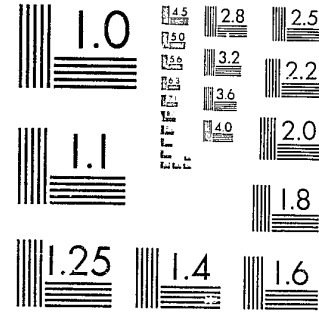


National Criminal Justice Reference Service



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3-18-82

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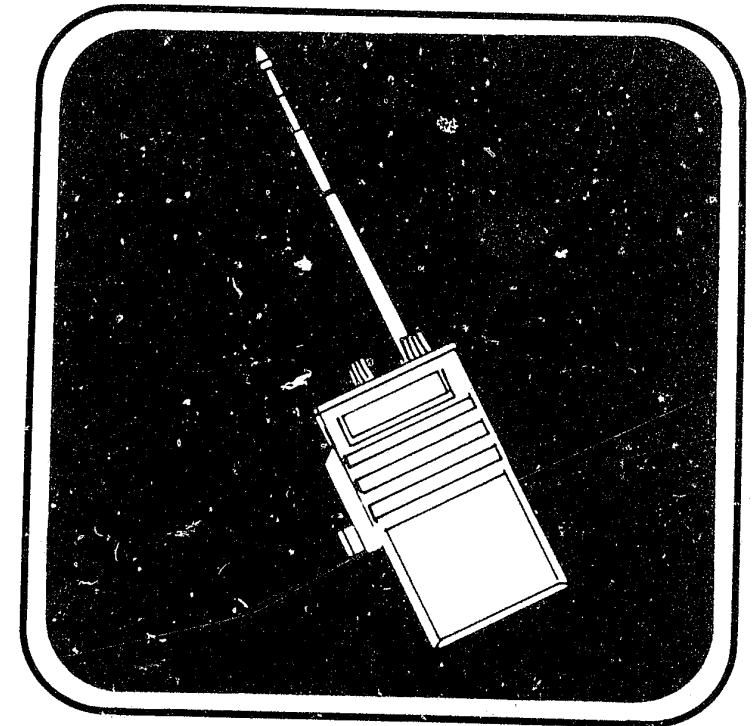
U. S. Department of Justice
National Institute of Justice



Technology Assessment Program

INFORMATION CENTER

Police Personal FM Transceivers Report



Volume II
Test Data

80852

A Program of the National Institute of Justice
Conducted by the

INTERNATIONAL ASSOCIATION of CHIEFS of POLICE

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About the Technology Assessment Program

The Technology Assessment Program is sponsored by the Office of Development, Testing, and Dissemination of the National Institute of Justice (NIJ), U.S. Department of Justice. The program responds to the mandate of the Justice System Improvement Act of 1979, which created NIJ and directed it to encourage research and development to improve the criminal justice system and to disseminate the results to Federal, State, and local agencies.

The Technology Assessment Program is an applied research effort that determines the technological needs of justice system agencies, sets minimum performance standards for specific devices, tests commercially available equipment against those standards, and disseminates the standards and the test results to criminal justice agencies nationwide and internationally.

The program operates through:

The **Technology Assessment Program Advisory Council (TAPAC)** consisting of nationally recognized criminal justice practitioners from Federal, State, and local agencies, which assesses technological needs and sets priorities for research programs and items to be evaluated and tested.

The **Law Enforcement Standards Laboratory (LESL)** at the National Bureau of Standards, which develops voluntary National performance standards for compliance testing to ensure that individual items of equipment are suitable for use by criminal justice agencies. The standards are based upon laboratory testing and evaluation of representative samples of each item of equipment to determine the key attributes, develop test methods, and establish minimum performance requirements for each essential attribute. In addition to the highly technical standards, LESL also produces user guides that explain in non-technical terms the capabilities of available equipment.

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Paul Cascarano, Assistant Director
National Institute of Justice

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POLICE PERSONAL FM TRANSCEIVERS REPORT

VOLUME II: TEST DATA

PREPARED BY THE
TECHNOLOGY ASSESSMENT PROGRAM INFORMATION CENTER
RESEARCH DIVISION
INTERNATIONAL ASSOCIATION OF CHIEFS OF POLICE
GAITHERSBURG, MARYLAND 20760

UNDER

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U.S. DEPARTMENT OF JUSTICE
NATIONAL INSTITUTE OF JUSTICE

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FOREWORD

Documentation of the Personal FM Transceivers testing program results is organized in two volumes to facilitate reader orientation. The two volumes are entitled and described as follows:

Vol. I: Police Personal FM Transceivers Report-
Volume I: Executive Summary

This volume provides an overview of transceiver compliance with the requirements of the test standard. An individual compliance summary for each transceiver tested is included.

Vol. II: Police Personal FM Transceivers Report-
Volume II: Test Data

Volume II contains a lengthy compilation of the test data upon which Volume I is based. Because of the technical orientation of the material, no general distribution of Vol. II will be made. Copies may be obtained by request directed to the International Association of Chiefs of Police or to the National Criminal Justice Reference Service.

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• General Electric - MASTR PE	2233-1
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METHODOLOGY

Upon approval of the transceiver testing program, a survey of communications equipment manufacturers was conducted to identify the personal FM transceiver models currently in production for law enforcement use in the United States. Eight manufacturers identified equipment models in production. Twenty-six transceivers, representing the basic models produced by the eight manufacturers, were selected for the program. Included among the twenty-six models were two Type I (25-50 MHz), fifteen Type II (150-174 MHz), and nine Type III (400-512 MHz) transceivers. Effort was made to select transceivers in proportion to: estimated usage by type; the number of models produced by each manufacturer; and RF output power. Individual transceivers ordered for the program were of one or two channel types ranging in carrier output power from approximately two to six watts. When possible, universal type transceivers were obtained to provide the additional input-output jacks that would facilitate testing.

Substantial time and effort was expended in selection of the best qualified laboratories for the testing program. Based on responses to the IACP's Request for Proposal and follow-up visits to the laboratories to further assess their capability to perform the desired testing, two contracts were awarded. Recipients of the contracts were Dayton T. Brown, Inc., Bohemia, Long Island, New York, and E-Systems, Melpar Division, Falls Church, Virginia.

As a preliminary phase of the testing program, each laboratory was required to completely test one each of two similar personal FM transceivers in accordance with the procedures and requirements of the Standard. Various phases of the testing were monitored by technical representatives of the IACP and NBS to follow progress of the testing and resolve any questions that might arise in the application of the Standard. During the on-the-site visits test instruments, environmental chambers, and vibration exciters were inventoried and checked for calibration. Upon satisfactory completion of the initial transceiver testing, the two laboratories were judged to be qualified and were directed to proceed with the testing of the main quantity of transceivers.

During transceiver testing, transceiver-to-test-instrument interface accessories such as adapter cables, battery blocks, external power supply adapters, and antenna adapters were used when specified by the manufacturer. All batteries were recharged in chargers specified by the manufacturer for the particular battery supplied with the transceiver.

In the structuring of the tests, it was the consensus of the TAPAC that many purchasers of transceivers would not have the facilities to check and adjust transceivers purchased and therefore the transceivers should be tested in the as received condition. With one exception, tests were to be conducted on each transceiver in the condition that it was received from the manufacturer. The exception was made that, in the event of a complete failure of a transceiver component, the testing laboratory was authorized to return the transceiver to the manufacturer or to a manufacturer's authorized service facility for repair in order that testing of the transceiver could be completed. Occurrences of transceiver repair during the transceiver testing program are noted in the test data reports.

THE STANDARD

The advisory council, TAPAC, adopted the standard "Personal FM Transceivers", NILECJ-STD-0209.00* for use in this testing program. This Standard is a Law Enforcement Equipment Standard developed by the Law Enforcement Standards Laboratory (LESL) of the National Bureau of Standards (NBS), accepted and issued by the National Institute of Justice (NIJ) formerly the National Institute of Law Enforcement and Criminal Justice (NILECJ). This Standard hereinafter referred to as the Standard, consists of performance and other requirements together with detailed descriptions of test methods.

Equipment which can meet the requirements of the Standard is judged to be of superior quality and suited to the needs of law enforcement agencies. Transmitter requirements of the Standard meet or exceed those specified in the Rules and Regulations of the Federal Communications Commission (FCC).

General as well as specific differences in performance requirements, test conditions and test procedures exist between this Standard and other standards such as Electronic Industries Association (EIA) Standard RS-316-B which also sets forth test procedures and performance requirements for personal FM transceivers.

It is important to note that all transceivers in this program were tested in accordance with the procedures of this Standard, and evaluations were made with reference to the performance requirements of this Standard. In a few instances, where applicable, comments on the test data have been made in reference to Federal Communications Commission (FCC) requirements (italicized in the test summaries) and requirements of RS-316-B. Testing of all transceivers in precisely the same manner, under the same conditions and to identical performance requirements of the Standard accomplished the principal objective of the program which was the development of objective, comparative performance data on personal FM transceivers available for law enforcement use.

In application of this Standard in this testing program the advisory council, TAPAC, recommended that three exceptions be made: 1) that the Audio Output Power (Earphones) test not be conducted; 2) that the Shock Test (drop test) not be conducted; and 3) that the testing sequence specified in the Standard be modified to require testing of the transceiver first under ambient temperature conditions followed by testing under the environmental conditions of vibration and extremes of temperature and humidity. The objective of the changes was to reduce testing costs and still produce the greatest amount of pertinent performance data.

*For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 027-000-00728-0.

FM TRANSCEIVER TEST DATA

A general summary of the transceiver test data is contained in Tables 1 and 2. The tables group the transceivers according to Types I, II and III and indicate only that a transceiver was or was not in compliance with the minimum performance requirements of the Standard. The results are shown for tests under both ambient (A) temperature test conditions and tests under conditions of environmental (E) extremes for the twenty-six transceiver characteristics tested.

Complete test data upon which Tables 1 and 2 are based is contained in the Appendix. The data represent performance measurements made under ambient temperature conditions, under high and low voltages with respect to nominal operating voltage, under vibration, and under conditions of high and low temperatures and high humidity.

For ease of reference the FM Transceiver Test Data reports are filed in the Appendix in numerical sequence of the IACP identification number assigned to each transceiver. The identification number of each transceiver appears at the top of the columns in Tables 1 and 2, and at the top and bottom of Appendix pages.

The test data for each transceiver is presented in the same manner on a standardized report form. The format of the form is explained in detail in the Appendix.

**TABLE 1
TRANSCEIVER COMPLIANCE SUMMARY**

(Requirements Specified in NILECJ-STD-0209.00)

Type I (25-50 mHz)

Type III (400-512 mHz)

	GE 2234		REPOU 2182											
	A	E	A	E	GE 2230	GE 2232	RE 2188	MOTOROLA 2212	MOTOROLA 2215	MOTOROLA 2217	ROA 2182	REPOU 2188	STANDARD 2181	
RECEIVER REQUIREMENTS														
SINAD Sensitivity	P	■	P	P	P	P	P	P	P	P	P	P	P	P
Selectivity														
Usable Bandwidth	P	■	P	P	P	P	P	X	P	P	P	P	P	P
Adjacent Channel Selectivity	P	■	P	P	P	P	P	P	P	P	P	P	P	P
Spurious Response Attenuation	P	-	P	-	X	-	X	-	P	-	X	-	P	-
Intermodulation Attenuation	X	-	P	-	P	-	P	-	P	-	P	-	P	-
Squelch														
Threshold Squelch Sensitivity	P	■	P	X	P	P	P	P	P	P	P	P	P	P
Tight Squelch Sensitivity	P	■	P	P	P	P	P	P	P	P	P	P	P	P
Squelch Block	X	-	P	-	P	-	P	-	P	-	P	-	X	-
Squelch Attack Time	P	-	P	-	P	-	P	-	P	-	P	-	P	-
Squelch Release Time	P	-	P	-	P	-	P	-	P	-	P	-	P	-
Audio Frequency														
Audio Output Power-Speaker	P	■	P	P	P	P	P	P	P	P	P	P	P	P
Audio Distortion-Speaker	P	■	P	P	P	P	P	P	P	P	P	P	P	P
Audio Frequency Response-Speaker	P	-	X	-	P	-	X	-	P	-	X	-	P	-
Audio Hum and Noise-Unsquelched	P	■	P	P	P	P	P	P	P	P	P	P	P	P
-Squelched	P	■	P	P	P	P	P	P	P	P	P	P	P	X
TRANSMITTER REQUIREMENTS														
RF Carrier														
Carrier Output Power	X	■	X	X	P	P	P	P	P	P	X	X	P	P
Carrier Frequency Tolerance	P	■	P	P	P	P	P	X	P	X	P	■	P	P
AM Hum and Noise	P	-	P	-	P	-	P	-	P	-	P	-	P	-
Carrier Attack Time	P	-	P	-	P	-	P	-	P	-	P	-	P	-
Audio Frequency Modulation														
Audio Frequency Harmonic Distortion	P	■	P	P	P	P	P	P	P	P	P	P	P	P
FM Hum and Noise Level	X	■	X	X	P	P	P	P	P	P	P	■	P	X
Audio Frequency Response	X	-	X	-	X	-	X	-	P	-	X	-	P	-
Frequency Deviation	X	-	P	-	P	-	P	-	P	-	P	-	P	-
Modulation Limiting	P	-	P	-	P	-	X	-	X	-	X	-	P	-
Electromagnetic Compatibility														
Radiated Spurious Emissions	n	-	P	-	P	-	P	-	P	-	P	-	P	-
Sideband Spectrum Separation--10kHz	P	-	P	-	P	-	P	-	P	-	P	-	X	-
--20kHz	P	-	P	-	P	-	P	-	P	-	X	-	P	-
Antenna														
Radiation Efficiency	N/A	-	N/A	-	P	-	P	-	P	-	P	-	X	-
Power Test Degradation	P	-	P	-	P	-	P	-	P	-	P	-	P	-

A Ambient Temperature Test Conditions
 E Environmental Test Conditions
 n No Test Was Conducted
 - No Environmental Test Required

P Requirement Of The Standard Was Met
 X Requirement Of The Standard Was Not Met
 ■ Transceiver Ceased Operation

**TABLE 2
TRANSCEIVER COMPLIANCE SUMMARY**

(Requirements Specified in NILECJ-STD-0209.00)

Type II (150-174 MHz)

	GE 2231	GE 2233	IEC 2186	IEC 2187	Motorola 2213	Motorola 2224	Motorola 2226	RCA 2207	Regency 2180	Regency 2181	REPCO 2201	REPCO 2195	Standard 2187	Wilson 2205	Wilson 2206	
	A E	A E	A E	A E	A E	A E	A E	A E	A E	A E	A E	A E	A E	A E	A E	
RECEIVER REQUIREMENTS																
SINAD Sensitivity	P n	P P	P P	P ■	P P	P P	P P	P ■	P X	P X	P P	P X	P P	P P	P X	
Selectivity																
Usable Bandwidth	P n	P ■	P X	P X	P P	P P	P P	P ■	P P	P ■	P P	P P	P P	P P	P P	
Adjacent Channel Selectivity	X n	P ■	P P	P ■	P P	P P	P P	P ■	X X	X ■	P P	P P	P P	P P	P P	
Spurious Response Attenuation	P -	P -	P -	P -	X -	P -	P -	P -	X -	X -	P -	P -	P -	X -	X -	
Intermodulation Attenuation	P -	P -	P -	P -	P -	P -	X -	P -	X -	X -	P -	X -	P -	P -	P -	
Squelch																
Threshold Squelch Sensitivity	P n	P X	P X	P ■	P P	P P	P P	P ■	P P	P X	P ■	P P	P P	P P	P P	
Tight Squelch Sensitivity	P n	P P	P P	P ■	P P	P P	P P	P ■	P ■	P X	P ■	P P	P P	P P	P P	
Squelch Block	P -	X -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	
Squelch Attack Time	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	
Squelch Release Time	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	X -	X -	X -	P -	
Audio Frequency																
Audio Output Power-Speaker	P n	P P	P P	P ■	P P	P P	P P	P ■	P P	P X	P P	P P	P P	P P	P P	
Audio Distortion-Speaker	P n	X P	P P	P ■	P P	P P	P P	P ■	X X	X P	P P	P P	P P	X P	X X	
Audio Frequency Response-Speaker	P -	P -	P -	P -	X -	X -	P -	P -	X -	X -	X -	P -	X -	X -	X -	
Audio Hum and Noise-Unsquelched	P n	P ■	P P	P ■	P P	P P	P P	P ■	P P	P P	P P	P P	P P	P P	P P	
-Squelched	P n	P ■	P P	P ■	P P	P P	P P	P ■	P P	P X	P X	P P	P P	P P	P P	
TRANSMITTER REQUIREMENTS																
RF Carrier																
Carrier Output Power	P n	X P	P P	X ■	X P	P P	P P	P P	X P	X X	X X	P P	P P	X P	P P	
Carrier Frequency Tolerance	P ■	P P	P P	P ■	P X	P P	P P	P P	P X	P ■	P P	P X	P X	P X	P X	
AM Hum and Noise	P -	P -	P -	P -	F -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	
Carrier Attack Time	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	
Audio Frequency Modulation																
Audio Frequency Harmonic Distortion	X n	P X	P P	P P	X P	P P	P P	P P	P P	P ■	P P	X X	X P	P P	P P	
FM Hum and Noise Level	X ■	X X	P P	P ■	P P	P P	P P	P P	P P	P ■	X P	X X	P X	X P	X P	
Audio Frequency Response	X -	X -	X -	X -	X -	P -	X -	P -	X -	X -	X -	P -	P -	X -	X -	
Frequency Deviation	P -	X -	P -	X -	P -	P -	P -	P -	P -	P -	P -	X -	X -	P -	X -	
Modulation Limiting	P -	P -	P -	P -	X -	P -	P -	X -	P -	P -	X -	P -	X -	X -	P -	
Electromagnetic Compatibility																
Radiated Spurious Emissions	n -	X -	P -	P -	P -	P -	P -	P -	P -	P -	P -	n -	P -	P -	P -	
Sideband Spectrum Separation—10kHz	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	X -	P -	P -	P -	P -	
—20kHz	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	X -	P -	P -	P -	P -	
Antenna																
Radiation Efficiency	n -	X -	P -	X -	P -	X -	P -	P -	P -	X -	P -	n -	P -	P -	P -	
Power Test Degradation	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	P -	

A Ambient Temperature Test Conditions
 E Environmental Test Conditions
 n No Test Was Conducted
 - No Environmental Test Required
 P Requirement Of The Standard Was Met
 X Requirement Of The Standard Was Not Met
 ■ Transceiver Ceased Operation

MANUFACTURERS OF TRANSCEIVERS TESTED

General Electric Company
Mobile Radio Department
Mountain View Road
Lynchburg, Virginia 24502

IEC Electronics Corporation
(now)
Harmon Electronics Division
SAB Harmon Industries, Inc.
Grain Valley, Missouri 64029

Motorola Inc.
Communications Division
1301 E. Algonquin Road
Schaumburg, Illinois 60196

RCA
(now)
TACTEC Systems, Inc.
Meadow Lands, Pennsylvania 15347

Regency Communications, Inc.
1227 S. Patrick Drive
Satellite Beach, Florida 32937

REPCO Incorporated
2421 North Orange Blossom Trail
Orlando, Florida 32804

Standard Communications Corporation
108 Victoria Street
P.O. Box 92151
Los Angeles, California 90000

Wilson Electronics Corporation
4288 S. Polaris Avenue
P.O. Box 19000
Las Vegas, Nevada 89119

APPENDIX

FORMAT
OF
FM TRANSCEIVER TEST DATA REPORT

The first page of the four-page report of each transceiver contains the following identification information:

Name of Manufacturer
 Transceiver Model Number
 Transceiver Serial Number
 Transceiver Type - by classification in the Standard
 - by Frequency Band
 IACP Item Number
 Nominal RF Power
 Transmit and Receive Test Frequencies

The test results are reported in a six-columnar format that correlates test procedures, minimum performance requirements and test results for every test performed on each transceiver. Contents of the columns are as follows:

1. The entry in the first column identifies the paragraph of the Standard in which the applicable test procedure is set forth.
2. Column two contains a listing of each transceiver characteristic tested and the applicable test conditions.
3. The letters in column three identify the minimum performance requirement as set forth in Tables 1 through 4 of the Standard.
4. Column four contains the numerical value of the minimum performance requirement for each transceiver characteristic tested.
5. Column five contains the numerical value of the test results.
6. Column six contains references to notes and comments on test data.
 - An (*) indicates that the minimum performance requirement (Column 4) was not met.
 - The numbers refer to comments of the testing laboratory.
 - The letters refer to comments of the transceiver manufacturer.

