THE ICOM IC-R71A RECEIVER
A 1991 APPRAISAL

David Clark

BACKGROUND

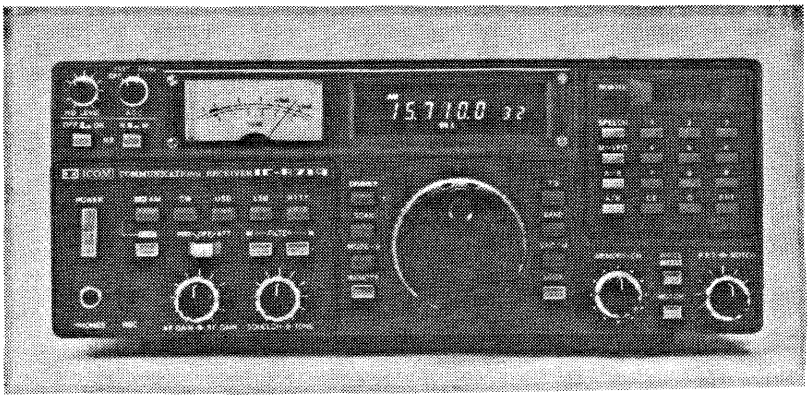
In 1979, two semi-professional receivers, the Drake R7 (later upgraded as model R7A) and the Japan Radio NRD-515 made their appearance in the SWL/Amateur Radio marketplace. While both of these rigs offered top-notch DX performance, their fully-configured $1500-2000 US price range in those days was beyond the budget of many hobbyists. About the same time, however, Japanese manufacturers, principally ICOM and Kenwood, were aggressively catering to the ham radio transceiver market with rigs that were beginning to exploit the emerging digital and microprocessor technologies. As is often the case with new technologies, they mature over time and the cost comes down. And so it was that in the fall of 1982, ICOM took the shortwave listening community by storm with the surprise introduction of the IC-R70 general coverage receiver at a "popular" price.

The design of the R70 was derived from the popular ICOM IC-720A ham transceiver and this heritage was manifest in a number of tuning idiocyncrocies. In spite of these shortcomings, the R70 introduced many shortwave listeners to several "long-forgotten" features such as a Notch Filter and a form of Passband Tuning (PBT). In addition, this innovative receiver offered modern conveniences like digital frequency readout with rock-solid stability and the convenience of dual VFO's - effectively a single channel memory. For a mid-range price of about $750, the receiver's on-air performance was in many respects like a dream come true, especially for DXers familiar with the so-called ECSS tuning technique. (Please refer to *Proceedings 1989* for a comprehensive review of the IC-R70.) [1]

ICOM clearly recognized it had struck a responsive chord in the marketplace. Less than two years later, in January, 1984, a grown-up version of their R70 brainchild was announced. First-released at a base price of $800 (and for a while retailing at less than $700, excluding options), the IC-R71A was destined to be a major factor in the "serious" tabletop shortwave receiver market into the 90's. The receiver has enjoyed an unusually long shelf life and is still being produced under the same model identification today (mid-1991). Regretably, due to a patent dispute, units manufactured after March 1989 have been devoid of the useful PBT circuit.

The original R71A continues to enjoy a favourable reputation as a high performance "DX machine". But in the face of more recent competitive offerings from Kenwood, Japan Radio, and the promising re-entry of Drake into the market, the price/performance ratio of the ICOM is *NOT* the clear winner that it was when first-introduced seven years ago as the mature follow-up to the revolutionary R70.

1984 - PERFORMANCE WITH PIZAZZ



For the most part, the R71A built upon the foundation established with the trend-setting R70 and the improved R71A software resolved most of the tuning quirks of its predecessor. Our present-day perspective is undoubtedly influenced by the capabilities of the gear that has become available in more recent times. We have seen the coming of the Kenwood R5000 and the Japan Radio NRD-525, each now of about five years' vintage (see reviews in *Proceedings 1990* and *Proceedings 1989* respectively). Now in 1991, both the new Drake R8 and the NRD-535 seem to offer great promise. But if we look back to 1984, many hobbyists found it hard to resist the temptation of ICOM's catchy advertising slogan - 'The Best Just Got Better'. I know...I bought the R71A, loaded with most of the available options!

