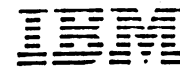


U.1-80



*Personal Computer
Hardware Reference
Library*

IBM PCjr SPEECH ATTACHMENT

IBM PC^{jr} Speech Attachment Technical Reference

6138761

First Edition (June 1984)

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```

0200 00 00
0201 00 00
0202 00 00
0203 00 00
0204 00 00
0205 00 00
0206 00 00
0207 00 00
0208 00 00
0209 00 00
0210 00 00
0211 00 00
0212 00 00
0213 00 00
0214 00 00
0215 00 00
0216 00 00
0217 00 00
0218 00 00
0219 00 00
0220 00 00
0221 00 00
0222 00 00
0223 00 00
0224 00 00
0225 00 00
0226 00 00
0227 00 00
0228 00 00
0229 00 00
0230 00 00
0231 00 00
0232 00 00
0233 00 00
0234 00 00
0235 00 00
0236 00 00
0237 00 00
0238 00 00
0239 00 00
0240 00 00
0241 00 00
0242 00 00
0243 00 00
0244 00 00
0245 00 00
0246 00 00
0247 00 00
0248 00 00
0249 00 00
0250 00 00
0251 00 00
0252 00 00
0253 00 00
0254 00 00
0255 00 00
0256 00 00
0257 00 00
0258 00 00
0259 00 00
0260 00 00
0261 00 00
0262 00 00
0263 00 00
0264 00 00
0265 00 00
0266 00 00
0267 00 00
0268 00 00
0269 00 00
0270 00 00
0271 00 00
0272 00 00
0273 00 00
0274 00 00
0275 00 00
0276 00 00
0277 00 00
0278 00 00
0279 00 00
0280 00 00
0281 00 00
0282 00 00
0283 00 00
0284 00 00
0285 00 00
0286 00 00
0287 00 00
0288 00 00
0289 00 00
0290 00 00
0291 00 00
0292 00 00
0293 00 00
0294 00 00
0295 00 00
0296 00 00
0297 00 00
0298 00 00
0299 00 00
0300 00 00

```

```

0300 00 00
0301 00 00
0302 00 00
0303 00 00
0304 00 00
0305 00 00
0306 00 00
0307 00 00
0308 00 00
0309 00 00
0310 00 00
0311 00 00
0312 00 00
0313 00 00
0314 00 00
0315 00 00
0316 00 00
0317 00 00
0318 00 00
0319 00 00
0320 00 00
0321 00 00
0322 00 00
0323 00 00
0324 00 00
0325 00 00
0326 00 00
0327 00 00
0328 00 00
0329 00 00
0330 00 00
0331 00 00
0332 00 00
0333 00 00
0334 00 00
0335 00 00
0336 00 00
0337 00 00
0338 00 00
0339 00 00
0340 00 00
0341 00 00
0342 00 00
0343 00 00
0344 00 00
0345 00 00
0346 00 00
0347 00 00
0348 00 00
0349 00 00
0350 00 00
0351 00 00
0352 00 00
0353 00 00
0354 00 00
0355 00 00
0356 00 00
0357 00 00
0358 00 00
0359 00 00
0360 00 00
0361 00 00
0362 00 00
0363 00 00
0364 00 00
0365 00 00
0366 00 00
0367 00 00
0368 00 00
0369 00 00
0370 00 00
0371 00 00
0372 00 00
0373 00 00
0374 00 00
0375 00 00
0376 00 00
0377 00 00
0378 00 00
0379 00 00
0380 00 00
0381 00 00
0382 00 00
0383 00 00
0384 00 00
0385 00 00
0386 00 00
0387 00 00
0388 00 00
0389 00 00
0390 00 00
0391 00 00
0392 00 00
0393 00 00
0394 00 00
0395 00 00
0396 00 00
0397 00 00
0398 00 00
0399 00 00
0400 00 00

```

```

0000 0100 R
0001 0100
0002 00 0100
0003 01 0100 R
0004 01 0100 R
0005 01 0100 R
0006 01 0100 R
0007 01 0100 R
0008 01 0100 R
0009 01 0100 R
0010 01 0100 R
0011 01 0100 R
0012 01 0100 R
0013 01 0100 R
0014 01 0100 R
0015 01 0100 R
0016 01 0100 R
0017 01 0100 R
0018 01 0100 R
0019 01 0100 R
0020 01 0100 R
0021 01 0100 R
0022 01 0100 R
0023 01 0100 R
0024 01 0100 R
0025 01 0100 R
0026 01 0100 R
0027 01 0100 R
0028 01 0100 R
0029 01 0100 R
0030 01 0100 R
0031 01 0100 R
0032 01 0100 R
0033 01 0100 R
0034 01 0100 R
0035 01 0100 R
0036 01 0100 R
0037 01 0100 R
0038 01 0100 R
0039 01 0100 R
0040 01 0100 R
0041 01 0100 R
0042 01 0100 R
0043 01 0100 R
0044 01 0100 R
0045 01 0100 R
0046 01 0100 R
0047 01 0100 R
0048 01 0100 R
0049 01 0100 R
0050 01 0100 R
0051 01 0100 R
0052 01 0100 R
0053 01 0100 R
0054 01 0100 R
0055 01 0100 R
0056 01 0100 R
0057 01 0100 R
0058 01 0100 R
0059 01 0100 R
0060 01 0100 R
0061 01 0100 R
0062 01 0100 R
0063 01 0100 R
0064 01 0100 R
0065 01 0100 R
0066 01 0100 R
0067 01 0100 R
0068 01 0100 R
0069 01 0100 R
0070 01 0100 R
0071 01 0100 R
0072 01 0100 R
0073 01 0100 R
0074 01 0100 R
0075 01 0100 R
0076 01 0100 R
0077 01 0100 R
0078 01 0100 R
0079 01 0100 R
0080 01 0100 R
0081 01 0100 R
0082 01 0100 R
0083 01 0100 R
0084 01 0100 R
0085 01 0100 R
0086 01 0100 R
0087 01 0100 R
0088 01 0100 R
0089 01 0100 R
0090 01 0100 R
0091 01 0100 R
0092 01 0100 R
0093 01 0100 R
0094 01 0100 R
0095 01 0100 R
0096 01 0100 R
0097 01 0100 R
0098 01 0100 R
0099 01 0100 R
0100 01 0100 R

```

```

INIT:
MOV AX, 0100H ; LOAD CODE ON THE 4K BOARD
MOV ES, AX
MOV DI, 0100H ; OFFSET BC, START
PUSH DI ; SAVE DI FOR LATER
MOV SI, DI ; ES, DI+LOCATION TO PUT CODE
PUSH CS ; US S1 LOC OF CODE TO LIST
POP DS ; NUMBER OF WORDS TO MOVE
MOV CX, 0000H ; SAVE CX FOR LATER USE
PUSH CX ; MOVE THE CODE TO RAM
REP MOVSB

PUSH ES ; SAVE REGS ADDRESSING RAM
CALL 0000H ; CALL RAM CODE

POP ES ; RESTORE REGS ADDRESSING
POP CX ; RAM
POP DI ; AX=0
ADR AX, AX
REP STOSB ; RESTORE USED RAM TO ZEROS

```

```

THIS CODE LOADS THE NEEDED INTERRUPT VECTORS
FOR AX, AX
MOV DS, AX
MOV WORD PTR TALKER_PIR, OFFSET START
MOV WORD PTR TALKER_PIR+2, CS
MOV WORD PTR TALKER_DIAG_PIR, OFFSET TALKER2_DIAG
MOV WORD PTR TALKER_DIAG_PIR+2, CS

```

POWER ON SELF TEST

DESCRIPTION:
TIMER CHANNELS ON THE 825A ARE TESTED FOR STUCK BITS. TIMER 1'S RESPONSE TO TIMER 0 IS CHECKED. HARDWARE ON THE CARD IS RESET (SEE BIOS RESET COMMAND)

ERROR CODES: (SOME MAY BE PASSED BY CODE PREVIOUSLY EXECUTED FROM RAM)
CUSTOMER LEVEL: J
SERVICE LEVEL: 2000

AA = 01 PART A FAIL MODE 03H
02 = 0 " " " " " "
03 = 0 " " " " " "
04 = 0 " " " " " "
05 = 0 " " " " " "

10 STUCK BIT IN TIMER CHANNEL 0
11 STUCK BIT IN TIMER CHANNEL 1
12 STUCK BIT IN TIMER CHANNEL 2
13 CVSD FRAME NOT CHANGING
14 CVSD CLOCK NOT CHANGING
15 CVSD FRAME NOT RESPONDING TO CVSD CLOCK AS EXPECTED
21 ALL ERROR DURING CARD RESET
26 TIMEOUT WAITING FOR LPC COMPLETION DURING CARD RESET

PORT A = F800H
PORT B = F800H
PORT C = F800H

TEST: 825A PROGRAMMABLE INTERVAL TIMER TEST

DESCRIPTION:
TEST FOR STUCK BITS IN TIMER CHANNELS 0, 1, AND 2.
TEST TO SEE THAT THE OUTPUT OF TIMER 0 IS WORKING
VERIFY THAT TIMER 1 DIVIDES TIMER 0 BY 8

NOTES:
COUNTER 0 = CVSD BIT CLOCK
COUNTER 1 = CVSD FRAME
COUNTER 2 = LPC INTERRUPT CLOCK

RESET HARDWARE INTO A KNOWN STATE

```

0060 10 0100 R
0061 0A 00
0062 10 00
0063 10 0100 R

```

```

CALL PDI TALKER ; INIT 8255, 8254, ACF
OR AL, AL ; AL = 00 PASSED, ELSE FAILED
JZ 1075H ; PASSED
JMP CARD_RESET_ERR ; REPORT CARD RESET ERROR

SET INITIAL COUNT FOR CNTS 0, 1, AND 2 TO TEST FOR STUCK BITS
1075H:
MOV AL, CTR0+HW ; BINARY ; FOR CNT 0254
MOV CR, CVSD_CLK ; COUNTER 0
MOV BR, OFFSET ; INITIAL COUNT FOR COUNTER 0
CALL INIT_TIMER ; SET INITIAL COUNT

MOV AL, CTR1+HW ; BINARY ; FOR CNT 0254
INC CR ; COUNTER 1 HAS CVSD FRAME ADDR
MOV BR, 0 ; INITIAL COUNT FOR CTR 1 IS 0
CALL INIT_TIMER ; SET INITIAL COUNT

MOV AL, CTR2+HW ; BINARY ; FOR LPC AND TIMER
INC CR ; COUNTER 2 HAS INTR LDR ADDR
MOV BR, 0 ; INITIAL COUNT IS 0
CALL INIT_TIMER ; SET INITIAL COUNT

```

```

0290 511
0291 00 ---- R
0292 0E 00 R
0293 0E 00 R
0294 0E 00 R
0295 0E 00 R
0296 0E 00 R
0297 0E 00 R
0298 0E 00 R
0299 0E 00 R
029A 0E 00 R
029B 0E 00 R
029C 0E 00 R
029D 0E 00 R
029E 0E 00 R
029F 0E 00 R
02A0 0E 00 R
02A1 0E 00 R
02A2 0E 00 R
02A3 0E 00 R
02A4 0E 00 R
02A5 0E 00 R
02A6 0E 00 R
02A7 0E 00 R
02A8 0E 00 R
02A9 0E 00 R
02AA 0E 00 R
02AB 0E 00 R
02AC 0E 00 R
02AD 0E 00 R
02AE 0E 00 R
02AF 0E 00 R
02B0 0E 00 R
02B1 0E 00 R
02B2 0E 00 R
02B3 0E 00 R
02B4 0E 00 R
02B5 0E 00 R
02B6 0E 00 R
02B7 0E 00 R
02B8 0E 00 R
02B9 0E 00 R
02BA 0E 00 R
02BB 0E 00 R
02BC 0E 00 R
02BD 0E 00 R
02BE 0E 00 R
02BF 0E 00 R
02C0 0E 00 R
02C1 0E 00 R
02C2 0E 00 R
02C3 0E 00 R
02C4 0E 00 R
02C5 0E 00 R
02C6 0E 00 R
02C7 0E 00 R
02C8 0E 00 R
02C9 0E 00 R
02CA 0E 00 R
02CB 0E 00 R
02CC 0E 00 R
02CD 0E 00 R
02CE 0E 00 R
02CF 0E 00 R
02D0 0E 00 R
02D1 0E 00 R
02D2 0E 00 R
02D3 0E 00 R
02D4 0E 00 R
02D5 0E 00 R
02D6 0E 00 R
02D7 0E 00 R
02D8 0E 00 R
02D9 0E 00 R
02DA 0E 00 R
02DB 0E 00 R
02DC 0E 00 R
02DD 0E 00 R
02DE 0E 00 R
02DF 0E 00 R
02E0 0E 00 R
02E1 0E 00 R
02E2 0E 00 R
02E3 0E 00 R
02E4 0E 00 R
02E5 0E 00 R
02E6 0E 00 R
02E7 0E 00 R
02E8 0E 00 R
02E9 0E 00 R
02EA 0E 00 R
02EB 0E 00 R
02EC 0E 00 R
02ED 0E 00 R
02EE 0E 00 R
02EF 0E 00 R
02F0 0E 00 R
02F1 0E 00 R
02F2 0E 00 R
02F3 0E 00 R
02F4 0E 00 R
02F5 0E 00 R
02F6 0E 00 R
02F7 0E 00 R
02F8 0E 00 R
02F9 0E 00 R
02FA 0E 00 R
02FB 0E 00 R
02FC 0E 00 R
02FD 0E 00 R
02FE 0E 00 R
02FF 0E 00 R

```

