



DECUS

PROGRAM LIBRARY

DECUS NO.	8-537
TITLE	TALKING EIGHTS
AUTHOR	Louise Gerhart
COMPANY	Digital Equipment Corporation Maynard, Massachusetts
DATE	June 5, 1972
SOURCE LANGUAGE	PAL-8


```
/TALKING EIGHTS
/WRITTEN FOR THE PDP-8/E EQUIPED WITH A DP8E
/FULL DUPLEX
/SYNC CODE = 226
/
/LOUISE GERHART
/PDP- 8 PROGRAMMING
/MAY 20, 1972
/
/
/STARTING ADDRESS- 0400
/
/THIS PROGRAM ENABLES THE USER TO SEND AND RECEIVE DATA OVER A
/FULL DUPLEX LINE. THE PROGRAM ASSUMES THE LINE IS
/INTERFACED TO THE PDP-8/E BY DIGITAL EQUIPMENT CORPORATION'S
/SYNCHRONOUS INTERFACE DP8E
/
/
/AFTER THE PROGRAM IS STARTED IT WAITS FOR AN INTERRUPT FROM EITHER
/THE DP8E OR THE TELETYPE. WHEN AN INTERRUPT OCCURS THE DEVICE IS
/SERVICED AND DATA IS EITHER TRANSMITTED OR RECEIVED
/
/
/IF THE OPERATOR WISHES TO SEND A MESSAGE, HE SHOULD TYPE THE MESSAGE
/ON THE TELETYPE. THE PDP-8 WILL BUFFER THE COMPLETE MESSAGE AND WHEN
/THE CHARACTER SLASH (/) IS TYPED THE ENTIRE MESSAGE WILL BE TRANSMITTED
/OVER THE DATAPHONE
/
/
/WHEN A COMPLETE MESSAGE (AN ENDING CHARACTER OF A SLASH) HAS BEEN
/RECEIVED FROM THE DP8E, THE PROGRAM WILL OUTPUT IT ON
/THE TELETYPE AS SOON AS THE KEYBOARD BECOMES INACTIVE. THE KEYBOARD
/BECOMES INACTIVE WHEN THE OPERATOR IS NOT IN THE PROCESS OF TYPING
/A MESSAGE
/
/
/THE PROGRAM WILL BUFFER ONLY ONE COMPLETE INCOMING MESSAGE AND ONLY ONE
/COMPLETE OUTGOING MESSAGE,
/
/
/INTERRUPTS ARE NOT TURNED ON UNTIL THE DATA SET IS READY.
/
/
/PROGRAM WILL OPERATE ON HALF DUPLEX LINES IF THE DP8E IS
/STRAPPED FOR HALF DUPLEX AND THE OPERATORS DO NOT
/ATTEMPT TO SEND MESSAGES SIMULTANEOUSLY
/
/
/
/TALKING EIGHTS
/
/
6400 SSSD=6400 /SKIP IF CHARACTER DETECT
6402 SSRO=6402 /SKIP IF RECV OVERFLOW
```

```

6403 SSTO=6403 /SKIP IF TRANSMIT OVERFLOW
6404 SGRR=6404 /RECV GO
6405 SGTT=6405 /TRANSMIT GO
6406 SCSD=6406 /CLEAR SYNC DECTECT
6410 SGR=6410 /SKIP ON RING FLAG
6411 SSCA=6411 /SKIP ON CARRIER FLAG
6412 SLCC=6412 /LOAD CONTROL
6413 SLFL=6413 /LOAD FIELD
6414 SRS2=6414 /READ STATUS REGISTER 2
6415 SRS1=6415 /READ STATUS REGISTER 1
6416 SSBE=6416 /SKIP ON BUS ERROR
/
/ACCESS ADDRESSES
7720 TECH1=7720
7721 TECH2=7721
7722 TECH3=7722
7723 TECH4=7723
7724 RWCNT=7724 /RECEIVE WORD COUNT
7725 RCA=7725 /RECEIVE CURRENT ADDRESS
7727 TWCNT=7727 /TRANSMIT WORD COUNT
7730 TCA=7730 /TRANSMIT CURRENT ADDRESS
/
0226 SYN=226 /EBCDIC SYNC CODE
2500 TOCHAR=2500 /BUFFER SIZE
/
0001 *1
0001 5100 JMP INTER
/
/
0020 *20
0020 0000 AC, 0
0021 0000 LINK, 0
0022 0000 ITMP, 0
0023 0000 KTEMP, 0
0024 0000 TCNT, 0
0025 0000 KCNT, 0
0026 0000 CNT10, 0
0027 0000 CNT11, 0
0030 0777 TOP1, 777
0031 3503 TOP2, 3477+4
0032 0000 TTYACT, 0
0033 0000 ACT637, 0
0034 1033 KEYACT, TAD ACT637 /OUTGOING BUFFER AVAILABLE?
0035 7700 SMA CLA /YES, FILL FROM KEYBOARD
0036 5577 JMP I (KEY /NO, IGNORE CHARACTERS
0037 6032 KCC
0040 5134 JMP EXIT
/
/INTERRUPT SERVICE
/
0100 *100
0100 3020 INTER, DCA AC /SAVE AC
0101 7010 RAR
0102 3021 DCA LINK /SAVE LINK
0103 6402 SSRO /SKIP ON RECEIVE OVERFLOW

