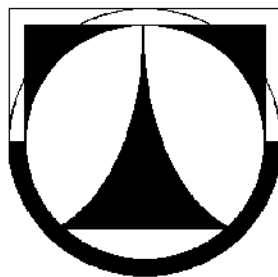


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# **TECHNICKÁ UNIVERZITA V LIBERCI**

## **FAKULTA STROJNÍ**



Studijní program : M2301 Strojní inženýrství

Obor : 2302T010 Konstrukce strojů a zařízení

Zaměření : Kolové dopravní a manipulační stroje

## **DIPLOMOVÁ PRÁCE**

Vazba akustického výkonu a vibrací motoru

KSD - DP - 481

Autor : Petr Hrubý

Vedoucí práce : doc. Dr. Ing. Pavel Němeček

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## **VAZBA AKUSTICKÉHO VÝKONU A VIBRACÍ MOTORU**

### **Anotace**

Diplomová práce shrnuje informace o zdrojích hluku a vibrací spalovacího motoru. Práce se zabývá zjištěním postupu výpočtu akustického výkonu při znalostech jeho vibrací. Ověření zjištěného postupu výpočtu je aplikováno na vznětový motor 1,9 TDI/ 96 kW.

### **Annotation**

This disertation work summarizes information about noise sources and vibrations of gas-engine. The diploma is engaged in finding out the procedure, which is able to calculate acoustical exploit when the vibrations are known. Attestation of finding calculation is applicated to compression-ignition engine 1,9TDI/96kW

***Místopřísežné prohlášení:***

Místopřísežně prohlašuji, že jsem diplomovou práci vypracoval samostatně s použitím uvedené literatury.

V Liberci, 27. května 2005

.....

Petr Hrubý

Evropská 516/10  
160 00-Praha 6

### ***Poděkování***

Rád bych poděkoval vedoucímu diplomové práce doc. Dr. Ing. Pavlu Němečkovi, konzultantovi Ing. Hynku Drozdovi a všem ostatním, kteří mi poskytli cenné rady při vypracování diplomové práce.



**Seznam použitých zkratek a symbolů**

|             |                              |                       |
|-------------|------------------------------|-----------------------|
| $f_n$       | frekvence rotujícího hřídele | [ Hz ]                |
| $n$         | otáčky                       | [ 1/min ]             |
| $f_z$       | zubová frekvence             | [ - ]                 |
| $z$         | počet zubů                   | [ - ]                 |
| $k$         | konstanta                    | [ - ]                 |
| $L_w$       | akustický výkon              | [ dB ]                |
| $W$         | výkon motoru                 | [ kW ]                |
| $W_{akust}$ | akustický výkon              | [ dB ]                |
| $V_{ef}$    | efektivní rychlost           | [ m/s ]               |
| $S$         | plocha                       | [ m <sup>2</sup> ]    |
| $\rho$      | hustota vzduchu              | [ kg/m <sup>3</sup> ] |
| $C$         | rychlost zvuku               | [ m/s ]               |
| $\Sigma$    | vyzařovací součinitel        | [ - ]                 |
| $L_v$       | průměrná efektivní rychlost  | [ m/s ]               |
| $a$         | zrychlení                    | [ m/s <sup>2</sup> ]  |
| $v$         | rychlost                     | [ m/s ]               |

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# 1. Úvod

## ***Základní pojmy zvuk a hluk***

Různými zvuky je obklopen každý z nás. Některé z nich si už ani neuvědomujeme. Pomocí zvuku se dokážeme mezi sebou dorozumívat, díky zvuku dokážeme odpočívat, relaxovat při poslechu hudby či ptačím zpěvu. Zvuk je však také zdrojem výstrahy a varování, například když zvoní telefon či houká klakson. A nakonec je to právě zvuk, který nám pomáhá i odhalovat závady na strojích, jako je například klepání ventilů či skřípění brzd.

Každý nepříjemný a nežádoucí zvuk, který poškozuje lidské zdraví, či vyvolává nepříjemný vjem označujeme jako HLUK.

Nejhorší vlastností hluku je však jeho potenciální nebezpečnost, spočívající v možnosti způsobení přechodných či trvalých škod, které se nejvíce a nejčastěji týká poškození nejjemnějšího a zároveň i nejsložitějšího zařízení jeho příjmu - lidského sluchu.

Cíle diplomové práce :

- shrnout informace o zdrojích hluku a vibrací pístového spalovacího motoru
- shrnout informace o vazbách vibrací ploch a vyzařovaného akustického výkonu
- získané poznatky aplikovat při odhadu vyzařovaného výkonu motoru 1,9 TDI při znalosti jeho vibrací

## 2. Frekvenční schéma vznětového motoru

### 2.1. Oblast nízkých kmitočtů

Oblast nízkých kmitočtů odpovídá kmitočtovému pásmu otáček hřídele. Spektrum sahá od 40% do několikanásobku základní harmonické frekvence. Zde se projevují nevyváženosti, ohyby a nesouososti hřídelí a jiné. Mezi zdroje kmitů patří mechanické vazby, které generují subharmonické a meziharmonické. Též vznikají složky závislé na nevyváženosti ozubených kol.

### 2.2. Oblast středních kmitočtů

Tato oblast odpovídá kmitočtovému pásmu zubových frekvencí ozubených kol. Zubové frekvence vznikají při záběru dvou nebo více ozubených kol a závisejí na počtu zubů jednotlivých kol a jejich rychlosti otáčení.

### 2.3. Oblast vysokých kmitočtů

Ve spektru je generována vadami na valivých ložiscích. Počáteční vadou ložisek bývají trhlinky nebo jamky na jedné z částí ložisek. Poškozená část vyvolává při pohybu a styku s další částí mechanické rázy, při nichž dochází k přenosu kinetické energie na těleso ložiska. Toto těleso se po rázu na vlastním kmitočtu rozkmitá. Rezonanční kmitočty se pohybují v oblasti od 5 do 20 kHz.

Pro výpočet jednotlivých frekvencí byly použity tyto vzorce.

**Frekvence rotujícího hřídele:**

$$f_h = n / 60 \quad [\text{Hz}] \quad (1)$$

Kde:

$f_h$  je frekvence rotujícího hřídele [Hz]  
 $n$  jsou otáčky hřídele [ $\text{min}^{-1}$ ]

---

**Zubové frekvence jednotlivých ozubených kol**

$$f_z = k * (n * z) / 60 \quad [\text{Hz}] \quad (1)$$

Kde:

$f_z$  je zubová frekvence ozubeného kola [Hz]

$k$  je konstanta určující řád harmonické složky ( $k = 0,5 ; 1 ; 1,5 ; 2 ; 3 \dots$ ) [-]

$n$  jsou otáčky hřídele [ $\text{min}^{-1}$ ]

$z$  je počet zubů [-]

### **3. Metody hodnocení hluku a vibrací vznětového motoru**

#### **3.1. Zdroje hluku a vibrací**

Spalovací motory, a to především pístové motory s vnitřním spalováním, jsou specifickými měniči energie. S principem přeměny chemické energie paliva na kinetickou energii na výstupní hřídeli motoru souvisí některé negativní dopady na životní prostředí. Samotný spalovací proces je vzhledem ke svému charakteru (rychlé změny tlaku při hoření) významným činitelem při vzniku hluku, další zdroje souvisejí s dynamikou pohybu jednotlivých částí (klikový a rozvodový mechanismus, čerpadla, pomocná ústrojí), podstatný je také hluk způsobený výměnou náplně.

Předmětem zkoumání je vznětový motor. Hluk je dán především vyzařováním vibrací motorového bloku a vyústěním sacího a výfukového potrubí. Hodnocení hluku sání a výfuku je možné nezávisle, obvykle měřením akustické intenzity. Pozornost je věnována zdrojům, které způsobují vibrace bloku. Jako podstatné byly vytipovány tyto části a děje: Ventilový rozvod; spalovací proces; setrvačné síly v klikovém mechanismu; čerpání kapalin a převody.

Dále budou detailněji popsány a budou naznačeny metody vyhodnocování jimi způsobených vibrací. Je využito specifického charakteru budících sil od jednotlivých zdrojů: například vibrace od rázů při dosedání ventilů do sedel jsou vázány na časování rozvodu, u převodů a čerpadel se využívá toho, že budící síly působí především na harmonických frekvencích jejich otáček. Při hodnocení vibrací od spalování se využívá výpočet přenosu mezi vibracemi a spalovacími tlaky.

### 3.2 Přehled současného stavu

Komplexní problém analýzy zdrojů hluku, který je dán vyzařováním z vibrujících povrchů, je možné rozčlenit podle postupů přeměny mechanické energie na dílčí etapy, které představují získání informací o :

- Zdrojích hluku (dynamických budících účincích)
- Přenosových cestách, jimiž se vlnění šíří
- Povrchových vibracích a jimi generovaného hluku.

Každý bod je možné řešit nezávisle, buď výpočtově nebo experimentálně.

#### 3.2.1 Budící síly

Je nutné určit zdroje podstatné z hlediska vyzařování hluku. K nim se přiřadí vhodná veličina, u níž se předpokládá snadná měřitelnost. Využívá se některé z extenzivních nebo intenzivních veličin – síla, tlak, moment, dráha, rychlost, zrychlení. Děje budící hluk jsou povahy termodynamické (spalování směsí) nebo mechanické (výměna náplně válce a pohyb částí rozvodů a klikového ústrojí). V případě výpočtu jsou obvykle modelovány pomocí metod MKP. Pro spalování a pohyb náplně se používá např. STAR CD nebo KIVA. K řešení dynamiky těles je určen ANSYS. Dynamika pohyblivých částí se modeluje např. pomocí ADAMS.

#### 3.2.2 Přenosové cesty

Jsou reprezentovány tuhými mechanickými strukturami – např. blokem motoru nebo klikovou hřídelí a plynnými či kapalnými médii – především vzduchem. Popis konstrukce z hlediska vibrací znamená stanovení vztahu mezi působením síly  $F(t)$  v místě  $i$  a odezvou ve formě vibrací  $x(t)$  na jiném místě  $l$ , tj. např. určení přenosové funkce :

$$H_{il}(j\omega) = x(j\omega)_l / F(j\omega)_i \quad (7)$$

Řešení umožňuje modální analýza. Výhodou popisu struktury pomocí modálních dat je komplexnost – úplný popis vibrací při znalosti budících signálů, nevýhodou je složitost experimentu.

### 3.2.3 Měření vibrací a hluku

Měření vibrací se řeší jedno-až tříosým snímačem zrychlení. Výsledky se prezentují buď kinematickými veličinami nebo výkonovými parametry. V současnosti se používají z důvodů rychlého a zejména současného měření např. při rozběhu také mikrofonní pole. Kromě odděleného měření hluku a vibrací se využívá i jejich kombinace – měření tzv. povrchové intenzity. Mikrofonné umístění v blízkosti povrchu se měří akustický tlak  $p_a$  a snímačem zrychlení na povrchu vibrace  $a$ . povrchová intenzita je :

$$I_p = p_a * \int_{-\infty}^t a * dt \quad (7)$$

### 3.2.4 Separace zdrojů vibrací a hluku

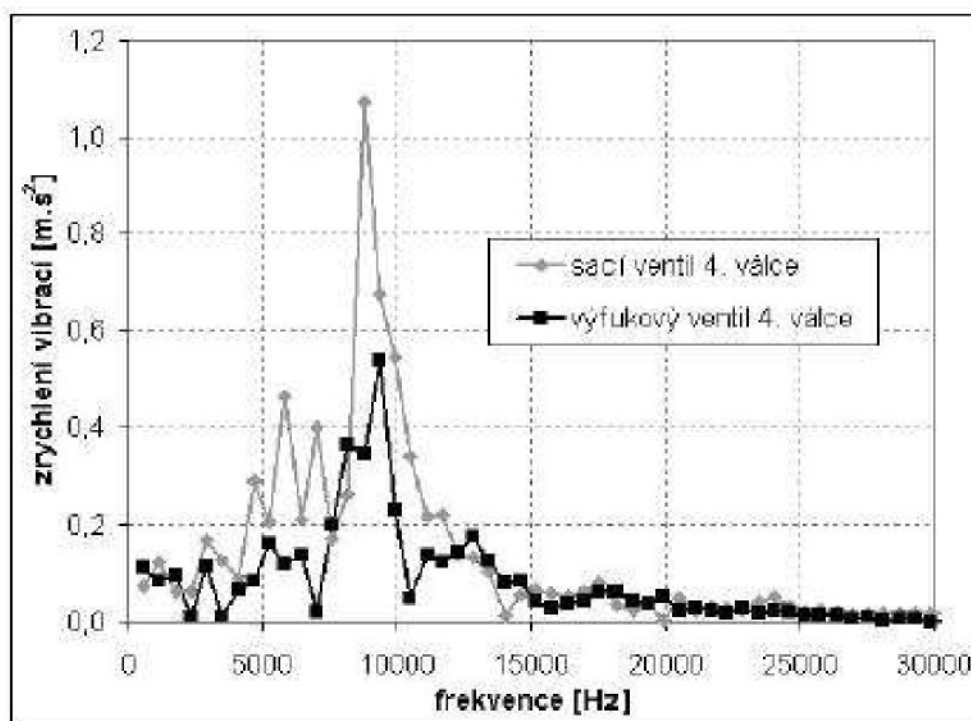
Požadavky na snížení vibrací a hluku strojů nutí konstruktéry hledat podstatné dílčí zdroje těchto emisí. Náročnost práce je dána tím, že množství strojů je tvořeno větším počtem mechanismů, které pracují závisle na sobě. Spalovací motor je toho typickým příkladem. K separaci účinků jednotlivých zdrojů je možné použít metody :

- Založené na možnosti budících sil
- Využívající znalost přenosových cest, případně jejich změnu
- Se zpracováním výsledného signálu vibrací či hluku se znalostí nebo předpoklady určitého chování zdroje.



### 3.3 Ventilový rozvod

Ventilový rozvod bývá typu OHC, případně DOHC. U konstrukčně starších motorů bylo používáno i rozvodů OHV. Významné vibrace vznikají zejména při zavírání ventilů, které je spojené s rázy při kontaktu ventilu se sedlem. Při otevírání dochází k podstatně menším vibracím. Frekvenční spektrum vibrací je spojité a široké (  $10^3$  až  $2 \cdot 10^4$  Hz ). Pro jejich vyhodnocování je podstatné, že mají omezenou dobu trvání a rázy jsou časově dobře určeny. Navržená metodika je založená na použití časových oken, které vymezují vibrace od jednotlivých ventilů. Protože na výsledných vibracích se podílejí i další zdroje, je nutné jejich vliv v časových oknech odstranit. Využívá se předpokladu, že vibrace rozvodů a ostatní vibrace jsou navzájem nekorelované. Z naměřeného signálu vibrací se vybere úsek, v němž se předpokládá převažující vliv rázu vyhodnocovaného ventilu. Počátek těchto vibrací je zpožděn vzhledem k okamžiku dosednutí ventilu do sedla o dopravní zpoždění ( při vzdálenosti místa měření od zdroje 0,2 m a frekvenci 10 kHz to je pro ohybovou vlnu přibližně 0,2 ms).

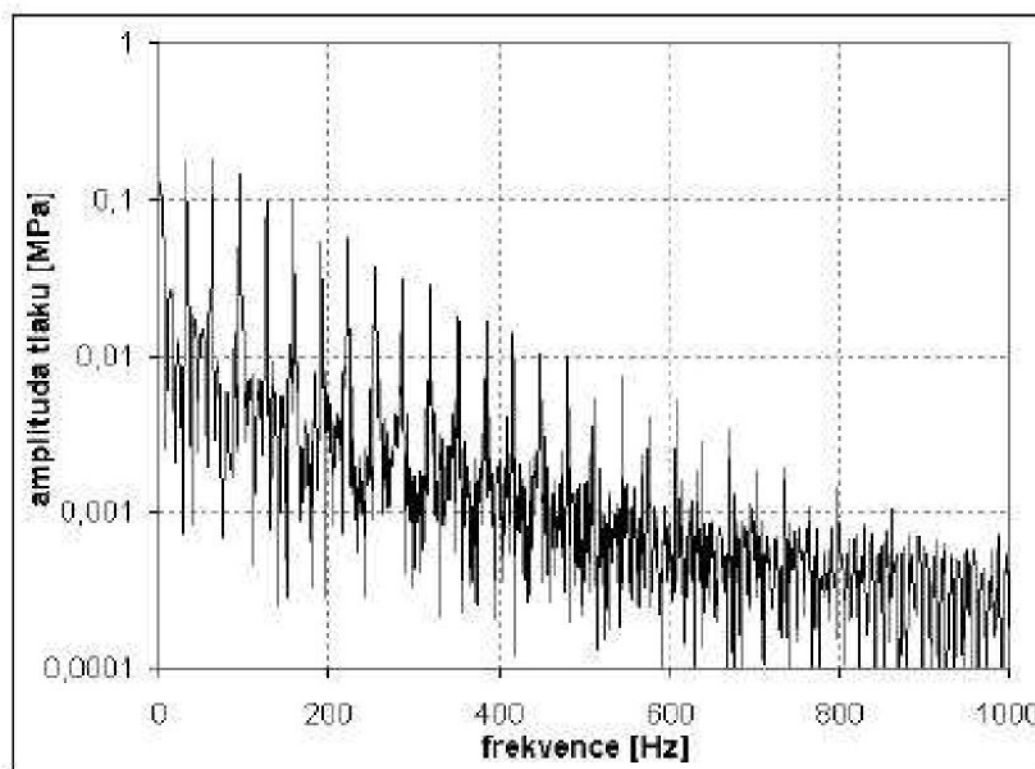


Obr.1 : Příklad frekvenční charakteristiky dosedání ventilů ve válci (7)

### 3.4 Spalovací proces

Příčinou hluku spalování je změna tlaku plynů ve spalovacím prostoru v průběhu termodynamického cyklu. Vyhodnocování podílu spalování na vibracích bloku motoru je založeno na výpočtu přenosových funkcí mezi spalovacími tlaky a povrchovými vibracemi motoru. Je tedy nutné současné měření tlaků ( vysokotlaká indikace ) i vibrací. Zjištění přenosových funkcí předpokládá možnost ovlivnit charakter spalovacího procesu ve válcích nezávisle na sobě.

Podstatné pro možnost výpočtu jednoznačné přenosové funkce je zajištění koherence mezi signály, linearita přenosu a dostatečně přesný popis signálu budících sil signálem ze snímače tlaku. Vzhledem k charakteru signálu tlaku je zřejmé, že vysoká koherence bude pouze na frekvencích s celočíselným násobkem  $\frac{1}{2}$  otáček klikového hřídele. Přenos je realizován hlavou válců, pístem a vložkou válce. U vibrací přenášených hlavou je možné uvažovat lineární přenos, přenos vložkou válce není zcela lineární, protože v průběhu otáčení klikové hřídele se na přenosu podílí proměnná plocha stěn. Důsledkem je, že každá harmonická složka tlaku se projeví ve vibracích nejen na shodné harmonické, ale také na dalších, zejména nejbližších harmonických složkách. Harmonické složky tlaku ( zejména frekvenčně blízké ) vykazují vzájemně velmi silnou korelaci.



Obr.2 : Příklad frekvenční charakteristiky tlaku ve válci

(7)

### 3.5 Ostatní zdroje

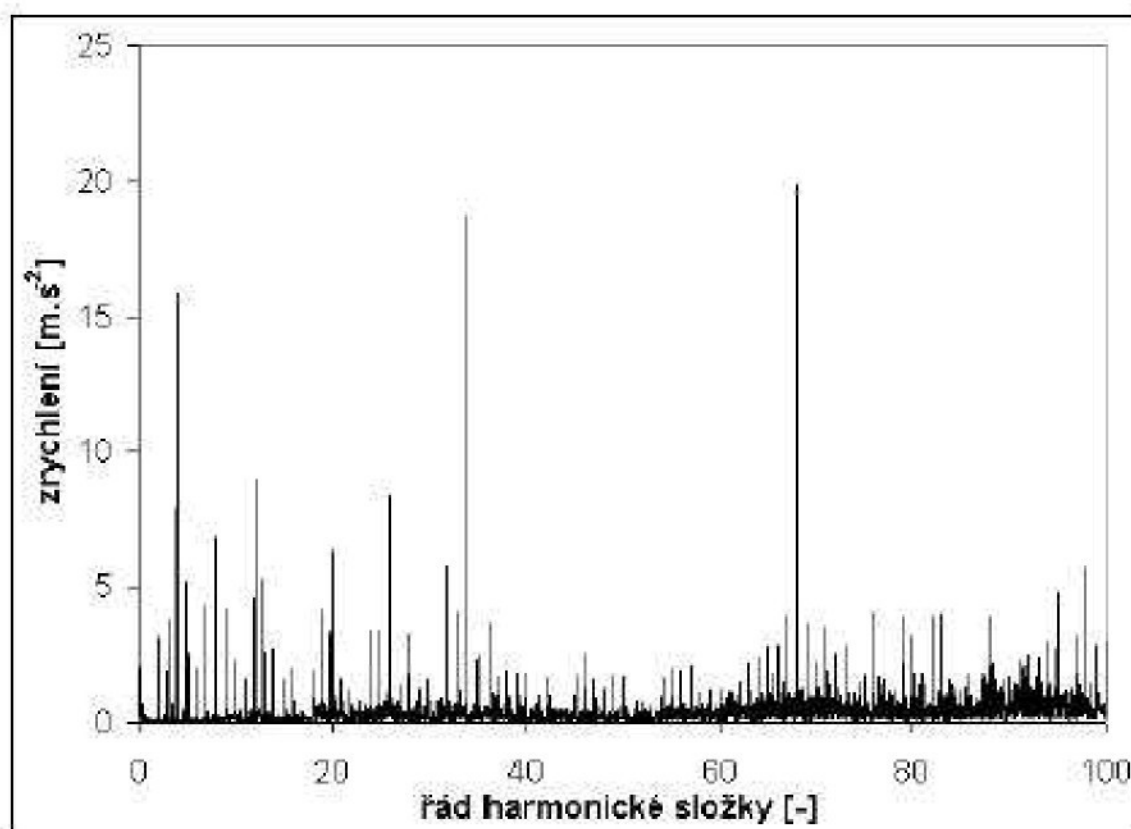
K dalším zdrojům hluku patří převody, klikový mechanismus a čerpadla. Budící síly spojené s jejich funkcí jsou tvořeny zejména harmonickými složkami určité základní frekvence  $f_0$ . U klikového mechanismu působí síly nevyvážených hmot především 1. a 2. řádu (i při dokonalém vyvážení vznikají vibrace vlivem konečné tuhosti klikové hřídele, která je deformována silami od hmot klikového mechanismu a primárních sil). Převody a čerpadla generují vibrace zejména na celočíselných násobcích zubových frekvencí:

$$f_{il} = i * z_l * f_0 \quad i = 1; 2 \dots \quad (1)$$

Kde:

$z_l$  je počet zubů kola l.

Pro vyhodnocování signálu na těchto frekvencích je možné použít synchronní filtraci. Provádí se záznam signálu o N vzorcích  $x_t = [x_{t,0}, x_{t,1}, \dots, x_{t,N-1}]$ , kde t je okamžik záznamu prvního vzorku.



Obr 3 : Příklad frekvenční charakteristiky vibrací motoru (7)

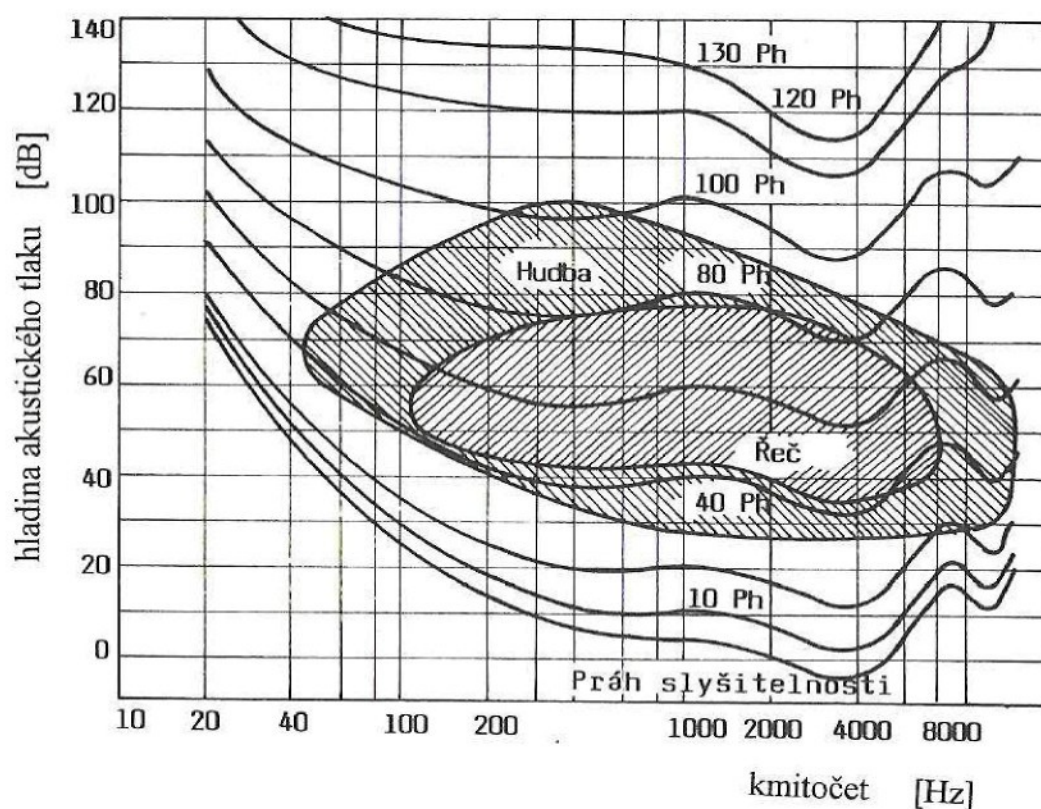
## 4. Zvuk

### 4.1. Lidský sluchový orgán

Počet změn za jednotku času určuje kmitočet zvuku. Jednotkou kmitočtu zvuku je Hz (Hertz) s rozměrem 1/s. Kmitočet je veličina, která nám umožňuje popis vlastností zvuku. Lidské ucho dokáže přijímat zvukové vlnění o frekvenčním pásmu 20 Hz – 20 kHz.

Zvukové vlnění však není omezené jen prahem slyšitelnosti lidského sluchového orgánu. Zvukové vlnění, jehož frekvence je nižší než 20 Hz, tedy pod dolní úrovní prahu slyšitelnosti lidského sluchového orgánu se nazývá infrazvuk. Naopak jestliže frekvence přesahuje 20 kHz, tedy je naopak nad horní mezí slyšitelnosti lidského sluchového orgánu, jedná se o ultrazvuk.

Hovoříme potom o třech pásmech : o infrazvuku, slyšitelném pásmu a ultrazvuku.



Obr.4 : Kmitočtové a amplitudové složení řeči

(5)

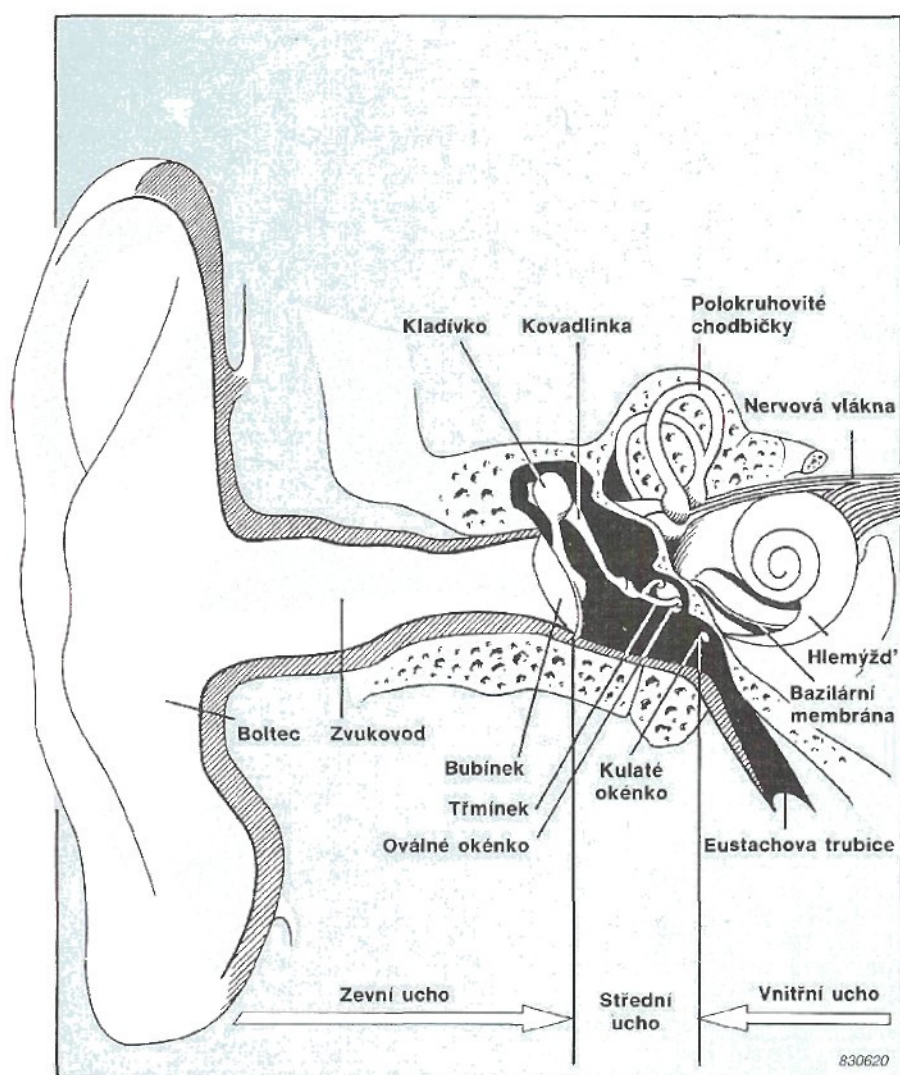


Člověk vnímá zvuk především prostřednictvím sluchového orgánu. Lidský sluchový orgán se skládá ze tří částí: zevního ucha, středního ucha a vnitřního ucha. Zevní ucho se skládá z boltce a zvukovodu. Toto zevní ucho soustřeďuje vzduchem se šířící zvukové vlny a přenáší odpovídající změnu tlaku na bubínek.

Bubínek už patří střednímu uchu. Střední ucho dále obsahuje sluchové kůstky, tedy kladívko, kovadlinku a třmínek. Sluchové kůstky tvoří soustavu malých pák, přenášející chvění bubínku k orgánům vnitřního ucha. Vnitřní ucho se skládá ze vzájemně nezávislých částí: polokruhových chodbiček, spolupůsobících při regulaci rovnováhy a hlemýžďe. Hlemýžď je spirálně stočená trubice, naplněná tekutinou a rozdělená po délce bazilární membránou.

Zvukem způsobené chvění zneklidňuje tekutinu v hlemýždi a vyvolává deformace bazilární membrány, na jejímž povrchu jsou tisíce citlivých vlasových buněk.

Tyto buňky zaznamenávají a přeměňují deformace bazilární membrány na nervové podněty, odváděné sluchovým nervem do mozku.



Obr. 5 : Řez lidským uchem

(5)

Základem určujícím účinek hluku je jeho intenzita. Člověk se necítí dobře v prostředí s nezvykle nízkou intenzitou hladinou akustického tlaku. Hodnoty okolo 20 dB považuje většina lidí již za hluboké ticho. Hladinu 30 dB hodnotí většina lidí jako příjemné ticho. Od 65 dB výše se začínají již nepříznivě projevovat účinky hluku. Při trvalém pobytu v takto exponovaném prostředí již vznikají trvalé poruchy sluchu.

Nebezpečnost hluku vůči lidskému sluchu spočívá především v tom, že lidský sluch nemá proti působení extrémních akustických signálů výraznější přirozenou ochranu. Například působí-li na lidský zrak velmi silné světlo, může člověk oči přivřít či zavřít. U lidského ucha však podobná ochrana neexistuje.

V předchozím odstavci jsem uvedl další veličinu sloužící k popisu a hodnocení zvuku, tedy decibel. Nejslabší zvuk, zaznamenávaný nepoškozeným lidským uchem, je charakterizován akustickým tlakem dvaceti miliontin základní jednotky tlaku 1 Pa. Tato hodnota je 5 000 000 000 x menší než normální barometrický tlak. Změna tlaku s hodnotou kolem 0,00002 Pa je tak malá, že vyvolává výchylku ušního bubínku, jež je menší než průměr jedné jediné molekuly vodíku. Naproti tomu je překvapivé, že lidský sluch je schopen snášet akustický tlak s hodnotami více než milionkrát většími.

## **4.2. Hluk pístových strojů**

Do této skupiny řadíme především spalovací motory. U těchto strojů se vyznačuje přerušovaným sacím a výfukovým procesem. Nerovnoměrné proudění plynů v kanálech spojené s tímto pracovním pochodem je jednou z hlavních příčin hlučnosti. Značný podíl na vyzařované akustické energii mají vibrace rozličných povrchů stroje. Z praxe je známo, že spalovací motory, které nejsou opatřeny tlumičem sání a výfuků vytvářejí ve svém nejbližším okolí hladiny akustického tlaku i přes 120 dB. Početně lze určit celkový akustický výkon z přibližného vztahu

$$L_W = 61,3 + 10 * \log W + 10 * \log n \quad (1)$$

kde je  $W$  [ kW ] výkon motoru,  
otáčky  $n$  [ ot/min ]

U vodou chlazených vznětových motorů lze očekávat hladiny akustického tlaku asi o 3 dB nižší. Spektrum hladiny akustického výkonu lze přibližně stanovit pro tyto motory pomocí relativních hladin uvedených v diagramu. Ve spektru je zahrnut pouze vlastní hluk motoru ( zatlumené sání i výfuk ).

### **4.3. Hnací agregát jako zdroj vibrací**

Pod pojmem hnací agregát obecně rozumíme agregát tvořený motorem, spojkou, a případně rozvodovkou. Pístový spalovací motor je ( při konstantní frekvenci otáčení ) zdrojem :

- Periodických volných sil a momentů, vznikajících vektorovým sečtením dynamických sil klikového ústrojí, tj. hlavně setrvačných sil jeho posuvných hmot, setrvačných momentů od kývavého pohybu ojníc, někdy nedokonalým vyvážením rotačních hmot, nebo nestejnou hmotností posuvných hmot.
- Periodického volného momentu kolem osy klikového hřídele, vznikajícího cykličností činnosti motoru, někdy i nerovnoměrným plněním válců a zapalováním, s harmonickými složkami v příslušném násobku frekvence otáčení. Z hlediska agregátu jsou běžně rozhodující harmonické složky s 1. a 2. harmonickou, nejvýše však se 4. harmonickou. U běžných automobilových zážehových motorů maximální frekvenci otáčení do 120 Hz je tedy rozsah uvažovaných budících do 240 Hz, resp. Maximálně do 480 Hz.

Při nízkých frekvencích těchto silových účinků je možno hnací agregát považovat za tuhé těleso, a tedy by motor bylo možno považovat za tuhou hmotu na níž působí silové buzení

$F(t)$ .

Kromě uvedených volných sil a momentů ( projevujících se navenek ) působí v motoru vnitřní síly ( od tlaků ve válcích, dynamické od jednotlivých částí klikového ústrojí, rozvodu atd. ). Základní frekvenční pásmo působení těchto účinků je shodné jako u volných sil a momentů, avšak dílčí pochody jako průběhy spalovacích tlaků, dynamické síly v rozvodu, atd. Obsahují výrazné složky s podstatně vyššími harmonickými. U automobilových zážehových motorů mají síly výraznější složky do frekvence cca 4 kHz.

Tyto vnitřní silové účinky rozkmitávají agregát jako pružné těleso a jeho stěny a víka jako desky. Za podmínek běžných pro uložení hnacího agregátu v automobilech a provedení hnacích agregátů jsou při frekvencích buzení vyšších než 40 Hz vibrace agregátu prakticky nezávisle na místě a způsobu uložení a závisí pouze na uspořádání motoru a jeho konstrukčním provedení.

## **5. Vazby akustického výkonu a vibrací motoru**

### **5.1. Analýza signálů**

Prozkoumejme nyní, jaké informace lze získat na základě měření a analýzy odezвовých signálů, generovaných automobilem při běžném provozu. Představme si, že uvnitř kabin je umístěn snímač zrychlení vibrací. Snímač je upevněn v místě, kde předpokládáme největší vyzařování hluku.

Časový průběh signálu na výstupu snímače, tedy časový průběh zrychlení vibrací, neumožňuje bezprostřední interpretaci a získání užitečné informace. Transformací tohoto signálu do kmitočtové oblasti lze získat spektrum zrychlení vibrací. Takové spektrum má často tvar a složení, ze kterého je možno usoudit, zda je energie vibrací rozložena více či méně rovnoměrně, či zda je soustředěna v jednom nebo několika úzkých pásmech kolem určitých kmitočtů.

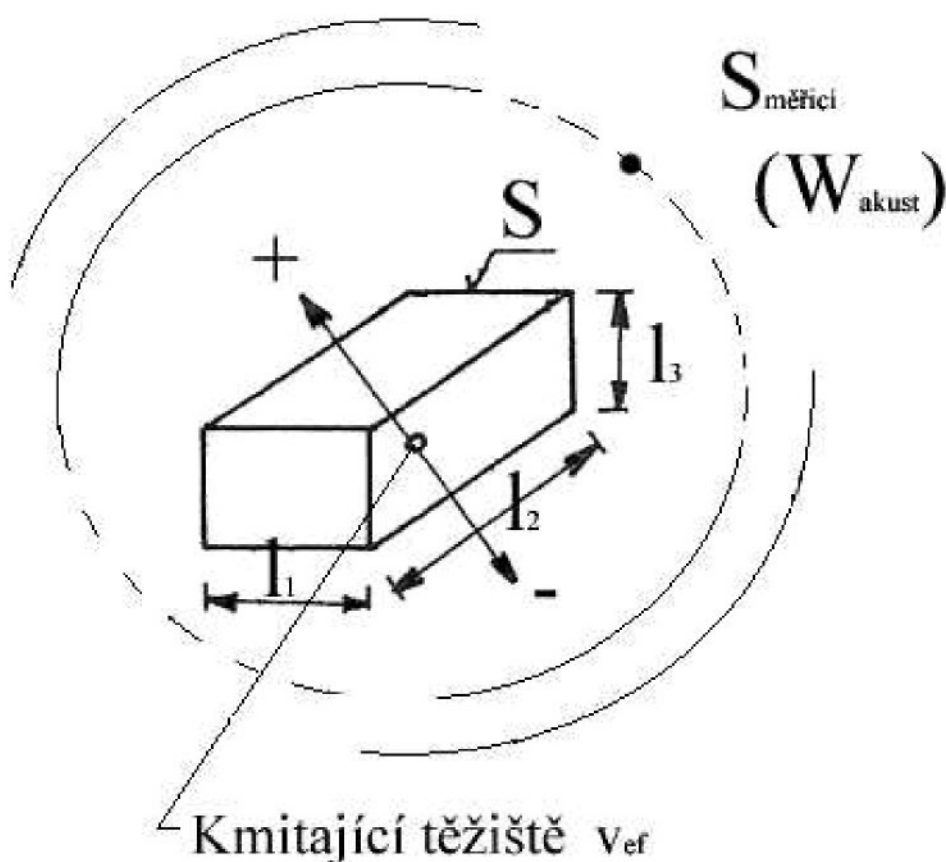
Na základě znalosti funkce jednotlivých ústrojí a mechanismů mohou být výrazné kmitočtové složky vztaženy k určitým mechanickým dílům nebo sestavám. Tak je pomocí spekter možno identifikovat možné zdroje hluku a vibrací.

V případě uvažovaného vozidla není například vyloučeno, že určitá diskrétní složka spektra zrychlení vibrací odpovídá rychlosti otáčení určitého hřídele převodového ústrojí. Taková složka může být příznakem jednoho z hlavních zdrojů vibrací a hluku.



## 5.2. Popis vyzařování hluku z vibrujícího povrchu

Při vyzařování hluku z kmitajícího povrchu jde o přeměnu mechanického výkonu reprezentovaného vibracemi tělesa ve slyšitelné frekvenční oblasti na klasický akustický výkon ve vzduchu, jenž se dále šíří prostředím obklopujícím vibrující těleso, nejčastěji vzduchem. Z teorie akustických vysílačů známe klasické zdroje zvuku: monopóly (pulzující koule), dipóly (oscilující koule), kvadrupóly (dvojice dipólů) atd. Stejným způsobem se chová i vibrující těleso jako zdroj zvuku. Vibrující těleso má konečné rozměry podle obr. 6. a chová se jako klasický vysílač do té doby, dokud je splněn předpoklad, že celé těleso kmitá jako celek, tedy neexistuje rozdíl mezi velikostmi mechanického pohybu reprezentovaného například zrychlením nebo rychlostí na jednotlivých místech jeho povrchu. Tímto způsobem se těleso stává nejčastěji zdrojem tzv. 1. řádu, tj. dipólem.



Obr. 6 : Kmitající těleso

(6)

$$W_{akust} = konst. * v_{ef}^2 * S \quad (6)$$

kde  $v_{ef}$  je efektivní rychlost, kterou těleso kmitá v obecně libovolném směru, nejčastěji v základních směrech os x,y,z.

- S je povrch kmitajícího tělesa.

Akustický výkon, který těleso tímto způsobem generuje, lze stanovit podle výše uvedené rovnice. Tato rovnice, ačkoliv byla původně stanovena pro vyzařování hluku rovinnými útvary deskového tvaru se stala univerzální rovnicí pro hluk vytvářený vibracemi kmitajícího povrchu.

Uvažovanou plochu lze ztotožnit s povrchem tělesa, které kmitá a získáme definitivní univerzální rovnici pro stanovení vyzářeného akustického výkonu libovolně kmitajícího tělesa.

$$W_{akust} = v_{ef}^2 * S * \rho_0 * c \quad (6)$$

Výše uvedené těleso však může mít v podstatě tři základní druhy tvaru:

1. Těleso tvaru koule nebo krychle
2. Těleso tvaru deskového
3. Těleso protáhlého tvaru tyče nebo potrubí

Předpokládáme – li, že všechny tři druhy těles kmitají konstantní, frekvenčně nezávislou rychlostí  $v_{ef}$  jako naprosto tuhá tělesa. Každý ze tří druhů těles vytvoří hluk o specifickém spektrálním obsahu. Rozdíl ve spektrech vzniklého zvuku – hluku označme pro jednoduchost vyzařovacím činitelem  $\sigma$ . Takže obecná rovnice přejde na rovnici:

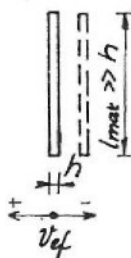
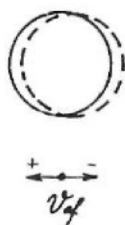
$$L_w = 20 \cdot \log (v_{ef} / 10^{-9}) + 10 \cdot \log S + 10 \cdot \log \sigma - 34 \quad (6)$$

Graficky můžeme znázornit kmitání podle obr. 7 Pro jednoduchost vztáhneme kmitání těles jen do jednoho směru, například osy x. V obr. 7 jsou základní další dvě zjednodušení:

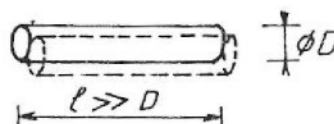
1. Těleso se nachází ve volném akustickém poli.
2. U desek a tyčí některý rozměr významně převažuje.

a) druh oscilujícího tělesa:

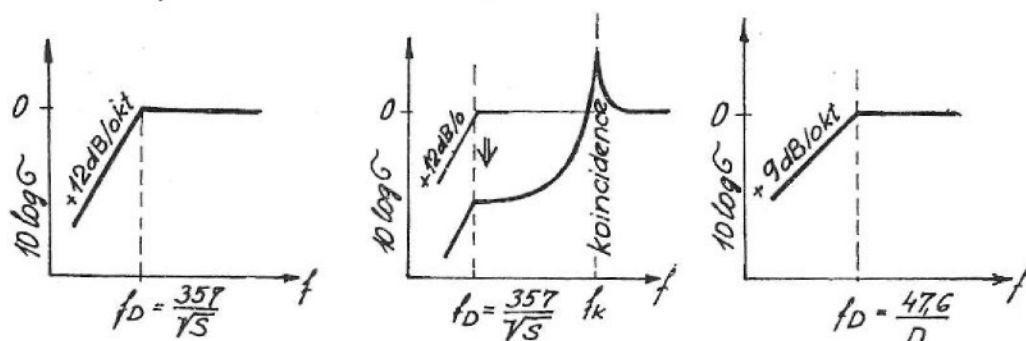
1. těleso tvaru koule nebo krychle



3. těleso tvaru tyče nebo potrubí



2. těleso tvaru deskového



b) frekvenční závislost vyzařovacího činitele

Obr.7 : Grafické znázornění vyzařovacího činitele

(6)

Typický pro frekvenční charakteristiku je zlom na frekvenci  $s_T$ , jejíž velikost je pro každý ze třech druhů těles odlišná. Vyzařovací činitel je z klasického hlediska vlastně účinnost vyjádřená též v procentech. V akustice se činitel  $\sigma$  převádí do logaritmického tvaru v rovnici

$$f_D = 1,05 * (c / \sqrt{S}) \quad (6)$$

Z obr. 7 plyne, že od frekvence  $f_D$  výše, je účinnost 100%, tedy  $10 * \log \sigma = 0$  dB. Ze všech tří druhů těles je deska nejdůležitějším prvkem, proto jí budeme věnovat největší pozornost.

### **5.3. Výpočet vyzářeného hluku z vibrujícího povrchu motoru**

Použijeme tuto rovnici:

$$L_w = L_v + 10 * \log S + 10 * \log \sigma - 34 \quad (6)$$

kde  $L_w$  je celková hladina vyzářeného akustického výkonu z vibrujícího povrchu motoru ( dB ).

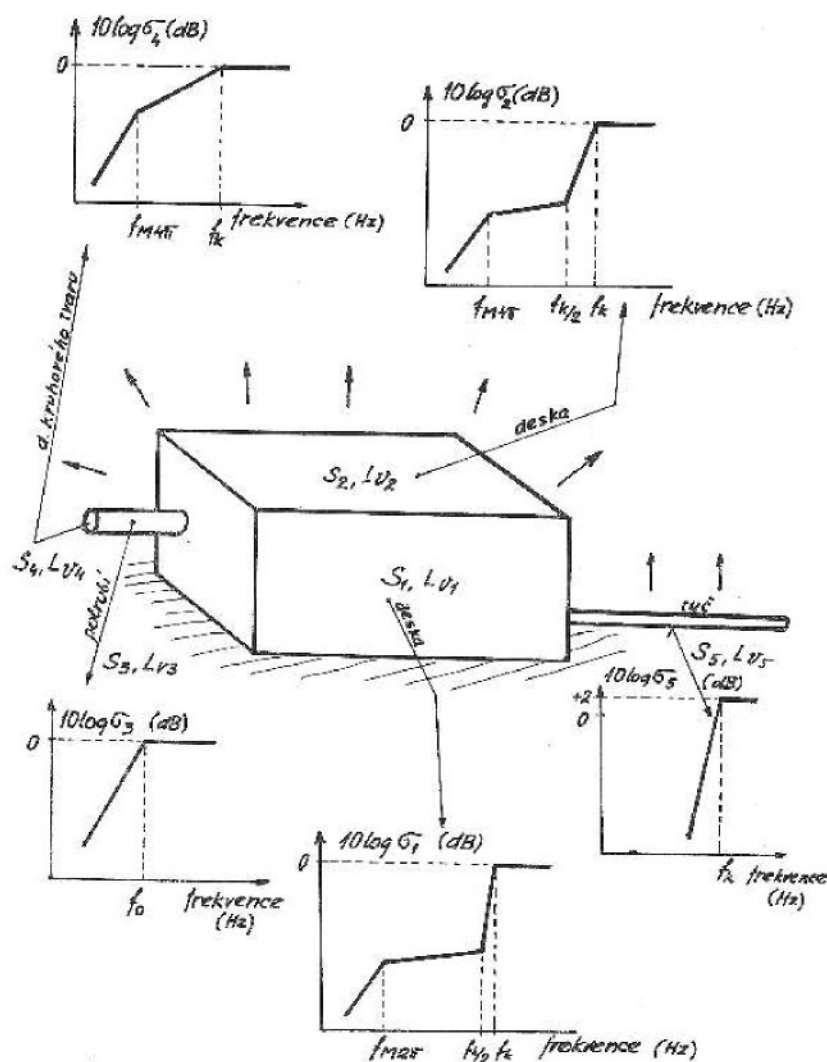
$L_v$  je průměrná hodnota efektivní rychlosti ( dB ).

$\sigma$  vyzařovací činitel plochy na povrchu motoru

$S$  plocha povrchu stroje, která vyzařuje (  $m^2$  )

Princip metody spočívá v rozdělení povrchu stroje na dílčí části, nedoporučuje se vyšší počet než  $n = 5$  a stanoví se příspěvky k celkovému akustickému výkonu odděleně. Metoda zároveň umožňuje posoudit, které plochy se dominantním způsobem ( při logaritmickém sčítání výkonů ) podílejí na hluku stroje. Prvním orientačním výpočtem celého akustického výkonu lze provádět obdobnou rovnici. Těleso je nahrazováno nejčastěji oscilující koulí s dipólovým efektem, kdy je bráno těleso jako celek. Je jasné, že celkový vyzařovací činitel neumožní hlubší analýzu snižování hluku.

Pakliže chceme provést přesnější výpočet vyzářeného hluku, rozdělíme povrch na dílčí vyzařovací plochy, v našem případě přibližně podle obr. 5 celý postup má smysl jen tehdy, jestliže je stroj uzavřenou akustickou strukturou, to znamená, že v povrchu neexistují otvory nebo akusticky průzvučné plochy, kterými by se hluk mohl šířit přímo.



Obr. 8 : Rozdělení vibrujících povrchů

(6)

#### **5.4. Vyzařovací činitel a jeho stanovení**

Závislost na kmitočtu má jediný zlom, jehož frekvence je určována základním charakteristickým rozměrem stroje, tj. nejdelším rozměrem stroje nebo plochy povrchu S. Tuto zlomovou frekvenci určujeme nejlépe graficky. Pod touto frekvencí má frekvenční závislost sklon 12 dB / oktávu a nad ní 0 dB / oktávu. Pro běžné případy umístění stroje nad zvuk odrážející rovinou používáme vztah

$$f_{D4n} = (1 / 2^{1/4}) \quad (6)$$

Uvažujeme-li příspěvky od jednotlivých vyzařujících ploch, řídíme se odlišnými pokyny podle toho, o jaký typ částí stroje jde. Rozeznáváme tyto typy částí strojů:

1. Vibrující desku ve volném poli
2. Vibrující desku jako součást povrchu stroje
3. Vibrující desku konkávního válcového tvaru jako součást povrchu
4. Vibrující desku kruhového tvaru
5. Pulsující nebo oscilující potrubí
6. Ohybově kmitající potrubí nebo tyč čtvercového průřezu
7. Uzavřený čtvercový profil
8. Ohybově kmitající nosník eliptického průřezu jako náhradu pro válcované profily typu I, L, U
9. Vyzařovací činitel litinové desky jako součást povrchu stroje

Mému zadání odpovídá druhý typ částí strojů ( vibrující deska ).

## 6. Postup výpočtu akustického výkonu

Pro nejjednodušší a nejpřímější určení vyzařovaného akustického výkonu při znalostech vibrací motoru je podle mého názoru vhodné použít vzorce :

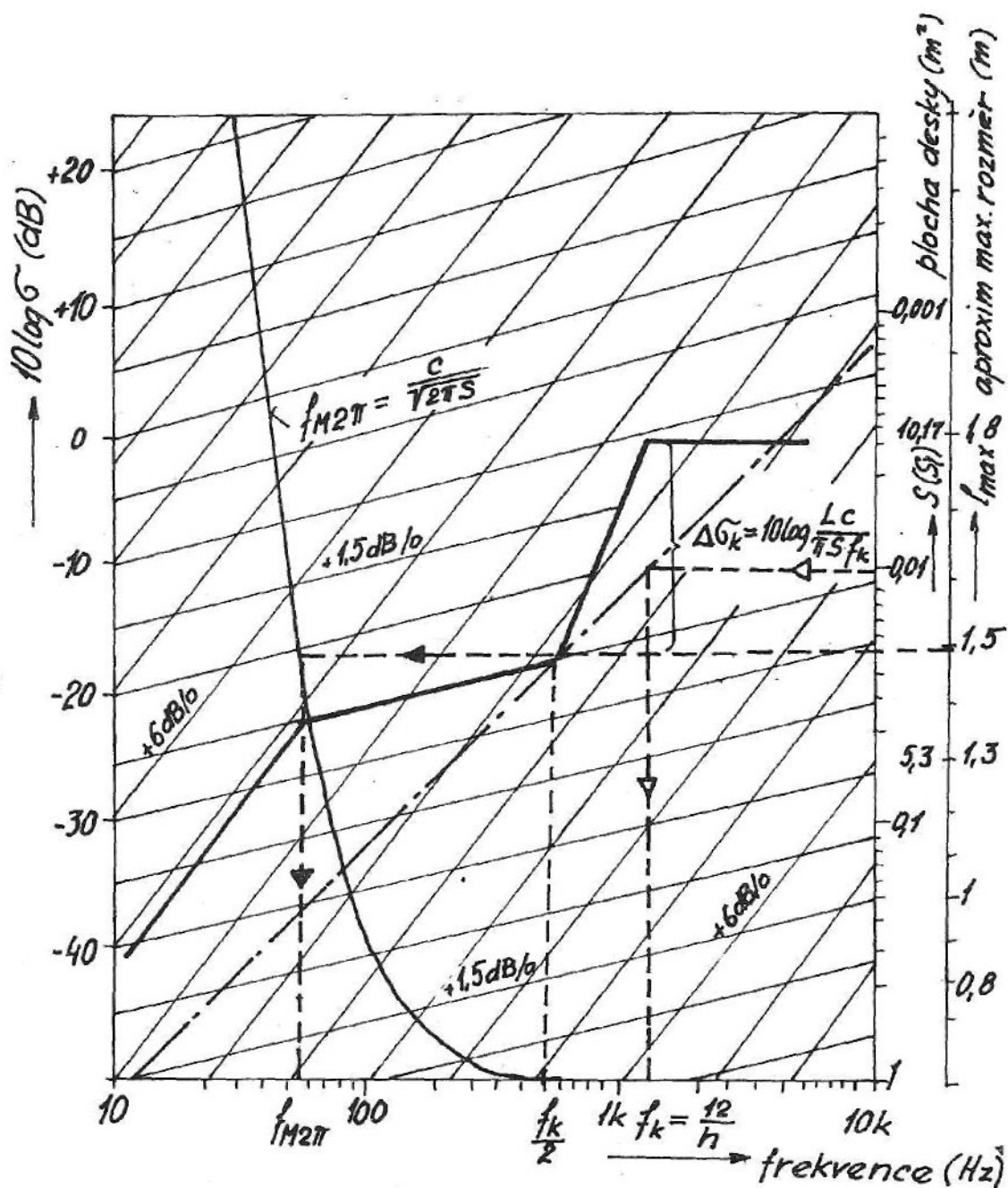
$$L_w = L_v + 10 \cdot \log S + 10 \cdot \log \sigma - 34$$

Popsaného v kapitole 5.3.

Použití tohoto vzorce je výhodné zejména vzhledem k jednoduchosti měření na jakémkoliv spalovacím motoru. Postačí nám totiž jen naměření vibrací povrchu motoru, nejčastěji bloku a hlavy motoru, případně i olejové vany.

K docílení přesných hodnot akustického výkonu, resp. hodnot srovnatelných s naměřeným akustickým výkonem, je však třeba velmi přesně spočítat plochu povrchu bloku motoru. Tento povrch bývá nejčastěji konstruován velmi složitě a to z důvodu různých náliťků, výstužných žeber atd. Nejideálnější je podle mého názoru rozdělení celé plochy strany bloku motoru na několik menších ploch, ve kterých jsou také měřeny vibrace a dále tyto menší plochy rozdělit na soubor různě velkých čtverců a obdélníků, jejichž plochy se po té sečtou.

Při výpočtu je také potřeba věnovat velkou pozornost odečítání a určování vyzařovacího činitele  $\sigma$ . Nejprve je důležité rozpoznat, o jaký typ vyzařovacího povrchu se jedná. V naprosté většině se u všech typů spalovacích motorů bude jednat o vibrující desky jako součásti povrchu stroje. Pro určení vyzařovacího činitele  $\sigma$ , resp. jeho logaritmické složky  $10 \times \log \sigma$  použijí graf č. 1.



Graf č. 1 Stanovení vyzařovacího činitele  $\sigma$  (6)

Z tohoto grafu je patrné, že vyzařovací činitel  $\sigma$  je závislý na frekvenci (Hz) a na ploše námi zvolené desky. Než začneme odečítat z grafu hodnoty pro jednotlivé frekvence, spočítáme z vzorce :

$$f_D = 1,05 * (c / \sqrt{S})$$

kritickou frekvenci  $f_D$ .



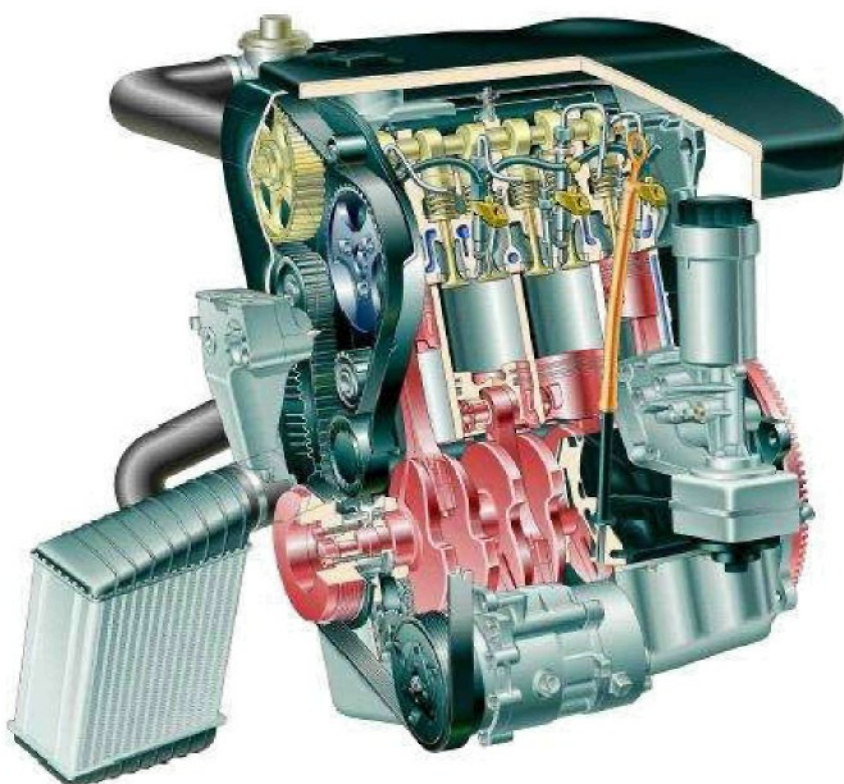
Tímto způsobem bychom měli dosáhnout přibližného určení vyzařovaného akustického výkonu jednotlivých složek rozdělených ploch povrchu motoru při naměřených hodnotách jejich vibrací. Přesnost výpočtu bude, podle mého názoru, velmi záležet na přesnosti výpočtu dílčích ploch a co nejpřesnějšího stanovení vyzařovacího činitele  $\sigma$ .

## 7. Experimentální část

### 7.1. Základní popis motoru:

Pro aplikaci poznatků o určování akustického výkonu z vibrací mi byl poskytnut motor používaný automobilkou Škoda ve svém voze Fabia RS. Jedná se tedy o přeplňovaný vznětový motor 1.9 TDI.

#### Vznětový motor TDI



Obr.9 : Vznětový motor 1,9 TDI

(8)

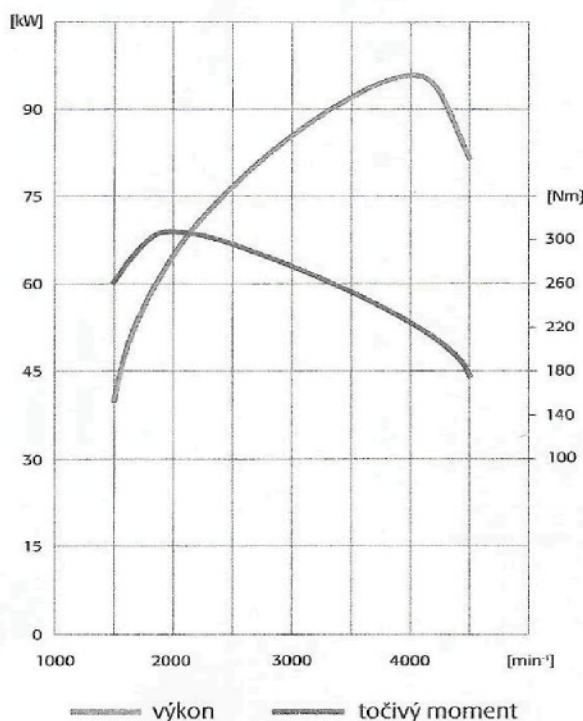
Motor 1,9 TDI/96 kW je vznětový, kapalinou chlazený čtyřválec, přeplňovaný výfukovým turbodmychadlem s nastavitelnou geometrií rozváděcích lopatek statoru turbodmychadla. Tato technologie zaručuje vysokou účinnost turbodmychadla a tím optimální plnění motoru v každém pracovním režimu. K tomu přispívá i chladič stlačeného vzduchu.

Blok motoru je zhotoven z šedé litiny, hlava válců u hliníkové slitiny. Váčkový hřídel je umístěn v hlavě válců, jedná se tedy o rozvod OHC a prostřednictvím hydraulických hrníčkových zdvihátek s automatickým vymezováním ventilové vůle ovládá dva ventily pro každý válec. Motor je vybaven oxidačním katalyzátorem a plní emisní normu EU 3.

Přeplňování se provádí turbodmychadlem s nastavitelnými rozváděcími lopatkami bez bypassu. Toto řešení má rozhodující význam pro optimální využití výkonu.

Úroveň šroubovitého zakřivení spalovacího prostoru a geometrie prohlubně ve dně pístu odpovídají výchozímu motoru 81 kW-TDI. Průměr děr v pětivotvorových vstřikovacích tryskách však byl zvýšen na 205  $\mu\text{m}$ .

Řídící jednotka motoru 1,9 TDI přejímá kontrolu nad množstvím vstřikovaného paliva, počátkem vstřiku, plnicím tlakem, zpětným vedením výfukových plynů, dobou žhavení a elektrickým vyhříváním chladicí kapaliny. Používá se řídicí jednotka firmy Bosch.



Obr. 9 : Výkonový diagram motoru 1,9 TDI, 96 kW (8)

Aby se snížil hluk ve vozidle, je na motoru použito dvouhmotnostního setrvačníku.

Řemenice na klikovém hřídeli je speciální konstrukce pro útlum kmitů a vyrovnávání nerovnoměrnosti chodů klikového hřídele.

## 7.2. Dvouhmotnostní setrvačnick

U zdvihových pístových motorů dochází vlivem nerovnoměrností spalovacího procesu ke vzniku torzních kmitů na klikovém hřídeli a na setrvačnicku. Tyto kmity se pak dále přenášejí přes spojku na převodovku a transmisní pohon. V rozsahu nízkých otáček se vznik torzního kmitání projevuje vibracemi a hlukem.

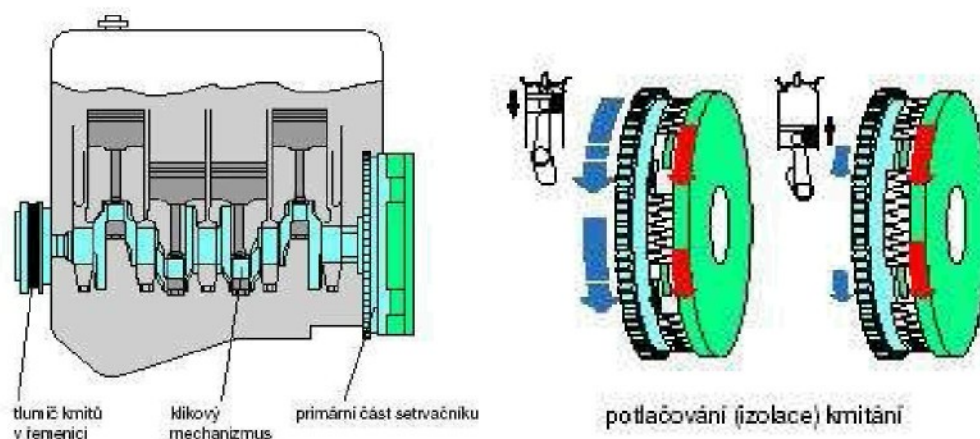
Dvouhmotnostní setrvačnick zabráňuje tomu, aby se torzní kmitání přenášelo na transmisní pohon, a aby na pohonu docházelo ke vzniku rezonančních kmitů.

Princip dvouhmotnostního setrvačnicku spočívá v tom, že celková hmota setrvačnicku je rozdělena do dvou samostatných hmotnostních částí. První část setrvačnicku patří hmotnostnímu momentu setrvačnosti motoru. Druhá část zvyšuje hmotnostní moment setrvačnosti převodovky. Obě hmotnostní části setrvačnicku jsou spolu pružně spojeny pomocí pružinového tlumičícího systému.

Díky zvětšenému hmotnostnímu momentu setrvačnosti převodovky, přechází kmitání na díly převodovky jen ve velmi nízkých otáčkách. Pružinovým tlumičícím systémem se téměř zcela potlačuje náchylnost hřídele převodovky ke vzniku kmitání.

Výsledkem použití dvouhmotnostního setrvačnicku je klidnější chod všech následných částí: sekundární části setrvačnicku, spojky, lamely spojky, převodovky a celého transmisního pohonu.

Menší hmotnost primární části setrvačnicku zvyšuje nerovnoměrnost chodu klikového hřídele. Nerovnoměrnost je následně potlačována tlumičem kmitů, který je umístěn v řemenici na klikovém hřídeli.

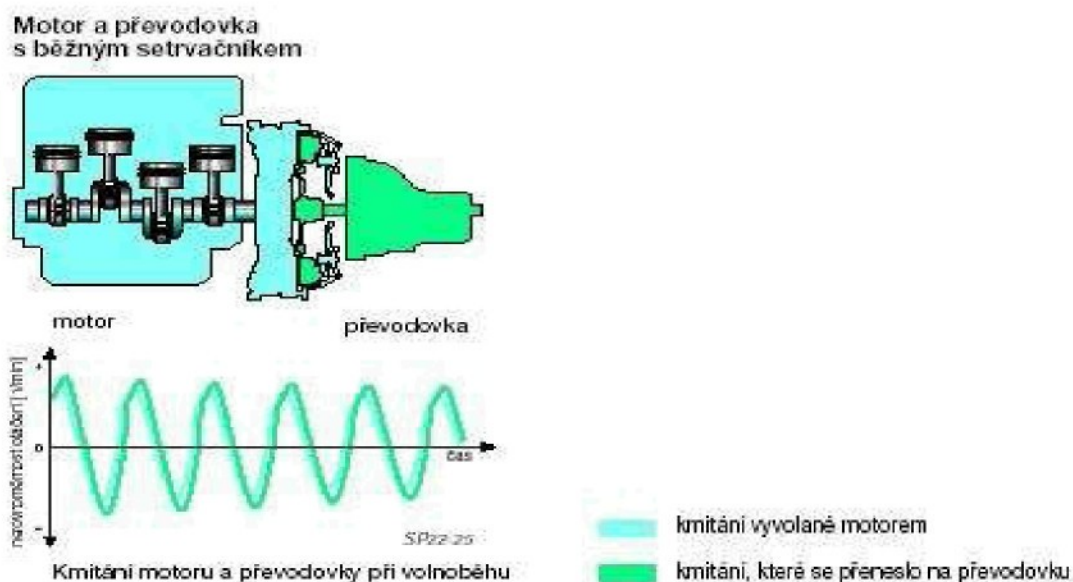


Obr.10 : Schéma umístění tlumiče kmitů (8)



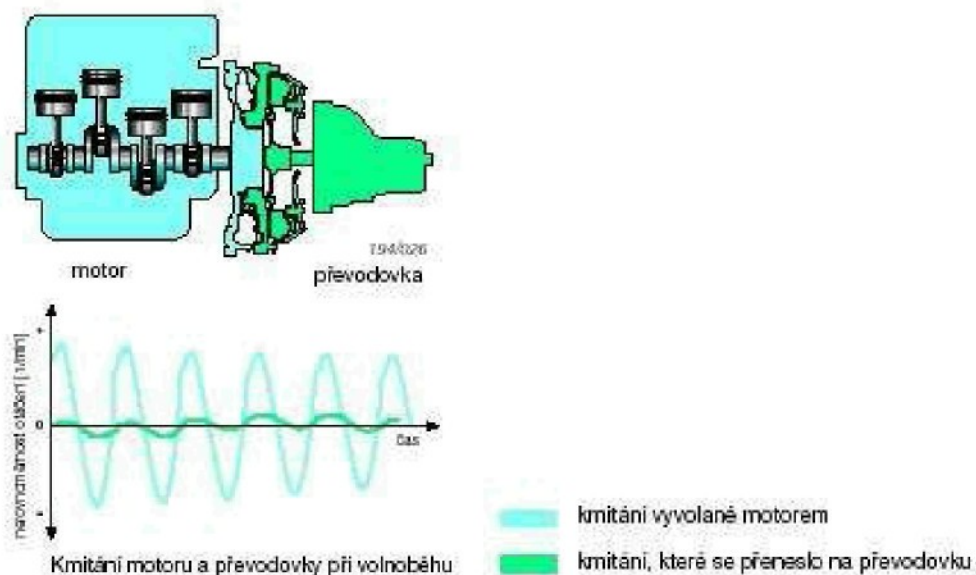
### 7.3. Porovnání setrvačníku normálního a dvouhmotnostního

Běžný setrvačník dokáže dobře tlumit kmitání motoru. Ostatní druhy kmitání jsou však bez zábran přenášeny dále na převodovku, což se projevuje vibracemi a hlukem zejména v oblasti nízkých otáček.



Obr. 11 : Schéma motoru s běžným setrvačníkem (8)

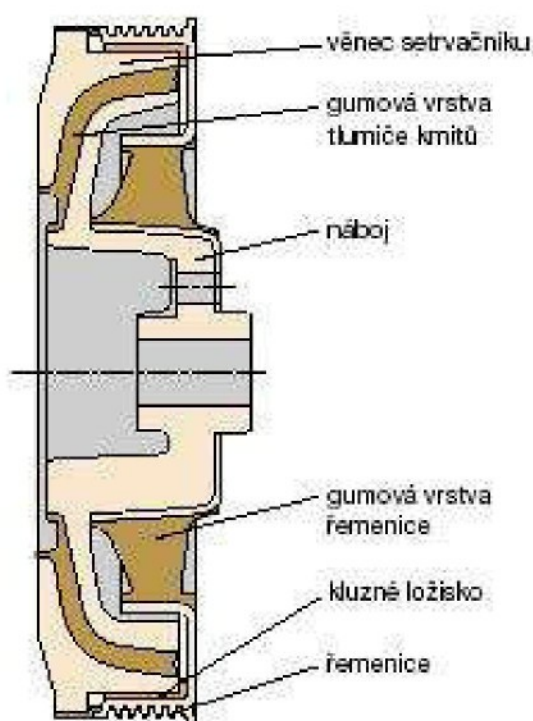
Dvouhmotnostní setrvačník vyvolává sice o něco vyšší kmitání motoru, ale díky pružinovému tlumicímu systému a zvýšenému hmotnostnímu momentu setrvačnosti převodovky se však téměř vůbec na součásti převodovky nepřenáší. Kromě znatelně vyššího jízdního komfortu se použití dvouhmotnostního setrvačníku projeví (vlivem menšího namáhání) delší životností součástí a nižší spotřebou paliva v oblasti nízkých otáček motoru.



Obr. 12 : Schéma motoru s dvouhmotnostním setrvačníkem (8)

#### 7.4. Tlumič kmitů řemenice

V důsledku snížení primární hmotnosti vyvolává dvouhmotnostní setrvačnick zvýšenou nerovnoměrnost otáčení klikového hřídele. Proti nerovnoměrnosti otáčení působí tlumič kmitů. Tlumič kmitů, který je zároveň řemenicí drážkového řemenu, vznikající nerovnoměrnost otáčení potlačuje. Díky oddělené řemenici zabezpečuje také klidný chod drážkového řemenu. Navíc dochází i k útlumu šíření hluku, který vzniká v procesu spalování, neboť tlumič kmitů tlumí (díky své konstrukci) i v axiálním směru.



Obr. 13 : Schéma řemenice

(8)

## 7.5 Vlastní měření a výpočty

Pro měření hodnot akustického tlaku a vibrací jsem použil dvoukanálový frekvenční analyzátor Bruel&Kjaer Typ 2144 (obr).



Obr Dvoukanálový frekvenční analyzátor typ 2144

Protože tento analyzátor neměří přímo akustický výkon, ale akustický tlak, je nutné tento naměřený akustický tlak ještě přepočítat na akustický výkon. K tomu použijeme vzorec :

$$Lv = p_a + 10 * \log S \quad [\text{dB}]$$

Naměřené hodnoty vibrací jsem přepočítal na zrychlení :

$$a = 10^{\frac{p_a}{20}} * 10^{-6} \quad [\text{m/s}^2]$$

A po té ze zrychlení na rychlost vibrací :

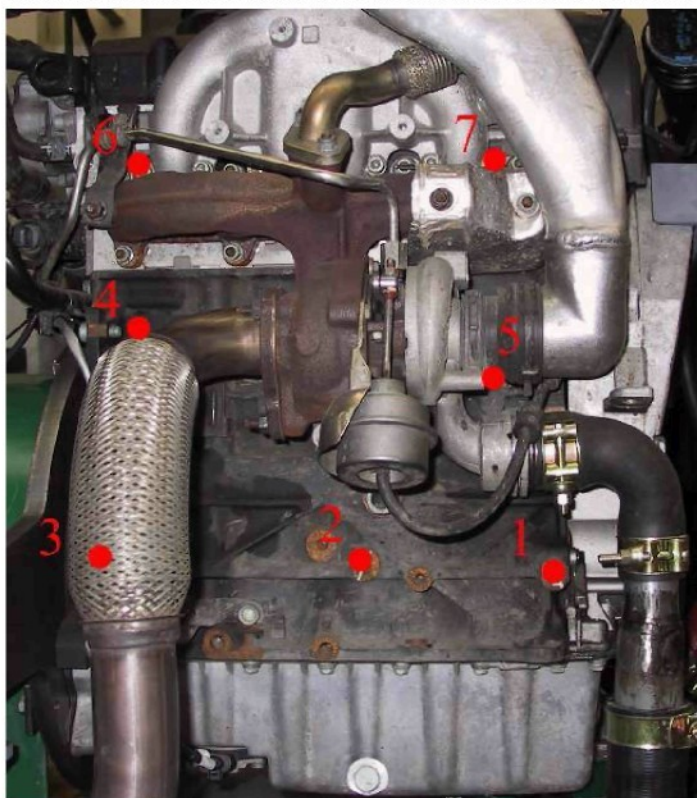
$$V = a / (2 * \pi * f) \quad [\text{m/s}]$$

Následným dosazením do vzorce

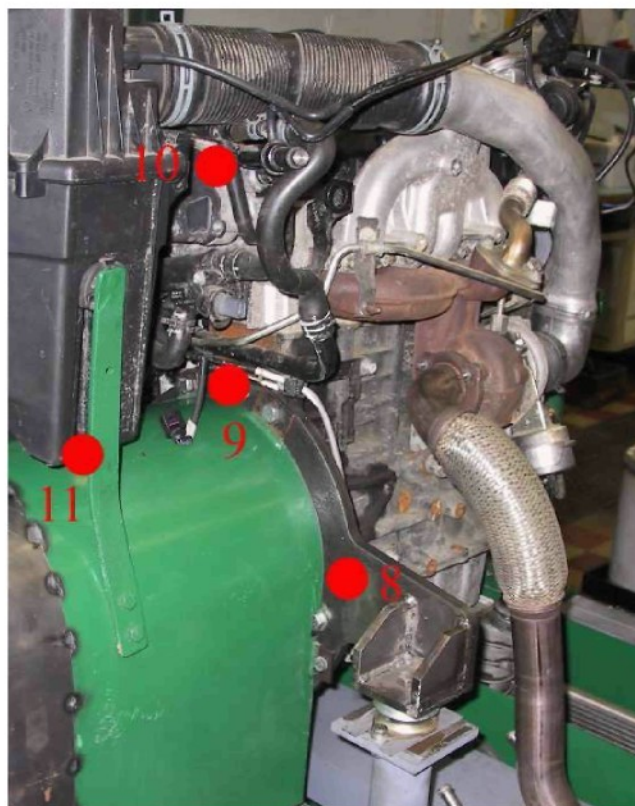
$$L_w = L_v + 10 * \log S + 10 * \log \sigma - 34 \quad [\text{dB}]$$

Pro následný výpočet bylo důležité přesné zaznamenání měřících míst na bloku motoru. Všechna místa jsou vyznačena na následujících obrázcích :



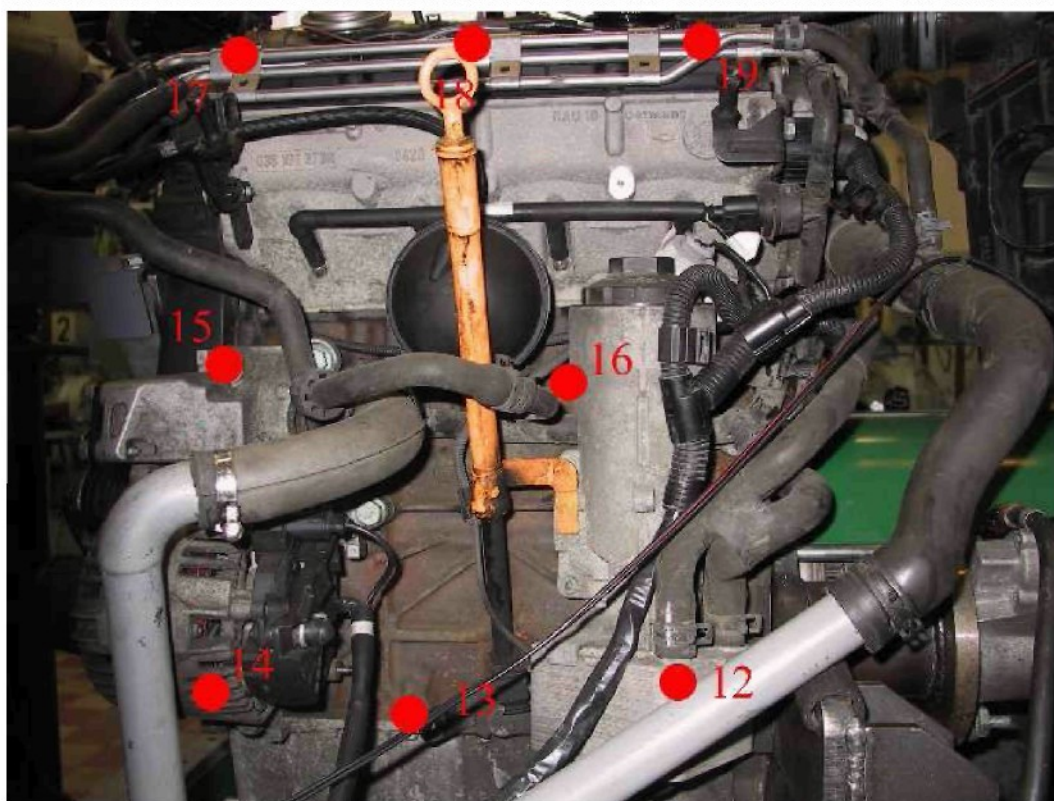


Obr.14 : Pohled na umístění bodů 1-7

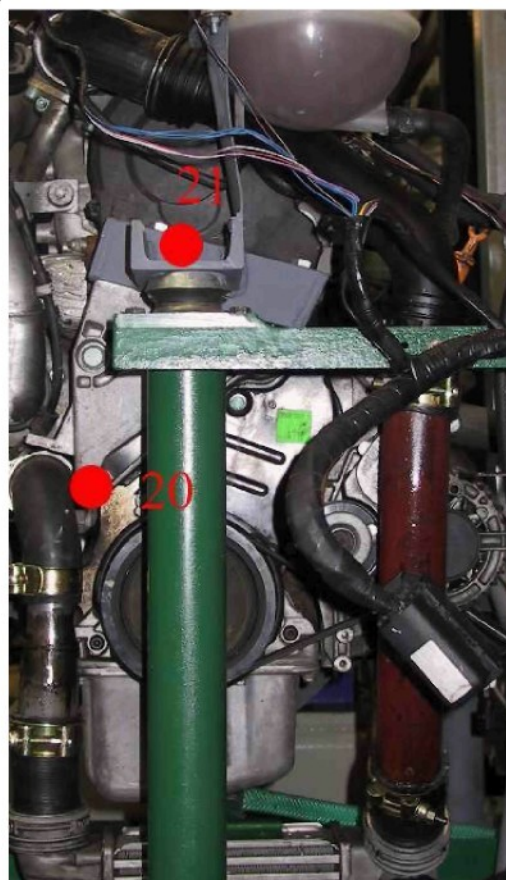


Obr. 15 : Pohled na umístění bodů 8-11



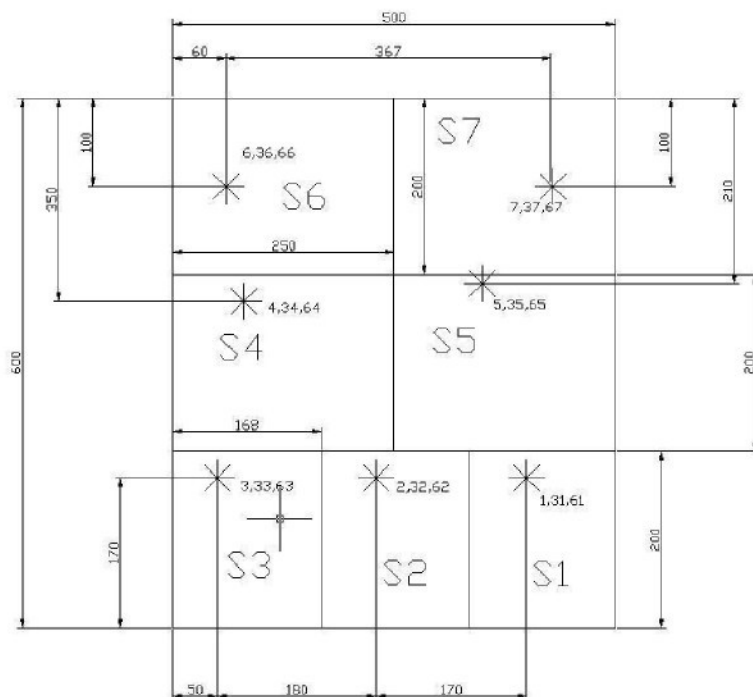


Obr.16 : Pohled na umístění bodů 12-19

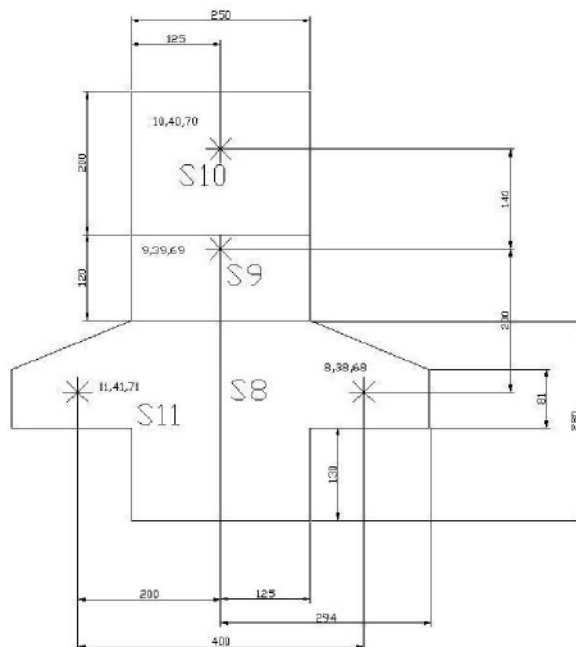


Obr. 17 : Pohled na umístění bodů 20-21

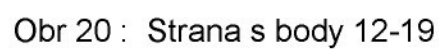
Povrch bloku motoru jsem rozdělil na tyto menší části, jak je patrné z obr. 18-21.