FM TRANSCEIVER TEST DATA

MANUFACTURER: Regency Communications, Inc.		ITEM NO.:	2180		
MODEL NO.: MCPH-406		RF POWER (Nominal):	4.0 Watts		
SERIAL NO.: 01007		TEST FREQUENCIES: T-	151.625 MHz		
TYPE: II		R-	151.625 MHz		
TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>					
5.4.1	RECEIVER SENSITIVITY				
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.24 uV	
	SINAD Sensitivity Variance -				
	Voltage +10%	B	0.7 uV or less	0.25 uV	
	-20%	B	0.7 uV or less	2.83 uV	*
	Temperature -30°C	U	+6 dB max. above 0.5 uV	-10.8 dB	
	+60°C	U	+6 dB max. above 0.5 uV	-0.8 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	0.9 dB	
<u>RECEIVER SELECTIVITY</u>					
5.4.2	RECEIVER SELECTIVITY				
5.4.2.1	Usable Bandwidth	C	5 kHz min.	6.40 kHz	
	Usable Bandwidth Variance -				
	Temperature -30°C	V	-20% max. below 5 kHz	7.8 %	
	+60°C	V	-20% max. below 5 kHz	4.7 %	
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-3.1 %	
5.4.2.2	Adjacent Channel Selectivity	D	70 dB min.	60.0 dB	*
	Adjacent Channel Selectivity Variance -				
	Temperature -30°C	W	58 dB min.	53.0 dB	*
	+60°C	W	58 dB min.	64.0 dB	
	Humidity 50°C, 90% RH	AE	58 dB min.	59.0 dB	
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	56.5 dB	*
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	56.5 dB	*
<u>RECEIVER SQUELCH</u>					
5.4.3	RECEIVER SQUELCH				
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.32 uV	
	Threshold Squelch Variance-				
	Voltage +10%	I	0.6 uV or less	0.29 uV	
	-20%	I	0.6 uV or less	0.57 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	-8.0 dB	
	+60°C	Y	+6 dB max. above 0.4 uV	4.0 dB	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-1.0 dB	
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	0.40 uV	
	Tight Squelch Variance -				
	Temperature -30°C	X	+6 dB max. above 4.0 uV	N	*1
	+60°C	X	+6 dB max. above 4.0 uV	N	*1
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	N	*1
5.4.3.2	Squelch Block	J	5 kHz min.	8.0 kHz	
5.4.3.3	Squelch Attack Time	K	150 ms max.	85 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	175 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2180

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	1290 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	0.9 dB	
	-20%	O	-3 dB max. below 500 mW	-2.1 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	0.0 dB	
	+60°C	Z	-6 dB max. below 500 mW	0.3 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	0.6 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	21.1 %	*
	Temperature -30°C	AB	18% max. at 500 mW	14.0 %	
	+60°C	AB	18% max. at 500 mW	23.2 %	*
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	20.1 %	*
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	-9.2 dB	*
	500 Hz		+6.0 dB (-10, +2 dB)	-3.5 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	14.1 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	22.3 dB	*
5.4.4.4	Audio Hum and Noise -				
	Unsquelled	S	40 dB min. below 500 mW	56.4 dB	
	Squelched	T	50 dB min. below 500 mW	106.0 dB	
	Audio Hum and Noise Variance -				
	Unsquelled				
	Temperature -30°C	AA	30 dB min.	62.4 dB	
	+60°C	AA	30 dB min.	53.6 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	56.5 dB	
	Squelched				
	Temperature -30°C	AA	40 dB min.	96.5 dB	
	+60°C	AA	40 dB min.	106.0 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	90.4 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			4.0 W	
	Measured			3.69 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.36 dB	*
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	0.48 dB	
	-10%	BB	±3 dB of nominal	-1.35 dB	
	-20%	BC	-6, +3 dB of nominal	-2.47 dB	
	Temperature -30°C	BN	±3 dB of nominal	-0.09 dB	
	+60°C	BN	±3 dB of nominal	-0.87 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	-0.50 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00039 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.00037 %	
	-15%	BE	0.0005% of nominal	0.00042 %	
	Temperature -30°C	BP	0.0005% of nominal	0.00020 %	
	+60°C	BP	0.0005% of nominal	0.00199 %	*
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00028 %	
	Vibration	BV	0.0005% of nominal	0.00099 %	*
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	90.9 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	8 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2180

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	3.2 %	
	Temperature Stability				
	-30°C	BQ	9% max.	5.9 %	
	+60°C	BQ	9% max.	3.2 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	50.4 dB	
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	45.9 dB	
	+60°C	BO	34 dB min. attenuation	44.2 dB	
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	51.1 dB	
	Vibration	BU	25 dB min. attenuation	53.1 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-18.4 dB	*
	500 Hz		-6.0 dB (+1, -3 dB)	-8.1 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	4.2 dB	*
	3000 Hz		+9.5 dB (+1, -4.6 dB)	4.0 dB	*
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.60 kHz	
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	2.90 kHz	
	500 Hz	BJ	≤5 kHz	4.90 kHz	
	1000 Hz	BJ	≤5 kHz	4.20 kHz	
	2000 Hz	BJ	≤5 kHz	4.40 kHz	
	2500 Hz	BJ	≤5 kHz	4.40 kHz	
	3000 Hz	BJ	≤5 kHz	4.30 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	55.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	20% min.	26.5 %	
	Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C	DA	8 hrs.	3 hrs. 55 min.	
	-30°C	DB	2 hrs.	1 hr. 5 min.	
	+60°C	DC	7 hrs.	2 hrs. 50 min.	

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2180

- No test data was obtained. The transceiver would not break squelch with +13 dBm input under low and high temperature conditions of -30°C and 60°C, and humidity condition of 50°C and 90% relative humidity.

FM TRANSCEIVER TEST DATA

MANUFACTURER: Regency Communications, Inc. ITEM NO.: 2181
 MODEL NO.: MCPH-251 RF POWER (Nominal): 2.5 Watts
 SERIAL NO.: Q3021 TEST FREQUENCIES: T- 151.625 MHz
 TYPE: II R- 151.625 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>					A
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.18 uV	
	SINAD Sensitivity Variance -				
	Voltage +10%	B	0.7 uV or less	0.17 uV	
	-20%	B	0.7 uV or less	1.17 uV	*
	Temperature -30°C	U	+6 dB max. above 0.5 uV	-38.1 dB	
	+60°C	U	+6 dB max. above 0.5 uV	-27.9 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-25.5 dB	
<u>RECEIVER SELECTIVITY</u>					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	6.10 kHz	
	Usable Bandwidth Variance -				
	Temperature -30°C	V	-20% max. below 5 kHz	N	*1
	+60°C	V	-20% max. below 5 kHz	-49.2 %	*
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-47.5 %	*
5.4.2.2	Adjacent Channel Selectivity	D	70 dB min.	60.0 dB	*
	Adjacent Channel Selectivity				
	Variance -				
	Temperature -30°C	W	58 dB min.	N	*1
	+60°C	W	58 dB min.	N	*2
	Humidity 50°C, 90% RH	AE	58 dB min.	N	*2
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	45.0 dB	*
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	54.0 dB	*
<u>RECEIVER SQUELCH</u>					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.20 uV	
	Threshold Squelch Variance-				
	Voltage +10%	I	0.6 uV or less	0.18 uV	
	-20%	I	0.6 uV or less	0.36 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	N	*1
	+60°C	Y	+6 dB max. above 0.4 uV	-3.0 dB	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	31.0 dB	*
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	0.29 uV	
	Tight Squelch Variance -				
	Temperature -30°C	X	+6 dB max. above 4.0 uV	N	*1
	+60°C	X	+6 dB max. above 4.0 uV	-70.7 dB	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	34.1 dB	*
5.4.3.2	Squelch Block	J	5 kHz min.	8.1 kHz	
5.4.3.3	Squelch Attack Time	K	150 ms max.	120 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	100 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2181

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	1290 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	0.9 dB	
-20%	O	-3 dB max. below 500 mW	-2.1 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	0.1 dB	
+60°C	Z	-6 dB max. below 500 mW	-15.9 dB	*
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	-14.3 dB	*
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	17.1 %	*
Temperature -30°C	AB	18% max. at 500 mW	12.4 %	
+60°C	AB	18% max. at 500 mW	11.3 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	12.6 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	-8.1 dB	*
500 Hz		+6.0 dB (-10, +2 dB)	-2.3 dB	
1000 Hz		0 dB (0, 0 dB)	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-15.3 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-23.9 dB	*
5.4.4.4 Audio Hum and Noise -				
Unsquelled	S	40 dB min. below 500 mW	57.2 dB	
Squelled	T	50 dB min. below 500 mW	71.8 dB	
Audio Hum and Noise Variance -				
Unsquelled				
Temperature -30°C	AA	30 dB min.	60.1 dB	
+60°C	AA	30 dB min.	60.1 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	58.0 dB	
Squelled				
Temperature -30°C	AA	40 dB min.	85.2 dB	
+60°C	AA	40 dB min.	56.7 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	1.8 dB	*
5.5.1 TRANSMITTER RF CARRIER				
5.5.1.1 Carrier Output Power				
Rated (nominal)			2.5 W	
Measured			1.42 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	-2.46 dB	*
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	1.11 dB	
-10%	BB	±3 dB of nominal	-38.95 dB	*
-20%	BC	-6, +3 dB of nominal	N	*3
Temperature -30°C	BN	±3 dB of nominal	N	*1
+60°C	BN	±3 dB of nominal	-7.03 dB	*
Humidity 50°C, 90% RH	BR	±3 dB of nominal	-6.71 dB	*
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00005 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00005 %	
-15%	BE	0.0005% of nominal	N	*3
Temperature -30°C	BP	0.0005% of nominal	N	*1
+60°C	BP	0.0005% of nominal	0.00035 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00007 %	
Vibration	BV	0.0005% of nominal	0.00033 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	84.3 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	8 ms	

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2181

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	3.7 %	
Temperature Stability				
-30°C	BQ	9% max.	N	*1
+60°C	BQ	9% max.	4.3 %	
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	46.8 dB	
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	N	*1
+60°C	BO	34 dB min. attenuation	39.2 dB	
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	48.3 dB	
Vibration	BU	25 dB min. attenuation	52.9 dB	
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	-19.0 dB	*
500 Hz		-6.0 dB (+1, -3 dB)	-8.6 dB	
1000 Hz		0 dB (0, 0 dB)	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	4.3 dB	*
3000 Hz		+9.5 dB (+1, -4.6 dB)	4.0 dB	*
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.60 kHz	
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	2.90 kHz	
500 Hz	EJ	≤5 kHz	4.90 kHz	
1000 Hz	BJ	≤5 kHz	4.40 kHz	
2000 Hz	BJ	≤5 kHz	4.30 kHz	
2500 Hz	BJ	≤5 kHz	4.30 kHz	
3000 Hz	BJ	≤5 kHz	4.20 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	55.0 dB	
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA				
5.6.1 Radiation Efficiency	CA	20% min.	7.3 %	*
Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)				
Service Life: 20 to 30°C	DA	8 hrs.	1 hr. 8 min.	
-30°C	DB	2 hrs.	n n	4
+60°C	DC	7 hrs.	n n	4

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2181

1. All test data was not obtained. The transceiver failed operation at -30°C, but recovered operation at ambient temperature.
 2. All test data was not obtained. The transceiver audio output was too low to make measurements at +60°C temperature and at 50°C, 90% relative humidity.
 3. Output was too low for measurement.
 4. The transmitter failed operation during the battery test after one hour and eight minutes operation. At this point, the battery measured 11.5 volts.
- A. The manufacturer has advised that this unit was not put into production.

FM TRANSCEIVER TEST DATA

MANUFACTURER: Standard Communications Corporation
 MODEL NO.: C831L06A
 SERIAL NO.: 89U010134
 TYPE: II

ITEM NO.: 2182
 RF POWER (Nominal): 3.0 Watts
 TEST FREQUENCIES: T- 155.010 MHz
 R- 155.010 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.22 uV	
SINAD Sensitivity Variance -				
Voltage +10%	B	0.7 uV or less	0.22 uV	
-20%	B	0.7 uV or less	0.22 uV	
Temperature -30°C	U	+6 dB max. above 0.5 uV	-3.4 dB	
+60°C	U	+6 dB max. above 0.5 uV	0.0 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-2.9 dB	
<u>RECEIVER SELECTIVITY</u>				
5.4.2.1 Usable Bandwidth	C	5 kHz min.	6.1 kHz	
Usable Bandwidth Variance -				
Temperature -30°C	V	-20% max. below 5 kHz	-12 %	
+60°C	V	-20% max. below 5 kHz	-16 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-12 %	
5.4.2.2 Adjacent Channel Selectivity	D	70 dB min.	74.0 dB	
Adjacent Channel Selectivity				
Variance -				
Temperature -30°C	W	58 dB min.	58.1 dB	
+60°C	W	58 dB min.	80.5 dB	
Humidity 50°C, 90% RH	AE	58 dB min.	74.5 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	44.6 dB	*
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	64.9 dB	
<u>RECEIVER SQUELCH</u>				
5.4.3.1 Threshold Squelch Sensitivity	G	0.4 uV or less	0.07 uV	
Threshold Squelch Variance-				
Voltage +10%	I	0.6 uV or less	0.06 uV	
-20%	I	0.6 uV or less	0.10 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-4.4 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-4.8 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-13.8 dB	
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.63 uV	
Tight Squelch Variance -				
Temperature -30°C	X	+6 dB max. above 4.0 uV	-4.1 dB	
+60°C	X	+6 dB max. above 4.0 uV	-2.2 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-9.8 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	5.7 kHz	
5.4.3.3 Squelch Attack Time	K	150 ms max.	9 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	350 ms	*

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2182

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	1102 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	4.0 dB	
	-20%	O	-3 dB max. below 500 mW	1.6 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	3.9 dB	
	+60°C	Z	-6 dB max. below 500 mW	4.2 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	4.2 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	6.6 %	
	Temperature -30°C	AB	18% max. at 500 mW	7.2 %	
	+60°C	AB	18% max. at 500 mW	4.8 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	7.9 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	5.6 dB	
	500 Hz		+6.0 dB (-10, +2 dB)	-4.5 dB	*
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-6.6 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-12.7 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsilenced	S	40 dB min. below 500 mW	51.3 dB	
	Silenced	T	50 dB min. below 500 mW	51.7 dB	
	Audio Hum and Noise Variance -				
	Unsilenced				
	Temperature -30°C	AA	30 dB min.	54.2 dB	
	+60°C	AA	30 dB min.	53.0 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	50.4 dB	
	Silenced				
	Temperature -30°C	AA	40 dB min.	54.2 dB	
	+60°C	AA	40 dB min.	63.0 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	50.4 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			3.0 W	
	Measured			3.05 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	0.05 dB	
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	1.5 dB	
	-10%	BB	±3 dB of nominal	-0.7 dB	
	-20%	BC	-6, +3 dB of nominal	-2.1 dB	
	Temperature -30°C	BN	±3 dB of nominal	0.5 dB	
	+60°C	BN	±3 dB of nominal	1.2 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	0.0 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00010 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.00013 %	
	-15%	BE	0.0005% of nominal	0.00041 %	
	Temperature -30°C	BP	0.0005% of nominal	-0.00098 %	*
	+60°C	BP	0.0005% of nominal	0.00607 %	*
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	-0.00055 %	*
	Vibration	BV	0.0005% of nominal	-0.00010 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	77.2 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	11 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2182

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	7.8 %	*
	Temperature Stability				
	-30°C	BQ	9% max.	4.7 %	
	+60°C	BQ	9% max.	3.2 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	45.0 dB	
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	37.4 dB	
	+60°C	BO	34 dB min. attenuation	34.9 dB	
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	27.0 dB	*
	Vibration	BU	25 dB min. attenuation	30.7 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-10.9 dB	
	500 Hz		-6.0 dB (+1, -3 dB)	-6.3 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	7.3 dB	
	3000 Hz		+9.5 dB (+1, -4.6 dB)	6.8 dB	
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	6.1 kHz	*
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	6.0 kHz	*
	500 Hz	BJ	≤5 kHz	5.5 kHz	*
	1000 Hz	BJ	≤5 kHz	5.9 kHz	*
	2500 Hz	BJ	≤5 kHz	5.0 kHz	
	3000 Hz	BJ	≤5 kHz	4.1 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	52.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	34.0 dB	
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	60.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	20% min.	27.8 %	
	Power Test Degradation	CB	1 dB max.	0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C	DA	8 hrs.	2 hrs. 42 min.	
	-30°C	DB	2 hrs.	N	1
	+60°C	DC	7 hrs.	3 hrs. 5 min.	

2182-3

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2182

- No test data was obtained. The transceiver did not produce one-half of rated output at -30°C.

FM TRANSCEIVER TEST DATA

MANUFACTURER: Standard Communications Corp. ITEM NO.: 2183
 MODEL NO.: C731L06AU1X1 RF POWER (Nominal): 2.0 Watts
 SERIAL NO.: 91U010243 TEST FREQUENCIES: T- 460.025 MHz
 TYPE: III R- 460.025 MHz

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.30 uV	
	SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.31 uV	
	-20%	B	0.7 uV or less	0.32 uV	
	Temperature -30°C	U	+6 dB max. above 0.5 uV	3.9 dB	
	+60°C	U	+6 dB max. above 0.5 uV	2.9 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	4.0 dB	
<u>RECEIVER SELECTIVITY</u>					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	5.5 kHz	
	Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	N	*1
	+60°C	V	-20% max. below 5 kHz	0 %	
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	4.0 %	
5.4.2.2	Adjacent Channel Selectivity	D	60 dB min.	77.0 dB	
	Adjacent Channel Selectivity Variance - Temperature -30°C	W	48 dB min.	N	*1
	+60°C	W	48 dB min.	74.7 dB	
	Humidity 50°C, 90% RH	AE	48 dB min.	75.1 dB	
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	48.0 dB	*
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	61.0 dB	
<u>RECEIVER SQUELCH</u>					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.07 uV	
	Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.09 uV	
	-20%	I	0.6 uV or less	0.19 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	N	*1
	+60°C	Y	+6 dB max. above 0.4 uV	-6.0 dB	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-2.5 dB	
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	2.0 uV	
	Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	N	*1
	+60°C	X	+6 dB max. above 4.0 uV	4.9 dB	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	3.8 dB	
5.4.3.2	Squelch Block	J	5 kHz min.	7.7 kHz	
5.4.3.3	Squelch Attack Time	K	150 ms max.	89 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	320 ms	*

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2183

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	1102 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	4.2 dB	
	-20%	O	-3 dB max. below 500 mW	0.9 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	N	*1
	+60°C	Z	-6 dB max. below 500 mW	4.1 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	3.5 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	2.8 %	
	Temperature -30°C	AB	18% max. at 500 mW	N	*1
	+60°C	AB	18% max. at 500 mW	4.8 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	4.8 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	5.2 dB	
	500 Hz		+6.0 dB (-10, +2 dB)	4.0 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-6.0 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-9.5 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsquenced	S	40 dB min. below 500 mW	45.5 dB	
	Squenced	T	50 dB min. below 500 mW	45.5 dB	*
	Audio Hum and Noise Variance -				
	Unsquenced				
	Temperature -30°C	AA	30 dB min.	N	*1
	+60°C	AA	30 dB min.	46.1 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	45.5 dB	
	Squenced				
	Temperature -30°C	AA	40 dB min.	N	*1
	+60°C	AA	40 dB min.	46.8 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	45.5 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			2.0 W	
	Measured			1.92 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.18 dB	
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	-0.45 dB	
	-10%	BB	±3 dB of nominal	-1.11 dB	
	-20%	BC	-6, +3 dB of nominal	-2.29 dB	
	Temperature -30°C	BN	±3 dB of nominal	0.79 dB	
	+60°C	BN	±3 dB of nominal	-0.18 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	-2.73 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00018 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.00027 %	
	-15%	BE	0.0005% of nominal	0.00033 %	
	Temperature -30°C	BP	0.0005% of nominal	0.0390 %	*
	+60°C	BP	0.0005% of nominal	0.00063 %	*
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00051 %	*
	Vibration	BV	0.0005% of nominal	0.00027 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	75.6 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	7 ms	

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2183

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	3.6 %	
	Temperature Stability				
	-30°C	BQ	9% max.	4.4 %	
	+60°C	BQ	9% max.	3.6 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	30.2 dB	*
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	28.5 dB	*
	+60°C	BO	34 dB min. attenuation	30.1 dB	*
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	30.1 dB	*
	Vibration	BU	25 dB min. attenuation	27.3 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-10.6 dB	
	500 Hz		-6.0 dB (+1, -3 dB)	-5.8 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	+7.3 dB	
	3000 Hz		+9.5 dB (+1, -4.6 dB)	+6.6 dB	
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.75 kHz	
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	6.3 kHz	
	500 Hz	BJ	≤5 kHz	5.5 kHz	
	1000 Hz	BJ	≤5 kHz	4.4 kHz	
	2500 Hz	BJ	≤5 kHz	5.3 kHz	
	3000 Hz	BJ	≤5 kHz	4.6 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	48.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	26.0 dB	*
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	60.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	50% min.	21.7 %	*
	Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C				
	-30°C	DA	8 hrs.	3 hrs. 10 min.	
	+60°C	DB	2 hrs.	N	2
		DC	7 hrs.	2 hrs. 55 min.	

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2186

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	1410 mW	
Audio Output Power Variance -				
Voltage +10%	C	-3 dB max. below 500 mW	0.9 dB	
-20%	O	-3 dB max. below 500 mW	-2.2 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	-0.2 dB	
+60°C	Z	-6 dB max. below 500 mW	-0.1 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	0.5 dB	
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	3.9 %	
Temperature -30°C	AB	18% max. at 500 mW	2.8 %	
+60°C	AB	18% max. at 500 mW	5.6 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	14.6 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	2.3 dB	
500 Hz		+6.0 dB (-10, +2 dB)	2.9 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-5.7 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-10.9 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquenced	S	40 dB min. below 500 mW	60.0 dB	
Squenced	T	50 dB min. below 500 mW	100.0 dB	
Audio Hum and Noise Variance -				
Unsquenced				
Temperature -30°C	AA	30 dB min.	55.1 dB	
+60°C	AA	30 dB min.	60.0 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	59.3 dB	
Squenced				
Temperature -30°C	AA	40 dB min.	90.5 dB	
+60°C	AA	40 dB min.	100.0 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	88.0 dB	
5.5.1 TRANSMITTER RF CARRIER				
5.5.1.1 Carrier Output Power				
Rated (nominal)			6.0 W	
Measured			5.9 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.07 dB	
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	0.8 dB	
-10%	BB	±3 dB of nominal	-1.0 dB	
-20%	BC	-6, +3 dB of nominal	-0.1 dB	
Temperature -30°C	BN	±3 dB of nominal	-0.2 dB	
+60°C	BN	±3 dB of nominal	-0.7 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	-0.5 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00001 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00001 %	
-15%	BE	0.0005% of nominal	0.00006 %	
Temperature -30°C	BP	0.0005% of nominal	0.00005 %	
+60°C	BP	0.0005% of nominal	0.00013 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00045 %	
Vibration	BY	0.0005% of nominal	0.00033 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	95.2 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	8 ms	

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2186

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	2.0 %	
Temperature Stability				
-30°C	BQ	9% max.	4.2 %	
+60°C	BQ	9% max.	2.2 %	
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	46.2 dB	
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	37.3 dB	
+60°C	BO	34 dB min. attenuation	45.2 dB	
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	45.1 dB	
Vibration	BU	25 dB min. attenuation	44.8 dB	
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	-15.3 dB	*
500 Hz		-6.0 dB (+1, -3 dB)	-7.2 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	6.4 dB	
3000 Hz		+9.5 dB (+1, -4.6 dB)	3.6 dB	*
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.60 kHz	
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	4.35 kHz	
500 Hz	BJ	≤5 kHz	4.80 kHz	
1000 Hz	BJ	≤5 kHz	4.70 kHz	
2000 Hz	BJ	≤5 kHz	4.85 kHz	
2500 Hz	BJ	≤5 kHz	4.30 kHz	
3000 Hz	BJ	≤5 kHz	3.15 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	50.0 dB	
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA				
5.6.1 Radiation Efficiency	CA	20% min.	33.0 %	
Power Test Degradation	CB	1 dB max.	1 dB	
5.7 BATTERY (NI-CAD)				
Service Life: 20 to 30°C	DA	8 hrs.	2 hrs. 10 min.	
-30°C	DB	2 hrs.	0 hrs. 40 min.	
+60°C	DC	7 hrs.	2 hrs. 26 min.	