```

0298 00 R6
0299 10 41
029A 00 0511
029B 10 42
029C 0A C4
029D 10 42
029E 10 42
029F 10 42
02A0 10 42
02A1 10 42
02A2 10 42
02A3 10 42
02A4 10 42
02A5 10 42
02A6 10 42
02A7 10 42
02A8 10 42
02A9 10 42
02AA 10 42
02AB 10 42
02AC 10 42
02AD 10 42
02AE 10 42
02AF 10 42
02B0 10 42
02B1 10 42
02B2 10 42
02B3 10 42
02B4 10 42
02B5 10 42
02B6 10 42
02B7 10 42
02B8 10 42
02B9 10 42
02BA 10 42
02BB 10 42
02BC 10 42
02BD 10 42
02BE 10 42
02BF 10 42
02C0 10 42
02C1 10 42
02C2 10 42
02C3 10 42
02C4 10 42
02C5 10 42
02C6 10 42
02C7 10 42
02C8 10 42
02C9 10 42
02CA 10 42
02CB 10 42
02CC 10 42
02CD 10 42
02CE 10 42
02CF 10 42
02D0 10 42
02D1 10 42
02D2 10 42
02D3 10 42
02D4 10 42
02D5 10 42
02D6 10 42
02D7 10 42
02D8 10 42
02D9 10 42
02DA 10 42
02DB 10 42
02DC 10 42
02DD 10 42
02DE 10 42
02DF 10 42
02E0 10 42
02E1 10 42
02E2 10 42
02E3 10 42
02E4 10 42
02E5 10 42
02E6 10 42
02E7 10 42
02E8 10 42
02E9 10 42
02EA 10 42
02EB 10 42
02EC 10 42
02ED 10 42
02EE 10 42
02EF 10 42
02F0 10 42
02F1 10 42
02F2 10 42
02F3 10 42
02F4 10 42
02F5 10 42
02F6 10 42
02F7 10 42
02F8 10 42
02F9 10 42
02FA 10 42
02FB 10 42
02FC 10 42
02FD 10 42
02FE 10 42
02FF 10 42

```

```

0298 0C 03
0299 10 41
029A 10 41
029B 10 41
029C 10 41
029D 10 41
029E 10 41
029F 10 41
02A0 10 41
02A1 10 41
02A2 10 41
02A3 10 41
02A4 10 41
02A5 10 41
02A6 10 41
02A7 10 41
02A8 10 41
02A9 10 41
02AA 10 41
02AB 10 41
02AC 10 41
02AD 10 41
02AE 10 41
02AF 10 41
02B0 10 41
02B1 10 41
02B2 10 41
02B3 10 41
02B4 10 41
02B5 10 41
02B6 10 41
02B7 10 41
02B8 10 41
02B9 10 41
02BA 10 41
02BB 10 41
02BC 10 41
02BD 10 41
02BE 10 41
02BF 10 41
02C0 10 41
02C1 10 41
02C2 10 41
02C3 10 41
02C4 10 41
02C5 10 41
02C6 10 41
02C7 10 41
02C8 10 41
02C9 10 41
02CA 10 41
02CB 10 41
02CC 10 41
02CD 10 41
02CE 10 41
02CF 10 41
02D0 10 41
02D1 10 41
02D2 10 41
02D3 10 41
02D4 10 41
02D5 10 41
02D6 10 41
02D7 10 41
02D8 10 41
02D9 10 41
02DA 10 41
02DB 10 41
02DC 10 41
02DD 10 41
02DE 10 41
02DF 10 41
02E0 10 41
02E1 10 41
02E2 10 41
02E3 10 41
02E4 10 41
02E5 10 41
02E6 10 41
02E7 10 41
02E8 10 41
02E9 10 41
02EA 10 41
02EB 10 41
02EC 10 41
02ED 10 41
02EE 10 41
02EF 10 41
02F0 10 41
02F1 10 41
02F2 10 41
02F3 10 41
02F4 10 41
02F5 10 41
02F6 10 41
02F7 10 41
02F8 10 41
02F9 10 41
02FA 10 41
02FB 10 41
02FC 10 41
02FD 10 41
02FE 10 41
02FF 10 41

```

```

0298 0C 03
0299 10 41
029A 10 41
029B 10 41
029C 10 41
029D 10 41
029E 10 41
029F 10 41
02A0 10 41
02A1 10 41
02A2 10 41
02A3 10 41
02A4 10 41
02A5 10 41
02A6 10 41
02A7 10 41
02A8 10 41
02A9 10 41
02AA 10 41
02AB 10 41
02AC 10 41
02AD 10 41
02AE 10 41
02AF 10 41
02B0 10 41
02B1 10 41
02B2 10 41
02B3 10 41
02B4 10 41
02B5 10 41
02B6 10 41
02B7 10 41
02B8 10 41
02B9 10 41
02BA 10 41
02BB 10 41
02BC 10 41
02BD 10 41
02BE 10 41
02BF 10 41
02C0 10 41
02C1 10 41
02C2 10 41
02C3 10 41
02C4 10 41
02C5 10 41
02C6 10 41
02C7 10 41
02C8 10 41
02C9 10 41
02CA 10 41
02CB 10 41
02CC 10 41
02CD 10 41
02CE 10 41
02CF 10 41
02D0 10 41
02D1 10 41
02D2 10 41
02D3 10 41
02D4 10 41
02D5 10 41
02D6 10 41
02D7 10 41
02D8 10 41
02D9 10 41
02DA 10 41
02DB 10 41
02DC 10 41
02DD 10 41
02DE 10 41
02DF 10 41
02E0 10 41
02E1 10 41
02E2 10 41
02E3 10 41
02E4 10 41
02E5 10 41
02E6 10 41
02E7 10 41
02E8 10 41
02E9 10 41
02EA 10 41
02EB 10 41
02EC 10 41
02ED 10 41
02EE 10 41
02EF 10 41
02F0 10 41
02F1 10 41
02F2 10 41
02F3 10 41
02F4 10 41
02F5 10 41
02F6 10 41
02F7 10 41
02F8 10 41
02F9 10 41
02FA 10 41
02FB 10 41
02FC 10 41
02FD 10 41
02FE 10 41
02FF 10 41

```

```

02BA 50
02BB 01 00
02BC 02 00
02BD 00 05C5 R
02BE 00 05C5 R
02BF 00 05C5 R
02C0 00 05C5 R
02C1 00 05C5 R
02C2 00 05C5 R
02C3 00 05C5 R
02C4 00 05C5 R
02C5 00 05C5 R
02C6 00 05C5 R
02C7 00 05C5 R
02C8 00 05C5 R
02C9 00 05C5 R
02CA 00 05C5 R
02CB 00 05C5 R
02CC 00 05C5 R
02CD 00 05C5 R
02CE 00 05C5 R
02CF 00 05C5 R
02D0 00 05C5 R
02D1 00 05C5 R
02D2 00 05C5 R
02D3 00 05C5 R
02D4 00 05C5 R
02D5 00 05C5 R
02D6 00 05C5 R
02D7 00 05C5 R
02D8 00 05C5 R
02D9 00 05C5 R
02DA 00 05C5 R
02DB 00 05C5 R
02DC 00 05C5 R
02DD 00 05C5 R
02DE 00 05C5 R
02DF 00 05C5 R
02E0 00 05C5 R
02E1 00 05C5 R
02E2 00 05C5 R
02E3 00 05C5 R
02E4 00 05C5 R
02E5 00 05C5 R
02E6 00 05C5 R
02E7 00 05C5 R
02E8 00 05C5 R
02E9 00 05C5 R
02EA 00 05C5 R
02EB 00 05C5 R
02EC 00 05C5 R
02ED 00 05C5 R
02EE 00 05C5 R
02EF 00 05C5 R
02F0 00 05C5 R
02F1 00 05C5 R
02F2 00 05C5 R
02F3 00 05C5 R
02F4 00 05C5 R
02F5 00 05C5 R
02F6 00 05C5 R
02F7 00 05C5 R
02F8 00 05C5 R
02F9 00 05C5 R
02FA 00 05C5 R
02FB 00 05C5 R
02FC 00 05C5 R
02FD 00 05C5 R
02FE 00 05C5 R
02FF 00 05C5 R

```

```

PUSH AX
MOV AX, 0100H
MOV DS, AX
INC PORT_A ; SET ERROR FLAG NON-ZERO
POP AX
POP DS
ASSUME DS NOTHING
RET ; RETURN TO CALLER

```

```

ROUTINE TO SOUND BEEPER
THIS PROC WILL SOUND THE BEEPER FOR A TIME DETERMINED BY THE CONTENTS OF DI.
ON EXIT: AX AND DI ARE DESTROYED
BEEP PROC NEAR
MOV AX, INITIAL_TIMER ; SET TIMER 2, LSB, MSB, BINARY
OUT TIMER+1, AX ; WRITE THE TIMER MODE REG
MOV AX, 555H ; DIVISOR FOR 1000 HZ
OUT TIMER+2, AX ; WRITE TIMER 2 CNT - LSB
MOV AX, AX ; WRITE TIMER 2 CNT - MSB
OUT TIMER+2, AX ; WRITE TIMER 2 CNT - MSB
IN AX, PORT_B ; GET CURRENT SITTING OF PORT
MOV AX, PORT_B ; SAVE THAT SITTING

```

```

OR AL, 03 ; TURN SPEAKER ON
OUT PORT_B, AL
XOR CX, CX ; SET DELAY COUNT
GF: LOOP GF ; DELAY BEFORE TURNING OFF
DEC BL ; DELAY CNT EXPIRED?
GF: JNZ GF ; NO - CONTINUE BEEPING SPK
MOV AX, AX ; RECOVER VALUE OF PCNT
OUT PORT_B, AL ; RETURN TO CALLER
BEEP ENDP

```

```

KPC_BYTE PROC NEAR
THIS PROC TO PRINT A HEX BYTE TO THE SCREEN.
THE CURSOR POSITION MUST BE SET ALREADY.
PASS: AX = BYTE TO PRINT
RETURNS: CX AND AX DESTROYED, FLAGS 100
KPC_BYTE PROC NEAR
PUSH AX
MOV CX, 4
SHR AX, CL
CALL KPC_BYTE
POP AX
AND AX, 0FH
KPC_BYTE ENDP

```

