

**Occupied Bandwidth Measurements
(FCC Rule 73.317)**

**KBVM
Portland, Oregon**

Common Antenna and Combiner System

Sylvan Tower, Portland, Oregon

February 7, 2006

On February 7th, 2006, Boyd Broadcast Technical Services made measurements of KBVM (88.3 MHz), Portland, Oregon, to show compliance with FCC Rule 73.317, following construction of KBVM with new facilities at this site. KBVM is one of three FM Broadcast stations operating from a common antenna and combining system at the "Sylvan Tower" in Portland, Oregon. The other two stations are KMHD (89.1 MHz) and KBPS (89.9 MHz). All stations at the site were operating with their authorized facilities at the time of the measurements.

All measurements were made at a forward port of a Shively directional coupler located in line following the multi-station combining system and prior to the facility's common antenna system. At this point attenuators were inserted ahead of the Agilent E4402B spectrum analyzer (Serial Number MY44221068), which was used for the measurements. A total of 50 dB of external attenuation was used to make a reference measurement of KBVM. The amplitude calibration of the instrument was electronically adjusted to account for this attenuation.

10 dB of external attenuation was used for all other measurements. This smaller amount of attenuation provides the necessary dynamic range for the spectrum analyzer to observe any spurious signals. Also double cavity notch filters, one for each of the eight stations (plus one filter for the eighth station), were inserted in cascade following the attenuators and ahead of the spectrum analyzer to prevent signal overload and subsequent erroneous intermodulation products. The amplitude versus frequency response of each of these filters is shown on pages 3 and 4 of this report.

The filters, Model 6367-2, are manufactured by Microwave Filter Company, Inc. Attenuators are precision devices manufactured by Coaxial Dynamics. All cables are constructed of high quality, 100% shielded coaxial cable with premium connectors and high quality RG-214 with premium connectors. Adapter connectors used are also premium quality. A block diagram of the measurement setup is shown on page 9 and a photograph of the complete test setup is shown on page 10.

Signals measured by the Agilent E4402B spectrum analyzer are digitized in the analyzer. Data was collected for a short period using the instrument's peak-hold feature. The data for the reference plots was collected over an approximate 10 minute period. Other measurements were collected for several minutes each. This was done to observe possible short duration signals.

Data from these plots was saved in the analyzer's hard drive, then converted to .GIF files and downloaded into a computer for viewing and analysis (and to provide the plots shown in this report). The Agilent analyzer collected 401 data points over the instrument's selected frequency span for these measurements.

A reference plot for KBVM is shown on page 4. With notch filters for the three stations in line to the spectrum analyzer, the FM band and the spectrum from 20 MHz through 1100 MHz were examined. Data plots for this part of the spectrum are shown on pages 5 through 8.

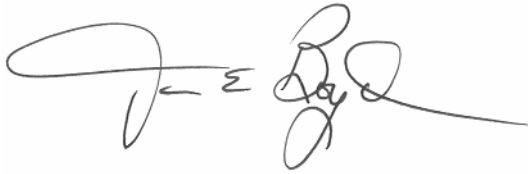
A number of signals were discovered, all were identified (mostly television and other FM broadcast stations located at this site and several other sites nearby), and were below the FCC limit of -80 dB (taking into account the rising response characteristic of the directional coupler) referenced to the peak carrier level of KBVM.

It is likely most of these signals were coming back down the transmission line from the common antenna and some signals observed were perhaps the result of instrument and/or cabling pickup in the room. No harmonic emissions or other spurious emissions from KBVM at levels higher than 80 dB below the fundamental carrier frequency were observed.

It is believed that KBVM is in full compliance with section 73.317 of the commission's rules. A copy of the pertinent sections of this rule can be found on page 11.

