAGSS EXCEPT CUE A		00029460
000478				5156	STEP0067	EQU *			00029470
000478	6396			5158	BU	DORST2	RETURN TO CLEAR SENSE DATA		00029480

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LOC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT

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000479	D804			5163	MIFTR13	ANDM	STATIMG,SETSTATB	MASK FOR INTF B PASS	00029510
00047A	2011			5166		BOC	DBUS,MISRTN0A	BRANCH IF NOT	00029520
00047B	8040			5169		ORI	CURCOMM,HOLDB	OTHERWISE SET HOLD B MASK ON	00029530
00047C	633C			5172		BU	BMASKED	RETURN TO MAINLINE	00029540

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
5177	***** SEVEN TRACK MODE SETS *****						00029580	
5178	* ALL SEVEN TRACK MODE SETS ENTER HERE AND SET UP SEVEN TRK MODE REGS *						00029590	
5179	* BY INTERFACE.						00029600	
5180	*****						00029610	
00047D	13F8			5183	CHK7TK STO LINK4,X'F8'	CLEAR TO HOLD THE COMMAND		00029630
00047E	4021			5186	XFR CURCOMM,AR	PUT IN A REGISTER		00029640
00047F	5006			5189	XFRH LSR	SET TO HI REGS		00029650
				5191	*** SEVEN TRACK MODE SETS			00029660
000480	C300			5193	AND LINK4,0	SET MODE BITS 2,3,4 IN WORK REG		00029670
000481	2E86			5197	SETBYINT BOC SCB,SETBMOD	TEST FOR B INTERFACE	1	00029690
000482	1A00			5200	SETAMOD STO SEVMODA,0	CLEAR INTF A MODE REG		00029700
000483	5321			5203	XFR LINK4,AR	MOVE MODE TO ALU INPUT REG		00029710
000484	8A00			5206	ORI SEVMODA,0	SET MODE INTO INTF A MODE REG		00029720
000485	6489			5209	BU SEVLINK	RETURN TO PRESETN STATUS		00029730
000486	1B00			5213	SETBMOD STO SEVMODB,0	CLER INTF B MOD REG	1	00029750
000487	5321			5216	XFR LINK4,AR	MOVE MODE TO ALU REG		00029760
000488	8B00			5219	ORI SEVMODB,0	MOVE MODE INTO A MODE REG		00029770
000489	4006			5223	SEVLINK XFR LSR	SET LO SET REGS		00029790
00048A	6167			5226	BU MODELINK	GO FINISH		00029800
00048B	D920			5230	SETSEV ANDM FLAGS,INTFB	MASK FOR INTERFACE B		00029820
00048C	2096			5233	BOC DBUS,SETSEVA	BRANCH IF OFF		00029830
00048D	5B21			5236	XFR SEVMODB,AR	SET MODE SET IN A REG		00029840
00048E	8200			5239	ORI XOUTAIM,0	SET ALSO IN XOUTAIM		00029850
00048F	DA80			5242	ANDM FLAGS1,BNRZI	MASK INTF B NRZ FLAG		00029860
000490	2092			5245	BOC DBUS,SKIPNRZ	BRANCH IF OOF		00029870
000491	8201			5248	ORI XOUTAIM,NRZMODE	OTHERWISE, SET NRZ IN MAS RE		00029880
000492	DB10			5251	SKIPNRZ ANDM FLAGS2,B64	CHECK LAST MODE SET FOR 6400		00029890
000493	2095			5254	BOC DBUS,SKIPNRZ1	BR IF NOT		00029900
000494	8202			5257	ORI XOUTAIM,MODE64	SET 6400 TO ALU 2		00029910
000495	60D2			5260	SKIPNRZ1 BU CMDWAIT	GO WAIT FOR THE COMMAND		00029920
000496	5A21			5264	SETSEVA XFR SEVMODA,AR	MOVE INTF A MODE TO MASK REG		00029940
000497	8200			5267	ORI XOUTAIM,0	SET MASK		00029950
000498	60CC			5270	BU CHKNRZ	RETURN TO CHECK 9TK NRZ		00029960
000499	D980			5274	MIFTR17 ANDM FLAGS,CONCON	MASK FOR CONT CONN	1	00029980
00049A	209C			5277	BOC DBUS,BAKTIDL	BRANCH IF OFF	1	00029990
00049B	6301			5280	BU HANGHERE	OTHERWISE GO HANG AND WAIT	1	00030000
00049C	630C			5284	BAKTIDL BU IDLE1	RETURN TO IDLE LOOP	1	00030020
00049D	2AA2			5288	IDLE2 BOC STATA,IDLE3	BRANCH IF 1ST PASS SWITCH ON		00030040
00049E	8808			5291	ORI STATIMG,SETSTATA	OTHERWISE SET 1ST PASS SWITCH		00030050
00049F	4828			5294	XFR STATIMG,STAT	SET TO HWWE		00030060
0004A0	234F			5297	BOC MIFTR,MIFTROA	BRANCH IF MIS AVAILABLE	***	00030070
0004A1	629A			5300	BU TERMSTA3	GO TO CHECK FOR CUE ON LAST INTF		00030080
0004A2	2353			5304	IDLE3 BOC MIFTR,MIFTROB	BRANCH IF MIS AVAILABLE	*	00030100

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
0004A3	8808			5308	BLOUT40	ORI STATIMG,SETSTATA	3	00030120
0004A4	6322			5311	BU	DEPRIM2	3	00030130
0004A5	880C			5315	YYY	ORI STATIMG,SETSTATA+SETSTATB	3	00030150
0004A6	6322			5318	BU	DEPRIM2	3	00030160
0004A7	E80C			5322	XXX	XO STATIMG,SETSTATB+SETSTATA	3	00030180
0004A8	0504			5325	STO	PNDSTS,DEVEND	3	00030190
0004A9	6322			5328	BU	DEPRIM2	3	00030200
0004AA	2A79			5332	MIFTR18	BOC STATA,MIFTR13	3	00030220
0004AB	62B5			5335	BU	NOTCHAIN	3	00030230
0004AC	D910			5341	ARSDV	ANDM FLAGS,CUEB	3	00030270
0004AD	33AF			5344	BOC	DREG3,STSONB	3	00030280
0004AE	3EB0			5347	BOC	NCUEB,NIXBSTS	3	00030290
0004AF	8040			5350	STSONB	ORI CURCOMM,HOLDB	3	00030300
0004B0	6318			5353	NIXBSTS	BU ITSRSVD	3	00030310
0004B1	C9F7			5358	BLOUT44	AND FLAGS,ONES-RESETOK		00030340
0004B2	6457			5361	BU	IDLE4		00030350
0004B3	22CF			5364	ANYERRS	BOC ALUR,CMDPAR00		00030360
0004B4	2BCC			5367	BOC	STATB,BUSYSTAT		00030370
0004B5	D902			5370	ANDM	FLAGS,STACK		00030380
0004B6	20B8			5373	BOC	DBUS,CONTCHK		00030390
0004B7	60E1			5376	BU	CMDWAIT3		00030400
0004B8	0500			5379	*** STAT	B OFF--STATD ON---STATC EITHER		00030420
0004B9				5381	CONTCHK	STO PNDSTS,0		00030430
0004BA	4488			5383	GETSNS0	EQU *		00030440
0004BB	D950			5385	XFR	WORK1,XINB		00030450
0004BC	2EC0			5388	ANDM	FLAGS,CUEA+CUEB		00030460
0004BD	31E5			5391	MIFTR14	BOC SCB,CUEBSTS		00030470
0004BE	C8FD			5394	CUEASTS	BOC DREG1,CMDWAIT8		00030480
0004BF	4828			5397	TUTSTRTN	AND STATIMG,ONES-SETSTATC		00030490
0004C0	33E5			5400	XFR	STATIMG,STAT		00030500
0004C1	64BD			5403	XFR	LINK4,IC		00030510
0004C2	3BB3			5407	CUEBSTS	BOC DREG3,CMDWAIT8		00030530
0004C3	3AC6			5410	BU	TUTSTRTN		00030540
0004C4	3BCC			5413	*** STAT	B ON		00030560
0004C5	64C3			5415	CHKBUSY	BOC STATD,ANYERRS		00030570
				5418	LOOKAGIN	BOC STATC,CONTCHK1		00030580
				5421	BOC	STATD,BUSYSTAT		00030590
				5424	BU	LOOKAGIN		00030600
0004C6	D902			5427	*** STATS	B AND C ON--STAT D OFF		00030620
0004C7	20CA			5429	CONTCHK1	ANDM FLAGS,STACK		00030630
				5432	BOC	DBUS,CONTCHK2		00030640

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
0004C8	8504			5435	ORI	PNDSTS,DEVEND	OR IN DEV END IN STATUS		00030650
0004C9	60E1			5438	BU	CMDWAIT3	GO PRESENT STACKED STATUS		00030660
0004CA	0504			5441	*** NO STACKED	STATUS			00030680
0004CB	60E1			5443	CONCHK2	STO PNDSTS,DEVEND	SET DEV END IN PENDING STATUS		00030690
				5446	BU	CMDWAIT3	GO SET LINKS		00030700
0004CC	0510			5450	BUSYSTAT	STO PNDSTS,BUSY	BUSY IN SCRATCH REG		00030720
0004CD	60E4			5453	BU	PENDLINK	GO TO RAISE STATUS IN		00030730
0004CE	60C8			5457	PRETURN1	BU PRETURN0			00030750
0004CF	60D6			5460	CMDPAR00	BU CMDPAR0			00030760
				5462	***** OPENERS *****				00030770
				5463	* OPENERS WILL RESET THE PING HOLD LATCH IN HARDWARE IF THE COMMAND *				00030780
				5464	* IS OTHER THAN TIO AND THE STATUS STACKED OR PENDING FLAGS ARE OFF. *				00030790
				5465	* WHEN ALU2 COMPLETES ASSEMBLING THE DEVICE STATUS, THIS ROUTINE WILL *				00030800
				5466	* CHECK ALU2 STATS TO DETERMINE IF THE DEVICE IS BUSY,NOT READY,OR HAS *				00030810
				5467	*A PENDING DEV END. IF NONE OF THE AFOREMENTIONED ITEMS APPLY THEN THE*				00030820
				5468	*DEVICE IS AVAILABLE AND THE COMMAND WILL BE DECODED. ALU2 STAT COMBOS*				00030830
				5469	*HAVE THE FOLLOWING MEANING:				00030840
				5470	* STATC=DEV END,UNT CHK(READY DROP WHEN DEV END WAS PRIMED)				00030850
				5471	* STATB AND STATC=DEV END DUE TO DEV END PRIME(REW OR DSE)				00030860
				5472	* STATB AND STATD=DEVICE IS BUSY				00030870
				5473	* STATC AND STATD=DEVICE IS NOT READY				00030880
				5474	*				00030890
				5475	*****				00030900
0004D0	6400			5478	RTNCOMR	BU COMREJC1	RETURN TO COMMAND REJECT		00030920
0004D1	6181			5481	RTNSENS	BU SENSEOK	RETURN TO SENSE		00030930
0004D2	6220			5484	RTNPROT	BU PROTEST1	RETURN TO CHECK FILE LPROTECT		00030940
0004D3	622C			5487	RTNTUTST	BU TUTESTIT	RETURN TO CHECK READY		00030950
0004D4	6233			5490	RTNTUTS1	BU TUTEST2	RETURN TO DO SENSE RESET		00030960
0004D5				5493	OPENERS	EQU *			00030980
0004D5	D906			5495	MIFTR02	ANDM	FLAGS,STATPNDG+STACK MASK FOR PENDING STATUS		00030990
0004D6	20D8			5498		BOC	DBUS,MAYBETIO		00031000
0004D7	64DB			5501		BU	OPENERS1		00031010
0004D8	F000			5505	MAYBETIO	XOM	CURCOMM,X'00'		00031030
0004D9	20DB			5508		BOC	DBUS,OPENERS0		00031040
0004DA	4044			5511		XFR	PING		00031050
0004DB				5513	OPENERS0	EQU *	TUS		00031060
0004DB	3BB3			5516	OPENERS1	BOC	STATD,ANYERRS		00031080
0004DC	2BC2			5519		BOC	STATB,CHKBUSY		00031090
0004DD	3AE0			5522		BOC	STATC,SEEIFUC		00031100
0004DE	28CE			5525		BOC	ADROUT,PRETURN1		00031110
0004DF	64DB			5528		BU	OPENERS1		00031120
				5532	*** STAT C WAS ON				00031150

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0004E0	3BB3			5534	SEEIFUC	BOC STATD,ANYERRS	BRANCH IF INT REQ	F01MAY72 9/04/73 00031160
0004E1	2BC6			5537		BOC STATB,CONTCHK1	BRANCH IF DEV END	00031170
0004E2	D902			5540		ANDM FLAGS,STACK	MASK FOR STACK LAG	00031180
0004E3	20E6			5543		BOC DBUS,SETDEUC	BRANCH IF OFF	00031190
0004E4	8506			5546		ORI PNDSTS,DEVEND+UNITCHK	OTHERWISE OR IN DE AND UC	00031200
0004E5	60E1			5549	CMDWAIT8	BU CMDWAIT3	GO CHECK FOR TIO	00031210
0004E6	0506			5552	SETDEUC	STO PNDSTS,DEVEND+UNITCHK	SET UC,DE--READY DROP ON DEP DEV	00031220
0004E7	60E1			5555		BU CMDWAIT3		00031230
				5558	***	STAT D WAS ON		00031250

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000500				5561	ORG BEGIN+X'500'		00031280
				5562	***** DISPLAY LSRs *****		00031290
				5563	* AN INDISPENSABLE ROUTINE TO ALLOW DISPLAY OF THE ALU1 LSR'S IN THE		00031300
				5564	* CHANNEL BUS IN INDICATORS. ON FIRST ROUND THE 16 LOW LSR'S(0-15)		00031310
				5565	* ARE DISPLAYED. SECOND ROUND(DON'T HIT RESET) WILL DISPLAY HIGH		00031320
				5566	* LSR'S(16-31). AN ANTOMATIC STOP IS NOT EMPLOYED IN THIS ROUTINE AND		00031330
				5567	* IT WILL CONTINUE TO DISPLAY HIGH LSR'S FOREVER. RESTART IS THE ONLY		00031340
				5568	* WAY TO DISPLAY LOW LSR'S A SECOND TIME.		00031350
				5569	*		00031360
				5570	* INSTRUCTION COUNTER(IC) DISPLAY IN RELATION TO LSR'S ON		00031370
				5571	* CHANNEL BUS IN ARE AS FOLLOWS:		00031380
				5572	*		00031390
				5573	* IC= 502 DISPLAY LSR0 -FIRST ROUND & LSR16-SECOND ROUND		00031400
				5574	* IC= 503 DISPLAY LSR1 -FIRST ROUND & LSR17-SECOND ROUND		00031410
				5575	* IC= 504 DISPLAY LSR2 -FIRST ROUND & LSR18-SECOND ROUND		00031420
				5576	* IC= 505 DISPLAY LSR3 -FIRST ROUND & LSR19-SECOND ROUND		00031430
				5577	* IC= 506 DISPLAY LSR4 -FIRST ROUND & LSR20-SECOND ROUND		00031440
				5578	* IC= 507 DISPLAY LSR5 -FIRST ROUND & LSR21-SECOND ROUND		00031450
				5579	* IC= 508 DISPLAY LSR6 -FIRST ROUND & LSR22-SECOND ROUND		00031460
				5580	* IC= 509 DISPLAY LSR7 -FIRST ROUND & LSR23-SECOND ROUND		00031470
				5581	* IC= 50A DISPLAY LSR8 -FIRST ROUND & LSR24-SECOND ROUND		00031480
				5582	* IC= 50B DISPLAY LSR9 -FIRST ROUND & LSR25-SECOND ROUND		00031490
				5583	* IC= 50C DISPLAY LSR10-FIRST ROUND & LSR26-SECOND ROUND		00031500
				5584	* IC= 50D DISPLAY LSR11-FIRST ROUND & LSR27-SECOND ROUND		00031510
				5585	* IC= 50E DISPLAY LSR12-FIRST ROUND & LSR28-SECOND ROUND		00031520
				5586	* IC= 50F DISPLAY LSR13-FIRST ROUND & LSR29-SECOND ROUND		00031530
				5587	* IC= 510 DISPLAY LSR14-FIRST ROUND & LSR30-SECOND ROUND		00031540
				5588	* IC= 511 DISPLAY LSR15-FIRST ROUND & LSR31-SECOND ROUND		00031550
				5589	*****		00031560
				5591	***** DISPALAY LSRs *****		00031580
000500	4006			5594	TRACELSR XFR LSR INSURE IN LOW SET		00031600
000501	4060			5597	GETHIGH XFR R0,CBI TAKE LSR TO CE PANEL		00031610
000502	4160			5600	XFR R1,CBI TAKE LSR TO CE PANEL		00031620
000503	4260			5603	XFR R2,CBI TAKE LSR TO CE PANEL		00031630
000504	4360			5606	XFR R3,CBI TAKE LSR TO CE PANEL		00031640
000505	4460			5609	XFR R4,CBI TAKE LSR TO CE PANEL		00031650
000506	4560			5612	XFR R5,CBI TAKE LSR TO CE PANEL		00031660
000507	4660			5615	XFR R6,CBI TAKE LSR TO CE PANEL		00031670
000508	4760			5618	XFR R7,CBI TAKE LSR TO CE PANEL		00031680
000509	4860			5621	XFR R8,CBI TAKE LSR TO CE PANEL		00031690
00050A	4960			5624	XFR R9,CBI TAKE LSR TO CE PANEL		00031700
00050B	4A60			5627	XFR R10,CBI TAKE LSR TO CE PANEL		00031710
00050C	4B60			5630	XFR R11,CBI TAKE LSR TO CE PANEL		00031720
00050D	4C60			5633	XFR R12,CBI TAKE LSR TO CE PANEL		00031730
00050E	4D60			5636	XFR R13,CBI TAKE LSR TO CE PANEL		00031740
00050F	4E60			5639	XFR R14,CBI TAKE LSR TO CE PANEL		00031750
000510	4F60			5642	XFR R15,CBI TAKE LSR TO CE PANEL		00031760
000511	5006			5645	XFRH LSR SET HIGH		00031770
000512	6501			5648	GETREST BU GETHIGH WILL STAY IN HIGH UNTIL RESET		00031780

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	
				5651	*****	F01MAY72 9/04/73
				5652	* THIS ROUTINE TEST THE ARITHMETIC FUNCTIONS OF *	00031800
				5653	* THE ALU1.THE TESTS PROGRESS AS FOLLOWS: *	00031810
				5654	*	00031820
				5655	* 1.ALU1 STATA-ALU2-STATS B AND C TEST *	00031830
				5656	* 2.ALU ADDER RIPPLE TEST *	00031840
				5657	* 3.OP CODES TEST *	00031850
				5658	* 4.CROSSOVER ALL ONES CHECK *	00031860
				5659	* 5.ALU2 STAT C ON AND CROSSOVER ALL *	00031870
				5660	* ZEROES CHECK *	00031880
				5661	*****	00031890
000513				5663	STEP0092 EQU *	00031900
000513 02FF				5665	ALUCHECK STO R2,X'FF'	00031920
000514 DB40				5668	ANDM FLAGS2,ALUFAIL	00031930
000515 3078				5671	BOC DREG0,LATER	00031940
000516 4242				5674	XFR R2,XOUTA	00031950
000517 1E03				5677	STO FRUSAV,3	00031960
000518 0205				5680	STO R2,NDXTST3 T	00031970
						00031980
000519 0800				5684	STO STATIM,0	00032000
00051A 4828				5687	XFR STATIM,STAT SET	00032010
					STATS TO HARDWARE	
00051B 2A67				5691	BOC STATA,ZONKA	00032030
					SHD BE OFF	
00051C 4241				5695	XFR R2,XOUTB	00032050
					KICK OFF ALU2	
00051D 2B67				5699	BOC STATB,ZONKA	00032070
00051E 3A6E				5702	BOC STATC,ZONKC	00032080
					SHD BE OFF	
00051F 1E04				5706	STO FRUSAV,4	00032100
					BUMP FRU REG	
000520 0000				5710	TESTONE STO R0,0	00032120
					CLEAR REG 0	
000521 3046				5714	BOC DREG0,TRAP11	00032140
000522 3144				5717	BOC DREG1,TRAP10	00032150
000523 3242				5720	BOC DREG2,TRAP9	00032160
000524 3340				5723	BOC DREG3,TRAP8	00032170
000525 343E				5726	BOC DREG4,TRAP7	00032180
000526 353C				5729	BOC DREG5,TRAP6	00032190
000527 363A				5732	BOC DREG6,TRAP5	00032200
000528 3738				5735	BOC DREG7,TRAP4	00032210
					BIT SHD BE OFF	
000529 04FF				5739	STO R4,ONES	00032230
					FILL REG 4	
00052A A001				5743	TEST1 ADD R0,1	00032250
00052B 2131				5746	BOC NALCO,AA	00032260
00052C 202E				5749	BOC DBUS,BB	00032270
					ON OVERFLOW DBUS SHD BE 0	
00052D 4011				5753	TRAP1 XFR HDWERR	00032290
					FALSE CARRY	
00052E A4FF				5757	BB ADD R4,ONES	00032310
00052F 2147				5760	BOC NALCO,OPCODES	00032320
					DECREMENT R4 BY ONE MORE	
000530 4011				5764	TRAP2 XFR HDWERR	00032340
					SHD BE NO CARRY HERE	
					PROBLEM	

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	9/04/73
000531	A4FF			5768	AA	ADD R4,ONES		00032360
000532	2136			5771	BOC	NALCO,CCTRAP		00032370
000533	4421			5774	XFR	R4,AR		00032380
000534	B000			5777	ADDM	R0,0		00032390
000535	2137			5780	BOC	NALCO,DD		00032400
000536	4011			5784	CCTRAP	XFR HDWERR		00032420
000537	3739			5789	DD	BOC DREG7,EE		00032450
000538	4011			5792	TRAP4	XFR HDWERR		00032460
000539	363B			5796	EE	BOC DREG6,FF		00032480
00053A	4011			5799	TRAP5	XFR HDWERR		00032490
00053B	353D			5803	FF	BOC DREG5,GG		00032510
00053C	4011			5806	TRAP6	XFR HDWERR		00032520
00053D	343F			5810	GG	BOC DREG4,HH		00032540
00053E	4011			5813	TRAP7	XFR HDWERR		00032550
00053F	3341			5817	HH	BOC DREG3,II		00032570
000540	4011			5820	TRAP8	XFR HDWERR		00032580
000541	3243			5824	II	BOC DREG2,JJ		00032600
000542	4011			5827	TRAP9	XFR HDWERR		00032610
000543	3145			5831	JJ	BOC DREG1,KK		00032630
000544	4011			5834	TRAP10	XFR HDWERR		00032640
000545	302A			5838	KK	BOC DREG0,TEST1		00032660
000546	4011			5841	TRAP11	XFR HDWERR		00032670
000547	0020			5845	OPCODES	STO R0,X'20'		00032690
000548	1E05			5848	STO	FRUSAV,5		00032700
000549	4021			5851	XFR	R0,AR		00032710
00054A	C000			5854	AND	R0,0		00032720
00054B	324D			5857	BOC	DREG2,ALU1001		00032730
00054C	4011			5861	TRAP106	XFR HDWERR		00032750
00054D	A020			5864	ALU1001	ADD R0,X'20'		00032760
00054E	3150			5867	BOC	DREG1,ALU1002		00032770
00054F	4011			5871	TRAP107	XFR HDWERR		00032790
000550	8020			5875	ALU1002	ORI R0,X'20'		00032810
000551	3253			5878	BOC	DREG2,ALU1003		00032820
000552	4011			5882	TRAP108	XFR HDWERR		00032840

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
000553	E09F			5886	ALU1003	XO R0,X'9F'	EXCLUSIVE OR R0 SET TO FF	F01MAY72 9/04/73 00032860
000554	A001			5889		ADD R0,X'01'	ADD 1 TO R0	00032870
000555	2058			5892		BOC DBUS,CHEKONB	RESULT SHOULD BE ZERO	00032880
000556	4011			5895	TRAP109	XFR HDWERR	EXCLUSIVE OR OP FAILURE	00032890
000557	1E06			5899		STO FRUSAV,6	BUMP FRU REG	00032910
000558	2B5B			5901	* GO TO	MAP 13-420		00032920
000559	226A			5903	CHEKONB	BOC STATB,CHKXINS	BRANCH IF ALU2 READY	00032930
00055A	6558			5905	* GO TO	MAP 13-420		00032940
				5907		BOC ALUR,ZONK	BRANCH IF ALU2 DIED	00032950
				5909	* GO TO	MAP 13-420		00032960
				5911		BU CHEKONB	WAIT	00032970
00055B	4090			5915	CHKXINS	XFR R0,XINA	CHECK	00032990
00055C	A001			5917	* GO TO	MAP 13-430		00033000
00055D	2172			5919		ADD R0,1	XINA	00033010
				5922		BOC NALCO,ZONKXA	AND	00033020
00055E	4088			5926		XFR R0,XINB	XINB	00033040
00055F	A001			5929		ADD R0,1	FORALL	00033050
000560	2176			5932		BOC NALCO,ZONKXB	ONES	00033060
000561	4042			5936		XFR R0,XOUTA	CLEAR XOUTA FOR ALU2	00033080
000562	1E07			5939		STO FRUSAV,7	BUMP FRU REG	00033090
000563	088F			5942	CHKSTATS	STO STATMG,SETSTATA+SETSTATB+SETSTATC+SETSTATD+STOP		00033100
000564	4828			5943+		ORG *-1		
000565	0800			5945		XFR STATMG,STAT	TRN ON THE STATS FOR TEST	00033110
000566	2A68			5948		STO STATMG,0	CLEAR STAT IMAGE REG	00033120
				5951		BOC STATA,WAIT	SHD BR	00033130
000567	4011			5955	ZONKA	XFR HDWERR		00033150
000568	3B6B			5960	* GO TO	MAP 13-440		00033190
000569	6568			5962	WAIT	BOC STATD,CKALUERR	STATD SAYS END OF ROUTINE	00033200
				5964	* GO TO	MAP 13-440		00033210
				5966		BU WAIT		00033220
00056A	4011			5970	ZONK	XFR HDWERR	ALU2 FAILED	00033240
00056B	226A			5974	CKALUERR	BOC ALUR,ZONK	LOOK FOR ALU2 HARD ERROR	00033260
00056C	1E08			5977		STO FRUSAV,8	BUMP FRU REG	00033270
00056D	3A6F			5980	CHKC	BOC STATC,STATSOK	SHD BE ON	00033280
00056E	4011			5984	ZONKC	XFR HDWERR		00033300
00056F				5987	STATSOK	EQU *		00033320
00056F	4090			5989		XFR R0,XINA	CHECK	00033330
000570	A0FF			5992		ADD R0,ONES	XINA	00033340
000571	2173			5995		BOC NALCO,XINAOK	AND	00033350
000572	4011			5999	ZONKXA	XFR HDWERR	XINB	00033370

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT
000573	4088			6003	XINAOK	XFR R0,XINB
000574	A0FF			6006		ADD R0,ONES
000575	2177			6009		BOC NALCO,XINBOK
000576	4011			6013	ZONKXB	XFR HDWERR
000577				6016	XINBOK	EQU *
000577	6771			6018	BU	CHKDISC
000578	6304			6021	LATER	BU IDLESCAN

FOR
ALL
ZEROES

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00033390
00033400
00033410
00033430
00033450
00033460
00033470

GO BACK TO POLL

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				6024	***** SET DIAGNOSE CMD *****		00033490
				6025	* DOSETDIA WILL FETCH FOUR BYTES FROM THE CHANNEL AND SAVE THEM FOR	*	00033500
				6026	* USE LATER. THE FIRST BYTE WILL BE PASSED TO ALU2 AND IF THE FORCE	*	00033510
				6027	* ALU ERRORS FLAG IS ON. IF THE GDT FLAG IS ON ALU1 WILL TIME OUT THE	*	00033520
				6028	* TIME SPECIFIED IN THE LAST TWO BYTES. THIS ROUTINE IS ENTERED WHEN	*	00033530
				6029	* THW CHANNEL ISSUES A SET DIAGNOSE COMMAND	*	00033540
				6030	*****		00033550
000579	4CA0			6033	DOSETDIA XFR SETDIA1,CBO		00033570
00057A	140E			6036	STO XOUTBIM,NDXFLAGS		00033580
00057B	4C42			6039	XFR SETDIA1,XOUTA		00033590
00057C	5441			6042	XFR XOUTBIM,XOUTB		00033600
00057D	1002			6045	STO LINK1,BRETRN4		00033610
00057E	118C			6048	STO LINK2,SETSTOP		00033620
00057F	128A			6051	STO LINK3,WRTHIO		00033630
000580	1387			6054	STO LINK4,SAV1FCH2		00033640
				6056	*****		00033650
				6057	*GOFETCH RESETS SERVICE IN FROM THE LAST BYTE FETCH AND LINKS TO	*	00033660
				6058	*THE SERVICE SUBROUTINE	*	00033670
				6059	*****		00033680
000581	4150			6061	GOFETCH XFR CTIMAGE,CTI		00033690
000582	620A			6064	BU SERVTRN		00033700
				6067	*****		00033720
				6068	*DIALINK IS THE COMMON RETURN FROM THE SERVICE ROUTINE. LINK REG 4	*	00033730
				6069	*WILL BE LOADED TO RETURN TO THE APPROPRIATE BYTE FETCH	*	00033740
				6070	*****		00033750
000583	2485			6073	DIALINK BOC BOPE,SETBOPE		00033770
000584	5322			6076	XFR LINK4,IC		00033780
000585	8720			6079	SETBOPE ORI SNSSTS2,BUSOC		00033790
000586	5322			6082	SETBOPO XFR LINK4,IC		00033800
				6085	*** SAVE BYTE 1--FETCH BYTE 2		00033820
000587	4DA0			6087	SAV1FCH2 XFR SETDIA2,CBO		00033830
000588	138A			6090	STO LINK4,SAV2FCH3		00033840
000589	6581			6093	BU GOFETCH		00033850
				6096	*** SAVE BYTE2--FETCH BYTE 3		00033870
00058A	4EA0			6098	SAV2FCH3 XFR SETCNT1,CBO		00033880
00058B	1410			6101	STO XOUTBIM,NDXFLAG2		00033890
00058C	4E42			6104	XFR SETCNT1,XOUTA		00033900
00058D	5441			6107	XFR XOUTBIM,XOUTB		00033910
00058E	1390			6110	STO LINK4,SAV3NOFC		00033920
00058F	6581			6113	BU GOFETCH		00033930
				6116	*** SAVE BYTE 3 DROP SERVICE IN		00033950
000590	4FA0			6118	SAV3NOFC XFR SETCNT2,CBO		00033960
000591	4150			6121	XFR CTIMAGE,CTI		00033970
				6124	***LOOK FOR GDT FLAG AND, IF ON, TIME OUT PRIOR TO PRESENTING STATUS		00033990
000592	DC10			6126	ANDM SETDIA1,GDT		00034000
000593	209E			6129	PRSNTSTS BOC DBUS,GIVSTS		00034010
000594	0400			6132	STO WORK1,0		00034020

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
000595	A401			6135	INCAGN	ADD WORK1,1	BUMP LOWEST COUNTER (400 NANOSECS)		00034030
000596	28A0			6138		BOC ADROUT,GDTHIO	HIO IF UP		00034040
000597	2195			6141		BOC NALCO,INCAGN	BRANCH IF NO CARRY TO BUMP AGAIN		00034050
000598	AFFF			6144		ADD SETCNT2,ONES	DECREMENT LO CNTR (103.150 USECS)		00034060
000599	219B			6147		BOC NALCO,DECHICNT	BRANCH IF NO CARRY TO DECR HI CNTR		00034070
00059A	6595			6150		BU INCAGN	OTHERWISE, GO BUMP LOWEST AGAIN		00034080
00059B	AEFF			6153	DECHICNT	ADD SETCNT1,ONES	DECREMENT HI CNTR (27 MSECS)		00034090
00059C	219E			6156		BOC NALCO,GIVSTS	GET OUT IF NO CARRY (PRESENT STATUS)		00034100
00059D	6595			6159		BU INCAGN	OTHERWISE GO DO IT ALL AGAIN		00034110
00059E	CCEF			6162	GIVSTS	AND SETDIA1,ONES-GDT	RESET THE FLAG		00034120
00059F	63D7			6165	GIVSTS1	BU CHEKSNS	GO ASSEMBLE ENDING STATUS		00034130
0005A0	634D			6168	GDTHIO	BU HIOPERG	GET OUT HIO ISSUED		00034140
0005A1	6203			6172	WRTINIT	BU WRTBGN	RETURN TO WRITE ROUTINE		00034160
0005A2	63B3			6175	DOAREAD	BU LETSREAD			00034170
0005A3	4150			6184	CLEANGO	XFR CTIMAGE,CTI	DROP STATUS IN		00034240
0005A4	4242			6187		XFR XOUTAIM,XOUTA	SET DATA FLOW MASK TO HDWE		00034250
0005A5	4828			6190		XFR STATIMG,STAT	RESET STAT D IF ON		00034260
0005A6	28A1			6193	SVCcoup	BOC ADROUT,WRTINIT	BRANCH IF HIO		00034270
0005A7	2DA6			6196		BOC SVCOUT,SVCoup	WAIT FOR SERVICE OUT TO DROP		00034280
0005A8	9000			6199		ORM CURCOMM,0	MASK FOR BRANCHING		00034290
0005A9	37A1			6202		BOC DREG7,WRTINIT	BRANCH IF WRITE OR TIE REQUEST		00034300
6179						*****			00034200
6180						* CLEANGO OCCURS WHEN CLEAN INITIAL STATUS IS ACCEPTED			00034210
6181						*****			00034220

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				6206	***** DIAGNOSTIC MEASURE AND READ *****	00034330	
				6207	* THE DMR (DIAGNOSTIC MEASURE AND READ) IS USED TO GATHER ONLINE	* 00034340	
				6208	* DATA FOR CAPSTAN PROFILE, VELOCITY, AND ASSYMMETRY. A SET DIAGNOSE	* 00034350	
				6209	* COMMAND MUST BE ISSUED AFTER ISSUING A PRIOR READ TYPE OP(DETERMINES	* 00034360	
				6210	* THE DIRECTION TO BE MEASURED--- FORWARD OR BACKWARD STATUS) A READ	* 00034370	
				6211	* OR READ BACKWARD COMMAND MUST BE ISSUED FOLLOWING THE SET DIAGNOSE.	* 00034380	
				6212	* THE CONTROLLER WILL SEND BYTES TO CHANNEL CCONSISTING OF TACH TIMING	* 00034390	
				6213	* COUNTS. THE FIRST SET DIAGNOSE CNT CONTAINS A NUMBER IN TACH COUNTS	* 00034400	
				6214	* THAT GO IS TO REMAIN UP, THE SECOND COUNT IS A NUMBER THAT GO IS	* 00034410	
				6215	* TO REMAIN DOWN. THE COUNTS WILL BE EXPIRED IN THAT ORDER. THE TIME	* 00034420	
				6216	* THAT GO REMAINS UP AFTER GO DOWN DEPENDS ON THE CHANNEL BYTE COUNT	* 00034430	
				6217	*****	00034440	
0005AA	1000			6220	CHKDMR STO LINK1,DMRRTN1 LOAD SERVICE OUT RESP RETURN	00034460	
0005AB	118C			6223	STO LINK2,SETSTOP LOAD CMD OUT RESP RETURN	00034470	
0005AC	128A			6226	STO LINK3,WRTHIO LOAD HIO RETURN	00034480	
0005AD	DC6C			6229	ANDM SETDIA1,DMR+IBGMSR+RDACC+RDSTOP CHECK DIAG BITS	00034490	
0005AE	20A2			6232	BOC DBUS,DOAREAD BRANCH IF OFF TO CHECK IBG MSR	00034500	
0005AF	8820			6236	ORI STATIMG,CONTROL SET CONTROL BIT IN XOUTA	00034520	
0005B0	4828			6239	XFR STATIMG,STAT	00034530	
0005B1	4242			6242	XFR XOUTAIM,XOUTA SET XOUTA TO HARDWARE	00034540	
0005B2	DC6C			6245	ANDM SETDIA1,DMR+IBGMSR+RDACC+RDSTOP CHECK DIAG BITS	00034550	
0005B3	31E6			6248	BOC DREG1,DOIBGMSR BRANCH IF IBG MEASURE BIT IS ON	00034560	
0005B4	32F8			6252	BOC DREG2,READACC BRANCH IF READ ACCESS BIT ON	00034580	
0005B5	34E5			6256	BOC DREG4,DORDSTOP BRANCH IF READ STOP MEASURE	00034600	
0005B6	140C			6260	STO XOUTBIM,NDXDMR LOAD ALU2 DMR BRANCH INDEX	00034620	
0005B7	5441			6263	XFR XOUTBIM,XOUTB START ALU2	00034630	
0005B8	18E4			6266	GORDSTOP STO LINK5,DMRSTOP SET STOP POINTER	00034640	
0005B9	19CB			6269	STO LINK6,DMR6 SET B CHANGED STATE POINTER	00034650	
0005BA	0400			6272	STO WORK1,0 CLEAR MODULO BYTE CNTR	00034660	
0005BB	A EFF			6276	DMR1 ADD SETCNT1,ONES DECREMENT GO UP COUNT BY ONE	00034680	
0005BC	21D9			6279	BOC NALCO,DMR4 BRANCH IF NO CARRY--FINISHED	00034690	
0005BD	4828			6283	DMR3 XFR STATIMG,STAT SET STATS TO HDWE	00034710	
0005BE	3BE3			6286	BOC STATD,ALU2STOP GET OUT IF IBGMSR OR ALU2 HARD ERR	00034720	
0005BF	DC60			6289	ANDM SETDIA1,IBGMSR+RDACC TEST FLAGS	00034730	
0005C0	20C2			6292	BOC DBUS,LOOKATA BR IF NEITHER	00034740	
0005C1	2BC7			6295	BOC STATB,DMR5 TEST STATB	00034750	
0005C2	2AC7			6298	LOOKATA BOC STATA,DMR5 CHECK STATB FOR ON OR OFF	00034760	
0005C3	2BCA			6301	*** WAIT FOR STATB TO COME ON THEN FETCH NEXT TWO BYTES OF COUNT	00034780	
0005C4	28E4			6303	DMR7 BOC STATB,ITSTIME WAIT FOR STATB TO COME ON	00034790	
0005C5	3BE3			6306	BOC ADROUT,DMRSTOP BRANCH IF HIO	00034800	
0005C6	65C3			6309	BOC STATD,ALU2STOP BRANCH IF ALU2 HAD HARD ERROR	00034810	
				6312	BU DMR7 GO BACK AND CHECK STAT B	00034820	
0005C7	3BE3			6315	*** WAIT FOR STATB TO GO OFF THEN FETCH NEXT TWO BYTES OF COUNT	00034840	
				6317	DMR5 BOC STATD,ALU2STOP BRANCH IF ALU2 HAD HARD ERROR	00034850	

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
0005C8	28E4			6320	BOC	ADROUT,DMRSTOP	BRANCH IF HIO		00034860
0005C9	2BC7			6323	BOC	STATB,DMR5	WAIT FOR STAT B TO FALL		00034870
0005CA	5922			6327	ITSTIME	XFR LINK6,IC	STAT B OFF GO GET NEXT 2 COUNTS		00034890
0005CB	A401			6332	DMR6	ADD WORK1,1	BUMP MODULO BYTE COUNT		00034920
0005CC	13D1			6335	STO	LINK4,DMR2	LOAD SERVICE RETURN POINTER		00034930
0005CD	5488			6338	SERVIBG	XFR XOUTBIM,XINB	GO FETCH HI ORDER COUNT BYTE		00034940
0005CE	5F90			6341	XFR	FORMAT,XINA	BRING IN SECOND BYTE		00034950
0005CF	5460			6344	XFR	XOUTBIM,CBI	MOVE TO CHAN BUS IN		00034960
0005D0	620A			6347	BU	SERVRTN	GO PRESENT TO CHANNEL		00034970
				6350	***	THE FIRST BYTE OF COUNT FOR ONE TACH TRANSITION HAS BEEN XFERRED			00034990
				6351	***	NOW XFR THE SECOND BYTE			00035000
0005D1	2AD5			6353	DMR2	BOC STATA,DMR8	BRANCH IF ONE FULL TACH TIME SENT		00035010
0005D2	8808			6356	ORI	STATIMG,SETSTATA	OTHERWISE SET STATA AND FINISH CNTS		00035020
0005D3	13BD			6359	STO	LINK4,DMR3	LOAD SERV RTN RETURN POINTER		00035030
0005D4	65D7			6362	BU	DMR9	GO FETCH NEXT BYTE		00035040
0005D5	C8F7			6366	DMR8	AND STATIMG,ONES-SETSTATA	RESET STAT A IN IMAGE REG		00035060
0005D6	13BB			6369	STO	LINK4,DMR1	LOAD ONE TACH SENT RETURN		00035070
0005D7	5F60			6372	DMR9	XFR FORMAT,CBI	MOVE TO CHAN BUS IN		00035080
0005D8	620A			6375	BU	SERVRTN	GO PRESENT BYTE TO CHANNEL		00035090
0005D9	8802			6379	DMR4	ORI STATIMG,SETSTATC	TELL ALU2 TO DROP MOVE		00035110
0005DA	0E00			6382	STO	SETCNT1,0	KEEP GO UP CNT CLEAR		00035120
0005DB	AFFF			6385	ADD	SETCNT2,ONES	DECREMENT GO DOWN COUNT REG		00035130
0005DC	21DE			6388	BOC	NALCO,DMRA	BRANCH IF DONE		00035140
0005DD	65BD			6391	BU	DMR3	OTHERWISE CONTINUE TACH TIMING		00035150
0005DE	C8FD			6395	DMRA	AND STATIMG,ONES-SETSTATC	NOTIFY ALU2 TO RAISE MOVE AGAIN		00035170
0005DF	0F00			6398	STO	SETCNT2,0	KEED GO DOWN COUNT CLEAR		00035180
0005E0	65BD			6401	BU	DMR3	RETURN TO EXPIRE CHANNEL BYTE COUNT		00035190
				6404	***	COMMON SERVICE ROUTINE RETURN AFTER SERV OUT RESP			00035210
0005E1	4150			6406	DMRLNK	XFR CTIMAGE,CTI	DROP SERVICE IN		00035220
0005E2	5322			6409	XFR	LINK4,IC	RETURN TO CALLER		00035230
				6412	***	COMMON ALU2 STOPPED LINK			00035250
0005E3	5822			6414	ALU2STOP	XFR LINK5,IC	RETURN TO STOP		00035260
				6417	***	COMMON ALU2 HARD ERROR RETURN UNIT CHECK WILL BE SET			00035280
0005E4	63B8			6419	DMRSTOP	BU BSTWAIT	GO ASSEMBLE UNIT CHECK STATUS		00035290

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
6422					***** IBG MEASURE *****		00035310
6423	*				THE IBG MEASURE ROUTINE WILL TRANSFER BYTES OF COUNT	*	00035320
6424	*				REPRESENTING THE TIME FOR EACH PARTIAL AND FULL TACH ENCOUNTERED	*	00035330
6425	*				WHILE TRAVERSING THE GAP BETWEEN TWO RECORDS. ONE BYTES EQUALS	*	00035340
6426	*				THE TIME FOR ONE FULL OR PARTIAL TACH. THE COMMAND ISSUED PRIOR	*	00035350
6427	*				TO THE SET DIAGNOSE COMMAND WILL DETERMINE THE DIRECTION OF TAPE	*	00035360
6428	*				MOTION	*	00035370
6429					*****		00035380
0005E5	8801			6432	DORDSTOP ORI STATIMG,SETSTATD	INDICATE RDSTOP TO ALU2	00035400
0005E6	143E			6435	DOIBGMSR STO XOUTBIM,NDXBSR	SET ALU2 INDEX TO DO BSR	00035410
0005E7	F00C			6438	XOM CURCOMM,X'0C'	MASK FOR RD BACK	00035420
0005E8	20EA			6441	BOC DBUS,DOBWD	BRANCH IF CFF	00035430
0005E9	1437			6444	STO XOUTBIM,NDXFSR	SET ALU2 INDEX TO DO FSR	00035440
0005EA	8802			6448	DOBWD ORI STATIMG,SETSTATC	INDICATE IBG MEASURE TO ALU2	00035460
0005EB	5441			6451	XFR XOUTBIM,XOUTB	KICK OFF SPACE OP	00035470
0005EC	18F5			6454	STO LINK5,IBGSTOP	SET STOP RETURN	00035480
0005ED	19F0			6457	STO LINK6,SCRAP1	SET RETRN TO SYNC WITH ALU2	00035490
0005EE	2BBD			6460	ISITUP BOC STATB,DMR3	BRANCH IF TAPE OP UP	00035500
0005EF	65EE			6463	BU ISITUP	GO BACK AND CHECK AGAIN	00035510
0005F0	8C00			6467	SCRAP1 ORI SETDIA1,0	MASK FOR RD STOP BIT	00035530
0005F1	34B8			6470	BOC DREG4,GORDSTOP	BRANCH IF IT IS	00035540
0005F2	13BD			6473	SCRAP2 STO LINK4,DMR3	SET FIRST BYTE RETURN	00035550
0005F3	19CD			6476	STO LINK6,SERVIBG	SET SERVICE POINTER	00035560
0005F4	65BD			6479	BU DMR3	GO SERVICE	00035570
0005F5	18E4			6482	*** IBGSTOP IS THE RETURN BEFOR THE LAST DATA TO CHANNEL		00035590
0005F6	5F90			6484	IBGSTOP STO LINK5,DMRSTOP	SET NEW STOP RETURN	00035600
0005F7	65D7			6487	XFR FORMAT,XINA	BRING IN LAST BYTR	00035610
				6490	BU DMR9	GO PRESENT THE LAST BYTE TO CHANNEL	00035620
6493					***** READ ACCESS *****		00035640
6494	*				THE READ ACCESS ROUTINE WILL TRANSFER TWO BYTES OF COUNT THAT	*	00035650
6495	*				REPRESENT THE ELAPSED TIME FROM THE RISE OF MOVE TO THE BEGINNING	*	00035660
6496	*				OF THE RECORD(BOR FOR PE AND FIRST BIT FOR NRZI). THE COMMAND ISSUED*		00035670
6497	*				PRIOR TO THE SET DIAGNOSE WILL DETERMINE THE DIRECTION.	*	00035680
6498					*****		00035690
0005F8	140D			6501	READACC STO XOUTBIM,NDXAXESS	RT FETCH ALU2 INDEX	00035710
0005F9	5441			6504	XFR XOUTBIM,XOUTB	KICK OFF ALU2	00035720
0005FA	18F5			6507	STO LINK5,IBGSTOP	SET STOP LINK	00035730
0005FB	65F2			6510	BU SCRAP2	TO PRESENT COUNTS TO CHANNEL	00035740

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000600				6513	ORG BEGIN+X'600'		00035760
				6514	*****		00035770
				6515	*		00035780
				6516	*		00035790
				6517	6250 WRITE		00035800
				6518	*		00035810
				6519	*		00035820
				6520	*		00035830
				6521	* DENSITY DETERMINATION - AWAY FROM LOAD POINT THE DRIVE CONTROLS THE		00035840
				6522	* DENSITY-AT LOAD POINT DRIVE FEATURES AND LAST MODE 2 SET DETERMINES		00035850
				6523	* DENSITY. THE FOLLOWING CHART SHOWS THE RESULTANT DENSITY ON TAPE.		00035860
				6524	*		00035870
				6525	* TAPE MODE SET MODE SET MODE SET		00035880
				6526	* UNIT 6250 1600 800		00035890
				6527	*		00035900
				6528	* 6250/1600 6250 1600 6250		00035910
				6529	* 6250 6250 6250		00035920
				6530	* 1600/800 1600 1600 800		00035930
				6531	* 1600 1600 1600 1600		00035940
				6532	*		00035950
				6533	*		00035960
				6534	*****		00035970
000600	F01F			6536	NOGO XOM CURCOMM,X'1F' ONE MORE LOOK		00035980
000601	20B7			6539	BOC DBUS,TRNAOFF 2ND CHANCE AT BR		00035990
000602	F017			6542	XOM CURCOMM,X'17' ARE WE ERG		00036000
000603	20B7			6545	BOC DBUS,TRNAOFF BR IF SO		00036010
000604	2206			6548	BOC ALUR,BADEND BR IF HDW ERROR		00036020
000605	66A4			6551	BU FORMTEND		00036030
000606	140B			6554	BADEND STO XOUTBIM,NDXABRT LOAD ALU2 INDEX		00036040
000607	5441			6557	XFR XOUTBIM,XOUTB KICK OFF ALU 2		00036050
000608	66A4			6560	BU FORMTEND		00036060
				6562	*****		00036070
				6563	* ENTRY POINT FOR WTM *****		00036080
				6564	*****		00036090
000609	C1FE			6566	BEGWRTM AND CTIMAGE,ONES-OPIN RESET OP IN IMAGE		00036100
00060A	8110			6569	ORI CTIMAGE,CUBUSY SET CU BUSY		00036110
00060B	66F9			6572	BU TMPATCH	EC734087	00036120
				6574	*****		00036130
				6575	* ENTRY POINT FOR NORMAL WRITE*****		00036140
				6576	*****		00036150
00060C	4488			6578	BEGWRITE XFR WORK1,XINB BRING IN TU SENSE BYTE 0		00036160
00060D	4150			6581	XFR CTIMAGE,CTI DROP SVI		00036170
00060E	C1C0			6584	AND CTIMAGE,HOLDA+HOLDB FOR HIO		00036180
00060F	8130			6587	ORI CTIMAGE,CUBUSY+HOLDINT		00036190
000610	4E90			6590	TMSKIP XFR SETCNT1,XINA BRING IN FEATURE BYTE	EC734087	00036200
000611	5441			6593	XFR XOUTBIM,XOUTB KICK OFF ALU2		00036210
000612	9400			6596	ORM WORK1,0 SET FOR TEST		00036220
000613	331E			6599	BOC DREG3,DOLPBRST BRANCH IF LOAD POINT IS ON		00036230
				6601	*****		00036240
				6602	*LOAD POINT IS OFF --- DETERMINE DENSITY *****		00036250
				6603	*****		00036260
000614	FE08			6605	XOM SETCNT1,X'08' TEST FOR 66250		00036270
000615	3419			6608	BOC DREG4,DOBOR16 BR IF NOT 6250 MODEL		00036280
000616	9E00			6611	ORM SETCNT1,0 GET LSR TO DBUS FOR TEST		00036290

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
000617	335B			6614	BOC	DREG3,NOBURST	WRITE IN 1600 BPI		00036300
000618	661C			6617	BU	GODO1600			00036310
000619	9E00			6620	DO8OR16	ORM SETCNT1,0	GET LSR FOR TEST		00036320
00061A	301D			6623	BOC	DREG0,GODO800	BR ON 7 TRK		00036330
00061B	331D			6626	BOC	DREG3,GODO800	BR IF IN NRZI MODE		00036340
00061C	670F			6629	GODO1600	BU CHKOP16			00036350
00061D	6740			6633	GODO800	BU CHKOP800			00036370
				6635	*****	*****			00036380
				6636	*	LOAD POINT IS ON DETERMINE DENSITY			00036390
				6637	*****	*****			00036400
00061E				6638	DOLPBRST	EQU *			00036410
00061E	9E00			6640	ORM	SETCNT1,0	GET LSR TO DBUS FOR TEST		00036420
00061F	3429			6643	BOC	DREG4,DO16OR64	BR IF 6250 MODEL		00036430
000620	301D			6646	BOC	DREG0,GODO800	BR ON 7 TRK		00036440
000621	3223			6650	LP8OR16	BOC DREG2,LPCKDENS	BR IF DUAL DENSITY AVAILABLE		00036460
000622	661C			6653	BU	GODO1600	GO WRITE IN 1600 MODE		00036470
000623	9800			6656	LPCKDENS	ORM STATIMG,0	TEST FOR LWR		00036480
000624	361C			6659	BOC	DREG6,GODO1600	BR IF LWR		00036490
000625	9200			6662	ORM	XOUTAIM,0	GET LSR FOR TEST		00036500
000626	361C			6665	BOC	DREG6,GODO1600	BR IF 6250 MODE SET - (WRT # 1600)		00036510
000627	371D			6668	BOC	DREG7,GODO800	BR IF 800 MODE SET		00036520
000628	661C			6671	BU	GODO1600			00036530
000629	9800			6674	DO16OR64	ORM STATIMG,0	TEST FOR LWR AT LP		00036540
00062A	361C			6677	BOC	DREG6,GODO1600			00036550
00062B	9E00			6680	ORM	SETCNT1,0	SET FOR TEST		00036560
00062C	322E			6683	BOC	DREG2,LP16OR64	BR IF DUAL DENSITY AVAILABLE		00036570
00062D	6630			6686	BU	GODO6400			00036580
00062E	D203			6689	LP16OR64	ANDM XOUTAIM,3	GET LSR FOR TEST		00036590
00062F	201C			6692	BOC	DBUS,GODO1600	BR IF 1600 MODE SET		00036600
000630				6694	GODO6400	EQU *			00036610
				6696	*****	*****			00036630
				6697	*	STARTING AT LOAD POINT - WAIT FOR TAPE MOTION TO START			00036640
				6698	*****	*****			00036650
000630	28D2			6701	*	GO TO MAP 13-450			00036680
				6703	WAIT SOME	BOC ADROUT,GOTHIO1	WATCH FOR HALT I/O		00036690
				6705	*	GO TO MAP 13-450			00036700
000631	2B34			6707	HIORET1	BOC STATB,STRTBSVI	WAIT FOR STATB		00036710
				6709	*	GO TO MAP 13-450			00036720
000632	3B00			6711	BOC	STATD,NOGO	STATD ON MEANS TROUBLE		00036730
000633	6630			6713	*	GO TO MAP 13-450			00036740
				6715	BU	WAIT SOME			00036750
				6718	*****	*****			00036770
				6719	*	WAIT NOW WHILE ALU2 WRITES ID BURST - COMPLETE ON FALL OF STATB			00036780
				6720	*****	*****			00036790
000634				6722	STRTBSVI	EQU *			00036810
000634	9800			6724	MAYBLWR	ORM STATIMG,0	ARE WE LWR		00036820
000635	365B			6727	BOC	DREG6,NOBURST	SKIP BURST IF SO		00036830

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000636	28D6			6730	* GO TO MAP 13-460		00036850
				6732	STRTBRST BOC ADROUT,GOTHIO3	WATCH FOR HIO	00036860
				6734	* GO TO MAP 13-460		00036870
000637	3B00			6736	HIORET3 BOC STATD,NOGO	ERROR EXIT	00036880
				6738	* GO TO MAP 13-460		00036890
000638	2B36			6740	BOC STATB,STRTBRST	WAIT FOR STAT B TO FALL	00036900
				6743	*****		00036920
				6744	* GET READY TO WRITE SAGC BURST - START AT RISE OF STATB		* 00036930
				6745	*****		00036940
000639	0EEA			6749	STO SETCNT1,ONES-21	LOAD HI CNT	*5384 * 00036970
00063A	0FF8			6752	STO SETCNT2,ONES-7	LOAD LO CNT	*DATA GRPS* 00036980
00063B	1F8C			6755	STO FORMAT,FORMAT11	SET FOR SAGC BST	00036990
00063C	5F42			6758	XFR FORMAT,XOUTA	CALL FOR ONES	00037000
00063D	2B41			6762	WAITONE BOC STATB,BRST111	WAIT FOR STAT B	00037020
00063E	3B00			6765	BOC STATD,NOGO	ERROR EXIT	00037030
00063F	28D8			6768	BOC ADROUT,GOTHIO4	HALT IO EXIT	00037040
000640	663D			6771	HIORET4 BU WAITONE		00037050
000641	1343			6775	BRST111 STO LINK4,BRST112	LOAD LINK RETURN	00037070
000642	66CD			6778	BU DOITFORA		00037080
000643	1345			6782	BRST112 STO LINK4,BRST113	LOAD LINK RETURN	00037100
000644	66C8			6785	BU DOITFORB		00037110
000645	AF01			6789	BRST113 ADD SETCNT2,1	BUMP LO CTR	00037130
000646	2141			6792	BOC NALCO,BRST111	GO BACK IF NO CARRY	00037140
000647	AE01			6795	ADD SETCNT1,1	BUMP HI CTR	00037150
000648	2141			6798	BOC NALCO,BRST111	GO BACK IF NO CARRY	00037160
				6801	*****		00037180
				6802	* BURST WRITTEN - APPEND AN INVERSE TAPE MARK TO THE END OF IT		* 00037190
				6803	*****		00037200
000649	0EF9			6807	SAGCNTM1 STO SETCNT1,ONES-6	LOAD HI CTR	**** 00037230
00064A	0F00			6810	STO SETCNT2,0	LOAD LO CTR	00037240
00064B	1FAC			6814	SAGCNTM2 STO FORMAT,SAGC1		00037260
00064C	134E			6817	STO LINK4,SAGCNTM3	LOAD LINK RETURN	00037270
00064D	66CD			6820	BU DOITFORA		00037280
00064E	1350			6824	SAGCNTM3 STO LINK4,SAGCNTM4	LOAD LINK RETURN	00037300
00064F	66C8			6827	BU DOITFORB		00037310
000650	AF01			6831	SAGCNTM4 ADD SETCNT2,1	BUMP LO CTR	00037330
000651	214B			6834	BOC NALCO,SAGCNTM2	IF NO CARRY - CINTINUE BURST	00037340
000652	AE01			6837	ADD SETCNT1,1	BUMP HI CTR	00037350
000653	214B			6840	BOC NALCO,SAGCNTM2	IF NO CARRY CONTINUE BURST	00037360

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000654	8880			6845	SAGCNTM5 ORI STATIMG,STOP		00037390
000655	4828			6848	XFR STATIMG,STAT	IMAGE STOP SIGNAL ROS2 TO DROP WRT COND	00037400
				6851	* GO TO MAP 13-470		00037420
000656	3B00			6853	SAGCNTM6 BOC STATD,NOGO	ERROR EXIT	00037430
				6855	* GO TO MAP 13-470		00037440
000657	28D4			6857	BOC ADROUT,GOTHIO2	WATCH FOR HIO	00037450
				6859	* GO TO MAP 13-470		00037460
000658	2B56			6861	HIORET2 BOC STATB,SAGCNTM6	WAIT FOR STAT B TO FALLL	00037470
000659	C87F			6864	AND STATIMG,ONES-STOP	RESET STOP FOR USE LATER	00037480
				6868	XFR STATIMG,STAT	DROP STOP TO ROS 2	00037500
00065B	28DC			6871	NOBURST BOC ADROUT,GOTHIO6	WATCH FOR HIO	00037510
00065C	3B00			6874	HIORET6 BOC STATD,NOGO	ERROR EXIT	00037520
00065D	2B5F			6877	BOC STATB,FORMAT1	WAIT OFR STAT B	00037530
00065E	665B			6880	BU NOBURST		00037540
				6884	*****		00037570
				6885	* WRITE FORMATTING - NOT LOAD POINT - 6250 BPI		* 00037580
				6886	*****		00037590
00065F	F01F			6889	FORMAT1 XOM CURCOMM,X'1F'	IS THIS WTM	00037610
000660	20AA			6892	BOC DBUS,BRSTTM1	BR IF SO	00037620
000661	F017			6895	XOM CURCOMM,X'17'	ARE WE ERG	00037630
000662	20B7			6898	BOC DBUS,TRNAOFF	BR IF SO	00037640
000663	1F81			6901	FORMAT1X STO FORMAT,FORMT10		00037650
000664	1368			6904	STO LINK4,FORMAT2	SET UP RETURN	00037660
000665	9C00			6907	ORM SETDIA1,0	TEST DIAG FLAGS	00037670
000666	346D			6910	BOC DREG4,FORMAT5	BR IF INHIBIT PREAMBLE	00037680
000667	66CD			6913	BU DOITFORA		00037690
				6917	FORMAT2 STO FORMAT,FORMT01+8		00037710
000668	1F8A			6920	STO LINK4,FORMAT3	SET UP RETURN	00037720
000669	136B			6923	BU DOITFORB		00037730
				6927	FORMAT3 STO LINK4,FORMAT5	SET UP RETURN	00037750
00066B	136D			6930	BU ONESBRST		00037760
				6934	FORMAT5 STO FORMAT,MARK1		00037780
00066D	1F88			6937	STO LINK4,FORMAT6	SET UP RETURN	00037790
00066E	1370			6940	BU DOITFORA		00037800
				6943	* GO TO MAP 13-480		00037820
000670	9D00			6945	FORMAT6 ORM SETDIA2,0	CHK FOR DIAG FLG	00037830
				6947	* GO TO MAP 13-480		00037840
000671	37EE			6949	BOC DREG7,SUDOWRT1	BR IF ON	00037850
				6951	* GO TO MAP 13-480		00037860
000672	1375			6953	STO LINK4,DATATIME	SET UP RETURN ROLS	00037870
				6955	* GO TO MAP 13-480		00037880
000673	1F40			6957	FORMAT60 STO FORMAT,ALOWEND	CLEAR FORMAT CONTROLS	00037890
				6959	* GO TO MAP 13-480		00037900
000674	66C8			6961	BU DOITFORB		00037910

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				6964	*****		00037930
				6965	* PREAMBLE COMPLETE - ALLOWEND IS ON - WAIT FOR ALLONES OR RESYNC		00037940
				6966	*****		00037950
000675	0462			6967	* GO TO MAP 13-480		00037960
				6969	DATATIME STO WORK1,ONES-157	LOAD RESYNC COUNTER	00037970
				6971	* GO TO MAP 13-480		00037980
000676	28E2			6973	DATALOOP BOC ADROUT,GOTHIO9	WATCH FOR HALT I/O	00037990
				6975	* GO TO MAP 13-480		00038000
000677	3F8E			6977	HIORET9 BOC ALLONES,WRAPUP	MONITOR END OF DATA	00038010
				6979	* GO TO MAP 13-480		00038020
000678	3B00			6981	BOC STATD,NOGO	ERROR EXIT	00038030
				6983	* GO TO MAP 13-480		00038040
000679	2780			6985	BOC CLOCKB,WAITONA1	EXIT ON RISE OF CLOCKB	00038050
				6987	* GO TO MAP 13-480		00038060
00067A	6676			6989	BU DATALOOP		00038070
				6992	* GO TO MAP 13-480		00038090
00067B	28E4			6994	WAITONA BOC ADROUT,GOTHIO10	WATCH FOR HALT I/O	00038100
				6996	* GO TO MAP 13-480		00038110
00067C	3B00			6998	BOC STATD,NOGO	ERROR EXIT	00038120
				7000	* GO TO MAP 13-480		00038130
00067D	277B			7002	HIORET10 BOC CLOCKB,WAITONA	EXIT ON FALL OF CLOCKB	00038140
				7004	* GO TO MAP 13-480		00038150
00067E	3F8E			7006	BOC ALLONES,WRAPUP		00038160
				7008	* GO TO MAP 13-480		00038170
00067F	6676			7010	BU DATALOOP		00038180
				7013	* GO TO MAP 13-480		00038200
000680	A401			7015	WAITONA1 ADD WORK1,1	BUMP RESYNC COUNTER	00038210
				7017	* GO TO MAP 13-480		00038220
000681	217B			7019	BOC NALCO,WAITONA	EXIT ON PASS 158	00038230
				7022	* GO TO MAP 13-480		00038250
000682	1F84			7024	STO FORMAT,MARK2		00038260
				7026	* GO TO MAP 13-480		00038270
000683	1385			7028	STO LINK4,FORMAT7	SET UP RETURN	00038280
				7030	* GO TO MAP 13-480		00038290
000684	66C8			7032	BU DOITFORB		00038300
				7035	* GO TO MAP 13-480		00038320
000685	3F8E			7037	FORMAT7 BOC ALLONES,WRAPUP	MONITOR FOR EOD	00038330
				7039	* GO TO MAP 13-480		00038340
000686	1F8C			7041	STO FORMAT,FORMT11		00038350
				7043	* GO TO MAP 13-480		00038360
000687	1389			7045	STO LINK4,FORMAT8	SET UP RETURN	00038370
				7047	* GO TO MAP 13-480		00038380
000688	66CD			7049	BU DOITFORA		00038390
				7052	* GO TO MAP 13-480		00038410
000689	138B			7054	FORMAT8 STO LINK4,FORMAT9	SET UP RETURN	00038420
				7056	* GO TO MAP 13-480		00038430
00068A	66C8			7058	BU DOITFORB		00038440

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
00068B	1F88			7061	* GO TO MAP 13-480			00038460
				7063	FORMAT9 STO FORMAT,MARK1			00038470
00068C	1370			7065	* GO TO MAP 13-480			00038480
				7067	STO LINK4,FORMAT6	SET UP RETURN		00038490
00068D	66CD			7069	* GO TO MAP 13-480			00038500
				7071	BU DOITFORA			00038510
				7074	*****			00038530
				7075	* END OF DATA OR OVERRUN - ALLOW FOR RESIDUAL & CRC FRAME, THEN		*	00038540
				7076	* FORMAT THE ENDING BURST.		*	00038550
				7077	*****			00038560
00068E	2490			7080	WRAPUP BOC BOPE,BOERR	BR ON BUS OUT EVEN		00038580
00068F	6691			7083	BU FORMAT10			00038590
000690	8720			7086	BOERR ORI SNSSTS2,BUSOC	SET BUS OUT CHK		00038600
000691	1F00			7090	FORMAT10 STO FORMAT,0	CALL FOR RESIDUAL FRAME		00038620
000692	1395			7093	STO LINK4,FORMAT12	SET UP RETURN		00038630
000693	04FC			7096	SETCT2 STO WORK1,ONES-3	SET CNT FOR 4		00038640
000694	66BA			7099	BU DOTWO			00038650
000695	1F84			7103	FORMAT12 STO FORMAT,MARK2			00038670
000696	1398			7106	STO LINK4,FORMAT14	SET UP RETURN		00038680
000697	66CD			7109	BU DOITFORA			00038690
000698	139C			7113	FORMAT14 STO LINK4,FORMAT16	SET UP RETURN		00038710
000699	9C00			7116	ORM SETDIA1,0	TEST DIAG FLAGS		00038720
00069A	32A2			7119	BOC DREG2,FORMAT19	BR IF INHIBIT POST AMBLE		00038730
00069B	66B8			7122	BU ONESBRST			00038740
00069C	139F			7127	FORMAT16 STO LINK4,FORMAT18	SET UP RETURN		00038770
00069D	1F86			7130	STO FORMAT,FORMT01+4			00038780
00069E	66C8			7133	BU DOITFORB			00038790
00069F	13A2			7137	FORMAT18 STO LINK4,FORMAT19	SET UP RETURN		00038810
0006A0	1F81			7140	STO FORMAT,FORMT10			00038820
0006A1	66CD			7143	BU DOITFORA			00038830
0006A2	8880			7147	FORMAT19 ORI STATIMG,STOP	IMAGE STOP		00038850
0006A3	4828			7150	XFR STATIMG,STAT	SET STOP		00038860
0006A4	38A7			7154	FORMTEND BOC OPRIN,TOSETSTP	CHK FOR PREVIOUS HIO		00038880
0006A5	C9FE			7157	AND FLAGS,ONES-CHAIN	YES - RESET CHAIN FLAG		00038890
0006A6	63B8			7160	BU BSTWAIT	BR IF YES		00038900
0006A7	C1CF			7163	TOSETSTP AND CTIMAGE,ONES-CUBUSY-HOLDINT			00038910
0006A8	8101			7166	ORI CTIMAGE,OPIN	RESTORE REGS		00038920
0006A9	63B8			7169	BU BSTWAIT	NORMAL EXIT		00038930
				7172	*****			00038950
				7173	***** 6250 WRITE TAPE MARK *****			00038960
				7174	*****			00038970