```

0104	7410		SKP		
0105	5134		JMP	EXIT	/IGNORE RECEIVE OVERFLOW
0106	6410		SGGR		/SKIP ON RING FLAG
0107	7410		SKP		
0110	5134		JMP	EXIT	/IGNORE RING FLAG
0111	6403		SSTO		/SKIP ON TRANSMIT OVERFLOW
0112	7410		SKP		
0113	5576		JMP I	(OUT	
0114	6400		SSCD		/SKIP ON CHARACTER DETECT
0115	7410		SKP		
0116	5575		JMP I	(IN637	
0117	6031		KSF		/SKIP ON KEYBOARD
0120	7410		SKP		
0121	5034		JMP	KEYACT	
0122	6041		TSF		/SKIP ON PRINTER
0123	7410		SKP		
0124	5574		JMP I	(TELE1	
0125	6416		SSBE		/SKIP ON BUS ERROR
0126	7410		SKP		
0127	7402		HLT		
0130	6411		SSCA		/SKIP ON CARRIER TRANSITION
0131	7410		SKP		
0132	5134		JMP	EXIT	
0133	7402		HLT		
0134	7300	EXIT,	CLA	CLL	/OK TRYED ALL THE INTERRUPT
0135	1021		TAD	LINK	/RESTORE LINK
0136	7004		RAL		
0137	1020		TAD	AC	/RESTORE AC
0140	6001		ION		
0141	5400		JMP I	0	
		/			
	0200	*200			
0200	6406	IN637,	SCSD		/CLEAR SYNC DETECT
		/			
0201	1030	TYPE,	TAD	TOP1	
0202	3010		DCA	10	/SET AUTO INDEX 10
0203	1777		TAD I	(RWCNT	/DETERMINE THE NUMBER OF INCOMING
0204	1376		TAD	(TOCHAR	/CHARACTERS
0205	7041		CIA		
0206	3024		DCA	TCNT	/AND STORE HERE
0207	5315		JMP	TELE2	
0210	1410	HERE,	TAD I	10	/GET CHARACTER
0211	1375		TAD	(-SYN	/A SYNC?
0212	7450		SNA		
0213	5217		JMP	TELE	/YES, GET ANOTHER CHARACTER
0214	1374		TAD	(SYN	/NO
0215	6046		TLS		/TYPE IT
0216	5134		JMP	EXIT	/RESTORE INTERRUPT
		/			
0217	2024	TELE,	ISZ	TCNT	/INCREMENT COUNTER
0220	5210		JMP	HERE	/IF NOT ZERO
0221	1373		TAD	(-TOCHAR	/RESET RECV WORD COUNT
0222	3777		DCA I	(RWCNT	
0223	1030		TAD	TOP1	
0224	3772		DCA I	(RCA	/RESET CURRENT ADDRESS