Obr 18 : Strana motoru s body 1-7



Obr 19: Strana s body 8-11 ( u setrvačníku)



Kde :

$$S_1 = 0,0336 \text{ m}^2$$

$$S_2 = 0,0336 \text{ m}^2$$

$$S_3 = 0,0036 \text{ m}^2$$

$$S_4 = 0,005 \text{ m}^2$$

$$S_5 = 0,05 \text{ m}^2$$

$$S_6 = 0,05 \text{ m}^2$$

$$S_7 = 0,05 \text{ m}^2$$

$$S_8 = 0,05452 \text{ m}^2$$

$$S_9 = 0,03 \text{ m}^2$$

$$S_{10} = 0,05 \text{ m}^2$$

$$S_{11} = 0,05452 \text{ m}^2$$

$$S_{12} = 0,0328 \text{ m}^2$$

$$S_{13} = 0,0336 \text{ m}^2$$

$$S_{14} = 0,0336 \text{ m}^2$$

$$S_{15} = 0,05 \text{ m}^2$$

$$S_{16} = 0,005 \text{ m}^2$$

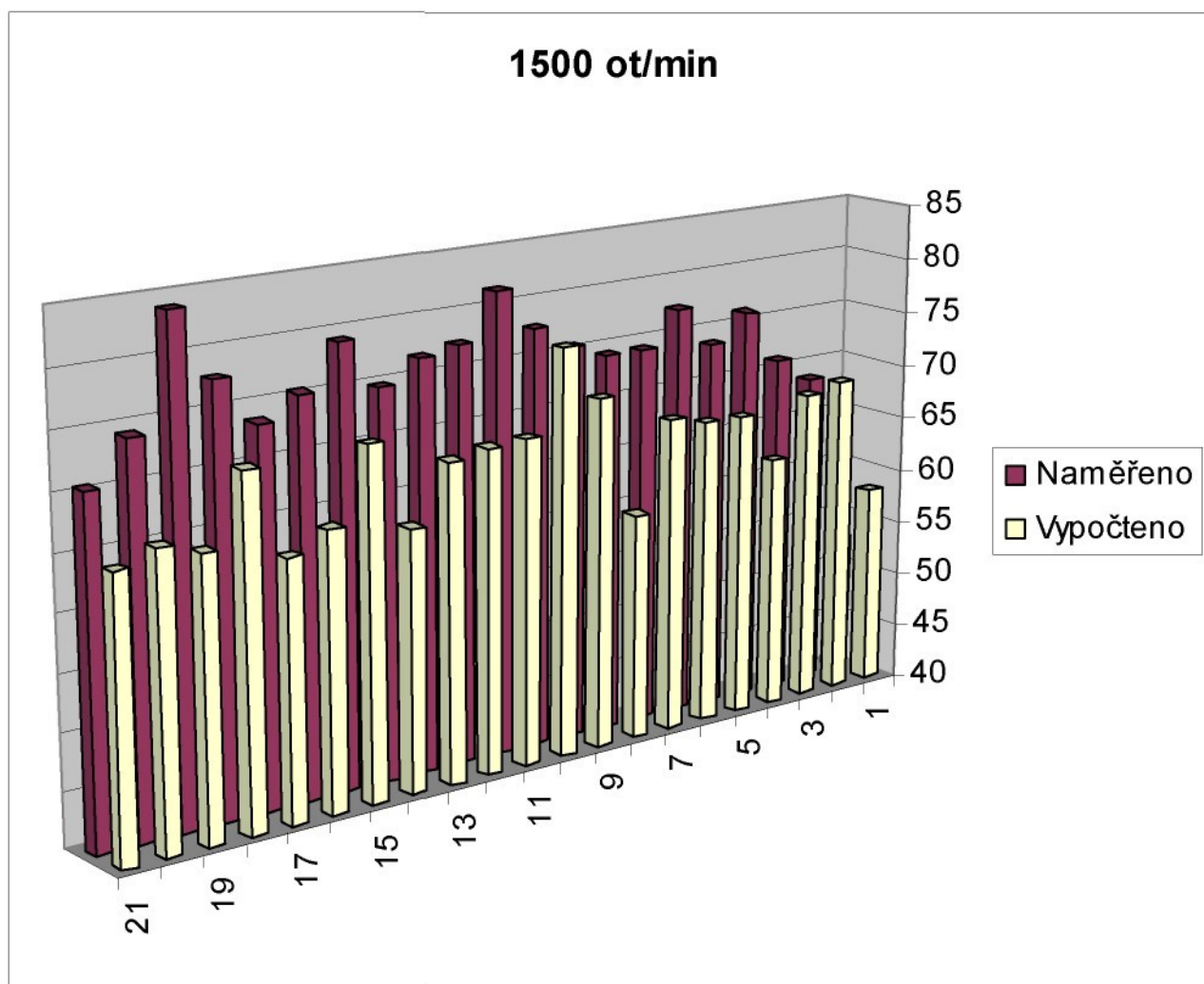
$$S_{17} = 0,0336 \text{ m}^2$$

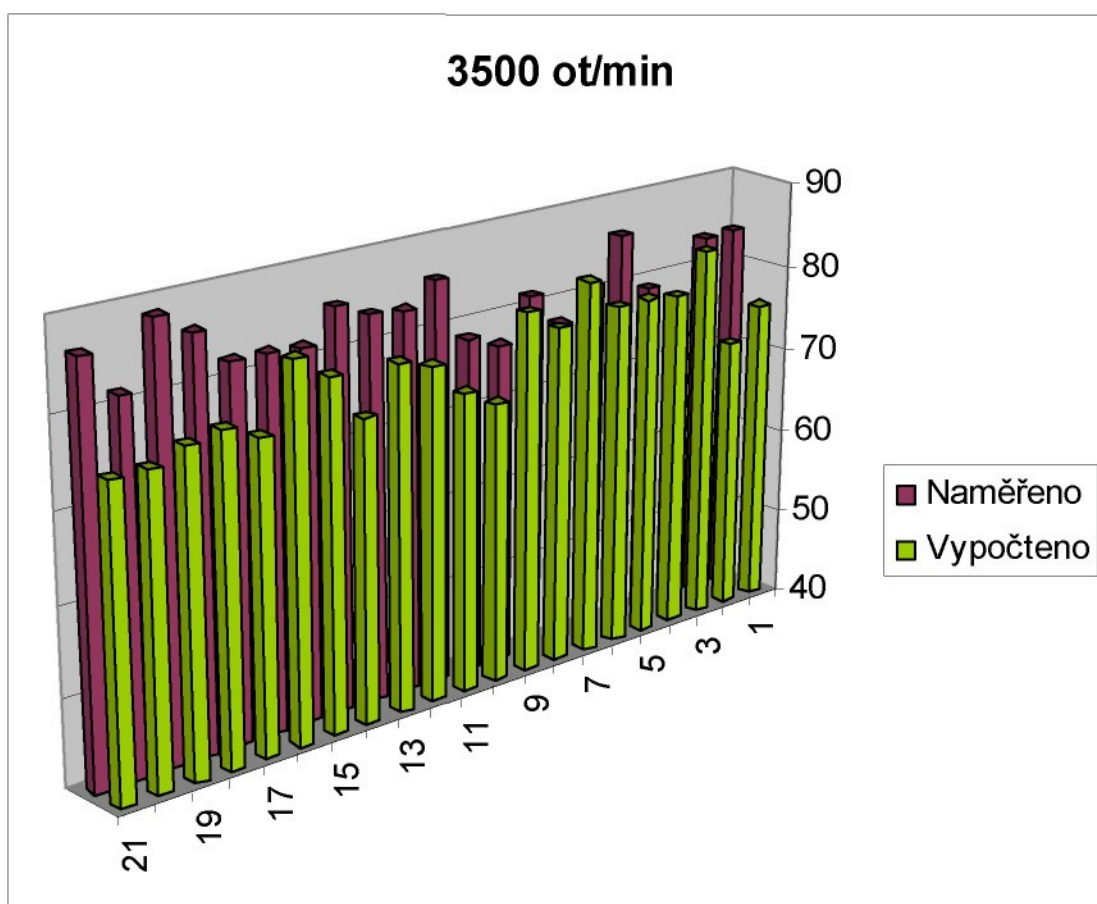
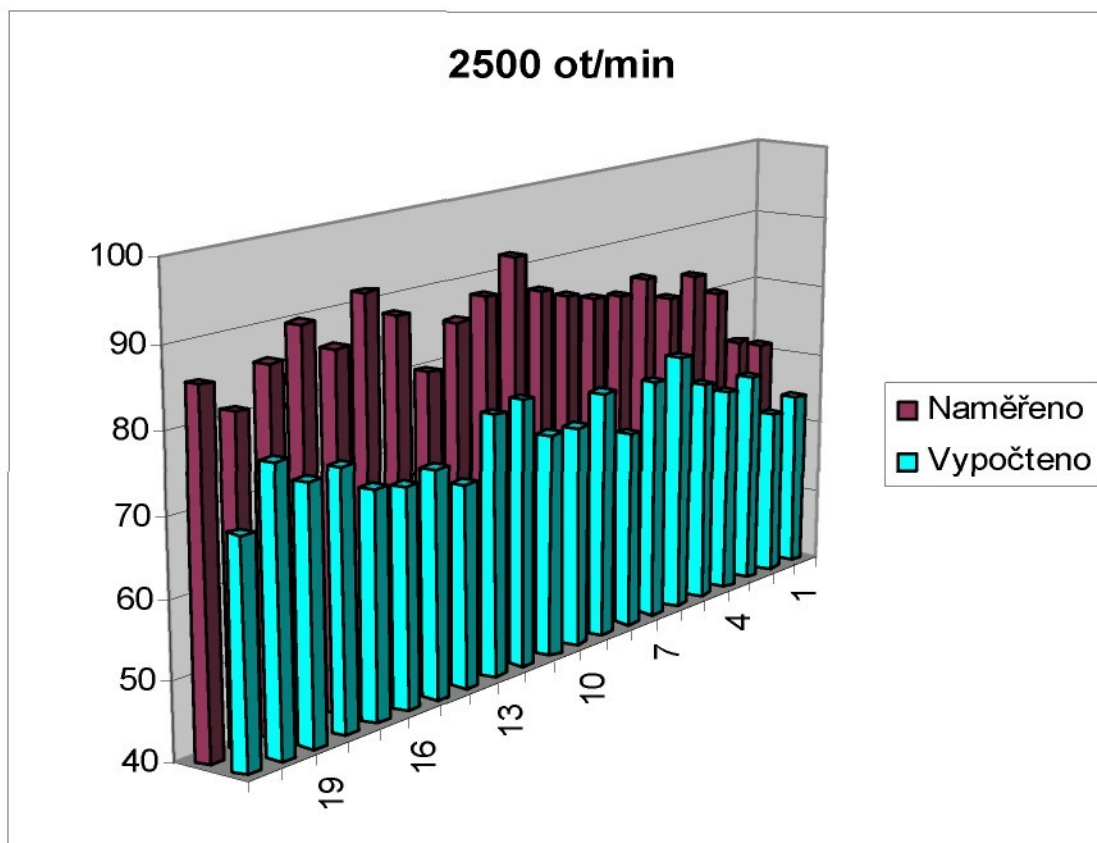
$$S_{18} = 0,0336 \text{ m}^2$$

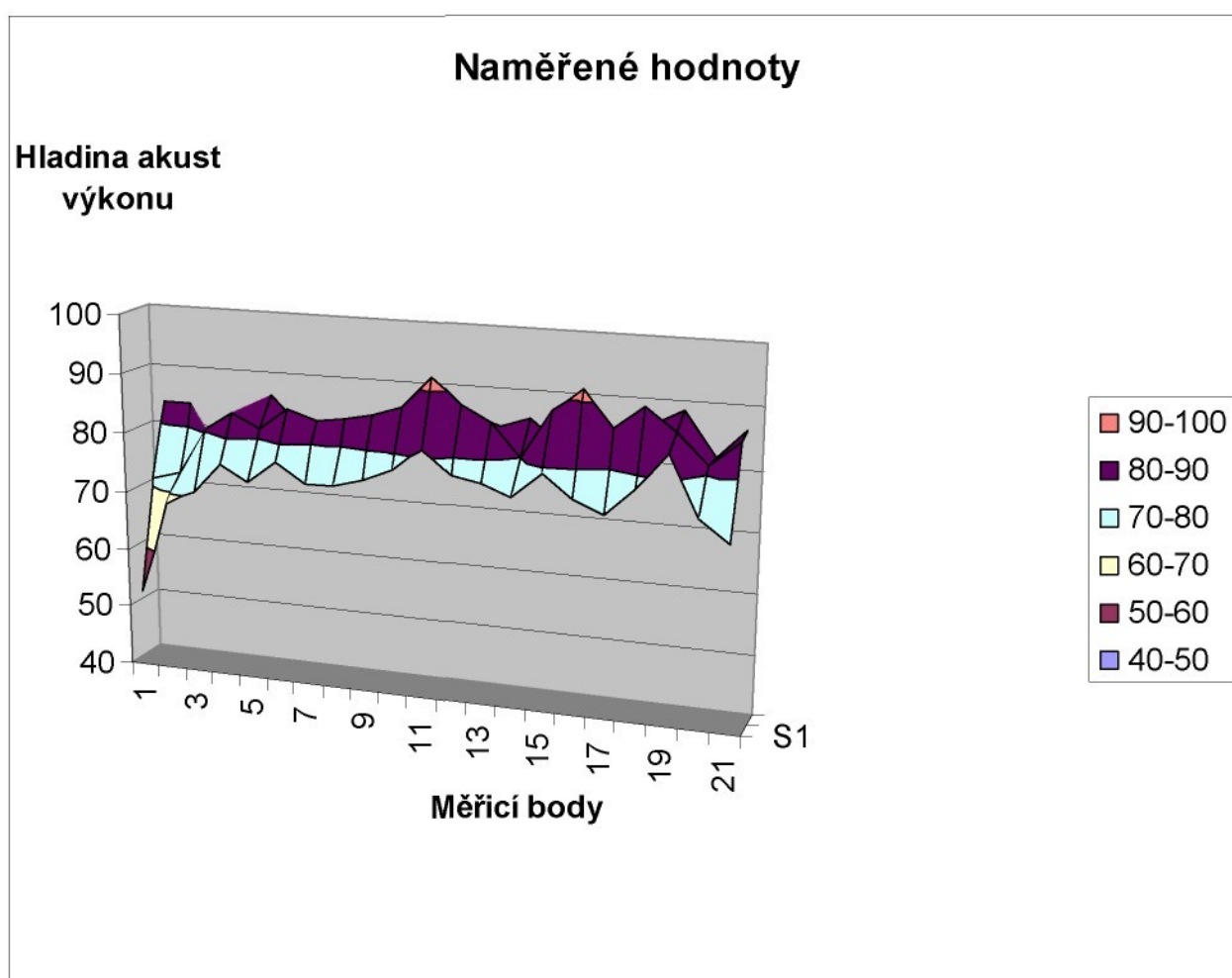
$$S_{19} = 0,0336 \text{ m}^2$$

$$S_{20} = 0,075 \text{ m}^2$$

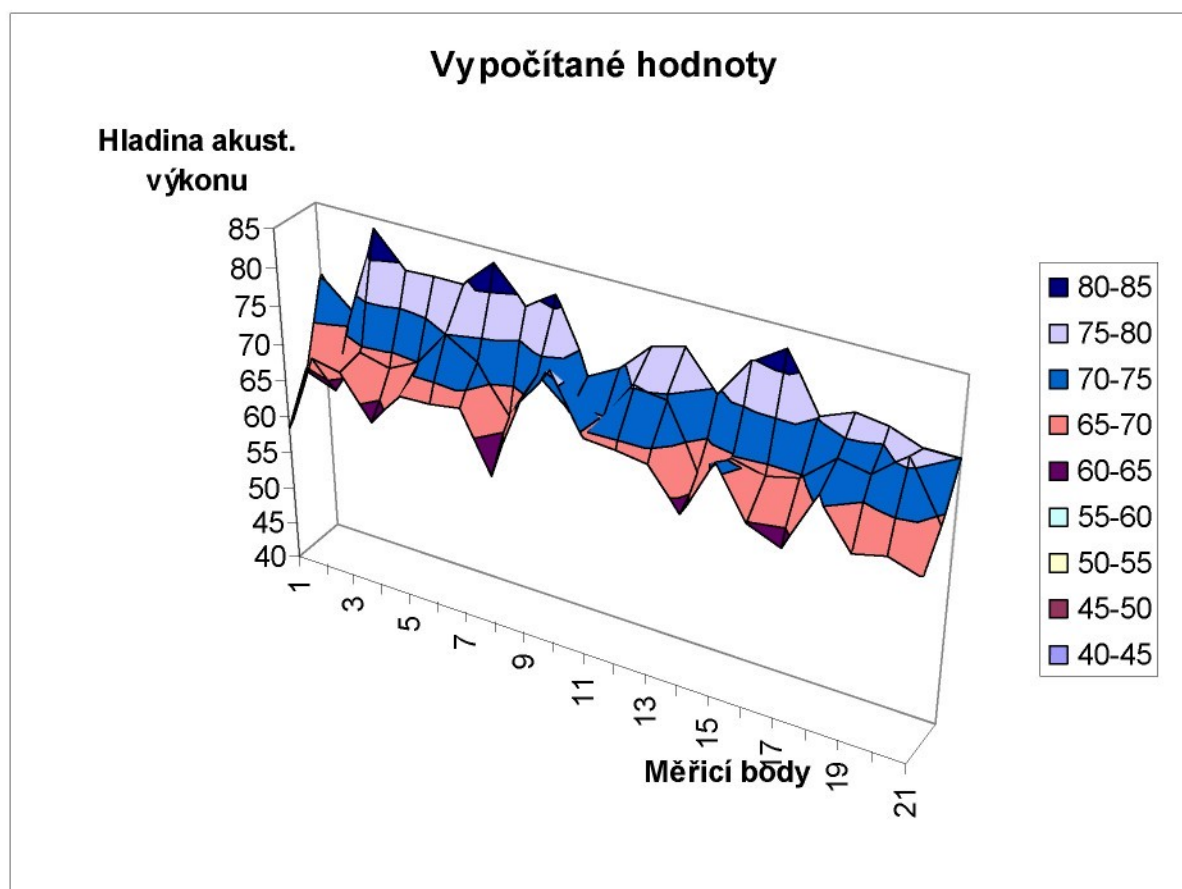
$$S_{21} = 0,075 \text{ m}^2$$

**Grafy porovnání naměřených a vypočtených hodnot pro 1500, 2500 a 3500 ot/min**



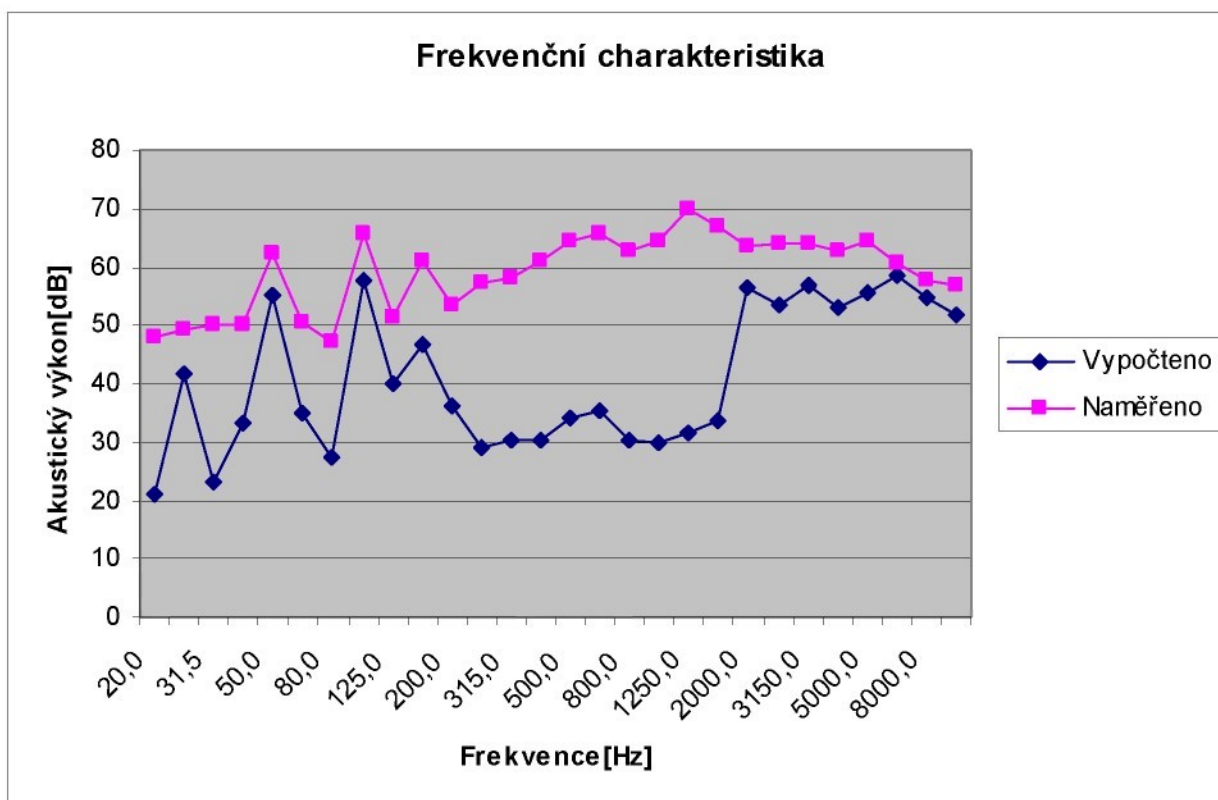
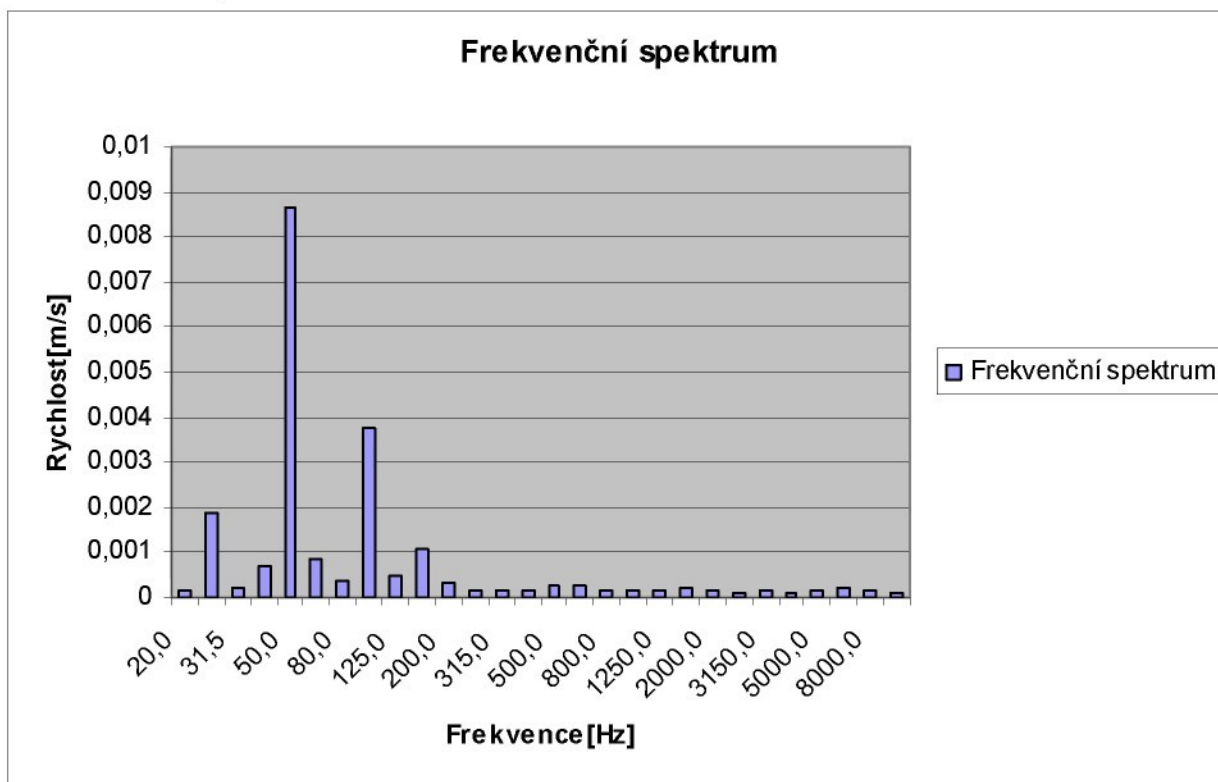
**Porovnání zvýšení akustického výkonu při 1500, 2500 a 3500 ot/min**

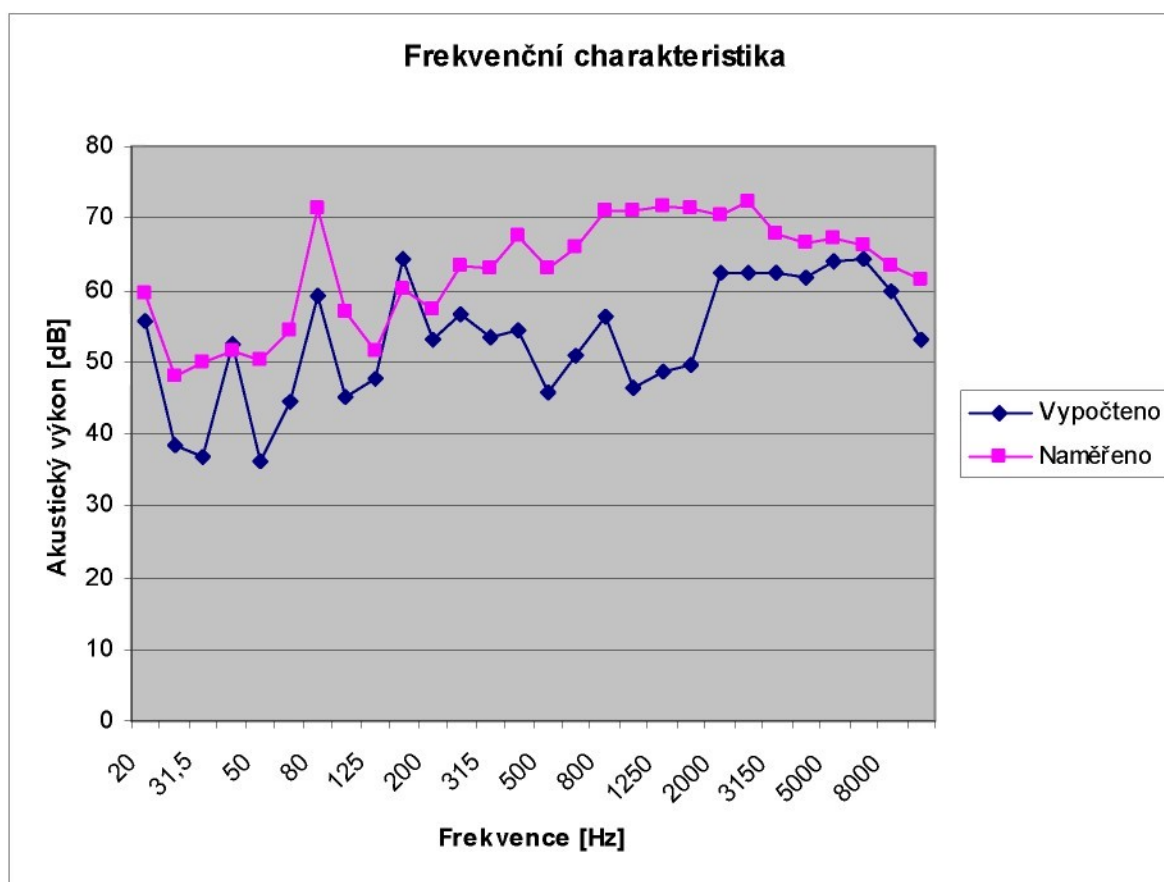
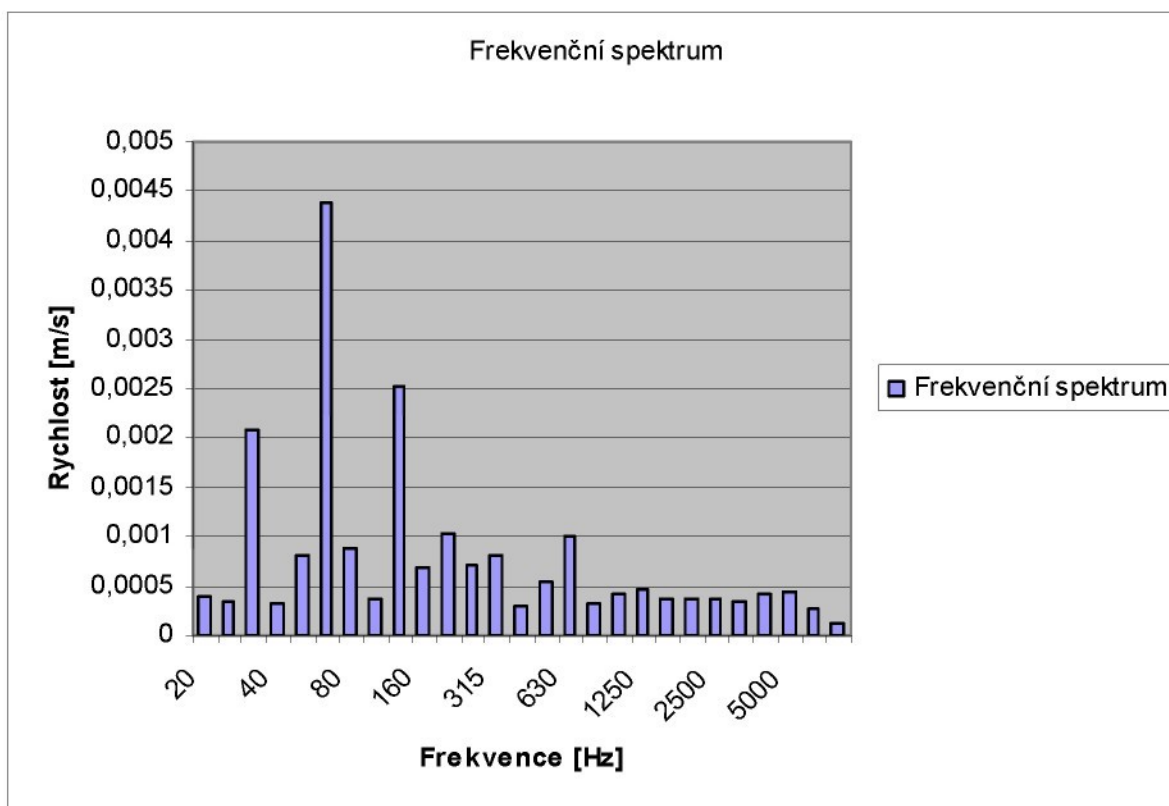


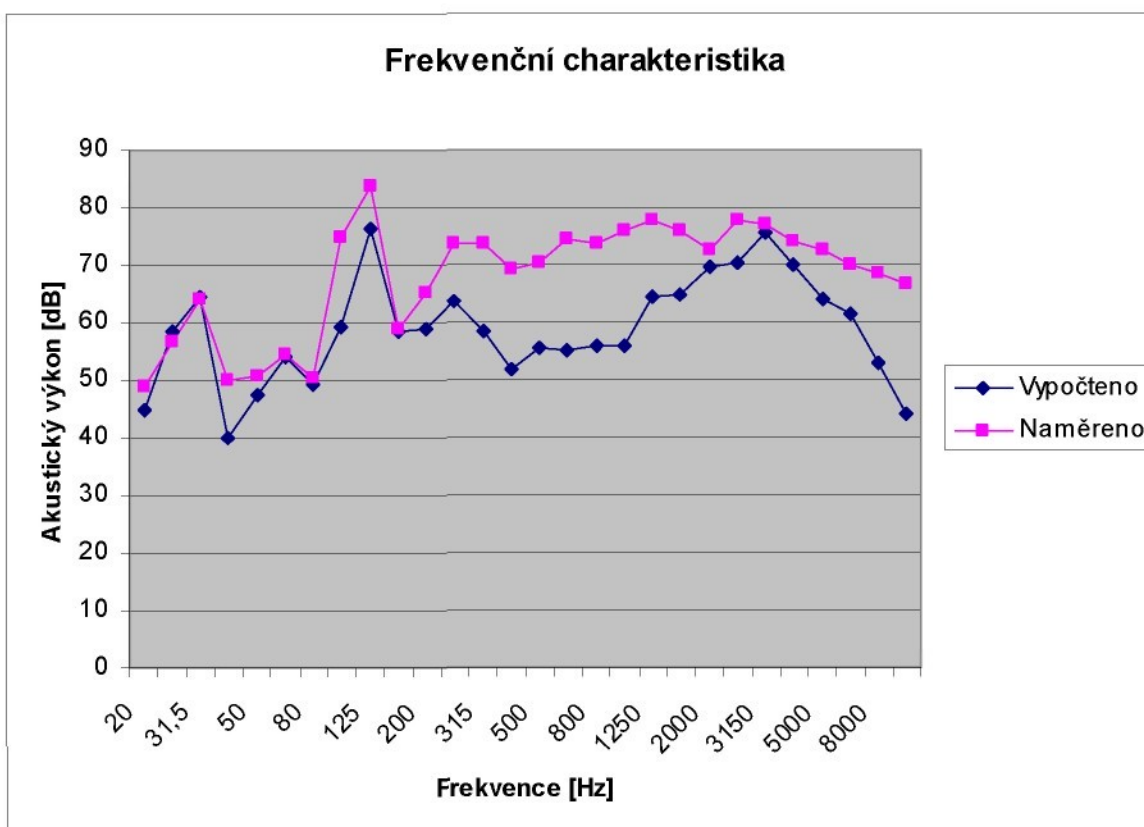
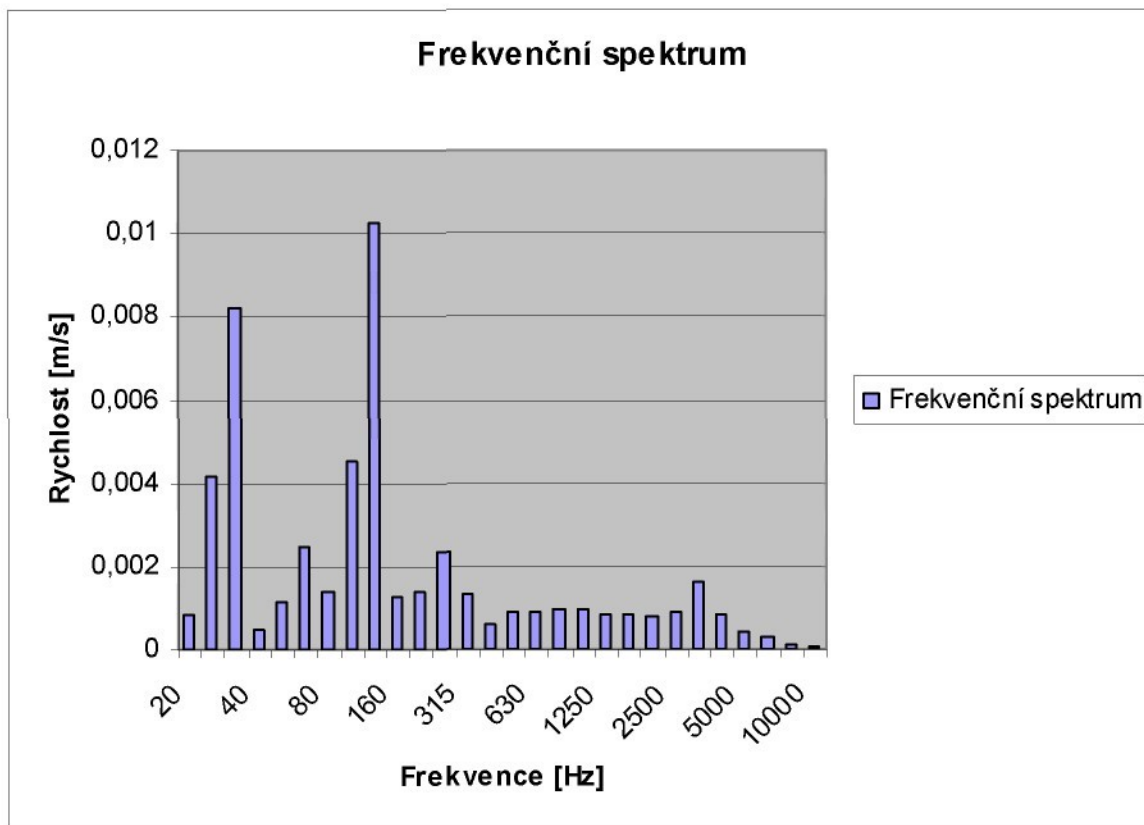


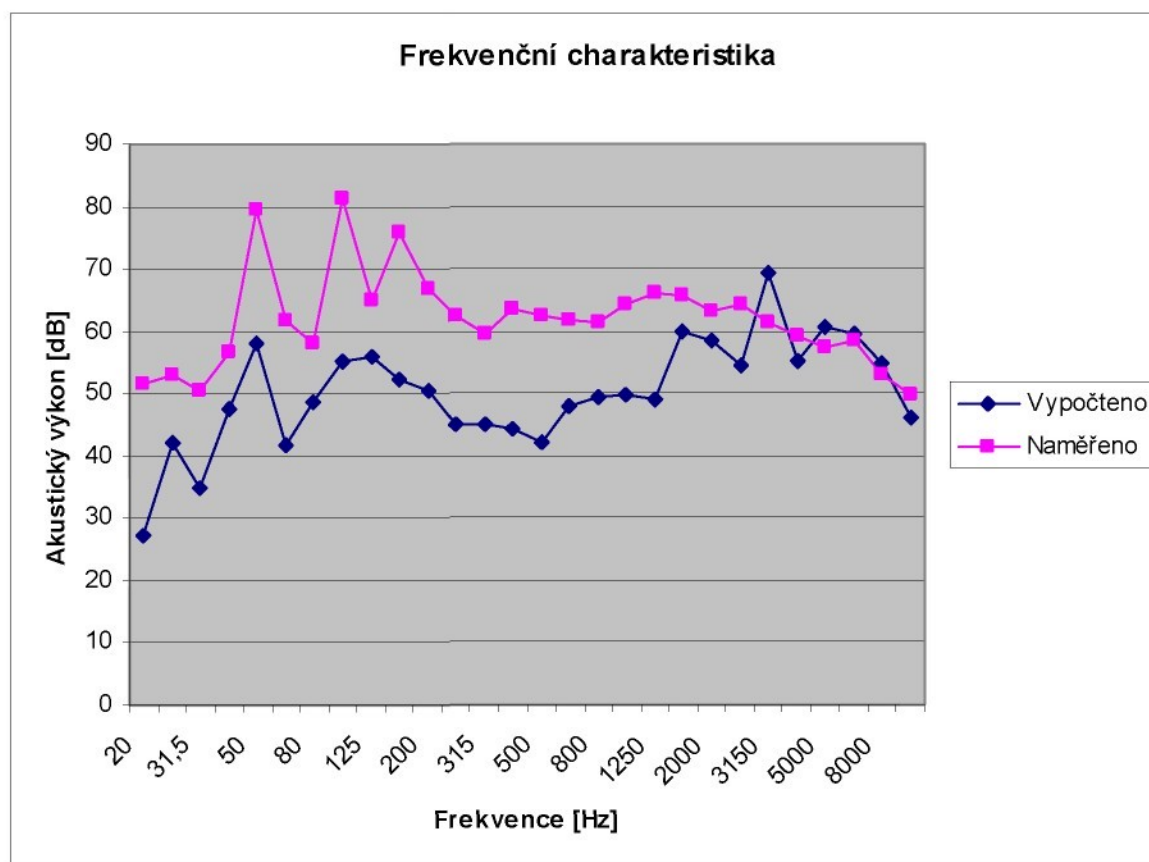
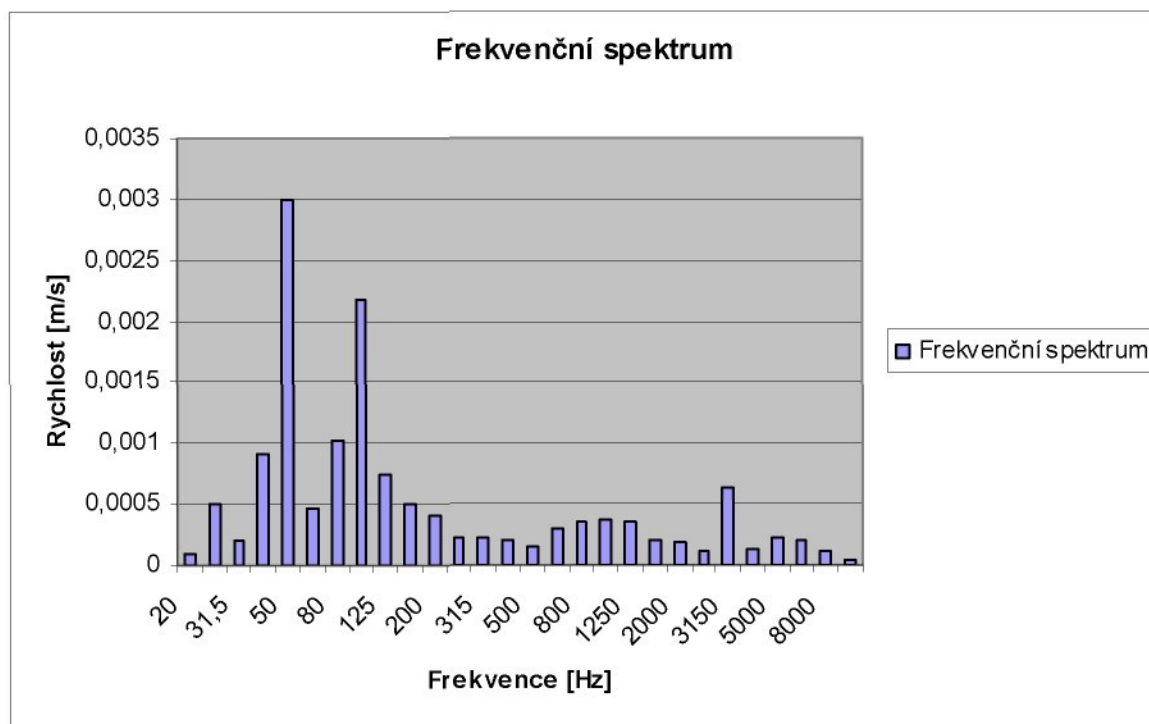
## Porovnání několika bodů hodnot naměřených a vypočtených

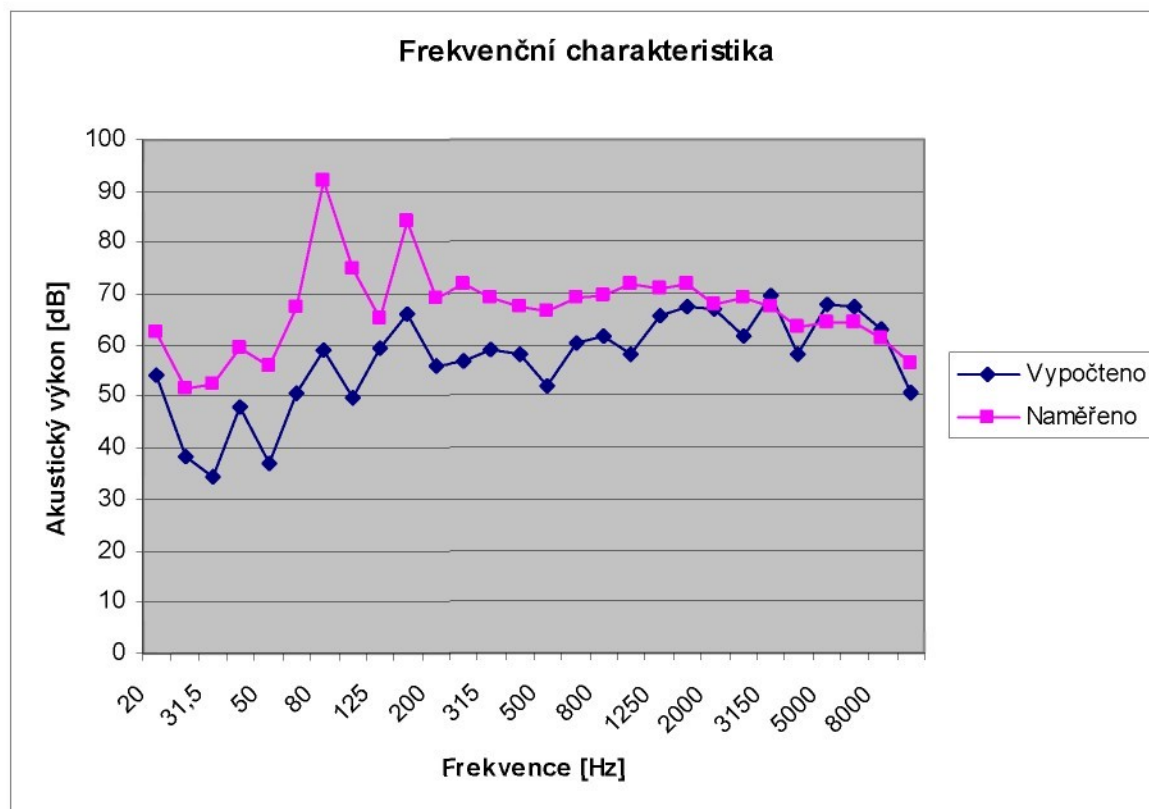
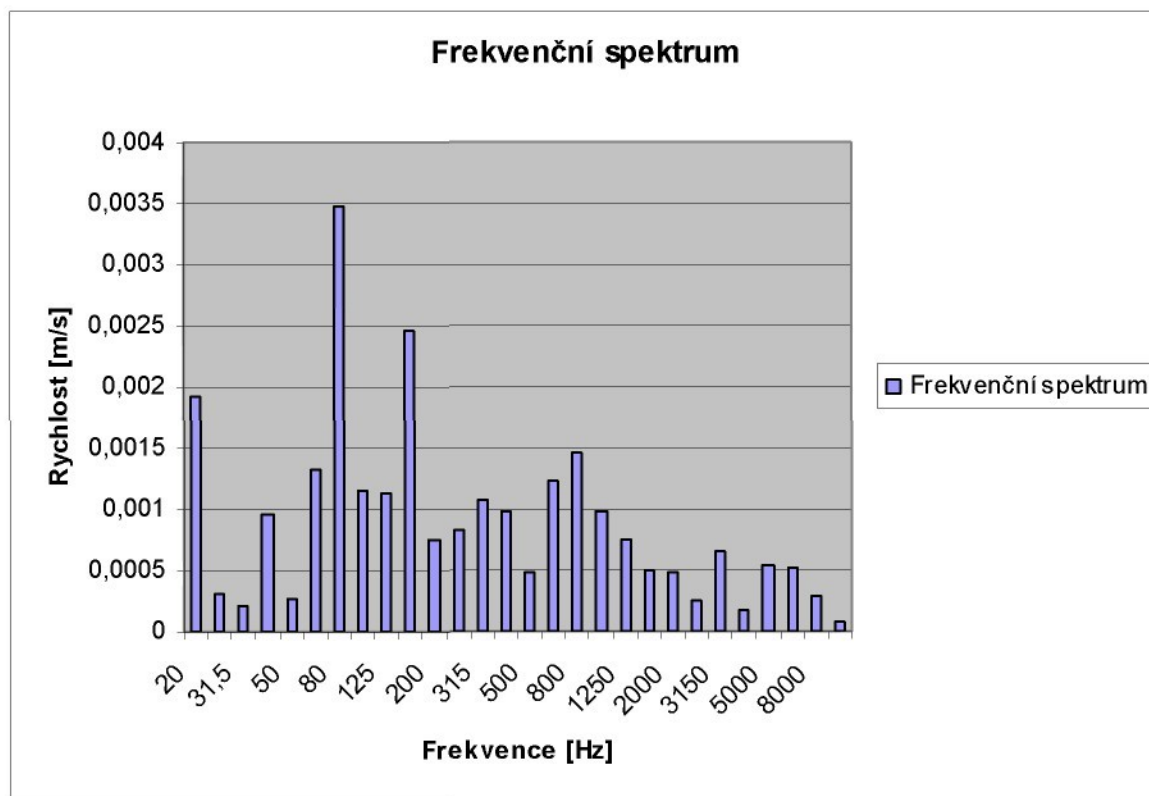
### -Bod číslo 1, 1500 ot/min

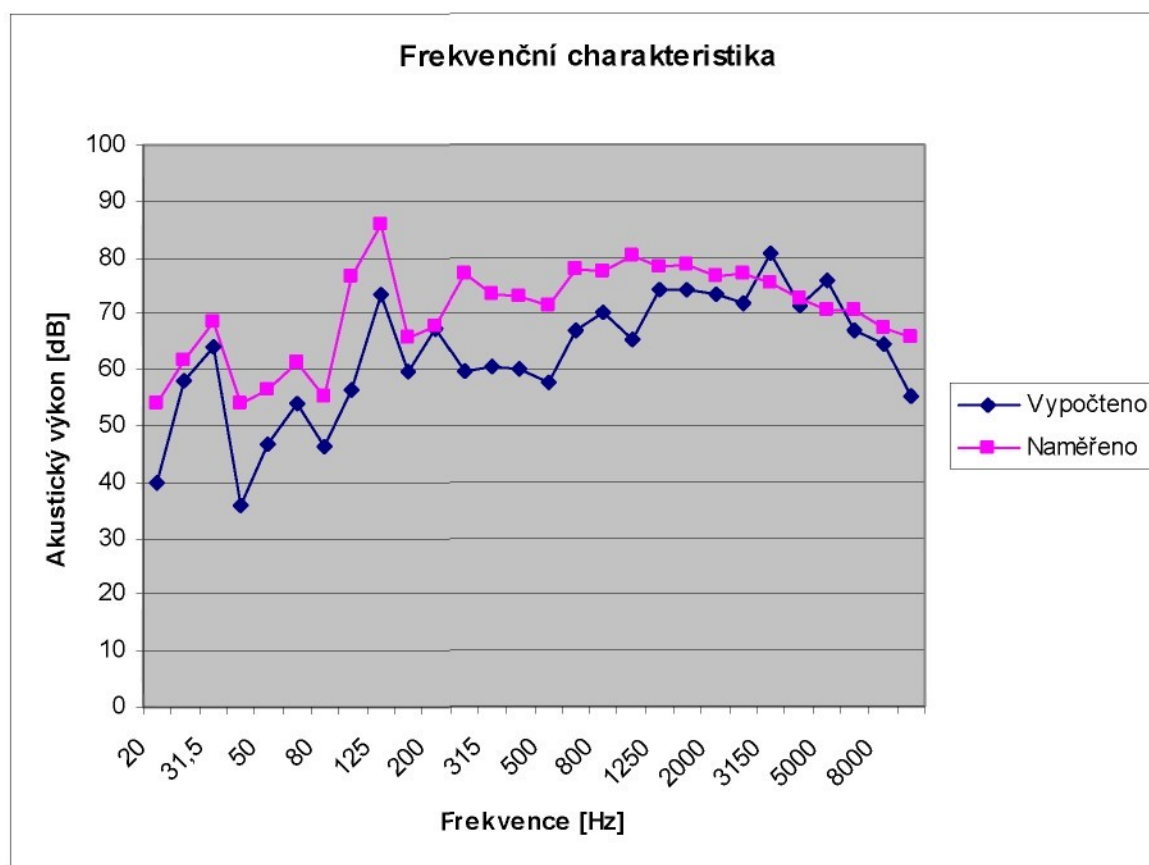
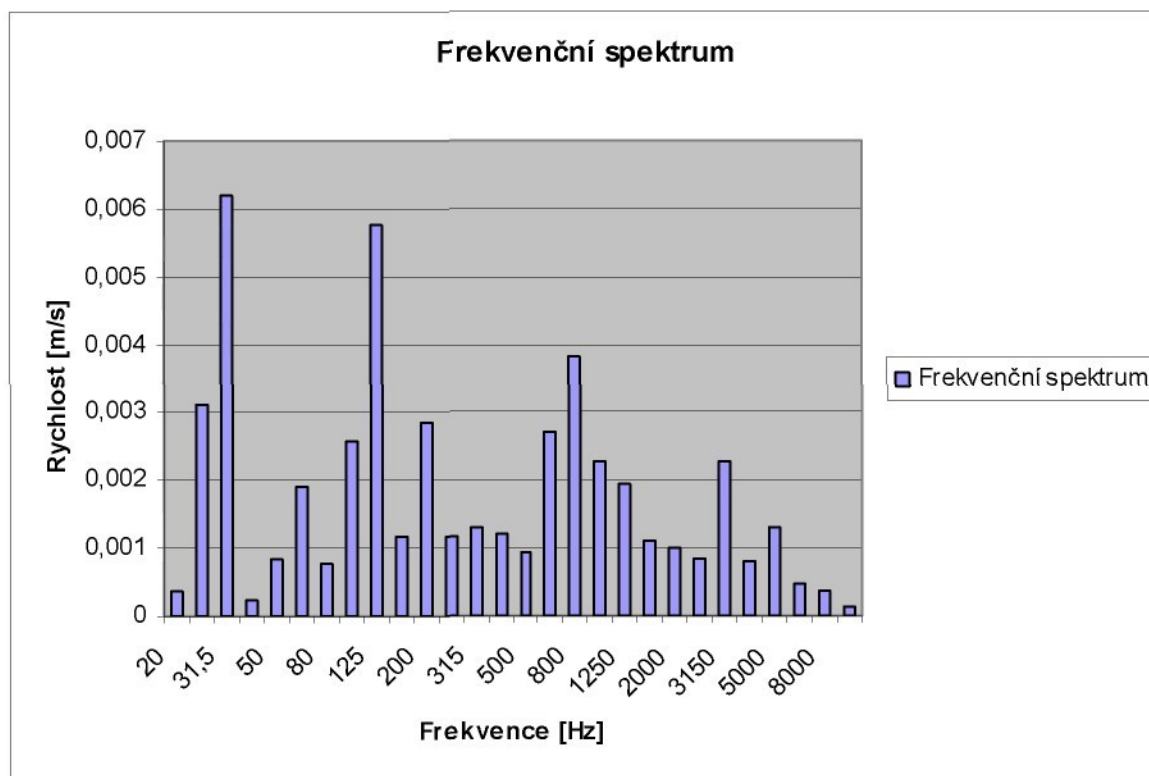


**-Bod číslo 1, 2500 ot/min**

**-Bod číslo 1, 3500 ot/min**

**-Bod číslo 11, 1500 ot/min**

**-Bod číslo 11, 2500 ot/min**

**-Bod číslo 11, 3500 ot/min**



## 8. Závěr:

Diplomová práce obsahuje shrnutí teorie výpočtu vyzařovaného akustického výkonu při znalostech vibrací motoru. Práce rozebírá a odhaduje jednotlivé součásti spalovacího motoru z hlediska jejich vibrací a vyzářeného výkonu.

Po aplikaci teoretických poznatků na vznětovém motoru 1.9 TDi jsem došel k závěru, že lze vypočítat hodnotu akustického výkonu při znalostech pouze vibrací motoru. Jak ukazují grafy, všechny vypočítané hodnoty akustického výkonu jsou menší než hodnoty naměřené. Z grafů je však patrné, že i takto zkreslené výpočty dokáží odhalit a ukázat maxima hodnot akustického výkonu při jednotlivých frekvencích. Nepřesnosti hodnot naměřených a vypočítaných si zdůvodňuji především nepřesností výpočtu povrchu bloku motoru, který je jako odlitek u každého spalovacího motoru velmi specifický. Výsledky pro porovnání uvádím ve výše uvedených grafech, všechny výpočty zpracované v programu MS Excel i s vypracovanými grafy jednotlivých měřicích bodů jsou na přiloženém CD.

**Seznam použité literatury:**

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7. internet
8. Dílenské příručky Škoda č.: 11-25

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27. května 2005

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Date

Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 1

Measured #####

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

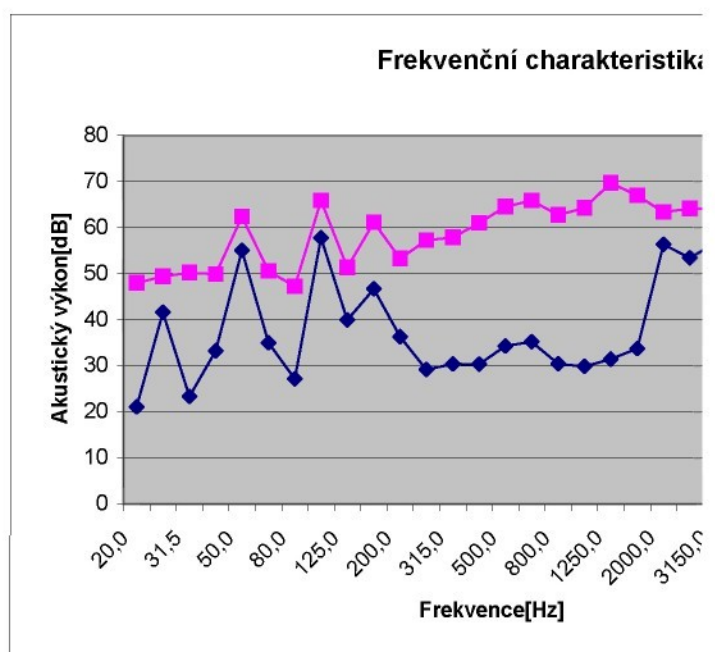
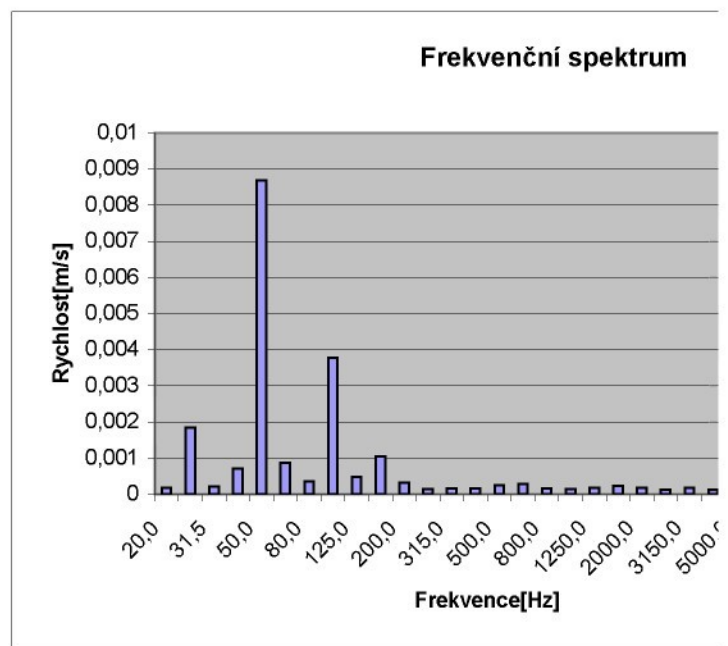
Spectrum r 1

| Frequency | Auto-A [dB] | Auto-B [dB] | a[m.s-2]  | v[m.s-1]  |             |
|-----------|-------------|-------------|-----------|-----------|-------------|
| 0,40 V    | 59,41 O     | 114,81      |           |           |             |
| 0,50 V    | 61,22 O     | 112,77      |           |           |             |
| 0,63 V    | 65,14 O     | 100,89      |           |           |             |
| 0,80 V    | 67,61 O     | 95,65       |           |           |             |
| 1,00 V    | 70,74 O     | 95,55       |           |           |             |
| 1,25 V    | 67,00 O     | 92,64       |           |           |             |
| 1,60 V    | 63,92 O     | 87,20       |           |           |             |
| 2,00 V    | 64,82 O     | 83,54       |           |           |             |
| 2,50 V    | 65,85 O     | 78,67       |           |           |             |
| 3,15 V    | 62,18 O     | 81,82       |           |           |             |
| 4,00 V    | 55,43 O     | 81,18       |           |           |             |
| 5,00 V    | 54,94 O     | 81,35       |           |           |             |
| 6,30 V    | 56,30 O     | 75,49       |           |           |             |
| 8,0 V     | 56,91 O     | 80,69       |           |           |             |
| 10,00 V   | 59,12 O     | 78,74       |           |           |             |
| 12,50 V   | 55,62 O     | 83,25       |           |           |             |
| 16,00 V   | 55,38 O     | 79,80       |           |           |             |
| 20,0 V    | 62,75 O     | 86,88       | 0,02208   | 0,0001757 | 48,01339277 |
| 25,0 V    | 64,18 O     | 109,29      | 0,291407  | 0,0018552 | 49,44339277 |
| 31,5 V    | 65,00 O     | 92,99       | 0,044617  | 0,0002254 | 50,26339277 |
| 40,0 V    | 64,67 O     | 105,03      | 0,1784432 | 0,00071   | 49,93339277 |
| 50,0 V    | 77,16 O     | 128,71      | 2,7258377 | 0,0086766 | 62,42339277 |
| 63,0 V    | 65,31 O     | 110,75      | 0,3447466 | 0,0008709 | 50,57339277 |
| 80,0 V    | 62,02 O     | 104,96      | 0,1770109 | 0,0003522 | 47,28339277 |
| 100,0 V   | 80,60 O     | 127,51      | 2,3741054 | 0,0037785 | 65,86339277 |
| 125,0 V   | 66,13 O     | 111,57      | 0,3788785 | 0,0004824 | 51,39339277 |
| 160,0 V   | 75,87 O     | 120,51      | 1,0604739 | 0,0010549 | 61,13339277 |
| 200,0 V   | 68,04 O     | 112,09      | 0,4022537 | 0,0003201 | 53,30339277 |
| 250,0 V   | 72,04 O     | 106,84      | 0,219786  | 0,0001399 | 57,30339277 |
| 315,0 V   | 72,65 O     | 110,09      | 0,3195214 | 0,0001614 | 57,91339277 |
| 400,0 V   | 75,75 O     | 112,13      | 0,4041104 | 0,0001608 | 61,01339277 |
| 500,0 V   | 79,33 O     | 117,99      | 0,7934143 | 0,0002526 | 64,59339277 |
| 630,0 V   | 80,60 O     | 120,93      | 1,1130124 | 0,0002812 | 65,86339277 |
| 800,0 V   | 77,49 O     | 118,20      | 0,8128305 | 0,0001617 | 62,75339277 |
| 1000,0 V  | 79,02 O     | 119,57      | 0,9516998 | 0,0001515 | 64,28339277 |
| 1250,0 V  | 84,48 O     | 123,14      | 1,4354894 | 0,0001828 | 69,74339277 |
| 1600,0 V  | 81,75 O     | 127,58      | 2,3933158 | 0,0002381 | 67,01339277 |
| 2000,0 V  | 78,15 O     | 127,07      | 2,256836  | 0,0001796 | 63,41339277 |

|            |         |        |           |           |             |
|------------|---------|--------|-----------|-----------|-------------|
| 2500,0 V   | 78,90 O | 126,10 | 2,0183664 | 0,0001285 | 64,16339277 |
| 3150,0 V   | 78,90 O | 131,35 | 3,6940264 | 0,0001866 | 64,16339277 |
| 4000,0 V   | 77,68 O | 129,96 | 3,1477483 | 0,0001252 | 62,94339277 |
| 5000,0 V   | 79,14 O | 134,17 | 5,1109308 | 0,0001627 | 64,40339277 |
| 6300,0 V   | 75,49 O | 139,01 | 8,9227762 | 0,0002254 | 60,75339277 |
| 8000,0 V   | 72,41 O | 137,51 | 7,5075805 | 0,0001494 | 57,67339277 |
| 10000,00 V | 71,54 O | 136,64 | 6,7920363 | 0,0001081 | 56,80339277 |
| A/L V      | 91,98 O | 152,70 |           |           |             |
| W V        | 91,11 O | 144,28 |           |           |             |
| L          |         |        |           |           |             |

Lw [dB]      10\*log sigma

|             |     |
|-------------|-----|
| 21,15919549 | -35 |
| 41,63099523 | -35 |
| 23,32358433 | -35 |
| 33,28859558 | -35 |
| 55,03039532 | -35 |
| 35,06298442 | -35 |
| 27,19799567 | -35 |
| 57,80979541 | -25 |
| 39,93159515 | -25 |
| 46,72739575 | -25 |
| 36,36919549 | -25 |
| 29,18099523 | -25 |
| 30,42358433 | -25 |
| 30,38859558 | -25 |
| 34,31039532 | -25 |
| 35,24298442 | -25 |
| 30,43799567 | -25 |
| 29,86979541 | -25 |
| 31,50159515 | -25 |
| 33,79739575 | -25 |
| 56,34919549 | -25 |

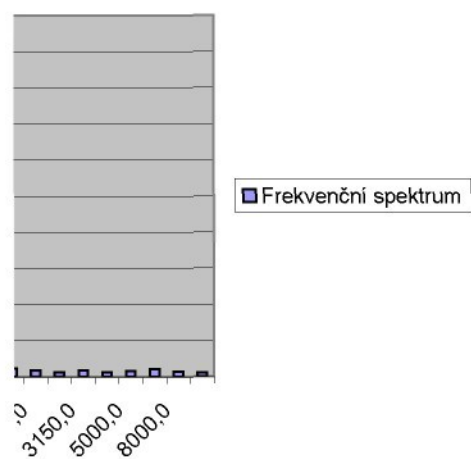




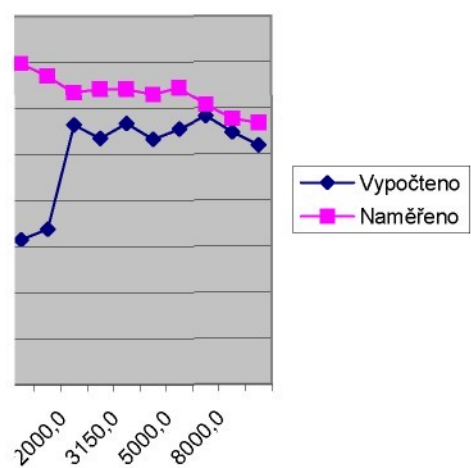
53,44099523  
56,68358433  
53,21859558  
55,49039532  
58,32298442  
54,74799567  
51,93979541

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 002

Measured 05-04-04 09:21:22

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

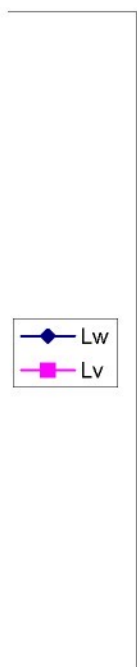
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 73,56 V    | 117,14      |          |          |          |          |
| 0,5       | V | 72,15 V    | 113,29      |          |          |          |          |
| 0,63      | V | 70,04 V    | 116,2       |          |          |          |          |
| 0,8       | V | 73,56 V    | 113,54      |          |          | S2 [m2]  | fd       |
| 1         | V | 74,5 V     | 113,17      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 67,28 V    | 109,69      |          |          |          |          |
| 1,6       | V | 62,06 V    | 106,58      |          |          |          |          |
| 2         | V | 60,44 V    | 97,86       |          |          |          |          |
| 2,5       | V | 57,36 V    | 93,15       |          |          |          |          |
| 3,15      | V | 58 V       | 94          |          |          |          |          |
| 4         | V | 52,66 V    | 95,29       |          |          |          |          |
| 5         | V | 51,79 V    | 88,71       |          |          |          |          |
| 6,3       | V | 53,27 V    | 84,43       |          |          |          |          |
| 8         | V | 55,01 V    | 84,97       |          |          |          |          |
| 10        | V | 58,42 V    | 82,08       |          |          |          |          |
| 12,5      | V | 54,77 V    | 83,77       |          |          | Lv       | Lw       |
| 16        | V | 53,62 V    | 80,13       |          |          |          |          |
| 20        | V | 63,64 V    | 84,29       | 0,016387 | 0,00013  | 48,90339 | 18,5692  |
| 25        | V | 63,22 V    | 106,09      | 0,201604 | 0,001283 | 48,48339 | 38,431   |
| 31,5      | V | 63,4 V     | 90,83       | 0,034794 | 0,000176 | 48,66339 | 21,16358 |
| 40        | V | 64,16 V    | 104,56      | 0,169044 | 0,000673 | 49,42339 | 32,8186  |
| 50        | V | 75,63 V    | 128,57      | 2,682255 | 0,008538 | 60,89339 | 54,8904  |
| 63        | V | 65,54 V    | 110,28      | 0,326588 | 0,000825 | 50,80339 | 34,59298 |
| 80        | V | 63,19 V    | 105,48      | 0,187932 | 0,000374 | 48,45339 | 27,718   |
| 100       | V | 83,37 V    | 125,63      | 1,912053 | 0,003043 | 68,63339 | 55,9298  |
| 125       | V | 67,85 V    | 111,64      | 0,381944 | 0,000486 | 53,11339 | 40,0016  |
| 160       | V | 75,09 V    | 116,2       | 0,645654 | 0,000642 | 60,35339 | 42,4174  |
| 200       | V | 68,95 V    | 112,06      | 0,400867 | 0,000319 | 54,21339 | 36,3392  |
| 250       | V | 71,26 V    | 107,15      | 0,227772 | 0,000145 | 56,52339 | 29,491   |
| 315       | V | 73,66 V    | 109,69      | 0,305141 | 0,000154 | 58,92339 | 30,02358 |
| 400       | V | 75,54 V    | 115,38      | 0,587489 | 0,000234 | 60,80339 | 33,6386  |
| 500       | V | 80,6 V     | 123,23      | 1,450441 | 0,000462 | 65,86339 | 39,5504  |
| 630       | V | 82,41 V    | 123,21      | 1,447105 | 0,000366 | 67,67339 | 37,52298 |
| 800       | V | 75,66 V    | 116,06      | 0,635331 | 0,000126 | 60,92339 | 28,298   |
| 1000      | V | 78,46 V    | 118,88      | 0,879023 | 0,00014  | 63,72339 | 29,1798  |
| 1250      | V | 81,75 V    | 123,49      | 1,494514 | 0,00019  | 67,01339 | 31,8516  |
| 1600      | V | 80,45 V    | 127,3       | 2,317395 | 0,000231 | 65,71339 | 33,5174  |
| 2000      | V | 77,04 V    | 129         | 2,818383 | 0,000224 | 62,30339 | 58,2792  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 79,3 V  | 135,04 | 5,64937  | 0,00036  | 64,56339 | 62,381   |
| 3150  | V | 81,75 V | 143,84 | 15,55966 | 0,000786 | 67,01339 | 69,17358 |
| 4000  | V | 78,17 V | 138,36 | 8,279422 | 0,000329 | 63,43339 | 61,6186  |
| 5000  | V | 78,27 V | 128,34 | 2,612161 | 8,31E-05 | 63,53339 | 49,6604  |
| 6300  | V | 77,52 V | 122,55 | 1,34122  | 3,39E-05 | 62,78339 | 41,86298 |
| 8000  | V | 72,36 V | 118,81 | 0,871967 | 1,73E-05 | 57,62339 | 36,048   |
| 10000 | V | 70,13 V | 110,75 | 0,344747 | 5,49E-06 | 55,39339 | 26,0498  |
| A/L   | V | 92,03 V | 145,88 | 19,67886 | #####    |          |          |
| W     | V | 90,85 V | 145,88 | 19,67886 | #####    |          |          |

L



Frekvence [ Hz]







Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 003

Measured 05-04-04 09:21:52

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

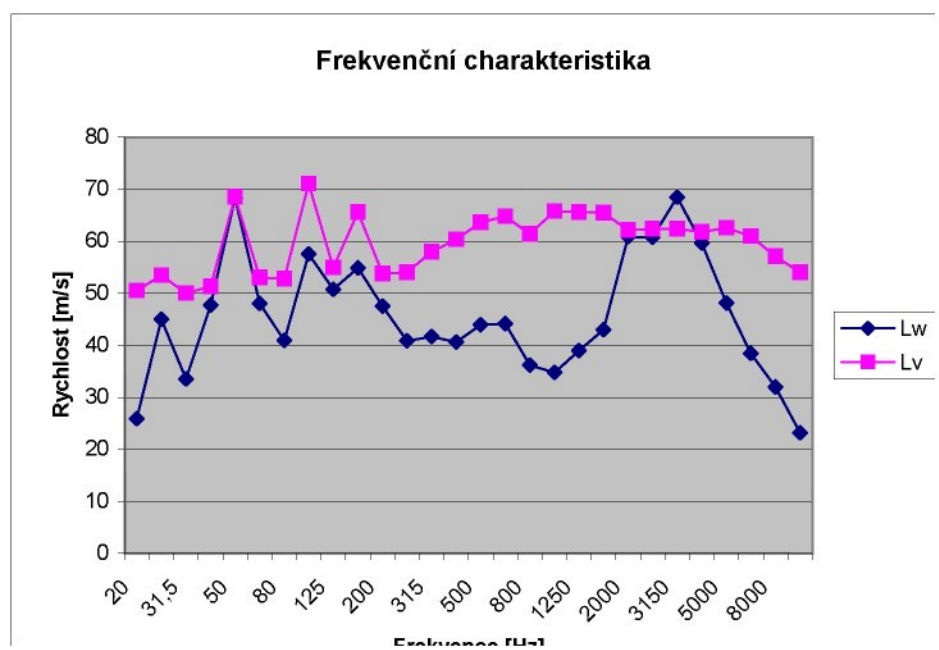
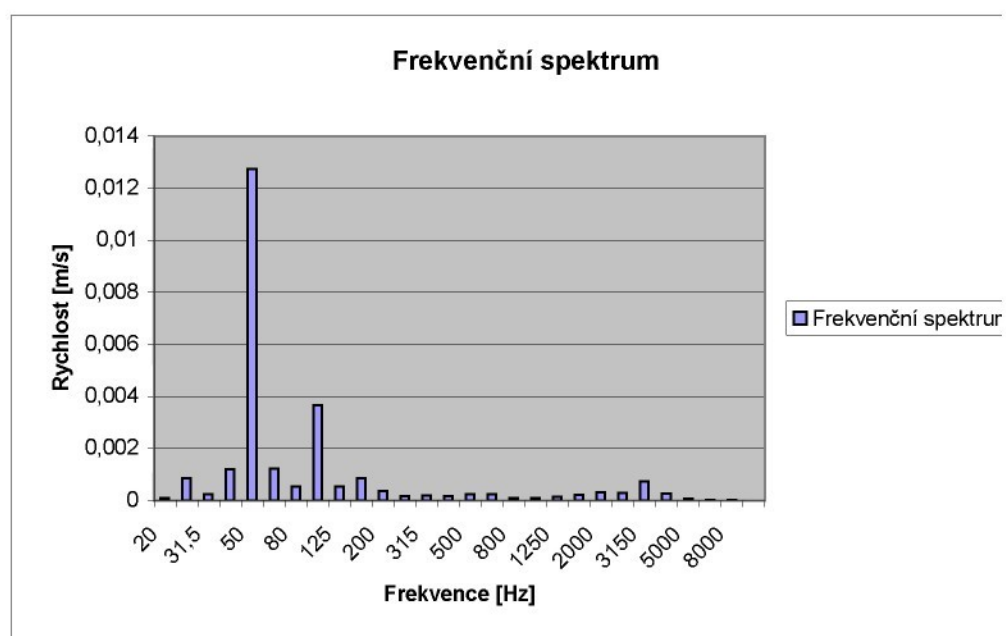
( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 67,24 V    | 110,06      |          |          |          |          |
| 0,5       | V | 71,05 V    | 105,88      |          |          |          |          |
| 0,63      | V | 65,5 V     | 104,82      |          |          |          |          |
| 0,8       | V | 67 V       | 96,61       |          |          | S3 [m2]  | fd       |
| 1         | V | 67,78 V    | 99,55       |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 72,15 V    | 100,56      |          |          |          |          |
| 1,6       | V | 67,76 V    | 94,33       |          |          |          |          |
| 2         | V | 64,79 V    | 85,96       |          |          |          |          |
| 2,5       | V | 64,82 V    | 88,55       |          |          |          |          |
| 3,15      | V | 60,91 V    | 80,01       |          |          |          |          |
| 4         | V | 58,79 V    | 75,33       |          |          |          |          |
| 5         | V | 57,41 V    | 70,22       |          |          |          |          |
| 6,3       | V | 58,14 V    | -256,12     |          |          |          |          |
| 8         | V | 61,99 V    | 78,01       |          |          |          |          |
| 10        | V | 63,4 V     | 77,42       |          |          |          |          |
| 12,5      | V | 63,24 V    | 82,97       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 64,58 V    | 75,96       |          |          |          |          |
| 20        | V | 65,26 V    | 81,65       | 0,012092 | 9,62E-05 | 50,52339 | 25,9292  |
| 25        | V | 68,23 V    | 102,66      | 0,135831 | 0,000865 | 53,49339 | 45,001   |
| 31,5      | V | 64,74 V    | 93,23       | 0,045867 | 0,000232 | 50,00339 | 33,56358 |
| 40        | V | 66,09 V    | 109,5       | 0,298538 | 0,001188 | 51,35339 | 47,7586  |
| 50        | V | 83,32 V    | 132,05      | 4,004055 | 0,012745 | 68,58339 | 68,3704  |
| 63        | V | 67,8 V     | 113,76      | 0,487528 | 0,001232 | 53,06339 | 48,07298 |
| 80        | V | 67,52 V    | 108,7       | 0,27227  | 0,000542 | 52,78339 | 40,938   |
| 100       | V | 85,79 V    | 127,23      | 2,298794 | 0,003659 | 71,05339 | 57,5298  |
| 125       | V | 69,71 V    | 112,39      | 0,41639  | 0,00053  | 54,97339 | 50,7516  |
| 160       | V | 80,36 V    | 118,67      | 0,858025 | 0,000853 | 65,62339 | 54,8874  |
| 200       | V | 68,51 V    | 113,24      | 0,459198 | 0,000365 | 53,77339 | 47,5192  |
| 250       | V | 68,79 V    | 108,49      | 0,265766 | 0,000169 | 54,05339 | 40,831   |
| 315       | V | 72,72 V    | 111,33      | 0,368553 | 0,000186 | 57,98339 | 41,66358 |
| 400       | V | 75,09 V    | 112,37      | 0,415432 | 0,000165 | 60,35339 | 40,6286  |
| 500       | V | 78,34 V    | 117,64      | 0,762079 | 0,000243 | 63,60339 | 43,9604  |
| 630       | V | 79,51 V    | 119,89      | 0,987416 | 0,000249 | 64,77339 | 44,20298 |
| 800       | V | 76,17 V    | 113,94      | 0,497737 | 9,9E-05  | 61,43339 | 36,178   |
| 1000      | V | 80,53 V    | 114,46      | 0,528445 | 8,41E-05 | 65,79339 | 34,7598  |
| 1250      | V | 80,36 V    | 120,58      | 1,069055 | 0,000136 | 65,62339 | 38,9416  |
| 1600      | V | 80,2 V     | 126,79      | 2,185244 | 0,000217 | 65,46339 | 43,0074  |
| 2000      | V | 76,86 V    | 131,61      | 3,806274 | 0,000303 | 62,12339 | 60,8892  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 77,14 V | 133,39 | 4,67197  | 0,000297 | 62,40339 | 60,731   |
| 3150  | V | 77,14 V | 143,15 | 14,37143 | 0,000726 | 62,40339 | 68,48358 |
| 4000  | V | 76,55 V | 136,4  | 6,606934 | 0,000263 | 61,81339 | 59,6586  |
| 5000  | V | 77,3 V  | 126,81 | 2,190282 | 6,97E-05 | 62,56339 | 48,1304  |
| 6300  | V | 75,75 V | 119,17 | 0,908866 | 2,3E-05  | 61,01339 | 38,48298 |
| 8000  | V | 71,87 V | 114,77 | 0,547646 | 1,09E-05 | 57,13339 | 32,008   |
| 10000 | V | 68,74 V | 107,9  | 0,248313 | 3,95E-06 | 54,00339 | 23,1998  |
| A/L   | V | 92,45 V | 145,13 | 18,05095 | #####    |          |          |
| W     | V | 89,51 V | 145,11 | 18,00943 | #####    |          |          |

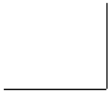
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—◆— Lw  
—■— Lv



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 004

Measured 05-04-04 09:22:14

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|-------------|-------------|----------|----------|---------|----------|
| 0,4       | V | 67,85 V     | 120,2       |          |          |         |          |
| 0,5       | V | 72,6 V      | 119,21      |          |          |         |          |
| 0,63      | V | 67,99 V     | 115,87      |          |          |         |          |
| 0,8       | V | 60,18 V     | 110,11      |          |          | S4 [m2] | fd       |
| 1         | V | 66,74 V     | 103,06      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 71,8 V      | 101,13      |          |          |         |          |
| 1,6       | V | 65,71 V     | 100,33      |          |          |         |          |
| 2         | V | 62,53 V     | 88,17       |          |          |         |          |
| 2,5       | V | 62,82 V     | 82,52       |          |          |         |          |
| 3,15      | V | 59,92 V     | 81,75       |          |          |         |          |
| 4         | V | 60,86 V     | 80,1        |          |          |         |          |
| 5         | V | 60,39 V     | 75,66       |          |          |         |          |
| 6,3       | V | 61,45 V     | 61,19       |          |          |         |          |
| 8         | V | 58,82 V     | 77,73       |          |          |         |          |
| 10        | V | 60,11 V     | 77,52       |          |          |         |          |
| 12,5      | V | 56,65 V     | 89,23       |          |          | Lv [dB] | Lw [dB]  |
| 16        | V | 55,97 V     | 79,51       |          |          |         |          |
| 20        | V | 63,1 V      | 78,08       | 0,008017 | 6,38E-05 | 50,0897 | 24,0855  |
| 25        | V | 64,93 V     | 96,31       | 0,065388 | 0,000416 | 51,9197 | 40,3773  |
| 31,5      | V | 62,3 V      | 86,1        | 0,020184 | 0,000102 | 49,2897 | 28,15989 |
| 40        | V | 67,12 V     | 100,14      | 0,101625 | 0,000404 | 54,1097 | 40,1249  |
| 50        | V | 88,31 V     | 123,38      | 1,475707 | 0,004697 | 75,2997 | 61,4267  |
| 63        | V | 70,74 V     | 105,03      | 0,178443 | 0,000451 | 57,7297 | 41,06929 |
| 80        | V | 68,46 V     | 105,69      | 0,192531 | 0,000383 | 55,4497 | 39,6543  |
| 100       | V | 88,97 V     | 124,36      | 1,651962 | 0,002629 | 75,9597 | 56,3861  |
| 125       | V | 71,57 V     | 113,22      | 0,458142 | 0,000583 | 58,5597 | 53,3079  |
| 160       | V | 80,31 V     | 123,89      | 1,564948 | 0,001557 | 67,2997 | 61,8337  |
| 200       | V | 66,98 V     | 122,13      | 1,277909 | 0,001017 | 53,9697 | 58,1355  |
| 250       | V | 71,42 V     | 111,19      | 0,36266  | 0,000231 | 58,4097 | 45,2573  |
| 315       | V | 72,46 V     | 100,63      | 0,107523 | 5,43E-05 | 59,4497 | 32,68989 |
| 400       | V | 75,33 V     | 99,01       | 0,089228 | 3,55E-05 | 62,3197 | 28,9949  |
| 500       | V | 78,5 V      | 101,5       | 0,11885  | 3,78E-05 | 65,4897 | 29,5467  |
| 630       | V | 79,51 V     | 108,35      | 0,261517 | 6,61E-05 | 66,4997 | 34,38929 |
| 800       | V | 75,14 V     | 109,38      | 0,294442 | 5,86E-05 | 62,1297 | 33,3443  |
| 1000      | V | 78,24 V     | 112,7       | 0,431519 | 6,87E-05 | 65,2297 | 34,7261  |
| 1250      | V | 80,27 V     | 122,11      | 1,27497  | 0,000162 | 67,2597 | 42,1979  |
| 1600      | V | 78,24 V     | 124,22      | 1,625549 | 0,000162 | 65,2297 | 57,1637  |
| 2000      | V | 75,61 V     | 131,94      | 3,953666 | 0,000315 | 62,5997 | 62,9455  |



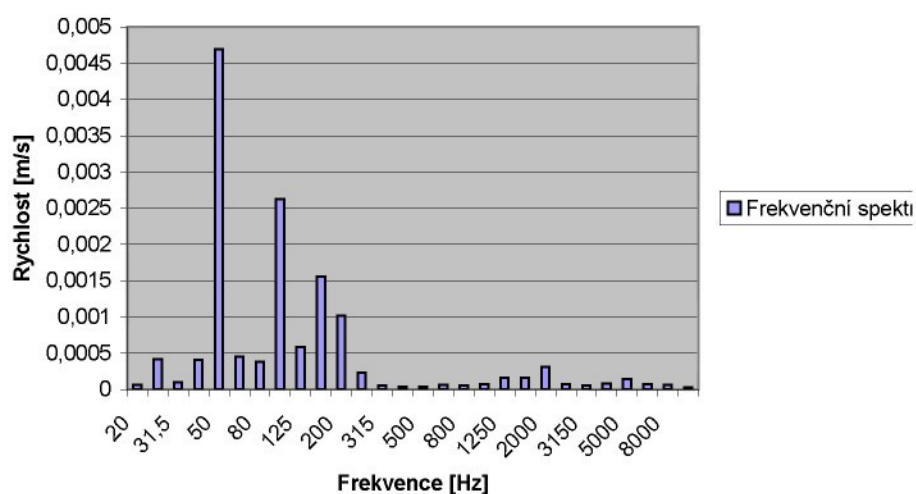
|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 75,45 V | 121,49 | 1,187135 | 7,56E-05 | 62,4397 | 50,5573  |
| 3150  | V | 77,52 V | 121,26 | 1,156112 | 5,84E-05 | 64,5097 | 48,31989 |
| 4000  | V | 78,17 V | 126,13 | 2,02535  | 8,06E-05 | 65,1597 | 51,1149  |
| 5000  | V | 79,56 V | 133,09 | 4,51336  | 0,000144 | 66,5497 | 56,1367  |
| 6300  | V | 73,92 V | 129,18 | 2,877398 | 7,27E-05 | 60,9097 | 50,21929 |
| 8000  | V | 71,19 V | 129,96 | 3,147748 | 6,26E-05 | 58,1797 | 48,9243  |
| 10000 | V | 68,44 V | 125,96 | 1,986095 | 3,16E-05 | 55,4297 | 42,9861  |
| A/L   | V | 93,93 V | 139,3  | 9,225714 | #####    |         |          |
| W     | V | 89,11 V | 139,11 | 9,026097 | #####    |         |          |

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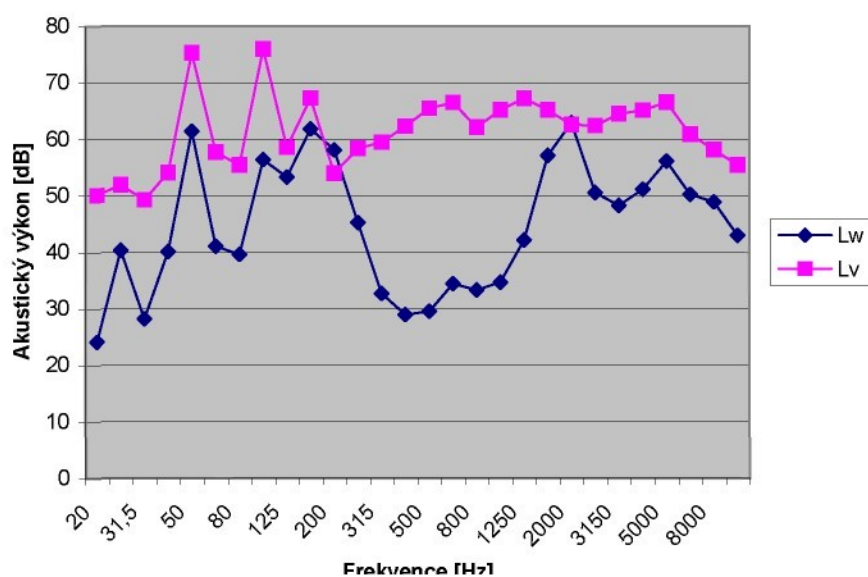
10\*log sigma

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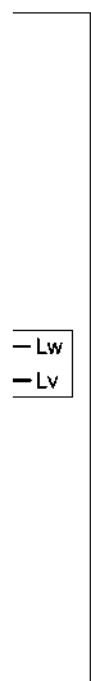
Frekvenční spektrum



Frekvenční charakteristika



Frekvence [Hz]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 005

Measured 05-04-04 09:22:46

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|------------|-------------|----------|----------|---------|----------|
| 0,4       | V | 61,03 V    | 103,76      |          |          |         |          |
| 0,5       | V | 70,37 V    | 109,17      |          |          |         |          |
| 0,63      | V | 67 V       | 109,33      |          |          |         |          |
| 0,8       | V | 70,27 V    | 100,49      |          |          | S5 [m2] | fd       |
| 1         | V | 74,88 V    | 101,69      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 70,6 V     | 94,85       |          |          |         |          |
| 1,6       | V | 67,03 V    | 89,25       |          |          |         |          |
| 2         | V | 67,85 V    | 89,96       |          |          |         |          |
| 2,5       | V | 63,24 V    | 82,27       |          |          |         |          |
| 3,15      | V | 60,84 V    | 76,5        |          |          |         |          |
| 4         | V | 56,3 V     | 75,33       |          |          |         |          |
| 5         | V | 52,73 V    | 68,98       |          |          |         |          |
| 6,3       | V | 53,08 V    | -256,12     |          |          |         |          |
| 8         | V | 55,78 V    | 75          |          |          |         |          |
| 10        | V | 58,94 V    | 72,95       |          |          |         |          |
| 12,5      | V | 54,28 V    | 86,45       |          |          | Lv [dB] | Lw [dB]  |
| 16        | V | 54,56 V    | 80,03       |          |          |         |          |
| 20        | V | 63,24 V    | 81,68       | 0,012134 | 9,66E-05 | 50,2297 | 27,6855  |
| 25        | V | 64,32 V    | 104,63      | 0,170412 | 0,001085 | 51,3097 | 48,6973  |
| 31,5      | V | 62,35 V    | 88,15       | 0,025556 | 0,000129 | 49,3397 | 30,20989 |
| 40        | V | 65,76 V    | 99,43       | 0,093648 | 0,000373 | 52,7497 | 39,4149  |
| 50        | V | 86,57 V    | 121,66      | 1,210598 | 0,003853 | 73,5597 | 59,7067  |
| 63        | V | 69,5 V     | 103,41      | 0,148081 | 0,000374 | 56,4897 | 39,44929 |
| 80        | V | 66,04 V    | 98,14       | 0,080724 | 0,000161 | 53,0297 | 32,1043  |
| 100       | V | 88,83 V    | 115,78      | 0,615177 | 0,000979 | 75,8197 | 47,8061  |
| 125       | V | 72,18 V    | 102,96      | 0,140605 | 0,000179 | 59,1697 | 43,0479  |
| 160       | V | 81,28 V    | 100,07      | 0,100809 | 0,0001   | 68,2697 | 38,0137  |
| 200       | V | 69,94 V    | 107,59      | 0,239607 | 0,000191 | 56,9297 | 43,5955  |
| 250       | V | 70,65 V    | 103,9       | 0,156675 | 9,97E-05 | 57,6397 | 37,9673  |
| 315       | V | 70,53 V    | 104,61      | 0,17002  | 8,59E-05 | 57,5197 | 36,66989 |
| 400       | V | 74,48 V    | 109,55      | 0,300262 | 0,000119 | 61,4697 | 39,5349  |
| 500       | V | 79,28 V    | 113,45      | 0,470435 | 0,00015  | 66,2697 | 41,4967  |
| 630       | V | 77,66 V    | 110,63      | 0,340017 | 8,59E-05 | 64,6497 | 36,66929 |
| 800       | V | 78,2 V     | 114,37      | 0,522998 | 0,000104 | 65,1897 | 38,3343  |
| 1000      | V | 80,2 V     | 116,84      | 0,695024 | 0,000111 | 67,1897 | 38,8661  |
| 1250      | V | 86,05 V    | 123,23      | 1,450441 | 0,000185 | 73,0397 | 43,3179  |
| 1600      | V | 82,92 V    | 130,57      | 3,376758 | 0,000336 | 69,9097 | 63,5137  |
| 2000      | V | 79,56 V    | 136,57      | 6,737519 | 0,000536 | 66,5497 | 67,5755  |

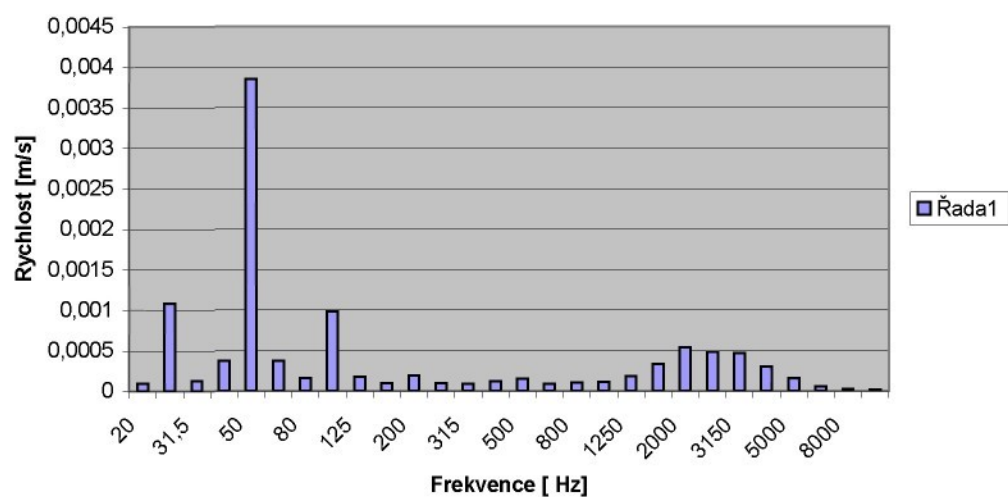
|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 77,3 V  | 137,56 | 7,550922 | 0,000481 | 64,2897 | 66,6273  |
| 3150  | V | 78,03 V | 139,32 | 9,246982 | 0,000467 | 65,0197 | 66,37989 |
| 4000  | V | 77,54 V | 137,53 | 7,524887 | 0,000299 | 64,5297 | 62,5149  |
| 5000  | V | 81,61 V | 134,01 | 5,017646 | 0,00016  | 68,5997 | 57,0567  |
| 6300  | V | 78,43 V | 126,97 | 2,231002 | 5,64E-05 | 65,4197 | 48,00929 |
| 8000  | V | 74,53 V | 123,28 | 1,458814 | 2,9E-05  | 61,5197 | 42,2443  |
| 10000 | V | 72,69 V | 121,82 | 1,233105 | 1,96E-05 | 59,6797 | 38,8461  |
| A/L   | V | 94,68 V | 145,15 | 18,09256 | #####    |         |          |
| W     | V | 92 V    | 144,71 | 17,19887 | #####    |         |          |

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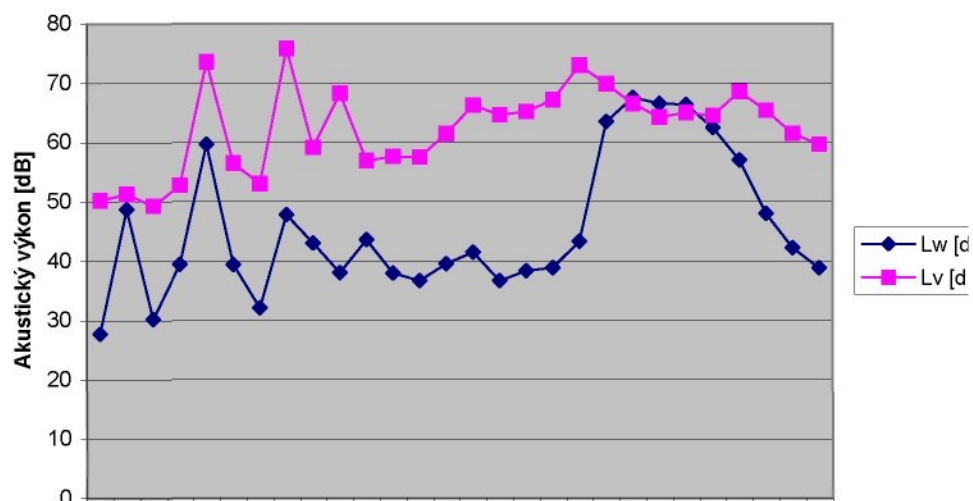
10\*log sigma

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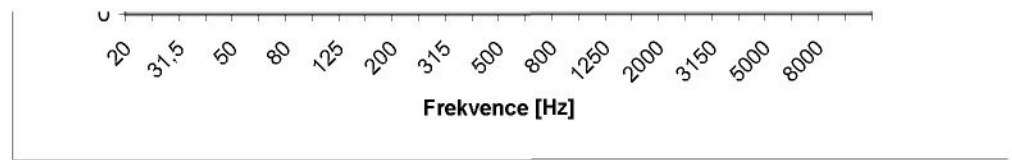
Frekvenční spektrum



Frekvenční charakteristika

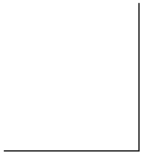






I Řada1

● Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 006

Measured 05-04-04 09:23:06

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

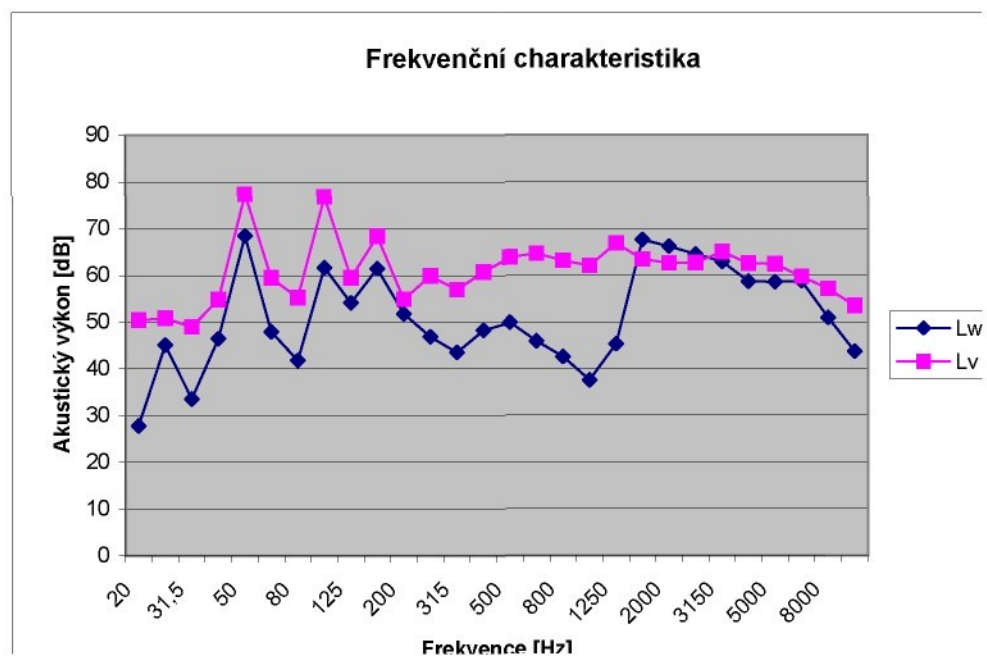
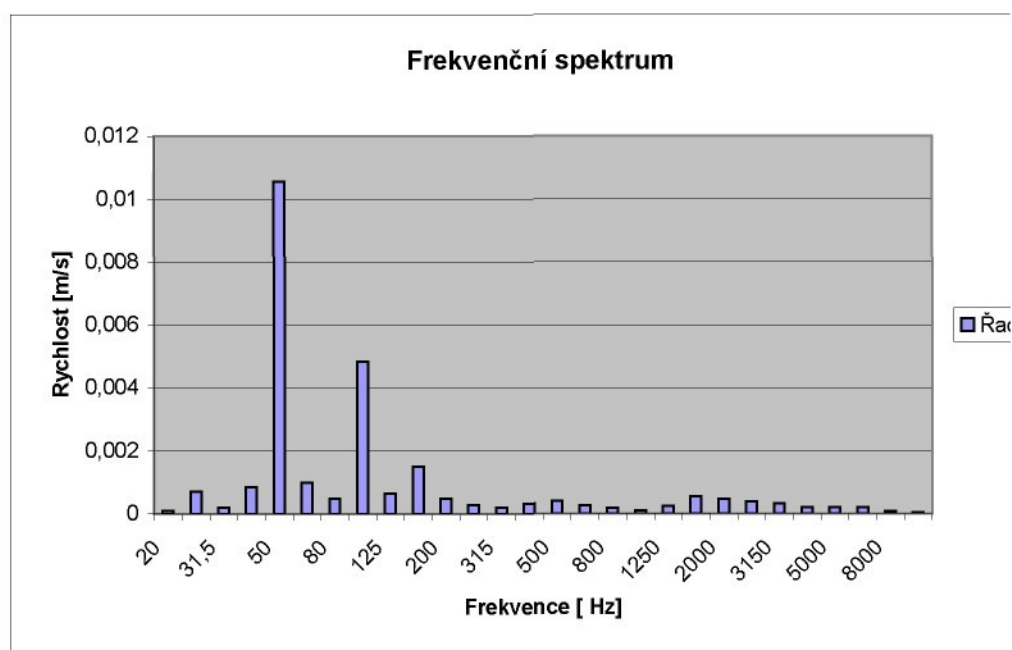
| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|------------|------------|----------|----------|---------|----------|
| 0,4       | V | 58,07 V    | 134,26     |          |          |         |          |
| 0,5       | V | 72,48 V    | 135,46     |          |          |         |          |
| 0,63      | V | 68,77 V    | 134,22     |          |          |         |          |
| 0,8       | V | 68,2 V     | 132,17     |          |          | S6 [m2] | fd       |
| 1         | V | 67,1 V     | 131,54     |          |          | 0,05    | 1596,553 |
| 1,25      | V | 66,81 V    | 130,15     |          |          |         |          |
| 1,6       | V | 65,19 V    | 118,34     |          |          |         |          |
| 2         | V | 67,68 V    | 112,98     |          |          |         |          |
| 2,5       | V | 64,84 V    | 111,69     |          |          |         |          |
| 3,15      | V | 64,35 V    | 98,49      |          |          |         |          |
| 4         | V | 61,59 V    | 88,97      |          |          |         |          |
| 5         | V | 58,56 V    | 82,31      |          |          |         |          |
| 6,3       | V | 57,74 V    | 81,61      |          |          |         |          |
| 8         | V | 59,38 V    | 76,5       |          |          |         |          |
| 10        | V | 58,91 V    | 81,02      |          |          |         |          |
| 12,5      | V | 56,73 V    | 93,11      |          |          | Lv [dB] | Lw [dB]  |
| 16        | V | 53,93 V    | 80,88      |          |          |         |          |
| 20        | V | 63,47 V    | 81,8       | 0,012303 | 9,79E-05 | 50,4597 | 27,8055  |
| 25        | V | 63,85 V    | 101,01     | 0,112331 | 0,000715 | 50,8397 | 45,0773  |
| 31,5      | V | 62,04 V    | 91,53      | 0,037714 | 0,000191 | 49,0297 | 33,58989 |
| 40        | V | 67,87 V    | 106,49     | 0,211106 | 0,00084  | 54,8597 | 46,4749  |
| 50        | V | 90,38 V    | 130,41     | 3,315126 | 0,010552 | 77,3697 | 68,4567  |
| 63        | V | 72,48 V    | 111,92     | 0,394457 | 0,000997 | 59,4697 | 47,95929 |
| 80        | V | 68,27 V    | 107,88     | 0,247742 | 0,000493 | 55,2597 | 41,8443  |
| 100       | V | 89,84 V    | 129,65     | 3,037386 | 0,004834 | 76,8297 | 61,6761  |
| 125       | V | 72,53 V    | 114,06     | 0,504661 | 0,000643 | 59,5197 | 54,1479  |
| 160       | V | 81,4 V     | 123,54     | 1,503142 | 0,001495 | 68,3897 | 61,4837  |
| 200       | V | 67,92 V    | 115,83     | 0,618728 | 0,000492 | 54,9097 | 51,8355  |
| 250       | V | 72,95 V    | 112,84     | 0,438531 | 0,000279 | 59,9397 | 46,9073  |
| 315       | V | 69,94 V    | 111,48     | 0,374973 | 0,000189 | 56,9297 | 43,53989 |
| 400       | V | 73,71 V    | 118,27     | 0,819408 | 0,000326 | 60,6997 | 48,2549  |
| 500       | V | 76,88 V    | 121,87     | 1,240224 | 0,000395 | 63,8697 | 49,9167  |
| 630       | V | 77,63 V    | 119,89     | 0,987416 | 0,000249 | 64,6197 | 45,92929 |
| 800       | V | 76,17 V    | 118,6      | 0,851138 | 0,000169 | 63,1597 | 42,5643  |
| 1000      | V | 75,05 V    | 115,52     | 0,597035 | 9,5E-05  | 62,0397 | 37,5461  |
| 1250      | V | 79,84 V    | 125,21     | 1,821797 | 0,000232 | 66,8297 | 45,2979  |
| 1600      | V | 76,39 V    | 134,62     | 5,382698 | 0,000535 | 63,3797 | 67,5637  |
| 2000      | V | 75,61 V    | 135,16     | 5,72796  | 0,000456 | 62,5997 | 66,1655  |

|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 75,68 V | 135,42 | 5,902011 | 0,000376 | 62,6697 | 64,4873  |
| 3150  | V | 77,96 V | 135,89 | 6,230171 | 0,000315 | 64,9497 | 62,94989 |
| 4000  | V | 75,49 V | 133,72 | 4,852885 | 0,000193 | 62,4797 | 58,7049  |
| 5000  | V | 75,38 V | 135,49 | 5,949768 | 0,000189 | 62,3697 | 58,5367  |
| 6300  | V | 72,74 V | 137,72 | 7,691304 | 0,000194 | 59,7297 | 58,75929 |
| 8000  | V | 70,11 V | 131,96 | 3,96278  | 7,88E-05 | 57,0997 | 50,9243  |
| 10000 | V | 66,46 V | 126,67 | 2,155262 | 3,43E-05 | 53,4497 | 43,6961  |
| A/L   | V | 94,59 V | 148,45 | 26,45453 | #####    |         |          |
| W     | V | 87,91 V | 146,4  | 20,89296 | #####    |         |          |

