

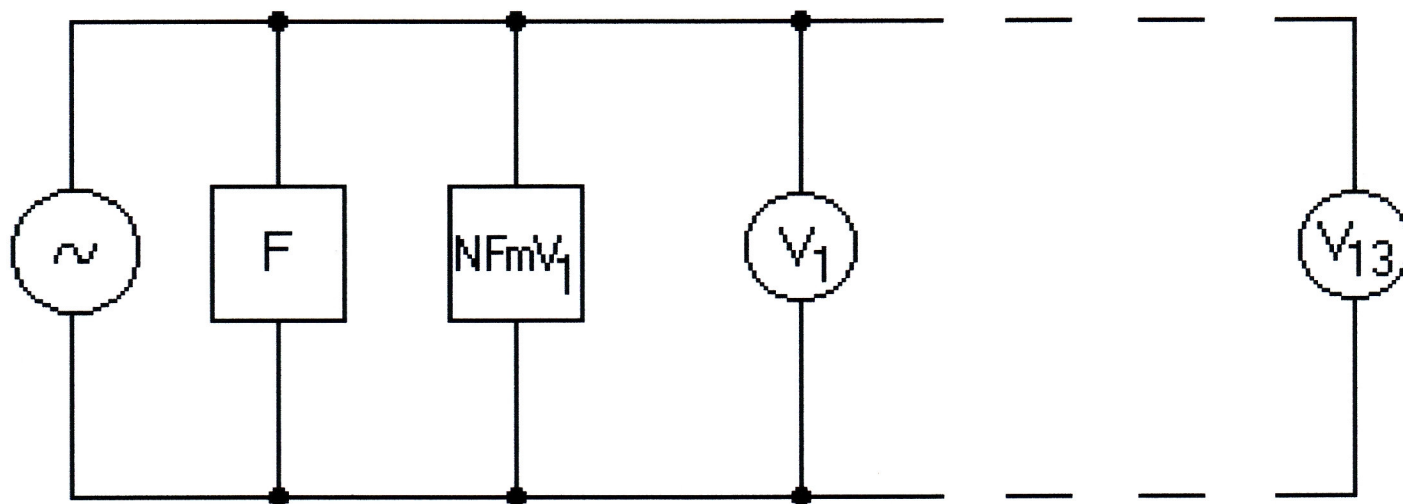
# Overovanie meracích prístrojov

- Úloha 1) Zmerajte frekvenčnú závislosť predložených meracích prístrojov  
2) Zmerané hodnoty spracujte graficky



