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DECUS NO.

8-827

TITLE

Half-Duplex Subset of Digital Data Communications Message
Protocol

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/PARAMETERS FOR RTS-8 TASKS

/RTS8 EXEC PARAMETERS - EDITED BY USER

0001 PDP8E=1
 0000 EAE=0
 0000 PWRFAL=0
 0020 HGHFLD=20
 0006 NTASKS=6
 /1 IF POWER FAIL/RESTART ENABLED IN HARDWARE
 /HIGHEST FIELD USED (EG 30 FOR A 16K MACHINE)
 /NUMBER OF TASKS IN SYSTEM

/COMMON TASK NUMBERS - EDITED BY USER
 /IT IS ADVISABLE TO DEFINE ALL TASKS HERE. NAMES GIVEN BELOW
 /ARE USED BY SOME SYSTEM TASKS AND SHOULD BE DELETED FROM THIS
 /LIST IF THE CORRESPONDING TASK IS NOT INCLUDED IN THE SYSTEM

0001 CLOCK=1
 0002 TTY=2
 0003 MCR=3
 0004 DDCMP=4
 0005 INPUT=5
 0006 OUTPUT=6
 /CLOCK HANDLER - SHOULD BE HIGH PRIORITY
 /TELETYPE DRIVER TASK
 /OS8= NTASKS /OS/8 SUPPORT - NORMALLY LOWEST PRIORITY
 /OS8F= /OS/8 FILE SUPPORT

/SOFTWARE PARAMETERS - EDITED BY USER

IFDEF OS8 <
 OSFLDS= /NUMBER OF FIELDS TO ALLOCATE TO OS/8 (EG 2)
 OSKBDV= /OS/8 KEYBOARD DEVICE CODE (EG 03 = CONSOLE)
 OSTTDV= /OS/8 TELEPRINTER DEVICE CODE (EG 04)
 OSSYSD= /OS/8 SYSTEM DEVICE DRIVER TASK (E.G. RK8)
 OSFILL= /# FILLS NEEDED AFTER LINE FEED
 > / (EG 4 FOR 2400 BAUD VT05)
 IFDEF MCR <
 0001 MCRSYS=1 /1 IF MCR SYSTAT FACILITY DESIRED
 >
 IFDEF CLOCK <
 0000 CLKTYP=0 /0 (DK8EA/DK8EC) OR 1 (KW12) OR 2 (VT8E) OR 3 (DK8EP)
 0020 CLKQLN=20 /MINIMUM NUMBER OF ENTRIES ON THE CLOCK QUEUE
 >
 DECIMAL
 0062 HERTZ=50 /NUMBER OF HARDWARE TICKS PER SECOND
 0062 SHERTZ=50 /NUMBER OF SYSTEM TICKS PER SECOND
 >
 OCTAL
 >

/EQUIVALENCES:

7344 AC7776= CLL STA RAL
 7346 AC7775= CLL STA RTL
 7330 AC4000= CLA STL RAR
 7350 AC3777= CLL STA RAR
 7332 AC2000= CLA STL RTR
 7326 AC0002= CLA STL RTL

/MONITOR CALL VALUES:

4020 CAL= JMS 20 /CALL THE EXECUTIVE
 5424 POSTDS= JMP I 24 /DISMISS AN INTERRUPT
 4425 WAITM= JMS I 25 /WAIT FOR MULTIPLE EVENTS

0000 SEND= 0 /SEND MESSAGE
 0001 RECEIV= 1 /RECEIVE MESSAGE
 0002 WAITE= 2 /WAIT FOR EVENT FLAG
 0003 RUN= 3 /CONTINUE TASK EXECUTION
 0004 SUSPND= 4 /SUSPEND TASK EXECUTION
 0005 POST= 5 /POST AN EVENT FLAG
 0006 SKPINS= 6 /INSERT CODE INTO INTERRUPT SKIP CHAIN
 0007 DERRAIL= 7 /INITIATE END-ACTION
 0010 BLKARG= 10 /BLOCK TASK FOR REASON SPECIFIED IN ARG
 0011 SENDM= 11 /SEND MESSAGE AND WAIT
 0012 UNBARG= 12 /UNBLOCK TASK FOR REASON SPECIFIED IN ARG

IFDEF UDC

<AO=0;DO=1;DI=2;GC=3;EC=4;RC=5
 DC=6;ECT=7;CS=10;DCT=11;AI=12>

/TASK STATUS FLAGS:

4000 MSGWT= 4000 /MESSAGE WAIT
 2000 EFWT= 2000 /EVENT FLAG WAIT
 1000 RUNWT= 1000 /SCHEDULE WAIT
 0400 SWPWT= 0400 /SWAPPER WAIT
 0200 EDRWT= 0200 /EVENT FLAG OR MESSAGE WAIT
 0100 USERWT= 0100 /USER SPECIFIED WAIT
 0040 ENABWT= 0040 /ENABLE WAIT
 0001 DNEWT= 0001 /DOES NOT EXIST WAIT