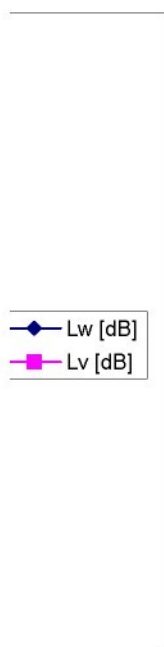
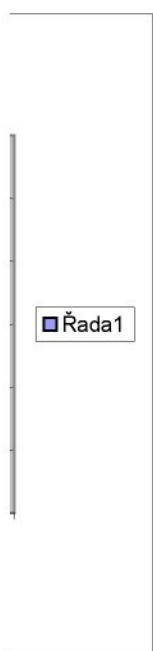
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10\*log sigma

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Frekvence [Hz]







Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 007

Measured 05-04-04 09:23:42

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

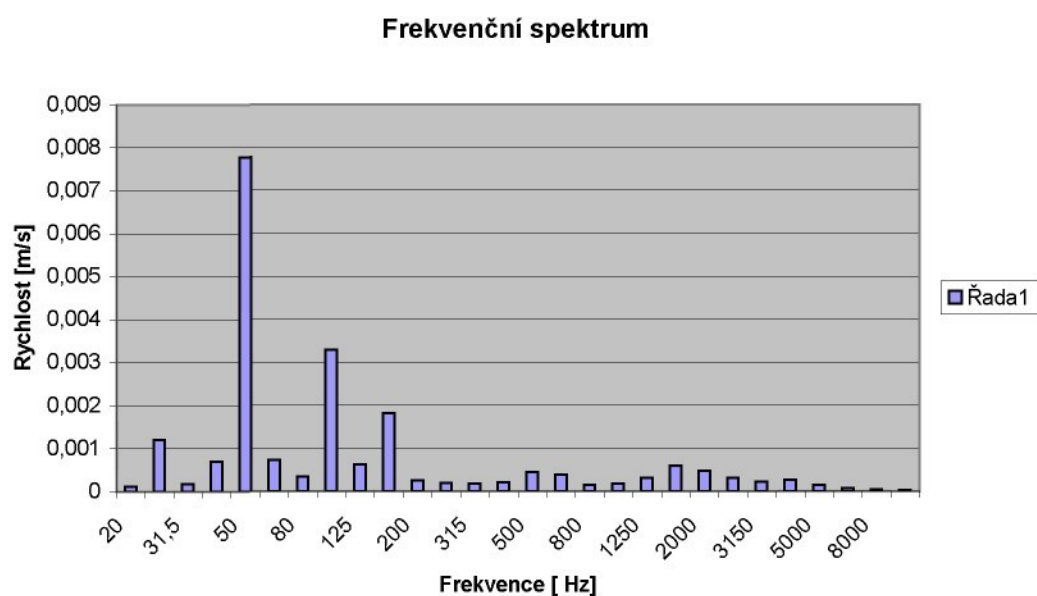
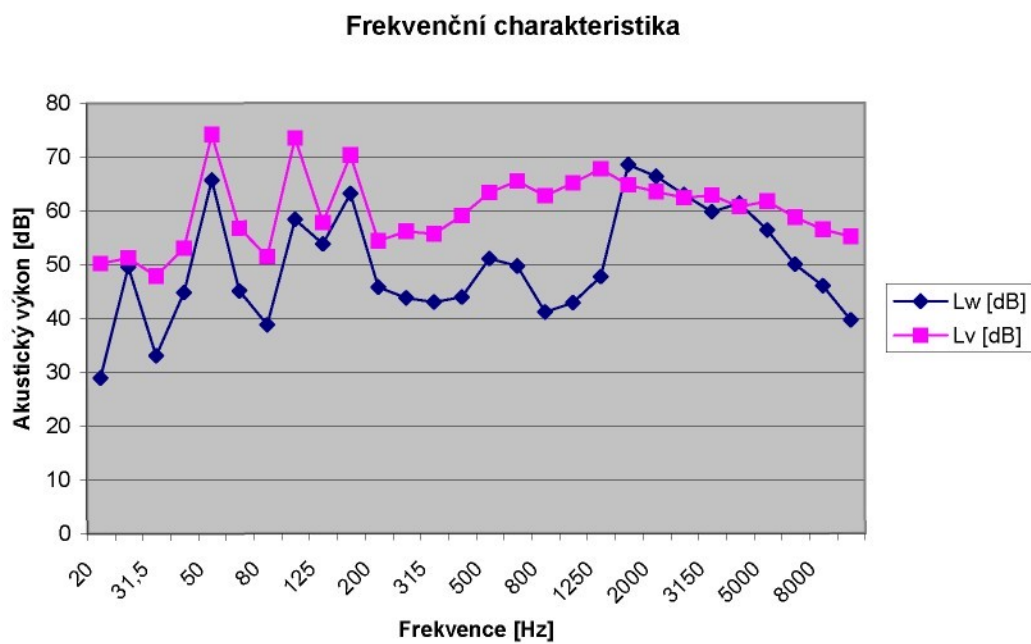
( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|-------------|-------------|----------|----------|---------|----------|
| 0,4       | V | 56,11 O     | 115,66      |          |          |         |          |
| 0,5       | V | 73,16 O     | 114,16      |          |          |         |          |
| 0,63      | V | 74,29 O     | 120,84      |          |          |         |          |
| 0,8       | V | 70,2 O      | 111,57      |          |          | S7 [m2] | fd       |
| 1         | V | 68,46 O     | 106,35      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 67,73 O     | 100,56      |          |          |         |          |
| 1,6       | V | 69,57 O     | 94,99       |          |          |         |          |
| 2         | V | 64,44 O     | 91,53       |          |          |         |          |
| 2,5       | V | 62,44 O     | 89,58       |          |          |         |          |
| 3,15      | V | 62,18 O     | 71,99       |          |          |         |          |
| 4         | V | 59,05 O     | 79,63       |          |          |         |          |
| 5         | V | 58,84 O     | 71,19       |          |          |         |          |
| 6,3       | V | 59,81 O     | 75,16       |          |          |         |          |
| 8         | V | 59,31 O     | 77,52       |          |          |         |          |
| 10        | V | 61,15 O     | 77,63       |          |          |         |          |
| 12,5      | V | 56,3 O      | 87,53       |          |          | Lv [dB] | Lw [dB]  |
| 16        | V | 57,13 O     | 78,39       |          |          |         |          |
| 20        | V | 63,26 O     | 82,97       | 0,014077 | 0,000112 | 50,2497 | 28,9755  |
| 25        | V | 64,32 O     | 105,55      | 0,189452 | 0,001206 | 51,3097 | 49,6173  |
| 31,5      | V | 60,91 O     | 91,04       | 0,035645 | 0,00018  | 47,8997 | 33,09989 |
| 40        | V | 66,13 O     | 104,89      | 0,17559  | 0,000699 | 53,1197 | 44,8749  |
| 50        | V | 87,23 O     | 127,75      | 2,440619 | 0,007769 | 74,2197 | 65,7967  |
| 63        | V | 69,82 O     | 109,1       | 0,285102 | 0,00072  | 56,8097 | 45,13929 |
| 80        | V | 64,42 O     | 104,8       | 0,17378  | 0,000346 | 51,4097 | 38,7643  |
| 100       | V | 86,45 O     | 126,31      | 2,067759 | 0,003291 | 73,4397 | 58,3361  |
| 125       | V | 70,74 O     | 113,71      | 0,48473  | 0,000617 | 57,7297 | 53,7979  |
| 160       | V | 83,28 O     | 125,21      | 1,821797 | 0,001812 | 70,2697 | 63,1537  |
| 200       | V | 67,36 O     | 109,78      | 0,308319 | 0,000245 | 54,3497 | 45,7855  |
| 250       | V | 69,12 O     | 109,71      | 0,305844 | 0,000195 | 56,1097 | 43,7773  |
| 315       | V | 68,67 O     | 110,89      | 0,350348 | 0,000177 | 55,6597 | 42,94989 |
| 400       | V | 72,06 O     | 113,92      | 0,496592 | 0,000198 | 59,0497 | 43,9049  |
| 500       | V | 76,34 O     | 123         | 1,412538 | 0,00045  | 63,3297 | 51,0467  |
| 630       | V | 78,46 O     | 123,66      | 1,524053 | 0,000385 | 65,4497 | 49,69929 |
| 800       | V | 75,73 O     | 117,14      | 0,719449 | 0,000143 | 62,7197 | 41,1043  |
| 1000      | V | 78,13 O     | 120,81      | 1,097741 | 0,000175 | 65,1197 | 42,8361  |
| 1250      | V | 80,76 O     | 127,63      | 2,407133 | 0,000306 | 67,7497 | 47,7179  |
| 1600      | V | 77,75 O     | 135,58      | 6,011737 | 0,000598 | 64,7397 | 68,5237  |
| 2000      | V | 76,55 O     | 135,39      | 5,881661 | 0,000468 | 63,5397 | 66,3955  |

|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 75,38 O | 133,89 | 4,948801 | 0,000315 | 62,3697 | 62,9573  |
| 3150  | V | 75,85 O | 132,71 | 4,320162 | 0,000218 | 62,8397 | 59,76989 |
| 4000  | V | 73,73 O | 136,4  | 6,606934 | 0,000263 | 60,7197 | 61,3849  |
| 5000  | V | 74,76 O | 133,3  | 4,62381  | 0,000147 | 61,7497 | 56,3467  |
| 6300  | V | 71,78 O | 128,95 | 2,802206 | 7,08E-05 | 58,7697 | 49,98929 |
| 8000  | V | 69,52 O | 127,02 | 2,243882 | 4,46E-05 | 56,5097 | 45,9843  |
| 10000 | V | 68,2 O  | 122,62 | 1,352073 | 2,15E-05 | 55,1897 | 39,6461  |
| A/L   | V | 92,83 O | 143,04 | 14,19058 | #####    |         |          |
| W     | V | 88,07 O | 143,46 | 14,89361 |          |         |          |

L

 $10 \cdot \log \sigma$ 

Frequency [Hz]



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| Řada1 |
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|         |
|---------|
| .w [dB] |
|---------|

|         |
|---------|
| .v [dB] |
|---------|



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 008

Measured 05-04-04 09:24:12

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

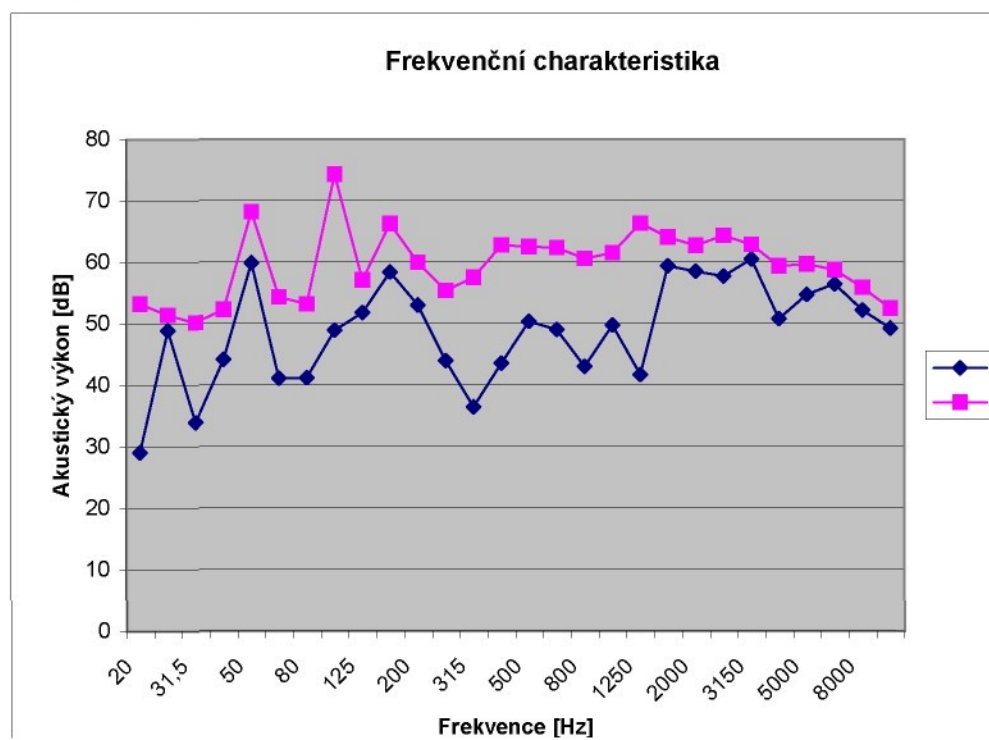
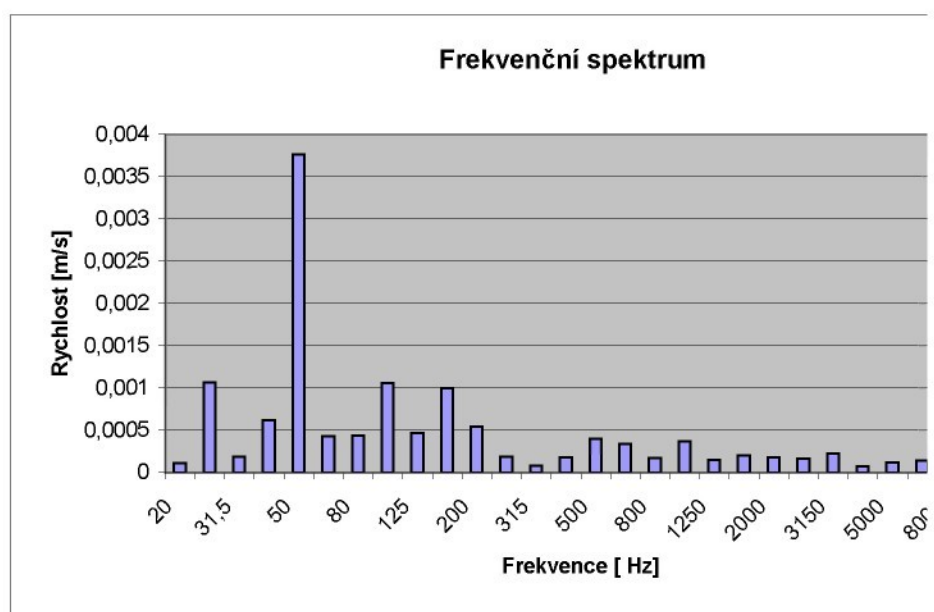
| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 69,66 V     | 118,34      |          |          |          |          |
| 0,5       | V | 72,81 V     | 112,77      |          |          |          |          |
| 0,63      | V | 74,53 V     | 116,95      |          |          |          |          |
| 0,8       | V | 76,55 V     | 114,51      |          |          | S8 [m2]  | fd       |
| 1         | V | 73,14 V     | 112,18      |          |          | 0,05452  | 1528,939 |
| 1,25      | V | 69,75 V     | 99,97       |          |          |          |          |
| 1,6       | V | 69,03 V     | 91,96       |          |          |          |          |
| 2         | V | 68,08 V     | 95,93       |          |          |          |          |
| 2,5       | V | 71,31 V     | 87,51       |          |          |          |          |
| 3,15      | V | 70,95 V     | 84,15       |          |          |          |          |
| 4         | V | 67,52 V     | 80,93       |          |          |          |          |
| 5         | V | 67,05 V     | 75          |          |          |          |          |
| 6,3       | V | 67,47 V     | -256,12     |          |          |          |          |
| 8         | V | 66,04 V     | 77,52       |          |          |          |          |
| 10        | V | 65,54 V     | 75,66       |          |          |          |          |
| 12,5      | V | 58,65 V     | 80,48       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 59,38 V     | 77,63       |          |          |          |          |
| 20        | V | 65,85 V     | 82,69       | 0,01363  | 0,000108 | 53,21556 | 29,07136 |
| 25        | V | 64,04 V     | 104,47      | 0,167302 | 0,001065 | 51,40556 | 48,91316 |
| 31,5      | V | 62,79 V     | 91,48       | 0,037497 | 0,000189 | 50,15556 | 33,91575 |
| 40        | V | 64,93 V     | 103,81      | 0,15506  | 0,000617 | 52,29556 | 44,17076 |
| 50        | V | 80,83 V     | 121,45      | 1,18168  | 0,003761 | 68,19556 | 59,87256 |
| 63        | V | 66,96 V     | 104,68      | 0,171396 | 0,000433 | 54,32556 | 41,09515 |
| 80        | V | 65,8 V      | 106,87      | 0,220546 | 0,000439 | 53,16556 | 41,21016 |
| 100       | V | 86,9 V      | 116,48      | 0,666807 | 0,001061 | 74,26556 | 48,88196 |
| 125       | V | 69,71 V     | 111,31      | 0,367705 | 0,000468 | 57,07556 | 51,77376 |
| 160       | V | 78,88 V     | 120,06      | 1,006932 | 0,001002 | 66,24556 | 58,37956 |
| 200       | V | 72,6 V      | 116,65      | 0,679986 | 0,000541 | 59,96556 | 53,03136 |
| 250       | V | 68,01 V     | 109,52      | 0,299226 | 0,00019  | 55,37556 | 43,96316 |
| 315       | V | 70,13 V     | 104,02      | 0,158855 | 8,03E-05 | 57,49556 | 36,45575 |
| 400       | V | 75,38 V     | 113,19      | 0,456562 | 0,000182 | 62,74556 | 43,55076 |
| 500       | V | 75,12 V     | 121,94      | 1,250259 | 0,000398 | 62,48556 | 50,36256 |
| 630       | V | 75 V        | 122,62      | 1,352073 | 0,000342 | 62,36556 | 49,03515 |
| 800       | V | 73,23 V     | 118,7       | 0,860994 | 0,000171 | 60,59556 | 43,04016 |
| 1000      | V | 74,13 V     | 127,35      | 2,330773 | 0,000371 | 61,49556 | 49,75196 |
| 1250      | V | 78,95 V     | 121,26      | 1,156112 | 0,000147 | 66,31556 | 41,72376 |
| 1600      | V | 76,69 V     | 126,06      | 2,009093 | 0,0002   | 64,05556 | 59,37956 |
| 2000      | V | 75,33 V     | 127,09      | 2,262039 | 0,00018  | 62,69556 | 58,47136 |



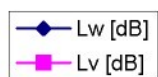
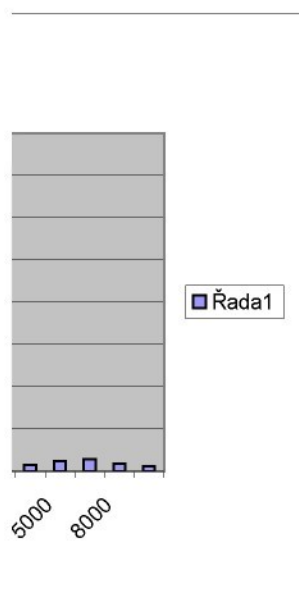
|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 76,95 V | 128,27 | 2,591194 | 0,000165 | 64,31556 | 57,71316 |
| 3150  | V | 75,52 V | 133,11 | 4,523765 | 0,000229 | 62,88556 | 60,54575 |
| 4000  | V | 71,99 V | 125,44 | 1,870682 | 7,44E-05 | 59,35556 | 50,80076 |
| 5000  | V | 72,34 V | 131,32 | 3,68129  | 0,000117 | 59,70556 | 54,74256 |
| 6300  | V | 71,4 V  | 135,06 | 5,662393 | 0,000143 | 58,76556 | 56,47515 |
| 8000  | V | 68,53 V | 132,83 | 4,380261 | 8,71E-05 | 55,89556 | 52,17016 |
| 10000 | V | 65,14 V | 131,87 | 3,921931 | 6,24E-05 | 52,50556 | 49,27196 |
| A/L   | V | 91,63 V | 143,81 | 15,50601 | #####    |          |          |
| W     | V | 86,76 V | 141,37 | 11,70847 | #####    |          |          |

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Frekvence [Hz]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 009

Measured 05-04-04 09:24:36

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 110 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 162 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

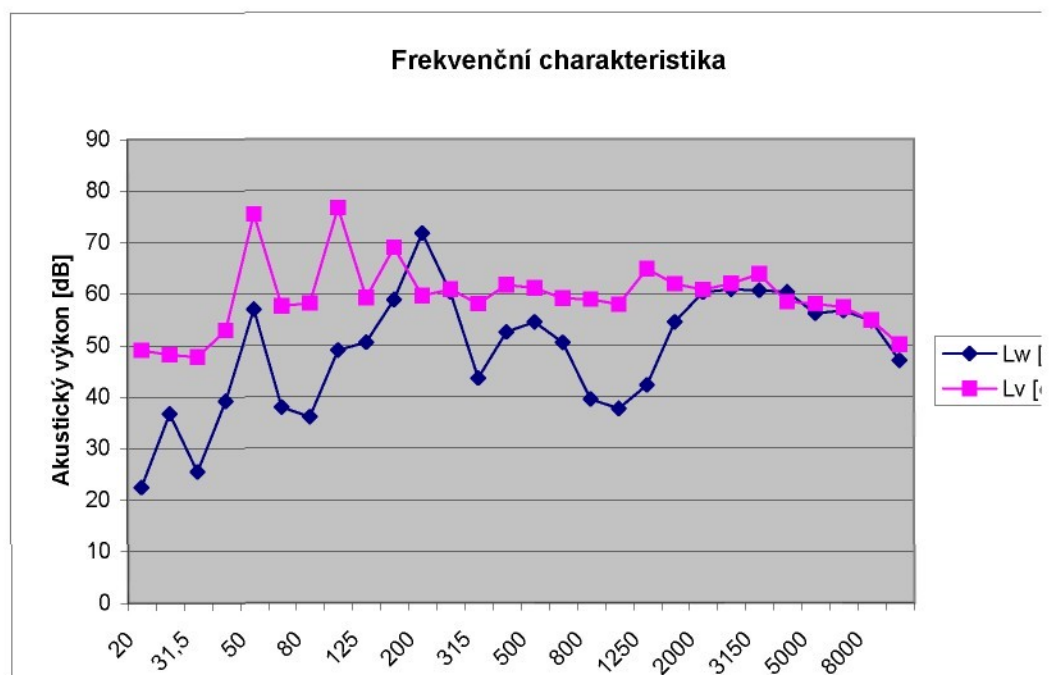
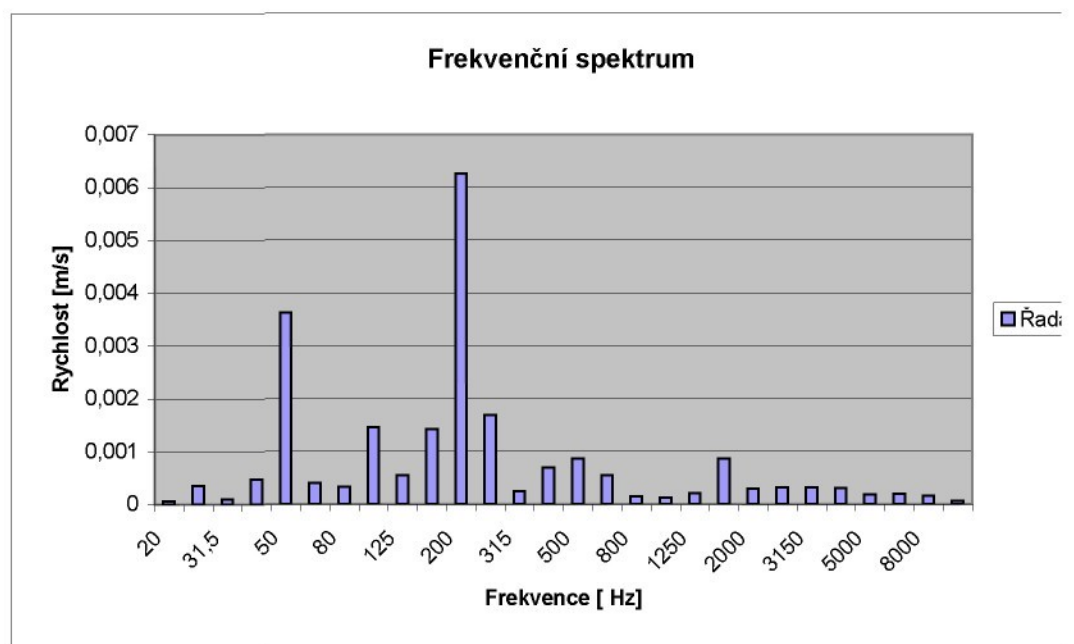
( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | V | 73,02 V    | 114,2      |          |          |          |          |
| 0,5       | V | 73,45 V    | 113,33     |          |          |          |          |
| 0,63      | V | 65,19 V    | 119,45     |          |          |          |          |
| 0,8       | V | 68,41 V    | 104,26     |          |          | S9 [m2]  | fd       |
| 1         | V | 72,15 V    | 103,08     |          |          | 0,03     | 2061,14  |
| 1,25      | V | 71,17 V    | 98,92      |          |          |          |          |
| 1,6       | V | 59,76 V    | 93,77      |          |          |          |          |
| 2         | V | 61,12 V    | 93,3       |          |          |          |          |
| 2,5       | V | 58,91 V    | 91,81      |          |          |          |          |
| 3,15      | V | 55,62 V    | 87,98      |          |          |          |          |
| 4         | V | 50,42 V    | 82,9       |          |          |          |          |
| 5         | V | 49,72 V    | 76,76      |          |          |          |          |
| 6,3       | V | 58,21 V    | 77,09      |          |          |          |          |
| 8         | V | 57,97 V    | 78,17      |          |          |          |          |
| 10        | V | 60,06 V    | 72,95      |          |          |          |          |
| 12,5      | V | 56 V       | 76,17      |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 55,48 V    | 74,2       |          |          |          |          |
| 20        | V | 64,35 V    | 78,71      | 0,00862  | 6,86E-05 | 49,12121 | 22,49702 |
| 25        | V | 63,43 V    | 94,94      | 0,055847 | 0,000356 | 48,20121 | 36,78882 |
| 31,5      | V | 63,05 V    | 85,65      | 0,019165 | 9,68E-05 | 47,82121 | 25,4914  |
| 40        | V | 68,2 V     | 101,46     | 0,118304 | 0,000471 | 52,97121 | 39,22642 |
| 50        | V | 90,69 V    | 121,14     | 1,14025  | 0,00363  | 75,46121 | 56,96822 |
| 63        | V | 72,84 V    | 104,18     | 0,161808 | 0,000409 | 57,61121 | 38,0008  |
| 80        | V | 73,38 V    | 104,37     | 0,165386 | 0,000329 | 58,15121 | 36,11582 |
| 100       | V | 91,93 V    | 119,24     | 0,91622  | 0,001458 | 76,70121 | 49,04762 |
| 125       | V | 74,48 V    | 112,7      | 0,431519 | 0,000549 | 59,25121 | 50,56941 |
| 160       | V | 84,19 V    | 123,12     | 1,432188 | 0,001425 | 68,96121 | 58,84522 |
| 200       | V | 74,81 V    | 137,91     | 7,861402 | 0,006256 | 59,58121 | 71,69702 |
| 250       | V | 76,06 V    | 128,46     | 2,6485   | 0,001686 | 60,83121 | 60,30882 |
| 315       | V | 73,31 V    | 113,78     | 0,488652 | 0,000247 | 58,08121 | 43,6214  |
| 400       | V | 76,95 V    | 124,79     | 1,735801 | 0,000691 | 61,72121 | 52,55642 |
| 500       | V | 76,34 V    | 128,67     | 2,713314 | 0,000864 | 61,11121 | 54,49822 |
| 630       | V | 74,36 V    | 126,71     | 2,16521  | 0,000547 | 59,13121 | 50,5308  |
| 800       | V | 74,18 V    | 117,78     | 0,774462 | 0,000154 | 58,95121 | 39,52582 |
| 1000      | V | 73,14 V    | 117,94     | 0,78886  | 0,000126 | 57,91121 | 37,74762 |
| 1250      | V | 80,06 V    | 124,41     | 1,661499 | 0,000212 | 64,83121 | 42,27941 |
| 1600      | V | 77,14 V    | 138,76     | 8,669619 | 0,000862 | 61,91121 | 54,48522 |
| 2000      | V | 76,03 V    | 131,49     | 3,75405  | 0,000299 | 60,80121 | 60,27702 |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 77,21 V | 134,01 | 5,017646 | 0,000319 | 61,98121 | 60,85882 |
| 3150  | V | 79,04 V | 135,84 | 6,194411 | 0,000313 | 63,81121 | 60,6814  |
| 4000  | V | 73,63 V | 137,58 | 7,568329 | 0,000301 | 58,40121 | 60,34642 |
| 5000  | V | 73,28 V | 135,37 | 5,868134 | 0,000187 | 58,05121 | 56,19822 |
| 6300  | V | 72,62 V | 137,91 | 7,861402 | 0,000199 | 57,39121 | 56,7308  |
| 8000  | V | 70,13 V | 138,03 | 7,970765 | 0,000159 | 54,90121 | 54,77582 |
| 10000 | V | 65,36 V | 132,22 | 4,083194 | 6,5E-05  | 50,13121 | 47,02762 |
| A/L   | V | 95,69 V | 146,94 | 22,2331  | #####    |          |          |
| W     | V | 88,03 V | 146,82 | 21,92805 |          |          |          |

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■ Rada1

◆ Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 010

Measured 05-04-04 09:25:20

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 103 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 165 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

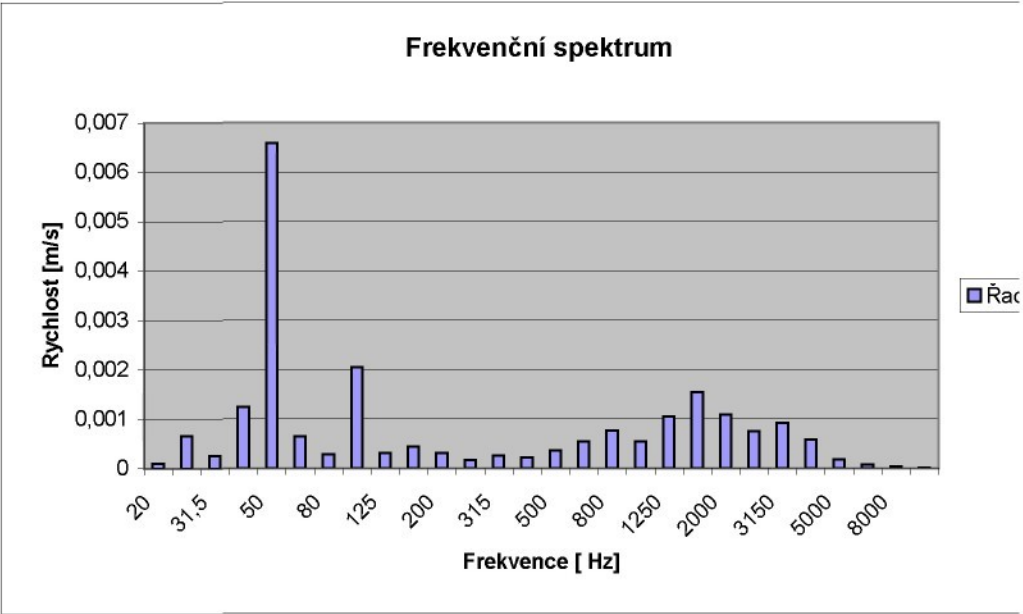
( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 47,34 O     |             | 99,9     |          |          |          |
| 0,5       | V | 60,72 O     |             | 99,58    |          |          |          |
| 0,63      | V | 64,23 O     |             | 107,78   |          |          |          |
| 0,8       | V | 64,49 O     |             | 101,86   |          | S10 [m2] | fd       |
| 1         | V | 67,66 O     |             | 101,13   |          | 0,05     | 1596,553 |
| 1,25      | V | 64,82 O     |             | 108,25   |          |          |          |
| 1,6       | V | 63,29 O     |             | 100,45   |          |          |          |
| 2         | V | 64,91 O     |             | 99,97    |          |          |          |
| 2,5       | V | 59,17 O     |             | 105,67   |          |          |          |
| 3,15      | V | 58,3 O      |             | 94,12    |          |          |          |
| 4         | V | 57,08 O     |             | 93,13    |          |          |          |
| 5         | V | 53,72 O     |             | 96,14    |          |          |          |
| 6,3       | V | 57,1 O      |             | 81,89    |          |          |          |
| 8         | V | 57,74 O     |             | 80,03    |          |          |          |
| 10        | V | 61,48 O     |             | 76,69    |          |          |          |
| 12,5      | V | 56,82 O     |             | 80,08    |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 56,21 O     |             | 78,01    |          |          |          |
| 20        | V | 63,92 O     | 81,8        | 0,012303 | 9,79E-05 | 50,9097  | 27,8055  |
| 25        | V | 63,31 O     | 100,26      | 0,103039 | 0,000656 | 50,2997  | 44,3273  |
| 31,5      | V | 60,35 O     | 93,91       | 0,049602 | 0,000251 | 47,3397  | 35,96989 |
| 40        | V | 68,74 O     | 109,88      | 0,311889 | 0,001241 | 55,7297  | 49,8649  |
| 50        | V | 92 O        | 126,31      | 2,067759 | 0,006582 | 78,9897  | 64,3567  |
| 63        | V | 74,03 O     | 108,14      | 0,25527  | 0,000645 | 61,0197  | 44,17929 |
| 80        | V | 68,6 O      | 102,89      | 0,139476 | 0,000277 | 55,5897  | 36,8543  |
| 100       | V | 90,66 O     | 122,18      | 1,285287 | 0,002046 | 77,6497  | 54,2061  |
| 125       | V | 73,61 O     | 107,85      | 0,246888 | 0,000314 | 60,5997  | 47,9379  |
| 160       | V | 83,7 O      | 112,91      | 0,442079 | 0,00044  | 70,6897  | 50,8537  |
| 200       | V | 69,54 O     | 111,8       | 0,389045 | 0,00031  | 56,5297  | 47,8055  |
| 250       | V | 73,38 O     | 107,95      | 0,249747 | 0,000159 | 60,3697  | 42,0173  |
| 315       | V | 70,39 O     | 114,2       | 0,512861 | 0,000259 | 57,3797  | 46,25989 |
| 400       | V | 75,45 O     | 114,77      | 0,547646 | 0,000218 | 62,4397  | 44,7549  |
| 500       | V | 72,84 O     | 121,07      | 1,131097 | 0,00036  | 59,8297  | 49,1167  |
| 630       | V | 73,73 O     | 126,62      | 2,142891 | 0,000541 | 60,7197  | 52,65929 |
| 800       | V | 73,14 O     | 131,65      | 3,823843 | 0,000761 | 60,1297  | 55,6143  |
| 1000      | V | 75 O        | 130,64      | 3,404082 | 0,000542 | 61,9897  | 52,6661  |
| 1250      | V | 79,89 O     | 138,29      | 8,212966 | 0,001046 | 66,8797  | 58,3779  |
| 1600      | V | 79 O        | 143,81      | 15,50601 | 0,001542 | 65,9897  | 76,7537  |
| 2000      | V | 75,54 O     | 142,68      | 13,61445 | 0,001083 | 62,5297  | 73,6855  |

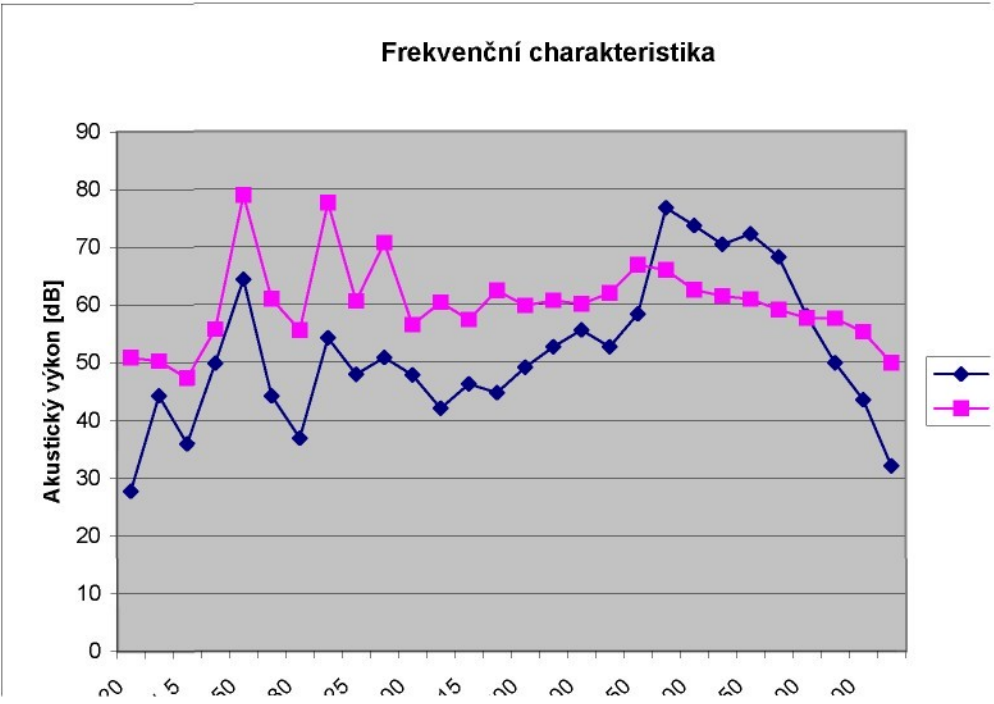
|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 74,53 O | 141,37 | 11,70847 | 0,000745 | 61,5197 | 70,4373  |
| 3150  | V | 73,94 O | 145,2  | 18,19701 | 0,000919 | 60,9297 | 72,25989 |
| 4000  | V | 72,15 O | 143,27 | 14,57136 | 0,00058  | 59,1397 | 68,2549  |
| 5000  | V | 70,67 O | 135,04 | 5,64937  | 0,00018  | 57,6597 | 58,0867  |
| 6300  | V | 70,6 O  | 128,88 | 2,779713 | 7,02E-05 | 57,5897 | 49,91929 |
| 8000  | V | 68,3 O  | 124,57 | 1,692388 | 3,37E-05 | 55,2897 | 43,5343  |
| 10000 | V | 62,91 O | 115,05 | 0,565588 | 9E-06    | 49,8997 | 32,0761  |
| A/L   | V | 95,55 O | 151,03 | 35,6041  | #####    |         |          |
| W     | V | 86,99 O | 150,99 | 35,44051 |          |         |          |

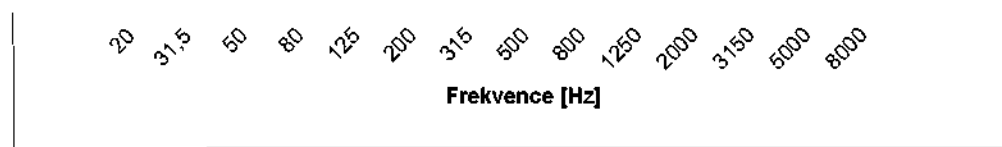
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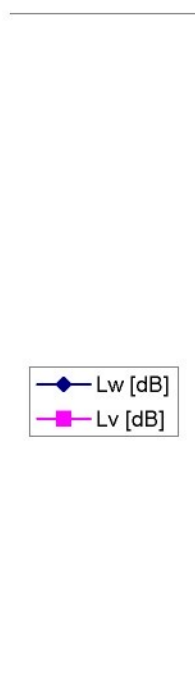
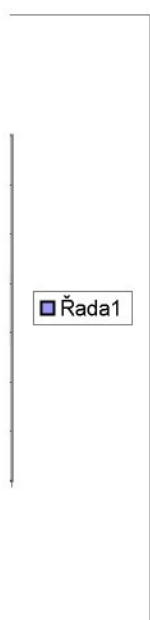


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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 011

Measured 05-04-04 09:27:14

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 103 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 165 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

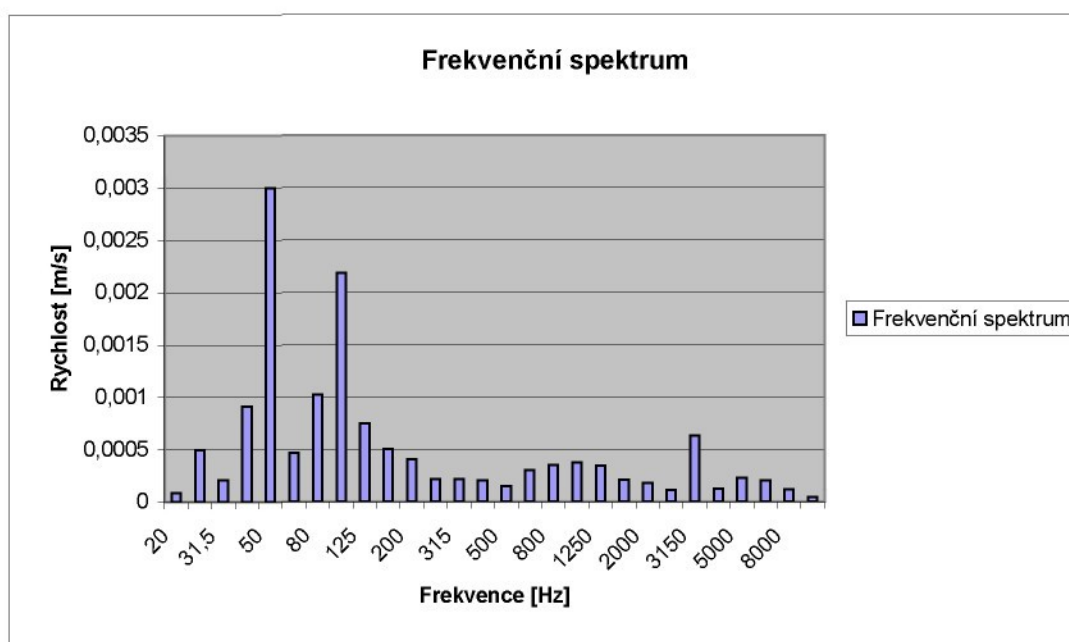
Application Inactive

( Start of Data )

Spectrum r 1

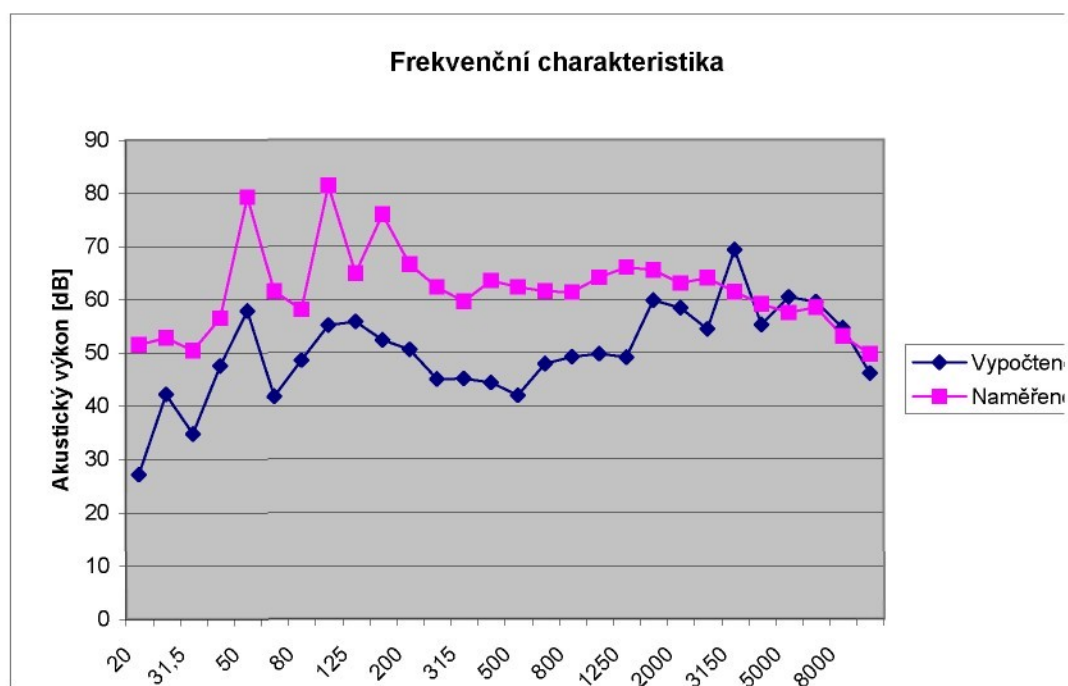
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | ○ | 70,37 V    | 117,54      |          |          |          |          |
| 0,5       | ○ | 67,97 V    | 115,99      |          |          |          |          |
| 0,63      | ○ | 71,07 V    | 110,56      |          |          |          |          |
| 0,8       | ○ | 67,24 V    | 111,17      |          |          | S11 [m2] | fd       |
| 1         | ○ | 67,31 V    | 106,98      |          |          | 0,05452  | 1528,939 |
| 1,25      | ○ | 62,68 V    | 105,55      |          |          |          |          |
| 1,6       | ○ | 65,85 V    | 90          |          |          |          |          |
| 2         | ○ | 62,98 V    | 86,69       |          |          |          |          |
| 2,5       | ○ | 62,6 V     | 86,69       |          |          |          |          |
| 3,15      | ○ | 60,32 V    | 66,7        |          |          |          |          |
| 4         | ○ | 55,43 V    | 80,85       |          |          |          |          |
| 5         | ○ | 53,97 V    | 82,6        |          |          |          |          |
| 6,3       | ○ | 57,48 V    | 83,04       |          |          |          |          |
| 8         | ○ | 58,79 V    | 79,37       |          |          |          |          |
| 10        | ○ | 60,72 V    | 77,49       |          |          |          |          |
| 12,5      | ○ | 56,98 V    | 82,27       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | ○ | 57,43 V    | 79          |          |          |          |          |
| 20        | ○ | 64,2 V     | 80,81       | 0,010977 | 8,74E-05 | 51,56556 | 27,19136 |
| 25        | ○ | 65,5 V     | 97,81       | 0,077714 | 0,000495 | 52,86556 | 42,25316 |
| 31,5      | ○ | 63,1 V     | 92,38       | 0,041591 | 0,00021  | 50,46556 | 34,81575 |
| 40        | ○ | 69,19 V    | 107,22      | 0,229615 | 0,000914 | 56,55556 | 47,58076 |
| 50        | ○ | 91,93 V    | 119,49      | 0,942975 | 0,003002 | 79,29556 | 57,91256 |
| 63        | ○ | 74,18 V    | 105,38      | 0,18578  | 0,000469 | 61,54556 | 41,79515 |
| 80        | ○ | 70,72 V    | 114,25      | 0,515822 | 0,001026 | 58,08556 | 48,59016 |
| 100       | ○ | 94,05 V    | 122,76      | 1,374042 | 0,002187 | 81,41556 | 55,16196 |
| 125       | ○ | 77,54 V    | 115,36      | 0,586138 | 0,000746 | 64,90556 | 55,82376 |
| 160       | ○ | 88,59 V    | 114,09      | 0,506407 | 0,000504 | 75,95556 | 52,40956 |
| 200       | ○ | 79,26 V    | 114,2       | 0,512861 | 0,000408 | 66,62556 | 50,58136 |
| 250       | ○ | 74,95 V    | 110,6       | 0,338844 | 0,000216 | 62,31556 | 45,04316 |
| 315       | ○ | 72,27 V    | 112,7       | 0,431519 | 0,000218 | 59,63556 | 45,13575 |
| 400       | ○ | 76,15 V    | 114,06      | 0,504661 | 0,000201 | 63,51556 | 44,42076 |
| 500       | ○ | 74,95 V    | 113,54      | 0,475335 | 0,000151 | 62,31556 | 41,96256 |
| 630       | ○ | 74,15 V    | 121,56      | 1,196741 | 0,000302 | 61,51556 | 47,97515 |
| 800       | ○ | 74,01 V    | 124,9       | 1,757924 | 0,00035  | 61,37556 | 49,24016 |
| 1000      | ○ | 76,76 V    | 127,42      | 2,349633 | 0,000374 | 64,12556 | 49,82196 |
| 1250      | ○ | 78,69 V    | 128,69      | 2,719568 | 0,000346 | 66,05556 | 49,15376 |
| 1600      | ○ | 78,17 V    | 126,55      | 2,12569  | 0,000211 | 65,53556 | 59,86956 |
| 2000      | ○ | 75,66 V    | 127,02      | 2,243882 | 0,000179 | 63,02556 | 58,40136 |

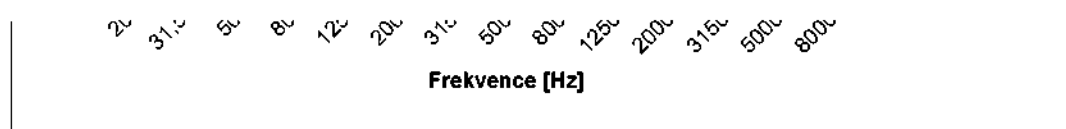
|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | ○ | 76,69 V | 125    | 1,778279 | 0,000113 | 64,05556 | 54,44316 |
| 3150  | ○ | 74,08 V | 141,95 | 12,51699 | 0,000632 | 61,44556 | 69,38575 |
| 4000  | ○ | 71,75 V | 129,94 | 3,140509 | 0,000125 | 59,11556 | 55,30076 |
| 5000  | ○ | 70,15 V | 137,02 | 7,095778 | 0,000226 | 57,51556 | 60,44256 |
| 6300  | ○ | 71,19 V | 138,14 | 8,07235  | 0,000204 | 58,55556 | 59,55515 |
| 8000  | ○ | 65,78 V | 135,32 | 5,834451 | 0,000116 | 53,14556 | 54,66016 |
| 10000 | ○ | 62,37 V | 128,76 | 2,741574 | 4,36E-05 | 49,73556 | 46,16196 |
| A/L   | ○ | 97,39 V | 145,55 | 18,94524 |          |          |          |
| W     | ○ | 87,46 V | 145,58 | 19,01078 |          |          |          |
| L     |   |         |        |          |          |          |          |



10\*log sigma

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 012

Measured 05-04-04 09:28:04

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 103 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 165 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

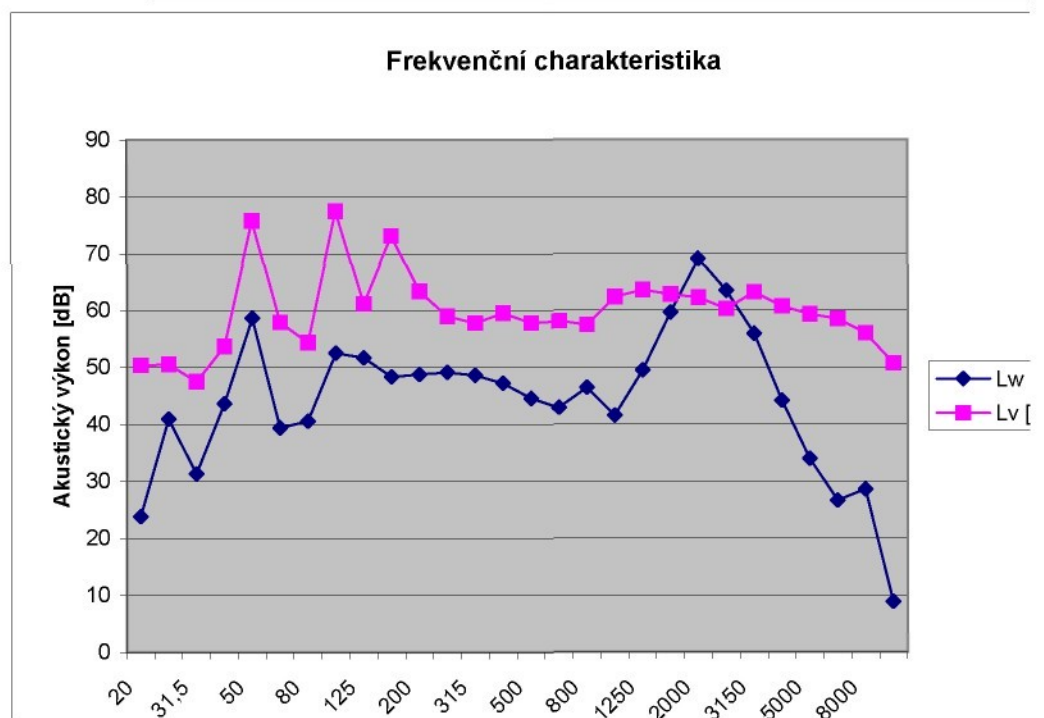
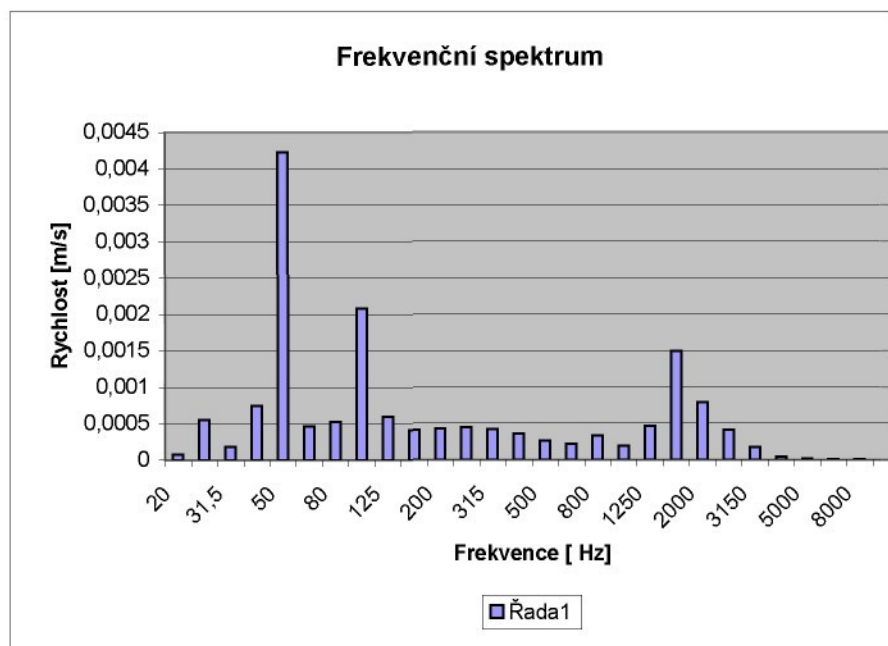
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | O | 70,44 V    | 113,8       |          |          |          |          |
| 0,5       | O | 68,93 V    | 112,96      |          |          |          |          |
| 0,63      | O | 63,05 V    | 106,89      |          |          |          |          |
| 0,8       | O | 66,39 V    | 110,32      |          |          | S12 [m2] | fd       |
| 1         | O | 64,96 V    | 104,61      |          |          | 0,0328   | 1971,203 |
| 1,25      | O | 65,17 V    | 109,71      |          |          |          |          |
| 1,6       | O | 69,1 V     | 88,9        |          |          |          |          |
| 2         | O | 61,62 V    | 89,44       |          |          |          |          |
| 2,5       | O | 65,52 V    | 86,15       |          |          |          |          |
| 3,15      | O | 60,89 V    | 84,1        |          |          |          |          |
| 4         | O | 54,73 V    | 82,83       |          |          |          |          |
| 5         | O | 55,57 V    | 79,26       |          |          |          |          |
| 6,3       | O | 55,53 V    | -256,12     |          |          |          |          |
| 8         | O | 57,48 V    | 78,01       |          |          |          |          |
| 10        | O | 59,12 V    | 78,74       |          |          |          |          |
| 12,5      | O | 57,64 V    | 87,46       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | O | 55,97 V    | 77,3        |          |          |          |          |
| 20        | O | 65,22 V    | 79,66       | 0,009616 | 7,65E-05 | 50,37874 | 23,83454 |
| 25        | O | 65,4 V     | 98,73       | 0,086397 | 0,00055  | 50,55874 | 40,96634 |
| 31,5      | O | 62,39 V    | 91,11       | 0,035934 | 0,000182 | 47,54874 | 31,33893 |
| 40        | O | 68,58 V    | 105,48      | 0,187932 | 0,000748 | 53,73874 | 43,63394 |
| 50        | O | 90,59 V    | 122,46      | 1,327394 | 0,004225 | 75,74874 | 58,67574 |
| 63        | O | 72,79 V    | 105,24      | 0,18281  | 0,000462 | 57,94874 | 39,44833 |
| 80        | O | 69,24 V    | 108,49      | 0,265766 | 0,000529 | 54,39874 | 40,62334 |
| 100       | O | 92,28 V    | 122,32      | 1,306171 | 0,002079 | 77,43874 | 52,51514 |
| 125       | O | 76,06 V    | 113,47      | 0,47152  | 0,0006   | 61,21874 | 51,72694 |
| 160       | O | 87,96 V    | 112,25      | 0,409732 | 0,000408 | 73,11874 | 48,36274 |
| 200       | O | 78,22 V    | 114,67      | 0,541377 | 0,000431 | 63,37874 | 48,84454 |
| 250       | O | 73,85 V    | 116,91      | 0,700648 | 0,000446 | 59,00874 | 49,14634 |
| 315       | O | 72,65 V    | 118,44      | 0,835603 | 0,000422 | 57,80874 | 48,66893 |
| 400       | O | 74,41 V    | 119,09      | 0,900534 | 0,000358 | 59,56874 | 47,24394 |
| 500       | O | 72,67 V    | 118,41      | 0,832722 | 0,000265 | 57,82874 | 44,62574 |
| 630       | O | 73 V       | 118,79      | 0,869961 | 0,00022  | 58,15874 | 42,99833 |
| 800       | O | 72,32 V    | 124,34      | 1,648162 | 0,000328 | 57,47874 | 46,47334 |
| 1000      | O | 77,23 V    | 121,4       | 1,174898 | 0,000187 | 62,38874 | 41,59514 |
| 1250      | O | 78,48 V    | 131,23      | 3,643343 | 0,000464 | 63,63874 | 49,48694 |
| 1600      | O | 77,66 V    | 143,55      | 15,04874 | 0,001497 | 62,81874 | 59,66274 |
| 2000      | O | 77,12 V    | 139,98      | 9,977001 | 0,000794 | 62,27874 | 69,15454 |

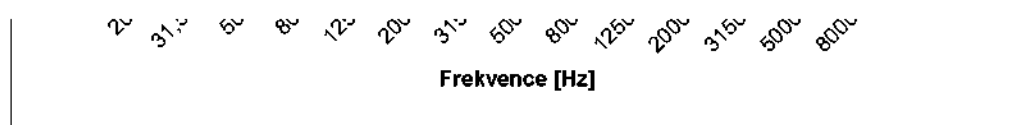


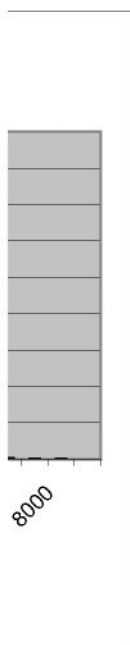
|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | ○ | 75,14 V | 136,26 | 6,501297 | 0,000414 | 60,29874 | 63,49634 |
| 3150  | ○ | 78,06 V | 130,76 | 3,451437 | 0,000174 | 63,21874 | 55,98893 |
| 4000  | ○ | 75,59 V | 121,05 | 1,128496 | 4,49E-05 | 60,74874 | 44,20394 |
| 5000  | ○ | 74,18 V | 112,75 | 0,43401  | 1,38E-05 | 59,33874 | 33,96574 |
| 6300  | ○ | 73,4 V  | 107,45 | 0,235776 | 5,96E-06 | 58,55874 | 26,65833 |
| 8000  | ○ | 70,88 V | 111,5  | 0,375837 | 7,48E-06 | 56,03874 | 28,63334 |
| 10000 | ○ | 65,59 V | 93,7   | 0,048417 | 7,71E-07 | 50,74874 | 8,895141 |
| A/L   | ○ | 96,19 V | 146,28 | 20,6063  | #####    |          |          |
| W     | ○ | 87,93 V | 146,12 | 20,23019 | #####    |          |          |

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◆ Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 013

Measured 05-04-04 09:28:30

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 103 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 165 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

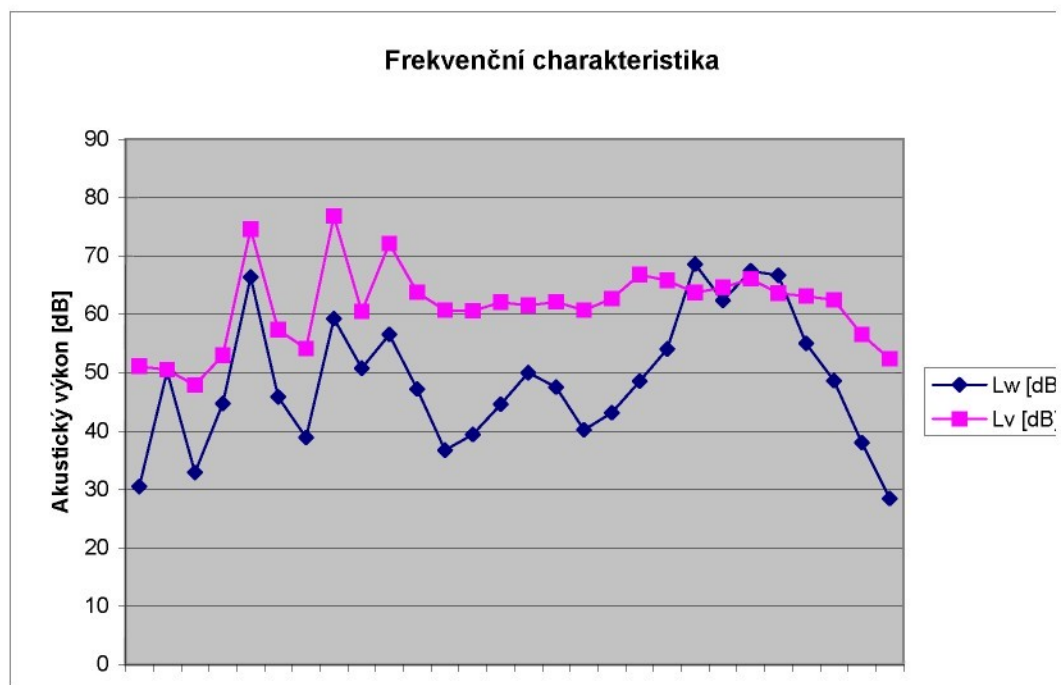
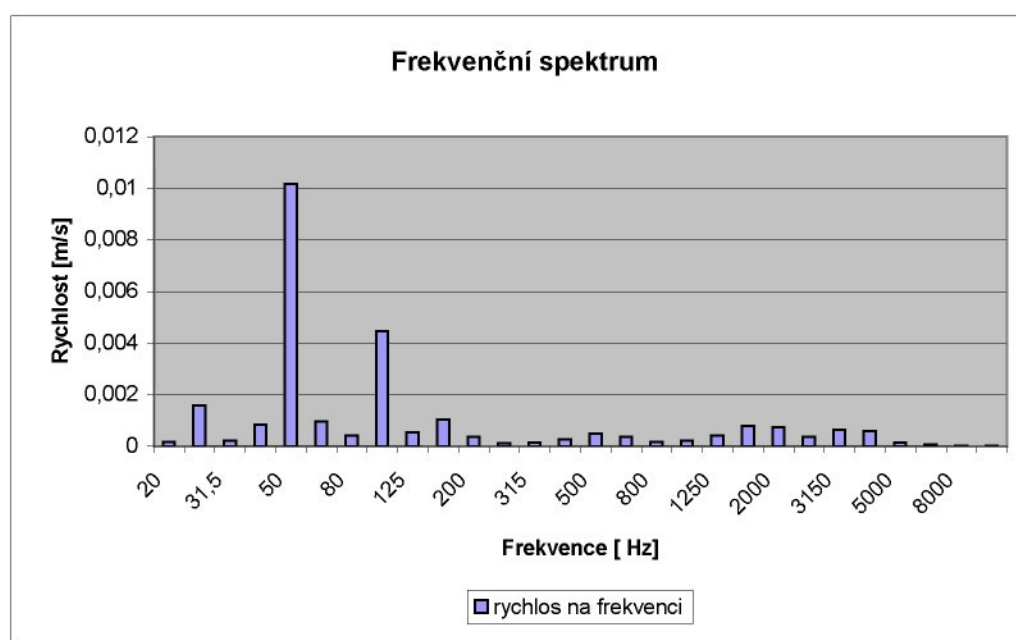
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |             |          |
|-----------|---|------------|-------------|----------|----------|-------------|----------|
| 0,4       | ○ | 72,55 V    | 112,13      |          |          |             |          |
| 0,5       | ○ | 72,18 V    | 112,39      |          |          |             |          |
| 0,63      | ○ | 75,7 V     | 106,87      |          |          |             |          |
| 0,8       | ○ | 75,92 V    | 101,27      |          |          | S13 [m2] fd |          |
| 1         | ○ | 74,39 V    | 102,21      |          |          | 0,0336      | 1947,595 |
| 1,25      | ○ | 70,51 V    | 98,16       |          |          |             |          |
| 1,6       | ○ | 59,74 V    | 85,02       |          |          |             |          |
| 2         | ○ | 62,09 V    | 83,68       |          |          |             |          |
| 2,5       | ○ | 62,35 V    | 82,92       |          |          |             |          |
| 3,15      | ○ | 57,15 V    | -256,12     |          |          |             |          |
| 4         | ○ | 56 V       | 78,74       |          |          |             |          |
| 5         | ○ | 54,3 V     | -256,12     |          |          |             |          |
| 6,3       | ○ | 57,31 V    | -256,12     |          |          |             |          |
| 8         | ○ | 56,91 V    | 80,22       |          |          |             |          |
| 10        | ○ | 59,29 V    | 79,37       |          |          |             |          |
| 12,5      | ○ | 58,65 V    | 83,23       |          |          | Lv [dB]     | Lw [dB]  |
| 16        | ○ | 57,74 V    | 80,13       |          |          |             |          |
| 20        | ○ | 65,85 V    | 86,24       | 0,020512 | 0,000163 | 51,11339    | 30,5192  |
| 25        | ○ | 65,24 V    | 107,88      | 0,247742 | 0,001577 | 50,50339    | 50,221   |
| 31,5      | ○ | 62,63 V    | 92,57       | 0,042511 | 0,000215 | 47,89339    | 32,90358 |
| 40        | ○ | 67,73 V    | 106,49      | 0,211106 | 0,00084  | 52,99339    | 44,7486  |
| 50        | ○ | 89,34 V    | 130,08      | 3,191538 | 0,010159 | 74,60339    | 66,4004  |
| 63        | ○ | 72,13 V    | 111,55      | 0,378007 | 0,000955 | 57,39339    | 45,86298 |
| 80        | ○ | 68,86 V    | 106,65      | 0,21503  | 0,000428 | 54,12339    | 38,888   |
| 100       | ○ | 91,56 V    | 128,97      | 2,808665 | 0,00447  | 76,82339    | 59,2698  |
| 125       | ○ | 75,21 V    | 112,44      | 0,418794 | 0,000533 | 60,47339    | 50,8016  |
| 160       | ○ | 86,85 V    | 120,32      | 1,037528 | 0,001032 | 72,11339    | 56,5374  |
| 200       | ○ | 78,5 V     | 112,96      | 0,444631 | 0,000354 | 63,76339    | 47,2392  |
| 250       | ○ | 75,45 V    | 104,4       | 0,165959 | 0,000106 | 60,71339    | 36,741   |
| 315       | ○ | 75,33 V    | 109,12      | 0,285759 | 0,000144 | 60,59339    | 39,45358 |
| 400       | ○ | 76,83 V    | 116,34      | 0,656145 | 0,000261 | 62,09339    | 44,5986  |
| 500       | ○ | 76,25 V    | 123,7       | 1,531087 | 0,000487 | 61,51339    | 50,0204  |
| 630       | ○ | 76,86 V    | 123,21      | 1,447105 | 0,000366 | 62,12339    | 47,52298 |
| 800       | ○ | 75,45 V    | 117,94      | 0,78886  | 0,000157 | 60,71339    | 40,178   |
| 1000      | ○ | 77,42 V    | 122,88      | 1,393157 | 0,000222 | 62,68339    | 43,1798  |
| 1250      | ○ | 81,54 V    | 130,15      | 3,217363 | 0,00041  | 66,80339    | 48,5116  |
| 1600      | ○ | 80,53 V    | 137,84      | 7,798301 | 0,000776 | 65,79339    | 54,0574  |
| 2000      | ○ | 78,46 V    | 139,32      | 9,246982 | 0,000736 | 63,72339    | 68,5992  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | ○ | 79,37 V | 135,04 | 5,64937  | 0,00036  | 64,63339 | 62,381   |
| 3150  | ○ | 80,81 V | 142,12 | 12,76439 | 0,000645 | 66,07339 | 67,45358 |
| 4000  | ○ | 78,34 V | 143,41 | 14,80812 | 0,000589 | 63,60339 | 66,6686  |
| 5000  | ○ | 77,89 V | 133,7  | 4,841724 | 0,000154 | 63,15339 | 55,0204  |
| 6300  | ○ | 77,19 V | 129,35 | 2,93427  | 7,41E-05 | 62,45339 | 48,66298 |
| 8000  | ○ | 71,26 V | 120,79 | 1,095217 | 2,18E-05 | 56,52339 | 38,028   |
| 10000 | ○ | 67,1 V  | 113,17 | 0,455512 | 7,25E-06 | 52,36339 | 28,4698  |
| A/L   | ○ | 95,93 V | 148,05 | 25,26388 | #####    |          |          |
| W     | ○ | 90,43 V | 148,02 | 25,17677 | #####    |          |          |

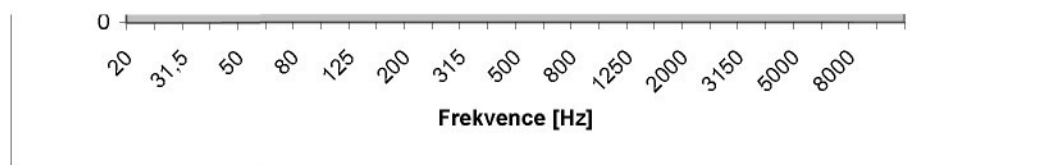
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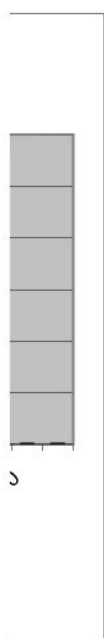
10\*log sigma

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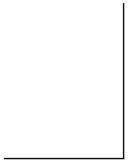






5

— Lw [dB]  
— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 014

Measured 05-04-04 09:29:14

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 103 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 165 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

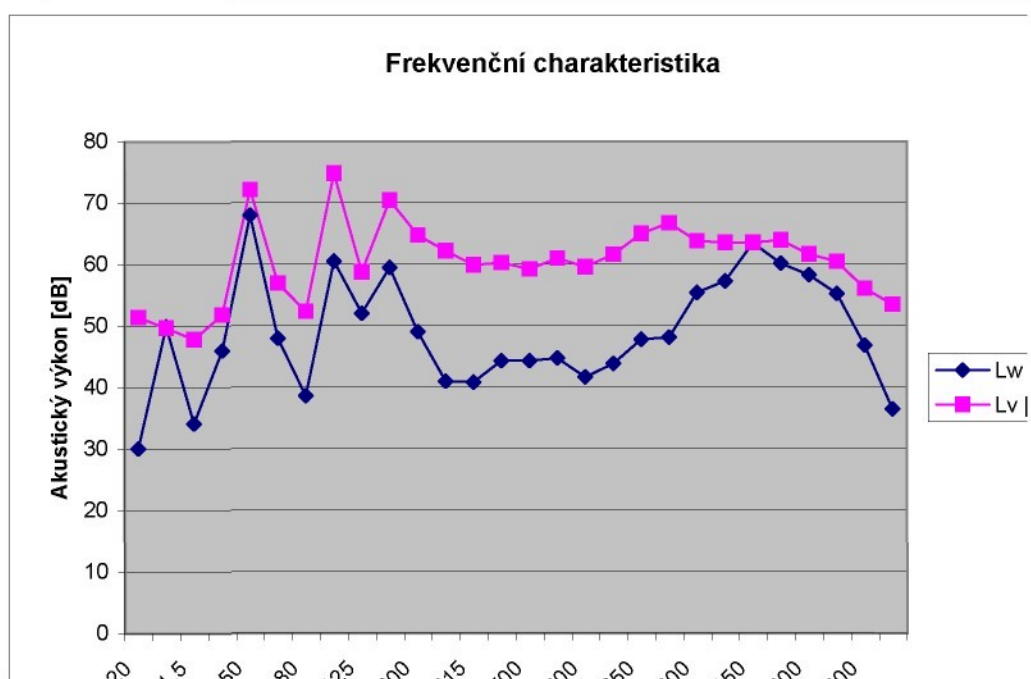
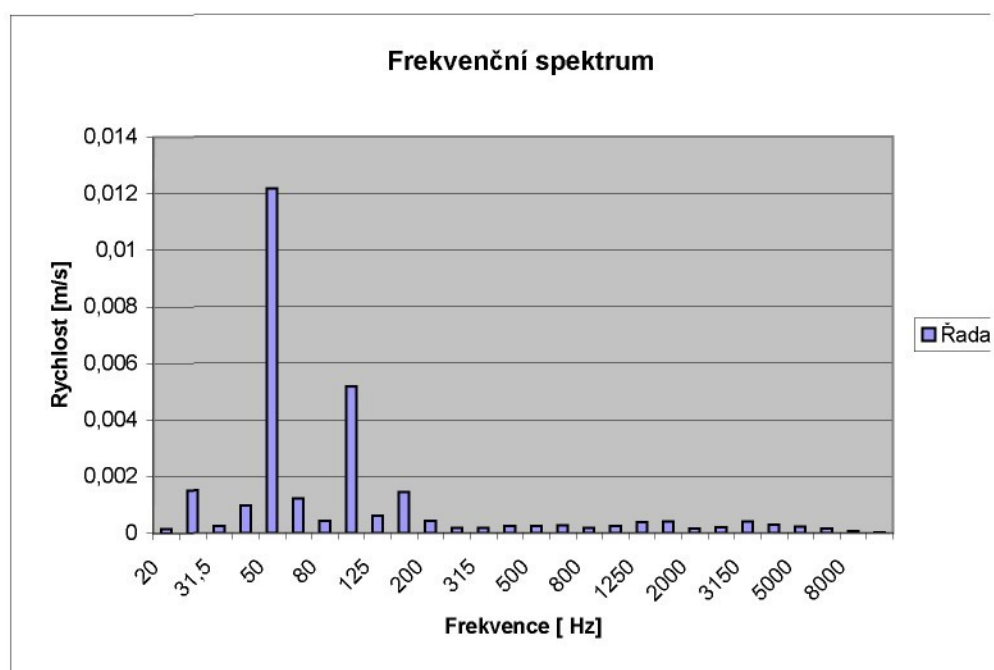
Spectrum r 1

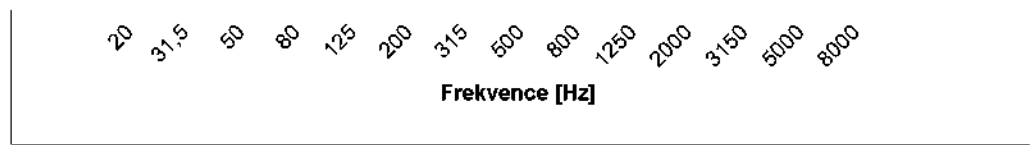
| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 72,11 V     | 108,91      |          |          |          |          |
| 0,5       | V | 72,6 V      | 113,69      |          |          |          |          |
| 0,63      | V | 73,09 V     | 109,48      |          |          |          |          |
| 0,8       | V | 71,54 V     | 92,85       |          | S14 [m2] | fd       |          |
| 1         | V | 64,37 V     | 91,7        |          | 0,0336   | 1947,595 |          |
| 1,25      | V | 65,64 V     | 89,25       |          |          |          |          |
| 1,6       | V | 63,64 V     | 88,8        |          |          |          |          |
| 2         | V | 62,11 V     | 84,76       |          |          |          |          |
| 2,5       | V | 62,06 V     | 78,74       |          |          |          |          |
| 3,15      | V | 59,52 V     | 69,71       |          |          |          |          |
| 4         | V | 53,32 V     | 80,13       |          |          |          |          |
| 5         | V | 51,76 V     | 82,83       |          |          |          |          |
| 6,3       | V | 57,9 V      | -256,12     |          |          |          |          |
| 8         | V | 58,35 V     | 77,3        |          |          |          |          |
| 10        | V | 58,87 V     | 71,47       |          |          |          |          |
| 12,5      | V | 55,78 V     | 84,17       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 56,14 V     | 79,26       |          |          |          |          |
| 20        | V | 66,16 V     | 85,75       | 0,019387 | 0,000154 | 51,42339 | 30,0292  |
| 25        | V | 64,42 V     | 107,55      | 0,238506 | 0,001518 | 49,68339 | 49,891   |
| 31,5      | V | 62,53 V     | 93,77       | 0,048809 | 0,000247 | 47,79339 | 34,10358 |
| 40        | V | 66,58 V     | 107,74      | 0,243781 | 0,00097  | 51,84339 | 45,9986  |
| 50        | V | 86,88 V     | 131,65      | 3,823843 | 0,012172 | 72,14339 | 67,9704  |
| 63        | V | 71,68 V     | 113,66      | 0,481948 | 0,001218 | 56,94339 | 47,97298 |
| 80        | V | 67,1 V      | 106,37      | 0,208209 | 0,000414 | 52,36339 | 38,608   |
| 100       | V | 89,53 V     | 130,24      | 3,250873 | 0,005174 | 74,79339 | 60,5398  |
| 125       | V | 73,47 V     | 113,66      | 0,481948 | 0,000614 | 58,73339 | 52,0216  |
| 160       | V | 85,14 V     | 123,28      | 1,458814 | 0,001451 | 70,40339 | 59,4974  |
| 200       | V | 79,49 V     | 114,72      | 0,544503 | 0,000433 | 64,75339 | 48,9992  |
| 250       | V | 76,93 V     | 108,65      | 0,270707 | 0,000172 | 62,19339 | 40,991   |
| 315       | V | 74,65 V     | 110,49      | 0,33458  | 0,000169 | 59,91339 | 40,82358 |
| 400       | V | 75 V        | 116,06      | 0,635331 | 0,000253 | 60,26339 | 44,3186  |
| 500       | V | 73,94 V     | 117,99      | 0,793414 | 0,000253 | 59,20339 | 44,3104  |
| 630       | V | 75,75 V     | 120,41      | 1,048335 | 0,000265 | 61,01339 | 44,72298 |
| 800       | V | 74,34 V     | 119,42      | 0,935406 | 0,000186 | 59,60339 | 41,658   |
| 1000      | V | 76,36 V     | 123,54      | 1,503142 | 0,000239 | 61,62339 | 43,8398  |
| 1250      | V | 79,75 V     | 129,47      | 2,975089 | 0,000379 | 65,01339 | 47,8316  |
| 1600      | V | 81,47 V     | 131,89      | 3,930972 | 0,000391 | 66,73339 | 48,1074  |
| 2000      | V | 78,55 V     | 126,15      | 2,030019 | 0,000162 | 63,81339 | 55,4292  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 78,27 V | 129,96 | 3,147748 | 0,0002   | 63,53339 | 57,301   |
| 3150  | V | 78,29 V | 138,14 | 8,07235  | 0,000408 | 63,55339 | 63,47358 |
| 4000  | V | 78,69 V | 136,9  | 6,99842  | 0,000278 | 63,95339 | 60,1586  |
| 5000  | V | 76,39 V | 136,95 | 7,038822 | 0,000224 | 61,65339 | 58,2704  |
| 6300  | V | 75,23 V | 135,96 | 6,280584 | 0,000159 | 60,49339 | 55,27298 |
| 8000  | V | 70,84 V | 129,56 | 3,006076 | 5,98E-05 | 56,10339 | 46,798   |
| 10000 | V | 68,23 V | 121,16 | 1,142878 | 1,82E-05 | 53,49339 | 36,4598  |
| A/L   | V | 94,31 V | 144,59 | 16,9629  | #####    |          |          |
| W     | V | 89,58 V | 144,56 | 16,90441 | #####    |          |          |

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Řada1

—◆— Lw [dB]  
—■— Lv [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 015

Measured 05-04-04 09:30:38

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

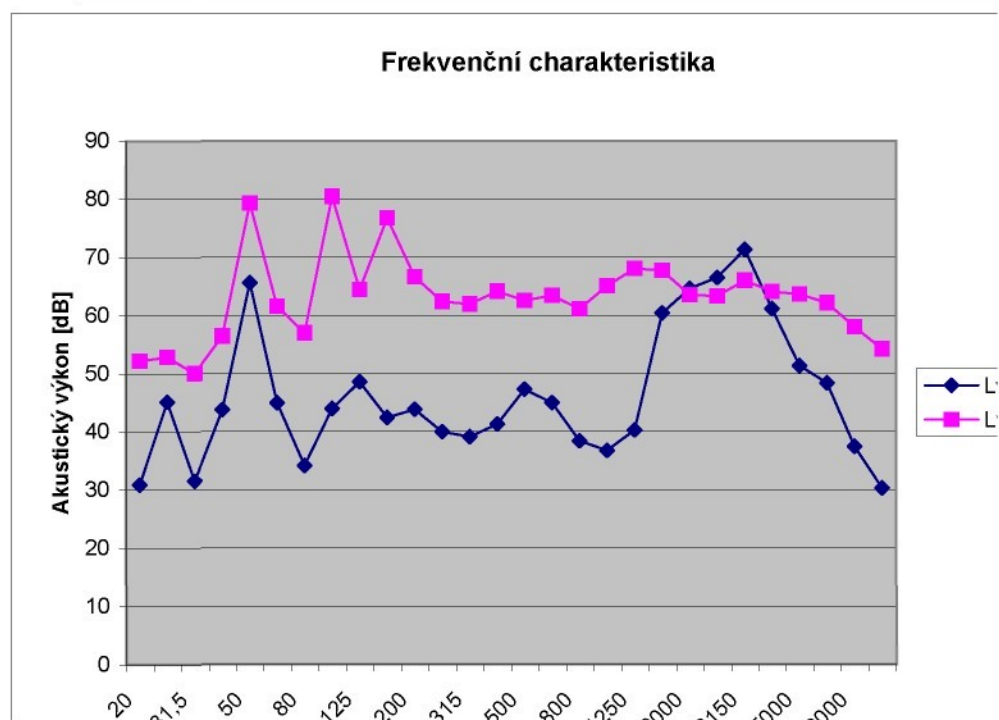
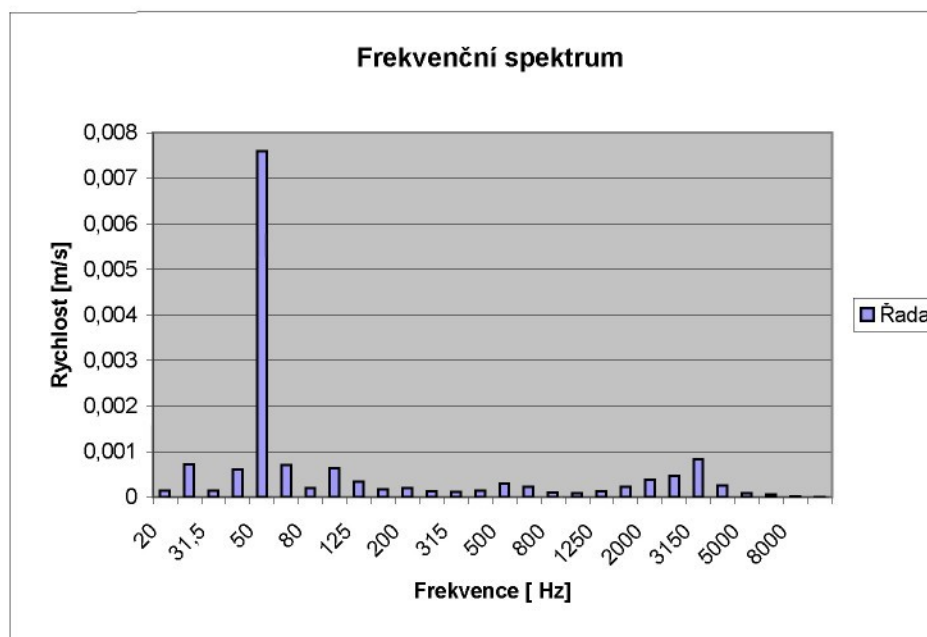
| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | V | 63,55 V    | 129,68     |          |          |          |          |
| 0,5       | V | 64,2 V     | 126,97     |          |          |          |          |
| 0,63      | V | 63,69 V    | 125,21     |          |          |          |          |
| 0,8       | V | 70,06 V    | 112,11     |          |          | S15 [m2] | fd       |
| 1         | V | 65,92 V    | 108,77     |          |          | 0,05     | 1596,553 |
| 1,25      | V | 67,31 V    | 107,83     |          |          |          |          |
| 1,6       | V | 65,33 V    | 95,98      |          |          |          |          |
| 2         | V | 64,32 V    | 95,74      |          |          |          |          |
| 2,5       | V | 62,75 V    | 90,38      |          |          |          |          |
| 3,15      | V | 57,22 V    | 86,62      |          |          |          |          |
| 4         | V | 55,06 V    | 87,6       |          |          |          |          |
| 5         | V | 57,62 V    | 87,37      |          |          |          |          |
| 6,3       | V | 57,97 V    | 81,23      |          |          |          |          |
| 8         | V | 56,54 V    | 84,92      |          |          |          |          |
| 10        | V | 58,61 V    | 82,12      |          |          |          |          |
| 12,5      | V | 58,82 V    | 86,36      |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 57,38 V    | 85,63      |          |          |          |          |
| 20        | V | 65,17 V    | 84,88      | 0,017539 | 0,00014  | 52,1597  | 30,8855  |
| 25        | V | 65,83 V    | 101,08     | 0,11324  | 0,000721 | 52,8197  | 45,1473  |
| 31,5      | V | 63,05 V    | 89,49      | 0,029819 | 0,000151 | 50,0397  | 31,54989 |
| 40        | V | 69,45 V    | 103,78     | 0,154525 | 0,000615 | 56,4397  | 43,7649  |
| 50        | V | 92,28 V    | 127,56     | 2,387811 | 0,007601 | 79,2697  | 65,6067  |
| 63        | V | 74,55 V    | 108,96     | 0,280543 | 0,000709 | 61,5397  | 44,99929 |
| 80        | V | 69,97 V    | 100,23     | 0,102683 | 0,000204 | 56,9597  | 34,1943  |
| 100       | V | 93,41 V    | 111,95     | 0,395822 | 0,00063  | 80,3997  | 43,9761  |
| 125       | V | 77,4 V     | 108,49     | 0,265766 | 0,000338 | 64,3897  | 48,5779  |
| 160       | V | 89,77 V    | 104,47     | 0,167302 | 0,000166 | 76,7597  | 42,4137  |
| 200       | V | 79,61 V    | 107,81     | 0,245754 | 0,000196 | 66,5997  | 43,8155  |
| 250       | V | 75,38 V    | 105,9      | 0,197242 | 0,000126 | 62,3697  | 39,9673  |
| 315       | V | 74,95 V    | 107,08     | 0,225944 | 0,000114 | 61,9397  | 39,13989 |
| 400       | V | 77,12 V    | 111,29     | 0,36686  | 0,000146 | 64,1097  | 41,2749  |
| 500       | V | 75,54 V    | 119,26     | 0,918333 | 0,000292 | 62,5297  | 47,3067  |
| 630       | V | 76,41 V    | 118,95     | 0,886135 | 0,000224 | 63,3997  | 44,98929 |
| 800       | V | 74,13 V    | 114,46     | 0,528445 | 0,000105 | 61,1197  | 38,4243  |
| 1000      | V | 78,06 V    | 114,72     | 0,544503 | 8,67E-05 | 65,0497  | 36,7461  |
| 1250      | V | 81,07 V    | 120,18     | 1,020939 | 0,00013  | 68,0597  | 40,2679  |
| 1600      | V | 80,69 V    | 127,44     | 2,355049 | 0,000234 | 67,6797  | 60,3837  |
| 2000      | V | 76,55 V    | 133,61     | 4,791815 | 0,000381 | 63,5397  | 64,6155  |

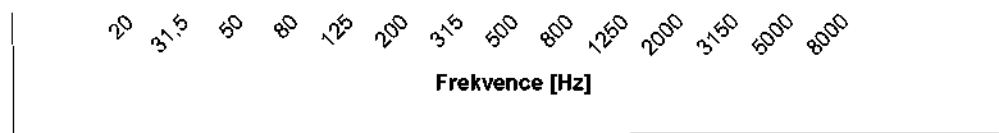
|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 76,34 V | 137,42 | 7,430191 | 0,000473 | 63,3297 | 66,4873  |
| 3150  | V | 79 V    | 144,28 | 16,36817 | 0,000827 | 65,9897 | 71,33989 |
| 4000  | V | 77,07 V | 136,19 | 6,449113 | 0,000257 | 64,0597 | 61,1749  |
| 5000  | V | 76,65 V | 128,31 | 2,603155 | 8,29E-05 | 63,6397 | 51,3567  |
| 6300  | V | 75,14 V | 127,37 | 2,336146 | 5,9E-05  | 62,1297 | 48,40929 |
| 8000  | V | 71,02 V | 118,53 | 0,844306 | 1,68E-05 | 58,0097 | 37,4943  |
| 10000 | V | 67,24 V | 113,33 | 0,463981 | 7,38E-06 | 54,2297 | 30,3561  |
| A/L   | V | 97,69 V | 146,28 | 20,6063  |          |         |          |
| W     | V | 89,63 V | 146,38 | 20,84491 |          |         |          |

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10\*log sigma

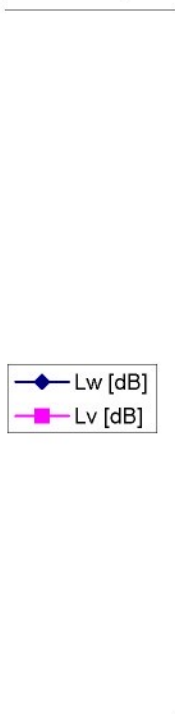
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■ Rada1



—◆—  $L_w$  [dB]  
—■—  $L_v$  [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 016