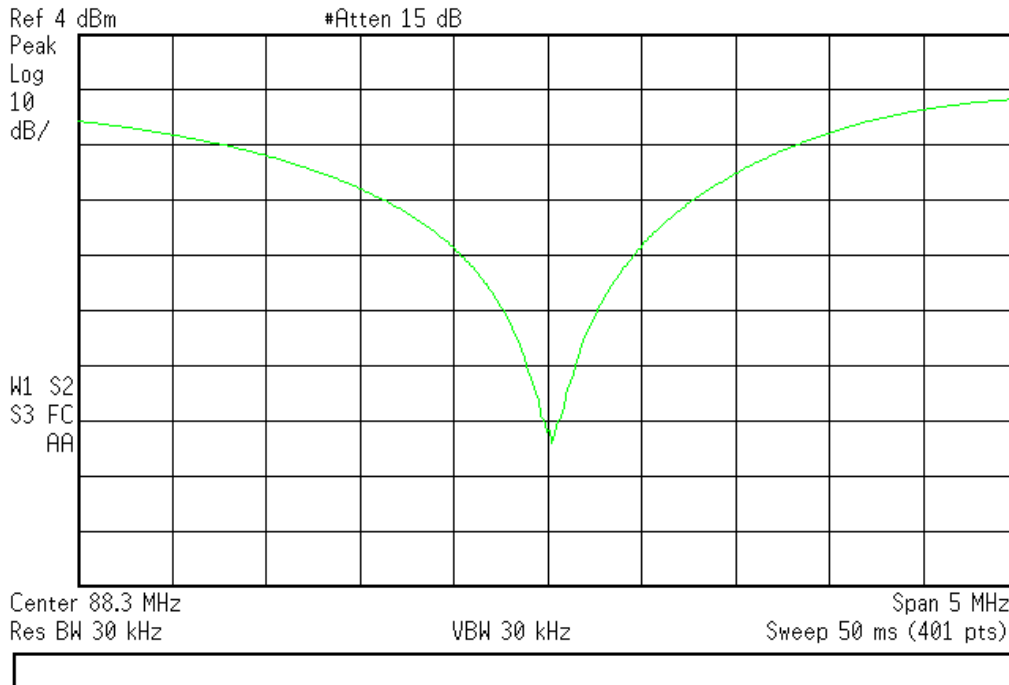
All information contained in this report was gathered by James E. Boyd, who has experience making these kinds of measurements and whose qualifications are a matter of record with the Federal Communications Commission.

Respectfully Submitted,

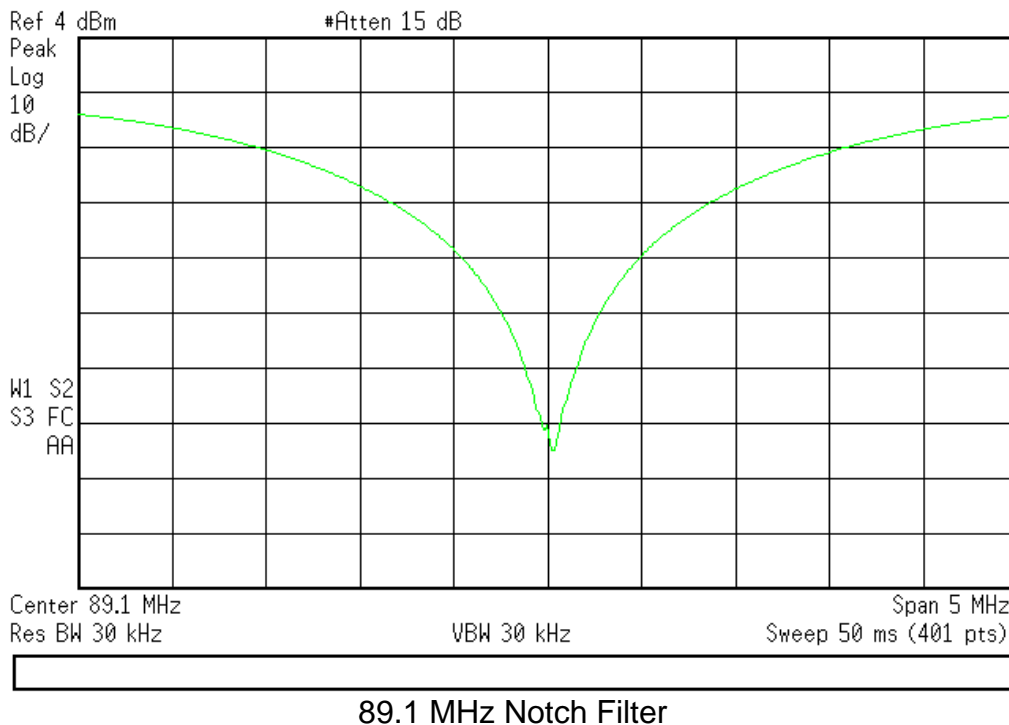
A handwritten signature in black ink, appearing to read 'J.E. Boyd', with a long horizontal line extending to the right.