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2187

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.4 RECEIVER AUDIO FREQUENCY</u>					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	1240 mW	
	Audio Output Power Variance -				
	Voltage +10%	C	-3 dB max. below 500 mW	0.9 dB	
	-20%	O	-3 dB max. below 500 mW	-2.2 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	0.0 dB	
	+60°C	Z	-6 dB max. below 500 mW	0.2 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	N	*1
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	2.9 %	
	Temperature -30°C	AB	18% max. at 500 mW	4.8 %	
	+60°C	AB	18% max. at 500 mW	6.6 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	N %	*1
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	1.1 dB	
	500 Hz		+6.0 dB (-10, +2 dB)	2.1 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-5.3 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-10.0 dB	
5.4.4.4	Audio Hum and Noise - Unsquelled	S	40 dB min. below 500 mW	60.5 dB	
	Squelched	T	50 dB min. below 500 mW	106.0 dB	
	Audio Hum and Noise Variance - Unsquelled				
	Temperature -30°C	AA	30 dB min.	60.9 dB	
	+60°C	AA	30 dB min.	60.1 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	N	*1
	Squelched				
	Temperature -30°C	AA	40 dB min.	96.5 dB	
	+60°C	AA	40 dB min.	100.0 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	N	*1
<u>5.5.1 TRANSMITTER RF CARRIER</u>					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			2.0 W	
	Measured			1.77 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.52 dB	*
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	0.34 dB	
	-10%	BB	±3 dB of nominal	-1.49 dB	
	-20%	BC	-6, +3 dB of nominal	-2.61 dB	
	Temperature -30°C	BN	±3 dB of nominal	-0.52 dB	
	+60°C	BN	±3 dB of nominal	-0.85 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	N	*1
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00001 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.0 %	
	-15%	BE	0.0005% of nominal	0.00004 %	
	Temperature -30°C	BP	0.0005% of nominal	0.00006 %	
	+60°C	BP	0.0005% of nominal	0.00013 %	
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	N	*1
	Vibration	BV	0.0005% of nominal	0.00033 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	93.1 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	8 ms	

2187-2

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2187

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION</u>					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	3.1 %	
	Temperature Stability				
	-30°C	BQ	9% max.	4.3 %	
	+60°C	BQ	9% max.	3.1 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	50.2 dB	
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	41.5 dB	
	+60°C	BO	34 dB min. attenuation	37.5 dB	
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	N	*1
	Vibration	BU	25 dB min. attenuation	36.3 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-18.0 dB	*
	500 Hz		-6.0 dB (+1, -3 dB)	-8.0 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	6.5 dB	
	3000 Hz		+9.5 dB (+1, -4.6 dB)	5.5 dB	
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.5000 kHz	*
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	4.90 kHz	
	500 Hz	BJ	≤5 kHz	4.90 kHz	
	1000 Hz	BJ	≤5 kHz	4.60 kHz	
	2000 Hz	BJ	≤5 kHz	4.40 kHz	
	2500 Hz	BJ	≤5 kHz	3.80 kHz	
	3000 Hz	BJ	≤5 kHz	2.80 kHz	
<u>5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY</u>					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	50.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
<u>5.6 ANTENNA</u>					
5.6.1	Radiation Efficiency	CA	20% min.	17.7 %	*
	Power Test Degradation	CB	1 dB max.	0.0 dB	
<u>5.7 BATTERY (NI-CAD)</u>					
	Service Life: 20 to 30°C	DA	8 hrs.	4 hrs. 56 min.	
	-30°C	DB	2 hrs.	3 hrs. 28 min.	
	+60°C	DC	7 hrs.	5 hrs. 10 min.	

2187-3

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2187

1. Test data was not obtained. The transmitter and receiver ceased to function during the humidity test at 50°C, 90% relative humidity. The transceiver recovered operation upon drying out under ambient temperature and humidity conditions.

FM TRANSCEIVER TEST DATA

MANUFACTURER: IEC Electronics Corp.
 MODEL NO.: LE-100
 SERIAL NO.: 9793
 TYPE: III

ITEM NO.: 2188
 RF POWER (Nominal): 2.0 Watts
 TEST FREQUENCIES: T- 464.500 MHz
 R- 464.500 MHz

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.33 uV	
5.4.1	SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.31 uV	
		B	0.7 uV or less	0.36 uV	
5.4.1	Temperature -30°C	U	+6 dB max. above 0.5 uV	-0.4 dB	
		U	+6 dB max. above 0.5 uV	-1.8 dB	
5.4.1	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-5.5 dB	
<u>RECEIVER SELECTIVITY</u>					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	5.40 kHz	
5.4.2.1	Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	-16.7 %	
		V	-20% max. below 5 kHz	24.1 %	
5.4.2.2	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-11.1 %	
		D	60 dB min.	74.0 dB	
5.4.2.2	Adjacent Channel Selectivity Variance - Temperature -30°C	W	48 dB min.	72.0 dB	
		W	48 dB min.	87.0 dB	
5.4.2.3	Humidity 50°C, 90% RH	AE	48 dB min.	69.0 dB	
5.4.2.4	Spurious Response Attenuation	E	60 dB min.	44.5 dB	
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	61.0 dB	*
<u>RECEIVER SQUELCH</u>					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.12 uV	
5.4.3.1	Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.02 uV	
		I	0.6 uV or less	0.34 uV	
5.4.3.1	Temperature -30°C	Y	+6 dB max. above 0.4 uV	-7.0 dB	
		Y	+6 dB max. above 0.4 uV	0.0 dB	
5.4.3.1	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-9.0 dB	
		H	4.0 uV or less	0.53 uV	
5.4.3.1	Tight Squelch Sensitivity Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	2.0 dB	
		X	+6 dB max. above 4.0 uV	-1.0 dB	
5.4.3.2	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-4.0 dB	
5.4.3.3	Squelch Block	J	5 kHz min.	7.1 kHz	
5.4.3.4	Squelch Attack Time	K	150 ms max.	45 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	65 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2188

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	1300 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	1.0 dB	
Voltage -20%	O	-3 dB max. below 500 mW	-2.1 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	-0.4 dB	
Temperature +60°C	Z	-6 dB max. below 500 mW	0.0 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	-0.7 dB	
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	3.5 %	
Temperature -30°C	AB	18% max. at 500 mW	3.7 %	
Temperature +60°C	AB	18% max. at 500 mW	2.1 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	9.0 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	3.0 dB	
500 Hz		+6.0 dB (-10, +2 dB)	3.4 dB	
1000 Hz		0 dB (0, 0 dB)	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-6.7 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-11.8 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquelled	S	40 dB min. below 500 mW	61.1 dB	
Squelched	T	50 dB min. below 500 mW	100.0 dB	
Audio Hum and Noise Variance -				
Unsquelled				
Temperature -30°C	AA	30 dB min.	60.1 dB	
Temperature +60°C	AA	30 dB min.	59.6 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	57.8 dB	
Squelched				
Temperature -30°C	AA	40 dB min.	94.0 dB	
Temperature +60°C	AA	40 dB min.	100.0 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	89.1 dB	
5.5.1 TRANSMITTER RF CARRIER				
5.5.1.1 Carrier Output Power Rated (nominal)			2.0 W	
Measured			1.98 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.04 dB	
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	1.10 dB	
Voltage -10%	BB	±3 dB of nominal	-1.21 dB	
Voltage -20%	BC	-6, +3 dB of nominal	-2.80 dB	
Temperature -30°C	BN	±3 dB of nominal	-0.37 dB	
Temperature +60°C	BN	±3 dB of nominal	-0.92 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	-0.65 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00007 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00007 %	
Voltage -15%	BE	0.0005% of nominal	0.00005 %	
Temperature -30°C	BP	0.0005% of nominal	0.00028 %	
Temperature +60°C	BP	0.0005% of nominal	0.00015 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00028 %	
Vibration	BV	0.0005% of nominal	0.00011 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	77.5 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	8 ms	

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2188

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	2.9 %	
Temperature Stability				
-30°C	BQ	9% max.	3.6 %	
+60°C	BQ	9% max.	3.6 %	
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	48.4 dB	
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	36.0 dB	
Temperature +60°C	BO	34 dB min. attenuation	35.2 dB	
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	37.0 dB	
Vibration	BU	25 dB min. attenuation	35.4 dB	
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	-18.8 dB	*
500 Hz		-6.0 dB (+1, -3 dB)	-8.2 dB	
1000 Hz		0 dB (0, 0 dB)	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	6.8 dB	
3000 Hz		+9.5 dB (+1, -4.6 dB)	6.4 dB	
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.70 kHz	
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	3.60 kHz	
500 Hz	BJ	≤5 kHz	4.35 kHz	
1000 Hz	BJ	≤5 kHz	4.70 kHz	
2000 Hz	BJ	≤5 kHz	3.75 kHz	
2500 Hz	BJ	≤5 kHz	3.20 kHz	
3000 Hz	BJ	≤5 kHz	2.70 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	50.0 dB	
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA				
5.6.1 Radiation Efficiency	CA	50% min.	69.9 %	
Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)				
Service Life: 20 to 30°C	DA	8 hrs.	3 hrs. 35 min.	
-30°C	DB	2 hrs.	1 hr. 20 min.	
+60°C	DC	7 hrs.	3 hrs. 33 min.	

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2188

FM TRANSCEIVER TEST DATA

MANUFACTURER: REPCO, Inc.
 MODEL NO.: RPX 50
 SERIAL NO.: HGC 79680
 TYPE: I

ITEM NO.: 2192
 RF POWER (Nominal): 3.0 Watts
 TEST FREQUENCIES: T- 34.000 MHz
 R- 34.525 MHz

TRANSCEIVER CHARACTERISTIC (25-50 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.1 RECEIVER SENSITIVITY</u>					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.18 uV	
	SINAD Sensitivity Variance -				
	Voltage +10%	B	0.7 uV or less	0.19 uV	
	-20%	B	0.7 uV or less	0.19 uV	
	Temperature -30°C	U	+6 dB max. above 0.5 uV	-9.9 dB	
	+60°C	U	+6 dB max. above 0.5 uV	-6.7 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-7.5 dB	
<u>5.4.2 RECEIVER SELECTIVITY</u>					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	7.3 kHz	
	Usable Bandwidth Variance -				
	Temperature -30°C	V	-20% max. below 5 kHz	54.0 %	
	+60°C	V	-20% max. below 5 kHz	62.0 %	
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	42.0 %	
5.4.2.2	Adjacent Channel Selectivity	D	60 dB min.	83.2 dB	
	Adjacent Channel Selectivity				
	Variance -				
	Temperature -30°C	W	48 dB min.	73.0 dB	
	+60°C	W	48 dB min.	75.1 dB	
	Humidity 50°C, 90% RH	AE	48 dB min.	75.1 dB	
5.4.2.3	Spurious Response Attenuation	E	70 dB min.	>70.0 dB	
5.4.2.4	Intermodulation Attenuation	F	70 dB min.	73.4 dB	
<u>5.4.3 RECEIVER SQUELCH</u>					
5.4.3.1	Threshold Squelch Sensitivity	G	0.3 uV or less	0.05 uV	
	Threshold Squelch Variance-				
	Voltage +10%	I	0.45 uV or less	0.05 uV	
	-20%	I	0.45 uV or less	0.05 uV	
	Temperature -30°C	Y	+6 dB max. above 0.30 uV	-13.2 dB	
	+60°C	Y	+6 dB max. above 0.30 uV	-10.1 dB	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.30 uV	12.0 dB	
5.4.3.1	Tight Squelch Sensitivity	H	3.0 uV or less	0.76 uV	*
	Tight Squelch Variance -				
	Temperature -30°C	X	+6 dB max. above 3.0 uV	-18.9 dB	
	+60°C	X	+6 dB max. above 3.0 uV	-8.7 dB	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 3.0 uV	-7.3 dB	
5.4.3.2	Squelch Block	J	5 kHz min.	5.3 kHz	
5.4.3.3	Squelch Attack Time	K	150 ms max.	45 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	18 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.

N-No test data was obtained. Requirement was not met.

n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2192

TRANSCEIVER CHARACTERISTIC (25-50 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.4 RECEIVER AUDIO FREQUENCY</u>					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	1021 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	4.0 dB	
	-20%	O	-3 dB max. below 500 mW	0.8 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	3.4 dB	
	+60°C	Z	-6 dB max. below 500 mW	3.8 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	2.3 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	2.4 %	
	Temperature -30°C	AB	18% max. at 500 mW	3.0 %	
	+60°C	AB	18% max. at 500 mW	1.2 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	1.5 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	-2.7 dB	* A
	500 Hz		+6.0 dB (-10, +2 dB)	5.3 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-7.0 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-25.7 dB	*
5.4.4.4	Audio Hum and Noise -				
	Unsquelled	S	40 dB min. below 500 mW	90.8 dB	1
	Squelched	T	50 dB min. below 500 mW	90.8 dB	
	Audio Hum and Noise Variance -				
	Unsquelled				
	Temperature -30°C	AA	30 dB min.	90.8 dB	
	+60°C	AA	30 dB min.	90.8 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	90.8 dB	
	Squelched				
	Temperature -30°C	AA	40 dB min.	90.8 dB	
	+60°C	AA	40 dB min.	90.8 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	90.8 dB	
<u>5.5.1 TRANSMITTER RF CARRIER</u>					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			3.0 W	
	Measured			5.2 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	2.4 dB	*
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	3.5 dB	*
	-10%	BB	±3 dB of nominal	1.1 dB	
	-20%	BC	-6, +3 dB of nominal	1.0 dB	
	Temperature -30°C	BN	±3 dB of nominal	1.3 dB	
	+60°C	BN	±3 dB of nominal	2.7 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	1.2 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.002% of nominal	0.00027 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.002% of nominal	0.00032 %	
	-15%	BE	0.002% of nominal	0.00059 %	
	Temperature -30°C	BP	0.002% of nominal	0.0014 %	
	+60°C	BP	0.002% of nominal	0.00013 %	
	Humidity 50°C, 90% RH	BT	0.002% of nominal	0.00014 %	
	Vibration	BV	0.002% of nominal	0.00009 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	56.5 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	15 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2192

TRANSCEIVER CHARACTERISTIC (25-50 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION</u>					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	2.5 %	
	Temperature Stability				
	-30°C	BQ	9% max.	2.0 %	
	+60°C	BQ	9% max.	2.0 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	32.3 dB	*
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	33.6 dB	*
	+60°C	BO	34 dB min. attenuation	33.5 dB	*
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	36.6 dB	
	Vibration	BU	25 dB min. attenuation	30.9 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	0.3 dB	* P
	500 Hz		-6.0 dB (+1, -3 dB)	0.4 dB	*
	1000 Hz		0 dB 0 dB	0.0 dB	*
	2500 Hz		+8.0 dB (+1, -3 dB)	0.0 dB	*
	3000 Hz		+9.5 dB (+1, -4.6 dB)	-0.4 dB	*
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.80 kHz	
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	5 kHz	4.52 kHz	
	500 Hz	BJ	5 kHz	4.65 kHz	
	1000 Hz	BJ	5 kHz	4.72 kHz	
	2500 Hz	BJ	5 kHz	4.90 kHz	
	3000 Hz	BJ	5 kHz	4.20 kHz	
<u>5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY</u>					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	53.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	25 dB min. attenuation	27.0 dB	
	±20 kHz Freq. Separation	BM	50 dB min. attenuation	60.0 dB	
<u>5.6 ANTENNA</u>					
5.6.1	Radiation Efficiency Power Test Degradation	CA	N/A	N/A	
		CB	2 dB max.	0.0 dB	
<u>5.7 BATTERY (NI-CAD)</u>					
	Service Life: 20 to 30°C	DA	8 hrs.	2 hrs. 25 min.	
	-30°C	DB	2 hrs.	0 hrs. 55 min.	
	+60°C	DC	7 hrs.	3 hrs. 15 min.	

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2192

1. Audio hum and noise measurement of -90.8 dB represent the measuring limit of the test instrumentation. The audio hum and noise was less than the measuring capability of the test instrumentation.
- A. Low frequencies are deliberately attenuated to improve rejection of CTCSS tone.
- B. The microphone element provides the pre-emphasis in our audio circuit. A microphone simulator is required for audio response measurements. All unit data indicates that the unit will pass when measured with the simulator circuit.

FM TRANSCEIVER TEST DATA

MANUFACTURER: REPCO, Inc.
 MODEL NO.: TEK 10-8
 SERIAL NO.: 118287
 TYPE: II

ITEM NO.: 2195
 RF POWER (Nominal): 2.2 Watts
 TEST FREQUENCIES: T- 155.145 MHz
 R- 155.145 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.20 uV	
SINAD Sensitivity Variance -				
Voltage +10%	B	0.7 uV or less	0.20 uV	
-20%	B	0.7 uV or less	0.22 uV	*1
Temperature -30°C	U	+6 dB max. above 0.5 uV	-8.9 dB	
+60°C	U	+6 dB max. above 0.5 uV	-6.4 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-6.4 dB	
<u>RECEIVER SELECTIVITY</u>				
5.4.2.1 Usable Bandwidth	C	5 kHz min.	6.8 kHz	
Usable Bandwidth Variance -				
Temperature -30°C	V	-20% max. below 5 kHz	38 %	
+60°C	V	-20% max. below 5 kHz	22 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	36 %	
5.4.2.2 Adjacent Channel Selectivity	D	70 dB min.	74.4 dB	
Adjacent Channel Selectivity				
Variance -				
Temperature -30°C	W	58 dB min.	73.1 dB	
+60°C	W	58 dB min.	67.4 dB	
Humidity 50°C, 90% RH	AE	58 dB min.	72.0 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	>60.0 dB	
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	55.5 dB	*
<u>RECEIVER SQUELCH</u>				
5.4.3.1 Threshold Squelch Sensitivity	G	0.4 uV or less	0.08 uV	
Threshold Squelch Variance-				
Voltage +10%	I	0.6 uV or less	0.08 uV	
-20%	I	0.6 uV or less	0.10 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-14.2 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-12.2 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-11.6 dB	
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.26 uV	
Tight Squelch Variance -				
Temperature -30°C	X	+6 dB max. above 4.0 uV	-21.4 dB	
+60°C	X	+6 dB max. above 4.0 uV	-22.8 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-20.9 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	5.0 kHz	
5.4.3.3 Squelch Attack Time	K	150 ms max.	60 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	300 ms	*

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2195

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	753 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	3.5 dB	
Voltage -20%	O	-3 dB max. below 500 mW	-2.0 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	2.7 dB	
Temperature +60°C	Z	-6 dB max. below 500 mW	2.9 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	3.0 dB	
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	1.8 %	
Temperature -30°C	AB	18% max. at 500 mW	3.7 %	
Temperature +60°C	AB	18% max. at 500 mW	4.1 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	2.4 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	8.1 dB	
500 Hz		+6.0 dB (-10, +2 dB)	5.5 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-8.2 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-16.0 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquelled	S	40 dB min. below 500 mW	51.2 dB	
Squelled	T	50 dB min. below 500 mW	82.8 dB	
Audio Hum and Noise Variance -				
Unsquelled				
Temperature -30°C	AA	30 dB min.	51.7 dB	
Temperature +60°C	AA	30 dB min.	50.8 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	52.2 dB	
Squelled				
Temperature -30°C	AA	40 dB min.	77.7 dB	
Temperature +60°C	AA	40 dB min.	66.2 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	72.7 dB	
5.5.1 TRANSMITTER RF CARRIER				
5.5.1.1 Carrier Output Power				
Rated (nominal)			2.2 W	
Measured			2.4 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	0.38 dB	
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	0.9 dB	
Voltage -10%	BB	±3 dB of nominal	-0.6 dB	
Voltage -20%	BC	-6, +3 dB of nominal	-1.7 dB	
Temperature -30°C	BN	±3 dB of nominal	0.2 dB	
Temperature +60°C	BN	±3 dB of nominal	0.0 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	0.2 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00001 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00002 %	
Voltage -15%	BE	0.0005% of nominal	0.00002 %	
Temperature -30°C	BP	0.0005% of nominal	0.00027 %	
Temperature +60°C	BP	0.0005% of nominal	0.00027 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00045 %	
Vibration	BV	0.0005% of nominal	0.00053 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	69.4 dB	*2
5.5.1.4 Carrier Attack Time	BG	100 ms max.	12 ms	

2195-2

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2195

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	6.0 %	*
Temperature Stability				
-30°C	BQ	9% max.	7.2 %	
+60°C	BQ	9% max.	22.0 %	*
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	36.4 dB	*
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	32.0 dB	*
Temperature +60°C	BO	34 dB min. attenuation	33.3 dB	*
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	36.7 dB	
Vibration	BU	25 dB min. attenuation	26.4 dB	
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	10.1 dB	
500 Hz		-6.0 dB (+1, -3 dB)	-5.8 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	9.0 dB	
3000 Hz		+9.5 dB (+1, -4.6 dB)	8.8 dB	
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	5.3 kHz	*
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	4.70 kHz	
500 Hz	BJ	≤5 kHz	4.90 kHz	
1000 Hz	BJ	≤5 kHz	4.75 kHz	
2500 Hz	BJ	≤5 kHz	5.00 kHz	
3000 Hz	BJ	≤5 kHz	4.30 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	n	3
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	31 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	60 dB	
5.6 ANTENNA				
5.6.1 Radiation Efficiency	CA	20% min.	n	3
Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)				
Service Life: 20 to 30°C	DA	8 hrs.	7 hrs.	
-30°C	DB	2 hrs.	0 min.	
+60°C	DC	7 hrs.	N	4

2195-3

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2195

1. The transceiver would not produce the required 500mW output at -20% of nominal voltage. Results indicated are for -10% reduction of nominal voltage.
2. The transceiver was within the compliance requirement at 10-30 Hz vibration but not during the 30-60 Hz vibration.
3. The transceiver failed to operate during the radiated spurious emissions and antenna efficiency tests.
4. The transceiver did not produce one-half of nominal power at -30°C or +60°C. No test could be conducted.