Measured 05-04-04 09:31:08

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

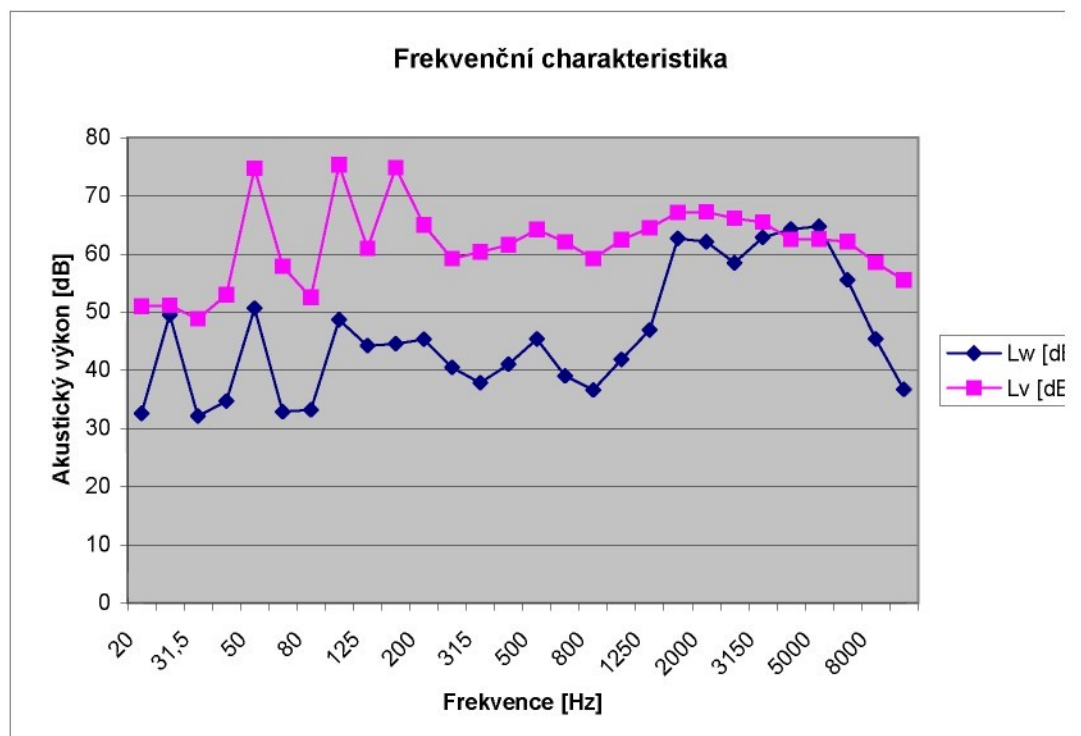
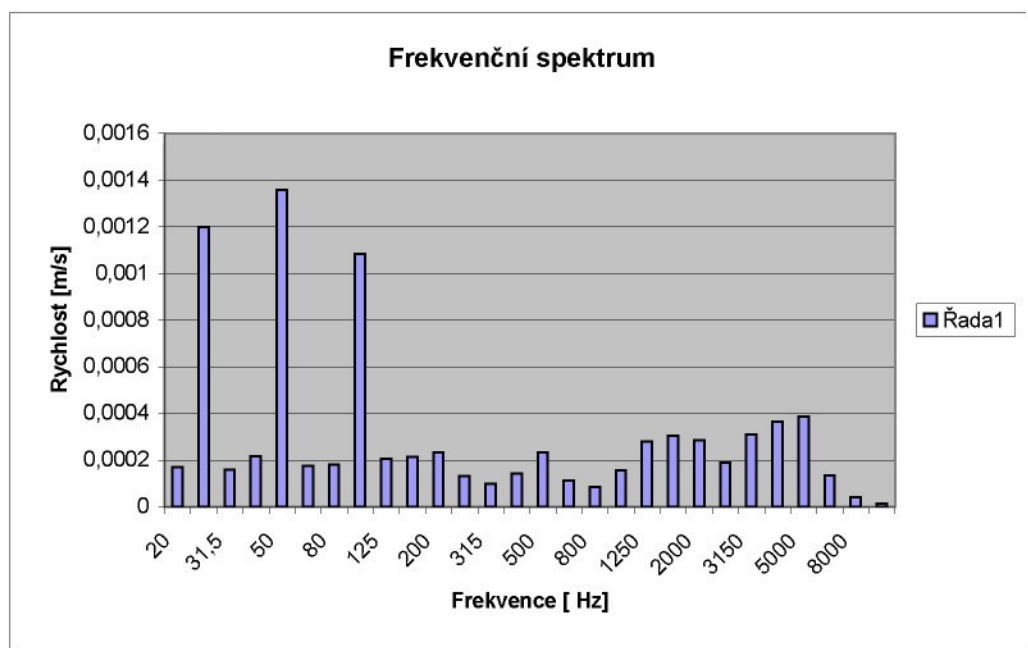
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 60,46 V    | 105,97      |          |          |          |          |
| 0,5       | V | 68,2 V     | 111,38      |          |          |          |          |
| 0,63      | V | 64,96 V    | 109,38      |          |          |          |          |
| 0,8       | V | 64,09 V    | 101,03      |          |          | S16 [m2] | fd       |
| 1         | V | 67,03 V    | 100,26      |          |          | 0,05     | 1596,553 |
| 1,25      | V | 63,73 V    | 96,05       |          |          |          |          |
| 1,6       | V | 63,19 V    | 96,45       |          |          |          |          |
| 2         | V | 64,16 V    | 90,83       |          |          |          |          |
| 2,5       | V | 61,12 V    | 94,66       |          |          |          |          |
| 3,15      | V | 57,17 V    | 89,11       |          |          |          |          |
| 4         | V | 51,5 V     | 83,75       |          |          |          |          |
| 5         | V | 52,49 V    | 84,48       |          |          |          |          |
| 6,3       | V | 56,16 V    | -256,12     |          |          |          |          |
| 8         | V | 57,48 V    | 81,23       |          |          |          |          |
| 10        | V | 59,08 V    | 80,43       |          |          |          |          |
| 12,5      | V | 56,21 V    | 85,06       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 55,62 V    | 85,32       |          |          |          |          |
| 20        | V | 64,02 V    | 86,64       | 0,021478 | 0,000171 | 51,0097  | 32,6455  |
| 25        | V | 64,16 V    | 105,5       | 0,188365 | 0,001199 | 51,1497  | 49,5673  |
| 31,5      | V | 61,88 V    | 90,05       | 0,031805 | 0,000161 | 48,8697  | 32,10989 |
| 40        | V | 66,01 V    | 94,75       | 0,054639 | 0,000217 | 52,9997  | 34,7349  |
| 50        | V | 87,72 V    | 112,6       | 0,42658  | 0,001358 | 74,7097  | 50,6467  |
| 63        | V | 70,91 V    | 96,85       | 0,069582 | 0,000176 | 57,8997  | 32,88929 |
| 80        | V | 65,57 V    | 99,25       | 0,091728 | 0,000182 | 52,5597  | 33,2143  |
| 100       | V | 88,36 V    | 116,67      | 0,681554 | 0,001085 | 75,3497  | 48,6961  |
| 125       | V | 73,99 V    | 104,14      | 0,161065 | 0,000205 | 60,9797  | 44,2279  |
| 160       | V | 87,86 V    | 106,63      | 0,214536 | 0,000213 | 74,8497  | 44,5737  |
| 200       | V | 77,99 V    | 109,31      | 0,292079 | 0,000232 | 64,9797  | 45,3155  |
| 250       | V | 72,22 V    | 106,42      | 0,209411 | 0,000133 | 59,2097  | 40,4873  |
| 315       | V | 73,38 V    | 105,81      | 0,195209 | 9,86E-05 | 60,3697  | 37,86989 |
| 400       | V | 74,58 V    | 111,05      | 0,356862 | 0,000142 | 61,5697  | 41,0349  |
| 500       | V | 77,21 V    | 117,33      | 0,73536  | 0,000234 | 64,1997  | 45,3767  |
| 630       | V | 75,07 V    | 113,05      | 0,449262 | 0,000113 | 62,0597  | 39,08929 |
| 800       | V | 72,2 V     | 112,67      | 0,430031 | 8,56E-05 | 59,1897  | 36,6343  |
| 1000      | V | 75,47 V    | 119,85      | 0,982879 | 0,000156 | 62,4597  | 41,8761  |
| 1250      | V | 77,49 V    | 126,86      | 2,202926 | 0,00028  | 64,4797  | 46,9479  |
| 1600      | V | 80,15 V    | 129,73      | 3,065491 | 0,000305 | 67,1397  | 62,6737  |
| 2000      | V | 80,24 V    | 131,09      | 3,585089 | 0,000285 | 67,2297  | 62,0955  |



|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 79,16 V | 129,44 | 2,964831 | 0,000189 | 66,1497 | 58,5073  |
| 3150  | V | 78,48 V | 135,75 | 6,130558 | 0,00031  | 65,4697 | 62,80989 |
| 4000  | V | 75,52 V | 139,27 | 9,193905 | 0,000366 | 62,5097 | 64,2549  |
| 5000  | V | 75,59 V | 141,7  | 12,16186 | 0,000387 | 62,5797 | 64,7467  |
| 6300  | V | 75,14 V | 134,55 | 5,339493 | 0,000135 | 62,1297 | 55,58929 |
| 8000  | V | 71,54 V | 126,43 | 2,096525 | 4,17E-05 | 58,5297 | 45,3943  |
| 10000 | V | 68,51 V | 119,71 | 0,967164 | 1,54E-05 | 55,4997 | 36,7361  |
| A/L   | V | 94,38 V | 145,55 | 18,94524 | #####    |         |          |
| W     | V | 89,16 V | 145,34 | 18,49269 | #####    |         |          |

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— Lw [dB]  
— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 017

Measured 05-04-04 09:31:30

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

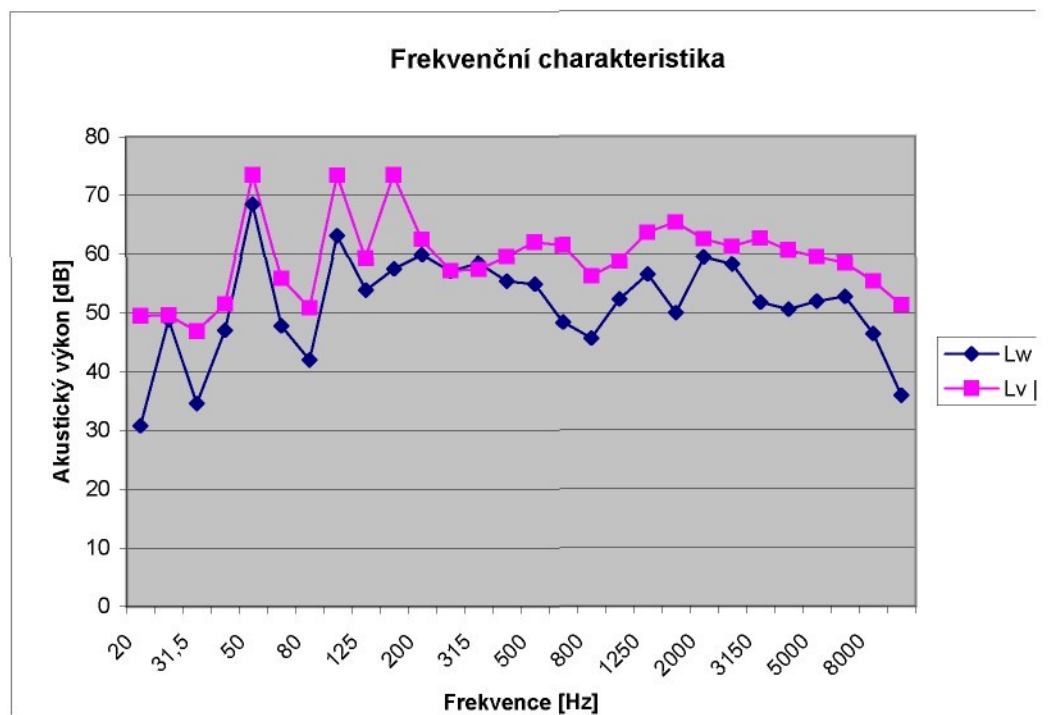
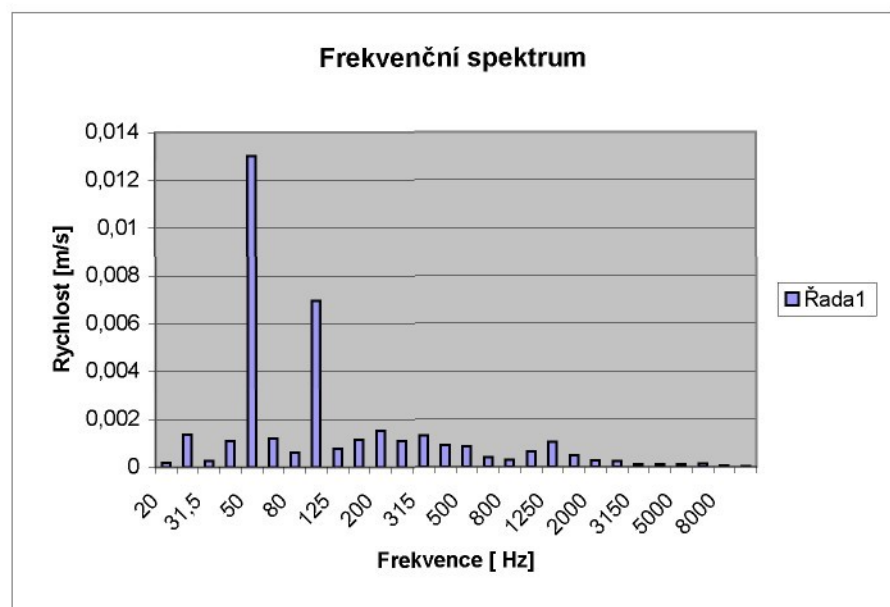
( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 67,61 V     | 116,39      |          |          |          |          |
| 0,5       | V | 70,79 V     | 113,03      |          |          |          |          |
| 0,63      | V | 65,87 V     | 111,59      |          |          |          |          |
| 0,8       | V | 67,43 V     | 108,63      |          |          | S17 [m2] | fd       |
| 1         | V | 62,68 V     | 111,69      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 66,93 V     | 109,5       |          |          |          |          |
| 1,6       | V | 65,17 V     | 91,53       |          |          |          |          |
| 2         | V | 63,4 V      | 90,26       |          |          |          |          |
| 2,5       | V | 58,28 V     | 82,5        |          |          |          |          |
| 3,15      | V | 56,44 V     | 71,71       |          |          |          |          |
| 4         | V | 52,84 V     | 86,01       |          |          |          |          |
| 5         | V | 50,3 V      | 79,49       |          |          |          |          |
| 6,3       | V | 57,1 V      | -256,12     |          |          |          |          |
| 8         | V | 57,78 V     | 85,68       |          |          |          |          |
| 10        | V | 59,34 V     | 82,99       |          |          |          |          |
| 12,5      | V | 54,56 V     | 89,67       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 56,07 V     | 83,94       |          |          |          |          |
| 20        | V | 64,23 V     | 86,55       | 0,021257 | 0,000169 | 49,49339 | 30,8292  |
| 25        | V | 64,35 V     | 106,51      | 0,211592 | 0,001347 | 49,61339 | 48,851   |
| 31,5      | V | 61,64 V     | 94,26       | 0,051642 | 0,000261 | 46,90339 | 34,59358 |
| 40        | V | 66,27 V     | 108,82      | 0,276058 | 0,001098 | 51,53339 | 47,0786  |
| 50        | V | 88,22 V     | 132,24      | 4,092607 | 0,013027 | 73,48339 | 68,5604  |
| 63        | V | 70,62 V     | 113,52      | 0,474242 | 0,001198 | 55,88339 | 47,83298 |
| 80        | V | 65,62 V     | 109,73      | 0,306549 | 0,00061  | 50,88339 | 41,968   |
| 100       | V | 88,17 V     | 132,83      | 4,380261 | 0,006971 | 73,43339 | 63,1298  |
| 125       | V | 74,06 V     | 115,5       | 0,595662 | 0,000758 | 59,32339 | 53,8616  |
| 160       | V | 88,24 V     | 121,31      | 1,162787 | 0,001157 | 73,50339 | 57,5274  |
| 200       | V | 77,26 V     | 125,66      | 1,918669 | 0,001527 | 62,52339 | 59,9392  |
| 250       | V | 71,92 V     | 124,76      | 1,729816 | 0,001101 | 57,18339 | 57,101   |
| 315       | V | 72,18 V     | 128,17      | 2,561533 | 0,001294 | 57,44339 | 58,50358 |
| 400       | V | 74,32 V     | 127,16      | 2,280342 | 0,000907 | 59,58339 | 55,4186  |
| 500       | V | 76,81 V     | 128,57      | 2,682255 | 0,000854 | 62,07339 | 54,8904  |
| 630       | V | 76,25 V     | 124,06      | 1,595879 | 0,000403 | 61,51339 | 48,37298 |
| 800       | V | 70,98 V     | 123,42      | 1,482518 | 0,000295 | 56,24339 | 45,658   |
| 1000      | V | 73,49 V     | 131,98      | 3,971915 | 0,000632 | 58,75339 | 52,2798  |
| 1250      | V | 78,39 V     | 138,17      | 8,100279 | 0,001031 | 63,65339 | 56,5316  |
| 1600      | V | 80,1 V      | 133,75      | 4,869675 | 0,000484 | 65,36339 | 49,9674  |
| 2000      | V | 77,26 V     | 130,17      | 3,224779 | 0,000257 | 62,52339 | 59,4492  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 75,96 V | 130,92 | 3,515604 | 0,000224 | 61,22339 | 58,261   |
| 3150  | V | 77,37 V | 126,43 | 2,096525 | 0,000106 | 62,63339 | 51,76358 |
| 4000  | V | 75,4 V  | 127,3  | 2,317395 | 9,22E-05 | 60,66339 | 50,5586  |
| 5000  | V | 74,22 V | 130,57 | 3,376758 | 0,000107 | 59,48339 | 51,8904  |
| 6300  | V | 73,19 V | 133,42 | 4,688134 | 0,000118 | 58,45339 | 52,73298 |
| 8000  | V | 70,11 V | 129,18 | 2,877398 | 5,72E-05 | 55,37339 | 46,418   |
| 10000 | V | 66,04 V | 120,6  | 1,071519 | 1,71E-05 | 51,30339 | 35,8998  |
| A/L   | V | 94,28 V | 143,88 | 15,63148 |          |          |          |
| W     | V | 88,12 V | 143,98 | 15,81248 |          |          |          |

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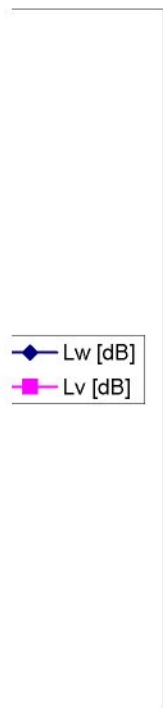


**Frekvence [Hz]**

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Rada1



◆ Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 018

Measured 05-04-04 09:32:24

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

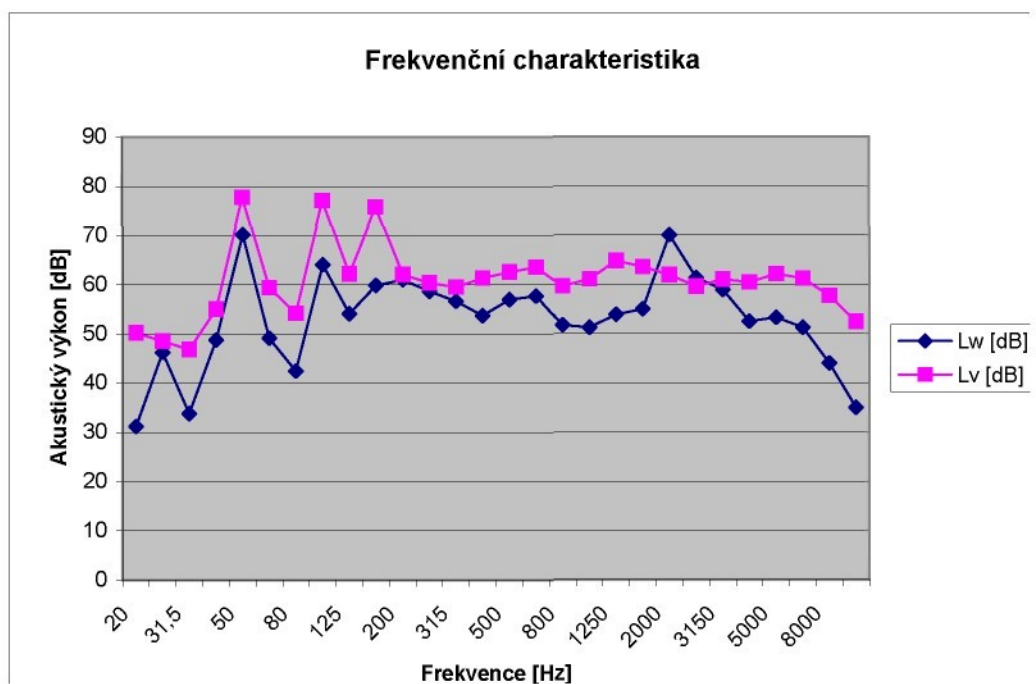
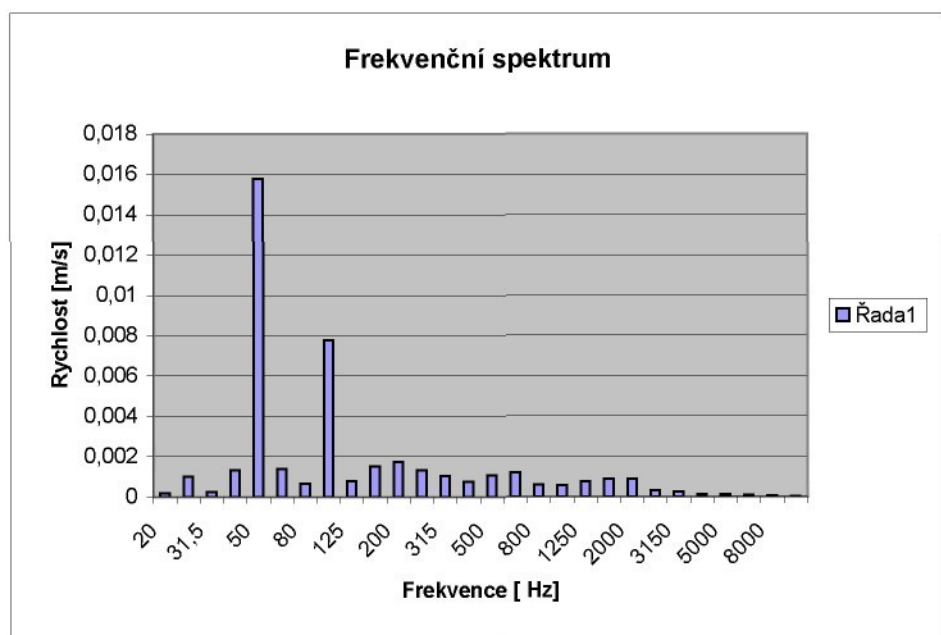
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |             |          |
|-----------|---|------------|-------------|----------|----------|-------------|----------|
| 0,4       | V | 69,24 V    | 122,43      |          |          |             |          |
| 0,5       | V | 62,68 V    | 123,45      |          |          |             |          |
| 0,63      | V | 73,63 V    | 119,4       |          |          |             |          |
| 0,8       | V | 63,45 V    | 119,61      |          |          | S18 [m2] fd |          |
| 1         | V | 64,74 V    | 118,84      |          |          | 0,0336      | 1947,595 |
| 1,25      | V | 63,45 V    | 118,32      |          |          |             |          |
| 1,6       | V | 62,58 V    | 113,19      |          |          |             |          |
| 2         | V | 58,21 V    | 112,86      |          |          |             |          |
| 2,5       | V | 58,58 V    | 114,93      |          |          |             |          |
| 3,15      | V | 54,11 V    | 101,6       |          |          |             |          |
| 4         | V | 52,49 V    | 96,14       |          |          |             |          |
| 5         | V | 49,43 V    | 94,78       |          |          |             |          |
| 6,3       | V | 55,86 V    | 78,69       |          |          |             |          |
| 8         | V | 56,04 V    | 82,83       |          |          |             |          |
| 10        | V | 59,05 V    | 84,59       |          |          |             |          |
| 12,5      | V | 55,03 V    | 92,26       |          |          | Lv [dB]     | Lw [dB]  |
| 16        | V | 55,93 V    | 84,48       |          |          |             |          |
| 20        | V | 65 V       | 86,88       | 0,02208  | 0,000176 | 50,26339    | 31,1592  |
| 25        | V | 63,29 V    | 103,9       | 0,156675 | 0,000997 | 48,55339    | 46,241   |
| 31,5      | V | 61,57 V    | 93,53       | 0,047479 | 0,00024  | 46,83339    | 33,86358 |
| 40        | V | 69,78 V    | 110,51      | 0,335351 | 0,001334 | 55,04339    | 48,7686  |
| 50        | V | 92,52 V    | 133,91      | 4,960209 | 0,015789 | 77,78339    | 70,2304  |
| 63        | V | 74,13 V    | 114,84      | 0,552077 | 0,001395 | 59,39339    | 49,15298 |
| 80        | V | 68,93 V    | 110,25      | 0,325462 | 0,000647 | 54,19339    | 42,488   |
| 100       | V | 91,86 V    | 133,77      | 4,880901 | 0,007768 | 77,12339    | 64,0698  |
| 125       | V | 76,97 V    | 115,8       | 0,616595 | 0,000785 | 62,23339    | 54,1616  |
| 160       | V | 90,54 V    | 123,63      | 1,518798 | 0,001511 | 75,80339    | 59,8474  |
| 200       | V | 76,83 V    | 126,79      | 2,185244 | 0,001739 | 62,09339    | 61,0692  |
| 250       | V | 75,14 V    | 126,36      | 2,079697 | 0,001324 | 60,40339    | 58,701   |
| 315       | V | 74,29 V    | 126,36      | 2,079697 | 0,001051 | 59,55339    | 56,69358 |
| 400       | V | 76,13 V    | 125,52      | 1,887991 | 0,000751 | 61,39339    | 53,7786  |
| 500       | V | 77,33 V    | 130,67      | 3,41586  | 0,001087 | 62,59339    | 56,9904  |
| 630       | V | 78,34 V    | 133,44      | 4,698941 | 0,001187 | 63,60339    | 57,75298 |
| 800       | V | 74,43 V    | 129,51      | 2,988822 | 0,000595 | 59,69339    | 51,748   |
| 1000      | V | 75,82 V    | 131         | 3,548134 | 0,000565 | 61,08339    | 51,2998  |
| 1250      | V | 79,56 V    | 135,49      | 5,949768 | 0,000758 | 64,82339    | 53,8516  |
| 1600      | V | 78,34 V    | 138,8       | 8,709636 | 0,000866 | 63,60339    | 55,0174  |
| 2000      | V | 76,72 V    | 140,8       | 10,96478 | 0,000873 | 61,98339    | 70,0792  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 74,34 V | 134,01 | 5,017646 | 0,000319 | 59,60339 | 61,351   |
| 3150  | V | 75,77 V | 133,61 | 4,791815 | 0,000242 | 61,03339 | 58,94358 |
| 4000  | V | 75,16 V | 129,23 | 2,89401  | 0,000115 | 60,42339 | 52,4886  |
| 5000  | V | 76,88 V | 131,98 | 3,971915 | 0,000126 | 62,14339 | 53,3004  |
| 6300  | V | 75,99 V | 131,96 | 3,96278  | 0,0001   | 61,25339 | 51,27298 |
| 8000  | V | 72,46 V | 126,74 | 2,172701 | 4,32E-05 | 57,72339 | 43,978   |
| 10000 | V | 67,19 V | 119,73 | 0,969393 | 1,54E-05 | 52,45339 | 35,0298  |
| A/L   | V | 97,18 V | 146,71 | 21,6521  |          |          |          |
| W     | V | 88,59 V | 146,59 | 21,35502 |          |          |          |

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Frekvence [Hz]

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-Lw [dB]  
-Lv [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 019

Measured 05-04-04 09:32:40

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

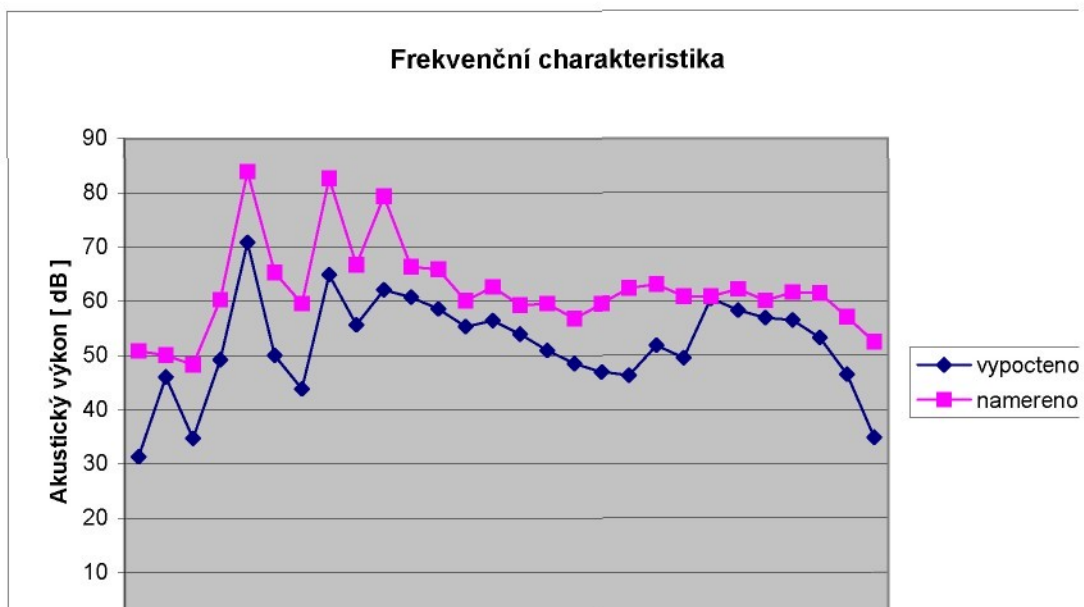
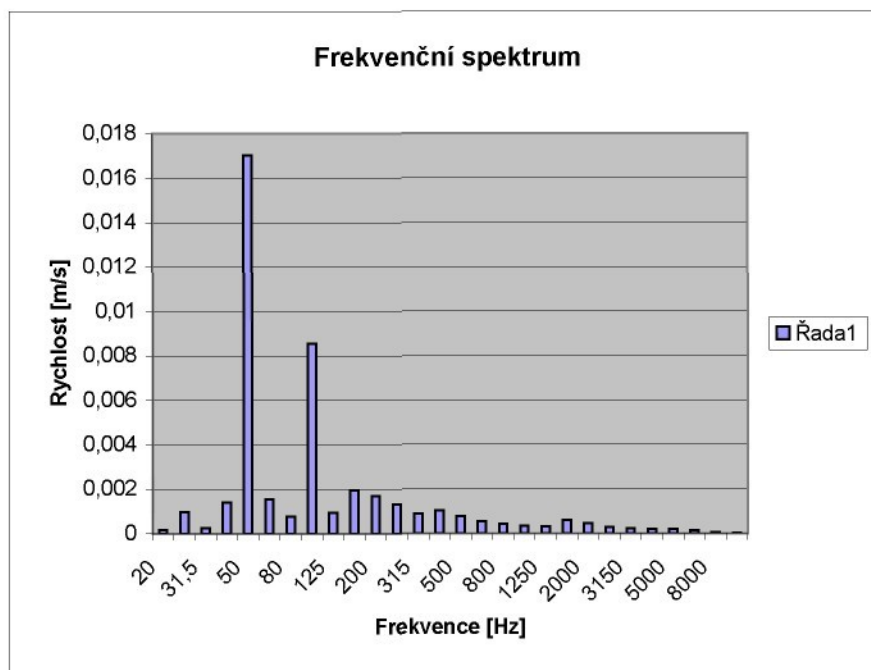
Spectrum r 1

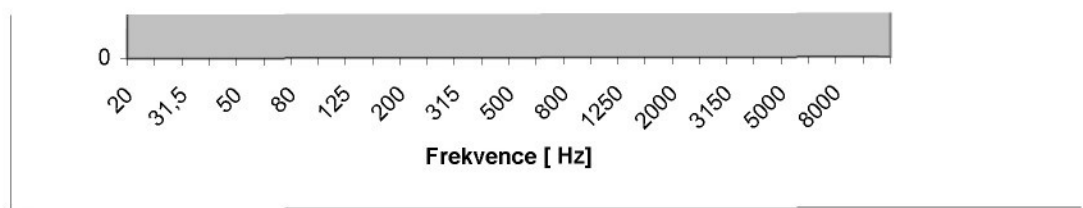
| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 64,09 V     | 110,53      |          |          |          |          |
| 0,5       | V | 63 V        | 112,77      |          |          |          |          |
| 0,63      | V | 62,02 V     | 108,68      |          |          |          |          |
| 0,8       | V | 68,53 V     | 111,05      |          |          | S19 [m2] | fd       |
| 1         | V | 67,1 V      | 110,96      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 68,16 V     | 111,57      |          |          |          |          |
| 1,6       | V | 62,89 V     | 106,35      |          |          |          |          |
| 2         | V | 56,68 V     | 103,93      |          |          |          |          |
| 2,5       | V | 56,82 V     | 97,04       |          |          |          |          |
| 3,15      | V | 56,44 V     | 84,71       |          |          |          |          |
| 4         | V | 52,73 V     | 82,12       |          |          |          |          |
| 5         | V | 50,61 V     | 83,44       |          |          |          |          |
| 6,3       | V | 55,13 V     | 78,69       |          |          |          |          |
| 8         | V | 57,27 V     | 82,12       |          |          |          |          |
| 10        | V | 58,61 V     | 82,83       |          |          |          |          |
| 12,5      | V | 56,51 V     | 94,17       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 55,78 V     | 83,23       |          |          |          |          |
| 20        | V | 65,59 V     | 87,09       | 0,02262  | 0,00018  | 50,85339 | 31,3692  |
| 25        | V | 64,79 V     | 103,71      | 0,153285 | 0,000976 | 50,05339 | 46,051   |
| 31,5      | V | 63,03 V     | 94,42       | 0,052602 | 0,000266 | 48,29339 | 34,75358 |
| 40        | V | 75,05 V     | 111         | 0,354813 | 0,001412 | 60,31339 | 49,2586  |
| 50        | V | 98,63 V     | 134,57      | 5,351802 | 0,017035 | 83,89339 | 70,8904  |
| 63        | V | 80,03 V     | 115,73      | 0,611646 | 0,001545 | 65,29339 | 50,04298 |
| 80        | V | 74,34 V     | 111,62      | 0,381066 | 0,000758 | 59,60339 | 43,858   |
| 100       | V | 97,41 V     | 134,62      | 5,382698 | 0,008567 | 82,67339 | 64,9198  |
| 125       | V | 81,49 V     | 117,35      | 0,737055 | 0,000938 | 66,75339 | 55,7116  |
| 160       | V | 94,12 V     | 125,89      | 1,970153 | 0,00196  | 79,38339 | 62,1074  |
| 200       | V | 81,09 V     | 126,5       | 2,113489 | 0,001682 | 66,35339 | 60,7792  |
| 250       | V | 80,62 V     | 126,29      | 2,063004 | 0,001313 | 65,88339 | 58,631   |
| 315       | V | 74,83 V     | 125,02      | 1,782379 | 0,000901 | 60,09339 | 55,35358 |
| 400       | V | 77,42 V     | 128,17      | 2,561533 | 0,001019 | 62,68339 | 56,4286  |
| 500       | V | 74,03 V     | 127,63      | 2,407133 | 0,000766 | 59,29339 | 53,9504  |
| 630       | V | 74,34 V     | 126,67      | 2,155262 | 0,000544 | 59,60339 | 50,98298 |
| 800       | V | 71,52 V     | 126,31      | 2,067759 | 0,000411 | 56,78339 | 48,548   |
| 1000      | V | 74,25 V     | 126,62      | 2,142891 | 0,000341 | 59,51339 | 46,9198  |
| 1250      | V | 77,09 V     | 127,87      | 2,474571 | 0,000315 | 62,35339 | 46,2316  |
| 1600      | V | 77,8 V      | 135,58      | 6,011737 | 0,000598 | 63,06339 | 51,7974  |
| 2000      | V | 75,56 V     | 135,2       | 5,754399 | 0,000458 | 60,82339 | 49,4792  |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 75,59 V  | 133,11 | 4,523765 | 0,000288 | 60,85339 | 60,451   |
| 3150  | V | 76,9 V   | 132,97 | 4,451435 | 0,000225 | 62,16339 | 58,30358 |
| 4000  | V | 74,79 V  | 133,63 | 4,802861 | 0,000191 | 60,05339 | 56,8886  |
| 5000  | V | 76,36 V  | 135,13 | 5,708211 | 0,000182 | 61,62339 | 56,4504  |
| 6300  | V | 76,13 V  | 133,91 | 4,960209 | 0,000125 | 61,39339 | 53,22298 |
| 8000  | V | 71,8 V   | 129,25 | 2,900681 | 5,77E-05 | 57,06339 | 46,488   |
| 10000 | V | 67,19 V  | 119,54 | 0,948418 | 1,51E-05 | 52,45339 | 34,8398  |
| A/L   | V | 102,09 V | 146,54 | 21,23244 |          |          |          |
| W     | V | 88,78 V  | 144,87 | 17,51862 |          |          |          |

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 020

Measured 05-04-04 09:35:04

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 71,28 V    | 125,96      |          |          |          |          |
| 0,5       | V | 66,16 V    | 124,43      |          |          |          |          |
| 0,63      | V | 64,84 V    | 118,13      |          |          |          |          |
| 0,8       | V | 65,33 V    | 113,66      |          |          | S20 [m2] | fd       |
| 1         | V | 62,96 V    | 110,11      |          |          | 0,075    | 1303,58  |
| 1,25      | V | 72,34 V    | 106,44      |          |          |          |          |
| 1,6       | V | 61,92 V    | 101,2       |          |          |          |          |
| 2         | V | 55,2 V     | 91,44       |          |          |          |          |
| 2,5       | V | 57,71 V    | 89,63       |          |          |          |          |
| 3,15      | V | 51,6 V     | 77,73       |          |          |          |          |
| 4         | V | 49,74 V    | 83,75       |          |          |          |          |
| 5         | V | 49,15 V    | 80,15       |          |          |          |          |
| 6,3       | V | 53,01 V    | -256,12     |          |          |          |          |
| 8         | V | 52,66 V    | 82,31       |          |          |          |          |
| 10        | V | 56,98 V    | 76,48       |          |          |          |          |
| 12,5      | V | 56,25 V    | -256,12     |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 54,89 V    | 84,01       |          |          |          |          |
| 20        | V | 64,25 V    | 83,87       | 0,015613 | 0,000124 | 53,00061 | 31,63642 |
| 25        | V | 63,59 V    | 96,12       | 0,063973 | 0,000407 | 52,34061 | 41,94822 |
| 31,5      | V | 62,44 V    | 88,4        | 0,026303 | 0,000133 | 51,19061 | 32,2208  |
| 40        | V | 65,52 V    | 98,73       | 0,086397 | 0,000344 | 54,27061 | 40,47582 |
| 50        | V | 85,46 V    | 107,74      | 0,243781 | 0,000776 | 74,21061 | 47,54762 |
| 63        | V | 69,1 V     | 98,23       | 0,081564 | 0,000206 | 57,85061 | 36,0302  |
| 80        | V | 62,63 V    | 102,87      | 0,139155 | 0,000277 | 51,38061 | 38,59522 |
| 100       | V | 81,23 V    | 110,42      | 0,331894 | 0,000528 | 69,98061 | 44,20702 |
| 125       | V | 66,89 V    | 105,05      | 0,178855 | 0,000228 | 55,64061 | 46,89882 |
| 160       | V | 79,14 V    | 109,45      | 0,296825 | 0,000295 | 67,89061 | 49,15462 |
| 200       | V | 71,02 V    | 109,66      | 0,304089 | 0,000242 | 59,77061 | 47,42642 |
| 250       | V | 70,11 V    | 105,92      | 0,197697 | 0,000126 | 58,86061 | 41,74822 |
| 315       | V | 70,91 V    | 104,82      | 0,174181 | 8,8E-05  | 59,66061 | 38,6408  |
| 400       | V | 74,43 V    | 112,16      | 0,405509 | 0,000161 | 63,18061 | 43,90582 |
| 500       | V | 77,23 V    | 119,31      | 0,923634 | 0,000294 | 65,98061 | 49,11762 |
| 630       | V | 78,34 V    | 116,93      | 0,702263 | 0,000177 | 67,09061 | 44,7302  |
| 800       | V | 73,92 V    | 114,37      | 0,522998 | 0,000104 | 62,67061 | 40,09522 |
| 1000      | V | 78,95 V    | 119,87      | 0,985145 | 0,000157 | 67,70061 | 58,65702 |
| 1250      | V | 82,45 V    | 122,22      | 1,291219 | 0,000164 | 71,20061 | 59,06882 |
| 1600      | V | 84,19 V    | 131,37      | 3,702542 | 0,000368 | 72,94061 | 66,07462 |
| 2000      | V | 78,69 V    | 129         | 2,818383 | 0,000224 | 67,44061 | 61,76642 |

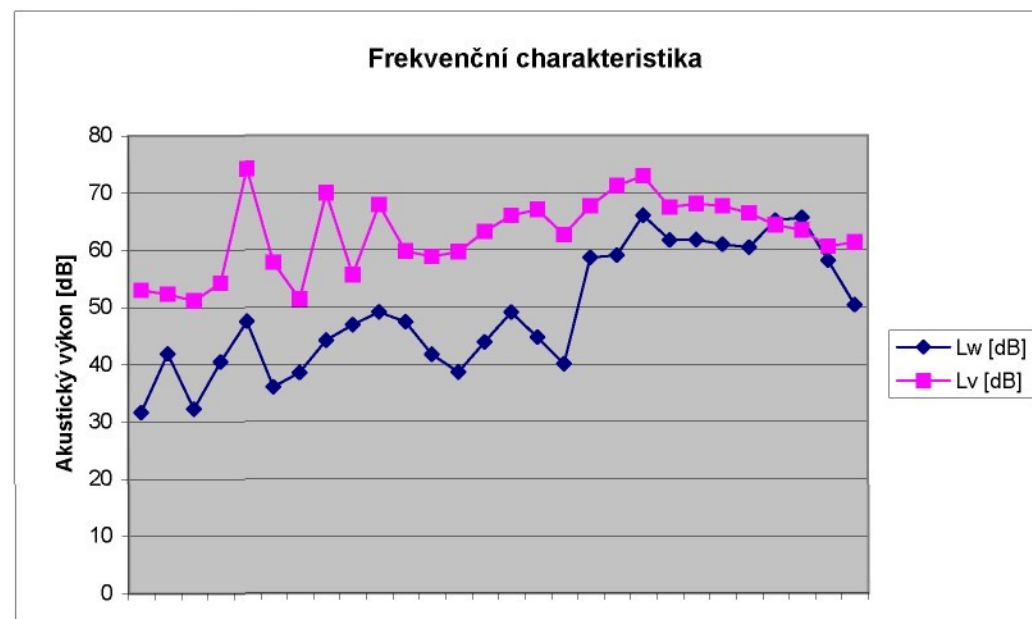
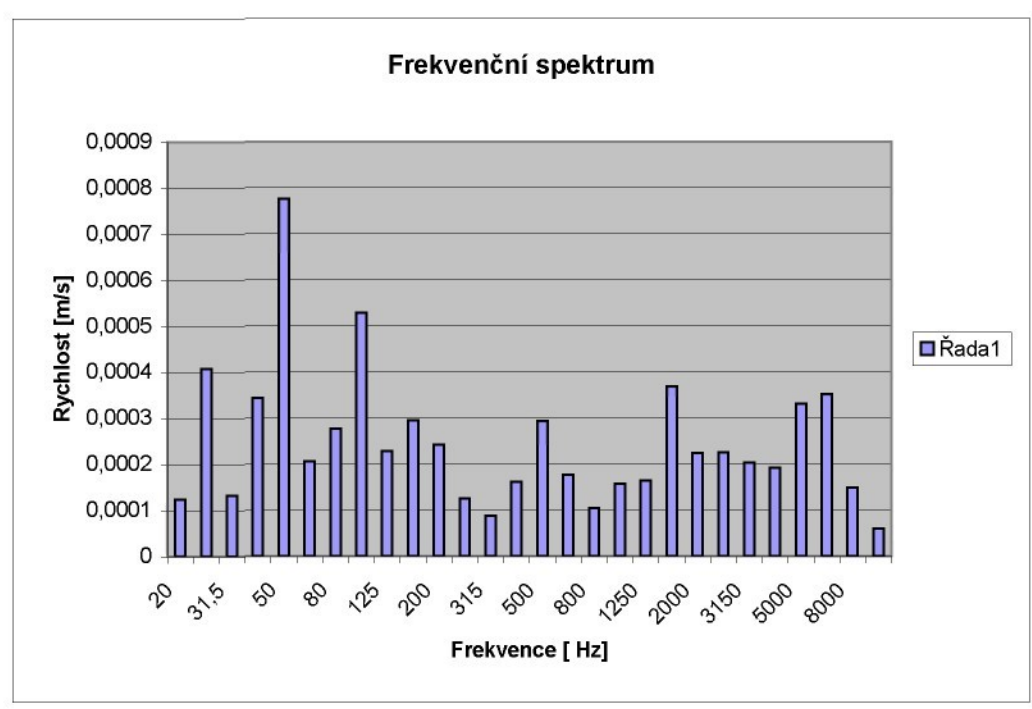


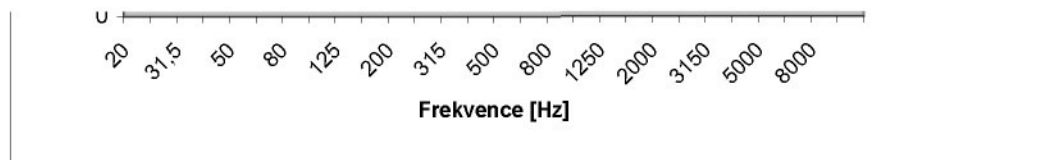
|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 79,35 V | 130,97 | 3,5359   | 0,000225 | 68,10061 | 61,79822 |
| 3150  | V | 78,95 V | 132,12 | 4,036454 | 0,000204 | 67,70061 | 60,9408  |
| 4000  | V | 77,7 V  | 133,7  | 4,841724 | 0,000193 | 66,45061 | 60,44582 |
| 5000  | V | 75,61 V | 140,33 | 10,38724 | 0,000331 | 64,36061 | 65,13762 |
| 6300  | V | 74,76 V | 142,87 | 13,91554 | 0,000352 | 63,51061 | 65,6702  |
| 8000  | V | 71,87 V | 137,46 | 7,464488 | 0,000149 | 60,62061 | 58,18522 |
| 10000 | V | 72,62 V | 131,63 | 3,815048 | 6,07E-05 | 61,37061 | 50,41702 |
| A/L   | V | 92,38 V | 146,92 | 22,18196 | #####    |          |          |
| W     | V | 90,83 V | 146,61 | 21,40425 | #####    |          |          |

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Lw [dB]  
Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 021

Measured 05-04-04 09:35:38

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:10.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 69,38 V    | 110,58      |          |          |          |          |
| 0,5       | V | 73,16 V    | 114,86      |          |          |          |          |
| 0,63      | V | 74,32 V    | 110,68      |          |          |          |          |
| 0,8       | V | 72,81 V    | 111,38      |          |          | S21 [m2] | fd       |
| 1         | V | 73,09 V    | 113,57      |          |          | 0,075    | 1303,58  |
| 1,25      | V | 69,43 V    | 112,79      |          |          |          |          |
| 1,6       | V | 56,47 V    | 101,83      |          |          |          |          |
| 2         | V | 59,48 V    | 94,05       |          |          |          |          |
| 2,5       | V | 56,44 V    | 89,46       |          |          |          |          |
| 3,15      | V | 55,06 V    | 82,5        |          |          |          |          |
| 4         | V | 53,24 V    | 85,68       |          |          |          |          |
| 5         | V | 46,35 V    | 82,83       |          |          |          |          |
| 6,3       | V | 52,56 V    | -256,12     |          |          |          |          |
| 8         | V | 53,27 V    | 83,44       |          |          |          |          |
| 10        | V | 58,09 V    | 78,69       |          |          |          |          |
| 12,5      | V | 56,23 V    | -256,12     |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 54,49 V    | 84,66       |          |          |          |          |
| 20        | V | 63,19 V    | 84,43       | 0,016653 | 0,000133 | 51,94061 | 32,19642 |
| 25        | V | 64,2 V     | 94,31       | 0,05194  | 0,000331 | 52,95061 | 40,13822 |
| 31,5      | V | 60,75 V    | 90,38       | 0,033037 | 0,000167 | 49,50061 | 34,2008  |
| 40        | V | 65,31 V    | 105,17      | 0,181343 | 0,000722 | 54,06061 | 46,91582 |
| 50        | V | 81,72 V    | 118,51      | 0,842364 | 0,002681 | 70,47061 | 58,31762 |
| 63        | V | 66,34 V    | 101,36      | 0,11695  | 0,000295 | 55,09061 | 39,1602  |
| 80        | V | 62,11 V    | 95,41       | 0,058952 | 0,000117 | 50,86061 | 31,13522 |
| 100       | V | 80,74 V    | 98,87       | 0,087801 | 0,00014  | 69,49061 | 32,65702 |
| 125       | V | 67,03 V    | 100,85      | 0,110281 | 0,00014  | 55,78061 | 42,69882 |
| 160       | V | 80,1 V     | 102,63      | 0,135363 | 0,000135 | 68,85061 | 42,33462 |
| 200       | V | 71,89 V    | 109,99      | 0,315864 | 0,000251 | 60,64061 | 47,75642 |
| 250       | V | 68,65 V    | 104,09      | 0,16014  | 0,000102 | 57,40061 | 39,91822 |
| 315       | V | 71,75 V    | 110,21      | 0,323966 | 0,000164 | 60,50061 | 44,0308  |
| 400       | V | 71,87 V    | 119,09      | 0,900534 | 0,000358 | 60,62061 | 50,83582 |
| 500       | V | 73,26 V    | 127,56      | 2,387811 | 0,00076  | 62,01061 | 57,36762 |
| 630       | V | 78,9 V     | 128,22      | 2,576321 | 0,000651 | 67,65061 | 56,0202  |
| 800       | V | 74,08 V    | 122,62      | 1,352073 | 0,000269 | 62,83061 | 63,34522 |
| 1000      | V | 75,4 V     | 121,59      | 1,200881 | 0,000191 | 64,15061 | 60,37702 |
| 1250      | V | 78,74 V    | 122,13      | 1,277909 | 0,000163 | 67,49061 | 58,97882 |
| 1600      | V | 78,13 V    | 125,02      | 1,782379 | 0,000177 | 66,88061 | 59,72462 |
| 2000      | V | 78,24 V    | 123,96      | 1,577611 | 0,000126 | 66,99061 | 56,72642 |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 77,19 V | 134,08 | 5,058247 | 0,000322 | 65,94061 | 64,90822 |
| 3150  | V | 75,21 V | 129,73 | 3,065491 | 0,000155 | 63,96061 | 58,5508  |
| 4000  | V | 73,26 V | 130,67 | 3,41586  | 0,000136 | 62,01061 | 57,41582 |
| 5000  | V | 74,62 V | 129,56 | 3,006076 | 9,57E-05 | 63,37061 | 54,36762 |
| 6300  | V | 72,91 V | 131,94 | 3,953666 | 9,99E-05 | 61,66061 | 54,7402  |
| 8000  | V | 69,71 V | 124,08 | 1,599558 | 3,18E-05 | 58,46061 | 44,80522 |
| 10000 | V | 68,16 V | 121,24 | 1,153453 | 1,84E-05 | 56,91061 | 40,02702 |
| A/L   | V | 89,91 V | 141,06 | 11,29796 | #####    |          |          |
| W     | V | 87,72 V | 140,05 | 10,05773 | #####    |          |          |

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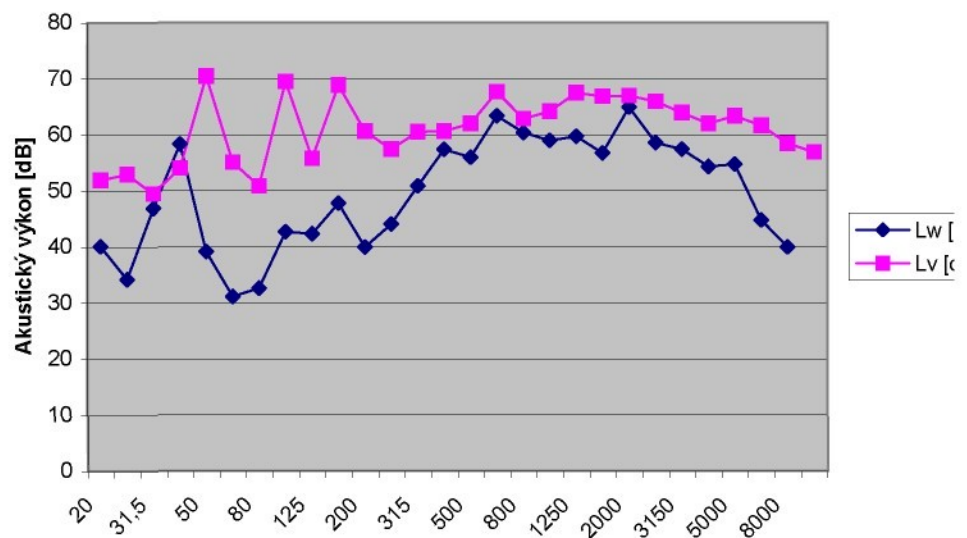
# Frekvenční charakteristika

Řada

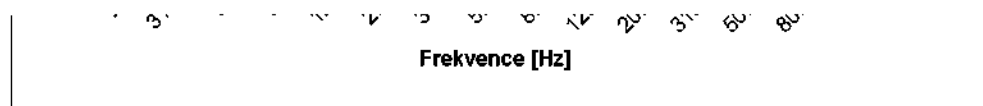
10\*log sigma

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Frekvenční charakteristika









◆ Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 031

Measured 05-04-04 09:38:10

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

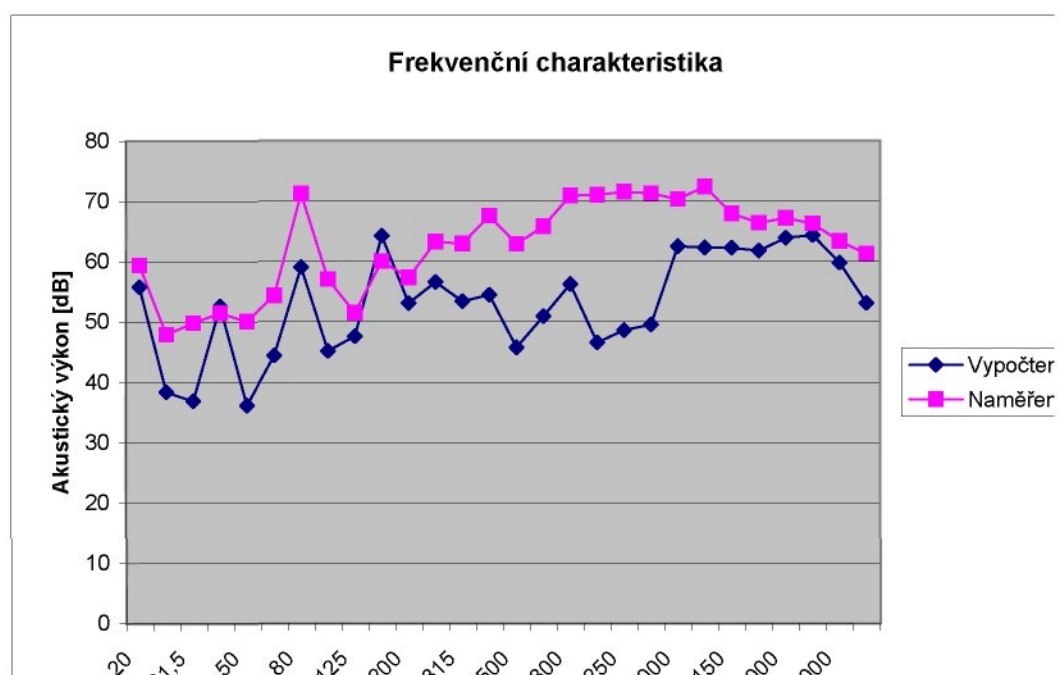
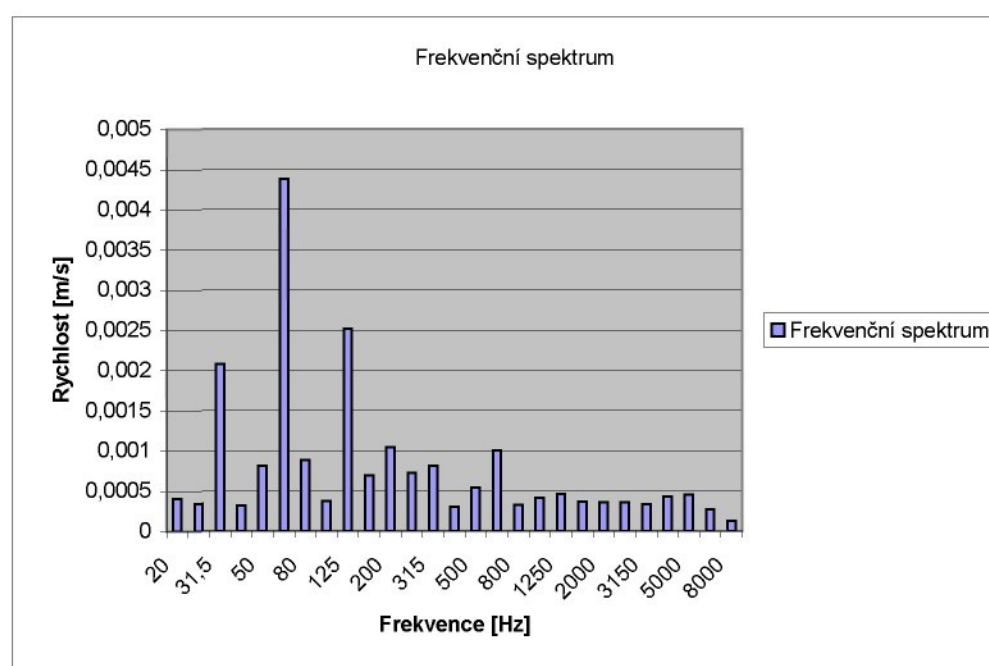
Spectrum r 1

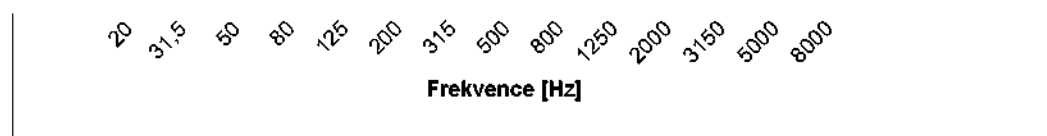
| Frequency | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|------------|-------------|----------|----------|----------|----------|
| 0,4       | V 71,4     | V 111,87    |          |          |          |          |
| 0,5       | V 76,06    | V 111,85    |          |          |          |          |
| 0,63      | V 74,6     | V 119,85    |          |          |          |          |
| 0,8       | V 69,68    | V 112,98    |          |          | S1 [m2]  | fd       |
| 1         | V 72,08    | V 112,18    |          |          | 0,0336   | 1947,595 |
| 1,25      | V 71,45    | V 116,56    |          |          |          |          |
| 1,6       | V 67,99    | V 106,56    |          |          |          |          |
| 2         | V 64,44    | V 102,99    |          |          |          |          |
| 2,5       | V 66,39    | V 102,3     |          |          |          |          |
| 3,15      | V 60,23    | V 93,11     |          |          |          |          |
| 4         | V 58,7     | V 91,44     |          |          |          |          |
| 5         | V 52,33    | V 91,04     |          |          |          |          |
| 6,3       | V 52,16    | V 84,71     |          |          |          |          |
| 8         | V 53,93    | V 86,62     |          |          |          |          |
| 10        | V 60,02    | V 85,51     |          |          |          |          |
| 12,5      | V 56,56    | V 85,02     |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V 56,49    | V 91,18     |          |          |          |          |
| 20        | V 74,13    | V 111,5     | 0,375837 | 0,002991 | 59,39339 | 55,7792  |
| 25        | V 62,68    | V 96,05     | 0,06346  | 0,000404 | 47,94339 | 38,391   |
| 31,5      | V 64,58    | V 96,56     | 0,067298 | 0,00034  | 49,84339 | 36,89358 |
| 40        | V 66,23    | V 114,34    | 0,521195 | 0,002074 | 51,49339 | 52,5986  |
| 50        | V 64,84    | V 99,86     | 0,098401 | 0,000313 | 50,10339 | 36,1804  |
| 63        | V 69,12    | V 110,13    | 0,320996 | 0,000811 | 54,38339 | 44,44298 |
| 80        | V 85,98    | V 126,86    | 2,202926 | 0,004383 | 71,24339 | 59,098   |
| 100       | V 71,82    | V 114,89    | 0,555265 | 0,000884 | 57,08339 | 45,1898  |
| 125       | V 66,23    | V 109,26    | 0,290402 | 0,00037  | 51,49339 | 47,6216  |
| 160       | V 74,79    | V 128,06    | 2,529298 | 0,002516 | 60,05339 | 64,2774  |
| 200       | V 72,06    | V 118,81    | 0,871967 | 0,000694 | 57,32339 | 53,0892  |
| 250       | V 77,99    | V 124,27    | 1,634933 | 0,001041 | 63,25339 | 56,611   |
| 315       | V 77,7     | V 123,09    | 1,42725  | 0,000721 | 62,96339 | 53,42358 |
| 400       | V 82,29    | V 126,2     | 2,041738 | 0,000812 | 67,55339 | 54,4586  |
| 500       | V 77,66    | V 119,42    | 0,935406 | 0,000298 | 62,92339 | 45,7404  |
| 630       | V 80,57    | V 126,57    | 2,130591 | 0,000538 | 65,83339 | 50,88298 |
| 800       | V 85,68    | V 134,01    | 5,017646 | 0,000998 | 70,94339 | 56,248   |
| 1000      | V 85,79    | V 126,24    | 2,051162 | 0,000326 | 71,05339 | 46,5398  |
| 1250      | V 86,29    | V 130,24    | 3,250873 | 0,000414 | 71,55339 | 48,6016  |
| 1600      | V 86,03    | V 133,3     | 4,62381  | 0,00046  | 71,29339 | 49,5174  |
| 2000      | V 85,09    | V 133,25    | 4,59727  | 0,000366 | 70,35339 | 62,5292  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 87,13 V | 134,97 | 5,604024 | 0,000357 | 72,39339 | 62,311   |
| 3150  | V | 82,69 V | 136,95 | 7,038822 | 0,000356 | 67,95339 | 62,28358 |
| 4000  | V | 81,14 V | 138,52 | 8,433348 | 0,000336 | 66,40339 | 61,7786  |
| 5000  | V | 81,94 V | 142,57 | 13,44312 | 0,000428 | 67,20339 | 63,8904  |
| 6300  | V | 81,02 V | 145,08 | 17,94734 | 0,000453 | 66,28339 | 64,39298 |
| 8000  | V | 78,1 V  | 142,59 | 13,47411 | 0,000268 | 63,36339 | 59,828   |
| 10000 | V | 76,03 V | 137,86 | 7,816278 | 0,000124 | 61,29339 | 53,1598  |
| A/L   | V | 96,19 V | 150,19 | 32,32213 | #####    |          |          |
| W     | V | 95,77 V | 150,04 | 31,76874 | #####    |          |          |

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 032

Measured 05-04-04 09:38:28

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

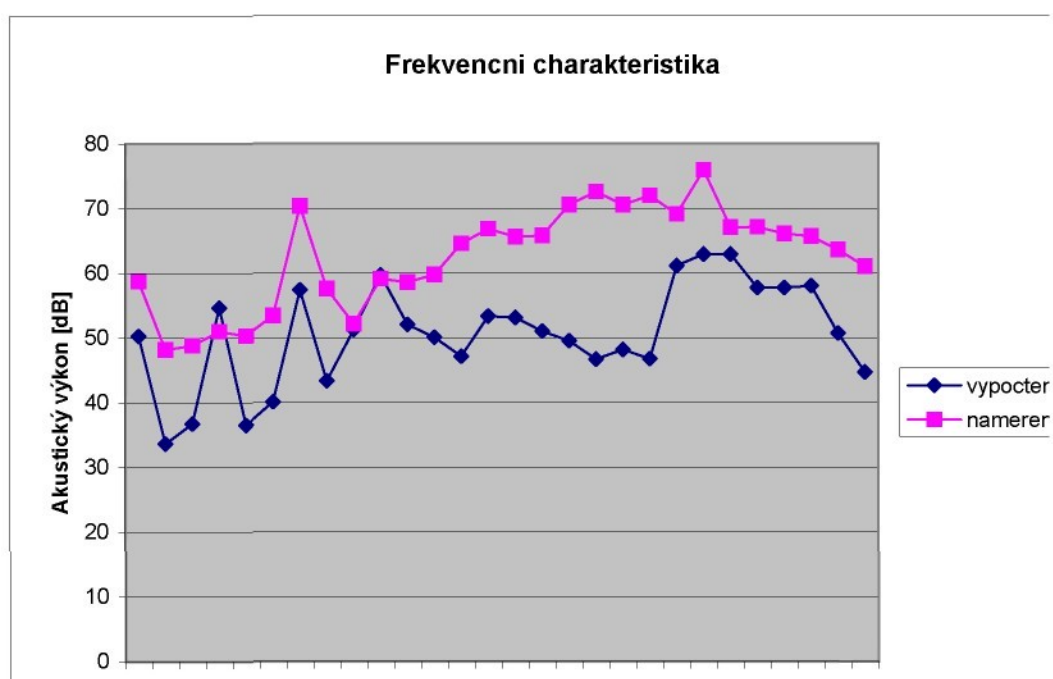
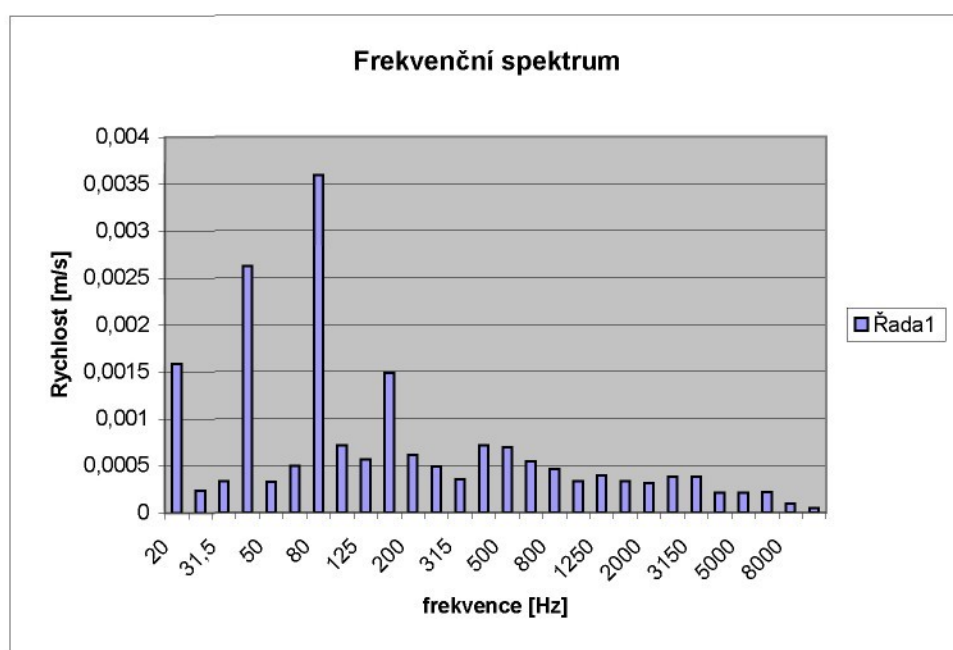
( Start of Data )

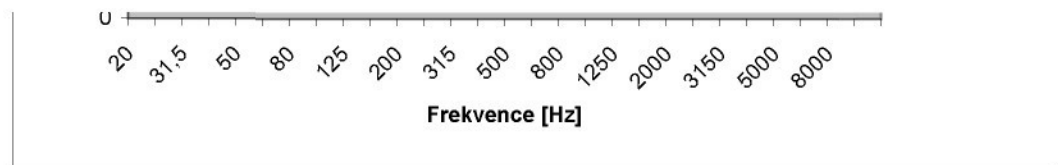
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | ○ | 70,65 V    | 109,95     |          |          |          |          |
| 0,5       | ○ | 68,98 V    | 121,12     |          |          |          |          |
| 0,63      | ○ | 64,09 V    | 116,39     |          |          |          |          |
| 0,8       | ○ | 64,23 V    | 124,74     |          |          | S2 [m2]  | fd       |
| 1         | ○ | 69,94 V    | 120,55     |          |          | 0,0336   | 1947,595 |
| 1,25      | ○ | 65,8 V     | 112,39     |          |          |          |          |
| 1,6       | ○ | 57,24 V    | 103,74     |          |          |          |          |
| 2         | ○ | 64,2 V     | 107,45     |          |          |          |          |
| 2,5       | ○ | 63,57 V    | 103,41     |          |          |          |          |
| 3,15      | ○ | 63,52 V    | 95,67      |          |          |          |          |
| 4         | ○ | 58,87 V    | 89,32      |          |          |          |          |
| 5         | ○ | 55,34 V    | 84,24      |          |          |          |          |
| 6,3       | ○ | 55,06 V    | -256,12    |          |          |          |          |
| 8         | ○ | 54,75 V    | 83,44      |          |          |          |          |
| 10        | ○ | 56,89 V    | 79,49      |          |          |          |          |
| 12,5      | ○ | 57,43 V    | 86,31      |          |          | Lv [dB]  | Lw [dB]  |
| 16        | ○ | 57,38 V    | 88,94      |          |          |          |          |
| 20        | ○ | 73,47 V    | 106        | 0,199526 | 0,001588 | 58,73339 | 50,2792  |
| 25        | ○ | 62,91 V    | 91,3       | 0,036728 | 0,000234 | 48,17339 | 33,641   |
| 31,5      | ○ | 63,59 V    | 96,45      | 0,066451 | 0,000336 | 48,85339 | 36,78358 |
| 40        | ○ | 65,76 V    | 116,39     | 0,659933 | 0,002626 | 51,02339 | 54,6486  |
| 50        | ○ | 65,03 V    | 100,19     | 0,102212 | 0,000325 | 50,29339 | 36,5104  |
| 63        | ○ | 68,16 V    | 105,83     | 0,195659 | 0,000494 | 53,42339 | 40,14298 |
| 80        | ○ | 85,11 V    | 125,14     | 1,807174 | 0,003595 | 70,37339 | 57,378   |
| 100       | ○ | 72,34 V    | 113,05     | 0,449262 | 0,000715 | 57,60339 | 43,3498  |
| 125       | ○ | 66,89 V    | 112,91     | 0,442079 | 0,000563 | 52,15339 | 51,2716  |
| 160       | ○ | 73,87 V    | 123,49     | 1,494514 | 0,001487 | 59,13339 | 59,7074  |
| 200       | ○ | 73,33 V    | 117,75     | 0,771792 | 0,000614 | 58,59339 | 52,0292  |
| 250       | ○ | 74,48 V    | 117,71     | 0,768245 | 0,000489 | 59,74339 | 50,051   |
| 315       | ○ | 79,3 V     | 116,81     | 0,692628 | 0,00035  | 64,56339 | 47,14358 |
| 400       | ○ | 81,56 V    | 125,07     | 1,792669 | 0,000713 | 66,82339 | 53,3286  |
| 500       | ○ | 80,36 V    | 126,81     | 2,190282 | 0,000697 | 65,62339 | 53,1304  |
| 630       | ○ | 80,55 V    | 126,71     | 2,16521  | 0,000547 | 65,81339 | 51,02298 |
| 800       | ○ | 85,3 V     | 127,3      | 2,317395 | 0,000461 | 70,56339 | 49,538   |
| 1000      | ○ | 87,32 V    | 126,39     | 2,086892 | 0,000332 | 72,58339 | 46,6898  |
| 1250      | ○ | 85,3 V     | 129,82     | 3,097419 | 0,000394 | 70,56339 | 48,1816  |
| 1600      | ○ | 86,71 V    | 130,52     | 3,357376 | 0,000334 | 71,97339 | 46,7374  |
| 2000      | ○ | 83,84 V    | 131,87     | 3,921931 | 0,000312 | 69,10339 | 61,1492  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | ○ | 90,69 V | 135,58 | 6,011737 | 0,000383 | 75,95339 | 62,921   |
| 3150  | ○ | 81,84 V | 137,58 | 7,568329 | 0,000382 | 67,10339 | 62,91358 |
| 4000  | ○ | 81,89 V | 134,48 | 5,296634 | 0,000211 | 67,15339 | 57,7386  |
| 5000  | ○ | 80,81 V | 136,4  | 6,606934 | 0,00021  | 66,07339 | 57,7204  |
| 6300  | ○ | 80,43 V | 138,71 | 8,619856 | 0,000218 | 65,69339 | 58,02298 |
| 8000  | ○ | 78,36 V | 133,46 | 4,709773 | 9,37E-05 | 63,62339 | 50,698   |
| 10000 | ○ | 75,8 V  | 129,44 | 2,964831 | 4,72E-05 | 61,06339 | 44,7398  |
| A/L   | ○ | 96,66 V | 145,48 | 18,79317 | #####    |          |          |
| W     | ○ | 96,64 V | 145,36 | 18,53532 | #####    |          |          |
| L     |   |         |        |          |          |          |          |

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 033

Measured 05-04-04 09:38:42

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

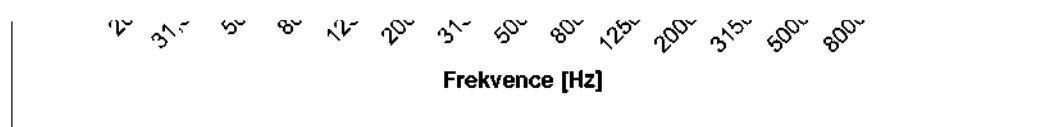
| Frequency | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |         |
|-----------|------------|-------------|----------|----------|----------|----------|---------|
| 0,4       | V 64,2     | 118,65      |          |          |          |          |         |
| 0,5       | V 71,33    | 117,66      |          |          |          |          |         |
| 0,63      | V 75,87    | 110,25      |          |          |          |          |         |
| 0,8       | V 64,32    | 117,24      |          |          | S3 [m2]  | fd       |         |
| 1         | V 65,66    | 117,99      |          |          | 0,0336   | 1947,595 |         |
| 1,25      | V 66,6     | 107,55      |          |          |          |          |         |
| 1,6       | V 65,97    | 105,62      |          |          |          |          |         |
| 2         | V 69,78    | 106,51      |          |          |          |          |         |
| 2,5       | V 60,54    | 102,87      |          |          |          |          |         |
| 3,15      | V 61,24    | 93,84       |          |          |          |          |         |
| 4         | V 63,59    | 85,84       |          |          |          |          |         |
| 5         | V 61,43    | 83,16       |          |          |          |          |         |
| 6,3       | V 61,24    | 76,48       |          |          |          |          |         |
| 8         | V 66,41    | 82,5        |          |          |          |          |         |
| 10        | V 67,21    | 82,12       |          |          |          |          |         |
| 12,5      | V 67,64    | 75,68       |          |          |          | Lv [dB]  | Lw [dB] |
| 16        | V 68,39    | 84,24       |          |          |          |          |         |
| 20        | V 74,6     | 98,54       | 0,084528 | 0,000673 | 59,86339 | 42,8192  |         |
| 25        | V 72,6     | 89,7        | 0,030549 | 0,000194 | 57,86339 | 32,041   |         |
| 31,5      | V 72,91    | 99,29       | 0,092151 | 0,000466 | 58,17339 | 39,62358 |         |
| 40        | V 71,21    | 118,62      | 0,8531   | 0,003394 | 56,47339 | 56,8786  |         |
| 50        | V 70,39    | 103,27      | 0,145714 | 0,000464 | 55,65339 | 39,5904  |         |
| 63        | V 72,53    | 112,06      | 0,400867 | 0,001013 | 57,79339 | 46,37298 |         |
| 80        | V 95,29    | 136,19      | 6,449113 | 0,01283  | 80,55339 | 68,428   |         |
| 100       | V 78,5     | 120,74      | 1,08893  | 0,001733 | 63,76339 | 51,0398  |         |
| 125       | V 71,68    | 114,65      | 0,540132 | 0,000688 | 56,94339 | 53,0116  |         |
| 160       | V 75,92    | 126,83      | 2,195331 | 0,002184 | 61,18339 | 63,0474  |         |
| 200       | V 72,62    | 115,71      | 0,610239 | 0,000486 | 57,88339 | 49,9892  |         |
| 250       | V 77,75    | 123,23      | 1,450441 | 0,000923 | 63,01339 | 55,571   |         |
| 315       | V 80,2     | 120,15      | 1,017419 | 0,000514 | 65,46339 | 50,48358 |         |
| 400       | V 80,67    | 122,88      | 1,393157 | 0,000554 | 65,93339 | 51,1386  |         |
| 500       | V 78,79    | 125,52      | 1,887991 | 0,000601 | 64,05339 | 51,8404  |         |
| 630       | V 81,25    | 127,07      | 2,256836 | 0,00057  | 66,51339 | 51,38298 |         |
| 800       | V 85,06    | 125,87      | 1,965622 | 0,000391 | 70,32339 | 48,108   |         |
| 1000      | V 90,19    | 123         | 1,412538 | 0,000225 | 75,45339 | 43,2998  |         |
| 1250      | V 83,77    | 126,71      | 2,16521  | 0,000276 | 69,03339 | 45,0716  |         |
| 1600      | V 85,68    | 132,34      | 4,139997 | 0,000412 | 70,94339 | 48,5574  |         |
| 2000      | V 85,65    | 138,38      | 8,298508 | 0,00066  | 70,91339 | 67,6592  |         |

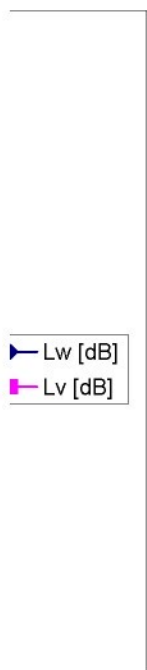
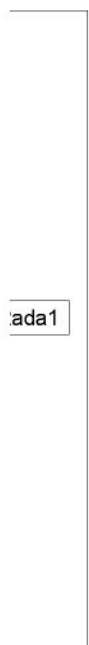


|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 84,15 V | 138,99 | 8,902254 | 0,000567 | 69,41339 | 66,331   |
| 3150  | V | 82,71 V | 143,95 | 15,75796 | 0,000796 | 67,97339 | 69,28358 |
| 4000  | V | 79,44 V | 138,66 | 8,570378 | 0,000341 | 64,70339 | 61,9186  |
| 5000  | V | 79,37 V | 133,89 | 4,948801 | 0,000158 | 64,63339 | 55,2104  |
| 6300  | V | 79,47 V | 129,56 | 3,006076 | 7,59E-05 | 64,73339 | 48,87298 |
| 8000  | V | 79,02 V | 124,22 | 1,625549 | 3,23E-05 | 64,28339 | 41,458   |
| 10000 | V | 75,82 V | 122,08 | 1,270574 | 2,02E-05 | 61,08339 | 37,3798  |
| A/L   | V | 98,63 V | 148,21 | 25,73357 | #####    |          |          |
| W     | V | 95,69 V | 147,79 | 24,51884 | #####    |          |          |

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 034

Measured 05-04-04 09:38:56

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|-------------|-------------|----------|----------|---------|----------|
| 0,4       | V | 67,83 V     | 111,97      |          |          |         |          |
| 0,5       | V | 72,72 V     | 114,79      |          |          |         |          |
| 0,63      | V | 76,27 V     | 113,92      |          |          |         |          |
| 0,8       | V | 75,61 V     | 119,05      |          |          | S4 [m2] | fd       |
| 1         | V | 69,87 V     | 119,66      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 73,33 V     | 117,71      |          |          |         |          |
| 1,6       | V | 69,99 V     | 113,19      |          |          |         |          |
| 2         | V | 68,58 V     | 108,7       |          |          |         |          |
| 2,5       | V | 65,97 V     | 100,54      |          |          |         |          |
| 3,15      | V | 68,79 V     | 92,33       |          |          |         |          |
| 4         | V | 66,3 V      | 87,49       |          |          |         |          |
| 5         | V | 71,05 V     | 77,73       |          |          |         |          |
| 6,3       | V | 68,01 V     | 74,72       |          |          |         |          |
| 8         | V | 68,46 V     | 83,16       |          |          |         |          |
| 10        | V | 67,31 V     | 71,71       |          |          |         |          |
| 12,5      | V | 65,76 V     | 77,73       |          |          | Lv [dB] | Lw [dB]  |
| 16        | V | 65,33 V     | 84,36       |          |          |         |          |
| 20        | V | 73,8 V      | 100,33      | 0,103872 | 0,000827 | 60,7897 | 46,3355  |
| 25        | V | 67,8 V      | 89,58       | 0,03013  | 0,000192 | 54,7897 | 33,6473  |
| 31,5      | V | 67,9 V      | 92,57       | 0,042511 | 0,000215 | 54,8897 | 34,62989 |
| 40        | V | 64,7 V      | 109,76      | 0,30761  | 0,001224 | 51,6897 | 49,7449  |
| 50        | V | 65,59 V     | 95,04       | 0,056494 | 0,00018  | 52,5797 | 33,0867  |
| 63        | V | 73,38 V     | 100,68      | 0,108143 | 0,000273 | 60,3697 | 36,71929 |
| 80        | V | 96,71 V     | 115,94      | 0,626614 | 0,001247 | 83,6997 | 49,9043  |
| 100       | V | 79,51 V     | 115         | 0,562341 | 0,000895 | 66,4997 | 47,0261  |
| 125       | V | 65,78 V     | 117,28      | 0,731139 | 0,000931 | 52,7697 | 57,3679  |
| 160       | V | 80,83 V     | 132,64      | 4,285485 | 0,004263 | 67,8197 | 70,5837  |
| 200       | V | 70,93 V     | 132,1       | 4,02717  | 0,003205 | 57,9197 | 68,1055  |
| 250       | V | 77,84 V     | 122,53      | 1,338135 | 0,000852 | 64,8297 | 56,5973  |
| 315       | V | 78,5 V      | 111,03      | 0,356041 | 0,00018  | 65,4897 | 43,08989 |
| 400       | V | 80,17 V     | 108,56      | 0,267917 | 0,000107 | 67,1597 | 38,5449  |
| 500       | V | 79,8 V      | 107,5       | 0,237137 | 7,55E-05 | 66,7897 | 35,5467  |
| 630       | V | 80,03 V     | 113,57      | 0,47698  | 0,00012  | 67,0197 | 39,60929 |
| 800       | V | 85,21 V     | 117,59      | 0,757705 | 0,000151 | 72,1997 | 41,5543  |
| 1000      | V | 83,42 V     | 123,16      | 1,438799 | 0,000229 | 70,4097 | 45,1861  |
| 1250      | V | 83,32 V     | 122,6       | 1,348963 | 0,000172 | 70,3097 | 42,6879  |
| 1600      | V | 82,64 V     | 132,9       | 4,415704 | 0,000439 | 69,6297 | 65,8437  |
| 2000      | V | 82,71 V     | 141,44      | 11,80321 | 0,000939 | 69,6997 | 72,4455  |

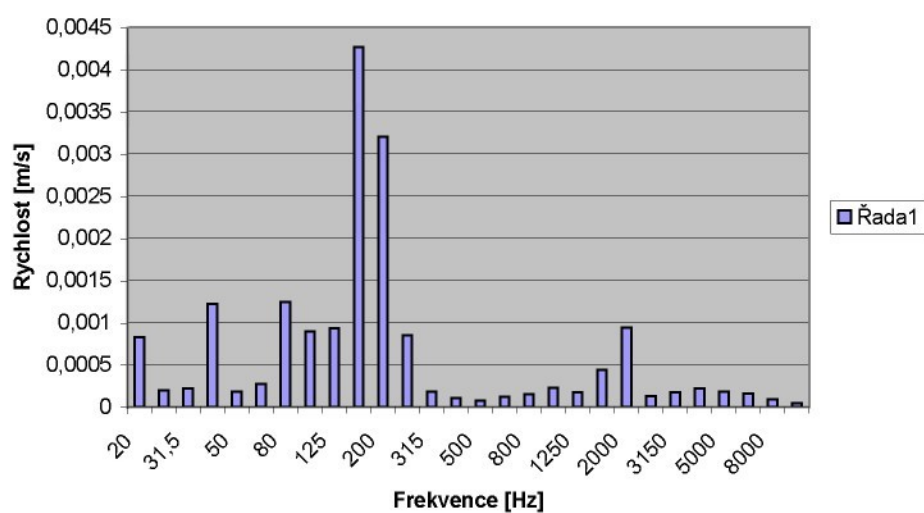
|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 85,56 V | 126,06 | 2,009093 | 0,000128 | 72,5497 | 55,1273  |
| 3150  | V | 82,85 V | 130,5  | 3,349654 | 0,000169 | 69,8397 | 57,55989 |
| 4000  | V | 79,84 V | 134,8  | 5,495409 | 0,000219 | 66,8297 | 59,7849  |
| 5000  | V | 79,09 V | 135,02 | 5,636377 | 0,000179 | 66,0797 | 58,0667  |
| 6300  | V | 78,39 V | 135,79 | 6,158855 | 0,000156 | 65,3797 | 56,82929 |
| 8000  | V | 76,81 V | 132,97 | 4,451435 | 8,86E-05 | 63,7997 | 51,9343  |
| 10000 | V | 74,79 V | 128,95 | 2,802206 | 4,46E-05 | 61,7797 | 45,9761  |
| A/L   | V | 98,7 V  | 149,48 | 29,78516 | #####    |         |          |
| W     | V | 93,98 V | 145,41 | 18,64232 | #####    |         |          |

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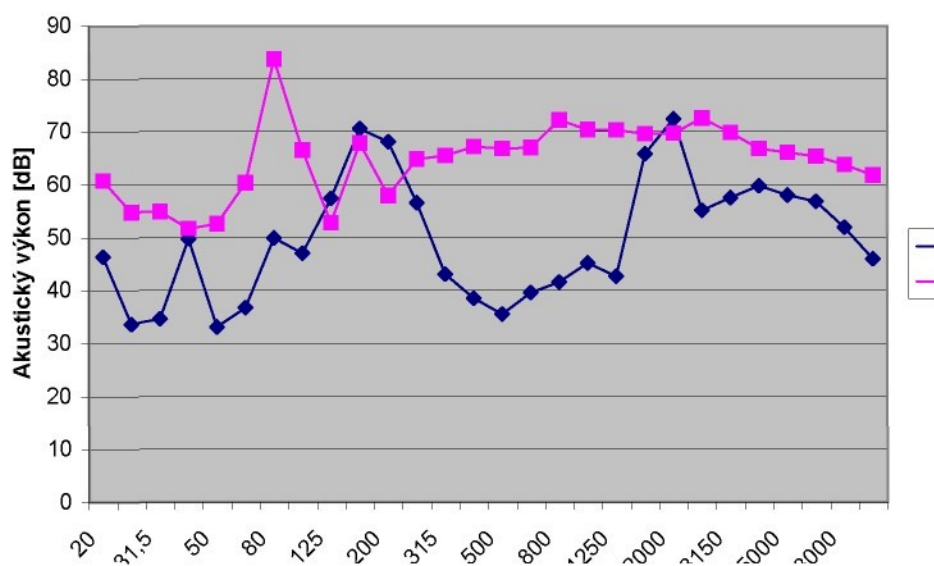
10\*log sigma

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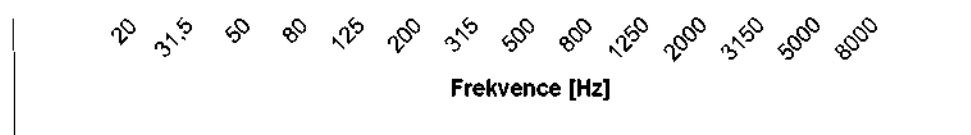
Frekvenční spektrum



Frekvenční charakteristika

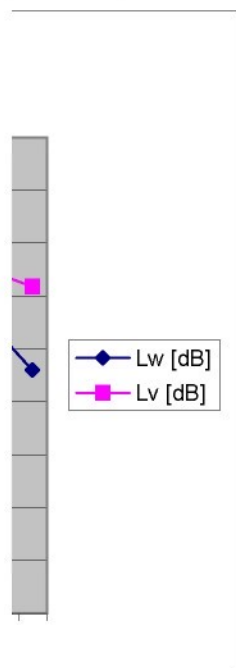








■ Rada1





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 035

Measured 05-04-04 09:39:16

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

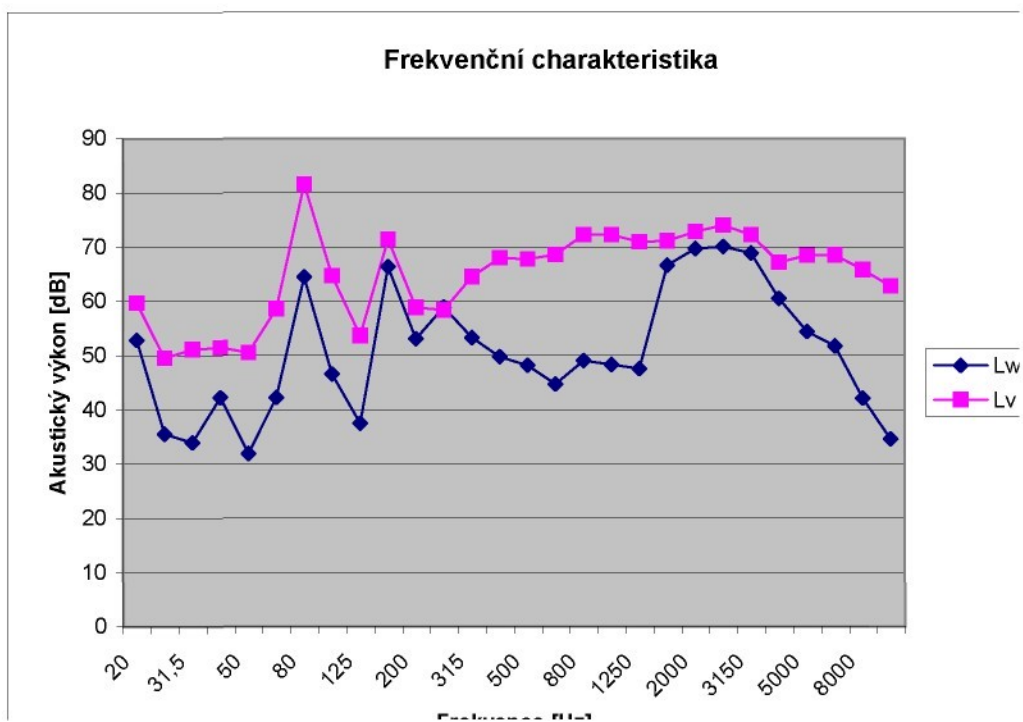
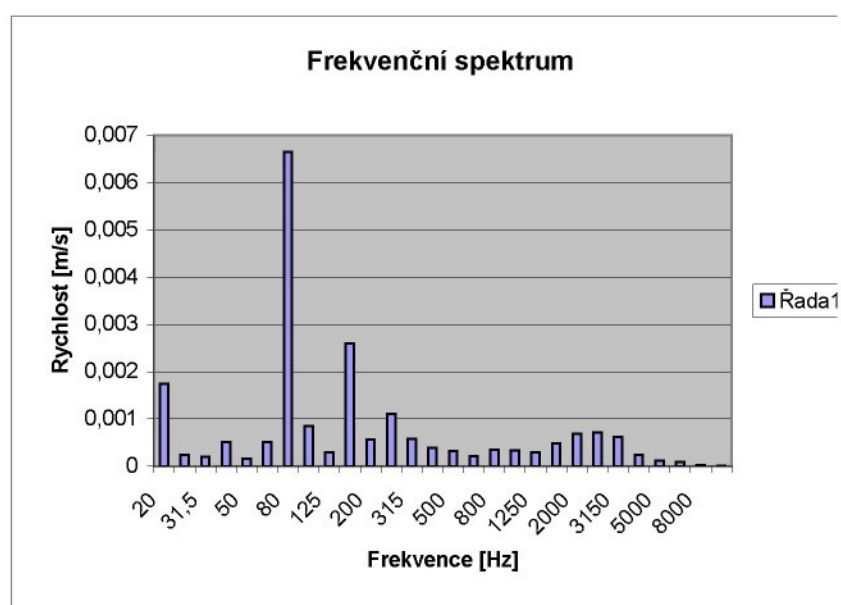
Spectrum r 1