Among the "firsts" for its time in "serious" SWL-oriented communications receivers, it sported a keypad for direct frequency entry, a dual-width Noise Blanker with a variable threshold control and 32 fully tunable memories, together with a number of scanning capabilities. Such optional niceties as infra-red remote control and synthesized voice readout of frequencies - useful for the sight-impaired - rendered a certain "sex appeal", albeit at extra cost. Provision was also made for an external computer interface. Software to control the receiver via this port never materialized from ICOM itself but was later provided in various forms by a number of third party vendors.

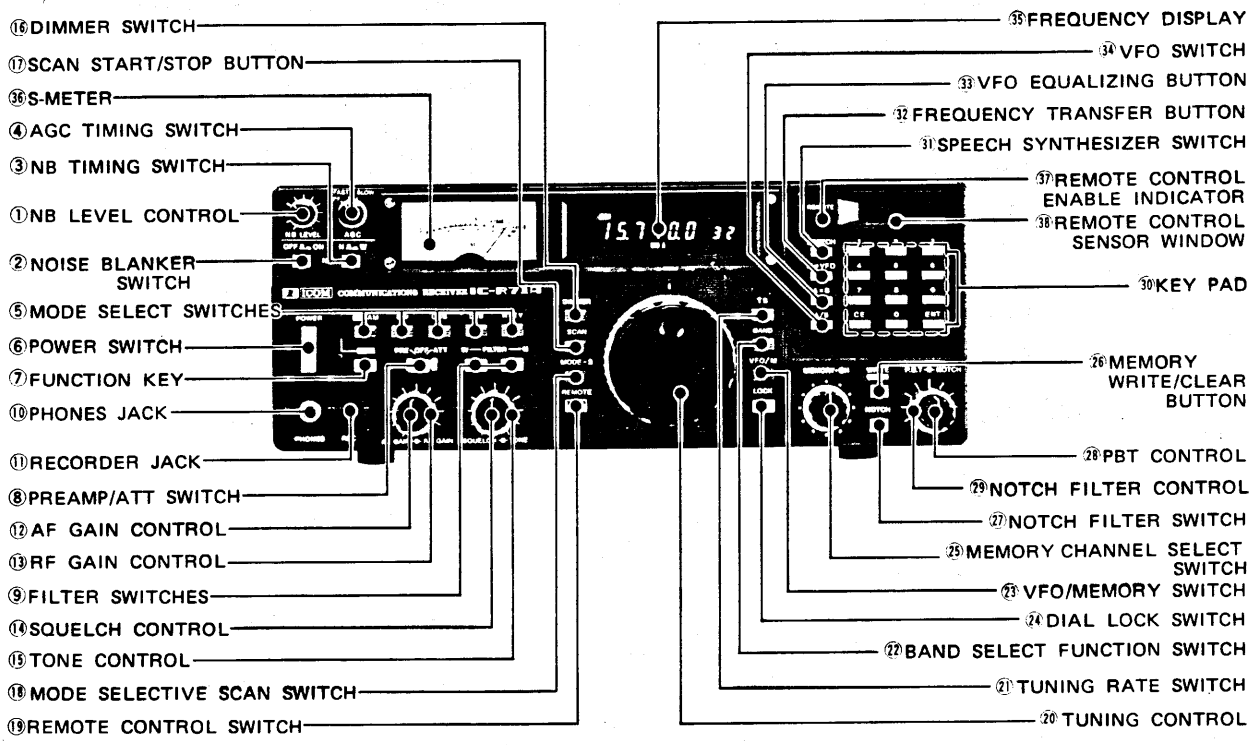


Figure 1 - FRONT PANEL LAYOUT

In terms of its all-important signal processing capabilities, several significant upgrades of interest to DXers were incorporated in the R71A. With a redesigned front-end, dynamic range was notably better. Although quality control (mostly alignment) had been a problem with some R70's, the R71A was, by most accounts, more reliably up to its rated specifications. While IF filter selection was achieved by an unnecessarily awkward arrangement involving two push-buttons, at least the filter selection was made mode-independent. The R70 offered only a single (wide) position for AM, rendering the PBT circuit of marginal use in that mode.

Traditionally, sensitivity "sells" and neither receiver was lacking in that regard, at least on the HF bands. High sensitivity with the switch-selectable preamplifier was complemented by low-noise receiver and microprocessor circuitry in the R71A. Taken together with the more flexible selectivity choices and high stability critical for ECSS, the "Three S" criteria (Sensitivity, Selectivity, Stability) combined to make the R71A the receiver of choice, especially for many DXers who were primarily interested in digging out weak shortwave broadcast and/or utility signals. The compact size and (optional) 12V DC capability made it an ideal rig for DXpeditions too.