```

KPC_BYTE PROC NEAR
PUSH AX
MOV AX, 10
MOV BX, 0
INT 10H
POP AX
KPC_BYTE ENDP

```

```

KPC_BYTE PROC NEAR
PUSH AX
MOV AX, 10
MOV BX, 0
INT 10H
POP AX
KPC_BYTE ENDP

```

```

BLEN = (S-BC_START+1)/2
INIT ENDP

```

CVSD and LPC

AN = 0 RESET LAND

AN = 1 CVSD (Continuously variable Slope Delta)

AL = 0 - CVSD RECORD (using speed table)
DS:SI = segment offset
(note 1 below)
BL = table speed
= 0 = 1800 bytes/sec
= 1 = 2400 bytes/sec
= 2 = 3000 bytes/sec
= 3 = 3600 bytes/sec
= 4 = 4200 bytes/sec
= 5 = 4800 bytes/sec
CR = byte count (note 2 below)

AL = 1 - CVSD PIA/RACH (using speed table)
DS:SI = segment offset
(note 1 below)
BL = table speed
= 0 = 1800 bytes/sec
= 1 = 2400 bytes/sec
= 2 = 3000 bytes/sec
= 3 = 3600 bytes/sec
= 4 = 4200 bytes/sec
= 5 = 4800 bytes/sec
CR = byte count (note 2 below)

AL = 2 - CVSD RECORD (using user speed)
DS:SI = segment offset
(note 1 below)
BX = user speed divisor
(note 1 below)

Speech Attachment 31

DESCRIPTION: THIS UNIT IS USED FOR... BEGINNING OF THE LINE...

Table with columns for unit numbers (e.g., 0001, 0002) and descriptions (e.g., UNIT, UNIT).

TABLE OF DIVISIONS FOR DIFFERENT CVDN MODES: UNIT, UNIT, UNIT...

ASSUME CVDN MODES: UNIT, UNIT, UNIT...

ROUTING INFO FROM SYSTEM BIOS: UNIT, UNIT, UNIT...

CUSTOMER LEVEL: UNIT, UNIT, UNIT...

POST BEHAVIOR: UNIT, UNIT, UNIT...

38 Speech Attachment

Table with columns for unit numbers (e.g., 0001, 0002) and descriptions (e.g., UNIT, UNIT).

TABLE OF DIVISIONS FOR DIFFERENT CVDN MODES: UNIT, UNIT, UNIT...

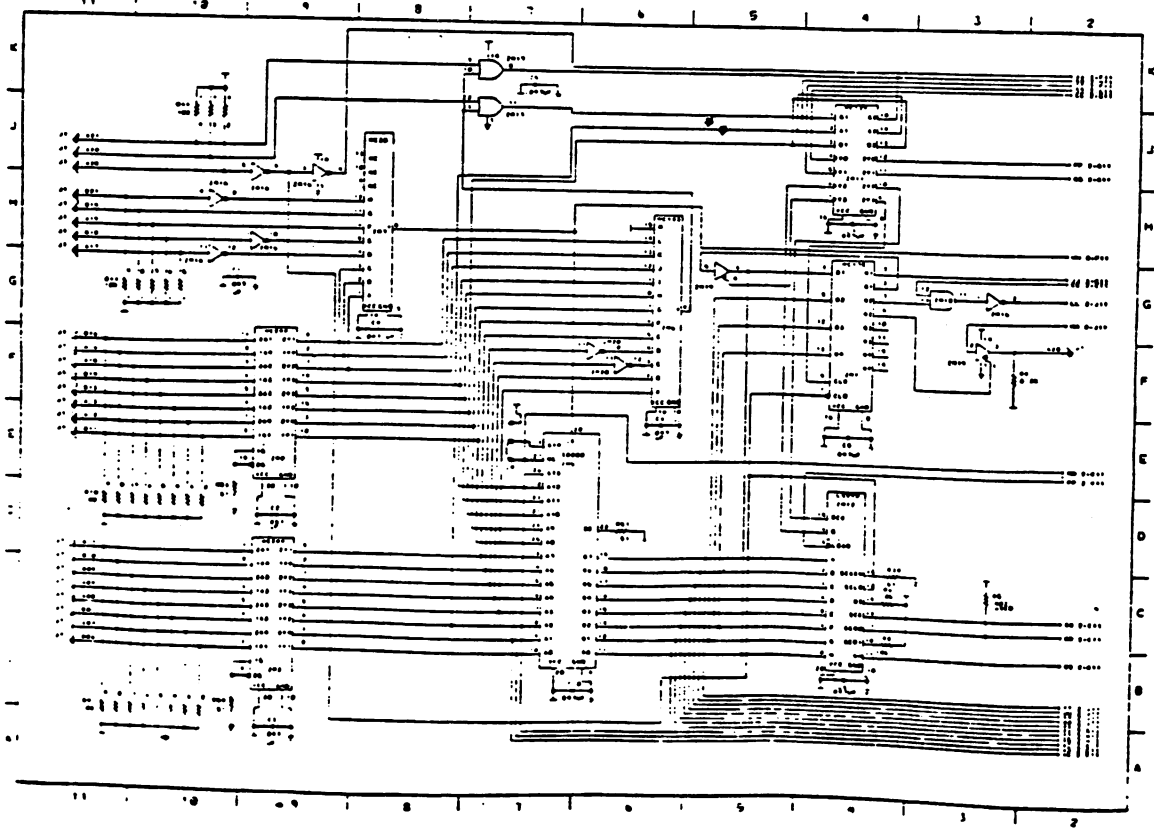
ASSUME CVDN MODES: UNIT, UNIT, UNIT...

ROUTING INFO FROM SYSTEM BIOS: UNIT, UNIT, UNIT...

CUSTOMER LEVEL: UNIT, UNIT, UNIT...

POST BEHAVIOR: UNIT, UNIT, UNIT...

UNIT, UNIT, UNIT...



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IN 00 AL, NMI_PIR1
MOV 01 AL, BOH
OUT 02 NMI_PORT, AL
LPC02A: MOV AL, LPC_INTRIG
        JMP EPCA_CD_ID_EXIT

LPC03:
        PUSH AN
        ;SAVE LPC_IRQ REQUEST
        ;-- SET LPC IN PROGRESS FLAG (0255 PORT A)
        MOV DR, PORTA
        IN DR, AL
        OUT AL, PORTA
        ;-- REFERENCE NMI AND HARDWARE INTERRUPTS
        ;ENABLE HARDWARE INT'S
        MOV AL, NMI_PORT
        OUT NMI_PORT, AL
        ;ENABLE NMI
        ;-- MAKE SURE ACL IS ENABLED
        CALL CLPWR_ACL
        ;ACL ENABLED?
        ;YES, CONTINUE
        PUSH CTR
        CALL ATTACH_ACL
        POP CTR
        ;ENABLE CARD ACL
        JNC LPAON
        ;ADJUST STACK
        JMP LPC_ERR_EXIT

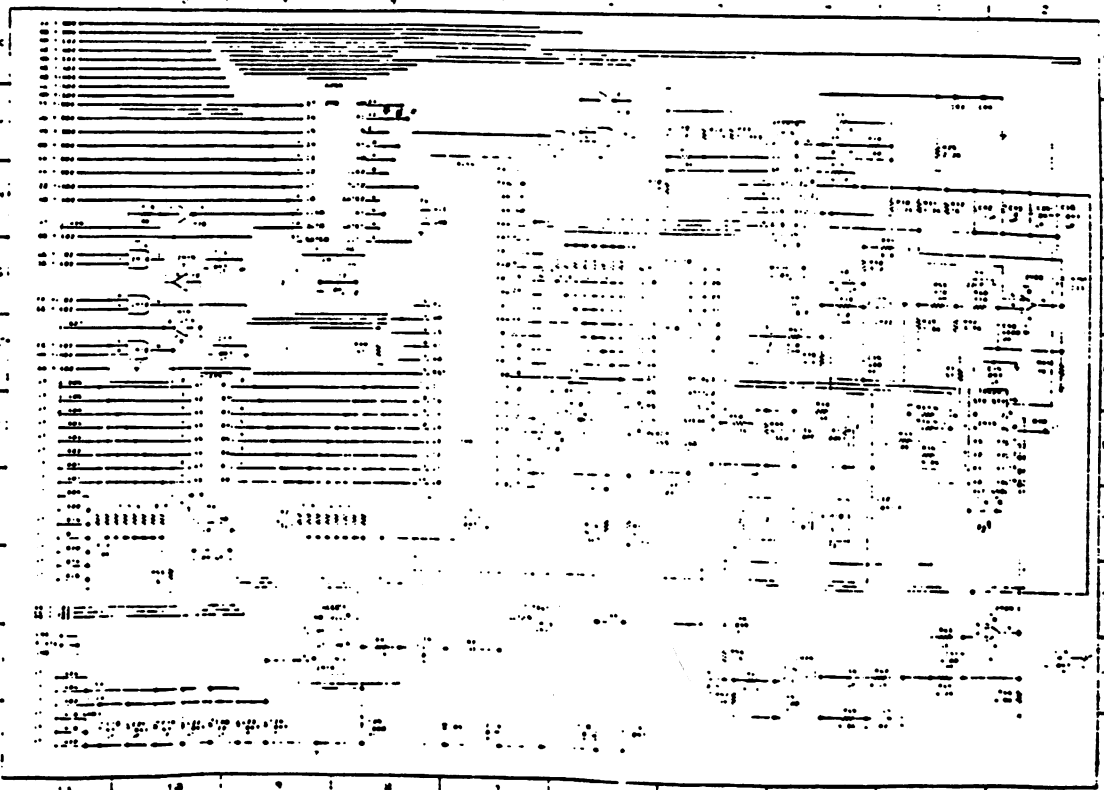
LPC04: OR BP, BP
        JNZ LPC10
        ;FOH ON BACKGROUND?
        ;IF FURE, DON'T TOUCH VECTORS
        ;-- SET DS = 0
        MOV DS, AX
        MOV DS, AX

        ASSUME DS:DUMMY
        ;-- CHECK TO SEE IF LPC INTR VECTOR HAS BEEN SET
        MOV AX, WORD PTR LPC_PIR
        ;LOOK AT INT 9 VECTOR
        CWD
        ;POINTING TO INT 9 VECTOR
        JNE LPA05
        MOV AX, CS
        ;--NMI ADDR CORRECT?
        MOV BP, AX
        ;AL: WORD PTR LPC_PIR+2
        ;IF NOT, SETUP INT 9
        JZ LPA10

        ;-- RED INTR VECTOR --> ONEH INTR
        ;-- DISABLE INTERRUPTS (NMI & OTHERS)
        MOV AL, PORT
        ;DISABLE NMI & HOLD REQUEST
        OUT NMI_PORT, AL
        ;DISABLE INTERRUPTS
        MOV AX, WORD PTR OLD9_PIR
        ;-- NMI PORT, AX
        MOV BP, AX
        ;SAVE OLD RED PIR
        MOV WORD PTR OLD_PIR+2, AX
        ;SETUP NEW INT 9 PIR
        ;-- SET LPC INTR VECTOR
        MOV WORD PTR LPC_PIR, OLD9_PIR
        MOV WORD PTR LPC_PIR+2, CS

        ;-- ENABLE INTERRUPTS (NMI & OTHERS)
        SETI
        ;ENABLE INTERRUPTS
        IN AL, PORT
        ;RESET LATCH
        OUT AL, PORT
        ;MASK TO ENABLE NMI
        ;ENABLE NMI

LPC10:
        ;-- DECODE LPC FUNCTION
        POP AX
        ;RESIDE AT LPC FUNCTION
        ;SPEAK LPC INTR FUNCTION
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D.F-8C Specifications

The following are specifications of the Speech Attachment:

- Size
 - Width 32 millimeters (1.26 inches)
 - Depth 290 millimeters (11.42 inches)
 - Height 96.5 millimeters (3.80 inches)
- Environment
 - Temperature
 - System On 15.6 to 32.2 degrees C (60 to 90 degrees F)
 - System Off 10 to 43 degrees C (50 to 110 degrees F)
 - Humidity
 - System On 8 to 80%
 - System Off 8 to 80%
- Power
 - +5Vdc with 150 milliamps maximum current
 - +12Vdc with 60 milliamps maximum current
- Microphone Input
 - Miniature phone jack
 - 500 ohm nominal impedance

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0953 00 00
0954 00 00
0955 00 00
0956 00 00
0957 00 00
0958 00 00
0959 00 00
0960 00 00
0961 00 00
0962 00 00
0963 00 00
0964 00 00
0965 00 00
0966 00 00
0967 00 00
0968 00 00
0969 00 00
0970 00 00
0971 00 00
0972 00 00
0973 00 00
0974 00 00
0975 00 00
0976 00 00
0977 00 00
0978 00 00
0979 00 00
0980 00 00
0981 00 00
0982 00 00
0983 00 00
0984 00 00
0985 00 00
0986 00 00
0987 00 00
0988 00 00
0989 00 00
0990 00 00
0991 00 00
0992 00 00
0993 00 00
0994 00 00
0995 00 00
0996 00 00
0997 00 00
0998 00 00
0999 00 00
1000 00 00
    
```

CX Number of bytes in the LPC word to be spoken. CX must not be larger than 4095 bytes.

Note: During this call, all registers except AX are preserved.

AL returns:

- 00H OK
- 01H Undefined command
- 02H LPC Speak in progress
- 03H Speech Attachment ACL error (stuck)
- 04H LPC index out of range
- 05H CVSD speed out of range
- 06H Timeout waiting for LPC READY

0675 3B CB
0677 7C 16
0679 7E 03
067D 80 FB 04

067E 51
067F 8B CB

0681 E8 069F R
0684 59
0685 75 16

0687 2B CB
0689 E8 06AA R

068C 78
068D E8 0F

068F E8 069F R
0692 75 09
0694 80 00

0696 E8 065D R
0699 33 C9
069B E8 EC

069D 09
069E 51C
069F C3

069F AC
0740 E8 065D R
06A3 75 04
06A5 E2 F8
06A7 32 C9
06A9 C3

06AA 0R 10
074A 75 21

```

*****
LOAD_BFR_HNDLR
DESCRIPTION
*****
THE REMAINING NUMBER OF BYTES IN THE LPC WORD TO BE OUTPUT
IS COMPARED TO THE MAXIMUM NUMBER OF OUTPUT BYTES PER WORD.
IF THERE ARE MORE BYTES LEFT TO BE OUTPUT THAN CAN BE SENT
OUT IN THIS CALL THEN
THE MAXIMUM ALLOWED NUMBER OF BYTES IS SENT OUT TO THE
LPC CHIP, AND
THE POINTER TO THE NEXT BYTE TO OUTPUT (INCREMENT AND
OVERRIDE) AND
THE REMAINING COUNT ARE FORWARDED INTO THE WORDS AND SAVED,
AND
THE CARRY FLAG IS RESET TO INDICATE NO ERROR.
IF ALL REMAINING BYTES TO BE OUTPUT CAN BE FORWARDED THIS
TIME THEN
THEY ARE SENT,
A BYTE OF THE IS SENT, AND
THE CARRY FLAG IS SET TO INDICATE END OF SPEECH DATA
OUTPUT.
*****
IN ENTRY
BX = MAXIMUM ALLOWED NUMBER OF BYTES TO BE OUTPUT.
CX = REMAINING NUMBER OF BYTES TO BE OUTPUT IN THE LPC
WORD.
DI:SI = POINTER TO LPC DATA.
DI = 0 (DIRECTION FLAG RESET BY INCREMENT)
*****
ON EXIT
INTERUPT VECTOR LOCATION HERE - THE FORWARDED ADDRESS OF
THE POINTER AND COUNT INFORMATION (INCREMENT, THE REMAINING
DATA TO BE OUTPUT FOR THE LPC WORD BEING FORWARDED.
DI:SI = EIPX WHERE X IS A HEX VALUE BEING FORWARDED. AN
OFFSET, WHICH IS A 3-BIT VALUE COUNT OF REMAINING BYTES
DI:SI = FFFF WHERE FFFF IS THE ADDRESS OF THE
NEXT LPC DATA TO BE OUTPUT.
FFFF:1 POINTS AT THE NEXT LPC DATA TO BE OUTPUT.
MMX IS THE REMAINING NUMBER OF BYTES TO BE OUTPUT.
*****
REGISTERS AX, BX, CX, DI, AND SI ARE ALTERED.
*****
LOAD_BFR_HNDLR PROC NEAR
LMP CR, BX ;IS REMAINING COUNT LESS THAN MAX?
JL COMPLETE_OUTPUT ;IF SO, FINISH WORD
JG COMPLETE_OUTPUT ;IF MORE THAN THE LIMIT, SEND LIMIT
SUB DI, BX ;IF THAT IS THE LIMIT REMAINING
;COMPLETE IN LPC CHIP. THEN GO TO ABOVE
;OVER RUNNING, THE QUEUES.
*****
COMPLETE_OUTPUT:
PUSH CR
MOV CR, BX ;LOAD MAXIMUM BYTE COUNT
CALL LOAD_BFR ;LOAD BYTES INTO LPC
POP CR
JMP LOAD_BFR_ERR ;JMP IF ERROR ENCOUNTERED
*****
UPDATE_COMPLETE:
SUB CR, BX ;ADJUST COUNT FOR BYTES OUTPUT
;THIS TIME
CALL SAVE_POINTER
CLC ;CLEAR CARRY INDICATES NO ERRORS
;CLEAR.
JMP SHOW_EXIT_BFR_HNDLR
*****
COMPLETE_OUTPUT:
CALL LOAD_BFR ;LOAD LAST BYTES
JMP LOAD_BFR_ERR ;JMP IF ERROR ENCOUNTERED
MOV AL, 0
CALL EPM_10 ;SEND BYTE OF 0 TO LPC
XOR CR, CR ;REMAINING COUNT = 0
JMP UPDATE_COMPLETE ;SAVE POINTER, CLEAR CARRY, RETURN
*****
LOAD_BFR_ERR:
SIC ;SET CARRY TO INDICATE SPEECH END
EXIT_BFR_HNDLR:
RET
LOAD_BFR_HNDLR ENDP
*****
; NOTES: - PRIOR TO CALLING THE LOAD_BFR PROCEDURE, WE MUST HAVE:
; CX = # OF BYTES TO LOAD
; DI:SI = SEGMENT:OFFSET OF DATA
; - THIS PROCEDURE DEPENDS ON REGISTERS AX & BX
; - THIS PROCEDURE MUST BE FOLLOWED BY A CHECK OF
; THE ZERO FLAG:
; IF 0H => NO ERRORS
; IF 0FF => ERROR WAITING FOR LPC READY
; (SET AX = EPCMDY, EIPX & EXIT)
*****
LOAD_BFR PROC NEAR
LOADDI: LODSB ;LOAD BFR WITH 16 BYTES OF DATA
CALL EPM_10 ;TIMING WAITING FOR LPC DATA
JMP LOADDI ;TIMING WAITING FOR LPC DATA
LODQ [LOADDI]
XOR AL, AL ;SET THE ZERO FLAG
LOADDI: RET
*****
LOAD_BFR ENDP
*****
SAVE_POINTER
THIS PROC FOLDS THE REGISTER AND COUNT FOR EPC INTO TWO WORDS.
SEE DISCUSSION ON LOAD_BFR_HNDLR FOR MORE INFO.
*****
SAVE_POINTER PROC NEAR
OR BP, BP ;ARE WE IN 16-BIT MODE?
JMP RP_POINTER_SAVE ;IF SO, POINT TO THIS SAVE

```


BX User speed divisor

CX Byte count

AL = 3 CVSD Playback (using user speed)

DS:SI segment:offset

BX User speed divisor

CX Byte count

AH = 2 LPC (Background)

AL = 0 LPC Status

AL = 1 LPC Speak - INTR (index)

BX Word number from index
(BX ≥ 1)

AL = 2 LPC Speak - INTR (buffer)

DS:SI Beginning of buffer
(segment:offset)

CX Number of bytes in the LPC
word to be spoken. **CX**
must not be larger than 4095
bytes.