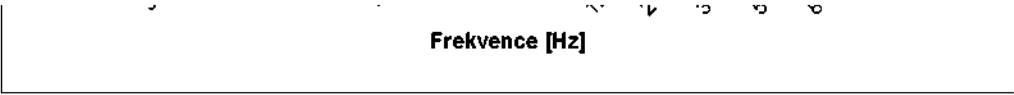
| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|------------|------------|----------|----------|---------|----------|
| 0,4       | V | 66,89 V    | 117,68     |          |          |         |          |
| 0,5       | V | 74,58 V    | 116,53     |          |          |         |          |
| 0,63      | V | 70,37 V    | 116,86     |          |          |         |          |
| 0,8       | V | 67,17 V    | 106,77     |          |          | S5 [m2] | fd       |
| 1         | V | 63,1 V     | 109,9      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 64,23 V    | 98,92      |          |          |         |          |
| 1,6       | V | 60,79 V    | 100,75     |          |          |         |          |
| 2         | V | 62,65 V    | 92,78      |          |          |         |          |
| 2,5       | V | 59,81 V    | 94,61      |          |          |         |          |
| 3,15      | V | 55,71 V    | 81,7       |          |          |         |          |
| 4         | V | 54,51 V    | 89,46      |          |          |         |          |
| 5         | V | 49,81 V    | 82,5       |          |          |         |          |
| 6,3       | V | 52,45 V    | -256,12    |          |          |         |          |
| 8         | V | 53,22 V    | 78,69      |          |          |         |          |
| 10        | V | 58,32 V    | 78,69      |          |          |         |          |
| 12,5      | V | 53,34 V    | 83,61      |          |          | Lv [dB] | Lw [dB]  |
| 16        | V | 55,06 V    | 88,8       |          |          |         |          |
| 20        | V | 72,72 V    | 106,84     | 0,219786 | 0,001749 | 59,7097 | 52,8455  |
| 25        | V | 62,56 V    | 91,48      | 0,037497 | 0,000239 | 49,5497 | 35,5473  |
| 31,5      | V | 64,13 V    | 91,88      | 0,039264 | 0,000198 | 51,1197 | 33,93989 |
| 40        | V | 64,42 V    | 102,23     | 0,129271 | 0,000514 | 51,4097 | 42,2149  |
| 50        | V | 63,5 V     | 93,84      | 0,049204 | 0,000157 | 50,4897 | 31,8867  |
| 63        | V | 71,61 V    | 106,16     | 0,203236 | 0,000513 | 58,5997 | 42,19929 |
| 80        | V | 94,57 V    | 130,48     | 3,34195  | 0,006649 | 81,5597 | 64,4443  |
| 100       | V | 77,66 V    | 114,51     | 0,531496 | 0,000846 | 64,6497 | 46,5361  |
| 125       | V | 66,63 V    | 107,34     | 0,232809 | 0,000296 | 53,6197 | 37,4279  |
| 160       | V | 84,43 V    | 128,36     | 2,618183 | 0,002604 | 71,4197 | 66,3037  |
| 200       | V | 71,8 V     | 117,05     | 0,712033 | 0,000567 | 58,7897 | 53,0555  |
| 250       | V | 71,38 V    | 124,83     | 1,743813 | 0,00111  | 58,3697 | 58,8973  |
| 315       | V | 77,52 V    | 121,21     | 1,149476 | 0,000581 | 64,5097 | 53,26989 |
| 400       | V | 81 V       | 119,71     | 0,967164 | 0,000385 | 67,9897 | 49,6949  |
| 500       | V | 80,76 V    | 120,11     | 1,012745 | 0,000322 | 67,7497 | 48,1567  |
| 630       | V | 81,56 V    | 118,67     | 0,858025 | 0,000217 | 68,5497 | 44,70929 |
| 800       | V | 85,23 V    | 125,04     | 1,786488 | 0,000355 | 72,2197 | 49,0043  |
| 1000      | V | 85,21 V    | 126,31     | 2,067759 | 0,000329 | 72,1997 | 48,3361  |
| 1250      | V | 83,91 V    | 127,47     | 2,363197 | 0,000301 | 70,8997 | 47,5579  |
| 1600      | V | 84,12 V    | 133,68     | 4,830588 | 0,000481 | 71,1097 | 66,6237  |
| 2000      | V | 85,82 V    | 138,69     | 8,600031 | 0,000684 | 72,8097 | 69,6955  |

|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 86,99 V | 140,99 | 11,20727 | 0,000713 | 73,9797 | 70,0573  |
| 3150  | V | 85,25 V | 141,81 | 12,31686 | 0,000622 | 72,2397 | 68,86989 |
| 4000  | V | 80,17 V | 135,46 | 5,929253 | 0,000236 | 67,1597 | 60,4449  |
| 5000  | V | 81,47 V | 131,35 | 3,694026 | 0,000118 | 68,4597 | 54,3967  |
| 6300  | V | 81,51 V | 130,67 | 3,41586  | 8,63E-05 | 68,4997 | 51,70929 |
| 8000  | V | 78,79 V | 123,16 | 1,438799 | 2,86E-05 | 65,7797 | 42,1243  |
| 10000 | V | 75,77 V | 117,5  | 0,749894 | 1,19E-05 | 62,7597 | 34,5261  |
| A/L   | V | 98,16 V | 145,65 | 19,16461 | #####    |         |          |
| W     | V | 95,53 V | 146,8  | 21,87762 | #####    |         |          |

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■ Řada1

◆ Lw [dB]  
■ Lv [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 036

Measured 05-04-04 09:39:30

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

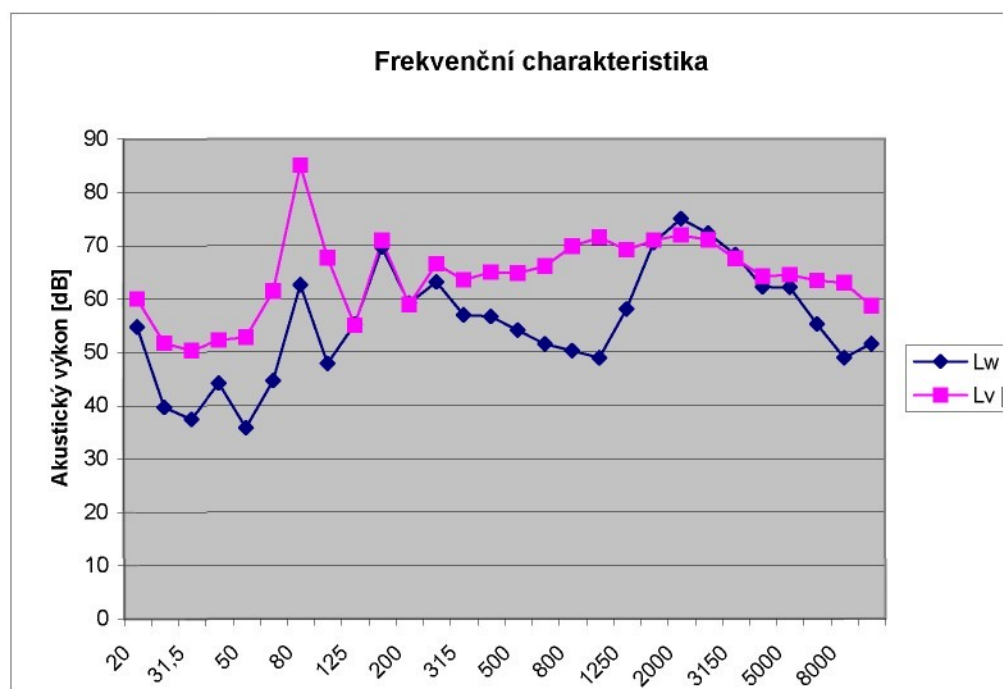
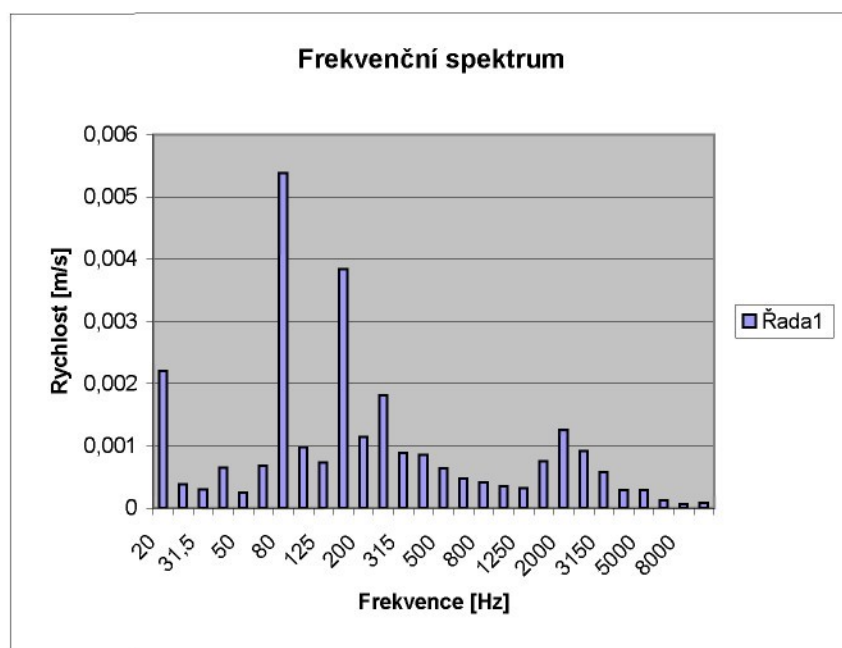
| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|------------|------------|----------|----------|---------|----------|
| 0,4       | V | 66,37 V    | 112,53     |          |          |         |          |
| 0,5       | V | 76,48 V    | 117,64     |          |          |         |          |
| 0,63      | V | 67,57 V    | 120,6      |          |          |         |          |
| 0,8       | V | 72,53 V    | 119,87     |          |          | S6 [m2] | fd       |
| 1         | V | 74,95 V    | 109,5      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 75,16 V    | 114,04     |          |          |         |          |
| 1,6       | V | 68,79 V    | 106,3      |          |          |         |          |
| 2         | V | 63,1 V     | 103,43     |          |          |         |          |
| 2,5       | V | 62,75 V    | 102,14     |          |          |         |          |
| 3,15      | V | 62,18 V    | 87,72      |          |          |         |          |
| 4         | V | 66,93 V    | 84,24      |          |          |         |          |
| 5         | V | 64,89 V    | 83,16      |          |          |         |          |
| 6,3       | V | 68,39 V    | 78,69      |          |          |         |          |
| 8         | V | 66,11 V    | 78,69      |          |          |         |          |
| 10        | V | 65,03 V    | 71,71      |          |          |         |          |
| 12,5      | V | 63,5 V     | 85,51      |          |          | Lv [dB] | Lw [dB]  |
| 16        | V | 60,63 V    | 88,45      |          |          |         |          |
| 20        | V | 73,05 V    | 108,84     | 0,276694 | 0,002202 | 60,0397 | 54,8455  |
| 25        | V | 64,74 V    | 95,69      | 0,060884 | 0,000388 | 51,7297 | 39,7573  |
| 31,5      | V | 63,36 V    | 95,39      | 0,058817 | 0,000297 | 50,3497 | 37,44989 |
| 40        | V | 65,24 V    | 104,23     | 0,162742 | 0,000648 | 52,2297 | 44,2149  |
| 50        | V | 65,8 V     | 97,74      | 0,07709  | 0,000245 | 52,7897 | 35,7867  |
| 63        | V | 74,46 V    | 108,61     | 0,269464 | 0,000681 | 61,4497 | 44,64929 |
| 80        | V | 98,05 V    | 128,64     | 2,703958 | 0,005379 | 85,0397 | 62,6043  |
| 100       | V | 80,69 V    | 115,8      | 0,616595 | 0,000981 | 67,6797 | 47,8261  |
| 125       | V | 67,99 V    | 115,17     | 0,573456 | 0,00073  | 54,9797 | 55,2579  |
| 160       | V | 83,91 V    | 131,72     | 3,854784 | 0,003834 | 70,8997 | 69,6637  |
| 200       | V | 71,92 V    | 123,16     | 1,438799 | 0,001145 | 58,9097 | 59,1655  |
| 250       | V | 79,54 V    | 129,11     | 2,854303 | 0,001817 | 66,5297 | 63,1773  |
| 315       | V | 76,55 V    | 124,93     | 1,764006 | 0,000891 | 63,5397 | 56,98989 |
| 400       | V | 77,99 V    | 126,67     | 2,155262 | 0,000858 | 64,9797 | 56,6549  |
| 500       | V | 77,77 V    | 126,03     | 2,002166 | 0,000637 | 64,7597 | 54,0767  |
| 630       | V | 79,14 V    | 125,47     | 1,877154 | 0,000474 | 66,1297 | 51,50929 |
| 800       | V | 82,85 V    | 126,27     | 2,058259 | 0,000409 | 69,8397 | 50,2343  |
| 1000      | V | 84,52 V    | 126,88     | 2,208005 | 0,000351 | 71,5097 | 48,9061  |
| 1250      | V | 82,2 V     | 127,96     | 2,500345 | 0,000318 | 69,1897 | 58,0479  |
| 1600      | V | 83,96 V    | 137,58     | 7,568329 | 0,000753 | 70,9497 | 70,5237  |
| 2000      | V | 84,92 V    | 143,98     | 15,81248 | 0,001258 | 71,9097 | 74,9855  |

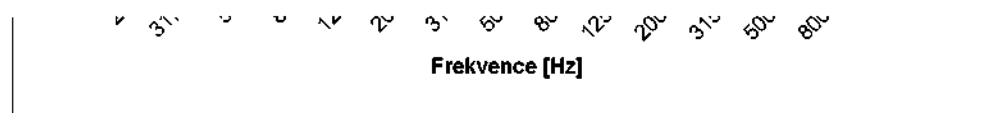
|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 84,05 V | 143,2  | 14,4544  | 0,00092  | 71,0397 | 72,2673  |
| 3150  | V | 80,53 V | 141,2  | 11,48154 | 0,00058  | 67,5197 | 68,25989 |
| 4000  | V | 77,21 V | 137,23 | 7,269424 | 0,000289 | 64,1997 | 62,2149  |
| 5000  | V | 77,52 V | 139,09 | 9,005338 | 0,000287 | 64,5097 | 62,1367  |
| 6300  | V | 76,43 V | 134,19 | 5,122713 | 0,000129 | 63,4197 | 55,22929 |
| 8000  | V | 75,99 V | 129,94 | 3,140509 | 6,25E-05 | 62,9797 | 48,9043  |
| 10000 | V | 71,68 V | 134,57 | 5,351802 | 8,52E-05 | 58,6697 | 51,5961  |
| A/L   | V | 99,48 V | 149,22 | 28,9068  | #####    |         |          |
| W     | V | 93,51 V | 149,6  | 30,19952 | #####    |         |          |

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10\*log sigma

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—◆— Lw [dB]  
—■— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 037

Measured 05-04-04 09:39:54

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | V | 61,24 V    | 115,38     |          |          |          |          |
| 0,5       | V | 73,56 V    | 117,94     |          |          |          |          |
| 0,63      | V | 73,35 V    | 117,47     |          |          |          |          |
| 0,8       | V | 69,97 V    | 113        |          | S7 [m2]  | fd       |          |
| 1         | V | 69,05 V    | 105,83     |          | 0,05     | 1596,553 |          |
| 1,25      | V | 65,38 V    | 109,01     |          |          |          |          |
| 1,6       | V | 61,69 V    | 94,97      |          |          |          |          |
| 2         | V | 56,75 V    | 86,76      |          |          |          |          |
| 2,5       | V | 59,88 V    | 87,72      |          |          |          |          |
| 3,15      | V | 54,07 V    | 85,51      |          |          |          |          |
| 4         | V | 49,36 V    | 79,49      |          |          |          |          |
| 5         | V | 46,57 V    | 79,49      |          |          |          |          |
| 6,3       | V | 51,81 V    | -256,12    |          |          |          |          |
| 8         | V | 52,82 V    | 85,14      |          |          |          |          |
| 10        | V | 58,3 V     | 83,75      |          |          |          |          |
| 12,5      | V | 55,5 V     | 83,61      |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 55,31 V    | 87,93      |          |          |          |          |
| 20        | V | 73,05 V    | 98,49      | 0,084043 | 0,000669 | 60,0397  | 44,4955  |
| 25        | V | 62,65 V    | 92,64      | 0,042855 | 0,000273 | 49,6397  | 36,7073  |
| 31,5      | V | 61,69 V    | 97,58      | 0,075683 | 0,000382 | 48,6797  | 39,63989 |
| 40        | V | 64,18 V    | 114,74     | 0,545758 | 0,002172 | 51,1697  | 54,7249  |
| 50        | V | 64,58 V    | 101,48     | 0,118577 | 0,000377 | 51,5697  | 39,5267  |
| 63        | V | 72,53 V    | 109,81     | 0,309386 | 0,000782 | 59,5197  | 45,84929 |
| 80        | V | 96,49 V    | 131,32     | 3,68129  | 0,007324 | 83,4797  | 65,2843  |
| 100       | V | 79,47 V    | 115,8      | 0,616595 | 0,000981 | 66,4597  | 47,8261  |
| 125       | V | 68,86 V    | 112,84     | 0,438531 | 0,000558 | 55,8497  | 52,9279  |
| 160       | V | 86,83 V    | 128,13     | 2,549764 | 0,002536 | 73,8197  | 66,0737  |
| 200       | V | 72,58 V    | 120,95     | 1,115578 | 0,000888 | 59,5697  | 56,9555  |
| 250       | V | 75,96 V    | 127,04     | 2,249055 | 0,001432 | 62,9497  | 61,1073  |
| 315       | V | 73,52 V    | 126,43     | 2,096525 | 0,001059 | 60,5097  | 58,48989 |
| 400       | V | 77,8 V     | 121,92     | 1,247384 | 0,000496 | 64,7897  | 51,9049  |
| 500       | V | 77,61 V    | 125,42     | 1,86638  | 0,000594 | 64,5997  | 53,4667  |
| 630       | V | 79,91 V    | 127,8      | 2,454709 | 0,00062  | 66,8997  | 53,83929 |
| 800       | V | 82,38 V    | 127,09     | 2,262039 | 0,00045  | 69,3697  | 51,0543  |
| 1000      | V | 86,9 V     | 128,06     | 2,529298 | 0,000403 | 73,8897  | 50,0861  |
| 1250      | V | 83,65 V    | 129,51     | 2,988822 | 0,000381 | 70,6397  | 59,5979  |
| 1600      | V | 83,54 V    | 138,36     | 8,279422 | 0,000824 | 70,5297  | 71,3037  |
| 2000      | V | 85,53 V    | 141,44     | 11,80321 | 0,000939 | 72,5197  | 72,4455  |

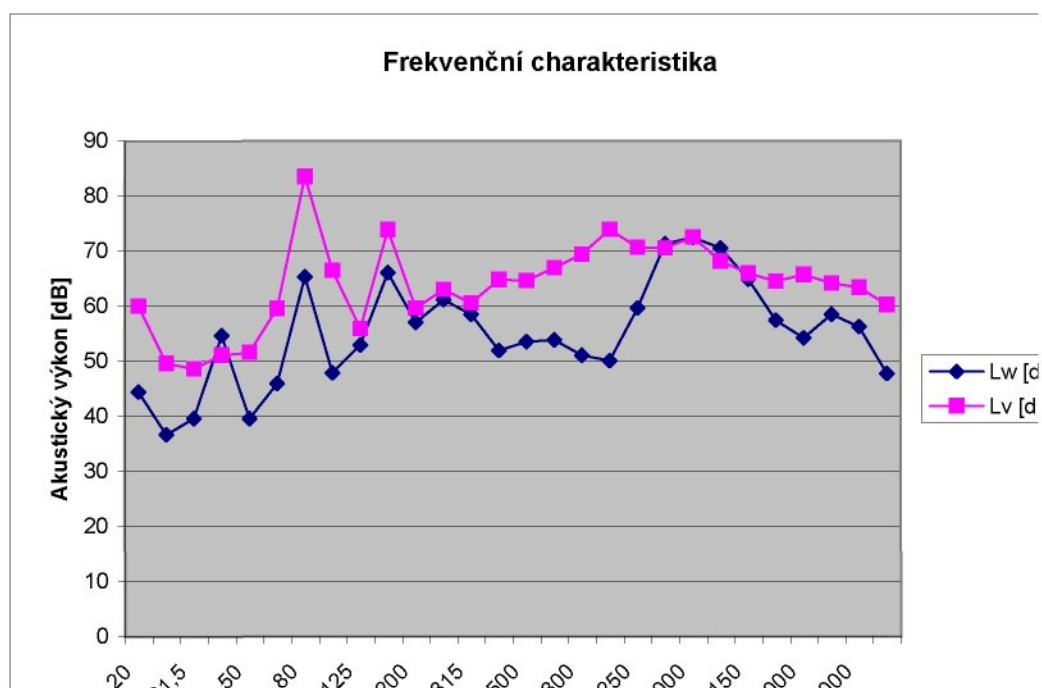
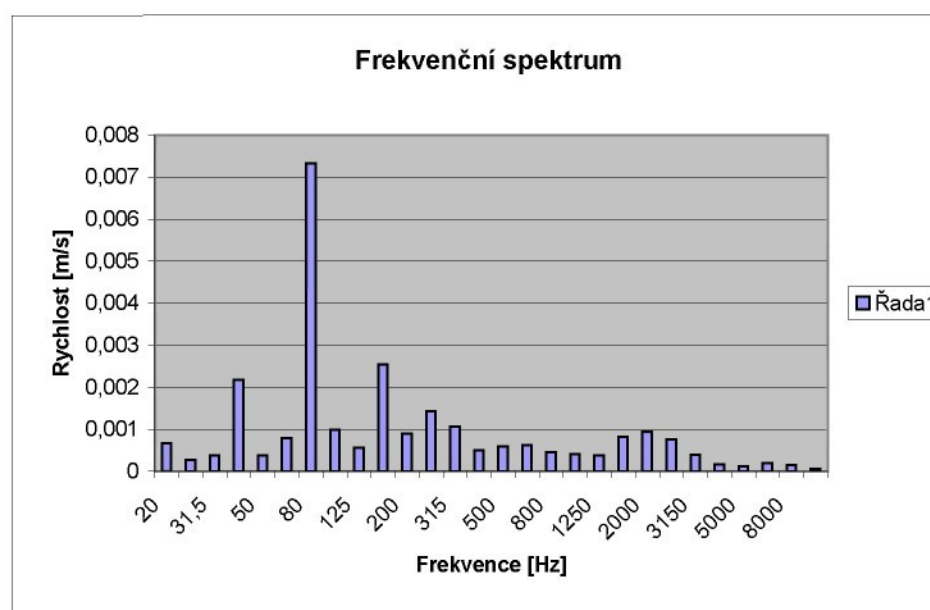


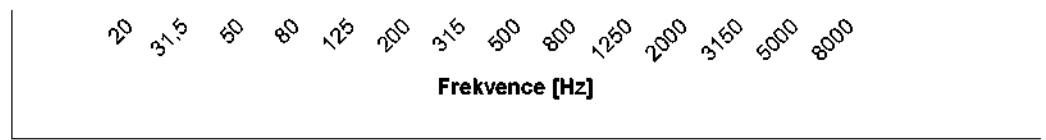
|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 81,16 V | 141,44 | 11,80321 | 0,000751 | 68,1497 | 70,5073  |
| 3150  | V | 78,95 V | 137,77 | 7,735707 | 0,000391 | 65,9397 | 64,82989 |
| 4000  | V | 77,49 V | 132,41 | 4,173496 | 0,000166 | 64,4797 | 57,3949  |
| 5000  | V | 78,71 V | 131,16 | 3,614099 | 0,000115 | 65,6997 | 54,2067  |
| 6300  | V | 77,12 V | 137,44 | 7,44732  | 0,000188 | 64,1097 | 58,47929 |
| 8000  | V | 76,36 V | 137,25 | 7,286182 | 0,000145 | 63,3497 | 56,2143  |
| 10000 | V | 73,23 V | 130,71 | 3,431626 | 5,46E-05 | 60,2197 | 47,7361  |
| A/L   | V | 98,59 V | 148,12 | 25,4683  | #####    |         |          |
| W     | V | 93,72 V | 147,95 | 24,97468 |          |         |          |

L

10\*log sigma

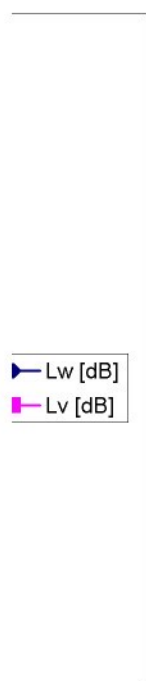
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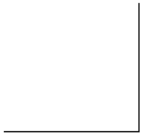




■ Rada1



► Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 038

Measured 05-04-04 09:40:30

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

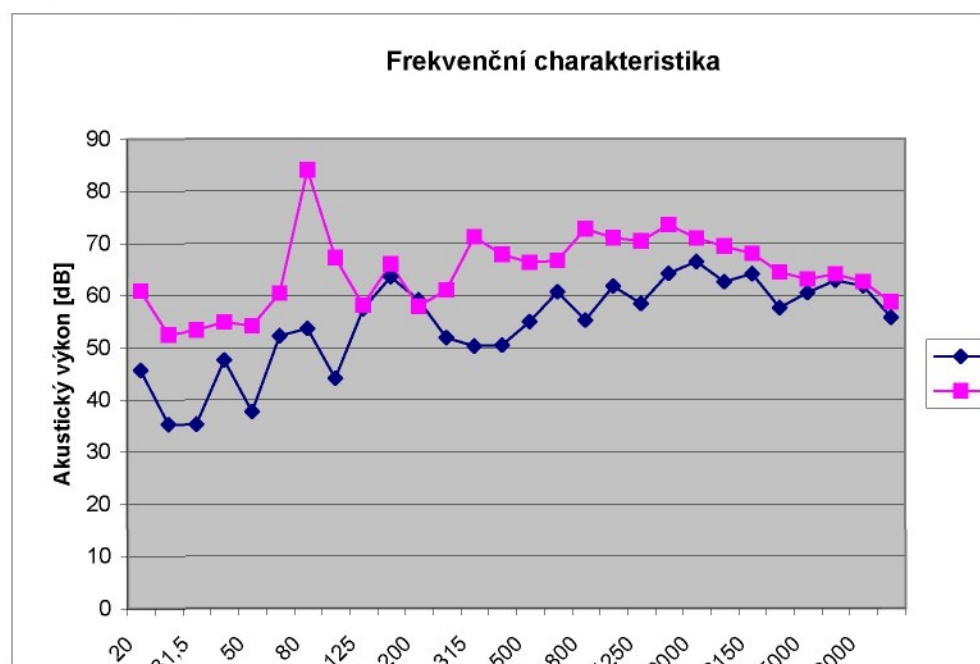
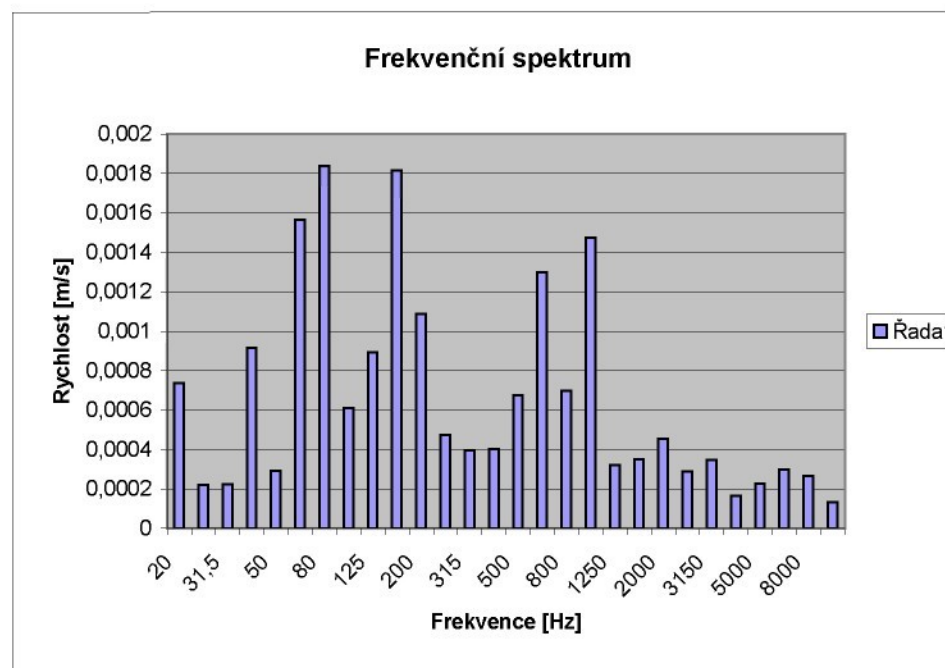
| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 67,73 V     | 118,67      |          |          |          |          |
| 0,5       | V | 61,19 V     | 111,15      |          |          |          |          |
| 0,63      | V | 67,87 V     | 112,89      |          |          |          |          |
| 0,8       | V | 68,39 V     | 106,4       |          |          | S8 [m2]  | fd       |
| 1         | V | 62,56 V     | 104,21      |          |          | 0,05452  | 1528,939 |
| 1,25      | V | 66,86 V     | 108,75      |          |          |          |          |
| 1,6       | V | 61,36 V     | 110,02      |          |          |          |          |
| 2         | V | 62,21 V     | 108,44      |          |          |          |          |
| 2,5       | V | 59,81 V     | 100,14      |          |          |          |          |
| 3,15      | V | 60,7 V      | 97,01       |          |          |          |          |
| 4         | V | 58,21 V     | 93,34       |          |          |          |          |
| 5         | V | 57,48 V     | 91,6        |          |          |          |          |
| 6,3       | V | 58,7 V      | 83,75       |          |          |          |          |
| 8         | V | 59,97 V     | 87,82       |          |          |          |          |
| 10        | V | 61,48 V     | 84,01       |          |          |          |          |
| 12,5      | V | 57,05 V     | 79,11       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 59,15 V     | 83,87       |          |          |          |          |
| 20        | V | 73,56 V     | 99,32       | 0,09247  | 0,000736 | 60,92556 | 45,70136 |
| 25        | V | 65,1 V      | 90,83       | 0,034794 | 0,000222 | 52,46556 | 35,27316 |
| 31,5      | V | 66,01 V     | 92,87       | 0,044005 | 0,000222 | 53,37556 | 35,30575 |
| 40        | V | 67,54 V     | 107,24      | 0,230144 | 0,000916 | 54,90556 | 47,60076 |
| 50        | V | 66,79 V     | 99,27       | 0,091939 | 0,000293 | 54,15556 | 37,69256 |
| 63        | V | 73,02 V     | 115,85      | 0,620155 | 0,001567 | 60,38556 | 52,26515 |
| 80        | V | 96,68 V     | 119,31      | 0,923634 | 0,001838 | 84,04556 | 53,65016 |
| 100       | V | 79,87 V     | 111,69      | 0,384149 | 0,000611 | 67,23556 | 44,09196 |
| 125       | V | 70,69 V     | 116,91      | 0,700648 | 0,000892 | 58,05556 | 57,37376 |
| 160       | V | 78,62 V     | 125,23      | 1,825997 | 0,001816 | 65,98556 | 63,54956 |
| 200       | V | 70,51 V     | 122,72      | 1,367729 | 0,001088 | 57,87556 | 59,10136 |
| 250       | V | 73,66 V     | 117,45      | 0,74559  | 0,000475 | 61,02556 | 51,89316 |
| 315       | V | 83,82 V     | 117,87      | 0,782528 | 0,000395 | 71,18556 | 50,30575 |
| 400       | V | 80,5 V      | 120,11      | 1,012745 | 0,000403 | 67,86556 | 50,47076 |
| 500       | V | 78,93 V     | 126,55      | 2,12569  | 0,000677 | 66,29556 | 54,97256 |
| 630       | V | 79,3 V      | 134,22      | 5,140437 | 0,001299 | 66,66556 | 60,63515 |
| 800       | V | 85,39 V     | 130,9       | 3,507519 | 0,000698 | 72,75556 | 55,24016 |
| 1000      | V | 83,68 V     | 139,34      | 9,268298 | 0,001475 | 71,04556 | 61,74196 |
| 1250      | V | 83,07 V     | 128,01      | 2,51478  | 0,00032  | 70,43556 | 58,47376 |
| 1600      | V | 86,19 V     | 130,92      | 3,515604 | 0,00035  | 73,55556 | 64,23956 |
| 2000      | V | 83,61 V     | 135,13      | 5,708211 | 0,000454 | 70,97556 | 66,51136 |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 82,05 V | 133,16 | 4,549881 | 0,00029  | 69,41556 | 62,60316 |
| 3150  | V | 80,64 V | 136,73 | 6,862779 | 0,000347 | 68,00556 | 64,16575 |
| 4000  | V | 77,07 V | 132,27 | 4,106766 | 0,000163 | 64,43556 | 57,63076 |
| 5000  | V | 75,73 V | 137,11 | 7,169684 | 0,000228 | 63,09556 | 60,53256 |
| 6300  | V | 76,72 V | 141,46 | 11,83042 | 0,000299 | 64,08556 | 62,87515 |
| 8000  | V | 75,23 V | 142,47 | 13,28924 | 0,000264 | 62,59556 | 61,81016 |
| 10000 | V | 71,38 V | 138,4  | 8,317638 | 0,000132 | 58,74556 | 55,80196 |
| A/L   | V | 98,61 V | 148,66 | 27,10192 | #####    |          |          |
| W     | V | 93,72 V | 148,54 | 26,73006 | #####    |          |          |

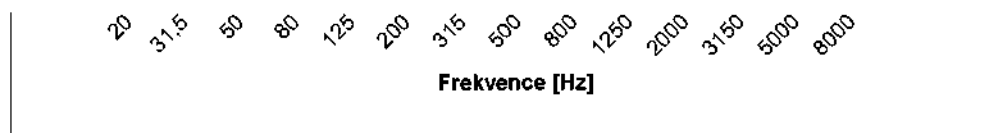
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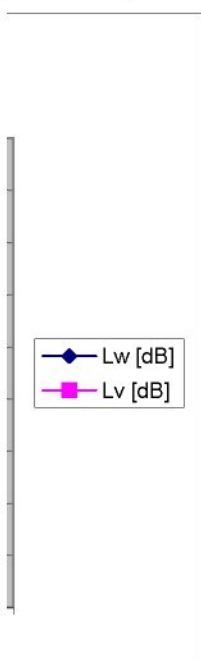
10\*log sigma

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 039

Measured 05-04-04 09:40:46

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 108 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

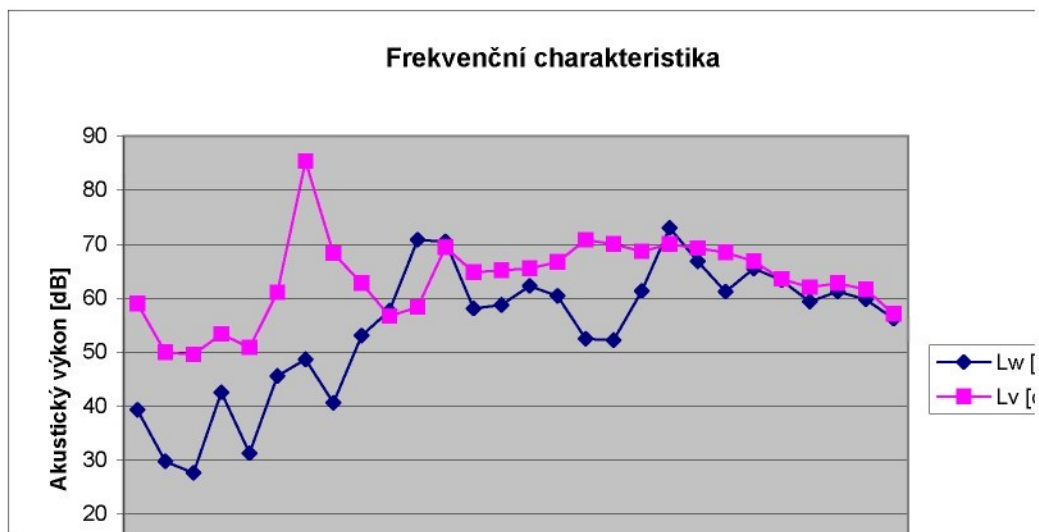
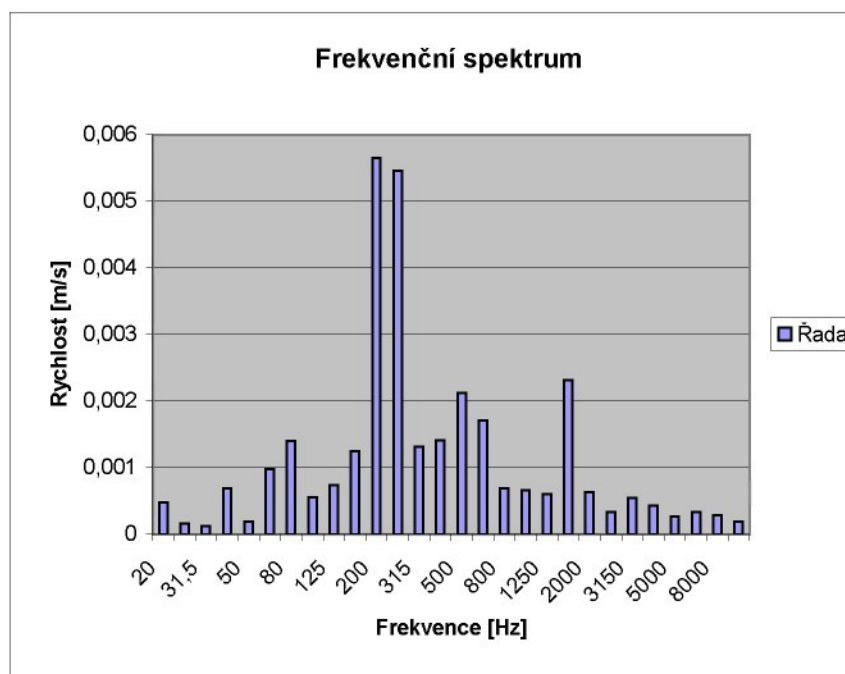
Spectrum r 1

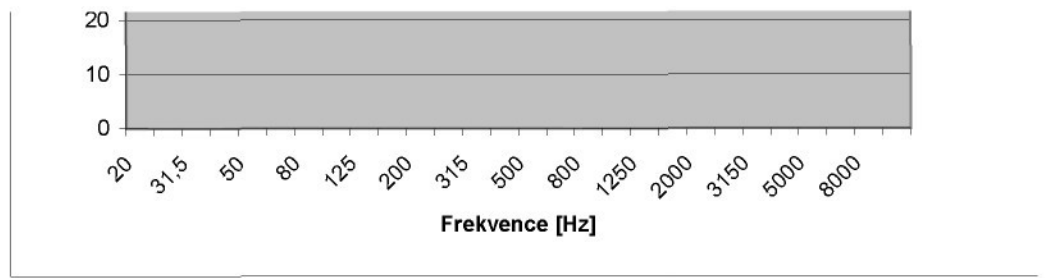
| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | O | 61,26 V    | 112,7      |          |          |          |          |
| 0,5       | O | 71 V       | 106,21     |          |          |          |          |
| 0,63      | O | 67,64 V    | 117,66     |          |          |          |          |
| 0,8       | O | 71,14 V    | 111,62     |          |          | S9 [m2]  | fd       |
| 1         | O | 67,1 V     | 110,46     |          |          | 0,03     | 2061,14  |
| 1,25      | O | 67,38 V    | 109,52     |          |          |          |          |
| 1,6       | O | 68,2 V     | 105,03     |          |          |          |          |
| 2         | O | 57,29 V    | 98,21      |          |          |          |          |
| 2,5       | O | 61,5 V     | 94,97      |          |          |          |          |
| 3,15      | O | 57,55 V    | 88,15      |          |          |          |          |
| 4         | O | 55,62 V    | 91,25      |          |          |          |          |
| 5         | O | 54,21 V    | 88,69      |          |          |          |          |
| 6,3       | O | 54,21 V    | 88,03      |          |          |          |          |
| 8         | O | 55,06 V    | 87,82      |          |          |          |          |
| 10        | O | 59,88 V    | 81,23      |          |          |          |          |
| 12,5      | O | 55,64 V    | 68,7       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | O | 57,52 V    | 83,61      |          |          |          |          |
| 20        | O | 74,22 V    | 95,53      | 0,059772 | 0,000476 | 58,99121 | 39,31702 |
| 25        | O | 65,22 V    | 87,93      | 0,024917 | 0,000159 | 49,99121 | 29,77882 |
| 31,5      | O | 64,84 V    | 87,82      | 0,024604 | 0,000124 | 49,61121 | 27,6614  |
| 40        | O | 68,6 V     | 104,84     | 0,174582 | 0,000695 | 53,37121 | 42,60642 |
| 50        | O | 66,11 V    | 95,53      | 0,059772 | 0,00019  | 50,88121 | 31,35822 |
| 63        | O | 76,29 V    | 111,8      | 0,389045 | 0,000983 | 61,06121 | 45,6208  |
| 80        | O | 100,61 V   | 116,95     | 0,703882 | 0,0014   | 85,38121 | 48,69582 |
| 100       | O | 83,56 V    | 110,84     | 0,348337 | 0,000554 | 68,33121 | 40,64762 |
| 125       | O | 78,01 V    | 115,24     | 0,578096 | 0,000736 | 62,78121 | 53,10941 |
| 160       | O | 71,94 V    | 121,99     | 1,257477 | 0,001251 | 56,71121 | 57,71522 |
| 200       | O | 73,61 V    | 137,02     | 7,095778 | 0,005647 | 58,38121 | 70,80702 |
| 250       | O | 84,66 V    | 138,66     | 8,570378 | 0,005456 | 69,43121 | 70,50882 |
| 315       | O | 80,03 V    | 128,29     | 2,597168 | 0,001312 | 64,80121 | 58,1314  |
| 400       | O | 80,43 V    | 131        | 3,548134 | 0,001412 | 65,20121 | 58,76642 |
| 500       | O | 80,76 V    | 136,47     | 6,660395 | 0,00212  | 65,53121 | 62,29822 |
| 630       | O | 81,94 V    | 136,62     | 6,776415 | 0,001712 | 66,71121 | 60,4408  |
| 800       | O | 86,05 V    | 130,76     | 3,451437 | 0,000687 | 70,82121 | 52,50582 |
| 1000      | O | 85,25 V    | 132,43     | 4,183117 | 0,000666 | 70,02121 | 52,23762 |
| 1250      | O | 83,87 V    | 133,46     | 4,709773 | 0,0006   | 68,64121 | 61,32941 |
| 1600      | O | 85,28 V    | 147,32     | 23,22737 | 0,00231  | 70,05121 | 73,04522 |
| 2000      | O | 84,48 V    | 138,03     | 7,970765 | 0,000634 | 69,25121 | 66,81702 |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | ○ | 83,7 V   | 134,36 | 5,223962 | 0,000333 | 68,47121 | 61,20882 |
| 3150  | ○ | 82,08 V  | 140,68 | 10,81434 | 0,000546 | 66,85121 | 65,5214  |
| 4000  | ○ | 78,81 V  | 140,59 | 10,70286 | 0,000426 | 63,58121 | 63,35642 |
| 5000  | ○ | 77,26 V  | 138,52 | 8,433348 | 0,000268 | 62,03121 | 59,34822 |
| 6300  | ○ | 78,03 V  | 142,47 | 13,28924 | 0,000336 | 62,80121 | 61,2908  |
| 8000  | ○ | 76,83 V  | 143,06 | 14,22329 | 0,000283 | 61,60121 | 59,80582 |
| 10000 | ○ | 72,32 V  | 141,41 | 11,76251 | 0,000187 | 57,09121 | 56,21762 |
| A/L   | ○ | 101,69 V | 152,54 | 42,3643  | #####    |          |          |
| W     | ○ | 94,57 V  | 152,4  | 41,68694 | #####    |          |          |
| L     |   |          |        |          |          |          |          |

10\*log sigma

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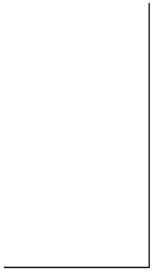


Řada1



Lw [dB]  
Lv [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 050

Measured 05-04-04 09:46:00

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

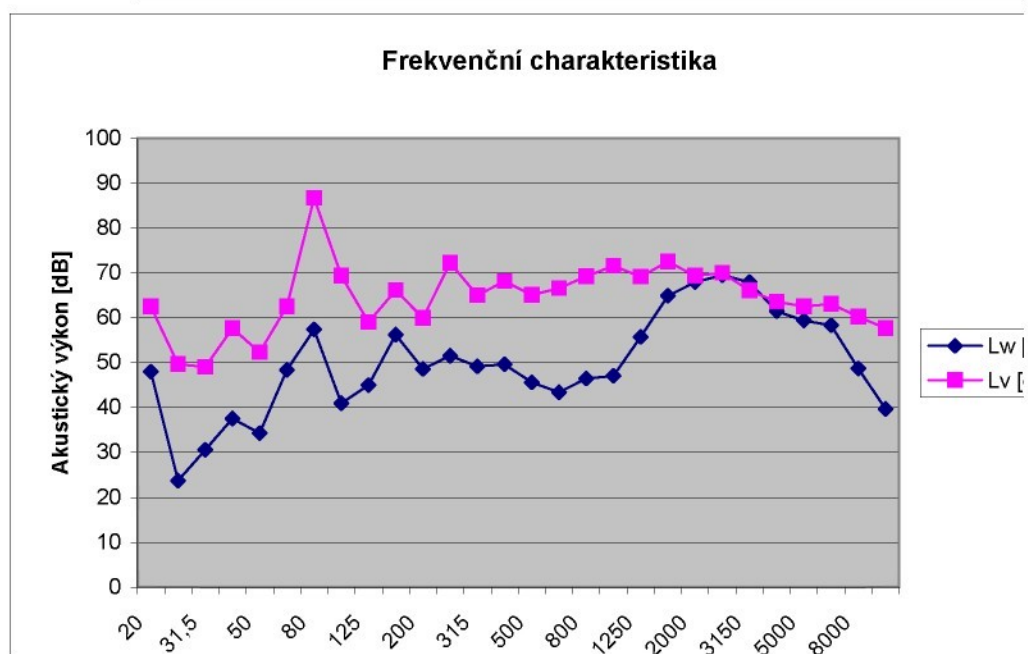
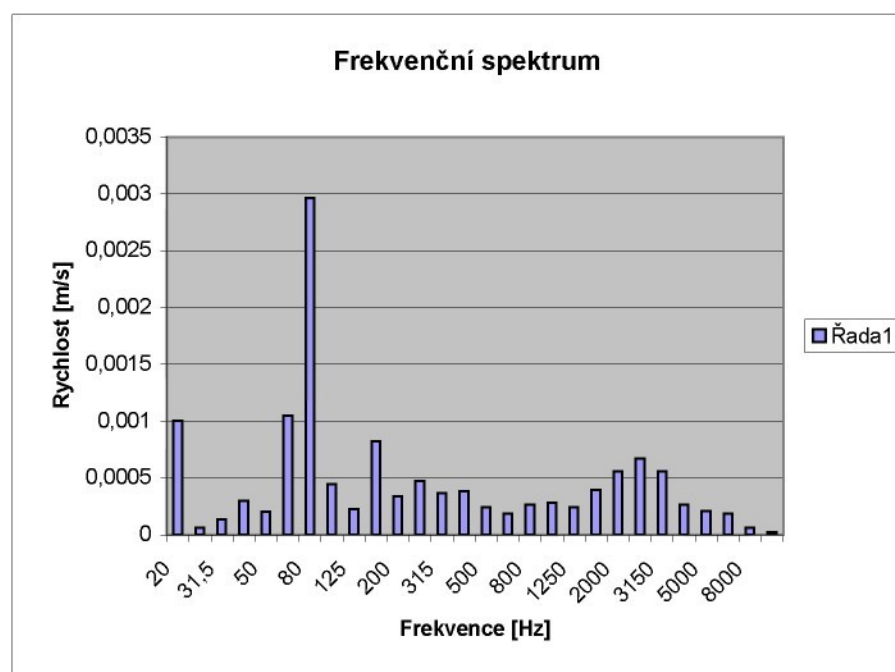
Spectrum r 1

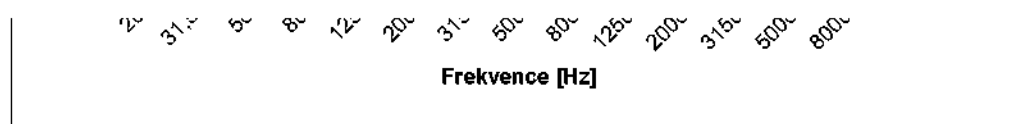
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 66,81 V    | 128,41      |          |          |          |          |
| 0,5       | V | 74,39 V    | 117,85      |          |          |          |          |
| 0,63      | V | 68,72 V    | 121,61      |          |          |          |          |
| 0,8       | V | 74,81 V    | 122,01      |          |          | S10 [m2] | fd       |
| 1         | V | 73,68 V    | 119,54      |          |          | 0,05     | 1596,553 |
| 1,25      | V | 70,37 V    | 112,63      |          |          |          |          |
| 1,6       | V | 70,62 V    | 105,95      |          |          |          |          |
| 2         | V | 58,49 V    | 99,81       |          |          |          |          |
| 2,5       | V | 61,36 V    | 98,73       |          |          |          |          |
| 3,15      | V | 55,74 V    | 87,49       |          |          |          |          |
| 4         | V | 56,37 V    | 90,85       |          |          |          |          |
| 5         | V | 47,41 V    | 84,48       |          |          |          |          |
| 6,3       | V | 58,11 V    | -256,12     |          |          |          |          |
| 8         | V | 58,04 V    | 79,7        |          |          |          |          |
| 10        | V | 56,47 V    | 84,48       |          |          |          |          |
| 12,5      | V | 55,69 V    | -256,12     |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 57,52 V    | 84,1        |          |          |          |          |
| 20        | V | 75,59 V    | 102         | 0,125893 | 0,001002 | 62,5797  | 48,0055  |
| 25        | V | 62,7 V     | 79,7        | 0,009661 | 6,15E-05 | 49,6897  | 23,7673  |
| 31,5      | V | 62,09 V    | 88,52       | 0,026669 | 0,000135 | 49,0797  | 30,57989 |
| 40        | V | 70,74 V    | 97,58       | 0,075683 | 0,000301 | 57,7297  | 37,5649  |
| 50        | V | 65,36 V    | 96,24       | 0,064863 | 0,000206 | 52,3497  | 34,2867  |
| 63        | V | 75,54 V    | 112,37      | 0,415432 | 0,001049 | 62,5297  | 48,40929 |
| 80        | V | 99,76 V    | 123,47      | 1,491077 | 0,002966 | 86,7497  | 57,4343  |
| 100       | V | 82,38 V    | 108,96      | 0,280543 | 0,000446 | 69,3697  | 40,9861  |
| 125       | V | 72,08 V    | 104,94      | 0,176604 | 0,000225 | 59,0697  | 45,0279  |
| 160       | V | 79,21 V    | 118,34      | 0,826038 | 0,000822 | 66,1997  | 56,2837  |
| 200       | V | 73,02 V    | 112,63      | 0,428055 | 0,000341 | 60,0097  | 48,6355  |
| 250       | V | 85,25 V    | 117,47      | 0,747309 | 0,000476 | 72,2397  | 51,5373  |
| 315       | V | 78,03 V    | 117,17      | 0,721938 | 0,000365 | 65,0197  | 49,22989 |
| 400       | V | 81,18 V    | 119,64      | 0,959401 | 0,000382 | 68,1697  | 49,6249  |
| 500       | V | 78,13 V    | 117,61      | 0,759451 | 0,000242 | 65,1197  | 45,6567  |
| 630       | V | 79,66 V    | 117,4       | 0,74131  | 0,000187 | 66,6497  | 43,43929 |
| 800       | V | 82,29 V    | 122,51      | 1,335058 | 0,000266 | 69,2797  | 46,4743  |
| 1000      | V | 84,64 V    | 125,07      | 1,792669 | 0,000285 | 71,6297  | 47,0961  |
| 1250      | V | 82,22 V    | 125,66      | 1,918669 | 0,000244 | 69,2097  | 55,7479  |
| 1600      | V | 85,58 V    | 131,94      | 3,953666 | 0,000393 | 72,5697  | 64,8837  |
| 2000      | V | 82,38 V    | 136,97      | 7,055048 | 0,000561 | 69,3697  | 67,9755  |

|       |   |          |        |          |          |         |          |
|-------|---|----------|--------|----------|----------|---------|----------|
| 2500  | V | 83,07 V  | 140,45 | 10,53174 | 0,00067  | 70,0597 | 69,5173  |
| 3150  | V | 79,16 V  | 140,92 | 11,11732 | 0,000562 | 66,1497 | 67,97989 |
| 4000  | V | 76,62 V  | 136,5  | 6,683439 | 0,000266 | 63,6097 | 61,4849  |
| 5000  | V | 75,59 V  | 136,4  | 6,606934 | 0,00021  | 62,5797 | 59,4467  |
| 6300  | V | 76,15 V  | 137,32 | 7,345139 | 0,000186 | 63,1397 | 58,35929 |
| 8000  | V | 73,31 V  | 129,73 | 3,065491 | 6,1E-05  | 60,2997 | 48,6943  |
| 10000 | V | 70,74 V  | 122,69 | 1,363013 | 2,17E-05 | 57,7297 | 39,7161  |
| A/L   | V | 100,77 V | 146,66 | 21,52782 | #####    |         |          |
| W     | V | 93,23 V  | 146,82 | 21,92805 | #####    |         |          |

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—◆— Lw [dB]  
—■— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 040

Measured 05-04-04 09:41:28

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 113 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

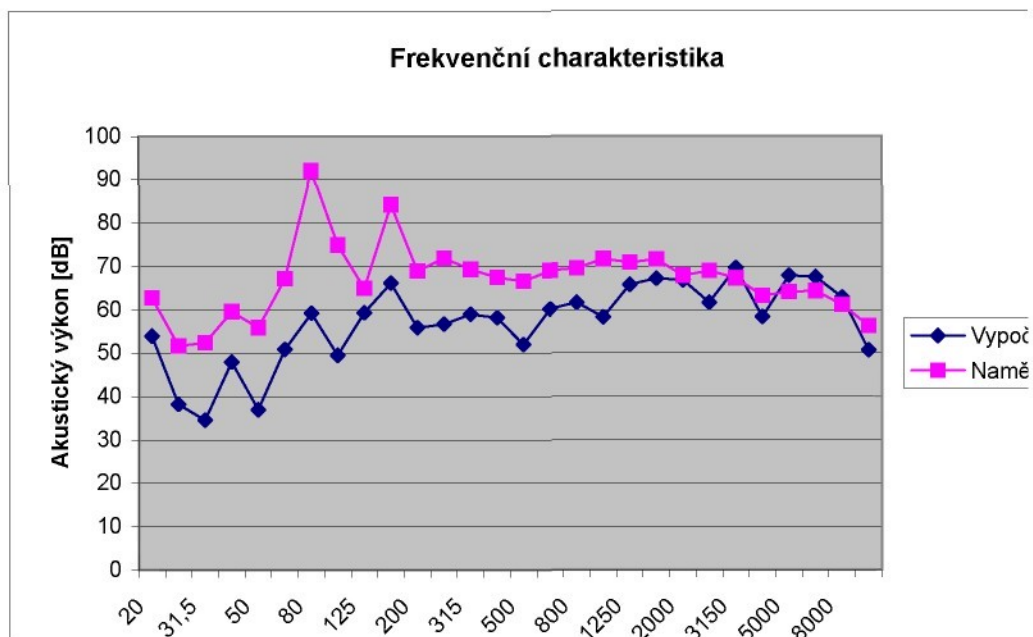
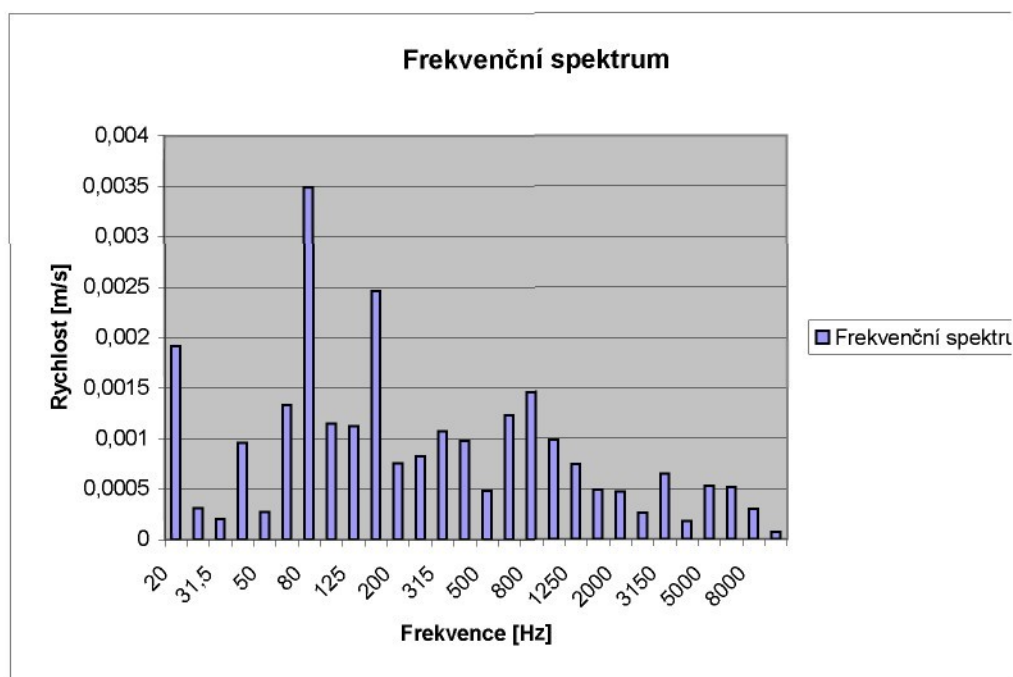
Spectrum r 1

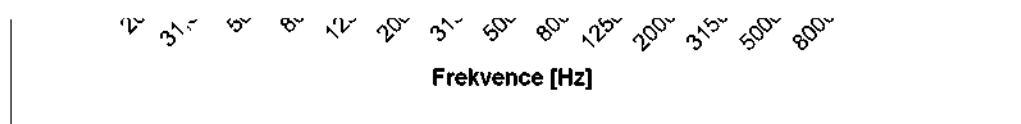
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 67,5 V     | 124,72      |          |          |          |          |
| 0,5       | V | 69,28 V    | 123,38      |          |          |          |          |
| 0,63      | V | 65,43 V    | 123         |          |          |          |          |
| 0,8       | V | 67,85 V    | 109,31      |          |          | S11 [m2] | fd       |
| 1         | V | 62,37 V    | 106,49      |          |          | 0,05452  | 1528,939 |
| 1,25      | V | 63,69 V    | 108,84      |          |          |          |          |
| 1,6       | V | 61,88 V    | 92,9        |          |          |          |          |
| 2         | V | 57,29 V    | 94,45       |          |          |          |          |
| 2,5       | V | 57,62 V    | 92,78       |          |          |          |          |
| 3,15      | V | 54,16 V    | -256,12     |          |          |          |          |
| 4         | V | 55,22 V    | 83,75       |          |          |          |          |
| 5         | V | 53,53 V    | 86,17       |          |          |          |          |
| 6,3       | V | 53,95 V    | 82,12       |          |          |          |          |
| 8         | V | 57,17 V    | 86,88       |          |          |          |          |
| 10        | V | 60,39 V    | 82,12       |          |          |          |          |
| 12,5      | V | 59,03 V    | 84,71       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 58,58 V    | 86,83       |          |          |          |          |
| 20        | V | 75,4 V     | 107,64      | 0,240991 | 0,001918 | 62,76556 | 54,02136 |
| 25        | V | 64,35 V    | 93,79       | 0,048922 | 0,000311 | 51,71556 | 38,23316 |
| 31,5      | V | 65,05 V    | 92,1        | 0,040272 | 0,000203 | 52,41556 | 34,53575 |
| 40        | V | 72,25 V    | 107,62      | 0,240436 | 0,000957 | 59,61556 | 47,98076 |
| 50        | V | 68,55 V    | 98,61       | 0,085212 | 0,000271 | 55,91556 | 37,03256 |
| 63        | V | 79,84 V    | 114,46      | 0,528445 | 0,001335 | 67,20556 | 50,87515 |
| 80        | V | 104,73 V   | 124,88      | 1,753881 | 0,003489 | 92,09556 | 59,22016 |
| 100       | V | 87,6 V     | 117,17      | 0,721938 | 0,001149 | 74,96556 | 49,57196 |
| 125       | V | 77,63 V    | 118,93      | 0,884097 | 0,001126 | 64,99556 | 59,39376 |
| 160       | V | 96,94 V    | 127,87      | 2,474571 | 0,002462 | 84,30556 | 66,18956 |
| 200       | V | 81,63 V    | 119,54      | 0,948418 | 0,000755 | 68,99556 | 55,92136 |
| 250       | V | 84,55 V    | 122,25      | 1,295687 | 0,000825 | 71,91556 | 56,69316 |
| 315       | V | 81,98 V    | 126,55      | 2,12569  | 0,001074 | 69,34556 | 58,98575 |
| 400       | V | 80,15 V    | 127,82      | 2,460368 | 0,000979 | 67,51556 | 58,18076 |
| 500       | V | 79,26 V    | 123,59      | 1,51182  | 0,000481 | 66,62556 | 52,01256 |
| 630       | V | 81,7 V     | 133,77      | 4,880901 | 0,001233 | 69,06556 | 60,18515 |
| 800       | V | 82,2 V     | 137,32      | 7,345139 | 0,001461 | 69,56556 | 61,66016 |
| 1000      | V | 84,34 V    | 135,84      | 6,194411 | 0,000986 | 71,70556 | 58,24196 |
| 1250      | V | 83,51 V    | 135,32      | 5,834451 | 0,000743 | 70,87556 | 65,78376 |
| 1600      | V | 84,26 V    | 133,89      | 4,948801 | 0,000492 | 71,62556 | 67,20956 |
| 2000      | V | 80,48 V    | 135,46      | 5,929253 | 0,000472 | 67,84556 | 66,84136 |



|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 81,65 V  | 132,19 | 4,069115 | 0,000259 | 69,01556 | 61,63316 |
| 3150  | V | 79,89 V  | 142,19 | 12,86767 | 0,00065  | 67,25556 | 69,62575 |
| 4000  | V | 75,89 V  | 132,99 | 4,461696 | 0,000178 | 63,25556 | 58,35076 |
| 5000  | V | 76,76 V  | 144,42 | 16,63413 | 0,000529 | 64,12556 | 67,84256 |
| 6300  | V | 76,95 V  | 146,16 | 20,32357 | 0,000513 | 64,31556 | 67,57515 |
| 8000  | V | 73,75 V  | 143,48 | 14,92794 | 0,000297 | 61,11556 | 62,82016 |
| 10000 | V | 68,93 V  | 133,23 | 4,586696 | 7,3E-05  | 56,29556 | 50,63196 |
| A/L   | V | 105,69 V | 151,67 | 38,32657 | #####    |          |          |
| W     | V | 93,62 V  | 151,39 | 37,11077 | #####    |          |          |

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í spektrum

— Vypočteno  
— Naměřeno



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 041

Measured 05-04-04 09:41:42

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 113 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

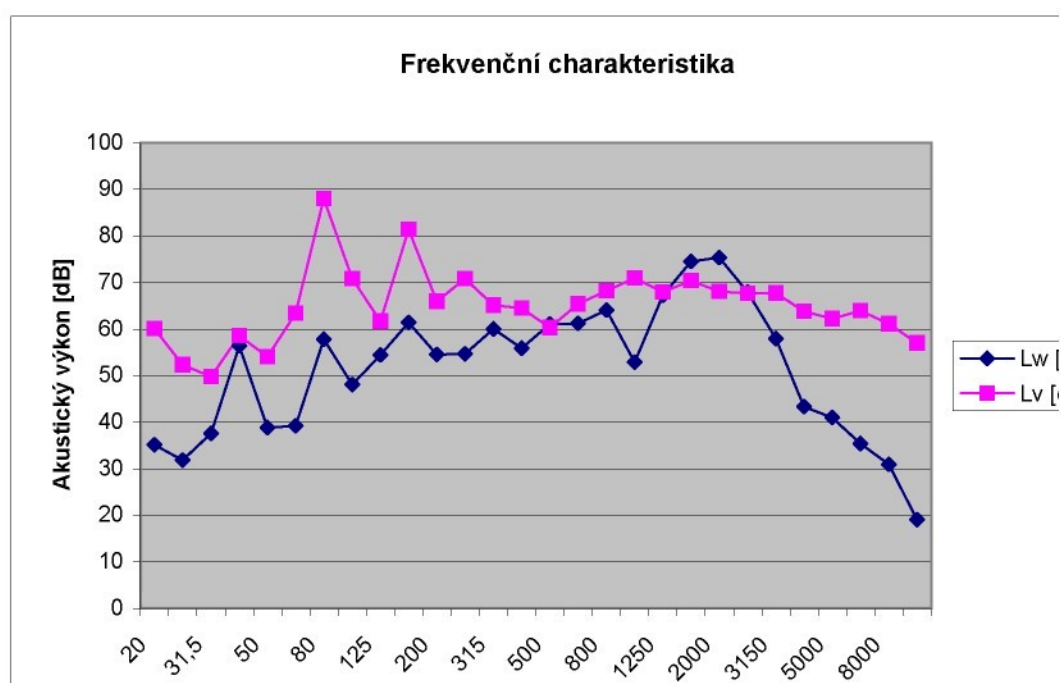
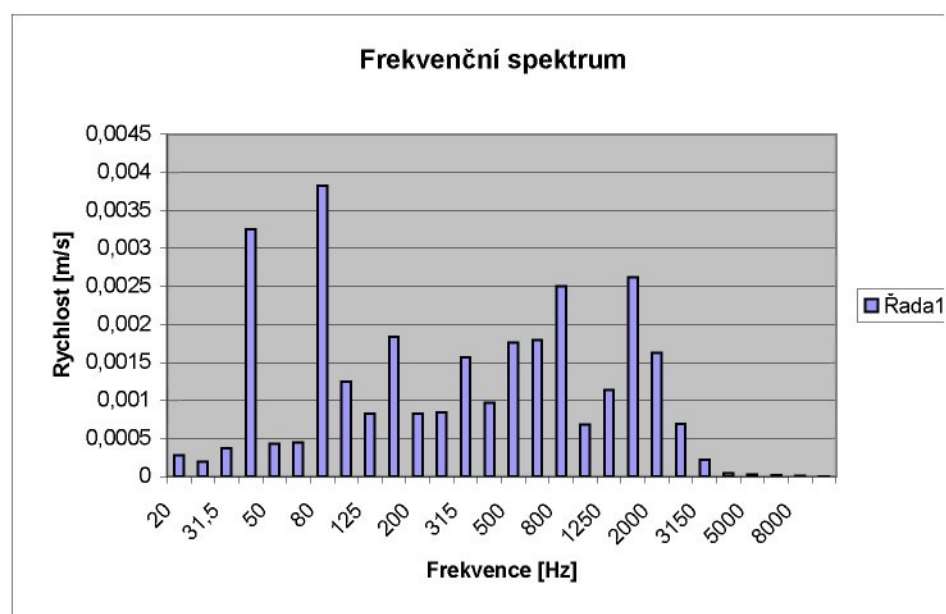
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 59,17 V    | 120,86      |          |          |          |          |
| 0,5       | V | 65,92 V    | 120,41      |          |          |          |          |
| 0,63      | V | 77,42 V    | 115,57      |          |          |          |          |
| 0,8       | V | 81,02 V    | 104,51      |          |          | S12 [m2] | fd       |
| 1         | V | 75,52 V    | 110,32      |          |          | 0,0328   | 1971,203 |
| 1,25      | V | 68,51 V    | 114,46      |          |          |          |          |
| 1,6       | V | 62,77 V    | 110,04      |          |          |          |          |
| 2         | V | 62,02 V    | 105,15      |          |          |          |          |
| 2,5       | V | 62,75 V    | 101,55      |          |          |          |          |
| 3,15      | V | 61,83 V    | 83,75       |          |          |          |          |
| 4         | V | 62,65 V    | 86,76       |          |          |          |          |
| 5         | V | 58,68 V    | 84,24       |          |          |          |          |
| 6,3       | V | 59,64 V    | -256,12     |          |          |          |          |
| 8         | V | 60,09 V    | 77,73       |          |          |          |          |
| 10        | V | 62,65 V    | 84,92       |          |          |          |          |
| 12,5      | V | 59,38 V    | 71,71       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 60,44 V    | 86,62       |          |          |          |          |
| 20        | V | 74,95 V    | 90,94       | 0,035237 | 0,00028  | 60,10874 | 35,11454 |
| 25        | V | 67,17 V    | 89,63       | 0,030304 | 0,000193 | 52,32874 | 31,86634 |
| 31,5      | V | 64,63 V    | 97,36       | 0,07379  | 0,000373 | 49,78874 | 37,58893 |
| 40        | V | 73,47 V    | 118,25      | 0,817523 | 0,003253 | 58,62874 | 56,40394 |
| 50        | V | 68,93 V    | 102,63      | 0,135363 | 0,000431 | 54,08874 | 38,84574 |
| 63        | V | 78,27 V    | 104,98      | 0,177419 | 0,000448 | 63,42874 | 39,18833 |
| 80        | V | 102,89 V   | 125,68      | 1,923092 | 0,003826 | 88,04874 | 57,81334 |
| 100       | V | 85,7 V     | 117,9       | 0,785236 | 0,00125  | 70,85874 | 48,09514 |
| 125       | V | 76,55 V    | 116,23      | 0,647888 | 0,000825 | 61,70874 | 54,48694 |
| 160       | V | 96,26 V    | 125,33      | 1,847141 | 0,001837 | 81,41874 | 61,44274 |
| 200       | V | 80,78 V    | 120,36      | 1,042317 | 0,000829 | 65,93874 | 54,53454 |
| 250       | V | 85,7 V     | 122,41      | 1,319775 | 0,00084  | 70,85874 | 54,64634 |
| 315       | V | 79,94 V    | 129,82      | 3,097419 | 0,001565 | 65,09874 | 60,04893 |
| 400       | V | 79,33 V    | 127,73      | 2,435006 | 0,000969 | 64,48874 | 55,88394 |
| 500       | V | 75,19 V    | 134,85      | 5,527134 | 0,001759 | 60,34874 | 61,06574 |
| 630       | V | 80,24 V    | 137,02      | 7,095778 | 0,001793 | 65,39874 | 61,22833 |
| 800       | V | 83,07 V    | 142         | 12,58925 | 0,002505 | 68,22874 | 64,13334 |
| 1000      | V | 85,84 V    | 132,66      | 4,295364 | 0,000684 | 70,99874 | 52,85514 |
| 1250      | V | 82,78 V    | 139,04      | 8,953648 | 0,00114  | 67,93874 | 67,29694 |
| 1600      | V | 85,3 V     | 148,42      | 26,36331 | 0,002622 | 70,45874 | 74,53274 |
| 2000      | V | 82,95 V    | 146,21      | 20,4409  | 0,001627 | 68,10874 | 75,38454 |

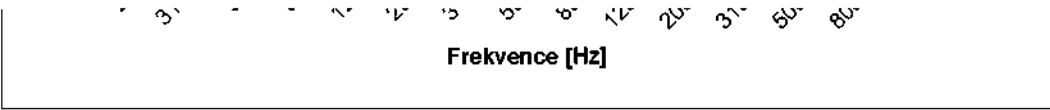
|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 82,5 V   | 140,73 | 10,87677 | 0,000692 | 67,65874 | 67,96634 |
| 3150  | V | 82,6 V   | 132,78 | 4,355119 | 0,00022  | 67,75874 | 58,00893 |
| 4000  | V | 78,69 V  | 120,2  | 1,023293 | 4,07E-05 | 63,84874 | 43,35394 |
| 5000  | V | 77,07 V  | 119,75 | 0,971628 | 3,09E-05 | 62,22874 | 40,96574 |
| 6300  | V | 78,81 V  | 116,23 | 0,647888 | 1,64E-05 | 63,96874 | 35,43833 |
| 8000  | V | 76,01 V  | 113,8  | 0,489779 | 9,74E-06 | 61,16874 | 30,93334 |
| 10000 | V | 71,85 V  | 103,88 | 0,156315 | 2,49E-06 | 57,00874 | 19,07514 |
| A/L   | V | 104,23 V | 152,14 | 40,45759 | #####    |          |          |
| W     | V | 94,33 V  | 152,09 | 40,22537 | #####    |          |          |

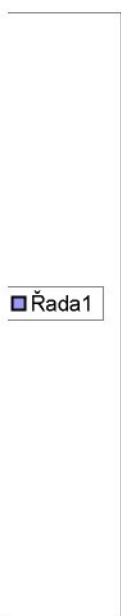
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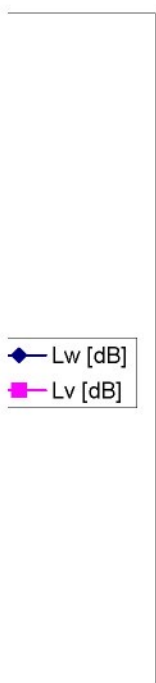








■ Řada1



◆ Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 042

Measured 05-04-04 09:42:02

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 113 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

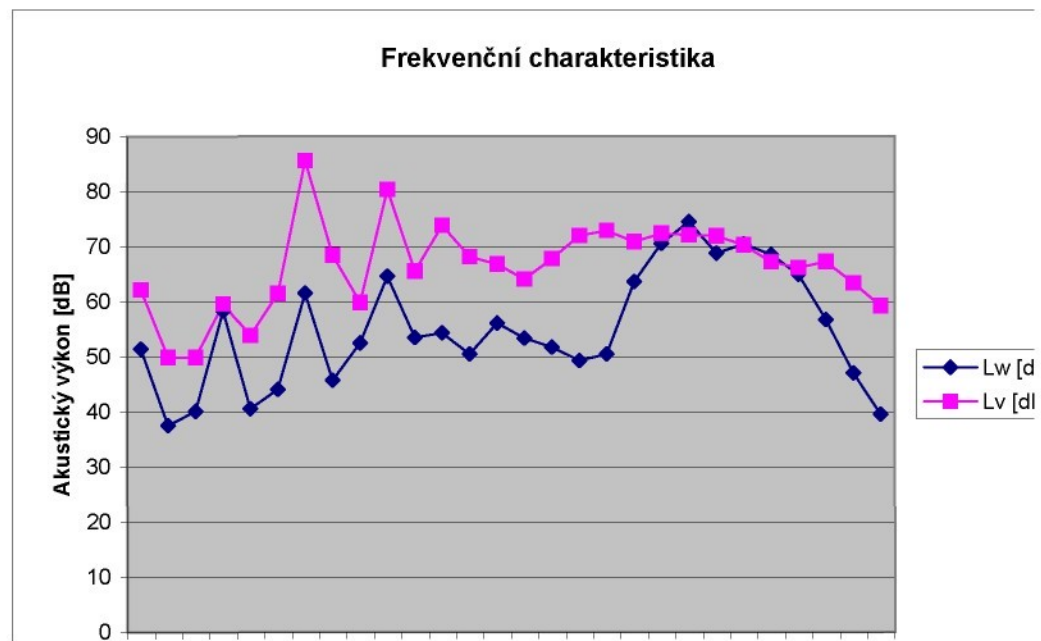
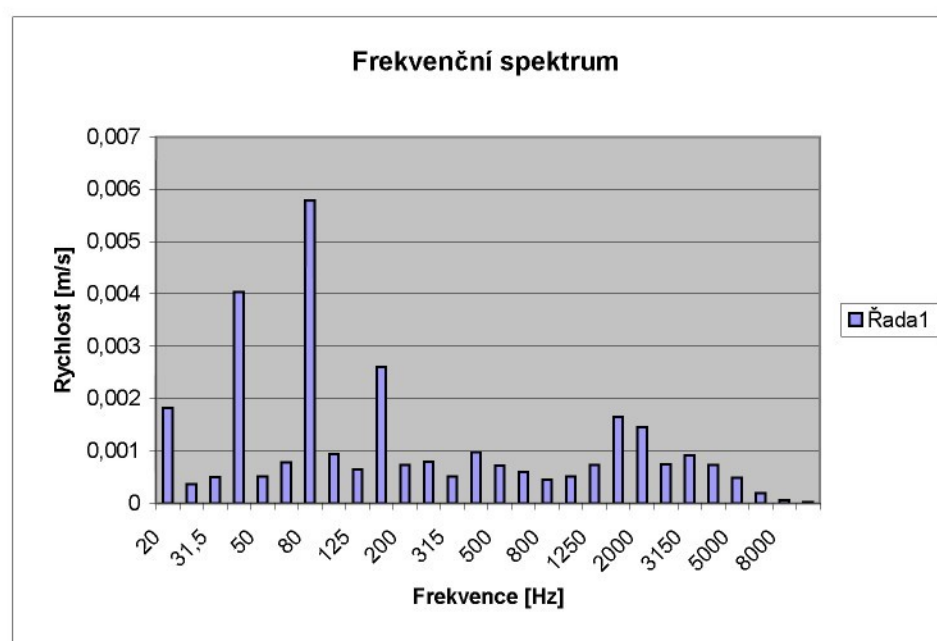
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 67,78 V    | 116,67      |          |          |          |          |
| 0,5       | V | 72,48 V    | 102,42      |          |          |          |          |
| 0,63      | V | 71,12 V    | 117         |          |          |          |          |
| 0,8       | V | 74,06 V    | 109,41      |          |          | S13 [m2] | fd       |
| 1         | V | 73,49 V    | 112,67      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 71,71 V    | 107,78      |          |          |          |          |
| 1,6       | V | 63,76 V    | 101,15      |          |          |          |          |
| 2         | V | 65,57 V    | 95,13       |          |          |          |          |
| 2,5       | V | 61,05 V    | 91,53       |          |          |          |          |
| 3,15      | V | 58,91 V    | 95,41       |          |          |          |          |
| 4         | V | 58,89 V    | 90,83       |          |          |          |          |
| 5         | V | 55,34 V    | 83,16       |          |          |          |          |
| 6,3       | V | 57,27 V    | -256,12     |          |          |          |          |
| 8         | V | 60,42 V    | 86,01       |          |          |          |          |
| 10        | V | 58,98 V    | 74,72       |          |          |          |          |
| 12,5      | V | 58,68 V    | 82,31       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 60,35 V    | 89,65       |          |          |          |          |
| 20        | V | 76,97 V    | 107,17      | 0,228297 | 0,001817 | 62,23339 | 51,4492  |
| 25        | V | 64,67 V    | 95,22       | 0,057677 | 0,000367 | 49,93339 | 37,561   |
| 31,5      | V | 64,7 V     | 99,86       | 0,098401 | 0,000497 | 49,96339 | 40,19358 |
| 40        | V | 74,41 V    | 120,11      | 1,012745 | 0,00403  | 59,67339 | 58,3686  |
| 50        | V | 68,6 V     | 104,18      | 0,161808 | 0,000515 | 53,86339 | 40,5004  |
| 63        | V | 76,17 V    | 109,76      | 0,30761  | 0,000777 | 61,43339 | 44,07298 |
| 80        | V | 100,33 V   | 129,28      | 2,910717 | 0,005791 | 85,59339 | 61,518   |
| 100       | V | 83,16 V    | 115,38      | 0,587489 | 0,000935 | 68,42339 | 45,6798  |
| 125       | V | 74,58 V    | 114,11      | 0,507575 | 0,000646 | 59,84339 | 52,4716  |
| 160       | V | 95,06 V    | 128,36      | 2,618183 | 0,002604 | 80,32339 | 64,5774  |
| 200       | V | 80,24 V    | 119,21      | 0,913061 | 0,000727 | 65,50339 | 53,4892  |
| 250       | V | 88,57 V    | 121,96      | 1,253141 | 0,000798 | 73,83339 | 54,301   |
| 315       | V | 82,9 V     | 120,11      | 1,012745 | 0,000512 | 68,16339 | 50,44358 |
| 400       | V | 81,56 V    | 127,84      | 2,466039 | 0,000981 | 66,82339 | 56,0986  |
| 500       | V | 78,83 V    | 127,07      | 2,256836 | 0,000718 | 64,09339 | 53,3904  |
| 630       | V | 82,55 V    | 127,44      | 2,355049 | 0,000595 | 67,81339 | 51,75298 |
| 800       | V | 86,69 V    | 127,07      | 2,256836 | 0,000449 | 71,95339 | 49,308   |
| 1000      | V | 87,63 V    | 130,17      | 3,224779 | 0,000513 | 72,89339 | 50,4698  |
| 1250      | V | 85,63 V    | 135,25      | 5,78762  | 0,000737 | 70,89339 | 63,6116  |
| 1600      | V | 87,11 V    | 144,38      | 16,5577  | 0,001647 | 72,37339 | 70,5974  |
| 2000      | V | 86,85 V    | 145,25      | 18,30206 | 0,001456 | 72,11339 | 74,5292  |

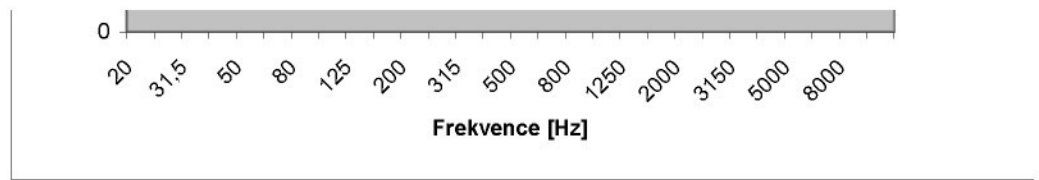
|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 86,64 V  | 141,41 | 11,76251 | 0,000749 | 71,90339 | 68,751   |
| 3150  | V | 85,02 V  | 145,13 | 18,05095 | 0,000912 | 70,28339 | 70,46358 |
| 4000  | V | 81,96 V  | 145,27 | 18,34425 | 0,00073  | 67,22339 | 68,5286  |
| 5000  | V | 80,9 V   | 143,65 | 15,22299 | 0,000485 | 66,16339 | 64,9704  |
| 6300  | V | 81,98 V  | 137,46 | 7,464488 | 0,000189 | 67,24339 | 56,77298 |
| 8000  | V | 78,1 V   | 129,77 | 3,07964  | 6,13E-05 | 63,36339 | 47,008   |
| 10000 | V | 73,96 V  | 124,22 | 1,625549 | 2,59E-05 | 59,22339 | 39,5198  |
| A/L   | V | 102,82 V | 152,66 | 42,95364 | #####    |          |          |
| W     | V | 96,85 V  | 152,54 | 42,3643  | #####    |          |          |

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10\*log sigma

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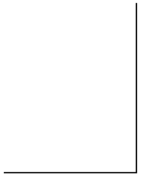




■ Rada1

— Lw [dB]  
— Lv [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 051

Measured 05-04-04 09:56:18

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

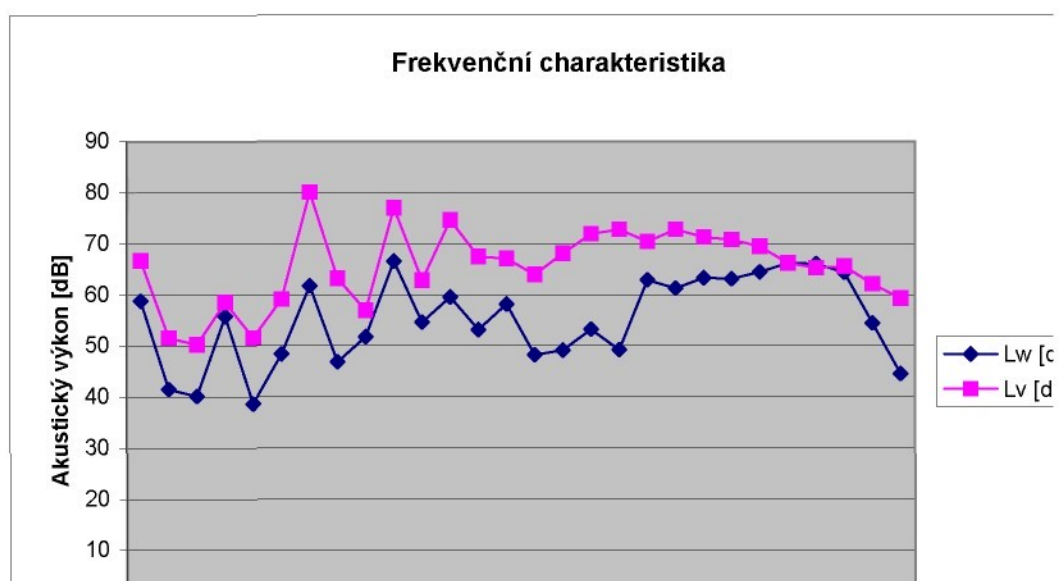
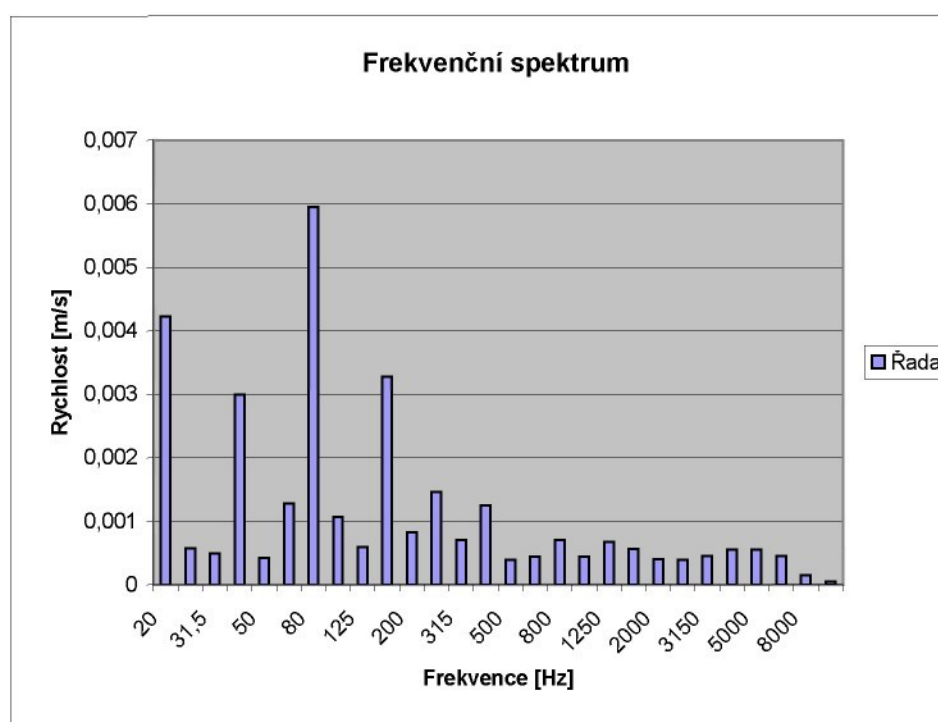
( Start of Data )

Spectrum r 1

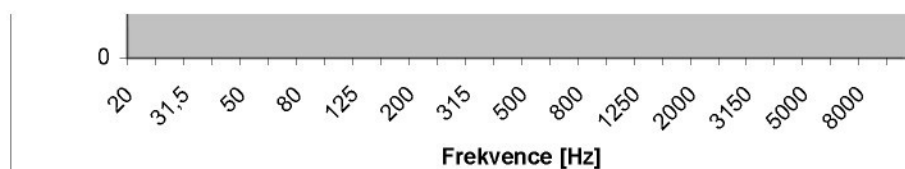
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |             |          |
|-----------|---|------------|-------------|----------|----------|-------------|----------|
| 0,4       | V | 73,75 V    | 109,1       |          |          |             |          |
| 0,5       | V | 74,55 V    | 110,72      |          |          |             |          |
| 0,63      | V | 69,47 V    | 119,61      |          |          |             |          |
| 0,8       | V | 65,47 V    | 116,65      |          |          | S14 [m2] fd |          |
| 1         | V | 68,95 V    | 105,78      |          |          | 0,0336      | 1947,595 |
| 1,25      | V | 67,8 V     | 105,22      |          |          |             |          |
| 1,6       | V | 68,32 V    | 101,46      |          |          |             |          |
| 2         | V | 62,91 V    | 99,81       |          |          |             |          |
| 2,5       | V | 61,59 V    | 100,05      |          |          |             |          |
| 3,15      | V | 61,88 V    | 94,02       |          |          |             |          |
| 4         | V | 54,33 V    | 82,71       |          |          |             |          |
| 5         | V | 53,53 V    | 82,71       |          |          |             |          |
| 6,3       | V | 57,38 V    | 79,7        |          |          |             |          |
| 8         | V | 58,79 V    | 89,49       |          |          |             |          |
| 10        | V | 60,68 V    | 81,47       |          |          |             |          |
| 12,5      | V | 58,11 V    | 88,45       |          |          | Lv [dB]     | Lw [dB]  |
| 16        | V | 61,92 V    | 96,07       |          |          |             |          |
| 20        | V | 81,4 V     | 114,49      | 0,530274 | 0,00422  | 66,66339    | 58,7692  |
| 25        | V | 66,34 V    | 99,15       | 0,090678 | 0,000577 | 51,60339    | 41,491   |
| 31,5      | V | 65,03 V    | 99,81       | 0,097836 | 0,000494 | 50,29339    | 40,14358 |
| 40        | V | 73,26 V    | 117,54      | 0,753356 | 0,002998 | 58,52339    | 55,7986  |
| 50        | V | 66,34 V    | 102,35      | 0,131069 | 0,000417 | 51,60339    | 38,6704  |
| 63        | V | 73,82 V    | 114,09      | 0,506407 | 0,001279 | 59,08339    | 48,40298 |
| 80        | V | 94,75 V    | 129,51      | 2,988822 | 0,005946 | 80,01339    | 61,748   |
| 100       | V | 77,89 V    | 116,53      | 0,670656 | 0,001067 | 63,15339    | 46,8298  |
| 125       | V | 71,66 V    | 113,4       | 0,467735 | 0,000596 | 56,92339    | 51,7616  |
| 160       | V | 91,7 V     | 130,36      | 3,296097 | 0,003279 | 76,96339    | 66,5774  |
| 200       | V | 77,56 V    | 120,32      | 1,037528 | 0,000826 | 62,82339    | 54,5992  |
| 250       | V | 89,34 V    | 127,23      | 2,298794 | 0,001463 | 74,60339    | 59,571   |
| 315       | V | 82,2 V     | 122,83      | 1,38516  | 0,0007   | 67,46339    | 53,16358 |
| 400       | V | 81,82 V    | 129,91      | 3,12968  | 0,001245 | 67,08339    | 58,1686  |
| 500       | V | 78,69 V    | 121,89      | 1,243083 | 0,000396 | 63,95339    | 48,2104  |
| 630       | V | 82,83 V    | 124,81      | 1,739803 | 0,00044  | 68,09339    | 49,12298 |
| 800       | V | 86,62 V    | 130,97      | 3,5359   | 0,000703 | 71,88339    | 53,208   |
| 1000      | V | 87,53 V    | 128,88      | 2,779713 | 0,000442 | 72,79339    | 49,1798  |
| 1250      | V | 85,11 V    | 134,48      | 5,296634 | 0,000674 | 70,37339    | 62,8416  |
| 1600      | V | 87,53 V    | 134,99      | 5,616943 | 0,000559 | 72,79339    | 61,2074  |
| 2000      | V | 86,01 V    | 134,03      | 5,029213 | 0,0004   | 71,27339    | 63,3092  |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 85,51 V | 135,75 | 6,130558 | 0,00039  | 70,77339 | 63,091   |
| 3150  | V | 84,19 V | 139,09 | 9,005338 | 0,000455 | 69,45339 | 64,42358 |
| 4000  | V | 80,95 V | 142,9  | 13,96368 | 0,000556 | 66,21339 | 66,1586  |
| 5000  | V | 79,96 V | 144,73 | 17,23852 | 0,000549 | 65,22339 | 66,0504  |
| 6300  | V | 80,27 V | 145,08 | 17,94734 | 0,000453 | 65,53339 | 64,39298 |
| 8000  | V | 76,86 V | 137,25 | 7,286182 | 0,000145 | 62,12339 | 54,488   |
| 10000 | V | 74,03 V | 129,25 | 2,900681 | 4,62E-05 | 59,29339 | 44,5498  |
| A/L   | V | 99,76 V | 150,63 | 34,00165 | #####    |          |          |
| W     | V | 96,31 V | 150,59 | 33,84543 | #####    |          |          |

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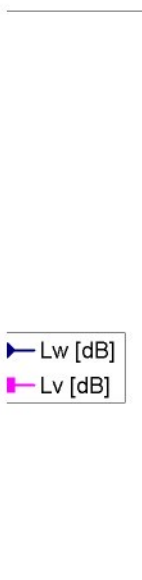
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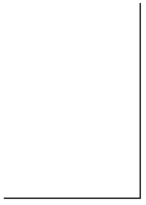




■ Rada1



▮ Lw [dB]  
▮ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 043

Measured 05-04-04 09:42:20

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 113 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 59,41 V     | 112,46      |          |          |          |          |
| 0,5       | V | 70,81 V     | 99,97       |          |          |          |          |
| 0,63      | V | 72,18 V     | 107,74      |          |          |          |          |
| 0,8       | V | 70,81 V     | 115,33      |          |          | S15 [m2] | fd       |
| 1         | V | 69,94 V     | 116,08      |          |          | 0,05     | 1596,553 |
| 1,25      | V | 70,86 V     | 114,18      |          |          |          |          |
| 1,6       | V | 70,01 V     | 107,52      |          |          |          |          |
| 2         | V | 71,49 V     | 104,04      |          |          |          |          |
| 2,5       | V | 68,01 V     | 100,37      |          |          |          |          |
| 3,15      | V | 67,9 V      | 92,26       |          |          |          |          |
| 4         | V | 66,49 V     | 87,72       |          |          |          |          |
| 5         | V | 62,82 V     | 81,7        |          |          |          |          |
| 6,3       | V | 61,26 V     | -256,12     |          |          |          |          |
| 8         | V | 64,06 V     | 80,74       |          |          |          |          |
| 10        | V | 66,39 V     | 78,69       |          |          |          |          |
| 12,5      | V | 61,92 V     | 82,67       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 65,47 V     | 88,9        |          |          |          |          |
| 20        | V | 76,34 V     | 104,96      | 0,177011 | 0,001409 | 63,3297  | 50,9655  |
| 25        | V | 67,31 V     | 91,01       | 0,035522 | 0,000226 | 54,2997  | 35,0773  |
| 31,5      | V | 64,02 V     | 89,82       | 0,030974 | 0,000156 | 51,0097  | 31,87989 |
| 40        | V | 70,39 V     | 103,13      | 0,143384 | 0,000571 | 57,3797  | 43,1149  |
| 50        | V | 66,89 V     | 91,53       | 0,037714 | 0,00012  | 53,8797  | 29,5767  |
| 63        | V | 76,69 V     | 98,59       | 0,085016 | 0,000215 | 63,6797  | 34,62929 |
| 80        | V | 101,17 V    | 122,39      | 1,31674  | 0,00262  | 88,1597  | 56,3543  |
| 100       | V | 84,19 V     | 109,73      | 0,306549 | 0,000488 | 71,1797  | 41,7561  |
| 125       | V | 75,12 V     | 105,53      | 0,189017 | 0,000241 | 62,1097  | 45,6179  |
| 160       | V | 94,4 V      | 119,07      | 0,898463 | 0,000894 | 81,3897  | 57,0137  |
| 200       | V | 79,26 V     | 115,83      | 0,618728 | 0,000492 | 66,2497  | 51,8355  |
| 250       | V | 82,15 V     | 116,77      | 0,689446 | 0,000439 | 69,1397  | 50,8373  |
| 315       | V | 76,22 V     | 118,77      | 0,867961 | 0,000439 | 63,2097  | 50,82989 |
| 400       | V | 78,5 V      | 116,95      | 0,703882 | 0,00028  | 65,4897  | 46,9349  |
| 500       | V | 79,07 V     | 120,48      | 1,056818 | 0,000336 | 66,0597  | 48,5267  |
| 630       | V | 79,84 V     | 117,66      | 0,763836 | 0,000193 | 66,8297  | 43,69929 |
| 800       | V | 83,72 V     | 124,46      | 1,671091 | 0,000332 | 70,7097  | 48,4243  |
| 1000      | V | 85,84 V     | 127,23      | 2,298794 | 0,000366 | 72,8297  | 49,2561  |
| 1250      | V | 81,51 V     | 129,23      | 2,89401  | 0,000368 | 68,4997  | 59,3179  |
| 1600      | V | 86,26 V     | 136,66      | 6,807694 | 0,000677 | 73,2497  | 69,6037  |
| 2000      | V | 86,62 V     | 138,19      | 8,118952 | 0,000646 | 73,6097  | 69,1955  |

