Fraud and deceit by CETECOM
Test report by CETECOM for Aaronia now revealed.

Further comments, June 7, 2006

Our commetary dated May 26, 2006 (only available in German) is once again subject to further comments, as in the meantime we dispose of as much as four(!) different versions of the CETECOM test report.

The first three versions have all been altered with respect to their contents, not, however, to their dates and test report numbers! In the latest version, which we downloaded from the internet from Aaronia on June 2, 2006, we merely found a modificaton of the date (now May 10, 2006), and of the test report no. (now 4-1905-01-02/05). The signatures are identical in all four versions!
Now we ask ourselves why one would change the test report no. and the date at this point of time, if there are no alterations as to the content. Why wasn't the date and the test report no. already altered earlier, at the same time as the content?

It's getting increasingly "interesting"!

We have taken this opportunity to add further explanations to the report.

On May 10, 2006 we were sent a test report from England of 74 pages, a report by CETECOM ICT Services GmbH, Untertuerkheimer Str. 6-10, 66117 Saarbrücken, Germany, dated April 28, 2006, with the test report no. 4-1905-01-01/05.

On May 11, 2006 we also found a 74-page test report by CETECOM ICT Services GmbH, Untertuerkheimer Str. 6-10, 66117 Saarbrücken, Germany on the Aaronia homepage (www.aaronia.de) under the category "Spectrum analyser", dated April 28, 2006, with the test report no. 4-1905-01-01/05. The test report can be found on the German version as well as on the English version of the Aaronia homepage.

It is important to mention that both versions of the test report show the same date and the same test report number, as well as totally identical testing engineers' signatures.
However, the test report version on the Aaronia homepage shows additions on some pages, which cannot be found on the version we received from England. Furthermore, on various pages the reference device SMIQ 26 turns into an FSIQ 26.

So we conclude that the CETECOM report on the Aaronia homepage is definitely not identical to the original version.

Commentary by Buergerwelle e. V. with reference to the CETECOM test report.

Some additions to the report on the Aaronia homepage are stated separately.

Page 3, point 1.1.2, Assessment reads:

"... Special attention was directed to the following signal shapes: CW, GSM, UMTS, WLAN and DECT. The measurements were exclusively performed by skilled personnel under objective and representative conditions, as well as with comparative device settings during all tests. The Spectrum Analyzer HF-2025E showed a sufficient measurement accuracy during the measurement of RMS-signal strength of pulsed and unpulsed signals as required by EMF-test specifications (see chapter 2.5 for details). It can therefore be applied for EMCE measurements of all tested signal types."

The reader of these lines will now think that the Aaronia Spectran is well capable of measuring all above mentioned signals.
These results are extremely contradictory to the test results gained by Buergerwelle. We have, therefore, analysed the test report, and discovered that large parts of it are wrong, or even misleading.

Page 11:
No calibration was stated for the following testing technology:
Vector Signal Generator SMJ100A
ESG Vector Signal Generator Agilent E4438C
Base Station Simulator CMU 200

2.4.7 Additional equipment utilized

Device	Type	Serial number	last calibration
Signal Analyzer	Rhode & Schwarz FSIQ26	835111/004	2004-04-07
Vector Signal Generator	SMJ100A	100300	n/a
ESG Vector Signal Generator	Agilent E4438C	MY45092266	n/a
Base station simulator	CMU200	106826	n/a
Wideband horn	EMCO 3115	3088	n/a

n/a : calibration not necessary for test cases in chapter 2.5.
A regular in-house verification of test equipment is performed annually.

For all relevant calibration information see annex 2.

from CETECOM-expertise page 11
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

The fact that devices ought to be calibrated makes sense and is indisputable, hopefully. Even if the reference device (e.g. PMM) for level measurements is calibrated, this will only guarantee for the measured level. The pulse types of the measured signals can, however, not be verified, in spite of a calibration of the reference device. It would, therefore, be safer to have the generators calibrated (and so checked), too. In this context, we would like to draw your attention on the calibration report of the Rohde & Schwarz FSIQ26, a device which was registered defective after its receiving inspection. CETECOM states that there is no need for a calibration for the tests in chapter 2.5, and that the testing devices undergo an annual regular in-house check-up anyway. It is, nevertheless, still not known, whether the devices have been calibrated or not, and if so, when.

Page 32:
Here, a broadband measuring device PMM 8053 is used to measure the sum of all signals between 0.1 and 3000 MHz, with a result of 0.52 V/m. The Spectran can also be adjusted to broadband measurement settings (CLR). That way, the individual signal intensities for the whole frequency range could be captured, provided that the Spectran would measure accurately.

But why was the Spectran setting changed to GSM 900 here with a result of 0.483 V/m? What is the aim of this alternated setting? CETECOM states that this chapter (2.5.5) shows that the GSM 900 signal is the dominating signal, and that the influences of the GSM 1800 on the measurement results of the broadband probe are low. Maybe because the Spectran only shows a little lower level for GSM 900 than the sum of all signals of the broadband probe? Has the Spectran subject to testing suddenly turned into the reference device? How is anybody supposed to know prior to a field measurement which is the strongest signal?

Broadband with reference to the Spectran in this case definitely implies the covered frequency range. I underlined that too, by using the CLR-button. However, depending on the version, the Spectran is able to measure a similarly large frequency range as the PMM. So if it is possible to apply the same setting on both devices, one ought to do so. For the reference measurement, it is of no importance whether in this mode the Spectran measures all frequencies at once, or whether the spectrum components are measured one by one, and then added up afterwards. One would, in this case, not have had to rely on suppositions about why both measurement results happen to be equal. Now, it looks as if the settings on the Spectran had been altered again and again, until eventually obtaining equal results. We will take up this matter in the near future, and document it on video, in order to make clear to everybody out there why this is a problem which ought to be taken serious.
The testing engineers should have noticed the varying measurement results from large bandwidths to small ones. Even if the client did not commission the investigation of the settings, it is a common and fair practice to document weaknesses detected as such. Especially if the test report can be seen as expertise with respect to its form and size.

Page 24:
The settings of the signal source CMU200 are not apparent, and are not documented anywhere. Are they pulsed signals or CW signals?
The lacking documentation of the settings is very questionable.
It is, in fact, usually a standard feature of such test reports for reasons of measurement repetition.
The PMM measuring device is preset to RMS values (average value). However, the PEP (peak value) is of more importance. If, for instance, a GSM signal only needs one time slot, it will only show 1/8 of the pulse as an average value. A DECT signal will have a stand-by pulse width of approx. 1%. In this case, the average value is only 1/100 of the peak value. This way of measuring is not adequate for the building biology or health assessment.