0225	6404		SGRR		/RECEIVE GO
0226	6042		TCF		/CLEAR PRINTER FLAG
0227	5134		JMP	EXIT	/RESTORE INTERRUPT
/					
0230	6036	KEY,	KRB		/READ IN CHARACTER
0231	6046		TLS		/TYPE CHARACTER
0232	3023		DCA	KTEMP	/AND SAVE IT
0233	7040		CMA		
0234	3032		DCA	TTYACT	/SET KEYBOARD ACTIVE
0235	1023		TAD	KTEMP	/GET CHARACTER
0236	1371		TAD	("-/	/A SLASH?
0237	7650		SNA	CLA	
0240	5245		JMP	KEYDON	/YES
0241	1023		TAD	KTEMP	/GET CHARACTER
0242	3411		DCA	I 11	/AND SAVE IT IN BUFFER
0243	2027		ISZ	CNT11	/INCREMENT COUNTER
0244	5134		JMP	EXIT	/RESTORE INTERRUPT
/					
0245	1023	KEYDON,	TAD	KTEMP	
0246	3411		DCA	I 11	/STORE SLASH
0247	2027		ISZ	CNT11	/INCREMENT COUNTER
0250	1370		TAD	(-4	/ALLOW FOR SYNC CHARACTERS
0251	1031		TAD	TOP2	/SET
0252	3767		DCA	I (TCA	/TRANSMIT CURRENT ADDRESS
0253	1027		TAD	CNT11	/AND SET
0254	7040		CMA		
0255	3766		DCA	I (TWCNT	/AND SET WORD COUNT
0256	7040		CMA		
0257	3033		DCA	ACT637	/SET ACTIVE OUTGOING LINE
0260	1365		TAD	(5400	/SEND REQUEST TO SEND
0261	6412		SLCC		
0262	7200		CLA		
0263	6414		SRS2		/CLEAR TO SEND
0264	0364		AND	(0400	
0265	7650		SNA	CLA	
0266	5263		JMP	.-3	/NO, WAIT FOR CLEAR TO SEND
0267	6405		SGTT		/TRANSMIT GO
0270	5134		JMP	EXIT	
/					
0271	1363	OUT,	TAD	(5000	/CLEAR REQUEST TO SEND
0272	6412		SLCC		
0273	7200		CLA		
0274	1031		TAD	TOP2	/TRANSMIT OVERFLOW
0275	3011		DCA	11	/RESET BUFFER
0276	1362		TAD	(4	
0277	3027		DCA	CNT11	/4 FOR THE SYNC CHARACTERS
0300	3033		DCA	ACT637	/SET BUFFER AVAILABLE
0301	5134		JMP	EXIT	/RESTORE INTERRUPT
/					
/					
0302	1032	TELE1,	TAD	TTYACT	/KEYBOARD ACTIVE
0303	7700		SMA	CLA	
0304	5217		JMP	TELE	
0305	3032		DCA	TTYACT	/SET KEYBOARD INACTIVE
0306	6042		TCF		/CLEAR PRINTER FLAG

0307	1023	TAD	KTEMP	/WAS LAST CHARACTER READ A
0310	1361	TAD	(-215	/CARRIAGE RETURN???
0311	7640	SZA	CLA	
0312	5315	JMP	TELE2	/NO, PROCEED
0313	1360	TAD	(212	/TYPE A LINE FEED
0314	5231	JMP	KEY+1	/AND STORE IT
0315	1024	TELE2, TAD	TCNT	/ANY DATA RECEIVED?
0316	7650	SNA	CLA	
0317	5134	JMP	EXIT	/NO
0320	1033	TAD	ACT637	/BUFFER ACTIVE?
0321	7640	SZA	CLA	
0322	5210	JMP	HERE	/YES
0323	1027	TAD	CNT11	/OUTGOING DATA?
0324	1370	TAD	(-4	
0325	7650	SNA	CLA	
0326	5210	JMP	HERE	/NO
0327	5134	JMP	EXIT	/YES