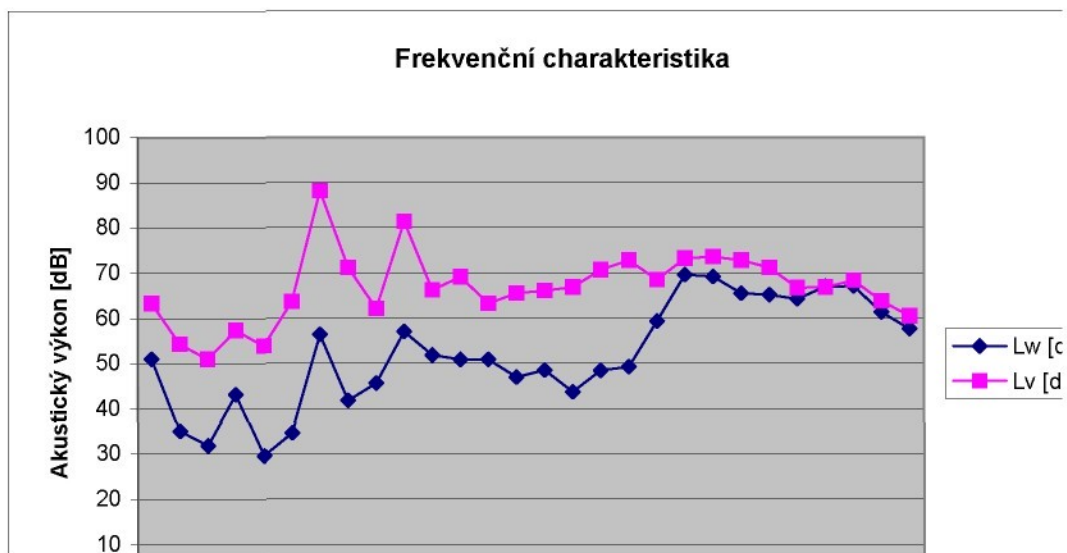
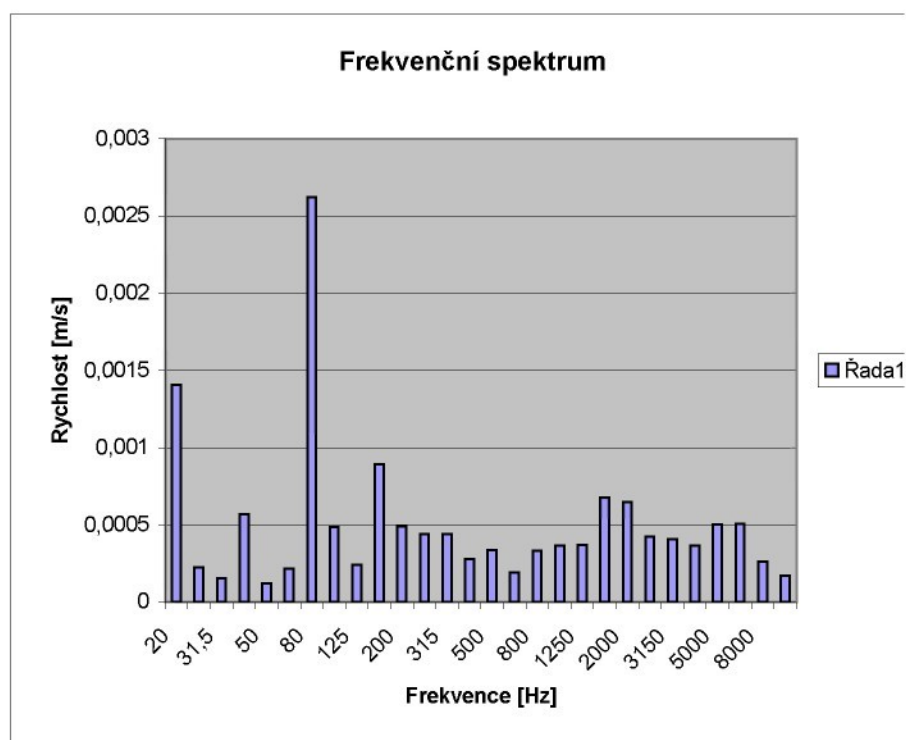


|       |   |          |        |          |          |         |          |
|-------|---|----------|--------|----------|----------|---------|----------|
| 2500  | V | 85,84 V  | 136,45 | 6,645077 | 0,000423 | 72,8297 | 65,5173  |
| 3150  | V | 84,19 V  | 138,1  | 8,035261 | 0,000406 | 71,1797 | 65,15989 |
| 4000  | V | 79,73 V  | 139,27 | 9,193905 | 0,000366 | 66,7197 | 64,2549  |
| 5000  | V | 79,89 V  | 143,98 | 15,81248 | 0,000503 | 66,8797 | 67,0267  |
| 6300  | V | 81,35 V  | 146,02 | 19,99862 | 0,000505 | 68,3397 | 67,05929 |
| 8000  | V | 76,81 V  | 142,4  | 13,18257 | 0,000262 | 63,7997 | 61,3643  |
| 10000 | V | 73,52 V  | 140,59 | 10,70286 | 0,00017  | 60,5097 | 57,6161  |
| A/L   | V | 102,84 V | 151,36 | 36,98282 | #####    |         |          |
| W     | V | 95,46 V  | 151,03 | 35,6041  | #####    |         |          |

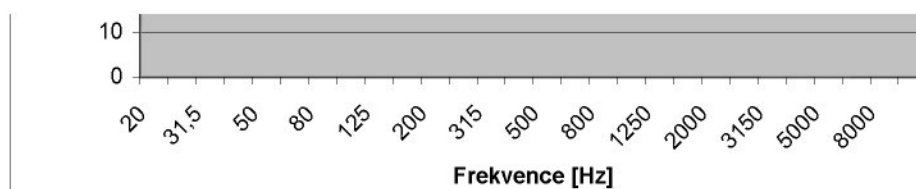
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10\*log sigma

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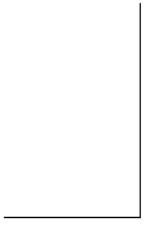


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Řada1

Lw [dB]  
Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 044

Measured 05-04-04 09:42:42

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 113 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

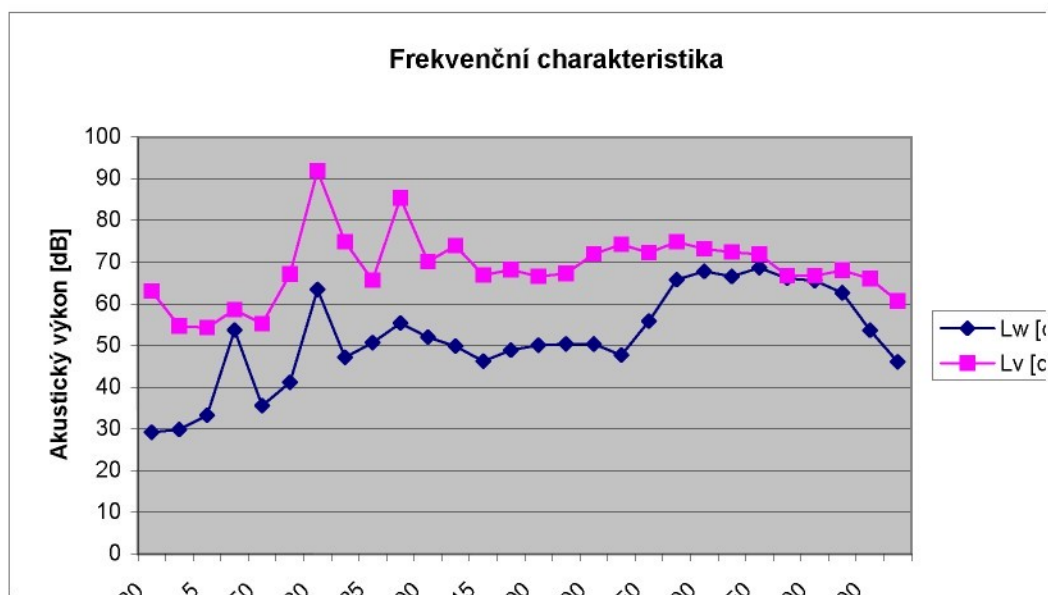
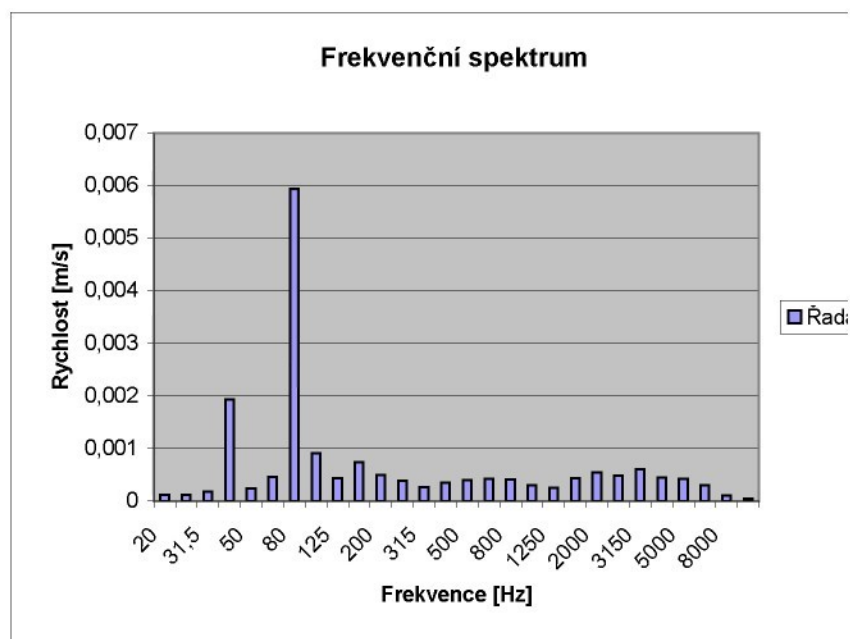
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 68,93 V    | 117,64      |          |          |          |          |
| 0,5       | V | 67,07 V    | 116,48      |          |          |          |          |
| 0,63      | V | 71,64 V    | 115,33      |          |          |          |          |
| 0,8       | V | 76,25 V    | 107,22      |          |          | S16 [m2] | fd       |
| 1         | V | 72,69 V    | 112,35      |          |          | 0,05     | 1596,553 |
| 1,25      | V | 73,38 V    | 111,17      |          |          |          |          |
| 1,6       | V | 68,81 V    | 99,74       |          |          |          |          |
| 2         | V | 65,59 V    | 94,87       |          |          |          |          |
| 2,5       | V | 57,43 V    | 90,26       |          |          |          |          |
| 3,15      | V | 60,21 V    | 88,69       |          |          |          |          |
| 4         | V | 55,88 V    | 92,47       |          |          |          |          |
| 5         | V | 56,16 V    | 89,02       |          |          |          |          |
| 6,3       | V | 59,12 V    | -256,12     |          |          |          |          |
| 8         | V | 55,71 V    | 85,68       |          |          |          |          |
| 10        | V | 57,05 V    | 82,83       |          |          |          |          |
| 12,5      | V | 54,3 V     | 74,72       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 58,23 V    | 87,72       |          |          |          |          |
| 20        | V | 76,08 V    | 83,16       | 0,014388 | 0,000114 | 63,0697  | 29,1655  |
| 25        | V | 67,68 V    | 85,79       | 0,019476 | 0,000124 | 54,6697  | 29,8573  |
| 31,5      | V | 67,31 V    | 91,18       | 0,036224 | 0,000183 | 54,2997  | 33,23989 |
| 40        | V | 71,64 V    | 113,71      | 0,48473  | 0,001929 | 58,6297  | 53,6949  |
| 50        | V | 68,23 V    | 97,55       | 0,075422 | 0,00024  | 55,2197  | 35,5967  |
| 63        | V | 80,1 V     | 105,13      | 0,180509 | 0,000456 | 67,0897  | 41,16929 |
| 80        | V | 104,91 V   | 129,51      | 2,988822 | 0,005946 | 91,8997  | 63,4743  |
| 100       | V | 87,89 V    | 115,12      | 0,570164 | 0,000907 | 74,8797  | 47,1461  |
| 125       | V | 78,69 V    | 110,6       | 0,338844 | 0,000431 | 65,6797  | 50,6879  |
| 160       | V | 98,4 V     | 117,47      | 0,747309 | 0,000743 | 85,3897  | 55,4137  |
| 200       | V | 83,14 V    | 115,99      | 0,630231 | 0,000502 | 70,1297  | 51,9955  |
| 250       | V | 86,99 V    | 115,78      | 0,615177 | 0,000392 | 73,9797  | 49,8473  |
| 315       | V | 79,91 V    | 114,2       | 0,512861 | 0,000259 | 66,8997  | 46,25989 |
| 400       | V | 81,21 V    | 118,93      | 0,884097 | 0,000352 | 68,1997  | 48,9149  |
| 500       | V | 79,61 V    | 122,01      | 1,260376 | 0,000401 | 66,5997  | 50,0567  |
| 630       | V | 80,29 V    | 124,36      | 1,651962 | 0,000417 | 67,2797  | 50,39929 |
| 800       | V | 84,95 V    | 126,39      | 2,086892 | 0,000415 | 71,9397  | 50,3543  |
| 1000      | V | 87,28 V    | 125,68      | 1,923092 | 0,000306 | 74,2697  | 47,7061  |
| 1250      | V | 85,3 V     | 125,77      | 1,943122 | 0,000247 | 72,2897  | 55,8579  |
| 1600      | V | 87,91 V    | 132,88      | 4,405549 | 0,000438 | 74,8997  | 65,8237  |
| 2000      | V | 86,24 V    | 136,78      | 6,902398 | 0,000549 | 73,2297  | 67,7855  |

|       |   |          |        |          |          |         |          |
|-------|---|----------|--------|----------|----------|---------|----------|
| 2500  | V | 85,44 V  | 137,53 | 7,524887 | 0,000479 | 72,4297 | 66,5973  |
| 3150  | V | 84,88 V  | 141,63 | 12,06424 | 0,00061  | 71,8697 | 68,68989 |
| 4000  | V | 79,77 V  | 141,13 | 11,38938 | 0,000453 | 66,7597 | 66,1149  |
| 5000  | V | 79,75 V  | 142,52 | 13,36596 | 0,000425 | 66,7397 | 65,5667  |
| 6300  | V | 81,04 V  | 141,6  | 12,02264 | 0,000304 | 68,0297 | 62,63929 |
| 8000  | V | 79,07 V  | 134,69 | 5,426253 | 0,000108 | 66,0597 | 53,6543  |
| 10000 | V | 73,68 V  | 129,07 | 2,841188 | 4,52E-05 | 60,6697 | 46,0961  |
| A/L   | V | 106,28 V | 149,15 | 28,67477 | #####    |         |          |
| W     | V | 96,61 V  | 148,99 | 28,1514  | #####    |         |          |

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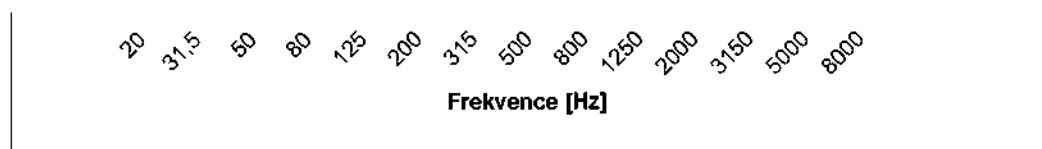
10\*log sigma

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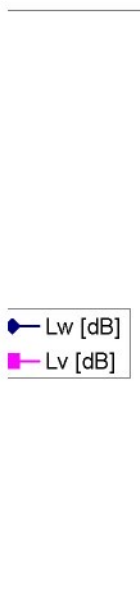


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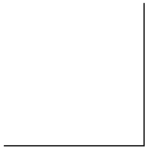




■ Řada1



● Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 045

Measured 05-04-04 09:42:58

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 113 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

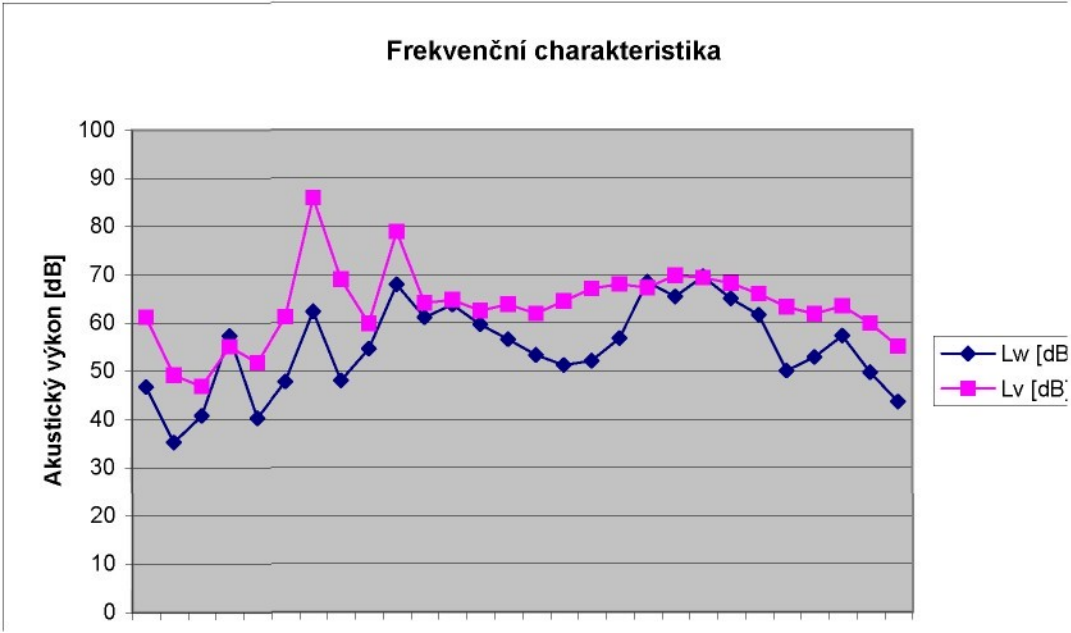
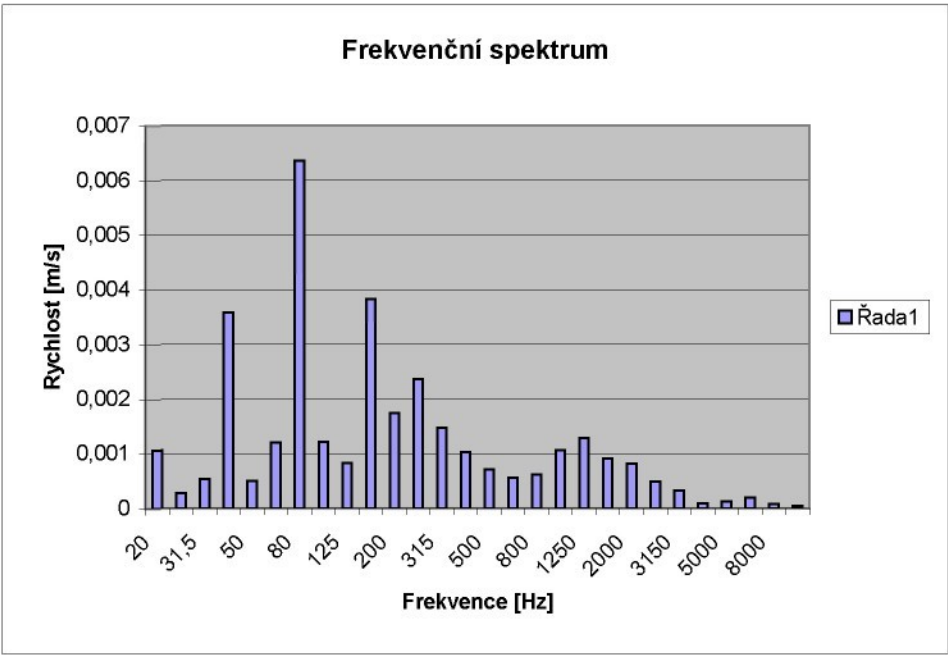
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 60,96 V    | 115,92      |          |          |          |          |
| 0,5       | V | 71,57 V    | 117,47      |          |          |          |          |
| 0,63      | V | 70,22 V    | 116,48      |          |          |          |          |
| 0,8       | V | 65,92 V    | 112,86      |          |          | S17 [m2] | fd       |
| 1         | V | 65,62 V    | 112,96      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 67,8 V     | 109,59      |          |          |          |          |
| 1,6       | V | 62,84 V    | 101,36      |          |          |          |          |
| 2         | V | 63,4 V     | 97,88       |          |          |          |          |
| 2,5       | V | 62,32 V    | 101,97      |          |          |          |          |
| 3,15      | V | 58,89 V    | 86,76       |          |          |          |          |
| 4         | V | 55,41 V    | 80,74       |          |          |          |          |
| 5         | V | 56,35 V    | 80,74       |          |          |          |          |
| 6,3       | V | 55,55 V    | -256,12     |          |          |          |          |
| 8         | V | 56,02 V    | 84,01       |          |          |          |          |
| 10        | V | 58,02 V    | 82,12       |          |          |          |          |
| 12,5      | V | 56,84 V    | 86,31       |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 57,05 V    | 87,77       |          |          |          |          |
| 20        | V | 75,94 V    | 102,47      | 0,132892 | 0,001058 | 61,20339 | 46,7492  |
| 25        | V | 63,97 V    | 92,9        | 0,044157 | 0,000281 | 49,23339 | 35,241   |
| 31,5      | V | 61,62 V    | 100,42      | 0,104954 | 0,00053  | 46,88339 | 40,75358 |
| 40        | V | 69,82 V    | 119,09      | 0,900534 | 0,003583 | 55,08339 | 57,3486  |
| 50        | V | 66,56 V    | 103,97      | 0,157943 | 0,000503 | 51,82339 | 40,2904  |
| 63        | V | 75,99 V    | 113,52      | 0,474242 | 0,001198 | 61,25339 | 47,83298 |
| 80        | V | 100,66 V   | 130,1       | 3,198895 | 0,006364 | 85,92339 | 62,338   |
| 100       | V | 83,72 V    | 117,68      | 0,765597 | 0,001218 | 68,98339 | 47,9798  |
| 125       | V | 74,58 V    | 116,25      | 0,649382 | 0,000827 | 59,84339 | 54,6116  |
| 160       | V | 93,65 V    | 131,7       | 3,845918 | 0,003826 | 78,91339 | 67,9174  |
| 200       | V | 78,83 V    | 126,81      | 2,190282 | 0,001743 | 64,09339 | 61,0892  |
| 250       | V | 79,47 V    | 131,39      | 3,711077 | 0,002363 | 64,73339 | 63,731   |
| 315       | V | 77,23 V    | 129,28      | 2,910717 | 0,001471 | 62,49339 | 59,61358 |
| 400       | V | 78,55 V    | 128,29      | 2,597168 | 0,001033 | 63,81339 | 56,5486  |
| 500       | V | 76,65 V    | 127,02      | 2,243882 | 0,000714 | 61,91339 | 53,3404  |
| 630       | V | 79,21 V    | 126,9       | 2,213095 | 0,000559 | 64,47339 | 51,21298 |
| 800       | V | 81,8 V     | 129,91      | 3,12968  | 0,000623 | 67,06339 | 52,148   |
| 1000      | V | 82,71 V    | 136,45      | 6,645077 | 0,001058 | 67,97339 | 56,7498  |
| 1250      | V | 82,03 V    | 140,1       | 10,11579 | 0,001288 | 67,29339 | 68,4616  |
| 1600      | V | 84,52 V    | 139,2       | 9,120108 | 0,000907 | 69,78339 | 65,4174  |
| 2000      | V | 84,03 V    | 140,28      | 10,32761 | 0,000822 | 69,29339 | 69,5592  |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 82,92 V  | 137,67 | 7,647157 | 0,000487 | 68,18339 | 65,011   |
| 3150  | V | 80,71 V  | 136,26 | 6,501297 | 0,000328 | 65,97339 | 61,59358 |
| 4000  | V | 78,03 V  | 126,81 | 2,190282 | 8,71E-05 | 63,29339 | 50,0686  |
| 5000  | V | 76,57 V  | 131,54 | 3,775722 | 0,00012  | 61,83339 | 52,8604  |
| 6300  | V | 78,22 V  | 138    | 7,943282 | 0,000201 | 63,48339 | 57,31298 |
| 8000  | V | 74,65 V  | 132,52 | 4,226686 | 8,41E-05 | 59,91339 | 49,758   |
| 10000 | V | 69,85 V  | 128,31 | 2,603155 | 4,14E-05 | 55,11339 | 43,6098  |
| A/L   | V | 102,04 V | 148,21 | 25,73357 | #####    |          |          |
| W     | V | 93,3 V   | 147,98 | 25,06109 | #####    |          |          |

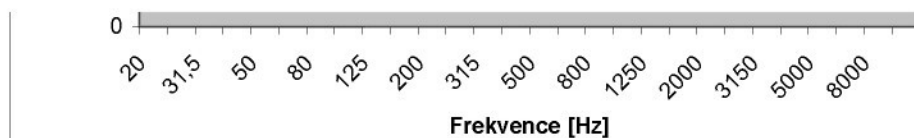
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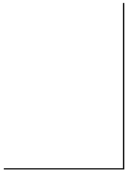
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ada1

- Lw [dB]  
- Lv [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 046

Measured 05-04-04 09:43:20

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 113 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 170 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

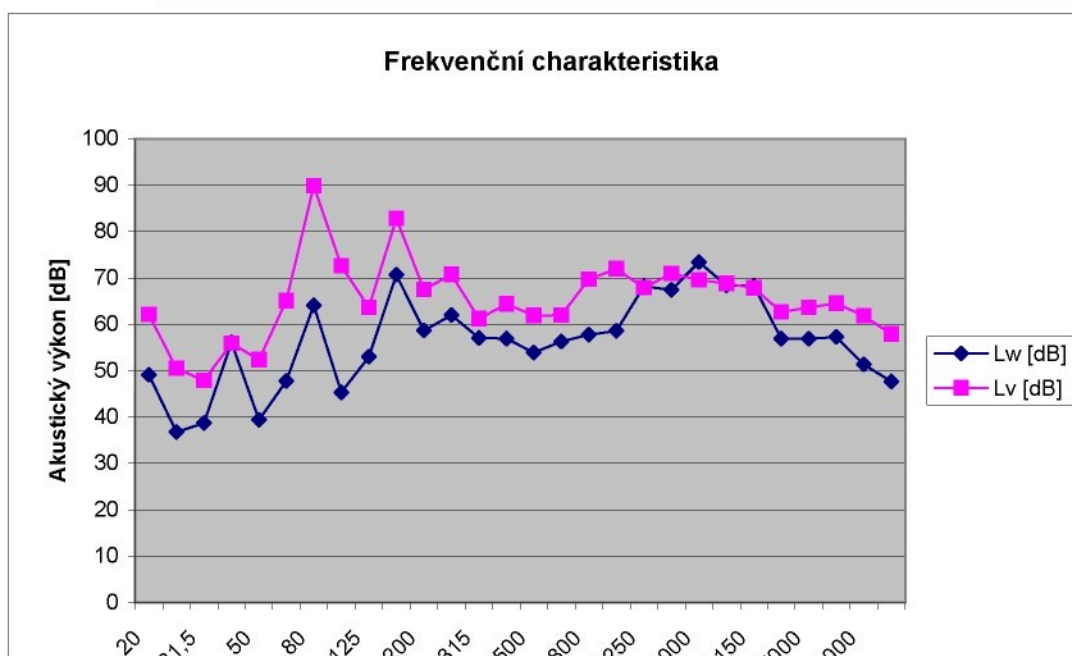
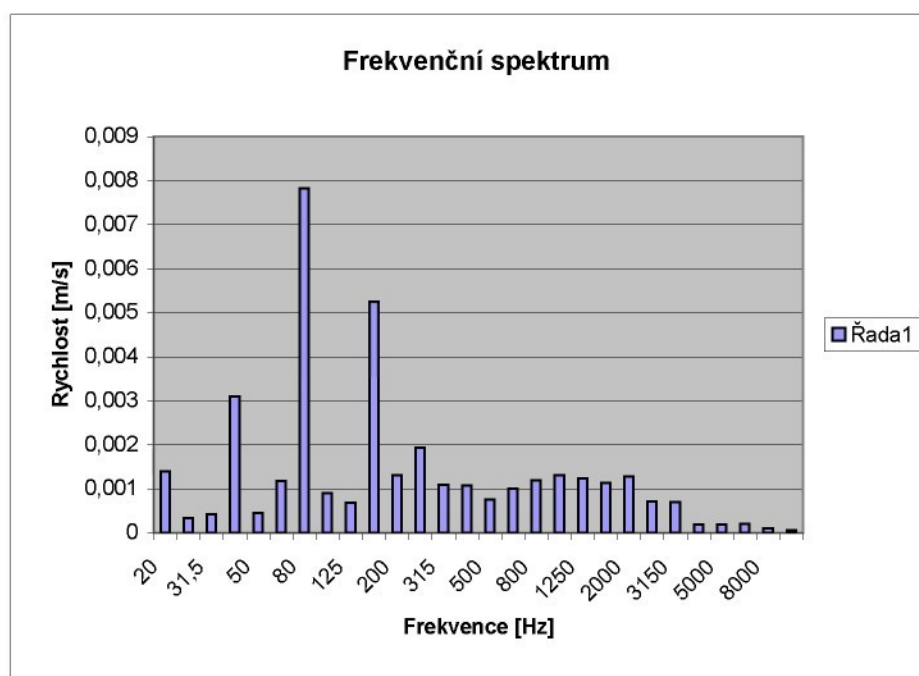
( Start of Data )

Spectrum r 1

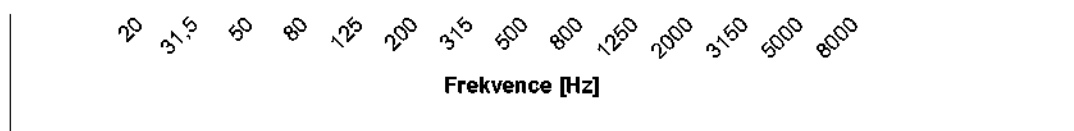
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |             |          |
|-----------|---|------------|-------------|----------|----------|-------------|----------|
| 0,4       | V | 69,14 V    | 107,45      |          |          |             |          |
| 0,5       | V | 68,44 V    | 97,18       |          |          |             |          |
| 0,63      | V | 71,64 V    | 95,48       |          |          |             |          |
| 0,8       | V | 67 V       | 97,46       |          |          | S18 [m2] fd |          |
| 1         | V | 66,46 V    | 95,79       |          |          | 0,0336      | 1947,595 |
| 1,25      | V | 57,48 V    | 95,04       |          |          |             |          |
| 1,6       | V | 63,87 V    | 98,87       |          |          |             |          |
| 2         | V | 63,4 V     | 94,61       |          |          |             |          |
| 2,5       | V | 61,19 V    | 87,25       |          |          |             |          |
| 3,15      | V | 58,02 V    | 90,73       |          |          |             |          |
| 4         | V | 56,7 V     | 84,24       |          |          |             |          |
| 5         | V | 54,77 V    | 79,49       |          |          |             |          |
| 6,3       | V | 57,71 V    | -256,12     |          |          |             |          |
| 8         | V | 58,21 V    | 88,43       |          |          |             |          |
| 10        | V | 60,09 V    | 78,69       |          |          |             |          |
| 12,5      | V | 54,82 V    | 87,37       |          |          | Lv [dB]     | Lw [dB]  |
| 16        | V | 56,61 V    | 86,01       |          |          |             |          |
| 20        | V | 76,83 V    | 104,87      | 0,175186 | 0,001394 | 62,09339    | 49,1492  |
| 25        | V | 65,24 V    | 94,45       | 0,052784 | 0,000336 | 50,50339    | 36,791   |
| 31,5      | V | 62,63 V    | 98,4        | 0,083176 | 0,00042  | 47,89339    | 38,73358 |
| 40        | V | 70,67 V    | 117,85      | 0,780728 | 0,003106 | 55,93339    | 56,1086  |
| 50        | V | 67,1 V     | 103,06      | 0,142233 | 0,000453 | 52,36339    | 39,3804  |
| 63        | V | 79,8 V     | 113,45      | 0,470435 | 0,001188 | 65,06339    | 47,76298 |
| 80        | V | 104,58 V   | 131,89      | 3,930972 | 0,00782  | 89,84339    | 64,128   |
| 100       | V | 87,35 V    | 115,03      | 0,564287 | 0,000898 | 72,61339    | 45,3298  |
| 125       | V | 78,34 V    | 114,63      | 0,53889  | 0,000686 | 63,60339    | 52,9916  |
| 160       | V | 97,53 V    | 134,45      | 5,278372 | 0,00525  | 82,79339    | 70,6674  |
| 200       | V | 82,24 V    | 124,36      | 1,651962 | 0,001315 | 67,50339    | 58,6392  |
| 250       | V | 85,49 V    | 129,65      | 3,037386 | 0,001934 | 70,75339    | 61,991   |
| 315       | V | 75,94 V    | 126,76      | 2,17771  | 0,0011   | 61,20339    | 57,09358 |
| 400       | V | 79,11 V    | 128,67      | 2,713314 | 0,00108  | 64,37339    | 56,9286  |
| 500       | V | 76,65 V    | 127,61      | 2,401596 | 0,000764 | 61,91339    | 53,9304  |
| 630       | V | 76,72 V    | 132,03      | 3,994846 | 0,001009 | 61,98339    | 56,34298 |
| 800       | V | 84,41 V    | 135,56      | 5,997911 | 0,001193 | 69,67339    | 57,798   |
| 1000      | V | 86,69 V    | 138,31      | 8,231898 | 0,00131  | 71,95339    | 58,6098  |
| 1250      | V | 82,64 V    | 139,79      | 9,761128 | 0,001243 | 67,90339    | 68,1516  |
| 1600      | V | 85,65 V    | 141,18      | 11,45513 | 0,001139 | 70,91339    | 67,3974  |
| 2000      | V | 84,29 V    | 144,12      | 16,06941 | 0,001279 | 69,55339    | 73,3992  |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 83,51 V  | 141,06 | 11,29796 | 0,000719 | 68,77339 | 68,401   |
| 3150  | V | 82,55 V  | 142,94 | 14,02814 | 0,000709 | 67,81339 | 68,27358 |
| 4000  | V | 77,4 V   | 133,65 | 4,813933 | 0,000192 | 62,66339 | 56,9086  |
| 5000  | V | 78,34 V  | 135,53 | 5,97723  | 0,00019  | 63,60339 | 56,8504  |
| 6300  | V | 79,28 V  | 137,98 | 7,925013 | 0,0002   | 64,54339 | 57,29298 |
| 8000  | V | 76,57 V  | 134,12 | 5,081594 | 0,000101 | 61,83339 | 51,358   |
| 10000 | V | 72,62 V  | 132,41 | 4,173496 | 6,64E-05 | 57,88339 | 47,7098  |
| A/L   | V | 105,74 V | 150,66 | 34,11929 | #####    |          |          |
| W     | V | 94,94 V  | 150,68 | 34,19794 | #####    |          |          |

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 047

Measured 05-04-04 09:43:34

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | ○ | 64,77 V    | 114,96     |          |          |          |          |
| 0,5       | ○ | 62,51 V    | 111,36     |          |          |          |          |
| 0,63      | ○ | 64,79 V    | 105,45     |          |          |          |          |
| 0,8       | ○ | 65,52 V    | 108,35     |          |          | S19 [m2] | fd       |
| 1         | ○ | 69,8 V     | 111,31     |          |          | 0,0336   | 1947,595 |
| 1,25      | ○ | 63,1 V     | 115,68     |          |          |          |          |
| 1,6       | ○ | 62,96 V    | 113,47     |          |          |          |          |
| 2         | ○ | 64,98 V    | 113,87     |          |          |          |          |
| 2,5       | ○ | 60,21 V    | 113,76     |          |          |          |          |
| 3,15      | ○ | 59,43 V    | 113,22     |          |          |          |          |
| 4         | ○ | 59,1 V     | 111,17     |          |          |          |          |
| 5         | ○ | 57,5 V     | 110,49     |          |          |          |          |
| 6,3       | ○ | 59,08 V    | 103,6      |          |          |          |          |
| 8         | ○ | 58,4 V     | 98,38      |          |          |          |          |
| 10        | ○ | 58,28 V    | 93,79      |          |          |          |          |
| 12,5      | ○ | 55,29 V    | 88,31      |          |          | Lv [dB]  | Lw [dB]  |
| 16        | ○ | 57,92 V    | 89,37      |          |          |          |          |
| 20        | ○ | 74,58 V    | 108,35     | 0,261517 | 0,002081 | 59,84339 | 52,6292  |
| 25        | ○ | 64,7 V     | 95,51      | 0,059635 | 0,00038  | 49,96339 | 37,851   |
| 31,5      | ○ | 62,11 V    | 99,93      | 0,099197 | 0,000501 | 47,37339 | 40,26358 |
| 40        | ○ | 70,67 V    | 114,84     | 0,552077 | 0,002197 | 55,93339 | 53,0986  |
| 50        | ○ | 68,67 V    | 101,57     | 0,119812 | 0,000381 | 53,93339 | 37,8904  |
| 63        | ○ | 83,37 V    | 112,25     | 0,409732 | 0,001035 | 68,63339 | 46,56298 |
| 80        | ○ | 108,39 V   | 131,75     | 3,868121 | 0,007695 | 93,65339 | 63,988   |
| 100       | ○ | 91,34 V    | 116,67     | 0,681554 | 0,001085 | 76,60339 | 46,9698  |
| 125       | ○ | 81,94 V    | 115,5      | 0,595662 | 0,000758 | 67,20339 | 53,8616  |
| 160       | ○ | 100,8 V    | 135,25     | 5,78762  | 0,005757 | 86,06339 | 71,4674  |
| 200       | ○ | 85,51 V    | 124,97     | 1,772148 | 0,00141  | 70,77339 | 59,2492  |
| 250       | ○ | 89,74 V    | 131,7      | 3,845918 | 0,002448 | 75,00339 | 64,041   |
| 315       | ○ | 76,03 V    | 131,58     | 3,79315  | 0,001917 | 61,29339 | 61,91358 |
| 400       | ○ | 81,25 V    | 132,45     | 4,19276  | 0,001668 | 66,51339 | 60,7086  |
| 500       | ○ | 77,23 V    | 128,55     | 2,676086 | 0,000852 | 62,49339 | 54,8704  |
| 630       | ○ | 77,87 V    | 131,54     | 3,775722 | 0,000954 | 63,13339 | 55,85298 |
| 800       | ○ | 81,58 V    | 134,85     | 5,527134 | 0,0011   | 66,84339 | 57,088   |
| 1000      | ○ | 85,53 V    | 134,33     | 5,20595  | 0,000829 | 70,79339 | 54,6298  |
| 1250      | ○ | 80,31 V    | 131,68     | 3,837072 | 0,000489 | 65,57339 | 60,0416  |
| 1600      | ○ | 82,48 V    | 141,39     | 11,73546 | 0,001167 | 67,74339 | 67,6074  |
| 2000      | ○ | 82,41 V    | 143,48     | 14,92794 | 0,001188 | 67,67339 | 72,7592  |

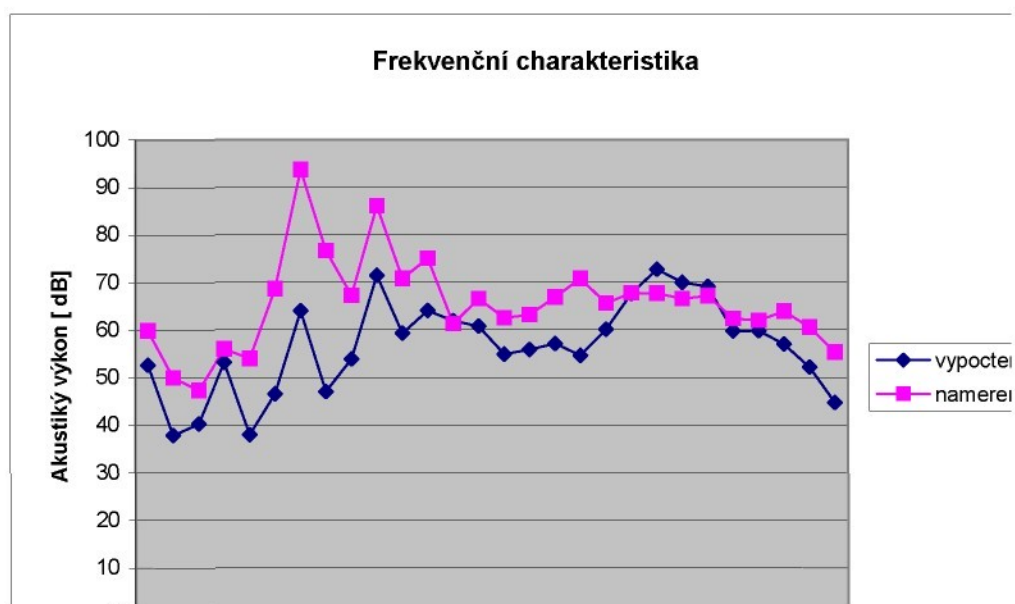
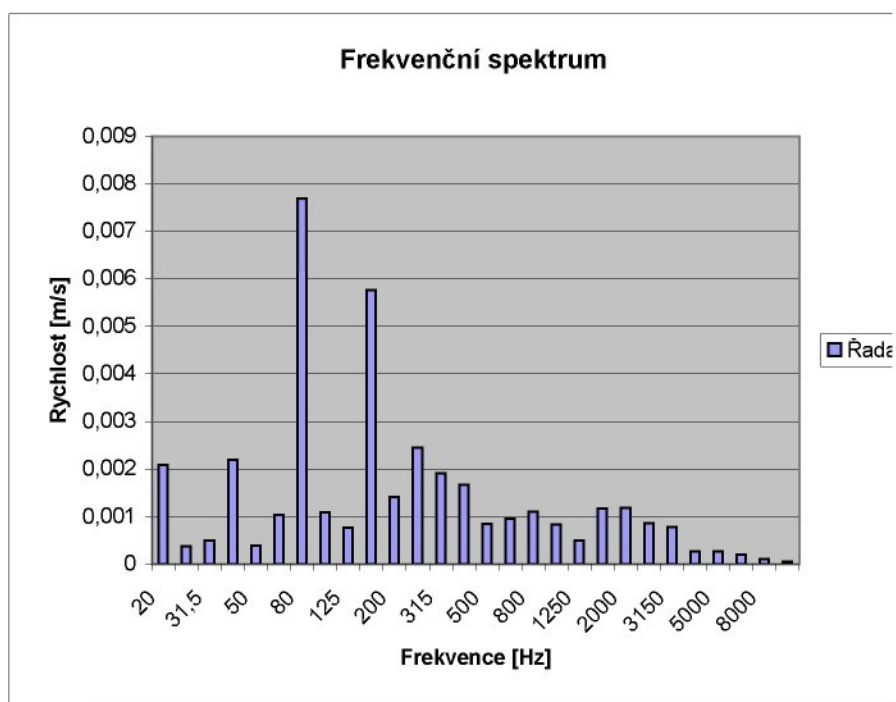


|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | ○ | 81,3 V   | 142,64 | 13,55189 | 0,000863 | 66,56339 | 69,981   |
| 3150  | ○ | 81,87 V  | 143,74 | 15,38155 | 0,000777 | 67,13339 | 69,07358 |
| 4000  | ○ | 77,07 V  | 136,5  | 6,683439 | 0,000266 | 62,33339 | 59,7586  |
| 5000  | ○ | 76,69 V  | 138,5  | 8,413951 | 0,000268 | 61,95339 | 59,8204  |
| 6300  | ○ | 78,62 V  | 137,63 | 7,612021 | 0,000192 | 63,88339 | 56,94298 |
| 8000  | ○ | 75,3 V   | 134,85 | 5,527134 | 0,00011  | 60,56339 | 52,088   |
| 10000 | ○ | 70,04 V  | 129,42 | 2,958012 | 4,71E-05 | 55,30339 | 44,7198  |
| A/L   | ○ | 109,24 V | 151,41 | 37,19632 | #####    |          |          |
| W     | ○ | 94,61 V  | 150,75 | 34,47466 | #####    |          |          |

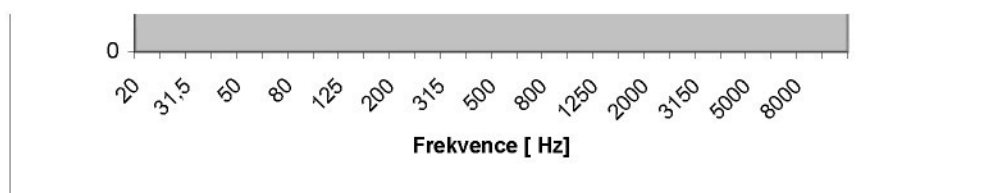
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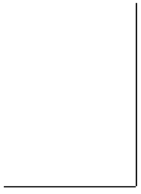


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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 048

Measured 05-04-04 09:44:18

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

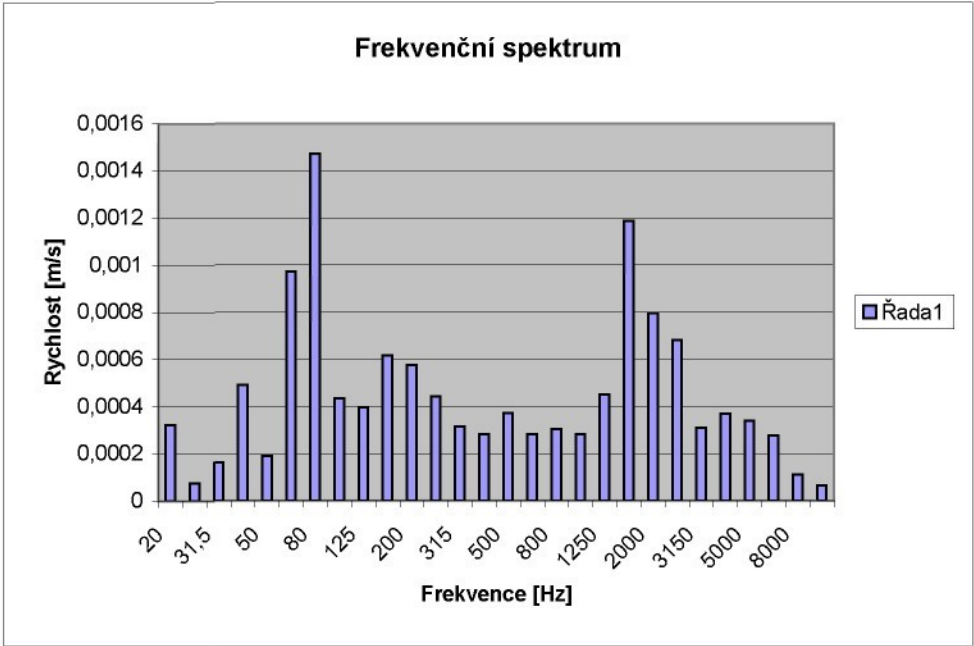
( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 68,93 V    | 136,29      |          |          |          |          |
| 0,5       | V | 71,09 V    | 138         |          |          |          |          |
| 0,63      | V | 75,59 V    | 137,11      |          |          |          |          |
| 0,8       | V | 78,03 V    | 140,85      |          |          | S20 [m2] | fd       |
| 1         | V | 76,48 V    | 140         |          |          | 0,075    | 1303,58  |
| 1,25      | V | 73,96 V    | 138,31      |          |          |          |          |
| 1,6       | V | 63,31 V    | 126,41      |          |          |          |          |
| 2         | V | 60,49 V    | 120,84      |          |          |          |          |
| 2,5       | V | 62,7 V     | 119,99      |          |          |          |          |
| 3,15      | V | 60,75 V    | 105,45      |          |          |          |          |
| 4         | V | 54,19 V    | 100,16      |          |          |          |          |
| 5         | V | 55,24 V    | 96,14       |          |          |          |          |
| 6,3       | V | 56,68 V    | 88,15       |          |          |          |          |
| 8         | V | 56,25 V    | 87,84       |          |          |          |          |
| 10        | V | 58,49 V    | 86,24       |          |          |          |          |
| 12,5      | V | 55,67 V    | -256,12     |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 56,47 V    | 89,25       |          |          |          |          |
| 20        | V | 74,32 V    | 92,14       | 0,040458 | 0,000322 | 63,07061 | 39,90642 |
| 25        | V | 62,65 V    | 81,47       | 0,011844 | 7,54E-05 | 51,40061 | 27,29822 |
| 31,5      | V | 62,28 V    | 90,12       | 0,032063 | 0,000162 | 51,03061 | 33,9408  |
| 40        | V | 66,86 V    | 101,81      | 0,123169 | 0,00049  | 55,61061 | 43,55582 |
| 50        | V | 65,1 V     | 95,46       | 0,059293 | 0,000189 | 53,85061 | 35,26762 |
| 63        | V | 69,57 V    | 111,69      | 0,384149 | 0,00097  | 58,32061 | 49,4902  |
| 80        | V | 92,61 V    | 117,38      | 0,739605 | 0,001471 | 81,36061 | 53,10522 |
| 100       | V | 76,5 V     | 108,7       | 0,27227  | 0,000433 | 65,25061 | 42,48702 |
| 125       | V | 66,93 V    | 109,83      | 0,310099 | 0,000395 | 55,68061 | 51,67882 |
| 160       | V | 82,29 V    | 115,85      | 0,620155 | 0,000617 | 71,04061 | 55,55462 |
| 200       | V | 70,88 V    | 117,19      | 0,723602 | 0,000576 | 59,63061 | 54,95642 |
| 250       | V | 77,68 V    | 116,84      | 0,695024 | 0,000442 | 66,43061 | 52,66822 |
| 315       | V | 75,4 V     | 115,85      | 0,620155 | 0,000313 | 64,15061 | 49,6708  |
| 400       | V | 78,1 V     | 116,98      | 0,706318 | 0,000281 | 66,85061 | 48,72582 |
| 500       | V | 78,31 V    | 121,31      | 1,162787 | 0,00037  | 67,06061 | 51,11762 |
| 630       | V | 79,42 V    | 120,95      | 1,115578 | 0,000282 | 68,17061 | 48,7502  |
| 800       | V | 83,42 V    | 123,66      | 1,524053 | 0,000303 | 72,17061 | 49,38522 |
| 1000      | V | 86,12 V    | 125         | 1,778279 | 0,000283 | 74,87061 | 48,78702 |
| 1250      | V | 86,17 V    | 130,95      | 3,527768 | 0,000449 | 74,92061 | 67,79882 |
| 1600      | V | 87,11 V    | 141,53      | 11,92614 | 0,001186 | 75,86061 | 76,23462 |
| 2000      | V | 84,62 V    | 139,98      | 9,977001 | 0,000794 | 73,37061 | 72,74642 |

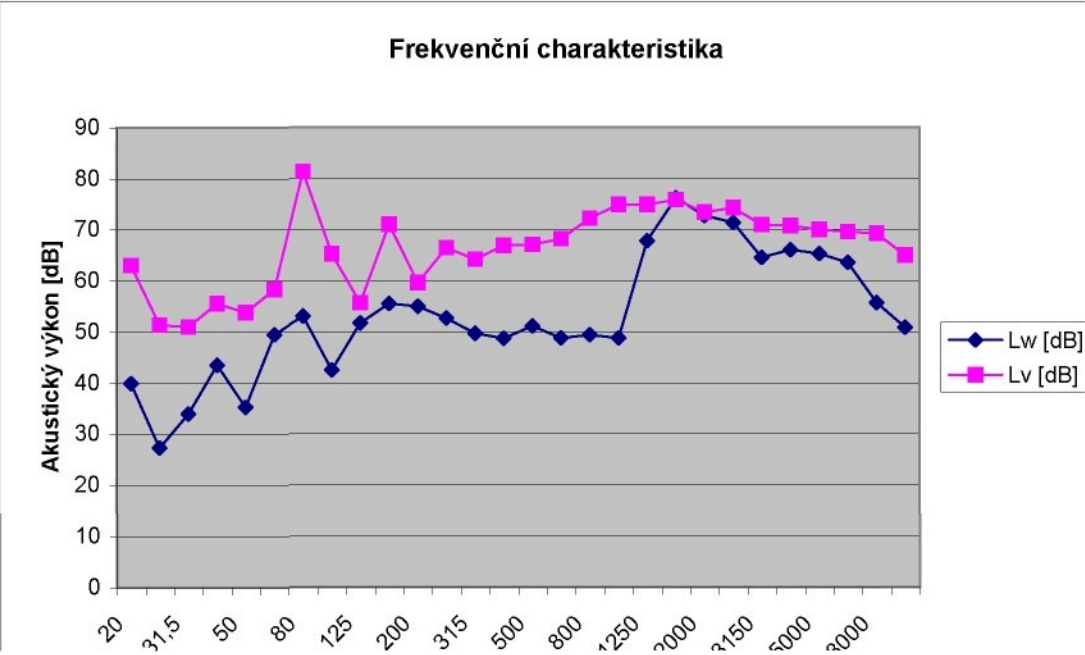
|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 85,49 V | 140,57 | 10,67825 | 0,00068  | 74,24061 | 71,39822 |
| 3150  | V | 82,17 V | 135,75 | 6,130558 | 0,00031  | 70,92061 | 64,5708  |
| 4000  | V | 82,01 V | 139,34 | 9,268298 | 0,000369 | 70,76061 | 66,08582 |
| 5000  | V | 81,28 V | 140,52 | 10,61696 | 0,000338 | 70,03061 | 65,32762 |
| 6300  | V | 80,81 V | 140,78 | 10,93956 | 0,000276 | 69,56061 | 63,5802  |
| 8000  | V | 80,48 V | 134,99 | 5,616943 | 0,000112 | 69,23061 | 55,71522 |
| 10000 | V | 76,25 V | 132,12 | 4,036454 | 6,42E-05 | 65,00061 | 50,90702 |
| A/L   | V | 97,27 V | 149,43 | 29,6142  | #####    |          |          |
| W     | V | 95,46 V | 150,91 | 35,11559 |          |          |          |

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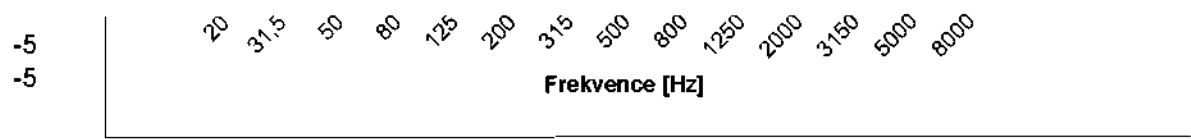


10\*log sigma

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11

· Lw [dB]  
· Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 049

Measured 05-04-04 09:44:32

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

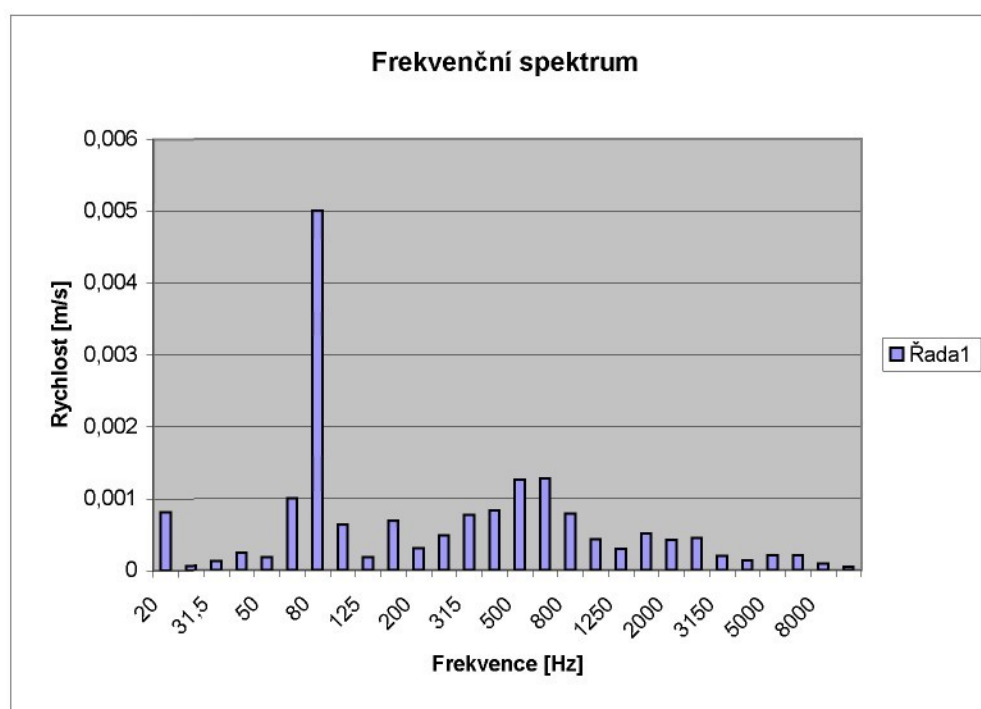
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 64,2 V     | 133,98      |          |          |          |          |
| 0,5       | V | 74,18 V    | 134,83      |          |          |          |          |
| 0,63      | V | 71,8 V     | 135,98      |          |          |          |          |
| 0,8       | V | 76,13 V    | 138,36      |          |          | S21 [m2] | fd       |
| 1         | V | 75,49 V    | 136,99      |          |          | 0,075    | 1303,58  |
| 1,25      | V | 76,6 V     | 135,79      |          |          |          |          |
| 1,6       | V | 66,58 V    | 126,1       |          |          |          |          |
| 2         | V | 68,6 V     | 120,55      |          |          |          |          |
| 2,5       | V | 63,33 V    | 117,78      |          |          |          |          |
| 3,15      | V | 57,67 V    | 108,65      |          |          |          |          |
| 4         | V | 52,05 V    | 98,59       |          |          |          |          |
| 5         | V | 55,41 V    | 97,76       |          |          |          |          |
| 6,3       | V | 58,21 V    | 88,45       |          |          |          |          |
| 8         | V | 54,98 V    | 83,68       |          |          |          |          |
| 10        | V | 57,78 V    | 87,49       |          |          |          |          |
| 12,5      | V | 55,22 V    | -256,12     |          |          | Lv [dB]  | Lw [dB]  |
| 16        | V | 54,89 V    | 90,59       |          |          |          |          |
| 20        | V | 73,31 V    | 100,21      | 0,102447 | 0,000815 | 62,06061 | 47,97642 |
| 25        | V | 62,82 V    | 80,67       | 0,010802 | 6,88E-05 | 51,57061 | 26,49822 |
| 31,5      | V | 61,71 V    | 88          | 0,025119 | 0,000127 | 50,46061 | 31,8208  |
| 40        | V | 67,5 V     | 95,65       | 0,060604 | 0,000241 | 56,25061 | 37,39582 |
| 50        | V | 64,32 V    | 94,94       | 0,055847 | 0,000178 | 53,07061 | 34,74762 |
| 63        | V | 72,48 V    | 111,92      | 0,394457 | 0,000997 | 61,23061 | 49,7202  |
| 80        | V | 96,8 V     | 128,01      | 2,51478  | 0,005003 | 85,55061 | 63,73522 |
| 100       | V | 80,29 V    | 111,97      | 0,396735 | 0,000631 | 69,04061 | 45,75702 |
| 125       | V | 70,15 V    | 102,96      | 0,140605 | 0,000179 | 58,90061 | 44,80882 |
| 160       | V | 84,66 V    | 116,77      | 0,689446 | 0,000686 | 73,41061 | 56,47462 |
| 200       | V | 71,49 V    | 111,76      | 0,387258 | 0,000308 | 60,24061 | 49,52642 |
| 250       | V | 77,73 V    | 117,64      | 0,762079 | 0,000485 | 66,48061 | 53,46822 |
| 315       | V | 77,91 V    | 123,68      | 1,527566 | 0,000772 | 66,66061 | 57,5008  |
| 400       | V | 77,02 V    | 126,36      | 2,079697 | 0,000827 | 65,77061 | 58,10582 |
| 500       | V | 74,22 V    | 131,96      | 3,96278  | 0,001261 | 62,97061 | 61,76762 |
| 630       | V | 80,38 V    | 134,05      | 5,040806 | 0,001273 | 69,13061 | 61,8502  |
| 800       | V | 86,15 V    | 131,91      | 3,940034 | 0,000784 | 74,90061 | 57,63522 |
| 1000      | V | 85,32 V    | 128,62      | 2,697739 | 0,000429 | 74,07061 | 52,40702 |
| 1250      | V | 84,36 V    | 127,44      | 2,355049 | 0,0003   | 73,11061 | 64,28882 |
| 1600      | V | 85,84 V    | 134,19      | 5,122713 | 0,00051  | 74,59061 | 68,89462 |
| 2000      | V | 86,4 V     | 134,43      | 5,266232 | 0,000419 | 75,15061 | 67,19642 |

|       |   |         |        |          |          |          |          |
|-------|---|---------|--------|----------|----------|----------|----------|
| 2500  | V | 84,17 V | 136,95 | 7,038822 | 0,000448 | 72,92061 | 67,77822 |
| 3150  | V | 80,85 V | 132,03 | 3,994846 | 0,000202 | 69,60061 | 60,8508  |
| 4000  | V | 77,66 V | 130,88 | 3,499452 | 0,000139 | 66,41061 | 57,62582 |
| 5000  | V | 77,21 V | 136,26 | 6,501297 | 0,000207 | 65,96061 | 61,06762 |
| 6300  | V | 79,21 V | 138,38 | 8,298508 | 0,00021  | 67,96061 | 61,1802  |
| 8000  | V | 76,55 V | 133,53 | 4,747883 | 9,45E-05 | 65,30061 | 54,25522 |
| 10000 | V | 73,14 V | 129,87 | 3,115301 | 4,96E-05 | 61,89061 | 48,65702 |
| A/L   | V | 99,01 V | 142,97 | 14,07667 | #####    |          |          |
| W     | V | 94,75 V | 147,9  | 24,83133 | #####    |          |          |

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10\*log sigma

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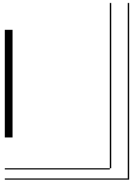
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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 061

Measured 05-04-04 09:47:56

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

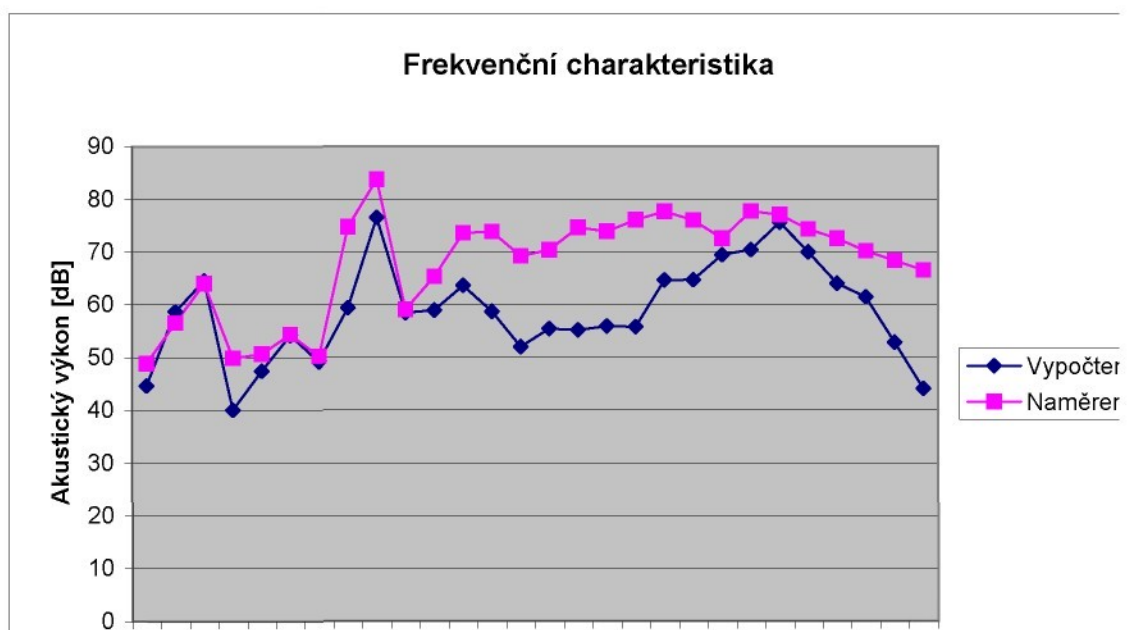
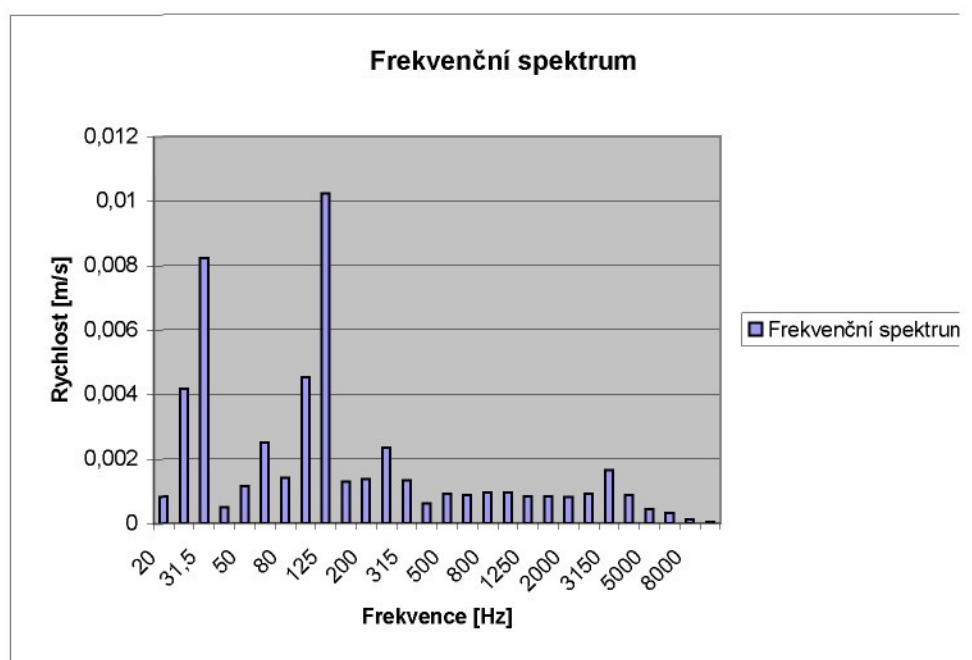
( Start of Data )

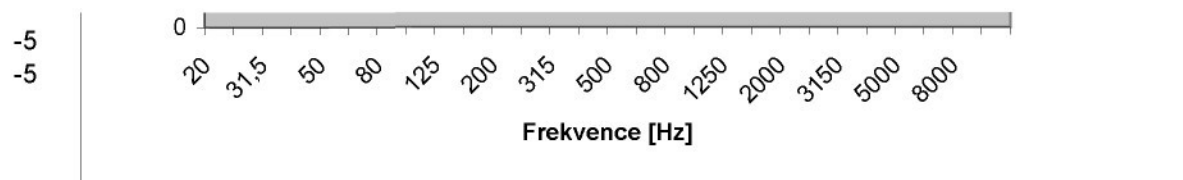
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | V | 74,48 V    | 118,13     |          |          |          |          |
| 0,5       | V | 72,01 V    | 117,97     |          |          |          |          |
| 0,63      | V | 69,68 V    | 117,78     |          |          |          |          |
| 0,8       | V | 75,4 V     | 110,84     |          |          | S1 [m2]  | fd       |
| 1         | V | 69,12 V    | 112,58     |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 73,99 V    | 112,63     |          |          |          |          |
| 1,6       | V | 68,3 V     | 108,82     |          |          |          |          |
| 2         | V | 67,92 V    | 103,17     |          |          |          |          |
| 2,5       | V | 65,19 V    | 99,25      |          |          |          |          |
| 3,15      | V | 62,39 V    | 88,15      |          |          |          |          |
| 4         | V | 59,17 V    | 91,46      |          |          |          |          |
| 5         | V | 59,45 V    | 82,71      |          |          |          |          |
| 6,3       | V | 58,49 V    | -256,12    |          |          |          |          |
| 8         | V | 59,29 V    | 88,73      |          |          |          |          |
| 10        | V | 60,37 V    | 86,24      |          |          |          |          |
| 12,5      | V | 57,31 V    | 88,87      |          |          |          |          |
| 16        | V | 57,31 V    | 90,59      |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 63,57 V    | 100,37     | 0,104352 | 0,00083  | 48,83339 | 44,6492  |
| 25        | V | 71,28 V    | 116,34     | 0,656145 | 0,004177 | 56,54339 | 58,681   |
| 31,5      | V | 78,74 V    | 124,22     | 1,625549 | 0,008213 | 64,00339 | 64,55358 |
| 40        | V | 64,6 V     | 101,79     | 0,122885 | 0,000489 | 49,86339 | 40,0486  |
| 50        | V | 65,4 V     | 111,15     | 0,360994 | 0,001149 | 50,66339 | 47,4704  |
| 63        | V | 69,12 V    | 119,89     | 0,987416 | 0,002494 | 54,38339 | 54,20298 |
| 80        | V | 64,98 V    | 116,98     | 0,706318 | 0,001405 | 50,24339 | 49,218   |
| 100       | V | 89,42 V    | 129,07     | 2,841188 | 0,004522 | 74,68339 | 59,3698  |
| 125       | V | 98,42 V    | 138,1      | 8,035261 | 0,010231 | 83,68339 | 76,4616  |
| 160       | V | 73,78 V    | 122,2      | 1,28825  | 0,001281 | 59,04339 | 58,4174  |
| 200       | V | 80,06 V    | 124,65     | 1,708048 | 0,001359 | 65,32339 | 58,9292  |
| 250       | V | 88,26 V    | 131,28     | 3,664376 | 0,002333 | 73,52339 | 63,621   |
| 315       | V | 88,55 V    | 128,34     | 2,612161 | 0,00132  | 73,81339 | 58,67358 |
| 400       | V | 83,94 V    | 123,75     | 1,539927 | 0,000613 | 69,20339 | 52,0086  |
| 500       | V | 85,06 V    | 129,11     | 2,854303 | 0,000909 | 70,32339 | 55,4304  |
| 630       | V | 89,32 V    | 130,83     | 3,479365 | 0,000879 | 74,58339 | 55,14298 |
| 800       | V | 88,59 V    | 133,65     | 4,813933 | 0,000958 | 73,85339 | 55,888   |
| 1000      | V | 90,78 V    | 135,46     | 5,929253 | 0,000944 | 76,04339 | 55,7598  |
| 1250      | V | 92,38 V    | 136,26     | 6,501297 | 0,000828 | 77,64339 | 64,6216  |
| 1600      | V | 90,71 V    | 138,45     | 8,365656 | 0,000832 | 75,97339 | 64,6674  |
| 2000      | V | 87,25 V    | 140,17     | 10,19765 | 0,000812 | 72,51339 | 69,4492  |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 92,4 V   | 143,06 | 14,22329 | 0,000905 | 77,66339 | 70,401   |
| 3150  | V | 91,77 V  | 150,21 | 32,39664 | 0,001637 | 77,03339 | 75,54358 |
| 4000  | V | 88,99 V  | 146,71 | 21,6521  | 0,000862 | 74,25339 | 69,9686  |
| 5000  | V | 87,25 V  | 142,71 | 13,66155 | 0,000435 | 72,51339 | 64,0304  |
| 6300  | V | 84,88 V  | 142,12 | 12,76439 | 0,000322 | 70,14339 | 61,43298 |
| 8000  | V | 83,09 V  | 135,6  | 6,025596 | 0,00012  | 68,35339 | 52,838   |
| 10000 | V | 81,25 V  | 128,74 | 2,735269 | 4,35E-05 | 66,51339 | 44,0398  |
| A/L   | V | 103,27 V | 154,07 | 50,52426 | #####    |          |          |
| W     | V | 101,34 V | 154    | 50,11872 | #####    |          |          |

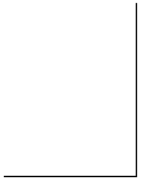
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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 062

Measured 05-04-04 09:48:36

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

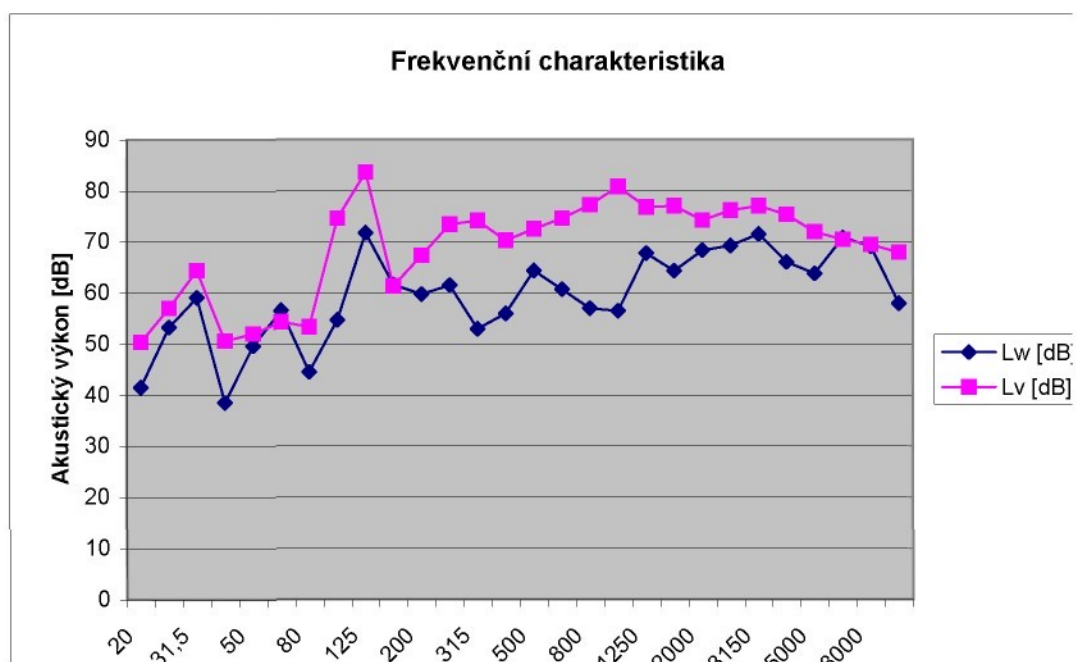
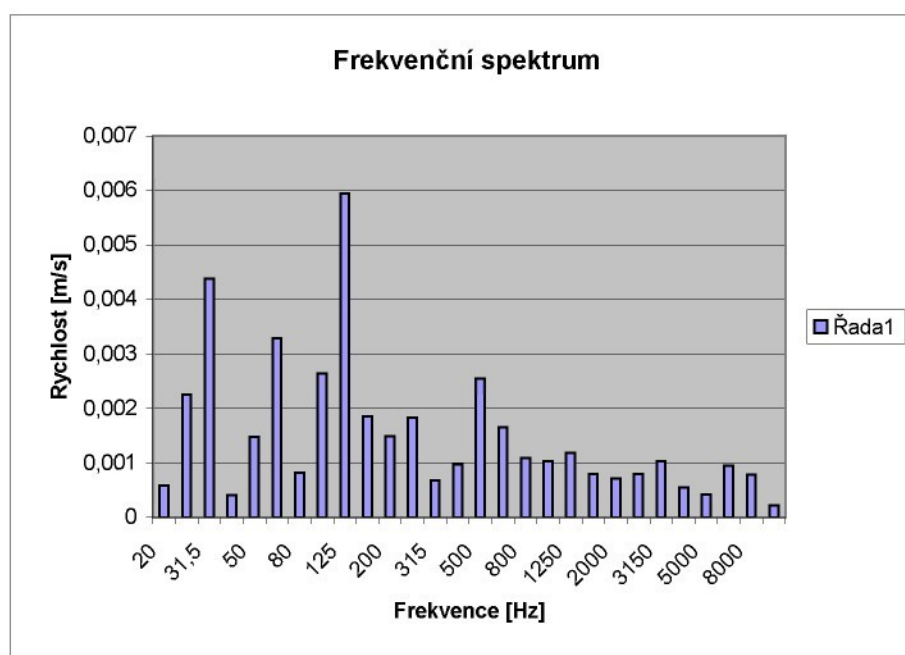
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | V | 62,04 V    | 114,74     |          |          |          |          |
| 0,5       | V | 66,39 V    | 110,11     |          |          |          |          |
| 0,63      | V | 67,26 V    | 116,74     |          |          |          |          |
| 0,8       | V | 69,82 V    | 118,04     |          |          | S2 [m2]  | fd       |
| 1         | V | 64,02 V    | 119,42     |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 64,89 V    | 114,72     |          |          |          |          |
| 1,6       | V | 68,04 V    | 110,68     |          |          |          |          |
| 2         | V | 60,68 V    | 105,36     |          |          |          |          |
| 2,5       | V | 63,95 V    | 107,92     |          |          |          |          |
| 3,15      | V | 66,23 V    | 97,11      |          |          |          |          |
| 4         | V | 61,92 V    | 94,75      |          |          |          |          |
| 5         | V | 54,4 V     | 89,7       |          |          |          |          |
| 6,3       | V | 54,77 V    | 79,7       |          |          |          |          |
| 8         | V | 59,01 V    | 92,5       |          |          |          |          |
| 10        | V | 58,47 V    | 88,15      |          |          |          |          |
| 12,5      | V | 57,29 V    | -256,12    |          |          |          |          |
| 16        | V | 58,61 V    | 92,71      |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 65,14 V    | 97,27      | 0,07303  | 0,000581 | 50,40339 | 41,5492  |
| 25        | V | 71,78 V    | 110,96     | 0,353183 | 0,002248 | 57,04339 | 53,301   |
| 31,5      | V | 79,14 V    | 118,77     | 0,867961 | 0,004385 | 64,40339 | 59,10358 |
| 40        | V | 65,36 V    | 100,28     | 0,103276 | 0,000411 | 50,62339 | 38,5386  |
| 50        | V | 66,74 V    | 113,31     | 0,462914 | 0,001473 | 52,00339 | 49,6304  |
| 63        | V | 69,1 V     | 122,29     | 1,301667 | 0,003288 | 54,36339 | 56,60298 |
| 80        | V | 68,08 V    | 112,27     | 0,410677 | 0,000817 | 53,34339 | 44,508   |
| 100       | V | 89,34 V    | 124,39     | 1,657677 | 0,002638 | 74,60339 | 54,6898  |
| 125       | V | 98,33 V    | 133,39     | 4,67197  | 0,005949 | 83,59339 | 71,7516  |
| 160       | V | 76,1 V     | 125,42     | 1,86638  | 0,001857 | 61,36339 | 61,6374  |
| 200       | V | 82,05 V    | 125,44     | 1,870682 | 0,001489 | 67,31339 | 59,7192  |
| 250       | V | 88,15 V    | 129,16     | 2,870781 | 0,001828 | 73,41339 | 61,501   |
| 315       | V | 88,85 V    | 122,62     | 1,352073 | 0,000683 | 74,11339 | 52,95358 |
| 400       | V | 84,99 V    | 127,73     | 2,435006 | 0,000969 | 70,25339 | 55,9886  |
| 500       | V | 87,25 V    | 138,07     | 8,007556 | 0,002549 | 72,51339 | 64,3904  |
| 630       | V | 89,32 V    | 136,33     | 6,553903 | 0,001656 | 74,58339 | 60,64298 |
| 800       | V | 91,98 V    | 134,76     | 5,47016  | 0,001088 | 77,24339 | 56,998   |
| 1000      | V | 95,51 V    | 136,19     | 6,449113 | 0,001026 | 80,77339 | 56,4898  |
| 1250      | V | 91,53 V    | 139,39     | 9,321805 | 0,001187 | 76,79339 | 67,7516  |
| 1600      | V | 91,79 V    | 138,07     | 8,007556 | 0,000797 | 77,05339 | 64,2874  |
| 2000      | V | 88,94 V    | 139,01     | 8,922776 | 0,00071  | 74,20339 | 68,2892  |

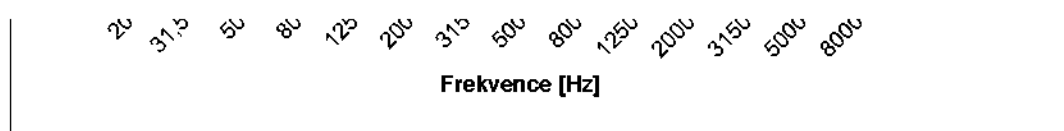


|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 90,9 V   | 141,91 | 12,45948 | 0,000793 | 76,16339 | 69,251   |
| 3150  | V | 91,74 V  | 146,16 | 20,32357 | 0,001027 | 77,00339 | 71,49358 |
| 4000  | V | 90,07 V  | 142,8  | 13,80384 | 0,000549 | 75,33339 | 66,0586  |
| 5000  | V | 86,66 V  | 142,47 | 13,28924 | 0,000423 | 71,92339 | 63,7904  |
| 6300  | V | 85,21 V  | 151,53 | 37,71377 | 0,000953 | 70,47339 | 70,84298 |
| 8000  | V | 84,15 V  | 151,9  | 39,35501 | 0,000783 | 69,41339 | 69,138   |
| 10000 | V | 82,67 V  | 142,68 | 13,61445 | 0,000217 | 67,93339 | 57,9798  |
| A/L   | V | 103,93 V | 156,61 | 67,68618 | #####    |          |          |
| W     | V | 102,26 V | 156,58 | 67,4528  | #####    |          |          |

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- Lw [dB]

- Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 063

Measured 05-04-04 09:48:50

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

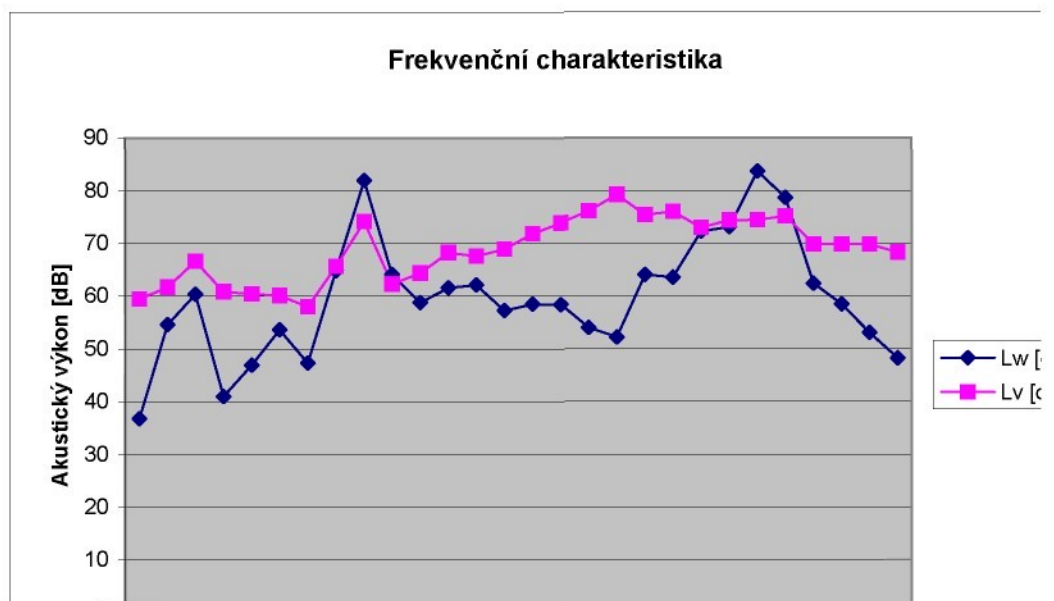
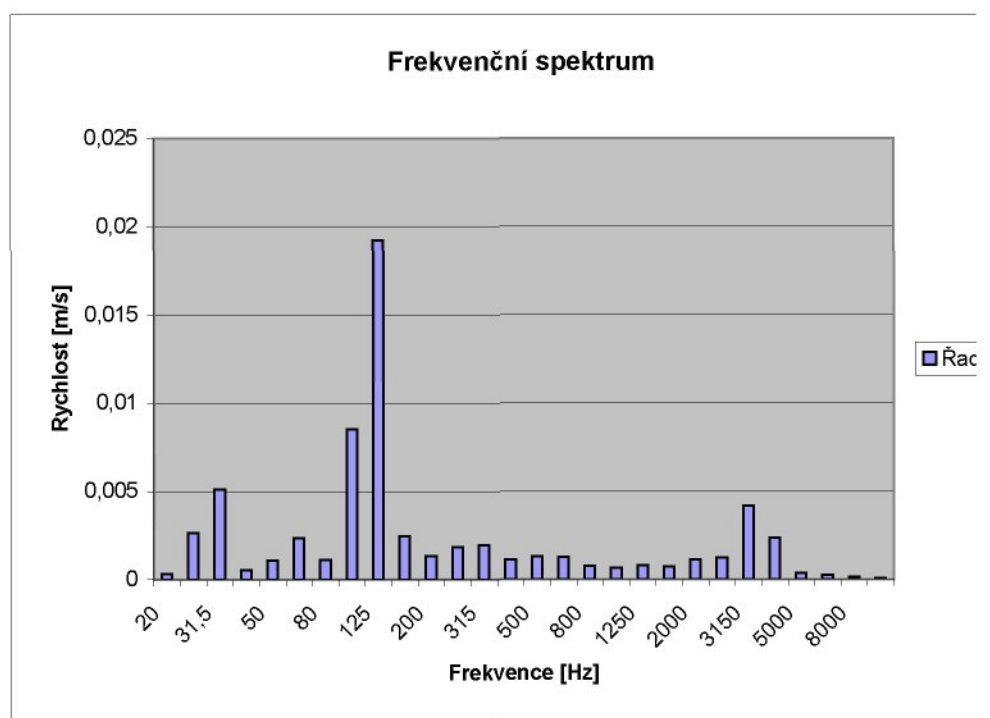
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | V | 71,57 V    | 120,88     |          |          |          |          |
| 0,5       | V | 70,79 V    | 120,98     |          |          |          |          |
| 0,63      | V | 74,67 V    | 123        |          |          |          |          |
| 0,8       | V | 69,8 V     | 115,1      |          |          | S3 [m2]  | fd       |
| 1         | V | 66,96 V    | 106,4      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 67,28 V    | 105,27     |          |          |          |          |
| 1,6       | V | 64,91 V    | 99,97      |          |          |          |          |
| 2         | V | 63,73 V    | 98,4       |          |          |          |          |
| 2,5       | V | 64,63 V    | 94,75      |          |          |          |          |
| 3,15      | V | 64,98 V    | -256,12    |          |          |          |          |
| 4         | V | 66,81 V    | 93,7       |          |          |          |          |
| 5         | V | 63,64 V    | 90,5       |          |          |          |          |
| 6,3       | V | 66,7 V     | -256,12    |          |          |          |          |
| 8         | V | 69,31 V    | 88,73      |          |          |          |          |
| 10        | V | 71,96 V    | 84,48      |          |          |          |          |
| 12,5      | V | 70,69 V    | 73,68      |          |          |          |          |
| 16        | V | 71,61 V    | 89,13      |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 74,22 V    | 92,5       | 0,04217  | 0,000336 | 59,48339 | 36,7792  |
| 25        | V | 76,48 V    | 112,3      | 0,412098 | 0,002623 | 61,74339 | 54,641   |
| 31,5      | V | 81,4 V     | 120,08     | 1,009253 | 0,005099 | 66,66339 | 60,41358 |
| 40        | V | 75,61 V    | 102,77     | 0,137562 | 0,000547 | 60,87339 | 41,0286  |
| 50        | V | 75,16 V    | 110,68     | 0,341979 | 0,001089 | 60,42339 | 47,0004  |
| 63        | V | 74,9 V     | 119,33     | 0,925763 | 0,002339 | 60,16339 | 53,64298 |
| 80        | V | 72,74 V    | 115,12     | 0,570164 | 0,001134 | 58,00339 | 47,358   |
| 100       | V | 80,43 V    | 134,57     | 5,351802 | 0,008518 | 65,69339 | 64,8698  |
| 125       | V | 88,92 V    | 143,58     | 15,1008  | 0,019227 | 74,18339 | 81,9416  |
| 160       | V | 77,09 V    | 127,91     | 2,485994 | 0,002473 | 62,35339 | 64,1274  |
| 200       | V | 79,14 V    | 124,55     | 1,688496 | 0,001344 | 64,40339 | 58,8292  |
| 250       | V | 82,99 V    | 129,28     | 2,910717 | 0,001853 | 68,25339 | 61,621   |
| 315       | V | 82,36 V    | 131,79     | 3,885975 | 0,001963 | 67,62339 | 62,12358 |
| 400       | V | 83,7 V     | 129,02     | 2,82488  | 0,001124 | 68,96339 | 57,2786  |
| 500       | V | 86,62 V    | 132,19     | 4,069115 | 0,001295 | 71,88339 | 58,5104  |
| 630       | V | 88,57 V    | 134,08     | 5,058247 | 0,001278 | 73,83339 | 58,39298 |
| 800       | V | 90,83 V    | 131,77     | 3,877037 | 0,000771 | 76,09339 | 54,008   |
| 1000      | V | 93,93 V    | 131,91     | 3,940034 | 0,000627 | 79,19339 | 52,2098  |
| 1250      | V | 90,12 V    | 135,68     | 6,08135  | 0,000774 | 75,38339 | 64,0416  |
| 1600      | V | 90,69 V    | 137,34     | 7,362071 | 0,000732 | 75,95339 | 63,5574  |
| 2000      | V | 87,67 V    | 142,92     | 13,99587 | 0,001114 | 72,93339 | 72,1992  |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 89,06 V  | 145,74 | 19,36422 | 0,001233 | 74,32339 | 73,081   |
| 3150  | V | 89,11 V  | 158,32 | 82,41381 | 0,004164 | 74,37339 | 83,65358 |
| 4000  | V | 89,89 V  | 155,38 | 58,74894 | 0,002338 | 75,15339 | 78,6386  |
| 5000  | V | 84,52 V  | 141,08 | 11,324   | 0,00036  | 69,78339 | 62,4004  |
| 6300  | V | 84,5 V   | 139,13 | 9,046904 | 0,000229 | 69,76339 | 58,44298 |
| 8000  | V | 84,52 V  | 135,79 | 6,158855 | 0,000123 | 69,78339 | 53,028   |
| 10000 | V | 82,99 V  | 132,95 | 4,441197 | 7,07E-05 | 68,25339 | 48,2498  |
| A/L   | V | 101,22 V | 160,65 | 107,7705 | #####    |          |          |
| W     | V | 100,82 V | 160,63 | 107,5227 |          |          |          |

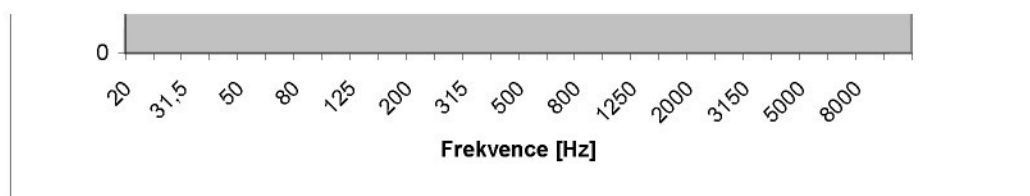
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◆ Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 064