2.5.3 Comparative measurement of an artificially generated GSM and UMTS signal with broadband field probe.

test description :

An EMCO wideband horn was fed with a GSM or UMTS signal generated by a CMU base station simulator.
The electromagnetic field in front of the horn was measured simultaneously both with the PMM broadband probe and the SPECTRAN HF-2025E at a distance of 2 meters and at a small distance between each other.
This has been a check under normal user conditions (no shielded chamber, unknown field structure possible reflections)

The test was performed with the following settings :

at 2140 MHz (WCDMA):

Aaronia SPECTRAN HF-2025E	PMM 8053
Hotkey UMTS :	
Center frequency : 2140 MHz	wide band probe EP330 0.1 – 3000 MHz
Span : 60 MHz	RMS : last 32 samples
Filter : 3 MHz	
Sample time : 50 ms	
Max hold mode : on	

at 900 MHz (GSM)

Aaronia SPECTRAN HF-2025E	PMM 8053
Hotkey GSM 900 :	
Center frequency : 940 MHz	wide band probe EP330 0.1 – 3000 MHz
Span : 40 MHz	RMS : last 32 samples
Filter : 3 MHz	
Sample time : 100 ms	
Max hold mode : on	

from CETECOM-expertise page 24
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

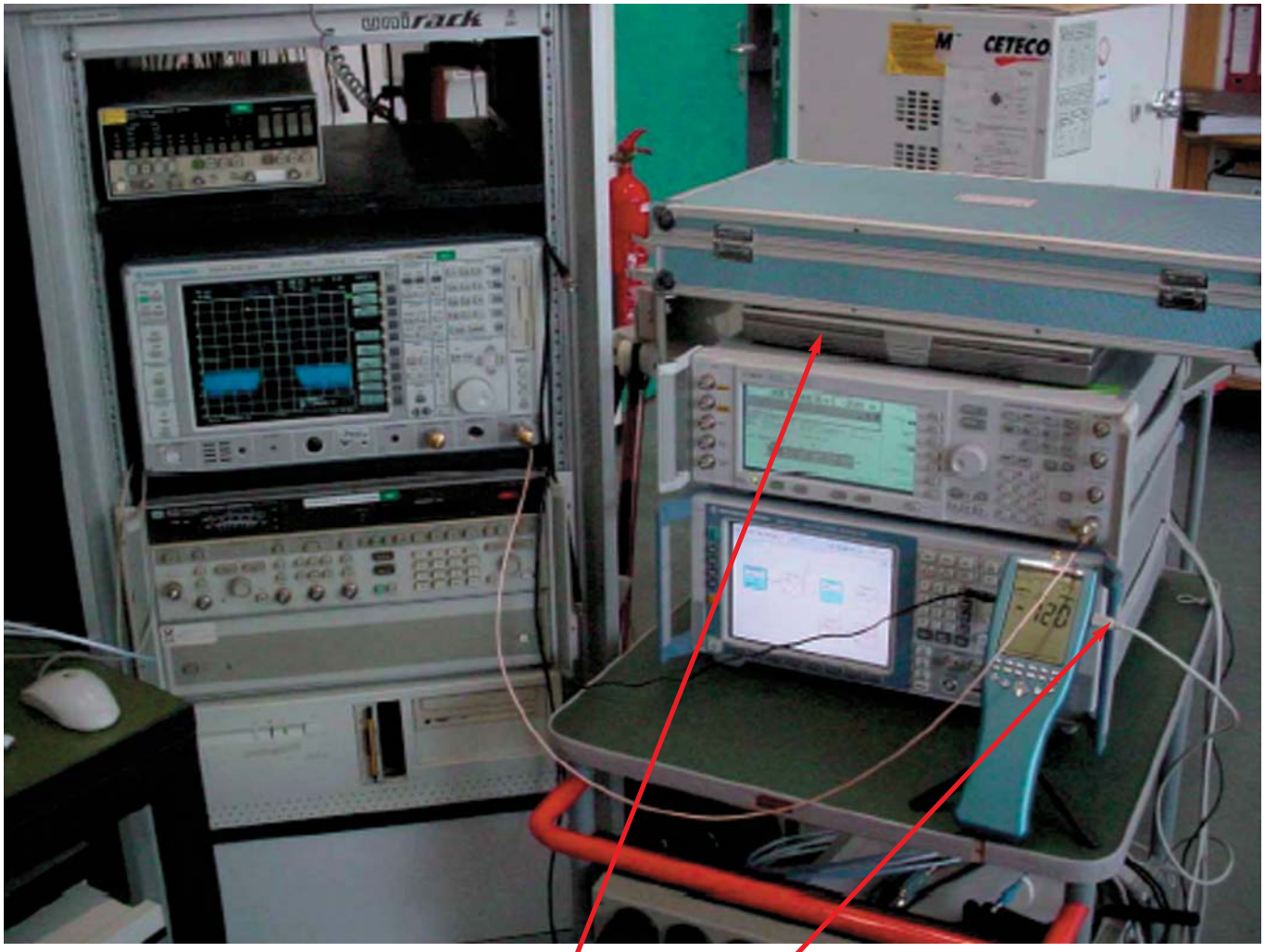
Another astonishing point is that the max. hold mode was chosen for the Spectran, whereas a floating average value out of 32 measurement values was chosen for the PMM 8053. According to our elaborations for the part of the Buergerwelle test called "At the last minute", all you need to do is wait until the Spectran eventually finds a specific value, which is then held endlessly. When undertaking comparative measurements, the respective measurement devices ought to have equal settings.

The RMS marks the average value of output. There are also industrial specifications according to which the peak value should be measured (Bundesnetzagentur (German member of the ERG), CEPT), or it is left up to the measuring engineer. One exception is the BUWAL (Swiss Agency for Environment, Forests and Landscape), who have strict regulations as to the measurement of the thermal output. It is the peak value, though, which is relevant with respect to the building biology. The peak value concerning the modulation of information to be transmitted (e.g. UMTS), and the peak value concerning the TDM carriers (DECT, GSM). Both peak values are relevant with respect to the building biology assessment (maybe even in combination, if TDM-UMTS is also being applied).

Page 42:
What strikes our attention here is the notebook to be seen right beneath the Aaronia case. It's obviously the same type as shown on Aaronia's homepage on page 4 of the IMST GmbH minutes, as well as on page 7 of the expertise by the Fachhochschule Koblenz, and on the own Aaronia measurement reports. Why did CETECOM not mention this notebook in their report?

What do you need a notebook for if you're only wanting to test a 250 Euro measurement device? If the notebook is employed for a measurement as well as its evaluation and documentation, it is to be mentioned in the reports of the devices used. If this had been done for the various tests, it would be obvious whether the serial numbers are equal or not.