FM TRANSCEIVER TEST DATA

MANUFACTURER: REPCO
 MODEL NO.: RPX 450
 SERIAL NO.: HGC 79785
 TYPE: III

ITEM NO.: 2198
 RF POWER (Nominal): 2.0 Watts
 TEST FREQUENCIES: T- 484.00 MHz
 R- 487.00 MHz

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.18 uV	
SINAD Sensitivity Variance -				
Voltage +10%	B	0.7 uV or less	0.18 uV	
-20%	B	0.7 uV or less	0.18 uV	
Temperature -30°C	U	+6 dB max. above 0.5 uV	-6.7 dB	
+60°C	U	+6 dB max. above 0.5 uV	-8.0 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-8.0 dB	
<u>RECEIVER SELECTIVITY</u>				
5.4.2.1 Usable Bandwidth	C	5 kHz min.	6.7 kHz	
Usable Bandwidth Variance -				
Temperature -30°C	V	-20% max. below 5 kHz	4.0 %	
+60°C	V	-20% max. below 5 kHz	8.0 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	42.0 %	
5.4.2.2 Adjacent Channel Selectivity	D	60 dB min.	76.7 dB	
Adjacent Channel Selectivity				
Variance -				
Temperature -30°C	W	48 dB min.	62.6 dB	
+60°C	W	48 dB min.	73.8 dB	
Humidity 50°C, 90% RH	AE	48 dB min.	74.0 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	>60.0 dB	
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	61.5 dB	
<u>RECEIVER SQUELCH</u>				
5.4.3.1 Threshold Squelch Sensitivity	G	0.4 uV or less	0.07 uV	
Threshold Squelch Variance-				
Voltage +10%	I	0.6 uV or less	0.10 uV	
-20%	I	0.6 uV or less	0.08 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-11.2 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-15.1 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-12.4 dB	
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.32 uV	
Tight Squelch Variance -				
Temperature -30°C	X	+6 dB max. above 4.0 uV	-22.2 dB	
+60°C	X	+6 dB max. above 4.0 uV	-20.0 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-20.4 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	4.7 kHz	*
5.4.3.3 Squelch Attack Time	K	150 ms max.	55 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	68 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2198

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	960 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	3.9 dB	
	-20%	O	-3 dB max. below 500 mW	0.7 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	2.8 dB	
	+60°C	Z	-6 dB max. below 500 mW	3.2 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	3.6 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	0.8 %	
	Temperature -30°C	AB	18% max. at 500 mW	2.8 %	
	+60°C	AB	18% max. at 500 mW	1.5 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	1.4 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	0.7 dB	
	500 Hz		+6.0 dB (-10, +2 dB)	6.5 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-9.7 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-13.3 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsquelled	S	40 dB min. below 500 mW	90.8 dB	
	Squelched	T	50 dB min. below 500 mW	90.8 dB	
	Audio Hum and Noise Variance -				
	Unsquelled				
	Temperature -30°C	AA	30 dB min.	84.8 dB	
	+60°C	AA	30 dB min.	90.8 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	90.8 dB	
	Squelched				
	Temperature -30°C	AA	40 dB min.	84.8 dB	
	+60°C	AA	40 dB min.	90.1 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	90.8 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			2.0 W	
	Measured			2.12 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	0.25 dB	
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	1.0 dB	
	-10%	BB	±3 dB of nominal	-0.8 dB	
	-20%	BC	-6, +3 dB of nominal	-1.6 dB	
	Temperature -30°C	BN	±3 dB of nominal	-0.1 dB	
	+60°C	BN	±3 dB of nominal	-0.1 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	-1.8 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00001 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.00002 %	
	-15%	BE	0.0005% of nominal	-0.00002 %	
	Temperature -30°C	BP	0.0005% of nominal	-0.00023 %	
	+60°C	BP	0.0005% of nominal	-0.00033 %	
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	-0.00048 %	
	Vibration	BV	0.0005% of nominal	-0.00013 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	70.1 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	12 ms	

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2198

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	3.8 %	
	Temperature Stability				
	-30°C	BQ	9% max.	3.0 %	
	+60°C	BQ	9% max.	3.4 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	40.0 dB	
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	30.4 dB	*
	+60°C	EO	34 dB min. attenuation	28.5 dB	*
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	30.1 dB	*
	Vibration	BU	25 dB min. attenuation	27.9 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	0.2 dB	* A
	500 Hz		-6.0 dB (+1, -3 dB)	0.3 dB	*
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	-1.0 dB	*
	3000 Hz		+9.5 dB (+1, -4.6 dB)	-1.6 dB	*
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.67 kHz	
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	4.59 kHz	
	500 Hz	BJ	≤5 kHz	4.62 kHz	
	1000 Hz	BJ	≤5 kHz	4.67 kHz	
	2500 Hz	BJ	≤5 kHz	4.60 kHz	
	3000 Hz	BJ	≤5 kHz	3.95 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	51.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	-24.0 dB	*
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	-60.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	50% min.	13.8 %	*
	Power Test Degradation	CB	1 dB max.	0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C				
	-30°C	DA	8 hrs.	4 hrs. 2 min.	
	+60°C	DB	2 hrs.	N	1
		DC	7 hrs.	0 hrs. 50 min.	

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2198

1. No test was conducted. The battery did not produce one-half of rated audio output power of the transceiver at -30°C.
- A. The microphone element provides the pre-emphasis in our audio circuit. A microphone simulator is required for audio response measurements. All unit data indicates that the unit will pass when measured with the simulator circuit.

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FM TRANSCEIVER TEST DATA

MANUFACTURER: REPCO, Inc.
 MODEL NO.: RPX 150
 SERIAL NO.: HGC 79679
 TYPE: II

ITEM NO.: 2201
 RF POWER (Nominal): 3.0 Watts
 TEST FREQUENCIES: T- 157.000 MHz
 R- 155.815 MHz

TRANSCEIVER CHARACTERISTIC
 (150-174 MHz)

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.1 RECEIVER SENSITIVITY				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.18 uV	
SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.18 uV	
-20%	B	0.7 uV or less	0.18 uV	
Temperature -30°C	U	+6 dB max. above 0.5 uV	-8.4 dB	
+60°C	U	+6 dB max. above 0.5 uV	-7.1 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-7.5 dB	
5.4.2 RECEIVER SELECTIVITY				
5.4.2.1 Usable Bandwidth	C	5 kHz min.	7.7 kHz	
Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	52.0 %	
+60°C	V	-20% max. below 5 kHz	30.0 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	40.0 %	
5.4.2.2 Adjacent Channel Selectivity	D	70 dB min.	86.8 dB	
Adjacent Channel Selectivity Variance - Temperature -30°C	W	58 dB min.	76.6 dB	
+60°C	W	58 dB min.	84.0 dB	
Humidity 50°C, 90% RH	AE	58 dB min.	83.4 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	>60.0 dB	
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	71.1 dB	
5.4.3 RECEIVER SQUELCH				
5.4.3.1 Threshold Squelch Sensitivity	G	0.4 uV or less	0.09 uV	
Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.08 uV	
-20%	I	0.6 uV or less	0.16 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-13.4 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-12.2 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	N	*1
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.50 uV	
Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	-21.9 dB	
+60°C	X	+6 dB max. above 4.0 uV	-15.4 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	N	*1
5.4.3.2 Squelch Block	J	5 kHz min.	N	
5.4.3.3 Squelch Attack Time	K	150 ms max.	5.25 kHz	
5.4.3.4 Squelch Release Time	L	250 ms max.	55 ms	
			63 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

2201-1

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2201

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.4 RECEIVER AUDIO FREQUENCY</u>					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	1042 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	4.2 dB	
	Voltage -20%	O	-3 dB max. below 500 mW	1.0 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	3.2 dB	
	Temperature +60°C	Z	-6 dB max. below 500 mW	3.7 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	3.2 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	1.7 %	
	Temperature -30°C	AB	18% max. at 500 mW	1.8 %	
	Temperature +60°C	AB	18% max. at 500 mW	2.4 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	2.1 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	-1.8 dB	* A
	500 Hz		+6.0 dB (-10, +2 dB)	5.6 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-8.3 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-14.8 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsquelled	S	40 dB min. below 500 mW	90.8 dB	
	Squelched	T	50 dB min. below 500 mW	90.8 dB	
	Audio Hum and Noise Variance -				
	Unsquelled				
	Temperature -30°C	AA	30 dB min.	73.6 dB	
	Temperature +60°C	AA	30 dB min.	90.8 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	90.8 dB	
	Squelched				
	Temperature -30°C	AA	40 dB min.	73.6 dB	
	Temperature +60°C	AA	40 dB min.	90.8 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	1.7 dB	*
<u>5.5.1 TRANSMITTER RF CARRIER</u>					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			3.0 W	
	Measured			1.27 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	-3.73 dB	*
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	-3.0 dB	*
	Voltage -10%	BB	±3 dB of nominal	-4.8 dB	*
	Voltage -20%	BC	-6, +3 dB of nominal	-5.7 dB	*
	Temperature -30°C	BN	±3 dB of nominal	-3.6 dB	*
	Temperature +60°C	BN	±3 dB of nominal	-3.8 dB	*
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	-3.8 dB	*
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00014 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.00010 %	
	Voltage -15%	BE	0.0005% of nominal	0.00030 %	
	Temperature -30°C	BP	0.0005% of nominal	0.00018 %	
	Temperature +60°C	BP	0.0005% of nominal	0.00019 %	
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00029 %	
	Vibration	BV	0.0005% of nominal	0.00021 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	45.6 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	12 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2201

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION</u>					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	3.2 %	
	Temperature Stability				
	-30°C	BQ	9% max.	1.5 %	
	+60°C	BQ	9% max.	1.5 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	38.4 dB	*
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	37.9 dB	
	Temperature +60°C	BO	34 dB min. attenuation	39.2 dB	
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	40.8 dB	
	Vibration	BU	25 dB min. attenuation	31.2 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-0.1 dB	* B
	500 Hz		-6.0 dB (+1, -3 dB)	0.2 dB	*
	1000 Hz		0 dB 0 dB	0.0 dB	*
	2500 Hz		+8.0 dB (+1, -3 dB)	0.5 dB	*
	3000 Hz		+9.5 dB (+1, -4.6 dB)	0.1 dB	*
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	5.4 kHz	*
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	4.85 kHz	*
	500 Hz	BJ	≤5 kHz	5.30 kHz	*
	1000 Hz	BJ	≤5 kHz	5.40 kHz	*
	2500 Hz	BJ	≤5 kHz	5.50 kHz	*
	3000 Hz	BJ	≤5 kHz	4.35 kHz	*
<u>5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY</u>					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	63.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	24.0 dB	*
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	56.0 dB	*
<u>5.6 ANTENNA</u>					
5.6.1	Radiation Efficiency	CA	20% min.	59 %	
	Power Test Degradation	CB	1 dB max.	0.0 dB	
<u>5.7 BATTERY (NI-CAD)</u>					
	Service Life: 20 to 30°C	DA	8 hrs.	8 hrs. 25 min.	
	-30°C	DB	2 hrs.	3 hrs. 0 min.	
	+60°C	DC	7 hrs.	4 hrs. 30 min.	

2201-3

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2201

1. No test data was obtained. The transceiver produced no squelch under 50°C temperature and 90% relative humidity conditions.
- A. Low frequencies are deliberately attenuated to improve rejection of CTCSS tones.
- B. The microphone element provides the pre-emphasis in our audio circuit. A microphone simulator is required for audio response measurements. All unit data indicates that the unit will pass when measured with the simulator circuit.

FM TRANSCEIVER TEST DATA

MANUFACTURER: Wilson Electronics Corp.
 MODEL NO.: HH-400-C4
 SERIAL NO.: C-13880
 TYPE: II

ITEM NO.: 2205
 RF POWER (Nominal): 4.0 Watts
 TEST FREQUENCIES: T- 151.625 MHz
 R- 151.625 MHz

TRANSCEIVER CHARACTERISTIC
 (150-174 MHz)

PERFORMANCE REQUIREMENT
 DEC-'78 NILECJ-STD-0209.00

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
RECEIVER SENSITIVITY				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.22 uV	
SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.19 uV	
-20%	B	0.7 uV or less	0.40 uV	
Temperature -30°C	U	+6 dB max. above 0.5 uV	-5.7 dB	
+60°C	U	+6 dB max. above 0.5 uV	-5.4 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-6.7 dB	
RECEIVER SELECTIVITY				
5.4.2 Usable Bandwidth	C	5 kHz min.	6.5 kHz	
5.4.2.1 Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	44.0 %	
+60°C	V	-20% max. below 5 kHz	10.0 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	20.0 %	
5.4.2.2 Adjacent Channel Selectivity	D	70 dB min.	77.7 dB	
Adjacent Channel Selectivity Variance - Temperature -30°C	W	58 dB min.	73.3 dB	
+60°C	W	58 dB min.	75.4 dB	
Humidity 50°C, 90% RH	AE	58 dB min.	77.8 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	44.5 dB	*
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	62.6 dB	
RECEIVER SQUELCH				
5.4.3 Threshold Squelch Sensitivity	G	0.4 uV or less	0.08 uV	
5.4.3.1 Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.09 uV	
-20%	I	0.6 uV or less	0.26 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-2.2 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-5.2 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-10.1 dB	
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.39 uV	
Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	-17.6 dB	
+60°C	X	+6 dB max. above 4.0 uV	-18.4 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-19.2 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	7.2 kHz	
5.4.3.3 Squelch Attack Time	K	150 ms max.	52 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	400 ms	*

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 n-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2205

TRANSCEIVER CHARACTERISTIC
(150-174 MHz)

REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.4 RECEIVER AUDIO FREQUENCY</u>			
5.4.4.1	Audio Output Power (Speaker) M	500 mW min.	661 mW
	Audio Output Power Variance - Voltage +10%	0	-3 dB max. below 500 mW
	-20%	0	-3 dB max. below 500 mW
	Temperature -30°C	Z	-6 dB max. below 500 mW
	+60°C	Z	-6 dB max. below 500 mW
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW
5.4.4.2	Audio Distortion (Speaker) P	10% max. at 500 mW	16.5 %
	Temperature -30°C	AB	18% max. at 500 mW
	+60°C	AB	18% max. at 500 mW
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW
5.4.4.3	Audio Frequency Response (Speaker) Q		
	300 Hz		+10.5 dB (-10, +2 dB)
	500 Hz		+6.0 dB (-10, +2 dB)
	1000 Hz		0 dB 0 dB
	2000 Hz		-6.0 dB (-10, +2 dB)
	3000 Hz		-9.5 dB (-10, +2 dB)
5.4.4.4	Audio Hum and Noise - Unscelched S	40 dB min. below 500 mW	74.0 dB
	Squelched T	50 dB min. below 500 mW	76.5 dB
	Audio Hum and Noise Variance - Unscelched		
	Temperature -30°C	AA	30 dB min.
	+60°C	AA	30 dB min.
	Humidity 50°C, 90% RH	AI	30 dB min.
	Squelched		
	Temperature -30°C	AA	40 dB min.
	+60°C	AA	40 dB min.
	Humidity 50°C, 90% RH	AI	40 dB min.
5.5.1	<u>TRANSMITTER RF CARRIER</u>		
5.5.1.1	Carrier Output Power Rated (nominal)		4.0 W
	Measured		3.06 W
	Relation to Rated Output	BA	-0.3, +1 dB of nominal
	Carrier Output Power Variance - Voltage +10%	BB	±3 dB of nominal
	-10%	BB	±3 dB of nominal
	-20%	BC	-6, +3 dB of nominal
	Temperature -30°C	BN	±3 dB of nominal
	+60°C	BN	±3 dB of nominal
	Humidity 50°C, 90% RH	BR	±3 dB of nominal
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal
5.5.1.2	Carrier Frequency Stability - Voltage +15%	BE	0.0005% of nominal
	-15%	BE	0.0005% of nominal
	Temperature -30°C	BP	0.0005% of nominal
	+60°C	BP	0.0005% of nominal
	Humidity 50°C, 90% RH	BT	0.0005% of nominal
	Vibration	BV	0.0005% of nominal
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation
5.5.1.4	Carrier Attack Time	BG	100 ms max.

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2205

TRANSCEIVER CHARACTERISTIC
(150-174 MHz)

REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION</u>			
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.
	Temperature Stability -30°C	BQ	9% max.
	+60°C	BQ	9% max.
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation
	FM Hum and Noise Stability		
	Temperature -30°C	BO	34 dB min. attenuation
	+60°C	BO	34 dB min. attenuation
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation
	Vibration	BU	25 dB min. attenuation
5.5.2.3	Audio Frequency Response		
	300 Hz		-10.5 dB (+1, -3 dB)
	500 Hz		-6.0 dB (+1, -3 dB)
	1000 Hz		0 dB 0 dB
	2500 Hz		+8.0 dB (+1, -3 dB)
	3000 Hz		+9.5 dB (+1, -4.6 dB)
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz
5.5.2.5	Modulation Limiting		
	300 Hz	BJ	≤5 kHz
	500 Hz	BJ	≤5 kHz
	1000 Hz	BJ	≤5 kHz
	2500 Hz	BJ	≤5 kHz
	3000 Hz	BJ	≤5 kHz
5.5.3	<u>TRANSMITTER ELECTROMAGNETIC COMPATIBILITY</u>		
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation
5.5.3.2	Sideband Spectrum - ±10 kHz Freq. Separation	BL	30 dB min. attenuation
	±20 kHz Freq. Separation	BM	60 dB min. attenuation
5.6	<u>ANTENNA</u>		
5.6.1	Radiation Efficiency	CA	20% min.
	Power Test Degradation	CB	1 dB max.
5.7	<u>BATTERY (NI-CAD)</u>		
	Service Life: 20 to 30°C	DA	8 hrs.
	-30°C	DB	2 hrs.
	+60°C	DC	7 hrs.
			2 hrs. 34 min.
			0 hr. 40 min.
			2 hrs. 30 min.