Dual VFO's are a handy feature for checking parallels or "holding" a frequency in one VFO while bandscanning with the other. Switching between VFO 'A' and 'B' was improved in the R71A to the extent it was smooth and virtually instantaneous. Each VFO acts like the other 32 memories, storing the frequency and the operating mode.

To listen to a signal in ECSS mode, the carrier frequency can be stored in USB mode in one VFO and in LSB mode in the other VFO (or in two adjacent memory channels). It is then possible to quickly switch between VFO's (or memory channels) and to independently fine-tune the frequency of any signal if necessary. This technique circumvents the automatic 1.5 kHz (SSB) offsets that would otherwise necessitate retuning each time when switching between upper and lower sideband ECSS modes. The software "remembers" the latest frequency tuned in VFO mode. In memory mode, the stored frequency can be fine-tuned (and rewritten) as necessary.

Although user friendliness was improved, the R71A, like its predecessor, bristled with knobs and buttons. As indicated by Figure 1, the instruction manual describes thirty-eight controls and functions which are supported on the compact front panel. This provided the user with a lot of flexibility to cope with a variety of reception conditions. Even so, the well-laid-out but rather small controls were crowded onto the front panel. This hardly afforded the "sense of command" many DXers associate with a more traditional "radioman's radio" like the NRD-515 or the hollow state Hammarlund or Collins sets. When it comes to desktop operation in the shack, ease of use seems to me to far outweigh the "need" for miniaturization.

SOME SHORTCUTS AND SHORTCOMINGS

Considering that the R71A was brought to the market during a period of inflation for almost the same base price as the R70, one assumed that some shortcuts or design liberties must have been taken. Fortunately, ICOM's proven, quadruple conversion superhet design was maintained and as noted, the front-end was even improved. In addition, as we shall discuss, many of the limitations of the stock model could be overcome with relatively simple modifications.

To keep the price competitive, it would seem that the principal compromise was in the stock IF filter lineup: in the R70, good quality crystal filters were provided for AM wide (6 kHz) and CW/RTTY (500 Hz) in the 2nd IF. In the R71A, only a low-cost 6 kHz ceramic in the 3rd IF (PBT) was provided for AM wide, while the CW and RTTY positions relied upon the 2.3 kHz SSB crystal filter in the 2nd IF unless a separate CW filter ($50-60 price range) was purchased as an optional extra.

Both receivers, in their stock versions, provided only inexpensive ceramic filters in the so-called PBT circuit. This was a pity because ultimate selectivity was actually degraded when this variable bandwidth feature was invoked due to the poor shape factor of these filters. Note that the ICOM function labelled PBT is neither "passband tuning" nor "passband shift" as these terms are conventionally understood. Rather, the feature is intended to continuously vary (narrow) the bandwidth of the selected filter position by up to 500 Hz from either the upper or lower edge of the passband. "Variable bandwidth tuning" would be a more apt description.

The R70 design was one of the first to provide variable rate tuning capability down to as little as 10 Hz synthesized steps; further, a Receiver Incremental Tuning (RIT) control was also included. This permitted analog tuning resolution of a carrier frequency, necessary for "on-the-nose" (in-phase) ECSS reception. Unfortunately, the RIT control was dropped from the R71A, an inappropriate (cost-saving?) omission.

The R71A is wired to accomodate 12 volt DC operation but ICOM sure doesn't make much of it. It's not listed in the specifications and a one-liner in the manual merely refers the owner to an ICOM dealer. The DC connector must be purchased as an option: $10 bucks!! Can you believe it? At least the five minute installation job is a simple matter for any user.

Whereas the R71A no longer "dictated" USB/LSB selection according to amateur band conventions, the automatic 1.5 kHz offsets continued to be invoked when switching from AM mode to either sideband, and when toggling between upper and lower sideband. This would have been a major nuisance for DXers using ECSS mode, were it not for the availability of the second VFO and tunable memory channels as outlined above. What's more, the highly desirable IF Notch was operative only in SSB/ECSS mode. At least with the R70, the Notch was partially usable in AM mode.

