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To: VSRT Group
From: A.E.E. Rogers
Subject: Evaluation of Star Com LNBFs for ozone observations.

Three models of the Star Com SR-3602 twin LNBF labelled:

- a) Digital Universal In Line connectors
- b) Digital Universal Diagonal connectors
- c) Super HD sat

are available.

Low Noise Block Converter Feeds (LNBF) were studied in memo 63. These LNBFs had only one output. Typical Y-factor results made using the cold sky as a “cold” load and an absorber as a “hot” load were in the range 5.8 to 6.6 dB. Measurements of 27 Star Com LNBFs were made in a similar manner as in memo 63 but without a ground screen yielded Y-factors in the range 4.3 to 6.6 dB. The results are listed in Table 1.

Other tests that were made on a few selected units were

- a) Local oscillator stability and phase noise
- b) Examination of output spectrum for spurs.

Figure 1 shows the spectrum of the local oscillator.

The spectral width averaged over 30 seconds between calibrations is about 100 Hz. Changes in temperature over 30 seconds contribute about 50% to this width.

The current parameters of NCAL=2, NCYC=20, NBUF=10 result in 30 seconds between frequency calibrations. LNBFs with phase locked local oscillators have better stability but some units tested have spurs in the bandpass. The local oscillator frequency is also sensitive to changes in the voltage to the LNBF so it is important to use regulated power supplies. Newer LNBFs from Octagon and X square have extremely stable local oscillators. The octagon has spurs. The X square has no spurs, based on the integrations of a few days, and pending further tests, is a good candidate to replace the Star Com SR-3602 as the best choice for new spectrometers.

Unit #	Output cold sky		Y-factor		Type	
	17v	12 v	17v	12v		
1	-62	-55	5.5	5.7	C	
2	-60	-61	5.5	6.3	B	G
3	-54	-54	6.6	5.9	A	G
4	-57	-56	4.9	4.3	B	P
5	-56	-56	4.8	4.7	B	
6	-59	-61	4.7	4.9	A	
7	-56	-58	6.1	5.6	B	G
8	-58	-57	5.8	5.5	B	
9	-57	-56	5.9	5.5	B	
10	-55	-55	5.4	4.9	B	
11	-59	-56	5.5	5.1	B	
12	-57	-57	4.8	5.4	B	
13	-58	-57	6.1	5.3	B	
14	-61	-60	5.5	5.1	D	P
15	-58	-53	6.5	5.8	B	G
16	-62	-62	5.9	5.6	A	G
17	-64	-62	5.5	5.1	A	
18	-64	-62	5.3	4.8	A	
19	-63	-62	4.4	4.8	A	P
20	-60	-61	4.6	4.9	A	
21	-64	-62	4.8	4.8	A	
22	-63	-61	4.7	4.8	A	
23	-61	-64	4.9	5.1	A	
24	-62	-61	5.8	5.7	A	G
25	-64	-62	4.7	5.3	A	
26	-58	-58	5.3	5.6	B	
27	-56	-57	4.6	5.4	B	

Table 1. Signal level and Y-factors for a series of LNBFs. Type A,B,C are Star Com. D is Prime Sat. G = very good P = poor.

Manufacturer	Part #	Style	#outputs	Notes
Star Com	SR-3602	a	2	
Star Com		b	2	
Star Com		c	2	
Fortec Star	FSKU		1	
Invacom	SNF-031	C120 flange	1	
Invacom	SNF-031	Horn	1	
SMART		EGATEL	1	
Avenger	PLL 3225-2		2	
Avenger	KSC322-2		2	S
Primesat	PT-2132	Platinum	2	S
Octagon	OTLSO	Twin slim	2	S
X-square	LSP-IT-02	Premium Twin HD	2	

Table 2. List of LNBFs for 11.072 GHz. Units with note = S have spurs.