On most of the photos, the Spectran has a USB connected to it. This was not mentioned in the report either. Why not? This could be a way to easily manipulate measurements, if you wish to do so.



from CETECOM niot mentioned

from CETECOM not mentioned USB connection

from CETECOM-expertise page 42
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

Page 29: DECT

With regard to the artificially generated signal, all wireless phones as well as the base station signal from one direction at an equal level. In reality, this is a non-existent constellation. Due to the varying distances to each of the mobile phones, the signal is again pulsed at a stronger level.

The test was perfomed with all 12 PP DECT channels activated. This is an absolutely unusual, special case with full attendance (all 12 channels in use). Reality proves to be different. Millions of DECT phones are to be found in households which do not work under the special conditions chosen by CETECOM.

The artificially generated signal used here is only interrupted by short breaks. All channels have the same level. This special case does not occur in reality. For the Spectran, this signal used here is very similar to an almost unpulsed signal (permanent signal, CW). The fact that the Spectran recognises these signals has already been documented in our BW Newsletter (fully occupied GSM control channel). As opposed to this DECT-test, the GSM signal does, however, exist in reality.

A point of interest with regard to DECT would have been the measurement of only the beacon signal (in the frequency level), as it is the main DECT signal to be found in reality.

The test was performed with the following settings :

at 1890 MHz (DECT):

Aaronia SPECTRAN HF-2025E	PMM 8053
Hotkey DECT :	
Center frequency : 1890 MHz	wide band probe EP330 0.1 – 3000 MHz
Span : 20 MHz	RMS : last 32 samples
Filter : 3 MHz	
Sample time : 50 ms	
Max hold mode : on	
Pulse mode on :	

Test result :

frequency / MHz	level PMM / V/m	level SPECTRAN / V/m
DECT 1900 MHz band	0.81 (RMS)	0.778

Remark : The test was performed with all 12 PP DECT channels activated to have direct comparison between PEP RMS-Value of Sprectran and averaged RMS of PMM 8053.

from CETECOM-expertise page 29
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

Page 40: UMTS = WCDMA

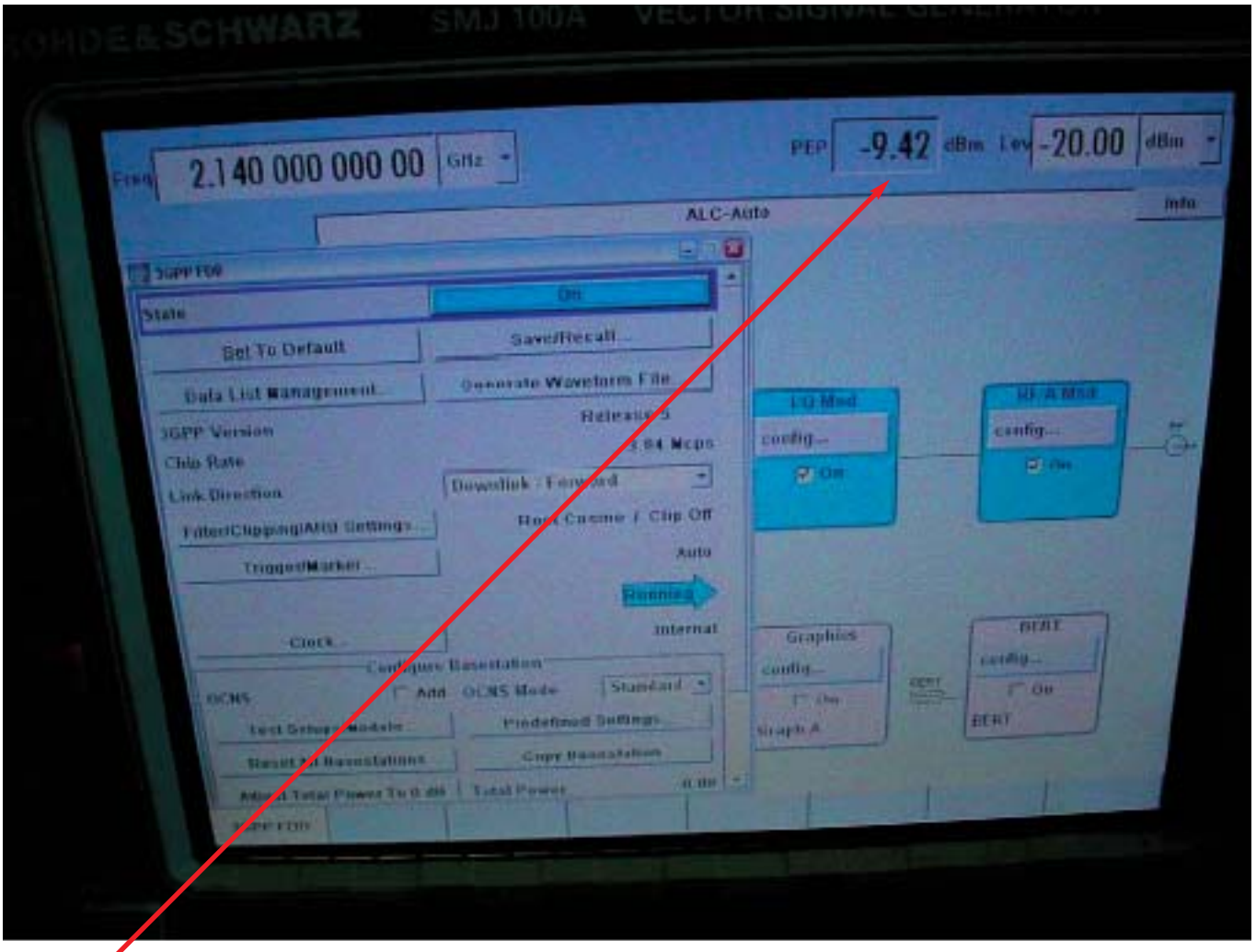
Page 57, top right corner of the photo: a value of -20 dBm is shown. This is the unpulsed part, which the Spectran (-21 dBm) is pretty well able of recognising. It is not capable of finding the peak value (PEP) of -9,42 dBm, though. This value is higher by more than a 10-fold! (please see chapter on Crest Factor on page 15 of the Buergerwelle test).