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
0006AA	0EDA			7177	BRSTTM1	STO SETCNT1,ONES-37	LOAD HI TM CTR	****	00038990
0006AB	1F9C			7181	BRSTTM2	STO FORMAT,TM64	CALL FOR TM		00039010
0006AC	13AE			7184		STO LINK4,BRSTTM3	LOAD LINK RETURN		00039020
0006AD	66CD			7187		BU DOITFORA			00039030
0006AE	13B0			7191	BRSTTM3	STO LINK4,BRSTTM4	LOAD LINK RETURN		00039050
0006AF	66C8			7194		BU DOITFORB			00039060
0006B0	AE01			7198	BRSTTM4	ADD SETCNT1,1	BUMP HI CTR		00039080
0006B1	21AB			7201		BOC NALCO,BRSTTM2	IF NO CARRY - CINTINUE BURST		00039090
0006B2	8880			7206	BRSTTM5	ORI STATIMG,STOP	IMAGE STOP		00039120
0006B3	4828			7209		XFR STATIMG,STAT	SIGNAL ROS2 TO DROP WRT COND		00039130
0006B4	3B00			7213	BRSTTM6	BOC STATD,NOGO	ERROR EXIT		00039150
0006B5	28DA			7216		BOC ADROUT,GOTHIO5	WATCH FOR HIO		00039160
0006B6	2BB4			7219	HIORET5	BOC STATB,BRSTTM6	WAIT FOR STAT B TO FALLL		00039170
0006B7	6249			7222	TRNAOFF	BU CTLWAIT			00039180
				7226	*****				00039210
				7227	* THIS SUBROUTINE WILL CONTROL THE WRITING OF A TEN GROUP BURST OF				* 00039220
				7228	* ALL ONES. A SECOND ENTRY POINT ALLOWS FOR RESIDUAL AND CRC FRAMES.				* 00039230
				7229	* ALSO USEFIL FOR CLOCKING NRZI CRC AND LRC BYTES, AND WRITING PE				* 00039240
				7230	* PREAMBLES AND POST AMBLES.				* 00039250
				7231	*****				00039260
0006B8	1F8C			7234	ONESBRST	STO FORMAT,FORMT11	CALL FOR ALL ONES		00039280
0006B9	04F2			7237		STO WORK1,ONES-13	SET COUNT FOR 14 GROUPS		00039290
0006BA	5F42			7240	DOTWO	XFR FORMAT,XOUTA	GATE TO DATA FLOW		00039300
0006BB	27C2			7244	CHKCLOCK	BOC CLOCKB,BCLOCKUP	GO TO PROPER WAIT LOOP		00039320
				7246	* GO TO MAP 13-510				00039330
0006BC	27C3			7248	ACLOCKUP	BOC CLOCKB,BUMPCTR	ADD TO COUNTER ON RISE OF A CLOCK		00039340
				7250	* GO TO MAP 13-510				00039350
0006BD	3B00			7252		BOC STATD,NOGO	ERROR EXIT		00039360
				7254	* GO TO MAP 13-510				00039370
0006BE	28E6			7256		BOC ADROUT,GOTHIO11	WATCH FOR HALT I/O		00039380
				7258	* GO TO MAP 13-510				00039390
0006BF	66BC			7260	HIORET11	BU ACLOCKUP	STAY IN LOOP TILL CLOCK A RISES		00039400
				7263	* GO TO MAP 13-510				00039420
0006C0	28E8			7265	ACTIVEB	BOC ADROUT,GOTHIO12	WATCH FOR HALT I/O		00039430
				7267	* GO TO MAP 13-510				00039440
0006C1	3B00			7269	HIORET12	BOC STATD,NOGO			00039450
				7271	* GO TO MAP 13-510				00039460
0006C2	27C0			7273	BCLOCKUP	BOC CLOCKB,ACTIVEB	STAY IN LOOP TILL FALL OF A CLOCK		00039470
0006C3	A401			7277	BUMPCTR	ADD WORK1,1	BUMP GROUP CTR		00039490
0006C4	21BB			7280		BOC NALCO,CHKCLOCK	EXIT ON PASS COMPLETE		00039500
0006C5	5322			7283		XFR LINK4,IC	RETURN TO PROPER ROUTINE		00039510
0006C6	675B			7286	NRZIRET2	BU CRCTIME1	NRZI RETURN		00039520
0006C7	6761			7289	NRZIRET3	BU CRCTIME2	NRZI RETURN		00039530

LOC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT

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7293 ***** 00039560
7294 * THIS SUBROUTINE WILL GATE XOUTA, THEN WAIT FOR CLOCK B TO FALL * 00039570
7295 ***** 00039580

0006C8 5F42 7297 * GO TO MAP 13-480 00039600
7299 DOITFORB XFR FORMAT,XOUTA SET FORMAT CONTROLS 00039610
7301 * GO TO MAP 13-480 00039620
0006C9 28DE 7303 RIGHTON BOC ADROUT,GOTHIO7 WATCH FOR HALT I/O 00039630
7305 * GO TO MAP 13-480 00039640
0006CA 3B00 7307 HIOTET7 BOC STATD,NOGO ERROR EXIT 00039650
7309 * GO TO MAP 13-480 00039660
0006CB 27C9 7311 BOC CLOCKB,RIGHTON WAIT FOR CLOCKB TO FALL 00039670
7313 * GO TO MAP 13-480 00039680
0006CC 5322 7315 RETURN11 XFR LINK4,IC RETURN 00039690

7318 ***** 00039710
7319 * THIS SUBROUTINE WILL GATE XOUTA, THEN WAIT FOR CLOCKB TO RISE * 00039720
7320 ***** 00039730

0006CD 5F42 7322 * GO TO MAP 13-480 00039750
7324 DOITFORA XFR FORMAT,XOUTA SET FORMAT CONTROLS 00039760
7326 * GO TO MAP 13-480 00039770
0006CE 27CC 7328 RIGHTOFF BOC CLOCKB,RETURN11 EXIT ON CLOCKB RISE 00039780
7330 * GO TO MAP 13-480 00039790
0006CF 3B00 7332 BOC STATD,NOGO ERROR EXIT 00039800
7334 * GO TO MAP 13-480 00039810
0006D0 28E0 7336 BOC ADROUT,GOTHIO8 WATCH FOR HALT I/O 00039820
7338 * GO TO MAP 13-480 00039830
0006D1 66CE 7340 HIOTET8 BU RIGHTOFF STAY IN LOOP 00039840

7343 ***** 00039860
7344 * HALT IO SECTION -- GET OFF THE INEERFACE * 00039870
7345 ***** 00039880

0006D2 4150 7348 GOTHIO1 XFR CTIMAGE,CTI CROP OP IN ON HIO 00039900
0006D3 6631 7351 BU HIOTET1 00039910
0006D4 4150 7354 GOTHIO2 XFR CTIMAGE,CTI DROP OP IN ON HIO 00039920
0006D5 6658 7357 BU HIOTET2 00039930
0006D6 4150 7360 GOTHIO3 XFR CTIMAGE,CTI DROP OP IN ON HIO 00039940
0006D7 6637 7363 BU HIOTET3 00039950
0006D8 4150 7366 GOTHIO4 XFR CTIMAGE,CTI DROP OP IN ON HIO 00039960
0006D9 6640 7369 BU HIOTET4 00039970
0006DA 4150 7372 GOTHIO5 XFR CTIMAGE,CTI DROP OP IN ON HIO 00039980
0006DB 66B6 7375 BU HIOTET5 00039990
0006DC 4150 7378 GOTHIO6 XFR CTIMAGE,CTI LDROP OP IN ON HIO 00040000
0006DD 665C 7381 BU HIOTET6 00040010
0006DE 4150 7384 GOTHIO7 XFR CTIMAGE,CTI DROP OP IN ON HIO 00040020
0006DF 66CA 7387 BU HIOTET7 00040030
0006E0 4150 7390 GOTHIO8 XFR CTIMAGE,CTI DROP OP IN ON HIO 00040040
0006E1 66D1 7393 BU HIOTET8 00040050
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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
0006E2	4150			7396	GOTHIO9 XFR CTIMAGE,CTI	DROP OP IN ON HIO		00040060
0006E3	6677			7399	BU HIORET9			00040070
0006E4	4150			7402	GOTHIO10 XFR CTIMAGE,CTI	DROP OP IN ON HIO		00040080
0006E5	667D			7405	BU HIORET10			00040090
0006E6	4150			7408	GOTHIO11 XFR CTIMAGE,CTI	DROP OP IN ON HIO		00040100
0006E7	66BF			7411	BU HIORET11			00040110
0006E8	4150			7414	GOTHIO12 XFR CTIMAGE,CTI	DROP OP IN ON HIO		00040120
0006E9	66C1			7417	BU HIORET12			00040130
0006EA	671D			7420	RETURN00 BU BEGONES			00040140
0006EB	6720			7423	RETURN01 BU PEDATA1			00040150
0006EC	6722			7426	RETURN02 BU PEDATA2			00040160
0006ED	673B			7429	RETURN03 BU ENDTM			00040170
				7431	*****			00040180
				7432	* MICRO DIAGNOSTIC---WITJ PROPER CONTROL BITS SET VIA SET DIAGNOSE,		*	00040190
				7433	* THIS CODE WILL LOOP WRITE FORMAT ONLY- NO DATA WILL BE WRITTEN.		*	00040200
				7434	* FORMAT LOOPED IS-- NORMAL PREAMBLE/32MARK ONES/ALLONES/32 MARK TWOS/*		*	00040210
				7435	* /NORMAL POST AMBLE.		*	00040220
				7436	*****			00040230
0006EE	13F1			7438	SUDOWRT1 STO LINK4,SUDOWRT3	LOAD LINK RETURN		00040240
0006EF	04E1			7441	SUDOWRT2 STO WORK1,ONES-30	LOAD CTR 31 MORE		00040250
0006F0	66BA			7444	BU DOTWO			00040260
0006F1	13F5			7448	SUDOWRT3 STO LINK4,SUDOWRT4	LOAD LINK RETURN		00040280
0006F2	1F8C			7451	STO FORMAT,FORMAT11	SET CONTROLS		00040290
0006F3	04FF			7454	STO WORK1,ONES	LOAD CTR - 1		00040300
0006F4	66BA			7457	BU DOTWO			00040310
0006F5	1F84			7461	SUDOWRT4 STO FORMAT,MARK2	CALL FOR MARK2		00040330
0006F6	1398			7464	STO LINK4,FORMAT14	LOAD LINK RETURN		00040340
0006F7	04E0			7467	STO WORK1,ONES-31	LOAD CTR - 32		00040350
0006F8	66BA			7470	BU DOTWO			00040360
0006F9	4150			7474	TMPATCH XFR CTIMAGE,CTI	DROP OP IN	EC734087	00040380
0006FA	4488			7477	XFR WORK1,XINB	BRING IN SENSE BYTE	EC734087	00040390
0006FB	6610			7480	BU TMSKIP		EC734087	00040400

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
000700				7483	ORG BEGIN+X'700'		00040420
				7484	*** SCREEN TIE BYTE FOR SINGLE TRACK ERROR. MOVE BYTE TO DATA FLOW		00040430
				7485	*** DEAD TRACK REG ONLY IF IT WAS SINGLE TRACK.		00040440
000700	0E00			7487	SCREENTI STO SETCNT1,0		00040450
000701	9200			7490	ORM XOUTAIM,0	MASK FOR TESTING	00040460
000702	200C			7493	BOC DBUS,DOTIEMS2	BRANCH IF 0--CORRECT FOR TRK P	00040470
000703	0401			7496	STO WORK1,1	INITIALIZE WORK1 TO RIPPLE SINGLEBIT	00040480
				7499	****BIT POSITION TO HEX CONVERTER***		00040500
				7500	*		00040510
				7501	* BIT 4 5 6 7 TRACK		00040520
				7502	*		00040530
				7503	* 0 0 0 0 P		00040540
				7504	* 0 0 0 1 7	\$	00040550
				7505	* 0 0 1 0 6	.	00040560
				7506	* 0 0 1 1 5		00040570
				7507	* 0 1 0 0 4		00040580
				7508	* 0 1 0 1 3		00040590
				7509	* 0 1 1 0 2		00040600
				7510	* 0 1 1 1 1		00040610
				7511	* 1 0 0 0 0		00040620
				7512	*		00040630
				7513	*****		00040640
000704	0E01			7516	STO SETCNT1,1		00040660
000705	4421			7520	NOTLAST XFR WORK1,AR	SET GENERATED SINGLE BIT IN A REG	00040680
000706	F200			7523	XOM XOUTAIM,0	MASK FOR MATCHING BYTES	00040690
000707	200C			7526	BOC DBUS,DOTIEMS2	BRANCH IF MATCH TIE BYTE ONLY HAS	00040700
000708	AE01			7529	ADD SETCNT1,1		00040710
				7531	*	A SINGLE BIT ON	00040720
000709	4421			7533	DOAGAIN XFR WORK1,AR	XFR PATTERN BIT TO ALU INPUT REG	00040730
00070A	A400			7536	ADD WORK1,0	SHIFT PATTERN BIT LEFT ONE TIME	00040740
00070B	2105			7539	BOC NALCO,NOTLAST	BRANCH IF NOT LAST PATTERN	00040750
00070C	4E42			7545	DOTIEMS2 XFR SETCNT1,XOUTA	SET TIE BYTE IN DATA FLOW REG	00040790
00070D	4014			7548	XFR TIP	TRANSFER TO DEAD TRACK REG	00040800
00070E	63D7			7551	BU CHEKSNS		00040810

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
				7554	* GO TO MAP 13-530			00040830
00070F	286D			7556	CHKOP16 BOC ADROUT,GOTHIO16	WATCH FOR HALT I/O		00040840
				7558	* GO TO MAP 13-530			00040850
000710	3B35			7560	HIORET16 BOC STATD,TONOGO	ERROR EXIT		00040860
				7562	* GO TO MAP 13-530			00040870
000711	2B13			7564	BOC STATB,READY16	WAIT FOR RISE OF B STAT		00040880
				7566	* GO TO MAP 13-530			00040890
000712	670F			7568	BU CHKOP16			00040900
000713	F01F			7572	READY16 XOM CURCOMM,X'1F'	IS THIS WTM		00040920
000714	2037			7575	BOC DBUS,TM1600	BR IF SO		00040930
000715	F017			7578	XOM CURCOMM,X'17'	IS THIS ERG		00040940
000716	203F			7581	BOC DBUS,ERGEXIT	BR IF SO		00040950

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				7584	*****		00040970
				7585	*		* 00040980
				7586	*	1600 BPI WRITE	* 00040990
				7587	*		* 00041000
				7588	*		* 00041010
				7589	*****		00041020
000717	13EA			7592	PREAMBLE STO LINK4,RETURN00	LOAD LINK RETURN - BEGONES	00041040
000718	9C00			7595	ORM SETDIA1,0	TEST FLAGS	00041050
000719	341D			7598	BOC DREG4,BEGONES	BR IF INHIBIT PREAMBLE	00041060
00071A	04D8			7601	LOAD40 STO WORK1,ONES-39	LOAD COUNT FOR PREAMBLE - 40	00041070
00071B	1F80			7604	STO FORMAT,FORMAT00	LOAD CONTROL BYTE	00041080
00071C	66BA			7607	BU DOTWO	LEAVE FOR 40 BYTES	00041090
				7610	****40 ZEROES ARE WRITTEN - SET CONTROLS TO WRITE BEGINNING ONES -		00041110
				7611	*** THEN TURN ON ALLOW END		00041120
00071D	13EB			7613	BEGONES STO LINK4,RETURN01	LOAD LINK RETURN - PE DATA1	00041130
00071E	1F88			7616	SETFOR1 STO FORMAT,MARK1	LOAD CONTROL BYTE	00041140
00071F	66CD			7619	BU DOITFORA		00041150
000720	13EC			7623	PEDATA1 STO LINK4,RETURN02	LOAD LINK RETURN - PEDATA2	00041170
000721	6673			7626	BU FORMAT60	GO TURN ON ALLOW END	00041180
000722				7629	PEDATA2 EQU *		00041200
				7630	* GO TO MAP 13-540		00041210
000722	3F2C			7632	BOC ALLONES,POSTAMBL	WATCH FOR EOD	00041220
				7634	* GO TO MAP 13-540		00041230
000723	3B35			7636	PEDATA3 BOC STATD,TONOGO	EXIT ON EARLY TERMINATE	00041240
				7638	* GO TO MAP 13-540		00041250
000724	2865			7640	BOC ADROUT,GOTHIO14	WATCH FOR HIO	00041260
000725				7642	HIORET14 EQU *		00041270
				7643	* GO TO MAP 13-540		00041280
000725	2727			7645	BOC CLOCKB,PEDATA5	WAIT FOR RISE OF	00041290
				7647	* GO TO MAP 13-540		00041300
000726	6723			7649	BU PEDATA3	CLOCK B	00041310
				7652	* GO TO MAP 13-540		00041330
000727	3F2C			7654	PEDATA5 BOC ALLONES,POSTAMBL	WATCH FOR EOD	00041340
				7656	* GO TO MAP 13-540		00041350
000728	3B35			7658	PEDATA6 BOC STATD,TONOGO	EXIT ON EARLY TERMINATE	00041360
				7660	* GO TO MAP 13-540		00041370
000729	2867			7662	BOC ADROUT,GOTHIO15	WATCH FOR HIO	00041380
				7664	* GO TO MAP 13-540		00041390
00072A	2728			7666	HIORET15 BOC CLOCKB,PEDATA6	WAIT FOR FALL OF CLOCK B	00041400
				7668	* GO TO MAP 13-540		00041410
00072B	6722			7670	BU PEDATA2		00041420
				7673	*** ALL ONES WRITTEN NOW - SO WRITE ENDING 40 ZEROES *****		00041440
00072C	1F80			7675	POSTAMBL STO FORMAT,X'80'	LOAD CONTROL REG	00041450
00072D	5F42			7678	XFR FORMAT,XOUTA	DO IT	00041460
00072E	2430			7681	BOC BOPE,COMPL1	BR IF PARITY BZD	00041470
00072F	6731			7684	BU COMPL		00041480
000730	8720			7687	COMPL1 ORI SNSSTS2,BUSOC	SET BUS OUT CHK	00041490

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LOC	OBJECT	CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	9/04/73
000731	13A2				7690	COMPL	STO LINK4,FORMAT19	LOAD LINK RETURN - AS STATED		00041500
000732	9C00				7693	ORM	SETDIA1,0	TEST FLAGS		00041510
000733	3236				7696	BOC	DREG2,DOINHPST	BR IF INHIBIT POSTAMBLE		00041520
000734	671A				7699	BU	LOAD40	GO WRITE POSTAMBLE - THEN SET STOP		00041530
000735	6600				7702	TONOGO	BU NOGO			00041540
000736	66A2				7705	DOINHPST	BU FORMAT19			00041550

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				7708	*****		00041570
				7709	*		* 00041580
				7710	*	1600 BPI WRITE TAPE MARK	* 00041590
				7711	*		* 00041600
				7712	*		* 00041610
				7713	*****		00041620
000737	04C0			7717	TM1600 STO WORK1,ONES-63	LOAD TM CTR	00041650
000738	13ED			7720	TM1600B STO LINK4,RETURN03	LOAD LINK RETURN - END TM	00041660
000739	1F92			7723	STO FORMAT,TM0	LOAD CONTROL BYTE	00041670
00073A	66BA			7726	BU DOTWO		00041680
00073B	8880			7730	ENDTM ORI STATIMG,STOP	IMAGE STOP	00041700
00073C	4828			7733	XFR STATIMG,STAT	GET STOP	00041710
00073D	1F80			7736	STROBE STO FORMAT,FORMT00	SET CONTROL REG	00041720
00073E	5F42			7739	XFR FORMAT,XOUTA	STOBE CONTROLS	00041730
00073F	6249			7742	ERGEXIT BU CTLWAIT	GO WAIT FOR ALU 2 TO COMPLETE	00041740

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	9/04/73
				7747	*****		00041780
				7748	*		00041790
				7749	*		00041800
				7750	*		00041810
				7751	*		00041820
				7752	*		00041830
				7753	*****		00041840
				7754	* GO TO MAP 13-520		00041850
000740	286F			7756	CHKOP800 BOC ADROUT,GOTHIO17	WATCH FOR HIO	00041860
				7758	* GO TO MAP 13-520		00041870
000741	3B35			7760	HIORET17 BOC STATD,TONOGO	ERROR EXIT	00041880
				7762	* GO TO MAP 13-520		00041890
000742	2B44			7764	BOC STATB,READY800	WATCH FOR TAPE OP	00041900
				7766	* GO TO MAP 13-520		00041910
000743	6740			7768	BU CHKOP800		00041920
000744	F001			7772	READY800 XOM CURCOMM,1	IS THIS A WRITE	00041940
000745	2049			7775	BOC DBUS,WRITESUM	BR IF SO	00041950
000746	F08B			7778	XOM CURCOMM,X'8B'	CHK FOR LWR	00041960
000747	2049			7781	BOC DBUS,WRITESUM	BR IF SO	00041970
000748	673D			7784	BU STROBE	MUST BE ERG OR WTM -- EXIT	00041980
000749	1F40			7788	WRITESUM STO FORMAT,ALOWEND		00042000
00074A	5F42			7791	XFR FORMAT,XOUTA	SET ALLOW END CONTROL	00042010
00074B	3F54			7794	* GO TO MAP 13-520		00042030
				7796	PHASE1 BOC ALLONES,DOCR	EXIT IF DONE	00042040
				7798	* GO TO MAP 13-520		00042050
00074C	2869			7800	WRITELUP BOC ADROUT,GOTHIO18	WATCH FOR HIO	00042060
				7802	* GO TO MAP 13-520		00042070
00074D	3B35			7804	HIORET18 BOC STATD,TONOGO	ERROR EXIT	00042080
				7806	* GO TO MAP 13-520		00042090
00074E	274C			7808	BOC CLOCKB,WRITELUP	WAIT FOR FALL	00042100
00074F	3F54			7811	* GO TO MAP 13-520		00042120
				7813	PHASE2 BOC ALLONES,DOCR	EXIT IF TIME	00042130
				7815	* GO TO MAP 13-520		00042140
000750	286B			7817	PHASE3 BOC ADROUT,GOTHIO19	WATCH FOR HIO	00042150
				7819	* GO TO MAP 13-520		00042160
000751	3B35			7821	HIORET19 BOC STATD,TONOGO	EARLT EXIT	00042170
				7823	* GO TO MAP 13-520		00042180
000752	274B			7825	BOC CLOCKB,PHASE1	WAIT FOR RISE	00042190
				7827	* GO TO MAP 13-520		00042200
000753	6750			7829	BU PHASE3		00042210
000754	2456			7833	DOCR	BOPE,DOCR3	BR IF PARITY BAD
000755	6757			7836	BU DOCR2		00042240
000756	8720			7839	DOCR3 ORI SNSSTS2,BUSOC	SET BUS OUT CHK	00042250
000757	13C6			7843	DOCR2 STO LINK4,NRZIRET2	LOAD LINK RETURN- CRCTIME1	00042270
000758	04FE			7846	STO WORK1,ONES-1	SET CNT TO 2	00042280
000759	1F80			7849	DOCR1 STO FORMAT,FORMT00	LOAD CONTROLS	00042290
00075A	66BA			7852	BU DOTWO		00042300

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	9/04/73
00075B	13C7			7857	CRCTIME1 STO LINK4,NRZIRET3	LOAD LINK RET		00042330
00075C	1F00			7860	STO FORMAT,0	CLEAR CONTROL REG		00042340
00075D	04FF			7863	STO WORK1,ONES	SET CRT TO 1		00042350
00075E	9E00			7866	ORM SETCNT1,0	TEST FOE 7 TRK		00042360
00075F	3062			7869	BOC DREG0,CRCTIME3	BR IF IT IS		00042370
000760	66BA			7872	BU DOTWO			00042380
000761	04FC			7876	CRCTIME2 STO WORK1,ONES-3	SET CTR TO 4		00042400
000762	13A2			7879	CRCTIME3 STO LINK4,FORMAT19	LOAD LINK RETURN		00042410
000763	6759			7882	BU DOCRC1			00042420
000764	66A2			7885	CRCTIME7 BU FORMAT19	7 TRK EXIT		00042430
000765	4150			7889	GOTHIO14 XFR CTIMAGE,CTI			00042450
000766	6725			7892	BU HIORET14			00042460
000767	4150			7895	GOTHIO15 XFR CTIMAGE,CTI			00042470
000768	672A			7898	BU HIORET15			00042480
000769	4150			7901	GOTHIO18 XFR CTIMAGE,CTI	GET OFF INTER FACE		00042490
00076A	674D			7904	BU HIORET18			00042500
00076B	4150			7907	GOTHIO19 XFR CTIMAGE,CTI			00042510
00076C	6751			7910	BU HIORET19			00042520
00076D	4150			7914	GOTHIO16 XFR CTIMAGE,CTI			00042540
00076E	6710			7917	BU HIORET16			00042550
00076F	4150			7920	GOTHIO17 XFR CTIMAGE,CTI			00042560
000770	6741			7923	BU HIORET17			00042570
000771				7926	CHKDISC EQU *			00042590
000771	DD02			7928	ANDM SETDIA2,2	TEST FOR DISC IN FLAG		00042600
000772	2075			7931	BOC DBUS,NOTHISTM	BR IF OFF		00042610
000773	CDFD			7934	AND SETDIA2,ONES-2	RESET FLG		00042620
000774	4011			7937	XFR HDWERR	TESY		00042630
000775				7939	NOTHISTM EQU *			00042640
000775	1E09			7941	STO FRUSAV,9	BUMP FRU REG		00042650
000776	4828			7944	XFR STATIMG,STAT	SET STATS TO HARDWARE		00042660
000777	6304			7947	BU IDLESCAN			00042670
				7949	*/	ALU1: END		00042680
				7950	END BEGIN	*/		00042690

ROS1	SYMBOL	LEN	VALUE	DEFN	REFERENCES	CROSS-REFERENCE																9/04/73
	#LINK4	00001	000003	00773	5193																	
	#LINK5	00001	000008	00778																		
	#LINK6	00001	000009	00779																		
	#MIFTR	00001	000003	00592	1820	2148	3359	3387	3458	3484	3564	3772	3815	3880	3960	3973	3990	4150	4175			
					5297	5304																
#NALCO	00001	000001	00590	4318	5746	5760	5771	5780	5922	5932	5995	6009	6141	6147	6156	6279	6388	6792				
				6798	6834	6840	7019	7201	7280	7539												
#NCUEA	00001	000005	00594	3391	5002																	
#NCUEB	00001	00001E	00621	4892	5347																	
#NGENR	00001	00001C	00619	0978	1047	4427																
#OPRIN	00001	000018	00615	2844	3355	3420	3449	3637	3753	7154												
#OVERRUN	00001	00001F	00622	4633																		
#PNDADDR	00001	000006	00759	1153	1159	1649	4439	4443														
#PNDSTS	00001	000005	00758	1218	1402	1408	1414	1420	1463	1603	1800	1839	3159	3162	3184	3197	3211	3395				
				3439	3443	3526	3572	3592	3601	3775	3781	3956	4647	4657	4667	4896	4925	4931				
				5435	5546																	
#PWRRT	00001	00000F	00605	0975	4100	4451	4485															
#REQTAGS	00001	00000A	00764	1029	1750	3461	3487	4140	4953	4967												
#R0	00001	000000	00721	5743	5777	5854	5864	5875	5886	5889	5919	5929	5992	6006								
#R1	00001	000001	00722																			
#R10	00001	00000A	00731																			
#R11	00001	00000B	00732																			
#R12	00001	00000C	00733																			
#R13	00001	00000D	00734																			
#R14	00001	00000E	00735																			
#R15	00001	00000F	00736																			
#R16	00001	000000	00737																			
#R17	00001	000001	00738																			
#R18	00001	000002	00739																			
#R19	00001	000003	00740																			
#R2	00001	000002	00723																			
#R20	00001	000004	00741																			
#R21	00001	000005	00742																			
#R22	00001	000006	00743																			
#R23	00001	000007	00744																			
#R24	00001	000008	00745																			
#R25	00001	000009	00746																			
#R26	00001	00000A	00747																			
#R27	00001	00000B	00748																			
#R28	00001	00000C	00749																			
#R29	00001	00000D	00750																			
#R3	00001	000003	00724																			
#R30	00001	00000E	00751																			
#R31	00001	00000F	00752																			
#R4	00001	000004	00725	5757	5768																	
#R5	00001	000005	00726																			
#R6	00001	000006	00727																			
#R7	00001	000007	00728																			
#R8	00001	000008	00729																			
#R9	00001	000009	00730																			
#SCB	00001	00000E	00604	1035	1184	1193	1473	1661	2270	2283	2299	4111	5130	5146	5197	5391						
#SELO	00001	000006	00595	1732																		
#SELRST	00001	00000C	00602	1061	1108																	
#SETCNT1	00001	00000E	00768	2449	2519	2540	2549	2570	4600	6153	6276	6605	6611	6620	6640	6680	6795	6837				

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
#SETCNT2	00001	00000F	00769	7198 7529 7866
#SETDIA1	00001	00000C	00766	2483 2504 2695 2704 2723 5018 5028 6144 6385 6789 6831
				1716 2309 2316 2831 2933 3039 4581 6126 6162 6229 6245 6289 6467 6907 7116
				7595 7693
#SETDIA2	00001	00000D	00767	3089 3102 3478 3662 3671 4617 6945 7928 7934
#SEVMODA	00001	00000A	00780	5206
#SEVMODB	00001	00000B	00781	5219
#SNSSTS2	00001	000007	00760	1791 2443 2834 3181 3204 3288 3307 4559 4606 4637 4654 4703 4709 4766 6079
				7086 7687 7839
#STATA	00001	00000A	00600	2746 3042 3168 3335 3819 5058 5071 5288 5332 5691 5951 6298 6353
#STATB	00001	00000B	00601	3156 3898 3940 3953 3970 4556 4613 5367 5519 5537 5699 5903 6295 6303 6323
				6460 6707 6740 6762 6861 6877 7219 7564 7764
#STATC	00001	00001A	00617	2749 2780 2929 2985 2992 3150 3233 3915 3937 4550 4626 5418 5522 5702 5980
#STATD	00001	00001B	00618	1080 2752 2777 3075 3230 3585 3614 3800 3901 3911 3943 4413 4510 4526 4542
				5415 5421 5516 5534 5962 6286 6309 6317 6711 6736 6765 6853 6874 6981 6998
				7213 7252 7269 7307 7332 7560 7636 7658 7760 7804 7821
#STATIMG	00001	000008	00761	1005 1286 1292 1624 1676 1722 1984 2058 2079 2093 2477 2630 2668 2701 2713
				2729 2768 2783 2939 3095 3098 3127 3187 3224 3319 3322 3374 3578 3822 3924
				3930 4007 4187 4459 4680 4751 5084 5097 5137 5163 5291 5308 5315 5322 5397
				6236 6356 6366 6379 6395 6432 6448 6656 6674 6724 6845 6864 7147 7206 7730
#SUPO	00001	000019	00616	1451 2863 3677 4230 4275
#SVCOUT	00001	00000D	00603	1346 1352 1355 1380 1541 2857 2882 4215 4284 4523 6196
#WORK1	00001	000004	00757	1587 1621 1652 2428 2437 2468 2510 2653 2840 2946 3111 3121 3529 3624 4025
				4370 4715 6135 6332 6596 7015 7277 7536
#WORK2	00001	000007	00777	
#WORK4	00001	00000C	00782	
#XOUTAIM	00001	000002	00755	1756 1765 2025 2076 2606 2662 2710 2736 4674 5239 5248 5257 5267 6662 6689
				7490 7523
#XOUTBIM	00001	000004	00774	
AA	00001	000531	05768	5746
ACLOCKUP	00001	0006BC	07248	7260
ACTIVEB	00001	0006C0	07265	7273
ADDIN	00001	000002	00817	1166 1172 1692 1806 3523
ADROFF	00002	000385	04297	4297
ADROUTUP	00001	0000BE	01699	1732
ALLCLEAR	00001	0002DB	03621	3604 3614
ALLOWDSE	00001	000010	00841	1458 1508 1520 2049 3688
ALOWEND	00001	000040	00797	6957 7788
ALUCHECK	00001	000513	05665	1064 3986
ALUERR	00001	000080	00919	2510
ALUFAIL	00001	000040	00891	1008 1105 2462 2513 5668
ALU1ERR	00001	000015	00708	1017 2498 2567 4091
ALU1001	00001	00054D	05864	5857
ALU1002	00001	000550	05875	5867
ALU1003	00001	000553	05886	5878
ALU2DIA	00001	000053	01283	1262 1274
ALU2ERR	00001	000016	00709	1014 2501 2585 4095
ALU2HDER	00001	0003DC	04654	4553 4565
ALU2STOP	00001	0005E3	06414	6286 6309 6317
ALU2UNEX	00001	0003E0	04667	4613
ANRZI	00001	000040	00839	1750 2276 2286 2302 4140 5122
ANYCUEA	00001	00029B	03391	3407 4789
ANYERRS	00001	0004B3	05364	5415 5516 5534
ANYMOR	00001	00000B	01023	1011

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SYMBOL				CROSS-REFERENCE																		
SYMBOL	LEN	VALUE	DEFN	REFERENCES																		
BEGWRTM	00001	000609	06566	3177																		
BFLAG	00001	0000A5	01618	1661																		
BHERE	00001	000292	03359	3420	3426																	
BIGPROB	00001	000267	03181	3137																		
BINTFC	00001	000020	00869	1621																		
BLKDC	00001	000080	00900	4617																		
BLKINTS	00001	000020	00903	3478																		
BLOUT40	00001	0004A3	05308	5067																		
BLOUT41	00001	000463	05077																			
BLOUT42	00001	000448	04990																			
BLOUT43	00001	000417	04824																			
BLOUT44	00001	0004B1	05358	5031																		
BLOUT45	00001	000459	05046																			
BLOUT46	00002	000438	04937																			
BLOWOUT1	00001	000396	04388																			
BMASKED	00001	00033C	03973	3996	5172																	
BNRZI	00001	000080	00838	2347	2361	2368	4117	4140	5242													
BOERR	00001	000690	07086	7080																		
BOT	00001	000010	00878	3121	4715																	
BRETURN1	00002	00027D	03270	3297																		
BRETURN2	00002	000201	02815	2677																		
BRETURN4	00002	000202	02818	6045																		
BRSTTM1	00001	0006AA	07177	6892																		
BRSTTM2	00001	0006AB	07181	7201																		
BRSTTM3	00001	0006AE	07191	7184																		
BRSTTM4	00001	0006B0	07198	7191																		
BRSTTM5	00001	0006B2	07206																			
BRSTTM6	00001	0006B4	07213	7219																		
BRST111	00001	000641	06775	6762	6792	6798																
BRST112	00001	000643	06782	6775																		
BRST113	00001	000645	06789	6782																		
BSTDONE	00001	0003C0	04562	4510																		
BSTWAIT	00001	0003B8	04534	3328	4523	4546	4556	6419	7160	7169												
BSTWAIT1	00001	0003BA	04542																			
BSTWAIT2	00001	0003DA	04647	2910	4571	4620	4640															
BUMPCTR	00001	0006C3	07277	7248																		
BUMPRIP	00001	000286	03301	3294																		
BUMP1	00001	000001	00918																			
BUSOC	00001	000020	00853	1791	2468	3307	6079	7086	7687	7839												
BUSY	00001	000010	00862	1414	1800	1839	3526	5450														
BUSYSTAT	00001	0004CC	05450	5367	5421																	
B64	00001	000010	00893	2350	2358	4103	4252	5118	5251													
CANCEL	00001	00028B	03319	2680	2683	2790																
CANCEL1	00002	0001F5	02790	2656	2755	2774																
CBI	00001	000060	00632	1163	1358	1695	2585	2665	2716	2837	3630	3659	4346	4408	5597	5600	5603	5606				
				5609	5612	5615	5618	5621	5624	5627	5630	5633	5636	5639	5642	6344	6372					
				1150	1556	1559	1814	2336	4358	6033	6087	6098	6118									
CBO	00001	0000A0	00637	5771																		
CCTRAP	00002	000536	05784	1259	1399	1492	1512	1710	3083	3452	3554	3647	3653	3685	4013	4042	4843	7157				
CHAIN	00001	000001	00828	3013	3211	3278	3601	4647	4657													
CHANEND	00001	000008	00863	4577	4584																	
CHEKB	00001	0003D0	04613	5892	5911																	
CHEKONB	00001	000558	05903	1252	4587	4590	4603	6165	7551													
CHEKSNS	00001	0003D7	04637	3446																		
CHEKTIO	00001	0002B2	03468																			

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
CHGSTS	00001	000001	00912	
CHKADRO	00001	000384	04293	4284
CHKAFLG	00002	0002A6	03430	3391
CHKALU2	00001	0003D4	04626	4731
CHKBFLG	00002	000430	04912	4892
CHKBIBO	00001	000386	04302	4293
CHKBOT	00001	000257	03121	3108
CHKBUSY	00001	0004C2	05415	5519
CHKC	00001	00056D	05980	
CHKCHAIN	00001	0002AA	03443	3436 4786
CHKCLOCK	00001	0006BB	07244	7280
CHKCONT	00001	000434	04925	3359
CHKCUEB	00001	00042B	04892	4908
CHKDISC	00001	000771	07926	6018
CHKDMR	00001	0005AA	06220	
CHKERRS	00001	00025C	03137	3075
CHKFTR	00002	0000CB	01746	1719
CHKISEL	00001	000011	01041	1057
CHKLWR	00001	000221	02933	
CHKNFP	00001	000225	02946	2936
CHKNOIS	00001	000191	02443	2465 2471
CHKNRZ	00001	0000CC	01750	5270
CHKONA	00001	000338	03960	
CHKONB	00001	00035C	04111	4338
CHKOPIN	00001	000304	03749	
CHKOP16	00001	00070F	07556	6629 7568
CHKOP800	00001	000740	07756	6633 7768
CHKOVRN	00001	0003D6	04633	
CHKPNDG	00001	0000B5	01670	1630
CHKPWON	00001	000359	04100	
CHKRDB	00001	00013B	02136	1925
CHKRDRV	00001	00041C	04843	2148
CHKRSTS	00001	000000	00975	
CHKSTATS	00001	000563	05942	
CHKSUPO	00001	000380	04275	4266
CHKSVCOU	00001	000382	04284	4275
CHKUNCHK	00001	0003D1	04617	4670
CHKXINS	00001	00055B	05915	5903
CHK7TK	00001	00047D	05183	2228 2259
CKALUERR	00001	00056B	05974	5962
CKCHAIN	00001	00024B	03083	3042
CKDEER	00001	00028F	03332	3230 3233
CKDSE	00001	000106	01940	1960
CKEOTBOT	00001	000251	03102	3086
CKHIMODE	00001	000154	02232	2201
CKRESRV	00001	0002CA	03564	3557
CKSELRST	00001	000017	01061	1047
CLEANGO	00001	0005A3	06184	1332
CLEANIT	00001	000279	03245	2031 2167 2323
CLEANUP	00001	0002DE	03630	3532 3598 3621 3656 4028
CLEAR	00001	000012	00629	1111 1114 2979 2982 4396 4400 4760 4763
CLEARAB	00001	0001F6	02794	2752
CLEARIT	00001	000025	01105	1023
CLRBUSIN	00001	0002E5	03653	3644

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
ROST	1	0	ROST	

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SYMBOL		LEN	VALUE	DEFN	REFERENCES																	9/04/7
CLRSTS	00001	000315	03808	3800																		
CMDOUTUP	00001	000062	01346																			
CMDPARER	00001	0000D5	01791	1809																		
CMDPAREX	00001	0000DC	01814																			
CMDPARO	00001	0000D6	01794	5460																		
CMDPARO0	00002	0004CF	05460	5364																		
CMDPAR1	00001	0000E6	01849	1797	2913																	
CMDPROC	00002	0000E5	01846	1829																		
CMDREJ	00001	000080	00851	4766																		
CMDWAIT	00001	0000D2	01776	1762	1784	5260																
CMDWAIT0	00001	0000CF	01759	1753																		
CMDWAIT1	00001	0000DA	01806	1780																		
CMDWAIT2	00002	00041B	04838	4812	4818																	
CMDWAIT3	00001	0000E1	01833	5376	5438	5446	5549	5555														
CMDWAIT4	00001	0000DE	01823	1803	4830	4838																
CMDWAIT8	00002	0004E5	05549	5394	5407																	
CMOOFF	00002	00037F	04270	4270																		
CMOUP	00001	000045	01232	1238																		
CNT40	00001	000080	00921	2582	2615																	
COFAIL	00001	000374	04220	4220																		
COMDECOD	00001	000100	01916	1846																		
COMPL	00001	000731	07690	7684																		
COMPL1	00001	000730	07687	7681																		
COMREJCT	00001	000108	01953	1931	1963	2021	2052	2153	4849	4864												
COMREJC1	00001	000400	04745	2952	5478																	
COMTESTA	00001	000114	01997	1967																		
COMTESTB	00001	000120	02038	1970																		
COMTESTC	00001	000129	02068	1997																		
CONCON	00001	000080	00821	1454	1512	1568	3363	3554	3647	4016	4821	4940	5274									
CONTCHK	00001	0004B8	05381	5373																		
CONTCHK1	00001	0004C6	05429	5418	5537																	
CONTCHK2	00001	0004CA	05443	5432																		
CONTCMD	00001	00010A	01960	2198																		
CONTEND	00001	00025D	03150																			
CONTEND1	00001	00025F	03156	3193																		
CONTEND2	00001	000260	03159	3200																		
CONTEND3	00001	000261	03162																			
CONTINIT	00001	000237	03013	1990	2082	2096																
CONTROL	00001	000020	00803	1005	2079	2093	4680	6236														
CONTSERV	00001	00023B	03028	1326																		
CONTSTAK	00001	00023C	03033	1329																		
CRCTIME1	00001	00075B	07857	7286																		
CRCTIME2	00001	000761	07876	7289																		
CRCTIME3	00001	000762	07879	7869																		
CRCTIME7	00002	000764	07885																			
CTI	00001	000050	00633	0984	1169	1337	1364	1395	1444	1600	1637	1702	1823	1864	1877	2339	2404	2743				
				2866	2891	3070	3383	3417	3633	3674	3756	3982	4054	4155	4240	4728	6061	6121				
				6184	6406	6581	7348	7354	7360	7366	7372	7378	7384	7390	7396	7402	7408	7414				
				7474	7889	7895	7901	7907	7914	7920												
CTIMAGE	00001	000001	00687	0984	1169	1337	1364	1395	1444	1600	1637	1702	1823	1864	1877	2339	2404	2743				
				2866	2891	3070	3383	3417	3633	3674	3756	3982	4054									

CROSS-REFERENCE				9/04/73															
SYMBOL	LEN	VALUE	DEFN	REFERENCES	1538	1597	3067	3380	3601	3662	3668	3671	3749	4051	4137	4725	6569	6587	7163
CUBUSY	00001	000010	00814	1218	1420	1463	1603	3184	3197	3395	3439	3601	4896						
CUE	00001	000020	00861	1211	1454	1476	1512	1667	3399	3433	4996	5154	5388						
CUEA	00001	000040	00822																
CUEASTS	00001	0004BC	05394																
CUEB	00001	000010	00824	1200	1454	1482	1512	1627	4179	4900	4915	5341	5388						
CUEBSTS	00001	0004C0	05407	5391															
CUEPNDG	00001	0002A9	03439	4921															
CUERSTB	00001	000085	01482	1473															
CURADDR	00001	000003	00689	1150	1156	1556	1646	1695											
CURCOMM	00001	000000	00686	1814	1886	3811	3976	4334	5186										
CUREA	00001	000009	00646	3403	3430														
CUREB	00001	00000A	00647	4904	4912														
CURFLAG	00001	000020	00840	2543	4140	4824	4868	4878	4974	4984	5049	5074							
CURSVD	00001	000001	00847	2549															
DATAACK	00001	000008	00855	3204	4559	4709													
DATALOOP	00001	000676	06973	6989	7010														
DATATIME	00001	000675	06969	6953															
DATCHECK	00001	0003E2	04674	4626	4629														
DD	00001	000537	05789	5780															
DECHICNT	00001	00059B	06153	6147															
DEDUN	00001	000276	03230	3236															
DEPRIMA	00001	000338	03958	3915	3953														
DEPRIMES	00001	00031D	03871	5034															
DEPRIM1	00001	000321	03884	4801															
DEPRIM2	00001	000322	03888	5100	5311	5318	5328												
DEPRIM3	00001	000325	03898	3904															
DEPRIM4	00001	000328	03908	3898	3940														
DEPRIM5	00001	000331	03937	3946															
DEPRIM6	00001	000335	03950	3937															
DEPRIM7	00001	00033A	03967	3901	3911	3943													
DEPRIM8	00001	000465	05084	5077															
DEPRIM9	00001	000468	05094	5087															
DEVBSY	00001	000040	009																

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
DMR9	00001	0005D7	06372	6362 6490
DOACUE	00001	000041	01218	1206
DOAGAIN	00001	000709	07533	
DOAREAD	00002	0005A2	06175	6232
DOBAKFIL	00001	000133	02104	2000
DOBKSPBL	00001	00012F	02090	1973
DOBDW	00001	0005EA	06448	6441
DOCONTRL	00001	000130	02093	2107 2115
DOCRC	00001	000754	07833	7796 7813
DOCRC1	00001	000759	07849	7882
DOCRC2	00001	000757	07843	7836
DOCRC3	00001	000756	07839	7833
DODATCK	00001	0003ED	04709	4700
DODES	00001	0002D2	03592	3650
DODES1	00001	0002D7	03607	3595 3694
DODIAMS	00001	00016C	02309	2207
DODSE	00001	000123	02049	1943
DOERG	00001	000121	02042	
DOFORA	00001	00036F	04179	5149
DOFORBLK	00001	000135	02112	2038
DOFORFIL	00001	000137	02120	2068
DOHOLDS	00001	000341	03990	3970
DOIBGMSR	00001	0005E6	06435	6248
DOINHPST	00002	000736	07705	7696
DOITAGN	00001	0002D9	03614	3617
DOITFORA	00001	0006CD	07324	6778 6820
DOITFORB	00001	0006C8	07299	6785 6827
DOITNOW	00001	0000ED	01871	2916
DOITONB	00001	0003A7	04459	4451
DOLPBRST	00001	00061E	06638	6599
DOLWR	00001	00016E	02316	2225
DONRZA	00001	00016A	02302	
DONRZB	00001	00017D	02368	2299
DONRZMS	00001	000169	02299	2235
DOPEA	00001	000165	02286	
DOPEA2	00001	000166	02289	2305
DOPEB	00001	000177	02347	2283
DOPEB2	00001	000178	02350	2371
DQPEMS	00001	000164	02283	2241
DORDBACK	00001	000146	02175	2139
DORDSTOP	00001	0005E5	06432	6256
DOREAD	00001	000143	02164	2133
DOREAD1	00001	000144	02167	2179
DOREAD2	00002	000145	02171	2099
DOREQA	00001	0002B8	03487	3744 4795
DOREQB	00001	000441	04967	
DORESETS	00001	000369	04155	4123 5126
DOREWIND	00001	00010F	01981	
DORST0	00001	00036B	04163	4454 4463
DORST1	00001	000477	05154	5146
DORST2	00001	000396	04386	4183 5158
DORST3	00001	00039C	04413	4418
DORST4	00001	00039E	04423	4413
DORST5	00001	0003A9	04468	4427 4435

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ENCLOS
6490

2115 2123
7813

3694 4032

6820 6913 6940 7049 7071 7109 7143 7187 7619
6827 6923 6961 7032 7058 7133 7194

4795

5126 5133 5141

4463

5158

4435 4447

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
DORST6	00001	0003AD	04485	
DORUNLOD	00001	000116	02005	
DORWD1	00001	000112	01990	2008
DOSENSE	00001	00017F	02384	2145 4874 4881
DOSETDIA	00001	000579	06033	2194
DOTESTIO	00001	000141	02157	1928
DOTIEMS	00001	000170	02323	2213 2253
DOTIEMS1	00001	000172	02330	3270
DOTIEMS2	00001	00070C	07545	7493 7526
DOWTWO	00001	0006BA	07240	7099 7444 7457 7470 7607 7726 7852 7872
DOWTM	00001	00012A	02073	
DOWTM1	00001	00012B	02076	2045 2064
DOWTM64	00002	000266	03177	3052 3058
DO16OR64	00001	000629	06674	6643
DO64A	00001	000161	02273	
DO64B	00001	00017A	02358	2270
DO64MS	00001	000160	02270	2247
DO8OR16	00001	000619	06620	6608
DRETURNO	00002	000303	03744	
DROPTAGS	00001	0002CC	03572	3560 4980
EE	00001	000539	05796	5789
ENABLDSE	00001	00008E	01520	1504
ENDHIO	00001	0003F2	04725	4623
ENDTM	00001	00073B	07730	7429
EOT	00001	000020	00877	3111
EQUIPCK	00001	000010	00854	3181 4654
ERGEXIT	00002	00073F	07742	7581
ERRRST	00001	000371	04187	4147
EXECSRST	00002	000014	01051	1904
EXIT	00001	0001D1	02671	2719
EXT	00001	000081	00648	1014
FF	00001	00053B	05803	5796
FLAGS	00001	000009	00695	4326 5015 5025 5110
FLAGS1	00001	00000A	00696	
FLAGS2	00001	00000B	00698	4252
FORCERR	00001	000002	00907	
FORCEUC	00001	000080	00890	1105 1855 2513 2970 2995
FORMAT	00001	00001F	00718	1889 6341 6372 6487 6755 6758 6814 6901 6917 6934 6957 7024 7041 7063 7090
				7103 7130 7140 7181 7234 7240 7299 7324 7451 7461 7604 7616 7675 7678 7723
				7736 7739 7788 7791 7849 7860
FORMAT1	00001	00065F	06889	6877
FORMAT1X	00001	000663	06901	
FORMAT10	00001	000691	07090	7083
FORMAT12	00001	000695	07103	7093
FORMAT14	00001	000698	07113	7106 7464
FORMAT16	00001	00069C	07127	7113
FORMAT18	00001	00069F	07137	7127
FORMAT19	00001	0006A2	07147	7119 7137 7690 7705 7879 7885
FORMAT2	00001	000668	06917	6904
FORMAT3	00001	00066B	06927	6920
FORMAT5	00001	00066D	06934	6910 6927
FORMAT6	00001	000670	06945	6937 7067
FORMAT60	00001	000673	06957	7626
FORMAT7	00001	000685	07037	7028

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
HADHIO	00001	0002A4	03423	3414
HADOVERN	00001	0003CE	04606	4633
HANGHERE	00002	000301	03737	3737 3784 5280
HARDWER	00002	0003AF	04492	4423
HDWERR	00001	000011	00628	3733 4492 5753 5764 5784 5792 5799 5806 5813 5820 5827 5834 5841 5861 5871
				5882 5895 5955 5970 5984 5999 6013 7937
HDWR	00001	000084	00636	1017
HH	00001	00053F	05817	5810
HIOLINK	00001	000090	01534	1342 1547
HIOLINK1	00001	000091	01538	1372
HIOLK	00001	00020B	02847	2854 2874
HIONOP	00001	000344	04007	1735 3284
HIONOP1	00002	00034C	04032	4019
HIONOP2	00001	000345	04010	
HIOPERG	00001	00034D	04042	3314 4520 4534 6168
HIORET1	00001	000631	06707	7351
HIORET10	00001	00067D	07002	7405
HIORET11	00002	0006BF	07260	7411
HIORET12	00001	0006C1	07269	7417
HIORET14	00001	000725	07642	7892
HIORET15	00001	00072A	07666	7898
HIORET16	00001	000710	07560	7917
HIORET17	00001	000741	07760	7923
HIORET18	00001	00074D	07804	7904
HIORET19	00001	000751	07821	7910
HIORET2	00001	000658	06861	7357
HIORET3	00001	000637	06736	7363
HIORET4	00002	000640	06771	7369
HIORET5	00001	0006B6	07219	7375
HIORET6	00001	00065C	06874	7381
HIORET7	00001	0006CA	07307	7387
HIORET8	00002	0006D1	07340	7393
HIORET9	00001	000677	06977	7399
HNDLERR	00001	000020	01090	1020
HOLDA	00001	000080	00811	1038 3993 4010 4048 4106 4134 5005 6584
HOLDB	00001	000040	00812	1054 4010 4048 4106 4134 5169 5350 6584
HOLDINT	00001	000020	00813	1496 3369 3516 3568 3682 4010 4022 4051 4134 4834 4871 6587 7163
HRDRST	00002	000398	04396	4388
IBGMSR	00001	000040	00905	4581 6229 6245 6289
IBGSTOP	00001	0005F5	06484	6454 6507
IC	00001	000022	00634	1301 1429 1487 1534 2786 2847 2894 2988 3002 5403 6076 6082 6327 6409 6414
				7283 7315
IDLE	00001	000306	03756	
IDLEPEND	00002	000302	03741	3493 3741
IDLESCAN	00001	000304	03747	3474 3640 4488 6021 7947
IDLE0	00001	00030A	03769	3762
IDLE1	00001	00030C	03775	5284
IDLE2	00001	00049D	05288	4987
IDLE3	00001	0004A2	05304	5288
IDLE4	00001	000457	05038	5361
II	00001	000541	05824	5817
INCAGN	00001	000595	06135	6141 6150 6159
INHP	00001	000082	00635	
INHPOST	00001	000020	00909	

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S	CROSS REFERENCE
SYMBOL	LEN VALUE DEFN REFERENCES
INHPRE	00001 000008 00908
INITSEV	00001 00046D 05114
INSDELAY	00002 000334 03946 3933
INSELCHK	00001 00002A 01126 1041
INTFB	00001 000020 00823 1178 1454 1512 1618 1664 3884 4885 4947 4960 4990 5038 5061 5094 5110 5154
	5230 1135
INTFCHK	00001 000032 01163
INTFERR	00001 00006A 01369
INTREQ	00001 000040 00852
ISITUP	00001 0005EE 06460 6463
ISLDPT	00001 0003EF 04715 4689
ISNOOP	00001 00015E 02263 2219
IS5ON	00001 000149 02198 2012
IS6ON	00001 000118 02012 1919
ITSOK	00001 00011C 02025 2018 2319
ITSRSVD	00001 000318 03819 5008 5353
ITSTIME	00001 0005CA 06327 6303
JJ	00001 000543 05831 5824
KK	00001 000545 05838 5831
LATER	00002 000578 06021 5671
LETSREAD	00001 0003B3 04516 6175
LINK1	00001 000010 00703 1223 1487 1990 2031 2082 2096 2157 2167 2263 2292 2323 2394 2677 2822 2988
	3002 3016 3248 3497 6045 6220
LINK2	00001 000011 00704 1226 1429 2397 2680 2825 2894 3019 3251 3500 6048 6223
LINK3	00001 000012 00705 1229 1534 1562 2683 2828 2847 3503 6051 6226
LINK4	00001 000013 00706 1256 1301 1880 1953 2384 2413 2452 2486 2522 2531 2552 2573 2588 2603 2618
	2627 2642 2656 2786 2904 2922 2956 2963 5183 5203 5216 5403 6054 6076 6082
	6090 6110 6335 6359 6369 6409 6473 6775 6782 6817 6824 6904 6920 6927 6937
	6953 7028 7045 7054 7067 7093 7106 7113 7127 7137 7184 7191 7283 7315 7438
	7448 7464 7592 7613 7623 7690 7720 7843 7857 7879
LINK5	00001 000018 00711 1892 6266 6414 6454 6484 6507
LINK6	00001 000019 00712 6269 6327 6457 6476
LOAD40	00001 00071A 07601 7699
LOOKAGIN	00001 0004C3 05418 5424
LOOKATA	00001 0005C2 06298 6292
LPCKDENS	00001 000623 06656 6650
LP16OR64	00001 00062E 06689 6683
LP8OR16	00001 000621 06650
LSR	00001 000006 00627 1096 1102 5189 5223 5594 5645
LWROP	00001 000004 00899 2316 2831 2933 3039
MARK1	00001 000088 00794 6934 7063 7616
MARK2	00001 000084 00795 7024 7103 7461
MASEMBLE	00001 0000C0 01710
MASKFORA	00001 000342 03993 4804
MAYBETIO	00001 0004D8 05505 5498
MAYBLWR	00001 000634 06724
MIFTR0A	00001 00044F 05012 5297
MIFTR0B	00001 000453 05025 5304
MIFTR0C	00001 000459 05044 3880
MIFTR0D	00001 000461 05071 3973
MIFTR00	00001 000036 01175
MIFTR01	00001 000082 01473
MIFTR02	00001 0004D5 05495
MIFTR03	00001 0000B2 01661

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
MIFTR04	00001	000412	04809	1820
MIFTR05	00001	000429	04885	3387
MIFTR06	00001	00043B	04947	3458
MIFTR07	00001	00043F	04960	3484
MIFTR08	00001	000443	04974	3564
MIFTR09	00001	000446	04984	3815
MIFTR10	00001	000471	05130	4150
MIFTR11	00001	000475	05146	4175
MIFTR12	00001	000015	01054	1035
MIFTR13	00001	000479	05163	3990 5332
MIFTR14	00001	0004BB	05391	
MIFTR17	00001	000499	05274	3772
MIFTR18	00001	0004AA	05332	3960
MISRTN0A	00002	000411	04804	5166
MISRTN1	00002	00040B	04786	4918
MISRTN2	00002	00040C	04789	4888
MISRTN3	00002	00040D	04792	4950
MISRTN4	00002	00040E	04795	4963
MISRTN5	00002	00040F	04798	4977
MISRTN7	00002	000410	04801	5055
MIST	00001	000048	00643	1032 3490 4159
MODELINK	00001	000167	02292	2256 2279 2312 2353 2364 5226
MODEREGS	00001	0000F5	01896	0975
MODETYPE	00001	00014A	02201	
MODE64	00001	000002	00786	1765 5257
MOVEON	00001	0002E2	03644	3575 3585
MOVEON2	00002	00001F	01086	1080
MOVEOUT	00001	000042	01221	1203 1214
NDXABRT	00001	00000B	00947	1026 1858 3792 6554
NDXADR	00001	0000EA	00967	1068
NDXAXESS	00001	00000D	00949	6501
NDXBSF	00001	00003C	00957	2104
NDXBSR	00001	00003E	00958	2090 6435
NDXDES	00001	000006	00942	3607
NDXDMR	00001	00000C	00948	6260
NDXERG	00001	000022	00962	2042
NDXERS	00001	000031	00954	2055
NDXFLAGS	00001	00000E	00950	1295 6036
NDXFLAG2	00001	000010	00952	6101
NDXFSF	00001	000035	00953	2120
NDXFSR	00001	000037	00955	2112 6444
NDXGRST	00001	000008	00944	4079
NDXPOLL	00001	000007	00943	3891
NDXRDB	00001	00003A	00959	2175
NDXRDF	00001	000033	00956	2164
NDXRWD	00001	00002F	00963	1981
NDXRWU	00001	000029	00964	2005
NDXSDE	00001	00000A	00946	3218
NDXSNS	00001	0000D6	00966	2407
NDXSNSR	00001	00000F	00951	4745
NDXSRST	00001	000009	00945	4131
NDXSTS	00001	0000EB	00965	1680
NDXTST3	00001	000005	00941	5680
NDXWRT	00001	000013	00960	2028

CROSS-REFERENCE																		
SYMBOL	LEN	VALUE	DEFN	REFERENCES														
NDXWTM	00001	000020	00961	2073														
NFP	00001	000040	00876	2946														
NIXASTS	00002	00044E	05008	5002														
NIXBSTS	00002	0004B0	05353	5347														
NOBURST	00001	00065B	06871	6614	6727	6880												
NOGO	00001	000600	06536	6711	6736	6765	6853	6874	6981	6998	7213	7252	7269	7307	7332	7702		
NOISE	00001	000080	00844	2449														
NORESETS	00001	000004	01002	0978														
NOSHORT	00001	0000AA	01634	1572	1590													
NOSTACK	00002	00007A	01432	1405	1411	1417	1423											
NOSVC	00001	0003BC	04550	4526														
NOTAINT	00001	00003C	01200	1184														
NOTBINT	00001	00003A	01193	1181														
NOTBINT1	00001	00003F	01211	1196														
NOTBOTH	00001	000036	01178															
NOTBUSY	00001	000001	00882															
NOTCHAIN	00001	0002B5	03478	3455	3765	3963	5335											
NOTCHANE	00001	00041F	04852	4846														
NOTCOMP	00001	000001	00848															
NOTCON	00002	00043A	04943	4928	4934													
NOTCONT	00001	00009E	01584	1575	1578													
NOTHISTM	00001	000775	07939	7931														
NOTLAST	00001	000705	07520	7539														
NOTNOW	00001	000270	03211	3335														
NOTPE	00001	000010	00886															
NOTPULL	00001	0001EE	02768	2800														
NOTRSV	00001	00041A	04834	4827														
NOTYET	00001	000352	04058	4058														
NRZIRET2	00002	0006C6	07286	7843														
NRZIRET3	00002	0006C7	07289	7857														
NRZMODE	00001	000001	00798	1756	5248													
NSUBSYS	00001	000040	00846	2519														
ONES	00001	0000FF	00916	1005	1029	1172	1292	1367	1399	1458	1476	1482	1508	1664	1806	1855	2276	2286
ONESBRST	00001	0006B8	07234	2289	2347	2350	2361	2513	2630	2713	2729	2783	2831	2869	3039	3064	3098	3102
				3127	3187	3224	3288	3319	3374	3380	3423	3523	3526	3548	3568	3601	3671	3682
				3685	3688	3749	3811	3833	3884	3930	4013	4042	4235	4312	4821	4834	4878	5358
				5397	5739	5757	5768	5992	6006	6144	6153	6162	6276	6366	6385	6395	6566	6749
				6752	6807	6864	6969	7096	7157	7163	7177	7237	7441	7454	7467	7601	7717	7846
				7863	7876	7934												
				7122														
				3165	3168													
				5760														
				1956	2387	2925	2959	2966										
OPENERS0	00001	0004DB	05513	5508														
OPENERS1	00001	0004DB	05516	5501	5528													
OPIN	00001	000001	00818	1166	1538	1634	3064	3411	3423	3523	3548	4235	4725	6566	7166			
OPINDROP	00001	0002E0	03637	3637														
OPINUP	00001	000305	03753	3753														
OVERUN	00001	000004	00856	4606														
PEDATA1	00001	000720	07623	7423														
PEDATA2	00001	000722	07629	7426	7670													
PEDATA3	00001	000723	07636	7649														
PEDATA5	00001	000727	07654	7645														
PEDATA6	00001	000728	07658	7666														

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SYMBOL				LEN	VALUE	DEFN	REFERENCES																CROSS REFERENCE																9/04/															
PENDLINK	00002	0000E4	01842				1836	4775	5453																																													
PHASE1	00001	00074B	07796				7825																																															
PHASE2	00001	00074F	07813																																																			
PHASE3	00001	000750	07817				7829																																															
PICKDROP	00002	000395	04381				4381																																															
PING	00001	000044	00644				3519	4937	5511																																													
PNDADDR	00001	000006	00692				1071	1077	1163	1584	1643	3918	3921	4083	4167																																							
PNDSTS	00001	000005	00691				1358	1581	1849	1871	2391	2837	3013	3028	3245	3278	3808	3874	4404	4408	4769																																	
							5325	5381	5443	5450	5552																																											
POLLED	00001	00002E	01150				1132																																															
POSTAMBL	00001	00072C	07675				7632	7654																																														
PREAMBLE	00001	000717	07592																																																			
PRETURN0	00002	0000C8	01735				1229	1235	1562	1776	5457																																											
PRETURN1	00002	0004CE	05457				5525																																															
PROTEST	00001	00021E	02922				2034	2085																																														
PROTEST1	00001	000220	02929				5484																																															
PRSNTSTS	00001	000593	06129																																																			
PULLAB	00001	0001EC	02762				2749																																															
PULLAB1	00001	0001F0	02774				2780																																															
PULLAB2	00001	0001F3	02783				2777																																															
PULL2	00001	0001E8	02749				2416	2758																																														
PWRRESET	00001	000373	04209				4100																																															
RDACC	00001	000020	00911				4581	6229	6245	6289																																												
RDNOISE	00001	000001	00858				2443	4559																																														
RDSTOP	00001	000008	00914				4581	6229	6245																																													
READACC	00001	0005F8	06501				6252																																															
READYTYPE	00001	000139	02130				1922																																															
READY16	00001	000713	07572				7564																																															
READY800	00001	000744	07772				7764																																															
REGINIT	00001	00038C	04330																																																			
REJTU	00001	000040	00845																																																			
REQINA	00001	000004	00834				3461																																															
REQINB	00001	000001	00836				4953																																															
REQTAGS	00001	00000A	00697				1032	3490	4159	4248																																												
RESETA	00001	000250	03098				3092																																															
RESETOK	00001	000008	00825				3833	4179	4431	4480	5154	5358																																										
RETURN00	00002	0006EA	07420				7592																																															
RETURN01	00002	0006EB	07423				7613																																															
RETURN02	00002	0006EC	07426				7623																																															
RETURN03	00002	0006ED	07429				7720																																															
RETURN11	00001	0006CC	07315				7328																																															
RIGHTOFF	00001	0006CE	07328				7340																																															
RIGHTON	00001	0006C9	07303				7311																																															
RIPBIBO	00001	000388	04312				4376																																															
RIPWRAP	00001	00038F	04346				4306	4318																																														
RLSCHANN	00001	0002EC	03674				3665																																															
RSTADDIN	00001	000060	01337				1232																																															
RSTCMDT	00002	0002DA	03617																																																			
RSTCOMTD	00001	000005	00626				3691																																															
RSTCUEA	00001	000083	01476																																																			
RSTDIAG	00001	0000C9	01739				1713																																															
RSTHLDIN	00001	0002CB	03568				4798																																															
RSTNRZ	00001	00035E	04117																																																			
RSTNTDUN	00001	0002D0	03585				3588																																															