James E. Boyd
Boyd Broadcast Technical Services
21818 SW Columbia Circle
Tualatin, OR 97062
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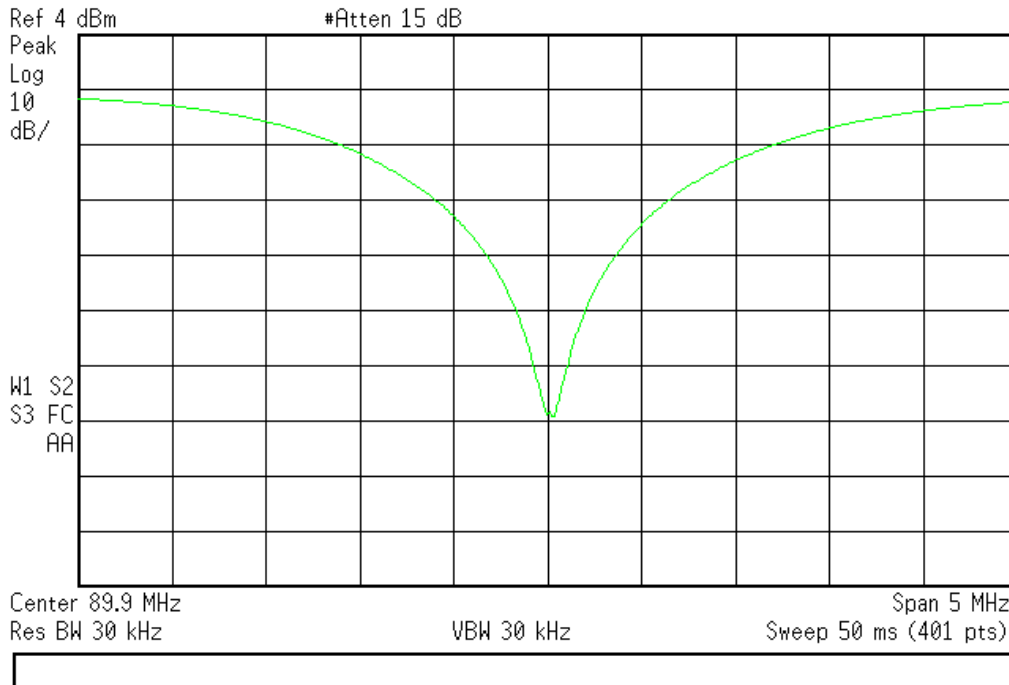
* Agilent 21:45:38 Feb 7, 2006