Measured 05-04-04 09:49:06

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|-------------|-------------|----------|----------|---------|----------|
| 0,4       | V | 58,42 V     | 104,04      |          |          |         |          |
| 0,5       | V | 75,66 V     | 109,5       |          |          |         |          |
| 0,63      | V | 75,92 V     | 109,31      |          |          |         |          |
| 0,8       | V | 74,39 V     | 109,45      |          |          | S4 [m2] | fd       |
| 1         | V | 66,6 V      | 116,86      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 69,82 V     | 114,06      |          |          |         |          |
| 1,6       | V | 66,51 V     | 111,97      |          |          |         |          |
| 2         | V | 71,14 V     | 102,68      |          |          |         |          |
| 2,5       | V | 68,04 V     | 103,86      |          |          |         |          |
| 3,15      | V | 71,49 V     | 97,18       |          |          |         |          |
| 4         | V | 70,06 V     | 92,26       |          |          |         |          |
| 5         | V | 71,64 V     | 85,72       |          |          |         |          |
| 6,3       | V | 73,94 V     | -256,12     |          |          |         |          |
| 8         | V | 72,79 V     | 76,69       |          |          |         |          |
| 10        | V | 74,5 V      | 86,24       |          |          |         |          |
| 12,5      | V | 74,06 V     | 76,69       |          |          |         |          |
| 16        | V | 70,44 V     | 89,13       |          |          | Lv [dB] | Lw [dB]  |
| 20        | V | 70,37 V     | 87,84       | 0,02466  | 0,000196 | 57,3597 | 33,8455  |
| 25        | V | 73,4 V      | 110,53      | 0,336124 | 0,00214  | 60,3897 | 54,5973  |
| 31,5      | V | 80,78 V     | 119,78      | 0,97499  | 0,004926 | 67,7697 | 61,83989 |
| 40        | V | 66,09 V     | 94,97       | 0,05604  | 0,000223 | 53,0797 | 34,9549  |
| 50        | V | 66,6 V      | 109,24      | 0,289734 | 0,000922 | 53,5897 | 47,2867  |
| 63        | V | 68,27 V     | 119,49      | 0,942975 | 0,002382 | 55,2597 | 55,52929 |
| 80        | V | 68,67 V     | 102,35      | 0,131069 | 0,000261 | 55,6597 | 36,3143  |
| 100       | V | 81,61 V     | 121,19      | 1,146833 | 0,001825 | 68,5997 | 53,2161  |
| 125       | V | 91,56 V     | 131,87      | 3,921931 | 0,004994 | 78,5497 | 71,9579  |
| 160       | V | 74,11 V     | 138,8       | 8,709636 | 0,008664 | 61,0997 | 76,7437  |
| 200       | V | 80,97 V     | 139,58      | 9,527962 | 0,007582 | 67,9597 | 75,5855  |
| 250       | V | 83,16 V     | 129,3       | 2,917427 | 0,001857 | 70,1497 | 63,3673  |
| 315       | V | 86,38 V     | 117,94      | 0,78886  | 0,000399 | 73,3697 | 49,99989 |
| 400       | V | 88,24 V     | 113,9       | 0,49545  | 0,000197 | 75,2297 | 43,8849  |
| 500       | V | 87,72 V     | 116,32      | 0,654636 | 0,000208 | 74,7097 | 44,3667  |
| 630       | V | 87,98 V     | 123,14      | 1,435489 | 0,000363 | 74,9697 | 49,17929 |
| 800       | V | 86,45 V     | 125,37      | 1,855667 | 0,000369 | 73,4397 | 49,3343  |
| 1000      | V | 89,27 V     | 131,61      | 3,806274 | 0,000606 | 76,2597 | 53,6361  |
| 1250      | V | 92,14 V     | 134,03      | 5,029213 | 0,00064  | 79,1297 | 64,1179  |
| 1600      | V | 89,06 V     | 138,66      | 8,570378 | 0,000853 | 76,0497 | 71,6037  |
| 2000      | V | 87,77 V     | 148,16      | 25,58586 | 0,002036 | 74,7597 | 79,1655  |

|       |   |          |        |          |          |         |          |
|-------|---|----------|--------|----------|----------|---------|----------|
| 2500  | V | 87,86 V  | 139,86 | 9,840111 | 0,000626 | 74,8497 | 68,9273  |
| 3150  | V | 91,67 V  | 141,23 | 11,52126 | 0,000582 | 78,6597 | 68,28989 |
| 4000  | V | 87,13 V  | 135,37 | 5,868134 | 0,000233 | 74,1197 | 60,3549  |
| 5000  | V | 85,61 V  | 136,38 | 6,591739 | 0,00021  | 72,5997 | 59,4267  |
| 6300  | V | 82,99 V  | 136,78 | 6,902398 | 0,000174 | 69,9797 | 57,81929 |
| 8000  | V | 82,74 V  | 141,51 | 11,89871 | 0,000237 | 69,7297 | 60,4743  |
| 10000 | V | 81,61 V  | 140,57 | 10,67825 | 0,00017  | 68,5997 | 57,5961  |
| A/L   | V | 100,94 V | 152,07 | 40,13285 | #####    |         |          |
| W     | V | 100,09 V | 152    | 39,81072 | #####    |         |          |

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10\*log sigma

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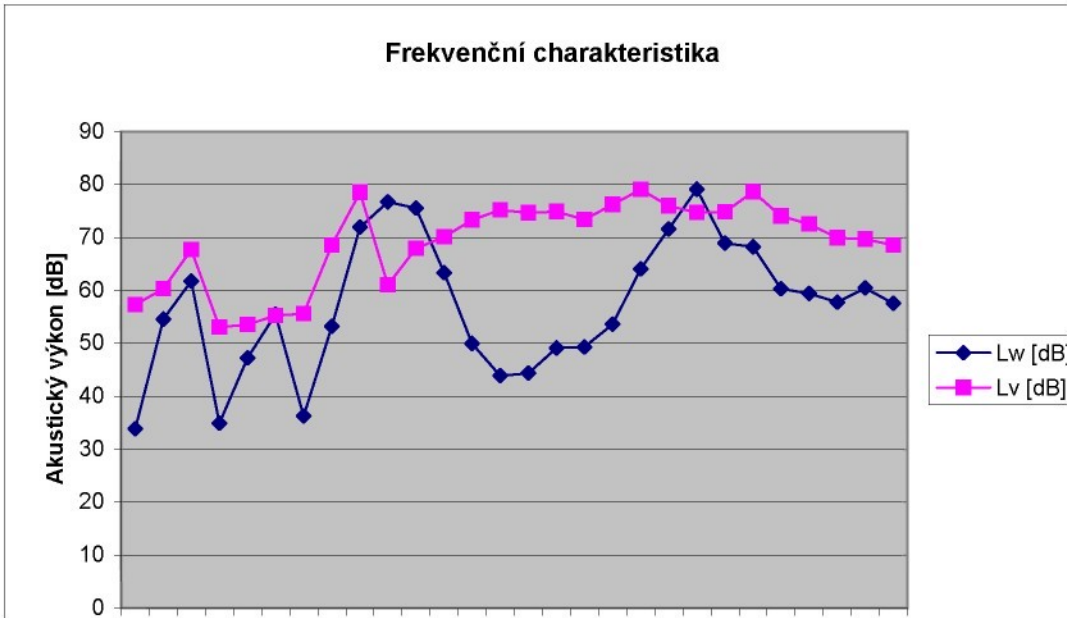
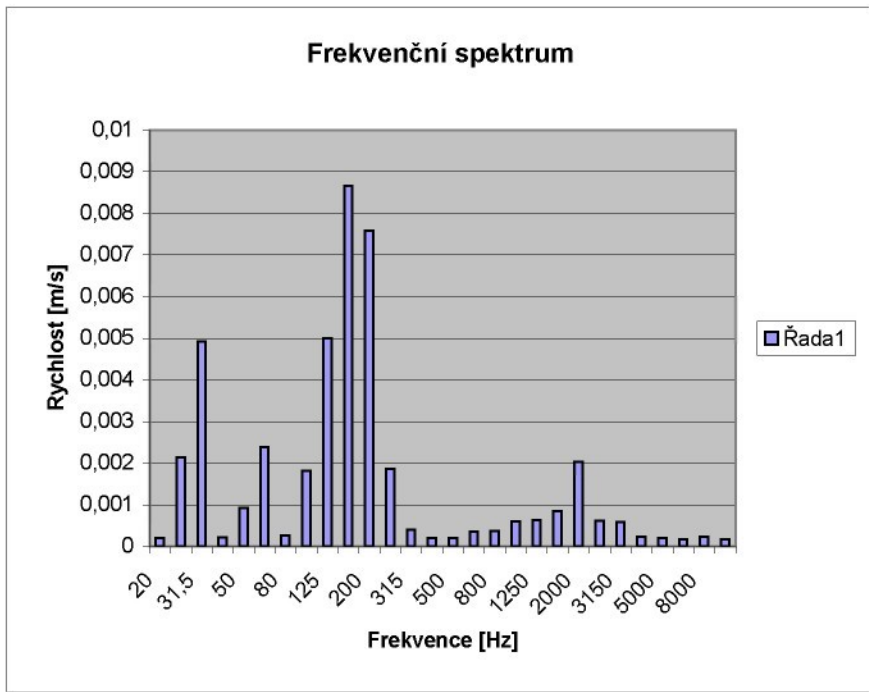
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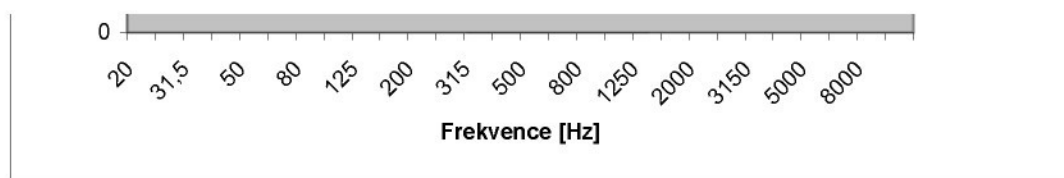
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- Lw [dB]  
- Lv [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 065

Measured 05-04-04 09:49:22

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

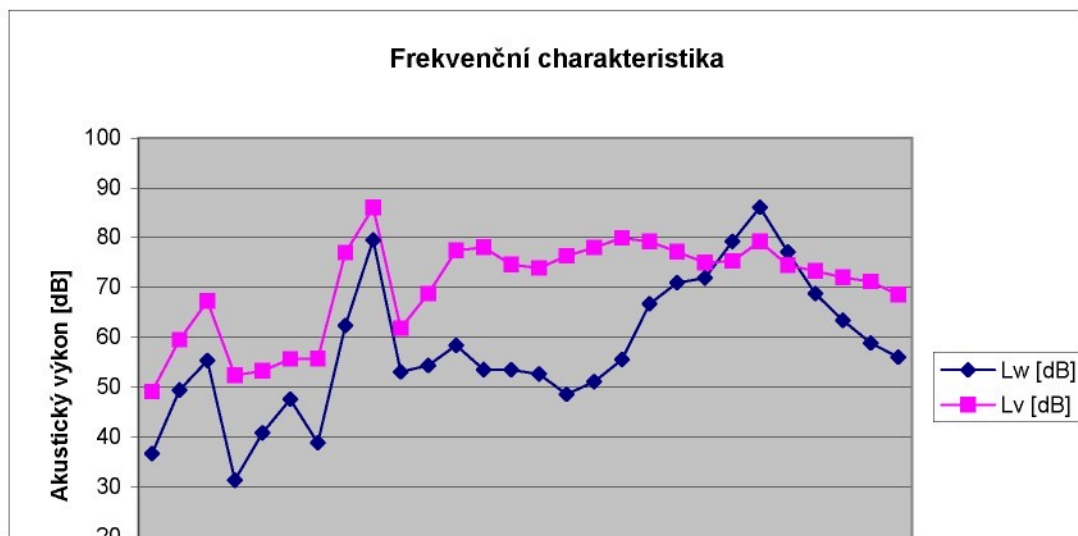
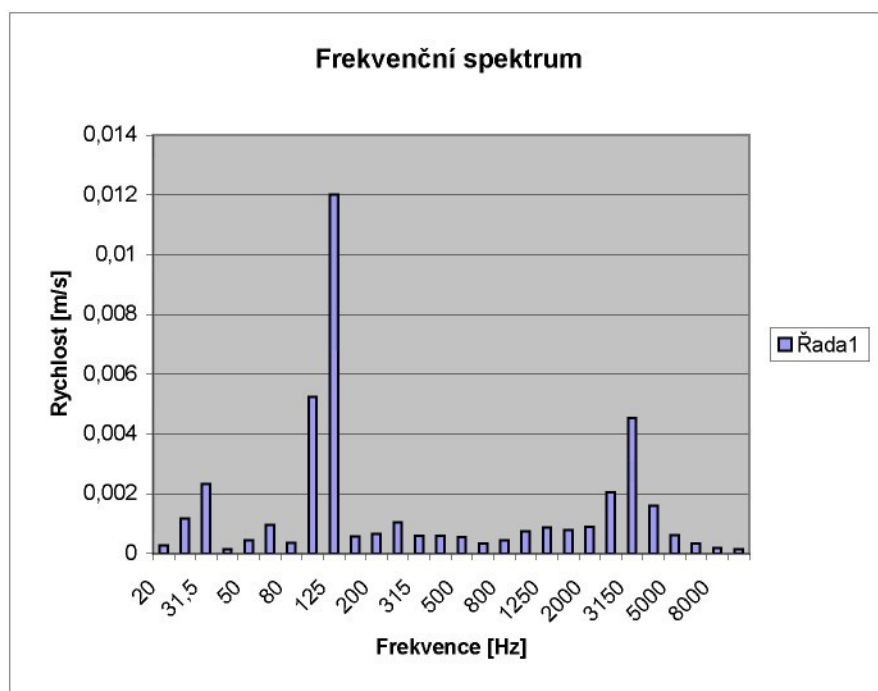
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|------------|-------------|----------|----------|---------|----------|
| 0,4       | V | 62,58 V    | 118,46      |          |          |         |          |
| 0,5       | V | 55,2 V     | 117,47      |          |          |         |          |
| 0,63      | V | 63,87 V    | 120,01      |          |          |         |          |
| 0,8       | V | 69,45 V    | 115,43      |          |          | S5 [m2] | fd       |
| 1         | V | 68,39 V    | 112,11      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 61,01 V    | 111,08      |          |          |         |          |
| 1,6       | V | 61,99 V    | 102,89      |          |          |         |          |
| 2         | V | 60,61 V    | 106,49      |          |          |         |          |
| 2,5       | V | 60,98 V    | 102,11      |          |          |         |          |
| 3,15      | V | 58,79 V    | 95,15       |          |          |         |          |
| 4         | V | 53,76 V    | 82,71       |          |          |         |          |
| 5         | V | 52,82 V    | 91,16       |          |          |         |          |
| 6,3       | V | 58,75 V    | 87,49       |          |          |         |          |
| 8         | V | 58,07 V    | 88,99       |          |          |         |          |
| 10        | V | 59,17 V    | 82,71       |          |          |         |          |
| 12,5      | V | 56,44 V    | -256,12     |          |          |         |          |
| 16        | V | 56,98 V    | 91,32       |          |          | Lv [dB] | Lw [dB]  |
| 20        | V | 62,13 V    | 90,69       | 0,034237 | 0,000272 | 49,1197 | 36,6955  |
| 25        | V | 72,55 V    | 105,36      | 0,185353 | 0,00118  | 59,5397 | 49,4273  |
| 31,5      | V | 80,29 V    | 113,29      | 0,461849 | 0,002334 | 67,2797 | 55,34989 |
| 40        | V | 65,4 V     | 91,39       | 0,037111 | 0,000148 | 52,3897 | 31,3749  |
| 50        | V | 66,34 V    | 102,77      | 0,137562 | 0,000438 | 53,3297 | 40,8167  |
| 63        | V | 68,67 V    | 111,57      | 0,378879 | 0,000957 | 55,6597 | 47,60929 |
| 80        | V | 68,74 V    | 104,89      | 0,17559  | 0,000349 | 55,7297 | 38,8543  |
| 100       | V | 90 V       | 130,34      | 3,288516 | 0,005234 | 76,9897 | 62,3661  |
| 125       | V | 99,1 V     | 139,49      | 9,429746 | 0,012006 | 86,0897 | 79,5779  |
| 160       | V | 74,83 V    | 115,19      | 0,574778 | 0,000572 | 61,8197 | 53,1337  |
| 200       | V | 81,82 V    | 118,37      | 0,828896 | 0,00066  | 68,8097 | 54,3755  |
| 250       | V | 90,47 V    | 124,36      | 1,651962 | 0,001052 | 77,4597 | 58,4273  |
| 315       | V | 91,11 V    | 121,49      | 1,187135 | 0,0006   | 78,0997 | 53,54989 |
| 400       | V | 87,67 V    | 123,54      | 1,503142 | 0,000598 | 74,6597 | 53,5249  |
| 500       | V | 86,92 V    | 124,62      | 1,702159 | 0,000542 | 73,9097 | 52,6667  |
| 630       | V | 89,39 V    | 122,55      | 1,34122  | 0,000339 | 76,3797 | 48,58929 |
| 800       | V | 91,04 V    | 127,16      | 2,280342 | 0,000454 | 78,0297 | 51,1243  |
| 1000      | V | 92,97 V    | 133,51      | 4,736963 | 0,000754 | 79,9597 | 55,5361  |
| 1250      | V | 92,28 V    | 136,64      | 6,792036 | 0,000865 | 79,2697 | 66,7279  |
| 1600      | V | 90,19 V    | 138,03      | 7,970765 | 0,000793 | 77,1797 | 70,9737  |
| 2000      | V | 88 V       | 140,94      | 11,14295 | 0,000887 | 74,9897 | 71,9455  |

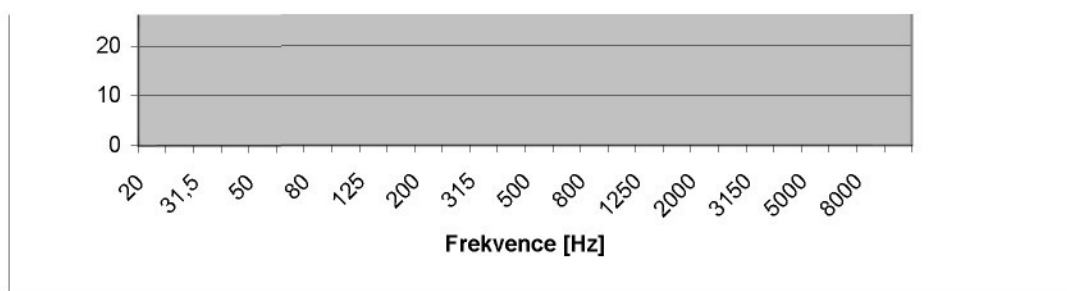
|       |   |          |        |          |          |         |          |
|-------|---|----------|--------|----------|----------|---------|----------|
| 2500  | V | 88,33 V  | 150,19 | 32,32213 | 0,002058 | 75,3197 | 79,2573  |
| 3150  | V | 92,24 V  | 159,08 | 89,94976 | 0,004545 | 79,2297 | 86,13989 |
| 4000  | V | 87,53 V  | 152,14 | 40,45759 | 0,00161  | 74,5197 | 77,1249  |
| 5000  | V | 86,38 V  | 145,76 | 19,40886 | 0,000618 | 73,3697 | 68,8067  |
| 6300  | V | 85,06 V  | 142,42 | 13,21296 | 0,000334 | 72,0497 | 63,45929 |
| 8000  | V | 84,24 V  | 139,93 | 9,919733 | 0,000197 | 71,2297 | 58,8943  |
| 10000 | V | 81,61 V  | 139,06 | 8,974288 | 0,000143 | 68,5997 | 56,0861  |
| A/L   | V | 103,83 V | 160,67 | 108,019  |          |         |          |
| W     | V | 101,36 V | 160,75 | 109,0184 |          |         |          |
| L     |   |          |        |          |          |         |          |

10\*log sigma

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· Lw [dB]

· Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 066

Measured 05-04-04 09:49:36

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|------------|-------------|----------|----------|---------|----------|
| 0,4       | V | 67,87 V    |             | 120,2    |          |         |          |
| 0,5       | V | 72,69 V    |             | 115,9    |          |         |          |
| 0,63      | V | 75,89 V    |             | 116,91   |          |         |          |
| 0,8       | V | 71,42 V    |             | 121,42   |          | S6 [m2] | fd       |
| 1         | V | 73,75 V    |             | 125,16   |          | 0,05    | 1596,553 |
| 1,25      | V | 75,12 V    |             | 124,29   |          |         |          |
| 1,6       | V | 65,31 V    |             | 113,57   |          |         |          |
| 2         | V | 62,16 V    |             | 108,11   |          |         |          |
| 2,5       | V | 65,31 V    |             | 102,3    |          |         |          |
| 3,15      | V | 67,38 V    |             | 97,48    |          |         |          |
| 4         | V | 66,37 V    |             | 93,32    |          |         |          |
| 5         | V | 72,44 V    |             | 79,7     |          |         |          |
| 6,3       | V | 71,05 V    | -256,12     |          |          |         |          |
| 8         | V | 70,6 V     | 91,16       |          |          |         |          |
| 10        | V | 70,81 V    | 86,69       |          |          |         |          |
| 12,5      | V | 68,06 V    | 79,7        |          |          |         |          |
| 16        | V | 65,8 V     | 88,31       |          |          | Lv [dB] | Lw [dB]  |
| 20        | V | 65,9 V     | 96,49       | 0,066757 | 0,000531 | 52,8897 | 42,4955  |
| 25        | V | 73,52 V    | 117,59      | 0,757705 | 0,004824 | 60,5097 | 61,6573  |
| 31,5      | V | 80,6 V     | 125,44      | 1,870682 | 0,009452 | 67,5897 | 67,49989 |
| 40        | V | 64,32 V    | 101,86      | 0,12388  | 0,000493 | 51,3097 | 41,8449  |
| 50        | V | 65,5 V     | 111,85      | 0,391291 | 0,001246 | 52,4897 | 49,8967  |
| 63        | V | 65,97 V    | 120,48      | 1,056818 | 0,00267  | 52,9597 | 56,51929 |
| 80        | V | 66,81 V    | 113,14      | 0,453942 | 0,000903 | 53,7997 | 47,1043  |
| 100       | V | 85,35 V    | 130,5       | 3,349654 | 0,005331 | 72,3397 | 62,5261  |
| 125       | V | 94,19 V    | 139,49      | 9,429746 | 0,012006 | 81,1797 | 79,5779  |
| 160       | V | 70,04 V    | 127,23      | 2,298794 | 0,002287 | 57,0297 | 65,1737  |
| 200       | V | 76,13 V    | 129,51      | 2,988822 | 0,002378 | 63,1197 | 65,5155  |
| 250       | V | 76,97 V    | 134,43      | 5,266232 | 0,003353 | 63,9597 | 68,4973  |
| 315       | V | 83,7 V     | 129,14      | 2,864178 | 0,001447 | 70,6897 | 61,19989 |
| 400       | V | 85,77 V    | 132,59      | 4,260887 | 0,001695 | 72,7597 | 62,5749  |
| 500       | V | 85,7 V     | 138,52      | 8,433348 | 0,002684 | 72,6897 | 66,5667  |
| 630       | V | 86,88 V    | 134,52      | 5,321083 | 0,001344 | 73,8697 | 60,55929 |
| 800       | V | 90,38 V    | 130,22      | 3,243396 | 0,000645 | 77,3697 | 54,1843  |
| 1000      | V | 91,39 V    | 131,96      | 3,96278  | 0,000631 | 78,3797 | 53,9861  |
| 1250      | V | 88,94 V    | 130,9       | 3,507519 | 0,000447 | 75,9297 | 60,9879  |
| 1600      | V | 87,63 V    | 136,29      | 6,52379  | 0,000649 | 74,6197 | 69,2337  |
| 2000      | V | 85,93 V    | 144,4       | 16,59587 | 0,001321 | 72,9197 | 75,4055  |

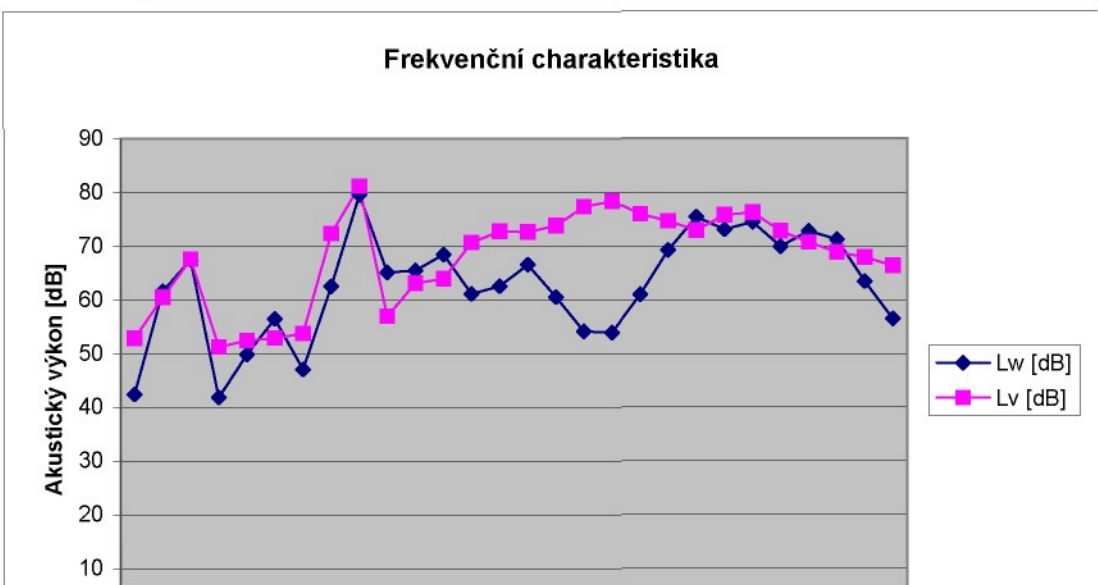
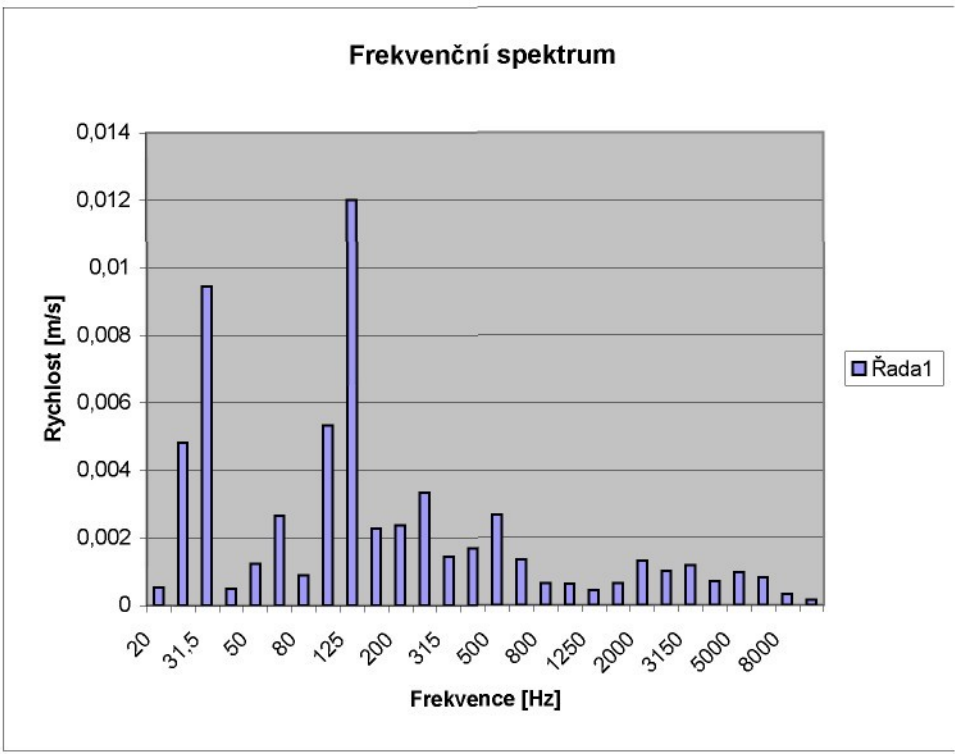


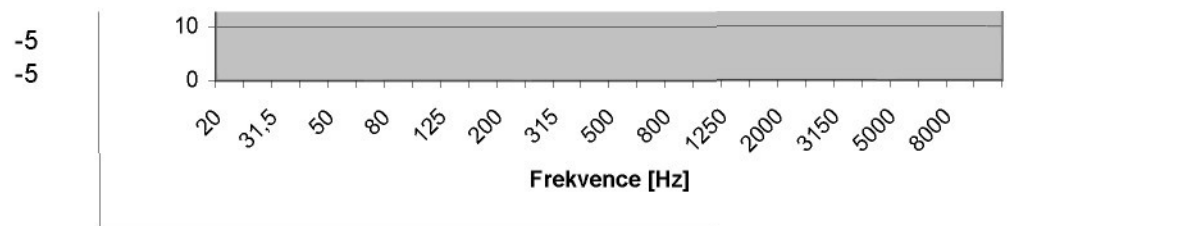
|       |   |          |        |          |          |         |          |
|-------|---|----------|--------|----------|----------|---------|----------|
| 2500  | V | 88,76 V  | 144    | 15,84893 | 0,001009 | 75,7497 | 73,0673  |
| 3150  | V | 89,23 V  | 147,39 | 23,41531 | 0,001183 | 76,2197 | 74,44989 |
| 4000  | V | 85,79 V  | 144,96 | 17,70109 | 0,000704 | 72,7797 | 69,9449  |
| 5000  | V | 83,72 V  | 149,76 | 30,76097 | 0,000979 | 70,7097 | 72,8067  |
| 6300  | V | 81,84 V  | 150,21 | 32,39664 | 0,000818 | 68,8297 | 71,24929 |
| 8000  | V | 80,9 V   | 144,45 | 16,69168 | 0,000332 | 67,8897 | 63,4143  |
| 10000 | V | 79,35 V  | 139,46 | 9,397233 | 0,00015  | 66,3397 | 56,4861  |
| A/L   | V | 100,59 V | 156,21 | 64,6398  | #####    |         |          |
| W     | V | 99,2 V   | 156,16 | 64,26877 |          |         |          |

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10\*log sigma

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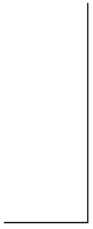




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v [dB]

r [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 067

Measured 05-04-04 09:49:52

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

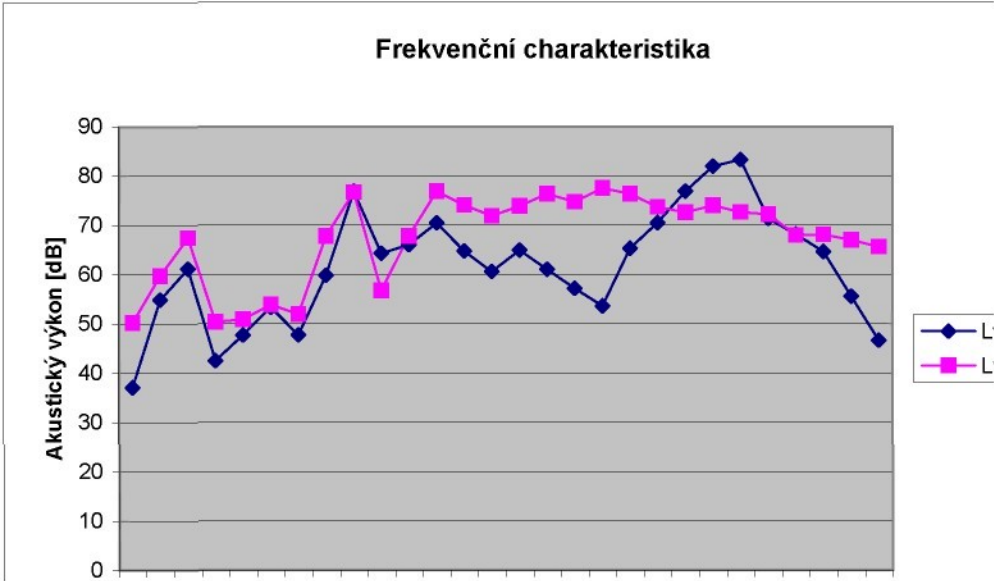
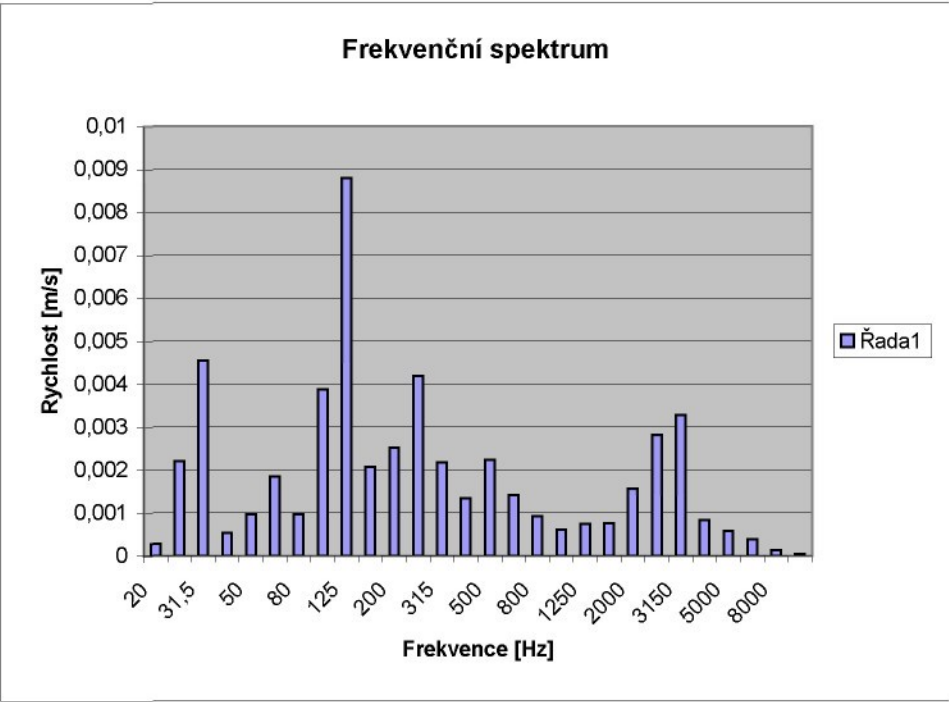
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |         |          |
|-----------|---|------------|-------------|----------|----------|---------|----------|
| 0,4       | V | 70,34 V    | 118,37      |          |          |         |          |
| 0,5       | V | 70,08 V    | 121,66      |          |          |         |          |
| 0,63      | V | 67,26 V    | 118,27      |          |          |         |          |
| 0,8       | V | 61,62 V    | 116,41      |          |          | S7 [m2] | fd       |
| 1         | V | 54,66 V    | 109,12      |          |          | 0,05    | 1596,553 |
| 1,25      | V | 65,07 V    | 112,32      |          |          |         |          |
| 1,6       | V | 62,23 V    | 103,57      |          |          |         |          |
| 2         | V | 63,03 V    | 102,02      |          |          |         |          |
| 2,5       | V | 62,32 V    | 104,16      |          |          |         |          |
| 3,15      | V | 58,65 V    | 95,51       |          |          |         |          |
| 4         | V | 53,88 V    | 95,62       |          |          |         |          |
| 5         | V | 55,76 V    | 94,33       |          |          |         |          |
| 6,3       | V | 55,93 V    | 95,2        |          |          |         |          |
| 8         | V | 55,86 V    | 94,1        |          |          |         |          |
| 10        | V | 58,89 V    | 91,46       |          |          |         |          |
| 12,5      | V | 55,24 V    | 88,45       |          |          |         |          |
| 16        | V | 53,95 V    | 90,5        |          |          | Lv [dB] | Lw [dB]  |
| 20        | V | 63,26 V    | 91,09       | 0,035851 | 0,000285 | 50,2497 | 37,0955  |
| 25        | V | 72,72 V    | 110,79      | 0,346338 | 0,002205 | 59,7097 | 54,8573  |
| 31,5      | V | 80,45 V    | 119,07      | 0,898463 | 0,00454  | 67,4397 | 61,12989 |
| 40        | V | 63,4 V     | 102,54      | 0,133968 | 0,000533 | 50,3897 | 42,5249  |
| 50        | V | 63,87 V    | 109,64      | 0,303389 | 0,000966 | 50,8597 | 47,6867  |
| 63        | V | 66,86 V    | 117,28      | 0,731139 | 0,001847 | 53,8497 | 53,31929 |
| 80        | V | 64,93 V    | 113,76      | 0,487528 | 0,00097  | 51,9197 | 47,7243  |
| 100       | V | 80,81 V    | 127,73      | 2,435006 | 0,003875 | 67,7997 | 59,7561  |
| 125       | V | 89,72 V    | 136,78      | 6,902398 | 0,008788 | 76,7097 | 76,8679  |
| 160       | V | 69,71 V    | 126,34      | 2,074914 | 0,002064 | 56,6997 | 64,2837  |
| 200       | V | 80,76 V    | 130,01      | 3,16592  | 0,002519 | 67,7497 | 66,0155  |
| 250       | V | 89,89 V    | 136,36      | 6,576578 | 0,004187 | 76,8797 | 70,4273  |
| 315       | V | 87,09 V    | 132,69      | 4,310226 | 0,002178 | 74,0797 | 64,74989 |
| 400       | V | 84,88 V    | 130,55      | 3,368992 | 0,00134  | 71,8697 | 60,5349  |
| 500       | V | 86,88 V    | 136,9       | 6,99842  | 0,002228 | 73,8697 | 64,9467  |
| 630       | V | 89,39 V    | 134,99      | 5,616943 | 0,001419 | 76,3797 | 61,02929 |
| 800       | V | 87,72 V    | 133,25      | 4,59727  | 0,000915 | 74,7097 | 57,2143  |
| 1000      | V | 90,54 V    | 131,61      | 3,806274 | 0,000606 | 77,5297 | 53,6361  |
| 1250      | V | 89,34 V    | 135,23      | 5,774309 | 0,000735 | 76,3297 | 65,3179  |
| 1600      | V | 86,73 V    | 137,56      | 7,550922 | 0,000751 | 73,7197 | 70,5037  |
| 2000      | V | 85,58 V    | 145,88      | 19,67886 | 0,001566 | 72,5697 | 76,8855  |

|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 87,02 V | 152,89 | 44,10624 | 0,002808 | 74,0097 | 81,9573  |
| 3150  | V | 85,65 V | 156,23 | 64,78881 | 0,003273 | 72,6397 | 83,28989 |
| 4000  | V | 85,23 V | 146,38 | 20,84491 | 0,000829 | 72,2197 | 71,3649  |
| 5000  | V | 80,97 V | 145,15 | 18,09256 | 0,000576 | 67,9597 | 68,1967  |
| 6300  | V | 81,09 V | 143,65 | 15,22299 | 0,000385 | 68,0797 | 64,68929 |
| 8000  | V | 79,98 V | 136,57 | 6,737519 | 0,000134 | 66,9697 | 55,5343  |
| 10000 | V | 78,64 V | 129,63 | 3,0304   | 4,82E-05 | 65,6297 | 46,6561  |
| A/L   | V | 99,81 V | 158,98 | 88,92011 |          |         |          |
| W     | V | 98,35 V | 159    | 89,12509 |          |         |          |

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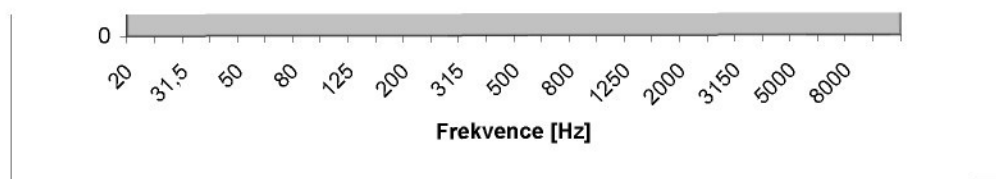
10\*log sigma

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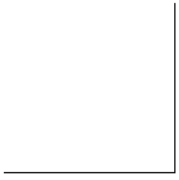


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—◆— Lw [dB]  
—■— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 068

Measured 05-04-04 09:50:08

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

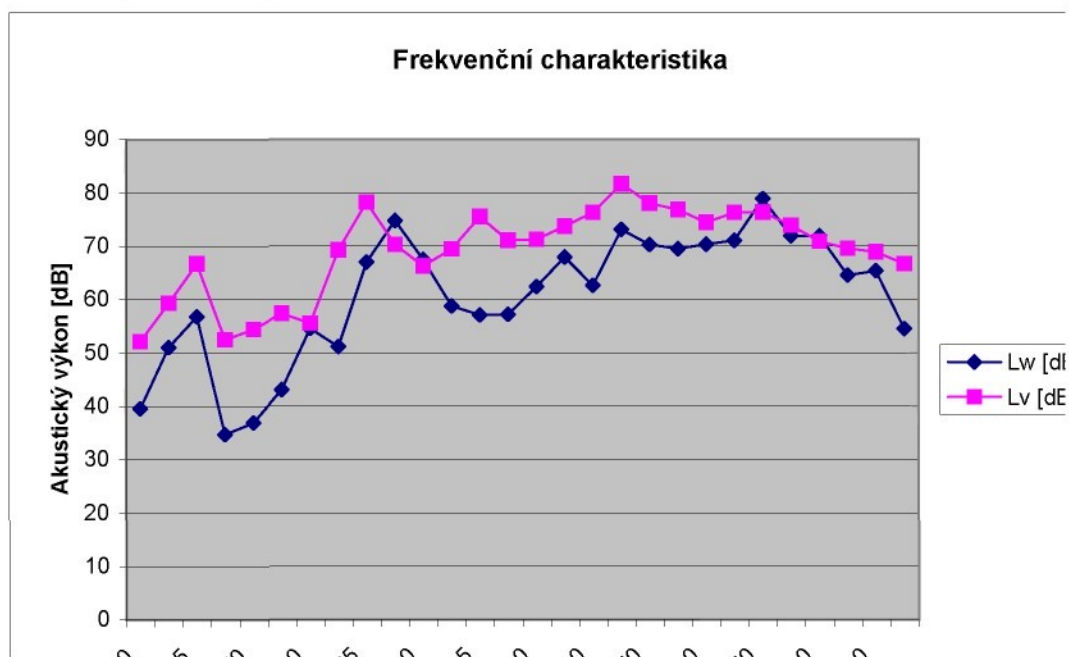
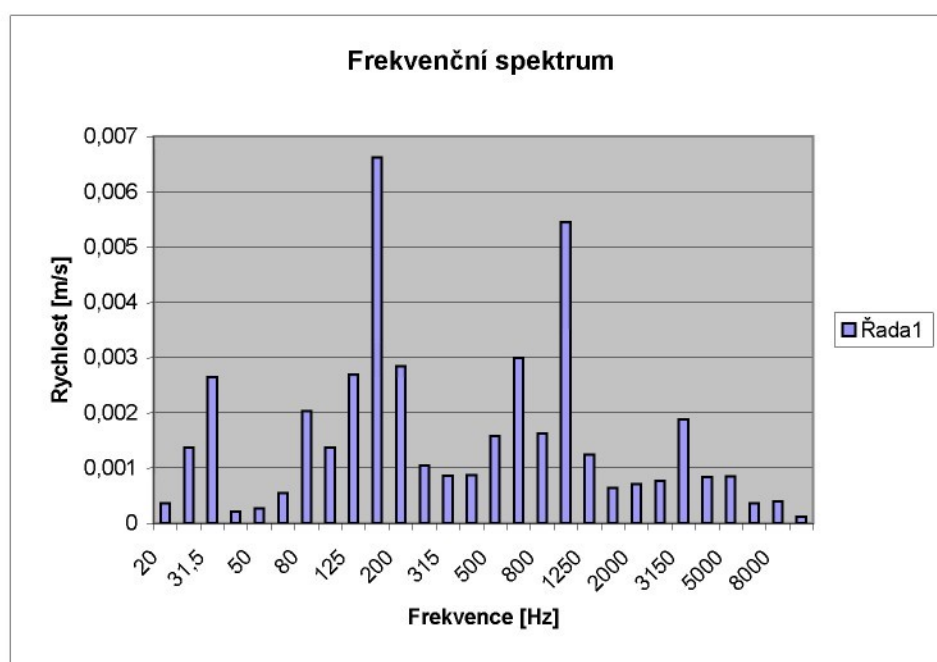
( Start of Data )

Spectrum r 1

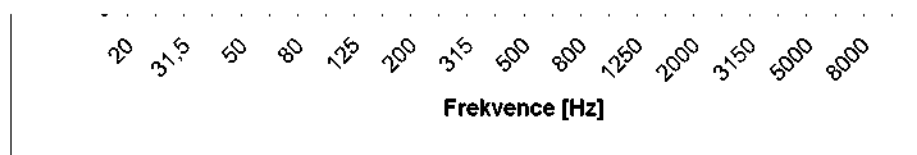
| Frequency |   | Auto-A [dB | Auto-B [dB | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|------------|----------|----------|----------|----------|
| 0,4       | V | 69,4 V     | 122,93     |          |          |          |          |
| 0,5       | V | 68,08 V    | 121,78     |          |          |          |          |
| 0,63      | V | 69,03 V    | 120,74     |          |          |          |          |
| 0,8       | V | 67 V       | 115,43     |          |          | S8 [m2]  | fd       |
| 1         | V | 77,84 V    | 113,85     |          |          | 0,05452  | 1528,939 |
| 1,25      | V | 76,43 V    | 114,25     |          |          |          |          |
| 1,6       | V | 68,25 V    | 105,05     |          |          |          |          |
| 2         | V | 63,24 V    | 101,64     |          |          |          |          |
| 2,5       | V | 63,71 V    | 94,47      |          |          |          |          |
| 3,15      | V | 62,42 V    | -256,12    |          |          |          |          |
| 4         | V | 64,37 V    | 94,47      |          |          |          |          |
| 5         | V | 64,6 V     | 79,7       |          |          |          |          |
| 6,3       | V | 65,92 V    | -256,12    |          |          |          |          |
| 8         | V | 64,63 V    | 89,7       |          |          |          |          |
| 10        | V | 63,69 V    | 88,15      |          |          |          |          |
| 12,5      | V | 61,12 V    | -256,12    |          |          |          |          |
| 16        | V | 62,06 V    | 90,21      |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 64,77 V    | 93,13      | 0,045342 | 0,000361 | 52,13556 | 39,51136 |
| 25        | V | 71,99 V    | 106,63     | 0,214536 | 0,001366 | 59,35556 | 51,07316 |
| 31,5      | V | 79,37 V    | 114,39     | 0,524204 | 0,002649 | 66,73556 | 56,82575 |
| 40        | V | 65,14 V    | 94,35      | 0,05218  | 0,000208 | 52,50556 | 34,71076 |
| 50        | V | 67,07 V    | 98,49      | 0,084043 | 0,000268 | 54,43556 | 36,91256 |
| 63        | V | 69,97 V    | 106,68     | 0,215774 | 0,000545 | 57,33556 | 43,09515 |
| 80        | V | 68,13 V    | 120,2      | 1,023293 | 0,002036 | 55,49556 | 54,54016 |
| 100       | V | 81,89 V    | 118,72     | 0,862979 | 0,001373 | 69,25556 | 51,12196 |
| 125       | V | 90,8 V     | 126,5      | 2,113489 | 0,002691 | 78,16556 | 66,96376 |
| 160       | V | 82,92 V    | 136,47     | 6,660395 | 0,006625 | 70,28556 | 74,78956 |
| 200       | V | 78,88 V    | 131,04     | 3,564511 | 0,002837 | 66,24556 | 67,42136 |
| 250       | V | 82,08 V    | 124,29     | 1,638702 | 0,001043 | 69,44556 | 58,73316 |
| 315       | V | 88,1 V     | 124,6      | 1,698244 | 0,000858 | 75,46556 | 57,03575 |
| 400       | V | 83,65 V    | 126,83     | 2,195331 | 0,000873 | 71,01556 | 57,19076 |
| 500       | V | 83,84 V    | 133,91     | 4,960209 | 0,001579 | 71,20556 | 62,33256 |
| 630       | V | 86,33 V    | 141,48     | 11,85769 | 0,002996 | 73,69556 | 67,89515 |
| 800       | V | 88,92 V    | 138,26     | 8,184648 | 0,001628 | 76,28556 | 62,60016 |
| 1000      | V | 94,21 V    | 150,7      | 34,27678 | 0,005455 | 81,57556 | 73,10196 |
| 1250      | V | 90,64 V    | 139,81     | 9,78363  | 0,001246 | 78,00556 | 70,27376 |
| 1600      | V | 89,46 V    | 136,17     | 6,434281 | 0,00064  | 76,82556 | 69,48956 |
| 2000      | V | 87,02 V    | 138,94     | 8,851156 | 0,000704 | 74,38556 | 70,32136 |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 88,87 V  | 141,6  | 12,02264 | 0,000765 | 76,23556 | 71,04316 |
| 3150  | V | 88,94 V  | 151,41 | 37,19632 | 0,001879 | 76,30556 | 78,84575 |
| 4000  | V | 86,48 V  | 146,52 | 21,18361 | 0,000843 | 73,84556 | 71,88076 |
| 5000  | V | 83,51 V  | 148,47 | 26,51551 | 0,000844 | 70,87556 | 71,89256 |
| 6300  | V | 82,15 V  | 143,08 | 14,25608 | 0,00036  | 69,51556 | 64,49515 |
| 8000  | V | 81,54 V  | 145,98 | 19,90673 | 0,000396 | 68,90556 | 65,32016 |
| 10000 | V | 79,28 V  | 137,09 | 7,153194 | 0,000114 | 66,64556 | 54,49196 |
| A/L   | V | 100,77 V | 157,17 | 72,19382 |          |          |          |
| W     | V | 100,12 V | 157,03 | 71,03952 |          |          |          |

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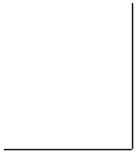
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Rada1

— Lw [dB]  
— Lv [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 069

Measured 05-04-04 09:50:22

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

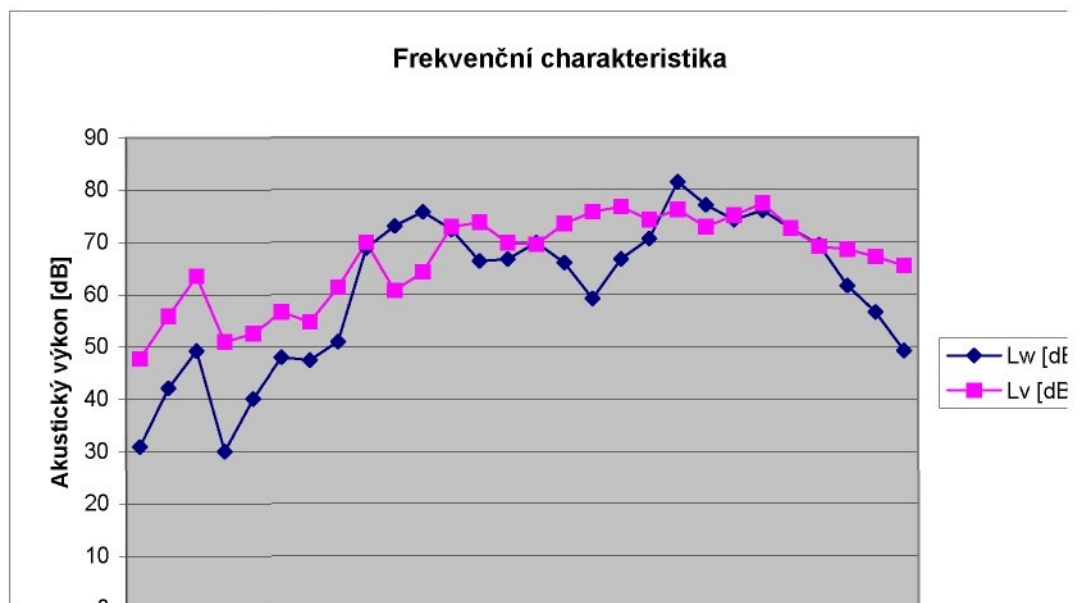
Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 59,45 V     | 111,52      |          |          |          |          |
| 0,5       | V | 72,06 V     | 114,86      |          |          |          |          |
| 0,63      | V | 70,81 V     | 114,37      |          |          |          |          |
| 0,8       | V | 71,64 V     | 115,43      |          |          | S9 [m2]  | fd       |
| 1         | V | 70,18 V     | 113,05      |          |          | 0,03     | 2061,14  |
| 1,25      | V | 69,45 V     | 118,93      |          |          |          |          |
| 1,6       | V | 62,86 V     | 111,85      |          |          |          |          |
| 2         | V | 59,1 V      | 102,63      |          |          |          |          |
| 2,5       | V | 62,79 V     | 99,34       |          |          |          |          |
| 3,15      | V | 61,15 V     | 91,74       |          |          |          |          |
| 4         | V | 59,88 V     | 90,12       |          |          |          |          |
| 5         | V | 57,36 V     | 88,15       |          |          |          |          |
| 6,3       | V | 56,87 V     | -256,12     |          |          |          |          |
| 8         | V | 61,08 V     | 82,71       |          |          |          |          |
| 10        | V | 60,44 V     | 79,7        |          |          |          |          |
| 12,5      | V | 58,77 V     | 88,45       |          |          |          |          |
| 16        | V | 57,08 V     | 90,4        |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 62,98 V     | 87,11       | 0,022673 | 0,00018  | 47,75121 | 30,89702 |
| 25        | V | 71,14 V     | 100,26      | 0,103039 | 0,000656 | 55,91121 | 42,10882 |
| 31,5      | V | 78,79 V     | 109,45      | 0,296825 | 0,0015   | 63,56121 | 49,2914  |
| 40        | V | 66,2 V      | 92,28       | 0,041115 | 0,000164 | 50,97121 | 30,04642 |
| 50        | V | 67,8 V      | 104,26      | 0,163305 | 0,00052  | 52,57121 | 40,08822 |
| 63        | V | 71,87 V     | 114,2       | 0,512861 | 0,001296 | 56,64121 | 48,0208  |
| 80        | V | 69,97 V     | 115,71      | 0,610239 | 0,001214 | 54,74121 | 47,45582 |
| 100       | V | 76,55 V     | 121,19      | 1,146833 | 0,001825 | 61,32121 | 50,99762 |
| 125       | V | 85,14 V     | 131         | 3,548134 | 0,004518 | 69,91121 | 68,86941 |
| 160       | V | 75,96 V     | 137,39      | 7,404573 | 0,007365 | 60,73121 | 73,11522 |
| 200       | V | 79,51 V     | 142,02      | 12,61828 | 0,010041 | 64,28121 | 75,80702 |
| 250       | V | 88,17 V     | 140,57      | 10,67825 | 0,006798 | 72,94121 | 72,41882 |
| 315       | V | 88,99 V     | 136,5       | 6,683439 | 0,003377 | 73,76121 | 66,3414  |
| 400       | V | 85,06 V     | 138,97      | 8,88178  | 0,003534 | 69,83121 | 66,73642 |
| 500       | V | 84,76 V     | 144,12      | 16,06941 | 0,005115 | 69,53121 | 69,94822 |
| 630       | V | 88,78 V     | 142,26      | 12,97179 | 0,003277 | 73,55121 | 66,0808  |
| 800       | V | 91,04 V     | 137,46      | 7,464488 | 0,001485 | 75,81121 | 59,20582 |
| 1000      | V | 91,98 V     | 146,96      | 22,28435 | 0,003547 | 76,75121 | 66,76762 |
| 1250      | V | 89,49 V     | 142,78      | 13,77209 | 0,001754 | 74,26121 | 70,64941 |
| 1600      | V | 91,48 V     | 155,81      | 61,73053 | 0,00614  | 76,25121 | 81,53522 |
| 2000      | V | 88,17 V     | 148,35      | 26,1517  | 0,002081 | 72,94121 | 77,13702 |

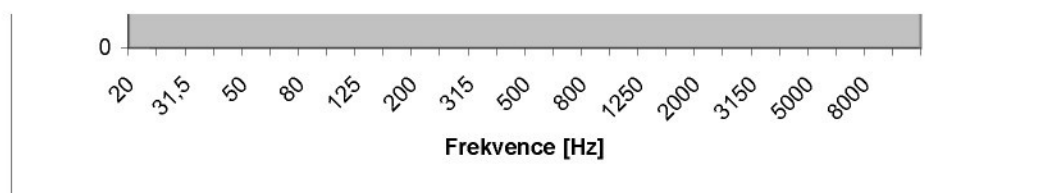
|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 90,33 V  | 147,43 | 23,52339 | 0,001498 | 75,10121 | 74,27882 |
| 3150  | V | 92,68 V  | 151,29 | 36,68597 | 0,001854 | 77,45121 | 76,1314  |
| 4000  | V | 87,93 V  | 149,88 | 31,1889  | 0,001241 | 72,70121 | 72,64642 |
| 5000  | V | 84,41 V  | 148,66 | 27,10192 | 0,000863 | 69,18121 | 69,48822 |
| 6300  | V | 83,84 V  | 142,87 | 13,91554 | 0,000352 | 68,61121 | 61,6908  |
| 8000  | V | 82,48 V  | 139,91 | 9,896919 | 0,000197 | 67,25121 | 56,65582 |
| 10000 | V | 80,76 V  | 134,45 | 5,278372 | 8,4E-05  | 65,53121 | 49,25762 |
| A/L   | V | 101,32 V | 160,09 | 101,0416 |          |          |          |
| W     | V | 101,06 V | 160,02 | 100,2305 |          |          |          |

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— Lw [dB]  
— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 070

Measured 05-04-04 09:50:34

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 64,44 V    | 116,27      |          |          |          |          |
| 0,5       | V | 69,54 V    | 117,59      |          |          |          |          |
| 0,63      | V | 71,33 V    | 118,91      |          |          |          |          |
| 0,8       | V | 75,94 V    | 122,81      |          |          | S10 [m2] | fd       |
| 1         | V | 71,02 V    | 122,58      |          |          | 0,05     | 1596,553 |
| 1,25      | V | 70,37 V    | 123,38      |          |          |          |          |
| 1,6       | V | 67,07 V    | 119,47      |          |          |          |          |
| 2         | V | 62,04 V    | 111,85      |          |          |          |          |
| 2,5       | V | 63,33 V    | 107,41      |          |          |          |          |
| 3,15      | V | 65,12 V    | 95,84       |          |          |          |          |
| 4         | V | 60,16 V    | 93,86       |          |          |          |          |
| 5         | V | 57,64 V    | 79,7        |          |          |          |          |
| 6,3       | V | 56,68 V    | 85,14       |          |          |          |          |
| 8         | V | 58,58 V    | 92,38       |          |          |          |          |
| 10        | V | 60,63 V    | 85,14       |          |          |          |          |
| 12,5      | V | 54,49 V    | -256,12     |          |          |          |          |
| 16        | V | 56,91 V    | 88,45       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 62,75 V    | 84,48       | 0,016749 | 0,000133 | 49,7397  | 30,4855  |
| 25        | V | 70,48 V    | 105,29      | 0,183865 | 0,001171 | 57,4697  | 49,3573  |
| 31,5      | V | 78,2 V     | 113,5       | 0,473151 | 0,002391 | 65,1897  | 55,55989 |
| 40        | V | 65,1 V     | 91,74       | 0,038637 | 0,000154 | 52,0897  | 31,7249  |
| 50        | V | 66,13 V    | 94,1        | 0,050699 | 0,000161 | 53,1197  | 32,1467  |
| 63        | V | 70,22 V    | 102,23      | 0,129271 | 0,000327 | 57,2097  | 38,26929 |
| 80        | V | 67,59 V    | 114,04      | 0,503501 | 0,001002 | 54,5797  | 48,0043  |
| 100       | V | 70,53 V    | 119,73      | 0,969393 | 0,001543 | 57,5197  | 51,7561  |
| 125       | V | 76,39 V    | 129         | 2,818383 | 0,003588 | 63,3797  | 69,0879  |
| 160       | V | 76,17 V    | 120,2       | 1,023293 | 0,001018 | 63,1597  | 58,1437  |
| 200       | V | 80,74 V    | 122,01      | 1,260376 | 0,001003 | 67,7297  | 58,0155  |
| 250       | V | 89,58 V    | 118,04      | 0,797995 | 0,000508 | 76,5697  | 52,1073  |
| 315       | V | 85,68 V    | 117,24      | 0,72778  | 0,000368 | 72,6697  | 49,29989 |
| 400       | V | 85,42 V    | 122,11      | 1,27497  | 0,000507 | 72,4097  | 52,0949  |
| 500       | V | 85,56 V    | 125,96      | 1,986095 | 0,000632 | 72,5497  | 54,0067  |
| 630       | V | 85,96 V    | 125,87      | 1,965622 | 0,000497 | 72,9497  | 51,90929 |
| 800       | V | 89,89 V    | 127,56      | 2,387811 | 0,000475 | 76,8797  | 51,5243  |
| 1000      | V | 91,39 V    | 128,17      | 2,561533 | 0,000408 | 78,3797  | 50,1961  |
| 1250      | V | 89,63 V    | 132,62      | 4,275629 | 0,000544 | 76,6197  | 62,7079  |
| 1600      | V | 90,12 V    | 132,69      | 4,310226 | 0,000429 | 77,1097  | 65,6337  |
| 2000      | V | 87,53 V    | 138,59      | 8,501587 | 0,000677 | 74,5197  | 69,5955  |

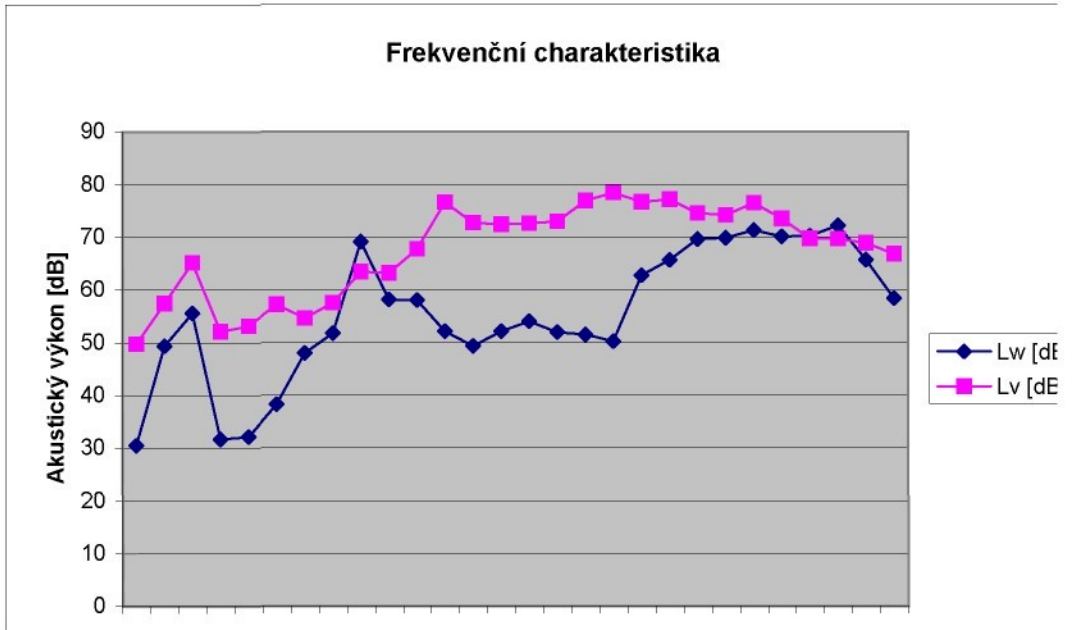
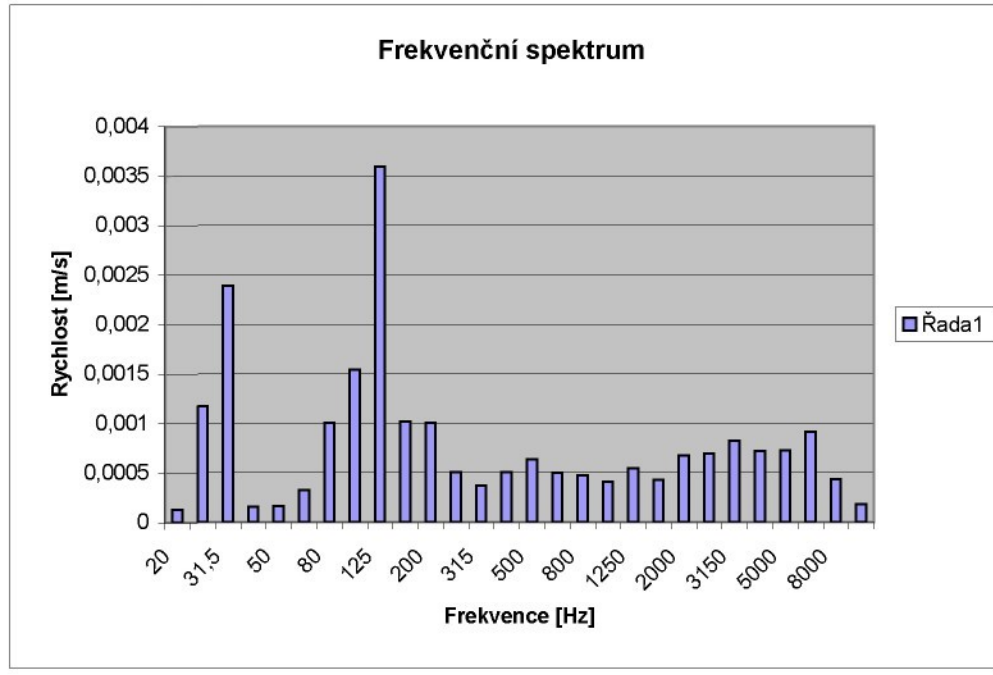


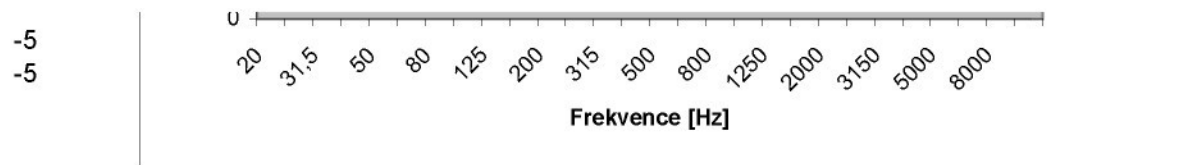
|       |   |         |        |          |          |         |          |
|-------|---|---------|--------|----------|----------|---------|----------|
| 2500  | V | 87,13 V | 140,75 | 10,90184 | 0,000694 | 74,1197 | 69,8173  |
| 3150  | V | 89,49 V | 144,26 | 16,33052 | 0,000825 | 76,4797 | 71,31989 |
| 4000  | V | 86,5 V  | 145,11 | 18,00943 | 0,000717 | 73,4897 | 70,0949  |
| 5000  | V | 82,71 V | 147,13 | 22,7248  | 0,000723 | 69,6997 | 70,1767  |
| 6300  | V | 82,64 V | 151,15 | 36,0994  | 0,000912 | 69,6297 | 72,18929 |
| 8000  | V | 81,89 V | 146,75 | 21,75204 | 0,000433 | 68,8797 | 65,7143  |
| 10000 | V | 79,82 V | 141,34 | 11,6681  | 0,000186 | 66,8097 | 58,3661  |
| A/L   | V | 100 V   | 155,34 | 58,47901 |          |         |          |
| W     | V | 99,58 V | 155,17 | 57,34559 |          |         |          |

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— Lw [dB]  
— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 071

Measured 05-04-04 09:51:16

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

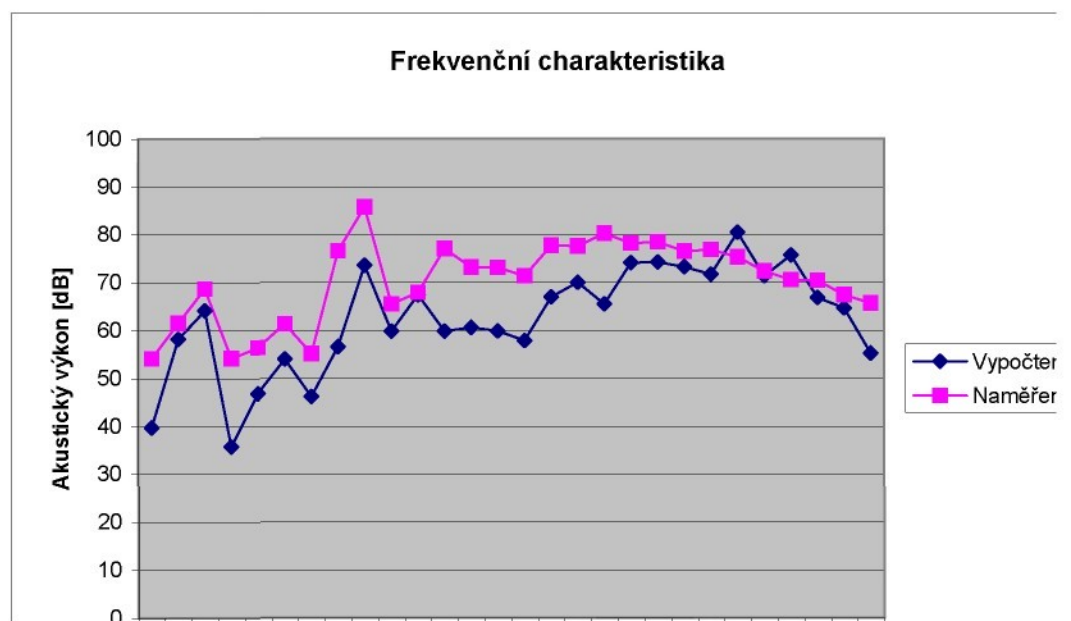
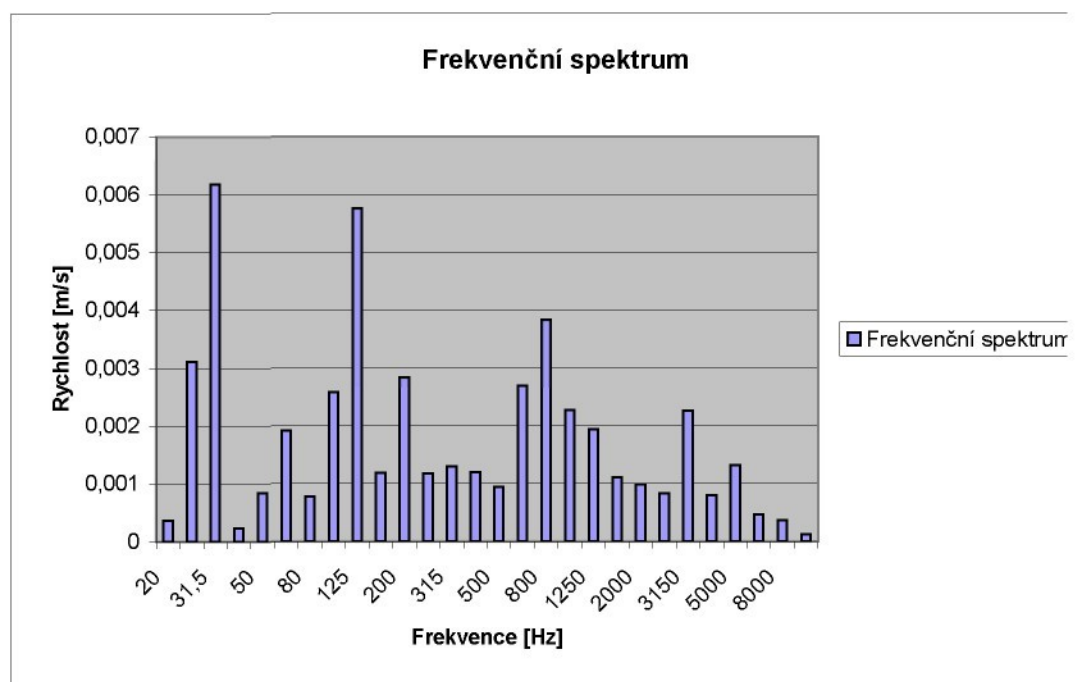
( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 83,65 V     | 115,83      |          |          |          |          |
| 0,5       | V | 79,4 V      | 123,3       |          |          |          |          |
| 0,63      | V | 75,82 V     | 120,79      |          |          |          |          |
| 0,8       | V | 73,38 V     | 114,2       |          |          | S11 [m2] | fd       |
| 1         | V | 73,75 V     | 113,36      |          |          | 0,05452  | 1528,939 |
| 1,25      | V | 68,39 V     | 98,96       |          |          |          |          |
| 1,6       | V | 66,41 V     | 96,87       |          |          |          |          |
| 2         | V | 58,77 V     | 90,5        |          |          |          |          |
| 2,5       | V | 56,68 V     | -256,12     |          |          |          |          |
| 3,15      | V | 59,57 V     | -256,12     |          |          |          |          |
| 4         | V | 56,77 V     | 79,7        |          |          |          |          |
| 5         | V | 54,75 V     | 92          |          |          |          |          |
| 6,3       | V | 55,95 V     | -256,12     |          |          |          |          |
| 8         | V | 57,97 V     | 86,69       |          |          |          |          |
| 10        | V | 61,17 V     | 89,7        |          |          |          |          |
| 12,5      | V | 59,38 V     | -256,12     |          |          |          |          |
| 16        | V | 61,12 V     | 84,83       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 66,79 V     | 93,37       | 0,046612 | 0,000371 | 54,15556 | 39,75136 |
| 25        | V | 74,18 V     | 113,8       | 0,489779 | 0,003118 | 61,54556 | 58,24316 |
| 31,5      | V | 81,37 V     | 121,75      | 1,223207 | 0,00618  | 68,73556 | 64,18575 |
| 40        | V | 66,86 V     | 95,41       | 0,058952 | 0,000235 | 54,22556 | 35,77076 |
| 50        | V | 69,05 V     | 108,44      | 0,264241 | 0,000841 | 56,41556 | 46,86256 |
| 63        | V | 74,03 V     | 117,61      | 0,759451 | 0,001919 | 61,39556 | 54,02515 |
| 80        | V | 67,8 V      | 111,83      | 0,390391 | 0,000777 | 55,16556 | 46,17016 |
| 100       | V | 89,27 V     | 124,2       | 1,62181  | 0,002581 | 76,63556 | 56,60196 |
| 125       | V | 98,42 V     | 133,11      | 4,523765 | 0,00576  | 85,78556 | 73,57376 |
| 160       | V | 78,17 V     | 121,54      | 1,193988 | 0,001188 | 65,53556 | 59,85956 |
| 200       | V | 80,53 V     | 131,04      | 3,564511 | 0,002837 | 67,89556 | 67,42136 |
| 250       | V | 89,72 V     | 125,37      | 1,855667 | 0,001181 | 77,08556 | 59,81316 |
| 315       | V | 85,86 V     | 128,2       | 2,570396 | 0,001299 | 73,22556 | 60,63575 |
| 400       | V | 85,75 V     | 129,56      | 3,006076 | 0,001196 | 73,11556 | 59,92076 |
| 500       | V | 84,05 V     | 129,44      | 2,964831 | 0,000944 | 71,41556 | 57,86256 |
| 630       | V | 90,4 V      | 140,57      | 10,67825 | 0,002698 | 77,76556 | 66,98515 |
| 800       | V | 90,24 V     | 145,69      | 19,25307 | 0,00383  | 77,60556 | 70,03016 |
| 1000      | V | 92,92 V     | 143,11      | 14,3054  | 0,002277 | 80,28556 | 65,51196 |
| 1250      | V | 90,85 V     | 143,67      | 15,25808 | 0,001943 | 78,21556 | 74,13376 |
| 1600      | V | 91,13 V     | 140,92      | 11,11732 | 0,001106 | 78,49556 | 74,23956 |
| 2000      | V | 89,16 V     | 141,88      | 12,41652 | 0,000988 | 76,52556 | 73,26136 |

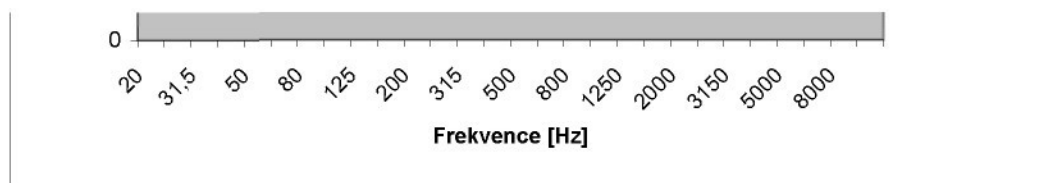
|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 89,53 V  | 142,31 | 13,04668 | 0,000831 | 76,89556 | 71,75316 |
| 3150  | V | 88 V     | 153,03 | 44,8229  | 0,002265 | 75,36556 | 80,46575 |
| 4000  | V | 85,04 V  | 146,05 | 20,06781 | 0,000798 | 72,40556 | 71,41076 |
| 5000  | V | 83,21 V  | 152,33 | 41,35233 | 0,001316 | 70,57556 | 75,75256 |
| 6300  | V | 83,07 V  | 145,44 | 18,70682 | 0,000473 | 70,43556 | 66,85515 |
| 8000  | V | 80,1 V   | 145,36 | 18,53532 | 0,000369 | 67,46556 | 64,70016 |
| 10000 | V | 78,34 V  | 137,86 | 7,816278 | 0,000124 | 65,70556 | 55,26196 |
| A/L   | V | 102,94 V | 158,09 | 80,26016 |          |          |          |
| W     | V | 100,54 V | 157,99 | 79,34143 |          |          |          |

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spektrum

Vypočteno  
Naměřeno



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 072

Measured 05-04-04 09:51:32

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

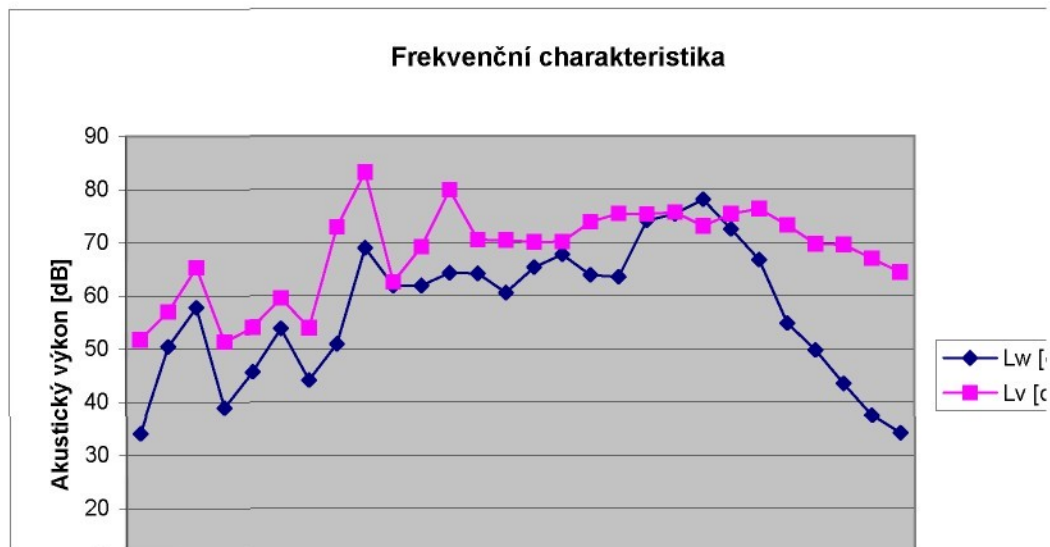
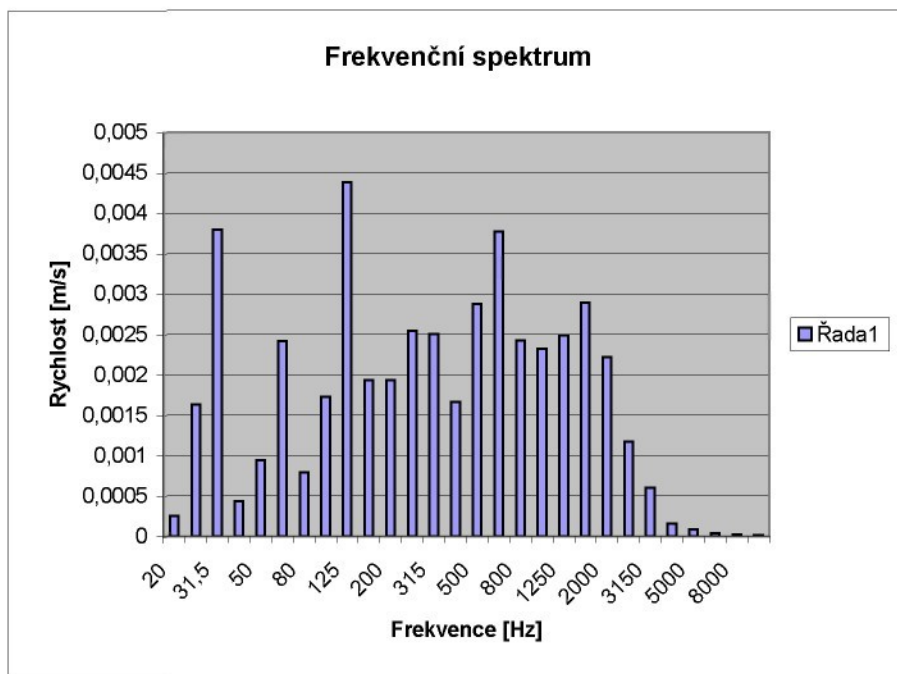
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 76,41 V    | 115,1       |          |          |          |          |
| 0,5       | V | 73,14 V    | 116,23      |          |          |          |          |
| 0,63      | V | 75,54 V    | 117,68      |          |          |          |          |
| 0,8       | V | 66,63 V    | 113,87      |          |          | S12 [m2] | fd       |
| 1         | V | 61,88 V    | 111,12      |          |          | 0,0328   | 1971,203 |
| 1,25      | V | 68,79 V    | 107,67      |          |          |          |          |
| 1,6       | V | 66,81 V    | 101,86      |          |          |          |          |
| 2         | V | 68,25 V    | 103,74      |          |          |          |          |
| 2,5       | V | 64,23 V    | 104,11      |          |          |          |          |
| 3,15      | V | 66,51 V    | 91,46       |          |          |          |          |
| 4         | V | 61,45 V    | 82,71       |          |          |          |          |
| 5         | V | 63,33 V    | 84,48       |          |          |          |          |
| 6,3       | V | 62,09 V    | -256,12     |          |          |          |          |
| 8         | V | 62,56 V    | 85,72       |          |          |          |          |
| 10        | V | 64,2 V     | 86,24       |          |          |          |          |
| 12,5      | V | 60,44 V    | 83,68       |          |          |          |          |
| 16        | V | 61,38 V    | 87,11       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 66,6 V     | 89,93       | 0,031369 | 0,00025  | 51,75874 | 34,10454 |
| 25        | V | 71,85 V    | 108,18      | 0,256448 | 0,001633 | 57,00874 | 50,41634 |
| 31,5      | V | 80,13 V    | 117,52      | 0,751623 | 0,003798 | 65,28874 | 57,74893 |
| 40        | V | 66,18 V    | 100,75      | 0,109018 | 0,000434 | 51,33874 | 38,90394 |
| 50        | V | 68,86 V    | 109,45      | 0,296825 | 0,000945 | 54,01874 | 45,66574 |
| 63        | V | 74,36 V    | 119,61      | 0,956093 | 0,002415 | 59,51874 | 53,81833 |
| 80        | V | 68,77 V    | 111,95      | 0,395822 | 0,000787 | 53,92874 | 44,08334 |
| 100       | V | 87,72 V    | 120,69      | 1,08268  | 0,001723 | 72,87874 | 50,88514 |
| 125       | V | 98,02 V    | 130,74      | 3,443499 | 0,004384 | 83,17874 | 68,99694 |
| 160       | V | 77,37 V    | 125,77      | 1,943122 | 0,001933 | 62,52874 | 61,88274 |
| 200       | V | 83,98 V    | 127,7       | 2,42661  | 0,001931 | 69,13874 | 61,87454 |
| 250       | V | 94,73 V    | 132,03      | 3,994846 | 0,002543 | 79,88874 | 64,26634 |
| 315       | V | 85,3 V     | 133,91      | 4,960209 | 0,002506 | 70,45874 | 64,13893 |
| 400       | V | 85,28 V    | 132,41      | 4,173496 | 0,001661 | 70,43874 | 60,56394 |
| 500       | V | 84,88 V    | 139,11      | 9,026097 | 0,002873 | 70,03874 | 65,32574 |
| 630       | V | 84,95 V    | 143,48      | 14,92794 | 0,003771 | 70,10874 | 67,68833 |
| 800       | V | 88,69 V    | 141,72      | 12,1899  | 0,002425 | 73,84874 | 63,85334 |
| 1000      | V | 90,26 V    | 143,29      | 14,60495 | 0,002324 | 75,41874 | 63,48514 |
| 1250      | V | 90,17 V    | 145,81      | 19,52091 | 0,002485 | 75,32874 | 74,06694 |
| 1600      | V | 90,52 V    | 149,27      | 29,07368 | 0,002892 | 75,67874 | 75,38274 |
| 2000      | V | 87,93 V    | 148,92      | 27,92544 | 0,002222 | 73,08874 | 78,09454 |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 90,19 V  | 145,32 | 18,45015 | 0,001175 | 75,34874 | 72,55634 |
| 3150  | V | 91,18 V  | 141,51 | 11,89871 | 0,000601 | 76,33874 | 66,73893 |
| 4000  | V | 88,07 V  | 131,68 | 3,837072 | 0,000153 | 73,22874 | 54,83394 |
| 5000  | V | 84,52 V  | 128,53 | 2,669931 | 8,5E-05  | 69,67874 | 49,74574 |
| 6300  | V | 84,41 V  | 124,25 | 1,631173 | 4,12E-05 | 69,56874 | 43,45833 |
| 8000  | V | 81,8 V   | 120,32 | 1,037528 | 2,06E-05 | 66,95874 | 37,45334 |
| 10000 | V | 79,26 V  | 118,95 | 0,886135 | 1,41E-05 | 64,41874 | 34,14514 |
| A/L   | V | 102,91 V | 155,24 | 57,8096  |          |          |          |
| W     | V | 100,37 V | 155,12 | 57,01643 |          |          |          |

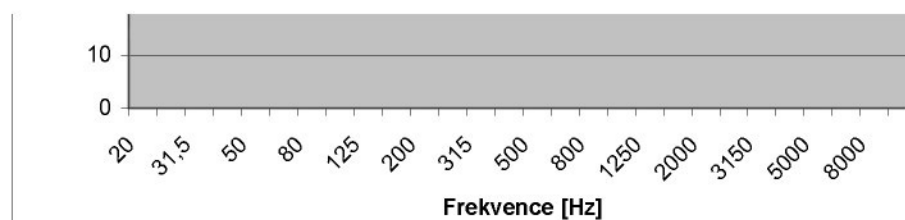
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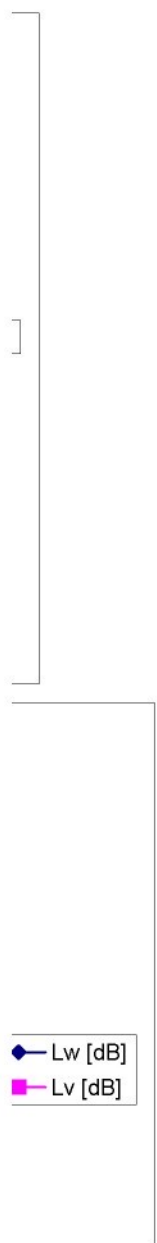
10\*log sigma

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 073

Measured 05-04-04 09:51:46

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

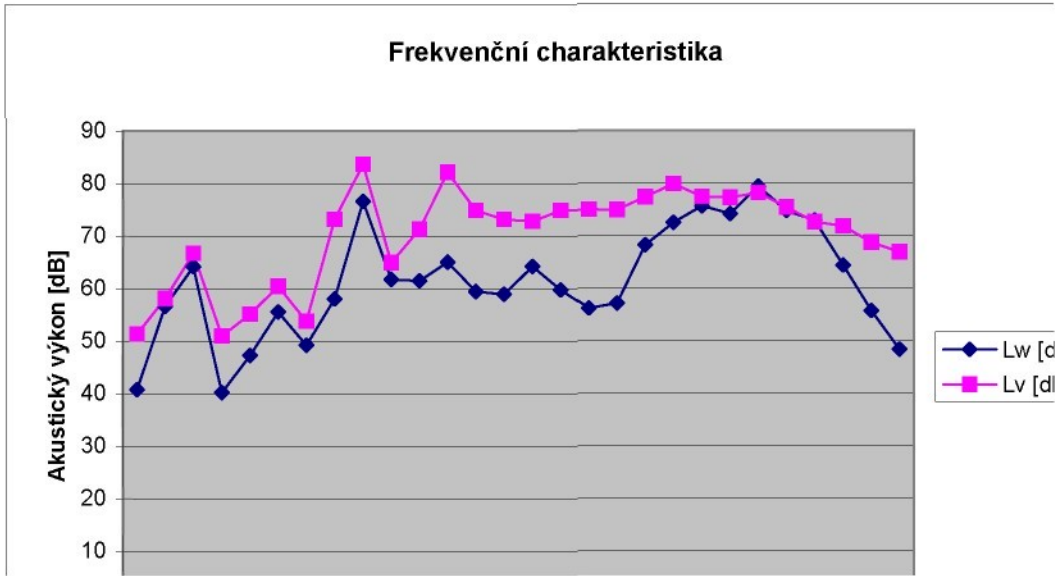
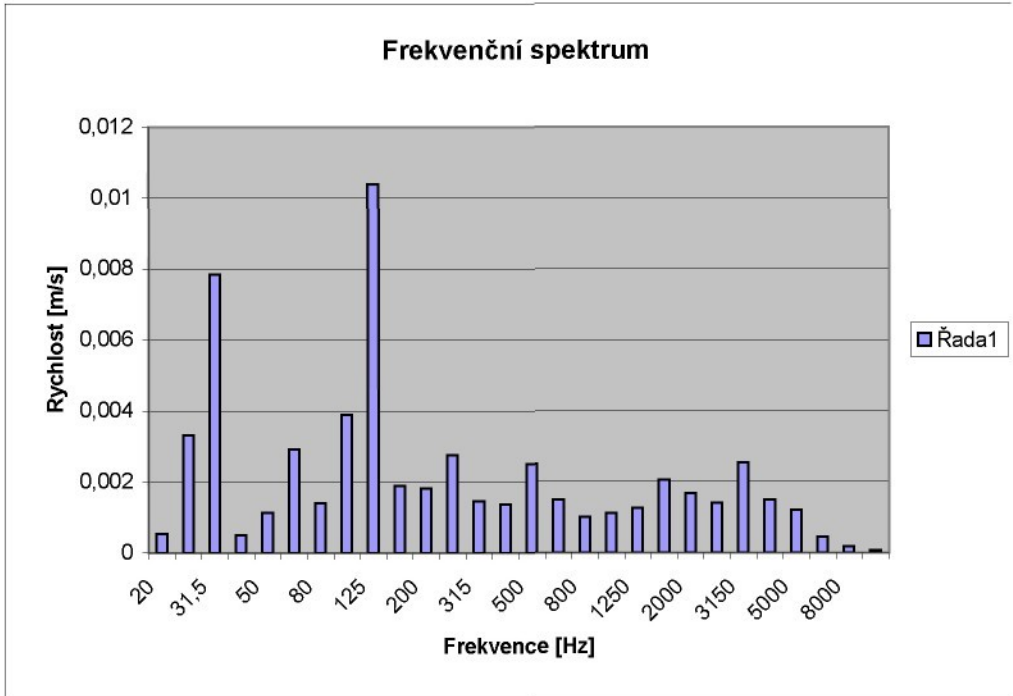
Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 64,82 V     | 116,32      |          |          |          |          |
| 0,5       | V | 67,68 V     | 108,09      |          |          |          |          |
| 0,63      | V | 70,46 V     | 117,31      |          |          |          |          |
| 0,8       | V | 69,17 V     | 111,66      |          |          | S13 [m2] | fd       |
| 1         | V | 68,81 V     | 118,6       |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 67,14 V     | 117,87      |          |          |          |          |
| 1,6       | V | 61,45 V     | 112,16      |          |          |          |          |
| 2         | V | 66,09 V     | 106         |          |          |          |          |
| 2,5       | V | 64,16 V     | 107,55      |          |          |          |          |
| 3,15      | V | 62,72 V     | 102,51      |          |          |          |          |
| 4         | V | 60,72 V     | 98,28       |          |          |          |          |
| 5         | V | 60,16 V     | 94,02       |          |          |          |          |
| 6,3       | V | 60,82 V     | 88,73       |          |          |          |          |
| 8         | V | 59,69 V     | 87,11       |          |          |          |          |
| 10        | V | 63,1 V      | 79,7        |          |          |          |          |
| 12,5      | V | 60,39 V     | 79,7        |          |          |          |          |
| 16        | V | 59,27 V     | 89,25       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 66,13 V     | 96,47       | 0,066604 | 0,00053  | 51,39339 | 40,7492  |
| 25        | V | 72,84 V     | 114,32      | 0,519996 | 0,00331  | 58,10339 | 56,661   |
| 31,5      | V | 81,47 V     | 123,82      | 1,552387 | 0,007843 | 66,73339 | 64,15358 |
| 40        | V | 65,76 V     | 101,97      | 0,125458 | 0,000499 | 51,02339 | 40,2286  |
| 50        | V | 69,9 V      | 110,98      | 0,353997 | 0,001127 | 55,16339 | 47,3004  |
| 63        | V | 75,16 V     | 121,26      | 1,156112 | 0,002921 | 60,42339 | 55,57298 |
| 80        | V | 68,53 V     | 117         | 0,707946 | 0,001408 | 53,79339 | 49,238   |
| 100       | V | 87,91 V     | 127,77      | 2,446245 | 0,003893 | 73,17339 | 58,0698  |
| 125       | V | 98,42 V     | 138,24      | 8,165824 | 0,010397 | 83,68339 | 76,6016  |
| 160       | V | 79,68 V     | 125,56      | 1,896706 | 0,001887 | 64,94339 | 61,7774  |
| 200       | V | 86,03 V     | 127,19      | 2,288232 | 0,001821 | 71,29339 | 61,4692  |
| 250       | V | 96,89 V     | 132,74      | 4,335109 | 0,00276  | 82,15339 | 65,081   |
| 315       | V | 89,6 V      | 129,16      | 2,870781 | 0,00145  | 74,86339 | 59,49358 |
| 400       | V | 87,89 V     | 130,69      | 3,423734 | 0,001362 | 73,15339 | 58,9486  |
| 500       | V | 87,58 V     | 137,93      | 7,879524 | 0,002508 | 72,84339 | 64,2504  |
| 630       | V | 89,6 V      | 135,44      | 5,915616 | 0,001494 | 74,86339 | 59,75298 |
| 800       | V | 89,72 V     | 134,01      | 5,017646 | 0,000998 | 74,98339 | 56,248   |
| 1000      | V | 89,67 V     | 136,85      | 6,95825  | 0,001107 | 74,93339 | 57,1498  |
| 1250      | V | 92,1 V      | 139,86      | 9,840111 | 0,001253 | 77,36339 | 68,2216  |
| 1600      | V | 94,64 V     | 146,31      | 20,67759 | 0,002057 | 79,90339 | 72,5274  |
| 2000      | V | 92,17 V     | 146,42      | 20,94112 | 0,001666 | 77,43339 | 75,6992  |

