

Aculab DSP65 Firmware Module

CALL PROGRESS TONE DETECTION

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Revision Record

Rev	Detail	Date
1	Initial Draft - Call Progress Tone Detection DSP Software module	23-Jan-1996
2	EC Ring Tone has now been added to the list of call progress tones recognised	13-Mar-1996
3	Modification to the detection threshold. It was too low at -38 dBm0 and is now revised at -17 dBm0	19-Jul-1996
4	This version now includes the ability to flush the buffers	10-Jul-1997
4.1	Re-format into new document standards	28-Mar-2001
4.2	Correction to the byte responses from the DSP65 upon recognition	12-Jan-2005

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1 Introduction

The DSP firmware module detects incoming call progress tones on a maximum of 32 timeslots and reports the possible occurrence of a tone by writing a byte on the corresponding output timeslot. The types of tones detected include UK and EC dial tone, ring back tone, busy tone and unobtainable. It also includes SIT detection.

2 Functionality

The DSP provides the ability to detect a number of standard UK and EC call progress tones. These tones are presented to the input stream of the DSP where their frequency and cadences are measured and compared with templates of the tones to be detected. The frequencies have a +/- 10% tolerance and the cadences are usually around +/- 25% tolerance.

2.1 Explanation of the Output I.D Bits

Each output timeslot byte represents the corresponding incoming signal recognised on that timeslot. The description of each byte is as follows:

Byte Response	Description
0x00	Not recognised
0x01	Ringback Tone (UK, EC)
0x02	Busy / Engaged Tone (UK, EC)
0x03	Dial / Unobtainable Tone (UK, EC)
0x04	Supervisory Information Tone (UK)
0x05	Path Engaged Tone (UK)

2.2 Full Description of the Tones and their Cadences

Unobtainable Tone:	UK	400 Hz, continuous tone
	EC	425 Hz, 0.167s on / 0.167s off
Busy / Engaged Tone:	UK	400 Hz, 0.375s on / 0.375s off
	EC	425 Hz, 0.5s on / 0.5s off
Path Engaged Tone:	UK	400 Hz, 0.4s on / 0.35s off / 0.225s on / 0.525s off
Ringback Tone:	UK	400 Hz or 450 Hz, 0.4s on / 0.2s off / 0.4s on / 2.0s off
	EC	425 Hz, 1.0s on / 3.0s off
Supervisory Tone:	UK	950 +/- 50 Hz, 330 +/- 70 ms with 30ms off
		1400 +/- 50 Hz, 330 +/- 70 ms with 30ms off
		1800 +/- 50 Hz, 330 +/- 70 ms with 30ms off

All Tones incorporate a +/- 25% tolerance on the cadences except where stipulated otherwise. For reference see specification BS 6305.

3 External interfaces

3.1 User Interface

The procedure for download utilises the program, fwdspldr.exe. It's used in the following manner:

```
Fwdspldr -t65 <dsp_pos> <dsp_firmware.b65> <port_no> <pm4_filename>
```

- dsp_pos = dspa OR dspb
- dsp_firmware = any firmware title with the extension .b65.
 For call progress tone detection: cproga.b65 for A-law
 For call progress tone detection: cprogu.b65 for mu-law
- port_no = 0, 1, 2.....n. As many ports as supported with DSP65s
- pm4_filename = any pm4 filename with ZAP loader

Note Refer to the DSP firmware guide for information on Card types, DSP's and their associated streams

3.2 Program types Available

There are two types of program available:

- cproga.b65 (for A-law)
- cprogu.b65 (for u-law)

For call progress tone detection

4 Configuration

Timeslot	Output
0	Call Progress i.d byte
1	Call Progress i.d byte
2	Call Progress i.d byte
3	Call Progress i.d byte
4	Call Progress i.d byte
5	Call Progress i.d byte
6	Call Progress i.d byte
7	Call Progress i.d byte
8	Call Progress i.d byte
9	Call Progress i.d byte
10	Call Progress i.d byte
11	Call Progress i.d byte
12	Call Progress i.d byte
13	Call Progress i.d byte
14	Call Progress i.d byte
15	Call Progress i.d byte
16	Call Progress i.d byte
17	Call Progress i.d byte
18	Call Progress i.d byte
19	Call Progress i.d byte
20	Call Progress i.d byte
21	Call Progress i.d byte
22	Call Progress i.d byte
23	Call Progress i.d byte
24	Call Progress i.d byte
25	Call Progress i.d byte
26	Call Progress i.d byte
27	Call Progress i.d byte
28	Call Progress i.d byte
29	Call Progress i.d byte
30	Call Progress i.d byte
31	Call Progress i.d byte