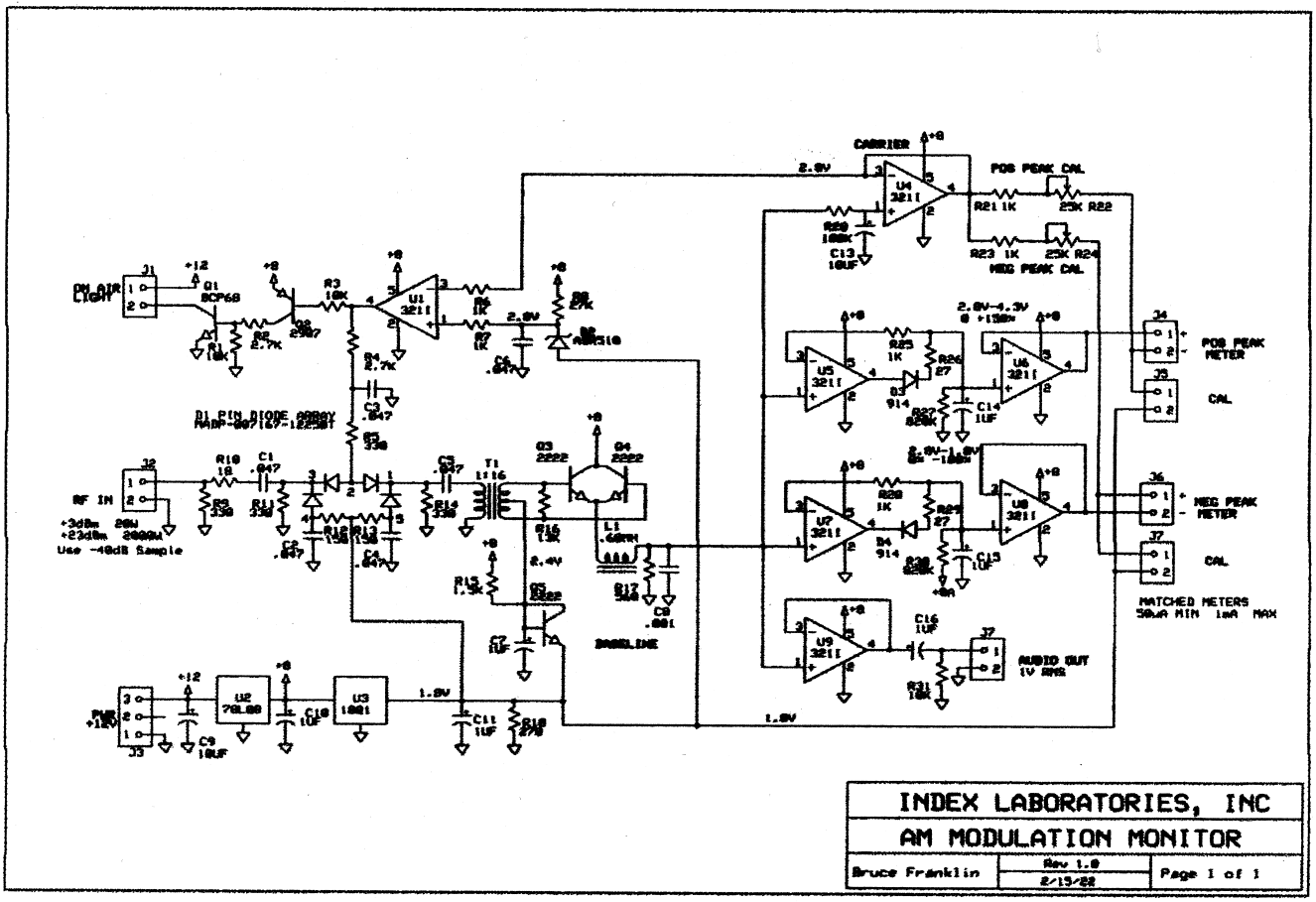
Hi Janis:

I've gotten some feedback with regard to the AM modulation monitor design that I described in my technote.

If I could eliminate the need for writing processor code and simplify the design such that it would be a reasonable weekend project for the technically proficient amateur there are a number of people who might be interested in building their own modulation meter.

The idea is that I would offer a tested PCB assembly and an RF sampling head. The user would provide a pair of matched analog meters and an enclosure and wire it up.



Here is my first cut at such a circuit. It is all analog with no microprocessor. The ideal meters would be 100uA so the 0-100 scale would be usable. I took a look on the internet and suitable new panel meters range from $13 for cheap ones to $75 for new Simpson meters. There are a number of suitable used meters listed on Ebay.

I was thinking that when I get time I could build one up and send it to you for evaluation.

73,
Bruce K7DYY

BUILD YOUR OWN HIGH QUALITY AM MODULATION METER

Here is an AM modulation meter featuring analog meters for positive modulation, negative modulation and carrier power along with an overmodulation flasher and on air light. Also, a low distortion detected audio output is provided. We offer a built and tested PCB assembly and RF sampler head. You supply the meters and enclosure and put it together.

The operating range for the unit is 100 watts to 500 watts carrier. The percent modulation meters will work down to about 50 watts but the carrier wattmeter is accurate above 100 watts.

When a signal in the operating range is present, the green on air light will come on. If the negative modulation reaches the baseline, the red overmodulation light will flash. The carrier wattmeter is optimized to accurately show carrier shift under modulation and provides an easy to read linear watts display.

Shown in the photographs is a completed version as built here. The 2 unit rack panel is custom cut and engraved by Front Panel Express using software on their website. The meters are from allelectronics with custom scales made with a free program from Tonne software. The panel and styling was selected to look good next to the Super Senior AM Transmitter. This modulation meter is equally suitable for use with vintage and former broadcast AM transmitters and the user will undoubtedly have his own ideas for packaging.

PUTTING IT TOGETHER

The wiring is straightforward as shown in the diagram. A source of 12VDC at 0.5A or more is required. Caution: Some wall wart supplies generate RF interference. You should check with your receiver to ensure your supply is not causing RFI.

The ON AIR connector is wired to the green indicator. Note polarity with the red wire to the plus terminal. The FLASH connector goes to the red overmodulation indicator also observing polarity.

The meters should be in the range of 50uA to 1mA full scale with the connectors labeled on the PCB. Note that the positive and negative modulation meters are plugged into the adjacent CAL connectors for calibration, then moved to the POS and NEG connectors.

The sampler head is connected to RF IN with an SMA cable. The transmitter output is connected to the sampler and the sampler is connected through a reference wattmeter for calibration then to a good quality dummy load.

The AUDIO connector would normally go to a front panel earphone jack

CALIBRATION

First, apply 12V power with no signal to the unit. The bias trimpot located near the 12V connector is adjusted to a point just beyond where the overmodulation light goes out.

Next, apply an unmodulated carrier with power near what you normally use. The green on air light should come on. The positive and negative modulation meters which are plugged into their respective CAL connectors are both adjusted to read 100%. Because of the wide range of meter sensitivity 25 turn pots are used. It would be prudent to turn the calibration pots counterclockwise before applying power to avoid damaging sensitive meters. The blue pots are near each of the outputs.

The RF PWR calibration pot is adjusted so that the meter indication matches your reference wattmeter. There is an additional pot for the RF power meter that is adjusted at the factory. If it needs to be reset, the procedure is detailed in the appendix.

You can now move the plugs from the CAL connectors to the POS and NEG connectors and the modulation meter is ready to use.