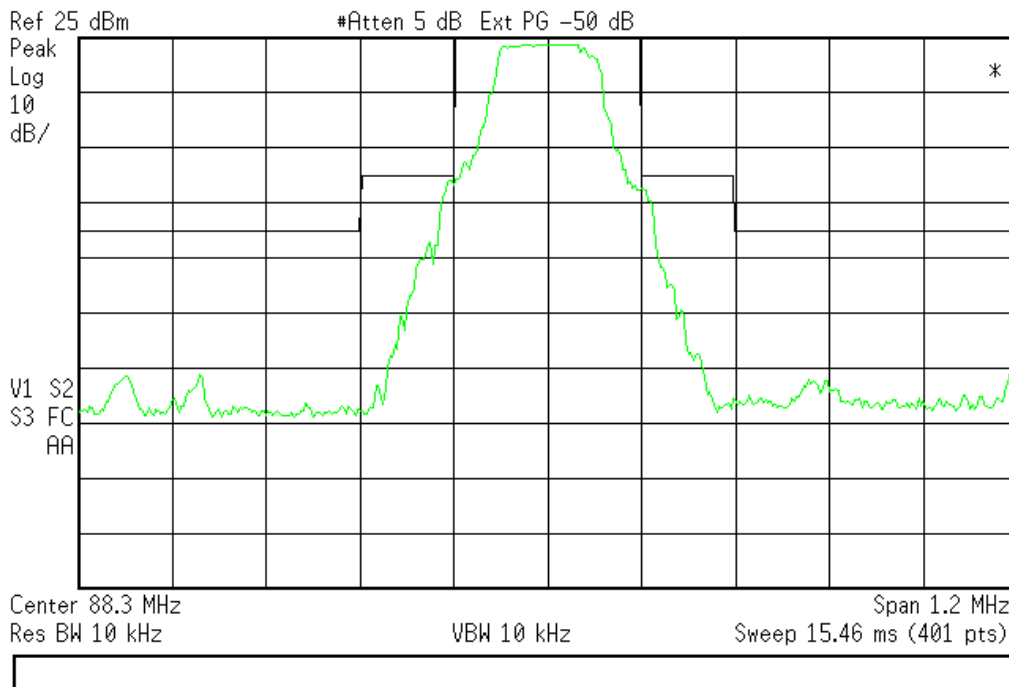
* Agilent 21:50:13 Feb 7, 2006



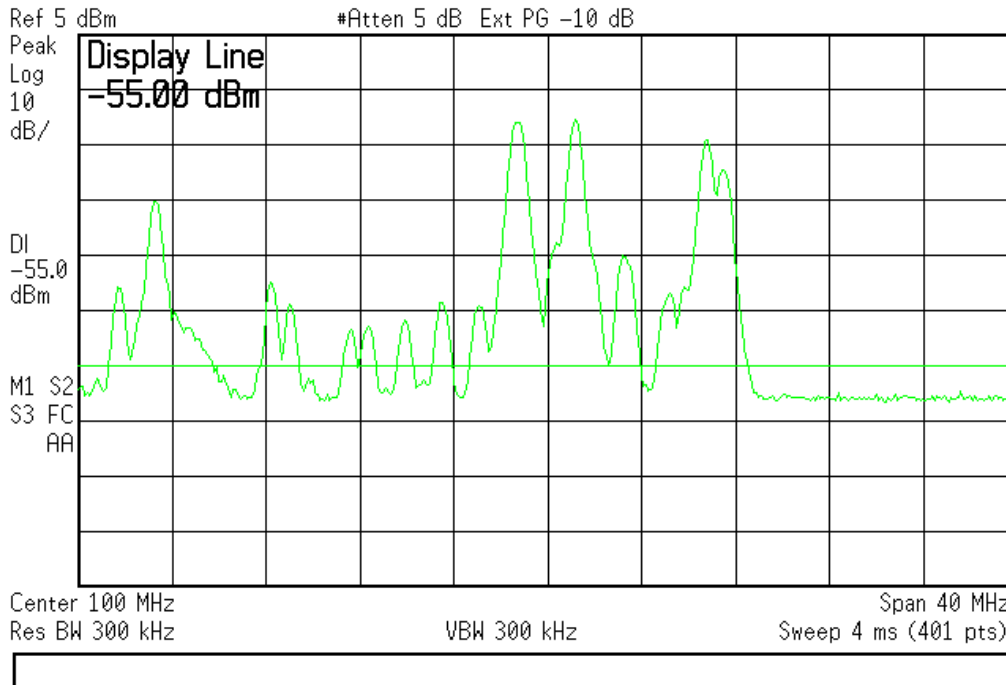
* Agilent 21:54:08 Feb 7, 2006



* Agilent 22:30:24 Feb 7, 2006

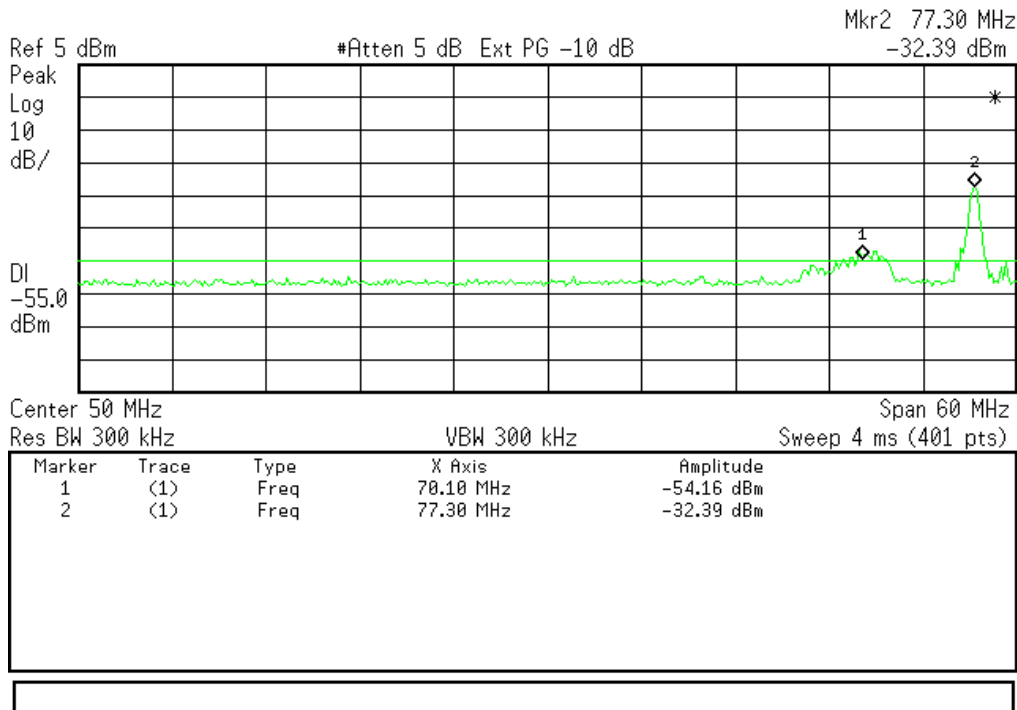


* Agilent 22:47:24 Feb 7, 2006



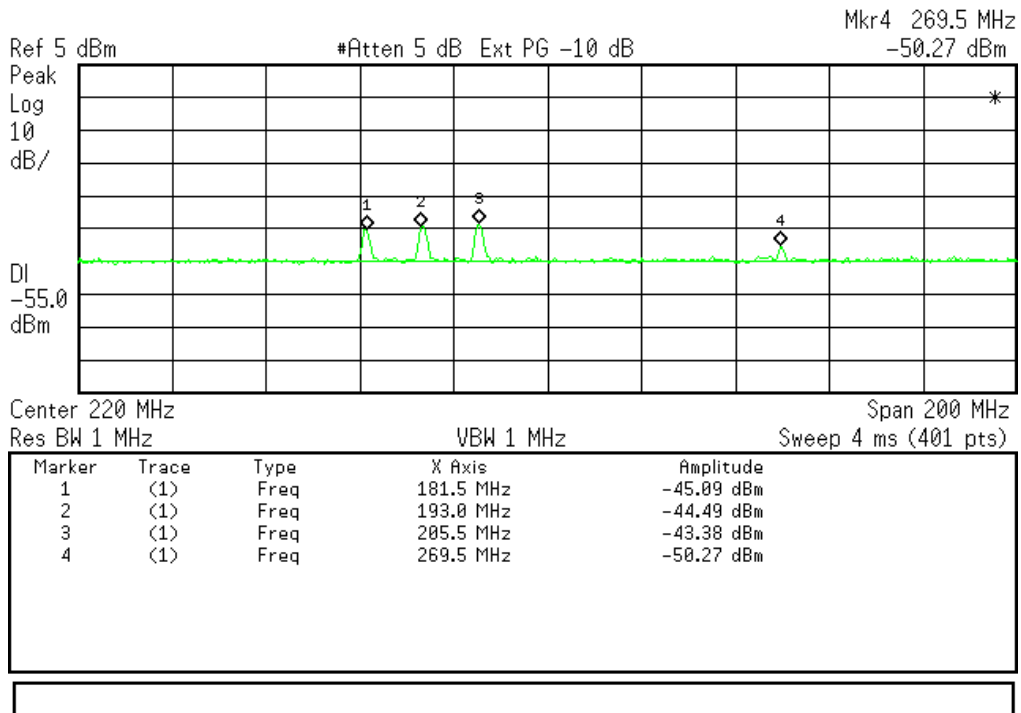
80 to 120 MHz with double cavity notch filters in line for each of the three stations