The fact that the Spectran can recognise the average value of UMTS signals is mentioned in the Buergerwelle test. For EMVU measurements, however, the peak values are also of interest. Also with regard to the building biology, it is the more important recognition value of UMTS signals. By omitting this additional factor, the reader of the report will gain the impression that UMTS has been absolutely accurately measured. This is not correct, as can be taken from our test report.

at 2140 MHz (WCDMA):

Aaronia SPECTRAN HF-2025E	FSIQ26
Hotkey UMTS :	
Center frequency : 2140 MHz	Center frequency : 2140 MHz
Span : 60 MHz	Span : 60 MHz
Filter : 3 MHz	Filter : 3 MHz
Sample time : 50 ms	RMS detector : on
Display mode : max hold	Display mode : max hold

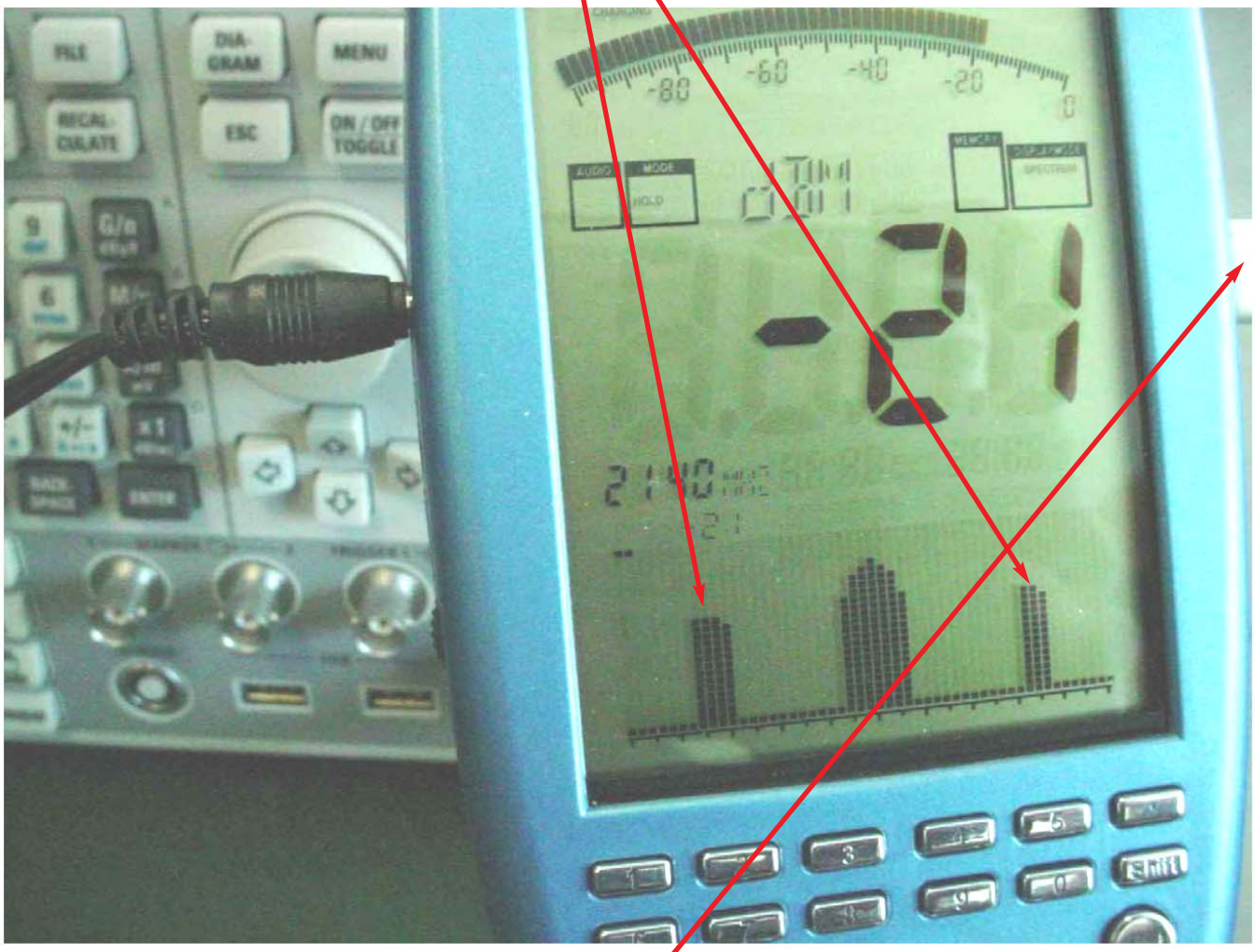
from CETECOM-expertise page 40
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de



Peak value will not be recognized by the SPECTRAN

from CETECOM-expertise page 57
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

Furthermore, the Spectran recognises additional frequencies (page 58, on the display), which had not even been fed in! So if the maximum level was to lie beyond the display values, one would obtain a completely wrong result.



from CETECOM not mentioned USB connection

from CETECOM-expertise page 58
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

Page 40: GSM 900 and GSM 1800

An unpulsed signal (CW) was caused by the generator. This can be seen on page 41, second table, second column, line 4 and 5: "unframed", i.e. unpulsed.
The following can be found in the operating manual of the Rhode & Schwarz generator SMJ 100A: unframed = CW signal.

Summary conducted power measurements of average channel power :

note : cable attenuation included in measurement values.