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87 /SYSTEM LOCATIONS:
88
89
90 MSGTBL= 1200-2 /TASK MESSAGE TABLE
91 TSTABL= NTASKS+2~2+MSGTBL-4 /TASK STATE TABLE - HOLDS
92 /TASK LINK,UM,DF,IF,PC,AC,MQ
93 TFTABL= NTASKS+2~4+TSTABL-1 /TASK FLAGS TABLE - HOLDS
94 /TASK STATUS FLAGS
95
96 TSWFLG= 35 /TASK SW INHIBIT FLAG IN FIELD 0
97 TODL= 36 / LOW ORDER TIME OF DAY IN FIELD 0
98 TODH= 37 /HIGH ORDER TIME OF DAY IN FIELD 0
99 DATE= 40 /DATE IN OS8 FORMAT IN FIELD 0
100 MCREF= 41 /MCR START EVENT FLAG IN FIELD 0
101
102
103
104
105 /TASK TABLE SETUP - 'TASK', 'CUR','INIWT', AND 'START'
106 /MUST BE DEFINED BY TASK:
107
108 *TASK~2+MSGTBL /MESSAGE BUFFER INITIALLY CLEAR
109 ZBLOCK 2
110 *TASK~4+TSTABL /INITIAL FLAGS
111 CUR~10+CUR
112 START /INITIAL AC 0
113 0
114 *TASK+TFTABL
115 INIWT
116
117
118 //DDCMP
119 /
120 /
121 / JONATHAN R. GROSS
122 / SOCIAL SCIENCES RESEARCH FACILITIES CENTER
123 / 25 BLEGEN HALL
124 / UNIVERSITY OF MINNESOTA WEST BANK
125 / MINNEAPOLIS, MINNESOTA 55455
126 / (612) 373-5599
127 /
128 /DEFINE THE STUFF NEEDED BY RTS8
129 CUR=10
130 TASK=DDCMP
131 INIWT=0
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150

```


221	11401	0006	CHARD	
222	11402	2632	CAL;SKPINS	
223	11403	4020		
224	11404	0006	AGCHNG	
225	11405	2532	CAL;SKPINS	
226	11406	4020		
227	11407	0006	XMTDVR	
228	11410	2744	CAL;SKPINS	
229	11411	4020		
230	11412	0006	RCVDVR	
231	11413	2505	CAL;SKPINS	
232	11414	4020		
233	11415	0006	RING	
234	11416	2522	CAL;SKPINS	
235	11417	4020		
236	11420	0006	BUSER	
237	11421	2650	CDF 0	
238	11422	6201	TAD (BKREGA-1	/BREAK REG.S ALWAYS IN ZERO
239	11423	1377	DCA XR1	
240	11424	3011	TAD (4000+SYNC	/IGNORE LEADIN SYNC
241	11425	1376	DCA I XR1	
242	11426	3411	TAD (SOH	
243	11427	1375	DCA I XR1	/RECOGNIZE HEADERS
244	11430	3411	TAD (ENQ	/UNNUMBERED HEADER
245	11431	1374	DCA I XR1	
246	11432	3411	TAD (DLE	/BOOTSTRAP
247	11433	1373	DCA I XR1	
248	11434	3411	CDF CUR	
249	11435	6211		
250	11436	5772	STRUP, JMP HANGUP	/MAY HAVE TO JUMP OUT OF THE BUFFER
251				
252				
253				
254	11572	1600	EJECT	
255	11573	0220		
256	11574	0005		
257	11575	0201		
258	11576	4226		
259	11577	7557		
260		2204	*TBUF+BUFLN	
261			/	
262			/	

THIS IS THE MAIN DDCMP CODE

263	/	LISTEN,	JMS GETMESS		
264	12204	4777	JMP GOTMESS		/GOT A MESSAGE, NOW GO DECODE IT
265	12205	5210	JMP TIMO		/TIMED OUT
266	12206	5262	HLT		/TO LATE TO RING, SYSTEM ERROR
267	12207	7402			
268	/				
269	12210	4776	GOTMESS,		JMS CKHD /CHECK HEADER CRC
270	12211	5303	JMP HBCCER		
271	12212	1450	STARTD,	TAD I HDO	/WHAT KIND MESSAGE?
272	12213	4775	JMS JMPTAB		
273	12214	0201	SOH;NUMBERD		/NUMBERED MESSAGE
274	12215	3063			
275	12216	0005	ENQ;NONUM		/UNNUMBERED MESSAGE
276	12217	2230			
277	12220	0220	DLE;BOOT		/BOOTSTRAP MESSAGE
278	12221	2227			
279	12222	0000	O;+1		/NOT RECOGNIZABLE
280	12223	2224			
281	/				
282	12224	1374	FORMER,	TAD (21	/HEADER FORMAT ERROR
283	12225	4773	JMS SENDNACK		
284	12226	5204	JMP LISTEN		
285	/				
286	12227	7402	BOOT,	HLT	/NO CODE YET FOR THIS
287	/				
288	/				
289	/				
290	12230	1451	NONUM,		RECEIVED AN UNNUMBERED MESSAGE
291	12231	4775	TAD I HD1		
292	12232	0001	JMS JMPTAB		/NO DATA RECEIVED
293	12233	2242	ACK;GOTACK		
294	12234	0002	NAK;RESEND		/BAD, RESEND LAST MESSAGE
295	12235	3310			
296	12236	0003	REP;RQRPLY		/MISSED A MESSAGE, REPLY
297	12237	2252			
298	12240	0000	O;FORMER		/SOMETHING ELSE
299	12241	2224			
300	/				

301	12242	1453	GOTACK,	TAD I HD3	/GET LAST ONE THEY RECEIVED
302	12243	3062		DCA LASGOT	
303	12244	1062		TAD LASGOT	/SEE IF THE LAST THING THEY GOT
304	12245	7041		CIA	/IS THE LAST THING WE SENT
305	12246	1061		TAD LASENT	
306	12247	7640		SZA CLA	
307	12250	5772		JMP RESEND	/THIS ACK IS A NACK,
308	12251	5771		JMP FORMES	/GO TO SEND A MESSAGE BACK
309					
310	12252	1454	RORPLY,	TAD I HD4	/CHECK NUMBER OF LAST MESSAGE THEY SENT.
311	12253	7041		CIA	/AND COMPARE IT TO WHAT WE HAVE
312	12254	1060		TAD LASTR	
313	12255	7650		SNA CLA	
314	12256	5770		JMP TACK	/TRANSMIT AN ACK
315	12257	7325		CLL CLA CML IAC RAL	/3
316	12260	4773		JMS SENDNACK	/SEND NACK SO THEY CAN RESEND
317	12261	5204		JMP LISTEN	
318					
319	12262	1061	TIMO,	TAD LASENT	/PREPARE A REP MESSAGE
320	12263	3327		DCA REPESE	
321	12264	4767		JMS GENCRC	
322	12265	2323		REPME5	
323	12266	0006		6	
324	12267	1056		TAD TRY5	/RESET TRY COUNT
325	12270	3055		DCA NTRY	
326	12271	2055	TAGAIN,	ISZ NTRY	/DID WE LOSE CONTACT?
327	12272	7410		SKP	/KEEP TRYING
328	12273	5333		JMP CL	/GIVE UP
329	12274	4766		JMS SENDM	/SEND IT
330	12275	2317		REPMESS-4	
331	12276	2332		REPMESS+7	
332					
333	12277	4777		JMS GETMESS	/WAIT FOR ACK OR NAK
334	12300	5210		JMP GOTMESS	/PROCESS LIKE NORMAL
335	12301	5271		JMP TAGAIN	/TIME OUT, SEND IT AGAIN
336	12302	7402		HLT	/NO BELLS NOW
337					
338	12303	7201	HBCCR,	CLA IAC	/1=BCC HEADER ERROR
339	12304	4773		JMS SENDNAK	
340	12305	5204		JMP LISTEN	