AH = 3 Polled LPC (foreground)

AL = 0 LPC Status

AL = 1 LPC Speak - INTR (index)

BX Word number from index (BX ≥ 1)

AL = 2 LPC Speak - INTR (buffer)

DS:SI Beginning of buffer
(segment:offset)

```

0641 06          PUSH    ES
0642 33 CD       MOV     AX,AX
0643 0E CO       MOV     ES:AX
0644          ASSUME  ES:DUMMY ;ADDRESS PTR AND COUNT SAVE LOGS

0683 80 C1       MOV     AX,CX ;SAVE COUNT IN LOW 3 NIBS OF AX
0684 81 04       MOV     CL,CX
0685 03 CE       ROR     SI,CL ;ROTATE NIBS OF SI
0686          PUSH    SI ;SAVE THIS NEW VERSION

0689 36          PUSH    SI

068A 81 E4 1000  AND    SI,DIHIGH ;MAX (LOW 3 NIBS) MUST SIGNIFICANT
068B 0B C6       OR     AX,SI ;OR IN WITH COUNT
068C 76 A3 011C R  MOV     ES:WORD PTR BFR,AX ;STORE PACKED WORD FOR USE
068D          ;NEXT TIME

068E 8C D0       MOV     AX,DS
068F 50         POP     BX
0690 8D E7 0F     AND    BX,DIH ;RESTORE ALTERED VERSION OF SI
0691          ;MAX (LOW 3 NIBS) MUST SIGNIFICANT
0692 03 C3       ADD    AX,DX ;ADD INTO SIGNATURE
0693          MOV     AX,DX ;STORE NEW VERSION OF
0694          ;SEGMENT ADDR

06D0 07          POP     ES ;RESTORE ES
06D1 03          NO_POINTER_SAVE:
06D2          RE

SAVE_POINTER ENDP
;-----
; NAME: LPC INTERRUPT HANDLER
; PURPOSE: TO PROVIDE SUPPORT FOR LPC HARDWARE INTR
; LINKAGE: HARDWARE INTR 1 (0259)
; INPUTS: VECTOR AREA FOR SOFTWARE INTR WHEN MUST
;         CONTAIN THE LPC BUFFER POINTER
; OUTPUTS: NONE
; EXIT: INTERRUPT RETURN
; PROCESS: (1) - CHECK TO SEE IF LPC OR NBD INTERRUPT,
;             IF NBD, ISSUE NBD INTERRUPT & RETURN
;             IF LPC, CONTINUE
;             (2) - MASK NMI AND OTHER HARDWARE INTERRUPTS.
;             (3) - CHECK TYPE OF LPC INTERRUPT. IF STRA*,
;             CU ON IF BUFFER LOW, CALL ROUTINE TO
;             SEND 8 MORE BYTES TO LPC CHIP. IF OTHER,
;             TURN OFF LPC AND LPC IN PROGRESS FLAG.
;             (4) - ISSUE I/O CMD TO INT 1 OF THE 0259
;             (5) - REENABLE NMI AND OTHERS
;             (6) - ISSUE IRET
;-----
; --> SAVE SOME REGISTERS
LPC_MN: PUSH    AX ;SAVE AX & DX
        PUSH    DX

; --> CHECK TO SEE IF LPC OR NBD INTERRUPT
; IF LPC, GO TO LPC INTR HANDLER CODE
; IF NBD, ISSUE NBD INTERRUPT & RETURN
MOV     AL,0BH ;AL,0BH
OUT     PORT_20H,AL ;SYSTEM 0259 CONTROL PORT
JMP     $+2
IN     AL,PORT_20H
TEST   AL,D2 ;LPC INTR ?
JNZ    LPCA00 ;YES, CONTINUE

06E0 5A         POP     DX ;RESTORE AX & DX
06E1 50         POP     AX
06E2 CD 4E     INT     NBD ;ISSUE NBD INTR
06E3          IRET    ;RETURN

;-----
; LPC INTERRUPT HANDLER
;-----
; --> SAVE OTHER REGISTERS
LPCA00: MOV     AL,10H
        OUT     NMI_PORT,AL ;DISABLE NMI
        CLI     ;DISABLE HARDWARE INTERRUPTS

FLAG_SETUP2: JMP     SETUP_FLAG2
        PUSH    SI ;SAVE REGISTERS
        PUSH    DI
        PUSH    BP
        ROR     BP,BP ;BP 0 MEANS LPC BACKGROUND

; --> READ 0259 PORT 0 (5220 STATUS REG) & SAVE IN AX
CALL    READ_PORT0

; --> DECODE TYPE OF LPC INTERRUPT
AND    AH,DI0H ;ZERO OUT BITS OF NO INTEREST
CMP    AH,1000000B ;STRA/ INTERRUPT
JZ     LPCA05 ;IF SO END INTERRUPT AND RETURN
CMP    AH,11000000B ;BUFFER LOW INTERRUPT
JNZ    LPCA00 ;IF NOT, EITHER LPC WORD IS DONE

;OR SOMETHING'S WRONG IN ANY CASE.
;DISCONTINUE LPC PROCESSING.

; --> BUFFER LOW INTR --> LOAD 8 MORE BYTES
LPCB01: ROR     AX,AX ;SET DS:SI TO POINT TO LPC DATA
        MOV     DS,AX
        LDS    SI,WORD PTR [BFR+PIN] ;GET PTR AND COUNT INTO
        ;DS:SI
        PUSH    SI ;SAVE SI
        MOV     CX,12

```

```

0117 00 0010  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0118 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0119 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0120 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0121 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0122 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0123 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0124 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0125 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0126 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0127 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0128 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0129 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0130 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0131 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0132 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0133 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0134 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0135 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0136 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0137 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0138 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0139 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0140 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0141 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0142 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0143 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0144 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0145 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0146 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0147 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0148 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0149 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0150 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0151 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0152 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0153 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0154 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0155 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0156 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0157 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0158 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0159 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0160 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0161 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0162 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0163 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0164 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0165 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0166 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0167 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0168 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0169 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0170 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0171 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0172 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0173 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0174 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0175 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0176 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0177 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0178 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0179 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0180 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0181 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER
0182 00 0000  MOV      PC, R7              WORD FROM PC TO REGISTER, PC
0183 00 0000  CALL      WORD FROM PC      WORD FROM PC TO REGISTER

```

AL = 2 CVSD Record (using user speed)
 DS:SI segment:offset

CX Byte count
 5 = 4800 Bytes/Sec
 4 = 4200 Bytes/Sec
 3 = 3600 Bytes/Sec
 2 = 3000 Bytes/Sec
 1 = 2400 Bytes/Sec
 0 = 1800 Bytes/Sec

BL Table speed
 DS:SI segment:offset
 AL = 1 CVSD Playback (using speed table)

CX Byte count
 5 = 4800 Bytes/Sec
 4 = 4200 Bytes/Sec
 3 = 3600 Bytes/Sec
 2 = 3000 Bytes/Sec
 1 = 2400 Bytes/Sec
 0 = 1800 Bytes/Sec

BL Table speed
 DS:SI segment:offset

Note: It is the responsibility of the program to restore the state of these devices.

Linear Predictive Coding (LPC)

There are two possible modes of LPC speech synthesis: background and foreground.

Background

This mode returns control to the calling program while speech synthesis is in progress with the following restrictions:

- The system cannot perform diskette or other operations that disable hardware interrupts for an extended period during speech synthesis.
- The system must not change environments during LPC background; for instance, changing from DOS to BASIC.

Foreground

In this mode control is not returned to the system until after the speech synthesis is completed.

Note: BIOS continuously polls the system during speech synthesis and updates when necessary.

Interrupt Hex 04D

Software interrupt hex 04D provides low level BIOS support for CVSD and LPC. The following lists the uses of this interrupt.

AIH = 0 Reset Adapter

AIH = 1 CVSD

```

0783 17
0784 0A 1A 0B 05 2F BA
0785 0B 1F
0786 C9 10 20 BA 0B 1C
0787 C8 10 20 BA 0B 1C
0788 5C BA
0789 078A
078A 11
078B 07 07 07 07
078C 07 07 07 07
078D 07 07 07 07
078E 07 07 07 07
078F 07 07 07 07
0790 07 07 07 07
0791 07 07 07 07
0792 07 07 07 07
0793 07 07 07 07
0794 07 07 07 07
0795 07 07 07 07
0796 07 07 07 07
0797 07 07 07 07
0798 07 07 07 07
0799 07 07 07 07
079A 07 07 07 07
079B 07 07 07 07
079C 07 07 07 07
079D 07 07 07 07
079E 07 07 07 07
079F 07 07 07 07
07A0 07 07 07 07
07A1 07 07 07 07
07A2 07 07 07 07
07A3 07 07 07 07
07A4 07 07 07 07
07A5 07 07 07 07
07A6 07 07 07 07
07A7 07 07 07 07
07A8 07 07 07 07
07A9 07 07 07 07
07AA 07 07 07 07
07AB 07 07 07 07
07AC 07 07 07 07
07AD 07 07 07 07
07AE 07 07 07 07
07AF 07 07 07 07
07B0 07 07 07 07
07B1 07 07 07 07
07B2 07 07 07 07
07B3 07 07 07 07
07B4 07 07 07 07
07B5 07 07 07 07
07B6 07 07 07 07
07B7 07 07 07 07
07B8 07 07 07 07
07B9 07 07 07 07
07BA 07 07 07 07
07BB 07 07 07 07
07BC 07 07 07 07
07BD 07 07 07 07
07BE 07 07 07 07
07BF 07 07 07 07
07C0 07 07 07 07
07C1 07 07 07 07
07C2 07 07 07 07
07C3 07 07 07 07
07C4 07 07 07 07
07C5 07 07 07 07
07C6 07 07 07 07
07C7 07 07 07 07
07C8 07 07 07 07
07C9 07 07 07 07
07CA 07 07 07 07
07CB 07 07 07 07
07CC 07 07 07 07
07CD 07 07 07 07
07CE 07 07 07 07
07CF 07 07 07 07
07D0 07 07 07 07
07D1 07 07 07 07
07D2 07 07 07 07
07D3 07 07 07 07
07D4 07 07 07 07
07D5 07 07 07 07
07D6 07 07 07 07
07D7 07 07 07 07
07D8 07 07 07 07
07D9 07 07 07 07
07DA 07 07 07 07
07DB 07 07 07 07
07DC 07 07 07 07
07DD 07 07 07 07
07DE 07 07 07 07
07DF 07 07 07 07
07E0 07 07 07 07
07E1 07 07 07 07
07E2 07 07 07 07
07E3 07 07 07 07
07E4 07 07 07 07
07E5 07 07 07 07
07E6 07 07 07 07
07E7 07 07 07 07
07E8 07 07 07 07
07E9 07 07 07 07
07EA 07 07 07 07
07EB 07 07 07 07
07EC 07 07 07 07
07ED 07 07 07 07
07EE 07 07 07 07
07EF 07 07 07 07
07F0 07 07 07 07
07F1 07 07 07 07
07F2 07 07 07 07
07F3 07 07 07 07
07F4 07 07 07 07
07F5 07 07 07 07
07F6 07 07 07 07
07F7 07 07 07 07
07F8 07 07 07 07
07F9 07 07 07 07
07FA 07 07 07 07
07FB 07 07 07 07
07FC 07 07 07 07
07FD 07 07 07 07
07FE 07 07 07 07
07FF 07 07 07 07

```

```

07CE 11
07CF 23
07D0 00 00 00 00
07D1 00 00 00 00
07D2 00 00 00 00
07D3 00 00 00 00
07D4 00 00 00 00
07D5 00 00 00 00
07D6 00 00 00 00
07D7 00 00 00 00
07D8 00 00 00 00
07D9 00 00 00 00
07DA 00 00 00 00
07DB 00 00 00 00
07DC 00 00 00 00
07DD 00 00 00 00
07DE 00 00 00 00
07DF 00 00 00 00
07E0 00 00 00 00
07E1 00 00 00 00
07E2 00 00 00 00
07E3 00 00 00 00
07E4 00 00 00 00
07E5 00 00 00 00
07E6 00 00 00 00
07E7 00 00 00 00
07E8 00 00 00 00
07E9 00 00 00 00
07EA 00 00 00 00
07EB 00 00 00 00
07EC 00 00 00 00
07ED 00 00 00 00
07EE 00 00 00 00
07EF 00 00 00 00
07F0 00 00 00 00
07F1 00 00 00 00
07F2 00 00 00 00
07F3 00 00 00 00
07F4 00 00 00 00
07F5 00 00 00 00
07F6 00 00 00 00
07F7 00 00 00 00
07F8 00 00 00 00
07F9 00 00 00 00
07FA 00 00 00 00
07FB 00 00 00 00
07FC 00 00 00 00
07FD 00 00 00 00
07FE 00 00 00 00
07FF 00 00 00 00