using this combiner and common antenna. All signals were identified (other radio and television broadcast stations at or near this transmitter site). No spurious emissions are present.

* Agilent 16:37:57 Feb 12, 2006



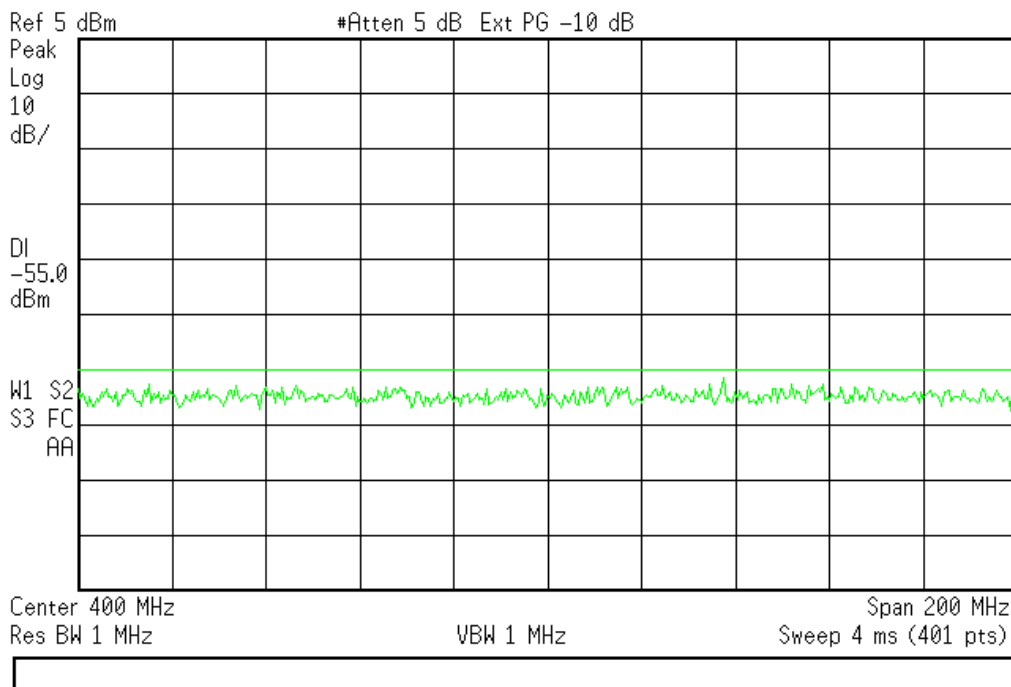
20 to 80 MHz. The marked signals are KPXG-DT (Channel 4) located 1.225 km away and KWBP-LP (Channel 5) co-located.