```

341 / / SENDACK SENDS AN UPDATED ACK MESSAGE OVER DP8
342 / /
343 / /
344 / SENDACK,0
345 12306 0000 TAD LASTR /UPDATE MESSAGE WITH LAST GOOD ONE RECEIVED
346 12307 1060 DCA ACKN
347 12310 3765 JMS GENCRC
348 12311 4767 ACKMESS
349 12312 3152 6
350 12313 0006 JMS SENDM
351 12314 4766 ACKMESS-4
352 12315 3146 ACKMESS+7
353 12316 3161 JMP I SENDACK
354 12317 5706
355 /
356 12320 0226 SYNC;SYNC;SYNC
357 12321 0226
358 12322 0226
359 12323 0005 REPME, ENQ;REP;FISEL;FILL
360 12324 0003
361 12325 0300
362 12326 0000
363 12327 0000 REPSEQ, 0
364 12330 0000 AO;ZBLOCK 2
365 12331 0000
366 /
367 12333 4020 CL, CAL;SEND /LAST WORDS BEFORE WE DIE
368 12334 0000
369 12335 0002 TTY;CLMESS
370 12336 2343
371 12337 4020 IFDEF MCR < /DON'T STOP IF YOU CAN'T BE RESTARTED
372 12340 0004 CAL;SUSPND /STOP MYSELF
373 12341 5742 >
374 12342 2204 JMP I .+1 /OPERATOR SAYS TRY AGAIN
375 IFDEF RESTRT <HANGUP>
376 IFNDEF RESTRT <LISTEN>
377 /
378

```

379	12343	0000	CLMESS, ZBLOCK 3	/RTS8 OVERHEAD
380	12346	0000	0	/PACKED ASCII
381	12347	0000	0	/NO INPUT
382	12350	0317	TEXT 'COMMUNICATIONS LOSS'	
383	12351	1515		
384	12352	2516		
385	12353	1103		
386	12354	0124		
387	12355	1117		
388	12356	1623		
389	12357	4014		
390	12360	1723		
391	12361	2300		
392	12365	3155		
393	12366	2660		
394	12367	3007		
395	12370	3207		
396	12371	3200		
397	12372	3310		
398	12373	3033		
399	12374	0021		
400	12375	2400		
401	12376	3000		
402	12377	2420		
403		2400	PAGE	
404				
405				
406			EJECT	
407			/	
408			/	ROUTINE TO SEARCH A BRANCH TABLE AND BRANCH ON MATCH.
409			/	TABLE ENDED WITH A ZERO ENTRY AND WHERE TO GO.
410			/	

4-1	12400	0000	JMPTAB, 0		/NEGATE CHARACTER FOR COMPARE
412	12401	7041		CIA TABCHR	/STORE IN A TEMP
413	12402	3217		SKP	/DON'T IN POINTER FIRST TIME ONLY
414	12403	7410			/POINT TO NEXT CHARACTER
415	12404	2200	JPT1,	ISZ JMPTAB	/GET CHARACTER TO COMPARE
416	12405	1600		TAD I JMPTAB	/COMMON CODE
417	12406	2200		ISZ JMPTAB	/END OF TABLE?
418	12407	7450		SNA	/YES, NO MATCH EXIT
419	12410	5214		JMP JEXIT	
420	12411	1217		TAD TABCHR	
421	12412	7640		SZA CLA	
422	12413	5204		JMP JPT1	/NO MATCH THIS TIME
423	12414	1600	JEXIT,	TAD I JMPTAB	/PICK UP BRANCH ADDRESS
424	12415	3200		DCA JMPTAB	
425	12416	5600		JMP I JMPTAB	
426	12417	0000	TABCHR, 0		
427			//		
428			/	GETMESS WAITS FOR:	
429			/		1) A MESSAGE TO COME OVER DP8E
430			/		2) A TIMEOUT
431			/	OR	3) THE PHONE TO RING
432			/	OR	AND TAKES THE APPROPRIATE EXUT
433			/	AND	
433	12420	0000	GETMESS, 0		0
434	12421	6201		CDF 0	
435	12422	1377		TAD (RBUF-1	/LOAD STARTING ADDRESS (MINUS 1)
436	12423	3776		DCA I (RCA	
437	12424	1375		TAD (-BUFLN-1	/LENGHT
438	12425	3774		DCA I (RWC	/SET UP TO IGNORE LEADING SYNC
439	12426	1373		TAD (4000+SYNC	
440	12427	3772		DCA I (TESTCO	
441	12430	6211		CDF CUR	
442	12431	4771		JMS SETIME	/START A COUNTER
443	12432	0454		6-SHERTZ	
444	12433	1370		TAD (4400	/TURN LINE AROUND AFTER RECEIVE
445	12434	3321		DCA RSET	/TELL INT TO RESET INTERFACE
446	12435	6406		SCSD	/CLEAR DETECT CIRCUITS
447	12436	1367		TAD (5000	
448	12437	6412		SLCC	/ENABLE DATA BREAK
449	12440	7200	RWAIT,	CLA	
450	12441	6002		IOF	/WAIT ON MULTIPLE CONDITIONS
451	12442	1366		TAD (4000+DDCMP	
452	12443	3271		DCA RCVFLG	
453	12444	1366		TAD (4000+DDCMP	
454	12445	3765		DCA TOMESS	
455	12446	1366		TAD (4000+DDCMP	
456	12447	3302		DCA RNGFLG	
457	12450	6404		SGRR	/ENABLE RECEIVE
458	12451	6202		CIF 0	
459	12452	4425		WAITM	/WAIT FOR SOMETHING
460	12453	2000		EFWT	

461	12454	1271	TAD RCVFLG	
462	12455	7650	SNA CLA	/POSTED?
463	12456	5264	JMP GEXIT	/YES
464	12457	1765	TAD TOMESS	
465	12460	7650	SNA CLA	
466	12461	5263	JMP GEXIT-1	/TAKE SECOND EXIT
467	12462	7001	IAC	
468	12463	7001	IAC	
469	12464	1220	TAD GETMESS	/TAKE EXIT 1-3
470	12465	3220	DCA GETMESS	
471	12466	6001	ION	
472	12467	4764	JMS CANCEL	/CANCEL THE TIMEOUT
473	12470	5620	JMP I GETMESS	/GO BACK
474				
475	12471	0000	RCVFLG, ZBLOCK 3	/RTS8 EVENT FLAG FOR RECIEVING A DP8 MESSAGE
476	12474	0000	XMTFLG, ZBLOCK 3	/RTS8 EVENT FLAG FOR SENDING MESSAGE
477	12477	0000	AGCFLG, ZBLOCK 3	/CARRIER CHANGED FLAG
478	12502	0000	RNGFLG, ZBLOCK 3	/PHONE RANG FLAG
479				
480	12505	0000	RCVQVR, ZBLOCK 2	/COMES HERE IN SKIP CHAIN
481	12507	6402	SSRO	
482	12510	5705	JMP I.-3	
483	12511	6213	CDF CIF CUR	
484	12512	1321	TAD RSET	/RESET INTERFACE?
485	12513	7440	SZA	
486	12514	6412	SLCC	/DISABLE DATA BRAKS AND INTERRUPTS
487				/TURN LINE AROUND
488	12515	7200	CLA	
489	12516	1363	TAD (RCVFLG	
490	12517	6202	CIF 0;POSTDS	/POST IT
491	12520	5424		
492				
493	12521	0000	RSET, 0	/DP8 FLAGS, ELSE ZERO
494				
495	12522	0000	RING, ZBLOCK 2	/COMES HERE WHEN PHONE RINGS
496	12524	6410	SSRG	
497	12525	5722	JMP I.-3	
498	12526	6213	CDF CIF CUR	
499	12527	1362	TAD (RNGFLG	
500	12530	6202	CIF 0;POSTDS	
501	12531	5424		
502				

503	12532	0000	AGCHNG, ZBLOCK 2	
504	12534	6411	SSCA	
505	12535	5732	JMP I *-3	
506	12536	6213	CDF CIF CUR	
507	12537	6414	SRS2	/SEE IF CARRIER IS ON
508	12540	7710	SPA CLA	
509	12541	5351	JMP OFFON	
510	12542	6201	CDF 0	
511	12543	1772	TAD I (TESTCO	/SEE IF WE GOT A HEADER
512	12544	7710	SPA CLA	
513	12545	5350	JMP NOISE	/NO, DO NOTHING
514	12546	7240	CLA CMA	/-1
515	12547	3774	DCA I (RWC	/FORCE AN EARLY TERMINATION
516	12550	6211	CDF CUR	
517	12551	1361	TAD (AGCFLG	
518	12552	6202	CIF 0;POSTDS	
519	12553	5424		
520				
521	12561	2477		
522	12562	2502		
523	12563	2471		
524	12564	2612		
525	12565	2620		
526	12566	4004		
527	12567	5000		
528	12570	4400		
529	12571	2600		
530	12572	7560		
531	12573	4226		
532	12574	7564		
533	12575	6777		
534	12576	7565		
535	12577	0177		
536		2600	PAGE	
537			/	
538	12600	0000	SETIME, 0	/SETS THE TIMEOUT TIMER
539	12601	1600	TAD I SETIME	
540	12602	3225	DCA TIMEL	/LOW ORDER TIME OUT BITS
541	12603	3220	DCA TOMESS	/CLEAR EF FIRST
542	12604	4020	CAL;SEND	
543	12605	0000		
544	12606	0001	CLOCK;TOMESS	
545	12607	2620		
546	12610	2200	ISZ SETIME	/TAKE SECOND EXIT
547	12611	5600	JMP I SETIME	
548			/	

549	12612	0000	CANCEL, 0	/CANCEL THE TIMEOUT CLOCK ENTRY
550	12613	4020	CAL;SEND	
551	12614	0000		
552	12615	0001	CLOCK;CANMES	
553	12616	2626		
554	12617	5612	JMP I CANCEL	
555			/	
556	12620	0000	TOMESS, ZBLOCK 3	/RTS8 OVERHEAD
557	12623	0000	0	/POST THIS MESSAGE AFTER SET TIME
558	12624	0000	0	/AFTER
559	12625	0000	TIMEL, 0	/WAITING TIMEL TICKS
560			/	
561	12626	0000	CANMESS,	ZBLOCK 3 /RTS8 OVERHEAD
562	12631	7004	7000+DDCMP	/DEQUEUE TIMER REQUEST
563			/	
564	12632	0000	CHARD, ZBLOCK 2	/COMES HERE WHEN CHARACTER DETECTED ON
565	12634	6400	SSCD	
566	12635	5632	JMP I .-3	
567	12636	6213	CDF CIF CUR	
568	12637	6417	SRCD	
569	12640	7650	SNA CLA	/RECEIVE, READ IT
570	12641	5245	JMP .+4	/SYNC IS CHARACTER 0
571	12642	6203	CDF CIF 0	/DO NOTHING ON SYNC
572	12643	1377	TAD (SYNC	/OTHERS ARE HEADER CHARACTERS. SYNC
573	12644	3776	DCA I (TESTCO	/MEANING NOW
574	12645	6211	CDF CUR	
575	12646	6202	CIF 0;POSTDS	/RESET IF
576	12647	5424		
577			/	
578	12650	0000	BUSER, ZBLOCK 2	/COMES HERE WHEN BUSS OVERLOADED
579	12652	6416	SSBE	
580	12653	5650	JMP I .-3	
581	12654	6213	CDF CIF CUR	
582	12655	2250	ISZ BUSER	
583	12656	6202	CIF 0;POSTDS	/SAY A ERROR HAS OCCURED
584	12657	5424		

587	12660	0000	SENDM,	0	SENDM SENDS A CORE	FFER OVER THE DP8E
588	12661	7240			CALL FOLLOWED BY FIRST AND LAST ADDRESS OF BUFFER.	
589	12662	1660				
590	12663	3335			CLA CMA	/-1
591	12664	2260			TAD I SENDM	
592	12665	1660			DCA STAD	/SAVE IT
593	12666	3336			ISZ SENDM	/GET LAST ADDRESS.
594	12667	6201			TAD I SENDM	
595	12670	1335			DCA LAD	
596	12671	3775			DCF 0	
597	12672	1336			TAD STAD	
598	12673	7040			DCA I (TCA	
599	12674	1335			TAD LAD	
600	12675	3774			CMA	/1'S COMP
601	12676	6213			TAD STAD	/COMPUTE COUNT
602	12677	3773			DCA I (TWC	
603	12700	1372			DCF CIF CUR	
604	12701	6412			DCA RSET	/TELL INT HAND TO IGNOR RECEIVES