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2205

FM TRANSCEIVER TEST DATA

MANUFACTURER: Wilson Electronics Corp. ITEM NO.: 2206
 MODEL NO.: HH-250-C4 RF POWER (Nominal): 2.5 Watts
 SERIAL NO.: C-13524 TEST FREQUENCIES: T- 151.625 MHz
 TYPE: II R- 151.625 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.1 RECEIVER SENSITIVITY</u>				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.18 uV	
SINAD Sensitivity Variance -				
Voltage +10%	B	0.7 uV or less	0.17 uV	
-20%	B	0.7 uV or less	0.21 uV	*1
Temperature -30°C	U	+6 dB max. above 0.5 uV	-2.4 dB	
+60°C	U	+6 dB max. above 0.5 uV	-7.1 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-7.0 dB	
<u>5.4.2 RECEIVER SELECTIVITY</u>				
5.4.2.1 Usable Bandwidth	C	5 kHz min.	6.3 kHz	
Usable Bandwidth Variance -				
Temperature -30°C	V	-20% max. below 5 kHz	-2.0 %	
+60°C	V	-20% max. below 5 kHz	8.0 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	14.0 %	
5.4.2.2 Adjacent Channel Selectivity	D	70 dB min.	82.4 dB	
Adjacent Channel Selectivity				
Variance -				
Temperature -30°C	W	58 dB min.	71.3 dB	
+60°C	W	58 dB min.	74.8 dB	
Humidity 50°C, 90% RH	AE	58 dB min.	75.9 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	46.0 dB	*
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	61.5 dB	
<u>5.4.3 RECEIVER SQUELCH</u>				
5.4.3.1 Threshold Squelch Sensitivity	G	0.4 uV or less	0.14 uV	
Threshold Squelch Variance-				
Voltage +10%	I	0.6 uV or less	0.11 uV	
-20%	I	0.6 uV or less	0.12 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-5.2 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-2.8 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-5.6 dB	
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.39 uV	
Tight Squelch Variance -				
Temperature -30°C	X	+6 dB max. above 4.0 uV	-9.1 dB	
+60°C	X	+6 dB max. above 4.0 uV	-17.4 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-18.4 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	6.4 kHz	
5.4.3.3 Squelch Attack Time	K	150 ms max.	115 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	104 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

TRANSCEIVER CHARACTERISTIC
(150-174 MHz)

ITEM NO.: 2206

PERFORMANCE REQUIREMENT
DEC-'78 NILECJ-STD-0209.00

REF.	TEST RESULTS	NOTES
5.4.4	RECEIVER AUDIO FREQUENCY	
5.4.4.1	Audio Output Power (Speaker) M Audio Output Power Variance - Voltage +10% O -20% O Temperature -30°C Z +60°C Z	500 mW min. 793 mW -3 dB max. below 500 mW -3 dB max. below 500 mW -6 dB max. below 500 mW -6 dB max. below 500 mW
5.4.4.2	Humidity 50°C, 90% RH AH Audio Distortion (Speaker) P Temperature -30°C AB +60°C AB	-3 dB max. below 500 mW 10% max. at 500 mW 18% max. at 500 mW 18% max. at 500 mW
5.4.4.3	Humidity 50°C, 90% RH AJ Audio Frequency Response (Speaker) Q	18% max. at 500 mW 19.3 % 18.0 %
5.4.4.4	300 Hz 500 Hz 1000 Hz 2000 Hz 3000 Hz Audio Hum and Noise - Unsilenced S Squelched T Audio Hum and Noise Variance - Unsilenced Temperature -30°C AA +60°C AA Humidity 50°C, 90% RH AI Squelched Temperature -30°C AA +60°C AA Humidity 50°C, 90% RH AI	+10.5 dB (-10, +2 dB) +6.0 dB (-10, +2 dB) 0 dB 0 dB -6.0 dB (-10, +2 dB) -9.5 dB (-10, +2 dB) 40 dB min. below 500 mW 50 dB min. below 500 mW 30 dB min. 30 dB min. 30 dB min. 40 dB min. 40 dB min. 40 dB min.
5.5.1	TRANSMITTER RF CARRIER	
5.5.1.1	Carrier Output Power Rated (nominal) Measured Relation to Rated Output Carrier Output Power Variance - Voltage +10% BB -10% BB -20% BC Temperature -30°C BN +60°C BN Humidity 50°C, 90% RH BR	2.5 W 2.9 W 0.64 dB ±3 dB of nominal ±3 dB of nominal -6, +3 dB of nominal ±3 dB of nominal ±3 dB of nominal ±3 dB of nominal
5.5.1.2	Carrier Frequency Tolerance	0.0005% of nominal
5.5.1.2	Carrier Frequency Stability - Voltage +15% BE -15% BE Temperature -30°C BP +60°C BP Humidity 50°C, 90% RH BT	0.00021 % 0.0005% of nominal 0.0005% of nominal 0.0005% of nominal 0.0005% of nominal 0.0005% of nominal
5.5.1.3	Vibration	0.00113 %
5.5.1.4	AM Hum and Noise Level Carrier Attack Time	-0.00039 % -0.00026 % 71.4 dB 4 ms

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FM TRANSCEIVER TEST DATA (continued)

TRANSCEIVER CHARACTERISTIC
(150-174 MHz)

ITEM NO.: 2206

PERFORMANCE REQUIREMENT
DEC-'78 NILECJ-STD-0209.00

REF.	TEST RESULTS	NOTES
5.5.2	TRANSMITTER AUDIO FREQUENCY MODULATION	
5.5.2.1	Audio Frequency Harmonic Distortion Temperature Stability -30°C BQ +60°C BQ	5% max. 3.8 % 9% max. 2.4 % 9% max. 3.8 %
5.5.2.2	FM Hum and Noise Level FM Hum and Noise Stability Temperature -30°C BQ +60°C BQ Humidity 50°C, 90% RH BS Vibration BU	40 dB min. attenuation 39.2 dB * 34 dB min. attenuation 35.5 dB 34 dB min. attenuation 39.6 dB 34 dB min. attenuation 39.6 dB 25 dB min. attenuation 30.1 dB
5.5.2.3	Audio Frequency Response 300 Hz 500 Hz 1000 Hz 2500 Hz 3000 Hz	-10.5 dB (+1, -3 dB) -6.0 dB (+1, -3 dB) 0 dB 0 dB +8.0 dB (+1, -3 dB) +9.5 dB (+1, -4.6 dB)
5.5.2.4	Frequency Deviation	-2.7 dB *
5.5.2.5	Modulation Limiting 300 Hz BQ 500 Hz BQ 1000 Hz BQ 2500 Hz BQ 3000 Hz BQ	Limits: 4.5125 - 4.9875 kHz 3.8 kHz * ≤5 kHz 3.7 kHz ≤5 kHz 4.7 kHz ≤5 kHz 4.1 kHz ≤5 kHz 3.0 kHz 2.3 kHz
5.5.3	TRANSMITTER ELECTROMAGNETIC COMPATIBILITY	
5.5.3.1	Radiated Spurious Emissions	BK 43 dB min. attenuation 54 dB
5.5.3.2	Sideband Spectrum - ±10 kHz Freq. Separation BL ±20 kHz Freq. Separation BM	30 dB min. attenuation 40.0 dB 60 dB min. attenuation 64.0 dB
5.6	ANTENNA	
5.6.1	Radiation Efficiency Power Test Degradation	CA 20% min. CB 1 dB max. 22.9 % 0.0 dB
5.7	BATTERY (NI-CAD) Service Life: 20 to 30°C -30°C +60°C	DA 8 hrs. DB 2 hrs. DC 7 hrs. 2 hrs. 41 min. 1 hr. 0 min. 3 hrs. 25 min.

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2206

- The required 12 dB SINAD could not be obtained at -20% of nominal battery voltage. Test results shown were obtained at -10% of nominal battery voltage.

FM TRANSCEIVER TEST DATA

MANUFACTURER: RCA
 MODEL NO.: TACTEC HCB36AA12
 SERIAL NO.: HQ 2516
 TYPE: II

ITEM NO.: 2207
 RF POWER (Nominal): 6.0 Watts
 TEST FREQUENCIES: T- 151.625 MHz
 R- 151.625 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.1 RECEIVER SENSITIVITY</u>					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.20 uV	
	SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.20 uV	
	-20%	B	0.7 uV or less	0.22 uV	
	Temperature -30°C	U	+6 dB max. above 0.5 uV	0.20 dB	
	+60°C	U	+6 dB max. above 0.5 uV	0.80 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	N	*1
<u>5.4.2 RECEIVER SELECTIVITY</u>					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	7.70 kHz	
	Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	-1.3 %	
	+60°C	V	-20% max. below 5 kHz	-2.6 %	
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	N	*1
5.4.2.2	Adjacent Channel Selectivity	D	70 dB min.	80.0 dB	
	Adjacent Channel Selectivity Variance - Temperature -30°C	W	58 dB min.	84.0 dB	
	+60°C	W	58 dB min.	86.0 dB	
	Humidity 50°C, 90% RH	AE	58 dB min.	N	*1
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	64.0 dB	
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	67.5 dB	
<u>5.4.3 RECEIVER SQUELCH</u>					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.18 uV	
	Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.20 uV	
	-20%	I	0.6 uV or less	0.13 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	3.0 dB	
	+60°C	Y	+6 dB max. above 0.4 uV	0.0 dB	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	N	*1
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	0.40 uV	
	Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	1.0 dB	
	+60°C	X	+6 dB max. above 4.0 uV	-4.0 dB	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	N	*1
5.4.3.2	Squelch Block	J	5 kHz min.	9.4 kHz	
5.4.3.3	Squelch Attack Time	K	150 ms max.	18 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	8 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2207

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.4 RECEIVER AUDIO FREQUENCY</u>				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	1060 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	0.9 dB	
-20%	O	-3 dB max. below 500 mW	-2.2 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	-0.4 dB	
+60°C	Z	-6 dB max. below 500 mW	0.0 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	N	*1
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	1.3 %	
Temperature -30°C	AB	18% max. at 500 mW	1.7 %	
+60°C	AB	18% max. at 500 mW	1.3 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	N	*1
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	0.6 dB	
500 Hz		+6.0 dB (-10, +2 dB)	2.6 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-8.4 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-17.0 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquelled	S	40 dB min. below 500 mW	61.4 dB	
Squelched	T	50 dB min. below 500 mW	68.2 dB	
Audio Hum and Noise Variance -				
Unsquelled				
Temperature -30°C	AA	30 dB min.	60.2 dB	
+60°C	AA	30 dB min.	62.2 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	N	*1
Squelched				
Temperature -30°C	AA	40 dB min.	68.5 dB	
+60°C	AA	40 dB min.	67.5 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	N	*1
<u>5.5.1 TRANSMITTER RF CARRIER</u>				
5.5.1.1 Carrier Output Power				
Rated (nominal)			6.0 W	
Measured			5.69 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.23 dB	
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	0.14 dB	
-10%	BB	±3 dB of nominal	-1.40 dB	
-20%	BC	-6, +3 dB of nominal	-2.85 dB	
Temperature -30°C	BN	±3 dB of nominal	-2.01 dB	
+60°C	BN	±3 dB of nominal	-0.74 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	-0.63 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00013 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00007 %	
-15%	BE	0.0005% of nominal	0.00025 %	
Temperature -30°C	BP	0.0005% of nominal	0.00010 %	
+60°C	BP	0.0005% of nominal	0.00007 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00023 %	
Vibration	BV	0.0005% of nominal	0.00033 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	72.2 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	50 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2207

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION</u>				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	1.4 %	
Temperature Stability				
-30°C	BQ	9% max.	3.4 %	
+60°C	BQ	9% max.	3.7 %	
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	58.0 dB	
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	45.3 dB	
+60°C	BO	34 dB min. attenuation	45.8 dB	
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	35.8 dB	
Vibration	BU	25 dB min. attenuation	52.9 dB	
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	-11.7 dB	
500 Hz		-6.0 dB (+1, -3 dB)	-6.4 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	6.9 dB	
3000 Hz		+9.5 dB (+1, -4.6 dB)	7.1 dB	
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.60 kHz	
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	5.05 kHz	*
500 Hz	BJ	≤5 kHz	4.30 kHz	
1000 Hz	BJ	≤5 kHz	4.50 kHz	
2000 Hz	BJ	≤5 kHz	3.50 kHz	
2500 Hz	BJ	≤5 kHz	3.30 kHz	
3000 Hz	BJ	≤5 kHz	3.20 kHz	
<u>5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY</u>				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	50.0 dB	
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
<u>5.6 ANTENNA</u>				
5.6.1 Radiation Efficiency	CA	20% min.	35.0 %	
Power Test Degradation	CB	1 dB max.	0.0 dB	
<u>5.7 BATTERY (NI-CAD)</u>				
Service Life: 20 to 30°C	DA	8 hrs.	3 hrs. 52 min.	
-30°C	DB	2 hrs.	1 hr. 15 min.	
+60°C	DC	7 hrs.	3 hrs. 35 min.	

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2207

- No test data was obtained. The receiver had no audio output during humidity test at +50°C, 90% relative humidity. The transceiver recovered operation upon drying out under ambient test conditions. A defective audio module in this transceiver was replaced with a properly operating module prior to the testing under humidity conditions.

FM TRANSCEIVER TEST DATA

MANUFACTURER: RCA
 MODEL NO.: HCB 54 AA12
 SERIAL NO.: HO 2517
 TYPE: III

ITEM NO.: 2208
 RF POWER (Nominal): 4.0 Watts
 TEST FREQUENCIES: T- 464.500 MHz
 R- 464.500 MHz

TRANSCEIVER CHARACTERISTIC
 (400-512 MHz)

REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.1 RECEIVER SENSITIVITY</u>			
5.4.1	SINAD Sensitivity	A 0.5 uV or less	0.22 uV
	SINAD Sensitivity Variance -		
	Voltage +10%	B 0.7 uV or less	0.22 uV
	-20%	B 0.7 uV or less	0.22 uV
	Temperature -30°C	U +6 dB max. above 0.5 uV	-1.6 dB
	+60°C	U +6 dB max. above 0.5 uV	-1.3 dB
	Humidity 50°C, 90% RH	AC +10 dB max. above 0.5 uV	-38.6 dB
<u>5.4.2 RECEIVER SELECTIVITY</u>			
5.4.2.1	Usable Bandwidth	C 5 kHz min.	6.60 kHz
	Usable Bandwidth Variance -		
	Temperature -30°C	V -20% max. below 5 kHz	-16.7 %
	+60°C	V -20% max. below 5 kHz	-3.0 %
	Humidity 50°C, 90% RH	AD -20% max. below 5 kHz	6.1 %
5.4.2.2	Adjacent Channel Selectivity	D 60 dB min.	78.0 dB
	Adjacent Channel Selectivity		
	Variance -		
	Temperature -30°C	W 48 dB min.	71.0 dB
	+60°C	W 48 dB min.	78.0 dB
	Humidity 50°C, 90% RH	AE 48 dB min.	69.0 dB
5.4.2.3	Spurious Response Attenuation	E 60 dB min.	51.0 dB
5.4.2.4	Intermodulation Attenuation	F 60 dB min.	71.0 dB
<u>5.4.3 RECEIVER SQUELCH</u>			
5.4.3.1	Threshold Squelch Sensitivity	G 0.4 uV or less	0.16 uV
	Threshold Squelch Variance-		
	Voltage +10%	I 0.6 uV or less	0.16 uV
	-20%	I 0.6 uV or less	0.18 uV
	Temperature -30°C	Y +6 dB max. above 0.4 uV	-5.4 dB
	+60°C	Y +6 dB max. above 0.4 uV	1.6 dB
	Humidity 50°C, 90% RH	AG +10 dB max. above 0.4 uV	-39.4 dB
5.4.3.1	Tight Squelch Sensitivity	H 4.0 uV or less	0.51 uV
	Tight Squelch Variance -		
	Temperature -30°C	X +6 dB max. above 4.0 uV	-2.4 dB
	+60°C	X +6 dB max. above 4.0 uV	0.6 dB
	Humidity 50°C, 90% RH	AF +10 dB max. above 4.0 uV	-37.4 dB
5.4.3.2	Squelch Block	J 5 kHz min.	8.9 kHz
5.4.3.3	Squelch Attack Time	K 150 ms max.	28 ms
5.4.3.4	Squelch Release Time	L 250 ms max.	150 ms

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2208

TRANSCEIVER CHARACTERISTIC
(400-512 MHz)

REF. PERFORMANCE REQUIREMENT
DEC-'78 NILECJ-STD-0209.00 TEST RESULTS NOTES

REF.	PERFORMANCE REQUIREMENT	TEST RESULTS	NOTES
5.4.4	RECEIVER AUDIO FREQUENCY		
5.4.4.1	Audio Output Power (Speaker)	M 500 mW min.	1030 mW
	Audio Output Power Variance -		
	Voltage +10%	O -3 dB max. below 500 mW	0.9 dB
	-20%	O -3 dB max. below 500 mW	-2.3 dB
	Temperature -30°C	Z -6 dB max. below 500 mW	0.3 dB
	+60°C	Z -6 dB max. below 500 mW	0.0 dB
	Humidity 50°C, 90% RH	AH -3 dB max. below 500 mW	0.1 dB
5.4.4.2	Audio Distortion (Speaker)	P 10% max. at 500 mW	1.9 %
	Temperature -30°C	AB 18% max. at 500 mW	6.5 %
	+60°C	AB 18% max. at 500 mW	1.1 %
	Humidity 50°C, 90% RH	AJ 18% max. at 500 mW	2.6 %
5.4.4.3	Audio Frequency Response (Speaker)	Q	
	300 Hz	+10.5 dB (-10, +2 dB)	0.4 dB *
	500 Hz	+6.0 dB (-10, +2 dB)	2.4 dB
	1000 Hz	0 dB 0 dB	0.0 dB
	2000 Hz	-6.0 dB (-10, +2 dB)	-8.1 dB
	3000 Hz	-9.5 dB (-10, +2 dB)	-16.2 dB
5.4.4.4	Audio Hum and Noise -		
	Unsquenced	S 40 dB min. below 500 mW	59.9 dB
	Squenced	T 50 dB min. below 500 mW	66.7 dB
	Audio Hum and Noise Variance -		
	Unsquenced		
	Temperature -30°C	AA 30 dB min.	59.8 dB
	+60°C	AA 30 dB min.	59.1 dB
	Humidity 50°C, 90% RH	AI 30 dB min.	68.8 dB
	Squenced		
	Temperature -30°C	AA 40 dB min.	66.9 dB
	+60°C	AA 40 dB min.	67.4 dB
	Humidity 50°C, 90% RH	AI 40 dB min.	67.2 dB
5.5.1	TRANSMITTER RF CARRIER		
5.5.1.1	Carrier Output Power		
	Rated (nominal)		4.0 W
	Measured		3.11 W
	Relation to Rated Output	BA -0.3, +1 dB of nominal	-1.10 dB *
	Carrier Output Power Variance -		
	Voltage +10%	BB ±3 dB of nominal	-1.15 dB
	-10%	BB ±3 dB of nominal	-1.07 dB
	-20%	BC -6, +3 dB of nominal	-1.83 dB
	Temperature -30°C	BN ±3 dB of nominal	-2.05 dB
	+60°C	BN ±3 dB of nominal	-1.83 dB
	Humidity 50°C, 90% RH	BR ±3 dB of nominal	-80.0 dB
5.5.1.2	Carrier Frequency Tolerance	BD 0.0005% of nominal	0.00002 % *1
5.5.1.2	Carrier Frequency Stability -		
	Voltage +15%	BE 0.0005% of nominal	0.00004 %
	-15%	BE 0.0005% of nominal	0.00012 %
	Temperature -30°C	BP 0.0005% of nominal	0.00008 %
	+60°C	BP 0.0005% of nominal	0.00016 %
	Humidity 50°C, 90% RH	BT 0.0005% of nominal	N
	Vibration	BV 0.0005% of nominal	0.00011 % *1
5.5.1.3	AM Hum and Noise Level	BF 34 dB min. attenuation	86.8 dB
5.5.1.4	Carrier Attack Time	BG 100 ms max.	14 ms

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2208

TRANSCEIVER CHARACTERISTIC
(400-512 MHz)

REF. PERFORMANCE REQUIREMENT
DEC-'78 NILECJ-STD-0209.00 TEST RESULTS NOTES

REF.	PERFORMANCE REQUIREMENT	TEST RESULTS	NOTES
5.5.2	TRANSMITTER AUDIO FREQUENCY MODULATION		
5.5.2.1	Audio Frequency Harmonic Distortion	BH 5% max.	1.0 %
	Temperature Stability		
	-30°C	BQ 9% max.	1.8 %
	+60°C	BQ 9% max.	1.7 %
5.5.2.2	FM Hum and Noise Level	BI 40 dB min. attenuation	52.8 dB
	FM Hum and Noise Stability		
	Temperature -30°C	BO 34 dB min. attenuation	40.3 dB
	+60°C	BO 34 dB min. attenuation	41.2 dB
	Humidity 50°C, 90% RH	BS 34 dB min. attenuation	N
	Vibration	BU 25 dB min. attenuation	43.9 dB *1
5.5.2.3	Audio Frequency Response		
	300 Hz	-10.5 dB (+1, -3 dB)	-11.7 dB
	500 Hz	-6.0 dB (+1, -3 dB)	-6.2 dB
	1000 Hz	0 dB 0 dB	0.0 dB
	2500 Hz	+8.0 dB (+1, -3 dB)	5.6 dB
	3000 Hz	+9.5 dB (+1, -4.6 dB)	5.6 dB
5.5.2.4	Frequency Deviation	BJ Limits: 4.5125 - 4.9875 kHz	4.70 kHz
5.5.2.5	Modulation Limiting		
	300 Hz	BJ ≤5 kHz	5.10 kHz *
	500 Hz	BJ ≤5 kHz	5.00 kHz
	1000 Hz	BJ ≤5 kHz	4.10 kHz
	2000 Hz	BJ ≤5 kHz	3.20 kHz
	2500 Hz	BJ ≤5 kHz	3.10 kHz
	3000 Hz	BJ ≤5 kHz	3.10 kHz
5.5.3	TRANSMITTER ELECTROMAGNETIC COMPATIBILITY		
5.5.3.1	Radiated Spurious Emissions	BK 43 dB min. attenuation	65.0 dB
5.5.3.2	Sideband Spectrum -		
	±10 kHz Freq. Separation	BL 30 dB min. attenuation	40.0 dB
	±20 kHz Freq. Separation	BM 60 dB min. attenuation	58.0 dB *
5.6	ANTENNA		
5.6.1	Radiation Efficiency	CA 50% min.	174.7 %
	Power Test Degradation	CB 1 dB max.	0.0 dB
5.7	BATTERY (NI-CAD)		
	Service Life: 20 to 30°C	DA 8 hrs.	3 hrs. 40 min.
	-30°C	DB 2 hrs.	n
	+60°C	DC 7 hrs.	3 hrs. 41 min. 2

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2208

1. All test data was not obtained. Audio output of the transmitter was intermittent during the humidity tests at 50°C, 90% relative humidity. The transmitter ceased functioning but resumed operation upon drying out at ambient temperature.
2. No test data was obtained. The transceiver failed to operate at -30°C during battery service life test.