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SCREENTI	00001	000700	07487	2342
SEEIFUC	00001	0004E0	05534	5522
SELOUTUP	00001	0000C7	01732	1699
SELRESET	00001	000362	04131	1086
SELRST1	00001	000473	05137	5130
SELRST2	00001	000365	04140	
SELRST3	00001	000368	04150	4190
SELRTN0	00001	000019	01068	1061 1108
SENSE	00001	000040	00802	1005 2477 2630 2701 2729 3319
SENSEA	00001	0001B9	02582	2573
SENSEB	00001	0001BE	02600	2588
SENSEC	00001	0001C2	02615	2603
SENSED	00001	0001C5	02627	2618
SENSEDS	00001	0001C6	02630	2576
SENSEE	00001	0001C9	02642	2627
SENSEF	00001	0001CB	02650	2642
SENSEOK	00001	000181	02391	5481
SENSE0	00001	000185	02404	1323
SENSE1	00001	00018A	02422	2413
SENSE2	00001	000194	02452	2446
SENSE3	00001	00019B	02477	2452
SENSE4	00001	0001A0	02495	2486
SENSE5	00001	0001A7	02516	2507
SENSE6	00001	0001AB	02531	2522
SENSE7	00001	0001AD	02540	2531
SENSE8	00001	0001B1	02552	2546
SENSE9	00001	0001B5	02567	2552
SERVIBG	00001	0005CD	06338	6476
SERVLINK	00001	000086	01487	1467 1479
SERVRTN	00001	00020A	02844	2686 6064 6347 6375
SERVRTN0	00001	00020C	02851	2844
SERVRTN1	00001	00020D	02854	2857 2860 2863
SERVRTN2	00001	000213	02874	2886
SETABRT	00001	00000C	01026	1117
SETADDR	00001	0000B8	01680	1670
SETADRIN	00001	0000BF	01702	
SETAMOD	00001	000482	05200	
SETBMOD	00001	000486	05213	5197
SETBOPE	00001	000585	06079	6073
SETBOPO	00001	000586	06082	
SETBYINT	00001	000481	05197	
SETCHAIN	00001	000087	01492	1451
SETCNT1	00001	00000E	00701	2716 2765 2797 4594 6098 6104 6382 6590 6749 6807 7177 7487 7516 7545
SETCNT2	00001	00000F	00702	2431 2434 2455 2495 2516 2555 2582 2600 2615 2633 5012 6118 6398 6752 6810
SETCT2	00001	000693	07096	
SETCUB	00001	000010	00901	
SETDEUC	00001	0004E6	05552	5543
SETDIA1	00001	00000C	00699	1277 1283 1739 4244 6033 6039
SETDIA2	00001	00000D	00700	1280 1742 4352 6087
SETELAG	00001	000288	03307	3301
SETFOR1	00001	00071E	07616	
SETHOLDA	00001	000010	01038	
SETHOLDS	00001	00033D	03976	5080 5090
SETLINK	00001	000042	01223	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
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[illegible]

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ROS1	LEN	VALUE	DEFN	REFERENCES	CROSS-REFERENCE
ROS1					
SYMBOL					
STAT	00001	000028	00642	1289 1683 1725 1987 2061 2674 2771 2942 3036 3046 3130 3190 3227 3325 3377	9/04/73
				3581 3825 3888 3908 3927 3950 4045 4163 4472 4562 4754 5046 5294 5400 5687	
				5945 6190 6239 6283 6848 6868 7150 7209 7733 7944	
STATIMG	00001	000008	00694	1289 1640 1683 1725 1987 2061 2674 2771 2942 3036 3046 3130 3190 3227 3325	
				3377 3581 3825 3871 3888 3908 3927 3950 4045 4087 4144 4163 4468 4472 4476	
				4562 4754 5046 5106 5294 5400 5684 5687 5942 5945 5948 6190 6239 6283 6848	
				6868 7150 7209 7733 7944	
STATPNDG	00001	000004	00826	1129 1568 1627 1667 1794 1826 1852 1874 3171 3281 3363 3759 4016 4660 4772	
				5495	
STATRTN	00001	000060	01335	1256 2400 3506	
STATRTN1	00001	000061	01339		
STATSOK	00001	00056F	05987	5980	
STEP0001	00001	000000	00973		
STEP0002	00001	0000F5	01894		
STEP0003	00001	0000F6	01898		
STEP0004	00001	0000F7	01902		
STEP0005	00001	000014	01049		
STEP0006	00001	000354	04077		
STEP0007	00001	000355	04081		
STEP0008	00001	000356	04085		
STEP0009	00001	000357	04089		
STEP0010	00001	000358	04093		
STEP0011	00001	000359	04098		
STEP0012	00001	000373	04212		
STEP0013	00001	000374	04217		
STEP0014	00001	000375	04222		
STEP0015	00001	000376	04227		
STEP0016	00001	000377	04233		
STEP0017	00001	000378	04238		
STEP0018	00001	000379	04242		
STEP0019	00001	00037A	04246		
STEP0020	00001	00037B	04250		
STEP0021	00001	00037C	04255		
STEP0022	00001	00037E	04264		
STEP0023	00001	000380	04273		
STEP0024	00001	000382	04282		
STEP0025	00001	000384	04291		
STEP0026	00001	000386	04300		
STEP0027	00001	000387	04304		
STEP0028	00001	00038F	04342		
STEP0029	00001	000390	04348		
STEP0030	00001	000391	04354		
STEP0031	00001	000392	04360		
STEP0032	00001	000393	04366		
STEP0033	00001	000394	04372		
STEP0034	00001	000388	04308		
STEP0035	00001	000389	04314		
STEP0036	00001	00038F	04343		
STEP0037	00001	000390	04349		
STEP0038	00001	000391	04355		
STEP0039	00001	000392	04361		
STEP0040	00001	000393	04367		
STEP0041	00001	000394	04373		
STEP0042	00001	000388	04309		

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SYMBOL LEN VALUE DEFN REFERENCES

STEP0043	00001	000389	04315	
STEP0044	00001	00038A	04320	
STEP0045	00001	00038B	04324	
STEP0046	00001	00038C	04328	
STEP0047	00001	00038D	04332	
STEP0048	00001	00038E	04336	
STEP0049	00001	00035C	04109	
STEP0050	00001	000361	04125	
STEP0051	00001	00046B	05104	
STEP0052	00001	00046C	05108	
STEP0053	00001	00046D	05112	
STEP0054	00001	00046E	05116	
STEP0055	00001	00046F	05120	
STEP0056	00001	000470	05124	
STEP0057	00001	000369	04153	
STEP0058	00001	00036A	04157	
STEP0059	00001	00036B	04161	
STEP0060	00001	00036C	04165	
STEP0061	00001	00036D	04169	
STEP0062	00001	00036E	04173	
STEP0063	00001	00036F	04177	
STEP0064	00001	000370	04181	
STEP0065	00001	000475	05144	
STEP0066	00001	000477	05152	
STEP0067	00001	000478	05156	
STEP0068	00001	000396	04385	
STEP0069	00001	000397	04390	
STEP0070	00001	000398	04394	
STEP0071	00001	000399	04398	
STEP0072	00001	00039A	04402	
STEP0073	00001	00039B	04406	
STEP0074	00001	00039C	04410	
STEP0075	00001	00039D	04415	
STEP0076	00001	00039E	04421	
STEP0077	00001	00039F	04425	
STEP0078	00001	0003A0	04429	
STEP0079	00001	0003A1	04433	
STEP0080	00001	0003A2	04437	
STEP0081	00001	0003A3	04441	
STEP0082	00001	0003A4	04445	
STEP0083	00001	0003A5	04449	
STEP0084	00001	0003A7	04457	
STEP0085	00001	0003A8	04461	
STEP0086	00001	0003A9	04466	
STEP0087	00001	0003AA	04470	
STEP0088	00001	0003AB	04474	
STEP0089	00001	0003AC	04478	
STEP0090	00001	0003AD	04483	
STEP0091	00001	000340	03984	
STEP0092	00001	000513	05663	
STOP	00001	000080	00801	3322 5942 6845 6864 7147 7206 7730
STOPLINK	00001	000079	01429	
STRIPADD	00001	0000B0	01652	
STROBE	00001	00073D	07736	7784

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
STRTALU2	00001	0000B9	01683	1673
STRTBRST	00001	000636	06732	6740
STRTBSVI	00001	000634	06722	6707
STSIMME	00001	0002BB	03497	3449
STSIN	00001	000004	00816	1361 1367
STSONA	00001	00044D	05005	4999
STSONB	00001	0004AF	05350	5344
SUDOWRT1	00001	0006EE	07438	6949
SUDOWRT2	00001	0006EF	07441	
SUDOWRT3	00001	0006F1	07448	7438
SUDOWRT4	00001	0006F5	07461	7448
SUPOFAIL	00001	000376	04230	4230
SUPOOFF	00002	000381	04279	4279
SUPREQA	00001	000008	00835	3487
SUPREQB	00001	000002	00837	4967
SVCIN	00001	000008	00815	2851 2869
SVCoup	00001	0005A6	06193	6196
SVCOUTUP	00001	000061	01342	1346 1349 1352 1355
SVCWATE	00001	0003B4	04520	4529
SVOOFF	00002	000383	04288	4288
SWSEL	00001	000010	00870	
TAKEDISC	00001	00007B	01444	1541
TAKELINK	00001	00007D	01451	1380
TAKELIN1	00001	000080	01463	1516
TAPSLIP	00001	000001	00910	
TERMACC	00001	0002C5	03548	1317
TERMATE	00002	000048	01249	1880
TERMSTAK	00001	0002BF	03516	1320
TERMSTAT	00001	000291	03355	1249 1842 1867 2157 3174 4663
TERMSTA0	00001	000293	03363	4943
TERMSTA1	00001	0002A0	03411	3355
TERMSTA2	00001	000296	03372	1606 3214 3366
TERMSTA3	00001	00029A	03387	3828 5021 5041 5300
TERMSTA4	00001	0002AC	03449	3471
TERMSTK1	00001	0002C1	03523	1432
TESTONE	00001	000520	05710	
TEST1	00001	00052A	05743	5838
TIP	00001	000014	00645	7548
TMPATCH	00001	0006F9	07474	6572
TMSKIP	00001	000610	06590	7480
TMO	00001	000092	00793	7723
TM1600	00001	000737	07717	7575
TM1600B	00001	000738	07720	
TM64	00001	00009C	00792	7181
TONOGO	00002	000735	07702	7560 7636 7658 7760 7804 7821
TOSETSTP	00001	0006A7	07163	7154
TRACELSR	00002	000500	05594	
TRAP1	00002	00052D	05753	
TRAP10	00002	000544	05834	5717
TRAP106	00002	00054C	05861	
TRAP107	00002	00054F	05871	
TRAP108	00002	000552	05882	
TRAP109	00002	000556	05895	
TRAP11	00002	000546	05841	5714

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
TRAP2	00002	000530	05764	
TRAP4	00002	000538	05792	5735
TRAP5	00002	00053A	05799	5732
TRAP6	00002	00053C	05806	5729
TRAP7	00002	00053E	05813	5726
TRAP8	00002	000540	05820	5723
TRAP9	00002	000542	05827	5720
TRETURN0	00002	00021C	02913	2973 2992 2998
TRETURN2	00001	000219	02904	2292
TRETURN3	00002	00021B	02910	2263
TRNAOFF	00002	0006B7	07222	6539 6545 6898
TROUBLE	00002	000300	03733	3788 3967
TSTERRS	00001	000197	02462	2440
TUADR	00001	000024	00630	1077 1686 3627 3921 4167 4476
TUBOMSK	00001	000002	00913	
TUTEST	00001	000228	02956	1993 2171 2295 2326
TUTESTIT	00001	00022C	02970	2929 2949 5487
TUTEST1	00001	00022A	02963	2160 2266
TUTEST2	00001	000233	02992	5490
TUTRTN	00001	000236	03002	2882
TUTSTRTN	00001	0004BD	05397	5410
UNITCHK	00001	000002	00865	1408 1849 1871 3184 3278 3775 3956 4657 4769 4925 4931 5546 5552
UNITEXC	00001	000001	00866	3197 4667
VEL	00001	000040	00898	
WAIT	00001	000568	05962	5951 5966
WAITONA	00001	00067B	06994	7002 7019
WAITONA1	00001	000680	07015	6985
WAITONE	00001	00063D	06762	6771
WAITSIO	00002	00037D	04261	4261
WAITSOME	00001	000630	06703	6715
WATESUM	00001	00006A	01372	1384 2397 3251
WCOHIO	00001	00027F	03278	2828
WCOSTOP	00002	00027E	03274	2825
WDCNT0	00001	000002	00857	2834 3288
WHOA	00001	000217	02891	2878
WORK1	00001	000004	00690	1559 1655 1686 2422 2665 2762 2794 3551 3627 3630 3659 4358 4597 4693 4696
				5385 6132 6272 6578 6969 7096 7237 7441 7454 7467 7477 7496 7520 7533 7601
				7717 7846 7863 7876
WORK2	00001	000017	00710	1295 1298
WORK4	00001	00001C	00715	
WRAPUP	00001	00068E	07080	6977 7006 7037
WRITE	00001	000004	00785	2025 2076 4674
WRITELUP	00001	00074C	07800	7808
WRITESUM	00001	000749	07788	7775 7781
WRONGCHN	00002	000039	01189	1189 1193
WRSTATUS	00001	000008	00879	
WRTBGN	00001	000203	02822	6172
WRTCHECK	00001	000119	02015	
WRTFST	00001	000282	03288	2822
WRTHIO	00002	00028A	03314	6051 6226
WRTINIT	00002	0005A1	06172	6193 6202
WRTPROB	00001	00026E	03204	3153
XINA	00001	000090	00638	2431 2762 4693 5915 5989 6341 6487 6590
XINAOK	00001	000573	06003	5995





LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT
000000				2	START

F01MAY72 2/04/74
00000030

```
6 *****
7 *
8 *      3803-2 MICROPROGRAM LISTING ROS2 (ALU2)
9 *
10 *      DRIVE AND DATAFLOW CONTROL
11 *
12 *      P/N 1846378   SYSTEM EC 736697
13 *      CARD ASSEMBLY 8237119   MODULE EC 736696
14 *
15 *
16 *      COPYRIGHT 1972   INTERNATIONAL BUSINESS MACHINES CORP
17 *
18 *
19 *      3803-2
20 *****
```

00000070
* 00000080
* 00000090
* 00000100
* 00000110
* 00000120
* 00000130
* 00000140
* 00000150
* 00000160
* 00000170
* 00000180
* 00000190
* 00000200
* 00000210

```
25 ***** ALU 2 INDEX BY ROUTINE ( ADDRESS IS HEX )
26 *
27 *      *****
28 *
29 *      ABORT
30 *      ALU CHECKOUT
31 *      BACKSPACE FILE
32 *      BACKSPACE RECORD
33 *      DATA SECURITY ERASE
34 *      DESELECT
35 *      DIAGNOSTIC MEASURE (DMR)
36 *      ENDUP
37 *      ERASE GAP
38 *      FETCH DRIVE STATUS
39 *      FORWARD SPACE FILE
40 *      FORWARD SPACE RECORD
41 *      GENERAL RESET
```

00000260
* 00000270
* 00000280
* 00000290
* 00000300
* 00000310
* 00000320
* 00000330
* 00000340
* 00000350
* 00000360
* 00000370
* 00000380
* 00000390
* 00000400
* 00000410
* 00000420

59C
03C
03E
031
1BB
561
1D0
022
2E1
035
037
1A1

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
				42 *		IBG MEASURE (NRZI)	544	F01MAY72 2/04/74
				43 *		IBG MEASURE (PE GCR)	513	* 00000430
				44 *		INITIAL SELECTION	0EA	* 00000440
				45 *		READ ACCESS UDIAGNOSTIC	58D	* 00000450
				46 *		READ BACKWARD	03A	* 00000460
				47 *		READ FORWARD	033	* 00000470
				48 *		REWIND	02F	* 00000480
				49 *		REWIND UNLOAD	029	* 00000490
				50 *		SCAN FOR DEVICE ENDS	34D	* 00000500
				51 *		SELECTIVE RESET	1A7	* 00000510
				52 *		SENSE	0D6	* 00000520
				53 *		SET DEVICE ENDS	200	* 00000530
				54 *		TURNAROUND	138	* 00000540
				55 *		VELOCITY CHECK- WRITE (PE NRZI)	300	* 00000550
				56 *		VELOCITY CHECK- WRITE (GCR)	7AD	* 00000560
				57 *		VELOCITY (GET TAPE TO SPEED - ALL OPS)	219	* 00000570
				58 *		WRITE	013	* 00000580
				59 *		WRITE ID BURST	6D0	* 00000590
				60 *		WRITE TAPE MARK	020	* 00000600
				61 *		WRITE SAGC	705	* 00000610
				62 *		POSITION ERASE HEAD	733	* 00000620
				63 *		DISPLAY LSRS	500	* 00000630
				64 *		FOUND TRACK (NRZI 9TRK)	445	* 00000640

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
66					*****		00000670
67					*****		00000680
68	*				TAPE UNIT COMMAND STATUS BYTE	TAPE UNIT CONTROL STATUS BYTE	00000690
69	*						00000700
70	*	0			BACKWARD	0 RUN	00000710
71	*	1			GAP CONTROL	1	00000720
72	*	2			DIAGNOSTIC MODE	2HIGH	00000730
73	*	3			OPPOSITE DIRECTION	3ALT DEN	00000740
74	*	4			WRITE STATUS	4LOW	00000750
75	*	5			EXTENDED STOP	5 ERASE	00000760
76	*	6			UNIT CHECK	6 ERASE MODE	00000770
77	*	7			POSITIONING	7 REW	00000780
78	*						00000790
79					*****		00000800
80	*				TAPE UNIT COMMANDS		00000810
81	*				COMMAND TAG UP	CONTROL TAG UP	00000820
82	*					TAG LINES	00000830
83	*	0			SET BACKWARD READ	0 RUN	00000840
84	*	1			SET FORWARD READ	1	00000850
85	*	2			SET DIAGNOSTIC	2 SET HIGH SENSE	00000860
86	*	3			SET PULSE	3 SET ALT DEN+SAGC	00000870
87	*	4			SET WRITE	4 SET LOW SENSE	00000880
88	*	5			SET EXTENDED STOP	5 ERASE TO TI	00000890
89	*	6			RESET	6 SET ERASE MODE	00000900
90	*	7			UNUSEABLE	7 MOVE	00000910
91	*						00000920
92	*						00000930
93	*						00000940
94	*						00000950
95	*						00000960
96	*				ALU2 XOUTA DATA FLOW CONTROL	ALU2 STATS	00000970
97	*						00000980
98	*	0			PE BIT	0 TAPE OP	00000990
99	*	1			FORWARD	1PERMIT READ/WRITE	00001000
100	*	2			ALLOW ENVELOPE LOSS	2 WRITE P BURST	00001010
101	*	3			SYNC	3 SEVEN TRK	00001020
102	*	4			6250	A ALU2 BOC	00001030
103	*	5	7	IPS 200		B ALU1 BOC	00001040
104	*	5		IPS 125		C ALU1 BOC	00001050
105	*	6	7	IPS 75		D ALU1 BOC - ALU2 TERM	00001060
106	*	6			LOGAIN		00001070
107					*****		00001080

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
109	*				*****		00001100
110	*				TAPE UNIT SENSE BYTES		00001110
111	*						00001120
112	*				TO OBTAIN SENSE BYTES ALU1 MUST LOAD THE TU ADDRESS REGISTER WITH		00001130
113	*				THE PROPER ADDRESS. ALU2 MUST TURN ON DEVICE SELECT BY ITSELF AND		00001140
114	*				PUT THE PROPER BIT ON THE BUS OUT.		00001150
115	*						00001160
116	*	TUBO		BIT 7 (01)	BRINGS IN SENSE BYTE 0	STATUS	00001170
117	*	TUBO		BIT 6 (02)	BRINGS IN SENSE BYTE 1	FEATURES & MODEL	00001180
118	*	TUBO		BIT 5 (04)	BRINGS IN SENSE BYTE 2	ERRORS	00001190
119	*	TUBO		BIT 4 (08)	BRINGS IN SENSE BYTE 3	SERIAL NUMBER	00001200
120	*	TUBO		BIT 3 (10)	BRINGS IN SENSE BYTE 4	SERIAL NUMBER	00001210
121	*	TUBO		BIT 2 (20)	BRINGS IN SENSE BYTE 5	EC LEVEL	00001220
122	*	TUBO		BIT 1 (40)	ALLOWS READ BUS AND TACH PULSES		00001230
123	*	TUBO		BIT 0 (80)	MONITORS THREAD AND LOAD SEQUENCE		00001240
124	*						00001250
125	*						00001260
126	*						00001270
127	*			BYTE 0	BYTE 1	BYTE 2	00001280
128	*						00001290
129	*	0		BACKWARD	0 7 TRACK	0 LAMP FAILURE	00001300
130	*	1		NOT FILE PROTECT	1 WRT&CURRENT&FAIL&	1 LEFT COL FAILURE	00001310
131	*	2		END OF TAPE	2 DUAL-DENSITY	2 RIGHT COL FAILURE	00001320
132	*	3		BEGINNING OF TAPE	3 ALT DEN	3 STOP KEY	00001330
133	*	4		WRITE STATUS	4 6250	4 DATA SECURITY ERASE	00001340
134	*	5		START	5 MODEL	5 ERASE HEAD FAILURE	00001350
135	*	6		UNIT CHECK	6 MODEL	6 AIR BEARING FAILURE	00001360
136	*	7		NOT BUSY	7 MODEL	7 LOAD FAILURE	00001370
137	*						00001380
138	*			BYTE 3	BYTE 4	BYTE 5	00001390
139	*						00001400
140	*	0			0	0 THERMAL/VOLTAGE CHK	00001410
141	*	1		DEVICE	1 DEVICE	1 SPARE	00001420
142	*	2		SERIAL	2 SERIAL	2 SPARE	00001430
143	*	3		NUMBER	3 NUMBER	3 SPARE	00001440
144	*	4		HIGH	4 LOW	4 ENGINEERING	00001450
145	*	5		ORDER	5 ORDER	5 CHANGE	00001460
146	*	6			6	6 LEVEL	00001470
147	*	7			7	7 OF DRIVE	00001480
148	*						00001490
149	*			LOAD AND THREAD SENSE BYTE			00001500
150	*						00001510
151	*	0		LOAD BUTTON DEPRESSED	WITH BIT 0 ON TUBO, THESE SIGNALS		00001520
152	*	1		LEFT REEL TURNING	RETURN TO THE CONTROLLER REAL TIME.		00001530
153	*	2		RIGHT REEL TURNING	THE SEQUENCE IS BITS 0 TO 6 IN THE		00001540
154	*	3		TAPE PRESENT	ORDER SHOWN. IF AN ERROR IS DETECT-		00001550
155	*	4		REELS LOADED	ED BY THE DRIVE, BIT 7 WILL APPEAR.		00001560
156	*	5		LOAD REWIND	IF A CARTRIDGE IS BEING USED, BIT		00001570
157	*	6		LOAD COMPLETE	7 INITIATES A RETRY.		00001580
158	*	7		LOAD CHECK			00001590
159	*			*****			00001600

LOC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT

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162 *****
163 * ALU2 LSR LAYOUT AND ASSIGNED BIT POSITIONS * 00001630
164 * * 00001640
165 * LSR0-WORK1 LSR1-WORK2 LSR2-WORK3 * 00001650
166 * 0 SCRATCH 0 SCRATCH 0 SCRATCH * 00001660
167 * 7 REGISTER 7 REGISTER 7 REGISTER * 00001670
168 * * 00001680
169 * LSR3-WORK4 LSR4-STATIMG LSR5-FLAGS * 00001690
170 * 0 SCRATCH 0 TAPE OP 0 DIAGNOSTIC WRITE * 00001700
171 * 7 REGISTER 1 PERMIT READ/WRITE 1 * 00001710
172 * 2 WRITE P BURST 2 INHIBIT POSTAMBLE * 00001720
173 * 3 NRZI 3 * 00001730
174 * 4 ALU2 BOC STATA 4 INHIBIT PREAMBLE * 00001740
175 * 5 ALU1 BOC STATB 5 LOOP WRT/RD OP * 00001750
176 * 6 ALU1 BOC STATC 6 TUBO MASK * 00001760
177 * 7 ALU1 BOC STATD TERM 7 CHANGE DIRECTION * 00001770
178 * * 00001780
179 * LSR6-SENSE1 LSR7-SENSE2 LSR8-TRACER(READ OP) * 00001790
180 * 0 BACKWARD 0 7 TRACK 0 CREASE OP * 00001800
181 * 1 NOT FILE PROTECT 1 WRT CURRENT FAIL 1 BOR MARK * 00001810
182 * 2 END OF TAPE 2 DUAL-DENSITY 2 * 00001820
183 * 3 BEGINNING OF TAPE 3 NRZI 3 IBG MARK * 00001830
184 * 4 WRITE STATUS 4 BIRCH 4 TAK MARK * 00001840
185 * 5 START 5 & 7 ASPEN 200 5 FILE OP * 00001850
186 * 6 UNIT CHECK 5 ASPEN 125 6 READ OP * 00001860
187 * 7 NOT BUSY 6 & 7 ASPEN 75 7 SPACE OP * 00001870
188 * * 00001880
189 * LSR8-TRACER(WRITE OP) LSR9-FRU LSR10-DTACHK2 * 00001890
190 * 0 0 DEFINED 0 * 00001900
191 * 1 LPMARK 7 ELSEWHERE 1 * 00001910
192 * 2 CHKBURST 2 WTM ERROR * 00001920
193 * 3 ERGFLAG 3 PE ID BURST CHK * 00001930
194 * 4 TAK MARK 4 START READ CHK * 00001940
195 * 5 ERG OP 5 PARTIAL RECORD * 00001950
196 * 6 WTM OP 6 EXCESSIVE POSTAMBLE * 00001960
197 * 7 * 00001970
198 * * 00001980
199 * LSR11-TUADDR LSR12-DTACHK1 LSR13-XOUTAIM * 00001990
200 * 0 SEL TU7 0 IBGDROP 0 PE BIT * 00002000
201 * 1 SEL TU6 1 FEEDTHRU 1 FORWARD * 00002010
202 * 2 SEL TU5 2 6400CRC 2 ALLOW LOSS * 00002020
203 * 3 SEL TU4 3 EARLY IBG DROP 3 SYNC * 00002030
204 * 4 SEL TU3 4 SAGC 4 BIRCH * 00002040
205 * 5 SEL TU2 5 SLOW BEGINNING 5 TU MODEL * 00002050
206 * 6 SEL TU1 6 SLOW ENDING 6 LOGAIN * 00002060
207 * 7 SEL TU0 7 VELOCITY RETRY 7 TU MODEL * 00002070
208 * * 00002080
* 00002090

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
210	*			LSR14-LODEPA	LSR15-LODEPB	LSR16-WORK1 (HIGH)	* 00002110
211	*			0 DEP TU 7	0 DEP TU 7	0 SCRATCH	* 00002120
212	*			1 DEP TU 6	1 DEP TU 6	7 REGISTER	* 00002130
213	*			2 DEP TU 5	2 DEP TU 5		* 00002140
214	*			3 DEP TU 4	3 DEP TU 4		* 00002150
215	*			4 DEP TU 3	4 DEP TU 3		* 00002160
216	*			5 DEP TU 2	5 DEP TU 2		* 00002170
217	*			6 DEP TU 1	6 DEP TU 1		* 00002180
218	*			7 DEP TU 0	7 DEP TU 0		* 00002190
219	*						* 00002200
220	*			LSR17-WORK2(HIGH)	LSR18-WORK3(HIGH)	LSR19-WORK4(HIGH)	* 00002210
221	*			0 SCRATCH	0 SCRATCH	0 SCRATCH	* 00002220
222	*			7 REGISTER	7 REGISTER	7 REGISTER	* 00002230
223	*						* 00002240
224	*			LSR20-STATIMG(HIGH)	LSR21-WORK5	LSR22-SENSE1(HIGH)	* 00002250
225	*			0 SAME AS	0 SCRATCH	0 SAME AS	* 00002260
226	*			7 LSR 4	7 REGISTER	7 LSR6	* 00002270
227	*						* 00002280
228	*			LSR23-TIEBYTE	LSR24-MPGMERR	LSR25-LINK2	* 00002290
229	*			0 HOLDS NRZI	0 NOISE	0 SECOND LEVEL	* 00002300
230	*			7 TIEBYTE	1 EXCESSIVE VEL CHG	7 LINK LSR	* 00002310
231	*				2		* 00002320
232	*				3 END DATA CHK		* 00002330
233	*				4		* 00002340
234	*				5		* 00002350
235	*				6		* 00002360
236	*				7 NOT CAPABLE		* 00002370
237	*						* 00002380
238	*			LSR26-LINK3	LSR27-TUADDR	LSR28-LINK1	* 00002390
239	*			0 THIRD LEVEL	0 SEL TU F	0 FIRS LEVEL	* 00002400
240	*			7 LINK LSR	1 SEL TU E	7 LINK LSR	* 00002410
241	*				2 SEL TU D		* 00002420
242	*				3 SEL TU C		* 00002430
243	*				4 SEL TU B		* 00002440
244	*				5 SEL TU A		* 00002450
245	*				6 SEL TU 9		* 00002460
246	*				7 SEL TU 8		* 00002470
247	*						* 00002480
248	*			LSR29-EQUIPCHK	LSR30-LODEPA(HIGH)	LSR31-LODEPB(HIGH)	* 00002490
249	*			0 CMD STATUS REJ	0 DEP TU F	0 DEP TU F	* 00002500
250	*			1 REJECT TU	1 DEP TU E	1 DEP TU E	* 00002510
251	*			2 CNTRL STATUS REJ	2 DEP TU D	2 DEP TU D	* 00002520
252	*			3 NO BLOCK	3 DEP TU C	3 DEP TU C	* 00002530
253	*			4 DYNAMIC REVERSAL	4 DEP TU B	4 DEP TU B	* 00002540
254	*			5 NO TACH	5 DEP TU A	5 DEP TU A	* 00002550
255	*			6 SAGC	6 DEP TU 9	6 DEP TU 9	* 00002560
256	*			7 VELOCITY FAIL	7 DEP TU 8	7 DEP TU 8	* 00002570
257	*						* 00002580
258	*						* 00002590
259	*						* 00002600
260	*						* 00002610
261	*						* 00002620
262	*			THIS IS A LIST OF NAMES WHICH ARE USED IN PLACE OF THE HEX VALUE OF			* 00002630
263	*			TRANSFERS, BRANCH ON CONDITIONS, LOCAL STORE REGISTERS, DATA FLOW			* 00002640

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				264	* CONTROLS, DRIVE CONTROLS AND THE VARIOUS BITS IN THE LSR'S.	*	00002650
				265	*	*	00002660
				266	*****	*****	00002670
				267	*****	*****	00002680
				269	***** ALU 2 TRANSFER ADDRESSES *****		00002700
				270	*	*	00002710
000084				271	XADDR EQU X'84' . EXT ADDR REG		00002720
				272	* DECODES THE ADDRESS FROM ALU1		00002730
				273	* TUADDR REG TO A SINGLE BIT WHICH		00002740
				274	* CORRESPONDS TO THE ADDR BIT POSITION		00002750
				275	* OF THE TUADDR REG ALU2.		00002760
00000A				276	CRC EQU X'0A' . SHIFT CRC PULSE		00002770
000006				277	LSR EQU X'06' . SET CONTROL FOR &I OR LO LSRS		00002780
000021				278	AR EQU X'21' . ALU INPUT REGISTER		00002790
000060				279	TUBO EQU X'60' . TAPE UNIT BUS OUT		00002800
000009				280	RESETERR EQU X'09' . RESET ERRORS SINGLE BYTE NOISE		00002810
000011				281	INDF EQU X'11' . ISSUED FOR DIAG CHANNEL BUFFER READ		00002820
000024				282	TUTAG EQU X'24' . TAPE UNIT OUT TAG REG		00002830
000014				283	REDLIGHT EQU X'14' . CE PANEL LIGHT FOR MPGM DETECTED ERRORS		00002840
				284	* DURING A TAPE OPERATION	*	00002850
000022				285	IC EQU X'22' . INSTRUCTION COUNTER		00002860
000082				286	INHP EQU X'82' . INHIBIT PARITY ON 'B' BUSS		00002870
000050				287	COMITD EQU X'50' . RESETS UNIT COMMITTED LATCH IN	*	00002880
				288	* DEVICE SWITCH	*	00002890
000081				289	TUBI EQU X'81' . TAPE UNIT BUSS IN		00002900
000090				290	XINA EQU X'90' . CROSSOVER INPUT REG A		00002910
000088				291	XINB EQU X'88' . CROSSOVER INPUT REG B		00002920
000042				292	XOUTA EQU X'42' . CROSSOVER OUTPUT REG A		00002930
000041				293	XOUTB EQU X'41' . CROSSOVER OUTPUT REG B		00002940
000043				294	XANXB EQU X'43' . VALUE FOR BOTH XOUTA AND XOUTB		00002950
000028				295	STAT EQU X'28' . GLITCHLESS CONTROL REG		00002960
000044				296	HDWERR EQU X'44' . SET ERROR LATCH FOR ALU ERRORS		00002970
				297	* ALSO SETS BIT 4 IN SENSE BYTE 12	*	00002980
000012				298	POINTERS EQU X'12' .		00002990
000018				299	BUFFCRC EQU X'18' . SAMPLE BUFFER CRC ERROR LATCH		00003000

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				301	***** BRANCH CONDITIONS *****		00003020
				302	*		00003030
000000				303	#DBUS EQU X'00' . D BUS EQUAL TO ZERO		00003040
000001				304	#NALCO EQU X'01' . NOT ALU CARRY OUT		00003050
000002				305	#ROCROT EQU X'02' . FLIP FLOP CHANGES EACH ROC ROTATION		00003060
000003				306	#NRZFPEAT EQU X'03' . BR IF NRZI FEATURE IS INSTALLED		00003070
000002				307	#CRCNEPR EQU X'02' . CRC NOT EQU EPR		00003080
000004				308	#RDTIME EQU X'04' . FREQUENCY OFF SDC OSCILLATOR	*	00003090
				309	*	PE = 1600 BPI BY MODEL	* 00003100
				310	*	NRZI = 800 BPI BY MODEL	* 00003110
000006				311	#TACHFF EQU X'06' . DRIVEN BY TACH PULSES- FLIP FLOP		00003120
000007				312	#STOP EQU X'07' . STOP (ALU 1 STAT BIT 0)		00003130
000008				313	#CRCMAT EQU X'08' . CRC = MATCH		00003140
000008				314	#ENDATA EQU X'08' . END DATA (ENDING ONES OR RDD 173)		00003150
000009				315	#NCONVCK EQU X'09' . DATA CONVERTER CHECK		00003160
000009				316	#NSAGCID EQU X'09' . INVERSE TAPE MARKER		00003170
00000C				317	#NPTE EQU X'0C' . P TRACK ENVELOP		00003180
00000C				318	#DEN556 EQU X'0C' . DENSIT 556		00003190
000005				319	#NSEVEN EQU X'05' . NOT SEVEN TRK		00003200
00000D				320	#DATARDY EQU X'0D' . DATA FROM SKEW BUFFER READY		00003210
00000E				321	#BOR EQU X'0E' . BEGINNING OF RECORD		00003220
00000F				322	#IBG EQU X'0F' . IBG DETECTION CONTROLS		00003230
000010				323	#DREG0 EQU X'10' . D REGISTER BIT 0		00003240
000011				324	#DREG1 EQU X'11' . D REGISTER BIT 1		00003250
000012				325	#DREG2 EQU X'12' . D REGISTER BIT 2		00003260
000013				326	#DREG3 EQU X'13' . D REGISOER BIT 3		00003270
000014				327	#DREG4 EQU X'14' . D REGISTER BIT 4		00003280
000015				328	#DREG5 EQU X'15' . D REGISTER BIT 5		00003290
000016				329	#DREG6 EQU X'16' . D REGISTER BIT 6		00003300
000017				330	#DREG7 EQU X'17' . D REGISTER BIT 7		00003310
000018				331	#6250 EQU X'18' . BR ON XOUTA BIT 4		00003320
000019				332	#N1TE EQU X'19' . NOT ONE TRK ENVELOPE		00003330
000019				333	#DEN200 EQU X'19' . DENSITY 200		00003340
00000A				334	#STATA EQU X'0A' . STAT A ALU 2		00003350
00000B				335	#STATB EQU X'0B' . STAT B ALU 1		00003360
00001A				336	#STATC EQU X'1A' . ALU 1 STAT C		00003370
00001B				337	#STATD EQU X'1B' . ALU 1 STAT D		00003380
00001C				338	#NENVLOS EQU X'1C' . NO ENVELOP LOSS		00003390
00001C				339	#NBLOCK EQU X'1C' . NO ZONE UP		00003400
00001D				340	#NTM EQU X'1D' . TAPE MARK BR COND		00003410
00000D				341	#NRPO EQU X'0D' .		00003420
00001E				342	#BSYTACH EQU X'1E' . WITH 'DEVSEL' CONDITION INDICATES	*	00003430
				343	*	DEVICE IS SWITCHED	* 00003440
				344	*	WITHOUT 'DEVSEL' INDICATES DEVICE	* 00003450
				345	*	IS BUSY	* 00003460
00001F				346	#DEVATTN EQU X'1F' . INTERRUPT FROM THE DRIVE		00003470
				347	*	CONDITIONS WHICH GENERATE 'DEVATTN'	* 00003480
				348	*	1. NOT READY TO READY	* 00003490
				349	*	2. READY DROP WITH MOVE ACTIVE	* 00003500
				350	*	3. BKWD INTO LP WITH MOVE ACTIVE	* 00003510
				351	*	* NOTE: WILL NOT BE SEEN AFTER MOVE	* 00003520
				352	*	IS DROPPED IN 2 & 3 ABOVE.	* 00003530
				353	*****		00003540
				354	* LSR REGISTERS USED FOR COMMAND, ADDRESS, AND STATUS.		00003550

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
000000				355 R0	EQU	X'00' . LSR 0		00003560
000001				356 R1	EQU	X'01' . LSR 1		00003570
000002				357 R2	EQU	X'02' . LSR 2		00003580
000003				358 R3	EQU	X'03' . LSR 3		00003590
000004				359 R4	EQU	X'04' . LSR 4		00003600
000005				360 R5	EQU	X'05' . LSR 5		00003610
000006				361 R6	EQU	X'06' . LSR 6		00003620
000007				362 R7	EQU	X'07' . LSR 7		00003630
000008				363 R8	EQU	X'08' . LSR 8		00003640
000009				364 R9	EQU	X'09' . LSR 9		00003650
00000A				365 R10	EQU	X'0A' . LSR 10		00003660
00000B				366 R11	EQU	X'0B' . LSR 11		00003670
00000C				367 R12	EQU	X'0C' . LSR 12		00003680
00000D				368 R13	EQU	X'0D' . LSR 13		00003690
00000E				369 R14	EQU	X'0E' . LSR 14		00003700
00000F				370 R15	EQU	X'0F' . LSR 15		00003710
000010				371 R16	EQU	X'10' . LSR 16		00003720
000011				372 R17	EQU	X'11' . LSR 17		00003730
000012				373 R18	EQU	X'12' . LSR 18		00003740
000013				374 R19	EQU	X'13' . LSR 19		00003750
000014				375 R20	EQU	X'14' . LSR 20		00003760
000015				376 R21	EQU	X'15' . LSR 21		00003770
000016				377 R22	EQU	X'16' . LSR 22		00003780
000017				378 R23	EQU	X'17' . LSR 23		00003790
000018				379 R24	EQU	X'18' . LSR 24		00003800
000019				380 R25	EQU	X'19' . LSR 25		00003810
00001A				381 R26	EQU	X'1A' . LSR 26		00003820
00001B				382 R27	EQU	X'1B' . LSR 27		00003830
00001C				383 R28	EQU	X'1C' . LSR 28		00003840
00001D				384 R29	EQU	X'1D' . LSR 29		00003850
00001E				385 R30	EQU	X'1E' . LSR 30		00003860
00001F				386 R31	EQU	X'1F' . LSR 31		00003870
				387 *			*	00003880
				388 *****		ALU2 LSR EQUATES *****		00003890
000000				389 WORK1	EQU	X'00' . LSR 0--WORK AREA		00003900
000001				390 WORK2	EQU	X'01' . LSR 1--WORK AREA		00003910
000002				391 WORK3	EQU	X'02' . LSR 2--WORK AREA		00003920
000003				392 WORK4	EQU	X'03' . LSR 3--WORK AREA		00003930
000004				393 STATIMG	EQU	X'04' . LSR 4--STAT REGISTER IMAGE		00003940
000005				394 FLAGS	EQU	X'05' . LSR 5--HOLDS DIAGNOSTIC FLAGS		00003950
000006				395 SENSE1	EQU	X'06' . LSR 6--HOLDS TU SENSE BYTE 0		00003960
000007				396 SENSE2	EQU	X'07' . LSR 7--HOLDS TU SENSE BYTE 1		00003970
000008				397 TRACER	EQU	X'08' . LSR 8--FLAGS FOR OPERATION		00003980
000009				398 FRU	EQU	X'09' . LSR 9--		00003990
00000A				399 DTACHK2	EQU	X'0A' . LSR 10--MICRO PGM DETECTED DATA CHKS		00004000
00000B				400 TUADDR	EQU	X'0B' . LSR 11--HOLDS TU ADDRESS		00004010
00000C				401 DTACHK1	EQU	X'0C' . LSR 12--MICRO PGM DETECTED DATA CHKS		00004020
00000D				402 XOUTAIM	EQU	X'0D' . LSR 13--XOUTA REGISTER IMAGE		00004030
00000E				403 LODEPA	EQU	X'0E' . LSR14--HOLDS DEV END PRIMES - INTF A		00004040
00000F				404 LODEPB	EQU	X'0F' . LSR 15--'OLDS DEV END PRIMES - INTF B		00004050
000015				405 WORK5	EQU	X'15' . LSR 21--WORK AREA		00004060
000017				406 TIEBYTE	EQU	X'17' . HOLDS NRZI TRK IN ERROR		00004070
000018				407 MPGMERR	EQU	X'18' . LSR 24--MICRO PGM DETECTED ERRORS		00004080
000019				408 LINK2	EQU	X'19' . LSR 25--SECOND LEVEL LINK		00004090

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
00001A				409	LINK3 EQU X'1A' . LSR 26-THIRD LEVEL LINK		00004100
00001C				410	LINK1 EQU X'1C' . LSR 28-FIRST LEVEL LINK		00004110
00001D				411	EQUIPCK EQU X'1D' . LSR 29-MICRO PGM DETECTED EQIP CHKS		00004120
				412	***** THESE LSR EQUATES ARE USED BY LOGICAL MACROS ONLY*****		00004130
				413	***** AND SHOULD NOT BE CODED *****		00004140
000000				414	#R0 EQU X'00' . LSR 0		00004150
000001				415	#R1 EQU X'01' . LSR 1		00004160
000002				416	#R2 EQU X'02' . LSR 2		00004170
000003				417	#R3 EQU X'03' . LSR 3		00004180
000004				418	#R4 EQU X'04' . LSR 4		00004190
000005				419	#R5 EQU X'05' . LSR 5		00004200
000006				420	#R6 EQU X'06' . LSR 6		00004210
000007				421	#R7 EQU X'07' . LSR 7		00004220
000008				422	#R8 EQU X'08' . LSR 8		00004230
000009				423	#R9 EQU X'09' . LSR 9		00004240
00000A				424	#R10 EQU X'0A' . LSR 10		00004250
00000B				425	#R11 EQU X'0B' . LSR 11		00004260
00000C				426	#R12 EQU X'0C' . LSR 12		00004270
00000D				427	#R13 EQU X'0D' . LSR 13		00004280
00000E				428	#R14 EQU X'0E' . LSR 14		00004290
00000F				429	#R15 EQU X'0F' . LSR 15		00004300
000000				430	#R16 EQU X'00' . LSR 16		00004310
000001				431	#R17 EQU X'01' . LSR 17		00004320
000002				432	#R18 EQU X'02' . LSR 18		00004330
000003				433	#R19 EQU X'03' . LSR 19		00004340
000004				434	#R20 EQU X'04' . LSR 20		00004350
000005				435	#R21 EQU X'05' . LSR 21		00004360
000006				436	#R22 EQU X'06' . LSR 22		00004370
000007				437	#R23 EQU X'07' . LSR 23		00004380
000008				438	#R24 EQU X'08' . LSR 24		00004390
000009				439	#R25 EQU X'09' . LSR 25		00004400
00000A				440	#R26 EQU X'0A' . LSR 26		00004410
00000B				441	#R27 EQU X'0B' . LSR 27		00004420
00000C				442	#R28 EQU X'0C' . LSR 28		00004430
00000D				443	#R29 EQU X'0D' . LSR 29		00004440
00000E				444	#R30 EQU X'0E' . LSR 30		00004450
00000F				445	#R31 EQU X'0F' . LSR 31		00004460
000000				446	#WORK1 EQU X'00' . LSR 0--WORK AREA		00004470
000001				447	#WORK2 EQU X'01' . LSR 1--WORK AREA		00004480
000002				448	#WORK3 EQU X'02' . LSR 2--WORK AREA		00004490
000003				449	#WORK4 EQU X'03' . LSR 3--WORK AREA		00004500
000004				450	#STATIMG EQU X'04' . LSR 4--STAT REGISTER IMAGE		00004510
000005				451	#FLAGS EQU X'05' . LSR 5--HOLDS DIAGNOSTIC FLAGS		00004520
000006				452	#SENSE1 EQU X'06' . LSR 6--HOLDS TU SENSE BYTE 0		00004530
000007				453	#SENSE2 EQU X'07' . LSR 7--HOLDS TU SENSE BYTE 1		00004540
000008				454	#TRACER EQU X'08' . LSR 8--FLAGS FOR OPERATION		00004550
000009				455	#FRU EQU X'09' . LSR 9--		00004560
00000A				456	#DTACHK2 EQU X'0A' . LSR 10-MICRO PGM DETECTED DATA CHKS		00004570
00000B				457	#TUADDR EQU X'0B' . LSR 11-HOLDS TU ADDRESS		00004580
00000C				458	#DTACHK1 EQU X'0C' . LSR 12-MICRO PGM DETECTED DATA CHKS		00004590
00000D				459	#XOUTAIM EQU X'0D' . LSR 13-XOUTA REGISTER IMAGE		00004600
00000E				460	#LODEPA EQU X'0E' . LSR 14-HOLDS DEV END PRIMES - INTF A		00004610
00000F				461	#LODEPB EQU X'0F' . LSR 15-OLDS DEV END PRIMES - INTF B		00004620
000005				462	#WORK5 EQU X'05' . LSR 21-WORK AREA		00004630

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
000008				463	#MPGMERR EQU X'08' . LSR 24-MICRO PGM DETECTED ERRORS		00004640
000007				464	#TIEBYTE EQU X'07' . HOLDS NRZI TRK IN ERROR		00004650
				465	*		00004660
				466	*****		00004670
				467	***** TAPE INTERFACE EQUATES *****		00004680
				468	*		00004690
				469	***** TU BUS OUT EQUATES *****		00004700
				470	*		00004710
				471	***** DEVICE COMMAND TAGS *****		00004720
				472	*		00004730
000080				473	RDBKWD EQU X'80' . READ BACKWARD BIT		00004740
000040				474	RDFWDD EQU X'40' . READ FORWARD BIT		00004750
000020				475	SETDIAG EQU X'20' . SET DIAGNOSTIC BIT		00004760
000012				476	#SETDIAG EQU X'12' . BR ON DREG		00004770
000008				477	WRITE EQU X'08' . SET WRITE BIT		00004780
000002				478	RESET EQU X'02' . SET DEV RESET BIT		00004790
				479	*		00004800
				480	***** COMMAND STATUS BYTE EQUATES *****		00004810
				481	*		00004820
				482	*BACKWD EQU X'80' . DEVICE IN BACKWARD STATUS		00004830
000011				483	#GAPCTRL EQU X'11' . INDICATES GAP CONTRL IS ON-BR ON DREG		00004840
000040				484	GAPCTRL EQU X'40' .		00004850
000020				485	DIAGMODE EQU X'20' . DEVICE IS IN DIAGNOSTIC MODE		00004860
				486	*WRSTAT EQU X'08' . DEVICE IS IN WRITE STATUS		00004870
000001				487	POSIT EQU X'01' . DEVICE IS IN STOP DELAY		00004880
000010				488	OPPDIR EQU X'10' . OPPOSITE DIRECTION INDICATED		00004890
000013				489	#OPPDIR EQU X'13' . BR ON DREG		00004900
000004				490	EXTEND EQU X'04' .		00004910
				491	*		00004920
				492	***** DEVICE CONTROL TAGS *****		00004930
				493	*		00004940
000080				494	RUN EQU X'80' . SET REWIND UNLOAD BIT		00004950
000010				495	SETDENS EQU X'10' . SET ALTERNATE DENSITY		00004960
000004				496	ERGTOTI EQU X'04' . SET ERASE TO TI		00004970
000001				497	REWIND EQU X'01' . SET REWIND BIT		00004980
000001				498	REW EQU X'01' . DEVICE IS IN REWIND STATUS		00004990
000002				499	SETERASE EQU X'02' . SET ERASE MODE		00005000
				500	*		00005010
				501	***** DEVICE CONTROL STATUS *****		00005020
				502	*		00005030
				503	* ALL STATUS RESPONSE IS CORRESPONDING BIT OF CONTROL COMMAND		00005040
				504	*		00005050
				505	***** TU TAGS OUT EQUATES *****		00005060
				506	*		00005070
000008				507	DEVSEL EQU X'08' . SET DEVICE SELECT TAG		00005080
000004				508	CONTROL EQU X'04' . SET DEVICE CONTROL TAG		00005090
000002				509	COMMAND EQU X'02' . SET DEVICE COMMAND TAG		00005100
000001				510	MOVE EQU X'01' . SET DEVICE MOVE TAG		00005110
				511	*		00005120
				512	***** XOUTA REGISTER EQUATES *****		00005130
				513	*		00005140
000080				514	PEBIT EQU X'80' . PE BIT FOR DATA FLOW		00005150
000040				515	FWDDATA EQU X'40' . FORWARD FOR DATA FLOW		00005160
000011				516	#FWDDATA EQU X'11' . BR ON DREG		00005170

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT
000020				517	NOLOSS	EQU X'20' .
000010				518	SYNC	EQU X'10' .
000013				519	#SYNC	EQU X'13' .
000008				520	HIDEN	EQU X'08' .
000014				521	#HIDEN	EQU X'14' .
000002				522	LOGAIN	EQU X'02' .
				523	*	

	F01MAY72	2/04/74
NOT ALLOW ENVELOPE LOSS		00005180
SYNC LINE FOR READ DETECTION		00005190
SYNC LINE FOR READ DETECTION		00005200
6400 DEVI250		00005210
6400 DEVI250		00005220
LOW GAIN TO DET CIRCUITS		00005230
	*	00005240

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				525	***** STAT BIT EQUATES *****		00005260
				526	*		00005270
000080				527	TAPEOP EQU X'80' . TAPE OP CONTROL BIT		00005280
000040				528	PERMRDWT EQU X'40' . PERMIT READ OR WRITE CONDITION		00005290
000020				529	WRTBURST EQU X'20' . WRITE PE LP BURST CONTROL BIT		00005300
000010				530	NRZI7 EQU X'10' . SET NRZI		00005310
000013				531	#NRZI7 EQU X'13' . BR ON DREG		00005320
000008				532	SETSTATA EQU X'08' . SET STAT REG A BIT		00005330
000004				533	SETSTATB EQU X'04' . SET STAT REG B BIT		00005340
000002				534	SETSTATC EQU X'02' . SET STAT REG C BIT		00005350
000001				535	SETSTATD EQU X'01' . STAT INDICATES ALU2 FINISHED		00005360
				536	*		00005370
				537	***** SENSE BIT EQUATES *****		00005380
				538	*		00005390
				539	***** TAPE UNIT SENSE BYTE ZERO *****		00005400
				540	*		00005410
				541	*BACKWD EQU X'80' . DEVICE IN BACKWARD STATUS		00005420
000011				542	#NFP EQU X'11' . NOT FILE PROTECT SENSE BIT-BR ON DREG		00005430
000020				543	EOT EQU X'20' . END OF TAPE SENSE BIT		00005440
000012				544	#EOT EQU X'12' . BR ON D REG		00005450
000010				545	BOT EQU X'10' . BEGINNING OF TAPE SENSE BIT		00005460
000013				546	#BOT EQU X'13' . BR ON D REG		00005470
000008				547	WRSTAT EQU X'08' . WRITE STATUS BIT		00005480
000014				548	#WRSTAT EQU X'14' . BR ON D REG		00005490
000015				549	#START EQU X'15' . BR ON DREG		00005500
000002				550	DEVCHK EQU X'02' . DEVICE CHECK BIT		00005510
000017				551	#NOTBUSY EQU X'17' . NOT BUSY BIT-BR ON DREG		00005520
				552	*		00005530
				553	*****TAPE UNIT SENSE BYTE ONE *****		00005540
				554	*		00005550
000080				555	SEVTRK EQU X'80' . 7 TRACK BIT		00005560
000010				556	#SEVTRK EQU X'10' . BR ON DREG		00005570
000020				557	DUALDEN EQU X'20' . DUAL DENSITY		00005580
000012				558	#DUALDEN EQU X'12' . BR ON DREG		00005590
000010				559	NOTPE EQU X'10' . OTHER THAN 1600 BPI		00005600
000013				560	#NOTPE EQU X'13' . BR ON DREG		00005610
				561	*		00005620
				562	*****		00005630
				563	* EXTRA EQUATES		00005640
000010				564	PULSE EQU X'10' .		00005650
000013				565	TM9TRK EQU X'13' . TAPE MARK CONFIG FOR 9 TRK NRZI		00005660
00000F				566	TM7TRK EQU X'0F' . TAPE MARK CONFIG FOR 7 TRK NRZI		00005670
0000FF				567	ONES EQU X'FF' .		00005680
000000				568	ZERO EQU X'00' .		00005690
000017				569	#ALU1NRZ EQU X'17' . ALU1 XOUTA NRZI BIT		00005700
000001				570	ONE EQU X'01' . FOR INCREMENT		00005710
000040				571	DVESNS6 EQU X'40' . SENSE TO DRIVE FOR READ BUS & TACH		00005720
000014				572	#SELHIGH EQU X'14' . HI ORDER ADDR BIT		00005730

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				574	***** CONTROL UNIT SENSE EQUATES *****		00005750
000001				576	CONVCK EQU X'01' . SET DATA CONVERTER CHECK		00005770
000010				577	SEVENTRK EQU X'10' . SEVEN TRACK BIT		00005780
000040				578	INTREQ EQU X'40' . INTERVENTION REQUIRED		00005790
000040				579	TUSTA EQU X'40' . TU STATUS A		00005800
000020				580	TUSTB EQU X'20' . TU STATUS B		00005810
000008				581	LDPT EQU X'08' . LOAD POINT		00005820
000004				582	WRSTA EQU X'04' . WRITE STATUS		00005830
000002				583	FP EQU X'02' . FILE PROTECTED		00005840
000004				584	PE EQU X'04' . PHASE ENCODING		00005850
000002				585	BKWD EQU X'02' . BACKWARD		00005860
000010				586	EQCHK EQU X'10' . EQUIPMENT CHECK		00005870
000008				587	DATACK EQU X'08' . DATA CHECK		00005880
000008				588	UDETERR EQU X'08' . MICRO PGM DETECTED ERROR		00005890
				589	*		00005900
				591	***** MPGMERR REG MISC ERRORS *****		00005920
				592	*		00005930
000080				593	NOISE EQU X'80' . NOISE ERROR		00005940
000040				594	EXVCHG EQU X'40' . EXCESSIVE VELOCITY CHANGE WHILE WRT		00005950
000010				595	ENDATAER EQU X'10' . END DATA CHK		00005960
000001				596	NOTCAP EQU X'01' . NOT CAPABLE		00005970
				597	*****		00005980
				598	***** DATA CHECK REG ONE SENSE BYTE 8 *****		00005990
				599	*		00006000
000080				600	IBGDROP EQU X'80' . NOT DIAG MODE IBG DROP AFTER BLOCK		00006010
000040				601	FDTHRU EQU X'40' . FEED THROUGH CHECK		00006020
000010				602	FASTBGN EQU X'10' . EARLY IBG DROP OR DATA READY		00006030
000008				603	TSAGC EQU X'08' . TEMPORARY SAGC ERROR		00006040
000004				604	SLOWBGN EQU X'04' . SLOW BEGIN READ BACK CHK		00006050
000002				605	SLOWEND EQU X'02' . SLOW ENDING READ BACK CHK		00006060
000001				606	RESTART EQU X'01' . FLAG BIT FOR RESTART AND		00006070
000001				607	VELTRY EQU X'01' . VELOCITY RETRY		00006080
				608	*****		00006090
				609	***** DATA CHECK REG TWO SENSE BYTE 5 *****		00006100
				610	*		00006110
000020				611	WTMERR EQU X'20' . WRITE MARK ERROR		00006120
000010				612	FORMATCK EQU X'10' . PE ID BURST CHK		00006130
000008				613	STREADCK EQU X'08' . START READ CHECK		00006140
000004				614	PARTREC EQU X'04' . PARTIAL RECORD		00006150
000002				615	EXCPOST EQU X'02' . EXCESSIVE POSTABBLE		00006160
				616	*****		00006170
				617	***** EQUIPMENT CHECK REG SENSE BYTE 10 *****		00006180
				618	*		00006190
000080				619	REJCMD EQU X'80' . COMMAND STATUS REJECT		00006200
000040				620	REJTU EQU X'40' . REJECT TAPE UNIT		00006210
000020				621	REJCTRL EQU X'20' . CONTROL STATUS REJECT		00006220
000010				622	NBLOCK EQU X'10' . NO BLOCK ON WRITE OP		00006230
000008				623	DYREV EQU X'08' . DYNAMIC REVERSAL ERROR		00006240
000004				624	NTACH EQU X'04' . TACH START FAIL		00006250
000002				625	PERR EQU X'02' . PERMANENT SAGC ERROR		00006260
000001				626	VELOCERR EQU X'01' . DID NOT MAKE VELOCITY IN 28 CNTS		00006270
				627	*****		00006280

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	FO1MAY72	2/04/74
				628	***** FLAGS FOR OPERATION *****		00006290
				629	*		00006300
000001				630	MK800 EQU X'01'	NRZI MODE FLAG	00006310
000017				631	#MK800 EQU X'17'	BR ON DREG	00006320
000012				632	#FIRST EQU X'12'	BR ON DREG	00006330
000014				633	#CNTRDY EQU X'14'	BR ON DREG	00006340
000008				634	CNTRDY EQU X'08'	FLAG USED AFTER INITIAL 4 COUNT	00006350
000020				635	FIRST EQU X'20'	INDICATE FIRST ENTRY ON FC-3 VELOCITY	00006360
000080				636	DATATIM EQU X'80'	WRT DATA TIME IN VELOCITY RTN	00006370
000004				637	ERGOP EQU X'04'	ERASE GAP ROUTINE IN CTRL.	00006380
000002				638	WTMOP EQU X'02'	WRITE TAPE MARK ROUTINE IN CTRL.	00006390
000015				639	#ERGOP EQU X'15'	BR ON DREG	00006400
000004				640	FORFLAG EQU X'04'	FORCE HAS BEEN SET TO DF	00006410
000008				641	TAKTR EQU X'08'	TRACE BIT FOR TAK CTR	00006420
000014				642	#TAKTR EQU X'14'	BR ON DREG	00006430
000010				643	ERGFLAG EQU X'10'	FLAG BIT	00006440
000040				644	CHKBRST EQU X'40'	CHECK BURST FLG	00006450
000020				645	LPMARK EQU X'20'		00006460
000011				646	#CHKBRST EQU X'11'	BR ON DREG	00006470
000012				647	#LPMARK EQU X'12'	BR ON DREG	00006480
				648	*****		00006490
				649	*		00006500
				650	*		00006510
000010				651	#CREASER EQU X'10'	BR ON DREG	00006520
000080				652	CREASER EQU X'80'	CREASE TAPE (PE) FLAG	00006530
000002				653	READOP EQU X'02'	READ TRACE BIT	00006540
000016				654	#READOP EQU X'16'	BR ON DREG	00006550
000004				655	FILEOP EQU X'04'	FILE TRACE BIT	00006560
000010				656	IBGMARK EQU X'10'	IBG TRACE BIT	00006570
000013				657	#IBGMARK EQU X'13'	BR ON DREG	00006580
000040				658	BORMARK EQU X'40'	BOR MARK ON THE WALL	00006590
000011				659	#BORMARK EQU X'11'	BR ON DREG	00006600
000001				660	SPACEOP EQU X'01'	SPACE COMMAND BIT	00006610
000017				661	#SPACEOP EQU X'17'	BR ON DREG	00006620
000080				662	BACKWD EQU X'80'	BACKWARD BIT FOR READ OP	00006630
000010				663	#BACKWD EQU X'10'	BR ON DREG	00006640
000016				664	#WTMOP EQU X'16'	BR ON DREG	00006650
				665	*****		00006660
				666	*		00006670
				667	*****SET DIAGNOSE REGISTER EQUATES *****		00006680
				668	*		00006690
000004				669	LWROP EQU X'04'	SET LOOP WRITE TO READ FLAG	00006700
000015				670	#LWROP EQU X'15'	BR ON DREG	00006710
000017				671	#CHGDIR EQU X'17'	EQRLY EXIT BEFORE RAISE OF MOVE	00006720
000002				672	TUBOMSK EQU X'02'	SET WORK 5 TO TUBO	00006730
				673	*****		00006740
				674	***** CONTROL UNIT SENSE BYTES *****		00006750
				675	*		00006760
				676	* THE SENSE BITS WILL BE PRESENTED IN XOUTA OR XOUTB IN THE PROPER		00006770
				677	* POSITION TO BE OR'ED INTO THE CONTROL UNIT SENSE BYTE.		00006780
				678	* THE FOLLOWING SENSE BITS WITH '*' IN FRONT ARE SET OR DECODED		00006790
				679	* BY ALU2 ALL OTHERS ARE SET BY ALU1, C.U. HARDWARE OR DEVICE		00006800
				680	*****		00006810
				681	* SENSE BYTE 0	SENSE BYTE 11	00006820

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
682	*					*	00006830
683	*BIT				BIT	*	00006840
684	* 0				0 B1 BUS PARITY-LSR ADDRESS ERR	*	00006850
685	**1				1 ROS1 PARITY ERROR	*	00006860
686	* 2				2 XFR-LO IC1 ERROR	*	00006870
687	**3				3 INSTR DECODE 1HI IC-BR ON COND.	*	00006880
688	**4				4 MICRO-PGM DETECT MALFUNCTION	*	00006890
689	* 5				5 D BUS PARITY ALU1	*	00006900
690	* 6				6 SPARE	*	00006910
691	**7				7 BRANCH ON COND.(BOC) ALU1	*	00006920
692	*****				*****	*	00006930
693	*				SENSE BYTE 1	*	00006940
694	*				SENSE BYTE 12	*	00006950
695	*BIT				BIT	*	00006960
696	**0				0 B2 BUS PARITY-LSR ADDRESS ERROR	*	00006970
697	**1				1 ROS2 PARITY ERROR	*	00006980
698	**2				2 XFR-LO IC2 ERROR	*	00006990
699	**3				3 INSTR DECODE 2(HI IC)BR ON COND.	*	00007000
700	**4				*4 MICRO-PGM DETECT MALFUNCTION	*	00007010
701	**5				5 D BUS PARITY ALU2	*	00007020
702	**6				6 SPARE	*	00007030
703	**7				7 BRANCH ON COND.(BOC)ALU2	*	00007040
704	*****				*****	*	00007050
705	*				SENSE BYTE 2	*	00007060
706	*				SENSE BYTE 13	*	00007070
707	* TRACK IN ERROR				BIT	*	00007080
708	*				0 < 00 NO FEATURES	*	00007090
709	*				1 < 01 7 TRACK FEATURE	*	00007100
710	*				< 10 9 TRACK FEATURE	*	00007110
711	*				< 11 SPARE	*	00007120
712	*					*	00007130
713	*				2 THRU 7 CU SERIAL NO - HIGH	*	00007140
714	*****				*****	*	00007150
715	*				SENSE BYTE 3	*	00007160
716	*				SENSE BYTE 14	*	00007170
717	*BIT				CONTROL UNIT UNIQUE ID-LOW	*	00007180
718	* 0				R-W VRC	*	00007190
719	* 1				MULTIPLE TRACK IN ERR/LRCR	*	00007200
720	* 2				SKEW	*	00007210
721	* 3				END DATA CHECK-CRCR	*	00007220
722	* 4				SKEW REG VRC/ENV CHECK	*	00007230
723	* 5				1600 BPI SET IN TU	*	00007240
724	* 6				BACKWARD	*	00007250
725	* 7				C COMPARE	*	00007260
726	*****				*****	*	00007270