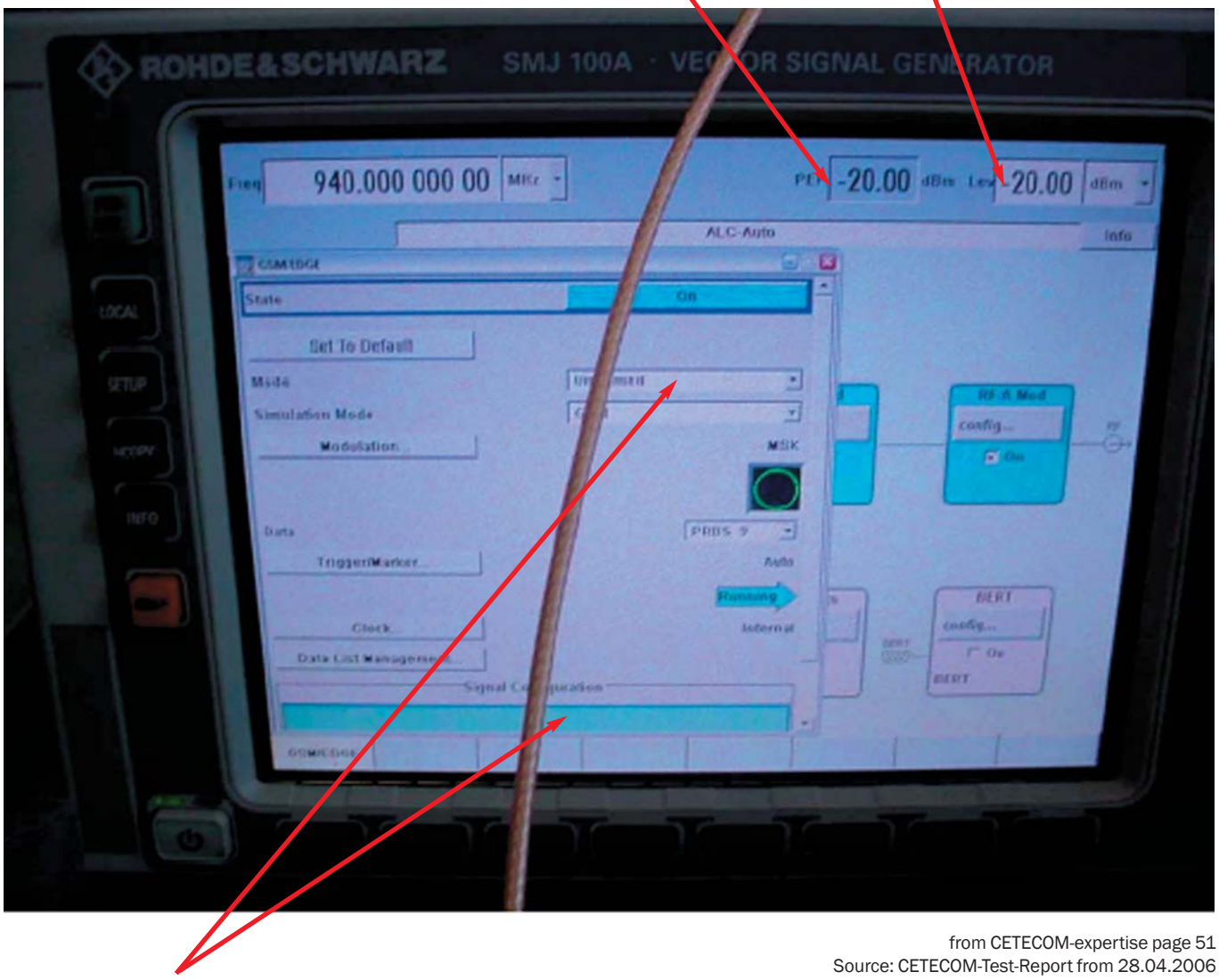
modulation	setting	output power	peak level FSIQ26 /dBm	peak level SPECTRAN /dBm
DECT	1 timeslot	-20 dBm	-21.67	-21
DECT	1 timeslot	0 dBm	-1.58	-3
GSM 900	1 timeslot, unframed	-20 dBm	-21.3	-22
GSM 1800	1 timeslot, unframed	-20 dBm	-21.64	-21
WCDMA (UMTS)	3.84 Mcps	-20 dBm	-20.98	-21
WLAN 802.11b	CCK, framed	-20 dBm	-20.56	-19

from CETECOM-expertise page 41
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

The control channel for GSM is also pulsed, but the intervals are only short (and stray in practice), so for a Spectran the signal is similar to a CW signal, thus enabling it to measure the signal (although for the biological effect we need a pulsed signal, not a CW signal!). Referring to our test, we have documented that the Spectran can recognise the first channel of the GSM networks. So that's no news. The note 1 timeslog, which means that only one of eight possible timeslots is in use, makes believe that the Spectran is also able to simply and reliably measure a signal of this type, fact which we have proven wrong in our tests.

Pages 51 and 54, top right corners of photos show: PEP (peak value) -20 dBm = Lev (average value) -20 dBm. The peak value (PEP) and the Level (average value) can only be identical when using CW signals. So, logically concluded, an unpulsed signal must have been fed in. Furthermore, the middle of the screen shows the setting "unframed".

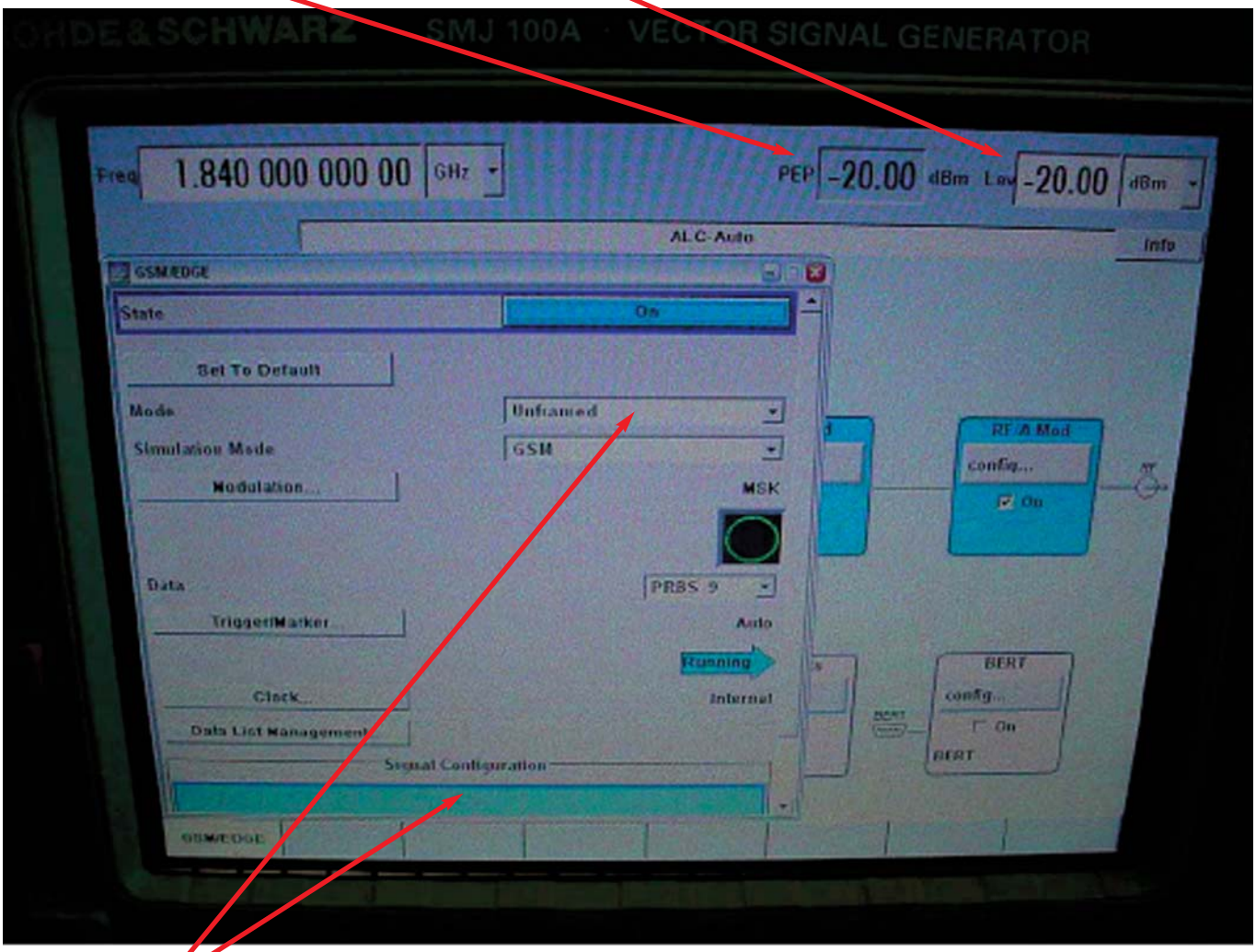
GSM 900-Setting



Setting „unframed“ equals to unpulsed signal

from CETECOM-expertise page 51
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

