



## ESKAB PLAM OPTION FOR THE ICOM R71

by Don Moman

The option we've all been waiting for! Phase Locked AM (PLAM) detection significantly reduces the distortion caused by selective fading, a situation that occurs most frequently on the shortwave bands, though it does occur on mediumwave also. As a selective fade goes across an AM signal, the carrier is lost momentarily. This causes a conventional AM detector problems, since it needs a carrier for proper demodulation. The result is a highly distorted signal for a second or so, until the carrier fades back in. Since the PLAM system uses only one of the two sidebands to produce audio, and is only dependent on the carrier for the reference locking signal, the overall effect of the fade is greatly reduced, often to the point where you don't notice it. The SONY ICF-2010 was the first hobbyist receiver to incorporate a PLAM circuit. One problem I noticed with the Sony, and several others have told me they had the same experience, was that when the carrier faded, and lock was momentarily lost, the circuit might not lock on properly when the carrier returned. The result would be an annoying low frequency growl, quite audible. The design of the ESKA board is such that I've never noted this or any other undesirable side effect. Circuit time constants are chosen so that the receiver's frequency will be maintained for short periods when the carrier is lost. During longer periods, the set just reverts back to the conventional USB or LSB mode.

PLAM also makes "ECSS" type tuning (or, more properly NSHD--non-synchronous heterodyne detection, when you tune an AM signal using the BFO in either the USB or LSB mode) almost automatic since once you get close to the correct frequency, the phase lock circuit will take over and keep the receiver properly tuned. With the PLAM board, NSHD becomes SHD! Manually tuning the R71 (most other sets are even harder) to exactly zero beat the AM signal is tricky, especially with weak, fading, drifting or heavily interfered with signals. You get close, but since the minimum tuning step is 10 Hz (unless you have done the Shortwave Horizons RIT mod, which gives you infinite resolution) you may be as much as 5 Hz off. Depending on the filter chosen and the position of the pass band control, you may be able to hear the results of being off frequency, even by a few Hertz. With the PLAM board, a lock range of about 70 Hz is maintained throughout the entire tuning range. This still requires rather precise tuning, but it's not hard to accomplish; your ears can easily hear the improvement when the PLAM locks in, and a front panel LED serves as a lock indicator. The lock range on the Sony ICF-2010 is much wider; 300 Hz at least, often more, necessary since the minimum tuning steps on 2010 are 100 Hz, compared with 10 Hz on the R71.

The PLAM board I tested was the final version but still hand made. The board mounts in place of, or on top of, the EX 257 FM option board. The FUNCTION LED on the R71 now also serves as the "lock" LED. Half of the noise blanker width switch is used to turn on the PLAM option. This means that you are restricted in choosing the noise blanker width (in PLAM mode you must be in wide) but really I find this no problem at all. There aren't many (any?) other points that are easily accessible and not essential, so the N3 width control is the only practical way to do it. There are about 17 wires that must be soldered into various points in the R71. The instructions are complete and very detailed, with numerous diagrams to eliminate any possible errors. The trickiest part is the soldering, as many of the wires are tied onto the leads of existing components. You MUST have a small iron with a fine tip, plus some soldering ability to install this mod. Nothing good comes easy, I guess.

Calibration should be done for optimum performance. The internal REFERENCE and USB/LSB oscillators may need to be adjusted slightly to obtain the desired goal of achieving lock approximately 30 Hz on either side of the exact frequency of the station and to make the display of the R71 indicate that exact frequency. The display of the R71 is not a frequency counter, it merely indicates what the receiver's internal logic thinks it is tuned to. For the two to match, all the internal oscillators must be accurately adjusted. The manual goes through several ways of doing this, both with and without test equipment. An oscilloscope, or at least, a DC voltmeter would be handy to have. I have also described similar calibration procedures in the R71 Performance Manual. If you have done everything correctly, and if the station is exactly on channel (e.g. 15070.00 kHz) you should be able to key in a frequency (this sets the undisplayed 10 Hz logic to zero) and obtain lock for about 30 Hz on either side of the center

frequency. Improper calibration or off frequency transmitters will make it necessary to manually tune for proper lock. The ICOM CR-64 high stability oscillator option is recommended to reduce warmup drift and improve long term stability.

