

BELAR ELECTRONICS LABORATORY, INC.
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INSTRUCTION SHEET

FMD-1 WIDE BAND FM DETECTOR

Connect the output of the FMD-1 to an oscilloscope or other measuring device. When making stereo separation measurements, the lead should be short and of low capacity. For maximum bandwidth, the unit may be plugged into the oscilloscope using a co-axial adaptor.

Connect the RF input of the FMD-1 to the RF cable normally feeding the monitor. The RF voltage should be between 2 to 5 volts. This cable may be any convenient length.

With a modulating signal, say 400 cycles, tune the detector for maximum audio output; remove the modulation and fine tune the detector for minimum 60 or 120 cycle noise. This last tuning insures that the carrier is centered on the linear portion of the discriminator S-curve. DO NOT TUNE FOR 0 DC VOLTS as there is approximately a 1 volt DC offset. DO NOT APPLY MORE THAN 8 VOLTS RMS (1 WATT) RF TO THE INPUT, otherwise the unit may be damaged. The detector is ready for operation. The output will be of the order of 0.2 volts RMS for 4 volts input and 100% modulation.

For AM noise measurements, tune the detector (toward Hi) for maximum DC output as measured with a Simpson VOM or equivalent 20,000 ohms per volt meter. The reading should be several volts or more. Divide the DC reading by 1.4 and the resulting number is the RMS output voltage for 100% AM modulation and the -50 db AM noise spec can be measured in reference to this number. For example, if the DC reading is 3.4 volts then dividing 3.4 by 1.4 yields 2.45 volts RMS for 100% AM modulation or plus 10 dbm. Then the -50 db AM noise spec would be 8 millivolts or -40 dbm. For convenience, if the DC reading is higher but near to 3.4 volts DC, the detector may be detuned so that it reads 3.4 volts DC.

PRECAUTIONS

1. When measuring low frequency stereo separation, be sure the scope has adequate low frequency response; otherwise there may be a phase error. This is important when adjusting (L-R) low frequency compensating circuits on phase modulated systems.
2. If the transmitter has excessive AM noise, there may be a hum beat on the baseline of the stereo composite waveform. The frequency of the audio oscillator may be shifted slightly so that the beat is not synchronized and the stereo separation measurement can be made.
3. Do not use a frequency monitor with 200 KC IF frequencies on the same RF line while making stereo measurements. These monitors will put a high RF level 200 KC on the line, away from carrier frequency which will show up as interference since the FMD-1 has a very wide bandwidth. Both the McMartin and H-P monitors have 200 KC IF frequencies.
4. The knob pointer should point to tune, between high and low; other tuning points may be found elsewhere, but these are incorrect.