605	12702	7200			TAD (5400	/ASSERT REQUEST TO SEND (PERHAPS AGAIN)
606	12703	4200			SLCC	
607	12704	3720			CLA	
608	12705	6002			JMS SETIME	/START THE TIMER FOR DEAD SLAVE
609	12706	6405			50~SHERTZ	
610	12707	1371			IOF	
611	12710	3220			SGTT	/TRANSMITT WHEN READY
612	12711	1371			TAD (4000+DDCMP	
613	12712	3770			DCA TOMESS	
614	12713	6202			TAD (4000+DDCMP	
615	12714	4425			DCA XMTFLG	/WAIT FOR TRANSMIT DONE OR TIME OUT
616	12715	2000			CIF 0	
617	12716	1770			WAITM; EFWT	
618	12717	7640			TAD XMTFLG	
619	12720	5337			SZA CLA	/TIME OUT OR DONE?
620	12721	6001			JMP TTD	/TIMED OUT
621	12722	1367			ION	
622	12723	3334			TAD (-10	
623	12724	2334			DCA TWAIT	
624	12725	5324			ISZ TWAIT	
625	12726	1366			JMP -1	/WAIT A LITTLE WHILE BEFORE
626	12727	6412			TAD (5000	/DROPPING CARRIER
627	12730	7200			SLCC	
628	12731	4212			CLA	
629	12732	2260			JMS CANCEL	/CANEL THE TIMER
630	12733	5660			ISZ SENDM	
631	12734	0000			JMP I SENDM	
632	12735	0000			0	
633	12736	0000			0	
634					0	
635					0	
636					0	

637	12737	7330	TT0,	CLL CLA CML RAR /4000
638	12740	6412		SLCC /SET TERMINAL READY, BUT THATS ALL
639	12741	7200		CLA
640	12742	6001		ION
641	12743	5765		JMP CL /PRINT A MESSAGE
642			/	
643	12744	0000	XMT0VR,	ZBLOCK 2 /COMES HERE ON TRANSMIT DONE
644	12746	6403		SSTO
645	12747	5744		JMP I .-3
646	12750	6213		CDF CIF CUR
647	12751	1370		TAD (XMTFLG
648	12752	6202		CIF 0:POSTDS /POST THE FLAG
649	12753	5424		
650	12765	2333		
651	12766	5000		
652	12767	7770		
653	12770	2474		
654	12771	4004		
655	12772	5400		
656	12773	2521		
657	12774	7567		
658	12775	7570		
659	12776	7560		
660	12777	0226		
661		3000	PAGE	
662				
663				
664				
665	13000	0000	EJECT	
666	13001	4777	CKHED,	0
667	13002	0200		JMS CRC /CHECK THE BCC OF THE HEADER
668	13003	0010		RBUF /AND TAKE SECOND EXIT IF OK.
669	13004	7650		10
670	13005	2200		SNA CLA /ZERO?
671	13006	5600		ISZ CKHED
672				JMP I CKHED
673			/	
674			/	
675			/	
676			/	

GENCRC ACCEPTS THE ADDRESS AND LENGHT OF A MESSAGE, AND
PUTS THE GENERATED CRC IN THE NEXT TWO LOCATIONS

677	13007	0000	GENCRC, 0		
678	13010	1607	TAD I GENCRC	/CALL TO GENERATE CRC.	
679	13011	3226	DCA GEN1	/TWO ARGS	
680	13012	2207	ISZ GENCRC	/FIRST ADDRESS AND LENGH	
681	13013	7305	CLA CLL IAC RAL /2	/ADD TWO TO LAST ADDRESS	
682	13014	1607	TAD I GENCRC		
683	13015	3227	DCA GEN2	/LENGHT	
684	13016	1607	TAD I GENCRC		
685	13017	2207	ISZ GENCRC		
686	13020	1226	TAD GEN1	/CALCULATE ADDRESS OF BCC	
687	13021	3232	DCA GEN4		
688	13022	3632	DCA I GEN4		
689	13023	2232	ISZ GEN4	/ZERO OUT BCC	
690	13024	3632	DCA I GEN4		
691	13025	4777	JMS CRC		
692	13026	0000	GEN1, 0		
693	13027	0000	GEN2, 0		
694	13030	7200	CLA		
695	13031	5607	JMP I GENCRC		
696	13032	0000	GEN4, 0		
697			/		
698			/		
699			/		
700	13033	0000	SENDNACK, 0		
701	13034	1376	TAD (FINAL+SELECT	/PACK REASON	
702	13035	3255	DCA RNAK		
703	13036	1060	TAD LASTR	/UPDATE LAST RECEIVED	
704	13037	3256	DCA NNAK		
705	13040	4207	JMS GENCRC		
706	13041	3053	NAKMESS		
707	13042	0006	6		
708	13043	4775	JMS SENDM	/SEND IT	
709	13044	3047	NAKMESS-4		
710	13045	3062	NAKMESS+7		
711	13046	5633	JMP I SENDNAK	/TAHT'S ALL	
712			/		
713	13047	0226	SYNC;SYNC;SYNC;SYNC		
714	13050	0226			
715	13051	0226			
716	13052	0226			
717	13053	0005	NAKMESS,ENQ;NAK		
718	13054	0002			
719	13055	0000	RNAK, 0	/REASON FOR NAK	
720	13056	0000	NNAK, 0	0:FILL;A0;ZBLOCK 2	
721	13057	0000			
722	13060	0000			
723	13061	0000			
724			/		

SENDNACK SENDS A NEGATIVE ACK WHO'S REASON IS IN ACC ON ENTRY.

725						
726						
727						
728	13063	7325	NUMBRD,	CLL CLA CML IAC RAL	/3	
729	13064	0452	AND I HD2		/GET UPPER 2 BITS OF LENGHT	
730	13065	7012	RTR;RTR;RAR		/SHIFT END-AROUND INTO PLACE	
731	13066	7012				
732	13067	7010				
733	13070	1451	TAD I HD1		/GET LOW ORDER BITS	
734	13071	3345	DCA MESLEN			
735	13072	7305	CLL CLA IAC RAL	/2		
736	13073	1345	TAD MESLEN		/ADD BCC CHARACTERS TO IT	
737	13074	3306	DCA DATLEN		/LENGTH OF DATA PORTION	
738	13075	1306	TAD DATLEN			
739	13076	1374	TAD (-BUFLEN+7		/SEE IF WE GOT THE WHOLE THING	
740	13077	7710	SPA CLA			
741	13100	5304	JMP DATCK		/LENGTH OK	
742	13101	1373	TAD (20		/MESSAGE TO LONG	
743	13102	4233	JMS SENDNAK			
744	13103	5772	JMP LISTEN			
745						
746	13104	4777	JMS CRC			
747	13105	0210	RBUF+10			
748	13106	0001	1			
749	13107	7650	SNA CLA		/LENGHT PUT HERE	
750	13110	5314	JMP DATOK		/OK?	
751	13111	7305	CLL CLA IAC RAL	/2	/YES	
752	13112	4233	JMS SENDNAK		/BAD CHECK	
753	13113	5772	JMP LISTEN			
754						
755	13114	1453	TAD I HD3			
756	13115	3062	DCA LASGOT		/GET NUMBER OF LAST ONE THEY GOT OK	
757	13116	1060	TAD LASTR		/UPDATE LAST ONE THEY GOT OK	
758	13117	7001	IAC			
759	13120	0057	AND P377		/TAKE MOD 400	
760	13121	7041	CIA			
761	13122	1454	TAD I HD4		/CHECK NUMBER OF THIS MESSAGE	
762	13123	7640	SZA CLA		/SEQUENCE ERROR, NO RESPONSE (SPEC. PAGE 27)	
763	13124	5772	JMP LISTEN			
764	13125	1454	TAD I HD4			
765	13126	3060	DCA LASTR		/UPDATE NUMBER OF LAST ONE WE GOT OK	
766						

767	EJECT		
768	/		
769	/		
770	/		
771	/		THE MESSAGE PASSED TO 'INPUT' IS IN THE FOLLOWING FORM
772	/		/CDF INSTRUCTION TO CHANGE TO FIELD OF BUFFER
773	/		BEGINNING ADDRESS OF BUFFER
774	/		LENGTH OF MESSAGE
775	/		
776	/		THE TASK INPUT SHOULD CHECK FOR A ZERO LENGTH MESSAGE IF
777	/		THAT COULD CAUSE PROBLEMS. IF INPUT ACCEPTS THE MESSAGE,
778	/		IT SHOULD SET THE LENGTH WORD TO ZERO BEFORE POSTING THE
779	/		PARAMETER MESSAGE. OTHERWISE THE LENGTH WORD MAY BE SET TO
780	/		21 IF THERE IS A HEADER FORMAT ERROR
781	/		10 IF THERE IS NO ROOM TO PROCESS INPUT
782	/		NOTE.....THE PARAMETER MESSAGE SHOULD BE POSTED AS SOON AS POSSIBLE SINCE
783	/		COMMUNICATIONS WILL NOT CONTINUE UNTIL THE MESSAGE IS POSTED.
784	/		ON THE OTHERHAND, DON'T POST THE MESSAGE BEFORE IT HAS BE PROCESSED OR
785	/		COPIED SINCE AFTER THE PARAMETER MESSAGE IS POSTED, THE MESSAGE CONTENTS
786	/		MAY CHANGE.
787	/		
788	13127	4020	CAL:SENDW /GIVE MESSAGE TO NEXT LEVEL
789	13130	0011	
790	13131	0005	INPUT:INMESS
791	13132	3140	
792	13133	1345	TAD MESLEN
793	13134	7450	SNA
794	13135	5771	JMP FORMES
795	13136	4233	JMS SENDNACK
796	13137	5772	JMP LISTEN
797	/		/SHOULD BE ZERO, ELSE DDCMP NACK REASON
798	13140	0000	/NOW RETURN A MESSAGE IF WAITING
799	13143	6211	
800	13144	0210	INMESS, ZBLOCK 3 /FOR RTS8
801	13145	0000	CDF CUR /FIELD OF BUFFER
802			RBUF+10 /START OF MESSAGE
			MESLEN, 0 /LENGTH

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13213 4020
13214 0001
13215 0000
13216 3217
13217 7402
13220 1615
13221 3234
13222 2215
13223 7040
13224 1615
13225 3012
13226 2215
13227 1615
13230 3315
13231 1315
13232 7041
13233 3314
13234 7402
13235 1412
13236 6211
13237 3411
13240 2314
13241 5234

13242 1217
13243 3250
13244 1373
13245 1215
13246 4020
13247 0005
13250 7402
13251 7305
13252 1011
13253 3312
13254 1372

/ / / / / / /
/ MAD,
/ MFLD,

/ TLOOP,
/

/ PFLD,

/

CAL;RECEIVE /GET THE MESSAGE
O /MESSAGE ADDRESS
DCA MFLD /CHANGE TO DF OF MESSAGE
HLT /GET CDF OF MESSAGE TO BE SENT
TAD I MAD /STORE IN TRANSFER LOOP
DCA TLOOP
ISZ MAD
CMA /-1
TAD I MAD /GET ADDRESS
DCA XR2 /STORE ADDRESS-1 IN XR
ISZ MAD /GET LENGTH
TAD I MAD /LENGTH
DCA OLEN /COUNTER
CIA MCNT
DCA MCNT
HLT /GET CHARACTER OF MESSAGE
TAD I XR2 /CHANGE DATA FIELD BACK
CDF CUR /PUT IN TRUF
DCA I XR1 /DONE?
ISZ MCNT /NO
JMP TLOOP /MESSAGE MAY BE POSTED NOW IT'S COPIED

TAD MFLD /YES, POST THE MESSAGE
DCA PFLD
TAD (-5
TAD MAD
CAL;POST

HLT
CLL CLA IAC RAL /2 /GET TOTAL LENGTH FOR SENDM
TAD XR1
DCA RESEND+2
TAD (TRUF

PARAMETER MESSAGES SENT TO DDCMP SHOULD BE IN THE FOLLOWING FORM
CDF INSTRUCTION TO CHANGE TO FIELD OF MESSAGE
FIRST ADDRESS OF BUFFER
LENGTH OF MESSAGE
NOTE.....NO CHECK IS MADE FOR A ZERO LENGTH MESSAGE OR
A MESSAGE GREATER THAN THE BUFFER SIZE. BEWARE.
DDCMP WILL POST THE MESSAGE IMMEDIATELY AFTER COPYING IT.