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	FO1MAY72	2/04/74
728	*				SENSE BYTE 4		* 00007290
729	*BIT				SENSE BYTE 17		* 00007300
730	**0				0 MULTI INTERFACE SW		* 00007310
731	**1				1< 000 SELECTION LOGIC		* 00007320
732	**2				2< 001 2 X 8 DEV ADDR LOW		* 00007330
733	* 3				3< 010 3 X 8 DEV ADDR LOW		* 00007340
734	**4				< 011 4 X 8 DEV ADDR LOW		* 00007350
735	**5				< 100 COMMUNICATOR FEAT ONLY		* 00007360
736	**6				< 101 2 X 8 DEV ADDR HIGH		* 00007370
737	* 7				< 110 3 X 8 DEV ADDR HIGH		* 00007380
738	*				< 111 4 X 8 DEV ADDR HIGH		* 00007390
739	*				4 THRU 7 EC LVL OF CU		* 00007400
740	*						* 00007410
741	*****						* 00007420
742	*				SENSE BYTE 5		* 00007430
743	*				SENSE BYTE 18		* 00007440
744	*BIT				BIT		* 00007450
745	* 0				0 POWER CHECK AND OVERTEMP		* 00007460
746	* 1				1 SPARE		* 00007470
747	**2				2 SPARE		* 00007480
748	**3				3 SPARE		* 00007490
749	**4				4 EC LEVEL OF DRIVE		* 00007500
750	**5				5 EC LEVEL OF DRIVE		* 00007510
751	**6				6 EC LEVEL OF DRIVE		* 00007520
752	* 7				7 EC LEVEL OF DRIVE		* 00007530
753	*						* 00007540
754	*****						* 00007550
755	*				SENSE BYTE 6		* 00007560
756	*				SENSE BYTE 19		* 00007570
757	*BIT				BIT		* 00007580
758	* 0				0 PRIMED FOR DEV END DR 7		* 00007590
759	* 1				1 PRIMED FOR DEV END DR 6		* 00007600
760	* 2				2 PRIMED FOR DEV END DR 5		* 00007610
761	* 3				3 PRIMED FOR DEV END DR 4		* 00007620
762	* 4				4 PRIMED FOR DEV END DR 3		* 00007630
763	* 5				5 PRIMED FOR DEV END DR 2		* 00007640
764	* 6				6 PRIMED FOR DEV END DR 1		* 00007650
765	* 7				7 PRIMED FOR DEV END DR 0		* 00007660
766	*						* 00007670
767	*****						* 00007680
768	*				SENSE BYTE 7		* 00007690
769	*				SENSE BYTE 20		* 00007700
770	*BIT				BIT		* 00007710
771	* 0				0 PRIMED FOR DEV END DR F		* 00007720
772	* 1				1 PRIMED FOR DEV END DR E		* 00007730
773	* 2				2 PRIMED FOR DEV END DR D		* 00007740
774	* 3				3 PRIMED FOR DEV END DR C		* 00007750
775	* 4				4 PRIMED FOR DEV END DR B		* 00007760
776	* 5				5 PRIMED FOR DEV END DR A		* 00007770
777	* 6				6 PRIMED FOR DEV END DR 9		* 00007780
778	* 7				7 PRIMED FOR DEV END DR 8		* 00007790
779	*						* 00007800
780	*****						* 00007810

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
782	*				SENSE BYTE 8		* 00007830
783	*					SENSE BYTE 21	* 00007840
784	*BIT					BIT	* 00007850
785	**0				IBG DROP WHILE WRITING	0 LOAD BUTTON DEPRESSED	* 00007860
786	**1					1 LEFT REEL TURNING	* 00007870
787	* 2					2 RIGHT REEL TURNING	* 00007880
788	**3				EARLY BEGIN READ BACK CHECK	3 TAPE PRESENT	* 00007890
789	**4				SAGC	4 REELS LOADED	* 00007900
790	**5				SLOW BEGIN ECK K	05 LOAD REWIND	* 00007910
791	**6				SLOW END READ BACK CHECK	6 LOAD COMPLETE	* 00007920
792	**7				VELOCITY RETRY OR RESTART	7 LOAD CHECK	* 00007930
793	*						* 00007940
794	*****						* 00007950
795	*				SENSE BYTE 9	SENSE BYTE 22	* 00007960
796	*						* 00007970
797	*BIT					FRU IDENTIFIERS(CU)-ALU 1	* 00007980
798	* 0				GCR CORRECTION		* 00007990
799	**1				VELOCITY DURING WRITE	SENSE BYTE 23	* 00008000
800	* 2				CHANNEL BUFFER CK		* 00008010
801	* 3				CRC III	*FRU IDENTIFIERS(CU)-ALU 2	* 00008020
802	* 4				6250 TCU		* 00008030
803	* 5				SPARE		* 00008040
804	* 6				SPARE		* 00008050
805	* 7				CONTROL UNIT RESERVED		* 00008060
806	*						* 00008070
807	*****						* 00008080
808	*				SENSE BYTE 10		* 00008090
809	*						* 00008100
810	*BIT						* 00008110
811	**0				COMMAND STATUS REJECT		* 00008120
812	* 1				SPARE		* 00008130
813	**2				CONTROL STATUS REJECT		* 00008140
814	**3				NO BLK ON RECORD READ BACK CHK		* 00008150
815	**4				DYNAMIC REVERSAL ERROR		* 00008160
816	**5				TACH START FAIL		* 00008170
817	* 6						* 00008180
818	**7				VELOCITY CHECK		* 00008190
819	*****						* 00008200

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
000000				821	BEGIN CSECT		00008220
				822	*****		00008230
				823	***** ALU2 ROS ENTRY BRANCH TABLE *****		00008240
				824	*****		00008250
				825	* ALU2 IS ALWAYS SLAVED TO ALU1. ANY OPERATION EXECUTED BY ALU2	*	00008260
				826	* MUST ALWAYS BE INITIATED BY ALU1 VIA A XOUTB. THE XOUTB BY ALU1	*	00008270
				827	* TRAPS ALU2 TO LOCATION 000. ALU2,BEGINNING EXECUTION AT 000,	*	00008280
				828	* FETCHES AN INDEX BYTE FROM ALU1 AND MOVES IT TO THE INSTRUCTION	*	00008290
				829	* COUNTER. THE INDEX BYTE WILL POINT TO ONE OF THE BRANCH INSTRUCT-	*	00008300
				830	* IONS IN THE BRANCH TABLE. THE SELECTED BRANCH INST WILL BE	*	00008310
				831	* EXECUTED AND THE DESIRED ROUTINE WILL BE ENTERED. WHEN THE	*	00008320
				832	* SELECTED ROUTINE COMPLETES, STAT D WILL BE SET INDICATING TO	*	00008330
				833	* ALU1 THAT THE DESIRED FUNCTION HAS BEEN COMPLETED. ALU2 WILL THEN	*	00008340
				834	* BE HELD AT LOCATION 000 UNTIL ACTUATED BY ALU1 VIA XOUTB TRAP	*	00008350
				835	*****		00008360
000000				837	STEP0001 EQU *		00008380
000000	4188			839	BYPASS XFR WORK2,XINB	FETCH ALU1 INDEX	00008390
000001				841	STEP0002 EQU *		00008400
000001	0400			843	STO STATIMG,ZERO	CLEAR STAT IMAGE REG	00008410
000002				845	STEP0003 EQU *		00008420
000002	1400			847	STOH STATIMG,0	CLEAR STAT IMAGE REG HIGH	00008430
000003				849	STEP0004 EQU *		00008440
000003	4428			851	XFR STATIMG,STAT	CLEAR ANY OUTSTANDING STATS	00008450
000004				853	STEP0005 EQU *		00008460
000004	4122			855	XFR WORK2,IC	MOVE INDEX TO INST CTR	00008470
000005				857	STEP0074 EQU *		00008480
000005	659C			859	NDXTST3 BU EXECTST3	GO DO ALU 2 CHECKOUT	00008490
000006	61BB			862	NDXDES BU EXECDES	HIO NOT OPRTING--GO DESELECT TU	00008500
000007	634D			865	NDXPOLL BU EXECPOLL	GO POLL DEVICE FOR STATUS	00008510
000008				867	STEP0006 EQU *		00008520
000008	61A1			869	NDXGRST BU EXECGRST	GO DO GENERAL RESET	00008530
000009	61A7			872	NDXSRST BU EXECSRST	GO DO SELECTIVE RESET	00008540
00000A	6202			875	NDXSDE BU EXECSDE	GO SET DEVICE END	00008550
00000B	61CB			878	NDXABRT BU EXECABRT		00008560
00000C	6563			881	NDXDMMR BU EXECDMMR	GO DO DIAG MEASERE	00008570
00000D	658D			884	NDXAXESS BU ACCESS	GO GET READ ACCESS TIME	00008580
00000E	4590			887	NDXFLAGS XFR FLAGS,XINA	BRING IN FLAG BYTE	00008590
00000F				889	NDXSNSR EQU *		00008600
00000F	61A9			891	BU ZAPIM	USE ON SENSE RESET & SEL RESET RETURN	00008610
000010	5590			894	NDXFLAG2 XFR WORK5,XINA	GET TUBO MASK (SET FLAGS #3)	00008620

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
000011				897	STEP0062 EQU *		00008640
000011	0401			899	SETDLONE STO STATIMG,SETSTATD	TURN ON STATD	00008650
000012				901	STEP0063 EQU *	RETURN TO ADDRESS 000	00008660
000012	4428			903	XFR STATIMG,STAT	AND STOP	00008670
				906	***** WRITE ROUTINE *****		00008690
				907	* INITIAL ENTRY ON WRITE COMMANDS EITHER PE, NRZI OR LWR EITHER	*	00008700
				908	* DENSITY. THE COMMAND IS SET IN REGISTER WORK4 AND REGISTER LINK1	*	00008710
				909	* CONTAINS THE ADDRESS OF THE ENTRY TO THE WRITE ROUTINE IN 'PAGE 2'	*	00008720
				910	* PART OF THIS ROUTINE IS SHARED BY WTM AND ERG ROUTINES	*	00008730
				911	*****		00008740
000013	0800			914	EXECWRT STO TRACER,ZERO	SET IDENTITY	00008760
000014	0308			917	SETUP STO WORK4,WRITE	SET WRITE COMMAND	00008770
000015	1C0F			920	STO LINK1,WRTSTR	SET RETURN ENTRY	00008780
000016	3A18			923	TESTLWR BOC STATC,SETLPCMD	BR IF LWR OR LWTM	00008790
000017	6733			926	BU NEEDERG	BR TO TURNAROUND	00008800
				929	*****		00008820
				930	* STATC ON FROM ALU1 INDICATES A LWR OR LWTM.	*	00008830
				931	* THE COMMAND IS SET TO ALLOW TURN-AROUND ROUTINE TO PROCESS THE	*	00008840
				932	* COMMAND AND SET DATA FLOW MASKS. THERE WILL NOT BE ANY TURNAROUND	*	00008850
				933	* DELAYS TAKEN.		00008860
				934	*****		00008870
000018				936	SETLPCMD EQU *		00008890
000018	0328			938	WRSTALP STO WORK4,WRITE+SETDIAG	SET WRITE AND DIAG CMD	00008900
000019	C6EF			941	AND SENSE1,ONES-BOT	TURN OFF BOT IF ON	00008910
00001A	341D			944	BOC WRTSTAT,GOTURN	BR WRITE STATUS	00008920
00001B	301E			947	BOC BACKWD,RDBKLP	BR BACKWARD STATUS	00008930
00001C	0360			950	STO WORK4,RDFWDD+SETDIAG	SET READ FWD AND DIAG CMD	00008940
00001D	6138			953	GOTURN BU TRNARN	GO TO TURNAROUND	00008950
00001E	03A0			956	RDBKLP STO WORK4,RDBKWD+SETDIAG	SET READ BKWD AND DIAG CMD	00008960
00001F	6138			959	BU TRNARN	GO TO TURNAROUND	00008970
				962	***** WRITE TAPE MARK ROUTINE *****		00008990
				963	* INITIAL ENTRY ON WRITE TAPE MARK COMMAND EITHER PE, NRZI	*	00009000
				964	* OR LOOP WRITE TAPE MARK.	*	00009010
				965	* THE WTM TRACE BIT IS SET ON IN TRACER REGISTER AND THEN	*	00009020
				966	* A BRANCH IS MADE TO SHARE THE REST OF THE SET UP WITH	*	00009030
				967	* THE WRITE ROUTINE.	*	00009040
				968	*****		00009050
000020	0802			970	EXECWTM STO TRACER,WTMOP	SET ROUTINE IDENTITY	00009060
000021	6014			973	BU SETUP	GO GET GOING	00009070

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				976	***** ERASE RECORD GAP *****		00009090
				977	* INITIAL ENTRY FOR ERASE GAP OP. THE REG TRACE BIT IS SET		* 00009100
				978	* IN THE TRACER REGISTER AND A BRANCH MADE TO SHARE THE REST OF THE		* 00009110
				979	* SETUP WITH THE WRITE ROUTINE.		* 00009120
				980	* THE TAK ROUTINE WILL DO THE COUNTING OF TACH PULSES AND ALSO		* 00009130
				981	* MONITER THE TU BUS IN TO ASSURE NO DATA IS PRESENT. IF ANY DATA		* 00009140
				982	* IS DETECTED THEN NOISE ERROR WILL BE SET.		* 00009150
				983	*		* 00009160
				984	* THERE ARE 106 TACH PULSES PER IN.		* 00009170
				985	*****		00009180
000022	0804			988	EXECERG STO TRACER, ERGOP	SET ERASE GAP OPERATION FLAG	00009200
000023	6014			991	BU SETUP	GO CONTINUE SET UP	00009210
000024	1948			995	ERGSTR STO LINK2, GOENDUP	SET UP RETURN TO ENDUP	00009230
000025	01B4			998	ERGCTR STO WORK2, ONES-75	SET COUNT FOR 336	00009240
000026	00FE			1001	STO WORK1, ONES-1	TAC COUNTS	00009250
000027	8810			1004	SETERGF ORI TRACER, ERGFLAG	SET FLAG TO CHECK FOR ERROR	00009260
000028	621C			1007	BU TAKS	GO TO TAK RTN	00009270
				1010	***** REWIND OR REWIND UNLOAD *****		00009290
				1011	* REWIND, REWIND UNLOAD AND DATA SECURITY ERASE SHARE A		* 00009300
				1012	* COMMON ROUTINE. THE ENTRY POINTS VARY SO THE COMMAND		* 00009310
				1013	* CAN BE SET IN WORK4. REWIND UNLOAD WILL SET STAT C ON		* 00009320
				1014	* THEN STAT A IS SET TO IDENTIFY THESE THREE COMMANDS TO		* 00009330
				1015	* TURNAROUND ROUTINE AND TO ENDUP ROUTINE.		* 00009340
				1016	*****		00009350
000029	0380			1018	EXECRWU STO WORK4, RUN	LOAD REWIND UNLOAD CMD	00009360
00002A	8402			1021	ORI STATIMG, SETSTATC	FLAG UNIT CHK	00009370
00002B	1CD0			1024	LKREWRUN STO LINK1, ENDUP	SET RETURN ADDRESS AFTER CMD EXEC	00009380
00002C	8408			1027	CTRLSETA ORI STATIMG, SETSTATA	SET STATA ON TO	00009390
00002D	4428			1030	XFR STATIMG, STAT	INDICATE REW, RUN OR DSE	00009400
00002E	6138			1033	SCOOT BU TRNARNND	GO TO TURNA ROUND	00009410
00002F	0301			1037	EXECRWD STO WORK4, REWIND	LOAD REW CMD	00009430
000030	602B			1040	BU LKREWRUN	GO SET LINKAGE REG & STAT A	00009440
				1043	***** DATA SECURITY ERASE *****		00009460
				1044	* INITIAL ENTRY FOR DATA SECURITY ERASE OP.		* 00009470
				1045	* THE COMMAND IS SET IN WORK 4 REGISTER AND A BRANCH IS		* 00009480
				1046	* MADE TO SHARE THE SETUP WITH REWIND AND REWIND		* 00009490
				1047	* IF ALL TESTS ARE OK. THE DRIVE WILL THEN CONTINUE TO ERASE		* 00009500
				1048	* TO END OF TAPE.		* 00009510
				1049	*****		00009520
000031	0304			1052	EXECDSE STO WORK4, ERGTOTI	PUT CMD IN LSR	00009540
000032	602B			1055	BU LKREWRUN	GO SET STATA ON	00009550

LOC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT

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1059 ***** 00009580
1060 * 00009590
1061 * 00009600
1062 ***** 00009610
1063 * *** ** * 00009620
1064 * * * * * 00009630
1065 * *** ** * 00009640
1066 * * * * * 00009650
1067 * * * * * 00009660
1068 *****READ OPERATION INPUT BRANCH TABLE***** 00009670
1069 * 00009680
1070 * DEPENDING ON THE TYPE OF OPERATION- ONE OF THE SIX INPUT LEGS WILL * 00009690
1071 * BE SELECTED. EACH LEG STORES AN APPROPRIATE TRACER ( NOT CE TRACE ) * 00009700
1072 * TO ENABLE THE MICROPROGRAM TO KEEP TABS ON WHAT IT IS DOING..THE SIX* 00009710
1073 * INPUT LEGS AND THE TRACERS THEY SET ARE; * 00009720
1074 * 1. READ BACKWARD TRACER 6 * 00009730
1075 * 2. READ FORWARD TRACER 6 * 00009740
1076 * 3. BACKSPACE FILE TRACER 5 * 00009750
1077 * 4. FORWARD SPACE FILE TRACER 5 * 00009760
1078 * 5. BACKSPACE RECORD TRACER 7 * 00009770
1079 * 6. FORWARDSpace RECORD TRACER 7 * 00009780
1080 * 00009790
1081 * TRACE REG * 00009800
1082 * 0 CREASER * 00009810
1083 * 1 BOR TRACE * 00009820
1084 * 2 CREASE POSSIBLR * 00009830
1085 * 3 IBGTRACE * 00009840
1086 * 4 TACH TRACE * 00009850
1087 * 5 FILE OP * 00009860
1088 * 6 READ OP * 00009870
1089 * 7 SPACE OP * 00009880
1090 ***** 00009890

000033 0802 1093 EXECRDF STO TRACER,READOP TURN ON THE READ TRACER 00009910
000034 6038 1096 BU SETFWD 00009920
000035 0804 1100 EXECFSF STO TRACER,X'04' TURN ON FILE TRACER 00009940
000036 6038 1103 BU SETFWD 00009950
000037 0801 1107 EXECFSR STO TRACER,SPACEOP TURN ON SPACE TRACER 00009970
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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				1110	*****		00009990
				1111	* NOW THAT THE OP TRACERS ARE STORED, PUT THE PROPER READ COMMAND	*	00010000
				1112	* IN WORK4 AND BRANCH TO START TAPE MOTION.	*	00010010
				1113	*****		00010020
000038	0340			1116	SETFWD STO WORK4,RDFWDD	SET RD FWD TO LSR	00010040
000039	6040			1119	BU CHGDIREC	ALL SET,GO AHEAD	00010050
00003A	0802			1123	EXECRDB STO TRACER,READOP	TRN ON READ TRACER	00010070
00003B	603F			1126	BU SETBKWD		00010080
00003C	0804			1129	EXECBSF STO TRACER,FILEOP	TRN ON THE FILE TRACER	00010090
00003D	603F			1132	BU SETBKWD		00010100
00003E	0801			1135	EXECBSR STO TRACER,SPACEOP	TRN ON THE SPACE TRACER	00010110
00003F	0380			1138	SETBKWD STO WORK4,RDBKWD	SET RD BKWD TO LSR	00010120
000040	1C56			1141	CHGDIREC STO LINK1,STARTAPE	SET UP RETURN REG	00010130
000041	6138			1144	BU TRNARND	AND BR TO TURNAOUND	00010140
000042	0009			1147	CREMOVE STO WORK1,DEVSEL+MOVE	BRING MOVE	00010150
000043	1000			1150	STOH WORK1,0	SET HIGH SENSE	00010160
000044	5060			1153	XFRH WORK1,TUBO	TO TAPE UNIT	00010170
000045	4024			1156	XFR WORK1,TUTAG	BACK UP	00010180

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				1161	*****		00010220
				1162	* READ -- NOT LOAD POINT		00010230
				1163	*****		00010240
				1164	* THIS IS THE ENTRY POINT IF BOT IS NOT ON IN TU SENSE	BYTE 0.	00010250
				1165	* HERE WE CYCLE UNTIL A BOR,TU INTERRUPT,TAPE MARK OR IBG DROPS US		00010260
				1166	* OUT OF THE LOOP. A TM WILL NOT DROP US OUT OF THE LOOP UNTIL WE		00010270
				1167	* ARE SATISFIED THAT IT IT A TRUE TAPE MARK (20 CELLS OF TM BOC).		00010280
				1168	*****		00010290
000046				1170	MODE6400 EQU *		00010310
000046	8440			1172	READTAPE ORI STATIMG,PERMRDWT	SET READ CONDITION	00010320
000047	4428			1175	XFR STATIMG,STAT	TO DATA FLOW	00010330
000048	D802			1178	ANDM TRACER,READOP	IF WE ARE NOT A READ OP	00010340
000049	204C			1181	BOC DBUS,NOTREAD	DONT SET SYNC	00010350
00004A	8D10			1184	ORI XOUTAIM,SYNC	IMAGE SYNC	00010360
00004B	4D42			1187	XFR XOUTAIM,XOUTA	SET SYNC TO HARDWARE	00010370
00004C	0101			1190	NOTREAD STO WORK2,1	SET NOISE BIT FOR ALU1	00010380
00004D	00EC			1193	SETUXCNT STO WORK1,ONES-19	SET CNT FOR 20 BIT CELLS	00010390
00004E	0244			1196	STO WORK3,ONES-187	LOAD SAGC ID CTR	00010400
00004F	0300			1199	STO WORK4,0	CLEAR SKEW CTR	00010410
000050	09FA			1202	STO FRU,ONES-5	SET NOISE RECORD BYPASS	00010420
000051	2453			1205	CHKCLOCK BOC RDTIME,CHKBOR	WAIT FOR READTIME	00010430
000052	6051			1208	BU CHKCLOCK	TO RISE	00010440
000053	2E6B			1211	CHKBOR BOC BOR,TRACEBOR	BR ON BOR	00010450
000054	3FB2			1214	CHKINTPT BOC DEVATTN,ABORTRD	BR ON TU INTERRUPT	00010460
000055	9D0C			1217	ORM XOUTAIM,0	TEST LSR	00010470
000056	3158			1220	BOC DREG1,FWDRD	BR IF FWD STATUS ON	00010480
000057	38CA			1223	BOC 6250,LOOKSUM	BR IF GCR	00010490
000058	3D61			1226	FWDRD BOC NTM,CHKIBG	BR IF TAPE MARK NOT DET	00010500
				1229	*****		00010520
				1230	* POSSIBLE TM CONFIGURATION.BUMP A COUNTER AMD RETURN.WHEN COUNT		00010530
				1231	* GETS LARGE ENOUGH, CALL IT A TM AND GO WAIT FOR IBG		00010540
				1232	* 20 BIT CELLS OF TM BOC NEEDED TO RECOGNIZE A TAPE MARK.		00010550
				1233	* THESE 20 BIT CELLS DO NOT HAVE TO BE CONTIGUOUS.		00010560
				1234	*****		00010570
000059	A001			1236	TMCONFIG ADD WORK1,1	BUMP UEX CNT BY ONR	00010580
00005A	2161			1239	BOC NALCO,CHKIBG	*****	00010590
00005B	CDEF			1242	AND XOUTAIM,ONES-SYNC	RESET SYNC - DONT NEED UT	00010600
00005C	4D42			1245	XFR XOUTAIM,XOUTA		00010610
00005D				1247	CHKUEX EQU *		00010620
00005D	9800			1249	ORM TRACER,0	GET TRACE REG TO DBUS FOR BRANCHING	00010630
00005E	35AF			1252	BOC DREG5,WAITEND	SKIP IF FILE SEARCH IS ON	00010640
				1254	* SET UNIT EXCEPTION		00010650
00005F	8404			1256	ORI STATIMG,SETSTATB	TRN ON STAT B FOR ENDUP	00010660
000060	60AF			1259	BU WAITEND	FLAGS UNIT EXCEPTION TO ALU1	00010670
000061	2F87			1262	CHKIBG BOC IBG,IBGYES1	BR IF IBG IS ON	00010680
000062	A301			1265	ADD WORK4,1	BUMP SKEW CTR	00010690
000063	3C69			1268	BOC NBLOCK,CLOCKWAIT	BR NO DATA DETECTED	00010700
000064	D820			1271	ANDM TRACER,X'20'	IS FWD HITCH ON	00010710
000065	2069			1274	BOC DBUS,CLOCKWAIT	BE GOING ON IF NOT	00010720
000066	A901			1278	BLOCKCHK ADD FRU,1	BUMP BYPASS CNT BY 1	00010740

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		
000067	2169			1281	BOC NALCO,CLOKWAIT	RETURN ON NO CARRY	F01MAY72 2/04/74 00010750
000068	8810			1284	ORI TRACER,IBGMARK	TURN ON IBGTRACE	00010760
000069	2469			1287	CLOKWAIT BOC RDTIME,CLOKWAIT	WAIT FOR READTIME	00010770
00006A	6051			1290	BU CHKCLOCK	TO FALL	00010780
				1296	*****		00010830
				1297	* A BOR DETECTED WILL GET US HERE , BUT IF WE ARE NOT A READ OP		* 00010840
				1298	* WE WILL RETURN TO THE ORIGINAL LOOP.		* 00010850
				1299	*****		00010860
00006B	8840			1301	TRACEBOR ORI TRACER,BORMARK	TURN ON BOR TRACE BIT	00010870
00006C	367A			1304	BOC READOP,READYES	BR IF A READ OP	00010880
00006D	6054			1307	BU CHKINTPT	GO BACK TO STARTING LOOP	00010890

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				1312	*****		00010930
				1313	* WE ARE NOW A READ OP SO COUNT BIT CELLS- THEN DROP SYNC AND		00010940
				1314	* NOT ALLOW ENVELOPE LOSS TO THE DATA FLOW,ALSO SET READ CONDITION.		00010950
				1315	*****		00010960
00006E	A901			1318	CNTABIT2 ADD FRU,1		00010980
00006F	2176			1321	BOC NALCO,TRYAGAIN	BUMP CTR BY 1 TEST FOR CTR 16	00010990
000070				1324	COUNT16 EQU *		00011010
000070	8D20			1326	ORI XOUTAIM,NOLOSS	TRN NOLOSS ON	00011020
000071	4D42			1329	XFR XOUTAIM,XOUTA	STROBE CONTROLS	00011030
000072	9D00			1332	ORM XOUTAIM,0	TEST FOR LOGAIN	00011040
000073	3684			1335	BOC DREG6,FORCEON	BR IF LOGAIN IS ON	00011050
000074	09FA			1338	STO FRU,ONES-5	SET CT FOR 6	00011060
000075	8D02			1341	ORI XOUTAIM,LOGAIN		00011070
000076	2FAC			1344	TRYAGAIN BOC IBG,SETRDCHK	ABEND IF IBG	00011080
000077	2476			1347	BOC RDTIME,TRYAGAIN	WAIT FOR RD TIME TO FALL	00011090
000078	607C			1350	BU CNTABIT	GO COUNT AGAIN IT	00011100
000079	62AB			1353	NOT1600A BU NOT1600		00011110
00007A	3879			1357	READYES BOC 6250,NOT1600A	BR IF 6250 MODE	00011130
00007B	09F5			1360	STO FRU,ONES-10	SET CNT FOR 11 BIT CELLS	00011140
00007C	246E			1364	CNTABIT BOC RDTIME,CNTABIT2	WAIT FOR READTIME TO RISE	00011160
00007D	607C			1367	BU CNTABIT		00011170
				1371	*****		00011200
				1372	* WE HAVE NOW UNBLOCKED THE DATA FLOW READ CIRCUITS,SO WE WILL		00011210
				1373	* CYCLE LOOKING FOR IBG,DATA READY OR TIMEOUT . DATA READY IS		00011220
				1374	* IS THE PROPER EXIT. ALL OTHERS WILL SET UNIT CHECK.		00011230
				1375	*****		00011240
00007E	A906			1379	COUNTPRE ADD FRU,6	BUMP TIME OUT COUNT	00011270
00007F	2181			1382	BOC NALCO,CKDTARDY	WHILE WAITING FOR BEG ONES	00011280
000080	60AC			1384	* TIME OUT EQUALS 40 BIT CELLS WITHOUT SEEING BEGINNING ONES		00011290
000081	2FAC			1386	BU SETRDCHK	GO SET START READ CHK	00011300
000082	2D8E			1389	CKDTARDY BOC IBG,SETRDCHK	BR IF IBG IS ON	00011310
000083	2481			1392	BOC DATARDY,PREAMBOK	WE WANT TO BR HERE ON DATA RDY	00011320
000084	247E			1395	BOC RDTIME,CKDTARDY	WAIT FOR READ TIME TI FALL	00011330
000085	2D8E			1398	FORCEON BOC RDTIME,COUNTPRE	WAIT	00011340
000086	6084			1401	BOC DATARDY,PREAMBOK	FOR ERADTIME	00011350
				1404	BU FORCEON	TO RISE	00011360

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				1410	*****		00011410
				1411	* WE WILL END UP HERE WHEN AN IBG IS DETECTED, IN TWO INSTANCES.		* 00011420
				1412	* THE FIRST IS WHILE WE ARE WAITING FOR IBG TO FALL AFTER WE START		* 00011430
				1413	* TAPE MOVING. IN THIS CASE WE WILL GO RIGHT BACK TO THE MAIN LOOP.		* 00011440
				1414	* THE SECOND IS ON A SPACE OP WHEN THE ENDING IBG IS DETECTED.		* 00011450
				1415	*****		00011460
000087	9800			1417	IBGYES1 ORM TRACER,0 GET TRACE REG TO DBUS FOR TESTING		00011470
000088	318B			1420	BOC BORMARK,IBGYES2 BR IF BOR TRACE IS ON		* 00011480
000089	338B			1423	BOC IBGMARK,IBGYES2 BR IF IBG TRACE IS ON		* 00011490
00008A	6069			1426	BU CLOKWAIT GO BACK TO START LOOP		00011500
00008B	37AF			1429	IBGYES2 BOC SPACEOP,WAITEND BR IF SPACE OP IS ON		00011510
00008C	C8AF			1432	AND TRACER,ONES-BORMARK-IBGMARK RESET TRACERS		00011520
00008D	604D			1435	BU SETUXCNT GO BACK TO START LOOP + RESET UEX CT		00011530
				1439	*****		00011560
				1440	* TO GET HERE WE MUST BE DOING A READ OP AND HAVE SEEN DATA READY.		* 00011570
				1441	* THE MAIN JOB NOW IS TO ASSURE END DATA IS FLAGGED NEXT. IBG		* 00011580
				1442	* SIGNALS AN ERROR CONDITION		* 00011590
				1443	*****		00011600
00008E	2891			1445	PREAMBOK BOC ENDATA,READEND BR IF END DATA COMES ON		00011610
00008F	2FAA			1448	BOC IBG,SETPARTL B0 IF IBG COMES ON		00011620
000090	608E			1451	BU PREAMBOK HANG TILL RECORD ENDS		00011630
				1455	*****		00011660
				1456	* NORMAL READ END- WE HAVE NOW SEEN END DATA. NOW WE MUST COUNT		* 00011670
				1457	* THE POSTAMBLE DATA READYS TO ASSURE PROPER LENGTH . 25 BYTES INTO		* 00011680
				1458	* THE PREAMBLE,SYNC IS RESET TO KEEP THE VFC FROM FALLING INTO THE		* 00011690
				1459	* IBG. FROM THAT POINT ON TIME SENSE IS USED TO MEASURE TO THE IBG		* 00011700
				1460	* TIME. A SECOND CHECK IS MADE TO ASSURE AT LEAST SIX CELLS OF BURST		* 00011710
				1461	* OCCUR AFTER ENDDATA. IF NOT,END DATA CHK IS SET ALONE.		* 00011720
				1462	*****		00011730
000091	09E7			1464	READEND STO FRU,ONES-24 LOAD THE COMP OF DEC 25		00011740
000092	2D9C			1467	RDYWAIT1 BOC DATARDY,CNTRDY1 BR TO CT ONE DATA RDY		00011750
000093	2F99			1470	BOC IBG,CHKPOST BR TO EXIT		00011760
000094	2D9C			1473	BOC DATARDY,CNTRDY1		00011770
000095	6092			1476	BU RDYWAIT1 WAIT FOR DATA RDY TO RISE		00011780
000096	3FB2			1479	IBGLOOK1 BOC DEVATTN,ABORTRD ABEND ON TU DEV END		00011790
000097	2D96			1482	BOC DATARDY,IBGLOOK1 HANG IN LOOP TILL DATA RDY FALLS		00011800
000098	6092			1485	BU RDYWAIT1 NOW GO WAIT FOR NEXT DATA RDY		00011810
000099	B90C			1489	CHKPOST ADDM FRU,12 ASSURE AT LEAST		00011830
00009A	21A6			1492	BOC NALCO,SETENDCK 6 BIT CELLS OCCUR		00011840
00009B	60B4			1495	READX BU STOPREAD AFTER ENDING ONES		00011850
00009C	A901			1499	CNTRDY1 ADD FRU,1 ADD ONE TO CNT		00011870
00009D	2196			1502	BOC NALCO,IBGLOOK1 STAY TILL CT 25 CTED		00011880
00009E	CD0C			1505	AND XOUTAIM,ONES-LOGAIN-SYNC-NOLOSS		00011890
00009F	4D42			1508	XFR XOUTAIM,XOUTA RESET CONTROLS		00011900
0000A0	09E7			1511	STO FRU,ONES-24 LOAD NEW CTR		00011910
0000A1	24A1			1514	X10X BOC RDTIME,X10X WAIT FOR FALL		00011920
0000A2	2F9B			1517	BOC IBG,READX NORMAL EXIT		00011930
0000A3	A901			1520	ADD FRU,1 BUMP CRT		00011940

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	2/04/74
0000A4	21A8			1523	BOC	NALCO,X11X	BR IF O K YET	00011950	
				1526 *		***** SET EXCESSIVE POSTAMBLE *****		00011970	
0000A5	8A02			1529	ORI	DTACHK2,EXCPOST	EXCESSIVE POST AMBLE	00011990	
				1532 *		***** SET END DATA CHECK *****		00012010	
0000A6	1810			1535	SETENDCK	STO	MPGMERR,ENDATAER	SET END DATA CHK	00012030
0000A7	60AD			1538	BU	SETLONOW	RETURN TO WAIT SOME MORE	00012040	
0000A8	24A1			1542	X11X	BOC	RDTIME,X10X	WAIT FOR RISE	00012060
0000A9	60A8			1545	BU	X11X		00012070	
				1548 *		***** SET PARTIAL RECORD *****		00012090	
0000AA	8A04			1551	SETPARTL	ORI	DTACHK2,PARTREC	SET PARTIAL RECORD	00012110
0000AB	60A6			1554	BU	SETENDCK		00012120	
				1557 *		***** SET START READ CHECK *****		00012140	
0000AC	8A08			1560	SETRDCHK	ORI	DTACHK2,STREADCK	SET START READ CHECK	00012160
0000AD				1562	SETLONOW	EQU	*	00012170	
0000AD	CDCD			1564	AND	XOUTAIM,ONES-LOGAIN-SYNC-NOLOSS		00012180	
0000AE	4D42			1567	XFR	XOUTAIM,XOUTA	RESET LO SENSE	00012190	
0000AF	2FB4			1570	WAITEND	BOC	IBG,STOPREAD	BR IF IBG IS ON	00012200
0000B0	3FB2			1573		BOC	DEVATTN,ABORTRD	ERROR EXIT	00012210
0000B1	60AF			1576	BU	WAITEND	WAIT FOR IBG	00012220	
				1579 *		***** SET NOISE ERROR *****		00012240	
0000B2	8402			1582	ABORTRD	ORI	STATIMG,SETSTATC	FLAG UNIT CHECK	00012260
0000B3	0100			1585	STO	WORK2,0	CLEAR NOISE BIT	00012270	
0000B4				1588	STOPREAD	EQU	*	00012290	
0000B4	3ABE			1590	BOC	STATC,DIAGHOOK	TOUCHE	00012300	
0000B5	D803			1593	ANDM	TRACER,SPACEOP+READOP	THIS A RECORD SPACE OP	00012310	
0000B6	37C3			1596	BOC	SPACEOP,CRESENS	BR IF SO	00012320	
0000B7	36BF			1599	BOC	READOP,CRESENSX		00012330	
0000B8	CDCD			1602	READSTOP	AND	XOUTAIM,ONES-NOLOSS-SYNC-LOGAIN	00012340	
0000B9	4D42			1605	XFR	XOUTAIM,XOUTA	DEACTIVATE FORCE AND NOT ALLOW	00012350	
0000BA	00CD			1608	STO	WORK1,ONES-50	SET 20 MICRO SEC. DELAY	00012360	
0000BB	A001			1611	DELAY	ADD	WORK1,ONE	DO THE DELAY	00012370
0000BC	21BB			1614	BOC	NALCO,DELAY	FOR SERVICE TO STOP	00012380	
0000BD	6635			1617	DOTIEX	BU	STROBTIE	PAGE HOP	00012390
0000BE	6513			1620	DIAGHOOK	BU	MEASIBG	GO MEASURE IBG	00012400
				1623	*****	*****		00012420	
				1624	*****	*****		00012430	
				1625	* NORMAL	ENDING OF ANY SPACE OP IS THROUGH THIS ROUTINE. AFTER MOVE	*	00012440	
				1626	* IS DROPPED	WE WILL MONITOR THE READ BUS UNTIL THE TACH PULSE SPREAD	*	00012450	
				1627	* SHOWS THE	DRIVE TO BE STOPPED. IF ANY READ DATA IS DETECTED,	*	00012460	
				1628	* DURING THIS	TIME, MOVE IS RAISED UNTIL IBG IS AGAIN DETECTED.	*	00012470	
				1629	*****	*****		00012480	

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
0000BF	5821			1632	CRESENSX XFR MPGMERR,AR		00012500
0000C0	9A00			1635	ORM DTACK2,0	TEST FOR READ ERRORS	00012510
0000C1	20B8			1638	BOC DBUS,READSTOP	BR IF NONE	00012520
0000C2	E803			1641	XO TRACER,SPACEOP+READOP	INVERT FLAGS	00012530
0000C3	8880			1644	CRESENS ORI TRACER,CREASER	SET FLAG FOR TAK RTN	00012540
0000C4	0008			1647	STO WORK1,DEVSEL	DROP MOVE	00012550
0000C5	4024			1650	XFR WORK1,TUTAG		00012560
0000C6	38D0			1653	BOC 6250,EXTENDIT	TAG	00012570
0000C7	0040			1656	NOW STO WORK1,DVESNS6	SET SENSE BIT ON	00012580
0000C8	4060			1659	XFR WORK1,TUBO	CALL FOR READ BUS AND TACH	00012590
0000C9	621C			1662	BU ZEROCTR		00012600
				1665	*****		00012620
				1666	* THIS CODE IS USED ON BKWD TYPE READ CMDS IN GCR MODE .. CONSTANTLY		00012630
				1667	* MONITOR FOR SAGC BURST AND IF IT IS SEEN ASSURE LOAD POINT IS HIT		00012640
				1668	*****		00012650
0000CA	2958			1670	LOOKSUM BOC NSAGCID,FWDRD	GO BACK IF NO SIGNAL	00012660
0000CB	A201			1673	ADD WORK3,1	BUMP SAGC CTR	00012670
0000CC	2158			1676	BOC NALCO,FWDRD	BR ON NO CARRY	00012680
0000CD	3FB2			1680	LPWAIT2 BOC DEVATTN,ABORTRD	NORMAL EXIT	00012700
0000CE	60CD			1683	BU LPWAIT2		00012710
0000CF	6131			1686	TOSETD BU TOSETD	PAGE HOP	00012720
0000D0	DD40			1689	EXTENDIT ANDM XOUTAIM,FWDDATA		00012730
0000D1	31C7			1692	BOC FWDDATA,NOW	BR IF FWD RD	00012740
0000D2	0384			1695	STO WORK4,EXTEND+RDBKWD		00012750
0000D3	020A			1698	STO WORK3,DEVSEL+COMMAND		00012760
0000D4	1A7A			1701	STO LINK3,CRERETR		00012770
0000D5	6769			1704	BU SETCMD3		00012780

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				1708 *	SENSE BYTES 0 AND 1		00012810
0000D6	0281			1711	EXECSNS STO WORK3,X'81'		00012830
0000D7	5821			1714	XFR MPGMERR,AR		00012840
0000D8	C200			1717	AND WORK3,ZERO		00012850
0000D9	0100			1720	STO WORK2,0		00012860
0000DA	9600			1723	SNS0 ORM SENSE1,ZERO		00012870
0000DB	20DE			1726	BOC DBUS,SNS1		00012880
0000DC	35E0			1729	BOC START,SNS2		00012890
0000DD	8220			1732	ORI WORK3,TUSTB		00012900
0000DE	8140			1735	SNS1 ORI WORK2,INTREQ		00012910
0000DF	60E1			1738	BU SNS3		00012920
0000E0	8240			1742	SNS2 ORI WORK3,TUSTA		00012940
0000E1	C504			1745	SNS3 AND FLAGS,LWROP		00012950
0000E2	5D21			1748	XFR EQUIPCK,AR		00012960
0000E3	9400			1751	ORM STATIMG,0		00012970
0000E4	20E6			1754	BOC DBUS,SNS4		00012980
0000E5	8110			1757	ORI WORK2,EQCHK		00012990
0000E6	DAEF			1760	SNS4 ANDM DTACK2,ONES-FORMATCK		00013000
0000E7	20E9			1763	BOC DBUS,SNS410		00013010
0000E8	6397			1766	BU SNS42		00013020
0000E9	6392			1769	SNS410 BU SNS41		00013030
1772					*****		00013050
1773					*		00013060
1774					INITIAL SELECTION OF TAPE UNIT		00013070
1775					*		00013080
1776					*****		00013090
1777					*****		00013100
1778					* THIS ROUTINE WILL GET THE TAPE UNIT ADDRESS FROM THE EXTERNAL		00013110
1779					* ADDRESS REGISTER IN THE PROPER BIT POSITION AND PUT IT IN THE		00013120
1780					* PROPER REGISTER.		00013130
1781					*		00013140
1782					TUADDR LSR LAYOUT (LOW) TUADDR LSR LAYOUT (HIGH)		00013150
1783					0 SELECT TU7 0 SELECT TU15		00013160
1784					1 SELECT TU6 1 SELECT TU14		00013170
1785					2 SELECT TU5 2 SELECT TU13		00013180
1786					3 SELECT TU4 3 SELECT TU12		00013190
1787					4 SELECT TU3 4 SELECT TU11		00013200
1788					5 SELECT TU2 5 SELECT TU10		00013210
1789					6 SELECT TU1 6 SELECT TU9		00013220
1790					7 SELECT TU0 7 SELECT TU8		00013230
1791					*		00013240
1792					*****		00013250
1793					* THERE ARE TWO TUADDR LSRS,ONE HIGH & THE OTHER LOW.WHICH ONE IS USED*		00013260
1794					* DEPENDS ON THE ADDRESS PASSED BY AL1. THIS ALLOWS THE MPGM WITH		00013270
1795					* THE MEANS TO KNOW WHICH DEVICE HE IS WORKING.		00013280
0000EA	0401			1798	GETADR STO STATIMG,SETSTATD		00013300
0000EB	4190			1801	EXECSTS XFR WORK2,XINA		00013310
0000EC	34F1			1804	BOC SELHIGH,CLEARLO		00013320
0000ED	1B00			1807	STOH TUADDR,0		00013330

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0000EE	4B84			1810	XFR	TUADDR,XADDR	GET DEV ADDR	F01MAY72 2/04/74 00013340
0000EF	8408			1813	ORI	STATMG,SETSTATA	SET STAT A TO DENOTE LO ORDER	00013350
0000F0	60F3			1816	BU	ADDREXIT	GO DO INITIAL SELECTION	00013360
0000F1	0B00			1819	CLEARLO	STO TUADDR,0	CLEAR LOW ADDR REG	00013370
0000F2	5B84			1822	XFRH	TUADDR,XADDR	GET DEV ADDR	00013380

L0C	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	
				1827	***** INITIAL STATUS ROUTINE *****	00013420
				1828	* THIS ROUTINE,UPON REQUEST BY ALU1,GETS TWO SENSE BYTES FROM THE	* 00013430
				1829	* SELECTED DRIVE AND PASSES THEM TO ALU1. A CHECK IS MADE TO SEE IF	* 00013440
				1830	* THE DRIVE IS AVAILABLE AND NOT BUSY. STATS ARE USED TO COMMUNICATE	* 00013450
				1831	* FINDINGS TO ALU1. VARIOUS REGISTERS ARE SET TO RESET STATUS.	* 00013460
				1832	*	* 00013470
				1833	* CLEAN STATUS STATD ALONE	* 00013480
				1834	* BUSY STATUS STATB AND STATD -DRIVE IS REWINDING,SWITCHED OR DSE	* 00013490
				1835	* UNIT CHECK STATUS STATC AND STATD-DRIVE IS NOT THERE OR NOT READY	* 00013500
				1836	* DEVICE END PENDING STATB AND STATC	* 00013510
				1837	* UNIT CHK AND DEV END PENDING -STAT C -DSE ONLY	* 00013520
				1838	* IF DEVICE IS FOUND BUSY,A DEVICE END WILL BE PRIMED.	* 00013530
				1839	*****	00013540
0000F3	4428			1842	ADDREXIT XFR STATIMG,STAT ENTRY FROM ADDR ROUTINE	00013560
0000F4	3EF9			1845	CHKSWTCH BOC BSYTACH,GOPRIME BR IF SWITCHED	00013570
0000F5	1CF6			1848	EXECSTSZ STO LINK1,SRETURN1 SET UP RETURN	00013580
0000F6	62E1			1851	BU FCHSTS RETURN TO STATUS1	00013590
0000F7	0000			1854	PRIMESET STO WORK1,ZERO CLEAR DEVICE SEL IF ON	00013600
0000F8	4024			1857	XFR WORK1,TUTAG TO ASSURE NOT LEFT OUTSTANDING	00013610
0000F9	3ACF			1860	GOPRIME BOC STATC,TOSETD2 BR TO GET OUT	00013620
0000FA	6200			1863	BU SETPRIME GO PRIME DEVICE END	00013630
000100				1866	ORG BEGIN+X'100'	00013650
				1867	*****	00013660
				1868	* RETURN FROM FETCH STATUS ROUTINE - INTERROGATE SENSE DATA	* 00013670
				1869	*****	00013680
000100	60F7			1872	ISBUSY1 BU PRIMESET	00013700
000101	4641			1875	STATUS1 XFR SENSE1,XOUTB SEND TU SNS	00013710
000102	4742			1878	XFR SENSE2,XOUTA SEND SECOND SENSE BYTE	00013720
000103	3E00			1881	BOC BSYTACH,ISBUSY1 BR IF BUSY(REW,RUN OR DSE)	00013730
				1884	*****	00013750
				1885	* INITIALIZE XOUTA IMAGE REG	00013760
				1886	*****	00013770
000104	0D45			1889	STATUSOK STO XOUTAIM,X'45' SET UP TO LOAD MODEL NO.	00013790
000105	4721			1892	XFR SENSE2,AR GET MOD NO TO A REG	00013800
000106	CD40			1895	AND XOUTAIM,X'40' AND PUT IT IN XOUTA	00013810
				1898	*****	00013830
				1899	* LOOK FOR DEVICE END PRIME ROUTINE.	* 00013840
				1900	*****	00013850
000107	2A09			1903	HAVPRIME BOC STATA,LOWYES STAT A ON SAYS LOW ADDR	00013870
000108	5006			1906	MUSTBEHI XFRH LSR SET HIGH	16 00013880
000109	4F21			1909	LOWYES XFR LODEPB,AR MOVE PRIME LSR TO AREG,(INTRF B)	00013890
00010A	2B0D			1912	BOC STATB,SOCKEM TEST FOR INTERFACE B	00013900
00010B	9000			1915	NOP1 CLEAR A REG IF NOT	00013910
00010C	4E21			1918	XFR LODEPA,AR MOVE PRIME LSR TO AREG,(INTF A)	00013920

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT
00010D	DB00			1921	SOCKEM	ANDM TUADDR,0
00010E	2012			1924	BOC	DBUS,NOPRIME

LOOK FOR PRIME
BR IF NOT

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00013930
00013940

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				1928	*****		00013970
				1929	* WE HAVE A PRIME SO LOOK FOR DRIVE PULSING. IF SO, GIVE UNIT CHK	*	00013980
				1930	* STATUS - IF NOT PRESENT DEVICE END.	*	00013990
				1931	*****		00014000
00010F	1C2F			1933	GOTPRIME STO LINK1,CDSTATS	LOAD PULSING RETMAGE -	00014010
000110	1932			1936	STO LINK2,PRETURN3	LOAD NO PULSE RETURN	00014020
000111	6126			1939	BU CHKPULSE	GO CHK IF PULSING	00014030
				1942	*****		00014050
				1943	* NO PRIME - CHECK FOR DRIVE PULSING. IF SO, PRIME FOR DEVICE END AND*		00014060
				1944	* SIGNAL UNIT CHECK STATUS. IF NOT , CONTINUE ON WITH TESTS	*	00014070
				1945	*****		00014080
000112	4006			1948	NOPRIME XFR LSR	SET LOW	16 00014100
000113	3A2F			1951	BOC STATC,CDSTATS	GO SET C AND D	00014110
000114	1CF9			1954	STO LINK1,GOPRIME2	LOAD PULSING RETURN	00014120
000115	1917			1957	STO LINK2,CHKMTI	LOAD NO PULSE RETURN	00014130
000116	6126			1960	BU CHKPULSE	GO CHECK IF PULSING	00014140
				1963	*****		00014160
				1964	* STATUS AT THIS POINT IS - NO PRIME , NO PULSE. LOOK FOR NOT RDY TO *		00014170
				1965	* RDY CONDITION AND SIGNAL DEVICE END IF SO.	*	00014180
				1966	*****		00014190
000117	3F32			1969	CHKMTI BOC DEVATTN,PRETURN3	GET OUT HERR IF MTI ON	00014210
000118	D6FF			1972	ANDM SENSE1,ONES	SEE IF START IS ON	00014220
000119	35E9			1975	BOC START,SETD	ALL DONE IF IT IS	00014230
00011A	202F			1978	BOC DBUS,CDSTATS	ALL DONE IF DRIVE IS NOT THERE	00014240
				1981	*****		00014260
				1982	* SET THE DRIVE PULSING - DEVICE WAS FOUND NOT READY. IF DRIVE	*	00014270
				1983	* ACCEPTS THE PULSE CMD, SIGNAL NOT RDY AND PRIME A DEVICE END. IF IT	*	00014280
				1984	* DOES NOT- SET EQUIPMENT CHK (CMD STS REJ) AND DO NOT PRIME.	*	00014290
				1985	*****		00014300
00011B	120A			1989	SETPULSE STO WORK3,DEVSEL+COMMAND		00014330
00011C	0910			1992	STO FRU,PULSE	SET THE	00014340
00011D	4960			1995	XFR FRU,TUBO	DRIVE PULSING	00014350
00011E	5224			1998	XFRH WORK3,TUTAG	SEND COMMAND BIT	00014360
00011F	03FE			2002	STO WORK4,ONES-1	SET UP WAIT CT	00014380
000120	A301			2005	AGAIN ADD WORK4,1	BUMP WAIT COUNT	00014390
000121	2120			2008	BOC NALCO,AGAIN	GO AGAIN IF NO CARRY	00014400
000122	1008			2011	STO WORK1,DEVSEL	RESET THE	00014410
000123	5024			2014	XFRH WORK1,TUTAG	COMMAND TAG	00014420
000124	1CF9			2017	STO LINK1,GOPRIME2	SET UP PULSING RET	00014430
000125	192E			2020	STO LINK2,DIDNTGO	SET NO PULSE RETURN	00014440
				2023	*****		00014460
				2024	* CHECK FOR DRIVE PULSING ROUTINE. IF PULSING, EXIT ON LINK 1. IF	*	00014470
				2025	* NOT, EXIT ON LINK 2.	*	00014480
				2026	*****		00014490
				2028	* NOTE THE FOLLOWING INSTRUCTIONS CANNOT BE SINGLE		00014510
				2029	* STEPPED AND ACHIEVE RELIABLE RESULTS.		00014520

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	2/04/74
000126	3F2A			2033	CHKPULSE BOC	DEVATTN,TACHON1	BR IF PULSE PRESENT	00014550
000127	3F2D			2036	TACHOFF1 BOC	DEVATTN,ISPULSE	BR IF PULSE PRESENT	00014560
000128	3F2D			2039	TACHOFF2 BOC	DEVATTN,ISPULSE	BR IF PULSE PRESENT	00014570
000129	5922			2042	NOPULSE XFR	LINK2,IC	NO PULSE EXIT	00014580
00012A	3F2C			2046	TACHON1 BOC	DEVATTN,TACHON2	BR IF PULSE PRESENT	00014600
00012B	612D			2049	BU	ISPULSE		00014610
00012C	3F29			2052	TACHON2 BOC	DEVATTN,NOPULSE	BR IF PULSE PRESENT	00014620
00012D	5C22			2055	ISPULSE XFR	LINK1,IC	PULSING EXIT	00014630
00012E	1D80			2058	DIDNTGO STO	EQUIPCK,REJCMD	SET COMMAND STATUS REJ	00014640
00012F	3ABB			2061	CDSTATS BOC	STATC,EXECDES		00014650
000130	8402			2064	ORI	STATIMG,SETSTATC	TRN ON STATC	00014660
000131	61E9			2067	TOSETD BU	SETD	INITIAL STATUS EXIT	00014670
000132	2A34			2070	PRETURN3 BOC	STATA,PRETURN1	IF STAT A IS ON -	00014680
000133	5006			2073	XFRH	LSR	BYPASS SET HIGH	00014690
000134	1200			2076	PRETURN1 STOH	WORK3,0	CLEAR THIS EREG	00014700
000135	6367			2079	BU	POLLALL		00014710
000136	6384			2082	PRETURN2 BU	SKIPB	GO STEP TO NEXT DEVICE	00014720
000137	6362			2085	PRETURN4 BU	GOGETIM		00014730

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				2089	***** TURNAROUND *****		00014760
				2090	* TURNAROUND WILL BE LINKED TO BY ALL FUNCTIONAL COMMANDS	*	00014770
				2091	* IMMEDIATELY AFTER RECEIVING CONTROL. TURNAROUND WILL RETURN VIA	*	00014780
				2092	* LINK REG 1 AND REQUIRES WORK4 TO BE LOADED WITH THE BUS OUT COMMAND	*	00014790
				2093	* PRIOR TO BEING ENTERED.	*	00014800
				2094	* TURNAROUND WILL:	*	00014810
				2095	* 1.CHECK DEVICE STATUS FOR LOADPOINT AND IF READ	*	00014820
				2096	* BACKWARD OR BACKSPACE OP, EXECUTE A UNIT CHECK EXIT.	*	00014830
				2097	* 2.CHECK DEVICE STATUS VERSUS COMMAND TO BE EXECUTED AND	*	00014840
				2098	* EXECUTE TURNAROUND DELAY IF IT IS REQUIRED.	*	00014850
				2099	* 3.CHECK DEVICE STATUS IF COMMAND IS BACKWARD AND DO	*	00014860
				2100	* FORWARD WRITE HITCH IF NECESSARY	*	00014870
				2101	* 4.SET DESIRED COMMAND ON BUS OUT AND RAISE THE MOVE TAG	*	00014880
				2102	* 5.EXIT INTO THE VELOCITY ROUTINE WHICH GETS DRIVE UP TO	*	00014890
				2103	* SPEED AND EXITS ON LINK1.	*	00014900
				2104	*	*	00014910
				2105	*	*	00014920
				2106	*****	*	00014930
000138	00FF			2110	TRNARND STO WORK1,ONES	FILL THE COUNTER	00014960
				2113	*****		00014980
				2114	* SET UP DATA FLOW MASK	*	00014990
				2115	*****		00015000
000139	D610			2118	ANDM SENSE1,BOT	MASK FOR BEGINNING OF TAPE	00015020
00013A	2040			2121	BOC DBUS,CHKNRZ	BRANCH IF OFF TO CHECK FOR BACKWARD	00015030
00013B	D308			2124	ANDM WORK4,WRITE	MASK FOR WRITE COMMAND	00015040
00013C	2075			2127	BOC DBUS,ISBAKWD	BRANCH IF NOT TO CHECK FOR BACKWARD	00015050
00013D	9700			2130	ORM SENSE2,0	GET LSR FOR TEST	00015060
00013E	3451			2133	BOC HIDDEN,CHK1601	BR ON BIRCH	00015070
00013F	23F1			2136	CHKFTR BOC NRZFEAT,CHK7LP	BR IF FEATURE INSTALLED	00015080
000140	9700			2140	CHKNRZ ORM SENSE2,0	TEST STATUS OF DRIVE	00015100
000141	3444			2143	BOC HIDDEN,CHK1602	BR IF 6250	00015110
000142	23E3			2146	BOC NRZFEAT,TURNNRZI	PAGE HOP IF NRZI PRESENT	00015120
000143	6145			2149	BU DO16		00015130
000144	3356			2154	CHK1602 BOC DREG3,DO64	BR IF GCR MODE	00015160
000145	8D80			2157	DO16 ORI XOUTAIM,PEBIT	SET FOR DATA FLOW	00015170
000146	D381			2160	CHKBKWD ANDM WORK4,RDBKWD+REW +RUN	IS CMD A BKWD TYPE READ OR MOTION	00015180
000147	207A			2163	BOC DBUS,DEVFWD	NO, GO CHECK FOR DEV IN FWD STATUS	00015190
000148	CDBF			2166	AND XOUTAIM,ONES-FWDDATA	ASSURE FORWARD IS OFF	00015200
000149	D608			2169	ANDM SENSE1,WRSTAT	IS DEV IN WRITE STATUS?	00015210
00014A	2058			2172	BOC DBUS,DEVBKWD	NO, GO CHECK FOR BACKWARD STATUS	00015220
				2175	*****		00015240
				2176	* DEVICE IS IN WRITE STATUS--SET UP AND DO FORWARD HITCH	*	00015250
				2177	*****		00015260
00014B	0109			2180	STO WORK2,MOVE+DEVSEL	SET CMD AND MOVE TAGS ON	00015280
00014C	5460			2183	XFRH STATIMG,TUBO	CLEAR BIT 6	00015290

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	2/04/74
00014D	4124			2186	XFR WORK2,TUTAG	MOVE TAG IMAGE TO TAG REG		00015300
00014E	019F			2189	TAHITCH STO WORK2,ONES-96	SET COUNT FOR .96 IN		00015310
00014F	1952			2192	STO LINK2,TRETURN3-BEGIN	TO SETLINK1 THEN DODELAY		00015320
000150	621C			2195	BU TAKS	GO DO HITCH FORWARD		00015330
				2198	* LOAD POINR DENSITY DETERMINATION	ON GCR DRIVE *****		00015350
000151	4290			2200	CHK1601 XFR WORK3,XINA	BRING IN MODE SEY		00015360
000152	3656			2203	BOC DREG6,DO64	BR IF 6250		00015370
000153	3756			2206	BOC DREG7,DO64	BR IF 800		00015380
000154	9700			2209	ORM SENSE2,0	GET LSR TO TEST		00015390
000155	3245			2212	BOC DUALDEN,DO16	BR IF DUAL DENS		00015400
000156	8D08			2215	DO64 ORI XOUTAIM,HIDEN	SET 6250		00015410
000157	6146			2218	BU CHKBKWD			00015420
				2223	DEVBKWD ANDM SENSE1,BACKWD	IS DEV IN BACKWARD STATUS		00015450
000158	D680			2226	BOC DREG0,LETSGO	YES GO AROUND TURNAROUND DELAY		00015460
000159	3061							
				2229	*****			00015480
				2230	* THIS DELAY IS TO ALLOW DRIVE TO STOP IF MOVING AND ALLOW TAPE TO		*	00015490
				2231	* STABILIZE IN COLUMNS.		*	00015500
				2232	*****			00015510
00015A	D708			2235	DODELAY ANDM SENSE2,HIDEN	ARE WE A 6250 UNIT		00015530
00015B	3480			2238	BOC HIDEN,NODELAY	BR IF SO		00015540
00015C	0191			2241	DODELAY1 STO WORK2,X'91'	LOAD TURNAROUND DELAY	11.16 MS	00015550
00015D	A001			2244	MOREYET ADD WORK1,1	BUMP TURNAROUND COUNT BY ONE		00015560
00015E	215D			2247	BOC NALCO,MOREYET	GO BACK IF NOT ALU CARRY OUT		00015570
00015F	A101			2250	ADD WORK2,1	BUMP OTHER CTR		00015580
000160	215D			2253	BOC NALCO,MOREYET	GO BACK IF NO CARRY		00015590
				2256	*****			00015610
				2257	* SET CONTROLS TO DF AND ISSUE CMD TO THE DRIVE		*	00015620
				2258	*****			00015630
000161	4360			2261	LETSGO XFR WORK4,TUBO	MOVE COMMAND TO BUS OUT		00015650
000162	2A65			2264	BOC STATA,SETCTRL	BR IF THIS IS REW, RUN, OR DSE		00015660
000163	020A			2267	STO WORK3,DEVSEL+COMMAND	RAISE COMMAND TAG		00015670
000164	6166			2270	BU SETAG	GO SET CMD TO DRIVE		00015680
000165	020C			2273	SETCTRL STO WORK3,CONTROL+DEVSEL	SET CONTROL AND SELECT TAG		00015690
000166	4224			2276	SETAG XFR WORK3,TUTAG	MOVE TAG IMAGE TO TAG REG		00015700
000167	A2F5			2279	BACKONCE ADD WORK3,X'F5'	DELAY		00015710
000168	2167			2282	BOC NALCO,BACKONCE	ONE TIME		00015720
000169	D340			2285	ANDM WORK4,RDFWDD	CMD RDFWD		00015730
00016A	206C			2288	BOC DBUS,MSKSTS	BR IF CMD NOT READ BKWD OP-RE-RUN		00015740
				2291	*****			00015760
				2292	* TEST RESPONDING COMMAND STATUS FROM DRIVE		*	00015770
				2293	*****			00015780
00016B	C3BF			2296	RDFMSK AND WORK4,ONES-RDFWDD	MODIFY COMMAND BYTE FOR READ FORWARD		00015800
00016C	4981			2299	MSKSTS XFR FRU,TUBI	FETCH STATUS BYTE		00015810
00016D	2A6F			2302	BOC STATA,SKIPMOD	BR IF CONTROL CMD		00015820
00016E	C9FE			2305	AND FRU,ONES-POSIT	TRN OFF POSIT IF ON		00015830

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
00016F	4921			2308	SKIPMOD	XFR FRU,AR	MOVE CMD BYTE TO ALU INPUT REG	00015840
000170	F300			2311		XOM WORK4,ZERO	COMPARE STATUS	00015850
000171	2082			2314		BOC DBUS,RDYMIVE	BRANCH IF ALL ZERO	00015860
000172	2ACE			2318		BOC STATA,CTRLREJ	BR IF A CONTROL REJECT	00015880
				2321	*	***** SET COMMAND STATUS REJECT *****		00015900
000173	1D80			2324	SETREJ	STO EQUIPCK,REJCMD	SET CMD STATUS REJECT OR REG	00015920
000174	61CF			2327		BU CLRXOUTA	GO TO UNIT CHECK ENDUP	00015930
000175	2A45			2331	ISBAKWD	BOC STATA,DO16	BR IF ON A RUN AT LP	00015950
000176	D380			2334		ANDM WORK4,RDBKWD	IS COMMAND READ BACKWARD	00015960
000177	2045			2337		BOC DBUS,DO16	NO, GO CHECK FOR FORWARD STATUS	00015970
000178	8402			2340		ORI STATIMG,SETSTATC	FLAG UNIT CHK	00015980
000179	61CF			2343		BU CLRXOUTA	GO TO ENDUP (BKWD AT LP)	00015990
00017A	D688			2347	DEVFWD	ANDM SENSE1,BACKWD+WRSTAT	IS DRIVE IN BACKWARD OR WRT STA	00016010
00017B	2061			2350		BOC DBUS,LETSGO	NO, GO SKIP DELAY	00016020
00017C	305A			2353		BOC BACKWD,DODELAY	BR IF BACKWARD	00016030
00017D	D340			2356		ANDM WORK4,RDFWDD	MASK FOR READ FORWARD	00016040
00017E	2061			2359		BOC DBUS,LETSGO	NO, GO SKIP DELAY	00016050
00017F	615A			2362		BU DODELAY	OTHERWISE DO TURNAROUND DELAY	00016060
000180	19E6			2366	NODELAY	STO LINK2,CRETURN1	LOAD LINK RETURN - LETSGO	00016080
000181	66DA			2369		BU CHKPOSIT		00016090
000182	9300			2373	RDYMIVE	ORM WORK4,0	IS THIS LWR	00016110
000183	329F			2376		BOC SETDIAG,ASSURFWD	BR IF LWR	00016120
000184	F0FF			2379		XOM WORK1,ONES	TEST THE COUNTER	00016130
000185	208B			2382		BOC DBUS,GOMOVE	BR IF TURNAROUND NOT NEEDED	00016140
000186	01CE			2385	SHORTDLY	STO WORK2,ONES-49	LOAD A NEW	00016150
				2388	*****			00016170
				2389	*	USE THIS DELAY ONLY IF PREVIOUS DELAY WAS USED AT 'DO DELAY'	*	00016180
				2390	*	DELAY IS FOR APPROX 5 MIL SEC	*	00016190
				2391	*****			00016200
000187	A001			2394	HOLDUP	ADD WORK1,1	COUNT	00016220
000188	2187			2397		BOC NALCO,HOLDUP	AND	00016230
000189	A101			2400		ADD WORK2,1	COUNT	00016240
00018A	2187			2403		BOC NALCO,HOLDUP	DOWN	00016250
00018B	2ACF			2406	GOMOVE	BOC STATA,CLRXTOUTA	BR IF CTRL COMMAND	00016260
00018C	4D42			2409		XFR XOUTAIM,XOUTA	SET DATA FLOW CONTRILS	00016270
00018D	8484			2412		ORI STATIMG,SETSTATB+TAPEOP	SET B FOR ALU1 ALSO TAPEOP	00016280
00018E	4428			2415		XFR STATIMG,STAT	TRN ON TAPE OP TO DATA FLOW	00016290
00018F	C4FB			2418		AND STATIMG,ONES-SETSTATB	RESET B STAT IN THE IMAGE	00016300

