

<b>PHONAK</b> <small>communication systems</small>  <b>Development</b>	<b>Technical Note</b>  <b>Manuel</b> <b>Campus S FM Transmitter (TX2S)</b> <b>US Version</b>	Doc.: TN010906.doc Vers.: <b>V1</b> Page: 1 of 5 Date: 06.09.01

**Distribution:** Montena EMC SA, CH-1728 Rossens, Mr Manfred Portman

Path: Marquis:> D:/data/phonak/T\_memos/Englisch/TN010906.doc

	Name	Date	Visum
<b>Produced by</b>	F. Marquis	06.09.01	FMa
<b>Approved</b>	F. Marquis	06.09.01	FMa
<b>Released</b>	F. Marquis	06.09.01	FMa

# Manuel

## Campus S FM Transmitter (TX2S)



History:

Version	Date	Modifications	Pages
V1.0	06.09.01	New document	all

<b>PHONAK</b> <small>communication systems</small>  <b>Development</b>	<b>Technical Note</b>  <b>Manuel</b> <b>Campus S FM Transmitter (TX2S)</b> <b>US Version</b>	Doc.: TN010906.doc Vers.: <b>V1</b> Page: 2 of 5 Date: 06.09.01
---	--	--

## Background

Hearing impaired persons use hearing aids (HA), which are electroacoustic amplifiers including a microphone and an earphone and having frequency response and dynamic characteristics specific to each hearing loss. BTE (Behind-The-Ear) hearing aids have the possibility to be connected to an external microphone, by means of electrical contacts placed on the bottom of the apparatus.

A wireless solution for a remote microphone still exists: an FM radio receiver is connected to the HA, via the electrical contact system for the external microphone. This FM radio receiver can be either :

- In form of a little box, self powered by its own battery, and connected to the contact system by a cable (for example Microvox R),

or

- A new system, fully miniaturised (Phonak Microlink), having the form of a piece of sugar, powered by the hearing aid battery, an clipped on the bottom of the BTE-HA.

A previous FM transmitter (Microvox TX2) is still in use for application in schools. The microphone is connected with a cable to the small transmitter having the form of a little box. The transmitter is fixed to the clothes by a clip and the microphone by a small cord around the neck or a needle to the shirt.

The Campus S (TX2S) is a more convenient remote microphone for hearing impaired persons. Campus S has an integrated synthesizer which allows to change the frequency of the transmitting channel.

TX2S is the development name of Campus S.

## Product description

The Phonak Campus S is a FM transmitter (channel bandwidth of 25 kHz) for FM receivers, as the Phonak MicroLink or MicroVox, connected to hearing aid instruments. Its frequency for north america is from 216 to 217MHz.

The Campus S is equipped with 2 audio inputs:

- Microphone-input                   for speech transmission (teacher)
- Audio-input                         for external audio source (CD-player, radio, ...)

The microphone can be switched as omnidirectional or directional.

The Campus S has 2 modes of operation: off and active (transmitting). The status of the Campus S is indicated with the LCD display. When in off sate, the LCD display is blank. When transmitting, the Channel number is indicated on the LCD display.

It can manually be switched on and off.

The Audio-input adds the left and right channels of a stereo signal to generate a mono signal.

The Campus S is powered by a prismatic NimH accumulator. A DC power supply (wallcharger) is used to charge the accumulator. The Campus S is protected against polarity inversion and false voltage (too high or AC).

The microphone cable is used as transmitter antenna.

<b>PHONAK</b> communication systems  <b>Development</b>	<b>Technical Note</b>  <b>Manuel</b> <b>Campus S FM Transmitter (TX2S)</b> <b>US Version</b>	Doc.: TN010906.doc Vers.: <b>V1</b> Page: 3 of 5 Date: 06.09.01
---	--	--

## Operating description

Before starting, charge the accumulator of the Campus S during at least 12 hours. To do this, connect the plug of the Wall-Charger to the DC input shown on figure 1. The DC input voltage must be between 3VDC and 6 VDC.