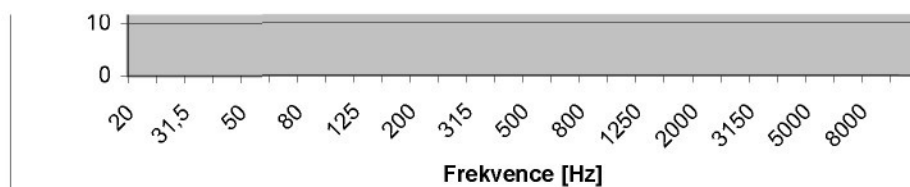
|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 91,98 V  | 146,87 | 22,05464 | 0,001404 | 77,24339 | 74,211   |
| 3150  | V | 92,94 V  | 154,04 | 50,35006 | 0,002544 | 78,20339 | 79,37358 |
| 4000  | V | 90,17 V  | 151,5  | 37,58374 | 0,001495 | 75,43339 | 74,7586  |
| 5000  | V | 87,35 V  | 151,6  | 38,01894 | 0,00121  | 72,61339 | 72,9204  |
| 6300  | V | 86,59 V  | 145,08 | 17,94734 | 0,000453 | 71,85339 | 64,39298 |
| 8000  | V | 83,47 V  | 138,54 | 8,452788 | 0,000168 | 68,73339 | 55,778   |
| 10000 | V | 81,63 V  | 133,09 | 4,51336  | 7,18E-05 | 66,89339 | 48,3898  |
| A/L   | V | 104,73 V | 158,75 | 86,59643 |          |          |          |
| W     | V | 102,77 V | 158,79 | 86,99614 |          |          |          |

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10\*log sigma  
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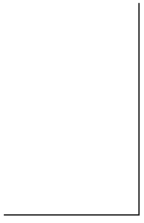


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I Řada1

— Lw [dB]  
— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 074

Measured 05-04-04 09:52:08

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

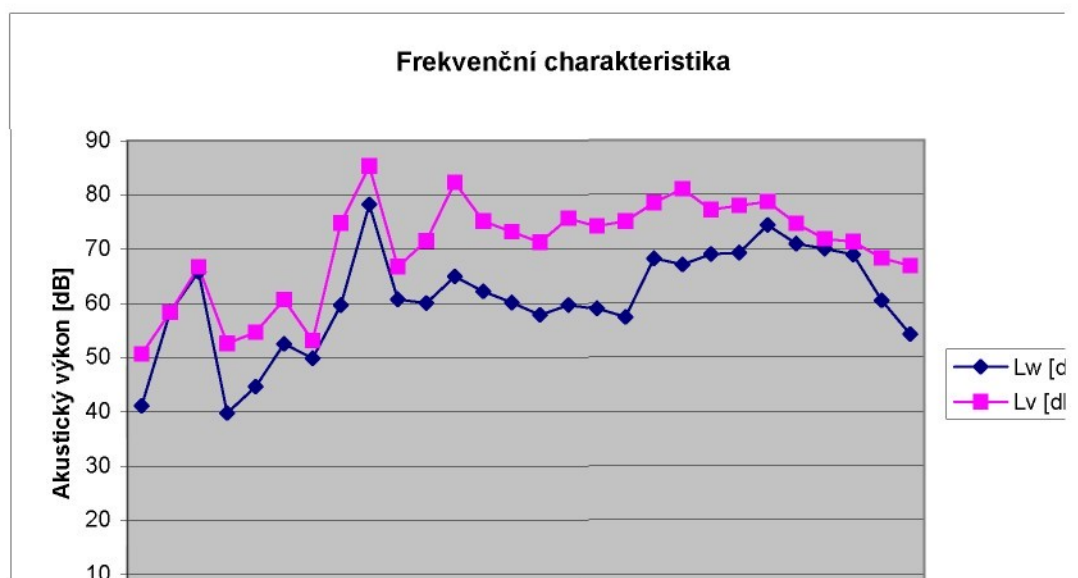
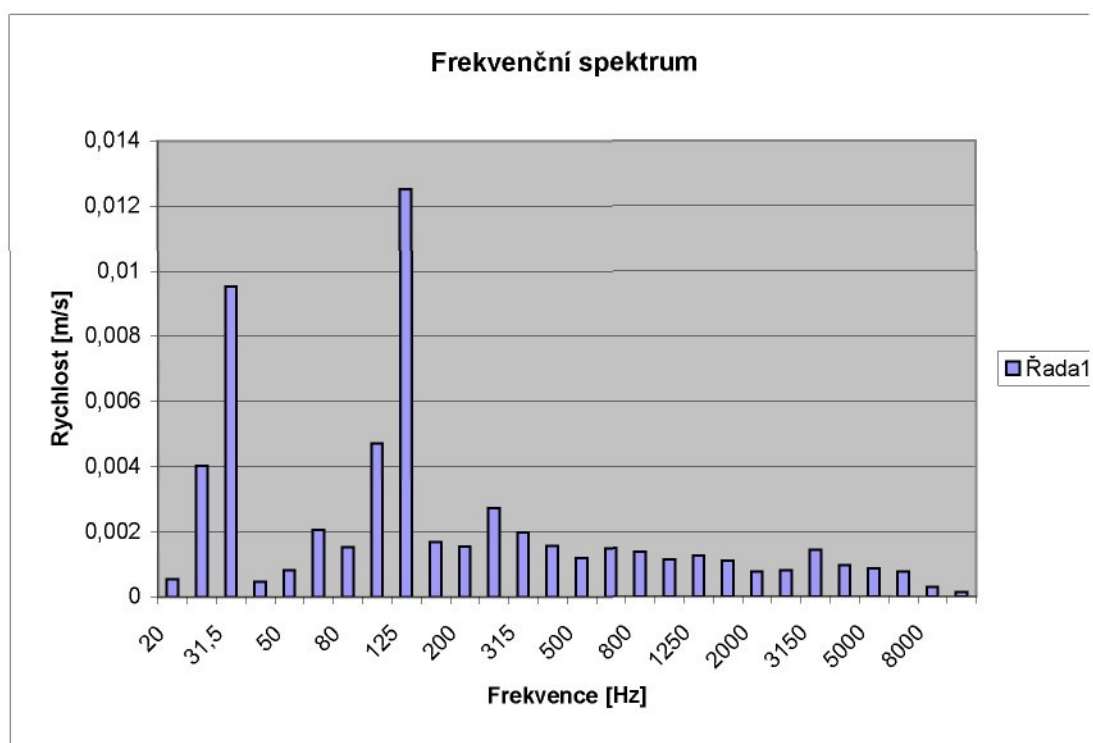
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 70,6 V     | 128,17      |          |          |          |          |
| 0,5       | V | 73,45 V    | 121,09      |          |          |          |          |
| 0,63      | V | 68,39 V    | 123,94      |          |          |          |          |
| 0,8       | V | 70,81 V    | 107,62      |          |          | S14 [m2] | fd       |
| 1         | V | 69,21 V    | 107,17      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 72,72 V    | 99,72       |          |          |          |          |
| 1,6       | V | 68,7 V     | 89,7        |          |          |          |          |
| 2         | V | 69,97 V    | 82,71       |          |          |          |          |
| 2,5       | V | 62,3 V     | 91,16       |          |          |          |          |
| 3,15      | V | 65,59 V    | 84,48       |          |          |          |          |
| 4         | V | 64,93 V    | 84,48       |          |          |          |          |
| 5         | V | 62,75 V    | 79,7        |          |          |          |          |
| 6,3       | V | 63,15 V    | -256,12     |          |          |          |          |
| 8         | V | 61,64 V    | 90,69       |          |          |          |          |
| 10        | V | 60,32 V    | 87,84       |          |          |          |          |
| 12,5      | V | 61,08 V    | -256,12     |          |          |          |          |
| 16        | V | 62,46 V    | 89,25       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 65,38 V    | 96,8        | 0,069183 | 0,000551 | 50,64339 | 41,0792  |
| 25        | V | 73,09 V    | 116,04      | 0,63387  | 0,004035 | 58,35339 | 58,381   |
| 31,5      | V | 81,49 V    | 125,52      | 1,887991 | 0,009539 | 66,75339 | 65,85358 |
| 40        | V | 67,36 V    | 101,57      | 0,119812 | 0,000477 | 52,62339 | 39,8286  |
| 50        | V | 69,45 V    | 108,3       | 0,260016 | 0,000828 | 54,71339 | 44,6204  |
| 63        | V | 75,45 V    | 118,22      | 0,814704 | 0,002058 | 60,71339 | 52,53298 |
| 80        | V | 67,9 V     | 117,68      | 0,765597 | 0,001523 | 53,16339 | 49,918   |
| 100       | V | 89,53 V    | 129,42      | 2,958012 | 0,004708 | 74,79339 | 59,7198  |
| 125       | V | 100,07 V   | 139,86      | 9,840111 | 0,012529 | 85,33339 | 78,2216  |
| 160       | V | 81,54 V    | 124,57      | 1,692388 | 0,001683 | 66,80339 | 60,7874  |
| 200       | V | 86,26 V    | 125,8       | 1,949845 | 0,001552 | 71,52339 | 60,0792  |
| 250       | V | 97,06 V    | 132,64      | 4,285485 | 0,002728 | 82,32339 | 64,981   |
| 315       | V | 89,89 V    | 131,89      | 3,930972 | 0,001986 | 75,15339 | 62,22358 |
| 400       | V | 87,96 V    | 131,94      | 3,953666 | 0,001573 | 73,22339 | 60,1986  |
| 500       | V | 86,03 V    | 131,54      | 3,775722 | 0,001202 | 71,29339 | 57,8604  |
| 630       | V | 90,47 V    | 135,37      | 5,868134 | 0,001482 | 75,73339 | 59,68298 |
| 800       | V | 88,9 V     | 136,76      | 6,886523 | 0,00137  | 74,16339 | 58,998   |
| 1000      | V | 89,79 V    | 137,09      | 7,153194 | 0,001138 | 75,05339 | 57,3898  |
| 1250      | V | 93,2 V     | 139,84      | 9,817479 | 0,00125  | 78,46339 | 68,2016  |
| 1600      | V | 95,77 V    | 140,85      | 11,02808 | 0,001097 | 81,03339 | 67,0674  |
| 2000      | V | 91,91 V    | 139,67      | 9,6272   | 0,000766 | 77,17339 | 68,9492  |

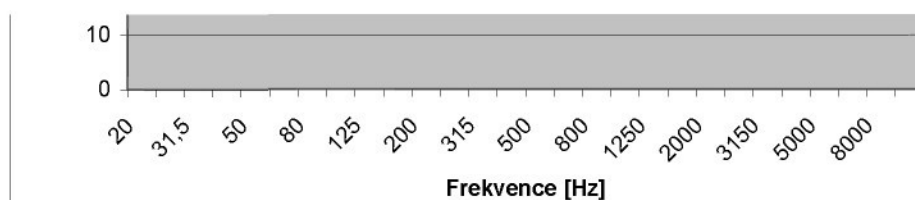


|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 92,66 V  | 141,95 | 12,51699 | 0,000797 | 77,92339 | 69,291   |
| 3150  | V | 93,39 V  | 149,01 | 28,2163  | 0,001426 | 78,65339 | 74,34358 |
| 4000  | V | 89,37 V  | 147,65 | 24,12682 | 0,00096  | 74,63339 | 70,9086  |
| 5000  | V | 86,55 V  | 148,66 | 27,10192 | 0,000863 | 71,81339 | 69,9804  |
| 6300  | V | 86,01 V  | 149,6  | 30,19952 | 0,000763 | 71,27339 | 68,91298 |
| 8000  | V | 83,02 V  | 143,22 | 14,48772 | 0,000288 | 68,28339 | 60,458   |
| 10000 | V | 81,56 V  | 138,9  | 8,810489 | 0,00014  | 66,82339 | 54,1998  |
| A/L   | V | 105,38 V | 156,23 | 64,78881 |          |          |          |
| W     | V | 103,15 V | 156,14 | 64,12096 |          |          |          |

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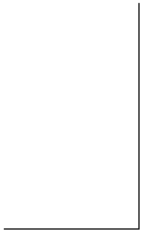


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■ Řada1

— Lw [dB]  
— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 075

Measured 05-04-04 09:52:24

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

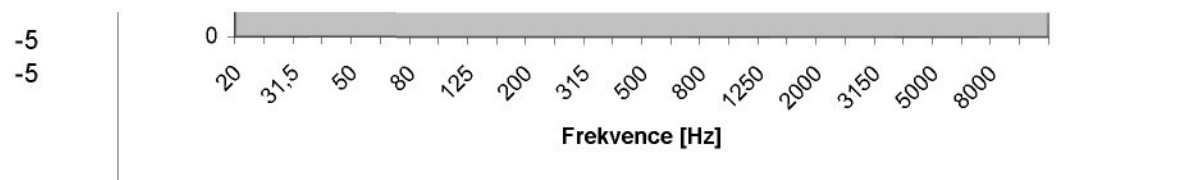
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 72,2 V     | 114,74      |          |          |          |          |
| 0,5       | V | 69,54 V    | 116,67      |          |          |          |          |
| 0,63      | V | 64,46 V    | 115,54      |          |          |          |          |
| 0,8       | V | 72,58 V    | 116,95      |          |          | S15 [m2] | fd       |
| 1         | V | 68,63 V    | 113,99      |          |          | 0,05     | 1596,553 |
| 1,25      | V | 65,22 V    | 114,84      |          |          |          |          |
| 1,6       | V | 67,12 V    | 111,48      |          |          |          |          |
| 2         | V | 61,73 V    | 106,63      |          |          |          |          |
| 2,5       | V | 61,5 V     | 100,77      |          |          |          |          |
| 3,15      | V | 62,23 V    | 94,17       |          |          |          |          |
| 4         | V | 59,62 V    | 94,33       |          |          |          |          |
| 5         | V | 58,98 V    | 90,85       |          |          |          |          |
| 6,3       | V | 58,75 V    | -256,12     |          |          |          |          |
| 8         | V | 59,64 V    | 88,45       |          |          |          |          |
| 10        | V | 59,52 V    | -256,12     |          |          |          |          |
| 12,5      | V | 56,16 V    | -256,12     |          |          |          |          |
| 16        | V | 57,71 V    | 89,93       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 64,39 V    | 89,49       | 0,029819 | 0,000237 | 51,3797  | 35,4955  |
| 25        | V | 70,51 V    | 105,43      | 0,186853 | 0,00119  | 57,4997  | 49,4973  |
| 31,5      | V | 78,93 V    | 114,81      | 0,550174 | 0,00278  | 65,9197  | 56,86989 |
| 40        | V | 63,69 V    | 93,58       | 0,047753 | 0,00019  | 50,6797  | 33,5649  |
| 50        | V | 67,36 V    | 102,26      | 0,129718 | 0,000413 | 54,3497  | 40,3067  |
| 63        | V | 73,56 V    | 112,63      | 0,428055 | 0,001081 | 60,5497  | 48,66929 |
| 80        | V | 66,3 V     | 99,15       | 0,090678 | 0,00018  | 53,2897  | 33,1143  |
| 100       | V | 84,36 V    | 117,87      | 0,782528 | 0,001245 | 71,3497  | 49,8961  |
| 125       | V | 94,75 V    | 128,43      | 2,639368 | 0,003361 | 81,7397  | 68,5179  |
| 160       | V | 78,79 V    | 120,95      | 1,115578 | 0,00111  | 65,7797  | 58,8937  |
| 200       | V | 80,17 V    | 123,54      | 1,503142 | 0,001196 | 67,1597  | 59,5455  |
| 250       | V | 90,5 V     | 128,34      | 2,612161 | 0,001663 | 77,4897  | 62,4073  |
| 315       | V | 80,6 V     | 125,02      | 1,782379 | 0,000901 | 67,5897  | 57,07989 |
| 400       | V | 83,35 V    | 126,31      | 2,067759 | 0,000823 | 70,3397  | 56,2949  |
| 500       | V | 87,28 V    | 128,6       | 2,691535 | 0,000857 | 74,2697  | 56,6467  |
| 630       | V | 88,5 V     | 127,14      | 2,275097 | 0,000575 | 75,4897  | 53,17929 |
| 800       | V | 88,85 V    | 126,81      | 2,190282 | 0,000436 | 75,8397  | 50,7743  |
| 1000      | V | 90,24 V    | 133,56      | 4,76431  | 0,000758 | 77,2297  | 55,5861  |
| 1250      | V | 90,29 V    | 140,5       | 10,59254 | 0,001349 | 77,2797  | 70,5879  |
| 1600      | V | 92,07 V    | 139,39      | 9,321805 | 0,000927 | 79,0597  | 72,3337  |
| 2000      | V | 91,04 V    | 141,48      | 11,85769 | 0,000944 | 78,0297  | 72,4855  |

|       |   |          |        |          |          |         |          |
|-------|---|----------|--------|----------|----------|---------|----------|
| 2500  | V | 91,67 V  | 142,87 | 13,91554 | 0,000886 | 78,6597 | 71,9373  |
| 3150  | V | 91,41 V  | 152,7  | 43,15191 | 0,00218  | 78,3997 | 79,75989 |
| 4000  | V | 88,26 V  | 153,29 | 46,1849  | 0,001838 | 75,2497 | 78,2749  |
| 5000  | V | 85,63 V  | 148,21 | 25,73357 | 0,000819 | 72,6197 | 71,2567  |
| 6300  | V | 84,92 V  | 147,15 | 22,77718 | 0,000575 | 71,9097 | 68,18929 |
| 8000  | V | 82,57 V  | 145,95 | 19,8381  | 0,000395 | 69,5597 | 64,9143  |
| 10000 | V | 80,13 V  | 138,36 | 8,279422 | 0,000132 | 67,1197 | 55,3861  |
| A/L   | V | 102,14 V | 158,06 | 79,98343 |          |         |          |
| W     | V | 101,22 V | 157,95 | 78,97688 |          |         |          |

L







IŘada1

— Lw [dB]  
— Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 076

Measured 05-04-04 09:52:36

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

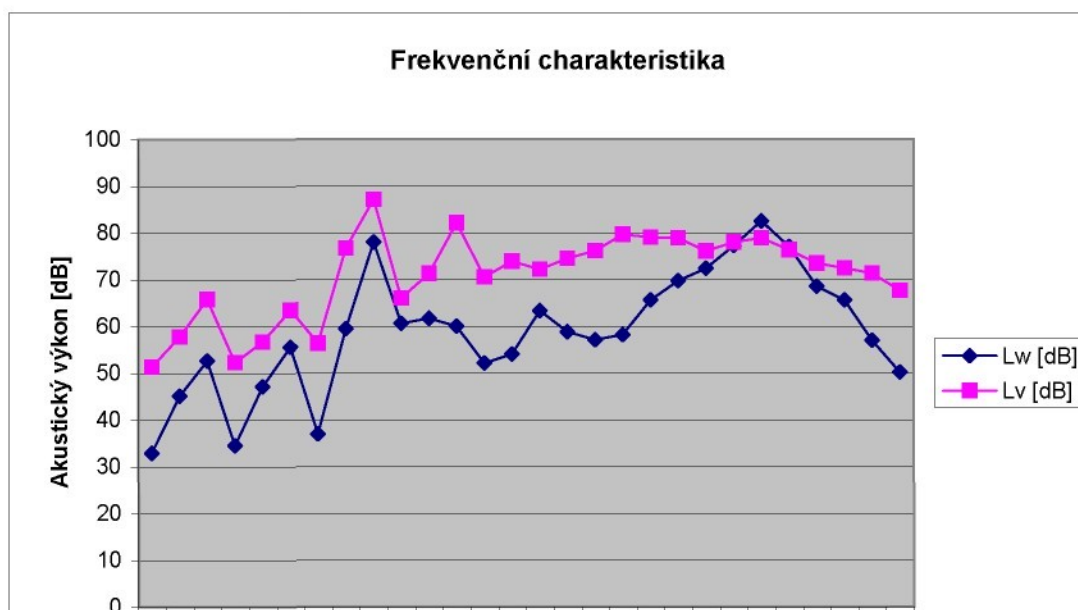
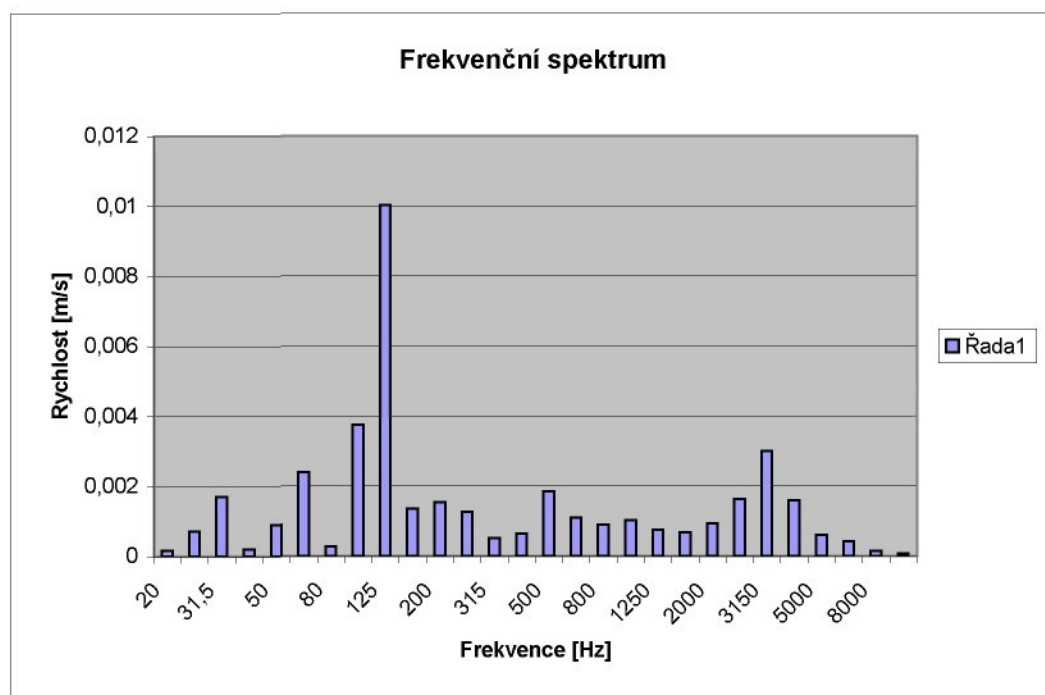
( Start of Data )

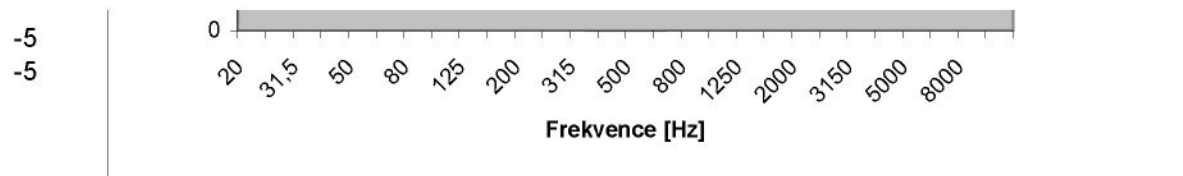
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 69,78 V    | 118,13      |          |          |          |          |
| 0,5       | V | 77,26 V    | 117,85      |          |          |          |          |
| 0,63      | V | 75,99 V    | 114,37      |          |          |          |          |
| 0,8       | V | 75,73 V    | 111,59      |          |          | S16 [m2] | fd       |
| 1         | V | 72,86 V    | 119,59      |          |          | 0,05     | 1596,553 |
| 1,25      | V | 71,05 V    | 117,19      |          |          |          |          |
| 1,6       | V | 65,92 V    | 106,72      |          |          |          |          |
| 2         | V | 66,23 V    | 103,08      |          |          |          |          |
| 2,5       | V | 65,59 V    | 104,98      |          |          |          |          |
| 3,15      | V | 60,21 V    | 97,83       |          |          |          |          |
| 4         | V | 57,2 V     | 96,24       |          |          |          |          |
| 5         | V | 59,81 V    | 88,73       |          |          |          |          |
| 6,3       | V | 58,32 V    | 79,7        |          |          |          |          |
| 8         | V | 58,14 V    | 88,15       |          |          |          |          |
| 10        | V | 62,46 V    | 85,72       |          |          |          |          |
| 12,5      | V | 56,68 V    | -256,12     |          |          |          |          |
| 16        | V | 58,47 V    | 85,72       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 64,37 V    | 86,92       | 0,022182 | 0,000177 | 51,3597  | 32,9255  |
| 25        | V | 70,84 V    | 101,06      | 0,11298  | 0,000719 | 57,8297  | 45,1273  |
| 31,5      | V | 78,83 V    | 110,58      | 0,338065 | 0,001708 | 65,8197  | 52,63989 |
| 40        | V | 65,33 V    | 94,52       | 0,053211 | 0,000212 | 52,3197  | 34,5049  |
| 50        | V | 69,71 V    | 109,08      | 0,284446 | 0,000905 | 56,6997  | 47,1267  |
| 63        | V | 76,53 V    | 119,57      | 0,9517   | 0,002404 | 63,5197  | 55,60929 |
| 80        | V | 69,35 V    | 103,03      | 0,141742 | 0,000282 | 56,3397  | 36,9943  |
| 100       | V | 89,72 V    | 127,44      | 2,355049 | 0,003748 | 76,7097  | 59,4661  |
| 125       | V | 100,14 V   | 137,93      | 7,879524 | 0,010033 | 87,1297  | 78,0179  |
| 160       | V | 79,07 V    | 122,67      | 1,359878 | 0,001353 | 66,0597  | 60,6137  |
| 200       | V | 84,29 V    | 125,7       | 1,927525 | 0,001534 | 71,2797  | 61,7055  |
| 250       | V | 95,11 V    | 125,96      | 1,986095 | 0,001264 | 82,0997  | 60,0273  |
| 315       | V | 83,54 V    | 120,06      | 1,006932 | 0,000509 | 70,5297  | 52,11989 |
| 400       | V | 86,92 V    | 124,08      | 1,599558 | 0,000636 | 73,9097  | 54,0649  |
| 500       | V | 85,21 V    | 135,32      | 5,834451 | 0,001857 | 72,1997  | 63,3667  |
| 630       | V | 87,51 V    | 132,78      | 4,355119 | 0,0011   | 74,4997  | 58,81929 |
| 800       | V | 89,2 V     | 133,18      | 4,560369 | 0,000907 | 76,1897  | 57,1443  |
| 1000      | V | 92,68 V    | 136,19      | 6,449113 | 0,001026 | 79,6697  | 58,2161  |
| 1250      | V | 92,07 V    | 135,51      | 5,963483 | 0,000759 | 79,0597  | 65,5979  |
| 1600      | V | 91,91 V    | 136,78      | 6,902398 | 0,000687 | 78,8997  | 69,7237  |
| 2000      | V | 89,11 V    | 141,37      | 11,70847 | 0,000932 | 76,0997  | 72,3755  |

|       |   |          |        |          |          |         |          |
|-------|---|----------|--------|----------|----------|---------|----------|
| 2500  | V | 91,01 V  | 148,19 | 25,67438 | 0,001634 | 77,9997 | 77,2573  |
| 3150  | V | 91,91 V  | 155,5  | 59,56621 | 0,00301  | 78,8997 | 82,55989 |
| 4000  | V | 89,39 V  | 152,07 | 40,13285 | 0,001597 | 76,3797 | 77,0549  |
| 5000  | V | 86,52 V  | 145,53 | 18,90166 | 0,000602 | 73,5097 | 68,5767  |
| 6300  | V | 85,51 V  | 144,59 | 16,9629  | 0,000429 | 72,4997 | 65,62929 |
| 8000  | V | 84,41 V  | 138,03 | 7,970765 | 0,000159 | 71,3997 | 56,9943  |
| 10000 | V | 80,71 V  | 133,16 | 4,549881 | 7,24E-05 | 67,6997 | 50,1861  |
| A/L   | V | 104,37 V | 158,46 | 83,75293 |          |         |          |
| W     | V | 101,72 V | 158,44 | 83,5603  |          |         |          |

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.w [dB]  
.v [dB]





Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 077

Measured 05-04-04 09:52:50

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 73,54 V    | 107,19      |          |          |          |          |
| 0,5       | V | 60,7 V     | 107,36      |          |          |          |          |
| 0,63      | V | 67,8 V     | 115,14      |          |          |          |          |
| 0,8       | V | 74,58 V    | 107,52      |          |          | S17 [m2] | fd       |
| 1         | V | 65,14 V    | 111,87      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 65,92 V    | 112,11      |          |          |          |          |
| 1,6       | V | 70,48 V    | 105,13      |          |          |          |          |
| 2         | V | 60,61 V    | 102,11      |          |          |          |          |
| 2,5       | V | 63,8 V     | 97,62       |          |          |          |          |
| 3,15      | V | 60,18 V    | 95,84       |          |          |          |          |
| 4         | V | 54,56 V    | 88,73       |          |          |          |          |
| 5         | V | 56,14 V    | 79,7        |          |          |          |          |
| 6,3       | V | 58,51 V    | -256,12     |          |          |          |          |
| 8         | V | 57,36 V    | 87,11       |          |          |          |          |
| 10        | V | 56,51 V    | 76,69       |          |          |          |          |
| 12,5      | V | 55,74 V    | -256,12     |          |          |          |          |
| 16        | V | 53,22 V    | 90,12       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 64,91 V    | 92,26       | 0,04102  | 0,000326 | 50,17339 | 36,5392  |
| 25        | V | 69,94 V    | 111,5       | 0,375837 | 0,002393 | 55,20339 | 53,841   |
| 31,5      | V | 77,59 V    | 121,12      | 1,137627 | 0,005748 | 62,85339 | 61,45358 |
| 40        | V | 62,32 V    | 103,64      | 0,152055 | 0,000605 | 47,58339 | 41,8986  |
| 50        | V | 65,76 V    | 102,75      | 0,137246 | 0,000437 | 51,02339 | 39,0704  |
| 63        | V | 70,55 V    | 108,56      | 0,267917 | 0,000677 | 55,81339 | 42,87298 |
| 80        | V | 65,47 V    | 118,88      | 0,879023 | 0,001749 | 50,73339 | 51,118   |
| 100       | V | 86,4 V     | 126,53      | 2,120801 | 0,003375 | 71,66339 | 56,8298  |
| 125       | V | 96,89 V    | 136,87      | 6,97429  | 0,00888  | 82,15339 | 75,2316  |
| 160       | V | 75,45 V    | 127,82      | 2,460368 | 0,002447 | 60,71339 | 64,0374  |
| 200       | V | 77,33 V    | 132,83      | 4,380261 | 0,003486 | 62,59339 | 67,1092  |
| 250       | V | 87,7 V     | 140,59      | 10,70286 | 0,006814 | 72,96339 | 72,931   |
| 315       | V | 82,17 V    | 138,61      | 8,521185 | 0,004305 | 67,43339 | 68,94358 |
| 400       | V | 83,37 V    | 138,9       | 8,810489 | 0,003506 | 68,63339 | 67,1586  |
| 500       | V | 86,36 V    | 138,31      | 8,231898 | 0,00262  | 71,62339 | 64,6304  |
| 630       | V | 89,11 V    | 134,15      | 5,099176 | 0,001288 | 74,37339 | 58,46298 |
| 800       | V | 86,97 V    | 136,29      | 6,52379  | 0,001298 | 72,23339 | 58,528   |
| 1000      | V | 88 V       | 146,59      | 21,35502 | 0,003399 | 73,26339 | 66,8898  |
| 1250      | V | 89,13 V    | 152,63      | 42,80554 | 0,00545  | 74,39339 | 80,9916  |
| 1600      | V | 87,56 V    | 146,92      | 22,18196 | 0,002206 | 72,82339 | 73,1374  |
| 2000      | V | 86,24 V    | 144,66      | 17,10015 | 0,001361 | 71,50339 | 73,9392  |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 88,29 V  | 144,49 | 16,76872 | 0,001068 | 73,55339 | 71,831   |
| 3150  | V | 89,67 V  | 143,08 | 14,25608 | 0,00072  | 74,93339 | 68,41358 |
| 4000  | V | 84,71 V  | 134,78 | 5,48277  | 0,000218 | 69,97339 | 58,0386  |
| 5000  | V | 81,23 V  | 135,7  | 6,095369 | 0,000194 | 66,49339 | 57,0204  |
| 6300  | V | 82,1 V   | 141,32 | 11,64126 | 0,000294 | 67,36339 | 60,63298 |
| 8000  | V | 79,4 V   | 140,21 | 10,24472 | 0,000204 | 64,66339 | 57,448   |
| 10000 | V | 76,22 V  | 135,46 | 5,929253 | 9,44E-05 | 61,48339 | 50,7598  |
| A/L   | V | 101,03 V | 156,42 | 66,22165 |          |          |          |
| W     | V | 98,59 V  | 156,42 | 66,22165 |          |          |          |

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10\*log sigma

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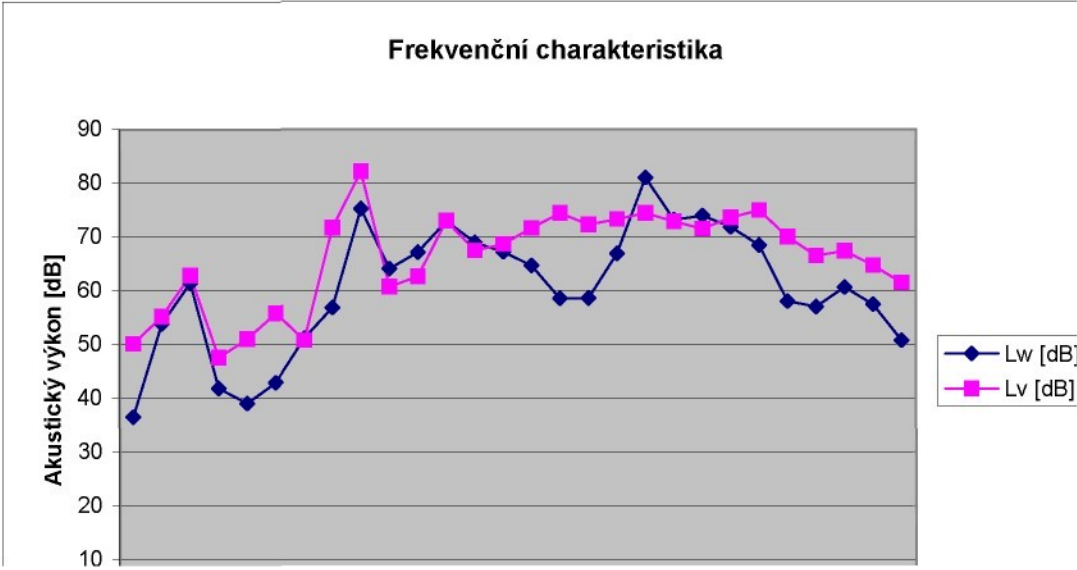
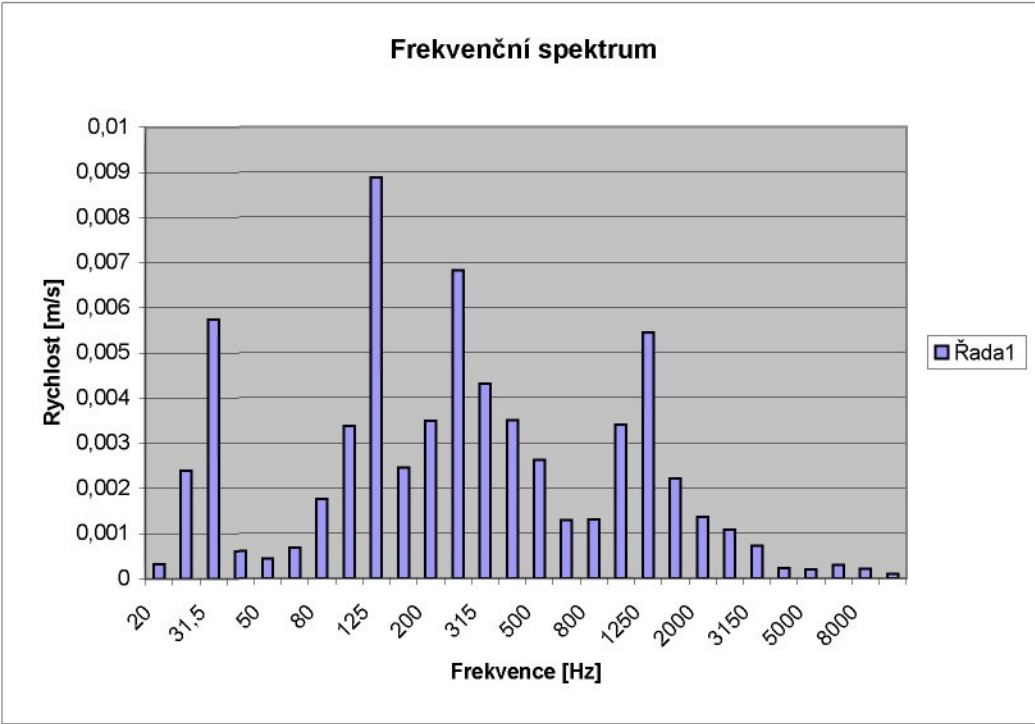
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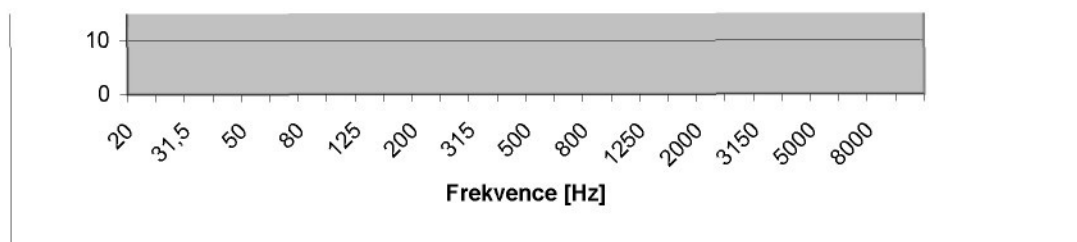
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- Lw [dB]  
- Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 078

Measured 05-04-04 09:53:00

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

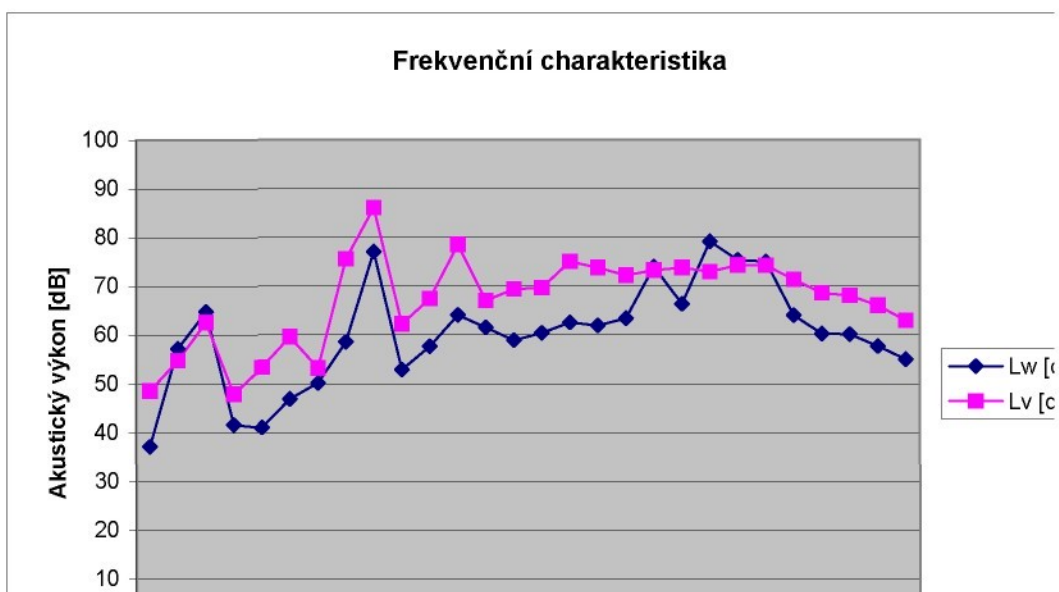
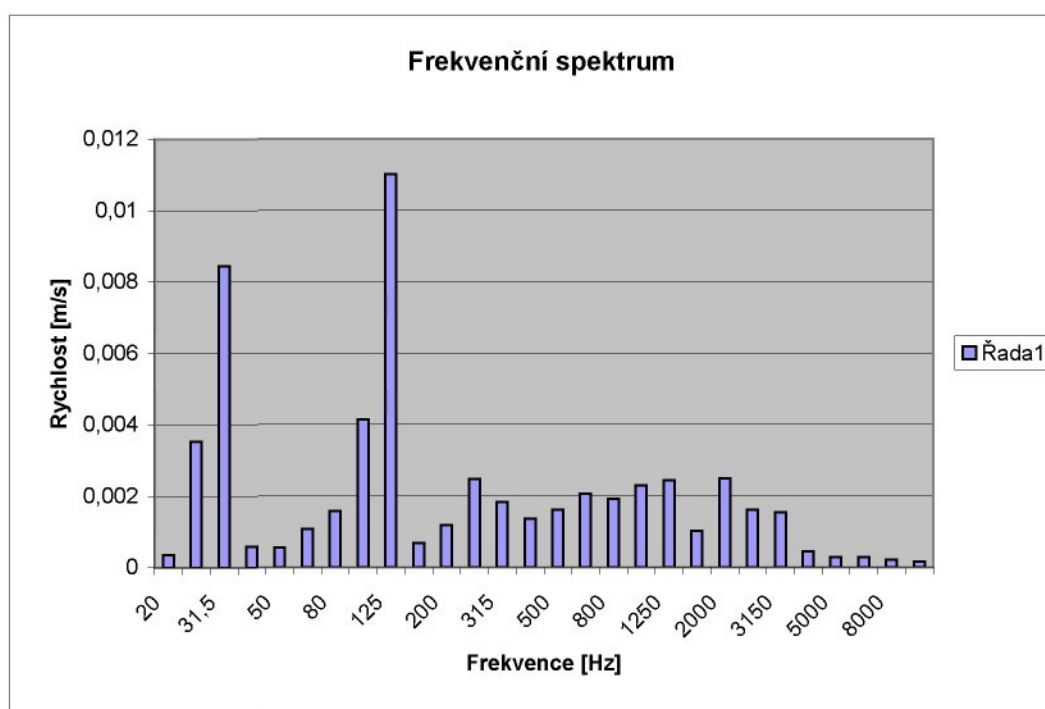
Spectrum r 1

| Frequency |   | Auto-A [dB] | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|-------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 45,27 V     | 105,74      |          |          |          |          |
| 0,5       | V | 69,35 V     | 98,28       |          |          |          |          |
| 0,63      | V | 55,64 V     | 104,54      |          |          |          |          |
| 0,8       | V | 68,16 V     | 120,36      |          |          | S18 [m2] | fd       |
| 1         | V | 68,46 V     | 122,67      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 67,73 V     | 121,59      |          |          |          |          |
| 1,6       | V | 61,1 V      | 119,07      |          |          |          |          |
| 2         | V | 67,12 V     | 119,73      |          |          |          |          |
| 2,5       | V | 63,92 V     | 119,28      |          |          |          |          |
| 3,15      | V | 62,28 V     | 109,52      |          |          |          |          |
| 4         | V | 58,61 V     | 103,22      |          |          |          |          |
| 5         | V | 57,27 V     | 99,67       |          |          |          |          |
| 6,3       | V | 55,67 V     | 88,15       |          |          |          |          |
| 8         | V | 55,29 V     | 90,31       |          |          |          |          |
| 10        | V | 56,54 V     | 91,74       |          |          |          |          |
| 12,5      | V | 56,73 V     | 73,68       |          |          |          |          |
| 16        | V | 54,66 V     | 90,59       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 63,31 V     | 92,87       | 0,044005 | 0,00035  | 48,57339 | 37,1492  |
| 25        | V | 69,57 V     | 114,89      | 0,555265 | 0,003535 | 54,83339 | 57,231   |
| 31,5      | V | 77,37 V     | 124,46      | 1,671091 | 0,008443 | 62,63339 | 64,79358 |
| 40        | V | 62,68 V     | 103,36      | 0,147231 | 0,000586 | 47,94339 | 41,6186  |
| 50        | V | 68,13 V     | 104,73      | 0,172385 | 0,000549 | 53,39339 | 41,0504  |
| 63        | V | 74,34 V     | 112,6       | 0,42658  | 0,001078 | 59,60339 | 46,91298 |
| 80        | V | 67,92 V     | 117,92      | 0,787046 | 0,001566 | 53,18339 | 50,158   |
| 100       | V | 90,29 V     | 128,29      | 2,597168 | 0,004134 | 75,55339 | 58,5898  |
| 125       | V | 100,82 V    | 138,73      | 8,639727 | 0,011    | 86,08339 | 77,0916  |
| 160       | V | 76,95 V     | 116,67      | 0,681554 | 0,000678 | 62,21339 | 52,8874  |
| 200       | V | 82,2 V      | 123,4       | 1,479108 | 0,001177 | 67,46339 | 57,6792  |
| 250       | V | 93,25 V     | 131,77      | 3,877037 | 0,002468 | 78,51339 | 64,111   |
| 315       | V | 81,75 V     | 131,18      | 3,62243  | 0,00183  | 67,01339 | 61,51358 |
| 400       | V | 84,15 V     | 130,67      | 3,41586  | 0,001359 | 69,41339 | 58,9286  |
| 500       | V | 84,43 V     | 134,1       | 5,069907 | 0,001614 | 69,69339 | 60,4204  |
| 630       | V | 89,79 V     | 138,24      | 8,165824 | 0,002063 | 75,05339 | 62,55298 |
| 800       | V | 88,57 V     | 139,7       | 9,660509 | 0,001922 | 73,83339 | 61,938   |
| 1000      | V | 86,97 V     | 143,15      | 14,37143 | 0,002287 | 72,23339 | 63,4498  |
| 1250      | V | 88,03 V     | 145,62      | 19,09853 | 0,002432 | 73,29339 | 73,9816  |
| 1600      | V | 88,52 V     | 140,17      | 10,19765 | 0,001014 | 73,78339 | 66,3874  |
| 2000      | V | 87,7 V      | 149,93      | 31,36895 | 0,002496 | 72,96339 | 79,2092  |

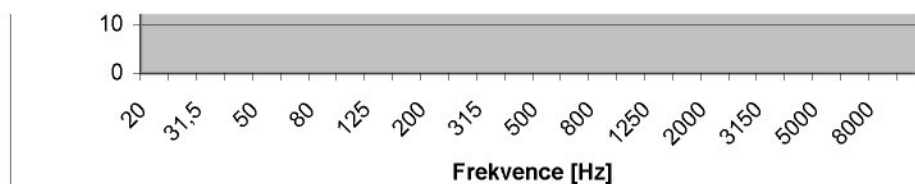


|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 89,04 V  | 148,02 | 25,17677 | 0,001603 | 74,30339 | 75,361   |
| 3150  | V | 88,97 V  | 149,72 | 30,61963 | 0,001547 | 74,23339 | 75,05358 |
| 4000  | V | 86,08 V  | 140,78 | 10,93956 | 0,000435 | 71,34339 | 64,0386  |
| 5000  | V | 83,37 V  | 138,94 | 8,851156 | 0,000282 | 68,63339 | 60,2604  |
| 6300  | V | 82,81 V  | 140,8  | 10,96478 | 0,000277 | 68,07339 | 60,11298 |
| 8000  | V | 80,78 V  | 140,47 | 10,55602 | 0,00021  | 66,04339 | 57,708   |
| 10000 | V | 77,7 V   | 139,7  | 9,660509 | 0,000154 | 62,96339 | 54,9998  |
| A/L   | V | 103,48 V | 156,14 | 64,12096 |          |          |          |
| W     | V | 99,13 V  | 156,11 | 63,89987 |          |          |          |

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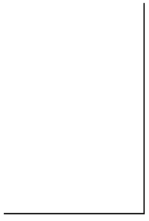


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● Lw [dB]  
■ Lv [dB]



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 079

Measured 05-04-04 09:53:12

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

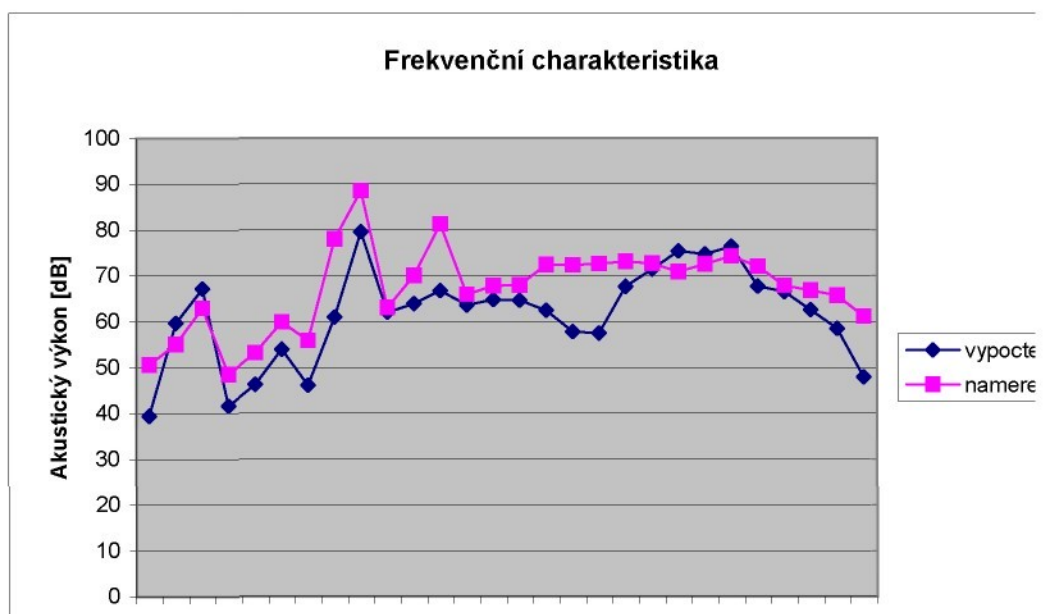
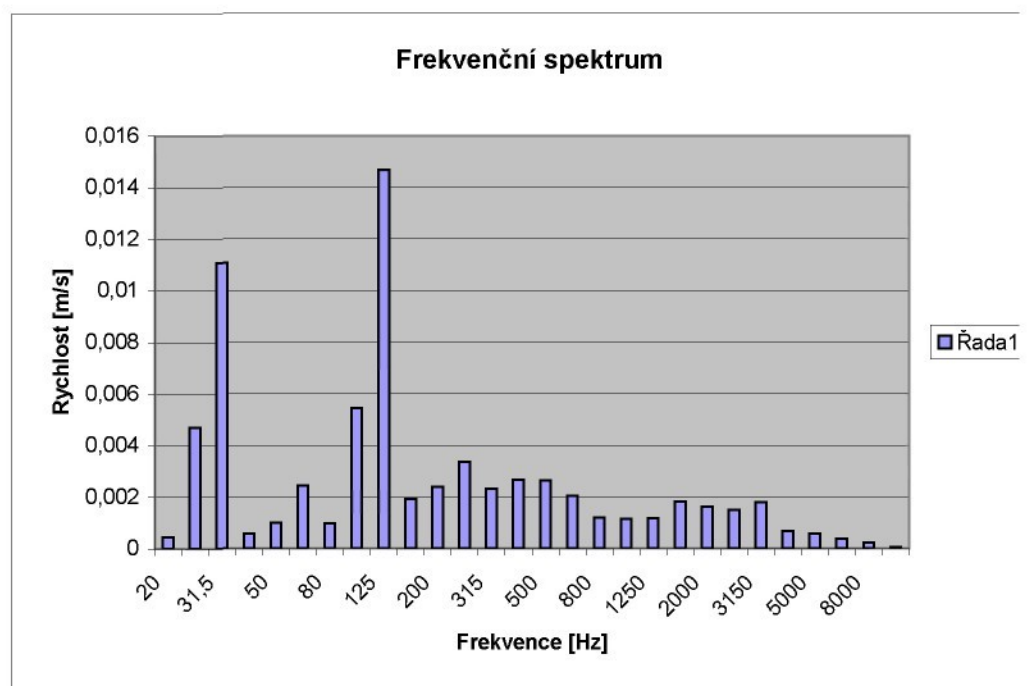
Spectrum r 1

| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 65,78 V    | 119,49      |          |          |          |          |
| 0,5       | V | 65,12 V    | 115,76      |          |          |          |          |
| 0,63      | V | 70,25 V    | 114,02      |          |          |          |          |
| 0,8       | V | 72,11 V    | 120,93      |          |          | S19 [m2] | fd       |
| 1         | V | 67,54 V    | 116,67      |          |          | 0,0336   | 1947,595 |
| 1,25      | V | 68,3 V     | 113,07      |          |          |          |          |
| 1,6       | V | 69,07 V    | 112,32      |          |          |          |          |
| 2         | V | 64,23 V    | 102,4       |          |          |          |          |
| 2,5       | V | 59,29 V    | 109,15      |          |          |          |          |
| 3,15      | V | 58,42 V    | 93,86       |          |          |          |          |
| 4         | V | 57,97 V    | 93,13       |          |          |          |          |
| 5         | V | 61,59 V    | 88,73       |          |          |          |          |
| 6,3       | V | 59,55 V    | -256,12     |          |          |          |          |
| 8         | V | 58,3 V     | 86,69       |          |          |          |          |
| 10        | V | 60,09 V    | 85,14       |          |          |          |          |
| 12,5      | V | 56,89 V    | 81,47       |          |          |          |          |
| 16        | V | 57,27 V    | 90,12       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 65,33 V    | 95,13       | 0,057082 | 0,000454 | 50,59339 | 39,4092  |
| 25        | V | 69,78 V    | 117,35      | 0,737055 | 0,004692 | 55,04339 | 59,691   |
| 31,5      | V | 77,68 V    | 126,81      | 2,190282 | 0,011066 | 62,94339 | 67,14358 |
| 40        | V | 63,24 V    | 103,31      | 0,146386 | 0,000582 | 48,50339 | 41,5686  |
| 50        | V | 67,92 V    | 109,97      | 0,315137 | 0,001003 | 53,18339 | 46,2904  |
| 63        | V | 74,62 V    | 119,66      | 0,961612 | 0,002429 | 59,88339 | 53,97298 |
| 80        | V | 70,6 V     | 113,78      | 0,488652 | 0,000972 | 55,86339 | 46,018   |
| 100       | V | 92,75 V    | 130,67      | 3,41586  | 0,005437 | 78,01339 | 60,9698  |
| 125       | V | 103,29 V   | 141,23      | 11,52126 | 0,014669 | 88,55339 | 79,5916  |
| 160       | V | 77,75 V    | 125,75      | 1,938653 | 0,001928 | 63,01339 | 61,9674  |
| 200       | V | 84,78 V    | 129,56      | 3,006076 | 0,002392 | 70,04339 | 63,8392  |
| 250       | V | 96 V       | 134,43      | 5,266232 | 0,003353 | 81,26339 | 66,771   |
| 315       | V | 80,62 V    | 133,23      | 4,586696 | 0,002317 | 65,88339 | 63,56358 |
| 400       | V | 82,5 V     | 136,52      | 6,698846 | 0,002665 | 67,76339 | 64,7786  |
| 500       | V | 82,69 V    | 138,33      | 8,250875 | 0,002626 | 67,95339 | 64,6504  |
| 630       | V | 87,16 V    | 138,1       | 8,035261 | 0,00203  | 72,42339 | 62,41298 |
| 800       | V | 87,09 V    | 135,58      | 6,011737 | 0,001196 | 72,35339 | 57,818   |
| 1000      | V | 87,32 V    | 137,13      | 7,186212 | 0,001144 | 72,58339 | 57,4298  |
| 1250      | V | 87,84 V    | 139,25      | 9,172759 | 0,001168 | 73,10339 | 67,6116  |
| 1600      | V | 87,44 V    | 145,22      | 18,23896 | 0,001814 | 72,70339 | 71,4374  |
| 2000      | V | 85,61 V    | 146,12      | 20,23019 | 0,00161  | 70,87339 | 75,3992  |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 87,28 V  | 147,39 | 23,41531 | 0,001491 | 72,54339 | 74,731   |
| 3150  | V | 88,99 V  | 151,06 | 35,72728 | 0,001805 | 74,25339 | 76,39358 |
| 4000  | V | 86,78 V  | 144,45 | 16,69168 | 0,000664 | 72,04339 | 67,7086  |
| 5000  | V | 82,6 V   | 145,18 | 18,15516 | 0,000578 | 67,86339 | 66,5004  |
| 6300  | V | 81,54 V  | 143,25 | 14,53784 | 0,000367 | 66,80339 | 62,56298 |
| 8000  | V | 80,45 V  | 141,27 | 11,57444 | 0,00023  | 65,71339 | 58,508   |
| 10000 | V | 75,85 V  | 132,57 | 4,251087 | 6,77E-05 | 61,11339 | 47,8698  |
| A/L   | V | 105,05 V | 156,14 | 64,12096 |          |          |          |
| W     | V | 98,63 V  | 156,11 | 63,89987 |          |          |          |

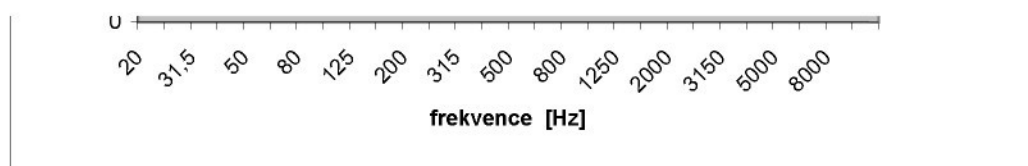
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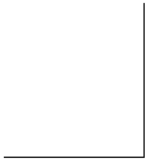


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■ Řada1

- vypočteno  
- namereno



Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 080

Measured 05-04-04 09:53:42

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

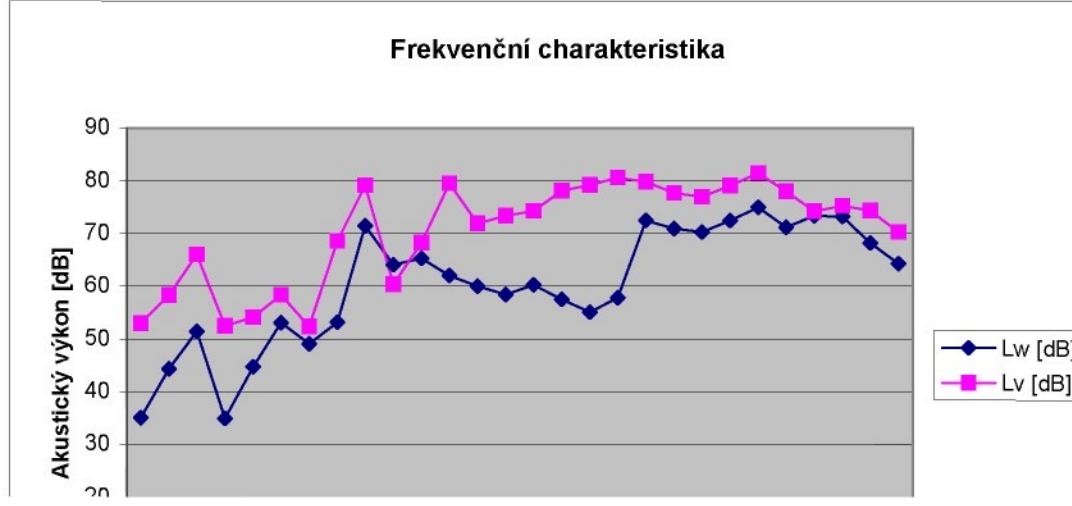
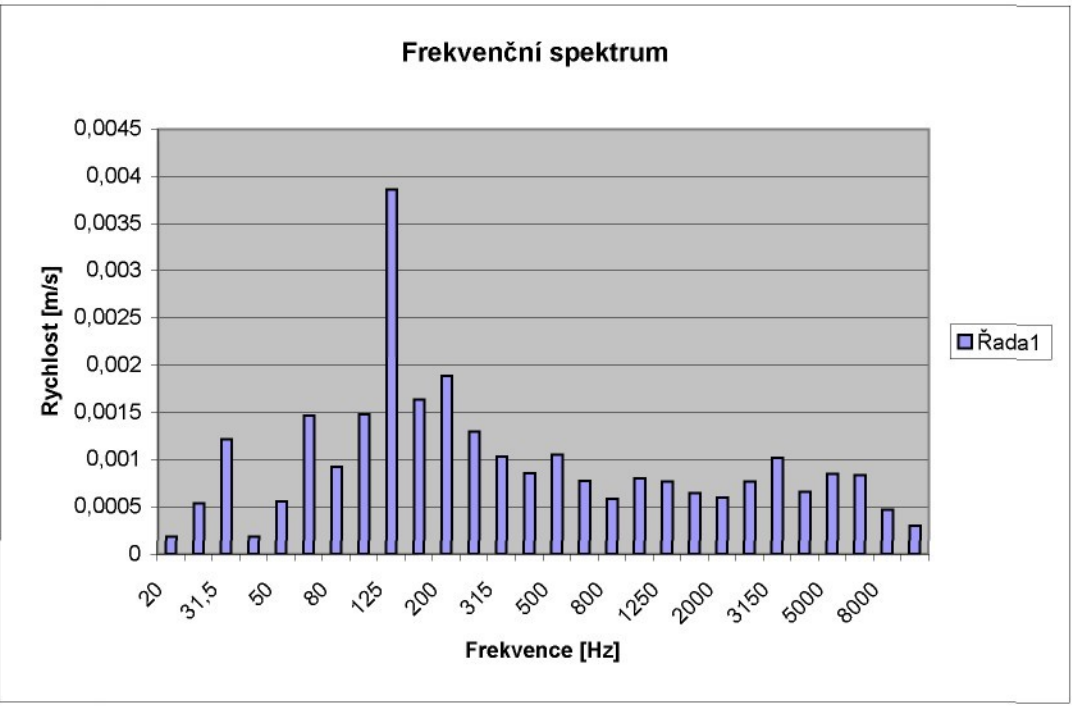
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 63,08 V    | 123,16      |          |          |          |          |
| 0,5       | V | 69,38 V    | 128,88      |          |          |          |          |
| 0,63      | V | 74,29 V    | 126,08      |          |          |          |          |
| 0,8       | V | 73,61 V    | 134,01      |          |          | S20 [m2] | fd       |
| 1         | V | 68,58 V    | 135,46      |          |          | 0,075    | 1303,58  |
| 1,25      | V | 71,02 V    | 132,74      |          |          |          |          |
| 1,6       | V | 72,48 V    | 130,1       |          |          |          |          |
| 2         | V | 66,56 V    | 128,46      |          |          |          |          |
| 2,5       | V | 64,53 V    | 125,8       |          |          |          |          |
| 3,15      | V | 66,41 V    | 112,6       |          |          |          |          |
| 4         | V | 59,95 V    | 109,57      |          |          |          |          |
| 5         | V | 58,82 V    | 101,97      |          |          |          |          |
| 6,3       | V | 59,5 V     | 94,89       |          |          |          |          |
| 8         | V | 57,1 V     | 91,6        |          |          |          |          |
| 10        | V | 60,58 V    | 85,72       |          |          |          |          |
| 12,5      | V | 56,37 V    | 73,68       |          |          |          |          |
| 16        | V | 55,08 V    | 83,23       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 64,2 V     | 87,3        | 0,023174 | 0,000184 | 52,95061 | 35,06642 |
| 25        | V | 69,52 V    | 98,52       | 0,084333 | 0,000537 | 58,27061 | 44,34822 |
| 31,5      | V | 77,26 V    | 107,62      | 0,240436 | 0,001215 | 66,01061 | 51,4408  |
| 40        | V | 63,71 V    | 93,18       | 0,045604 | 0,000181 | 52,46061 | 34,92582 |
| 50        | V | 65,38 V    | 104,91      | 0,175995 | 0,00056  | 54,13061 | 44,71762 |
| 63        | V | 69,64 V    | 115,26      | 0,579429 | 0,001464 | 58,39061 | 53,0602  |
| 80        | V | 63,59 V    | 113,36      | 0,465586 | 0,000926 | 52,34061 | 49,08522 |
| 100       | V | 79,82 V    | 119,38      | 0,931108 | 0,001482 | 68,57061 | 53,16702 |
| 125       | V | 90,38 V    | 129,63      | 3,0304   | 0,003858 | 79,13061 | 71,47882 |
| 160       | V | 71,64 V    | 124,34      | 1,648162 | 0,001639 | 60,39061 | 64,04462 |
| 200       | V | 79,51 V    | 127,51      | 2,374105 | 0,001889 | 68,26061 | 65,27642 |
| 250       | V | 90,73 V    | 126,17      | 2,034698 | 0,001295 | 79,48061 | 61,99822 |
| 315       | V | 83,16 V    | 126,2       | 2,041738 | 0,001032 | 71,91061 | 60,0208  |
| 400       | V | 84,59 V    | 126,69      | 2,16023  | 0,00086  | 73,34061 | 58,43582 |
| 500       | V | 85,53 V    | 130,41      | 3,315126 | 0,001055 | 74,28061 | 60,21762 |
| 630       | V | 89,34 V    | 129,73      | 3,065491 | 0,000774 | 78,09061 | 57,5302  |
| 800       | V | 90,43 V    | 129,33      | 2,927521 | 0,000582 | 79,18061 | 55,05522 |
| 1000      | V | 91,84 V    | 134,03      | 5,029213 | 0,0008   | 80,59061 | 57,81702 |
| 1250      | V | 91,04 V    | 135,58      | 6,011737 | 0,000765 | 79,79061 | 72,42882 |
| 1600      | V | 88,94 V    | 136,24      | 6,486344 | 0,000645 | 77,69061 | 70,94462 |
| 2000      | V | 88,17 V    | 137,51      | 7,507581 | 0,000597 | 76,92061 | 70,27642 |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 90,31 V  | 141,63 | 12,06424 | 0,000768 | 79,06061 | 72,45822 |
| 3150  | V | 92,68 V  | 146,12 | 20,23019 | 0,001022 | 81,43061 | 74,9408  |
| 4000  | V | 89,23 V  | 144,42 | 16,63413 | 0,000662 | 77,98061 | 71,16582 |
| 5000  | V | 85,44 V  | 148,54 | 26,73006 | 0,000851 | 74,19061 | 73,34762 |
| 6300  | V | 86,52 V  | 150,37 | 32,99894 | 0,000834 | 75,27061 | 73,1702  |
| 8000  | V | 85,58 V  | 147,48 | 23,6592  | 0,000471 | 74,33061 | 68,20522 |
| 10000 | V | 81,51 V  | 145,46 | 18,74995 | 0,000298 | 70,26061 | 64,24702 |
| A/L   | V | 101,72 V | 156,35 | 65,69011 |          |          |          |
| W     | V | 101,13 V | 155,9  | 62,37348 |          |          |          |

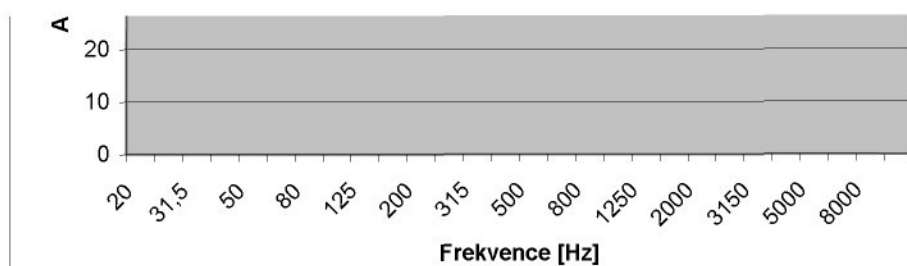
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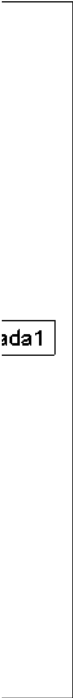
10\*log sigma

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Instrument B&K-7667, VP7342,V1.20,145,106,113,165,109,126

File no. 081

Measured 05-04-04 09:53:56

Measurem

Measurem 2 Channel Auto Spectra Analysis (dual)

Input ch. A PROBE/PREAMP, HP 0.7 Hz, Max. 118 dB, ref. 2.0E-05 Pa.

Input ch. B CHARGE, HP 0.3 Hz, LP 1 kHz OFF, Max. 175 dB, ref. 1.0E-06 m/(s\*s).

No. of spec 1

Bandwidth 1/3 oct., 11.2E+3 Hz upper freq. real time.

Averaging Linear, 0:00:05.000

Spectrum v Add to spectrum : LIN., Add to W-Ch : A

Spectrum v Add to spectrum : LIN., Add to W-Ch : LIN.

Hold Inactive

Application Inactive

( Start of Data )

Spectrum r 1

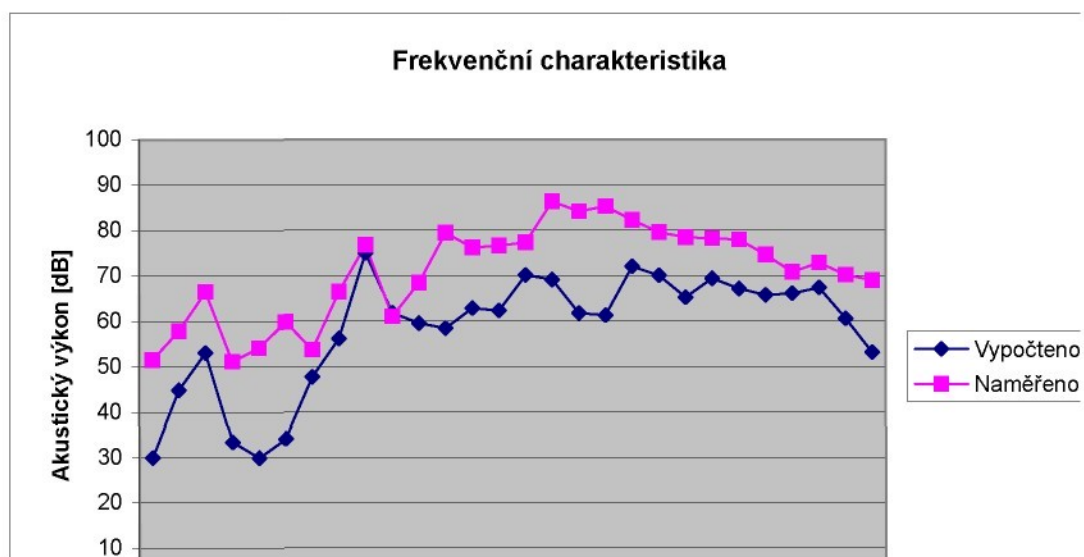
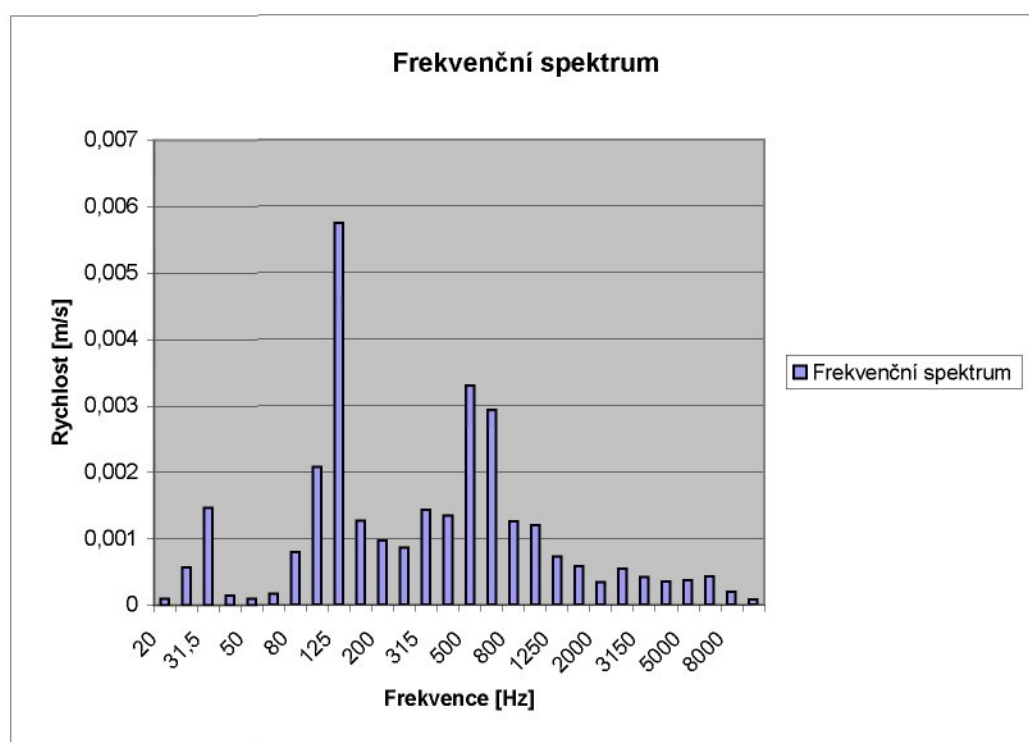
| Frequency |   | Auto-A [dB | Auto-B [dB] | a[m.s-2] | v[m.s-1] |          |          |
|-----------|---|------------|-------------|----------|----------|----------|----------|
| 0,4       | V | 61,36 V    | 124,39      |          |          |          |          |
| 0,5       | V | 70,67 V    | 115,17      |          |          |          |          |
| 0,63      | V | 74,06 V    | 124,81      |          |          |          |          |
| 0,8       | V | 74,15 V    | 122,15      |          |          | S21 [m2] | fd       |
| 1         | V | 69,1 V     | 114,93      |          |          | 0,075    | 1303,58  |
| 1,25      | V | 65,47 V    | 116,13      |          |          |          |          |
| 1,6       | V | 71,35 V    | 99,72       |          |          |          |          |
| 2         | V | 57,38 V    | 106,47      |          |          |          |          |
| 2,5       | V | 65,17 V    | 104,84      |          |          |          |          |
| 3,15      | V | 57,45 V    | 93,51       |          |          |          |          |
| 4         | V | 55,17 V    | 87,49       |          |          |          |          |
| 5         | V | 52,14 V    | 86,69       |          |          |          |          |
| 6,3       | V | 57,38 V    | -256,12     |          |          |          |          |
| 8         | V | 58,49 V    | 85,72       |          |          |          |          |
| 10        | V | 58,44 V    | -256,12     |          |          |          |          |
| 12,5      | V | 54,98 V    | 81,47       |          |          |          |          |
| 16        | V | 53,55 V    | 89,25       |          |          | Lv [dB]  | Lw [dB]  |
| 20        | V | 62,7 V     | 82,12       | 0,012764 | 0,000102 | 51,45061 | 29,88642 |
| 25        | V | 69,05 V    | 98,99       | 0,089023 | 0,000567 | 57,80061 | 44,81822 |
| 31,5      | V | 77,77 V    | 109,24      | 0,289734 | 0,001464 | 66,52061 | 53,0608  |
| 40        | V | 62,39 V    | 91,6        | 0,038019 | 0,000151 | 51,14061 | 33,34582 |
| 50        | V | 65,33 V    | 90,1        | 0,031989 | 0,000102 | 54,08061 | 29,90762 |
| 63        | V | 71,05 V    | 96,24       | 0,064863 | 0,000164 | 59,80061 | 34,0402  |
| 80        | V | 64,91 V    | 111,97      | 0,396735 | 0,000789 | 53,66061 | 47,69522 |
| 100       | V | 77,66 V    | 122,32      | 1,306171 | 0,002079 | 66,41061 | 56,10702 |
| 125       | V | 88 V       | 133,09      | 4,51336  | 0,005747 | 76,75061 | 74,93882 |
| 160       | V | 72,25 V    | 122,08      | 1,270574 | 0,001264 | 61,00061 | 61,78462 |
| 200       | V | 79,66 V    | 121,73      | 1,220394 | 0,000971 | 68,41061 | 59,49642 |
| 250       | V | 90,69 V    | 122,58      | 1,34586  | 0,000857 | 79,44061 | 58,40822 |
| 315       | V | 87,44 V    | 129,02      | 2,82488  | 0,001427 | 76,19061 | 62,8408  |
| 400       | V | 87,86 V    | 130,55      | 3,368992 | 0,00134  | 76,61061 | 62,29582 |
| 500       | V | 88,57 V    | 140,31      | 10,36335 | 0,003299 | 77,32061 | 70,11762 |
| 630       | V | 97,58 V    | 141,3       | 11,61449 | 0,002934 | 86,33061 | 69,1002  |
| 800       | V | 95,37 V    | 135,98      | 6,295062 | 0,001252 | 84,12061 | 61,70522 |
| 1000      | V | 96,49 V    | 137,51      | 7,507581 | 0,001195 | 85,24061 | 61,29702 |
| 1250      | V | 93,48 V    | 135,16      | 5,72796  | 0,000729 | 82,23061 | 72,00882 |
| 1600      | V | 90,78 V    | 135,3       | 5,821032 | 0,000579 | 79,53061 | 70,00462 |
| 2000      | V | 89,65 V    | 132,5       | 4,216965 | 0,000336 | 78,40061 | 65,26642 |

|       |   |          |        |          |          |          |          |
|-------|---|----------|--------|----------|----------|----------|----------|
| 2500  | V | 89,49 V  | 138,57 | 8,482034 | 0,00054  | 78,24061 | 69,39822 |
| 3150  | V | 89,2 V   | 138,31 | 8,231898 | 0,000416 | 77,95061 | 67,1308  |
| 4000  | V | 85,86 V  | 138,99 | 8,902254 | 0,000354 | 74,61061 | 65,73582 |
| 5000  | V | 82,08 V  | 141,3  | 11,61449 | 0,00037  | 70,83061 | 66,10762 |
| 6300  | V | 84,08 V  | 144,56 | 16,90441 | 0,000427 | 72,83061 | 67,3602  |
| 8000  | V | 81,4 V   | 139,84 | 9,817479 | 0,000195 | 70,15061 | 60,56522 |
| 10000 | V | 80,22 V  | 134,33 | 5,20595  | 8,29E-05 | 68,97061 | 53,11702 |
| A/L   | V | 103,88 V | 151,06 | 35,72728 | #####    |          |          |
| W     | V | 103,13 V | 150,94 | 35,23709 | #####    |          |          |

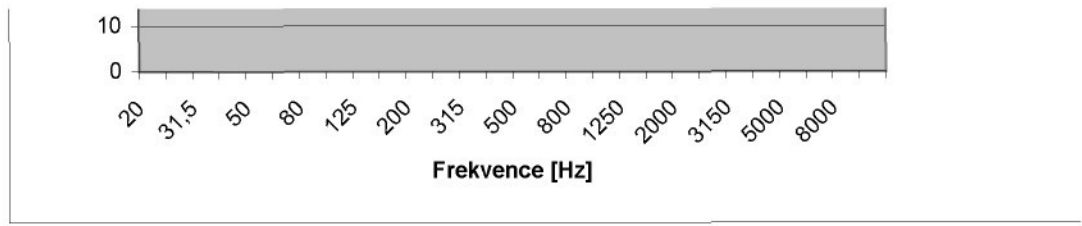
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# hodnoty Lv

| Body | Hodnota |
|------|---------|
| 1    | 52,809  |
| 2    | 68,633  |
| 3    | 71,053  |
| 4    | 75,959  |
| 5    | 73,559  |
| 6    | 77,369  |
| 7    | 74,219  |
| 8    | 74,265  |
| 9    | 75,461  |
| 10   | 77,649  |
| 11   | 81,415  |
| 12   | 77,438  |
| 13   | 76,823  |
| 14   | 74,793  |
| 15   | 79,269  |
| 16   | 75,349  |
| 17   | 73,483  |
| 18   | 77,783  |
| 19   | 83,893  |
| 20   | 74,21   |
| 21   | 70,47   |

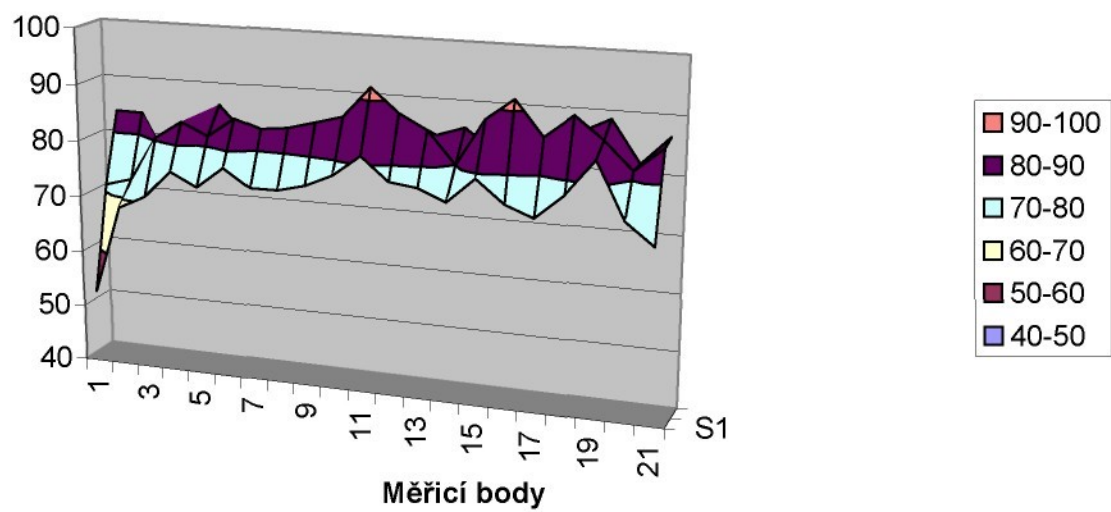
| Body | Hodnota |
|------|---------|
| 31   | 71,234  |
| 32   | 72,583  |
| 33   | 80,553  |
| 34   | 83,699  |
| 35   | 81,559  |
| 36   | 85,039  |
| 37   | 83,479  |
| 38   | 84,045  |
| 39   | 85,381  |
| 40   | 86,749  |
| 41   | 92,095  |
| 42   | 88,048  |
| 43   | 85,539  |
| 44   | 80,013  |
| 45   | 88,159  |
| 46   | 91,889  |
| 47   | 85,923  |
| 48   | 89,843  |
| 49   | 86,063  |
| 50   | 81,36   |
| 51   | 85,55   |

| Body | Hodnota |
|------|---------|
| 61   | 83,683  |
| 62   | 83,593  |
| 63   | 75,153  |
| 64   | 79,129  |
| 65   | 86,089  |
| 66   | 81,179  |
| 67   | 77,529  |
| 68   | 81,575  |
| 69   | 76,751  |
| 70   | 78,379  |
| 71   | 85,785  |
| 72   | 83,178  |
| 73   | 83,683  |
| 74   | 85,333  |
| 75   | 81,739  |
| 76   | 82,099  |
| 77   | 82,153  |
| 78   | 86,083  |
| 79   | 88,553  |
| 80   | 81,43   |
| 81   | 86,33   |



## Naměřené hodnoty

Hladina akust.  
výkonu



# Hodnoty Lw

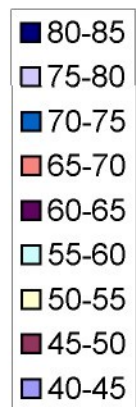
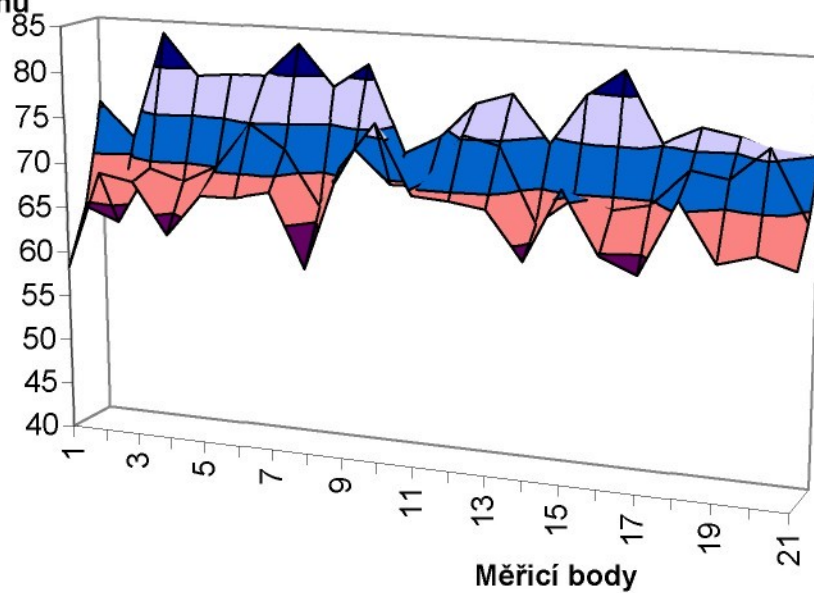
| Body | Hodnota |
|------|---------|
| 1    | 58,322  |
| 2    | 69,173  |
| 3    | 68,483  |
| 4    | 62,945  |
| 5    | 67,575  |
| 6    | 67,653  |
| 7    | 68,523  |
| 8    | 60,546  |
| 9    | 71,697  |
| 10   | 76,753  |
| 11   | 69,385  |
| 12   | 69,154  |
| 13   | 68,599  |
| 14   | 63,473  |
| 15   | 71,339  |
| 16   | 64,746  |
| 17   | 63,129  |
| 18   | 71,072  |
| 19   | 64,919  |
| 20   | 66,074  |
| 21   | 64,908  |

| Body | Hodnota |
|------|---------|
| 31   | 64,392  |
| 32   | 62,921  |
| 33   | 69,283  |
| 34   | 68,105  |
| 35   | 70,057  |
| 36   | 74,985  |
| 37   | 72,445  |
| 38   | 66,511  |
| 39   | 73,045  |
| 40   | 69,517  |
| 41   | 69,625  |
| 42   | 75,384  |
| 43   | 74,529  |
| 44   | 66,577  |
| 45   | 69,603  |
| 46   | 68,689  |
| 47   | 69,559  |
| 48   | 73,399  |
| 49   | 72,759  |
| 50   | 76,234  |
| 51   | 68,894  |

| Body | Hodnota |
|------|---------|
| 61   | 75,543  |
| 62   | 71,751  |
| 63   | 83,653  |
| 64   | 79,165  |
| 65   | 79,577  |
| 66   | 79,577  |
| 67   | 83,289  |
| 68   | 78,845  |
| 69   | 81,535  |
| 70   | 72,189  |
| 71   | 74,239  |
| 72   | 78,094  |
| 73   | 79,373  |
| 74   | 74,345  |
| 75   | 79,759  |
| 76   | 82,559  |
| 77   | 75,231  |
| 78   | 77,091  |
| 79   | 76,393  |
| 80   | 74,941  |
| 81   | 74,938  |

## Vypočítané hodnoty

Hladina akust.  
výkonu



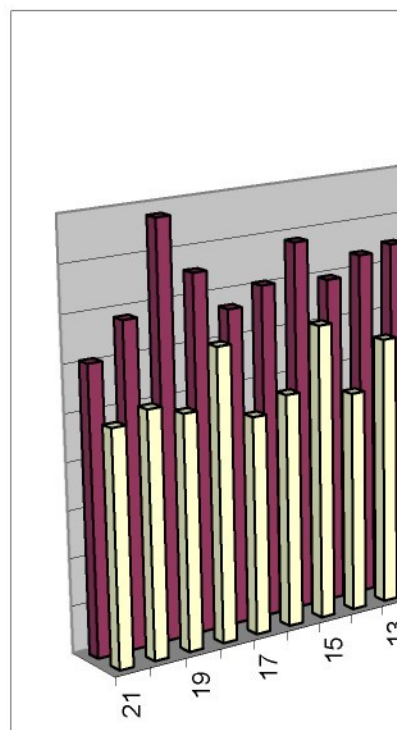
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|----|--------|
| 1  | 52,809 |
| 2  | 68,633 |
| 3  | 71,053 |
| 4  | 75,959 |
| 5  | 73,559 |
| 6  | 77,369 |
| 7  | 74,219 |
| 8  | 74,265 |
| 9  | 75,461 |
| 10 | 77,649 |
| 11 | 81,415 |
| 12 | 77,438 |
| 13 | 76,823 |
| 14 | 74,793 |
| 15 | 79,269 |
| 16 | 75,349 |
| 17 | 73,483 |
| 18 | 77,783 |
| 19 | 83,893 |
| 20 | 74,21  |
| 21 | 70,47  |

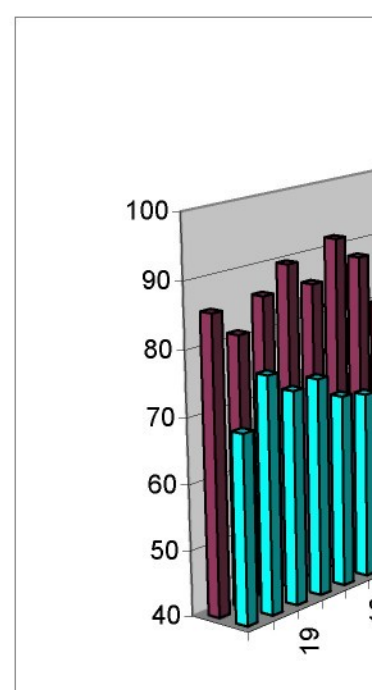
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|    |        |
|----|--------|
| 1  | 58,322 |
| 2  | 69,173 |
| 3  | 68,483 |
| 4  | 62,945 |
| 5  | 67,575 |
| 6  | 67,653 |
| 7  | 68,523 |
| 8  | 60,546 |
| 9  | 71,697 |
| 10 | 76,753 |
| 11 | 69,385 |
| 12 | 69,154 |
| 13 | 68,599 |
| 14 | 63,473 |
| 15 | 71,339 |
| 16 | 64,746 |
| 17 | 63,129 |
| 18 | 71,072 |
| 19 | 64,919 |
| 20 | 66,074 |
| 21 | 64,908 |



|    |        |
|----|--------|
| 31 | 71,234 |
| 32 | 72,583 |
| 33 | 80,553 |
| 34 | 83,699 |
| 35 | 81,559 |
| 36 | 85,039 |
| 37 | 83,479 |
| 38 | 84,045 |
| 39 | 85,381 |
| 40 | 86,749 |
| 41 | 92,095 |
| 42 | 88,048 |
| 43 | 85,539 |
| 44 | 80,013 |
| 45 | 88,159 |
| 46 | 91,889 |
| 47 | 85,923 |
| 48 | 89,843 |
| 49 | 86,063 |
| 50 | 81,36  |
| 51 | 85,55  |

|    |        |
|----|--------|
| 31 | 64,392 |
| 32 | 62,921 |
| 33 | 69,283 |
| 34 | 68,105 |
| 35 | 70,057 |
| 36 | 74,985 |
| 37 | 72,445 |
| 38 | 66,511 |
| 39 | 73,045 |
| 40 | 69,517 |
| 41 | 69,625 |
| 42 | 75,384 |
| 43 | 74,529 |
| 44 | 66,577 |
| 45 | 69,603 |
| 46 | 68,689 |
| 47 | 69,559 |
| 48 | 73,399 |
| 49 | 72,759 |
| 50 | 76,234 |
| 51 | 68,894 |



|    |        |
|----|--------|
| 61 | 83,683 |
| 62 | 83,593 |

|    |        |
|----|--------|
| 61 | 75,543 |
| 62 | 71,751 |

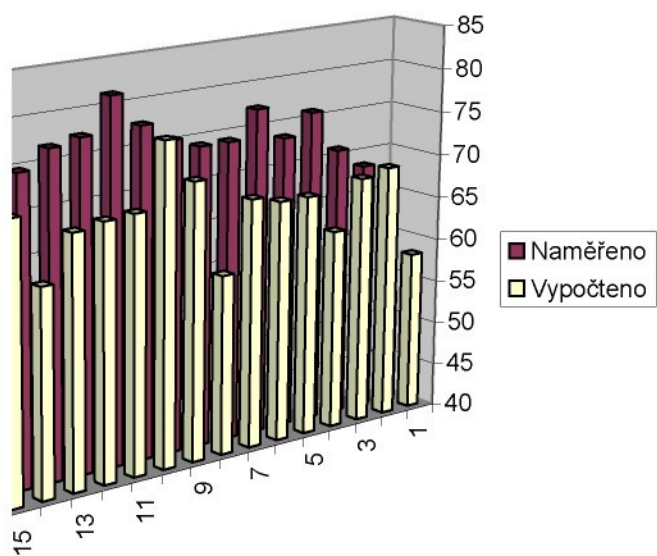
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|----|--------|
| 63 | 75,153 |
| 64 | 79,129 |
| 65 | 86,089 |
| 66 | 81,179 |
| 67 | 77,529 |
| 68 | 81,575 |
| 69 | 76,751 |
| 70 | 78,379 |
| 71 | 85,785 |
| 72 | 83,178 |
| 73 | 83,683 |
| 74 | 85,333 |
| 75 | 81,739 |
| 76 | 82,099 |
| 77 | 82,153 |
| 78 | 86,083 |
| 79 | 88,553 |
| 80 | 81,43  |
| 81 | 86,33  |

|    |        |
|----|--------|
| 63 | 83,653 |
| 64 | 79,165 |
| 65 | 79,577 |
| 66 | 79,577 |
| 67 | 83,289 |
| 68 | 78,845 |
| 69 | 81,535 |
| 70 | 72,189 |
| 71 | 74,239 |
| 72 | 78,094 |
| 73 | 79,373 |
| 74 | 74,345 |
| 75 | 79,759 |
| 76 | 82,559 |
| 77 | 75,231 |
| 78 | 77,091 |
| 79 | 76,393 |
| 80 | 74,941 |
| 81 | 74,938 |

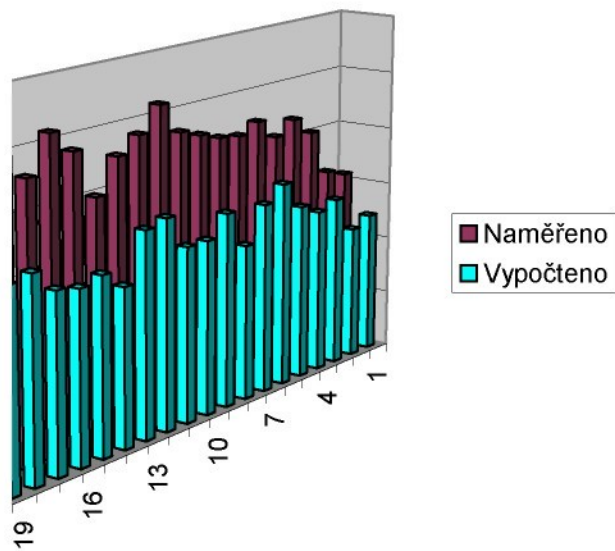
3  
ot



1500 ot/min



2500 ot/min



**NI**