FM TRANSCEIVER TEST DATA

MANUFACTURER: Motorola
 MODEL NO.: HT 220 - H34FFN1130D
 SERIAL NO.: 236 ADU 0317
 TYPE: III

ITEM NO.: 2212
 RF POWER (Nominal): 4.0 Watts
 TEST FREQUENCIES: T- 464.500 MHz
 R- 464.500 MHz

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.33 uV	
	SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.31 uV	
	-20%	B	0.7 uV or less	0.36 uV	
	Temperature -30°C	U	+6 dB max. above 0.5 uV	-5.9 dB	
	+60°C	U	+6 dB max. above 0.5 uV	2.8 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-2.3 dB	
<u>RECEIVER SELECTIVITY</u>					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	5.40 kHz	
	Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	-22.2 %	*
	+60°C	V	-20% max. below 5 kHz	18.5 %	
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-5.6 %	
5.4.2.2	Adjacent Channel Selectivity	D	60 dB min.	68.0 dB	
	Adjacent Channel Selectivity Variance - Temperature -30°C	W	48 dB min.	64.0 dB	
	+60°C	W	48 dB min.	63.0 dB	
	Humidity 50°C, 90% RH	AE	48 dB min.	69.0 dB	
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	53.0 dB	*
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	60.0 dB	
<u>RECEIVER SQUELCH</u>					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.12 uV	
	Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.02 uV	
	-20%	I	0.6 uV or less	0.34 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	-13.0 dB	
	+60°C	Y	+6 dB max. above 0.4 uV	-4.0 dB	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-9.0 dB	
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	0.53 uV	
	Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	-10.0 dB	
	+60°C	X	+6 dB max. above 4.0 uV	0.0 dB	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-7.0 dB	
5.4.3.2	Squelch Block	J	5 kHz min.	7.1 kHz	
5.4.3.3	Squelch Attack Time	K	150 ms max.	120 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	80 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2212

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	770 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	0.8 dB	
	-20%	O	-3 dB max. below 500 mW	-2.0 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	-0.6 dB	
	+60°C	Z	-6 dB max. below 500 mW	0.0 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	-0.2 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	6.3 %	
	Temperature -30°C	AB	18% max. at 500 mW	13.3 %	
	+60°C	AB	18% max. at 500 mW	3.2 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	3.5 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	-1.0 dB	*
	500 Hz		+6.0 dB (-10, +2 dB)	4.3 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-10.5 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-18.1 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsquelled	S	40 dB min. below 500 mW	64.8 dB	
	Squelled	T	50 dB min. below 500 mW	86.1 dB	
	Audio Hum and Noise Variance -				
	Unsquelled				
	Temperature -30°C	AA	30 dB min.	62.6 dB	
	+60°C	AA	30 dB min.	59.9 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	70.7 dB	
	Squelled				
	Temperature -30°C	AA	40 dB min.	87.2 dB	
	+60°C	AA	40 dB min.	87.9 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	87.2 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			4.0 W	
	Measured			4.08 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	0.09 dB	
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	1.08 dB	
	-10%	BB	±3 dB of nominal	-1.11 dB	
	-20%	BC	-6, +3 dB of nominal	-2.62 dB	
	Temperature -30°C	BN	±3 dB of nominal	-1.18 dB	
	+60°C	BN	±3 dB of nominal	-1.24 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	-1.70 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00021 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.00007 %	
	-15%	BE	0.0005% of nominal	0.00005 %	
	Temperature -30°C	BP	0.0005% of nominal	0.00021 %	
	+60°C	BP	0.0005% of nominal	0.00058 %	*
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00078 %	*
	Vibration	BV	0.0005% of nominal	0.00003 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	77.5 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	8 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2212

TRANSCEIVER CHARACTERISTIC (400-512 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	2.9 %	
	Temperature Stability				
	-30°C	BQ	9% max.	7.5 %	
	+60°C	BQ	9% max.	6.3 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	45.0 dB	
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	39.9 dB	
	+60°C	BO	34 dB min. attenuation	36.4 dB	
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	40.3 dB	
	Vibration	BU	25 dB min. attenuation	35.3 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-18.8 dB	*
	500 Hz		-6.0 dB (+1, -3 dB)	-8.2 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	6.8 dB	
	3000 Hz		+9.5 dB (+1, -4.6 dB)	6.4 dB	
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.65 kHz	
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	5.10 kHz	*
	500 Hz	BJ	≤5 kHz	5.10 kHz	*
	1000 Hz	BJ	≤5 kHz	4.80 kHz	
	2000 Hz	BJ	≤5 kHz	4.60 kHz	
	2500 Hz	BJ	≤5 kHz	4.30 kHz	
	3000 Hz	BJ	≤5 kHz	3.80 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	55.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	50% min.	73.9 %	
	Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C	DA	8 hrs.	3 hrs. 28 min.	
	-30°C	DB	2 hrs.	2 hrs. 0 min.	
	+60°C	DC	7 hrs.	4 hrs. 5 min.	

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2212

FM TRANSCEIVER TEST DATA

MANUFACTURER: Motorola
 MODEL NO.: HT220-H23FFN1130E
 SERIAL NO.: 231 ADU 0839
 TYPE: II

ITEM NO.: 2213
 RF POWER (Nominal): 1.8 Watts
 TEST FREQUENCIES: T- 151.625 MHz
 R- 151.625 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.1 RECEIVER SENSITIVITY</u>				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.21 uV	
SINAD Sensitivity Variance -				
Voltage +10%	B	0.7 uV or less	0.21 uV	
-20%	U	0.7 uV or less	0.25 uV	
Temperature -30°C	U	+6 dB max. above 0.5 uV	-6.0 dB	
+60°C	U	+6 dB max. above 0.5 uV	-4.3 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-4.8 dB	
<u>5.4.2 RECEIVER SELECTIVITY</u>				
5.4.2.1 Usable Bandwidth	C	5 kHz min.	6.30 kHz	
Usable Bandwidth Variance -				
Temperature -30°C	V	-20% max. below 5 kHz	-7.9 %	
+60°C	V	-20% max. below 5 kHz	-4.8 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-17.5 %	
5.4.2.2 Adjacent Channel Selectivity	D	70 dB min.	88.0 dB	
Adjacent Channel Selectivity				
Variance -				
Temperature -30°C	W	58 dB min.	78.0 dB	
+60°C	W	58 dB min.	81.0 dB	
Humidity 50°C, 90% RH	AE	58 dB min.	79.0 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	54.0 dB	
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	77.0 dB	
<u>5.4.3 RECEIVER SQUELCH</u>				
5.4.3.1 Threshold Squelch Sensitivity	G	0.4 uV or less	0.14 uV	
Threshold Squelch Variance-				
Voltage +10%	I	0.6 uV or less	0.20 uV	
-20%	I	0.6 uV or less	0.01 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-10.0 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-9.0 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-10.0 dB	
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.32 uV	
Tight Squelch Variance -				
Temperature -30°C	X	+6 dB max. above 4.0 uV	-7.0 dB	
+60°C	X	+6 dB max. above 4.0 uV	-9.0 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-11.0 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	8.70 kHz	
5.4.3.3 Squelch Attack Time	K	150 ms max.	120 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	80 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2213

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	870 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	0.8 dB	
Voltage -20%	O	-3 dB max. below 500 mW	-2.0 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	-0.6 dB	
Temperature +60°C	Z	-6 dB max. below 500 mW	-0.1 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	-0.2 dB	
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	6.2 %	
Temperature -30°C	AB	18% max. at 500 mW	4.7 %	
Temperature +60°C	AB	18% max. at 500 mW	7.3 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	11.3 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	-1.4 dB	*
500 Hz		+6.0 dB (-10, +2 dB)	4.3 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-9.5 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-16.7 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquelled	S	40 dB min. below 500 mW	64.5 dB	
Squelled	T	50 dB min. below 500 mW	86.5 dB	
Audio Hum and Noise Variance -				
Unsquelled				
Temperature -30°C	AA	30 dB min.	65.3 dB	
Temperature +60°C	AA	30 dB min.	56.8 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	57.3 dB	
Squelled				
Temperature -30°C	AA	40 dB min.	88.3 dB	
Temperature +60°C	AA	40 dB min.	86.5 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	88.9 dB	
5.5.1 TRANSMITTER RF CARRIER				
5.5.1.1 Carrier Output Power				
Rated (nominal)			1.8 W	
Measured			1.60 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.51 dB	*
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	0.48 dB	
Voltage -10%	BB	±3 dB of nominal	-1.75 dB	
Voltage -20%	BC	-6, +3 dB of nominal	-3.17 dB	
Temperature -30°C	BN	±3 dB of nominal	-0.75 dB	
Temperature +60°C	BN	±3 dB of nominal	-1.38 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	-2.46 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00003 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00004 %	
Voltage -15%	BE	0.0005% of nominal	0.00011 %	
Temperature -30°C	BP	0.0005% of nominal	0.00081 %	*
Temperature +60°C	BP	0.0005% of nominal	0.00008 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00022 %	
Vibration	BV	0.0005% of nominal	0.00017 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	86.9 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	6 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2213

TRANSCEIVER CHARACTERISTIC (150-174 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	8.1 %	*
Temperature Stability				
-30°C	BQ	9% max.	6.5 %	
+60°C	BQ	9% max.	6.9 %	
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	44.3 dB	
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	43.5 dB	
Temperature +60°C	BO	34 dB min. attenuation	38.5 dB	
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	50.2 dB	
5.5.2.3 Audio Frequency Response	BU	25 dB min. attenuation	36.8 dB	
300 Hz		-10.5 dB (+1, -3 dB)	-12.8 dB	
500 Hz		-6.0 dB (+1, -3 dB)	-6.9 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	5.1 dB	
3000 Hz		+9.5 dB (+1, -4.6 dB)	3.8 dB	*
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.65 kHz	
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	5.05 kHz	*
500 Hz	BJ	≤5 kHz	5.18 kHz	*
1000 Hz	BJ	≤5 kHz	5.18 kHz	*
2000 Hz	BJ	≤5 kHz	4.65 kHz	*
2500 Hz	BJ	≤5 kHz	3.90 kHz	
3000 Hz	BJ	≤5 kHz	3.00 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	55.0 dB	
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA				
5.6.1 Radiation Efficiency	CA	20% min.	26.6 %	
Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)				
Service Life: 20 to 30°C	DA	8 hrs.	4 hrs. 45 min.	
-30°C	DB	2 hrs.	1 hr. 40 min.	
+60°C	DC	7 hrs.	4 hrs. 40 min.	

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2213

2213-4

FM TRANSCEIVER TEST DATA

MANUFACTURER: Motorola
 MODEL NO.: MX320-H33AAU1120B
 SERIAL NO.: 278 ADU 2000
 TYPE: II

ITEM NO.: 2224
 RF POWER (Nominal): 2.5 Watts
 TEST FREQUENCIES: T- 151.625 MHz
 R- 151.625 MHz

TRANSCIEVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.1 RECEIVER SENSITIVITY					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.27 uV	
	SINAD Sensitivity Variance -				
	Voltage +10%	B	0.7 uV or less	0.26 uV	
	-20%	B	0.7 uV or less	0.28 uV	
	Temperature -30°C	U	+6 dB max. above 0.5 uV	1.2 dB	
	+60°C	U	+6 dB max. above 0.5 uV	-2.0 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-6.3 dB	
5.4.2 RECEIVER SELECTIVITY					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	5.6 kHz	
	Usable Bandwidth Variance -				
	Temperature -30°C	V	-20% max. below 5 kHz	-5.4 %	
	+60°C	V	-20% max. below 5 kHz	1.8 %	
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-17.9 %	
5.4.2.2	Adjacent Channel Selectivity	D	70 dB min.	88.0 dB	
	Adjacent Channel Selectivity Variance -				
	Temperature -30°C	W	58 dB min.	90.0 dB	
	+60°C	W	58 dB min.	80.0 dB	
	Humidity 50°C, 90% RH	AE	58 dB min.	76.0 dB	
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	107.0 dB	
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	74.0 dB	
5.4.3 RECEIVER SQUELCH					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.08 uV	
	Threshold Squelch Variance-				
	Voltage +10%	I	0.6 uV or less	0.09 uV	
	-20%	I	0.6 uV or less	0.07 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	0.0 dB	
	+60°C	Y	+6 dB max. above 0.4 uV	-4.0 dB	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-11.0 dB	
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	0.23 uV	
	Tight Squelch Variance -				
	Temperature -30°C	X	+6 dB max. above 4.0 uV	-1.0 dB	
	+60°C	X	+6 dB max. above 4.0 uV	0.0 dB	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-9.0 dB	
5.4.3.2	Squelch Block	J	5 kHz min.	8.7 kHz	
5.4.3.3	Squelch Attack Time	K	150 ms max.	12 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	28 ms	

A-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 H-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2224

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	930 mW	
	Audio Output Power Variance -				
	Voltage				
	+10%	O	-3 dB max. below 500 mW	1.0 dB	
	-20%	O	-3 dB max. below 500 mW	-2.4 dB	
	Temperature				
	-30°C	Z	-6 dB max. below 500 mW	-0.4 dB	
	+60°C	Z	-6 dB max. below 500 mW	0.0 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	0.4 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	1.2 %	
	Temperature				
	-30°C	AB	18% max. at 500 mW	2.5 %	
	+60°C	AB	18% max. at 500 mW	2.0 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	1.2 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	0.2 dB	*
	500 Hz		+6.0 dB (-10, +2 dB)	7.7 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-9.0 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-17.3 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsquelled	S	40 dB min. below 500 mW	61.6 dB	
	Squelled	T	50 dB min. below 500 mW	92.7 dB	
	Audio Hum and Noise Variance -				
	Unsquelled				
	Temperature				
	-30°C	AA	30 dB min.	61.1 dB	
	+60°C	AA	30 dB min.	61.5 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	62.3 dB	
	Squelled				
	Temperature				
	-30°C	AA	40 dB min.	91.7 dB	
	+60°C	AA	40 dB min.	87.2 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	80.1 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			2.5 W	
	Measured			2.54 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	0.06 dB	
	Carrier Output Power Variance -				
	Voltage				
	+10%	BB	±3 dB of nominal	0.10 dB	
	-10%	BB	±3 dB of nominal	0.0 dB	
	-20%	BC	-6, +3 dB of nominal	-1.0 dB	
	Temperature				
	-30°C	BN	±3 dB of nominal	-0.3 dB	
	+60°C	BN	±3 dB of nominal	-0.7 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	-0.2 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00012 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage				
	+15%	BE	0.0005% of nominal	0.00013 %	
	-15%	BE	0.0005% of nominal	0.00011 %	
	Temperature				
	-30°C	BP	0.0005% of nominal	0.00036 %	
	+60°C	BP	0.0005% of nominal	0.00006 %	
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00034 %	
	Vibration	BV	0.0005% of nominal	0.00033 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	85.5 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	10 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2224

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	2.5 %	
	Temperature Stability				
	-30°C	BQ	9% max.	1.3 %	
	+60°C	BQ	9% max.	1.5 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	50.3 dB	
	FM Hum and Noise Stability				
	Temperature				
	-30°C	BO	34 dB min. attenuation	47.9 dB	
	+60°C	BO	34 dB min. attenuation	46.0 dB	
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	49.7 dB	
	Vibration	BU	25 dB min. attenuation	47.3 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-10.5 dB	
	500 Hz		-6.0 dB (+1, -3 dB)	-6.1 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	7.3 dB	
	3000 Hz		+9.5 dB (+1, -4.6 dB)	6.4 dB	
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.70 kHz	
5.5.2.4	Modulation Limiting				
	300 Hz	BJ	≤5 kHz		
	500 Hz	BJ	≤5 kHz	4.50 kHz	
	1000 Hz	BJ	≤5 kHz	4.80 kHz	
	2000 Hz	BJ	≤5 kHz	4.80 kHz	
	2500 Hz	BJ	≤5 kHz	4.90 kHz	
	3000 Hz	BJ	≤5 kHz	4.55 kHz	
		BJ	≤5 kHz	3.60 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	55.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	20% min.	18.2 %	*
	Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C				
	-30°C	DA	8 hrs.	6 hrs. 21 min.	
	+60°C	DB	2 hrs.	0 hrs. 45 min.	
		DC	7 hrs.	6 hrs. 7 min.	

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2224

2224-4

FM TRANSCEIVER TEST DATA

MANUFACTURER: Motorola
 MODEL NO.: MX 330 - H44AAU11208
 SERIAL NO.: 278 ADU 2113
 TYPE: III

ITEM NO.: 2225
 RF POWER (Nominal): 5.0 Watts
 TEST FREQUENCIES: T- 464.450 MHz
 R- 464.500 MHz

TRANSCEIVER CHARACTERISTIC
 (400-512 MHz)

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.23 uV	
5.4.1 SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.24 uV	
-20%	B	0.7 uV or less	0.31 uV	
Temperature -30°C	U	+6 dB max. above 0.5 uV	-0.4 dB	
+60°C	U	+6 dB max. above 0.5 uV	-3.4 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-9.1 dB	
<u>RECEIVER SELECTIVITY</u>				
5.4.2 Usable Bandwidth	C	5 kHz min.	6.10 kHz	
5.4.2.1 Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	-13.1 %	
+60°C	V	-20% max. below 5 kHz	0.0 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-18.0 %	
5.4.2.2 Adjacent Channel Selectivity	D	60 dB min.	80.0 dB	
Adjacent Channel Selectivity Variance - Temperature -30°C	W	48 dB min.	84.0 dB	
+60°C	W	48 dB min.	85.0 dB	
Humidity 50°C, 90% RH	AE	48 dB min.	82.0 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	120.0 dB	
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	72.0 dB	
<u>RECEIVER SQUELCH</u>				
5.4.3 Threshold Squelch Sensitivity	G	0.4 uV or less	0.15 uV	
5.4.3.1 Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.13 uV	
-20%	I	0.6 uV or less	0.13 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-1.0 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-5.0 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-3.0 dB	
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.34 uV	
Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	-1.0 dB	
+60°C	X	+6 dB max. above 4.0 uV	-4.0 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-9.0 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	12.5 kHz	
5.4.3.3 Squelch Attack Time	K	150 ms max.	60 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	50 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2225

TRANSCEIVER CHARACTERISTIC (400-512 mHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.4 RECEIVER AUDIO FREQUENCY</u>				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	950 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	1.0 dB	
-20%	O	-3 dB max. below 500 mW	-2.4 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	0.2 dB	
+60°C	Z	-6 dB max. below 500 mW	0.0 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	0.2 dB	
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	0.8 %	
Temperature -30°C	AB	18% max. at 500 mW	3.1 %	
+60°C	AB	18% max. at 500 mW	3.3 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	4.5 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	1.9 dB	
500 Hz		+6.0 dB (-10, +2 dB)	6.9 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-7.8 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-15.3 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquelled	S	40 dB min. below 500 mW	61.8 dB	
Squelched	T	50 dB min. below 500 mW	87.3 dB	
Audio Hum and Noise Variance -				
Unsquelled				
Temperature -30°C	AA	30 dB min.	63.5 dB	
+60°C	AA	30 dB min.	64.5 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	62.2 dB	
Squelched				
Temperature -30°C	AA	40 dB min.	79.3 dB	
+60°C	AA	40 dB min.	93.9 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	93.3 dB	
<u>5.5.1 TRANSMITTER RF CARRIER</u>				
5.5.1.1 Carrier Output Power				
Rated (nominal)			5.0 W	
Measured			5.18 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	0.16 dB	
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	0.42 dB	
-10%	BB	±3 dB of nominal	-0.94 dB	
-20%	BC	-6, +3 dB of nominal	-2.33 dB	
Temperature -30°C	BN	±3 dB of nominal	-0.58 dB	
+60°C	BN	±3 dB of nominal	-1.23 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	-0.32 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00009 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00019 %	
-15%	BE	0.0005% of nominal	0.00017 %	
Temperature -30°C	BP	0.0005% of nominal	0.00057 %	*
+60°C	BP	0.0005% of nominal	0.00003 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00037 %	
Vibration	BV	0.0005% of nominal	0.00032 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	83.1 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	6 ms	

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2225

TRANSCEIVER CHARACTERISTIC (400-512 mHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION</u>				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	0.7 %	
Temperature Stability				
-30°C	BQ	9% max.	4.8 %	
+60°C	BQ	9% max.	4.4 %	
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	51.0 dB	
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	51.1 dB	
+60°C	BO	34 dB min. attenuation	46.7 dB	
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	49.1 dB	
Vibration	BU	25 dB min. attenuation	42.1 dB	
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	-10.5 dB	
500 Hz		-6.0 dB (+1, -3 dB)	-6.1 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	7.7 dB	
3000 Hz		+9.5 dB (+1, -4.6 dB)	7.0 dB	
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.65 kHz	
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	5.05 kHz	*
500 Hz	BJ	≤5 kHz	4.70 kHz	
1000 Hz	BJ	≤5 kHz	4.60 kHz	
2000 Hz	BJ	≤5 kHz	4.40 kHz	
2500 Hz	BJ	≤5 kHz	4.10 kHz	
3000 Hz	BJ	≤5 kHz	3.25 kHz	
<u>5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY</u>				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	55.0 dB	
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
<u>5.6 ANTENNA</u>				
5.6.1 Radiation Efficiency	CA	50% min.	94.5 %	
Power Test Degradation	CB	1 dB max.	0.0 dB	
<u>5.7 BATTERY (NI-CAD)</u>				
Service Life: 20 to 30°C	DA	8 hrs.	4 hrs. 57 min.	
-30°C	DB	2 hrs.	3 hrs. 19 min.	
+60°C	DC	7 hrs.	4 hrs. 42 min.	

