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*** ZYCOMM HF7070 DSP HF Shortwave Receiver



" You Seen It Here First ! "

Here are a couple of limited front panel photo's of the proposed UK " ZYCOMM HF7070 " DSP HF receiver , taken in Nov of 2010.
(NOTE : The AOR logo you see in the photo's above are no longer valid.) Display format appears will be in XX.XXX.xx (down to 10 hz just like with the AR7030) ?

6 encoders (not including the tuning knob). A nice "rubber track" tuning knob (no more "greasy door knob" like with the AR7030's tuning).
Our thanks to Colin G3SBI and Mark Sumner who took these pictures (I did my best to enhance them). Mark is organising the build on the HF7070.

(Photo's : Mark Sumner via Colin G3SBI , Photo Edit : N9EWO)

The ZYCOMM HF7070 Short Wave Receiver

This receiver is a double conversion superhet with a first IF of 45 MHz and a second IF centred round 45KHz before going to a 24Bit audio ADC. The output from the ADC goes to an advanced 24 Bit fixed point DSP system. The radio covers DC to 30MHz and has a noise figure of 12 dB without the use of a preamplifier before the first mixer. Out of band IP3 at 50KHz spacing is 45dBm giving an SSB IP3 dynamic range of 115 dB. The Ip3 within the 15KHz bandwidth of the roofing filters is 19dBm at 100 Hz spacing in an SSB bandwidth giving an IP3 dynamic range of 97dB. This in band linearity sets new standards for an up-conversion radio and gives superb high fidelity reception of FM AM SSB and CW signals.

The receivers analog front end has two H-mode mixers using fast bus switches. The first mixer is terminated by hybrid connected 2 pole 45MHz filters of 15KHz bandwidth which is followed by the first IF amplifier. This amplifier having a noise figure of 1,3 dB and IP3 out of 40dBm drives a further 4 poles of roofing filter which is followed by a second amplifier. This amplifier drives the second H-mode mixer which produces an output centred on 45KHz. There is a stage of amplification at 45KHz before the 24 Bit audio ADC.

The superb technical performance of this receiver apart from the linearity of individual elements in the signal path is due to careful control of the gain distribution before the 24 Bit ADC.

A fact that is not generally appreciated is that the in-band IP3 of crystal filters is worse for a narrower design bandwidth at roughly 6dB per octave. In the HF7070 the in band IP3 of its 15KHz bandwidth roofing filter is 26dBm and this is not degraded by circuitry following the filters. The last thing this receiver needs is the narrower VHF roofing filter options of Japanese designed receivers.

Now that a pre production batch of ten HF7070s is being made I am looking forward to seeing a few independent reviews on this superb HF receiver. I would also like to acknowledge that the basic signal path design of the HF7070 faithfully follows the principles established by Bill Squires W2PUL in the 1960s. Bill was tragically killed in a flying accident shortly

after the launch of his [Squires Sanders SS-1R short wave receiver](#).

Colin G3SBI

[Colin, G3SBI has posted an internal photo of the long awaited ZYCOMM HF7070 receiver on this web page \(posted below as well\)](#). We can get a feeling that by looking at this picture that it will be using a optical encoder for tuning (knob) ??, 6 front panel controls - encoders , full keyboard "front panel" entry. Also with the relays in the "row", almost has to be using front end filtering-preselection, and the use of BNC antenna connectors (no more PL-259's). I think I see a optical TOSLINK jack too on the rear panel ?? Same type of "soft metal" diecast cabinet too as used in the AR7030?? Still going to use a 9 pin serial port for computer connections (for lower noise?).

Also information via Colin, John Thorpe has indicated that an "external" switching mode power supply will be included with the 7070. Appears that it will use the more standard 12 vdc requirement, where the AR7030 is at 15 vdc to operate properly.

"The SMPS we have chosen for the 7070 is quiet in comparison to some. It runs at about 70kHz with a fairly pure sinewave and I have found harmonics only up to 280kHz. Obviously the interference it produces will depend on the installation, grounding and power line arrangements in each situation, but I recon this PSU will cause little problems other than on the few harmonic frequencies in the LW band. Since the PSU is external to the radio the user can always replace with an analogue supply if (s)he wishes. Power requirement is 12V at 1.5A."



**Internal Photo of the ZYCOMM HF7070. The AOR markings your see on the "PC Boards" is no longer valid.
(photo : Colin, G3SBI)**

More information as I receive it.
As always, "Caveat Emptor".

Cheers,
Dave N9EWO
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Links :

[" Measurements by John Thorpe on the ZYCOMM HF7070 HF Receiver Production Prototype "](#)

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