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
000190	9500			2424	ORM FLAGS,0		00016340
000191	3796			2427	BOC CHGDIR,CHKREAD	IS THIS LWR	00016350
000192	359B			2430	BOC LWROP,LPNMOVE	BR IF DONE - EARLY EXIT-	00016360
000193	010B			2433	STO WORK2,DEVSEL+COMMAND+MOVE	BR IF SO	00016370
000194	4124			2436	XFR WORK2,TUTAG	RAISE MOVE TAG	00016380
						XFER TAG IMAGE TO TAG REG	
				2439	*****		00016400
				2440	* THE DRIVE IS STARTING TO MOVE---EXIT TO ASSURE THIS AND RECEIVE		* 00016410
				2441	* GAP CONTROL		* 00016420
				2442	*****		00016430
000195	6219			2445	BU EXECVEL		00016450
000196	3098			2449	CHKREAD BOC DREG0,READCHAN	BR IF CHANNEL BUFFER READ	00016470
000197	61CF			2452	BU CLRXOUTA	CHG DIR EXIT	00016480
				2455	* CHANNEL BUFFER READ UDIAG -- EXITS ON STOP *****		00016500
000198	4011			2457	READCHAN XFR INDF	START BUFFER READ OUT	00016510
000199	27CF			2460	READWAIT BOC STOP,CLR XOUTA	HANG TILL CMD OUT	00016520
00019A	6199			2463	BU READWAIT		00016530
				2466	*****		00016550
				2467	* THE FOLLOWING USED FOR LWR OP		00016560
				2468	*****		00016570
00019B	5460			2471	LPNMOVE XFRH STATIMG,TUBO	CLEAR THE BUS	00016590
00019C	0209			2474	STO WORK3,DEVSEL+MOVE	DROP THE	00016600
00019D	4224			2477	XFR WORK3,TUTAG	COMMAND TAG	00016610
00019E	6600			2481	BU LWRDELAY		00016630
00019F	8D40			2484	ASSURFWD ORI XOUTAIM,FWDDATA	SET FWD FOR LWR	00016640
0001A0	6186			2487	BU SHORTDLY		00016650
				2490	***** GENERAL AND SELECTIVE RESETS *****		00016670
				2491	*		* 00016680
				2492	* DEPENDING ON ENTRY POINT, A SELECTIVE OR GENERAL RESET WILL BE		* 00016690
				2493	* PERFORMED. SELECTIVE BYPASSES RESET OF DEVICE END PRIMES AND		* 00016700
				2494	* COMMITTED LATCH. OTHERWISE THE TWO RESETS ARE THE SAME.		00016710
				2495	*****		00016720
0001A1				2497	STEP0007 EQU *		00016740
0001A1	2BA5			2499	EXECGRST BOC	STATB,RESTDEB	00016750
0001A2				2501	STEP0071 EQU *	BRANCH IF RESET IS FOR INTERFACEB *M	00016760
0001A2	0E00			2503	STO LODEPA,0	THRU HERE FOR CHNL A, ODD DRIVES	00016770
0001A3				2505	STEP0072 EQU *	CLEAR DE PRIME REGISTER A	00016780
0001A3	1E00			2507	STOH LODEPA,0	CLEAR DE PRIME REGISTER A HIGH *16	00016790
0001A4				2509	STEP0073 EQU *		00016800
0001A4	61A7			2511	BU EXECSRST		00016810
0001A5				2513	STEP0008 EQU *	THRU HERE FOR CHNL B, EVEN DRIVES	00016820

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	2/04/74
0001A5	0F00			2515	RESTDEB	STO LODEPB,0	CLEAR DE PRIME REGISTER B	*MIS**	00016830
0001A6				2517	STEP0009	EQU *			00016840
0001A6	1F00			2519		STOH LODEPB,0	CLEAR DE PRIME REGISTER B HIGH	*16	00016850
0001A7				2522	STEP0010	EQU *			00016870
0001A7	1CFC			2524	EXECSRST	STO LINK1,SRETURN7	SET UP FOR RETURN		00016880
0001A8				2526	STEP0011	EQU *			00016890
0001A8	62E1			2528		BU FCHSTS	AND GO SELECT DEVICE		00016900
0001A9				2530	STEP0038	EQU *			00016910
0001A9	100A			2532	ZAPIM	STOH WORK1,DEVSEL+COMMAND S UP COMMAND FOR RESETG			00016920
0001AA				2534	STEP0039	EQU *			00016930
0001AA	1102			2536		STOH WORK2,RESET	GET DRIVE RESET READY		00016940
0001AB				2538	STEP0040	EQU *			00016950
0001AB	5024			2540	XFRH	WORK1,TUTAG	RAISE COMMAND TAG TO DRIVE		00016960
0001AC				2542	STEP0041	EQU *			00016970
0001AC	1008			2544		STOH WORK1,DEVSEL	CLEAR OUT COMMAND TAG		00016980
0001AD				2546	STEP0042	EQU *	ISSUE SENSE RESET TO THE DRIVE		00016990
0001AD	5160			2548	XFRH	WORK2,TUBO	AND RESET IT		00017000
0001AE				2550	STEP0043	EQU *			00017010
0001AE	3BBO			2552		BOC STATD,CLEEREM	DON'T CHECK STAT C		00017020
0001AF				2554	STEP0044	EQU *			00017030
0001AF	3AC1			2556		BOC STATC,RESET1	BR IF THIS IS AN ALU ERR RESET		00017040
0001B0				2558	STEP0045	EQU *			00017050
0001B0	0C00			2560	CLEEREM	STO DTACHK1,0	CLEAR		00017060
0001B1				2562	STEP0046	EQU *			00017070
0001B1	0A00			2564		STO DTACHK2,0	ERROR		00017080
0001B2				2566	STEP0047	EQU *			00017090
0001B2	1D00			2568		STO EQUIPCK,0	REGS		00017100
0001B3				2570	STEP0048	EQU *			00017110
0001B3	1800			2572		STO MPGMERR,0			00017120
0001B4				2574	STEP0049	EQU *			00017130
0001B4	1700			2576		STO TIEBYTE,0	CLR TIE		00017140
0001B5				2578	STEP0050	EQU *			00017150
0001B5	0900			2580		STO FRU,0			00017160
0001B6				2582	STEP0051	EQU *			00017170
0001B6	0800			2584		STO TRACER,0	CLEAR TRACE REGISTER		00017180
0001B7				2586	STEP0052	EQU *			00017190
0001B7	3BCC			2588		BOC STATD,CLEARCMD	BR IF THIS IS A SENSE RESET		00017200
0001B8				2590	STEP0053	EQU *			00017210
0001B8	0500			2592		STO FLAGS,0	CLEAR FLAGS REG		00017220
0001B9				2594	STEP0054	EQU *			00017230
0001B9	F109			2596		XOM WORK2,NDXSRST	IS THIS A SELECTIVE RESET		00017240
0001BA				2598	STEP0055	EQU *			00017250
0001BA	20C1			2600		BOC DBUS,RESET1	BR IF SO		00017260
				2603	***** DESELECT TAPE UNIT *****				00017280
				2604	* THIS ROUTINE IS USED AFTER EACH OPERATION TO ASSURE DE-SELECT OF THE*				00017290
				2605	* TAPE UNIT. THE COMMITTED LATCH WILL ALSO BE RESET.				00017300
				2606	*****				00017310
0001BB				2608	STEP0056	EQU *			00017330
0001BB	0000			2610	EXECDER	STO WORK1,ZERO	CLEAR TAGS		00017340
0001BC				2612	STEP0057	EQU *			00017350
0001BC	4024			2614		XFR WORK1,TUTAG	TO THE DRIVE		00017360

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0001BD				2616	STEP0058	EQU *	LOOP THRU HERE EIGHT TIMES	00017370
0001BD	A024			2618	DESWAIT	ADD WORK1,36	ALLOW X POINTS	00017380
0001BE				2620	STEP0059	EQU *	LOOP THRU HERE EIGHT TIMES	00017390
0001BE	21BD			2622		BOC NALCO,DESWAIT	TO SETTLE 3.2 USEC DELAY	00017400
0001BF				2624	STEP0060	EQU *	RESET THE COMMITTED LATCH	00017410
0001BF	4050			2626		XFR COMITD	RESET THE DEVICE COMMITTED LATCH	00017420
0001C0				2628	STEP0061	EQU *	THRU HERE SIXTEEN TIMES	00017430
0001C0	6011			2630		BU SETDLONE	GO SET STAT D AND TERMINATE	00017440
				2633	* CHECK FOR DEV END PRIME. IF ONE IS FOUND BYPASS RESET TO COMMITTED.			00017460
0001C1	4E21			2636	RESET1	XFR LODEPA,AR	SET DEV END PRIMES TO TEST A	00017480
0001C2	4F21			2639	RESET2	XFR LODEPB,AR	SET DEV END PRIMES TO TEST B	00017490
0001C3	DB00			2642	RESET3	ANDM TUADDR,ZERO	DO ADDR AND DEV PRIME COMPARE	00017500
0001C4	20C6			2645		BOC DBUS,CHKHI	BR IF NOT	00017510
0001C5	61CB			2648		BU EXECABRT		*16 00017520
0001C6	5006			2651	CHKHI	XFRH LSR	SET HI	*16 00017530
0001C7	4E21			2654		XFR LODEPA,AR	LOOK FOR	*16 00017540
0001C8	4F21			2657		XFR LODEPB,AR	HIGH PRIMES	*16 00017550
0001C9	DB00			2660		ANDM TUADDR,0	BR OUT	*16 00017560
0001CA	20BB			2663		BOC DBUS,EXECDES	IF NONE	*16 00017570
				2665	***** ABORT ROUTINE *****			00017580
				2666	*			* 00017590
				2667	* USED BY ALU1 TO INSURE TAPE MOTION IS STOPPED.			* 00017600
				2668	*			* 00017610
				2669	* THIS ROUTINE MUST FOLLOW RESETS ROUTINE			* 00017620
				2670	*****			00017630
0001CB	1000			2673	EXECABRT	STOH WORK1,ZERO	CLEAR REG	00017650
0001CC	5024			2677	CLEARCMD	XFRH WORK1,TUTAG	DROP ALL DRIVE TAGS	00017670
0001CD	6011			2680		BU SETDLONE	ALL DONE	00017680
				2682	*			00017690
					***** SET CONTROL STATUS REJECT *****			
0001CE	1D20			2685	CTRLREJ	STO EQUIPCK,REJCTRL	SET CONTROL STATUS REJECT	00017710
0001CF	0100			2688	CLRROUTA	STO WORK2,0	ASSURE NOISE BIT OFF - READ OP -	00017720

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				2692	***** ENDUP ROUTINE *****	00017750	
				2693	*	00017760	
				2694	* THE ENDUP ROUTINE IS ENTERED BY ALL CMD ROUTINES.	00017770	
				2695	* ENDUP SETS THE STATUS INTO THE STAT REG AND SETS STAT D TO	00017780	
				2696	* INDICATE TO ALU1, ALU2 IS FINISHED. ALU2 WILL BE TRAPPED TO ADDRESS	00017790	
				2697	* ZERO WHEN STAT D IS SET AND WILL REMAIN DORMANT UNTIL CALLED BY	00017800	
				2698	* ALU1 AGAIN, (VIA ALU1 XOUTB)	00017810	
				2699	* THE DEVICE STATUS IS ALWAYS RETRIEVED AND CHECKED FOR UNIT CHECK	00017820	
				2700	* AND UNIT EXCEPTION CONDITIONS(EOT ON WRITE). THE MPGM ERROR REG IS	00017830	
				2701	* CHECKED AND IF ANY BITS ARE ON, THE UNIT CHECK STAT IS SET.	00017840	
				2702	*	00017850	
				2703	*****	00017860	
0001D0	4018			2707	ENDUP XFR BUFFCRC	00017890	
0001D1	C41F			2710	ENDUP800 AND STATIMG,ONES-TAPEOP-PERMRDWT-WRTBURST	00017900	
0001D2	1CF7			2713	STO LINK1,SRETURN2	00017910	
0001D3	4428			2716	XFR STATIMG,STAT	00017920	
0001D4	4142			2719	XFR WORK2,XOUTA	00017930	
0001D5	62E1			2722	BU FCHSTS	00017940	
0001D6	2AEB			2725	SNSRTN BOC STATA,BUSYYET	00017950	
0001D7	9600			2728	NEXTONE ORM SENSE1,0	00017960	
0001D8	34DA			2731	BOC WRTSTAT,CHKEOT	00017970	
0001D9	61DD			2734	BU ENDCHK	00017980	
0001DA	32DC			2737	CHKEOT BOC EOT,SETUX	00017990	
0001DB	61DD			2740	BU ENDCHK HK	00018000	
0001DC	8404			2743	SETUX ORI STATIMG,SETSTATB	00018010	
0001DD				2745	ENDCHK EQU *	00018020	
0001DD				2746	CKSTART EQU *	00018030	
0001DD	9600			2748	ORM SENSE1,0	00018040	
0001DE	35E0			2751	BOC START,TSTFOERR	00018050	
0001DF	1D40			2754	REWFAIL STO EQUIPCK,REJTU	00018060	
0001E0	DCF6			2757	TSTFOERR ANDM DTACHK1,ONES-TSAGC-VELTRY	00018070	**
0001E1	20E3			2760	BOC DBUS,TSTFOMOR	00018080	
0001E2	61E7			2763	BU SETUCK	00018090	
0001E3	5821			2766	TSTFOMOR XFR MPGMERR,AR	00018100	
0001E4	5D21			2769	XFR EQUIPCK,AR	00018110	
0001E5	9A00			2772	ORM DTACHK2,0	00018120	
0001E6	20E9			2775	BOC DBUS,DUNAGN	00018130	
0001E7	8402			2778	SETUCK ORI STATIMG,SETSTATC	00018140	
0001E8	4014			2782	XFR REDLIGHT FLAG ALU DETECTED DATA ERROR	00018160	
0001E9				2784	DUNAGN EQU *	00018170	
0001E9	8401			2786	SETD ORI STATIMG,SETSTATD	00018180	
0001EA	4428			2789	XFR STATIMG,STAT	00018190	
				2791	***** ALU2 IS NOW TRAPPED UNTIL CALLED BY ALU1	00018200	

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				2794	*****		00018230
				2795	* REWIND,REWIND UNLOAD AND DATA SECURITY ERASE USE THIS ROUTINE	*	00018240
				2796	* TO ASSURE THE DEVICE WENT BUSY. IF IT DIDNT, A CHECK IS MADE	*	00018250
				2797	* TO SEE IF THE OPERATION HAS BEEN COMPLETED. CHAINING OF THESE	*	00018260
				2798	* COMMANDS IS SIGNALLED BY ALU1 STATD BEING ON, AND ALU2 WILL	*	00018270
				2799	* REMAIN HERE IN ENDUP UNTIL THE TAPE UNIT IS FINISHED.	*	00018280
				2800	*****		00018290
0001EB				2801	BUSYYET EQU *		00018300
0001EB	4088			2803	XFR WORK1,XINB	GET THE CURRENT CMD INDEX	00018310
0001EC	F029			2806	XOM WORK1,EXECRWU	IS IT A REWIND UNLOAD	00018320
0001ED	201B			2809	BOC DBUS,SETPULSE	BR IF SO	00018330
0001EE	D6FF			2812	ANDM SENSE1,ONES	GET SENSE BYTE FOR TEST	00018340
0001EF	37F2			2815	BOC NOTBUSY,LPLOOK	BR IF NOT BUSY	00018350
0001F0	3BD0			2818	BOC STATD,ENDUP	IF CHAINED-STATD WILL BE ON-	00018360
0001F1	61DD			2821	BU CKSTART	IF NOT CHAINED-TAKE NORMAL EXIT	00018370
0001F2	33F5			2824	LPLOOK BOC BOT,ISITREW	BR IF BOT IS ON	00018380
0001F3	32F7			2827	BOC EOT,ISITDSE	BR IF EOT IS ON	00018390
0001F4	61DF			2830	BU REWFAIL	NOT BUSY AND NOT AT LP OR TI	00018400
0001F5	34DF			2833	ISITREW BOC WRTSTAT,REWFAIL	BR IF NOT-MUST BE REW/RUN	00018410
0001F6	61DD			2836	BU CKSTART	SET U.C.-WE HIT LP ON A DSE	00018420
0001F7	34DD			2839	ISITDSE BOC WRTSTAT,ENDCHK	SET U.C. IF NOT-WE HIT T1 ON A REW	00018430
0001F8	61DF			2842	BU REWFAIL	DSE COMPLETE-GO FINISH UP	00018440

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
0001F9	0403			2848	GOPRIME2 STO STATIMG,SETSTATD+SETSTATC SET UP FOR LATER		00018480
0001FA	1403			2851	STOH STATIMG,SETSTATD+SETSTATC SET UP FOR LATER		00018490
0001FB	6202			2854	BU EXECSDE GO SET A PRIME ON		00018500

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
000200				2859	ORG BEGIN+X'200'		00018540
				2860	*****SET DEVICE END PRIME ROUTINE*****		00018550
				2861	* THIS ROUTINE IS USED BY ALU1 TO PRIME THE DEVICE END STILL HELD	*	00018560
				2862	* BY ALU2 IN TUADDR LES. UPON PRIMING, A BRANCH WILL BE TAKEN TO	*	00018570
				2863	* POLLMTI WHERE A WAIT WILL BE INITIATED IN CASE ALU1 WANTS IT TURNED	*	00018580
				2864	* OFF AGAIN.	*	00018590
				2865	* NOTE INITIAL STATUS DOES NOT TAKE THIS BRANCH.	*	00018600
				2866	*****		00018610
000200	0405			2869	SETPRIME STO STATIMG,SETSTATB+SETSTATD SET FOR USE LATER		00018630
000201	1405			2872	STOH STATIMG,SETSTATB+SETSTATD SET FOR USE LATER IF HI		00018640
000202	9B00			2875	EXECSDE ORM TUADDR,0 SEE IF LOW LSR HOLDS ADDRESS	16	00018650
000203	2005			2878	BOC DBUS,ISHIGH BR IF NOT TO SET HI	16	00018660
000204	6206			2881	BU ISLOW SKIP SET HIGH	16	00018670
000205	5006			2884	ISHIGH XFRH LSR SET HIGH	16	00018680
000206	4B21			2887	ISLOW XFR TUADDR,AR GET PRIME BIT TO A BUS		00018690
000207	2B09			2890	BOC STATB,DOIT BR IF INTERFACE B		00018700
000208	8E00			2893	ORI LODEPA,0 PRIME PROPER		00018710
000209	8F00			2896	DOIT ORI LODEPB,0 DEVICE END		00018720
00020A	4428			2899	XFR STATIMG,STAT SET STAT D IF NECESSARY		00018730
00020B	8402			2902	ORI STATIMG,SETSTATC SET STAT C FOR		00018740
00020C	4428			2905	XFR STATIMG,STAT ALU14		00018750
00020D	1200			2908	STOH WORK3,0		00018760
00020E	6370			2911	BU POLLMTIX GO WAIT TO RESET THE DEVICE END		00018770
				2913	*		00018780
				2914	*		00018790
				2917	*****		00018820
				2918	* RETURN HERE AFTER GAP CONTROL IS RECEIVED FROM DRIVE AND EXIT	*	00018830
				2919	* TO ASSURE DRIVE IS AT THE CORRECT VELOCITY-NORMAL RETURN TO 'WRTST'	*	00018840
				2920	* IF LIMITS ARE NOT MET THEN EXIT TO ENDUP.	*	00018850
				2921	*****		00018860
00020F	9700			2924	WRTSTR ORM SENSE2,0 GET LSR FOR TEST		00018880
000210	3412			2927	BOC HIDDEN,WRTSTR2 BR IF BIRCH		00018890
000211	6213			2930	BU WRTSTR1		00018900
000212	3316			2933	WRTSTR2 BOC DREG3,WRTSTR3 BR IF 6250 BPI		00018910
000213	1600			2937	WRTSTR1 STO H SENSE1,0 CLEAR THE REG FOR VELOCITY		00018930
000214	13E7			2940	VELSTR STO H WORK4,ONES-24 SET MAX CNT TO 24		00018940
000215	6300			2943	BU CHKVEL GO ASSURE VELOCITY IS CORRECT		00018950
000216	67AD			2946	WRTSTR3 BU SETCOUNT 6250 EXIT		00018960

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				2951	***** VELOCITY SUBROUTINE *****		00019000
				2952	*		* 00019010
				2953	* THIS ROUTINE WILL ASSURE THE CAPSTAN STARTS MOVING BY COUNTING		* 00019020
				2954	* FOR 256 BIT CELLS, C. DURING WHICH CHECKING FOR A TACH PULSE.		* 00019030
				2955	* IF IT DOES NOT APPEAR DURING THIS TIME NOTACH TU ERROR IS SET.		* 00019040
				2956	*		* 00019050
				2957	* OTHERWISE WAIT FOR GAP CONTROL AND WHEN RECEIVED RESET COMMAND		* 00019060
				2958	* TAG AND RETURN ON LINK1.		* 00019070
				2959	*		* 00019080
				2960	*****		00019090
000217	4081			2964	VEL1 XFR WORK1,TUBI GET CMD STATUS BYTE		00019120
000218	313F			2967	BOC GAPCTRL,GAPCTLON BR IF GAP CONTROL IS ON		00019130
000219	1917			2970	EXECVEL STO LINK2,VEL1 POINY TO RETURN		00019140
00021A	00FF			2973	VELGAP STO WORK1,ONES SET UP		00019150
00021B	01FF			2976	STO WORK2,ONES COUNT REGISTERS1		00019160
				2979	***** TACH COUNT SUBROUTINE *****		00019180
				2980	*		* 00019190
				2981	* THE NUMBER OF TACH PULSES TO BE MEASURED MUST BE COMPLEMENTED		* 00019200
				2982	* AND SET IN REGISTER WORK1 AND WORK2 BEFORE ENTRY TO ROUTINE.		* 00019210
				2983	* EXAMPLE - TO COUNT 360 TACH PULSES WHICH WOULD EQUAL A DISTANCE		* 00019220
				2984	* OF 3.6 INCHES CONVERT 360 TO HEX = 168		* 00019230
				2985	* NOW COMPLEMENT TO 2 BYTES = FE96		* 00019240
				2986	* SET 'FE' IN WORK1 AND SET '96' IN WORK2		* 00019250
				2987	*		* 00019260
				2988	*****		00019270
00021C				2991	TAKS EQU *		00019300
00021C	0200			2993	ZEROCTR STO WORK3,0 CLEAR TIME OUT CTR		00019310
00021D	9500			2996	ROUNDUP ORM FLAGS,0 GET LSR TO TEST		00019320
00021E	332A			2999	BOC DREG3,CHKBORRD RD CHK SAGC BRST		00019330
00021F	3C25			3002	NOTLPRD BOC NBLOCK,TACHWAIT SKIP NEXT TESTS IF IBG IS ACTIVE		00019340
000220	D890			3005	ANDM TRACER,ERGFLAG+CREASER SET FOR TESTS		00019350
000221	2025			3008	BOC DBUS,TACHWAIT BR IF NEITHER FLAG IS ON		00019360
000222	304B			3011	BOC CREASER,CREMOVEX SKIP OUT IF TAPE CREASE		00019370
				3014	* ***** SET NOISE ERROR *****		00019390
000223	1880			3017	ERGNOISE STO MPGMERR,NOISE SET NOISE ERROR ON ERASE		00019410
000224	1D02			3020	STO EQUIPCK,PERR SET EQUIPMENT CHK		00019420
000225	2427			3024	TACHWAIT BOC RDTIME,TACHYET WAIT FOR READ TIME		00019440
000226	6225			3027	BU TACHWAIT TO RISE		00019450
000227	3E2E			3030	TACHYET BOC BSYTACH,POSITIVE LOOK FOR TACH		00019460
000228	8808			3033	ORI TRACER,TAKTR TRN ON TACH TRACE		00019470
000229	6230			3036	BU COUNTUP		00019480
00022A	2E2C			3040	CHKBORRD BOC BOR,BORUP SAMPLE BOR		00019500
00022B	6225			3043	BU TACHWAIT		00019510

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
00022C	8840			3047	BORUP	ORI TRACER,BORMARK	SET FLAG - BOR SEEN	00019530
00022D	6225			3050	BU	TACHWAIT		00019540
00022E	9800			3054	POSITIVE	ORM TRACER,0	LOOK FOR TACH TRACE	00019560
00022F	3439			3057	BOC	TAKTR,CNTATACH	BR IF ON	00019570
000230	2430			3060	COUNTUP	BOC RDTIME,COUNTUP	WAIT FOR READ TIME TO FALL	00019580
000231	A201			3063	ADD	WORK3,1	BUMP TIME OUT CT	00019590
000232	211D			3066	BOC	NALCO,ROUNDUP	AND GET	00019600
000233	3F47			3069	BOC	DEVATTN,UCKON	--- MAYBE BUMP LP	00019610
000234	D880			3072	ANDM	TRACER,CREASER	OUT ON	00019620
000235	2046			3075	BOC	DBUS,SETNTACH	OVERFLOW	00019630
000236	0101			3078	STO	WORK2,1		00019640
000237	3849			3081	BOC	6250,SUMMORE		00019650
000238	60B8			3084	KRETURN1	BU READSTOP		00019660
000239	C8F7			3088	CNTATACH	AND TRACER,ONES-TAKTR	RESET TACH TRACE	00019680
00023A	A101			3091	ADD	WORK2,1	BUMP LOW	00019690
00023B	211C			3094	BOC	NALCO,ZEROCTR	ORDER CT	00019700
00023C	A001			3097	ADD	WORK1,1	BUMP HIGH	00019710
00023D	211C			3100	BOC	NALCO,ZEROCTR	ORDER CT	00019720
00023E				3102	CNTNCARY	EQU *		00019730
00023E	5922			3104	GOBACK	XFR LINK2,IC	RETURN	00019740
00023F	4160			3107	* VELOCITY SUBROUTINE EXIT POINT - WHEN GAP CONTROL COMES ON.			* 00019760
000240	0009			3109	GAPCTLON	XFR WORK2,TUBO	PUT ZEROS ON TU BUS OUT	00019770
000241	4024			3112	STO	WORK1,DEVSEL+MOVE	RESET COMMAND TAG	00019780
000242	D502			3115	XFR	WORK1,TUTAG	TO THE DRIVE	00019790
000243	2045			3118	ANDM	FLAGS,TUBOMSK	IS THE SET TUBO MASK FLAG ON	00019800
000244	5560			3121	BOC	DBUS,NOMASK	BR IF NOT	00019810
000245	5C22			3124	XFR	WORK5,TUBO	SET MASK OUT IF SO	00019820
				3127	NOMASK	XFR LINK1,IC	RETURN TO CALLER	00019830
				3130	* THIS IS THE TIME OUT FOR THE TACH ROUTINE IF A TACH PULSE DOES			* 00019850
				3131	* NOT APPEAR WITHIN 256 BIT CELLS			* 00019860
				3133	* ***** SET NO TACH ERROR *****			00019880
000246	1D04			3136	SETNTACH	STO EQUIPCK,NTACH	SET NO TACH PULSE ERROR	00019900
000247	8402			3139	UCKON	ORI STATING,SETSTATC	SET UNIT CHECK ONLY ON MTI	00019910
000248	61CF			3142	GOENDUP	BU CLRXOUTA	GO TO END	00019920
000249	19EA			3146	SUMMORE	STO LINK2,CRETURN5	LOAD LINK RETURN	00019940
00024A	66DA			3149	BU	CHKPOSIT		00019950
00024B	2E4E			3152	CREMOVEX	BOC BOR,CREMOVEZ	BR IF BOR UP	00019960
00024C	D820			3155	ANDM	TRACER,X'20'	TEST FOR FWD HITCH FLAG	00019970
00024D	2025			3158	BOC	DBUS,TACHWAIT	BR IF NOT	00019980
00024E	6042			3161	CREMOVEZ	BU CREMOVE		00019990
				3163	*****			00020000
				3164	***** TACH COUNT BRANCH TABLE *****			00020010
				3165	*****			00020020
00024F	6400			3167	TRETURN2	BU NRZILINK	WRITE FROM LP RETURN	00020030
000250	66D6			3170	TRETURN5	BU WRT2		00020040
000251	66AC			3173	WTMSTR2	BU WTMWAY		00020050

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	2/04/74
000252				3175	TRETURN3 EQU *	RETURN TO TA HITCH		00020060
				3177	*****			00020080
				3178	* RETURN FROM FORWARD HITCH TO DROP MOVE AND RETURN TO TURN AROUND *			00020090
				3179	*****			00020100
000252	0208			3181	SETLINK1 STO WORK3,DEVSEL	RESET THE MOVE TAG		00020110
000253	4224			3184	XFR WORK3,TUTAG	PASS TO THE DRIVE		00020120
000254	8820			3187	ORI TRACER,X'20'	SET FLAG FOR CREASE TAPE		00020130
000255	615A			3190	BU DODELAY	GO BACK TO TRNARND		00020140

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				3193	*****		00020160
				3194	* THIS IS THE RETURN POINT FROM TURNAROUND ROUTINE. AT THIS POINT	*	00020170
				3195	* THE TAPE UNIT HAS ACCEPTED THE READ COMMAND AND IS UP TO SPEED.	*	00020180
				3196	*	*	00020190
				3197	*****		00020200
000256	9600			3200	STARTAPE ORM SENSE1,0 SEE IF BOT IS ON		00020220
000257	3361			3203	BOC DREG3,LPBURST - BR IF IT IS		00020230
000258	9700			3206	ORM SENSE2,0 GET SNS TO DBUS FOR TEST		00020240
000259	345B			3209	BOC HIDDEN,READSTAR BR IF 6250 POSSIBLE		00020250
00025A	335C			3212	BOC NOTPE,ISNRZI2 BR IF NRZI UNIT		00020260
00025B	6046			3215	READSTAR BU READTAPE NO BOT, LOOK FOR DATA		00020270
00025C	2302			3218	ISNRZI2 BOC NRZFEB,ISNRZI BR IF NRZI FEATURE IS INSTALLED		00020280
				3221	* ***** SET NOT CAPABLE *****		00020300
00025D	1801			3224	NOTCOMP STO MPGMERR,NOTCAP SET NOT CAPABLE		00020320
00025E	61CF			3227	GOEND BU CLRXOUTA STOP		00020330
00025F	335B			3231	READHIGH BOC NOTPE,READSTAR BR IF 1600 BPI		00020350
000260	6046			3234	BU MODE6400 GO READ AT 6250		00020360

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
3238				*****	*****	00020390	
3239	*			READ FROM LOAD POINT		00020400	
3240				*****	*****	00020410	
000261	1965			3243	LPBURST STO LINK2,READLP	00020430	
000262	01D4			3246	STO WORK2,X'D4'	00020440	
000263	00FE			3249	LPBURST1 STO WORK1,X'FE'	00020450	
000264	621C			3252	CRETEST BU ZEROCTR	00020460	
				3255	*****	00020480	
				3257	*****	00020500	
				3258	* AT THIS POINT WE ARE READY TO SAMPLE THE IDENTIFICATION AREA OF THE	00020510	
				3259	* TAPE TO DETERMINE DENSITY. BASICALLY THIS ROUTINE CONSISTS OF	00020520	
				3260	* THREE COUNTERS (EACH SPANS TWO LSR) WHICH VIE FOR INCREMENTATION.	00020530	
				3261	* THE FIRST TO OVERFLOW DETERMINES THE OPERATING MODE. THE TCU RESET	00020540	
				3262	* READ MODE FROM LOAD POINT IS 1600 BPI. THUS, IF PTE IS DETECTED,NO	00020550	
				3263	* FURTHER ACTION IS REQUIRED AS FAR AS INITIALIZATION. IF 1TE IS	00020560	
				3264	* DETECTED, A MODE SET WILL BE ISSUED TO THE TAPE UNIT AND GCR CON-	00020570	
				3265	* TROLS ACTIVATED, IF NEITHER PTE OR 1TE IS DETECTED,A CHECK IS MADE	00020580	
				3266	* TO DETERMINE NRZI CAPABILITIES AND IF POSSIBLE THE OPERATION	00020590	
				3267	* CONTINUES. NOT CAPABLE CAN RESULT FROM, GCR TAPE ON AN INCAPABLE	00020600	
				3268	* DEVICE. ALSO, THE REQUIRED FEATURES MUST BE RESIDENT ON THE TCU.	00020610	
				3269	*	00020620	
				3270	*****	00020630	
000265	9700			3273	READLP ORM SENSE2,0	00020650	
000266	307C			3276	BOC SEVTRK,SETNRZI	00020660	
000267	09FE			3279	STO FRU,ONES-1	00020670	
000268	03FB			3282	STO WORK4,ONES-4	00020680	
000269	02FE			3285	STO WORK3,ONES-1	00020690	
00026A	246A			3289	OKALREDY BOC RDTIME,OKALREDY	00020710	
00026B	3980			3292	BOC N1TE,COUNTLPB	00020720	
				3294	* ONE TRK ENV COUNT LOOP	00020730	
00026C	A101			3296	ADD WORK2,1	00020740	
00026D	217E			3299	BOC NALCO,WAITACEL	00020750	
00026E	A201			3302	ADD WORK3,1	00020760	
00026F	217E			3305	BOC NALCO,WAITACEL	00020770	
000270	D708			3309	READ6400 ANDM SENSE2,HIDEN	00020790	
000271	205D			3312	BOC DBUS,NOTCOMP	00020800	
000272	CD7F			3315	AND XOUTAIM,ONES-PEBIT	00020810	
000273	8D08			3318	ORI XOUTAIM,HIDEN	00020820	
000274	4D42			3321	XFR XOUTAIM,XOUTA	00020830	
				3323	*****	00020840	
				3324	* GO TO TACH ROUTINE AND MOVE ENOUGH TAPE TO GET INTO THE BEGINNING	00020850	
				3325	* OF THE SAGC BURST. TAPE IS GCR	00020860	
				3326	*****	00020870	
000275	198A			3330	OKFOR64 STO LINK2,SETNORM	00020900	

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	2/04/74
000276	0165			3333	STO WORK2,ONES-154	LOAD LO CTR		00020910
000277	6263			3336	BU LPBURST1			00020920
				3339	* NRZI COUNT LOOP			00020940
000278	A001			3341	CNTNRZI ADD WORK1,1	BUMP CTR BY ONE		00020950
000279	217E			3344	BOC NALCO,WAITACEL			00020960
00027A	A301			3347	ADD WORK4,1	BUMP CTR BY ONE		00020970
00027B	217E			3350	BOC NALCO,WAITACEL	BR IF NO OVERFLOW		00020980
00027C	23E8			3353	SETNRZI BOC NRZFEAT,SET800	GO SET NRZI		00020990
00027D	625D			3356	BU NOTCOMP	NRZI NOT INSTALLED- SET NOT CAPABLE		00021000
00027E	246A			3359	WAITACEL BOC RDTIME,OKALREDY	WAIT FOR READTIME		00021010
00027F	627E			3362	BU WAITACEL	TO BECOME ACTIVE		00021020
				3366	COUNTLPB BOC NPTE,CNTNRZI	BR IF NO P BURST		00021040
000280	2C78			3368	* P TRK ENV COUNT LOOP			00021050
000281	A101			3370	ADD WORK2,1	BUMP CTR BY ONE		00021060
000282	217E			3373	BOC NALCO,WAITACEL	BR IF NO OVERFLOW		00021070
000283	A901			3376	ADD FRU,1	BUMP CTR BY ONE		00021080
000284	217E			3379	BOC NALCO,WAITACEL	BR IF NO OVERFLOW		00021090
000285	9700			3382	ORM SENSE2,0	LET SENSE FOR TEST		00021100
000286	3488			3385	BOC HIDDEN,CHKSUMOR	BR IF BIRCH DRIVE		00021110
000287	6046			3388	BU READTAPE STAR	NOT BIRCH - CONTINUE		00021120
000288	325B			3391	CHKSUMOR BOC DUALDEN,READSTAR	BR IF 1600 INSTALLED		00021130
000289	625D			3394	BU NOTCOMP	GO SET NOT CAP - NO 1600 FEATURE		00021140
				3398	*****			00021170
				3399	* ENTERING SAGC BURST. LINK OUT TO TURN ON SAGC LOGIC-ALSO SETS 6250			00021180
				3400	*****			00021190
00028A	1A3D			3403	SETNORM STO LINK3,ZRETURN1	SET LINK RETURN		00021210
00028B	0310			3406	STO WORK4,SETDENS	LOAD COMMAND		00021220
00028C	020D			3409	STO WORK3,DEVSEL+CONTROL+MOVE			00021230
00028D	6530			3412	BU SETCTRL1			00021240
				3415	*****			00021260
				3416	* GO BACK TO THE TACH ROUTINE AND CROSS MOST OF THE SAGC BURST			00021270
				3417	*****			00021280
00028E	00FD			3420	NORMDONE STO WORK1,ONES-2	SET UP TO MOVE TAPE		00021300
00028F	01F3			3423	STO WORK2,ONES-12	6 INCHES APPROX		00021310
000290	1993			3426	STO LINK2,CHKATT	LOAD RETURN - CHK ATT		00021320
000291	8510			3429	ORI FLAGS,16	SET FLAG FOR BOR CHK		00021330
000292	621C			3432	BU ZEROCTR	GO COUNT 550 TACHS		00021340
				3435	*****			00021360
				3436	* NEARING END OF SAGC - CHECK RESULTS AS FOLLOWS AND WAIT FOR END			00021370
				3437	* AS NECESSARY.			00021380
				3438	* BOR DEVATTN			00021390
				3439	* 0 0	EQUIPMENT CHECK + SAGC		00021400
				3440	* 0 1	NOT CAPABLE + SAGC		00021410
				3441	* 1 1	READ FIRST BLOCK - FORCE SAGC ERROR	+NOISE*	00021420
				3442	* 1 0	NORMAL		00021430

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				3443	*****		00021440
000293	9800			3446	CHKATT ORM TRACER,0	TEST LSR FOR BOR SEEN	00021460
000294	3199			3449	BOC BORMARK,RESETBOR	BR IF ALL OK	00021470
000295	3F97			3452	BOC DEVATTN,BRSTCK1	SEE WHAT TAPE UNIT HAS TO SAY	00021480
000296	6719			3455	BU EQSAGC		00021490
000297	8C08			3459	BRSTCK1 ORI DTACHK1,TSAGC	SET TEMPORARY ERROR	* UC * 00021510
000298	625D			3462	BU NOTCOMP		00021520
000299	C8BF			3466	RESETBOR AND TRACER,ONES-BORMARK	RESET BOR SEEN FLAG	00021540
00029A	C5EF			3469	AND FLAGS,X'EF'	TRN OFF BOR FLAG	00021550
00029B	3EA5			3472	BRSTCK2 BOC BSYTACH,BRSTCK10	WAIT FOR TACH CHG	00021560
00029C	299B			3475	BOC NSAGCID,BRSTCK2		00021570
00029D	3FA0			3479	BRSTCK3 BOC DEVATTN,BRSTCK5	SET SAGC CK IF ON	00021590
00029E				3481	BRSTCK4 EQU *		00021600
00029E	2FE0			3483	BRSTCK41 BOC IBG,MODE6401	WAIT FOR END OF SAGC	00021610
00029F	629E			3486	BU BRSTCK41		00021620
0002A0	8C08			3489	BRSTCK5 ORI DTACHK1,TSAGC	SET ERROR	*UC* 00021630
0002A1	D802			3492	ANDM TRACER,READOP	ARE WE A READ OP	00021640
0002A2	20A4			3495	BOC DBUS,BRSTCK6	BR IF NOT	00021650
0002A3	1880			3498	STO MPGMERR,NOISE	SET ERROR FOR FIRST READ	00021660
0002A4				3500	BRSTCK6 EQU *		00021670
0002A4	629E			3502	BU BRSTCK4		00021680
0002A5	A0FF			3505	BRSTCK10 ADD WORK1,ONES	DECREMENT CTR	00021690
0002A6	205D			3508	BOC DBUS,NOTCOMP	EXIT ON OVERFLOW	00021700
0002A7	29A9			3511	BRSTCK11 BOC NSAGCID,BRSTCK12	BR IF STILL NO SAGC ID	00021710
0002A8	629D			3514	BU BRSTCK3	GOOD EXIT	00021720
0002A9	3EA7			3517	BRSTCK12 BOC BSYTACH,BRSTCK11	WAIT FOR TACH TO CHG	00021730
0002AA	629B			3520	BU BRSTCK2		00021740

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
0002AB	02D0			3523	*** GCR READ OP -- LOAD CONTROL COUNTERS *****		00021760
0002AC	0018			3525	NOT1600 STO WORK3,ONES-47		00021770
0002AD	09F9			3528	STO WORK1,24		00021780
0002AE	4321			3531	STO FRU,ONES-6		00021790
0002AF	A900			3534	XFR WORK4,AR		00021800
0002B0	21B2			3537	ADD FRU,0		00021810
0002B1	62B4			3540	BOC NALCO,OKDOK		00021820
				3543	BU SETMIN		00021830
0002B2	B904			3547	OKDOK ADDM FRU,4		00021850
0002B3	21B5			3550	BOC NALCO,READ001		00021860
0002B4	09FC			3553	SETMIN STO FRU,ONES-3		00021870
				3556	*****		00021890
				3557	* CYCLE WAITING FOR ROC ROTATN. IF IBG COMES ACTIVE, OR TIME OUT IS	*	00021900
				3558	* REACHED - SET START READ CHECK. AT APPROPRIATE POINT SET LO GAIN	*	00021910
				3559	*****		00021920
0002B5	24B5			3562	READ001 BOC RDTIME,READ001		00021940
0002B6	2FC0			3566	BOC IBG,SETRDERR		00021960
0002B7	A0FF			3569	ADD WORK1,ONES		00021970
0002B8	20C0			3572	BOC DBUS,SETRDERR		00021980
0002B9	A901			3575	ADD FRU,1		00021990
0002BA	21BD			3578	BOC NALCO,READ002		00022000
0002BB	8D22			3581	ORI XOUTAIM,LOGAIN+NOLOSS AGE LOW GAIN		00022010
0002BC	4D42			3584	XFR XOUTAIM,XOUTA		00022020
0002BD	24B5			3588	READ002 BOC RDTIME,READ001		00022040
0002BE	22C1			3591	BOC ROCROT,READ003		00022050
0002BF	62BD			3594	BU READ002		00022060
0002C0	60AC			3597	SETRDERR BU SETRDCHK		00022070
				3600	*****		00022090
				3601	* MARK HAS BEEN SEEN. DROP SYNC LINE TO DETECTION CIRCUITS	*	00022100
				3602	*****		00022110
0002C1	CDEF			3606	READ003 AND XOUTAIM,ONES-SYNC		00022140
0002C2	4D42			3609	XFR XOUTAIM,XOUTA		00022150
0002C3	24C5			3612	READ004 BOC RDTIME,READ0041		00022160
0002C4	62C3			3615	BU READ004		00022170
0002C5	2DCA			3619	READ0041 BOC DATARDY,READ0051		00022190
0002C6	A0FF			3622	ADD WORK1,ONES		00022200
0002C7	20C0			3625	BOC DBUS,SETRDERR		00022210
0002C8	24C8			3628	READ0042 BOC RDTIME,READ0042		00022220
0002C9	62C3			3631	BU READ004		00022230
				3634	*****		00022250
				3635	* DATA TIME - WAIT FOR EOD WHILE COUNTING FOR RESYNC BURST.	*	00022260
				3636	*****		00022270
0002CA	28DF			3639	READ0051 BOC ENDATA,READ008		00022290

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0002CB	2FDE			3642	BOC	IBG,NOENDERR	ERRRR EXIT	F01MAY72 2/04/74 00022300
0002CC	22CA			3645	BOC	ROCROT,READ0051	WAIT FOR ROC ROTATIONS	00022310
0002CD	DD40			3648	TESTFWD ANDM	XOUTAIM,FWDDATA	TEST FORWARD BIT	00022320
0002CE	20D9			3651	BOC	DBUS,READ007	BR IF BKWD OP	00022330
0002CF	28DF			3654	BOC	ENDATA,READ008	NORMAL EXIT	00022340
0002D0	A201			3657	ADD	WORK3,1	BUMP RESYNC CTR	00022350
0002D1	21D9			3660	BOC	NALCO,READ007	BR IF NOT TIME YET	00022360
0002D2	ED10			3663	XO	XOUTAIM,SYNC	INVERT THE SYNC LINE	00022370
0002D3	4D42			3666	XFR	XOUTAIM,XOUTA	SET OR RESET SYNC	00022380
0002D4	9D00			3669	ORM	XOUTAIM,0	TEST LSR	00022390
0002D5	33D8			3672	BOC	SYNC,READ006	BR IF SYNC IS NOW ON	00022400
0002D6	02CF			3675	STO	WORK3,ONES-48	LOAD FOR NEW RESYNC BURST	00022410
0002D7	62D9			3678	BU	READ007		00022420
0002D8	02FF			3681	READ006	STO WORK3,ONES	LOAD COUNT FOR RESYNC ACTIVE	00022430
0002D9	22CA			3684	READ007	BOC ROCROT,READ0051	GO TO PROPER LOOP	00022440
0002DA	28DF			3687	READ017	BOC ENDATA,READ008	WATCH FO EOD	00022450
0002DB	22CD			3690	BOC	ROCROT,TESTFWD	WAIT FOR ROC ROTAIONS	00022460
0002DC	2FDE			3693	BOC	IBG,NOENDERR	ERROR EXIT	00022470
0002DD	62DA			3696	BU	READ017		00022480
				3699	*****	*****		00022500
				3700	* EOD DETECTED N/ POASTAMBLE CHECK		*	00022510
				3701	*****	*****		00022520
0002DE	8A04			3705	NOENDERR	ORI DTACHK2,PARTREC	SET PARTIAL RECORD	00022550
0002DF				3707	READ008	EQU *		00022560
0002DF	60AD			3709	READ010	BU SETLONOW		00022570
0002E0	1CFB			3713	MODE6401	STO LINK1,SRETURN6	LOAD LINK RETURN-SETFWD	00022590

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	FO1MAY72	2/04/74
				3718	***** FETCH STATUS SUBROUTINE *****		00022630
				3719	* THIS SUBROUTINE IS USED BY ANY ROUTINE REQUIRING SENSE DATA FROM		* 00022640
				3720	* THE DEVICE. TWO BYTES OF SENSE DATA WILL BE RETURNED AND CONTROL		* 00022650
				3721	* RELINQUISHED TO THE CALLING ROUTINE VIA LINK REG 1.		* 00022660
				3722	*		* 00022670
				3723	*****		00022680
0002E1				3725	STEP0012 EQU *		00022700
0002E1	0000			3727	FCHSTS STO WORK1,0	CLEAR THE TU	00022710
0002E2				3729	STEP0013 EQU *		00022720
0002E2	4060			3731	XFR WORK1,TUBO	BUS OUT	00022730
0002E3				3733	STEP0014 EQU *		00022740
0002E3	0008			3735	STO WORK1,DEVSEL	SET SELECT & RESET ALL OTHER TAGS	00022750
0002E4				3737	TUBODOWN EQU *		00022760
0002E4				3738	STEP0015 EQU *		00022770
0002E4	4024			3740	XFR WORK1,TUTAG	IF THEY ARE ON	00022780
0002E5				3742	STEP0016 EQU *		00022790
0002E5	0001			3744	STO WORK1,1	SET FOR SENSE BYTE ZERO *****	00022800
0002E6				3746	STEP0017 EQU *		00022810
0002E6	4060			3748	FCHSNS XFR WORK1,TUBO	XFER TO THE TAPE UNIT BUS OUT REG	00022820
0002E7				3750	STEP0018 EQU *		00022830
0002E7	06FE			3752	STO SENSE1,ONES-1	LOAD WAIT COUNT	00022840
0002E8				3754	STEP0019 EQU *		00022850
0002E8				3755	STEP0021 EQU *		00022860
0002E8	A601			3757	HUP1 ADD SENSE1,1	AND	00022870
0002E9				3759	STEP0020 EQU *		00022880
0002E9				3760	STEP0022 EQU *		00022890
0002E9	21E8			3762	BOC NALCO,HUP1	WAIT	00022900
0002EA				3764	STEP0023 EQU *		00022910
0002EA	4021			3766	FCHLAST XFR WORK1,AR	SHIFT BIT LEFT IF	00022920
0002EB				3768	STEP0024 EQU *		00022930
0002EB	A000			3770	ADD WORK1,ZERO	NOT	00022940
0002EC				3772	STEP0025 EQU *		00022950
0002EC	4681			3774	XFR SENSE1,TUBI	FETCH 1ST SENSE BYTE	00022960
0002ED				3776	STEP0026 EQU *		00022970
0002ED	5681			3778	XFRH SENSE1,TUBI	AND PUT IT IN HIGH REG ALSO	00022980
0002EE				3780	STEP0027 EQU *		00022990
0002EE	4060			3782	FCHNEXT XFR WORK1,TUBO	MOVE TO TAPE BUS OUT	00023000
0002EF				3784	STEP0028 EQU *		00023010
0002EF	07FE			3786	STO SENSE2,ONES-1	LOAD WAIT COUNT	00023020
0002F0				3788	STEP0029 EQU *		00023030
0002F0				3789	STEP0031 EQU *		00023040
0002F0	A701			3791	HUP2 ADD SENSE2,1	AND	00023050
0002F1				3793	STEP0030 EQU *		00023060
0002F1				3794	STEP0032 EQU *		00023070
0002F1	21F0			3796	BOC NALCO,HUP2	WAIT	00023080
0002F2				3798	STEP0033 EQU *		00023090
0002F2	4781			3800	XFR SENSE2,TUBI	FETCH 2ND SENSE BYTE	00023100
0002F3				3802	STEP0034 EQU *		00023110
0002F3	4021			3804	XFR WORK1,AR	SET UP FOR	00023120
0002F4				3806	STEP0035 EQU *		00023130
0002F4	A000			3808	ADD WORK1,0	SENSE OP	00023140
0002F5				3810	STEP0036 EQU *		00023150

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00023160

Address	Hex	Instruction	Comment	Hex	Instruction	Comment	Hex	Instruction	Comment
0002F6	6101	3816	***** STATUS FETCH BRANCH TABLE *****	00023190					
0002F7	61D6	3818	SRETURN1 BU STATUS1	INIT STATUS RETURN	*	00023200			
0002F8	6365	3821	SRETURN2 BU SNSRTN	ENDVP RETURN	*	00023210			
0002F9	63F9	3824	SRETURN3 BU POLL6	DEV END RETURN		00023220			
0002FA	6014	3827	SRETURN4 BU SNSLINK	RETURN TO SENSE ROUTINE		00023230			
0002FB	6038	3830	SRETURN5 BU SETUP			00023240			
0002FC	61A9	3833	SRETURN6 BU SETFWD	READ AT LP RETURN		00023250			
		3835	STEP0037 EQU *			00023260			
		3837	SRETURN7 BU ZAPIM			00023270			

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	2/04/74
000300				3840	ORG BEGIN+X'300'			00023290
				3842	*****			00023310
				3843	* THIS IS THE ENTRY POINT FOR WRITE DELAY VELOCITY CHECK AND	*		00023320
				3844	* FOR CHECKING DURING FC-3.	*		00023330
				3845	*	*		00023340
				3846	* THE ERROR EXIT IN THE CASE THE DRIVE DOES NOT ACHIEVE	*		00023350
				3847	* SPECIFIED VELOCITY IS SET VELOCITY ERROR AND ABORT TO	*		00023360
				3848	* ENDUP.	*		00023370
				3849	*	*		00023380
				3850	* THE NORMAL EXIT FOR FC-3 CHECK IS VIA STOP.	*		00023390
				3851	* THE ERROR EXIT SETS DATA CHECK AND RETURNS TO WRITE ROUTINE	*		00023400
				3852	* IF IBG COMES UP AN EXIT TO WRITE ROUTINE WILL BE TAKEN.	*		00023410
				3853	*	*		00023420
				3854	* NOTE: REGISTER 'SENSE1' IS USED IN THIS ROUTINE TO HOLD THE FLAGS	*		00023430
				3855	*****	*		00023440
				3857	* COUNT FOR 75 IN			00023460
000300	1078			3860	CHKVEL STO H WORK1,ONES-135	SET VELOCITY COMPARE		00023480
000301	1118			3863	STO H WORK2,24	COUNTS		00023490
000302	9700			3866	ORM SENSE2,0 ERO	IS THIS 75 IN		00023500
000303	360A			3869	BOC DREG6,SETHI	BR IF SO		00023510
000304	3708			3872	BOC DREG7,CNT200	BR IF 200 IN.		00023520
				3875	* COUNT FOR 125 IN			00023540
000305	10AF			3878	STO H WORK1,ONES-80	SET VELOCITY COMPARE		00023560
000306	110D			3881	STO H WORK2,13	COUNTS		00023570
000307	630A			3884	BU SETHI	GO INITIAL COUNTS		00023580
				3887	* COUNT FOR 200 IN			00023600
000308	10CD			3890	CNT200 STO H WORK1,ONES-50	SET VELOCITY COMPARE		00023620
000309	110A			3893	STO H WORK2,10	COUNTS		00023630
00030A	5006			3896	SETHI XFRH LSR	SET TO THE HIGH REGISTERS		00023640
00030B	02FC			3899	SET4 STO WORK3,ONES-3	SET INITIAL GO COUNT		00023650
				3902	* TRANSFER COUNT TO COUNTER REGISTER			00023670
00030C	1500			3905	INITCNT STO WORK5,ZERO	MOVE CONTENTS OF		00023690
00030D	4021			3908	XFR WORK1,AR	WORK1 TO		00023700
00030E	8500			3911	ORI WORK5,0	WORK5		00023710

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				3915	*****		00023740
				3916	* THIS SUBROUTINE DOES THE COUNTING OF TIME FOR EACH LEVEL OF		00023750
				3917	* TACH FLIP FLOP.		00023760
				3918	*****		00023770
00030F	2619			3921	BOC TACHFF,TACHPRZ	BR IF ON POSITIVE PORTION	00023790
000310	273F			3924	NTACHPRZ BOC STOP,VELEXIT	RETURN TO WRITE IF PRESENT	00023800
000311	A501			3927	ADD WORK5,ONE	BUMP THE COUNTER	00023810
000312	2117			3930	BOC NALCO,NPRZ	AND BR IF OK	00023820
				3933	* THE DRIVE WAS TOO SLOW		00023840
000313	2622			3936	WAITL BOC TACHFF,CHKCNTS	WAIT UNTIL TACHFF CHANGES	00023860
000314	273F			3939	BOC STOP,VELEXIT	CREASE TAPE EXIT	00023870
000315	3F2C			3942	BOC DEVATTN,UEXEND	BR IF DRIVE INTERRUPT	00023880
000316	6313			3945	BU WAITL	HANG IN THERE	00023890
000317	2622			3948	NPRZ BOC TACHFF,CHKCNTS	BR IF SO NORMAL EXIT FROM LOOP	00023900
000318	6310			3951	BU NTACHPRZ	BACK FOR NEXT COUNT	00023910
				3954	*****		00023930
000319	273F			3957	TACHPRZ BOC STOP,VELEXIT	RETURN TO WRITE IF PRESENT	00023950
00031A	201B			3960	NOP2		00023960
00031B	A501			3963	ADD WORK5,ONE	BUMP	00023970
00031C	2121			3966	BOC NALCO,PRZ	COUNTER	00023980
				3969	* THE DRIVE WAS TOO SLOW (COUNT EXHAUSTED)		00024000
00031D	3F2C			3972	WAIT1L BOC DEVATTN,UEXEND	BR ON READY DROP	00024020
00031E	273F			3975	BOC STOP,VELEXIT	CREASE TAPE EX	00024030
00031F	261D			3978	BOC TACHFF,WAIT1L	WAIT UNTIL CONDITION NOT MET	00024040
000320	6322			3981	BU CHKCNTS	GO CHECK THE COUNT	00024050
000321	2619			3984	PRZ BOC TACHFF,TACHPRZ	BR TO REMAIN IN LOOP	00024060
				3987	*****		00024080
				3988	* ENTRY TO CHECK THE COUNT.	*	00024090
				3989	*****		00024100
000322	9600			3992	CHKCNTS ORM SENSE1,0	IS THIS INITIAL 4 COUNT	00024120
000323	342E			3995	BOC CNTRDY,TSTIME	BR IF NOT	00024130
000324	A201			3998	ADD WORK3,ONE	ADD FOR 1ST 4 COUNT	00024140
000325	210C			4001	BOC NALCO,INITCNT	BR IF NOT DONE YET	00024150
000326	8608			4004	ORI SENSE1,CNTRDY	SET TRACE TO INDICATE 4 COMPLETE	00024160
000327	02FB			4007	RECNT STO WORK3,ONES-4	RESET COUNT TO 4	00024170
000328	6332			4010	BU WASTET	GO CHECK THE GO COUNT	00024180
000329	A301			4013	TST28 ADD WORK4,ONE	ADD ONE TO 28 COUNT	00024190
00032A	210C			4016	BOC NALCO,INITCNT	BR IF NOT TO LIMIT	00024200
				4018	* BOC STOP,HIOEXIT	BR ON STOP TO GET OUT	00024210
				4020	* ***** SET VELOCITY ERROR *****		00024230
00032B	1D01			4023	SETVELCK STO EQUIPCK,VELOCERR	SET VELOCITY ERROR IF SO	00024250
00032C	4006			4026	UEXEND XFR LSR	SET LOW REGS	00024260

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	GO TERMINATE WRITE OP	F01MAY72	2/04/74
00032D	6247			4029	BU UCKON			00024270
				4032	*****			00024290
				4033	* ENTRY TO TEST TACH COUNT REG			00024300
				4034	*****			00024310
00032E	3239			4037	TSTIME BOC FIRST,REFIRST	BR IF THIS IS 1ST PASS DURING FC-3		00024330
00032F	4121			4040	XFR WORK2,AR	TEST FOR THE		00024340
000330	B500			4043	ADDM WORK5,ZERO	DRIVE TOO FAST		00024350
000331	213B			4046	WSTLOOP BOC NALCO,NOTGOOD	BR IF SO		00024360
000332	D680			4049	WASTET ANDM SENSE1,DATATIM	IS THIS DURING WRT DATA		00024370
000333	2048			4052	BOC DBUS,TSTGO	BR IF NOT		00024380
000334	D601			4055	CKFC3 ANDM SENSE1,MK800	ARE WE NRZI		00024390
000335	3738			4058	BOC MK800,DLYNRZ	BR IF NRZI		00024400
000336	2F3F			4061	BOC IBG,VELEXIT	BR IF FC-3 AND IBG UP		00024410
000337	630A			4064	DLYSETHI BU SETHI	OTHERWISE GO RESET 4 COUNT		00024420
000338	6337			4067	DLYNRZ BU DLYSETHI	EQUALIZE FOR NRZI LEG		00024430
000339	C6DF			4070	REFIRST AND SENSE1,ONES-FIRST	RESET THE 1ST PASS FLAG		00024440
00033A	6332			4073	BU WASTET	GO RESET TO 4 GO COUNT		00024450
00033B	D680			4076	NOTGOOD ANDM SENSE1,DATATIM	IS THIS DURING DATA TIME		00024460
00033C	2045			4079	BOC DBUS,RETRY	BR IF NOT		00024470
00033D	8840			4082	ORI MPGMERR,EXVCHG	SET ERROR		00024480
00033E	6334			4085	BU CKFC3	GO BACK TO CHECK IBG		00024490
				4088	*****			00024510
				4089	* NORMAL EXIT TO RETURN TO WRITE ROUTINE			00024520
				4090	*****			00024530
00033F	D680			4093	VELEXIT ANDM SENSE1,DATATIM	IS THIS WRITE DELAY		00024550
000340	204B			4096	BOC DBUS,WAITLOP	BR IF SO		00024560
000341	4006			4099	XFR LSR	SET LOW LSR'S		00024570
000342	3844			4102	BOC 6250,VELEXIT1	BR IF BIRCH		00024580
000343	2385			4105	BOC NRZFEAT,CKNORPE	BR TO CHECK DENSITY FOR RETURN		00024590
000344	6671			4108	VELEXIT1 BU WRITE28	6400 RETURN		00024600
				4111	*****			00024620
				4112	* USE DURING 28 COUNT IF VEL IS OUT OF SPEC.			00024630
				4113	*****			00024640
000345	0401			4116	RETRY STO STATIMG,VELTRY	SET ERROR ON IN REG TO SAVE		00024660
000346	02FC			4119	STO WORK3,ONES-3	SET COUNT AGAIN		00024670
000347	6329			4122	BU TST28	GO BUMP THE 28 COUNT		00024680
				4125	*****			00024700
				4126	* THIS IS THE NORMAL EXIT FOR 8 COUNT IN WRT DELAY.			00024710
				4127	*****			00024720
000348	A201			4130	TSTGO ADD WORK3,ONE	IS THE GO COUNT DONE		00024740
000349	2129			4133	BOC NALCO,TST28	BR IF NOT		00024750
00034A	67F9			4136	BU VELOCOK			00024760
00034B	261D			4140	WAITLOP BOC TACHFF,WAIT1L	RETURN TO PROPER WAIT LOOP		00024780
00034C	6313			4143	BU WAITL	TO COUNT ONE TACH		00024790

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
4146					***** SCAN FOR DEVICE ENDS *****		00024810
4147					* SEARCH FOR DEV ENDS REQUIRES MAXIMUM COMMUNICATION BETWEEN THE TWO		* 00024820
4148					* ALUS. ALU2 SEARCHS HIS DEPRIME REGS FOR BITS. WHEN HE FINDS ONE,		* 00024830
4149					* THE ADDRESS IS PASSED TO ALU1 VIA XOUTB AND A WAIT IS INITIATED		* 00024840
4150					* WHILE ALU1 SELECTS THE DEVICE. WHEN ALU1 HAS THE DEVICE SELECTED,		* 00024850
4151					* ALU2 IS KICKED OFF TO DETERMINE THE DEVICE STATUS. IF A LIVE DEV		* 00024860
4152					* END IS FOUND,ALU2 AGAIN RETURNS TO ALU1 WITH STAT C ON		* 00024870
4153					* IF NO DEV END IS FOUND FOR THAT DEVICE, A DIFFERENT ADDRESS		* 00024880
4154					* WILL BE PLACED IN XOUTB (NEXT POSSIBLE DE).WHEN ALU2 RETURNS TO ALU1		* 00024890
4155					* AFTER RUNNING OUT OF DE PRIMES,STATD WILL BE SET.		* 00024900
4156							* 00024910
4157					ALU1 STATS	ALU2 STATS	* 00024920
4158					A	A	* 00024930
4159					B INTERFACE B	B DE PRIME FOUND - WAIT	* 00024940
4160					C STEP ALU2	C DEVICE FREE	* 00024950
4161					D	D FINISHED	* 00024960
4162							* 00024970
4163							* 00024980
4164					*****		00024990
00034D	0100			4167	EXEC POLL STO WORK2,0	CLEAR LSR TO HOLD TU ADDR	00025010
00034E	1200			4170	STOH WORK3,0	CLEAR FLAG	00025020
00034F	0B01			4173	EXEC PULL STO TUADDR,1	SET UP TUADDR LSR	00025030
000350				4175	POLL1 EQU *		00025040
000350	4F21			4177	XFR LODEPB,AR	DO WE HAVE A DEV END B	MIS* 00025050
000351	2B54			4180	BOC STATB,POLL3	SKIP	MIS* 00025060
000352	9000			4183	NOP1	RESET AR	MIS* 00025070
000353	4E21			4186	POLL2 XFR LODEPA,AR	DO WE HAVE A DEV END A	00025080
000354	DB00			4189	POLL3 ANDM TUADDR,0	DREG NOT ZERO SAYS DEV END	00025090
000355	2086			4192	BOC DBUS,POLLNEXT	BR IF NOT	00025100
000356	4141			4195	POLL10 XFR WORK2,XOUTB	SEND DEV ADDRESS RO ALU1	00025110
000357	8404			4198	ORI STATIMG,SETSTATB	TELL ALU1	00025120
000358	4428			4201	XFR STATIMG,STAT	SET STAT B	00025130
				4204	*****		00025150
				4205	* WARNING DO NOT SINGLE STEP THROUGH NEXT INSTRUCTIONS IF MORE THAN *		00025160
				4206	* ONE PRIME .		00025170
				4207	*****		00025180
000359	3A59			4209	WTEONC BOC STATC,WTEONC	WAIT FOR STATC TO GO OFF	00025190
00035A	3A5C			4212	POLL4 BOC STATC,POLL5	WAIT FOR ALU1	00025200
00035B	635A			4215	BU POLL4	STAT C TO COME ON	00025210
00035C	C4FB			4218	POLL5 AND STATIMG,ONES-SETSTATB		00025220
00035D	4428			4221	XFR STATIMG,STAT	TRN OFF STAT B	00025230
00035E	3E83			4224	BOC BSYTACH,POLLSTEP	BR IF SWITCHED	00025240
				4227	*****		00025260
				4228	* GO SEE IF DEVICE IS PULSING - IF SO DO NOT PRESENT DEV END		* 00025270
				4229	*****		00025280
00035F	1C36			4232	STO LINK1,PRETURN2	SET FOR PULSE RET-POLLSTEP	00025300
000360	1937			4235	STO LINK2,PRETURN4	SET FOR NO PULSE RET-SKIPB M	00025310
000361	6126			4238	BU CHKPULSE		00025320
000362	1CF8			4241	GOGETIM STO LINK1,SRETURN3	RETURN TO POLL6	00025330

