

ORION ELECTRIC CO., LTD.

41-1 Iehisa-cho, Takefu-shi
FUKUI 915-8555, JAPAN

TEL:(0778) 23-0001
TELEX:5175-588 ORION J
FAX:(0778) 23-7799

ATTACHMENT H --- MEASUREMENT OF THE UHF NOISE FIGURES ON BULLETIN OST MP-2 AND STATISTICAL PLAN.

1. Measurements of TV Tuner Noise Figure

This documents is the material of UHF TV Receiver Noise Figure measurement.

1) Measurements Procedure.(ON BULLETIN OST MP-2 JULY 1982)

- a. The measurements of noise figures are made in a shielded room.
- b. Before testing, the television receiver and Noise figure test equipment are to be subjected to a warm-up period of sufficient time for stabilization of factors which could affect the measurements.
- c. Automatic Gain Control bias, preceding the noise output measurement point, is maintained at the level(4.0V) existing When there is no input signal with the receivers UHF input terminated in its nominal impedance(75 ohm).
- d. It must first be ascertained that the noise figure contribution of the I.F. amplifier following the measuring point not exceed 0.3dB.

If the influence of the 2nd stage is $\Delta F(\text{dB})$, then

$$\Delta F(\text{dB}) = 10 \cdot \log_{10} \left[1 + \frac{F2 - 1}{G1F1} \right] \quad \text{is given}$$

so that Tuner Gain : $G1 = 39 \text{ dB}(\text{typical})$ then the influence of the 2nd stage is to be less than 0.3dB so that influence of the 2nd stage can be ignored.

e. N.F. Value = Meter Reading --- Balun Insertion loss

Balun Insertion loss is mentioned in ATTACHMENT H-4. Therefor, it can get noise figures of UHF Tuner by correcting Factors of this value.

ORION ELECTRIC CO., LTD.

41-1 Iehisa-cho, Takefu-shi
FUKUI 915-8555, JAPAN

TEL:(0778) 23-0001
TELEX:5175-588 ORION J
FAX:(0778) 23-7799

2) Test Equipment

a. Standard Noise Figure Indicator

(Automatic Standard NF Indicator with Solid State Noise Source)

* Manufactured by Elena Electronics Co., Ltd.(Japan)

* Model ENF-2005

b. Noise Source

* Model No. MC1100 Made by M.S.C. and correct proofs.

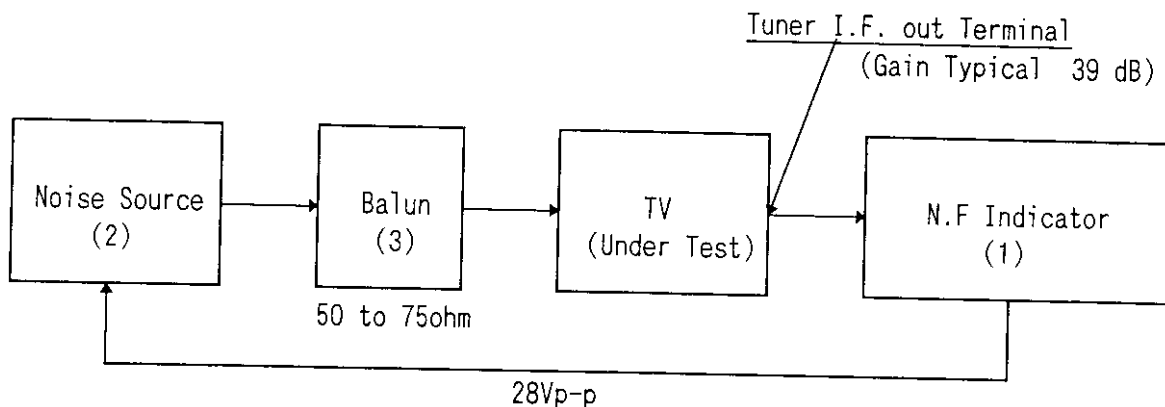
* ENR --- This Indicator has no internal oscillator then can be use
no correction of compensation.
This Indicator will be send to FCC in November from Elena
Electronics, and has already applied for it by KEC.

c. UHF Balun

* Model No. MP614A (50 to 75 ohm)
Made by Anritsu Corporation

* Insertion Loss --- Please see Attachment H-4

3) Block Diagram of UHF TV NF measurement.