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2225

FM TRANSCEIVER TEST DATA

MANUFACTURER: Motorola
 MODEL NO.: MT500-H33BBU1124A
 SERIAL NO.: 230 ADU 1660
 TYPE: II

ITEM NO.: 2226
 RF POWER (Nominal): 5.0 Watts
 TEST FREQUENCIES: T- 151.625 MHz
 R- 151.625 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.1 RECEIVER SENSITIVITY</u>					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.19 uV	
	SINAD Sensitivity Variance -				
	Voltage +10%	B	0.7 uV or less	0.21 uV	
	-20%	B	0.7 uV or less	0.22 uV	
	Temperature -30°C	U	+6 dB max. above 0.5 uV	1.0 dB	
	+60°C	U	+6 dB max. above 0.5 uV	-1.5 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-1.2 dB	
<u>5.4.2 RECEIVER SELECTIVITY</u>					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	6.00 kHz	
	Usable Bandwidth Variance -				
	Temperature -30°C	V	-20% max. below 5 kHz	1.7 %	
	+60°C	V	-20% max. below 5 kHz	-1.7 %	
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	-6.7 %	
5.4.2.2	Adjacent Channel Selectivity	D	70 dB min.	86.0 dB	
	Adjacent Channel Selectivity				
	Variance -				
	Temperature -30°C	W	58 dB min.	89.0 dB	
	+60°C	W	58 dB min.	94.0 dB	
	Humidity 50°C, 90% RH	AE	58 dB min.	85.0 dB	
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	75.0 dB	
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	56.0 dB	*
<u>5.4.3 RECEIVER SQUELCH</u>					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.10 uV	
	Threshold Squelch Variance -				
	Voltage +10%	I	0.6 uV or less	0.01 uV	
	-20%	I	0.6 uV or less	0.10 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	-3.0 dB	
	+60°C	Y	+6 dB max. above 0.4 uV	-6.0 dB	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-3.0 dB	
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	0.40 uV	
	Tight Squelch Variance -				
	Temperature -30°C	X	+6 dB max. above 4.0 uV	0.0 dB	
	+60°C	X	+6 dB max. above 4.0 uV	-1.0 dB	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-1.0 dB	
5.4.3.2	Squelch Block	J	5 kHz min.	10.5 kHz	
5.4.3.3	Squelch Attack Time	K	150 ms max.	45 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	85 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2226

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	930 mW	
	Audio Output Power Variance -				
	Voltage				
	+10%	O	-3 dB max. below 500 mW	0.9 dB	
	-20%	O	-3 dB max. below 500 mW	-2.1 dB	
	Temperature				
	-30°C	Z	-6 dB max. below 500 mW	-0.3 dB	
	+60°C	Z	-6 dB max. below 500 mW	0.1 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	0.1 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	1.3 %	
	Temperature				
	-30°C	AB	18% max. at 500 mW	1.7 %	
	+60°C	AB	18% max. at 500 mW	1.5 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	1.2 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	1.5 dB	
	500 Hz		+6.0 dB (-10, +2 dB)	4.1 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-7.4 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-17.4 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsquenced	S	40 dB min. below 500 mW	73.3 dB	
	Squelched	T	50 dB min. below 500 mW	63.5 dB	
	Audio Hum and Noise Variance -				
	Unsquenced				
	Temperature				
	-30°C	AA	30 dB min.	75.1 dB	
	+60°C	AA	30 dB min.	67.4 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	69.7 dB	
	Squelched				
	Temperature				
	-30°C	AA	40 dB min.	64.5 dB	
	+60°C	AA	40 dB min.	63.2 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	78.1 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			5.0 W	
	Measured			6.06 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	0.84 dB	
	Carrier Output Power Variance -				
	Voltage				
	+10%	BB	±3 dB of nominal	1.8 dB	
	-10%	BB	±3 dB of nominal	-0.4 dB	
	-20%	BC	-6, +3 dB of nominal	-1.8 dB	
	Temperature				
	-30°C	BN	±3 dB of nominal	0.7 dB	
	+60°C	BN	±3 dB of nominal	0.1 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	0.0 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00017 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage				
	+15%	BE	0.0005% of nominal	0.00016 %	
	-15%	BE	0.0005% of nominal	0.00017 %	
	Temperature				
	-30°C	BP	0.0005% of nominal	0.00010 %	
	+60°C	BP	0.0005% of nominal	0.00022 %	
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00015 %	
	Vibration	BV	0.0005% of nominal	0.00018 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	81.8 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	4 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2226

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	1.2 %	
	Temperature Stability				
	-30°C	BQ	9% max.	4.0 %	
	+60°C	BQ	9% max.	1.7 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	46.7 dB	
	FM Hum and Noise Stability				
	Temperature				
	-30°C	BO	34 dB min. attenuation	39.3 dB	
	+60°C	BO	34 dB min. attenuation	38.5 dB	
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	52.7 dB	
	Vibration	BU	25 dB min. attenuation	44.2 dB	
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-7.8 dB	* A
	500 Hz		-6.0 dB (+1, -3 dB)	-3.9 dB	*
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	2.9 dB	*
	3000 Hz		+9.5 dB (+1, -4.6 dB)	1.7 dB	*
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.60 kHz	
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	5.00 kHz	
	500 Hz	BJ	≤5 kHz	4.80 kHz	
	1000 Hz	BJ	≤5 kHz	4.70 kHz	
	2000 Hz	BJ	≤5 kHz	4.60 kHz	
	2500 Hz	BJ	≤5 kHz	4.30 kHz	
	3000 Hz	BJ	≤5 kHz	3.60 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	55.0 dB	
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	20% min.	20.8 %	
	Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C	DA	8 hrs.	4 hrs. 0 min.	
	-30°C	DB	2 hrs.	1 hr. 30 min.	
	+60°C	DC	7 hrs.	3 hrs. 45 min.	

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CONTINUED

1 OF 2

FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2226

A. A microphone compensator must be used to obtain audio response measurements.

FM TRANSCEIVER TEST DATA

MANUFACTURER: Motorola
 MODEL NO.: MT 500 - H34BBU1124A
 SERIAL NO.: 411 ADU 1096
 TYPE: III

ITEM NO.: 2227
 RF POWER (Nominal): 4.0 Watts
 TEST FREQUENCIES: T- 464.500 MHz
 R- 464.500 MHz

TRANSCEIVER CHARACTERISTIC
 (400-512 MHz)

PERFORMANCE REQUIREMENT
 REF. JEC-'78 NILECJ-STD-0209.00 TEST RESULTS NOTES

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT JEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.1 RECEIVER SENSITIVITY				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.26 uV	
SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.25 uV	
-20%	B	0.7 uV or less	0.26 uV	
Temperature -30°C	U	+6 dB max. above 0.5 uV	-4.9 dB	
+60°C	U	+6 dB max. above 0.5 uV	-1.7 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-3.7 dB	
5.4.2 RECEIVER SELECTIVITY				
5.4.2.1 Usable Bandwidth	C	5 kHz min.	5.50 kHz	
Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	7.3 %	
+60°C	V	-20% max. below 5 kHz	16.4 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	3.6 %	
5.4.2.2 Adjacent Channel Selectivity	D	60 dB min.	79.0 dB	
Adjacent Channel Selectivity Variance - Temperature -30°C	W	48 dB min.	70.0 dB	
+60°C	W	48 dB min.	77.0 dB	
Humidity 50°C, 90% RH	AE	48 dB min.	81.0 dB	
5.4.2.3 Spurious Response Attenuation	E	60 dB min.	72.0 dB	
5.4.2.4 Intermodulation Attenuation	F	60 dB min.	77.0 dB	
5.4.3 RECEIVER SQUELCH				
5.4.3.1 Threshold Squelch Sensitivity	G	0.4 uV or less	0.19 uV	
Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.19 uV	
-20%	I	0.6 uV or less	0.21 uV	
Temperature -30°C	Y	+6 dB max. above 0.4 uV	-5.0 dB	
+60°C	Y	+6 dB max. above 0.4 uV	-3.0 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	-2.0 dB	
5.4.3.1 Tight Squelch Sensitivity	H	4.0 uV or less	0.42 uV	
Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	-6.0 dB	
+60°C	X	+6 dB max. above 4.0 uV	-1.0 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-4.0 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	10.6 kHz	
5.4.3.3 Squelch Attack Time	K	150 ms max.	65 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	110 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2227

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	670 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	0.7 dB	
-20%	O	-3 dB max. below 500 mW	-1.8 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	-3.6 dB	
+60°C	Z	-6 dB max. below 500 mW	0.5 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	0.4 dB	
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	2.9 %	
Temperature -30°C	AB	18% max. at 500 mW	2.5 %	
+60°C	AB	18% max. at 500 mW	2.0 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	3.4 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	4.8 dB	
500 Hz		+6.0 dB (-10, +2 dB)	4.3 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-6.1 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-14.8 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquelched	S	40 dB min. below 500 mW	61.8 dB	
Squelched	T	50 dB min. below 500 mW	84.9 dB	
Audio Hum and Noise Variance -				
Unsquelched				
Temperature -30°C	AA	30 dB min.	57.4 dB	
+60°C	AA	30 dB min.	62.4 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	61.7 dB	
Squelched				
Temperature -30°C	AA	40 dB min.	86.5 dB	
+60°C	AA	40 dB min.	85.9 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	85.6 dB	
5.5.1 TRANSMITTER RF CARRIER				
5.5.1.1 Carrier Output Power				
Rated (nominal)			4.0 W	
Measured			4.91 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	0.89 dB	
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	1.80 dB	
-10%	BB	±3 dB of nominal	-0.20 dB	
-20%	BC	-6, +3 dB of nominal	-1.43 dB	
Temperature -30°C	BN	±3 dB of nominal	0.29 dB	
+60°C	BN	±3 dB of nominal	-0.36 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	0.07 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00022 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00025 %	
-15%	BE	0.0005% of nominal	0.00028 %	
Temperature -30°C	BP	0.0005% of nominal	0.00015 %	
+60°C	BP	0.0005% of nominal	0.00016 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00015 %	
Vibration	BV	0.0005% of nominal	0.00019 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	64.9 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	6 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2227

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	0.7 %	
Temperature Stability				
-30°C	BQ	9% max.	4.7 %	
+60°C	BQ	9% max.	1.5 %	
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	45.5 dB	
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	39.1 dB	
+60°C	BO	34 dB min. attenuation	38.5 dB	
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	51.0 dB	
Vibration	BU	25 dB min. attenuation	48.3 dB	
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	-7.8 dB	* A
500 Hz		-6.0 dB (+1, -3 dB)	-3.9 dB	*
1000 Hz		0 dB 0 dB	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	1.2 dB	*
3000 Hz		+9.5 dB (+1, -4.6 dB)	-0.9 dB	*
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.60 kHz	
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	5.05 kHz	*
500 Hz	BJ	≤5 kHz	4.90 kHz	
1000 Hz	BJ	≤5 kHz	4.80 kHz	
2000 Hz	BJ	≤5 kHz	4.50 kHz	
2500 Hz	BJ	≤5 kHz	3.90 kHz	
3000 Hz	BJ	≤5 kHz	3.00 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	60.0 dB	
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	65.0 dB	
5.6 ANTENNA				
5.6.1 Radiation Efficiency	CA	50% min.	60.3 %	
Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)				
Service Life: 20 to 30°C	DA	8 hrs.	4 hrs. 0 min.	
-30°C	DB	2 hrs.	3 hrs. 0 min.	
+60°C	DC	7 hrs.	3 hrs. 45 min.	

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2227

A. A microphone compensator must be used to obtain audio response measurements.

FM TRANSCEIVER TEST DATA

MANUFACTURER: General Electric
 MODEL NO.: PE65RBSBMX
 SERIAL NO.: 938261346
 TYPE: III

ITEM NO.: 2230
 RF POWER (Nominal): 3.5 Watts
 TEST FREQUENCIES: T- 464.500 MHz
 R- 464.500 MHz

TRANSCEIVER CHARACTERISTIC
 (400-512 MHz)

REF.	PERFORMANCE REQUIREMENT DEC-78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>			
5.4.1	SINAD Sensitivity	A 0.5 uV or less	0.27 uV
5.4.1	SINAD Sensitivity Variance - Voltage +10% -20% Temperature -30°C +60°C Humidity 50°C, 90% RH	B 0.7 uV or less	0.28 uV
		B 0.7 uV or less	0.29 uV
		U +6 dB max. above 0.5 uV	2.9 dB
		U +6 dB max. above 0.5 uV	-1.5 dB
		AC +10 dB max. above 0.5 uV	-1.5 dB
<u>RECEIVER SELECTIVITY</u>			
5.4.2.1	Usable Bandwidth	C 5 kHz min.	6.4 kHz
5.4.2.1	Usable Bandwidth Variance - Temperature -30°C +60°C Humidity 50°C, 90% RH	V -20% max. below 5 kHz	-16 %
		V -20% max. below 5 kHz	+10 %
		AD -20% max. below 5 kHz	-14 %
5.4.2.2	Adjacent Channel Selectivity Adjacent Channel Selectivity Variance - Temperature -30°C +60°C Humidity 50°C, 90% RH	D 60 dB min.	81.4 dB
		W 48 dB min.	58.3 dB
5.4.2.3	Spurious Response Attenuation	AE 48 dB min.	69.9 dB
5.4.2.4	Intermodulation Attenuation	E 60 dB min.	68.7 dB
		F 60 dB min.	52.6 dB
<u>RECEIVER SQUELCH</u>			
5.4.3.1	Threshold Squelch Sensitivity	G 0.4 uV or less	0.11 uV
5.4.3.1	Threshold Squelch Variance- Voltage +10% -20% Temperature -30°C +60°C Humidity 50°C, 90% RH	I 0.6 uV or less	0.10 uV
		I 0.6 uV or less	0.17 uV
		Y +6 dB max. above 0.4 uV	0.8 dB
		Y +6 dB max. above 0.4 uV	-5.2 dB
		AG +10 dB max. above 0.4 uV	-5.6 dB
5.4.3.1	Tight Squelch Sensitivity Tight Squelch Variance - Temperature -30°C +60°C Humidity 50°C, 90% RH	H 4.0 uV or less	0.56 uV
		X +6 dB max. above 4.0 uV	-15.1 dB
		X +6 dB max. above 4.0 uV	-10.8 dB
5.4.3.2	Squelch Block	AF +10 dB max. above 4.0 uV	-9.8 dB
5.4.3.3	Squelch Attack Time	J 5 kHz min.	4.1 kHz
5.4.3.4	Squelch Release Time	K 150 ms max.	24 ms
		L 250 ms max.	130 ms

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2230

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	891 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	3.4 dB	
Voltage -20%	O	-3 dB max. below 500 mW	0.2 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	2.9 dB	
Temperature +60°C	Z	-6 dB max. below 500 mW	3.2 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	3.1 dB	
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	3.3 %	
Temperature -30°C	AB	18% max. at 500 mW	4.6 %	
Temperature +60°C	AB	18% max. at 500 mW	3.2 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	3.0 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
200 Hz		+10.5 dB (-10, +2 dB)	4.9 dB	
500 Hz		+6.0 dB (-10, +2 dB)	3.8 dB	
1000 Hz		0 dB 0 dB	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-8.9 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-15.7 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquelled	S	40 dB min. below 500 mW	61.9 dB	
Squelched	T	50 dB min. below 500 mW	61.9 dB	
Audio Hum and Noise Variance -				
Unsquelled				
Temperature -30°C	AA	30 dB min.	64.1 dB	
Temperature +60°C	AA	30 dB min.	63.3 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	62.8 dB	
Squelched				
Temperature -30°C	AA	40 dB min.	74.7 dB	
Temperature +60°C	AA	40 dB min.	76.5 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	72.4 dB	
5.5.1 TRANSMITTER RF CARRIER				
5.5.1.1 Carrier Output Power				
Rated (nominal)			3.5 W	
Measured			3.4 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.13 dB	
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	0.6 dB	
Voltage -10%	BB	±3 dB of nominal	-1.1 dB	
Voltage -20%	BC	-6, +3 dB of nominal	-2.2 dB	
Temperature -30°C	BN	±3 dB of nominal	0.1 dB	
Temperature +60°C	BN	±3 dB of nominal	-3.4 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	-0.9 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	-0.00006 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	-0.00009 %	
Voltage -15%	BE	0.0005% of nominal	-0.00007 %	
Temperature -30°C	BP	0.0005% of nominal	-0.00003 %	
Temperature +60°C	BP	0.0005% of nominal	-0.00002 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	-0.00024 %	
Vibration	BV	0.0005% of nominal	N	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	40.5 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	15 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2230

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	6.0 %	*
Temperature Stability -30°C	BQ	9% max.	7.4 %	
Temperature +60°C	BQ	9% max.	5.2 %	
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	24.4 dB	*
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	23.5 dB	*
Temperature +60°C	BO	34 dB min. attenuation	25.3 dB	*
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	27.8 dB	*
Vibration	BU	25 dB min. attenuation	N	*1
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	-32.3 dB	*
500 Hz		-6.0 dB (+1, -3 dB)	-16.7 dB	*
1000 Hz		0 dB 0 dB	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	3.7 dB	*
3000 Hz		+9.5 dB (+1, -4.6 dB)	3.7 dB	*
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.82 kHz	
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤5 kHz	1.10 kHz	
500 Hz	BJ	≤5 kHz	4.32 kHz	
1000 Hz	BJ	≤5 kHz	4.82 kHz	
2500 Hz	BJ	≤5 kHz	4.15 kHz	
3000 Hz	BJ	≤5 kHz	3.90 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	49.5 dB	
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	-32 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	-52 dB	*
5.6 ANTENNA				
5.6.1 Radiation Efficiency	CA	50% min.	23.0 %	*
Power Test Degradation	CB	1 dB max.	0 dB	
5.7 BATTERY (NI-CAD)				
Service Life: 20 to 30°C	DA	8 hrs.	2 hrs. 40 min.	
-30°C	DB	2 hrs.	1 hr. 5 min.	
+60°C	DC	7 hrs.	n	1

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2230

- This unit failed during the room temperature measurements (no RF output) and it was returned to a General Electric service shop for repair. Upon return of the repaired unit the room temperature tests were completed. During the vibration testing the RF output was found to be intermittent. NO measurements could be made. When the unit was checked without vibration, its operation was normal. During the +60°C portion of the battery service life test the test unit produced no audio output power.

FM TRANSCEIVER TEST DATA

MANUFACTURER: General Electric
 MODEL NO.: PY56YBSBH
 SERIAL NO.: 938261446
 TYPE: II

ITEM NO.: 2231
 RF POWER (Nominal): 2.0 Watts
 TEST FREQUENCIES: T- 151.625 MHz
 R- 151.625 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-78 NILECJ-STO-0209.00	TEST RESULTS	NOTES
RECEIVER SENSITIVITY					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.19 uV	
	SINAD Sensitivity Variance - Voltage +10%	B	0.7 uV or less	0.18 uV	
	-20%	B	0.7 uV or less	0.32 uV	
	Temperature -30°C	U	+6 dB max. above 0.5 uV	n	
	+60°C	U	+6 dB max. above 0.5 uV	n	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	n	1
RECEIVER SELECTIVITY					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	7.2 kHz	
	Usable Bandwidth Variance - Temperature -30°C	V	-20% max. below 5 kHz	n	
	+60°C	V	-20% max. below 5 kHz	n	
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	n	1
5.4.2.2	Adjacent Channel Selectivity	D	70 dB min.	61.5 dB	*
	Adjacent Channel Selectivity Variance - Temperature -30°C	W	58 dB min.	n	
	+60°C	W	58 dB min.	n	
	Humidity 50°C, 90% RH	AE	58 dB min.	n	
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	>60 dB	
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	62.1 dB	
RECEIVER SQUELCH					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.05 uV	
	Threshold Squelch Variance- Voltage +10%	I	0.6 uV or less	0.05 uV	
	-20%	I	0.6 uV or less	0.09 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	n	
	+60°C	Y	+6 dB max. above 0.4 uV	n	
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	n	1
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	0.44 uV	
	Tight Squelch Variance - Temperature -30°C	X	+6 dB max. above 4.0 uV	n	
	+60°C	X	+6 dB max. above 4.0 uV	n	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	n	1
5.4.3.2	Squelch Block	J	5 kHz min.	n	
5.4.3.3	Squelch Attack Time	K	150 ms max.	6.1 kHz	
5.4.3.4	Squelch Release Time	L	250 ms max.	23 ms	
				68 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2231

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	878 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	3.4 dB	
	Voltage -20%	O	-3 dB max. below 500 mW	0.0 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	n	
	Temperature +60°C	Z	-6 dB max. below 500 mW	n	1
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	n	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	2.4 %	
	Temperature -30°C	AB	18% max. at 500 mW	n	
	Temperature +60°C	AB	18% max. at 500 mW	n	1
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	n	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	3.8 dB	
	500 Hz		+6.0 dB (-10, +2 dB)	2.0 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-8.2 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-15.4 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsquelched	S	40 dB min. below 500 mW	68.5 dB	
	Squelched	T	50 dB min. below 500 mW	92.0 dB	
	Audio Hum and Noise Variance -				
	Unsquelched				
	Temperature -30°C	AA	30 dB min.	n	
	Temperature +60°C	AA	30 dB min.	n	1
	Humidity 50°C, 90% RH	AI	30 dB min.	n	
	Squelched				
	Temperature -30°C	AA	40 dB min.	n	
	Temperature +60°C	AA	40 dB min.	n	1
	Humidity 50°C, 90% RH	AI	40 dB min.	n	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			2.0 W	
	Measured			2.55 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	1.0 dB	
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	1.8 dB	
	Voltage -10%	BB	±3 dB of nominal	0.0 dB	
	Voltage -20%	BC	-6, +3 dB of nominal	-1.5 dB	
	Temperature -30°C	BN	±3 dB of nominal	n	
	Temperature +60°C	BN	±3 dB of nominal	n	1
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	n	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00003 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.00003 %	
	Voltage -15%	BE	0.0005% of nominal	0.00001 %	
	Temperature -30°C	BP	0.0005% of nominal	n	1
	Temperature +60°C	BP	0.0005% of nominal	n	
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	n	
	Vibration	BV	0.0005% of nominal	N	*1
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	76.7 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	15 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2231

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	7.2 %	*
	Temperature Stability -30°C	BQ	9% max.	n	1
	Temperature +60°C	BQ	9% max.	n	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	38.6 dB	*
	FM Hum and Noise Stability -30°C	BO	34 dB min. attenuation	n	
	Temperature +60°C	BO	34 dB min. attenuation	n	1
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	n	
	Vibration	BU	25 dB min. attenuation	N	*1
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-24.8 dB	*
	500 Hz		-6.0 dB (+1, -3 dB)	-14.5 dB	*
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	5.7 dB	
	3000 Hz		+9.5 dB (+1, -4.6 dB)	4.3 dB	*
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.80 kHz	
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	2.35 kHz	
	500 Hz	BJ	≤5 kHz	4.60 kHz	
	1000 Hz	BJ	≤5 kHz	4.75 kHz	
	2500 Hz	BJ	≤5 kHz	3.60 kHz	
	3000 Hz	BJ	≤5 kHz	3.30 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	n	1
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	30.0 dB	
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	60.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	20% min.	n	1
	Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C	DA	8 hrs.	2 hrs. 24 min.	
	-30°C	DB	2 hrs.	n	
	+60°C	DC	7 hrs.	n	1

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2231

- The test item operated properly for all room temperature tests excluding vibration, radiated spurious emissions and antenna efficiency. During the vibration test the RF output was found too intermittent and no measurements were performed. Spot checking the transmitter without vibration indicated normal operation. During the +60°C environment, the test unit failed to operate. The unit was spot checked at room temperature and found not to be operating. The unit was sent to a General Electric service facility for repair. The long turn-around time for the repair prohibited any further environmental testing to be performed. Upon return of the repaired unit, it was spot checked and found to be operating, but during the radiated spurious emissions and antenna efficiency tests, the unit failed with an indication of no RF output power.