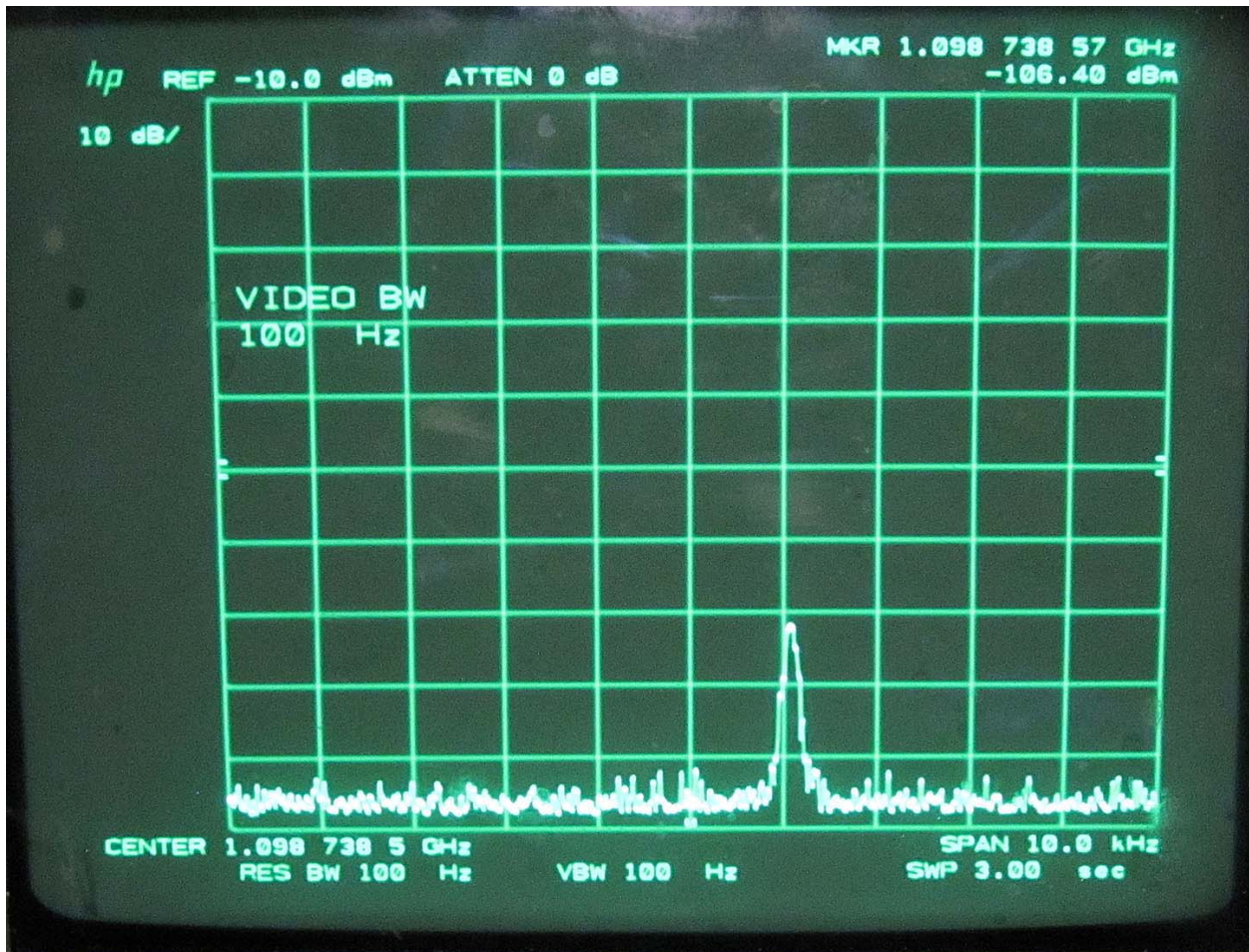


Figure 1. Spectrum of LO measured with test signal injected at 10.8498 GHz.