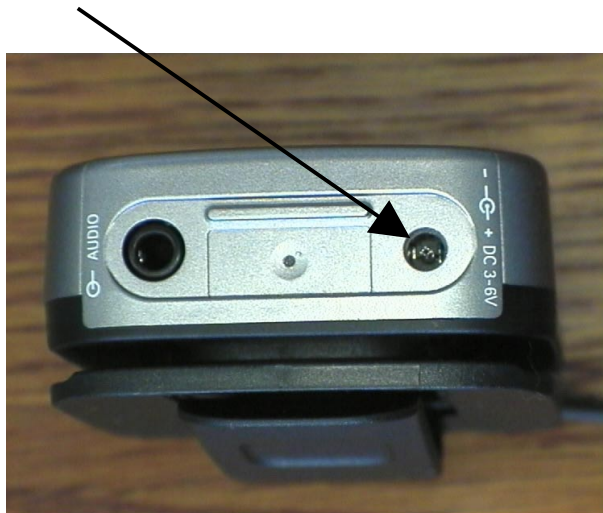


fig. 1 Campus S, audio and DC input

### 1. Switching ON/OFF

To switch the Campus S ON, press during 1 second on the "ON/OFF" button. Then the channel number will be displayed. The accumulator charge status is displayed. The Campus S is transmitting on the displayed channel.

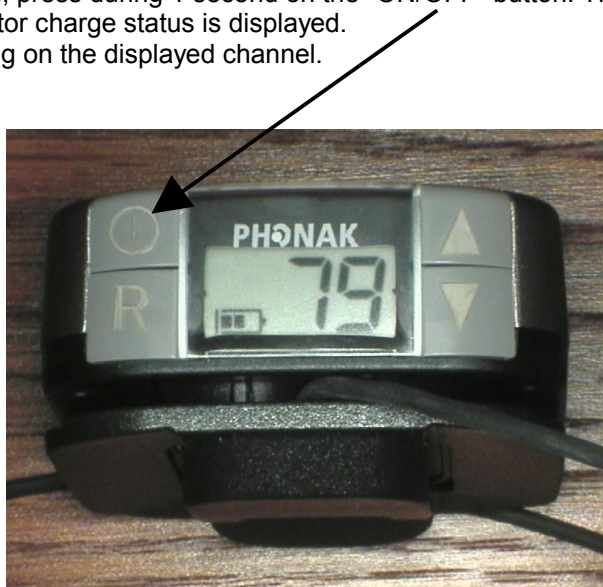


fig. 2 LCD and buttons

To switch the Campus S OFF, press during 1 second on the "ON/OFF" button. The LCD display will become blank. The Campus S is in OFF state and is no more sending.

<b>PHONAK</b> communication systems  <b>Development</b>	<b>Technical Note</b>  <b>Manuel</b> <b>Campus S FM Transmitter (TX2S)</b> <b>US Version</b>	Doc.: TN010906.doc Vers.: <b>V1</b> Page: 4 of 5 Date: 06.09.01
---	--	--

## 2. Channel change

To change the transmitting channel of the Campus S, press button "channel UP" or "channel DOWN" shown on fig. 3. Then the new channel number will be displayed and the Campus S is transmitting on the new channel. "Channel UP" will increment to the next available channel and "channel DOWN" will decrement to the next available channel. There are 23 channels programmed in the Campus S (see list in para 6).