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	2/04/74	
000363	4006			4244	XFR	LSR	ASSURE LOW		00025340	
000364	62E1			4247	BU	FCHSTS	GO GET SNS BYTES		00025350	
000365	2A90			4250	POLL6	BOC	STATA,SETHIMOD		00025360	
000366	3E83			4253	POLL66	BOC	BSYTACH,POLLSTEP		00025370	
000367	0004			4256	POLLALL	STO	WORK1,4	SET TO CHECK	00025380	
000368	4060			4259	XFR	WORK1,TUBO	ASK FOR SNS BUTE 2		00025390	
000369	A055			4262	BBB	ADD	WORK1,85	USE WK1 FOR TIMER	00025400	
00036A	2169			4265	BOC	NALCO,BBB	BACK TWICE		00025410	
00036B	4681			4268	XFR	SENSE1,TUBI	BRING IN SENSE BYTE 2		00025420	
00036C	346E			4271	BOC	DREG4,DRVUNTCK	BR IF NOT		00025430	
00036D	8404			4274	DEVDONE	ORI	STATIMG,SETSTATB	WE HAVE A LIVE DEV END	00025440	
00036E	8402			4277	DRVUNTCK	ORI	STATIMG,SETSTATC	SET STATC ON NOT READY COND.	00025450	
00036F	4428			4280	XFRSTAT	XFR	STATIMG,STAT	TELL ALU1	00025460	
000370				4282	POLLMTIX	EQU	*	GO WAIT TO RESET THE DEV END	00025470	
000370	3B72			4284	BOC	STATD,DOINDE	IS STATD ON		00025480	
000371	6370			4287	BU	POLLMTIX	WAIT FOR IT		00025490	
4290							*****		00025510	
4291							* IF THE TAPE UNIT INTERRUPT IS ON - TAPE WILL BE ISSUED A RESET	*	00025520	
4292							* ON GO AHEAD FROM ALU1,THE DEVICE END PRIME WILL BE RESET	*	00025530	
4293							*****		00025540	
000372	00FF			4296	DOINDE	STO	WORK1,ONES	SET MASK TO GET	00025560	
000373	4B21			4299	XFR	TUADDR,AR	ONES COMPLEMENT		00025570	
000374	E000			4302	XO	WORK1,0	OF THE ADDR		00025580	
000375	4021			4305	XFR	WORK1,AR	TO RESET THE PRIME		00025590	
000376	2B79			4308	BOC	STATB,FINDTU7	BR IF INTERFACE B	MIS*	00025600	
000377	CE00			4311	AND	LODEPA,0	TRN OFF DEV END A		00025610	
000378	637A			4314	BU	FINDTU77	ALL DONE AND RESET ALL STATS		00025620	
000379	CF00			4317	FINDTU7	AND	LODEPB,0	TRN OFF DEV END B	MIS*	00025630
00037A	3F7E			4320	FINDTU77	BOC	DEVATN,RESETTU	BR IF MTI ON		00025640
00037B	5221			4323	POLLSTOP	XFRH	WORK3,AR	PUT FLAG		00025650
00037C	8400			4326	ORI	STATIMG,0	INTO			00025660
00037D	61E9			4329	SNSTOP	BU	SETD	STAT REG		00025670
00037E	100A			4333	RESETTU	STOH	WORK1,DEVSEL+COMMAND	RESET		00025690
00037F	1102			4336	STOH	WORK2,RESET	OUTSTANDING			00025700
000380	5160			4339	XFRH	WORK2,TUBO	INTERRUPT			00025710
000381	5024			4342	XFRH	WORK1,TUTAG	TAPE UNIT			00025720
000382	61CB			4345	BU	EXECABRT				00025730
000383	1204			4348	POLLSTEP	STOH	WORK3,SETSTATB	SET FLAG (HOLD INTERFACE)		00025740
000384	1900			4351	SKIPB	STO	LINK2,0	CLEAR DEVICE		00025750
000385	5924			4354	XFR	LINK2,TUTAG	SELECT			00025760
000386	A101			4358	POLLNEXT	ADD	WORK2,1	BUMP TU ADDR BY 1		00025780
000387	4B21			4361	XFR	TUADDR,AR	BUMP TU ADR BY 1			00025790
000388	AB00			4364	ADD	TUADDR,0	BY PROPAGATION			00025800
000389	2150			4367	BOC	NALCO,POLL1	BR TO DO NEXT DEV			00025810
00038A	2A7B			4370	BOC	STATA,POLLSTOP	BR OUT ON 2ND PASS			00025820
00038B	5006			4373	XFRH	LSR	SET HI			00025830
00038C	8408			4376	ORI	STATIMG,SETSTATA	TRN ON STAT A ON FIRST PASS			00025840
00038D	4428			4379	XFR	STATIMG,STAT	TO ALLOW BR ON SECOND PASS			00025850
00038E	0108			4382	STO	WORK2,8	TRN ON HIGH ORDER SEL BIT			00025860
00038F	634F			4385	BU	EXECPULL	GO RUN 2ND PASS			00025870
000390	5006			4388	SETHIMOD	XFRH	LSR	SET HI		00025880
000391	6366			4391	BU	POLL66				00025890

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	FO1MAY72 2/04/74
				4394	***** SENSE ROUTINE *****	00025910
				4395	*	00025920
				4396	* THIS ROUTINE WILL ASSEMBLE AND PRESENT TO ALU1 THE SENSE BITS FROM	00025930
				4397	* ALU2 AND/OR THE DRIVE.	00025940
				4398	* THE SENSE BITS WILL BE PRESENTED IN XOUTA OR XOUTB IN THE PROPER	00025950
				4399	* POSITION TO BE OR'ED INTO THE CONTROL UNIT SENSE BYTE.	00025960
				4400	*****	00025970
000392	4C21			4403	SNS41 XFR DTACHK1,AR LOOK FOR	00025990
000393	5821			4406	XFR MPGMERR,AR ANY	00026000
000394	8400			4409	ORI STATIMG,ZERO DATA	00026010
000395	D4F6			4412	ANDM STATIMG,X'F6' CHECKS	00026020
000396	2098			4415	BOC DBUS,SNS5 BR IF NO DATA CHECKS	00026030
000397	8108			4418	SNS42 ORI WORK2,DATAACK SET DATA CHECK ON	00026040
000398	299A			4421	SNS5 BOC NCONVCK,SNS6 BR IF NOT DATA CONVERTER CHECK	00026050
000399	8101			4424	ORI WORK2,CONVCK SET THE ERROR	00026060
00039A	D780			4428	SNS6 ANDM SENSE2,SEVTRK IS THIS 7 TRK DR.	00026080
00039B	209D			4431	BOC DBUS,SNS7 BR IF NOT	00026090
00039C	8210			4434	ORI WORK3,SEVENTRK SET ON IF SOCU	00026100
00039D	D610			4437	SNS7 ANDM SENSE1,BOT IS THIS BEGIN OF TAPE DR	00026110
00039E	20A0			4440	BOC DBUS,SNS8 BR IF NOT	00026120
00039F	8208			4443	ORI WORK3,LDPT SET LOAD POINT ON CU	00026130
0003A0	D608			4446	SNS8 ANDM SENSE1,WRSTAT IS WRITE STATUS ON DR	00026140
0003A1	20A3			4449	BOC DBUS,SNS9 BR IF NOT	00026150
0003A2	8204			4452	ORI WORK3,WRSTA SET ON IF SO. CU	00026160
0003A3	9600			4455	SNS9 ORM SENSE1,ZERO IS DRIVE FILE PROTECTED	00026170
0003A4	31A6			4458	BOC NFP,SNSB BR IF NOT	00026180
0003A5	8202			4461	ORI WORK3,FP SET FILE PROTECT ON	00026190
0003A6	19A8			4464	SNSB STO LINK2,SNSC RETURN TO SNSC	00026200
0003A7	63EF			4467	BU SNSWAIT GO SEND BYTES 0 AND 1	00026210
				4470	* SENSE BYTE 2 AND 3	* 00026230
0003A8	0210			4473	SNSC STO WORK3,ENDATAER SET UP MASK FOR END DATA CHK	00026250
0003A9	5821			4476	XFR MPGMERR,AR SET REG TO AR TO TEST AND	00026260
0003AA	C200			4479	AND WORK3,ZERO IF ON WILL REMAIN ON	00026270
0003AB	9700			4482	ORM SENSE2,ZERO IS UNIT NOT PHASE ENCODED DR	00026280
0003AC	33AE			4485	BOC NOTPE,SNSD BR IF SO (NRZI)	00026290
0003AD	8204			4488	SNSC2 ORI WORK3,PE SET PE ON CU	00026300
0003AE	D680			4491	SNSD ANDM SENSE1,BACKWD IS UNIT BACKWARD DR	00026310
0003AF	20B1			4494	BOC DBUS,SNSE BR IF NOT	00026320
0003B0	8202			4497	ORI WORK3,BKWD SET ON IF SO CU	00026330
0003B1	19B6			4500	SNSE STO LINK2,SNSF RETURN TO SNSF	00026340
0003B2	3CB4			4503	BOC NENVLOS,SNSLES BR IF NO LOSS OF ENV	00026350
0003B3	8208			4506	ORI WORK3,X'08' SET ENV ERROR	* UC * 00026360
0003B4	5742			4509	SNSLES XFR TIEBYTE,XOUTA GO SEND BYTES 2 AND 3	00026370
0003B5	63F0			4512	BU WAIT4	00026380
				4515	* SENSE BYTE 4 AND 5	* 00026400
0003B6	C622			4518	SNSF AND SENSE1,EOT+DEVCHK CLEAR ALL BITS BUT THESE TWO	00026420
0003B7	0140			4521	STO WORK2,REJTU SET MASK IN REG	00026430
0003B8	5D21			4524	XFR EQUIPCK,AR PUT EQUIPMENT CHK ON AR	00026440

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0003B9	C100			4527		AND WORK2,ZERO	AND MASK AND AR	F01MAY72 2/04/74
0003BA	4621			4530		XFR SENSE1,AR	PUT BITS	00026450
0003BB	4521			4533		XFR FLAGS,AR	ON AR TO	00026460
0003BC	8100			4536		ORI WORK2,ZERO	PASS TO REG	00026470
0003BD	19C2			4539	VRCDONE	STO LINK2,SNSG	RETURN TO SNSG	00026480
0003BE	2DC0			4542		BOC NRPQ,SKIPRPQ		00026490
0003BF	8201			4545		ORI WORK3,1	SET RPQ BIT	00026500
0003C0	4A21			4548	SKIPRPQ	XFR DTACHK2,AR	PUT REG IN AR	00026510
0003C1	63EE			4551		BU POSBYTE	GO SET IN WORK3	00026520
								00026530
				4554	*	SENSE BYTES 6 AND 7		00026550
0003C2	4742			4557	SNSG	XFR SENSE2,XOUTA	PASS REG TO XOVER	00026570
0003C3	19C6			4560		STO LINK2,SNSH	RETURN TO SNSH	00026580
0003C4	1CF9			4563	SCANLINK	STO LINK1,SRETURN4	RETURN TO SNSLINK	00026590
0003C5	62E6			4566		BU FCHSNS	GO PULL 2 BYTES OF SENSE	00026600
0003C6	19C9			4569	SNSH	STO LINK2,SNSJ	SET RETURN TO SNSJ	00026610
0003C7	4641			4572	SNSI	XFR SENSE1,XOUTB	PASS SENSE 1 TO XOVER	00026620
0003C8	63F1			4575		BU WAIT0	GO FINISH	00026630
				4578	*	SENSE BYTES 8 AND 9		00026650
0003C9	4C42			4581	SNSJ	XFR DTACHK1,XOUTA	PASS ERROR REG TO XOVER	00026670
0003CA	8240			4584		ORI WORK3,EXVCHG	SET MASK IN REG	00026680
0003CB	5821			4587		XFR MPGMERR,AR	PUT ERROR REG ON AR	00026690
0003CC	C200			4590		AND WORK3,ZERO	AND MASK AND AR	00026700
0003CD	19CF			4593	SKIPSDR	STO LINK2,SNSK	SET RETURN TO SNSK	00026710
0003CE	63F0			4596		BU WAIT4	GO FINISH	00026720
				4599	*	SENSE BYTES 10 AND 11		00026740
0003CF	01BD			4602	SNSK	STO WORK2,ONES-REJTU-PERR	MASK IN REG	00026760
0003D0	5D21			4605		XFR EQUIPCK,AR	PUT ERROR REG ON AR	00026770
0003D1	C100			4608		AND WORK2,ZERO	AND MASK AND AR	00026780
0003D2	19D4			4611		STO LINK2,SNSL	RETURN TO SNSL	00026790
0003D3	63EF			4614		BU SNSWAIT	GO PASS TO X OVERS	00026800
				4617	*	SENSE BYTES 12 AND 13		00026820
0003D4	19D6			4620	SNSL	STO LINK2,SNSM	RETURN AFTER SENDING	00026840
0003D5	63EF			4623		BU SNSWAIT	2 BLANK BYTES	00026850
				4626	*	SENSE BYTES 14 AND 15		00026870
0003D6	19D9			4629	SNSM	STO LINK2,SNSO	RETURN TO SNSO	00026890
0003D7	4721			4632	SNSN	XFR SENSE2,AR	GET TU SERIAL NO-HIGH	00026900
0003D8	63EE			4635		BU POSBYTE	GO FINISH	00026910

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				4639 *	SENSE BYTES 16 AND 17		00026940
0003D9	19DB			4642	SNSO STO LINK2,SNRP	RETURN TO SNRP	00026960
0003DA	62E6			4645	BU FCHSNS	PULL 2 BYTES FROM DRIVE	00026970
0003DB	4642			4648	SNRP XFR SENSE1,XOUTA	PASS TU SERIAL NO.-LOW	00026980
0003DC	19DE			4651	STO LINK2,SNRP	RETURN TO SNRP	00026990
0003DD	63F0			4654	BU WAIT4	GO FINISH	00027000
				4657 *	SENSE BYTES 18 AND 19		00027020
0003DE	19E4			4660	SNRP STO LINK2,SNRP	RETURN TO SNRP	00027040
0003DF	4742			4663	XFR SENSE2,XOUTA	PASS SENSE2 TO X OVER	00027050
0003E0	4F41			4666	XFR LODEPB,XOUTB	PASS DEV END PRIMES LOW INTF B	00027060
0003E1	2BF1			4669	BOC STATB,WAIT0	BE IF B INTERFACE	00027070
0003E2	4E41			4672	XFR LODEPA,XOUTB	PASS DEV END PRIMES LOW INTF A	00027080
0003E3	63F1			4675	BU WAIT0	GO FINISH	00027090
				4678 *	SENSE BYTES 20 AND 21		00027110
0003E4	19E6			4681	SNRP STO LINK2,SNRP	RETURN TO SNRP	00027130
0003E5	62E6			4684	BU FCHSNS	GO GET THE LOAD AND THREAD BYTE	00027140
0003E6	19EC			4687	SNRP STO LINK2,SNRP	RETURN TO SNRP	00027150
0003E7	4741			4690	SNRP XFR SENSE2,XOUTB	PASS DRIVE LOAD BYTE TO XOVER	00027160
0003E8	5F42			4693	XFRH LODEPB,XOUTA	PASS DEV END PRIMES HI INTF B	00027170
0003E9	2BF1			4696	BOC STATB,WAIT0	BR IF B INET	00027180
0003EA	5E42			4699	XFRH LODEPA,XOUTA	PASS DEV END PRIMES 8-15 INTF A	00027190
0003EB	63F1			4702	BU WAIT0	GO FINISH	00027200
				4705 *	SENSE BYTES 22 AND 23		00027220
0003EC	19FC			4708	SNRP STO LINK2,DALONE	WHEN RETURN MADE SET STAT D	00027240
0003ED	4921			4711	XFR FRU,AR	SET UP TO PASS EM	00027250
0003EE	8200			4715	POSBYTE ORI WORK3,ZERO	PUT THE AR INTO WORK3	00027270
				4717	*****	*****	00027280
				4718	* USE THIS SUBROUTINE TO SEND 2 BYTES TO ALU1	*	00027290
				4719	*****	*****	00027300
0003EF	4142			4722	SNRP XFR WORK2,XOUTA	PASS BYTE TO ALU1	00027320
0003F0	4241			4725	WAIT4 XFR WORK3,XOUTB	PASS BYTE TO ALU1	00027330
0003F1	0402			4728	WAIT0 STO STATMG,SETSTATC	TURN ON STATC	00027340
0003F2	4428			4731	XFR STATMG,STAT	FOR ALU2	00027350
0003F3	3BF6			4734	WAIT1 BOC STATD,WAIT5	WHEN D COMES ON GO	00027360
0003F4	27FC			4737	BOC STOP,DALONE	BR IF STOP IS ON	00027370
0003F5	63F3			4740	BU WAIT1	GET NEXT SENSE BYTES	00027380
0003F6	5428			4743	WAIT5 XFRH STATMG,STAT	CLEAR STATC	00027390
0003F7	27FC			4746	WAIT2 BOC STOP,DALONE	BR IF STOP IS ON	00027400
0003F8	3BF7			4749	BOC STATD,WAIT2	WAIT UNTIL STATD GOES OFF.	00027410
0003F9	0100			4752	SNRLINK STO WORK2,ZERO	CLEAR XOUTB INPUT REG	00027420
0003FA	0200			4755	STO WORK3,ZERO	CLEAR XOUTA INPUT REG	00027430
0003FB	5922			4758	XFR LINK2,IC	RETURN VIA LINK	00027440
0003FC	6011			4761	DALONE BU SETDLONE	GO SET STAT D	00027450

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	2/04/74
000400				4764	ORG BEGIN+X'400'			00027470
000400	5A22			4766	NRZILINK XFR LINK3,IC	THIS IS THE RETURN FOR ALL NRZI RTN		00027480
4769					*****READ OPERATION - NRZI*****			00027500
4770					*			00027510
4771					* SET	READ CONDITION. THEN WAIT FOR		00027520
4772					* END DATA. FILE SEARCHES CYCLE THE READ OP UNTIL A TM IS DETECTED.			00027530
4773					* SINGLE BIT NOISE REJECTION IS ACCOMPLISHED VIA MICRO CODE			00027540
4774					* TWO DATA RDYS MUST BE SEEN BEFORE ENDDATA OR THE DATA IS IGNORED			00027550
4775					*****			00027560
000401	625D			4778	XXXXX BU NOTCOMP	OTHERWISE SET NOT CAP		00027580
000402	0100			4781	ISNRZI STO WORK2,0	CLEAR NOISE BIT ALU1		00027590
000403	D780			4785	ANDM SENSE2,SEVTRK	ARE WE 7 TRK		00027610
000404	2007			4788	BOC DBUS,ISNRZI3	BR IF NOT		00027620
000405	2501			4791	BOC NSEVEN,XXXXX			00027630
000406	8410			4794	ORI STATIMG,NRZI7	SET 7 TRK CONTROL		00027640
000407	8440			4797	ISNRZI3 ORI STATIMG,PERMRDWT	SET READ CONDITION		00027650
000408	4428			4800	XFRFOP XFR STATIMG,STAT	TO DATA FLOW		00027660
000409	2D0C			4803	NRZILOOP BOC DATARDY,SEENONE1	NORMAL EXIT		00027670
00040A	3F3B			4806	BOC DEVATN,ABEND800	LOAD POINT OR RDY DROP EXIT		00027680
00040B	6409			4809	BU NRZILOOP	TRY AGAIN		00027690
00040C	2D0C			4813	SEENONE1 BOC DATARDY,SEENONE1	WAIT FOR FALL		00027710
00040D	2D10			4816	SEENONE BOC DATARDY,ENDSOON	WATCH FOR FIRST CHAR GATE		00027720
00040E	283D			4819	BOC ENDDATA,STRTOVER	SINGLE BYTE NOISE REJ		00027730
00040F	640D			4822	BU SEENONE			00027740
000410	2813			4826	ENDSOON BOC ENDDATA,CHKFOP	WATCH FOR SECOND CHAR GARE		00027760
000411	3F3B			4829	BOC DEVATN,ABEND800	WATCH FOR RDY DROP		00027770
000412	6410			4832	BU ENDSOON			00027780
000413	3D18			4836	CHKFOP BOC NTM,NOMARKER	DO WE HAVE A TM		00027800
000414	9800			4839	ISITFOP ORM TRACER,0	TM DETECTED --- CHK FOR FILEOP		00027810
000415	3517			4842	BOC DREG5,ISFOP800	SKIP NEXT INSTRUCTION IF YES		00027820
000416	8404			4845	ORI STATIMG,SETSTATB	SET UNIT EXCEPTION		00027830
000417	641B			4848	ISFOP800 BU STOPNRZI	GO TO NORMAL END		00027840
000418	9800			4851	NOMARKER ORM TRACER,0	NO TM, ARE WE A FILE SEARCH		00027850
000419	353E			4854	BOC DREG5,NRZIFOP	BR IF YES TO INITIATE NEW READ		00027860
4857					*****			00027880
4858					* STOP DELAY IS SUCH THAT ON END DATA SIGNAL MOVE IS DROPPED AND THE*			00027890
4859					* READ BUS IS MONITORED FOR APPROXIMATELY 20 BIT CELLS. IF ANY DATA IS			00027900
4860					* DETECTED MOVE WILL BE RAISED AGAIN. IF DATA IS NOT DETECTED, A			00027910
4861					* NORMAL ENDING ENSUES. IF MOVE IS RAISED WE WILL HAVE TO GO FOR 20			00027920
4862					* BIT CELLS WITHOUT SEEING DATA BEFORE WE WILL DROP IT AND TRY FOR			00027930
4863					* A NORMAL ENDING AGAIN. EACH TIME DATA IS DETECTED WITH MOVE UP, THE			00027940
4864					* COUNTER IS RESET.			00027950
4865					*****			00027960
4866					* SET UP FOR STOP DELAY			00027970

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				4867	*****		00027980
00041A	3A2E			4870	NRZISTOP BOC STATC,TOIBG800	DIAG HOOK MEAS IBG	00028000
00041B	02EC			4873	STOPNRZI STO WORK3,ONES-19	OTHERWISE SET UP FIR 800BPI	00028010
00041C	1540			4876	NRZISTAR STO WORK5,DVESNS6	ASK FOR TACH PULSES	00028020
00041D	5560			4879	XFR WORK5,TUBO	AND READ BUS FROM TU	00028030
00041E	1C33			4882	MOVEDOWN STO LINK1,ENDREAD	SET FOR RETURN	00028040
00041F	1508			4885	STO WORK5,DEVSEL	DROP MOVE	00028050
000420	5524			4888	XFRTAGS XFR WORK5,TUTAG	LOAD TUTAG	00028060
				4891	* INITIALIZE COUNT		00028080
000421	0300			4894	STO WORK4,0	CLEAR CTR	00028100
000422	4221			4897	XFR WORK3,AR	AND LOAD	00028110
000423	A300			4900	ADD WORK4,0	TIME OUT CT	00028120
000424	2427			4904	CNTLOOP BOC RDTIME,GO	WAIT	00028140
000425	2D2F			4907	BOC DATARDY,MOVEUP	RD TIME TO RISE	00028150
000426	6424			4910	BU CNTLOOP		00028160
000427	A301			4914	GO ADD WORK4,1	BUMP CTR	00028180
000428	212B			4917	BOC NALCO,GOSOMOR	& BR IF NOT DONE	00028190
000429	3F3B			4920	BOC DEVATTN,ABEND800	ERROR OR LP EXIT	00028200
00042A	5C22			4923	XFR LINK1,IC	EXIT	00028210
00042B	2D2F			4927	GOSOMOR BOC DATARDY,MOVEUP	WAIT FOR READTIME	00028230
00042C	242B			4930	BOC RDTIME,GOSOMOR	TO FALL	00028240
00042D	6424			4933	BU CNTLOOP		00028250
00042E	6544			4936	TOIBG800 BU NRZIIBG		00028260
				4939	* ***** SET NOISE ERROR *****		00028280
00042F	0101			4942	MOVEUP STO WORK2,1 SE	TRN ON NOISE ERROR	00028300
000430	1509			4945	STO WORK5,DEVSEL+MOVE	SET UP TO RAISE MOVE	00028310
000431	1C1E			4948	STO LINK1,MOVEDOWN	SET UP RETURN	00028320
000432	6420			4951	BU XFRTAGS		00028330
				4954	* END OR READ OP - DROP TAPE OP AND READ COND , THEN EXIT TO CHK CRC **		00028350
000433	3D35			4957	ENDREAD BOC NTM,ENDREAD2	BR IF NO TM READ	00028370
000434	6436			4960	BU ENDREAD3		00028380
000435	4018			4963	ENDREAD2 XFR BUFCRC	STROBE CRC ERROR LATC *****	00028390
000436	C43F			4966	ENDREAD3 AND STATIMG,ONES-TAPEOP-PERMRDWT		00028400
000437	4428			4969	XFR STATIMG,STF	RESET TAPE OP	00028410
000438	2945			4972	ALLDONE BOC NCONVCK,CHK RC	IS DATA CONV CHECK ON	00028420
000439	8402			4975	ENDERR ORI STATIMG,SETSTATC	SET UNIT CHECK IF SO	00028430
00043A	61D1			4978	ALLDONE1 BU ENDUP800		00028440
00043B	0100			4981	ABEND800 STO WORK2,0		00028450
00043C	6439			4984	BU ENDERR		00028460
				4987	* ***** SET RESTART *****		00028480
00043D	8C01			4990	STRTOVER ORI DTACHK1,RESTART	SET RETRY BIT	00028500
00043E	3F3B			4993	NRZIFOP BOC DEVATTN,ABEND800	CHK FOR RDY DROP OR BKWD AT LP	00028510

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
00043F	4009			4996	XFR RESETERR	REEET SENSE DATA	00028520
000440	4009			4999	XFR RESETERR	REEET SENSE DATA	00028530
				5001	*****		00028540
				5002	* READ OP COMPLETE-FILE SEARCH ACTIVE & NO TM DETECTED. RE-INITIALIZE		00028550
				5003	* DATA FLOW TO READ ANOTHER RECORD.		00028560
				5004	*****		00028570
000441	C47F			5006	AND STATIMG,ONES-TAPEOP	RESET TAPE OP	00028580
000442	4428			5009	XFR STATIMG,STAT	MOMENTARILY	00028590
000443	8480			5012	ORI STATIMG,TAPEOP	BRING TAPE OP	00028600
000444	6408			5015	BU XFRFOP	GO READ NEXT RECORD	00028610
				5019	***** FOUND TRACK - 9 TRACK NRZI *****		00028640
				5020	*		00028650
				5021	* AFTER DROPPING TAPE OP, CHECK CRC FOR MATCH PATTERN. IF OK, EXIT.		00028660
				5022	* IF NOT, CHECK FOR CRC EQUAL TO EPR,SHIFTING CRC IF NECESSARY. IF		00028670
				5023	* TRACK IN ERROR IS FOUND, PASS TIE BYTE TO ALU1 FOR INSERTION INTO		00028680
				5024	* SENSE DATA. IF READ WAS BACKWARD, FLOP TIE BYTE BEFORE PASSING IT.		00028690
				5025	*		00028700
				5026	*****		00028710
000445	9400			5029	CHKCRC ORM	STATIMG,0	00028730
000446	333A			5032	BOC	NRZI7,ALLDONE1	00028740
				5036	BOC	CRCMAT,TIEEQU03	00028760
000448	0201			5040	STO	WORK3,1	00028780
000449	2253			5043	CHKMATCH BOC	CRCNEPR,NEXTRK	00028790
00044A	400A			5046	LASTCHK XFR	CRC	00028800
00044B	204C			5049	NOP2		00028810
00044C	2259			5052	BOC	CRCNEPR,SETTIE	00028820
00044D	0203			5055	TIEEQU03 STO	WORK3,3	00028830
00044E	4221			5058	XFRTIE XFR	WORK3,AR	00028840
00044F	5006			5061	XFRTIEB2 XFRH	LSR	00028850
000450	8700			5064	ORI	TIEBYTE,0	00028860
000451	4006			5067	XFR	LSR	00028870
000452	61D1			5070	BU	ENDUP800	00028880
000453	400A			5074	NEXTRK XFR	CRC	00028900
000454	4221			5077	XFR	WORK3,AR	00028910
000455	A200			5080	ADD	WORK3,0	00028920
000456	2149			5083	BOC	NALCO,CHKMATCH	00028930
000457	224D			5086	BOC	CRCNEPR,TIEEQU03	00028940
000458	644A			5089	BU	LASTCHK	00028950
000459	9D00			5093	SETTIE ORM	XOUTAIM,0	00028970
00045A	314E			5096	BOC	DREG1,XFRTIE	00028980
				5099	* READ WAS BACKWARD - FLOP THE TIE BYTE *****		00029000
00045B	0001			5101	FLOPTIE STO	WORK1,1	00029010
00045C	9200			5104	ORM	WORK3,0	00029020
00045D	2063			5107	BOC	DBUS,XFRTIEB1	00029030

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
00045E	4021			5111	DONEXTRK	XFR WORK1,AR		00029050
00045F	A000			5114		ADD WORK1,0		00029060
000460	4221			5117		XFR WORK3,AR		00029070
000461	A200			5120		ADD WORK3,0		00029080
000462	215E			5123		BOC NALCO,DONEXTRK		00029090
000463	4021			5126	XFRTIEB1	XFR WORK1,AR		00029100
000464	644E			5129	BU	XFRTIE		00029110
				5131	***** NRZI WRITE ROUTINE *****			00029120
				5132	*	ENTRY TO THIS ROUTINE IS 'WRTSTNRZ' AND IF THE WRITE IS	*	00029130
				5133	*	NRZI A NRZI WRITE TYPE OPERATION WILL BE PERFORMED.	*	00029140
				5134	*	WITH 'BOT' IN THE SENSE A 'LOAD POINT ERASE' IS PERFORMED AND THEN	*	00029150
				5135	*	RETURN TO PERFORM THE CORRECT OPERATION - WRT (LWR),WTM (LWTM), OR	*	00029160
				5136	*	ERG.	*	00029170
				5137	*	WRITE OPERATION WILL PROCEED AS FOLLOWS:	*	00029180
				5138	*		*	00029190
				5139	*	SET 'PERMRDWT' WHICH STARTS THE WRITE CLOCK THEN USE A	*	00029200
				5140	*	COUNTER TO CHECK FOR THE 1ST DATA READY. IF AT THIS TIME STOP	*	00029210
				5141	*	IS NOT ON THEN AN EXIT IS MADE TO CHECK VELOCITY VIA THE	*	00029220
				5142	*	'CHKVEL' SUBROUTINE.	*	00029230
				5143	*	WHEN STOP COMES ON THEN A COUNTER IS MAINTAINED UNTIL	*	00029240
				5144	*	'ENDATA' IS DETECTED OR THE COUNTER IS EXHAUSTED.	*	00029250
				5145	*****			00029260
000465	DD88			5150	WRTSTNRZ	ANDM XOUTAIM,PEBIT+HIDEN		00029300
000466	2068			5153		BOC DBUS,NRZWRT		00029310
000467	6611			5156	BU	NOTNRZI		00029320
000468	D780			5159	NRZWRT	ANDM SENSE2,SEVTRK		00029330
000469	206B			5162		BOC DBUS,OKTOWRT		00029340
00046A	2501			5165		BOC NSEVEN,XXXXX X		00029350
00046B	3A75			5168	OKTOWRT	BOC STATC,NOTLPNRZ		00029360
00046C	194F			5171		STO LINK2,TRETURN2		00029370
00046D	D610			5174	ANDM	SENSE1,BOT		00029380
00046E	2075			5177		BOC DBUS,NOTLPNRZ		00029390
00046F	1A42			5180		STO LINK3,NRZIBOTZ		00029400
000470	64EB			5183	BU	SET8001		00029410
000471	00FD			5187	NRZIBOT	STO WORK1,ONES-2		00029430
000472	010F			5190		STO WORK2,15		00029440
000473	1A75			5193		STO LINK3,NOTLPNRZ		00029450
000474	6027			5196	BU	SETERGF		00029460
000475	0900			5200	NOTLPNRZ	STO FRU,0		00029480
000476	9800			5203	ORM	TRACER,0		00029490
000477	3588			5206		BOC ERGOP,NRETURN1		00029500
000478	367B			5209		BOC WTMOP,NRZTM		00029510
				5212	*****			00029530
				5213	*	THIS IS A WRITE CMD OR LWR	*	00029540
				5214	*****			00029550
000479	19BB			5217		STO LINK2,WRITING		00029570
00047A	6498			5220	BU	VELCK800		00029580

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	
				5224	***** NRZI WRITE TAPE MARK *****	00029610
				5225	* THE TAPE MARK IS WRITTEN ENTIRELY WITH THE MICRO PROGRAM.	* 00029620
				5226	*	* 00029630
				5227	* HOWEVER 'PERMRDWT' IS SET TO ALLOW THE WREAD CLOCK TO RUN	* 00029640
				5228	* AFTER IT HAS BEEN WRITTEN THE NORMAL CHECKS ARE MADE AND IN	* 00029650
				5229	* ADDITION THE 'TM' BR COND IS CHECKED TO ASSURE IT COMES UP	* 00029660
				5230	*	* 00029670
				5231	* THE FOLLOWING ROUTINE IS SHARED BY NORMAL WTM AND LOOP WTM	* 00029680
				5232	*****	00029690
00047B	1A7E			5234	NRZTM STO LINK3,NRZTM1 RETURN TO NRZTM1	00029700
00047C	3A3A			5237	BOC STATC,ALLDONE1 BR OUT WE ARE ALL DONE	00029710
00047D	6025			5240	BU ERGCTR GO DO ERG BEFORE WTM	00029720
00047E	030F			5244	NRZTM1 STO WORK4,TM7TRK SET OF	00029740
00047F	9700			5247	ORM SENSE2,ZERO IS THIS 7 TRACK	00029750
000480	3082			5250	BOC SEVTRK,SETRET3 BR IF SO TO SET OF	00029760
000481	0313			5253	STO WORK4,TM9TRK SET 13 IN REG	00029770
000482	1A89			5258	SETRET3 STO LINK3,SETUBO POINT TO RETURN AFTER SETTING	00029800
000483	00FF			5261	STO WORK1,ONES LOCK IN ON	00029810
000484	648F			5264	BU RDSYNC1 READ TIME	00029820
				5268	*****	00029850
				5269	* THIS IS RETURN FORM 'CHKVEL' ROUTINE TO DETERMINE (PE OR NRZI) AND *	00029860
				5270	* RETURN TO PROPER ROUTINE.	* 00029870
				5271	*****	00029880
000485	DD80			5273	CKNORPE ANDM XOUTAIM,PEBIT IS THE WRITE IN NRZI	00029890
000486	20CA			5276	BOC DBUS,CHECKEND BR IF SO	00029900
000487	6671			5279	BU WRITE28 OTHERWISE BR TO PE WRITE	00029910

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	GO TO DO ERASE OP	F01MAY72	2/04/74
000488	6024			5284	NRETURN1 BU ERGSTR			00029940
				5287	*****			00029960
				5288	* WRITE THE DATA CHAR OF TM CONFIGURATION HERE THEN WAIT EITHER			* 00029970
				5289	* 4 OR 8 'RDTIMES' FOR 7 OR 9 TRACK RESPECTIVELY AND RETURN TO			* 00029980
				5290	* 'NRZLRC'.			* 00029990
				5291	*****			00030000
000489	4360			5294	SETUBO XFR WORK4,TUBO	WRITE THE DATA CHAR OF TM		00030020
00048A	00FC			5297	SET7CNT STO WORK1,ONES-3	SET SPACING COUNT BETWEEN CHAR		00030030
00048B	9700			5300	SETCNT ORM SENSE2,ZERO	IS THIS A 7 TRK		00030040
00048C	308E			5303	BOC SEVTRK,NRZSET	BR IF SO		00030050
00048D	00F8			5306	STO WORK1,ONES-7	SET COUNT TO		00030060
00048E	1A95			5309	NRZSET STO LINK3,NRZLRC	RETURN AFTER COUNTING SPACE		00030070
00048F	248F			5312	RDSYNC1 BOC RDTIME,RDSYNC1	HANG TILL READ TIME FALLS		00030080
000490	2492			5315	RDSYNC2 BOC RDTIME,RDSYNC3	WAIT FOR RD TIME TO RISE		00030090
000491	6490			5318	BU RDSYNC2			00030100
000492	A001			5322	RDSYNC3 ADD WORK1,1	BUMP CTR		00030120
000493	218F			5325	BOC NALCO,RDSYNC1	LOOP TILL OVERFLOW		00030130
000494	5A22			5328	XFR LINK3,IC	EXIT		00030140
				5331	*****			00030160
				5332	* WRITE THE LRC CHAR OF TM CONFIG			* 00030170
				5333	*****			00030180
000495	0300			5336	NRZLRC STO WORK4,ZERO	WRITE THE		00030200
000496	4360			5339	XFR WORK4,TUBO	LRC CHAR		00030210
000497	19B9			5342	STO LINK2,TMEND	LOAD LINK RETYRN		00030220
				5345	*****			00030240
				5346	*** VELOCITY WINDOW *** NO DATA EXPECTED			00030250
				5347	*****			00030260
000498	D410			5349	VELCK800 ANDM STATIMG,NRZI7	IS THIS 7 TRK		00030270
000499	209E			5352	BOC DBUS,VELCK80A	BR IF NOT		00030280
00049A	0018			5355	STO WORK1,24	LOAD CTR FOR 200 BPI		00030290
00049B	399F			5358	BOC DEN200,VELCK80B	BR IF 200 BPI		00030300
00049C	0041			5361	STO WORK1,65	LOAD CTR FOR 556 BPI		00030310
00049D	2C9F			5364	BOC DEN556,VELCK80B	BR IF IT IS 556		00030320
00049E	0064			5367	VELCK80A STO WORK1,100	LOAD VELOCITY WINDOW CTR		00030330
00049F	0169			5370	VELCK80B STO WORK2,ONES-150	LOAD STOP TIME OUT CTR		00030340
0004A0	8440			5373	VELCK801 ORI STATIMG,PERMRDWT	IMAGE WRITE CONDITION		00030350
0004A1	4428			5376	XFR STATIMG,STAT	SET WRITE CONDITION		00030360
0004A2	3AAE			5380	VELCK802 BOC STATC,VELCK805	SKIP CK IF LWR		00030380
0004A3	2DAA			5383	VELCK803 BOC DATARDY,SETERR1	SHD NOT BRANCH		00030390
0004A4	24A3			5386	SETERR10 BOC RDTIME,VELCK803	WAIT FOR RD TIME TO FALL		00030400
0004A5	A0FF			5390	ADD WORK1,ONES	DECREMENT CTR		00030420
0004A6	20AE			5393	BOC DBUS,VELCK805	NORMAL EXIT		00030430
0004A7	2DAC			5396	VELCK804 BOC DATARDY,SETERR2	SHD NOT BRANCH		00030440
0004A8	24A3			5399	SETERR20 BOC RDTIME,VELCK803	WAIT FOR READ TIME		00030450
0004A9	64A7			5402	BU VELCK804			00030460

LOC	OBJECT	CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
0004AA	8C10				5406	SETERR1	ORI DTACHK1,FASTBGN	SET ERROR - WRITE DELAY NOISE *UC*	00030480
0004AB	64A4				5409		BU SETERR10		00030490
0004AC	8C10				5412	SETERR2	ORI DTACHK1,FASTBGN	SET ERROR - WRITE DELAY NOISE *UC*	00030500
0004AD	64A8				5415		BU SETERR20		00030510
					5418		*****		00030530
					5419		* VELOCITY ERROR WINDOW CLOSED - WAIT FOR READ DATA	*	00030540
					5420		*****		00030550
0004AE	2DB5				5422	VELCK805	BOC DATARDY,VELCK808	NORMAL EXIT	00030560
0004AF	24B1				5425		BOC RDTIME,VELCK806	WAIT FOR RDTIME	00030570
0004B0	64AE				5428		BU VELCK805		00030580
0004B1	27B6				5432	VELCK806	BOC STOP,VELCK809	RUN TIME OUT CTR IF ON	00030600
0004B2	2DB5				5435	VELCK807	BOC DATARDY,VELCK808	NORMAL EXIT	00030610
0004B3	24B2				5438		BOC RDTIME,VELCK807	WAIT FOR RD TIME TO FALL	00030620
0004B4	64AE				5441		BU VELCK805		00030630
0004B5	5922				5445	VELCK808	XFR LINK2,IC	EXIT	00030650
0004B6	A101				5449	VELCK809	ADD WORK2,1	BUMP TIME OUT CTR	00030670
0004B7	21B2				5452		BOC NALCO,VELCK807	CONTINUE IF OK YET	00030680
0004B8	6634				5455		BU VELBAD	GO SET NO BLOCK	00030690
					5458		*****		00030710
					5459		* THIS ROUTINE LOOKS FOR 'ENDATA' AS NORMAL EXIT ON WRT OR WTM	*	00030720
					5460		*****		00030730
0004B9	2DB9				5462	TMEND	BOC DATARDY,TMEND	WAIT FOR FALL	00030740
0004BA	66EB				5465		BU TMLOOP1		00030750
					5471		*****		00030800
					5472		* WRITE OP - FIRST DATARDY SEEN - CHECK FOR SINGLE BYTE NOISE AND	*	00030810
					5473		* THEN WAIT FOR END DATA	*	00030820
					5474		*****		00030830
0004BB	2DBB				5476	WRITING	BOC DATARDY,WRITING	WAIT FOR DATA RDY TO FALL	00030840
0004BC	2DC6				5479	NRZI1000	BOC DATARDY,NRZI1004	WATCH FOR 2ND OME	00030850
0004BD	24BC				5482		BOC RDTIME,NRZI1000	WAIT FOR FALL	00030860
0004BE	27C3				5486		BOC STOP,NRZI1003	WATCH FOR STOP	00030880
0004BF	28CC				5489	NRZI1001	BOC ENDATA,INTRUBLE	SINGLE BYTE OF NOISE CREATED	00030890
0004C0	2DC6				5492	NRZI1002	BOC DATARDY,NRZI1004	WATCH FOR 2ND ONE	00030900
0004C1	24BC				5495		BOC RDTIME,NRZI1000	WATCH FOR RISE	00030910
0004C2	64C0				5498		BU NRZI1002		00030920
0004C3	A001				5502	NRZI1003	ADD WORK1,1	BUMP TIME OUT CTR	00030940
0004C4	21C0				5505		BOC NALCO,NRZI1002	BR IF OK YRT	00030950
0004C5	6634				5508		BU VELBAD		00030960
0004C6	27CA				5512	NRZI1004	BOC STOP,NRZI1005	BYPASS IF STOP IS ON	00030980

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
0004C7	3ACA			5515		BOC STATC,NRZI1005	BYPASS IF LWR	00030990
0004C8	16A9			5518	WRITE888	STOH SENSE1,FIRST+DATATIM+CNTRDY+MK800		00031000
0004C9	6300			5521		BU CHKVEL		00031010
0004CA				5524	CHECKEND	EQU *		00031030
0004CA	28F8			5526	NRZI1005	BOC ENDATA,ENDWRTNZ	WAIT FOR END DATA	00031040
0004CB	64CA			5529		BU CHECKEND		00031050
0004CC	3ACA			5533	INTRUBLE	BOC STATC,NRZI1005	DONT RETRY ON LWR	00031070
0004CD	D980			5536		ANDM FRU,128	IS RESTART FLAG ON	00031080
0004CE	20D1			5539		BOC DBUS,LOADCTR	BR IF NOT	00031090
0004CF	A301			5542		ADD WORK4,1	BUMP RESTART CTR	00031100
0004D0	21C0			5545		BOC NALCO,NRZI1002	BR IF NOT TIMED OUT	00031110
0004D1	8980			5548	LOADCTR	ORI FRU,128	TRN ON RESTART FLAG	00031120
0004D2	03F5			5551		STO WORK4,ONES-10	LOAD RESTART CTR	00031130
0004D3	2DBB			5554	NRZI1006	BOC DATARDY,WRITING	WATCH FOR CHAR GATE	00031140
0004D4	24D6			5557		BOC RDTIME,NRZI1007	WATCH FOR RISE	00031150
0004D5	64D3			5560		BU NRZI1006		00031160
0004D6	27DA			5564	NRZI1007	BOC STOP,NRZI1009	WATCH FOR STIP	00031180
0004D7	2DBB			5567	NRZI1008	BOC DATARDY,WRITING	WATCH FOR DATA RDY	00031190
0004D8	24D7			5570		BOC RDTIME,NRZI1008	WAIT FOR FALL	00031200
0004D9	64D3			5573		BU NRZI1006		00031210
0004DA	A101			5577	NRZI1009	ADD WORK2,1	BUMP CTR	00031230
0004DB	21D7			5580		BOC NALCO,NRZI1008	BR IF OK YET	00031240
0004DC	6634			5583		BU VELBAD		00031250
0004DD	3AE0			5588	END	BOC STATC,LWREND	BR IF LWR	00031280
0004DE	1703			5591	GOODEND	STO TIEBYTE,3	SET TIE BYTE TO 3	00031290
0004DF	61D0			5594		BU ENDUP		00031300
0004E0	4009			5597	LWREND	XFR RESETERR		00031310
0004E1	4009			5600		XFR RESETERR		00031320
0004E2	64DE			5603		BU GOODEND		00031330
				5606	*****			00031350
				5607	* CONTROL INITIALIZATION FOR TURNAROUND ROUTINE IF NRZI FEATURE IS			* 00031360
				5608	* INSTALLED. TURNS ON NRZI CONTROLS AND TURNS OFF PE CONTROLS.			* 00031370
				5609	*****			00031380
0004E3	30E6			5611	TURNNRZI	BOC SEVTRK,DO8007	BR IF 7 TRK	00031390
0004E4	33E7			5614		BOC NOTPE,DO800	BR IF NRZI MODE	00031400
0004E5	6145			5617		BU DO16		00031410
0004E6	8410			5620	DO8007	ORI STATIMG,NRZI7	SET 7 TRK BIR	00031420
0004E7	6146			5623	DO800	BU CHKBKWD		00031430
				5625	*****			00031440
				5626	* READ OP ENTRY AFTER LEAVING LOAD POINT WITH NO P BURST DETECTED.HERE*			00031450
				5627	* WE WILL TURN ON THE NRZI CONTROLS, TURN OFF THE PE CONTROL AND GO			* 00031460
				5628	* SET NRZI TO THE TAPE UNIT. NRZI WRITE OP AT LOAD POINT ENTERS AT			* 00031470
				5629	* SET 8001 TO INITIALIZE CONTROL LSRS.			* 00031480
				5630	*****			00031490
0004E8	CD77			5632	SET800	AND XOUTAIM,ONES-HIDEN-PEBIT		00031500

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0004E9	4D42			5635	XFR	XOUTAIM,XOUTA	TRN OFF PE CONTROLS	00031510
0004EA	1A41			5638	STO	LINK3,ISNRZIZ	RETURN TO RDNRLP	00031520
0004EB	0310			5641	SET8001	STO WORK4,SETDENS	SET UP FOR NRZI MOS	00031530
0004EC	020D			5644	STO	WORK3,DEVSEL+CONTROL+MOVE	REaise CTRL & MOVE	00031540
0004ED	D7A8			5647	ANDM	SENSE2,DUALDEN+SEVTRK+HIDEN	IS A NRZI DRIVE	00031550
0004EE	3401			5650	BOC	HIDEN,XXXXX	NRZI TAPE ON GCR DR - SET NOT CAP.	00031560
0004EF	2001			5653	BOC	DBUS,XXXXX	BR IF NOT TO SET NOT CAPABLE	00031570
0004F0	6530			5656	BU	SETCTRL1		00031580
0004F1	30E6			5660	** DENSITY DETERMINATION FOR	MODS 3,5 AND 7 AT LOAD POINT		00031610
0004F2	32F4			5662	CHK7LP	BOC SEVTRK,DO8007	IS THIS A SEVEN TRACK UNIT	00031620
0004F3	6145			5665	BOC	DUALDEN,CHK800	BR IF DUAL DEN	00031630
0004F4	4290			5668	BU	DO16		00031640
0004F5	37E7			5671	CHK800	XFR WORK3,XINA	IS THIS A 9 TRK NRZ MOS	00031650
0004F6	6145			5674	BOC	ALU1NRZ,DO800	BR IF SO	00031660
0004F7	6557			5677	BU	DO16	RETURN TO TURN AROUND	00031670
0004F8	27DD			5680	ACCESS8	BU ACCESS80		00031680
0004F9	64F8			5683	ENDWRTNZ	BOC STOP,END		00031690
				5686	BU	ENDWRTNZ	WAIT FOR STOP	00031700

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72	2/04/74
000500				5690	ORG BEGIN+X'500'			00031730
				5691	*****DISPLAY LSR SUBROUTINE*****			00031740
				5692	*			00031750
				5693	* AN INDISPENSABLE ROUTINE TO ALLOW DISPLAY OF THE ALU2 LSR'S IN			00031760
				5694	* THE TUBO INDICATORS. ON FIRST ROUND THE 16 LOW LSRS (0-15)			00031770
				5695	* ARE DISPLAYED. SECOND ROUND (DONT HIT RESET.) WILL DISPLAY HIGH			00031780
				5696	* LSRS (16-31). AN AUTOMATIC STOP IS NOT EMPLOYED IN THIS ROUTINE *			00031790
				5697	* AND IT WILL CONTINUE TO DISPLAY HIGH LSRS FOREVER. RESTART IS THE			00031800
				5698	* ONLY WAY TO DISPLAY LOW LSRS A SECOND TIME.			00031810
				5699	*			00031820
				5700	* IC DISPLAY IN RELATION TO LSRS ON TUBO ARE AS FOLLOWS:			00031830
				5701	* IC= 502 DISPLAY LSR0 -FIRST ROUND & LSR16-SECOND ROUND			00031840
				5702	* IC=503 DISPLAY LSR1 -FIRST ROUND & LSR17-SECOND ROUND			00031850
				5703	* IC= 504 DISPLAY LSR2 -FIRST ROUND & LSR18-SECOND ROUND			00031860
				5704	* IC= 505 DISPLAY LSR3 -FIRST ROUND & LSR19-SECOND ROUND			00031870
				5705	* IC= 506 DISPLAY LSR4 -FIRST ROUND & LSR20-SECOND ROUND			00031880
				5706	* IC= 507 DISPLAY LSR5 -FIRST ROUND & LSR21-SECOND ROUND			00031890
				5707	* IC= 508 DISPLAY LSR6 -FIRST ROUND & LSR22-SECOND ROUND			00031900
				5708	* IC= 509 DISPLAY LSR7 -FIRST ROUND & LSR23-SECOND ROUND			00031910
				5709	* IC= 50A DISPLAY LSR8 -FIRST ROUND & LSR24-SECOND ROUND			00031920
				5710	* IC= 50B DISPLAY LSR9 -FIRST ROUND & LSR25-SECOND ROUND			00031930
				5711	* IC= 50C DISPLAY LSR10-FIRST ROUND & LSR26-SECOND ROUND			00031940
				5712	* IC= 50D DISPLAY LSR11-FIRST ROUND & LSR27-SECOND ROUND			00031950
				5713	* IC= 50E DISPLAY LSR12-FIRST ROUND & LSR28-SECOND ROUND			00031960
				5714	* IC= 50F DISPLAY LSR10-FIRST ROUND & LSR29-SECOND ROUND			00031970
				5715	* IC= 510 DISPLAY LSR14-FIRST ROUND & LSR30-SECOND ROUND			00031980
				5716	* IC= 511 DISPLAY LSR15-FIRST ROUND & LSR31-SECOND ROUND			00031990
				5717	*****			00032000
000500	4006			5719	TRACELSR XFR LSR	INSURE IN LOW SET		00032010
000501	4060			5722	GETHIGH XFR R0,TUBO	TAKE LSR TO CE PANEL		00032020
000502	4160			5725	XFR R1,TUBO	TAKE LSR TO CE PANEL		00032030
000503	4260			5728	XFR R2,TUBO	TAKE LSR TO CE PANEL		00032040
000504	4360			5731	XFR R3,TUBO	TAKE LSR TO CE PANEL		00032050
000505	4460			5734	XFR R4,TUBO	TAKE LSR TO CE PANEL		00032060
000506	4560			5737	XFR R5,TUBO	TAKE LSR TO CE PANEL		00032070
000507	4660			5740	XFR R6,TUBO	TAKE LSR TO CE PANEL		00032080
000508	4760			5743	XFR R7,TUBO	TAKE LSR TO CE PANEL		00032090
000509	4860			5746	XFR R8,TUBO	TAKE LSR TO CE PANEL		00032100
00050A	4960			5749	XFR R9,TUBO	TAKE LSR TO CE PANEL		00032110
00050B	4A60			5752	XFR R10,TUBO	TAKE LSR TO CE PANEL		00032120
00050C	4B60			5755	XFR R11,TUBO	TAKE LSR TO CE PANEL		00032130
00050D	4C60			5758	XFR R12,TUBO	TAKE LSR TO CE PANEL		00032140
00050E	4D60			5761	XFR R13,TUBO	TAKE LSR TO CE PANEL		00032150
00050F	4E60			5764	XFR R14,TUBO	TAKE LSR TO CE PANEL		00032160
000510	4F60			5767	XFR R15,TUBO	TAKE LSR TO CE PANEL		00032170
000511	5006			5770	XFRH LSR	SET HIGH		00032180
000512	6501			5773	TRACTRAP BU GETHIGH			00032190

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				5776	*****		00032210
				5777	*		00032220
				5778	* DIAGNOSTIC MEASURE IBG PE OR GCR		00032230
				5779	*		00032240
				5780	* THIS ROUTINE CLOCKS ACROSS THE IBG, SENDING A COUNT TO CHANNEL AFTER*		00032250
				5781	* EVERY ACTIVE TRANSITION OF THE TACH.FIRST AND LAST COUNTS ARE		00032260
				5782	* PARTIAL		00032270
				5783	*****		00032280
000513	3B61			5786	MEASIBG BOC STATD,TAKTOSTP BR IF CNTING STOP TAKS		00032300
000514	9500			5789	ORM FLAGS,0 TEST DIAG FLAGS		00032310
000515	302B			5792	BOC DREG0,SETLEVEL		00032320
000516	8408			5795	MEASIBGA ORI STATIMG,SETSTATA TRN ON STATA FOR FIRST PASS		00032330
000517	4428			5798	SETSTATS XFR STATIMG,STAT SET STATSCREQUIRED		00032340
000518	272A			5801	BOC STOP,ZIPOUT		00032350
000519	0101			5804	STO WORK2,1 CLEAR CTR		00032360
00051A	2F1D			5808	STILLOK BOC IBG,OKYET ASSURE IBG IS ON		00032380
00051B	2F29			5811	WTFORIBG BOC IBG,ALLDONEA WT FOR NEXT IBG		00032390
00051C	651B			5814	BU WTFORIBG NORMAL ENDING		00032400
00051D	3E22			5817	OKYET BOC BSYTACH,TACHUP LOOK FOR TACH		00032410
00051E	2A23			5820	TACHDOWN BOC STATA,RUNCTR IS THIS LOCK IN		00032420
00051F	8408			5823	ORI STATIMG,SETSTATA TRN ON STAT A		00032430
000520	4428			5826	XFR STATIMG,STAT LOCK IN PASS		00032440
000521	6523			5829	BU RUNCTR GO COUNT		00032450
000522	2A26			5833	TACHUP BOC STATA,SENDEM1 SEND CTR IF STAT A IS ON		00032470
000523	A101			5836	RUNCTR ADD WORK2,1 BUMP		00032480
000524	211A			5839	BOC NALCO,STILLOK CTR		00032490
000525	E408			5842	XO STATIMG,SETSTATA INVERT STAT A		00032500
000526	E40C			5846	SENDEM1 XO STATIMG,SETSTATA+SETSTATB INVERT B & TRN OFF A		00032520
000527	4141			5849	XFR WORK2,XOUTB SEND BYTE TO ALU1		00032530
000528	6517			5852	BU SETSTATS RUN AGAIN		00032540
000529	C4F7			5856	ALLDONEA AND STATIMG,ONES-SETSTATA		00032560
00052A	60B8			5859	ZIPOUT BU READSTOP ASSURE STAT A IS OFF - NORMAL END		00032570
00052B	0300			5863	SETLEVEL STO WORK4,0		00032590
00052C	5521			5866	XFR WORK5,AR MOVE CMD TO WORK 4		00032600
00052D	8300			5869	ORI WORK4,0		00032610
00052E	020D			5872	STO WORK3,DEVSEL+CONTROL+MOVE		00032620
00052F	1A17			5875	STO LINK3,SETSTATS LOAD LINK RETURN		00032630
				5878	***** SET MODE TO DRIVE *****		00032650
000530	4224			5881	SETCTRL1 XFR WORK3,TUTAG BRING UP CONTROL TAG		00032670
000531	4360			5884	XFR WORK4,TUBO SET CMD TO BUS OUT		00032680
000532	01FE			5887	SETLEV STO WORK2,ONES-1 SET FOR DELAY		00032690
000533	A101			5890	DLYTIME ADD WORK2,1 BUMP REGISTER FOR DELAY		00032700
000534	2133			5893	BOC NALCO,DLYTIME BACK TWICE		00032710
000535	4981			5896	XFR FRU,TUBI GET CONTROLSTATUS BYTE		00032720
000536	4160			5899	XFR WORK2,TUBO CLEAR CMD FROM BUS OUT		00032730
000537	C2FB			5902	AND WORK3,ONES-CONTROL RESET CONTOL TAG		00032740

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	2/04/74
000538	4224			5905	XFR	WORK3,TUTAG	TO THE DRIVE		00032750
000539	4921			5908	XFR	FRU,AR	MASK IT		00032760
00053A	F300			5911	XOM	WORK4,0	CHK STATUS		00032770
00053B	2043			5914	BOC	DBUS,CTLLINK	BR IF OK		00032780
00053C	61CE			5917	BU	CTRLREJ	GO SET CONTROL STATUS REJECT		00032790
00053D	628E			5920	ZRETURN1	BU	NORMDONE		00032800
00053E	670B			5923	ZRETURN2	BU	WRT6		00032810
00053F	6744			5926	CTLRET6	BU	ERASE6		00032820
000540	674E			5929	CTLRET3	BU	ERASE1		00032830
000541	6402			5932	ISNRZIZ	BU	ISNRZI		00032840
000542	6471			5935	NRZIBOTZ	BU	NRZIBOT		00032850
000543	5A22			5938	CTLLINK	XFR	LINK3,IC	RETURN TO CALLER	00032860
				5941	*				* 00032880
				5942	*	DIAGNOSTIC	MEASURE IBG	NRZI	* 00032890
				5943	*				* 00032900
				5944	*	THIS ROUTINE CLOCKS ACROSS THE IBG, SENDING A COUNT TO CHANNEL AFTER			* 00032910
				5945	*	EVERY ACTIVE TRANSITION OF THE TACH. FIRST AND LAST COUNTS ARE			* 00032920
				5946	*	PARTIAL			* 00032930
				5947	*	*****			* 00032940
000544	3B61			5949	NRZIIBG	BOC	STATD,TAKTOSTP	BR IF CTING STOP TAKS	00032950
000545	8408			5953	NRZIIBGA	ORI	STATIMG,SETSTATA	TRN ON STAT A FOR FIRST PASS	00032970
000546	4428			5956	DOSTATS	XFR	STATIMG,STAT	SET STATS REQUIRED	00032980
000547	0101			5959		STO	WORK2,1	CLR CTR	00032990
000548	2D55			5963	START800	BOC	DATARDY,CLEANUP	LOOK FOR DTA RDY	00033010
000549	3E4E			5966		BOC	BSYTACH,POSITIV	LOOK FOR TACH	00033020
00054A	2A4F			5969	NEGATIVE	BOC	STATA,STEPCTR		00033030
00054B	8408			5972		ORI	STATIMG,SETSTATA	LOCK IN PASS	00033040
00054C	4428			5975		XFR	STATIMG,STAT	TRN ON STATA	00033050
00054D	654F			5978		BU	STEPCTR	GO CNT ONE	00033060
00054E	2A52			5982	POSITIV	BOC	STATA,SENDEM5	SEND CTR IF STAT A IS ON	00033080
00054F	A101			5985	STEPCTR	ADD	WORK2,1	BUMP CTR BY 1	00033090
000550	2148			5988		BOC	NALCO,START800	& LOOK FOR OVERFLOW	00033100
000551	E408			5991		XO	STATIMG,SETSTATA	INVERT STAT A	00033110
000552	E40C			5995	SENDEM5	XO	STATIMG,SETSTATA+SETSTATB	INVERT B & TRN OFF A	00033130
000553	4141			5998		XFR	WORK2,XOUTB	SEND CTR YO ALU1	00033140
000554	6546			6001		BU	DOSTATS	GO AGAIN	00033150
000555	C4F7			6005	CLEANUP	AND	STATIMG,ONES-SETSTATA	TRN OFF STAT A	00033170
000556	641B			6008		BU	STOPNRZI	GO TO NORMAL STOP	00033180

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				6012	*****		00033210
				6013	*		00033220
				6014	* DIAGNOSTIC MEASURE ACCESS TIME NRZI		* 00033230
				6015	*		* 00033240
				6016	* THIS ROUTINE TURNS ON DATA FLOW, RAISES MOVE AND CLOCKS UNTIL DATA		* 00033250
				6017	* IS DETECTED. TWO BYTES (COUNTERS) ARE THEN SET TO CHANNEL		* 00033260
				6018	* NRZI STOP DELAY IS DMPLOYED TO SPACE TAPE TO NEXT IBG.		* 00033270
				6019	*****		00033280
000557	9700			6022	ACCESS80 ORM SENSE2,0	LOOK SEE IF NRZI MODE	00033300
000558	335A			6025	BOC NOTPE,GOAHEAD	BR IF SO	00033310
000559	6591			6028	BU ACCESS16	GO RUN PE MODE	00033320
00055A				6031	GOAHEAD EQU *		00033340
00055A	1509			6033	STO WORK5,DEVSEL+MOVE	SET UP FOR MOVE	00033350
00055B	5524			6036	XFR WORK5,TUTAG	RAISE MOVE	00033360
00055C	4D42			6039	XFR XOUTAIM,XOUTA		00033370
00055D	8490			6042	ORI STATIMG,TAPEOP+NRZI7		00033380
00055E	4428			6045	XFR STATIMG,STAT	TRN ON RD CONDITION	00033390
00055F	8440			6048	ORI STATIMG,PERMRDWT		00033400
000560	6545			6051	BU NRZIIBGA	GO MEASURE ACCESS TIME	00033410

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				6055	*****	*****	00033440
				6056	*		00033450
				6057	*		00033460
				6058	*		00033470
				6059	* THIS ROUTINE WILL ACCUMULATE COUNTS DURING THE POSITIVE AND NEGATIVE		00033480
				6060	* PORTIONS OF THE TACH PULSE. THESE COUNTS WILL BE SENT TO CHANNEL		00033490
				6061	* IN TWO DATA BYTES ON EACH TRANSITION OF THE TACH PULSE. THE		00033500
				6062	* NUMBER OF TACH PULSES TO COUNT IS CONTROLLED BY BY THE CHANNEL BYTE		00033510
				6063	* COUNT THE FIRST TWO BYTES SENT TO CHANNEL SHOULD BE DISREGARDED		00033520
				6064	* AS THESE ARE ACCUMULATED DURING 'LOCKIN'.		00033530
				6065	*		00033540
				6066	*****	*****	00033550
				6067	*		00033560
000561	0408			6070	TAKTOSTP STO	STATIMG,SETSTAT	00033580
000562	4428			6073	XFR	STATIMG,STAT	00033590
000563	0000			6076	EXECMDR STO	WORK1,0	00033600
000564	0140			6079	STO	WORK2,DVESNS6	00033610
000565	4160			6082	XFR	WORK2,TUBO	00033620
000566	02B4			6085	TACHASYM STO	WORK3,X'B4'	00033630
000567	03DE			6088	STO	WORK4,X'DE'	00033640
000568	3A6B			6091	BOC	STATC,DROPMOVE	00033650
000569	0109			6094	STO	WORK2,DEVSEL+MOVE	00033660
00056A	656C			6097	BU	EDSPLACE	00033670
00056B	0108			6100	DROPMOVE STO	WORK2,DEVSEL	00033680
00056C	4124			6103	EDSPLACE XFR	WORK2,TUTAG	00033690
00056D	3E74			6107	CHKDETAC BOC	BSYTACH,POSTACH	00033710
00056E	3E7A			6111	NEGTACH BOC	BSYTACH,SENDEM6	00033730
00056F	A201			6114	ADD	WORK3,1	00033740
000570	216E			6117	BOC	NALCO,NEGTACH	00033750
000571	A301			6120	ADD	WORK4,1	00033760
000572	216E			6123	BOC	NALCO,NEGTACH	00033770
000573	657B			6126	BU	SENDEM3	00033780
000574	3E76			6130	POSTACH BOC	BSYTACH,UPCOUNT1	00033800
000575	657B			6133	BU	SENDEM3	00033810
000576	A201			6136	UPCOUNT1 ADD	WORK3,1	00033820
000577	2174			6139	BOC	NALCO,POSTACH	00033830
000578	A301			6142	ADD	WORK4,1	00033840
000579	2174			6145	BOC	NALCO,POSTACH	00033850
00057A	657B			6148	SENDEM6 BU	SENDEM3	00033860
00057B	2A82			6152	SENDEM3 BOC	STAT,SENDEM4	00033880
00057C	D101			6155	ANDM	WORK2,MOVE	00033890
00057D	2082			6158	BOC	DBUS,SENDEM4	00033900
00057E	3E66			6161	BOC	BSYTACH,TACHASYM	00033910
00057F	8408			6164	ORI	STATIMG,SETSTAT	00033920
000580	4428			6167	XFR	STATIMG,STAT	00033930
000581	6566			6170	BU	TACHASYM	00033940
000582	2789			6174	SENDEM4 BOC	STOP,STOPEXIT	00033960

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	2/04/74
000583	4242			6177	XFR	WORK3,XOUTA	SEND DATA		00033970
000584	4341			6180	XFR	WORK4,XOUTB	TO ALU1		00033980
000585	E404			6183	XO	STATIMG,SETSTATB	INVERT STAT B		00033990
000586	4428			6186	XFR	STATIMG,STAT	AND THE OTHER OFF (WILL ALTERNATE)		00034000
000587	A001			6189	ADD	WORK1,1	BUMPM BYTE CTR		00034010
000588	6566			6192	BU	TACHASYM			00034020
000589	0100			6196	STOPEXIT	STO WORK2,0	CLEAR		00034040
00058A	4124			6199	XFR	WORK2,TUTAG	TAGS TO THE		00034050
00058B	4041			6202	XFR	WORK1,XOUTB	TAPE UNIT		00034060
00058C	6011			6205	BU	SETDLONE	AND STOP		00034070

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				6209	*****		00034100
				6210	*		* 00034110
				6211	* DIAGNOSTIC MEASURE ACCESS TIME		* 00034120
				6212	*		* 00034130
				6213	* THIS ROUTINE RAISES MOVE - THEN BRANCHES TO THE IBG MEASURE ROUTINE		00034140
				6214	*****		00034150
00058D	5460			6217	ACCESS XFRH STATIMG,TUBO		00034170
00058E	9700			6220	ORM SENSE2,0		00034180
00058F	349A			6223	BOC HIDDEN,CHKMORE		00034190
000590	23F7			6226	BOC NRZFEAT,ACCESS8		00034200
000591	8D80			6229	ACCESS16 ORI XOUTAIM,PEBIT		00034210
000592	4D42			6232	STROBEA XFR XOUTAIM,XOUTA		00034220
000593	8480			6235	ORI STATIMG,TAPEOP		00034230
000594	4428			6238	XFR STATIMG,STAT		00034240
000595	1509			6241	STO WORK5,DEVSEL+MOVE		00034250
000596	5524			6244	XFR WORK5,TUTAG		00034260
000597	6516			6247	BU MEASIBGA		00034270
000598	8D08			6251	ACCESS64 ORI XOUTAIM,HIDDEN		00034290
000599	6592			6254	BU STROBEA		00034300
00059A	3398			6258	CHKMORE BOC NOTPE,ACCESS64		00034320
00059B	6591			6261	BU ACCESS16		00034330

LOC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT

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6269 *****ALU CHECKOUT ROUTINE***** 00034400
6270 * 00034410
6271 * THIS ROUTINE RUNS CONTINUALLY DURING TCU IDLE TIME, CONSTANTLY * 00034420
6272 * CHECKING THE CIRCUITS IT NEEDS TO FUNCTION PROPERLY. IF A FAILURE * 00034430
6273 * IS DETECTED, A HARDWARE ERROR IS FORCED * 00034440
6274 * 00034450
6275 ***** 00034460