```

```

0811 00 1C 01
0812 76 12
0813 00 1C 0E
0814 74 20
0815 00 1C 0F
0816 74 25
0817 00 1C 0D
0818 75 22
0819 00 00 10
081A 00 00 10
081B 00 00 10
081C 00 00 10
081D 00 00 10
081E 00 00 10
081F 00 00 10
0820 00 00 10
0821 00 00 10
0822 00 00 10
0823 00 00 10
0824 00 00 10
0825 00 00 10
0826 00 00 10
0827 00 00 10
0828 00 00 10
0829 00 00 10
082A 00 00 10
082B 00 00 10
082C 00 00 10
082D 00 00 10
082E 00 00 10
082F 00 00 10
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0832 00 00 10
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0836 00 00 10
0837 00 00 10
0838 00 00 10
0839 00 00 10
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083F 00 00 10
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0843 00 00 10
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0846 00 00 10
0847 00 00 10
0848 00 00 10
0849 00 00 10
084A 00 00 10
084B 00 00 10
084C 00 00 10
084D 00 00 10
084E 00 00 10
084F 00 00 10
0850 00 00 10
0851 00 00 10
0852 00 00 10
0853 00 00 10
0854 00 00 10
0855 00 00 10
0856 00 00 10
0857 00 00 10
0858 00 00 10
0859 00 00 10
085A 00 00 10
085B 00 00 10
085C 00 00 10
085D 00 00 10
085E 00 00 10
085F 00 00 10
0860 00 00 10
0861 00 00 10
0862 00 00 10
0863 00 00 10
0864 00 00 10
0865 00 00 10
0866 00 00 10
0867 00 00 10
0868 00 00 10
0869 00 00 10
086A 00 00 10
086B 00 00 10
086C 00 00 10
086D 00 00 10
086E 00 00 10
086F 00 00 10
0870 00 00 10
0871 00 00 10
0872 00 00 10
0873 00 00 10
0874 00 00 10
0875 00 00 10
0876 00 00 10
0877 00 00 10
0878 00 00 10
0879 00 00 10
087A 00 00 10
087B 00 00 10
087C 00 00 10
087D 00 00 10
087E 00 00 10
087F 00 00 10
0880 00 00 10
0881 00 00 10
0882 00 00 10
0883 00 00 10
0884 00 00 10
0885 00 00 10
0886 00 00 10
0887 00 00 10
0888 00 00 10
0889 00 00 10
088A 00 00 10
088B 00 00 10
088C 00 00 10
088D 00 00 10
088E 00 00 10
088F 00 00 10
0890 00 00 10
0891 00 00 10
0892 00 00 10
0893 00 00 10
0894 00 00 10
0895 00 00 10
0896 00 00 10
0897 00 00 10
0898 00 00 10
0899 00 00 10
089A 00 00 10
089B 00 00 10
089C 00 00 10
089D 00 00 10
089E 00 00 10
089F 00 00 10
08A0 00 00 10
08A1 00 00 10
08A2 00 00 10
08A3 00 00 10
08A4 00 00 10
08A5 00 00 10
08A6 00 00 10
08A7 00 00 10
08A8 00 00 10
08A9 00 00 10
08AA 00 00 10
08AB 00 00 10
08AC 00 00 10
08AD 00 00 10
08AE 00 00 10
08AF 00 00 10
08B0 00 00 10
08B1 00 00 10
08B2 00 00 10
08B3 00 00 10
08B4 00 00 10
08B5 00 00 10
08B6 00 00 10
08B7 00 00 10
08B8 00 00 10
08B9 00 00 10
08BA 00 00 10
08BB 00 00 10
08BC 00 00 10
08BD 00 00 10
08BE 00 00 10
08BF 00 00 10
08C0 00 00 10
08C1 00 00 10
08C2 00 00 10
08C3 00 00 10
08C4 00 00 10
08C5 00 00 10
08C6 00 00 10
08C7 00 00 10
08C8 00 00 10
08C9 00 00 10
08CA 00 00 10
08CB 00 00 10
08CC 00 00 10
08CD 00 00 10
08CE 00 00 10
08CF 00 00 10
08D0 00 00 10
08D1 00 00 10
08D2 00 00 10
08D3 00 00 10
08D4 00 00 10
08D5 00 00 10
08D6 00 00 10
08D7 00 00 10
08D8 00 00 10
08D9 00 00 10
08DA 00 00 10
08DB 00 00 10
08DC 00 00 10
08DD 00 00 10
08DE 00 00 10
08DF 00 00 10
08E0 00 00 10
08E1 00 00 10
08E2 00 00 10
08E3 00 00 10
08E4 00 00 10
08E5 00 00 10
08E6 00 00 10
08E7 00 00 10
08E8 00 00 10
08E9 00 00 10
08EA 00 00 10
08EB 00 00 10
08EC 00 00 10
08ED 00 00 10
08EE 00 00 10
08EF 00 00 10
08F0 00 00 10
08F1 00 00 10
08F2 00 00 10
08F3 00 00 10
08F4 00 00 10
08F5 00 00 10
08F6 00 00 10
08F7 00 00 10
08F8 00 00 10
08F9 00 00 10
08FA 00 00 10
08FB 00 00 10
08FC 00 00 10
08FD 00 00 10
08FE 00 00 10
08FF 00 00 10

```

```

0816 00 07
0817 00 07 01 R
0818 00 07 01 R
0819 00 07 01 R
081A 00 07 01 R
081B 00 07 01 R
081C 00 07 01 R
081D 00 07 01 R
081E 00 07 01 R
081F 00 07 01 R
0820 00 07 01 R
0821 00 07 01 R
0822 00 07 01 R
0823 00 07 01 R
0824 00 07 01 R
0825 00 07 01 R
0826 00 07 01 R
0827 00 07 01 R
0828 00 07 01 R
0829 00 07 01 R
082A 00 07 01 R
082B 00 07 01 R
082C 00 07 01 R
082D 00 07 01 R
082E 00 07 01 R
082F 00 07 01 R
0830 00 07 01 R
0831 00 07 01 R
0832 00 07 01 R
0833 00 07 01 R
0834 00 07 01 R
0835 00 07 01 R
0836 00 07 01 R
0837 00 07 01 R
0838 00 07 01 R
0839 00 07 01 R
083A 00 07 01 R
083B 00 07 01 R
083C 00 07 01 R
083D 00 07 01 R
083E 00 07 01 R
083F 00 07 01 R
0840 00 07 01 R
0841 00 07 01 R
0842 00 07 01 R
0843 00 07 01 R
0844 00 07 01 R
0845 00 07 01 R
0846 00 07 01 R
0847 00 07 01 R
0848 00 07 01 R
0849 00 07 01 R
084A 00 07 01 R
084B 00 07 01 R
084C 00 07 01 R
084D 00 07 01 R
084E 00 07 01 R
084F 00 07 01 R
0850 00 07 01 R
0851 00 07 01 R
0852 00 07 01 R
0853 00 07 01 R
0854 00 07 01 R
0855 00 07 01 R
0856 00 07 01 R
0857 00 07 01 R
0858 00 07 01 R
0859 00 07 01 R
085A 00 07 01 R
085B 00 07 01 R
085C 00 07 01 R
085D 00 07 01 R
085E 00 07 01 R
085F 00 07 01 R
0860 00 07 01 R
0861 00 07 01 R
0862 00 07 01 R
0863 00 07 01 R
0864 00 07 01 R
0865 00 07 01 R
0866 00 07 01 R
0867 00 07 01 R
0868 00 07 01 R
0869 00 07 01 R
086A 00 07 01 R
086B 00 07 01 R
086C 00 07 01 R
086D 00 07 01 R
086E 00 07 01 R
086F 00 07 01 R
0870 00 07 01 R
0871 00 07 01 R
0872 00 07 01 R
0873 00 07 01 R
0874 00 07 01 R
0875 00 07 01 R
0876 00 07 01 R
0877 00 07 01 R
0878 00 07 01 R
0879 00 07 01 R
087A 00 07 01 R
087B 00 07 01 R
087C 00 07 01 R
087D 00 07 01 R
087E 00 07 01 R
087F 00 07 01 R
0880 00 07 01 R
0881 00 07 01 R
0882 00 07 01 R
0883 00 07 01 R
0884 00 07 01 R
0885 00 07 01 R
0886 00 07 01 R
0887 00 07 01 R
0888 00 07 01 R
0889 00 07 01 R
088A 00 07 01 R
088B 00 07 01 R
088C 00 07 01 R
088D 00 07 01 R
088E 00 07 01 R
088F 00 07 01 R
0890 00 07 01 R
0891 00 07 01 R
0892 00 07 01 R
0893 00 07 01 R
0894 00 07 01 R
0895 00 07 01 R
0896 00 07 01 R
0897 00 07 01 R
0898 00 07 01 R
0899 00 07 01 R
089A 00 07 01 R
089B 00 07 01 R
089C 00 07 01 R
089D 00 07 01 R
089E 00 07 01 R
089F 00 07 01 R
08A0 00 07 01 R
08A1 00 07 01 R
08A2 00 07 01 R
08A3 00 07 01 R
08A4 00 07 01 R
08A5 00 07 01 R
08A6 00 07 01 R
08A7 00 07 01 R
08A8 00 07 01 R
08A9 00 07 01 R
08AA 00 07 01 R
08AB 00 07 01 R
08AC 00 07 01 R
08AD 00 07 01 R
08AE 00 07 01 R
08AF 00 07 01 R
08B0 00 07 01 R
08B1 00 07 01 R
08B2 00 07 01 R
08B3 00 07 01 R
08B4 00 07 01 R
08B5 00 07 01 R
08B6 00 07 01 R
08B7 00 07 01 R
08B8 00 07 01 R
08B9 00 07 01 R
08BA 00 07 01 R
08BB 00 07 01 R
08BC 00 07 01 R
08BD 00 07 01 R
08BE 00 07 01 R
08BF 00 07 01 R
08C0 00 07 01 R
08C1 00 07 01 R
08C2 00 07 01 R
08C3 00 07 01 R
08C4 00 07 01 R
08C5 00 07 01 R
08C6 00 07 01 R
08C7 00 07 01 R
08C8 00 07 01 R
08C9 00 07 01 R
08CA 00 07 01 R
08CB 00 07 01 R
08CC 00 07 01 R
08CD 00 07 01 R
08CE 00 07 01 R
08CF 00 07 01 R
08D0 00 07 01 R
08D1 00 07 01 R
08D2 00 07 01 R
08D3 00 07 01 R
08D4 00 07 01 R
08D5 00 07 01 R
08D6 00 07 01 R
08D7 00 07 01 R
08D8 00 07 01 R
08D9 00 07 01 R
08DA 00 07 01 R
08DB 00 07 01 R
08DC 00 07 01 R
08DD 00 07 01 R
08DE 00 07 01 R
08DF 00 07 01 R
08E0 00 07 01 R
08E1 00 07 01 R
08E2 00 07 01 R
08E3 00 07 01 R
08E4 00 07 01 R
08E5 00 07 01 R
08E6 00 07 01 R
08E7 00 07 01 R
08E8 00 07 01 R
08E9 00 07 01 R
08EA 00 07 01 R
08EB 00 07 01 R
08EC 00 07 01 R
08ED 00 07 01 R
08EE 00 07 01 R
08EF 00 07 01 R
08F0 00 07 01 R
08F1 00 07 01 R
08F2 00 07 01 R
08F3 00 07 01 R
08F4 00 07 01 R
08F5 00 07 01 R
08F6 00 07 01 R
08F7 00 07 01 R
08F8 00 07 01 R
08F9 00 07 01 R
08FA 00 07 01 R
08FB 00 07 01 R
08FC 00 07 01 R
08FD 00 07 01 R
08FE 00 07 01 R
08FF 00 07 01 R

```

```

0821 01 C2 0B03
0822 00 02
0823 00
0824 00
0825 00
0826 00
0827 00
0828 00
0829 00
082A 00
082B 00
082C 00
082D 00
082E 00
082F 00
0830 00
0831 00
0832 00
0833 00
0834 00
0835 00
0836 00
0837 00
0838 00
0839 00
083A 00
083B 00
083C 00
083D 00
083E 00
083F 00
0840 00
0841 00
0842 00
0843 00
0844 00
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0846 00
0847 00
0848 00
0849 00
084A 00
084B 00
084C 00
084D 00
084E 00
084F 00
0850 00
0851 00
0852 00
0853 00
0854 00
0855 00
0856 00
0857 00
0858 00
0859 00
085A 00
085B 00
085C 00
085D 00
085E 00
085F 00
0860 00
0861 00
0862 00
0863 00
0864 00
0865 00
0866 00
0867 00
0868 00
0869 00
086A 00
086B 00
086C 00
086D 00
086E 00
086F 00
0870 00
0871 00
0872 00
0873 00
0874 00
0875 00
0876 00
0877 00
0878 00
0879 00
087A 00
087B 00
087C 00
087D 00
087E 00
087F 00
0880 00
0881 00
0882 00
0883 00
0884 00
0885 00
0886 00
0887 00
0888 00
0889 00
088A 00
088B 00
088C 00
088D 00
088E 00
088F 00
0890 00
0891 00
0892 00
0893 00
0894 00
0895 00
0896 00
0897 00
0898 00
0899 00
089A 00
089B 00
089C 00
089D 00
089E 00
089F 00
08A0 00
08A1 00
08A2 00
08A3 00
08A4 00
08A5 00
08A6 00
08A7 00
08A8 00
08A9 00
08AA 00
08AB 00
08AC 00
08AD 00
08AE 00
08AF 00
08B0 00
08B1 00
08B2 00
08B3 00
08B4 00
08B5 00
08B6 00
08B7 00
08B8 00
08B9 00
08BA 00
08BB 00
08BC 00
08BD 00
08BE 00
08BF 00
08C0 00
08C1 00
08C2 00
08C3 00
08C4 00
08C5 00
08C6 00
08C7 00
08C8 00
08C9 00
08CA 00
08CB 00
08CC 00
08CD 00
08CE 00
08CF 00
08D0 00
08D1 00
08D2 00
08D3 00
08D4 00
08D5 00
08D6 00
08D7 00
08D8 00
08D9 00
08DA 00
08DB 00
08DC 00
08DD 00
08DE 00
08DF 00
08E0 00
08E1 00
08E2 00
08E3 00
08E4 00
08E5 00
08E6 00
08E7 00
08E8 00
08E9 00
08EA 00
08EB 00
08EC 00
08ED 00
08EE 00
08EF 00
08F0 00
08F1 00
08F2 00
08F3 00
08F4 00
08F5 00
08F6 00
08F7 00
08F8 00
08F9 00
08FA 00
08FB 00
08FC 00
08FD 00
08FE 00
08FF 00