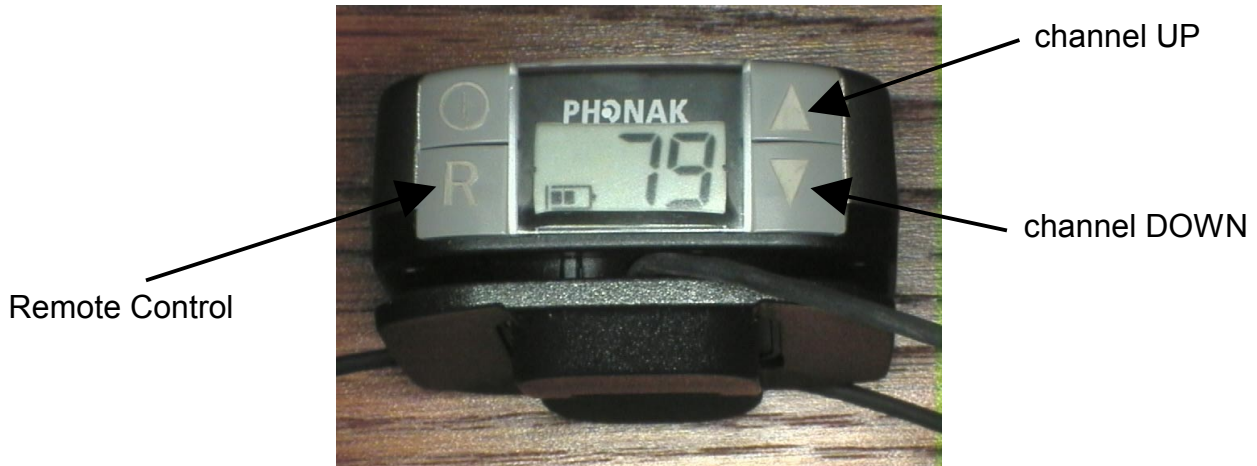


fig. 3 LCD and buttons

## 3. Remote Control function

By pushing the "Remote Control" button, the Campus S will inductively send a command to synchronize future receivers to the same frequency.

## 4. External audio source

An external audio source (CD player, Radio, ...) can be connected to the Campus S via the audio input Jack (3.5mm). The audio level will be adapted with an AGC circuit (Automatic Gain Control). The signal will be mixed with the signal of the MM8 microphone. The microphone can be switched OFF.

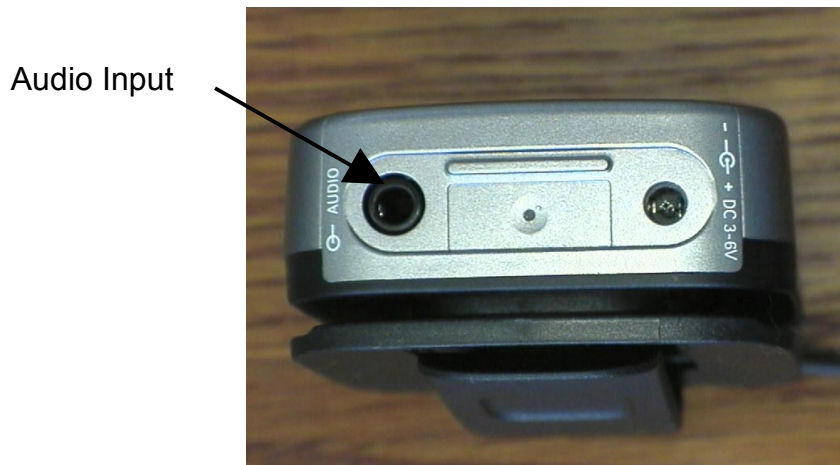


fig. 4 Campus S, audio and DC input

## 5 MM8 microphone

The MM8 microphone can be set in 3 different modes by rotation of the upper part of the microphone.

In fig. 5, the MM8 microphone is set in "OFF" position. In this case, only the external audio signal will be transmitted.

In fig. 6, the MM8 microphone is set in "OMNI" position. In this case, the microphone has an omni-directional characteristic

In fig. 7, the MM8 microphone is set in "DIR" position. In this case, the microphone has an directional characteristic



fig. 5 Position "OFF"



fig. 6 Position "OMNI"



fig. 7 Position "DIR"

## 6 Frequency list of the 23 channels

Phonak Channel	Frequency [MHz]
N01	216.0125
N02	216.0375
N04	216.0875
N05	216.1125
N08	216.1875
N09	216.2125
N12	216.2875
N13	216.3125
N16	216.3875
N17	216.4125
N18	216.4375
N61	216.5125
N62	216.5375
N64	216.5875
N65	216.6125
N68	216.6875
N69	216.7125
N72	216.7875
N73	216.8125
N76	216.8875
N77	216.9125
N79	216.9625
N80	216.9875