

# ORION ELECTRIC CO., LTD.

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## 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

$$\Delta F(\text{dB}) = 10 \cdot \log_{10} \left[ 1 + \frac{F_2 - 1}{G_1 F_1} \right] \quad \text{is given}$$

so that Tuner Gain :  $G_1 = 39 \text{ dB}(\text{typical})$  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. Therefore, it can get noise figures of UHF Tuner by correcting Factors of this value.

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## 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.

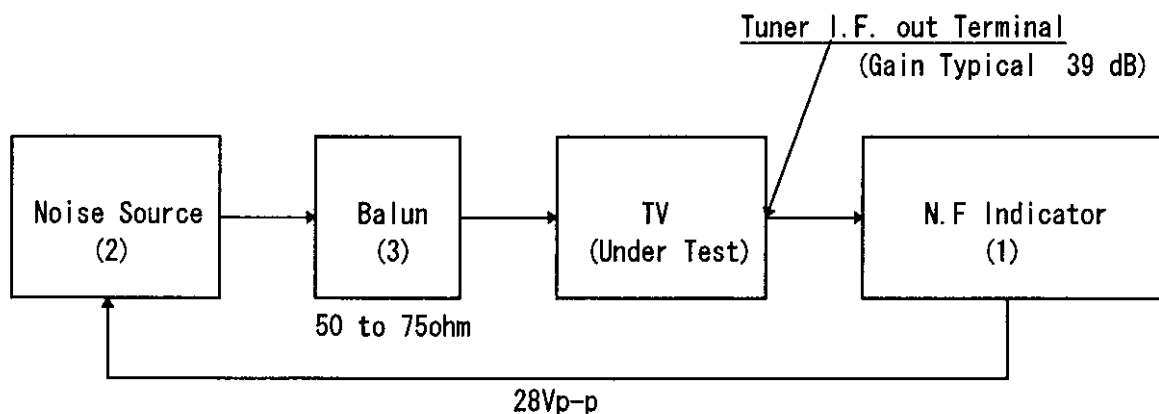
\* ENR — This Indicator has no internal oscillator then can be use  
no correction of compensation.  
This Indicator will be send to FCC in November from Elena  
Electronics, and has already applied for it by KEC.

- 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 M4C8D(MVR2040A) 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 Ration of Noise Source — H-3  
M.S.C. Model MC1100, SN1012
4. Measurements Data — H-4  
Insertion Loss of UHF Balun

Product ID.Code: M4C8D  
(Model No. : MVR2040A )  
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
M4C8D (MVR2040A)	TCMN0682PA08B	SAMSUNG

- (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. : M4C8D

- ( )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.

## 9. LIST OF TEST EQUIPMENTS

Equipment	Manufacturer	Model No.	Specifications	KEC Control No.	Test Item (*)	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESHS10	Frequency Range 9kHz-30MHz	FS-67	1	1998/10	1999/10
		ESVS10	Frequency Range 20MHz-1GHz	FS-60	2	1999/6	2000/6
Spectrum Analyzer	Rohde & Schwarz	FSA	Frequency Range 100 Hz-1.8 GHz	SA-35	2	1999/7	2000/7
	Hewlett Packard	8568B	Frequency Range 100 Hz-1.5 GHz	FS-46-3	1,3,4,5	1999/6	2000/6
Pre-amplifier	Anritsu	MH648A	Frequency Range 100 Hz-1.2 GHz	AM-28	4,5	1999/6	2000/6
Biconical Antenna	Schwarzbeck	BBA9106	Frequency Range 30MHz-300MHz	AN-219	2	1999/2	2000/2
Log-Periodic Antenna	Schwarzbeck	UHALP9108 A	Frequency Range 300MHz-1GHz	AN-218	2	1999/2	2000/2
Tuned Dipole Antenna	Kyoritsu	KBA-511AS	Frequency Range 25MHz-500MHz	AN-132	N/A	1999/3	2000/3
		KBA-611S	Frequency Range 500MHz-1GHz	AN-115	N/A	1999/3	2000/3
LISN	Kyoritsu	KNW-407	Frequency Range 150kHz-30MHz	FL-107	1	1999/4	2000/4
Impeadance Transformer	NMC	MB-009	Frequency Range 10MHz-2GHz 50 $\Omega$ : 75 $\Omega$	AX-27	3,4	1998/11	1999/11
Matching Transfomer	Anritsu	MG614A	Frequency Range 10MHz-1.2GHz 50 $\Omega$ : 75 $\Omega$	AX-28-4	5	1998/12	1999/12



- Continued -

Instrument	Manufacturer	Model No.	Specifications	KEC Control No.	Test Item (*)	Last Cal.	Next Cal.
Video Part Signal Generator	Anritsu	MG3601A	Frequency Range 100kHz - 1.04GHz	SG-41	1,2,3,4	1998/9	1999/9
Audio Part Signal Generator	Anritsu	MG3601A	Frequency Range 100kHz - 1.04GHz	SG-48	1,2,3,4	1998/9	1999/9
Multiburst Signal Generator	Anritsu	MG318A	According to ANSI C63.4(1992) Section 12 Fig.15	MG-35	1,2,3,4,5	1998/12	1999/12
Matching Trans Former	Anritsu	MG614A	Frequency Range 10MHz - 1.2GHz	AX-28-2	1,2,3,4	1998/11	1999/11
Four-Port Junction Pad	Anritsu	MP659A	Frequency Range 40MHz - 1GHz	AX-16	1,2,3,4	1998/11	1999/11

[Note]

Test Item (\*):

- 1: Conducted Emission Measurement
- 2: Radiated Emission Measurement
- 3: Output Signal level Measurement
- 4: Output Terminal Conducted Spurious Measurement
- 5: Transfer Switch Measurement

N/A: Not Applicable

The overall program of calibration and verification of equipment is designed and operated so as to ensure that measurements made by KEC are traceable to national standards of measurement or equivalent abroad.