* Agilent 17:22:32 Feb 12, 2006



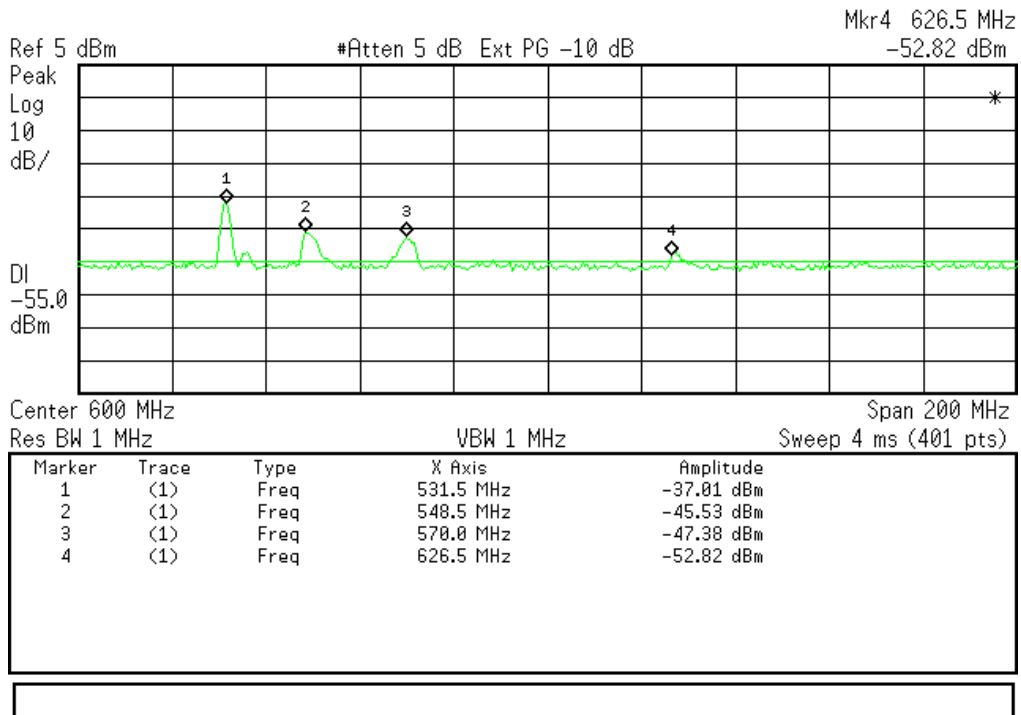
108 to 308 MHz The first three markers are KGW (Channel 8) and KOPB (Channel 10) both located 1,225 km away and KPTV(Channel 12) located 1.34 km away. The forth marker appears to be near 89.9 X 3, the third harmonic of KBPS one of the threestations in this combiner and common antenna.