PEP(peak value) -20 dBm = Lev(average value) -20 dBm. GSM 1800-Setting

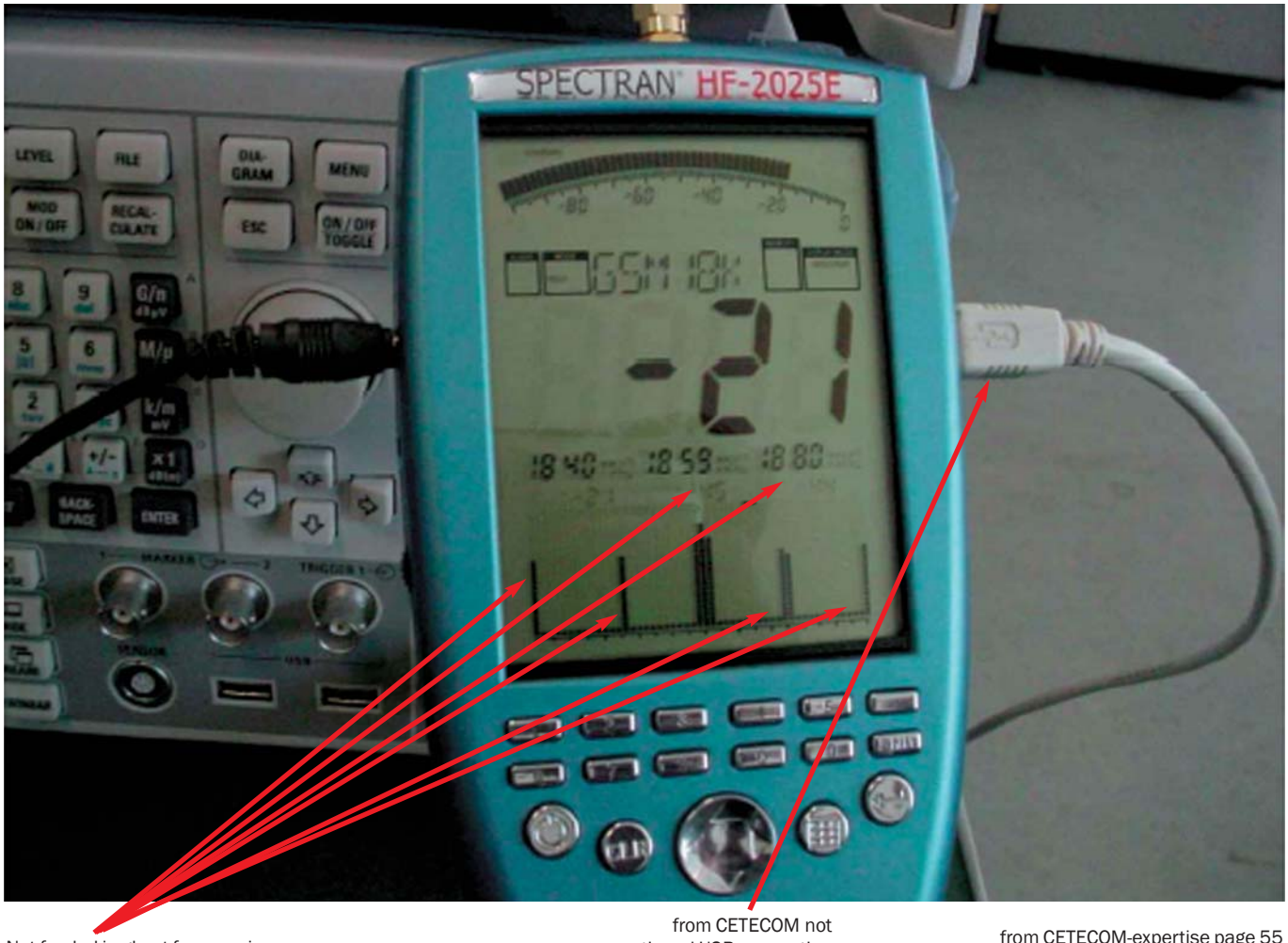


Setting „unframed“ equals to unpulsed signal.

from CETECOM-expertise page 54
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

Thus, an unpulsed GSM signal is being used here. This is a misleading information by CETECOM. GSM is pulsed!

Page 55:
Here, the Spectran shows Alias effects (ghost frequencies which have not even been fed in).
"Alias effects in spectrum display had no influence on measured peak level accuracy".
Just imagine the highest level to be beyond the display range. In that case the Spectran would show nothing but ghost frequencies. As in reality you cannot identify ghost frequencies when doing measurements, you are being pretty much lead astray.



from CETECOM-expertise page 55
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

