

AMSD-2

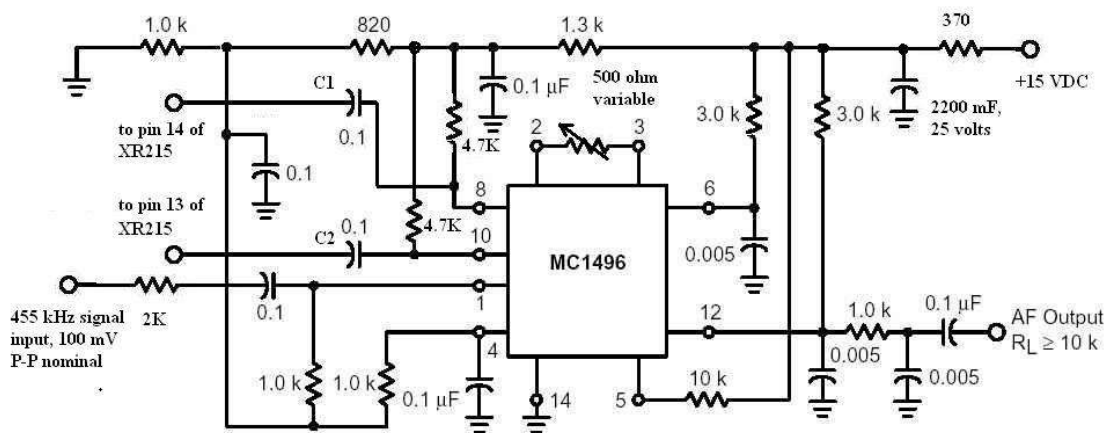
Dallas Lankford, 7/8/04
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The AMSD-2 is an updated and improved version of the AMSD-1 AM synchronous detector which was described in the 1989 issue of Fine Tuning's *Proceedings* edited by John Bryant. The AMSD-1 used two Exar IC's, an XR-215 and an XR-2228. While a few XR-215's can still be found by the diligent scrounger, XR-2228's appear to be unavailable. The 2228 is basically a product detector, so I decided to see if an MC1496P could be used instead. After a few adjustments to my initial design, it seems to be working fine. However, additional use and testing may reveal other adjustments which should be made. Nevertheless, I believe it is close enough to the final version should anyone wish to build it.

Like the AMSD-1, the AMSD-2 has an extremely wide capture and lock range, in excess of ± 100 kHz at most signal levels. You never hear it lock or unlock unless you feed it with a signal generator (and no BW filter). When connected to a receiver 455 kHz IF output with appropriate signal levels the AMSD-2 is completely transparent to the user. There are no hets, whistles, growls, or any other indication that you are using an AM synchronous detector as you tune your receiver. Weak signals, strong signals, it makes no difference. You want USB AMS? Just off tune your receiver to the appropriate side. Again, no hets, whistles, or growls. The AMSD-1, and now the AMSD-2, used to be in a class by themselves (oops, and some of the Racals). However, ICOM figured out how to implement a 32 bit DSP AM synchronous detector in their IC-746Pro that is in the same class. I understand they also use an AMSD in their new IC-7800.

In addition to the XR-215 and MC1496P, the AMSD-2 uses a Velleman M4001 audio amplifier. With a 12 volt supply, it puts out 1.56 watts of undistorted audio into an 8 ohm speaker. The frequency response is 20 – 20,000 Hz at 3 dB down, 86 dB S/N ratio, 40 mV sensitivity with an input impedance of 150 K ohms, and 0.05% THD. It is an excellent audio amp. With an 18 volt supply, it will put out about 3.5 watts into 8 ohms.

This is not intended to be a construction article, but enough information will be given below for an experienced builder to reproduce my new design.



455 kHz signal at 100 mV P-P nominal

XR-215

OP AMP

VCO

to C1

to C2

C0 = 470 pF silver mica // 60 pF variable

Mouser 24AA024

I have been testing the AMSD-2 with my R-390A and WJ-8711A. It works very well with both of them. However, despite what some people say, an AMSD won't let you hear any signals you couldn't hear almost as well without it.