```

```

0000 00 0000 R
0001 01 0000 R
0002 02 0000 R
0003 03 0000 R
0004 04 0000 R
0005 05 0000 R
0006 06 0000 R
0007 07 0000 R
0008 08 0000 R
0009 09 0000 R
0010 0A 0000 R
0011 0B 0000 R
0012 0C 0000 R
0013 0D 0000 R
0014 0E 0000 R
0015 0F 0000 R
0016 10 0000 R
0017 11 0000 R
0018 12 0000 R
0019 13 0000 R
0020 14 0000 R
0021 15 0000 R
0022 16 0000 R
0023 17 0000 R
0024 18 0000 R
0025 19 0000 R
0026 1A 0000 R
0027 1B 0000 R
0028 1C 0000 R
0029 1D 0000 R
0030 1E 0000 R
0031 1F 0000 R
0032 20 0000 R
0033 21 0000 R
0034 22 0000 R
0035 23 0000 R
0036 24 0000 R
0037 25 0000 R
0038 26 0000 R
0039 27 0000 R
0040 28 0000 R
0041 29 0000 R
0042 2A 0000 R
0043 2B 0000 R
0044 2C 0000 R
0045 2D 0000 R
0046 2E 0000 R
0047 2F 0000 R
0048 30 0000 R
0049 31 0000 R
0050 32 0000 R
0051 33 0000 R
0052 34 0000 R
0053 35 0000 R
0054 36 0000 R
0055 37 0000 R
0056 38 0000 R
0057 39 0000 R
0058 3A 0000 R
0059 3B 0000 R
0060 3C 0000 R
0061 3D 0000 R
0062 3E 0000 R
0063 3F 0000 R
0064 40 0000 R
0065 41 0000 R
0066 42 0000 R
0067 43 0000 R
0068 44 0000 R
0069 45 0000 R
0070 46 0000 R
0071 47 0000 R
0072 48 0000 R
0073 49 0000 R
0074 4A 0000 R
0075 4B 0000 R
0076 4C 0000 R
0077 4D 0000 R
0078 4E 0000 R
0079 4F 0000 R
0080 50 0000 R
0081 51 0000 R
0082 52 0000 R
0083 53 0000 R
0084 54 0000 R
0085 55 0000 R
0086 56 0000 R
0087 57 0000 R
0088 58 0000 R
0089 59 0000 R
0090 5A 0000 R
0091 5B 0000 R
0092 5C 0000 R
0093 5D 0000 R
0094 5E 0000 R
0095 5F 0000 R
0096 60 0000 R
0097 61 0000 R
0098 62 0000 R
0099 63 0000 R
0100 64 0000 R
0101 65 0000 R
0102 66 0000 R
0103 67 0000 R
0104 68 0000 R
0105 69 0000 R
0106 6A 0000 R
0107 6B 0000 R
0108 6C 0000 R
0109 6D 0000 R
0110 6E 0000 R
0111 6F 0000 R
0112 70 0000 R
0113 71 0000 R
0114 72 0000 R
0115 73 0000 R
0116 74 0000 R
0117 75 0000 R
0118 76 0000 R
0119 77 0000 R
0120 78 0000 R
0121 79 0000 R
0122 7A 0000 R
0123 7B 0000 R
0124 7C 0000 R
0125 7D 0000 R
0126 7E 0000 R
0127 7F 0000 R
0128 80 0000 R
0129 81 0000 R
0130 82 0000 R
0131 83 0000 R
0132 84 0000 R
0133 85 0000 R
0134 86 0000 R
0135 87 0000 R
0136 88 0000 R
0137 89 0000 R
0138 8A 0000 R
0139 8B 0000 R
0140 8C 0000 R
0141 8D 0000 R
0142 8E 0000 R
0143 8F 0000 R
0144 90 0000 R
0145 91 0000 R
0146 92 0000 R
0147 93 0000 R
0148 94 0000 R
0149 95 0000 R
0150 96 0000 R
0151 97 0000 R
0152 98 0000 R
0153 99 0000 R
0154 9A 0000 R
0155 9B 0000 R
0156 9C 0000 R
0157 9D 0000 R
0158 9E 0000 R
0159 9F 0000 R
0160 A0 0000 R
0161 A1 0000 R
0162 A2 0000 R
0163 A3 0000 R
0164 A4 0000 R
0165 A5 0000 R
0166 A6 0000 R
0167 A7 0000 R
0168 A8 0000 R
0169 A9 0000 R
0170 AA 0000 R
0171 AB 0000 R
0172 AC 0000 R
0173 AD 0000 R
0174 AE 0000 R
0175 AF 0000 R
0176 B0 0000 R
0177 B1 0000 R
0178 B2 0000 R
0179 B3 0000 R
0180 B4 0000 R
0181 B5 0000 R
0182 B6 0000 R
0183 B7 0000 R
0184 B8 0000 R
0185 B9 0000 R
0186 BA 0000 R
0187 BB 0000 R
0188 BC 0000 R
0189 BD 0000 R
0190 BE 0000 R
0191 BF 0000 R
0192 C0 0000 R
0193 C1 0000 R
0194 C2 0000 R
0195 C3 0000 R
0196 C4 0000 R
0197 C5 0000 R
0198 C6 0000 R
0199 CA 0000 R
0200 CB 0000 R
0201 CC 0000 R
0202 CD 0000 R
0203 CE 0000 R
0204 CF 0000 R
0205 D0 0000 R
0206 D1 0000 R
0207 D2 0000 R
0208 D3 0000 R
0209 D4 0000 R
0210 D5 0000 R
0211 D6 0000 R
0212 D7 0000 R
0213 D8 0000 R
0214 D9 0000 R
0215 DA 0000 R
0216 DB 0000 R
0217 DC 0000 R
0218 DD 0000 R
0219 DE 0000 R
0220 DF 0000 R
0221 E0 0000 R
0222 E1 0000 R
0223 E2 0000 R
0224 E3 0000 R
0225 E4 0000 R
0226 E5 0000 R
0227 E6 0000 R
0228 E7 0000 R
0229 E8 0000 R
0230 E9 0000 R
0231 EA 0000 R
0232 EB 0000 R
0233 EC 0000 R
0234 ED 0000 R
0235 EE 0000 R
0236 EF 0000 R
0237 F0 0000 R
0238 F1 0000 R
0239 F2 0000 R
0240 F3 0000 R
0241 F4 0000 R
0242 F5 0000 R
0243 F6 0000 R
0244 F7 0000 R
0245 F8 0000 R
0246 F9 0000 R
0247 FA 0000 R
0248 FB 0000 R
0249 FC 0000 R
0250 FD 0000 R
0251 FE 0000 R
0252 FF 0000 R

```

The following shows Audio Control Latch addresses.

Device	ACL (hex)	Device	ACL (hex)
1	079F	17	879F
2	0F9F	18	8F9F
3	179F	19	979F
4	1F9F	20	9F9F
5	279F	21	A79F
6	2F9F	22	AF9F
7	379F	23	B79F
8	3F9F	24	BF9F
9	479F	25	C79F
10	4F9F	26	CF9F
11	579F	27	D79F
12	5F9F	28	DF9F
13	679F	29	E79F
14	6F9F	30	EF9F
15	779F	31	F79F
16	7F9F	32	FF9F

A program must read the Speech Attachment's ACL each time it needs the channel. If the channel is not enabled, another device has control. The program should either post an error or regain control of the channel.

Audio Multiplexers

Before the Speech Attachment begins speech synthesis, it's BIOS sets the following control devices so that audio, generated by the Speech Attachment, will be heard on the PCjr's audio output.

- The Audio Channel Enable bit in the ACL
- The Audio Channel Multiplexer (points to the intended speech source)
- The PCjr Sound Multiplexer (points to the external audio channel)

0 Disabled

1 Enabled

-CHAN ENA (I)

0 Enabled

1 Disabled

Programs that use the Speech Attachment are responsible for sharing the audio channel. Before using the audio channel, the Speech Attachment BIOS must perform the following steps:

- 1 Issue 32 Disable Channel commands (0011) to each of the possible 32 audio control latches as shown in the following figure.
- 2 Read the Speech Attachment's audio control latch. -CHAN ENA should be inactive.
- 3 Enable the Speech Attachment's audio control channel by setting +CHAN ENA active.
- 4 When read, -CHAN ENA should be active.

```

0918 01 14 08      AND     SP, 8           ; OTHERWISE FALL THROUGH
091E 86 45         MOV     DH, ER, CVSD E2 ; ADJUST START PIN UNIT
0920 87 13         MOV     BH, ER, CVSD E2
0922 EB 16         JMP     SHORT E2 E2    ; SETUP ERROR RETURN CODES
0924

```

```

0926 33 E0         ROR     AH, AH           ; CLEAR SCREEN
0928 C0 10         INC     SI              ;
092A 87 70         MOV     AH, 3          ;
092C C0 10         MOV     CH, 20H       ;
092E 00 0F03 0     INT     $              ; TURN OFF CURSOR
0930 0A 070E 0     MOV     BP, OFFSET I2 ;
0932 C0 82         MOV     DH, SPEAKER, ;
0934 83 01         INT     $              ;
0936 00 02 0     PRINT                ;
0938 00 02 0     PRINT                ;
093A 00 02 0     PRINT                ;
093C 00 02 0     PRINT                ;
093E 00 02 0     PRINT                ;
0940 00 02 0     PRINT                ;
0942 00 02 0     PRINT                ;
0944 00 02 0     PRINT                ;
0946 00 02 0     PRINT                ;
0948 00 02 0     PRINT                ;
094A 00 02 0     PRINT                ;
094C 00 02 0     PRINT                ;
094E 00 02 0     PRINT                ;
0950 00 02 0     PRINT                ;
0952 00 02 0     PRINT                ;
0954 00 02 0     PRINT                ;
0956 00 02 0     PRINT                ;
0958 00 02 0     PRINT                ;
095A 00 02 0     PRINT                ;
095C 00 02 0     PRINT                ;
095E 00 02 0     PRINT                ;
0960 00 02 0     PRINT                ;
0962 00 02 0     PRINT                ;
0964 00 02 0     PRINT                ;
0966 00 02 0     PRINT                ;
0968 00 02 0     PRINT                ;
096A 00 02 0     PRINT                ;
096C 00 02 0     PRINT                ;
096E 00 02 0     PRINT                ;
0970 00 02 0     PRINT                ;
0972 00 02 0     PRINT                ;
0974 00 02 0     PRINT                ;
0976 00 02 0     PRINT                ;
0978 00 02 0     PRINT                ;
097A 00 02 0     PRINT                ;
097C 00 02 0     PRINT                ;
097E 00 02 0     PRINT                ;
0980 00 02 0     PRINT                ;

```

```

RECORD_OR:
; OTHERWISE FALL THROUGH
; ADJUST START PIN UNIT
; SETUP ERROR RETURN CODES

```

```

TR, ER1: MOV     BL, AL
          JMP     SHORT TR, ER
PLAYBACK OR: MOV     DH, 0

```

```

RETURN TO DCP
TEST PASSED:
TEST FAILED:
DH = ASCII ERROR CODE IN CUSTOMER LEVEL
BH = ERROR CODE IN SERVICE LEVEL

```

```

TR, ER1: MOV     DI, 0
          RET     2
          ENJP

```

```

; RESET
RESET CARD TO NORMAL CONDITION

```

```

RESET PROC NEAR
ROR     AH, AH           ; CLEAR AH
INT     $              ;
CNP     AH, 0H          ; TO RESET CARD
JZ     RET OK          ;
MOV     DH, ER, LPC C1 ;
MOV     BH, ER, LPC S1 ;
MOV     BL, DL          ;
SIC

```

```

RESET_OR: RET
RESET ENDP

```

```

; DELAY
THIS ROUTINE WAITS APPROXIMATELY CA * 10 SECONDS
BEFORE RETURNING
ON ENTRY: CX = DELAY TIME
ON EXIT:  DH = 0

```

```

DELAY PROC NEAR
DEL10:  PUSH     CX
        MOV     CX, 13120 ; DECIMAL VALUE TO GIVE WAIT TIME
        ; OF .1 SECOND
DEL20:  LOOP    DEL20
        POP     CX
        LOOP    DEL10
        RET

```

```

DELAY ENDP
ASSUME DS DATA

```

```

; ANIOFF
THIS PROCEDURE IS CALLED TO DISABLE ARI AND SELECTED
; INTERRUPTS ON THE B259.
; INPUT: BL - MASK TO DISABLE B259 INTERRUPTS
; OUTPUT: AH - INITIAL TIMER VALUE
;         BL - ORIGINAL B259 MASK
ANIOFF PROC NEAR

```

```

; *****
ALL INTERRUPTS ARE ABOVE TO BE DISABLED. THERE IS A POTENTIAL

```


- Channel 2 creates an interrupt pulse during LPC operations.
- Channel 2 can be routed to the audio channel and heard on external audio devices.

These functions are selected by the state of the interrupt enable signal on the Audio Control Latch (ACL) port as follows.

-INT ENA	Channel 2 Function
1	Interrupt Mode
0	Audio Mode

When used for interrupts, the Speech Attachment initializes channel 2's divisor to 8 and channel 2 to the hardware retriggerable one-shot mode. Then the channel 2 gate goes high when -INT goes low and interrupts are enabled.