In many cases, especially for weak signal reception, engaging the PLAM option can make a substantial improvement in the amount of recovered audio. The lower frequency audio range in SSB on R71 is very restricted, and the PLAM board contains a capacitor (22 uF connected between R157 and R158) to extend the lower tones. Also the 2.8 filter is selected automatically in the PLAM mode. The overall improvement is impressive, and I find myself using the PLAM mode just about all the time, even on good strong signals. The mods I had done to my R71 including the 6 kHz filter, "true" pass band tuning etc didn't cause any problems and worked even better in conjunction with the PLAM option.

A PLAM option for the R70 should be available soon. A 4 kHz high quality crystal filter is also available from this company, and can be used anywhere the FL-33 6 kHz filter is used. In Canada, the PLAM board will cost Can\$229 and the 4 kHz filter is Can\$79. They are available from Shortwave Horizons, #61-52152 Range Rd. 210, Sherwood Park, Alberta T8G 1A5. In the U.S.A., they are available from Radio West. (ed. note: according to Radio Netherlands Media Network, Radio West has changed hands and is now in Vista, CA 92083, but darned if I could decipher the street address. Phone number is now 619-726-3910.)

(originally from CIDX Messenger)

## NEWS FROM EUROPE

via Ben Peters, except where indicated

One thing for MW DXers to note regarding the JRC MRD-525 is that it uses a series of indicators on the fluorescent display as a signal strength "meter". Ben Peters has found that this indicator does not give a good idea of what your loop antenna is doing. Nulling, peaking and tuning a loop are not easy exercises while using the MRD-525, as nulls and peaks are not defined well by the indicator.

Eavis, P.O. Box 32001, S-20064 Malmoe, Sweden, makers of the above R71 PLAM option, is also proposing to sell a modified JRC MRD-525 with improved selectivity, an added PLAM circuit and possibly a converter for 87-137 MHz. These modifications are apparently sufficiently complex that no add-on kits will be sold, just the radios with options already wired in. Radio West will handle these in U S A (R. Netherlands Media Network)

The Kenwood R-5000. A new 100 kHz to 30 MHz receiver from this well-known Japanese company--has anyone seen/tried one yet? This radio is apparently the receiver section from the TS-440S transceiver, and seems to be close to the ICOM R-71 in its specifications, that is, fine intermodulation performance and sensitivity (somewhat reduced sensitivity on MW), somewhat less selectivity than desirable without use of optional IF filters, and any number of bells and whistles, such as keyboard and tuning knob frequency selection, 100 memory channels, scanning facilities, clock/timer, switchable AGC and noise blanker, notch filter, "IF shift" plus various options. The price is supposed to be similar to that of the R71 (about Can\$1200 in Canada according to Don Moman; a bit less than the R71). This should be (have been?) available in Europe in the late fall of 1986, so presumably North American availability will be at a similar time.

Two devices are available from Surrey Electronics, The Forge, Lucks Green, Cranleigh, Surrey GU6 7RG, England.

The first is their Advanced Active Aerial. Right off, its price of £500 plus shipping should stop anyone in their tracks, but although it seems similar to other active antennas in appearance (a whip and amplifier placed high up, then coax leading to a control box with attenuators and tuner next to the receiver), it covers 4 kHz to 40 MHz, and has a very high signal handling capability. It is intended to be used near powerful MW and LW transmitters, yet its sensitivity is claimed to be limited by atmospheric noise on the tropical bands and lower.

The second device is a considerably modified Yaesu FRG-8800. Mods include superior IF filtering, improved AGC response, and improved image rejection, improved audio quality and S-meter, as well as buffered IF output. Intermodulation distortion at the RF input is not improved. These modifications appear to be aimed at the commercial monitoring market, rather than at DXers, and the price is £720 plus shipping.

Further details on either item from Surrey Electronics.