00059C 0900 6278 EXECTST3 STO FRU,X'00' BRING IN BYTE OF ALL ONES 00034480
00059D 4090 6281 XFR WORK1,XINA 00034490
00059E B001 6284 ADDM WORK1,1 FROM ALU1 & CHK IT 00034500
00059F 21F1 6287 HERE BOC NALCO,ZONK2 ONE OR MORE XOUTA BITS MISSING 00034510
0005A0 4043 6290 XFR WORK1,XANXB SSET UP XOUTA AND XOUTB FOR ALU 1 00034520
6292 * CHECK STATS TO BE OFF-THEN TUR A ON & CHECK IT * 00034530
6294 BOC STOP,ZONK2 STOP SHD BE OFF 00034540
6297 BOC STATA,ZONKA SHD BR OFF 00034550
6300 BOC STATB,ZONKB SHD BE OFF 00034560
6303 BOC STATC,ZONKC SHD BE OFF 00034570
6306 BOC STATD,ZONKD SHD BE OFF 00034580
6309 ORI STATIMG,SETSTATA+SETSTATB TRN ON STATS 00034590
6312 XFR STATIMG,STAT FOR ALU1 00034600
6315 BOC STATA,TSTHI TEST STAT A 00034610
6318 ZONKA XFR HDWERR STATA PROBLEM (OFF OR ON) 00034620
6320 * CHECK HIGH LSR OPERATION AND DREGS FOR HOT BITS OR BOC'S * 00034630
6322 TSTHI STO R2,0 SET UP LOW 00034640
6325 BOC DREG7,TRAP4 SHD BE OFF 00034650
6328 BOC DREG6,TRAP5 SHD BE OFF 00034660
6331 BOC DREG5,TRAP6 SHD BE OFF 00034670
6334 BOC DREG4,TRAP7 SHD BE OFF 00034680
6337 BOC DREG3,TRAP8 SHD BE OFF 00034690
6340 BOC DREG2,TRAP9 SHD BE OFF 00034700
6343 BOC DREG1,TRAP10 SHD BE OFF 00034710
6346 BOC DREG0,TRAP11 SHD BE OFF 00034720
6349 STO R0,ONES LSRs FOR TEST 00034730
6352 STO R2,ONES SET UP AND TEST 00034740
6355 XFRH R2,AR FOR STO HIGH 00034750
6358 XO R0,0 AN D XFR HIGH 00034760
6361 BOC DBUS,TSTHI10K 00034770
6364 XFR HDWERR STO H OR XFRH WENT IN LOW LSR'S 00034780

0005B9 5006 6368 TSTHI10K XFRH LSR SET HIGH 00034800
0005BA 9200 6371 ORM R2,0 ASSURE HI 00034810
0005BB 20BF 6374 BOC DBUS,ZONK IS SET 00034820
0005BC 4221 6377 XFR R2,AR ASSURE 00034830
0005BD E200 6380 XO R2,0 XFR LO 00034840
0005BE 20C0 6383 BOC DBUS,XFRLO USES HI LSR 00034850
0005BF 4044 6386 ZONK XFR HDWERR 00034860

0005C0 4006 6390 XFRLO XFR LSR SET LO 00034880
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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72 2/04/74
0005C1	0000			6393	* CHECK ADDER OPERATION- ALSO BOC DREGS, NALCO,DBUS	* 00034900
0005C2	04FF			6395	TESTONE STO R0,0	00034910
0005C3	A001			6398	STO R4,ONES	00034920
0005C4	21CA			6401	TEST1 ADD R0,1	00034930
0005C5	20C7			6404	BOC NALCO,AA	00034940
0005C6	4044			6407	BOC DBUS,BB	00034950
0005C7	A4FF			6410	TRAP1 XFR HDWERR	00034960
0005C8	21E0			6413	BB ADD R4,ONES	00034970
0005C9	4044			6416	BOC NALCO,OPCODES	00034980
0005CA	A4FF			6419	TRAP2 XFR HDWERR	00034990
0005CB	21CF			6422	AA ADD R4,ONES	00035000
0005CC	4421			6425	BOC NALCO,CCTRAP	00035010
0005CD	B000			6428	XFR R4,AR	00035020
0005CE	21D0			6431	ADDM R0,0	00035030
				6434	BOC NALCO,DD	00035040
				6436	* WAS A CARRY	00035050
0005CF	4044			6438	CCTRAP XFR HDWERR	00035060
0005D0	37D2			6443	DD BOC DREG7,EE	00035090
0005D1	4044			6446	TRAP4 XFR HDWERR	00035100
0005D2	36D4			6449	EE BOC DREG6,FF	00035110
0005D3	4044			6452	TRAP5 XFR HDWERR	00035120
0005D4	35D6			6455	FF BOC DREG5,GG	00035130
0005D5	4044			6458	TRAP6 XFR HDWERR	00035140
0005D6	34D8			6461	GG BOC DREG4,HH	00035150
0005D7	4044			6464	TRAP7 XFR HDWERR	00035160
0005D8	33DA			6467	HH BOC DREG3,II	00035170
0005D9	4044			6470	TRAP8 XFR HDWERR	00035180
0005DA	32DC			6473	II BOC DREG2,JJ	00035190
0005DB	4044			6476	TRAP9 XFR HDWERR	00035200
0005DC	31DE			6479	JJ BOC DREG1,KK	00035210
0005DD	4044			6482	TRAP10 XFR HDWERR	00035220
0005DE	30C3			6485	KK BOC DREG0,TEST1	00035230
0005DF	4044			6488	TRAP11 XFR HDWERR	00035240
0005E0				6491	OPCODES EQU *	00035260
0005E0	0000			6492	* CHECK DATA FLOW SIGNALS FOR INACTIVE STATE	* 00035270
0005E1	4060			6494	CHKDTRDY STO WORK1,0	00035280
				6497	XFR WORK1,TUBO	00035290
0005E2				6500	CHKBOCS EQU *	00035310
0005E2	4981			6501	* CHECK TUBI FOR POSSIBLE HOT BITS	* 00035320
0005E3	B9FF			6503	XFR FRU,TUBI	00035330
0005E4	21E6			6506	ADDM FRU,ONES S	00035340
0005E5	4044			6509	BOC NALCO,STOPWAIT	00035350
				6512	ZONK10 XFR HDWERR	00035360
				6514	* WAIT FOR STOP STAT TO COME ON, THEN CHK OTHER STATS FOR ACTIVE	* 00035370
0005E6	27E8			6516	STOPWAIT BOC STOP,CHKSTATS	00035380
0005E7	65E6			6519	BU STOPWAIT	00035390

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0005E8	2BEA			6522	CHKSTATS	BOC	STATB,CHKC	F01MAY72 2/04/74
0005E9	4044			6525	ZONKB	XFR	HDWERR	00035400
0005EA	3AEC			6528	CHKC	BOC	STATC,CHKD	00035410
0005EB	4044			6531	ZONKC	XFR	HDWERR	00035420
0005EC	3BEE			6534	CHKD	BOC	STATD,CHKA	00035430
0005ED	4044			6537	ZONKD	XFR	HDWERR	00035440
0005EE				6539	CHKA	EQU	*	00035450
0005EE	4090			6541	CHKXINA	XFR	WORK1,XINA	00035460
				6543	* CHECK	XINA	FROM ALU1 FOR NO BITS - THEN CLEAR XOUTS TO ALU1	00035470
0005EF	A0FF			6545	ADD	WORK1,ONES	CHK XINA	00035480
0005F0	21F2			6548	BOC	NALCO,SETUPX	FOR ALL	00035490
0005F1	4044			6551	ZONK2	XFR	ZEROES	00035500
0005F2	5443			6554	SETUPX	XFRH	STATIMG,XANXB	00035510
0005F3	0403			6557	ALU2COMP	STO	STATIMG,SETSTATC+SETSTATD	00035520
0005F4	4428			6560	XFR	STATIMG,STAT	CLEAR XOUTA AND XOUTB	00035530
							ALL DONE	00035540

6563 ***** 00035560

0005F5	1CFA			6567	WRTP2	STO	LINK1,SRETURN5	00035590
0005F6	C4DF			6570		AND	STATIMG,ONES-WRTBURST	00035600
0005F7	4428			6573		XFR	STATIMG,STAT	00035610
0005F8	2FFA			6576	WAITIBG	BOC	IBG,DONE	00035620
0005F9	65F8			6579		BU	WAITIBG	00035630
0005FA				6581	DONE	EQU	*	00035640
0005FA	62E1			6583		BU	FCHSTS	00035650
000600				6585		ORG	BEGIN+X'600'	00035660
				6586	** THE FOLLOWING INSTRUCTIONS USED		FOR LWR *****	00035670
000600	3804			6588	LWRDELAY	BOC	6250,STAYFWD	00035680
000601	DD80			6591		ANDM	XOUTAIM,X'80'	00035690
000602	2004			6594		BOC	DBUS,STAYFWD	00035700
000603	CDBF			6597		AND	XOUTAIM,ONES-FWDDATA	00035710
000604	8D10			6600	STAYFWD	ORI	XOUTAIM,SYNC	00035720
000605	4D42			6603		XFR	XOUTAIM,XOUTA	00035730
000606	D502			6606		ANDM	FLAGS,TUBOMSK	00035740
000607	2009			6609		BOC	DBUS,NOMASKW	00035750
000608	5560			6612		XFR	WORK5,TUBO	00035760
000609				6614	NOMASKW	EQU	*	00035770
000609	A202			6616	ZEBRA	ADD	WORK3,2	00035780
00060A	2109			6619		BOC	NALCO,ZEBRA	00035790

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
6622					*****		00035810
6623					*		00035820
6624					X X XXX X XXXX XXXX XX XXX		00035830
6625					X X X X X X X X X X X		00035840
6626					X X X XXX X X XXX X X XXX		00035850
6627					X X X X X X X X X X X		00035860
6628					X X X X X X XXXX XX X		00035870
6629					*		00035880
6630					*		00035890
6631					*		00035900
6632					*		00035910
6633					*		00035920
6634					*****		00035930
00060B				6636	WRTAWAY EQU *		00035950
00060B 2365				6638	BOC NRZFEAT,WRTSTNRZ		00035960
00060C D718				6641	ANDM SENSE2,NOTPE+HIDEN	CHECKINK FOR NRZI	00035970
00060D 2011				6644	BOC DBUS,ALLOK	BR IF NEITHER	00035980
00060E 3411				6647	BOC HIDEN,ALLOK	BR IF BIRCH	00035990
00060F 1801				6650	STO MPGMERR,NOTCAP	SET NOT CAP	00036000
000610 61CF				6653	BU CLRXOUTA	TU IN NRZI AND NO NRZI FEAT	00036010
000611				6655	NOTNRZIW EQU *		00036020
000611 9600				6657	ALLOK ORM SENSE1,0	GET LSR FOR TEST	00036030
000612 33D0				6660	BOC BOT,WRT1	BR IF LP IS ON	00036040
000613 9800				6663	ORM TRACER,0	SEE WHAT WE ARE DOING	00036050
000614 36A9				6666	BOC WTMOP,DOWTM64	BR IF WRITE TAPE MARK	00036060
000615 35A8				6669	BOC ERGOP,ERGAWAY	BR IF ERASE GAP	00036070
000616 1937				6673	STO LINK2,IBGGONE	SET UP LINK RETURN	00036090
6676				6676	*****		00036110
6677				6677	* WAIT FOR READ DATA- WRITE OP HAS BEEN INITIATED. IF READ DATA IS		00036120
6678				6678	* SEEN TOO SOON, EARLY BEGIN CHECK WILL BE SET. EXIT OCCURS WHEN BLK		00036130
6679				6679	* RISES. IF BLK DOES NOT RISE WITHIN A SPECIFIC TIME AFTER STOP IS		00036140
6680				6680	* SEEN, NO BLOCK WILL BE SET AND AN ERROR EXIT TAKEN.		00036150
6681				6681	*****		00036160
000617 8D10				6683	***** SEQUENCE 0 *****		00036180
000618 4D42				6685	SETSYNC ORI XOUTAIM,SYNC	N IMAGE SYNC	00036190
000619 8D22				6688	XFR XOUTAIM,XOUTA	SET SYNC TO DATA FLOW	00036200
00061A 381C				6691	ORI XOUTAIM,LOGAIN+NOLOSS	SET LO GAIN FOR LATER	00036210
00061B CDFD				6694	BOC 6250,SETSYNC2		00036220
00061C 02FA				6697	AND XOUTAIM,ONES-LOGAIN	RESET LOGAIN FOREPE	00036230
00061D 0100				6700	SETSYNC2 STO WORK3,ONES-5	LOAD BLOCK RECOGNITION COUNT	00036240
				6703	STO WORK2,0	CLR TIME OUT CTR	00036250
00061E				6706	VELCHK1 EQU *	MARK SEQ 0	00036270
00061E 8440				6708	ORI STATIMG,PERMRDWT	IMAGE WRITE CONDITION	00036280
00061F 4428				6711	XFR STATIMG,STAT	SET WRITE CONDITION	00036290
000620 00C8				6714	STO WORK1,200	LOAD CTR -	00036300
000621 3A2C				6717	BOC STATC,VELCHK4	LWR BR	00036310
000622 2422				6720	VELCHK2 BOC RDTIME,VELCHK2	WAIT FOR RDTIME TO FALL	00036320

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
000623	A0FF			6723	ADD	WORK1,ONES	DECREMENT CTR BY ONE	F01MAY72 2/04/74 00036330
000624	202C			6726	BOC	DBUS,VELCHK4	EXIT ON NO CARRY	00036340
000625	3C2A			6729	VELCHK10	BOC	NBLOCK,VELCHK3	IBG SHD NOT FALL HERE
000626	8C10			6732	ORI	DTACHK1,FASTBGN	SET EARLY BEGIN	* UC * 00036360
000627	3829			6735	BOC	6250,SETEQCK	BR IF GCR	00036370
000628	662A			6738	BU	VELCHK3		00036380
000629	1D02			6741	SETEQCK	STO	EQUIPCK,PERR	CANT RECOVER FROM THIS ONE
00062A	2422			6744	VELCHK3	BOC	RDTIME,VELCHK2	WAIT FOR RDTIME TO RISE
00062B	662A			6747	BU	VELCHK3		00036410
00062C	242C			6750	*****	SEQUENCE 1 *****		00036430
00062D	3C2F			6752	VELCHK4	BOC	RDTIME,VELCHK4	WAIT FOR RDTIME TO FALL
00062E	5922			6755		BOC	NBLOCK,VELCHK5	WAIT FOR IBG TO FALL
				6758		XFR	LINK2,IC	RETURN
00062F	2732			6762	VELCHK5	BOC	STOP,VELCHK8	IS STOP ON
000630				6764	VELCHK6	EQU	*	00036490
000630	242C			6766	VELCHK7	BOC	RDTIME,VELCHK4	WAIT FOR RISE OF READ TIME
000631	6630			6769		BU	VELCHK7	00036510
000632	A101			6772	*	RUN TIME OUT	COUNTER IF STOP IS ON *****	00036530
000633	2130			6774	VELCHK8	ADD	WORK2,1	BUMP CTR
000634	1D10			6777		BOC	NALCO,VELCHK6	WAIT FOR OVERFLOW
000635				6780	VELBAD	STO	EQUIPCK,NBLOCK	SET NO BLOCK ERROR
000635	4012			6782	VELOUT	EQU	*	00036570
000636	61D0			6784	STROBTIE	XFR	POINTERS	GET TIE TO BUS
				6787		BU	ENDUP	00036580
6791	*****							00036620
6792	*	BLK HAS FALLEN SO CONTINUE READ BACK CHECK WHILE WAITING FOR THE					*	00036630
6793	*	MARK1.					*	00036640
6794	*****							00036650
000637	00FC			6797	*****	SEQUENCE 2 *****		00036680
000638	03E8			6799	IBGGONE	STO	WORK1,ONES-3	LOAD LO GAIN CTR
000639	383C			6802		STO	WORK4,ONES-23	LOAD MARK TIME OUT CTR
00063A	00F5			6805		BOC	6250,WRITE20	BR IF BIRCH MODE
00063B	03D7			6808		STO	WORK1,ONES-10	LOAD LO GAIN CTR
00063C				6811		STO	WORK4,ONES-40	LOAD BEG ONES TIME OUT
00063C				6813	WRITE20	EQU	*	ET SEQ
00063C	243C			6815	WRITE201	BOC	RDTIME,WRITE201	WAIT FOR RDTIME TO FALL
00063D	2F43			6818		BOC	IBG,WRITE30	IBG SHD NOT RISE
00063E	3C43			6821	WRITE33	BOC	NBLOCK,WRITE30	SHD NOT TAKE BRANCH
00063F	A201			6824		ADD	WORK3,1	BUMP BLOCK CTR
000640	2144			6827		BOC	NALCO,WRITE22	BR ON NO CARRY
000641	8901			6830		ORI	FRU,1	SET BOR SEEN SEQ 7
000642	2E44			6833		BOC	BOR,WRITE22	BOR SHD BE UP
000643	8C80			6836	WRITE30	ORI	DTACHK1,IBGDROP	SET ERROR
000644	A001			6839	WRITE22	ADD	WORK1,1	BUMP CTR

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
000645	214C			6842	BOC	NALCO,WRITE220		00036840
000646	4D42			6845	XFR	XOUTAIM,XOUTA		00036850
000647	384E			6848	BOC	6250,RESYNC		00036860
000648	9D00			6851	ORM	XOUTAIM,0		00036870
000649	364F			6854	BOC	DREG6,WRT01		00036880
00064A	8D02			6857	ORI	XOUTAIM,LOGAIN		00036890
00064B	00FA			6860	STO	WORK1,ONES-5		00036900
00064C				6862	WRITE220 EQU	*		00036910
00064C	243C			6864	WRITE221 BOC	RDTIME,WRITE201		00036920
00064D	664C			6867	BU	WRITE221		00036930
				6871	*****	*****		00036960
				6872	* LO GAIN HAS BEEN SET SO MONITOR FOR BEGINNING MARK	SET START		00036970
				6873	* READ CHECK IF BEGINNING MARK IS MISSED,AND DROP LO GAIN.			00036980
				6874	*****	*****		00036990
00064E	CDEF			6877	RESYNC	AND XOUTAIM,ONES-SYNC	RESET FOR USE LATER	RLC ONLY 00037010
00064F	2451			6880	WRT01	BOC RDTIME,WRT02	WAIT FOR READ TIME	00037020
000650	664F			6883	BU	WRT01		00037030
000651	226A			6887	WRT02	BOC ROCROT,WRITE27	WATCH FOR ROC ROTATION	00037050
000652	3C57			6890	WRT03	BOC NBLOCK,WRT04	TEST NO BLOCK	00037060
000653	A201			6893		ADD WORK3,1	BUMP BLOCK CTR	00037070
000654	2158			6896		BOC NALCO,WRT05	BR IF NO CARRY	00037080
000655	8901			6899		ORI FRU,1	SET SEQ (7) BOR SEEN	00037090
000656	2E58			6902		BOC BOR,WRT05	TEST BOR	00037100
000657	8C80			6905	WRT04	ORI DTACHK1,IBGDROP	SET ERROR - NO BOR OR BLOCK	CREAS 00037110
000658	2458			6908	WRT05	BOC RDTIME,WRT05	WAIT FOR FALL	00037120
000659	D901			6912	WRT06	ANDM FRU,1	HAS BOR BEEN SEEN	00037140
00065A	205C			6915		BOC DBUS,WRT07	BR IF NOT	00037150
00065B	2D6C			6918		BOC DATARDY,WRITE23	NORMAL EXIT ON FRAME BUFFER DATA	00037160
00065C	2767			6921	WRT07	BOC STOP,WRT08	LOOK FOR STOP	00037170
00065D	A301			6924		ADD WORK4,1	BUMP TIME OUT CTR	00037180
00065E	214F			6927		BOC NALCO,WRT01		00037190
00065F	2261			6930		BOC ROCROT,SKIPSLO	SKIP SLOW BGN IF ROC ROTATION	00037200
000660	8C04			6933		ORI DTACHK1,SLOWBGN	SET ERROR	00037210
000661	8A08			6936	SKIPSLO	ORI DTACHK2,STREADCK	SET ERROR -- START REDA CHK	00037220
000662	CDFD			6939		AND XOUTAIM,ONES-LOGAIN	RESET IMAGE	00037230
000663	4D42			6942		XFR XOUTAIM,XOUTA	RESET LOGAIN AND SYNC	00037240
000664	D901			6945		ANDM FRU,1	HAVE EE SEEN BOR	00037250
000665	204F			6948		BOC DBUS,WRT01	BR IF NOT	00037260
000666	6671			6951		BU WRITE28		00037270
000667	A101			6954	WRT08	ADD WORK2,1	BUMP TIME OUT CTR	00037280
000668	214F			6957		BOC NALCO,WRT01	BR IF OK	00037290
000669	667C			6960		BU WRITE25X	ERROR	00037300
				6965	*****	*****		00037340
				6966	* MARK1 HAS BEEN SEEN.	RESET SYNC BIT IN XOUTA	*	00037350
				6967	* AND EXIT TO CHECK VELOCITY IF STOP HAS NOT BEEN SEEN.		*	00037360

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
00066A	4D42			6971	***** SEQUENCE 3 *****		00037400
00066B	6652			6973	WRITE27 XFR XOUTAIM,XOUTA		00037410
				6976	BU WRT03		00037420
00066C				6979	WRITE23 EQU *		00037440
00066C	4D42			6981	XFR XOUTAIM,XOUTA	ASSURE SYNC IS RESER	00037450
00066D	2771			6984	BOC STOP,WRITE28	DONT VELOCITY CHECK IF STOP IS ON	00037460
00066E	3A71			6987	BOC STATC,WRITE28	BR IF LWR	00037470
00066F	16A8			6990	WRITE999 STOH SENSE1,FIRST+DATATIM+CNTRDY		00037480
000670	6300			6993	BU CHKVEL		00037490
000671	2F83			6996	WRITE28 BOC IBG,DROPGO		00037500
				6999	*****		00037520
				7000	* WAIT FOR END DATA- THEN EXIT TO POSTAMBLE CHECK.	*	00037530
				7001	*****		00037540
				7003	***** SEQUENCE 4 *****		00037560
000672				7004	WRITE28X EQU *	J	00037570
000672	2474			7006	WRITE280 BOC RDTIME,WRITE32	WAIT FOR RDTIME TO RISE	00037580
000673	6672			7009	BU WRITE280		00037590
000674	2888			7012	WRITE32 BOC ENDATA,WRITE40	BR ON EOD	00037600
000675	2474			7015	BOC RDTIME,WRITE32	WAIT FOR RD TIME TO FALL	00037610
000676	277A			7018	BOC STOP,WRITE25	GO RUN TIMEOUT CTR	00037620
000677	2888			7021	WRITE34 BOC ENDATA,WRITE40	NORMAL EXIT	00037630
000678	2474			7024	BOC RDTIME,WRITE32	WAIT FOR RD TIME TO RISE	00037640
000679	6677			7027	BU WRITE34		00037650
				7030	* RUN TIME OUT CTR IF STOP IS ON		00037670
00067A	A101			7032	WRITE25 ADD WORK2,1	BUMP TIME OUT	00037680
00067B	2177			7035	BOC NALCO,WRITE34	SHD NEVER CARRY	00037690
00067C	8C02			7038	WRITE25X ORI DTACHK1,SLOWEND	SET ERROR	* UC * 00037700
00067D	277F			7041	CHKBORXX BOC STOP,CHKBORXY	WAIT FOR STOP IF NECESSARY	00037710
00067E	667D			7044	BU CHKBORXX		00037720
00067F	D901			7047	CHKBORXY ANDM FRU,X'01'	HAVE WE SEEN BOR	00037730
000680	2034			7050	BOC DBUS,VELBAD	BR IF NOT	00037740
000681	2F35			7053	LOOKIBG BOC IBG,VELOUT	WAIT FOR IBG	00037750
000682	6681			7056	BU LOOKIBG		00037760
000683	9500			7059	DROPGO ORM FLAGS,0	TEST FOR DIAG WRITE	00037770
000684	3072			7062	BOC DREG0,WRITE280	GO BACK IF SO	00037780
000685	1508			7065	STO WORK5,DEVSEL		00037790
000686	5524			7068	XFR WORK5,TUTAG	DROP MOVE	00037800
000687	6672			7071	BU WRITE280		00037810
				7075	*****		00037840
				7076	* END OF DATA DETECTED. CHECK POSTAMBLE	*	00037850
				7077	*****		00037860

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
000688				7078	WRITE40	EQU *		00037870
000688	CDDF			7080		AND XOUTAIM,ONES-NOLOSS	RESET NOLOSS	00037880
000689	4D42			7083		XOUTAIM,XOUTA	DO IT	00037890
00068A	00F4			7086		STO WORK1,ONES-11	LOAD ONES CTR 12 GRPS	00037900
00068B	388D			7089		BOC 6250,WRITE41	BR IF HI DENS	00037910
00068C	00E2			7092		STO WORK1,ONES-29	RELOAD CTR FOR 1600	00037920
00068D	2D91			7095	WRITE41	BOC DATARDY,WRITE420	WAIT FOR ONES TO RISE	00037930
00068E	2FA3			7098		BOC IBG,WRITE49	NORMAL EXIT	00037940
00068F	2D91			7101		BOC DATARDY,WRITE420	420WATCH AGAIN FOR ONES	00037950
000690	668D			7104		BU WRITE41		00037960
000691	A001			7108	WRITE420	ADD WORK1,1	BUMP ONES CTR	00037980
000692	219E			7111		BOC NALCO,WRITE43	BR ON NO CARRY	00037990
000693	38A4			7114		BOC 6250,SETENDER	BR IF GCR	00038000
000694	CDCF			7117		AND XOUTAIM,ONES-SYNC-NOLOSS		00038010
000695	4D42			7120		XFR XOUTAIM,XOUTA	LINE TO DATA FLOW	00038020
000696	00EC			7123		STO WORK1,ONES-19	LOAD NEW CTR	00038030
000697	2497			7127	HERENOW	BOC RDTIME,HERENOW	WAIT FOE RD TIME TO FALL	00038050
000698	2FA6			7130		BOC IBG,WRITE50	NORMAL EXIT	00038060
000699	A001			7133		ADD WORK1,1	BUMP CTR	00038070
00069A	219C			7136		BOC NALCO,THERE	BR IF OK YET	00038080
00069B	8A02			7139		ORI DTACHK2,EXCPOST	SET ERROR	00038090
00069C	2497			7143	THERE	BOC RDTIME,HERENOW	WAIT FOE RD TIME TO RISE	00038110
00069D	669C			7146		BU THERE		00038120
00069E	2D9E			7149	WRITE43	BOC DATARDY,WRITE43	WAIT FOR ONES TO FALL	00038130
00069F	668D			7152		BU WRITE41		00038140
0006A0	B001			7156	WRITE54	ADDM WORK1,1	CK RESULTS	00038160
0006A1	21A4			7159	WRITE542	BOC NALCO,SETENDER	SHD CARRY	00038170
0006A2	667D			7162		BU CHKBORXX		00038180
0006A3	38A0			7165	WRITE49	BOC 6250,WRITE54	BR IF GCR	00038190
0006A4	8A02			7168	SETENDER	ORI DTACHK2,EXCPOST	SET ERROR	00038200
0006A5	667D			7171		BU CHKBORXX	* UC *	00038210
0006A6	B00F			7175	WRITE50	ADDM WORK1,15	ASSURE MORE THAN 5 BYTES	00038230
0006A7	66A1			7178		BU WRITE542	GO CHK RESULTS	00038240

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
0006A8	6024			7183	ERGAWAY	BU ERGSTR	GO DO ERASE GAP	00038270
7186	*****						00038290	
7187	* WRITE TAPE MARK HAS BEEN INITIATED - READ BACK CHECK TO ASSURE						* 00038300	
7188	* GOOD TAPE MARK. IF READ DATA IS SEEN TOO SOON, EARLY BEGIN CHECK						* 00038310	
7189	* WILL BE SET. IF NO READ DATA IS SEEN, NO BLOCK ERROR IS SET.						* 00038320	
7190	* ONCE BLK RISES, THE TAPE MARK BRANCH CONDITION MUST STAY UP						* 00038330	
7191	* UNTIL BLK FALLS AGAIN. IBGDROP ERROR INDICATES THAT THIS						* 00038340	
7192	* DID NOT HAPPEN.						* 00038350	
7193	*****						00038360	
0006A9	1951			7196	DOWTM64	STO LINK2,WTMSTR2	LOAD LINK RETURN	00038380
0006AA	3AAC			7199	BOC	STATC,WTMAWAY	BR IF LWTM	00038390
0006AB	6025			7202	BU	ERGCTR	GO DO ERG FIRST	00038400
0006AC	19AE			7206	WTMAWAY	STO LINK2,WTM20	LOAD LINK RETURN	00038420
0006AD	661C			7209	BU	SETSYNC2	GO WAIT FOR DATA	00038430
0006AE	00CA			7213	WTM20	STO WORK1,ONES-53	LOAD TM WINDOW CTR	00038450
0006AF	03CE			7216	STO	WORK4,ONES-49	SET TM COUNTER	00038460
0006B0	24B0			7219	WTM21	BOC RDTIME,WTM21	WAIT FOR RDTIME TO FALL	00038470
0006B1	A001			7222	ADD	WORK1,1	BUMP WINDOW CTR	00038480
0006B2	21BB			7225	BOC	NALCO,WTM22	BR IF STILL OPEN	00038490
0006B3	01E3			7228	WTM21A	STO WORK2,ONES-28	LOAD TIME OUY	00038500
0006B4	24B4			7231	WTM21B	BOC RDTIME,WTM21B	WAIT FOR RDTIME TO FALL	00038510
0006B5	A101			7234	WTM25	ADD WORK2,1	BUMP TIME OUT	00038520
0006B6	21B8			7237	BOC	NALCO,WTM26	BR ON NO CARRY	00038530
0006B7	8C02			7240	ORI	DTACHK1,SLOWEND	SET ERROR	* UC * 00038540
0006B8	2FCA			7243	WTM26	BOC IBG,WTM30	NORMAL EXIT	00038550
0006B9	24B4			7246	BOC	RDTIME,WTM21B	WAIT FOR RD TIME TO RISE	00038560
0006BA	66B8			7249	BU	WTM26		00038570
0006BB	3CC8			7252	WTM22	BOC NBLOCK,WTM27A	SHOULD NOT BRANCH	00038580
0006BC	A201			7255	ADD	WORK3,1	BUMP BLOCK CTR	00038590
0006BD	21BF			7258	BOC	NALCO,WTM23	BR ON NO CARRY	00038600
0006BE	8901			7261	ORI	FRU,1	SET SEQ 7 - BLOCK SEEN	00038610
0006BF	3DC5			7264	WTM23	BOC NTM,WTM27	BR IF NO TAPE MARK	00038620
0006C0	A301			7267	ADD	WORK4,1	BUMP TM COUNTER	00038630
0006C1	21C3			7270	BOC	NALCO,WTM24	BR ON NO CARRY	00038640
0006C2	8902			7273	ORI	FRU,2	SET, SEQ 6 - TM GOOD	00038650
0006C3	24B0			7276	WTM24	BOC RDTIME,WTM21	WAIT FOR RD TIME	00038660
0006C4	66C3			7280	BU	WTM24		00038680
0006C5	9900			7283	WTM27	ORM FRU,0		00038690
0006C6	37C8			7286	BOC	DREG7,WTM27A	BR IF BLOCK OK	00038700
0006C7	66C3			7289	BU	WTM24		00038710
0006C8	8C80			7292	WTM27A	ORI DTACHK1,IBGDROP	SET ERROR	* UC * 00038720
0006C9	66C3			7295	BU	WTM24		00038730
0006CA	9900			7300	WTM30	ORM FRU,0	GET REGISTER FOR TEST	00038760
0006CB	37CD			7303	BOC	DREG7,WTM31	BR IF BLOCK OK	00038770
0006CC	6634			7306	BU	VELBAD	GO SET NOBLOCK ERROR	00038780

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
0006CD	36CF			7309	WTM31	BOC DREG6,WTM32		00038790
0006CE	8A20			7312	SETWTMCK	ORI DTACHK2,WTMERR	* UC *	00038800
0006CF	61D0			7315	WTM32	BU ENDUP		00038810
				7318	***	LOAD POINT - WRITE ID BURST *****		00038830
0006D0	8424			7320	WRT1	ORI STATIMG,WRTBURST+SETSTATB		00038840
				7322	*****	*****		00038850
				7323	*	TURN ON WRITE CONDITION & WRITE BURST STAT - THEN MOVE FIRST TWO	*	00038860
				7324	*	INCHES WITHOUT CHECKING.	*	00038870
				7325	*****	*****		00038880
0006D1	4428			7327	XFR	STATIMG,STAT	SET WRITE BURST STAT	00038890
0006D2	1950			7330	STO	LINK2,TRETURNS	LOAD RETURN - WRT2	00038900
0006D3	00FF			7333	STO	WORK1,ONES	LOAD HIGH COUNTER	00038910
0006D4	0100			7336	STO	WORK2,0	LOAD LOW COUNTER - 2 INCHES	00038920
0006D5	621C			7339	BU	ZEROCTR		00038930
				7342	*****	*****		00038950
				7343	*	TURN ON FLAG FOR TAK COUNTER (CHECK BURST), THEN MOVE NEXT FOUR	*	00038960
				7344	*	INCHES CHECKING BURST.	*	00038970
				7345	*****	*****		00038980
0006D6	1900			7347	WRT2	STO LINK2,WRT4	LOAD LINK RETURN	00038990
0006D7	8820			7350	WRT21	ORI TRACER,LPMARK	SET FLAG FOR TRK CTR	00039000
0006D8	03F0			7353	STO	WORK4,ONES-15	CLEAR ID CTR	00039010
0006D9	6703			7356	WRT3	BU WRT30		00039020
				7360	*****	CHECK POSITIONING SUBROUTINE *****		00039050
				7361	*		*	00039060
				7362	*	CHECK FOR POSITIONING RESPONSE TO COMMAND TAG - IF ON, WAIT	*	00039070
				7363	*	FOR IT TO FALL.	*	00039080
				7364	*		*	00039090
				7365	*****	*****		00039100
0006DA	5460			7368	CHKPOSIT	XFRH STATIMG,TUBO	ASSURE TUBO IS CLEAR	00039120
0006DB	020A			7371	STO	WORK3,DEVSEL+COMMAND		00039130
0006DC	4224			7374	XFR	WORK3,TUTAG	RAISE CMD TAG	00039140
0006DD	A278			7377	ONEMORE	ADD WORK3,120	BUMP WAIT COUNTER	00039150
0006DE	21DD			7380	BOC	NALCO,ONEMORE	WAIT FOR CARRY OUT	00039160
0006DF	3FE5			7383	WAIT SOME	BOC DEVATTN,ZAP1	ABNORMAL EXIT	00039170
0006E0	4281			7386	XFR	WORK3,TUBI	BRING IN DEVICE RESPONSE	00039180
0006E1	37DF			7389	BOC	DREG7,WAIT SOME	WAIT FOR POSITIONING TO FALL	00039190
0006E2	0208			7392	STO	WORK3,DEVSEL	RESET CMD TAG IMAGE	00039200
0006E3	4224			7395	XFR	WORK3,TUTAG	DROP CMD TAG	00039210
0006E4	5922			7398	XFR	LINK2,IC	RETURN TO CALLER	00039220
0006E5	671D			7401	ZAP1	BU ENDUPEX		00039230
				7405	CRETURN1	BU LETSGO	TRNARND RETURN	00039250
0006E7	675E			7409	CRETURN2	BU ERASE4		00039270
0006E8	677C			7412	CRETURN3	BU BKWDINIT		00039280
0006E9	674C			7415	CRETURN4	BU DOBOTXX		00039290

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
0006EA	60B8			7418	CRETURN5	BU READSTOP		00039300
				7421	**	NRZI TM - READ BACK CHECK		00039320
0006EB	2DFA			7423	TMLOOP1	BOC DATARDY,SETBOR1		00039330
0006EC	28F1			7426	TM10BOR	BOC ENDATA,TMFINIS		00039340
0006ED	24EB			7429		BOC RDTIME,TMLOOP1		00039350
				7433		ADD WORK2,1		00039370
0006EE	A101			7436		BOC NALCO,TMLOOP2		00039380
0006EF	21F7			7439		ORI DTACHK1,SLOWEND		00039390
0006F0	8C02							
0006F1	9900			7443	TMFINIS	ORM FRU,0		00039410
0006F2	37F4			7446		BOC DREG7,TMEND2		00039420
0006F3	6634			7449		BU VELBAD		00039430
0006F4	3DCE			7453	TMEND2	BOC NTM,SETWTMCK		00039450
0006F5	61D0			7456		BU ENDUP		00039460
0006F6	8901			7461	SETBOR2	ORI FRU,1		00039490
0006F7	2DF6			7464	TMLOOP2	BOC DATARDY,SETBOR2		00039500
0006F8	24EB			7467	TM20BOR	BOC RDTIME,TMLOOP1		00039510
0006F9	66F7			7470		BU TMLOOP2		00039520
0006FA	8901			7474	SETBOR1	ORI FRU,1		00039540
0006FB	66EC			7477		BU TM10BOR		00039550
000700				7480		ORG BEGIN+X'700'		00039570
000700	1905			7482	WRT4	STO LINK2,WRT5		00039580
000701	3803			7485		BOC 6250,WRT30		00039590
000702	197B			7488		STO LINK2,ARETURN1		00039600
000703	002B			7491	WRT30	STO WORK1,ONES-212		00039610
000704	6783			7494		BU CLRCTR1		00039620
				7497	*****	*****		00039640
				7498	* RESET WRITE BURST STAT AND	AND GO SET NORMALIZE	*	00039650
				7499	* TO THE TAPE UNIT.		*	00039660
				7500	*****	*****		00039670
000705	C4DB			7502	WRT5	AND STATIMG,ONES-WRTBURST-SETSTATB		00039680
000706	4428			7505		XFR STATIMG,STAT		00039690
000707	1A3E			7508		STO LINK3,ZRETURN2		00039700
000708	0312			7511		STO WORK4,SETDENS+SETERASE D SET NORMALIZE CMD		00039710
000709	020D			7514		STO WORK3,DEVSEL+CONTROL+MOVE		00039720
00070A	6530			7517		BU SETCTRL1		00039730
				7519	* SAGC CIRCUITS MUST WAIT WRT TO RD HEAD DISTANCE BEFORE ADJUSTING			00039740
				7521	*****	*****		00039760
				7522	* TURN ON WRT CONDITION AND STATB TO ALLOW ALU1 TO BEGIN WRITE OF		*	00039770
				7523	* SAGC BURST. THEN EXIT TO TAK COUNTER 512 TACHS WITH NO CHECKING		*	00039780
				7524	*****	*****		00039790
00070B	8444			7526	WRT6	ORI STATIMG,SETSTATB+PERMRDWT		00039800
00070C	8840			7529		ORI TRACER,CHKBRST		00039810
						SET FLAG FOR TAK COUNTER		

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	2/04/74
00070D	1911			7532	STO	LINK2,WRT7	LOAD RETURN		00039820
00070E	0000			7535	STO	WORK1,0	LOAD COUNT - 256 TACKS		00039830
00070F	4428			7538	XFR	STATIMG,STAT	NOTIFY ALU 1 TO GO AHEAD		00039840
000710	6783			7541	BU	CLRCTR1			00039850
000711	1913			7545	WRT7	STO	LINK2,WRT8	SET RETURN	00039870
000712	6783			7548	BU	CLRCTR1	GO COUNT 256 TACHS		00039880
000713	1916			7552	WRT8	STO	LINK2,WRT9	SET RETURN	00039900
000714	009B			7555	STO	WORK1,ONES-100	SET COUNT - 101 TACHS		00039910
000715	6783			7558	BU	CLRCTR1			00039920
				7560	*****				00039930
				7561	* BOR	INTERRUPT	WRITE	READ	* 00039940
				7562	* 0	0	EQUIP CK	EQUIP CK	* 00039950
				7563	* 1	1	ID BURST CK	READ ERROR + SAGC BIT	00039960
				7564	* 1	0	NORMAL	NORMAL	00039970
				7565	* 0	1	ID BURST CK	NOT CAP	* 00039980
000716	D820			7568	WRT9	ANDM	TRACER,LPMARK	CHK BOR FLG / SHD BE OFF	00040000
000717	201F			7571	BOC	DBUS,WRT90	BR IF OK		00040010
000718	3F1B			7574	BOC	DEVATTN,DTASAGC	BYPASS EQUIP CHK IF TU HOLLERS		00040020
000719	1D02			7577	EQSAGC	STO	EQUIPCK,PERR	SET EQUIPMENT CHECK	* UC * 00040030
00071A	671C			7580	BU	ENDUPEXA			00040040
00071B	8A10			7584	DTASAGC	ORI	DTACHK2,FORMATCK	SET ERROR	* UC * 00040060
00071C	8C08			7587	ENDUPEXA	ORI	DTACHK1,TSAGC	SET ERROR	* UC * 00040070
00071D	C4FB			7590	ENDUPEX	AND	STATIMG,ONES-SETSTATB		00040080
00071E	61CF			7593	BU	CLRROUTA			00040090
00071F	0087			7598	WRT90	STO	WORK1,ONES-120	LOAD CTR	00040120
000720	01FE			7601	STO	WORK2,ONES-1	LOAD CTR		00040130
000721	2421			7604	ID3	BOC	RDTIME,ID3	WAIT FOR FALL	00040140
000722	2424			7607	ID4	BOC	RDTIME,ID5	WAIT FOR RISE	00040150
000723	6722			7610	BU	ID4			00040160
000724	271B			7613	ID5	BOC	STOP,DTASAGC	ERROR EXIT	00040170
000725	291F			7616	BOC	NSAGCID,WRT90	WAIT FOR ID		00040180
000726	A001			7619	ADD	WORK1,1	BUMP CTRS		00040190
000727	2121			7622	BOC	NALCO,ID3			00040200
000728	A101			7625	ADD	WORK2,1	BUMP CTR		00040210
000729	2121			7628	BOC	NALCO,ID3			00040220
00072A	272C			7631	ID12	BOC	STOP,ID14	NORMAL EXIT	00040230
00072B	672A			7634	BU	ID12			00040240
00072C	3F1B			7637	ID14	BOC	DEVATTN,DTASAGC	ERROR EXIT	00040250
00072D	2F2F			7640	ID145	BOC	IBG,WRT95	WAIT FOR IBG	00040260
00072E	672D			7643	BU	ID145			00040270
00072F	1CFA			7646	WRT95	STO	LINK1,SRETURN5	LOAD LINK RETURN	00040280
000730	C4BB			7649	AND	STATIMG,ONES-SETSTATB	PERMRDWT		00040290
000731	4428			7652	XFR	STATIMG,STAT	RESET SOMETHING		00040300
000732	62E1			7655	BU	FCHSTS			00040310

7660 ***** 00040350

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	F01MAY72	2/04/74
				7661 *		*	00040360
				7662 *	THIS SUBROUTINE IS USED BY ALL WRITE OPS TO DETERMINE IF ERASE HEAD*		00040370
				7663 *	POSITIONING IS REQUIRED. THREE CASES ARE CONSIDERED - 1.BACKWARD AT*		00040380
				7664 *	LOAD POINT 2.BACKWARD READ STATUS AND NOT LOAD POINT 3.FORWARD	*	00040390
				7665 *	READ STATUS. REQUIRED TAPE MOTIONS ARE PERFORMED BY THIS CODE.	*	00040400
				7666 *		*	00040410
				7667 *	*****		00040420
000733	D708			7670	NEEDERG ANDM SENSE2,HIDEN IS THIS A BIRCH TAPE UNIT		00040440
000734	205B			7673	BOC DBUS,ERGNONE EXIT IF NOT		00040450
000735	9600			7677	ORM SENSE1,0 GET SENSE BYTE FOR TEST		00040470
000736	345B			7680	BOC WRTSTAT,ERGNONE EXIT IF ALREADY IN WRT STATUS		00040480
000737	334A			7683	BOC BOT,DOBOT BR IF BOT IS ON		00040490
000738	305C			7686	BOC BACKWD,DOBACKWD BR IF BKWD READ STATUS		00040500
				7689	*****		00040520
				7690	***** WRITE AFTER FORWARD READ *****		00040530
				7691	*****		00040540
000739	19E7			7694	STO LINK2,CRETURN2 LOAD LINK RETURN ERASE4		00040560
00073A	66DA			7697	BU CHKPOSIT GO CHECK FOR POSITIONING		00040570
00073B	00FF			7702	ERASE5 STO WORK1,ONES LOAD CTR		00040600
00073C	0340			7705	STO WORK4,RDFWDD PRELOAD CMD		00040610
00073D	1940			7708	STO LINK2,ERASE8 LOAD LINK RETURN		00040620
00073E	1A81			7711	STO LINK3,TAKMOVE LOAD LINK FOR SET CMD		00040630
00073F	6768			7714	BU SETCMD2		00040640
000740	1A3F			7717	ERASE8 STO LINK3,CTLRET6 PRELOAD LINK RETURN - ERASE 6		00040650
000741	0302			7720	ERASE7 STO WORK4,SETERASE PRELOAD CTRL		00040660
000742	020D			7723	STO WORK3,DEVSEL+CONTROL+MOVE		00040670
000743	6530			7726	BU SETCTRL1 GO SET CTRL CMD		00040680
000744	0089			7730	ERASE6 STO WORK1,ONES-118 LOAD FWD TAK CT		00040700
000745	1947			7733	STO LINK2,ERASE9 LOAD LINK RETURN		00040710
000746	6781			7736	BU TAKMOVE		00040720
000747	1A56			7740	ERASE9 STO LINK3,ERASE3 LOAD LINK RETURN		00040740
000748	0308			7743	STO WORK4,WRITE LOAD CMD		00040750
000749	6768			7746	BU SETCMD2 GO SET WRITE MODE		00040760
				7749	*****		00040780
				7750	***** WRITE FROM LOAD POINT *****		00040790
				7751	*****		00040800
00074A	19E9			7753	DOBOT STO LINK2,CRETURN4 LOAD RETURN--- DOBOTXX		00040810
00074B	66DA			7756	BU CHKPOSIT		00040820
00074C	1A40			7760	DOBOTXX STO LINK3,CTLRET3 LOAD LINK RETURN - ERASE 1		00040840
00074D	6741			7763	BU ERASE7		00040850
00074E	0069			7767	ERASE1 STO WORK1,ONES-150 LOAD BKWD TAK CT		00040870
00074F	1951			7770	STO LINK2,ERASE2 LOAD LINK RETURN		00040880

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	2/04/74
000750	6781			7773		BU TAKMOVE	GO RAISE MOVE		00040890
000751	1956			7777	ERASE2	STO LINK2,ERASE3	LOAD LINK RETURN		00040910
000752	0091			7780		STO WORK1,145	LOAD FWD TAK CT		00040920
000753	0308			7783		STO WORK4,WRITE	PRELOAD CMD		00040930
000754	1A81			7786		STO LINK3,TAKMOVE	LOAD LINK FOR SET CMD		00040940
000755	6768			7789		BU SETCMD2	GO SET WRITE		00040950
000756	0208			7793	ERASE3	STO WORK3,DEVSEL	IMAGE TUTAGS		00040970
000757	4224			7796		XFR WORK3,TUTAG	DROP MOVE		00040980
000758	C67F			7799		AND SENSE1,ONES-BACKWD	RESET BKWD BIT		00040990
000759	8608			7802		ORI SENSE1,WRSTAT	TURN ON WRET STATUS		00041000
00075A	0308			7805		STO WORK4,WRITE	LOAD CMD		00041010
00075B	6138			7808	ERGNONE	BU TRNARN	* CHECK THIS *****		00041020
				7811	*****				00041040
				7812	***** WRITE AFTER BACKWARD READ *****				00041050
				7813	*****				00041060
00075C	19E8			7816	DOBACKWD	STO LINK2,CRETURN3	LOAD LINK RETUEN	BKWDINIT	00041080
00075D	66DA			7819		BU CHKPOSIT			00041090
00075E	0073			7824	ERASE4	STO WORK1,ONES-140	LOAD BKWD TAK CT		00041120
00075F	9700			7827		ORM SENSE2,0	TEST LSR		00041130
000760	3362			7830		BOC DREG3,ERASE40	BR IF GCR MODE		00041140
000761	006D			7833		STO WORK1,ONES-146	CHG CONSTANT FOR PE		00041150
000762	193B			7836	ERASE40	STO LINK2,ERASE5	LOAD LINK RETURN		00041160
000763	0380			7839		STO WORK4,RDBKWD	PRELOAD CMD		00041170
000764	1A81			7842		STO LINK3,TAKMOVE	LOAD LINK FOR SET CMD		00041180
				7845	***** SET COMMAND SUBROUTINE *****				00041200
				7846	*				* 00041210
				7847	* RAISE MOVE TO DEVICE IF ENTRY POINT IS SETCMD1. ASSUME MOVE				* 00041220
				7848	* IS ON IF ENTRY POINT IS SETCMD2. SET CMD TO TUBO & RAISE				* 00041230
				7849	* COMMAND TAG. CHECK TAPE UNIT RESPONSE - IF SATISFACTORY, CLEAR				* 00041240
				7850	* THE TUBO AND DROP CMD TAG. EXIT ROUTINE WITH MOVE STILL UP.				* 00041250
				7851	*				* 00041260
				7852	*****				00041270
000765	020A			7855	SETCMD1	STO WORK3,DEVSEL+COMMAND	RAISE COMMAND IN IMAGE		00041290
000766	4360			7858		XFR WORK4,TUBO	PASS CMD		00041300
000767	4224			7861		XFR WORK3,TUTAG	GIVE CMD TO DEVICE		00041310
000768	020B			7864	SETCMD2	STO WORK3,DEVSEL+COMMAND+MOVE			00041320
000769	4224			7867	SETCMD3	XFR WORK3,TUTAG	RAISE CMD TAG		00041330
00076A	4360			7870		XFR WORK4,TUBO	SET CMD TO TUBO		00041340
00076B	A270			7873	ONCEAGN	ADD WORK3,112	BUMP COUNTER		00041350
00076C	216B			7876		BOC NALCO,ONCEAGN	WAIT FOR OVERFLOW		00041360
00076D	D340			7879		ANDM WORK4,RDFWDD	IS CMD READ FWD		00041370
00076E	2070			7882		BOC DBUS,GETSTATS	BR IF NOT		00041380
00076F	0300			7885		STO WORK4,0	MODIFY STATUS BYTE FOR READ FWD		00041390
000770				7887	GETSTATS	EQU *	S CMD SET SAGC		00041400
000770	4981			7889	STATSNOW	XFR FRU,TUBI	BRING IN DEVICE RESPONSE		00041410

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT	F01MAY72	2/04/74
000771	C9AE			7892	AND	FRU,ONES-GAPCTRL-OPPDIR-POSIT DONT CARE BITS		00041420
000772	4321			7895	XFR	WORK4,AR		00041430
000773	F900			7898	XOM	FRU,0		00041440
000774	2076			7901	BOC	DBUS,CMDEXIT		00041450
000775	6173			7904	BU	SETREJ		00041460
000776	C209			7908	CMDEXIT	AND WORK3,DEVSEL+MOVE		00041480
000777	5460			7911	XFRH	STATIMG,TUBO		00041490
000778	4224			7914	XFR	WORK3,TUTAG		00041500
000779	5A22			7917	XFR	LINK3,IC		00041510
00077A	60C7			7920	CRERETRN	BU NOW		00041520
7925	***** MOTION CONTROL VIA TACH LINE SUBROUTINE *****							00041560
7926	*							00041570
7927	*	THIS CODE CAN BE ENTERED WITH MOVE UP OR DOWN. ITS MAIN						00041580
7928	*	FUNCTION IS TO HOLD MOVE UP FOR A PRE-SPECIFIED AMOUNT. EACH						00041590
7929	*	TIME A TACH PULSE IS SEEN, WORK1 IS INCREMENTED. EXIT OCCURS WHEN						00041600
7930	*	WORK1 OVERFLOWS.						00041610
7931	*			CHKBRST	FLAG	LPMARK FLAG		00041620
7932	*			0		0 NOT LP CHECK		00041630
7933	*			0		1 CHECK ID TRACK		00041640
7934	*			1		1 NO CHK ON ID OR SAGC BRST		00041650
7935	*			1		0 CHECK SAGC - ONCE BOR IS SEEN		00041660
7936	*							00041670
7937	*****							00041680
00077B	65F5			7939	ARETURN1	BU W RTP2		00041690
00077C	0074			7943	BKWDINIT	STO WORK1,ONES-139		00041710
00077D	9700			7946	ORM	SENSE2,0		00041720
00077E	3380			7949	BOC	DREG3,ERASER		00041730
00077F	0079			7952	STO	WORK1,ONES-134		00041740
000780	193B			7955	ERASER	STO LINK2,ERASE5		00041750
000781	020B			7959	TAKMOVE	STO WORK3,DEVSEL+MOVE+COMMAND MOVE TAG		00041770
000782	4224			7962	XFR	WORK3,TUTAG		00041780
000783	0200			7965	CLRCCTR1	STO WORK3,0		00041790
000784	01FE			7968	STO	WORK2,X'FE'		00041800
000785	2487			7972	TACH1	BOC RD'TIME,TACH2		00041820
000786	6785			7975	BU	TACH1		00041830
000787	3E8A			7978	TACH2	BOC BSYTACH,YESTAK		00041840
000788	8808			7981	ORI	TRACER,TAKTR		00041850
000789	678C			7984	BU	COUNTDWN		00041860
00078A	9800			7988	YESTAK	ORM TRACER,0		00041880
00078B	3492			7991	BOC	TAKTR,COUNTONE		00041890
00078C	248C			7994	COUNTDWN	BOC RD'TIME,COUNTDWN		00041900
00078D	A201			7997	ADD	WORK3,1		00041910
00078E	2185			8000	BOC	NALCO,TACH1		00041920

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		F01MAY72	2/04/74
00078F	A101			8003	ADD	WORK2,1	BUMP CTR		00041930
000790	2185			8006	BOC	NALCO,TACH1	BR ON NO CARRY		00041940
000791	6246			8009	BU	SETNTACH	ERROR EXIT		00041950
000792	C8F7			8013	COUNTONE	AND TRACER,ONES-TAKTR	RESET TAK TRACE		00041970
000793	31A9			8016	BOC	CHKBRST,CHKID	BR ON FLAG		00041980
000794	32A1			8019	BOC	LPMARK,CHK1ORP	BR ON FLAG		00041990
000795	5381			8022	XFRH	WORK4,TUBI	BRING IN CMD STATUS		00042000
000796	339C			8025	BOC	OPPDIR,SUBONE	BR IF ON TO DECREMENT CTR		00042010
000797	A001			8028	TACH3	ADD WORK1,1	BUMP CTR		00042020
000798	2183			8031	BOC	NALCO,CLRCTR1	KEEP COUNTING TILL OVERFLOW		00042030
000799	0209			8034	STO	WORK3,DEVSEL+MOVE			00042040
00079A	4224			8037	XFR	WORK3,TUTAG	DROP CMD TAG		00042050
00079B	5922			8040	XFR	LINK2,IC	RETURN - NORMAL EXIT		00042060
00079C	A0FF			8044	SUBONE	ADD WORK1,ONES	SUBTRACT ONE FROM COUNTER		00042080
00079D	209F			8047	BOC	DBUS,SETDRCK	SET DYNAMIC REVERSAL ERROR		00042090
00079E	6783			8050	BU	CLRCTR1			00042100
00079F	1D08			8053	SETDRCK	STO EQUIPCK,DYREV	SET ERROR		00042110
0007A0	671D			8056	BU	ENDUPEX	EXIT		00042120
0007A1	39A3			8058	* CHECK	FOR CREASE IN SINGLE TRK ENVELOPE			00042130
0007A2	6797			8060	CHK1ORP	BOC N1TE,CHKPOR1			00042140
				8063	BU	TACH3			00042150
0007A3	2CA5			8067	CHKPOR1	BOC NPTE,CNTFORER			00042170
0007A4	6797			8070	BU	TACH3			00042180
0007A5	A301			8074	CNTFORER	ADD WORK4,1			00042200
0007A6	2197			8077	BOC	NALCO,TACH3			00042210
0007A7	8A10			8080	IBGON	ORI DTACHK2,FORMATCK	SET ERROR CREASE IN BURST	* UC *	00042220
0007A8	671D			8083	BU	ENDUPEX			00042230
0007A9	2EAB			8087	CHKID	BOC BOR,CHKID2	SAMPLE BOR		00042250
0007AA	6797			8090	BU	TACH3			00042260
0007AB	C8DF			8093	CHKID2	AND TRACER,ONES-LPMARK	REST NO CHECK FLAG		00042270
0007AC	6797			8096	BU	TACH3			00042280
8099					*****	VELOCITY CHECK FOR WRITE OPS ON 6250 UNITS	*****		00042300
8100					*	*****	*		00042310
8101					*	TACH	*		00042320
8102					*	LINE	*		00042330
8103					*	*****	*		00042340
8104					*	A	B	C	00042350
8105					*			D	00042360
8106					*	AT RISE OF GAP CONTROL,CHECK ONE FULL TACH FOR BEING IN SPEC.			00042370
8107					*	IF TACH A+B IS OUT OF SPEC, DROP COUNT ACCUMULATED ON A AND COUNT			00042380
8108					*	ACROSS C. NOW CHECK FOR B+C IN SPEC. IF SO,EXIT -	IF A+B IS		00042390
8109					*	NOT IN SPEC - VELOCITY RETRY WILL BE SET.			00042400
8110					*				00042410
8111					*	VELOCITY LIMITS + OR - 6 PER CENT			00042420
8112					*	MOD 4	118.1US	131.1US	00042430
8113					*	MOD 6	70.8US	79.8US	00042440
8114					*	MOD 8	44.3US	49.9US	00042450
8115					*				00042460

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT		F01MAY72 2/04/74
				8116	*****		00042470
0007AD	101F			8119	SETCOUNT STO WORK1,ONES-224	LOAD BASE COUNT FOR MOD 3	00042490
0007AE	1118			8122	STOH WORK2,24	LOAD PEAK COUNT FOR MOD 3	00042500
0007AF	9700			8125	ORM SENSE2,0	SEE WHAT KIND OF DRIVE	00042510
0007B0	36B7			8128	BOC DREG6,ISOKNOW	BR IF MOD 3	00042520
0007B1	37B5			8131	BOC DREG7,NOW200	BR IF MOD 7	00042530
0007B2	1077			8134	STOH WORK1,ONES-136	LOAD BASE COUNT FOR MOD 5	00042540
0007B3	1111			8137	STOH WORK2,17	LOAD PEAK COUNT FOR MOD 5	00042550
0007B4	67B7			8140	BU ISOKNOW		00042560
0007B5	10AA			8143	NOW200 STO WORK1,ONES-85	LOAD BASE COUNT FOR MOD 7	00042570
0007B6	110B			8146	STOH WORK2,11	LOAD PEAK COUNT FOR MOD 7	00042580
				8149	*****		00042600
				8150	* CLOCK ACROSS TACHA *		00042610
				8151	*****		00042620
0007B7	5006			8154	ISOKNOW XFRH LSR	SET HIGH MODE	00042640
0007B8	0200			8157	STO WORK3,0	LOAD A CTR	00042650
0007B9	15E1			8160	STO WORK5,ONES-30	LOAD RETRY CTR	00042660
0007BA	3EBA			8163	WAITONE BOC BSYTACH,WAITONE	GET IN SYNC	00042670
0007BB	3EBD			8166	ONEMORET BOC BSYTACH,VELOC001	EXIT ON RISE	00042680
0007BC	67BB			8169	BU ONEMORET		00042690
0007BD	3EBF			8173	VELOC001 BOC BSYTACH,VELOC002	LOOK AT TACH	00042710
0007BE	67C4			8176	BU VELOC003	NORMAL EXIT	00042720
0007BF	A201			8179	VELOC002 ADD WORK3,1	BUMP CTR A	00042730
0007C0	21BD			8182	BOC NALCO,VELOC001	LOOK FOR CARRY	00042740
				8184	* DRIVE WAS TOO SLOW		00042750
0007C1	3FDB			8186	VELOC004 BOC DEVATTN,UNTCHK1	EXIT ON READY DROP	00042760
0007C2	20C3			8189	NOP2		00042770
0007C3	3EC1			8192	BOC BSYTACH,VELOC004	HANG TILL TACH CHANGES	00042780
				8194	*****		00042790
				8195	* CLOCK ACROSS TACHB *		00042800
				8196	*****		00042810
0007C4	0300			8199	VELOC003 STO WORK4,0	CLEAR CTR B	00042830
0007C5	3ECB			8202	VELOC005 BOC BSYTACH,VELOC006	NORMAL EXIT	00042840
0007C6	A301			8205	ADD WORK4,1	BUMP CTR B	00042850
0007C7	21C5			8208	BOC NALCO,VELOC005	LOOK FOR CARRY	00042860
				8210	* DRIVE TOO SLOW		00042870
0007C8	3FDB			8212	VELOC007 BOC DEVATTN,UNTCHK1	EXIT ON READY DROP	00042880
0007C9	3ECB			8215	BOC BSYTACH,VELOC006	HANG TILL TACH CHANGES	00042890
0007CA	67C8			8218	BU VELOC007		00042900
				8221	* CHECK ACCUMULATED COUNTS		00042920
0007CB	4321			8223	VELOC006 XFR WORK4,AR	GET CTR A TO A REG	00042930
0007CC	A200			8226	ADD WORK3,0	ADD CTR A TO CTR B	00042940
0007CD	21CF			8229	BOC NALCO,VELOC008	TAKE BR IF OK	00042950
0007CE	67F4			8232	VELOC009 BU VELOC021		00042960
0007CF	4021			8235	VELOC008 XFR WORK1,AR	GET BASE CT TO A REG	00042970
0007D0	A200			8238	ADD WORK3,0	ADD BASE TO CTR B	00042980
0007D1	21D3			8241	BOC NALCO,VELOC011	TAKE BR IF OK	00042990

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT		
0007D2	67F7			8244	VELOC010	BU VELOC024		
0007D3	4121			8247	VELOC011	XFR WORK2,AR	GET PEAKING CT TO A REG	
0007D4	B200			8250		ADDM WORK3,0	ADD TO ACCUMULATED CTS	
0007D5	21D7			8253		BOC NALCO,VELOCOUT	SHOULD CARRY NORMALLY	
0007D6	67F9			8256		BU VELOCOK		
0007D7	0401			8259	VELOCOUT	STO STATIMG,VELTRY	SET VELOCITY RETRY	
0007D8	A501			8262		ADD WORK5,1	BUMP RETRY CTR	
0007D9	21DE			8265		BOC NALCO,VELOC012	GO RETRY AGAIN	
0007DA	632B			8268		BU SETVELCK	GO ABORT	
0007DB	4006			8272	UNTCHK1	XFR LSR	SET LOW MODE	
0007DC	8402			8275		ORI STATIMG,SETSTATC	SET UNIT CHECK	
0007DD	61D0			8278		BU ENDUP	GO SET UNIT CHECK	
0007DE	3EE1			8282	VELOC012	BOC BSYTACH,VELOC013	SEE WHICH WAY TACH SETS	
0007DF	0304			8285		STO WORK4,4		
0007E0	67C5			8288		BU VELOC005		
0007E1	67E2			8291	VELOC013	BU VELOC014		
				8294	*****			
				8295	* CLOCK ACROSS TACHC *			
				8296	*****			
0007E2	0204			8299	VELOC014	STO WORK3,4	CLEAR CTR A	
0007E3	3EEF			8302	VELOC026	BOC BSYTACH,VELOC016	WAIT FOR TACH TO FALL	
				8304		* CHECK ACCUMULATED COUNTS		
0007E4	4221			8306	VELOC015	XFR WORK3,AR	GET CTR B TO A REG	
0007E5	A300			8309		ADD WORK4,0	ADD CTR B TO CTR A	
0007E6	21E7			8312		BOC NALCO,VELOC017	TAKE BR IF OK	
0007E7	4021			8315	VELOC017	XFR WORK1,AR	GET BASE CT TO A REG	
0007E8	A300			8318		ADD WORK4,0	ADD BASE TO A & B CTRS	
0007E9	21EB			8321		BOC NALCO,VELOC020		
0007EA	67F7			8324	VELOC019	BU VELOC024		
0007EB	4121			8327	VELOC020	XFR WORK2,AR	GET PEAKING CT TO A REG	
0007EC	B300			8330		ADDM WORK4,0	ADD TO ACCUMULATED CTS	
0007ED	21D7			8333		BOC NALCO,VELOCOUT	SHD CARRY NORMALLY	
0007EE	67F9			8336		BU VELOCOK		
0007EF	A201			8339	VELOC016	ADD WORK3,1	BUMP CTR	
0007F0	21E3			8342		BOC NALCO,VELOC026	BR ON NO CARRY	
				8344	* DRIVE WAS TOO SLOW			
0007F1	3FDB			8346	VELOC027	BOC DEVATTN,UNTCHK1	EXIT	
0007F2	3EF1			8349		BOC BSYTACH,VELOC027	HANG TILL TACH CHANGES	
0007F3	67E4			8352		BU VELOC015	EXIT	
0007F4	67F5			8357	VELOC021	BU VELOC022		
0007F5	67F6			8360	VELOC022	BU VELOC023		
0007F6	67F7			8363	VELOC023	BU VELOC024		
0007F7	67F8			8366	VELOC024	BU VELOC025		
0007F8	67D7			8369	VELOC025	BU VELOCOUT		
0007F9	4421			8372	VELOCOK	XFR STATIMG,AR	GET VELOCITY RETRY TO AR (IF ON)	
0007FA	4006			8375		XFR LSR	SET LOW MOD	
0007FB	8C00			8378		ORI DTACHK1,0	SET ERROR IF NEEDED	

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LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE	STATEMENT
0007FC	660B			8381		BU WRTAWAY
				8383 *		EJECT
				8384		END