* Agilent 23:03:54 Feb 7, 2006



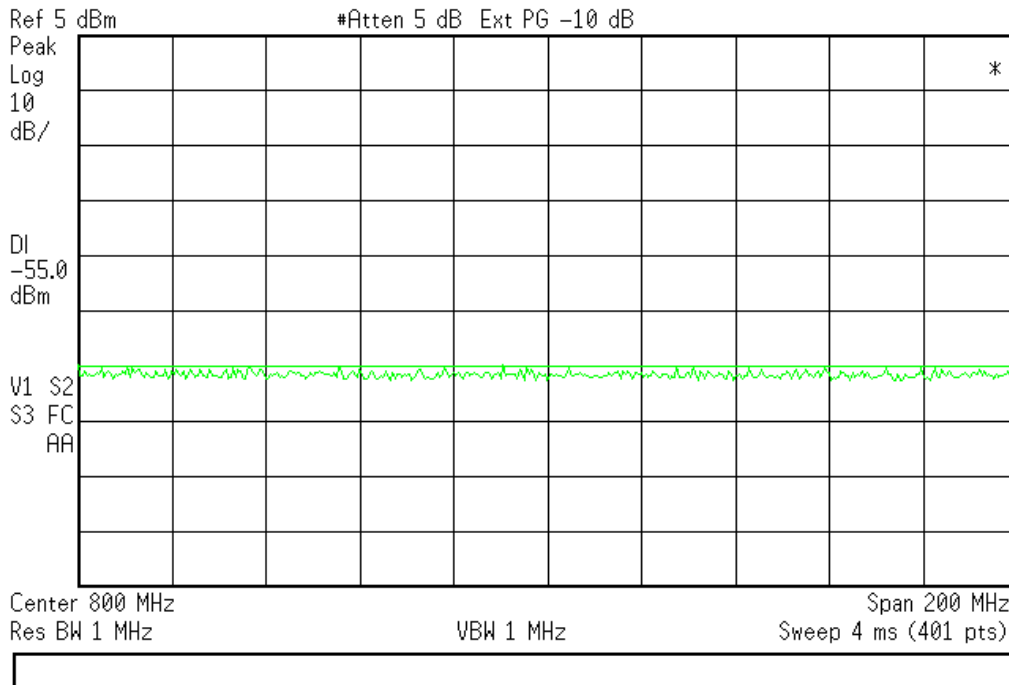
300 to 500 MHz

* Agilent 22:03:29 Feb 12, 2006

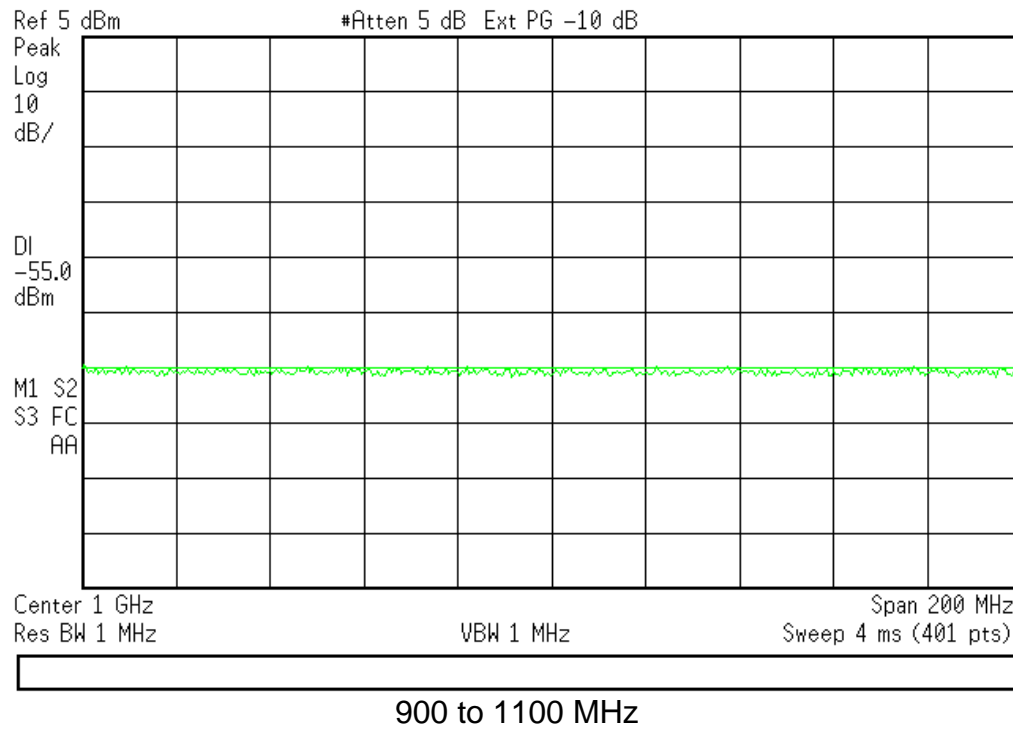


500 to 700 MHz. Markers show KNMT-TV (Channel 24) and KOIN-DT (Channel 40) co-located, KOPB-DT (Channel 27) and KGW-DT (Channel 46) both 1.225 km away.