```

923 / KGDEVCO=0340
924 RCRH=6001+KGDEVCO /READ BCC HIGH
925 RCRL=6002+KGDEVCO /READ BCC LOW
926 RCGB=6004+KGDEVCO /GENERATE BCC
927 RCLC=6005+KGDEVCO /LOAD CONTROL
928 RCCB=6006+KGDEVCO /CLEAR BCC
929 /
930 CRC, 0 /ENTRY
931 TAD I CRC /SET UP BUFFER ADDRESS
932 DCA KGCADR
933 ISZ CRC
934 TAD I CRC /SET UP LENGTH
935 CIA
936 DCA KGCCNT
937 RCCB /CLEAR KGB
938 TAD KGC100 /ENABLE CRC-16
939 RCLC
940 CLA
941 /
942 KGC2, TAD I KGCADR /GET CHARACTER
943 RCGB /GENERATE CRC-16
944 CLA
945 ISZ KGCADR
946 ISZ KGCCNT /DONE?
947 JMP KGC2 /NO
948 /
949 CLL CLA CMA RTL /-3
950 TAD KGCADR /BACK UP
951 DCA KGCADR
952 RCRH /READ BCC HIGH
953 DCA I KGCADR
954 ISZ KGCADR
955 RCRL /READ BCC LOW
956 DCA I KGCADR
957 RCRH /READ HI AGAIN
958 TAD I KGCADR /ADD TO LOW FOR ZERO CHECK
959 ISZ CRC
960 JMP I CRC /EXIT TO CALL+3
961 /
962 KGCADR, 0
963 KGCCNT, 0
964 KGC100, 100 >
965 /
966
967
968

```

```

969          EJECT
970
971          IFNDEF KGB <
972          FREESP=,
973          /MAYBE USE SPACE TO LITERALS
974          3316
975          2660
976          13366
977          13367
978          13370
979          13371
980          13372
981          13373
982          13374
983          13375
984          13376
985          13377
986          3400
987          PAGE
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989          /
990          /
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1000          /
1001          /
1002          /
1003          /
1004          /
1005          /
1006          /
1007          /
1008          /
1009          /
1010          /
1011          /
1012          /

```

ROUTINE TO GENERATE/CHECK CRC-16
(ARNOLD G. NELSON, HEALTH COMPUTER SCIENCES)

CALL FOLLOWED BY TWO ARGUMENTS, BA AND BL.
BA IS THE STARTING ADDRESS OF A BUFFER WHICH CONTAINS A
STRING OF RIGHT ADJUSTED 8-BIT CHARACTERS, ONE CHARACTER
PER 12-BIT WORD. BL IS THE LENGTH OF THE BUFFER.

THIS ROUTINE PUTS THE RESIDUE IN THE LAST TWO WORDS OF THE BUFFER,
SO IF YOU WANT TO CALCULATE THE CRC, LEAVE THE LAST TWO LOCATIONS
AS ZERO, OTHERWISE, CHECK AC-MQ TO MAKE SURE IT IS ZERO ON EXIT.
AC-MQ WILL CONTAIN CRC RESIDUE ON EXIT