Commentators have suggested the R71A was "tailor-made" for the serious SWL crowd. They must have been thinking only in terms of strong, clear channel signals which are readily tunable in AM mode on the International Bands. Even at that, wide AM performance often suffers in the face of typical 5 kHz channel spacing on the HF bands and the wide position is virtually useless on the Tropical Bands. A mid-range bandwidth (say 4 kHz) with good skirt selectivity is sorely needed. Of course, the NRD-525/535 share the same deficiency! ICOM and Japan Radio, even today, could afford to learn a lesson from Drake. The new Drake R8 utilizes L/C tuned circuits in the 50 kHz 2nd IF (instead of ceramic and/or crystal bandwidth filters). Otherwise, it continues

the 1982 tradition of the expensive R7A, offering a range of five well-selected bandwidths, including 4 kHz, with better than 1:2 shape factors.

"Japanese audio" has been an irritation to many for more than a decade. Some optimists originally suggested that the audio output of the R71A was significantly improved over the R70. Indeed, the R71A Manual states that the detected AF is fed into "a high performance and low distortion AF power amplifier IC". Rubbish! In lab tests, AM distortion was found to be inordinately high, especially at the lower audio frequencies. The Tone control is of little use because it merely cuts treble response. As one reviewer wryly asserted, the Tone control, such as it is, should be permanently welded in the full clockwise (maximum treble) position. Judicious adjustment of the PBT control and the Notch Filter (in ECSS mode, or in AM mode with modification) near the carrier frequency serves to alleviate the muddy low-end response to some extent.

The front panel of the R71A is so busy that there was no room for a forward-facing speaker as provided on the R70. ICOM might as well have not bothered with the flimsy, top-firing speaker in the R71A. An external speaker is highly recommended; at least it will mask the distortion of the audio stage to some degree. The contemporary Kenwood R5000 receiver is widely acknowledged to provide much more "pleasant" audio, especially for extended periods of program listening. Early reports also indicate that audio quality *far superior* to ICOM or Japan Radio receivers is a strong suit of the Drake R8. Still, I personally don't think any solid state communications receiver that we have seen to date can hold a candle to the "intelligible", low distortion audio which is delivered by many of the older, better-grade tube-type receivers.

The R71A provided three different scanning modes and two selectable scanning speeds, with or without squelch. The problem is that the combination of the inadequate threshold level of the squelch and a pre-set scan speed that is too fast mean that it is almost impossible to spot weak DX signals in any scanning mode. There is an internal pot that can be adjusted to slow the scan speed. In any event, scanning capabilities may be of some value to utility DXers but I have not found them to be of much use as a SWBC DXer.

A year after the R71A made its appearance, there was a short-lived rhubard in the SWL press when it was learned that the lithium "back-up" battery didn't just back up the data contents stored in the memory channels. In fact, it was also required to maintain the program functions in the "volatile" Random Access Memory (RAM) when receiver power was shut off.

After some waffling on the subject, ICOM said that the battery was more likely to last fifteen or more years, not just five to seven years as originally prescribed. In the event of battery failure, ICOM said it would re-program the RAM board and supply a replacement battery for about $25. In the end, however, a technique was found so that the battery could be replaced periodically before it expired, without the inconvenience of removing the RAM board and shipping it back to the factory service centre.

1989 - THE 'BEST' IS NO LONGER BETTER!

Eliminating the PBT circuit with no change in list price (now $999) amounted to a de facto price increase early in 1989. Worse still, the marketing geniuses at ICOM chose not to change a "winning" model identification - pretty deceitful to the unsuspecting consumer!

The bottom line, however, is that the absence of a PBT circuit (including an appropriate substitute filter) *SERIOUSLY DETRACTS* from the "new" R71A's merit as a DX receiver, at least in its current $850+ retail price class. I understand that at least one supplier, Electronic Equipment Bank, is (or was) prepared to "restore" the PBT functionality but at a cost of more than $100. With that, we're well on the way towards $1,000 and we haven't even talked about options or modifications yet!

In 1991 there are plenty of "original" R71A's (often with some of the ICOM options or other modifications already incorporated) available on the used market for much less money. Look for the concentric PBT/Notch controls in the lower right-hand corner of the front panel as shown in Figure 1 - that's the one you want. I strongly advise avoiding the "new" version.