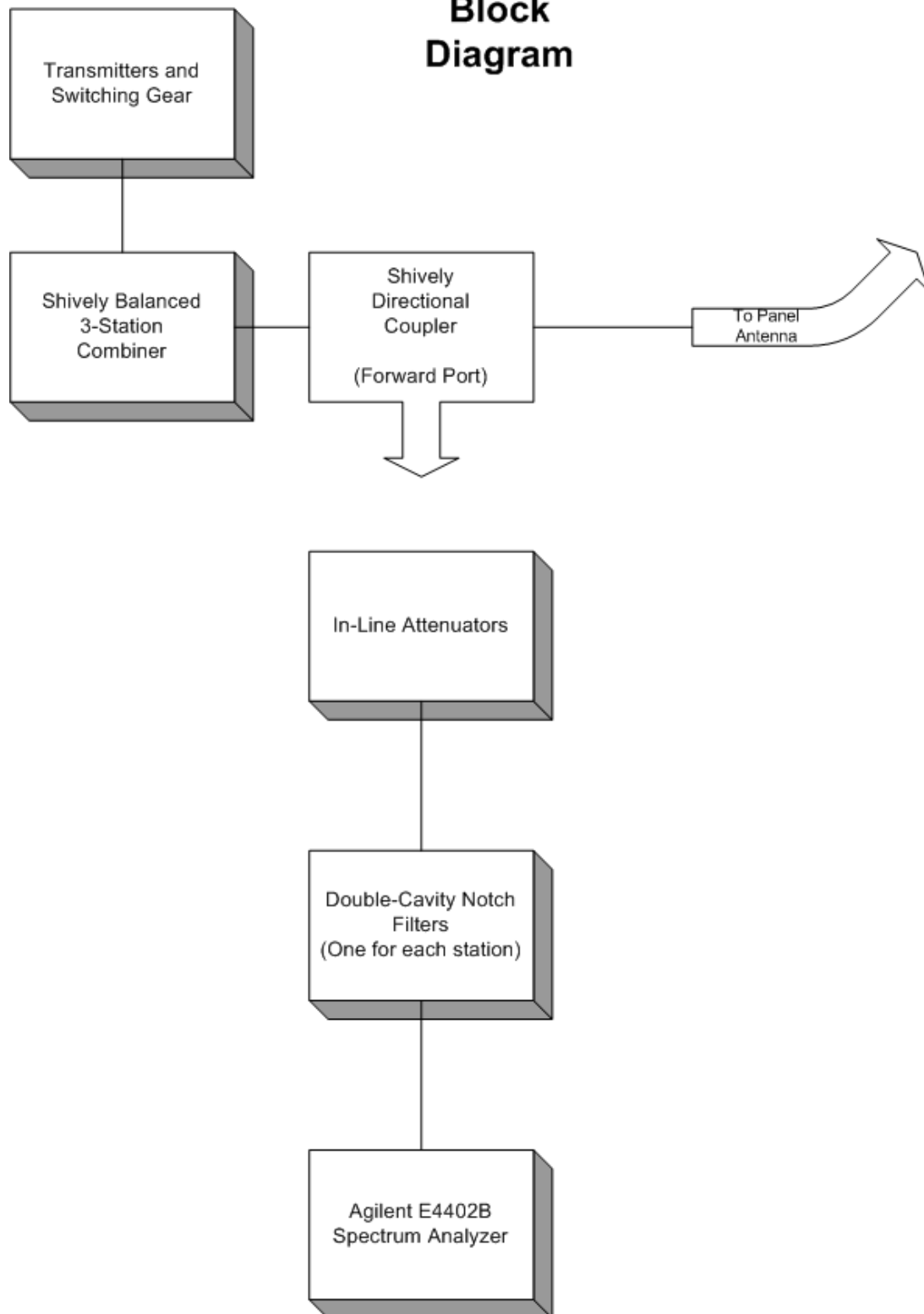
* Agilent 23:16:49 Feb 7, 2006



700 to 900 MHz.



Equipment Block Diagram





Test Setup

73.317 FM TRANSMISSION SYSTEM REQUIREMENTS

- (a) FM broadcast stations employing transmitters authorized after January 1, 1960, must maintain the bandwidth occupied by their emissions in accordance with the specification detailed below. FM broadcast stations employing transmitters installed or type accepted before January 1, 1960, must achieve the highest degree of compliance with these specifications practicable with their existing equipment. In either case, should harmful interference to other authorized stations occur, the licensee shall correct the problem promptly or cease operation.
- (b) Any emission appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive must be attenuated 25 dB below the level of the unmodulated carrier. Compliance with this requirement will be deemed to show the occupied bandwidth to be 240 kHz or less.
- (c) Any emission appearing on a frequency removed from the carrier by more than 240 kHz and up to and including 600 kHz must be attenuated at least 35 dB below the level of the unmodulated carrier.
- (d) Any emission appearing on a frequency removed the carrier by more than 600 kHz must be attenuated at $43 + 10\log(\text{Power in watts})$ dB below the level of the unmodulated carrier, or 80 dB, whichever is the lesser attenuation.