```

0
TAD I CRC
DCA CRCADR
ISZ CRC
TAD I CRC
CIA
DCA CRCENT
DCA CRC16U
DCA CRC16L
TAD I CRCADR
DCA CRCCHR
TAD (-10
DCA CRCBIT

```

/SUBROUTINE ENTRANCE
/BUFFER ADDRESS
/BUFFER LENGTH
/MAKE MINUS FOR COUNT
/CLEAR OUT RESIDUE
/GET A CHARACTER

1013	CRC4,	13415	1310	TAD CRCCHR	/SHIFT CHAR RIGT ONE
1014		13416	7110	CLL RAR	
1015		13417	3310	DCA CRCCHR	
1016		13420	7430	SZL	/IS BIT THERE?
1017		13421	1376	TAD (400	/INSERT CURRENT BIT INTO BIT 3 OF CRC16L WORD
1018		13422	1306	TAD CRC16L	
1019		13423	3306	DCA CRC16L	
1020		13424	1307	TAD CRC16U	/TEST X16 BIT IN CRC16U
1021		13425	7010	RAR; SNL	
1022		13426	7420		
1023		13427	5252	JMP CRC6	/X16 = 0, GOTO SHIFT
1024	/				
1025	/			EXCLUSIVE OR PROCUDURES (X16 = 1)	
1026	/				
1027		13430	7004	RAL	
1028		13431	1314	TAD CRCPCU	/(A+B)-2*(A AND B)
1029		13432	3312	DCA CRCCTMP	
1030		13433	1307	TAD CRC16U	
1031		13434	0314	AND CRCPCU	
1032		13435	7104	CLL RAL; CIA	
1033		13436	7041		
1034		13437	1312	TAD CRCCTMP	
1035		13440	3307	DCA CRC16U	
1036	/				/EXCLUSIVE OR CRC-16 LOWER
1037		13441	1306	TAD CRC16L	
1038		13442	1313	TAD CRCPCL	
1039		13443	3312	DCA CRCCTMP	
1040		13444	1306	TAD CRC16L	
1041		13445	0313	AND CRCPCL	
1042		13446	7104	CLL RAL; CIA	
1043		13447	7041		
1044		13450	1312	TAD CRCCTMP	
1045		13451	3306	DCA CRC16L	
1046	/				
1047	/			SHIFT PROCEDURES	
1048	/				
1049		13452	7200	CLA	/SHIFT CRC-16 LOWER
1050		13453	1306	TAD CRC16L	
1051		13454	7110	CLL RAR	
1052		13455	3306	DCA CRC16L	
1053		13456	7430	SZL	
1054		13457	1376	TAD (400	/IF RIGHT BIT WAS 1, ADD BIT
1055		13460	1307	TAD CRC16U	/TO CRC UPPER (POSITION 3)
1056		13461	7110	CLL RAR	
1057		13462	3307	DCA CRC16U	
1058	/				
1059		13463	2311	ISZ CRCBIT	/UPDATE BIT COUNT
1060		13464	5215	JMP CRC4	/NOT DONE, PROCESS NEXT BIT
1061		13465	2304	ISZ CRCADR	/UPDATE CHAR ADDRESS
1062		13466	2305	ISZ CRCCNT	/UPDATE CHARACTER COUNT

1063	13467	5211	/	JMP CRC2	/NOT DONE, PROCESS NEXT CHAR
1064					
1065	13470	7344		CLL CLA CMA RAL /-2	
1066	13471	1304		TAD CRCADR	/BACK UP ADDRESS BY 2
1067	13472	3304		DCA CRCADR	
1068	13473	1307		TAD CRC16U	/STORE CRC16U IN (BA+BL-2), SAVE IN MA
1069	13474	3704		DCA I CRCADR	
1070	13475	2304		ISZ CRCADR	
1071	13476	1306		TAD CRC16L	/STORE CRC16L IN (BA+BL-1), SAVE IN AC
1072	13477	3704		DCA I CRCADR	
1073	13500	1306		TAD CRC16L	
1074	13501	1307		TAD CRC16U	/CALLING ROUTINE MAY CHECK FOR ZERO
1075	13502	2200		ISZ CRC	
1076	13503	5600		JMP I CRC	/EXIT TO CALL+3
1077			//		
1078			/	CRC16L	---NLLLLLLL BITS 0-7, N=NEXT BIT
1079			/	CRC16U	---UUUUUUU BITS 8-15
1080			/		
1081			/	CRCPCL	---101000000 1 +X2
1082			/	CRCPCU	---00000011 X15+X16
1083			/		
1084	13504	0000		CRCADR, 0	/BUFFER ADDRESS
1085	13505	0000		CRCNT, 0	/CHARACTER COUNT
1086	13506	0000		CRC16L, 0	/CRC LOWER
1087	13507	0000		CRC16U, 0	/CRC UPPER
1088	13510	0000		CRCCHR, 0	/CURRENT CHARACTER
1089	13511	0000		CRCBIT, 0	/BIT COUNTER
1090	13512	0000		CRCIMP, 0	/TEMPORARY
1091			/		
1092	13513	0500		CRCPCL, 0500	/POLYNOMIAL CONSTANT LOWER
1093	13514	0003		CRCPCU, 0003	/POLYNOMIAL CONSTANT UPPER
1094		3515		ENDCRC=,	/FREE SPACE TO END OF PAGE-LITERALS
1095	13576	0400			
1096	13577	7770			
1097				PAGE	
1098					
1099					
1100					

1101	EJECT			
1102	/			
1103		1437	IFNDEF RESTRT < *STRTUP+1 >	
1104	PAGE	1600		
1105	HANGUP,	6401	SCSI	/CLEAR HARDWARE OF MODEM CONTROLLER
1106		1377	TAD (CUR~10+CUR~10	/SET EXTENDED ADDRESS FIELDS IN
1107		6413	SLFL	/INTERFACE.
1108		7330	CLL CLA CML RAR /4000	
1109		6412	SLCC	/TERMINAL READY
1110		7200	CLA	
1111		1056	TAD TRY5	/RESET COUNT
1112		3055	DCA NTRY	
1113	/			
1114	/			
1115	/			
1116	/			
1117	/		THE FOLLOWING CODE IS THE CODE THAT ESTABLISHES	
			THE INITIAL CONTACT.	
1118	SWAIT,	4776'	JMS GETMESS	/WAIT FOR MESSAGE OR PHONE TO RING
1119		5253	JMP SMESS	/GOT A MESSAGE
1120		5210	JMP SWAIT	/TIMED OUT
1121			/PHONE RANG	
1122		4020	CAL;SENDW	/WAIT FOR MODEM TO ANSWER PHONE
1123		0011	CLOCK;ANSWER	
1124		0001		
1125		1726		
1126		4775'	JMS GENCRC	/SEND A START MESSAGE
1127		3324	STARTM	
1128		0006	6	
1129		2055	ISZ NTRY	/HAVE WE TRIED A LOT
1130		7410	SKP	/NO YET
1131		5200	JMP HANGUP	/GIVE UP
1132		4774'	JMS SENDM	/SEND IT
1133		3320	STARTM-4	
1134		3333	STARTM+7	
1135	/			
1136		4776'	JMS GETMESS	/WAIT FOR RESPONSE
1137		5234	JMP CKSTAK	/GO CHECK IF ITS A LEGAL STACK
1138		5222	JMP RANG	/TIMED OUT, SEND PROBE AGAIN.
1139		5222	JMP RANG	/?
1140	/			

1141	11634	4773	CKSTAK,	JMS CKHED	/CHECK HEADER CRC
1142	11635	5222		JMP RANG	/BAD CRC, SEND START AGAIN.
1143	11636	1450		TAD I HD0	/CHECK TYPE.
1144	11637	1372		TAD (-ENG	
1145	11640	7640		SZA CLA	
1146	11641	5222		JMP RANG	/WRONG TYPE, RESEND START.
1147	11642	1451		TAD I HD1	/CHECK TO SEE IF STACK
1148	11643	1371		TAD (-STAK	
1149	11644	7640		SZA CLA	
1150	11645	5222		JMP RANG	/WRONG KIND OF MESSAGE
1151			/IN THE		/-1
1152	11646	7040	GENERAL CASE,	CMA	/GET NUMBER OF FIRST MESSAGE TO BE SENT
1153	11647	1454		TAD I HD4	
1154	11650	0057		AND P377	/SAY WE GOT PREVIOUS ONE OK.
1155	11651	3060		DCA LASTR	/GO GET A MESSAGE TO SEND TO TERMINAL
1156	11652	5770		JMP FORMESS	
1157			/		
1158	11653	2055	SMESS,	ISZ NTRY	/HAVE WE GOTTEN A LOT OF JUNK?
1159	11654	7410		SKP	/TIME FOR MORE
1160	11655	5200		JMP HANGUP	
1161	11656	4773		JMS CKHED	/CHECK HEADER CRC
1162	11657	5210		JMP SWAIT	/BAD CRC
1163	11660	1450		TAD I HD0	
1164	11661	1372		TAD (-ENG	/SEE IF IT COULD BE A START MESSAGE
1165	11662	7640		SZA CLA	
1166	11663	5210		JMP SWAIT	/WRONG TYPE
1167	11664	1451		TAD I HD1	
1168	11665	1367		TAD (-STRT	
1169	11666	7640		SZA CLA	/START MESSAGE?
1170	11667	5210		JMP SWAIT	/NO