OPTIONS AND MODIFICATIONS GALORE

A glance at the 1985 catalogue of one of the major SWL suppliers reveals that a stock R71A could be had for an attractive $659. But as soon as an enthusiastic buyer started loading up on a number of the available options, it wasn't too hard to get the eventual price-tag up in the $900-1100 range. (By this time, the older but top quality Japan Radio NRD-515 had been discounted to a comparable $1,000 price level, in advance of the release of the '525'.)

The RC-11 remote control unit (about $60) was interesting in that it allowed memory channels to be called up and entered directly. Notwithstanding ICOM's somewhat misleading advertising, the keypad on the receiver could not be used to access/update memory channels directly. It is necessary to manually select a channel using the memory channel switch and to hit the memory/write button after punching up a desired frequency.

Both the R70 and the R71A exhibited excellent frequency stability. The R71A is rated as having less than 50 Hz variation after more than one hour. I found it to be virtually drift-free for extended periods of time in ECSS mode so the optional CR-64 high stability crystal oven (approximately $55) is not required, except perhaps for professional applications.

Fortunately, many of the inherent limitations of the stock R71A could be resolved with modifications. As an information source, I highly recommend the *ICOM R71A Performance Manual* which was published by Don Moman in 1985. [2] This manual is *THE* required reference for every owner or prospective owner of the R71A and the $10 price is right. It contains a useful summary of the operating features of the receiver and is a gold mine of information detailing a host of performance-enhancing modifications and upgrades.

I will not devote time describing the wiring changes and other specifics associated with modifications mentioned below. The reader should refer to the manual. Some of the modifications cited originated with other hobbyists and are acknowledged in the text. Don also provides simple, step-by-step procedures for alignment and other adjustments to bring the receiver to specification without the necessity of having an RF signal generator and a digital frequency counter. That is worth the price of the manual alone!

RF SECTION:

As noted, sensitivity on the HF bands is first-rate, especially when the low-noise preamp is switched on for weak signal reception. Below 1600 kHz however, the preamp is disabled to reduce the possibility of front-end overload and degraded dynamic range in strong signal environments. For MW DXers, a simple modification (involves cutting one wire in the bandpass filter section) is all that's required to enable the preamp to kick in, down to about 500 kHz. (A similar modification to the R70 extended the preamp range down to about 200 kHz, thus covering most of the overseas LW broadcast band as well.) The second step is to bypass a fixed attenuator in the MW bandpass filter circuit. These changes are especially desirable for MW DXers using loop antennas. The sensitivity improvement in both receivers is quite significant: 15-20 db additional gain!

This is an opportune time to mention that the owner of the R71A (or any other solid state receiver) ought to take precautions to provide some kind of RF protection from static buildup. The front-end of the R71A tends to be more immune to high static levels than some other receivers but it is unprotected nonetheless. Some receivers like NRD-515/525/535 employ back-to-back or series diodes to limit RF voltage at the antenna input but they cause rectification problems with strong signals.

A trick that Don describes in his manual overcomes this problem but still provides a worthwhile degree of protection. The simple procedure is to install a small neon bulb (the NE-2 available from Radio Shack has a firing voltage of about 70 volts) and a small resistor (10K ohms at 1/4 watt) in parallel with the antenna input and the chassis ground. The resistor acts to "bleed" off static charges before they reach the 70 volt level but if that point is reached, the neon bulb will then conduct heavily, thus limiting the voltage potential at the antenna input. Don tells me "I have never blown a front end on any set that had the neon bulb modification, even though I've seen in flashing merrily away with large thunderstorms in the area".

Of course, neither this arrangement nor any of the commercially available "protection" devices will be of much use in the case of a direct lightening hit. The only safe recourse with the approach of an electrical storm is to physically disconnect the antenna *AND* the AC power source.

IF SECTION:

The one "must-have" option for the serious DXer was the FL44A, a high quality 2.4 kHz eight-pole crystal lattice filter which replaced the 2.8 kHz ceramic in the PBT circuit. This filter was not cheap at $150 but it provided far superior ultimate selectivity for narrow (ICOM called it "normal") AM and SSB/ECSS. Alternatively, some DXers opted for a Collins mechanical filter in one of several available bandwidths which could be optionally installed by some dealers, including Universal Radio.

The subject of IF selectivity merits further discussion because the manner in which the various filter combinations (including the PBT circuit) were invoked, depending on mode and position selected, was quite

complex. ICOM did not make matters any easier to understand: the published specifications were incomplete and the manual contained misleading information in this critical area.