Note: The -INT ENA signal on the ACL port is set active for channel 2 to function in this manner.

Interrupt Mode (Interrupt Enabled)

During LPC operations, channel 2 transforms the positive edge of the LPC interrupt signal into a short negative-going pulse. This negative-going pulse is applied to the IRQ1 line and the system senses an interrupt on the positive edge of this signal. Use of this pulse allows sharing of the system interrupt line and prevents the disabling of local interrupts from causing a false interrupt.

Audio Mode (Interrupt Disabled)

The channel 2 output may be multiplexed onto the audio channel. When the -INT ENA bit on the ACL port is cleared, the channel 2 gate is held active.

0B44	1C40	R	DW	015E1	C0104-2000H
0B46	1C28	R	DW	015E1	C0105-2000H
0B48	1C18	R	DW	015E1	C0106-2000H
0B4A	104C	R	DW	015E1	C0107-2000H
0B4C	103E	R	DW	015E1	C0108-2000H
0B4E	1025	R	DW	015E1	C0109-2000H
0B50	104C	R	DW	015E1	C0110-2000H
0B52	103E	R	DW	015E1	C0111-2000H
0B54	1025	R	DW	015E1	C0112-2000H
0B56	1010	R	DW	015E1	C0113-2000H
0B58	1000	R	DW	015E1	END_Pc1-2000H
0B5A	0000	R	DW	015E1	END_Pc1-2000H
0B5C	0015	R	DW	015E1	C0114-4000H
0B5E	0067	R	DW	015E1	C0115-4000H

0B60	0014	R	DW	015E1	C0116-4000H
0B62	0110	R	DW	015E1	C0117-4000H
0B64	0100	R	DW	015E1	C0118-4000H
0B66	01C4	R	DW	015E1	C0119-4000H
0B68	019C	R	DW	015E1	C0120-4000H
0B6A	019C	R	DW	015E1	C0121-4000H
0B6C	1000	R	DW	015E1	C0122-4000H
0B6E	1039	R	DW	015E1	C0123-4000H
0B70	100A	R	DW	015E1	C0124-4000H
0B72	1110	R	DW	015E1	C0125-4000H
0B74	1110	R	DW	015E1	C0126-4000H
0B76	117E	R	DW	015E1	C0127-4000H
0B78	1101	R	DW	015E1	C0128-4000H
0B7A	1210	R	DW	015E1	C0129-4000H
0B7C	12A5	R	DW	015E1	C0130-4000H
0B7E	1332	R	DW	015E1	C0131-4000H
0B80	1332	R	DW	015E1	C0132-4000H
0B82	1332	R	DW	015E1	C0133-4000H
0B84	1421	R	DW	015E1	C0134-4000H
0B86	1403	R	DW	015E1	C0135-4000H
0B88	151E	R	DW	015E1	C0136-4000H
0B8A	1567	R	DW	015E1	C0137-4000H
0B8C	15A7	R	DW	015E1	C0138-4000H
0B8E	1670	R	DW	015E1	C0139-4000H
0B90	1609	R	DW	015E1	C0140-4000H
0B92	1619	R	DW	015E1	C0141-4000H
0B94	1750	R	DW	015E1	C0142-4000H
0B96	17A0	R	DW	015E1	C0143-4000H
0B98	1777	R	DW	015E1	C0144-4000H
0B9A	1821	R	DW	015E1	C0145-4000H
0B9C	1890	R	DW	015E1	C0146-4000H
0B9E	1871	R	DW	015E1	C0147-4000H
0BA0	19A9	R	DW	015E1	C0148-4000H
0BA2	1904	R	DW	015E1	C0149-4000H
0BA4	1A20	R	DW	015E1	C0150-4000H
0BA6	1A07	R	DW	015E1	C0151-4000H
0BA8	1A07	R	DW	015E1	C0152-4000H
0BAC	19A9	R	DW	015E1	C0153-4000H
0BAE	1904	R	DW	015E1	C0154-4000H
0BB0	1A20	R	DW	015E1	C0155-4000H
0BB2	1A07	R	DW	015E1	C0156-4000H
0BB4	1AAA	R	DW	015E1	C0157-4000H
0BB6	1826	R	DW	015E1	C0158-4000H
0BB8	1826	R	DW	015E1	C0159-4000H
0BBC	1826	R	DW	015E1	C0160-4000H
0BBE	1826	R	DW	015E1	C0161-4000H
0BC0	1826	R	DW	015E1	C0162-4000H
0BC2	1826	R	DW	015E1	C0163-4000H
0BC4	1826	R	DW	015E1	C0164-4000H
0BC6	1826	R	DW	015E1	C0165-4000H
0BC8	1826	R	DW	015E1	C0166-4000H
0BCA	1826	R	DW	015E1	C0167-4000H
0BCC	1826	R	DW	015E1	C0168-4000H
0BCE	1826	R	DW	015E1	C0169-4000H
0BCF	1826	R	DW	015E1	C0170-4000H
0BD0	1826	R	DW	015E1	C0171-4000H
0BD2	1826	R	DW	015E1	C0172-4000H
0BD4	1826	R	DW	015E1	C0173-4000H
0BD6	1826	R	DW	015E1	C0174-4000H
0BD8	1826	R	DW	015E1	C0175-4000H
0BDA	1826	R	DW	015E1	C0176-4000H
0BDC	1826	R	DW	015E1	C0177-4000H
0BDE	1826	R	DW	015E1	C0178-4000H
0BD0	1826	R	DW	015E1	C0179-4000H
0BD2	1826	R	DW	015E1	C0180-4000H
0BD4	1826	R	DW	015E1	C0181-4000H
0BD6	1826	R	DW	015E1	C0182-4000H
0BD8	1826	R	DW	015E1	C0183-4000H
0BDA	1826	R	DW	015E1	C0184-4000H
0BDC	1826	R	DW	015E1	C0185-4000H
0BDE	1826	R	DW	015E1	C0186-4000H
0BD0	1826	R	DW	015E1	C0187-4000H
0BD2	1826	R	DW	015E1	C0188-4000H
0BD4	1826	R	DW	015E1	C0189-4000H
0BD6	1826	R	DW	015E1	C0190-4000H
0BD8	1826	R	DW	015E1	C0191-4000H
0BDA	1826	R	DW	015E1	C0192-4000H
0BDC	1826	R	DW	015E1	C0193-4000H
0BDE	1826	R	DW	015E1	C0194-4000H
0BD0	1826	R	DW	015E1	C0195-4000H
0BD2	1826	R	DW	015E1	C0196-4000H
0BD4	1826	R	DW	015E1	C0197-4000H
0BD6	1826	R	DW	015E1	C0198-4000H
0BD8	1826	R	DW	015E1	C0199-4000H
0BDA	1826	R	DW	015E1	C0200-4000H

audio channel.

The Speech Attachment uses an 8254 Timer to create the various clock signals required. CVSD circuits use channels 0 and 1 and channel 2 creates the LPC interrupt pulse. Channel 2 may also be gated onto the

Timer

state.

Bit 0 - LPC RDY—A 1 on this bit indicates a bus state and a 0 indicates a completed

Bit 1 - LPC INT—A 0 on this bit indicates an interrupt.

-CVSD CLK divided by 8.

Bit 2 - CVSD FRAME—The negative going edge of this bit is used to read the Shift Register (S/R) during CVSD encode and the positive going edge is used to write to S/R during CVSD decode. CVSD FRAME is

data into and out of the Shift Register.

Bit 3 - CVSD CLOCK—This signal is the inverted form of the clock used by CVSD for the bit sample rate. It is used to clock serial

read its inactive and a 1 indicates that it is

Bit 4 - LPC RS—A 0 on this bit indicates LPC

write its inactive and a 1 indicates that it is

Bit 5 - LPC WS—A 0 on this bit indicates LPC

indicates CVSD encode (in, record).

Bit 6 - CVSD E/D—A 0 on this bit indicates

Bit 7 - Reserved

Address	Byte	Value	Type	Comment
0000	00	00	0000	0000
0001	00	00	0000	0000
0002	00	00	0000	0000
0003	00	00	0000	0000
0004	00	00	0000	0000
0005	00	00	0000	0000
0006	00	00	0000	0000
0007	00	00	0000	0000
0008	00	00	0000	0000
0009	00	00	0000	0000
000A	00	00	0000	0000
000B	00	00	0000	0000
000C	00	00	0000	0000
000D	00	00	0000	0000
000E	00	00	0000	0000
000F	00	00	0000	0000
0010	00	00	0000	0000
0011	00	00	0000	0000
0012	00	00	0000	0000
0013	00	00	0000	0000
0014	00	00	0000	0000
0015	00	00	0000	0000
0016	00	00	0000	0000
0017	00	00	0000	0000
0018	00	00	0000	0000
0019	00	00	0000	0000
001A	00	00	0000	0000
001B	00	00	0000	0000
001C	00	00	0000	0000
001D	00	00	0000	0000
001E	00	00	0000	0000
001F	00	00	0000	0000
0020	00	00	0000	0000
0021	00	00	0000	0000
0022	00	00	0000	0000
0023	00	00	0000	0000
0024	00	00	0000	0000
0025	00	00	0000	0000
0026	00	00	0000	0000
0027	00	00	0000	0000
0028	00	00	0000	0000
0029	00	00	0000	0000
002A	00	00	0000	0000
002B	00	00	0000	0000
002C	00	00	0000	0000
002D	00	00	0000	0000
002E	00	00	0000	0000
002F	00	00	0000	0000
0030	00	00	0000	0000
0031	00	00	0000	0000
0032	00	00	0000	0000
0033	00	00	0000	0000
0034	00	00	0000	0000
0035	00	00	0000	0000
0036	00	00	0000	0000
0037	00	00	0000	0000
0038	00	00	0000	0000
0039	00	00	0000	0000
003A	00	00	0000	0000
003B	00	00	0000	0000
003C	00	00	0000	0000
003D	00	00	0000	0000
003E	00	00	0000	0000
003F	00	00	0000	0000
0040	00	00	0000	0000
0041	00	00	0000	0000
0042	00	00	0000	0000
0043	00	00	0000	0000
0044	00	00	0000	0000
0045	00	00	0000	0000
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0049	00	00	0000	0000
004A	00	00	0000	0000
004B	00	00	0000	0000
004C	00	00	0000	0000
004D	00	00	0000	0000
004E	00	00	0000	0000
004F	00	00	0000	0000
0050	00	00	0000	0000
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0054	00	00	0000	0000
0055	00	00	0000	0000
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0057	00	00	0000	0000
0058	00	00	0000	0000
0059	00	00	0000	0000
005A	00	00	0000	0000
005B	00	00	0000	0000
005C	00	00	0000	0000
005D	00	00	0000	0000
005E	00	00	0000	0000
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0060	00	00	0000	0000
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0069	00	00	0000	0000
006A	00	00	0000	0000
006B	00	00	0000	0000
006C	00	00	0000	0000
006D	00	00	0000	0000
006E	00	00	0000	0000
006F	00	00	0000	0000
0070	00	00	0000	0000
0071	00	00	0000	0000
0072	00	00	0000	0000
0073	00	00	0000	0000
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0075	00	00	0000	0000
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007C	00	00	0000	0000
007D	00	00	0000	0000
007E	00	00	0000	0000
007F	00	00	0000	0000
0080	00	00	0000	0000
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0089	00	00	0000	0000
008A	00	00	0000	0000
008B	00	00	0000	0000
008C	00	00	0000	0000
008D	00	00	0000	0000
008E	00	00	0000	0000
008F	00	00	0000	0000
0090	00	00	0000	0000
0091	00	00	0000	0000
0092	00	00	0000	0000
0093	00	00	0000	0000
0094	00	00	0000	0000
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0097	00	00	0000	0000
0098	00	00	0000	0000
0099	00	00	0000	0000
009A	00	00	0000	0000
009B	00	00	0000	0000
009C	00	00	0000	0000
009D	00	00	0000	0000
009E	00	00	0000	0000
009F	00	00	0000	0000
00A0	00	00	0000	0000
00A1	00	00	0000	0000
00A2	00	00	0000	0000
00A3	00	00	0000	0000
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00A5	00	00	0000	0000
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00A7	00	00	0000	0000
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00A9	00	00	0000	0000
00AA	00	00	0000	0000
00AB	00	00	0000	0000
00AC	00	00	0000	0000
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00AE	00	00	0000	0000
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00B2	00	00	0000	0000
00B3	00	00	0000	0000
00B4	00	00	0000	0000
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00B9	00	00	0000	0000
00BA	00	00	0000	0000
00BB	00	00	0000	0000
00BC	00	00	0000	0000
00BD	00	00	0000	0000
00BE	00	00	0000	0000
00BF	00	00	0000	0000
00C0	00	00	0000	0000
00C1	00	00	0000	0000
00C2	00	00	0000	0000
00C3	00	00	0000	0000
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00CB	00	00	0000	0000
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00CE	00	00	0000	0000
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00D6	00	00	0000	0000
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00DA	00	00	0000	0000
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00DD	00	00	0000	0000
00DE	00	00	0000	0000
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00EB	00	00	0000	0000
00EC	00	00	0000	0000
00ED	00	00	0000	0000
00EE	00	00	0000	0000
00EF	00	00	0000	0000
00F0	00	00	0000	0000
00F1	00	00	0000	0000
00F2	00	00	0000	0000
00F3	00	00	0000	0000
00F4	00	00	0000	0000
00F5	00	00	0000	0000
00F6	00	00	0000	0000
00F7	00	00	0000	

50 an	115 read	180 no
51 again	116 red	181 negative
52 all	117 right	182 number
53 add	118 release	183 not
54 am	119 start	184 alternate
55 are	120 stop	185 up
56 a m.	121 -s (plural morpheme)	186 -ing
57 ahead		187 chime 1
58 answer	122 save	188 bat hitting ball
59 back	123 second	189 ball being caught
60 by	124 sorry	190 gunshot
61 brake	125 screen	191 laser
62 at	126 score	192 phaser
63 as	127 select	193 buzz
64 and	128 -th	194 lic
65 code	129 third	195 loc
66 computer	130 thr-	196 fast chime