1171	11670	7240	NEWSAK,	CLA CMA	/YES, MAKE -1
1172	11671	1454		TAD I HD4	
1173	11672	0057		AND P377	
1174	11673	3060		DCA LASTR	/SAY WE GOT PREVIOUS MESSAGE
1175	11674	1454		TAD I HD4	
1176	11675	3766		DCA FSTSE	/SAY WE HAVE YOUR NUMBER
1177	11676	2055	SENSAK,	ISZ NTRY	/HAVE WE RESPONDED A LOT?
1178	11677	7410		SKP	/KEEP TRYING
1179	11700	5200		JMP HANGUP	/GIVE UP
1180	11701	4775		JMS GENCRC	
1181	11702	3336		SAKM	
1182	11703	0006		6	
1183	11704	4774		JMS SENDM	
1184	11705	3332		SAKM-4	
1185	11706	3345		SAKM+7	
1186			/		

1187	11707	4776'	JMS GETMESS	/WAIT FOR RESPONSE
1188	11710	5313	JMP CIFOK	/GOT SOMETHING, SEE IF IT'S OK.
1189	11711	5276	JMP SENSACK	/TIMED OUT REPOUND AGAIN
1190	11712	7402	HLT	/TOO LATE TO RING NOW
1191			/	
1192	11713	4773'	JMS CKHED	/CHECK HEADER CRC
1193	11714	5276	JMP SENSACK	/BAD CRC
1194	11715	1450	TAD I HD0	
1195	11716	1372	TAD (-ENQ	/START AGAIN?
1196	11717	7640	SZA CLA	
1197	11720	5765'	JMP STARTD	/NO, STARTED UP
1198	11721	1451	TAD I HD1	
1199	11722	1367	TAD (-STRT	
1200	11723	7640	SZA CLA	
1201	11724	5765'	JMP STARTD	/COULD BE AN ACK OR SOMETHING
1202	11725	5270	JMP NEWSACK	/HE MUST HAVE MISSED MY SAK
1203			/	
1204			/	
1205	11726	0000	ANSWER,ZBLOCK 3	/MESSAGE TO TELL CLOCK TO RESTART IN 3 SECS
1206	11731	0000	ZBLOCK 2	
1207	11733	0226	3~SHERTZ	/THREE SECONDS
1208	11765	2212		
1209	11766	3341		
1210	11767	7772		
1211	11770	3200		
1212	11771	7771		
1213	11772	7773		
1214	11773	3000		
1215	11774	2660		
1216	11775	3007		
1217	11776	2420		
1218	11777	1100		
1219		2000	PAGE	
1220		3316	IFDEF FREESP < *FREESP > /USE SOME LEFTOVER SPACE	
1221	13316	0226	SYNC;SYNC;SYNC;SYNC	
1222	13317	0226		
1223	13320	0226		
1224	13321	0226		
1225	13322	0300	FISEL;FILL	
1226	13323	0000		
1227	13324	0005	STARTM, ENQ;STRT	/START MESSAGE
1228	13325	0006		
1229	13326	0001	1	/NUMBER OF FIRST MESSAGE TO BE SENT
1230	13327	0000	A0;ZBLOCK 2	/DESTINATION ADDRESS AND SPACE FOR CRC

1231	13330	0000		
1232			//	
1233	13332	0226		
1234	13333	0226		SYNC;SYNC;SYNC;SYNC
1235	13334	0226		
1236	13335	0226		
1237	13336	0005	SAKM,	
1238	13337	0007	ENQ;STAK	/START ACKNOWLEDGE MESSAGE
1239	13340	0300		
1240	13341	0000	FSTSEQ, 0	
1241	13342	0001	FISEL	/THEIR FIRST SEQUENCE NUMBER GOES HERE
1242	13343	0000		/OUR FIRST NUMBER,DEST.ADDR.,BCC SPAVE.
1243	13344	0000		
1244			/	
1245				
1246				
1247			EJECT	
1248			IFDEF MCRFLD <	
1249			FIELD MCRFLD%10	
1250			NAMES=6176	
1251			*TASK^2+NAMES	
1252			0404	/DD
1253			0320	/CP
1254			>	
1255				
1256			/	
1257	1400		START=DP8E	
1258	\$			

1259	ACK	0001	ENABWT	0040	NTASKS	0006	SRTA	6407
	ACKMES	3152	ENDCRC	3515	NTRY	0055	SSBE	6416
	ACKN	3155	ENG	0005	NUMBRD	3063	SSCA	6411
	AC0002	7326	EORMWT	0200	OFFON	2551	SSCD	6400
	AC2000	7332	FILL	0000	OLEN	3315	SSRG	6410
	AC3777	7350	FINAL	0100	OUTPUT	0006	SSRD	6402
	AC4000	7330	FISEL	0300	PDP8E	0001	SSTO	6403
	AC7775	7346	FORMER	2224	PFLD	3250	STAD	2735
	AC7776	7344	FORMES	3200	POST	0005	STAK	0007
	AGCFLG	2477	FREESP	3316	POSTDS	5424	START	1400
	AGCHNG	2532	FSTSEQ	3341	PWRFL	0000	STARTD	2212
	ANSWER	1726	GENCRC	3007	P377	0057	STARTM	3324
	A0	0000	GEN1	3026	RANG	1622	STRT	0006
	BKREGA	7560	GEN2	3027	RBUF	0200	STRTUP	1436
	BLKARG	0010	GEN4	3032	RCA	7565	SUSPND	0004
	BOOT	2227	GETMES	2420	RCVFLG	2471	SWAIT	1610
	BUFLEN	1000	GEXIT	2464	RCVOVR	2505	SWPWT	0400
	BUSER	2650	GOTACK	2242	RECEIV	0001	SYNC	0226
	CAL	4020	GOTMES	2210	REP	0003	TABCHR	2417
	CANCEL	2612	HANGUP	1600	REPME	2323	TACK	3207
	CANMES	2626	HBCCER	2303	REPSEQ	2327	TAGAIN	2271
	CHARD	2632	HDO	0050	RES	0004	TASK	0004
	CIFOK	1713	HD1	0051	RESAK	0005	TBUF	1204
	CKHED	3000	HD2	0052	RESEND	3310	TCA	7570
	CKSTAK	1634	HD3	0053	RING	2522	TESTC0	7560
	CL	2333	HD4	0054	RNAG	3055	TESTC1	7561
	CLKQLN	0020	HERTZ	0062	RNGFLG	2502	TESTC2	7562
	CLKTYP	0000	HGHFLD	0020	RQRPLY	2252	TESTC3	7563
	CLMESS	2343	INIWT	0000	RSET	2521	TFTABL	1251
	CLOCK	0001	INMESS	3140	RUN	0003	TIMEL	2625
	CRC	3400	INPUT	0005	RUNWT	1000	TIMO	2262
	CRCADR	3504	JEXIT	2414	RWAIT	2440	TLOOP	3234
	CRCBIT	3511	JMPTAB	2400	RWC	7564	TODH	0037
	CRCCHR	3510	JPT1	2404	SAKM	3336	TODL	0036
	CRCENT	3505	LAD	2736	SCSD	6406	TOMESS	2620
	CRCPCL	3513	LASENT	0061	SCSI	6401	TRYS	0056
	CRCPCU	3514	LASGOT	0062	SELECT	0200	TSTABL	1212
	CRCIMP	3512	LASTR	0060	SEND	0000	TSWFLG	0035
	CRC16L	3506	L1STEN	2204	SENDAC	2306	TTO	2737
	CRC16U	3507	MAD	3215	SENDM	2660	TTY	0002
	CRC2	3411	MCNT	3314	SENDNA	3033	TWAIT	2734
	CRC4	3415	MCR	0003	SENDW	0011	TWC	7567
	CRC6	3452	MCREF	0041	SENSAK	1676	UNBARG	0012

CUR	0010	MCRSYS	0001	SETIME	2600	USERWT	0100
DATE	3104	MESLEN	3145	SGRR	6404	WAITE	0002
DATE	0040	MFLD	3217	SGTT	6405	WAITM	4425
DATLEN	3106	MSGTBL	1176	SHERTZ	0062	XMTFLG	2474
DATOK	3114	MSGWT	4000	SKPINS	0006	XMTDVR	2744
DDCMP	0004	MSEND	3211	SLCC	6412	XRI	0011
DERAIL	0007	NAK	0002	SLFL	6413	XR2	0012
DLE	0220	NAKMS	3053	SMESS	1653		
DNEWT	0001	NEWSAK	1670	SDH	0201		
DPBE	1400	NNAK	3056	SRCD	6417		
EAE	0000	NOISE	2550	SRS1	6415		
EFWT	2000	NONUM	2230	SRS2	6414		

1260
 1261
 1262
 1263
 1264
 1265
 ERRORS DETECTED: 0
 LINKS GENERATED: 54

ACK	164#	292	808	807#		
ACKMES	348	351	352			
ACKN	346	810#				
AC0002	54#					
AC2000	53#					
AC3777	52#					
AC4000	51#					
AC7775	50#					
AC7776	49#					
AGCFLG	477#	517				
AGCHNG	225	503#				
AI	80#					
ANSWER	1125	1205#				
AO	74#					
AO	161#	363	722	812	1230	1242
BKREGA	133#	175	239			
BLKARG	70#					
B00T	278	286#				
BUFLEN	134#	209	260	437	739	
BUSER	237	578#	582			
CAL	58#	220	223	226	229	232
	550	788	846	874	1122	235
	550	788	846	874	1122	235
CANCEL	472	549#	554	630		367
CANMES	553	561#				372
CHARD	222	564#				542
CIFOK	1188	1192#				
CKHED	269	665#	670	671	1141	1161