To assist owners and prospective owners of the R71A, Figure 2 shows the mode/filter combinations for both the stock version and as altered when the optional 2.4 kHz PBT and CW (2nd IF) crystal filters were incorporated. [2]

MODE	SELECTED> POSITION	WIDE	NORMAL	OPTIONAL NORMAL	OPTIONAL NARROW
AM	- 6db -60db	6.1 11.0	2.8 4.7	2.4 3.1	(Same as Normal)
	2nd IF 3rd IF (PBT)	-- 6 kHz Ceramic	2.8 kHz Crystal 2.8 kHz Ceramic	2.8 kHz Crystal 2.4 kHz Crystal	(Same as Normal)
SSB/ ECSS	- 6db -60db	2.8 4.7	2.2 3.3	2.2 3.3	(Same as Normal)
	2nd IF 3rd IF (PBT)	2.8 kHz Crystal 6 kHz Ceramic	2.3 kHz Crystal 2.8 kHz Ceramic	2.3 kHz Crystal 2.4 kHz Crystal	(Same as Normal)
CW	- 6db -60db	(Same as SSB)	(Same as SSB)	(Same as SSB)	0.25 0.90
	2nd IF 3rd IF (PBT)	(Same as SSB)	(Same as SSB)	(Same as SSB)	250 Hz Crystal 2.4 kHz Crystal

Figure 2 - IF FILTER CONFIGURATIONS / MEASUREMENTS: STOCK AND OPTIONAL

Other selectivity modifications (not reflected in Figure 2) were also possible and are outlined in Don's manual. For example, unless you were a utility DXer requiring a narrow CW filter, the unused 2nd IF slot could be wired to incorporate the better 6 kHz crystal as found in the R70 for improved AM wide performance. The FL-33 filter (costing about $40) yielded selectivity measurements of 5.8 kHz at -6db and 9.6 kHz at -60db.

Taking matters a step further, a tighter ceramic (such as the 5 kHz filter which Sony uses for narrow selectivity in the ICF-2010) could be substituted for the stock 6 kHz PBT ceramic. Don told me about this particular filter although it is not mentioned in his manual. The pin-for-pin replacement makes substitution a simple matter. This filter does significantly improve the performance of the PBT in wide AM and to some extent in wide SSB/ECSS mode. Don says that he has also used it to good effect in other rigs which he has owned, including the ICOM IC-735 and the Kenwood TS-440. The Sony part number is 1-527-569-00.

Don cites other ceramic filters that can be used for this substitution, although some mechanical and electrical expertise is required to perform the installation. For example, the Vernitron VTD-3-I, a better-grade 4 kHz ceramic, yields selectivity of 4.3 kHz at -6db and only 6.6 kHz at -60db when used in combination with the FL-33. Terrific!

Now that we've invested the effort to improve AM selectivity, wouldn't it be nice if the Notch Filter could be made to operate in AM mode? Well, as Don describes, this very worthwhile enhancement can be accomplished quite simply: all that's involved is splicing in one resistor in the IF section. The notch will now cover the range of +1200 Hz to -1500 Hz in AM mode - quite adequate for most close-in hets, especially when

one considers that the notch depth is superb, measuring close to 100db reduction!

Modifications in the IF section are rounded out by adding a jumper wire between two diodes near the filter switch which must also be set to the "on" position. The effect of this change is to enable true PBT with the R71A, a capability which Drake made famous with the R4 Series and the R7/R7A. Thus, the PBT filter (3rd IF in the R71A) can be positioned anywhere in the passband, making it possible to move between the upper and lower sidebands without retuning. Rotating the PBT control is a neat trick for tailoring the audio response to the individual's liking too, even if there is not a problem with an interferring signal.

IMPROVED SYNCHRONOUS DETECTION:

Since I am a fan of ECSS, I bemoan the lack of RIT. One cannot fine-tune within the minimum 10 Hz synthesizer tuning steps. Don provides a solution for this that I have never seen elsewhere. The modification involves moving the MASTER CAL trimmer to the tone control (no loss since since it should be left in maximum treble position anyway). The result is plenty of RIT range on either side of the tuned frequency. With a good ear you can now get perfect phase-match in ECSS mode when reception conditions warrant using that tuning technique.

One other problem in SSB/ECSS mode is the greatly reduced audio output as compared with AM mode. Installation of one resistor in parallel with another in the audio section serves to provide a modest increase in the audio output from the product detector IC while leaving the AM mode output undisturbed.

