Sherwood Engineering HF Test Results

Model: Yaesu VR-5000 Serial # 0M050011 Test Date 03/18/2001

IF BW, Wide AM -6/-60, kHz: 17.2 / 29.6	Ultimate	70	dB
IF BW, AM -6/-60, kHz: 8.7 / 12.3	Ultimate	70	dB
IF BW, Nar AM -6/-60, kHz: 3.9 / 5.2	Ultimate	70	dB
IF BW, SSB/CW -6/-60, Hz: 4.0 / 5.2	Ultimate	70	dB

Front End Selectivity (A - F)			C
Image Rejection		Unknown	
IF Rejection @ 10.7 MHz	(Front-end band dependent)	30	dB

Dynamic Range @ 15 MHz, DR 20:	64 dB	IP3	-38	dBm
Dynamic Range @ 15 MHz, DR	**5:**	**49 dB**	**IP3**	**-60**	**dBm**

Blocking at 100 kHz	110	dB
Phase Noise (normalized) @ 10 kHz offset:	94	dBc

Noise floor, SSB bandwidth	29 MHz	-130	dBm
Sensitivity, SSB bandwith	29 Mhz	0.21	uV
Noise floor, SSB bandwidth	14.2 Mhz	-134	dBm
Sensitivity, SSB bandwidth	14.2 MHz	0.15	uV
Noise floor, SSB bandwidth	10 MHz	-134	dBm
Sensitivity, SSB bandwidth	10 MHz	0.15	uV
Noise floor, SSB bandwidth	5 MHz	-132	dBm
Sensitivity, SSB bandwidth	5 MHz	0.17	uV
Noise floor	2 MHz	-126	dBm
Sensitivity	2 MHz	0.35	uV
Noise floor	1 MHz	-120	dBm
Sensitivity	1 MHz	0.8	uV
Noise floor	200 kHz	-101	dBm
Sensitivity	200 kHz	5.0	uV
AGC Threshold -3 dB:		11	uV

Stability at 10 MHz after 10 second warmup	100	Hz

Frequency response Distortion AM, 60% modulation narrow & wide bandwidths

100 Hz	-10.4	dB	9	%	9	%
200 Hz	-5.3	dB	4	%	3	%
400 Hz	-1.8	dB	3	%	3	%
1000 Hz	ref	dB	3	%	1.5	%
2000 Hz	+0.3	dB	3	%	1.5	%
3000 Hz	-4.1	dB		%		%

Distortion SSB and audio noise floor

100 Hz	3	%	-30	dB
200 Hz	3	%	-30	dB
400 Hz	3	%	-35	dB
1000 Hz	0.8	%	-45	dB
2000 Hz	0.2	%	-50	dB
Other				dB

Distortion, Synchronous AM, if available

100 Hz	%
200 Hz	%
400 Hz	%
1000 Hz	%
2500 Hz	%
5000 Hz	%
Other	%

Is distortion similar at record jack as headphone output?		Yes
Gain pots other than AF: RF or IF?		No
Attenuators .	19	dB
Preamp:	None	dB

audio notches

Fixed frequency:	DSP	kHz
Variable, range:	DSP	kHz

Comments:

Dynamic range of LCD spectrum display is only 20 dB Usable only from -80 dBm to -100 dBm. This is much worse than the computer operated radios reviewed two years ago, and much worsethan the 60 display range of the R-9000. The update rate is ever 4 seconds when scanning 100 kHz, which is too slow for really effectiveusage if one is trying to scan for signals while using this internal display. (Update is every 8 seconds when scanning 200 kHz.) If an external spectrum display/analyzer is attached to the rear 10.7 MHz

IF output, this feature can be quite useful plus/minus 100 kHz. Accurate display can realized with an antenna signal equivalent of -50 dBm to -120 dBm (compared to the -80 to -100 dBm range of the internal LCD display). Signal compresses 5 dB if input signal is -40 dBm. A -120 dBm signal is 10 dB above the noise when using a resolution bandwidthof 1 kHz. The -50 to -120 dBm signal range gives a very nice 70 dB display range when used with a high quality spectrum analyzer. If an external spectrum display / analyzer has a 3 kHz resolution

bandwidthand a 100 msec sweep time, the real-time information presented is excellent, and is a wonderful aid to locating signals.

Radio was swept from 30 MHz to 1 GHz, looking for possible first IF. None was located. Possibly first IF is 10.7 MHz. On HF bands, it appears the first IF bandwidth is approximately 22 kHz.

First IF rejection is quite poor between 5 and 20 MHz, being as lowas 30 dB. Improves when front end selectivity outside this range provides addditional rejection at 10.7 Mhz.

Radio blocks in the plus / minus 6 to 10 kHz range when an undesired signal is inside this range but outside the final filter bandwidth. This made filter ultimate rejection numbers problamatic.Thus the radio quiets when a strong signal is 6 to 10 kHz off frequency while using the 4 kHz last IF filter.

Choice of filter bandwidths is questionable. The 4 kHz filter gives very muffled audio, and the 8.7 kHz filter passes the 5 kHz adjacent-channel heterodyne virtually all the time while tuning the bands.

The S meter has only five bars on the LCD display. The first bar comes on a 0.8 uV and the last bar comes on at 5.6 uV. Sofor the most part, the meter is saturated all the time.

When used with a 20 meter beam on the 19 meter band, the radio was in overload all the time without the 20 db attenuator actuated. Even an external 10 dB attenuator did not clean up the overload. With a more modest antenna, a 10 dB attenuator might be very helpful.

The inband noise comes up as much as 20 dB when the narrow 4 kHz filter is selected. This masked all SSB distortion figures below 1000 Hz. The inband noise problem below 1 kHz was also noted in narrow AM bandwidth. There was no problem in standard AM bandwidth.

I wish there was a way to slow down the AGC on SSB. Quite fatiging with it as fast as it is. Background comes up too much between,