0360 0212
0361 7563
0362 0004
0363 5000
0364 0400
0365 5400
0366 7727
0367 7730
0370 7774
0371 7521
0372 7725
0373 5300
0374 0226
0375 7552
0376 2500
77 7724
0400

*400
/

0400	7200	BEGIN, CLA		
0401	1030	TAD	TOP1	/SET UP BUFFERS
0402	3010	DCA	10	
0403	1031	TAD	TOP2	
0404	3011	DCA	11	
0405	1377	TAD	(4	
0406	3027	DCA	CNT11	
0407	3032	DCA	TTYACT	/CLEAR SWITCHES
0410	3033	DCA	ACT637	
0411	7200	CLA		
0412	6413	SLFL		/SET FIELD
0413	1376	TAD	(257	/SET CHARACTER DETECT
0414	3775	DCA I	(TECH1	
0415	1376	TAD	(257	
0416	3774	DCA I	(TECH2	
0417	1376	TAD	(257	
0420	3773	DCA I	(TECH3	
0421	1376	TAD	(257	
0422	3772	DCA I	(TECH4	

0423	1371	TAD	(-TOCHAR	/SET RECV WORD COUNT
0424	3770	DCA I	(RWCNT	
0425	1030	TAD	TOP1	/SET RECV CURRENT ADDRESS
0426	3767	DCA I	(RCA	
0427	6404	SGRR		/RECV GO
0430	1366	TAD	(5000	/ENABLE INTERFACE AND SET
0431	6412	SLCC		/TERMINAL READY
0432	7200	CLA		
0433	6415	SRS1		
0434	0365	AND	(020	/DATA SET READY?
0435	7650	SNA CLA		
0436	5233	JMP	.-3	/NO
0437	6001	ION		/YES
0440	5240	JMP	.	
0565	0020			
0566	5000			
0567	7725			
0570	7724			
0571	5300			
0572	7723			
0573	7722			
0574	7721			
0575	7720			
0576	0257			
0577	0004			
	3500			
	*3500			
3500	0226	SYN		
3501	0226	SYN		
3502	0226	SYN		
3503	0226	SYN		
	/			
	\$			
0174	0302			
0175	0200			
0176	0271			
0177	0230			

0000	01000000	00000000	11111111	11111111	10000000	00000000	00000000	00000000
0100	11111111	11111111	11111111	11111111	11000000	00000000	00000000	00001111
0200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0300	11111111	11111111	11111111	00000000	00000000	00000000	11111111	11111111
0400	11111111	11111111	11111111	11111111	10000000	00000000	00000000	00000000
0500	00000000	00000000	00000000	00000000	00000000	00000000	00000111	11111111

0600
0700

1000
1100
1200
1300
1400
1500
1600
1700

2000
2100
2200
2300
2400
2500
2600
2700

3000
3100
3200
3300

3400	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
3500	11110000	00000000	00000000	00000000	00000000	00000000	00000000	00000000

3600
3700

4000
4100

4200
4300

4400
4500

4600
4700

5000
5100

5200
5300

5400
5500

5600
5700

6000
6100

6200
6300

6400
6500

6600
6700

7000
7100

7200
7300

7400
7500

7600
7700

AC	0020
ACT637	0033
BEGIN	0400
CNT10	0026
CNT11	0027
EXIT	0134
HERE	0210
IN637	0200
INTER	0100
ITMP	0022
KCNT	0025
KEY	0230
KEYACT	0034
KEYDON	0245
KTEMP	0023
LINK	0021
OUT	0271
RCA	7725
RWCNT	7724
SCSD	6406
SGGR	6410
SGRR	6404
SGTT	6405
SLCC	6412
SLFL	6413
SRS1	6415
SRS2	6414
SSBE	6416
SSCA	6411
SSCD	6400
SSRO	6402
SSTO	6403
SYN	0226
TCA	7730
TCNT	0024
TECH1	7720
TECH2	7721
TECH3	7722
TECH4	7723
TELE	0217
TELE1	0302
TELE2	0315
TOCHAR	2500
TOP1	0030
TOP2	0031
TTYACT	0032
TWCNT	7727
TYPE	0201

ERRORS DETECTED: 0

LINKS GENERATED: 0