Moman's manual does not address internal or external add-on synchronous detection devices which can used to reduce the effects of selective fading. They are worth considering because they also provide much better audio quality than can be obtained by operating the R71A "barefoot" in ECSS mode. Units which employ either the phase lock loop (PLL) or the non-phase lock loop (non-PLL) principle can be used. The various means by which synchronous detection can be achieved and the advantages of each are clearly explained in an article by Craig Siegenthaler in *Proceedings 1990*. [3]

For those prepared to invest an additional $200 or so, perhaps the "ultimate" in PLL synchronous ECSS reception was available by purchasing the ESKAB/EDVIS 'Phase Locked AM [PLAM] Board'. Early editions of this add-on unit were manufactured for the R70 and well as the NRD-515 but they are quite rare. The PLAM board for the R71A was more widely distributed. Mine was purchased from and installed by Don Moman. The installation procedure is rather beyond the capabilities of an electronics neophyte like me!

Briefly, the PLAM board enables the user to obtain phase-locked AM reception using the product detector of the R71A in USB or LSB mode. Once installed, it is activated by placing the noise blanker 'Width' control in the "wide" position. The lock range is in the order of 50 to 70 Hz relative to the carrier frequency of the intended signal. PLAM lock is indicated by a steady glow from the 'Function' LED on the front panel of the receiver. The PLAM works well with moderate level signals, provided there is not another interferring carrier in the passband. ESKAB therefore recommended (and supplied) an optional 4 kHz crystal filter that could be fitted in the available 2nd IF slot (instead of ICOM's 6 kHz FL-33 as discussed previously). This filter provided an ideal bandwidth for effective performance in phase-locked, as well as normal AM mode on the SWBC bands.

As with other PLL synchronous detectors, it tends to exhault background noise as well as the desired signal, thus rendering it less useful for weak signals, except under very quiet conditions. I have found on occasion that the circuit helped pull a very weak signal up out of the mud. The absence of an RIT does make the PLL device somewhat "touchy" to operate. A similar PLAM board is presently available from ESKAB for the NRD-525 but the R71A version may not be available now, except where already installed in a used receiver.

Other R71A owners or prospective owners might consider the MultiBand AM Pickup (MAP) unit currently available from Kiwa Electronics as an appropriate alternative. ECSS reception is not possible when the MAP is used with the R71A (or the R70) because the receiver's product detector follows the 4th IF which functions at 9 MHz - the MAP operates at the more conventional 455 kHz. However, the MAP offers the capability of (non-PLL) synchronous detection in AM mode, additional stages of IF filtering and *vastly improved* audio. A full review of this high quality add-on unit can also be found in *Proceedings 1989*. [4]

OTHER:

One other audio-related modification is worthy of note. The fixed record output level in the stock R71A is limited to about 100mv, as compared with the standard "line" level of .775v at 600 ohms. This is inadequate,

especially for very simple portable recorders. A modification whereby one offending resistor is shorted out serves to triple the signal level. Why risk having an unnecessarily poor recording of those once-in-a-season DX catches?

Finally, Bob Grove describes a solution for the potential expiration of the lithium battery. [5] To paraphrase his explanation: With bottom plate cover removed, locate the backup battery near the centre, plug in power to the receiver and turn in on normally so that the RAM circuit will remain powered up, even when the original battery is removed. Unsolder the old battery, ensuring that a soldering iron having a non-grounded tip is used (so as not to short out the grounded power supply in the process). Remove and replace the battery with a fresh one. Performing this surgery about every five years should ensure that the receiver functions will not die due to loss of the operating software. I've had my R71A for seven years now and it still holds the original battery. I wonder if I'm living on borrowed time?

THE LAST WORD - A 1991 APPRAISAL

In my opinion, there is no doubt that the "original" ICOM IC-R71A continues to be a *very capable DX receiver*, even by today's standards. A clean, used R71A (ie. a unit manufactured before March, 1989) which has been fitted with the FL-44A filter, or an appropriate substitute Collins mechanical filter, in the PBT circuit is a worthwhile buy for $750 U.S. or less (as is the venerable NRD-515).