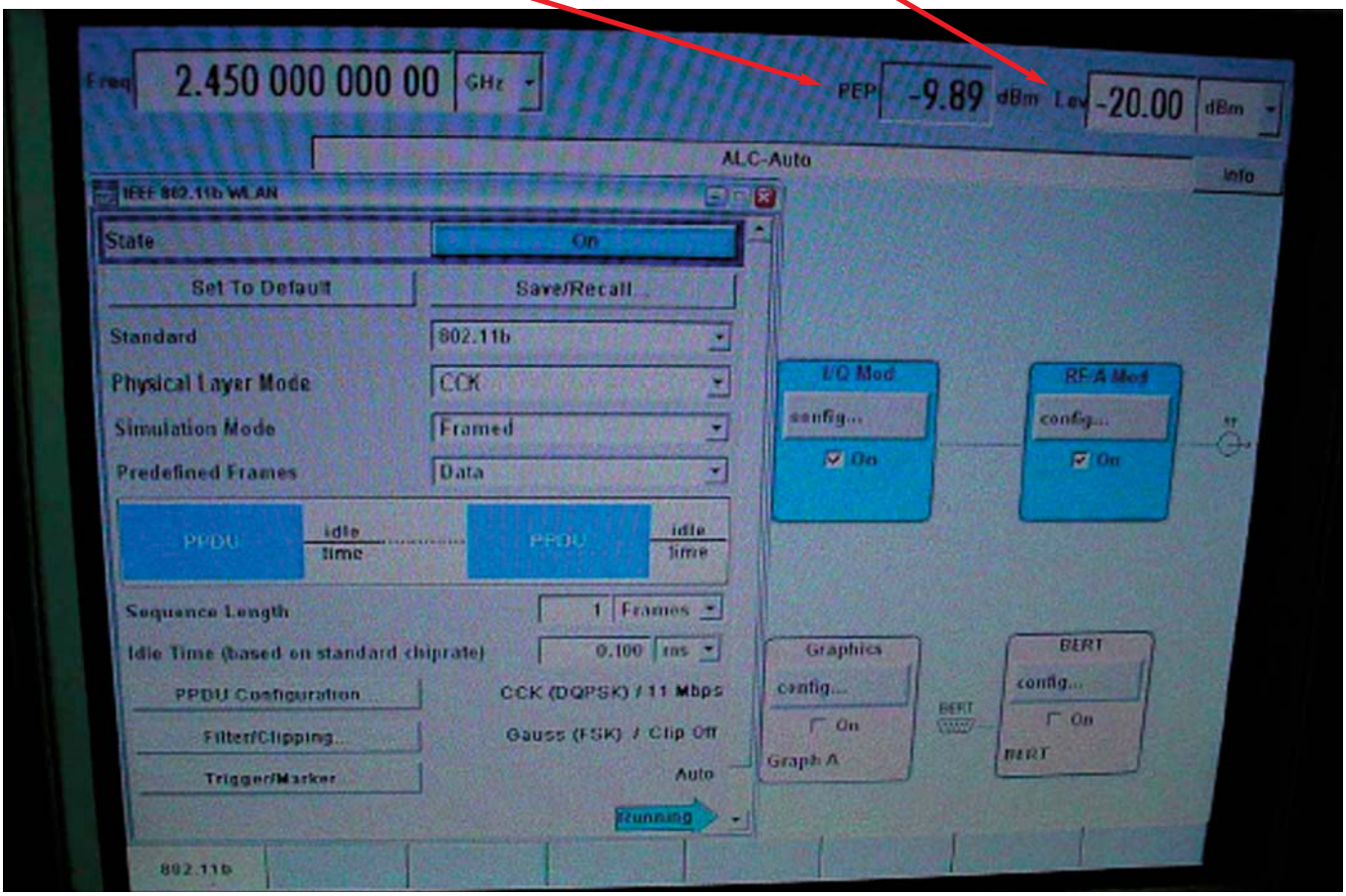
The CETECOM ought to have noticed that there were various sources with different levels, and that it is not possible to just ignore these ghost signals. Within a frequency section of the frequency range, a disturbance coming from an outside source can considerably exceed the signals within. This way, the signals subject to measurement are being outweighed by the disturbances. When switching to the broadband mode (CLR), it may possibly be the case that the high level of pulsed signals beyond the testing range cannot be recognised, as it will not be displayed in this mode. In this case you would only have the possibility to scan the whole frequency range in small MHZ steps in order to find out whether there is a high level to be found anywhere. That would take several minutes, and is not practicable in a room with strongly varying levels within only few centimetres. Also, this procedure would require detailed knowledge of frequencies and possible disturbances, which would be asking too much, even of interested amateurs of an action group.

We were especially irritated about the fact that the testing engineers were obviously aware of the problems with ghost frequencies, but did not draw any logical conclusions. It is obvious on the photo that these ghost frequency levels are not getting any less at the display edges, so it ought to be clear to any expert that this is no negligible problem, as there are always several adjacent frequency bands in reality. The results obtained this way are useless, because the value displayed can just as well be a value from an adjacent frequency band with a completely different frequency. With regard to the USB connection, we would like to note here, as a matter of form, that on the devices acquired by us this display is not possible without a manipulation via USB. If you use the Hotkey GSM18K, no ghost frequencies will be indicated, but no pulsed signals will be recognised either (see Buergerwelle test report). The outcome shown on the photo (peak value missing on the display) reminds of the pulse mode, which is inappropriate due to the extremely high ghost frequencies described above.

Page 60: WLAN

A WLAN signal with 2.45 GHz (2450 MHz) is fed in (page 60). The Spectran is set for 2450 MHz center and 80 MHz span, meaning it searches between 2110 and 2190 MHz. On page 61, the Spectran shows the peak signal with -19 dBm at 1840 MHz, a value beyond the display. This signal at 1840 MHz is also stated in the summary on page 41.
The Spectran only finds the CW-signal part. The PEP of -9.89 dBm is not found.
So how can CETECOM claim in its assessment on page 3 that the Spectran can measure WLAN, although they declared themselves on page 61 that the Spectran indicates 1840 MHz?
The report found on the Aaronia homepage has the following addition on page 61, as opposed to the English version dated May 10: "the measurement has been performed in the 2.4 GHz band, the picture has been taken before a full display update so that a frequency marker of the previous measurement at 1800 MHz appears".

The PEP is not recognised, the Spectran only finds the CW-part (also see next page).



from CETECOM-expertise page 60
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

modulation	setting	output power	peak level FSIQ26 /dBm	peak level SPECTRAN /dBm
DECT	1 timeslot	-20 dBm	-21.67	-21
DECT	1 timeslot	0 dBm	-1.58	-3
GSM 900	1 timeslot, unframed	-20 dBm	-21.3	-22
GSM 1800	1 timeslot, unframed	-20 dBm	-21.64	-21
WCDMA (UMTS)	3.84 Mcps	-20 dBm	-20.98	-21
WLAN 802.11b	CCK, framed	-20 dBm	-20.56	-19