2. STATISTICAL PLAN

TV Receiver UHF Noise Figure --- Certification and Compliance Criteria
(July 1982)

In reply to yours of Jan. 14, 1980, we have pleasure of stating below:

Production Line compliance

We carry out QUALITY ASSURANCE for Plan C and submit the annual report of M4C9A(MVR4040A) to the FCC.

A. Sampling Size

We check Sampling Size by TV Receiver Noise Figure --- Certification and Compliance Criteria 3.12.

B. Data Calculation Method

When one sampling is 20 sets, measurement data are a total 200 point, that is 20 set multiplied by 10 point/set. We check whether the measurement data comply with statistical condition on $X + KS \leq 14$, by TV Receiver Noise Figure --- Certification and Compliance Criteria 3.13.

5) ATTACHED SHEET

1. Block Diagram of Model ENF-2005 --- H-1
Standard Noise Figure Indicator "Elena Electronics".
2. Specifications of Standard NF Indicator --- H-2
Model ENF-2005
3. Excess Noise Ratio of Noise Source --- H-3
M.S.C. Model MC1100, SN1012
4. Measurements Data --- H-4
Insertion Loss of UHF Balun

Product ID.Code: M4C9A
 (Model No.: MVR4040A)
 Brand Name: MEMOREX

TV RECEIVER APPLICATION CHECKLIST

- (X) 1. A statement identifying the production run plan we will be using to show compliance in meeting "TV Receiver, UHF Noise Figures Certification and Compliance Criteria" (July 1982).

: We will use the production run plan C to show compliance in meeting 14dB UHF Noise Figure requirement.

- (X) 2. A statement that NF measurements were made pursuant to OST MP-2, July 1982.

: NF measurements were made pursuant to OST BULLETIN MP-2, July 1982.

- (X) 3. The names of all manufacturing sources for the VHF and UHF tuners as well as the tuner manufacture's part No.

Product ID. Code (Model No.)	VHF/UHF 1 PACK TUNER	
	PART NO.	SOURCE
M4C9A(MVR4040A)	ENG56702G	MATSUSHITA

- (X) 4. UHF and VHF tuner part numbers assigned by the receiver manufacturer.

: There are no tuner part assigned by receiver manufacturer.

(X) 5. Frequency bands tuned by receiver.

VHF : 2 - 13 ch

UHF : 14- 69 ch

CATV : 1 -125 ch(101 - 845MHz)

(X) 6. Pursuant to Section 15.117 of the Rules, a statement specifying the receiver design noise figure, in dB.

: Because TV Tuner built in as part of a video tape recorder which uses a power splitter between the antenna terminals of the video tape recorder and input terminals of the TV Tuner, the limits of Noise Figure, pursuant to section 15.117(g)(4), complies with the limits subtracted 4dB from 14dB.

() 7. The length of the UHF lead, from antenna input terminal to the tuner.

:

(X) 8. A numbered electrical schematic for the receiver.

: Attached

(X) 9. The exact chassis number (MFR'S Model No. instead of chassis No.)
(This number is classified with SUFFIX in order to show voltage difference, Radio band difference and so on.)

: Mfr's No. : M4C9A

()10. Picture tube size in inches.

:

(X)11. Type of receiver - color or black and white.

: Color

(X)12. A description of the cabinet material.

: plastic and metal cover

()13. Copy of all the information submitted with the original certification for the basic receiver.

:Attached

(X)14. A statement that the contribution not exceed 0.3dB for the channel.

$$\Delta F(\text{dB}) = 10 \cdot \log_{10} \left[1 + \frac{F2 - 1}{G1F1} \right]$$

where

F1 : 7.0 dB ----- typical value

F2 : 8.5 dB ----- N.F. indicator (I.F. Noise Figure)
* See ATTACHMENT H 2/4

G1 : 39.0 dB ----- See ATTACHMENT H 2/4

$$\Delta F = 10 \cdot \log_{10} 1.014 = 0.060 \text{ dB}$$

The contribution does not exceed 0.3dB, so, neglected.