GO WRITE

F01MAY72	2/04/74
	00043530
	00043540
	00043550

ROS2

CROSS-REFERENCE

2/04/74

SYMBOL	LEN	VALUE	DEFN	REFERENCES
#ALU1NRZ	00001	000017	00569	5674
#BACKWD	00001	000010	00663	0947 2353 7686
#BOR	00001	00000E	00321	1211 3040 3152 6833 6902 8087
#BORMARK	00001	000011	00659	1420 3449
#BOT	00001	000013	00546	2824 6660 7683
#BSYTACH	00001	00001E	00342	1845 1881 3030 3472 3517 4224 4253 5817 5966 6107 6111 6130 6161 7978 8163
				8166 8173 8192 8202 8215 8282 8302 8349
#CHGDIR	00001	000017	00671	2427
#CHKBRST	00001	000011	00646	8016
#CNTRDY	00001	000014	00633	3995
#CRCMAT	00001	000008	00313	5036
#CRCNEPR	00001	000002	00307	5043 5052 5086
#CREASER	00001	000010	00651	3011
#DATARDY	00001	00000D	00320	1392 1401 1467 1473 1482 3619 4803 4813 4816 4907 4927 5383 5396 5422 5435
				5462 5476 5479 5492 5554 5567 5963 6918 7095 7101 7149 7423 7464
#DBUS	00001	000000	00303	1181 1274 1638 1726 1754 1763 1924 1978 2121 2127 2163 2172 2288 2314 2337
				2350 2359 2382 2600 2645 2663 2760 2775 2809 2878 3008 3075 3121 3158 3312
				3495 3508 3572 3625 3651 4052 4079 4096 4192 4415 4431 4440 4449 4494 4788
				5107 5153 5162 5177 5276 5352 5393 5539 5653 5914 6158 6361 6374 6383 6407
				6594 6609 6644 6726 6915 6948 7050 7571 7673 7882 7901 8047
#DEN200	00001	000019	00333	5358
#DEN556	00001	00000C	00318	5364
#DEVATTN	00001	00001F	00346	1214 1479 1573 1680 1969 2033 2036 2039 2046 2052 3069 3452 3479 3942 3972
				4320 4806 4829 4920 4993 7383 7574 7637 8186 8212 8346
#DREG0	00001	000010	00323	2226 2449 5792 6346 6485 7062
#DREG1	00001	000011	00324	1220 5096 6343 6479
#DREG2	00001	000012	00325	6340 6473
#DREG3	00001	000013	00326	2154 2933 2999 3203 6337 6467 7830 7949
#DREG4	00001	000014	00327	4271 6334 6461
#DREG5	00001	000015	00328	1252 4842 4854 6331 6455
#DREG6	00001	000016	00329	1335 2203 3869 6328 6449 6854 7309 8128
#DREG7	00001	000017	00330	2206 3872 6325 6443 7286 7303 7389 7446 8131
#DTACHK1	00001	00000C	00458	2757 3459 3489 4990 5406 5412 6732 6836 6905 6933 7038 7240 7292 7439 7587
				8378
#DTACHK2	00001	00000A	00456	1529 1551 1560 1635 1760 2772 3705 6936 7139 7168 7312 7584 8080
#DUALDEN	00001	000012	00558	2212 3391 5665
#ENDATA	00001	000008	00314	1445 3639 3654 3687 4819 4826 5489 5526 7012 7021 7426
#EOT	00001	000012	00544	2737 2827
#ERGOP	00001	000015	00639	5206 6669
#FIRST	00001	000012	00632	4037
#FLAGS	00001	000005	00451	1745 2424 2996 3118 3429 3469 5789 6606 7059
#FRU	00001	000009	00455	1278 1318 1379 1489 1499 1520 2305 3376 3537 3547 3575 5536 5548 6506 6830
				6899 6912 6945 7047 7261 7273 7283 7300 7443 7461 7474 7892 7898
#FWDDATA	00001	000011	00516	1692
#GAPCTRL	00001	000011	00483	2967
#HIDEN	00001	000014	00521	2133
#IBG	00001	00000F	00322	1262 1344 1389 1448 1470 1517 1570 3483 3566 3642 3693 4061 5808 5811 6576
				6818 6996 7053 7098 7130 7243 7640
#IBGMARK	00001	000013	00657	1423
#LODEPA	00001	00000E	00460	2893
#LODEPB	00001	00000F	00461	2896 4317
#LPMARK	00001	000012	00647	8019
#LWROP	00001	000015	00670	2430
#MK800	00001	000017	00631	4058

ROS2 SYMBOL				CROSS-REFERENCE																PAGE
LEN	VALUE	DEFN	REFERENCES																	2/04/
#R31	00001	00000F	00445																	
#R4	00001	000004	00418	6413	6422															
#R5	00001	000005	00419																	
#R6	00001	000006	00420																	
#R7	00001	000007	00421																	
#R8	00001	000008	00422																	
#R9	00001	000009	00423																	
#SELHIGH	00001	000014	00572	1804																
#SENSE1	00001	000006	00452	0941	1723	1972	2118	2169	2223	2347	2728	2748	2812	3200	3757	3992	4004	4049		
				4055	4070	4076	4093	4437	4446	4455	4491	4518	5174	6657	7677	7799	7802			
#SENSE2	00001	000007	00453	2130	2140	2209	2235	2924	3206	3273	3309	3382	3791	3866	4428	4482	4785	5159		
				5247	5300	5647	6022	6220	6641	7670	7827	7946	8125							
#SETDIAG	00001	000012	00476	2376																
#SEVTRK	00001	000010	00556	3276	5250	5303	5611	5662												
#SPACEOP	00001	000017	00661	1429	1596															
#START	00001	000015	00549	1729	1975	2751														
#STATA	00001	00000A	00334	1903	2070	2264	2302	2318	2331	2406	2725	4250	4370	5820	5833	5969	5982	6152		
				6297	6315															
#STATB	00001	00000B	00335	1912	2499	2890	4180	4308	4669	4696	6300	6522								
#STATC	00001	00001A	00336	0923	1590	1860	1951	2061	2556	4209	4212	4870	5168	5237	5380	5515	5533	5588		
				6091	6303	6528	6717	6987	7199											
#STATD	00001	00001B	00337	2552	2588	2818	4284	4734	4749	5786	5949	6306	6534							
#STATIMG	00001	000004	00450	1021	1027	1172	1256	1582	1751	1813	2064	2340	2412	2418	2710	2743	2778	2786		
				2902	3139	4198	4218	4274	4277	4326	4376	4409	4412	4794	4797	4845	4966	4975		
				5006	5012	5029	5349	5373	5620	5795	5823	5842	5846	5856	5953	5972	5991	5995		
				6005	6042	6048	6164	6183	6235	6309	6570	6708	7320	7502	7526	7590	7649	8275		
#STOP	00001	000007	00312	2460	3934	3939	3957	3975	4737	4746	5432	5486	5512	5564	5683	5801	6174	6294		
				6516	6762	6921	6984	7018	7041	7613	7631									
#SYNC	00001	000013	00519	3672																
#TACHFF	00001	000006	00311	3921	3936	3948	3978	3984	4140											
#TAKTR	00001	000014	00642	3057																

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ROS2 CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES															
ABEND800	00001	00043B	04981	4806	4829	4920	4993												
ABORTRD	00001	0000B2	01582	1214	1479	1573	1680												
ACCESS	00001	00058D	06217	0884															
ACCESS16	00001	000591	06229	6028	6261														
ACCESS64	00001	000598	06251	6258															
ACCESS8	00002	0004F7	05680	6226															
ACCESS80	00001	000557	06022	5680															
ADDREXIT	00001	0000F3	01842	1816															
AGAIN	00001	000120	02005	2008															
ALLDONE	00001	000438	04972																
ALLDONEA	00001	000529	05856	5811															
ALLDONE1	00002	00043A	04978	5032	5237														
ALLOK	00001	000611	06657	6644	6647														
ALU2COMP	00001	0005F3	06557																
AR	00001	000021	00278	1632	1714	1748	1892	1909	1918	2308	2636	2639	2654	2657	2766	2769	2887	3534	
				3766	3804	3908	4040	4177	4186	4299	4305	4323	4361	4403	4406	4476	4524	4530	
				4533	4548	4587	4605	4632	4711	4897	5058	5077	5111	5117	5126	5866	5908	6355	
				6377	6428	7895	8223	8235	8247	8306	8315	8327	8372						
ARETURN1	00002	00077B	07939	7488															
ASSURFWD	00001	00019F	02484	2376															
BACKONCE	00001	000167	02279	2282															
BACKWD	00001	000080	00662	2223	2347	4491	7799												
BB	00001	0005C7	06413	6407															
BBB	00001	000369	04262	4265															
BEGIN	00001	000000	00821	0920	0923	0944	0947	0995	1024	1141	1181	1205	1211	1214	1220	1223	1226	1239	
				1252	1262	1268	1274	1281	1287	1304	1321	1335	1344	1347	1357	1364	1382	1389	
				1392	1395	1398	1401	1420	1423	1429	1445	1448	1467	1470	1473	1479	1482	1492	
				1502	1514	1517	1523	1542	1570	1573	1590	1596	1599	1614	1638	1653	1670	1676	
				1680	1692	1701	1726	1729	1754	1763	1804	1845	1848	1860	1866	1881	1903	1912	
				1924	1933	1936	1951	1954	1957	1969	1975	1978	2008	2017	2020	2033	2036	2039	
				2046	2052	2061	2070	2121	2127	2133	2136	2143	2146	2154	2163	2172	2192	2203	
				2206	2212	2226	2238	2247	2253	2264	2282	2288	2302	2314	2318	2331	2337	2350	
				2353	2359	2366	2376	2382	2397	2403	2406	2427	2430	2449	2460	2499	2524	2552	
				2556	2588	2596	2600	2622	2645	2663	2713	2725	2731	2737	2751	2760	2775	2806	
				2809	2815	2818	2824	2827	2833	2839	2859	2878	2890	2927	2933	2967	2970	2999	
				3002	3008	3011	3024	3030	3040	3057	3060	3066	3069	3075	3081	3094	3100	3121	
				3146	3152	3158	3203	3209	3212	3218	3231	3243	3276	3289	3292	3299	3305	3312	
				3330	3344	3350	3353	3359	3366	3373	3379	3385	3391	3403	3426	3449	3452	3472	
				3475	3479	3483	3495	3508	3511	3517	3540	3550	3562	3566	3572	3578	3588	3591	
				3612	3619	3625	3628	3639	3642	3645	3651	3654	3660	3672	3684	3687	3690	3693	
				3713	3762	3796	3840	3869	3872	3921	3924	3930	3936	3939	3942	3948	3957	3960	
				3966	3972	3975	3978	3984	3995	4001	4016	4037	4046	4052	4058	4061	4079	4096	
				4102	4105	4133	4140	4180	4192	4209	4212	4224	4232	4235	4241	4250	4253	4265	
				4271	4284	4308	4320	4367	4370	4415	4421	4431	4440	4449	4458	4464	4485	4494	
				4500	4503	4539	4542	4560	4563	4569	4593	4611	4620	4629	4642	4651	4660	4669	
				4681	4687	4696	4708	4734	4737	4746	4749	4764	4788	4791	4803	4806	4813	4816	
				4819	4826	4829	4836	4842	4854	4870	4882	4904	4907	4917	4920	4927	4930	4948	
				4957	4972	4993	5032	5036	5043	5049	5052	5083	5086	5096	5107	5123	5153	5162	
				5165	5168	5171	5177	5180	5193	5206	5209	5217	5234	5237	5250	5258	5276	5303	
				5309	5312	5315	5325	5342	5352	5358	5364	5380	5383	5386	5393	5396	5399	5422	
				5425	5432	5435	5438	5452	5462	5476	5479	5482	5486	5489	5492	5495	5505	5512	
				5515	5526	5533	5539	5545	5554	5557	5564	5567	5570	5580	5588	5611	5614	5638	
				5650	5653	5662	5665	5674	5683	5690	5786	5792	5801	5808	5811	5817	5820	5833	
				5839	5875	5893	5914	5949	5963	5966	5969	5982	5988	6025	6091	6107	6111	6117	

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[illegible]

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
CHKDTRDY	00001	0005E0	06494	
CHKEOT	00001	0001DA	02737	2731
CHKFOP	00001	000413	04836	4826
CHKFTR	00001	00013F	02136	
CHKHI	00002	0001C6	02651	2645
CHKIBG	00001	000061	01262	1226 1239
CHKID	00001	0007A9	08087	8016
CHKID2	00001	0007AB	08093	8087
CHKINTPT	00001	000054	01214	1307
CHKMATCH	00001	000449	05043	5083
CHKMORE	00001	00059A	06258	6223
CHKMTI	00001	000117	01969	1957
CHKNRZ	00001	000140	02140	2121
CHKPOR1	00001	0007A3	08067	8060
CHKPOSIT	00001	0006DA	07368	2369 3149 7697 7756 7819
CHKPOST	00001	000099	01489	1470
CHKPULSE	00001	000126	02033	1939 1960 4238
CHKREAD	00001	000196	02449	2427
CHKSTATS	00001	0005E8	06522	6516
CHKSUMOR	00001	000288	03391	3385
CHKSWTCH	00001	0000F4	01845	
CHKUEX	00001	00005D	01247	
CHKVEL	00001	000300	03860	2943 5521 6993
CHKXINA	00001	0005EE	06541	
CHK1ORP	00001	0007A1	08060	8019
CHK1601	00001	000151	02200	2133
CHK1602	00001	000144	02154	2143
CHK7LP	00001	0004F1	05662	2136
CHK800	00001	0004F4	05671	5665
CKDTARDY	00001	000081	01389	1382 1395
CKFC3	00001	000334	04055	4085
CKNORPE	00001	000485	05273	4105
CKSTART	00001	0001DD	02746	2821 2836
CLEANUP	00001	000555	06005	5963
CLEARCMD	00001	0001CC	02677	2588
CLEARLO	00001	0000F1	01819	1804
CLEEREM	00001	0001B0	02560	2552
CLOKWAIT	00001	000069	01287	1268 1274 1281 1287 1426
CLRCTR1	00001	000783	07965	7494 7541 7548 7558 8031 8050
CLRROUTA	00001	0001CF	02688	2327 2343 2406 2452 2460 3142 3227 6653 7593
CMDEXIT	00001	000776	07908	7901
CNTABIT	00001	00007C	01364	1350 1367
CNTABIT2	00001	00006E	01318	1364
CNTATACH	00001	000239	03088	3057
CNTFORER	00001	0007A5	08074	8067
CNTLOOP	00001	000424	04904	4910 4933
CNTNCARY	00001	00023E	03102	
CNTNRZI	00001	000278	03341	3366
CNTRDY	00001	000008	00634	4004 5518 6990
CNTRDY1	00001	00009C	01499	1467 1473
CNT200	00001	000308	03890	3872
COMITD	00001	000050	00287	2626
COMMAND	00001	000002	00509	1698 1989 2267 2433 2532 4333 7371 7855 7864 7959
CONTROL	00001	000004	00508	2273 3409 5644 5872 5902 7514 7723

ROS2	SYMBOL	LEN	VALUE	DEFN	REFERENCES	CROSS-REFERENCE
	CONVCK	00001	000001	00576	4424	
	COUNTDWN	00001	00078C	07994	7984	7994
	COUNTLPB	00001	000280	03366	3292	
	COUNTONE	00001	000792	08013	7991	
	COUNTPRE	00001	00007E	01379	1398	
	COUNTUP	00001	000230	03060	3036	3060
	COUNT16	00001	000070	01324		
	CRC	00001	00000A	00276	5046	5074
	CREASER	00001	000080	00652	1644	3005 3072
	CREMOVE	00001	000042	01147	3161	
	CREMOVEX	00001	00024B	03152	3011	
	CREMOVEZ	00002	00024E	03161	3152	
	CRERETRN	00002	00077A	07920	1701	
	CRESENS	00001	0000C3	01644	1596	
	CRESENSX	00001	0000BF	01632	1599	
	CRETEST	00002	000264	03252		
	CRETURN1	00002	0006E6	07405	2366	
	CRETURN2	00002	0006E7	07409	7694	
	CRETURN3	00002	0006E8	07412	7816	
	CRETURN4	00002	0006E9	07415	7753	
	CRETURN5	00002	0006EA	07418	3146	
	CTLINK	00001	000543	05938	5914	
	CTLRET3	00002	000540	05929	7760	
	CTLRET6	00002	00053F	05926	7717	
	CTRLREJ	00001	0001CE	02685	2318	5917
	CTRLSETA	00001	00002C	01027		
	DALONE	00002	0003FC	04761	4708	4737 4746
	DATAACK	00001	000008	00587	4418	
	DATATIM	00001	000080	00636	4049	4076 4093 5518 6990
	DD	00001	0005D0	06443	6434	
	DELAY	00001	0000BB	01611	1614	
	DESWAIT	00001	0001BD	02618	2622	
	DEVBKWD	00001	000158	02223	2172	
	DEVCHK	00001	000002	00550	4518	
	DEVDONE	00001	00036D	04274		
	DEVFWD	00001	00017A	02347	2163	
	DEVSEL	00001	000008	00507	1147 3735 7793	1647 4333 7855 1698 4885 7864 1989 4945 7908 2011 5644 7959 2180 5872 8034 2267 6033 2273 6094 2433 6100 2474 6241 2532 7065 2544 7371 3112 7392 3181 7514 3409 7723
	DIAGHOOK	00002	0000BE	01620	1590	
	DIAGMODE	00001	000020	00485		
	DIDNTGO	00001	00012E	02058	2020	
	DLYNRZ	00002	000338	04067	4058	
	DLYSETHI	00002	000337	04064	4067	
	DLYTIME	00001	000533	05890	5893	
	DOBACKWD	00001	00075C	07816	7686	
	DOBOT	00001	00074A	07753	7683	
	DOBOTXX	00001	00074C	07760	7415	
	DODELAY	00001	00015A	02235	2353	2362 3190
	DODELAY1	00001	00015C	02241		
	DOINDE	00001	000372	04296	4284	
	DOIT	00001	000209	02896	2890	
	DONE	00001	0005FA	06581	6576	
	DONEXTRK	00001	00045E	05111	5123	

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SOURCE	SYMBOL	LEN	VALUE	DEFN	REFERENCES
	ERGSTR	00001	000024	00995	5284 7183
	ERGTOTI	00001	000004	00496	1052
	EXCPOST	00001	000002	00615	1529 7139 7168
	EXECABRT	00001	0001CB	02673	0878 2648 4345
	EXECBSF	00001	00003C	01129	
	EXECBSR	00001	00003E	01135	
	EXECDSE	00001	0001BB	02610	0862 2061 2663
	EXECDMR	00001	000563	06076	0881
	EXECDSE	00001	000031	01052	
	EXECERG	00001	000022	00988	
	EXECFSF	00001	000035	01100	
	EXECFSR	00001	000037	01107	
	EXECGRST	00001	0001A1	02499	0869
	EXECPOLL	00001	00034D	04167	0865
	EXECPULL	00001	00034F	04173	4385
	EXECRDB	00001	00003A	01123	
	EXECRDF	00001	000033	01093	
	EXECRWD	00001	00002F	01037	
	EXECRWU	00001	000029	01018	2806
	EXECSDE	00001	000202	02875	0875 2854
	EXECSNS	00001	0000D6	01711	
	EXECSRST	00001	0001A7	02524	0872 2511
	EXECSTS	00001	0000EB	01801	
	EXECSTSZ	00001	0000F5	01848	
	EXECTST3	00001	00059C	06278	0859
	EXECVEL	00001	000219	02970	2445
	EXECWRT	00001	000013	00914	
	EXECWTM	00001	000020	00970	
	EXTEND	00001	000004	00490	1695
	EXTENDIT	00001	0000D0	01689	1653
	EXVCHG	00001	000040	00594	4082 4584
	FASTBGN	00001	000010	00602	5406 5412 6732
	FCHLAST	00001	0002EA	03766	
	FCHNEXT	00001	0002EE	03782	
	FCHSNS	00001	0002E6	03748	4566 4645 4684
	FCHSTS	00001	0002E1	03727	1851 2528 2722 4247 6583 7655
	FDTHRU	00001	000040	00601	
	FF	00001	0005D4	06455	6449
	FILEOP	00001	000004	00655	1129
	FINDTU7	00001	000379	04317	4308
	FINDTU77	00001	00037A	04320	4314
	FIRST	00001	000020	00635	4070 5518 6990
	FLAGS	00001	000005	00394	0887 2592 4533
	FLOPTIE	00001	00045B	05101	
	FORCEON	00001	000084	01398	1335 1404
	FORFLAG	00001	000004	00640	
	FORMATCK	00001	000010	00612	1760 7584 8080
	FP	00001	000002	00583	4461
	FRU	00001	000009	00398	1202 1338 1360 1464 1511 1992 1995 2299 2308 2580 3279 3531 3553 4711 5200
					5896 5908 6278 6503 7889
					1689 2166 2484 3648 6597
	FWDDATA	00001	000040	00515	
	FWDRD	00001	000058	01226	1220 1670 1676
	GAPCTLON	00001	00023F	03109	2967
	GAPCTRL	00001	000040	00484	7892

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
GETADR	00001	0000EA	01798	
GETHIGH	00001	000501	05722	5773
GETSTATS	00001	000770	07887	7882
GG	00001	0005D6	06461	6455
GO	00001	000427	04914	4904
GOAHEAD	00001	00055A	06031	6025
GOBACK	00001	00023E	03104	
GOEND	00002	00025E	03227	
GOENDUP	00002	000248	03142	0995
GOGETIM	00001	000362	04241	2085
GOMOVE	00001	00018B	02406	2382
GOODEND	00001	0004DE	05591	5603
GOPRIME	00001	0000F9	01860	1845
GOPRIME2	00001	0001F9	02848	1954 2017
GOSOMOR	00001	00042B	04927	4917 4930
GOTPRIME	00001	00010F	01933	
GOTURN	00002	00001D	00953	0944
HAVPRIME	00001	000107	01903	
HDWERR	00001	000044	00296	6318 6364 6386 6410 6419 6438 6446 6452 6458 6464 6470 6476 6482 6488 6512
HERE	00001	00059F	06287	6525 6531 6537 6551
HERENOW	00001	000697	07127	7127 7143
HH	00001	0005D8	06467	6461
HIDEN	00001	000008	00520	2215 2235 3309 3318 5150 5632 5647 6251 6641 7670
HOLDUP	00001	000187	02394	2397 2403
HUP1	00001	0002E8	03757	3762
HUP2	00001	0002F0	03791	3796
IBGDROP	00001	000080	00600	6836 6905 7292
IBGGONE	00001	000637	06799	6673
IBGLOOK1	00001	000096	01479	1482 1502
IBGMARK	00001	000010	00656	1284 1432
IBGON	00001	0007A7	08080	
IBGYES1	00001	000087	01417	1262
IBGYES2	00001	00008B	01429	1420 1423
IC	00001	000022	00285	0855 2042 2055 3104 3127 3812 4758 4766 4923 5328 5445 5938 6758 7398 7917
ID12	00001	00072A	07631	7634
ID14	00001	00072C	07637	7631
ID145	00001	00072D	07640	7643
ID3	00001	000721	07604	7604 7622 7628
ID4	00001	000722	07607	7610
ID5	00001	000724	07613	7607
II	00001	0005DA	06473	6467
INDF	00001	000011	00281	2457
INHP	00001	000082	00286	
INITCNT	00001	00030C	03905	4001 4016
INTREQ	00001	000040	00578	1735
INTRUBLE	00001	0004CC	05533	5489
ISBAKWD	00001	000175	02331	2127
ISBUSY1	00002	000100	01872	1881
ISFOP800	00002	000417	04848	4842
ISHIGH	00002	000205	02884	2878
ISITDSE	00001	0001F7	02839	2827
ISITFOP	00001	000414	04839	

CROSS-REFERENCE

SOURCE	DESTINATION	CROSS REFERENCE
ISITREW	00001	0001F5 02833 2824
ISLOW	00001	000206 02887 2881
ISNRZI	00001	000402 04781 3218 5932
ISNRZIZ	00002	000541 05932 5638
ISNRZI2	00001	00025C 03218 3212
ISNRZI3	00001	000407 04797 4788
ISOKNOW	00002	0007B7 08154 8128 8140
ISPULSE	00001	00012D 02055 2036 2039 2049
JJ	00001	0005DC 06479 6473
KK	00001	0005DE 06485 6479
KRETURN1	00002	000238 03084
LASTCHK	00002	00044A 05046 5089
LDPT	00001	000008 00581 4443
LETSO	00001	000161 02261 2226
LINK1	00001	00001C 00410 0920 1024 1141 1848 1933 1954 2017 2055 2524 2713 3127 3713 3812 4232 4241
LINK2	00001	000019 00408 4563 4882 4923 4948 6567 7646 0995 1936 1957 2020 2042 2192 2366 2970 3104 3146 3243 3330 3426 4235 4351
LINK3	00001	00001A 00409 4354 4464 4500 4539 4560 4569 4593 4611 4620 4629 4642 4651 4660 4681 4687
LKREWRUN	00001	00002B 01024 4708 4758 5171 5217 5342 5445 6673 6758 7196 7206 7330 7347 7398 7482 7488
LOADCTR	00001	0004D1 05548 7532 7545 7552 7694 7708 7733 7753 7770 7816 7836 7955 8040
LODEPA	00001	00000E 00403 1701 3403 4766 5180 5193 5234 5258 5309 5328 5638 5875 5938 7508 7711 7717
LODEPB	00001	00000F 00404 7740 7760 7786 7842 7917
LOGAIN	00001	000002 00522 1040 1055
LOOKIBG	00001	000681 07053 1918 2503 2507 2636 2654 4186 4672 4699
LOOKSUM	00001	0000CA 01670 1909 2515 2519 2639 2657 4177 4666 4693
LOWYES	00001	000109 01909 1341 1505 1564 1602 3581 6691 6697 6857 6939
LPBURST	00001	000261 03243 1223
LPBURST1	00001	000263 03249 1903
LPLOOK	00001	0001F2 02824 3203
LPMARK	00001	000020 00645 3236
LPNMOVE	00001	00019B 02471 2815
LPWAIT2	00001	0000CD 01680 7350 7568 8093
LSR	00001	000006 00277 2430
LWRDELAY	00001	000600 06588 1683
LWREND	00002	0004E0 05597 1906 1948 2073 2651 2884 3896 4026 4099 4244 4373 4388 5061 5067 5719 5770
LWROP	00001	000004 00669 6390 8154 8272 8375
MEASIBG	00001	000513 05786
MEASIBGA	00001	000516 05795
MK800	00001	000001 00630 4055 5518
MODE6400	00001	000046 01170 3234
MODE6401	00001	0002E0 03713 3483
MOREYET	00001	00015D 02244 2247 2253
MOVE	00001	000001 00510 1147 2180 2433 2474 3112 3409 4945 5644 5872 6033 6094 6155 6241 7514 7723
MOVEDOWN	00001	00041E 04882 7864 7908 7959 8034
MOVEUP	00001	00042F 04942 4948
MPCMERR	00001	000018 00407 4907 4927
MSKSTS	00001	00016C 02299 1535 1632 1714 2572 2766 3017 3224 3498 4406 4476 4587 6650
MUSTBEHI	00002	000108 01906 2288

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SYMBOL	LEN	VALUE	DEFN	REFERENCES	CROSS-REFERENCE
ROSN	00001	000010	00622	6780	
NBLOCK	00001	00000B	00878		
NDXABRT	00002	00000D	00884		
NDXAXESS	00002	000006	00862		
NDXDES	00002	00000C	00881		
NDXDMR	00001	00000E	00887		
NDXFLAG2	00001	000010	00894		
NDXGRST	00002	000008	00869		
NDXPOLL	00002	000007	00865		
NDXSDE	00002	00000A	00875		
NDXSNSR	00001	00000F	00889		
NDXSRST	00002	000009	00872	2596	
NDXTST3	00002	000005	00859		
NEEDERG	00001	000733	07670	0926	
NEGATIVE	00001	00054A	05969		
NEGTAH	00001	00056E	06111	6117 6123	
NEXTONE	00001	0001D7	02728		
NEXTRK	00002	000453	05074	5043	
NOELAY	00001	000180	02366	2238	
NOENDERR	00001	0002DE	03705	3642 3693	
NOISE	00001	000080	00593	3017 3498	
NOLOSS	00001	000020	00517	1326 1505 1564 1602 3581 6691 7080 7117	
NOMARKER	00001	000418	04851	4836	
NOMASK	00001	000245	03127	3121	
NOMASKW	00001	000609	06614	6609	
NOPRIME	00002	000112	01948	1924	
NOPULSE	00001	000129	02042	2052	
NORMDONE	00001	00028E	03420	5920	
NOTCAP	00001	000001	00596	3224 6650	
NOTCOMP	00001	00025D	03224	3312 3356 3394 3462 3508 4778	
NOTGOOD	00001	00033B	04076	4046	
NOTLPNRZ	00001	000475	05200	5168 5177 5193	
NOTLPRD	00001	00021F	03002		
NOTNRZIW	00001	000611	06655	5156	
NOTPE	00001	000010	00559	6641	
NOTREAD	00001	00004C	01190	1181	
NOT1600	00001	0002AB	03525	1353	
NOT1600A	00002	000079	01353	1357	
NOW	00001	0000C7	01656	1692 7920	
NOW200	00001	0007B5	08143	8131	
NPRZ	00001	000317	03948	3930	
NRETURN1	00002	000488	05284	5206	
NRZIBOT	00001	000471	05187	5935	
NRZIBOTZ	00002	000542	05935	5180	
NRZIFOP	00001	00043E	04993	4854	
NRZIIBG	00001	000544	05949	4936	
NRZIIBGA	00001	000545	05953	6051	
NRZILINK	00001	000400	04766	3167	
NRZILOOP	00001	000409	04803	4809	
NRZISTAR	00001	00041C	04876		
NRZISTOP	00001	00041A	04870		
NRZI1000	00001	0004BC	05479	5482 5495	
NRZI1001	00001	0004BF	05489		
NRZI1002	00001	0004C0	05492	5498 5505 5545	

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20 6042

63 3998 4013 4130

01	1193	1196	1202	1242	1338	1360	1432	1464	1505	1511	1564	1602
72	2002	2110	2166	2189	2296	2305	2379	2385	2418	2710	2757	2812
76	3088	3279	3282	3285	3315	3333	3420	3423	3466	3505	3525	3531
06	3622	3675	3681	3752	3786	3860	3878	3890	3899	4007	4070	4119
02	4873	4966	5006	5187	5261	5297	5306	5370	5390	5551	5632	5856
05	6349	6352	6398	6413	6422	6506	6545	6570	6597	6697	6700	6723
08	6811	6860	6877	6939	7080	7086	7092	7117	7123	7213	7216	7228
91	7502	7555	7590	7598	7601	7649	7702	7730	7767	7799	7824	7833
52	8013	8044	8093	8119	8134	8143	8160					

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
POSBYTE	00001	0003EE	04715	4551 4635
POSIT	00001	000001	00487	2305 7892
POSITIV	00001	00054E	05982	5966
POSITIVE	00001	00022E	03054	3030
POSTACH	00001	000574	06130	6107 6139 6145
PREAMBOK	00001	00008E	01445	1392 1401 1451
PRETURN1	00001	000134	02076	2070
PRETURN2	00002	000136	02082	4232
PRETURN3	00001	000132	02070	1936 1969
PRETURN4	00002	000137	02085	4235
PRIMESET	00001	0000F7	01854	1872
PRZ	00001	000321	03984	3966
PULSE	00001	000010	00564	1992
RDBKLP	00001	00001E	00956	0947
RDBKWD	00001	000080	00473	0956 1138 1695 2160 2334 7839
RDFMSK	00001	00016B	02296	
RDFWDD	00001	000040	00474	0950 1116 2285 2296 2356 7705 7879
RDSYNC1	00001	00048F	05312	5264 5312 5325
RDSYNC2	00001	000490	05315	5318
RDSYNC3	00001	000492	05322	5315
RDYMOVE	00001	000182	02373	2314
RDYWAIT1	00001	000092	01467	1476 1485
READCHAN	00002	000198	02457	2449
READEND	00001	000091	01464	1445
READHIGH	00001	00025F	03231	
READLP	00001	000265	03273	3243
READOP	00001	000002	00653	1093 1123 1178 1593 1641 3492
READSTAR	00002	00025B	03215	3209 3231 3391
READSTOP	00001	0000B8	01602	1638 3084 5859 7418
READTAPE	00001	000046	01172	3215 3388
READWAIT	00001	000199	02460	2463
READX	00002	00009B	01495	1517
READYES	00001	00007A	01357	1304
READ001	00001	0002B5	03562	3550 3562 3588
READ002	00001	0002BD	03588	3578 3594
READ003	00001	0002C1	03606	3591
READ004	00001	0002C3	03612	3615 3631
READ0041	00001	0002C5	03619	3612
READ0042	00001	0002C8	03628	3628
READ0051	00001	0002CA	03639	3619 3645 3684
READ006	00001	0002D8	03681	3672
READ007	00001	0002D9	03684	3651 3660 3678
READ008	00001	0002DF	03707	3639 3654 3687
READ010	00002	0002DF	03709	
READ017	00001	0002DA	03687	3696
READ6400	00001	000270	03309	
RECNT	00001	000327	04007	
REDLIGHT	00001	000014	00283	2782
REFIRST	00001	000339	04070	4037
REJCMD	00001	000080	00619	2058 2324
REJCTRL	00001	000020	00621	2685
REJTU	00001	000040	00620	2754 4521 4602
RESET	00001	000002	00478	2536 4336
RESETBOR	00001	000299	03466	3449

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
RESETEERR	00001	000009	00280	4996 4999 5597 5600
RESETTU	00001	00037E	04333	4320
RESET1	00001	0001C1	02636	2556 2600
RESET2	00001	0001C2	02639	
RESET3	00001	0001C3	02642	
RESTART	00001	000001	00606	4990
RESTDEB	00001	0001A5	02515	2499
RESYNC	00001	00064E	06877	6848
RETRY	00001	000345	04116	4079
REW	00001	000001	00498	2160
REWFAIL	00001	0001DF	02754	2830 2842
REWIND	00001	000001	00497	1037
ROUNDUP	00001	00021D	02996	3066
RUN	00001	000080	00494	1018
RUNCTR	00001	000523	05836	5820 5829
R0	00001	000000	00355	5722 6349 6395
R1	00001	000001	00356	5725
R10	00001	00000A	00365	5752
R11	00001	00000B	00366	5755
R12	00001	00000C	00367	5758
R13	00001	00000D	00368	5761
R14	00001	00000E	00369	5764
R15	00001	00000F	00370	5767
R16	00001	000010	00371	
R17	00001	000011	00372	
R18	00001	000012	00373	
R19	00001	000013	00374	
R2	00001	000002	00357	5728 6322 6352 6355 6377
R20	00001	000014	00375	
R21	00001	000015	00376	
R22	00001	000016	00377	
R23	00001	000017	00378	
R24	00001	000018	00379	
R25	00001	000019	00380	
R26	00001	00001A	00381	
R27	00001	00001B	00382	
R28	00001	00001C	00383	
R29	00001	00001D	00384	
R3	00001	000003	00358	5731
R30	00001	00001E	00385	
R31	00001	00001F	00386	
R4	00001	000004	00359	5734 6398 6428
R5	00001	000005	00360	5737
R6	00001	000006	00361	5740
R7	00001	000007	00362	5743
R8	00001	000008	00363	5746
R9	00001	000009	00364	5749
SCANLINK	00001	0003C4	04563	
SCOOT	00002	00002E	01033	
SEENONE	00001	00040D	04816	4822
SEENONE1	00001	00040C	04813	4803 4813
SENDEM1	00001	000526	05846	5833
SENDEM3	00001	00057B	06152	6126 6133 6148
SENDEM4	00001	000582	06174	6152 6158

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SOURCE	SYMBOL	LEN	VALUE	DEFN	REFERENCES	CROSS REFERENCE
	SENDEM5	00001	000552	05995	5982	
	SENDEM6	00002	00057A	06148	6111	
	SENSE1	00001	000006	00395	1875	2937 3752 3774 3778 4268 4530 4572 4648 5518 6990
	SENSE2	00001	000007	00396	1878	1892 3786 3800 4557 4632 4663 4690
	SETAG	00001	000166	02276	2270	
	SETBKWD	00001	00003F	01138	1126	1132
	SETBOR1	00001	0006FA	07474	7423	
	SETBOR2	00001	0006F6	07461	7464	
	SETCMD1	00001	000765	07855		
	SETCMD2	00001	000768	07864	7714	7746 7789
	SETCMD3	00001	000769	07867	1704	
	SETCNT	00001	00048B	05300		
	SETCOUNT	00001	0007AD	08119	2946	
	SETCTRL	00001	000165	02273	2264	
	SETCTRL1	00001	000530	05881	3412	5656 7517 7726
	SETD	00001	0001E9	02786	1975	2067 4329
	SETDENS	00001	000010	00495	3406	5641 7511
	SETDIAG	00001	000020	00475	0938	0950 0956
	SETDLONE	00001	000011	00899	2630	2680 4761 6205
	SETDRCK	00001	00079F	08053	8047	
	SETENDCK	00001	0000A6	01535	1492	1554
	SETENDER	00001	0006A4	07168	7114	7159
	SETEQCK	00001	000629	06741	6735	
	SETERASE	00001	000002	00499	7511	7720
	SETERGF	00001	000027	01004	5196	
	SETERR1	00001	0004AA	05406	5383	
	SETERR10	00001	0004A4	05386	5409	
	SETERR2	00001	0004AC	05412	5396	
	SETERR20	00001	0004A8	05399	5415	
	SETFWD	00001	000038	01116	1096	1103 3833
	SETHI	00002	00030A	03896	3869	3884 4064
	SETHIMOD	00002	000390	04388	4250	
	SETLEV	00001	000532	05887		
	SETLEVEL	00001	00052B	05863	5792	
	SETLINK1	00001	000252	03181		
	SETLONOW	00001	0000AD	01562	1538	3709
	SETLPCMD	00001	000018	00936	0923	
	SETMPCN	00001	0002B4	03553	3543	
	SETNORM	00001	00028A	03403	3330	
	SETNRZ1	00001	00027C	03353	3276	
	SETNTACH	00001	000246	03136	3075	8009
	SETPARTL	00001	0000AA	01551	1448	
	SETPRIME	00001	000200	02869	1863	
	SETPULSE	00001	00011B	01989	2809	
	SETRDCHK	00001	0000AC	01560	1344	1386 1389 3597
	SETRDERR	00002	0002C0	03597	3566	3572 3625
	SETREJ	00001	000173	02324	7904	
	SETRET3	00001	000482	05258	5250	
	SETSTATATA	00001	000008	00532	1027	1813 4376 5795 5823 5842 5846 5856 5953 5972 5991 5995 6005 6070 6164
	SETSTATB	00001	000004	00533	6309	
	SETSTATC	00001	000002	00534	1256	2412 2418 2743 2869 2872 4198 4218 4274 4348 4845 5846 5995 6183 6309
	SETSTATD	00001	000001	00535	7320	7502 7526 7590 7649
					1021	1582 2064 2340 2778 2848 2851 2902 3139 4277 4728 4975 6557 8275
					0899	1798 2786 2848 2851 2869 2872 6557

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SYMBOL	LEN	VALUE	DEFN	REFERENCES	CROSS-REFERENCE
SETSTATS	00001	000517	05798	5852 5875	
SETSYN2	00001	000617	06685		
SETSYN2	00001	00061C	06700	6694 7209	
SETTIE	00001	000459	05093	5052	
SETUBO	00001	000489	05294	5258	
SETUCK	00001	0001E7	02778	2763	
SETUP	00001	000014	00917	0973 0991 3830	
SETUPX	00001	0005F2	06554	6548	
SETUX	00001	0001DC	02743	2737	
SETUXCNT	00001	00004D	01193	1435	
SETVELCK	00001	00032B	04023	8268	
SETWTMCK	00001	0006CE	07312	7453	
SET4	00001	00030B	03899		
SET7CNT	00001	00048A	05297		
SET800	00001	0004E8	05632	3353	
SET8001	00001	0004EB	05641	5183	
SEVENTRK	00001	000010	00577	4434	
SEVTRK	00001	000080	00555	4428 4785 5159 5647	
SHORTDLY	00001	000186	02385	2487	
SKIPB	00001	000384	04351	2082	
SKIPMOD	00001	00016F	02308	2302	
SKIPRPQ	00001	0003C0	04548	4542	
SKIPSDR	00001	0003CD	04593		
SKIPSLO	00001	000661	06936	6930	
SLOWBGN	00001	000004	00604	6933	
SLOWEND	00001	000002	00605	7038 7240 7439	
SNSB	00001	0003A6	04464	4458	
SNSC	00001	0003A8	04473	4464	
SNSC2	00001	0003AD	04488		
SNSD	00001	0003AE	04491	4485	
SNSE	00001	0003B1	04500	4494	
SNSF	00001	0003B6	04518	4500	
SNSG	00001	0003C2	04557	4539	
SNSH	00001	0003C6	04569	4560	
SNSI	00001	0003C7	04572		
SNSJ	00001	0003C9	04581	4569	
SNSK	00001	0003CF	04602	4593	
SNSL	00001	0003D4	04620	4611	
SNSLES	00001	0003B4	04509	4503	
SNSLINK	00001	0003F9	04752	3827	
SNSM	00001	0003D6	04629	4620	
SNSN	00001	0003D7	04632		
SNSO	00001	0003D9	04642	4629	
SNSP	00001	0003DB	04648	4642	
SNSQ	00001	0003DE	04660	4651	
SNSR	00001	0003E4	04681	4660	
SNSRTN	00001	0001D6	02725	3821	
SNSS	00001	0003E6	04687	4681	
SNST	00001	0003E7	04690		
SNSTOP	00002	00037D	04329		
SNSV	00001	0003EC	04708	4687	
SNSWAIT	00001	0003EF	04722	4467 4614 4623	
SNSO	00001	0000DA	01723		
SNS1	00001	0000DE	01735	1726	

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
SNS2	00001	0000E0	01742	1729
SNS3	00001	0000E1	01745	1738
SNS4	00001	0000E6	01760	1754
SNS41	00001	000392	04403	1769
SNS410	00002	0000E9	01769	1763
SNS42	00001	000397	04418	1766
SNS5	00001	000398	04421	4415
SNS6	00001	00039A	04428	4421
SNS7	00001	00039D	04437	4431
SNS8	00001	0003A0	04446	4440
SNS9	00001	0003A3	04455	4449
SOCKEM	00001	00010D	01921	1912
SPACEOP	00001	000001	00660	1107 1135 1593 1641
SRETURN1	00002	0002F6	03818	1848
SRETURN2	00002	0002F7	03821	2713
SRETURN3	00002	0002F8	03824	4241
SRETURN4	00002	0002F9	03827	4563
SRETURN5	00002	0002FA	03830	6567 7646
SRETURN6	00002	0002FB	03833	3713
SRETURN7	00002	0002FC	03837	2524
STARTAPE	00001	000256	03200	1141
START800	00001	000548	05963	5988
STAT	00001	000028	00295	0851 0903 1030 1175 1842 2415 2716 2789 2899 2905 4201 4221 4280 4379 4731
				4743 4800 4969 5009 5376 5798 5826 5956 5975 6045 6073 6167 6186 6238 6312
STATIMG	00001	000004	00393	0843 0847 0851 0899 0903 1030 1175 1798 1842 2183 2415 2471 2716 2789 2848
				2851 2869 2872 2899 2905 4116 4201 4221 4280 4379 4728 4731 4743 4800 4969
				5009 5376 5798 5826 5956 5975 6045 6070 6073 6167 6186 6217 6238 6312 6554
				6557 6560 6573 6711 7327 7368 7505 7538 7652 7911 8259 8372
STATSNOW	00001	000770	07889	
STATUSOK	00001	000104	01889	
STATUS1	00001	000101	01875	3818
STAYFWD	00001	000604	06600	6588 6594
STEPCTR	00001	00054F	05985	5969 5978
STEP0001	00001	000000	00837	
STEP0002	00001	000001	00841	
STEP0003	00001	000002	00845	
STEP0004	00001	000003	00849	
STEP0005	00001	000004	00853	
STEP0006	00001	000008	00867	
STEP0007	00001	0001A1	02497	
STEP0008	00001	0001A5	02513	
STEP0009	00001	0001A6	02517	
STEP0010	00001	0001A7	02522	
STEP0011	00001	0001A8	02526	
STEP0012	00001	0002E1	03725	
STEP0013	00001	0002E2	03729	
STEP0014	00001	0002E3	03733	
STEP0015	00001	0002E4	03738	
STEP0016	00001	0002E5	03742	
STEP0017	00001	0002E6	03746	
STEP0018	00001	0002E7	03750	
STEP0019	00001	0002E8	03754	
STEP0020	00001	0002E9	03759	

ROS2

SOURCE	SYMBOL	LEN	VALUE	DEFN	REFERENCES
	STEP0021	00001	0002E8	03755	
	STEP0022	00001	0002E9	03760	
	STEP0023	00001	0002EA	03764	
	STEP0024	00001	0002EB	03768	
	STEP0025	00001	0002EC	03772	
	STEP0026	00001	0002ED	03776	
	STEP0027	00001	0002EE	03780	
	STEP0028	00001	0002EF	03784	
	STEP0029	00001	0002F0	03788	
	STEP0030	00001	0002F1	03793	
	STEP0031	00001	0002F0	03789	
	STEP0032	00001	0002F1	03794	
	STEP0033	00001	0002F2	03798	
	STEP0034	00001	0002F3	03802	
	STEP0035	00001	0002F4	03806	
	STEP0036	00001	0002F5	03810	
	STEP0037	00001	0002FC	03835	
	STEP0038	00001	0001A9	02530	
	STEP0039	00001	0001AA	02534	
	STEP0040	00001	0001AB	02538	
	STEP0041	00001	0001AC	02542	
	STEP0042	00001	0001AD	02546	
	STEP0043	00001	0001AE	02550	
	STEP0044	00001	0001AF	02554	
	STEP0045	00001	0001B0	02558	
	STEP0046	00001	0001B1	02562	
	STEP0047	00001	0001B2	02566	
	STEP0048	00001	0001B3	02570	
	STEP0049	00001	0001B4	02574	
	STEP0050	00001	0001B5	02578	
	STEP0051	00001	0001B6	02582	
	STEP0052	00001	0001B7	02586	
	STEP0053	00001	0001B8	02590	
	STEP0054	00001	0001B9	02594	
	STEP0055	00001	0001BA	02598	
	STEP0056	00001	0001BB	02608	
	STEP0057	00001	0001BC	02612	
	STEP0058	00001	0001BD	02616	
	STEP0059	00001	0001BE	02620	
	STEP0060	00001	0001BF	02624	
	STEP0061	00001	0001C0	02628	
	STEP0062	00001	000011	00897	
	STEP0063	00001	000012	00901	
	STEP0071	00001	0001A2	02501	
	STEP0072	00001	0001A3	02505	
	STEP0073	00001	0001A4	02509	
	STEP0074	00001	000005	00857	
	STILLOK	00001	00051A	05808	5839
	STOPEXIT	00001	000589	06196	6174
	STOPNRZI	00001	00041B	04873	4848 6008
	STOPREAD	00001	0000B4	01588	1495 1570
	STOPWAIT	00001	0005E6	06516	6509 6519
	STREADCK	00001	000008	00613	1560 6936
	STROBEA	00001	000592	06232	6254

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ROS2	LEN	VALUE	DEFN	REFERENCES	CROSS-REFERENCE
SYMBOL					
STROBTIE	00002	000635	06784	1617	
STRTOVER	00001	00043D	04990	4819	
SUBONE	00001	00079C	08044	8025	
SUMMORE	00001	000249	03146	3081	
SYNC	00001	000010	00518	1184	1242 1505 1564 1602 3606 3663 6600 6685 6877 7117
TACHASYM	00001	000566	06085	6161	6170 6192
TACHDOWN	00001	00051E	05820		
TACHOFF1	00001	000127	02036		
TACHOFF2	00001	000128	02039		
TACHON1	00001	00012A	02046	2033	
TACHON2	00001	00012C	02052	2046	
TACHPRZ	00001	000319	03957	3921	3984
TACHUP	00001	000522	05833	5817	
TACHWAIT	00001	000225	03024	3002	3008 3027 3043 3050 3158
TACHYET	00001	000227	03030	3024	
TACH1	00001	000785	07972	7975	8000 8006
TACH2	00001	000787	07978	7972	
TACH3	00001	000797	08028	8063	8070 8077 8090 8096
TAHITCH	00001	00014E	02189		
TAKMOVE	00001	000781	07959	7711	7736 7773 7786 7842
TAKS	00001	00021C	02991	1007	2195
TAKTOSTP	00001	000561	06070	5786	5949
TAKTR	00001	000008	00641	3033	3088 7981 8013
TAPEOP	00001	000080	00527	2412	2710 4966 5006 5012 6042 6235
TESTFWD	00001	0002CD	03648	3690	
TESTLWR	00001	000016	00923		
TESTONE	00001	0005C1	06395		
TEST1	00001	0005C3	06401	6485	
THERE	00001	00069C	07143	7136	7146
TIEBYTE	00001	000017	00406	2576	4509 5591
TIEQU03	00001	00044D	05055	5036	5086
TMCONFIG	00001	000059	01236		
TMEND	00001	0004B9	05462	5342	5462
TMEND2	00001	0006F4	07453	7446	
TMFINIS	00001	0006F1	07443	7426	
TMLOOP1	00001	0006EB	07423	5465	7429 7467
TMLOOP2	00001	0006F7	07464	7436	7470
TM10BOR	00001	0006EC	07426	7477	
TM20BOR	00001	0006F8	07467		
TM7TRK	00001	00000F	00566	5244	
TM9TRK	00001	000013	00565	5253	
TOIBG800	00002	00042E	04936	4870	
TOSETD	00002	000131	02067	1686	
TOSETD2	00002	0000CF	01686	1860	
TRACEBOR	00001	00006B	01301	1211	
TRACELSR	00002	000500	05719		
TRACER	00001	000008	00397	0914	0970 0988 1093 1100 1107 1123 1129 1135 2584
TRACTRAP	00002	000512	05773		
TRAP1	00002	0005C6	06410		
TRAP10	00002	0005DD	06482	6343	
TRAP11	00002	0005DF	06488	6346	
TRAP2	00002	0005C9	06419		
TRAP4	00002	0005D1	06446	6325	
TRAP5	00002	0005D3	06452	6328	

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ROS2 CROSS-REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
TRAP6	00002	0005D5	06458	6331
TRAP7	00002	0005D7	06464	6334
TRAP8	00002	0005D9	06470	6337
TRAP9	00002	0005DB	06476	6340
TRETURN2	00002	00024F	03167	5171
TRETURN3	00001	000252	03175	2192
TRETURN5	00002	000250	03170	7330
TRNARND	00001	000138	02110	0953 0959 1033 1144 7808
TRYAGAIN	00001	000076	01344	1321 1347
TSAGC	00001	000008	00603	2757 3459 3489 7587
TSTFOERR	00001	0001E0	02757	2751
TSTFOMOR	00001	0001E3	02766	2760
TSTGO	00001	000348	04130	4052
TSTHI	00001	0005AA	06322	6315
TSTHI10K	00002	0005B9	06368	6361
TSTIME	00001	00032E	04037	3995
TST28	00001	000329	04013	4122 4133
TUADDR	00001	00000B	00400	1807 1810 1819 1822 2887 4173 4299 4361
TUBI	00001	000081	00289	2299 2964 3774 3778 3800 4268 5896 6503 7386 7889 8022
TUBO	00001	000060	00279	1153 1659 1995 2183 2261 2471 2548 3109 3124 3731 3748 3782 4259 4339 4879
				5294 5339 5722 5725 5728 5731 5734 5737 5740 5743 5746 5749 5752 5755 5758
				5761 5764 5767 5884 5899 6082 6217 6497 6612 7368 7858 7870 7911
TUBODOWN	00001	0002E4	03737	
TUBOMSK	00001	000002	00672	3118 6606
TURNRZI	00001	0004E3	05611	2146
TUSTA	00001	000040	00579	1742
TUSTB	00001	000020	00580	1732
TUTAG	00001	000024	00282	1156 1650 1857 1998 2014 2186 2276 2436 2477 2540 2614 2677 3115 3184 3740
				4342 4354 4888 5881 5905 6036 6103 6199 6244 7068 7374 7395 7796 7861 7867
				7914 7962 8037
				3069 4029
UCKON	00001	000247	03139	
UDETERR	00001	000008	00588	
UEXEND	00002	00032C	04026	3942 3972
UNTCHK1	00002	0007DB	08272	8186 8212 8346
UPCOUNT1	00001	000576	06136	6130
VELBAD	00001	000634	06780	5455 5508 5583 7050 7306 7449
VELCHK1	00001	00061E	06706	
VELCHK10	00001	000625	06729	
VELCHK2	00001	000622	06720	6720 6744
VELCHK3	00001	00062A	06744	6729 6738 6747
VELCHK4	00001	00062C	06752	6717 6726 6752 6766
VELCHK5	00001	00062F	06762	6755
VELCHK6	00001	000630	06764	6777
VELCHK7	00001	000630	06766	6769
VELCHK8	00001	000632	06774	6762
VELCK80A	00001	00049E	05367	5352
VELCK80B	00001	00049F	05370	5358 5364
VELCK800	00001	000498	05349	5220
VELCK801	00001	0004A0	05373	
VELCK802	00001	0004A2	05380	
VELCK803	00001	0004A3	05383	5386 5399
VELCK804	00001	0004A7	05396	5402
VELCK805	00001	0004AE	05422	5380 5393 5428 5441
VELCK806	00001	0004B1	05432	5425

SYMBOL	LEN	VALUE	DEFN	REFERENCES	CROSS-REFERENCE
VELCK807	00001	0004B2	05435	5438 5452	
VELCK808	00001	0004B5	05445	5422 5435	
VELCK809	00001	0004B6	05449	5432	
VELEXIT	00001	00033F	04093	3924 3939 3957 3975 4061	
VELEXIT1	00002	000344	04108	4102	
VELGAP	00001	00021A	02973		
VELOCERR	00001	000001	00626	4023	
VELOCOK	00001	0007F9	08372	4136 8256 8336	
VELOCOUT	00001	0007D7	08259	8253 8333 8369	
VELOC001	00001	0007BD	08173	8166 8182	
VELOC002	00001	0007BF	08179	8173	
VELOC003	00001	0007C4	08199	8176	
VELOC004	00001	0007C1	08186	8192	
VELOC005	00001	0007C5	08202	8208 8288	
VELOC006	00001	0007CB	08223	8202 8215	
VELOC007	00001	0007C8	08212	8218	
VELOC008	00001	0007CF	08235	8229	
VELOC009	00002	0007CE	08232		
VELOC010	00002	0007D2	08244		
VELOC011	00001	0007D3	08247	8241	
VELOC012	00001	0007DE	08282	8265	
VELOC013	00002	0007E1	08291	8282	
VELOC014	00001	0007E2	08299	8291	
VELOC015	00001	0007E4	08306	8352	
VELOC016	00001	0007EF	08339	8302	
VELOC017	00001	0007E7	08315	8312	
VELOC019	00002	0007EA	08324		
VELOC020	00001	0007EB	08327	8321	
VELOC021	00002	0007F4	08357	8232	
VELOC022	00002	0007F5	08360	8357	
VELOC023	00002	0007F6	08363	8360	
VELOC024	00002	0007F7	08366	8244 8324 8363	
VELOC025	00002	0007F8	08369	8366	
VELOC026	00001	0007E3	08302	8342	
VELOC027	00001	0007F1	08346	8349	
VELOUT	00001	000635	06782	7053	
VELSTR	00001	000214	02940		
VELTRY	00001	000001	00607	2757 4116 8259	
VEL1	00001	000217	02964	2970	
VRCDONE	00001	0003BD	04539		
WAITACEL	00001	00027E	03359	3299 3305 3344 3350 3362 3373 3379	
WAITEND	00001	0000AF	01570	1252 1259 1429 1576	
WAITIBG	00001	0005F8	06576	6579	
WAITL	00001	000313	03936	3945 4143	
WAITLOP	00001	00034B	04140	4096	
WAITONE	00001	0007BA	08163	8163	
WAITSOME	00001	0006DF	07383	7389	
WAIT0	00001	0003F1	04728	4575 4669 4675 4696 4702	
WAIT1	00001	0003F3	04734	4740	
WAIT1L	00001	00031D	03972	3978 4140	
WAIT2	00001	0003F7	04746	4749	
WAIT4	00001	0003F0	04725	4512 4596 4654	
WAIT5	00001	0003F6	04743	4734	
WASTET	00001	000332	04049	4010 4073	

CROSS-REFERENCE

[illegible]

ROS2	SYMBOL	LEN	VALUE	DEFN	REFERENCES	CROSS-REFERENCE
	WRTAWAY	00001	00060B	06636	8381	
	WRTBURST	00001	000020	00529	2710	6570 7320 7502
	WRT2P	00001	0005F5	06567	7939	
	WRTSTNRZ	00001	000465	05150	6638	
	WRTSTR	00001	00020F	02924	0920	
	WRTSTR1	00001	000213	02937	2930	
	WRTSTR2	00001	000212	02933	2927	
	WRTSTR3	00002	000216	02946	2933	
	WRT01	00001	00064F	06880	6854	6883 6927 6948 6957
	WRT02	00001	000651	06887	6880	
	WRT03	00001	000652	06890	6976	
	WRT04	00001	000657	06905	6890	
	WRT05	00001	000658	06908	6896	6902 6908
	WRT06	00001	000659	06912		
	WRT07	00001	00065C	06921	6915	
	WRT08	00001	000667	06954	6921	
	WRT1	00001	0006D0	07320	6660	
	WRT2	00001	0006D6	07347	3170	
	WRT21	00001	0006D7	07350		
	WRT3	00002	0006D9	07356		
	WRT30	00001	000703	07491	7356	7485
	WRT4	00001	000700	07482	7347	
	WRT5	00001	000705	07502	7482	
	WRT6	00001	00070B	07526	5923	
	WRT7	00001	000711	07545	7532	
	WRT8	00001	000713	07552	7545	
	WRT9	00001	000716	07568	7552	
	WRT90	00001	00071F	07598	7571	7616
	WRT95	00001	00072F	07646	7640	
	WSTLOOP	00001	000331	04046		
	WTEONC	00001	000359	04209	4209	
	WTFORIBG	00001	00051B	05811	5814	
	WTMAWAY	00001	0006AC	07206	3173	7199
	WTMERR	00001	000020	00611	7312	
	WTMOP	00001	000002	00638	0970	
	WTMSTR2	00002	000251	03173	7196	
	WTM20	00001	0006AE	07213	7206	
	WTM21	00001	0006B0	07219	7219	7276
	WTM21A	00001	0006B3	07228		
	WTM21B	00001	0006B4	07231	7231	7246
	WTM22	00001	0006BB	07252	7225	
	WTM23	00001	0006BF	07264	7258	
	WTM24	00001	0006C3	07276	7270	7280 7289 7295
	WTM25	00001	0006B5	07234		
	WTM26	00001	0006B8	07243	7237	7249
	WTM27	00001	0006C5	07283	7264	
	WTM27A	00001	0006C8	07292	7252	7286
	WTM30	00001	0006CA	07300	7243	
	WTM31	00001	0006CD	07309	7303	
	WTM32	00002	0006CF	07315	7309	
	XADDR	00001	000084	00271	1810	1822
	XANXB	00001	000043	00294	6290	6554
	XFRFOP	00001	000408	04800	5015	
	XFRLO	00002	0005C0	06390	6383	

ROS2

CROSS-REFERENCE

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SYMBOL	LEN	VALUE	DEFN	REFERENCES
XFRSTAT	00001	00036F	04280	
XFRTAGS	00001	000420	04888	4951
XFRTIE	00001	00044E	05058	5096 5129
XFRTIEB1	00001	000463	05126	5107
XFRTIEB2	00002	00044F	05061	
XINA	00001	000090	00290	0887 0894 1801 2200 5671 6281 6541
XINB	00001	000088	00291	0839 2803
XOUTA	00001	000042	00292	1187 1245 1329 1508 1567 1605 1878 2409 2719 3321 3584 3609 3666 4509 4557 4581 4648 4663 4693 4699 4722 5635 6039 6177 6232 6603 6688 6845 6942 6973 6981 7083 7120
XOUTAIM	00001	00000D	00402	1187 1245 1329 1508 1567 1605 1889 2409 3321 3584 3609 3666 5635 6039 6232 6603 6688 6845 6942 6973 6981 7083 7120
XOUTB	00001	000041	00293	1875 4195 4572 4666 4672 4690 4725 5849 5998 6180 6202
XXXXX	00002	000401	04778	4791 5165 5650 5653
X10X	00001	0000A1	01514	1514 1542
X11X	00001	0000A8	01542	1523 1545
YESTAK	00001	00078A	07988	7978
ZAPIM	00001	0001A9	02532	0891 3837
ZAP1	00002	0006E5	07401	7383
ZEBRA	00001	000609	06616	6619
ZERO	00001	000000	00568	0843 0914 1717 1723 1854 2311 2610 2642 2673 3770 3905 4043 4409 4455 4479 4482 4527 4536 4590 4608 4715 4752 4755 5247 5300 5336
ZEROCTR	00001	00021C	02993	1662 3094 3100 3252 3432 7339
ZIPOUT	00002	00052A	05859	5801
ZONK	00002	0005BF	06386	6374
ZONKA	00002	0005A9	06318	6297
ZONKB	00002	0005E9	06525	6300
ZONKC	00002	0005EB	06531	6303
ZONKD	00002	0005ED	06537	6306
ZONK10	00002	0005E5	06512	
ZONK2	00002	0005F1	06551	6287 6294
ZRETURN1	00002	00053D	05920	3403
ZRETURN2	00002	00053E	05923	7508

ROS2 3803-2 MICROCODE LISTING

NUMBER OF PRINTED LINES = 6021 PRINTED LINES
ZRETURN1 00002 00053D 05920 3403
ZRETURN2 00002 00053E 05923 7508

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END OF LISTING PAGE 127 OF 127



ROS1 (ALU1)

() DESCRIPTION: THIS SUPPLEMENT PAGE PROVIDES THE MICROCODE MODIFICATIONS DONE BY CARD ASSEMBLY 8565073 OR 8565076 AT 0A1-B2J2, INSTALLED BY ECs 846627 OR 847836.

() PRE-REQUISITES: 3803 MODEL 2 WITH ECs 846627 OR 847836 INSTALLED.

() INSTRUCTION: INSERT THIS SUPPLEMENT PAGE AT THE BEGINNING OF MICROCODE LISTINGS PN 1846377 AND NOTE REFERENCE TO THIS PAGE AT ENTRY ADDRESS ON APPLICABLE MICROCODE PAGE.

PATCH STORE MICROCODE LISTINGS					
INSTR ADDR	PATCH STORE CONTROL []	OBJECT CODE	SOURCE STATEMENT		PATCH NAME
2DC	ENTER	C400	AND	WORK 1, ZERO	ALLOCATED BUSY
2DD	RETURN	62DE	BU	2DE	
328	ENTER	4828	DEPRIM4	XFR STATIMG, STAT	ALTERNATE PATH DEVICE BUSY
329		3B8C	BOC	STATD, DEPRIM70	
32A		6380	BU	380, FREEAREA	
380		3A82	FREEAREA	BOC STATC, CKCONCHA	
381	RETURN	632B	BU	32B	
382		D981	CKCONCHA	ANDM FLAGS, CONCON+CHAIN	
383		2085	BOC	DBUS, TAGO	
384	RETURN	6338	PCHKONA	BU 338	
385		0202	TAGO	STO XOUTAIM, SETSTATIC	
386		4228	XFR	XOUTAIM, STAT	
387		A202	PAIDLY	ADD XOUTAIM, X'02'	
388		2187	BOC	NALCO, PAIDLY	
389		0200	STO	XOUTAIM, 0	
38A		4828	XFR	STATIMG, STAT	
38B		6384	BU	PCHKONA	
38C	RETURN	633A	DEPRIM70	BU 33A	
385	ENTER	4828	DEPRIM6	XFR STATDMG, STAT	
336		2B82	BOC	STATB, CKCONCHA	
337	RETURN	6337	BU	337	
0A3	ENTER	8520	ORI	PNDSTS, CUE	EXTRA DEVICE END
0A4		D50C	ANDM	PNDSTS, CEND+DEND	
0A5		34AA	BOC	DREG4, RTN1	
0A6		20AA	BOC	DBUS, RTN1	
0A7		4642	XFR	PNDADDR, XOUTA	
0A8		14EB	STO	XOUTBIM, NDXSTS	
0A9		5441	XFR	XOUTBIM, XOUTB	
0AA	RETURN	6296	RTN1	BU TERMSTA2	
0F0	ENTER	1348	STO	LINK4, TERMATE	SENSE RESET
0F1	RETURN	5322	XFR	LINK4, IC	

NOTES

[] ENTER ENABLES THE PATCH STORE FOR SUCCEEDING INSTRUCTIONS, AND RETURN DISABLES THE PATCH STORE FOR SUCCEEDING INSTRUCTIONS.

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EC	846771							
DATE	11JUN82							



ROS2 (ALU2)

- () DESCRIPTION: THIS SUPPLEMENT PAGE PROVIDES THE MICROCODE MODIFICATIONS DONE BY CARD ASSEMBLIES 8565073 OR 8565076 AT 01A-A2G2; INSTALLED BY ECs 846626 OR 847836.
- () PRE-REQUISITES: 3803 MODEL 2 WITH ECs 846627 OR 847836 INSTALLED.
- () INSTRUCTION: INSERT THIS SUPPLEMENT PAGE AT THE BEGINNING OF MICROCODE LISTINGS PN 1846378 AND NOTE REFERENCE TO THIS PAGE AT ENTRY ADDRESS ON APPLICABLE MICROCODE PAGE.

PATCH STORE MICROCODE LISTINGS					
INSTR ADDR	PATCH STORE CONTROL 1	OBJECT CODE	SOURCE STATEMENT		PATCH NAME
213	ENTER	1600	WRTSTR1	STOH SENSE 1, 0	VELOCITY RETRY EXTENSION
214	RETURN	1300	VELSTR	STOH WORK 4, ZERO	
7B8	ENTER	0200		STO WORK 3, 0	
7B9	RETURN	1500		STOH WORK 5, ZERO	
15A	ENTER	D708	DODELAY	ANDM SENSE 2, HIDDEN	TURNAROUND DELAY
15B	RETURN	615C		BU 15C	
63F	ENTER	6744	CTLRET6	BU ERASE6	TRUNCATED POSTAMBLE
744	RETURN	0083	ERASE6	STO WORK 1, X'83'	
38E	ENTER	8402	DRUVNTCK	ORI STATIMG, SETSTATIC	ALTERNATE PATH DEVICE BUSY
36F		63C0		BU 3C0, FREEAREA	
3C0		4428	FREEAREA	XFR STATIMG, STAT	
3C1		3AC4	PPOLMTIX	BOC STATC, TAG00	
3C2		3BCE		BOC STATD, EXITPTCH	
3C3		63C1		BU PPOLMTIX	
3C4		0002	TAG00	STO WORK 1, RESET	
3C5		4060		XFR WORK 1, TUBO	
3C6		000A		STO WORK 1, DEVSEL+COMM	
3C7		4024		XFR WORK 1, TUTAG	
3C8		0000		STO WORK 1, 0	
3C9		A000		ADD WORK 1, 0	
3CA		4024		XFR WORK 1, TUTAG	
3CB		A024	TAG002	ADD WORK 1, 36	
3CC		21CB		BOC NALCO, TAG002	
3CD		4050		XFR COMITD	
3CE	RETURN	6370	EXITPTCH	BU POLLMTIX	

NOTES

- 1 ENTER ENABLES THE PATCH STORE FOR SUCCEEDING INSTRUCTIONS, AND RETURN DISABLES THE PATCH STORE FOR SUCCEEDING INSTRUCTIONS.

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EC	846771							
DATE	11 JUN 82							