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Jm

## 1. Schéma zapojenia doplnená o meracie prístroje:



## 2. Tabuľka nameraných hodnôt:

f [Hz]	U <sub>1</sub> [V]	U <sub>2</sub> [V]	U <sub>3</sub> [V]	U <sub>4</sub> [V]	U <sub>5</sub> [V]	U <sub>6</sub> [V]	U <sub>7</sub> [V]	U <sub>8</sub> [V]	U <sub>9</sub> [V]	U <sub>10</sub> [V]	U <sub>11</sub> [V]	U <sub>12</sub> [V]	U <sub>13</sub> [V]	U [V]
50	1,034	1,034	1,034	1,032	1,033	1,036	1,035	1,034	1,031	1,034	1,035	1,032	1,031	1,000
500	1,042	1,036	1,037	1,035	1,037	1,040	1,044	1,033	1,032	1,023	1,025	1,030	1,025	1,000
1000	1,046	1,036	1,038	1,037	1,039	1,041	1,051	1,036	1,035	1,001	1,050	1,030	1,021	1,000
1500	1,054	1,043	1,044	1,044	1,045	1,047	1,060	1,041	1,042	0,971	0,976	1,031	1,020	1,000
2000	1,065	1,050	1,053	1,053	1,053	1,056	1,071	1,049	1,052	0,931	0,939	1,031	1,019	1,000
2500	1,076	1,059	1,064	1,064	1,064	1,067	1,084	1,060	1,065	0,888	0,898	1,031	1,019	1,000
3000	1,089	1,071	1,077	1,079	1,078	1,081	1,100	1,076	1,083	0,873	0,852	1,031	1,017	1,000
3500	1,100	1,081	1,088	1,090	1,087	1,090	1,100	1,085	1,095	0,795	0,808	1,029	1,017	1,000
4000	1,114	1,093	1,101	1,103	1,100	1,103	1,122	1,099	1,111	0,749	0,763	1,028	1,015	1,000
4500	1,127	1,106	1,115	1,118	1,114	1,117	1,136	1,114	1,129	0,705	0,722	1,028	1,014	1,000
5000	1,141	1,119	1,129	1,133	1,127	1,130	1,150	1,130	1,148	0,666	0,684	1,027	1,014	1,000
5500	1,154	1,133	1,143	1,148	1,141	1,144	1,164	1,146	1,167	0,628	0,648	1,027	1,013	1,000
6000	1,168	1,147	1,159	1,163	1,156	1,159	1,178	1,163	1,187	0,592	0,613	1,026	1,013	1,000
6500	1,182	1,161	1,174	1,178	1,170	1,173	1,192	1,181	1,208	0,557	0,580	1,026	1,013	1,000
7000	1,194	1,174	1,187	1,192	1,182	1,186	1,204	1,197	1,226	0,529	0,554	1,026	1,013	1,000
7500	1,206	1,186	1,199	1,204	1,194	1,198	1,216	1,212	1,244	0,503	0,528	1,026	1,013	1,000
8000	1,217	1,198	1,212	1,217	1,206	1,210	1,228	1,228	1,261	0,471	0,503	1,025	1,012	1,000
12000	1,289	1,272	1,291	1,295	1,279	1,285	1,299	1,332	1,380	0,328	0,363	1,023	1,009	1,000
16000	1,323	1,306	1,329	1,330	1,311	1,320	1,332	1,388	1,446	0,243	0,285	1,018	1,004	1,000
20000	1,337	1,318	1,343	1,344	1,323	1,333	1,345	1,415	1,479	0,190	0,236	1,011	0,997	1,000
24000	1,339	1,317	1,345	1,344	1,323	1,335	1,344	1,425	1,492	0,157	0,204	1,003	0,989	1,000
28000	1,334	1,309	1,339	1,338	1,316	1,330	1,336	1,424	1,494	0,135	0,181	0,994	0,980	1,000
32000	1,325	1,296	1,329	1,327	1,305	1,321	1,325	1,416	1,488	0,121	0,164	0,985	0,970	1,000
36000	1,314	1,280	1,315	1,313	1,291	1,310	1,310	1,403	1,476	0,100	0,151	0,974	0,960	1,000
40000	1,300	1,262	1,299	1,297	1,276	1,296	1,294	1,388	1,468	0,108	0,141	0,963	0,948	1,000
44000	1,284	1,241	1,280	1,278	1,258	1,280	1,274	1,374	1,446	0,104	0,132	0,949	0,934	1,000
48000	1,268	1,219	1,262	1,259	1,239	1,263	1,254	1,347	1,424	0,101	0,125	0,935	0,921	1,000
52000	1,252	1,199	1,243	1,243	1,222	1,248	1,236	1,327	1,404	0,100	0,129	0,922	0,907	1,000
56000	1,233	1,175	1,222	1,220	1,201	1,229	1,213	1,302	1,380	0,097	0,114	0,906	0,891	1,000
60000	1,215	1,152	1,201	1,200	1,181	1,211	1,193	1,278	1,358	0,096	0,104	0,891	0,876	1,000
80000	1,120	1,027	1,091	1,091	1,077	1,114	1,078	1,147	1,231	0,083	0,087	0,808	0,739	1,000
100000	1,019	0,902	0,975	0,978	0,965	1,012	0,963	1,006	1,095	0,064	0,064	0,723	0,704	1,000

## 3. Vyhodnotenie merania:

Meraním sme kontrolovali 13 multimetrov (voltmetrov) a zistili sme, že ich presnosť sa zvyšovaním frekvencie radikálne mení. Zaujímavé bolo, že U<sub>1</sub>-U<sub>9</sub> pri frekvencií 100 000 Hz začali znovu ukazovať pomerne presné hodnoty ( do 10% ), pričom v rozsahu od 4000 Hz – 60 000 Hz nemerali presne. U<sub>10</sub> a U<sub>11</sub> prestali presne merať ( prekročili prípustnú hranicu 10% ) už pri 2500 Hz. Najlepšie sa osvedčili multimetre s NDR, ktoré merali presne až po hodnoty okolo 56 000 Hz.



Graf nameraných hodnôt