(Part 2 of 2) Standard Vocabulary

I/O Address Decode

The Speech Attachment uses the following ports:

Device	Address	Port
8255 PPI	FB98	Port A Data
	FB99	Port B Data
	FB9A	Port C Data
	FB9B	Mode Register
8254 Timer	FB9C	Channel 0
	FB9D	Channel 1
	FB9E	Channel 2
	FB9F	Control Word Register
Shift Register	FF98	Shift Register
Audio Control Latch	FF9F	Audio Control Latch

I/O Port Addresses

6 Speech Attachment

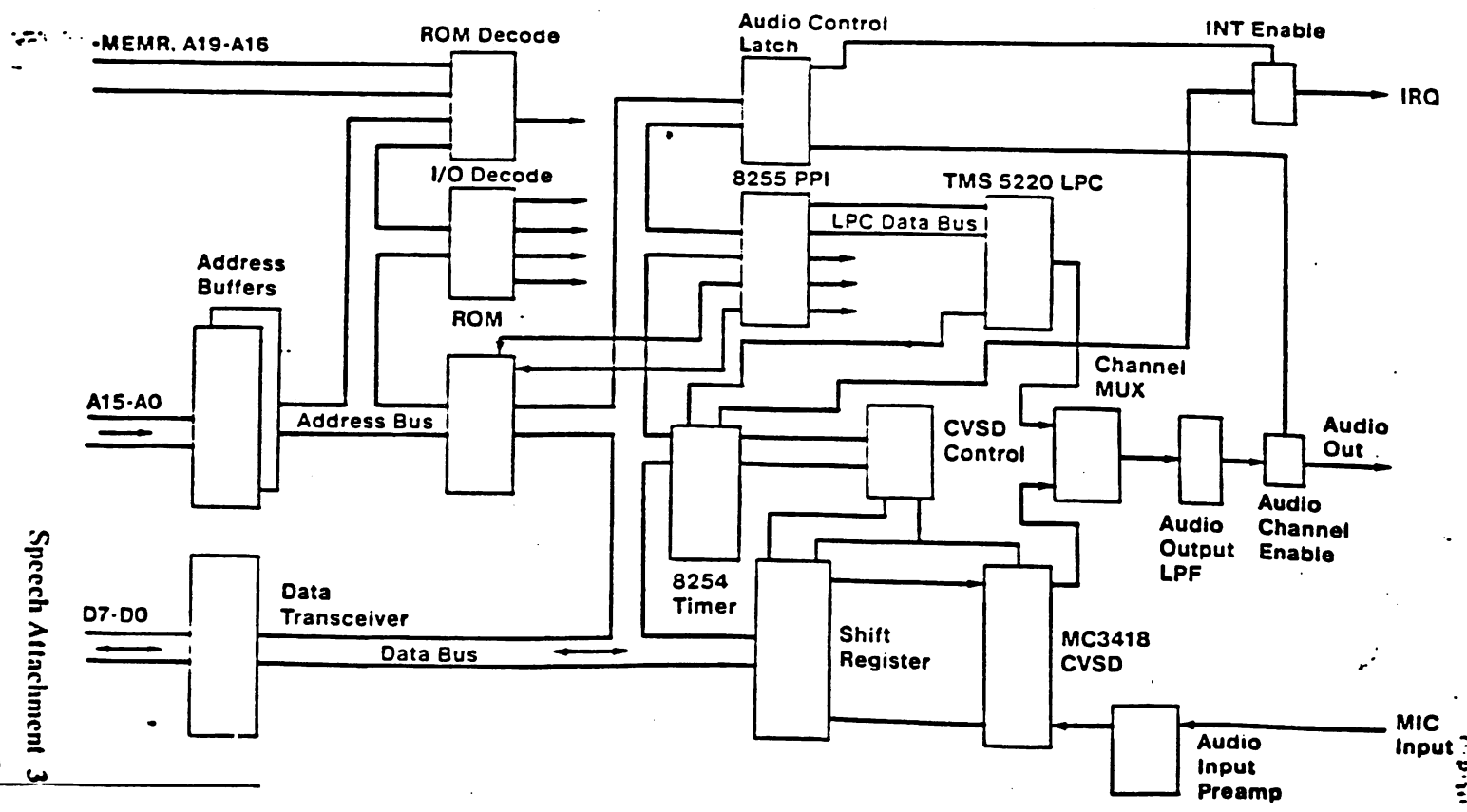
Number 0000	L WORD 0000	DATA	Length +0010
Number 0001	L WORD 0001	DATA	
Number 0002	L BYTE 0002	DATA	
Number 0003	L BYTE 0003	DATA	
Number 0004	L BYTE 0004	DATA	
Number 0005	L BYTE 0005	DATA	
Number 0006	L WORD 0006	DATA	Length +0021
Number 0007	L WORD 0007	DATA	
Number 0008	L BYTE 0008	DATA	
Number 0009	L WORD 0009	DATA	
Number 0010	L WORD 0010	DATA	
Number 0011	L WORD 0011	DATA	
Number 0012	L WORD 0012	DATA	
Number 0013	L WORD 0013	DATA	
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Number 0016	L WORD 0016	DATA	
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Number 0205	L WORD 0205	DATA	
Number 0206	L WORD 0206	DATA	
Number 0207	L WORD 0207	DATA	
Number 0208	L WORD 0208	DATA	
Number 0209	L WORD 0209	DATA	
Number 0210	L WORD 0210	DATA	
Number 0211	L WORD 0211	DATA	
Number 0212	L WORD 0212	DATA	
Number 0213	L WORD 0213	DATA	
Number 0214	L WORD 0214	DATA	
Number 0215	L WORD 0215	DATA	
Number 0216	L WORD 0216	DATA	
Number 0217	L WORD 0217	DATA	
Number 0218	L WORD 0218	DATA	
Number 0219	L WORD 0219	DATA	
Number 0220	L WORD 0220	DATA	
Number 0221	L WORD 0221	DATA	
Number 0222	L WORD 0222	DATA	
Number 0223	L WORD 0223	DATA	
Number 0224	L WORD 0224	DATA	
Number 0225	L WORD 0225	DATA	
Number 0226	L WORD 0226	DATA	
Number 0227	L WORD 0227	DATA	
Number 0228	L WORD 0228	DATA	
Number 0229	L WORD 0229	DATA	
Number 0230	L WORD 0230	DATA	
Number 0231	L WORD 0231	DATA	
Number 0232	L WORD 0232	DATA	
Number 0233	L WORD 0233	DATA	
Number 0234	L WORD 0234	DATA	
Number 0235	L WORD 0235	DATA	
Number 0236	L WORD 0236	DATA	
Number 0237	L WORD 0237	DATA	
Number 0238	L WORD 0238	DATA	
Number 0239	L WORD 0239	DATA	
Number 0240	L WORD 0240	DATA	
Number 0241	L WORD 0241	DATA	
Number 0242	L WORD 0242	DATA	
Number 0243	L WORD 0243	DATA	
Number 0244	L WORD 0244	DATA	
Number 0245	L WORD 0245	DATA	
Number 0246	L WORD 0246	DATA	
Number 0247	L WORD 0247	DATA	
Number 0248	L WORD 0248	DATA	
Number 0249	L WORD 0249	DATA	
Number 0250	L WORD 0250	DATA	
Number 0251	L WORD 0251	DATA	
Number 0252	L WORD 0252	DATA	
Number 0253	L WORD 0253	DATA	
Number 0254	L WORD 0254	DATA	
Number 0255	L WORD 0255	DATA	
Number 0256	L WORD 0256	DATA	
Number 0257	L WORD 025		

The Speech Attachment uses a 32K by 8 bit ROM module, which contains the standard vocabulary and BIOS support. This module appears as normal system memory at hex CE000 through CFFFF.

Vocabulary

There are 196 words, phrases, and sound effects encoded in the standard vocabulary on the ROM module of the Speech Attachment. The following is a list of these showing their corresponding index numbers.

12 ANIL	1000	1000	1000
12 BURN	1001	1001	1001
12 SLICK	1002	1002	1002
12 M... ..	1003	1003	1003
12... ..	1004	1004	1004
12... ..	1005	1005	1005
12... ..	1006	1006	1006
12... ..	1007	1007	1007
12... ..	1008	1008	1008
12... ..	1009	1009	1009
12... ..	1010	1010	1010
12... ..	1011	1011	1011
12... ..	1012	1012	1012
12... ..	1013	1013	1013
12... ..	1014	1014	1014
12... ..	1015	1015	1015
12... ..	1016	1016	1016
12... ..	1017	1017	1017
12... ..	1018	1018	1018
12... ..	1019	1019	1019
12... ..	1020	1020	1020
12... ..	1021	1021	1021
12... ..	1022	1022	1022
12... ..	1023	1023	1023
12... ..	1024	1024	1024
12... ..	1025	1025	1025
12... ..	1026	1026	1026
12... ..	1027	1027	1027
12... ..	1028	1028	1028
12... ..	1029	1029	1029
12... ..	1030	1030	1030
12... ..	1031	1031	1031
12... ..	1032	1032	1032
12... ..	1033	1033	1033
12... ..	1034	1034	1034
12... ..	1035	1035	1035
12... ..	1036	1036	1036
12... ..	1037	1037	1037
12... ..	1038	1038	1038
12... ..	1039	1039	1039
12... ..	1040	1040	1040
12... ..	1041	1041	1041
12... ..	1042	1042	1042
12... ..	1043	1043	1043
12... ..	1044	1044	1044
12... ..	1045	1045	1045
12... ..	1046	1046	1046
12... ..	1047	1047	1047
12... ..	1048	1048	1048
12... ..	1049	1049	1049
12... ..	1050	1050	1050
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12... ..	1052	1052	1052
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12... ..	1060	1060	1060
12... ..	1061	1061	1061
12... ..	1062	1062	1062
12... ..	1063	1063	1063
12... ..	1064	1064	1064
12... ..	1065	1065	1065
12... ..	1066	1066	1066
12... ..	1067	1067	1067
12... ..	1068	1068	1068
12... ..	1069	1069	1069
12... ..	1070	1070	1070
12... ..	1071	1071	1071
12... ..	1072	1072	1072
12... ..	1073	1073	1073
12... ..	1074	1074	1074
12... ..	1075	1075	1075
12... ..	1076	1076	1076
12... ..	1077	1077	1077
12... ..	1078	1078	1078
12... ..	1079	1079	1079
12... ..	1080	1080	1080
12... ..	1081	1081	1081
12... ..	1082	1082	1082
12... ..	1083	1083	1083
12... ..	1084	1084	1084
12... ..	1085	1085	1085
12... ..	1086	1086	1086
12... ..	1087	1087	1087
12... ..	1088	1088	1088
12... ..	1089	1089	1089
12... ..	1090	1090	1090
12... ..	1091	1091	1091
12... ..	1092	1092	1092
12... ..	1093	1093	1093
12... ..	1094	1094	1094
12... ..	1095	1095	1095
12... ..	1096	1096	1096
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12... ..	1098	1098	1098
12... ..	1099	1099	1099
12... ..	1100	1100	1100
12... ..	1101	1101	1101
12... ..	1102	1102	1102
12... ..	1103	1103	1103
12... ..	1104	1104	1104
12... ..	1105	1105	1105
12... ..	1106	1106	1106
12... ..	1107	1107	1107
12... ..	1108	1108	1108
12... ..	1109	1109	1109
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12... ..	1111	1111	1111
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12... ..	1117	1117	1117
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12... ..	1189	1189	1189
12... ..	1190	1190	1190
12... ..	1191	1191	1191
12... ..	1192	1192	1192
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12... ..	1194	1194	1194
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12... ..	1197	1197	1197
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12... ..	1294	1294	1294
12... ..	1295	1295	1

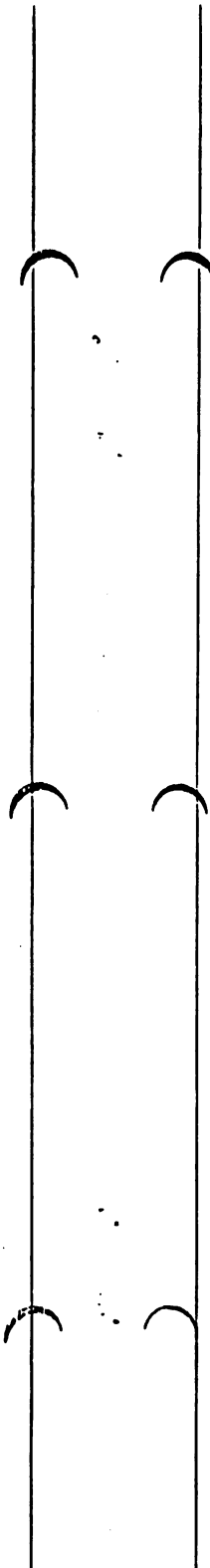


Speech Attachment 3
D/F-88

Microphone

An external microphone jack is provided at the rear of the attachment.

The following is a block diagram of the Speech Attachment.



Reader's Comment Form

Speech Attachment
Technical Reference

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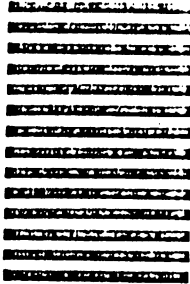


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Speech Attachment

The Speech Attachment is a side mounted attachment that adds speech capability to the PCjr. It contains a program accessible vocabulary of words, phrases, and sound effects and accepts audio input from external sources.

Description

The Speech Attachment provides two technologies for speech reproduction:

- Speech encoding (speech-to-data) and decoding (data-to-speech) using a continuously variable slope delta (CVSD) modulation technique.
- Speech synthesis using linear predictive coding (LPC).

An internal ROM module contains the BIOS necessary to control the Speech Attachment.

CVSD

CVSD allows the user to encode speech using a microphone and store the resulting uncompressed speech data in system memory (RAM), on diskette, or another storage device. The stored speech data may then be decoded with the resulting speech output available through the audio channel of the PCjr.

LPC

LPC synthesizes speech from compressed speech data on the internal ROM module. LPC speech data may also reside on program cartridges or may be placed in RAM from a diskette or another storage device.



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