I would not advise paying more than $600 for an "original" R71A if the PBT filter has not been upgraded. Alternatively, if one's hobby budget is a constraint, the predecessor R70 remains a relative "bargain" in the $350-400 price range. Of course for that money, or even less, this writer would be looking first for a well-preserved Hammarlund SP-600, HQ-180 series or Collins R-390A...and I already have all three of these boat anchors. Old habits die hard!

I reiterate my belief that the "new" R71A should *NOT* be purchased at the current $850 retail. For about the same outlay, the Kenwood R5000 would be the better buy, brand new, for all 'round DX and program listening purposes. Moving up the pricing ladder to somewhat more than $1100, the NRD-525 has been the serious DXer's "receiver of choice" for the past five years. The '525' is not without its "blemishes" either, but Guy Atkins describes many worthwhile modifications and upgrades elsewhere in this edition of *Proceedings*.

If the price is right and you are inclined to tinker,invest ten bucks for Don Moman's Performance Manual and have fun with the R71A. You will certainly hear lots of DX with it. But I'll conclude this appraisal by hedging my bets. Earlier this year, Japan Radio purported to "re-write the standard" by which other receivers are judged with the release of the new NRD-535D in North America. It contains several interesting built-in enhancements over the '525': a PLL synchronous detector and a variable bandwidth control. It is also reported that the aggravating IF "white noise" inherent in the '525' has been cleaned up. It remains to be determined, however, if the NRD-535 "delivers" on its stock $1600 price-tag, especially since the stock IF filter lineup remains unchanged. Regardless, human nature being what it is, many '525' owners will probably jump on the bandwagon and "upgrade" to the '535'. Do we detect some emerging bargains in used '525' receivers?

At the April/91 Dayton Hamfest, a pre-production model of the new Drake R8 was showcased and garnered a lot of attention. The R8 also features a PLL synchronous detector and on paper appears to carry over many of its *very impressive* specifications from the vintage R7A. The proof of the pudding will be in the performance and an encouraging picture was beginning to emerge as this article was being completed in July, 1991.

Guy Atkins was one of the early R8 purchasers. He expresses some concerns with the ergonomics and operating software. But he does report that when it comes to tough-signal DX performance, "this radio really cooks", the equal of a Drake R7 and an NRD-515 in side-by-side comparisons, with vastly superior audio quality to boot!. While hunting trans-Pacific "splits" on medium wave, sometimes separated from powerful domestics by only one or two kilohertz, Guy found the Drake's 1.8 kHz selectivity was not quite the equal of a 1.9 kHz Collins mechanical fitted in a '525' but that's a mighty demanding test!

I think it's a pretty good bet that the Drake R8, at an indicated retail price of $960, will emerge as the "hot" item of the year among SWBC DXers and perhaps will remain-so for some years to come, just as the R71A did in its heyday. I'm sure you'll be able to read all about these recent offerings from Japan Radio and R.L. Drake in *Proceedings 1992*.

REFERENCES

[1] Atkins, Kevin; Strawman, Jerry; and Tow, John. "The ICOM IC-R70 - A DXers Review, Technical Description and Modifications". *Proceedings 1989*. Fine Tuning Special Publications, 1989

[2] Moman, Donald. "ICOM R71 Performance Manual". Shortwave Horizons, 1985

[3] Siegenthaler, Craig. "Synchronous Detection". *Proceedings 1990*

[4] Atkins, Guy. "The Kiwa Electronics' Multiband AM Pickup". *Proceedings 1989*.

[5] Grove, Bob. "Ask Bob" column in Monitoring Times, June, 1990

SELECTED BIBLIOGRAPHY

Lichte, Rainer. *Radio Receiver - Chance or Choice*. Gilfer Shortwave, 1985

Magne, Lawrence. "WRTH Tests Full-Size Receivers". *World Radio TV Handbook, 1985*. Billboard Publications, Inc., 1984

Magne, Lawrence. "RDI Evaluates The ICOM IC-R71 Receiver - A Radio Database International White Paper" (Edition 1.2 and Addendum). International Broadcasting Services, Ltd., 1988

McCoy, Lew. "The ICOM R71A General Coverage Receiver" in CQ Magazine, August, 1984

Moman, Donald. "ICOM IC-R71A: The Best Just Got Better - Or Did It?" in The Messenger (Canadian International DX Club), July, 1984

Moman, Donald. "Receiver Comparison Guide" in The Messenger (CIDX), November, 1984

Tow, John. "A Critical Review of The ICOM R-71A" in FRENDX (North American Shortwave Association), July, 1984