					1192	

[illegible]

970093

FISEL	172#	360		809	890		1225	1239											
FORMER	282#	299																	
FORMES	308	794		825#	1156														
FREESP	972#	1220		1220															
FSTSEQ	1176	1240#																	
GENCRC	321	347		677#	678		680	682	684	685	695	705*							
GEN1	901	906		1126	1180														
GEN2	679	686		692#															
GENA	683	693#																	
GETMES	687	688		689	690		696#												
GEXIT	264	333		433#	469		470	473	1118	1136	1187								
GOTACK	463	466		469#															
GOTMES	293	301#																	
HANGUP	265	269#		334															
HBCCR	250	376		1105#	1131		1160	1179											
HDO	270	338#																	
HD1	191#	191		192	193		194	195	271	1143	1163	1194							
HD2	192#	290		733	1147		1167	1198											
HD3	193#	729																	
HD3	194#	301		755															
HD4	195#	310		761	764		1153	1172	1175										
HERTZ	43#																		
HGHFLD	10#																		
INIWT	114	130#																	
INMESS	791	798#																	
INPUT	22#	790																	
JEXIT	419	423#																	
JMPTAB	272	291		411#	415		416	417	423	424	425								
JPT1	415#	422																	
KGCADR	933	943		946	951		952	954	955	957	959	963#							
KGCCNT	937	947																	
KGC100	939	965#		964#															
KGDC2	943#	948																	
KGDEVIC	924#	925		926	927		928	929											
KGB	920	971																	
LAD	595	599		635#															
LASENT	200#	305		319	894		897	898											
LASGOT	201#	302		303	756														
LASTR	199#	312		345	703		757	765	892										

MAD	912	848#	851	853	855	857	858	873
MCNT	862	867	914#					
MCR	20#	36	371					
MCREP	100#							
MCRFLD	1248	1249						
MCRSYS	37#							
MESLEN	734	736	792	801#				
MFLD	849	850#	870					
MSGTBL	90#	91	107	827				
M2SEND	830	835#						
NAK	165#	294	718					
NAKME5	706	709	710	717#				
NAMES	1250#	1251						
NEWSAK	1171#	1202						
NNAK	704	720#						
NOISE	513	516#						
NONUM	276	290#						
NTASKS	11#	91	93					
NTRY	196#	325	326	1112	1129	1158	1177	
NUMBRD	274	728#						
OFFON	509	517#						
OLEN	859	860	882	885	904	915#		
OSFILL	34#							
OSFLDS	30#							
OSKBDV	31#							
OSSYSD	33#							
OSTTDV	32#							
OSB	29							
OUTPUT	23#							
PDP8E	7#							
PFLD	871	876#						
POST	67#	875						
POSTDS	59#	491	501	519	576	584	649	
PWRFAL	9#	204	205					
P377	198#	759	883	896	1154	1173		
RANG	1129#	1138	1139	1142	1146	1150		
RBUF	191	192	193	194	195	208#	209	435
	800						667	747
RCA	180#	181	436					
RCCB	929#	938						
RCGB	927#	944						
RCLC	928#	940						
RCRH	925#	953	958					
RCRL	926#	956						

RCVFLG	452	461	475#	489					
RCVOVR	231	480#							
RECEIV	63#	847							
REP	166#	296	359						
REPMES	322	330	331	358#					
REPSEQ	320	362#							
RES	167#								
RESAK	168#								
RESEND	295	307	879	909#					
RESTR	376	377	1103						
RING	234	495#							
RNAK	702	719#							
RNGFLG	456	478#	499						
RORPLY	297	310#							
RSET	445	484	493#	604					
RUN	65#								
RUNWT	81#								
RWAIT	449#								
RWC	179#	180	438	515					
SAKM	1181	1184	1185	1237#					
SCSD	145#	446							
SCSI	140#	1105							
SELECT	171#	172	701						
SEND	62#	368	543	551					
SENDAC	344#	353	832						
SENDM	329	350	589#	591	593	594	631	632	708
	1132	1183							909
SENDNA	283	316	339						
SENDW	71#	789	1123			700#	711	743	
SENSAK	1177#	1189	1193					752	795
SETIME	442	538#	539						
SGRR	143#	457		546	547			608	
SGTT	144#	611							

SHERTZ	44#	443	609	1207					
SKPINS	68#	221	224	227	230	233	236		
SLCC	149#	448	486	606	628	638	1109		
SLFL	150#	1107							
SMESS	1119	1158#							
SOH	163#	214	243	273					
SRCD	154#	568							
SRS1	152#								
SRS2	151#	507							
SRTA	146#								
SSBE	153#	579							
SSCA	148#	504							
SSCD	139#	565							
SSRG	147#	496							
SSRO	141#	481							
SSTO	142#	644							
STAD	592	597	601	634#					
STAK	162#	1148	1238						
START	111	1256#							
STARTD	271#	1197	1201						
STARTM	1127	1133	1134	1227#					
STRT	160#	1168	1199	1228					
STRTUP	250#	1103							
SUSPND	66#	373							
SWAIT	1118#	1120	1162	1166	1170				
SWPWT	82#								
SYNC	158#	210	211	212	213	241	355	356	357
	572	713	714	715	716	803	804	805	806
	1222	1223	1224	1233	1234	1235	1236		
	413	420	426#						
TABCHR	314	832#							
TACK	326#	335							
TAGAIN	107	109	113	129#	827	1251			
TASK	214#	260	835	880	902	907	910	911	
TBUF	182#	598							
TCA	175#	176	440	511	573				
TESTC0	176#	177							
TESTC1	177#	178							
TESTC2	178#	179							
TESTC3	93#	113							
TFTABL	540	559#							
TIMEL	266	319#							
TIMO	852	863#	868						
TLOOP	98#								
TODH	97#								
TODL	454	464	541	545	556#	613			
TOMESS	197#	324	1111						
TRYS	91#	93	109						
TSTABL									

TSMFLG	96#								
TTO	621	637#							
TTY	19#	369							
TWAIT	624	625	633#						
TWC	181#	182	602						
UDC	74								
UNBARG	72#								
USERWT	84#								
WAITE	64#								
WAITM	60#	459	617						
XMTFLG	476#	615	619	647					
XMTOVR	228	643#							
XR1	188#	240	242	244	246	248	836	866	878 881
	884	891	893	899					
	189#	856	864						
XR2	247								
-11573	245								
-11574	243								
-11575	241								
-11576	239								
-11577	1168	1199							
-11767	1148								
-11771	1144	1164	1195						
-11772	1106								
-11777	282								
-12374	517								
-12561	499								
-12562	489								
-12563	451	453	455						
-12566	447								
-12567	444								
-12570	440	511							
-12572	439								
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-12575	436								
-12576	435								
-12577	627								
-12766	623								
-12767									

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