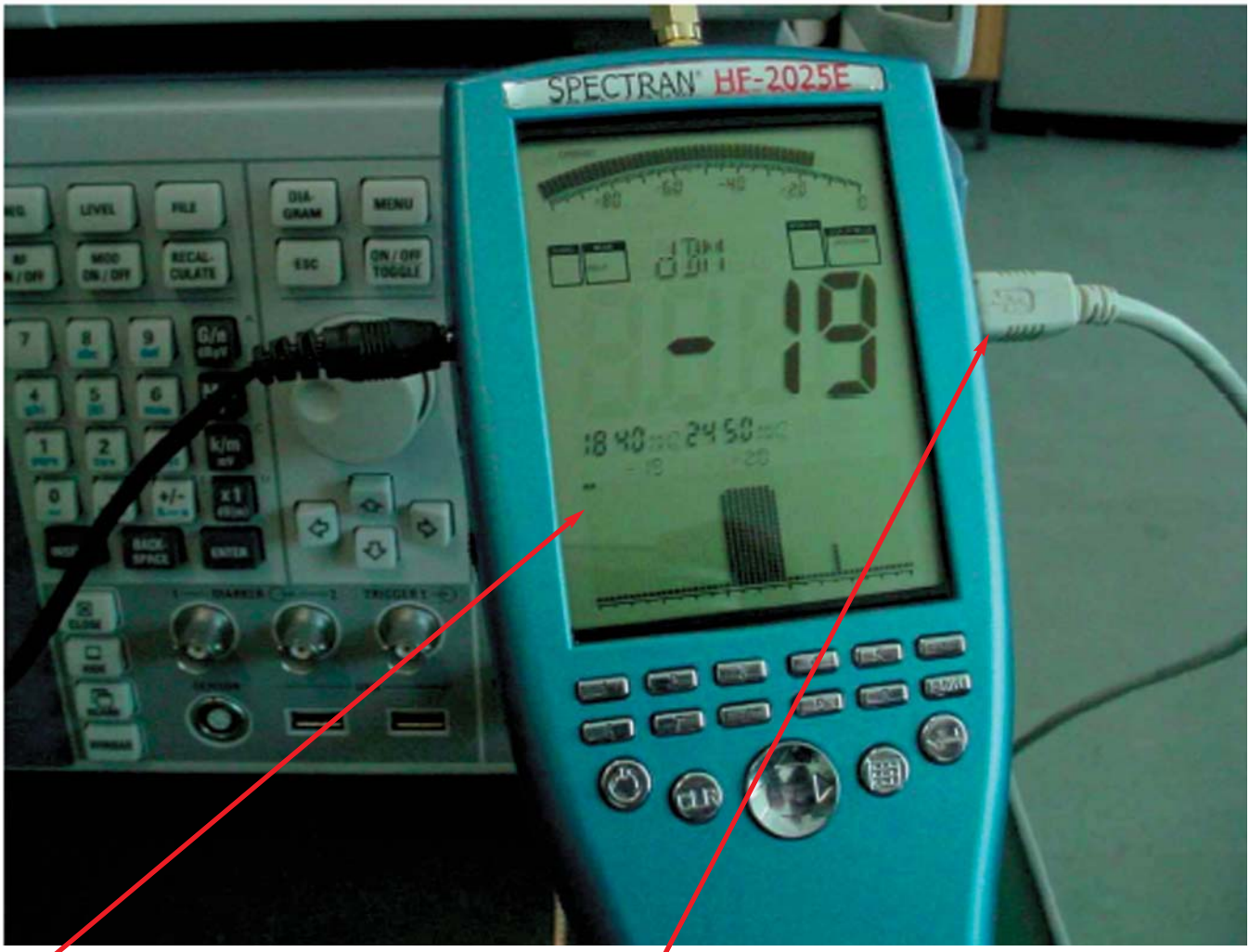
This is the level of the frequency at 1840 MHz

from CETECOM-expertise page 41
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

Now it's starting to get particularly interesting. Obviously, the mistake was detected and attempts were made to conceal it in retrospect with the help of this explanation, however indefensible it may be. Why did CETECOM stick to the level of -19 dBm on page 41, if, according to the above explanation, it was a value taken from a previous measurement, and has nothing to do with the 2450 MHz?

As explained above, the mistake was obviously detected but not corrected in the assessment. Why so? Does a max.-hold setting make sense for a laboratory measurement? Evidently, these unnecessary settings produce mistakes in the first place. First you forget to delete the max.-hold, then you forget to set it. Again, it looks as if the measurement was documented (photographed) after obtaining equal results, and then stopped without rechecking all settings. The photo on page 52 shows that there is no max.-hold-setting on the Spectran, although this setting is documented on page 40.

WLAN peak value SPECTRAN
(the measurement has been performed in the 2.4 GHz band, the picture has been taken before a full display update so that a frequency marker of the previous measurement at 1800 MHz appears.)



the level of -19 dBm is from the frequency at 1840 MHz

from CETECOM not mentioned USB connection

from CETECOM-expertise page 61
Source: CETECOM-Test-Report from 28.04.2006
www.aaronia.de

Was the result already known beforehand?
The fact that the Spectran is able to recognise CW signals (and if modulated, their average value), has already been put to paper in our Buergerwelle test. However, The Spectrans acquired by us were not nearly as accurate. More to this later.

WLAN peak value SPECTRAN

This is the version, we received from England on 10.05.2006. Here no additional explanation was made, like it was done on the version this page before, which was down loaded from the Aaronia Homepage.

from CETECOM not mentioned USB connection

from CETECOM-expertise page 61
Source: CETECOM-Test-Report from 28.04.2006
Version from England

Evaluation of the CETECOM test report

All experts familiar with the subject matter of measurements and verifications will only shake their heads when reading the CETECOM test report.

The test report suffered a poor performance. Moreover, it was "tested" just like that, that good results had been obtained from the Aaronia Spectran. This was only possible with the help of misleading settings. The GSM signal wasn't a pulsed GSM signal, but simply a permanent MSK-modulation signal. An absolute special setting was chosen for DECT, etc. With the correct settings on the laboratory measuring technology, these results would not have been obtained.

On page 3 CETECOM states: "The measurements were exclusively performed by skilled personnel under objective and representative conditions, as well as with comparative device settings during all tests."

These statements are a farce. As mentioned above, the settings used often varied. On the basis of the "inconsistencies" discovered by me, there can be no talk of expert knowledge. Furthermore, one can definitely not talk of representative conditions, if special conditons are chosen for a measurement, as was done with the DECT.
Elementary mistakes were detected, such as "Alias effects" (ghost frequencies), which already render impossible a practical measurement on two frequency bands. Nevertheless, the results gained hereby were used for evaluation purposes.
Measurement values taken from measurements in the GSM band were used for the evaluation of the WLAN measurements, although aware of the error. There is no reference made to this in the evaluation summary, though.

Is this a matter of incompetence or purpose on behalf of CETECOM?

This commentary does not even list all the objections discovered on my part. Depending on how the situation develops, I may issue further remarks on this in the near future.

My final question, arising from this appalling CETECOM test report, is: Are we dealing with a goodwill test report here?

Dear readers,

the Buergerwelle test results are definitely correct. We will, therefore, also in the future closely scrutinize every "expertise" or "test result", etc. applicable to raise doubts about the correctness of our test results, and to mislead the public. We feel we owe this to our credibility, and of course to you.

We have, in fact, had several calls from people who acquired an Aaronia Spectran due to the expertises, test reports, etc. on the Aaronia homepage, with the aim of obtaining accurate results, and now feel deceited because so many of the specifications quoted by the producer are not met.