FM TRANSCEIVER TEST DATA

MANUFACTURER: General Electric
 MODEL NO.: PY65YBSBMX
 SERIAL NO.: 938261546
 TYPE: III

ITEM NO.: 2232
 RF POWER (Nominal): 4.0 Watts
 TEST FREQUENCIES: T- 464.500 MHz
 R- 464.500 MHz

TRANSCEIVER CHARACTERISTIC
 (4 00-512 MHz)

REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>RECEIVER SENSITIVITY</u>			
5.4.1	SINAD Sensitivity	A 0.5 uV or less	0.31 uV
	SINAD Sensitivity Variance -		
	Voltage +10%	B 0.7 uV or less	0.31 uV
	-20%	B 0.7 uV or less	0.31 uV
	Temperature -30°C	U +6 dB max. above 0.5 uV	1.0 dB
	+60°C	U +6 dB max. above 0.5 uV	-1.9 dB
	Humidity 50°C, 90% RH	AC +10 dB max. above 0.5 uV	1.3 dB
<u>RECEIVER SELECTIVITY</u>			
5.4.2.1	Usable Bandwidth	C 5 kHz min.	7.6 kHz
	Usable Bandwidth Variance -		
	Temperature -30°C	V -20% max. below 5 kHz	2.0 %
	+60°C	V -20% max. below 5 kHz	8.0 %
	Humidity 50°C, 90% RH	AD -20% max. below 5 kHz	16.0 %
5.4.2.2	Adjacent Channel Selectivity	D 60 dB min.	84.4 dB
	Adjacent Channel Selectivity Variance -		
	Temperature -30°C	W 48 dB min.	73.8 dB
	+60°C	W 48 dB min.	76.3 dB
	Humidity 50°C, 90% RH	AE 48 dB min.	79.8 dB
5.4.2.3	Spurious Response Attenuation	E 60 dB min.	55.2 dB
5.4.2.4	Intermodulation Attenuation	F 60 dB min.	64.3 dB
<u>RECEIVER SQUELCH</u>			
5.4.3.1	Threshold Squelch Sensitivity	G 0.4 uV or less	0.11 uV
	Threshold Squelch Variance-		
	Voltage +10%	I 0.6 uV or less	0.10 uV
	-20%	I 0.6 uV or less	0.18 uV
	Temperature -30°C	Y +6 dB max. above 0.4 uV	-2.5 dB
	+60°C	Y +6 dB max. above 0.4 uV	-4.8 dB
	Humidity 50°C, 90% RH	AG +10 dB max. above 0.4 uV	-3.1 dB
5.4.3.1	Tight Squelch Sensitivity	H 4.0 uV or less	1.42 uV
	Tight Squelch Variance -		
	Temperature -30°C	X +6 dB max. above 4.0 uV	-1.9 dB
	+60°C	X +6 dB max. above 4.0 uV	-4.8 dB
	Humidity 50°C, 90% RH	AF +10 dB max. above 4.0 uV	-3.4 dB
5.4.3.2	Squelch Block	J 5 kHz min.	5.2 kHz
5.4.3.3	Squelch Attack Time	K 150 ms max.	24 ms
5.4.3.4	Squelch Release Time	L 250 ms max.	140 ms

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2232

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY				
5.4.4.1 Audio Output Power (Speaker)	M	500 mW min.	980 mW	
Audio Output Power Variance -				
Voltage +10%	O	-3 dB max. below 500 mW	3.5 dB	
-20%	O	-3 dB max. below 500 mW	0.2 dB	
Temperature -30°C	Z	-6 dB max. below 500 mW	3.1 dB	
+60°C	Z	-6 dB max. below 500 mW	3.2 dB	
Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	3.1 dB	
5.4.4.2 Audio Distortion (Speaker)	P	10% max. at 500 mW	2.9 %	
Temperature -30°C	AB	18% max. at 500 mW	5.2 %	
+60°C	AB	18% max. at 500 mW	1.2 %	
Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	1.1 %	
5.4.4.3 Audio Frequency Response (Speaker)	Q			
300 Hz		+10.5 dB (-10, +2 dB)	5.0 dB	
500 Hz		+6.0 dB (-10, +2 dB)	1.7 dB	
1000 Hz		0 dB (0, 0 dB)	0.0 dB	
2000 Hz		-6.0 dB (-10, +2 dB)	-7.6 dB	
3000 Hz		-9.5 dB (-10, +2 dB)	-14.3 dB	
5.4.4.4 Audio Hum and Noise -				
Unsquelled	S	40 dB min. below 500 mW	66.5 dB	
Squelled	T	50 dB min. below 500 mW	89.1 dB	
Audio Hum and Noise Variance -				
Unsquelled				
Temperature -30°C	AA	30 dB min.	60.4 dB	
+60°C	AA	30 dB min.	66.5 dB	
Humidity 50°C, 90% RH	AI	30 dB min.	64.1 dB	
Squelled				
Temperature -30°C	AA	40 dB min.	75.1 dB	
+60°C	AA	40 dB min.	82.5 dB	
Humidity 50°C, 90% RH	AI	40 dB min.	71.1 dB	
5.5.1 TRANSMITTER RF CARRIER				
5.5.1.1 Carrier Output Power				
Rated (nominal)			4.0 W	
Measured			3.68 W	
Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.36 dB	*
Carrier Output Power Variance -				
Voltage +10%	BB	±3 dB of nominal	1.1 dB	
-10%	BB	±3 dB of nominal	-1.6 dB	
-20%	BC	-6, +3 dB of nominal	-2.6 dB	
Temperature -30°C	BN	±3 dB of nominal	0.0 dB	
+60°C	BN	±3 dB of nominal	-0.5 dB	
Humidity 50°C, 90% RH	BR	±3 dB of nominal	-1.2 dB	
5.5.1.2 Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00015 %	
5.5.1.2 Carrier Frequency Stability -				
Voltage +15%	BE	0.0005% of nominal	0.00013 %	
-15%	BE	0.0005% of nominal	0.00011 %	
Temperature -30°C	BP	0.0005% of nominal	0.00015 %	
+60°C	BP	0.0005% of nominal	0.00013 %	
Humidity 50°C, 90% RH	BT	0.0005% of nominal	0.00031 %	
Vibration	BY	0.0005% of nominal	0.00030 %	
5.5.1.3 AM Hum and Noise Level	BF	34 dB min. attenuation	69.8 dB	
5.5.1.4 Carrier Attack Time	BG	100 ms max.	n	1

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2232

TRANSCEIVER CHARACTERISTIC (400-512 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION				
5.5.2.1 Audio Frequency Harmonic Distortion	BH	5% max.	17.5 %	*
Temperature Stability				
-30°C	BQ	9% max.	9.2 %	*
+60°C	BQ	9% max.	7.4 %	*
5.5.2.2 FM Hum and Noise Level	BI	40 dB min. attenuation	26.9 dB	*
FM Hum and Noise Stability				
Temperature -30°C	BO	34 dB min. attenuation	24.9 dB	*
+60°C	BO	34 dB min. attenuation	28.7 dB	*
Humidity 50°C, 90% RH	BS	34 dB min. attenuation	28.1 dB	*
Vibration	BU	25 dB min. attenuation	23.0 dB	*
5.5.2.3 Audio Frequency Response				
300 Hz		-10.5 dB (+1, -3 dB)	-23.6 dB	*
500 Hz		-6.0 dB (+1, -3 dB)	-13.8 dB	*
1000 Hz		0 dB (0, 0 dB)	0.0 dB	
2500 Hz		+8.0 dB (+1, -3 dB)	7.8 dB	
3000 Hz		+9.5 dB (+1, -4.6 dB)	7.1 dB	
5.5.2.4 Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.20 kHz	*
5.5.2.5 Modulation Limiting				
300 Hz	BJ	≤ 5 kHz	2.35 kHz	
500 Hz	BJ	≤ 5 kHz	3.90 kHz	
1000 Hz	BJ	≤ 5 kHz	4.10 kHz	
2500 Hz	BJ	≤ 5 kHz	3.10 kHz	
3000 Hz	BJ	≤ 5 kHz	2.82 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY				
5.5.3.1 Radiated Spurious Emissions	BK	43 dB min. attenuation	n	2
5.5.3.2 Sideband Spectrum -				
±10 kHz Freq. Separation	BL	30 dB min. attenuation	37.0 dB	
±20 kHz Freq. Separation	BM	60 dB min. attenuation	60.0 dB	
5.6 ANTENNA				
5.6.1 Radiation Efficiency	CA	50% min.	n	2
Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)				
Service Life: 20 to 30°C	DA	8 hrs.	n	
-30°C	DB	2 hrs.	n	1
+60°C	DC	7 hrs.	n	

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2232

1. No test was conducted. The mechanical push-to-talk (PTT) switch used in this transceiver was not adaptable for making accurate measurements of carrier attack time, and battery service life.
2. The unit failed to operate (no RF output power) during the radiated spurious emissions and antenna efficiency tests.

FM TRANSCEIVER TEST DATA

MANUFACTURER: General Electric
 MODEL NO.: PE66RBSBH
 SERIAL NO.: 938261246
 TYPE: II

ITEM NO.: 2233
 RF POWER (Nominal): 5.0 Watts
 TEST FREQUENCIES: T- 151.625 MHz
 R- 151.625 MHz

TRANSCEIVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.1 RECEIVER SENSITIVITY					
5.4.1	SINAD Sensitivity	A	0.5 uV or less	0.31 uV	
	SINAD Sensitivity Variance -				
	Voltage +10%	B	0.7 uV or less	0.30 uV	
	-20%	B	0.7 uV or less	0.52 uV	
	Temperature -30°C	U	+6 dB max. above 0.5 uV	-5.4 dB	
	+60°C	U	+6 dB max. above 0.5 uV	-2.4 dB	
	Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	5.1 dB	
5.4.2 RECEIVER SELECTIVITY					
5.4.2.1	Usable Bandwidth	C	5 kHz min.	7.6 kHz	
	Usable Bandwidth Variance -				
	Temperature -30°C	V	-20% max. below 5 kHz	28 %	
	+60°C	V	-20% max. below 5 kHz	N	*1
	Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	26 %	
5.4.2.2	Adjacent Channel Selectivity	D	70 dB min.	89.3 dB	
	Adjacent Channel Selectivity Variance -				
	Temperature -30°C	W	58 dB min.	N	*1
	+60°C	W	58 dB min.	N	*1
	Humidity 50°C, 90% RH	AE	58 dB min.	70.3	
5.4.2.3	Spurious Response Attenuation	E	60 dB min.	>60.0 dB	
5.4.2.4	Intermodulation Attenuation	F	60 dB min.	80.5 dB	
5.4.3 RECEIVER SQUELCH					
5.4.3.1	Threshold Squelch Sensitivity	G	0.4 uV or less	0.13 uV	
	Threshold Squelch Variance-				
	Voltage +10%	I	0.6 uV or less	0.13 uV	
	-20%	I	0.6 uV or less	0.56 uV	
	Temperature -30°C	Y	+6 dB max. above 0.4 uV	-11.2 dB	
	+60°C	Y	+6 dB max. above 0.4 uV	N	*1
	Humidity 50°C, 90% RH	AG	+10 dB max. above 0.4 uV	0.4 dB	
5.4.3.1	Tight Squelch Sensitivity	H	4.0 uV or less	0.58 uV	
	Tight Squelch Variance -				
	Temperature -30°C	X	+6 dB max. above 4.0 uV	-17.4 dB	
	+60°C	X	+6 dB max. above 4.0 uV	-14.9 dB	
	Humidity 50°C, 90% RH	AF	+10 dB max. above 4.0 uV	-9.1 dB	
5.4.3.2	Squelch Block	J	5 kHz min.	4.8 kHz	*
5.4.3.3	Squelch Attack Time	K	150 ms max.	24 ms	
5.4.3.4	Squelch Release Time	L	250 ms max.	192 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2233

TRANSCIEVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	780 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	2.8 dB	
	Voltage -20%	O	-3 dB max. below 500 mW	0.1 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	2.3 dB	
	Temperature +60°C	Z	-6 dB max. below 500 mW	2.8 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	2.9 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	13.3 %	*
	Temperature -30°C	AB	18% max. at 500 mW	3.3 %	
	Temperature +60°C	AB	18% max. at 500 mW	3.8 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	11.0 %	1
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	5.6 dB	
	500 Hz		+6.0 dB (-10, +2 dB)	3.7 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-8.7 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-15.9 dB	
5.4.4.4	Audio Hum and Noise -				
	Unscelched	S	40 dB min. below 500 mW	67.5 dB	
	Scelched	T	50 dB min. below 500 mW	86.0 dB	
	Audio Hum and Noise Variance -				
	Unscelched				
	Temperature -30°C	AA	30 dB min.	N	*1
	Temperature +60°C	AA	30 dB min.	60.0 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	66.5 dB	
	Scelched				
	Temperature -30°C	AA	40 dB min.	N	*1
	Temperature +60°C	AA	40 dB min.	72.3 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	72.3 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			5.0 W	
	Measured			4.18 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	-0.78 dB	*
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	0.4 dB	
	Voltage -10%	BB	±3 dB of nominal	-1.9 dB	
	Voltage -20%	BC	-6, +3 dB of nominal	-3.2 dB	
	Temperature -30°C	BN	±3 dB of nominal	-0.7 dB	
	Temperature +60°C	BN	±3 dB of nominal	-1.7 dB	
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	-1.6 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.0005% of nominal	0.00003 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.0005% of nominal	0.00003 %	
	Voltage -15%	BE	0.0005% of nominal	0.00004 %	
	Temperature -30°C	BP	0.0005% of nominal	0.00017 %	
	Temperature +60°C	BP	0.0005% of nominal	-0.00027 %	
	Humidity 50°C, 90% RH	BT	0.0005% of nominal	-0.00027 %	
	Vibration	BV	0.0005% of nominal	-0.00027 %	
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	67.7 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	4 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2233

TRANSCIEVER CHARACTERISTIC (150-174 MHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	4.3 %	
	Temperature Stability				
	-30°C	BQ	9% max.	11.0 %	*
	+60°C	BQ	9% max.	4.3 %	
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	38.4 dB	*
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	22.7 dB	*
	Temperature +60°C	BO	34 dB min. attenuation	36.9 dB	
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	36.3 dB	
	Vibration	BU	25 dB min. attenuation	N	*2
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-31.1 dB	*
	500 Hz		-6.0 dB (+1, -3 dB)	-16.6 dB	*
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	5.7 dB	
	3000 Hz		+9.5 dB (+1, -4.6 c.)	5.4 dB	
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.15 kHz	*
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	≤5 kHz	0.92 kHz	
	500 Hz	BJ	≤5 kHz	4.05 kHz	
	1000 Hz	BJ	≤5 kHz	4.15 kHz	
	2500 Hz	BJ	≤5 kHz	3.40 kHz	
	3000 Hz	BJ	≤5 kHz	3.17 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	38.0 dB	*
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	30 dB min. attenuation	40.0 dB	
	±20 kHz Freq. Separation	BM	60 dB min. attenuation	60.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	20% min.	16.0 %	*
	Power Test Degradation	CB	1 dB max.	0.0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C				
	-30°C	DA	8 hrs.	2 hrs.	55 min.
	+60°C	DB	2 hrs.	1 hr.	10 min.
		DC	7 hrs.	n	1

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2233

1. The test unit had intermittent audio output during the +60°C and -30°C environmental conditions. Data that was recorded at these conditions is of limited value because of the above observations. A spot check of the test item at room temperature conditions indicated normal operation.
2. The transceiver met the vibration requirement during 10-20 Hz vibration with an attenuation of 29.2 dB. During 30-60 Hz vibration deviation was too unstable to permit measurement to be made.

FM TRANSCEIVER TEST DATA

MANUFACTURER: General Electric
 MODEL NO.: PE 54RBSBAX
 SERIAL NO.: 938261146
 TYPE: I

ITEM NO.: 2234
 RF POWER (Nominal): 2.0 Watts
 TEST FREQUENCIES: T- 34.525 MHz
 R- 34.525 MHz

TRANSCEIVER CHARACTERISTIC (25-50 MHz)	REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
<u>5.4.1 RECEIVER SENSITIVITY</u>				
5.4.1 SINAD Sensitivity	A	0.5 uV or less	0.47 uV	
SINAD Sensitivity Variance -				
Voltage +10%	B	0.7 uV or less	0.48 uV	
-20%	B	0.7 uV or less	0.51 uV	
Temperature -30°C	U	+6 dB max. above 0.5 uV	N	1
+60°C	U	+6 dB max. above 0.5 uV	-0.5 dB	
Humidity 50°C, 90% RH	AC	+10 dB max. above 0.5 uV	-0.4 dB	
<u>5.4.2 RECEIVER SELECTIVITY</u>				
5.4.2.1 Usable Bandwidth	C	5 kHz min.	7.50 kHz	
Usable Bandwidth Variance -				
Temperature -30°C	V	-20% max. below 5 kHz	N	1
+60°C	V	-20% max. below 5 kHz	42.0 %	
Humidity 50°C, 90% RH	AD	-20% max. below 5 kHz	42.0 %	
5.4.2.2 Adjacent Channel Selectivity	D	60 dB min.	84.1 dB	
Adjacent Channel Selectivity				
Variance -				
Temperature -30°C	W	48 dB min.	N	1
+60°C	W	48 dB min.	66.4 dB	
Humidity 50°C, 90% RH	AE	48 dB min.	81.4 dB	
5.4.2.3 Spurious Response Attenuation	E	70 dB min.	>70.0 dB	
5.4.2.4 Intermodulation Attenuation	F	70 dB min.	67.8 dB	*
<u>5.4.3 RECEIVER SQUELCH</u>				
5.4.3.1 Threshold Squelch Sensitivity	G	0.3 uV or less	0.19 uV	
Threshold Squelch Variance-				
Voltage +10%	I	0.45 uV or less	0.24 uV	
-20%	I	0.45 uV or less	0.16 uV	
Temperature -30°C	Y	+6 dB max. above 0.30 uV	N	1
+60°C	Y	+6 dB max. above 0.30 uV	-3.5 dB	
Humidity 50°C, 90% RH	AG	+10 dB max. above 0.30 uV	-4.5 dB	
5.4.3.1 Tight Squelch Sensitivity	H	3.0 uV or less	1.1 uV	
Tight Squelch Variance -				
Temperature -30°C	X	+6 dB max. above 3.0 uV	N	1
+60°C	X	+6 dB max. above 3.0 uV	-11.1 dB	
Humidity 50°C, 90% RH	AF	+10 dB max. above 3.0 uV	-11.3 dB	
5.4.3.2 Squelch Block	J	5 kHz min.	3.8 kHz	*
5.4.3.3 Squelch Attack Time	K	150 ms max.	25 ms	
5.4.3.4 Squelch Release Time	L	250 ms max.	174 ms	

*-Requirement of NILECJ Standard was not met. See fourth page for notes and comments.
 N-No test data was obtained. Requirement was not met.
 n-No test data was obtained. No evaluation was made.

FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2234

TRANSCEIVER CHARACTERISTIC (25-50 mHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.4.4 RECEIVER AUDIO FREQUENCY					
5.4.4.1	Audio Output Power (Speaker)	M	500 mW min.	858 mW	
	Audio Output Power Variance -				
	Voltage +10%	O	-3 dB max. below 500 mW	3.3 dB	
	-20%	O	-3 dB max. below 500 mW	0.1 dB	
	Temperature -30°C	Z	-6 dB max. below 500 mW	N	*1
	+60°C	Z	-6 dB max. below 500 mW	2.8 dB	
	Humidity 50°C, 90% RH	AH	-3 dB max. below 500 mW	1.8 dB	
5.4.4.2	Audio Distortion (Speaker)	P	10% max. at 500 mW	3.4 %	
	Temperature -30°C	AB	18% max. at 500 mW	N	*1
	+60°C	AB	18% max. at 500 mW	3.2 %	
	Humidity 50°C, 90% RH	AJ	18% max. at 500 mW	3.4 %	
5.4.4.3	Audio Frequency Response (Speaker)	Q			
	300 Hz		+10.5 dB (-10, +2 dB)	5.3 dB	
	500 Hz		+6.0 dB (-10, +2 dB)	3.9 dB	
	1000 Hz		0 dB 0 dB	0.0 dB	
	2000 Hz		-6.0 dB (-10, +2 dB)	-8.9 dB	
	3000 Hz		-9.5 dB (-10, +2 dB)	-16.0 dB	
5.4.4.4	Audio Hum and Noise -				
	Unsquenced	S	40 dB min. below 500 mW	66.9 dB	
	Squenced	T	50 dB min. below 500 mW	90.5 dB	
	Audio Hum and Noise Variance -				
	Unsquenced				
	Temperature -30°C	AA	30 dB min.	N	*1
	+60°C	AA	30 dB min.	72.0 dB	
	Humidity 50°C, 90% RH	AI	30 dB min.	66.9 dB	
	Squenced				
	Temperature -30°C	AA	40 dB min.	N	*1
	+60°C	AA	40 dB min.	76.5 dB	
	Humidity 50°C, 90% RH	AI	40 dB min.	72.0 dB	
5.5.1 TRANSMITTER RF CARRIER					
5.5.1.1	Carrier Output Power				
	Rated (nominal)			2.0 W	
	Measured			1.42 W	
	Relation to Rated Output	BA	-0.3, +1 dB of nominal	-1.5 dB	*
	Carrier Output Power Variance -				
	Voltage +10%	BB	±3 dB of nominal	-0.5 dB	
	-10%	BB	±3 dB of nominal	-2.8 dB	
	-20%	BC	-6, +3 dB of nominal	-4.4 dB	
	Temperature -30°C	BN	±3 dB of nominal	N	*2
	+60°C	BN	±3 dB of nominal	N	*2
	Humidity 50°C, 90% RH	BR	±3 dB of nominal	-1.3 dB	
5.5.1.2	Carrier Frequency Tolerance	BD	0.002% of nominal	0.00087 %	
5.5.1.2	Carrier Frequency Stability -				
	Voltage +15%	BE	0.002% of nominal	0.00058 %	
	-15%	BE	0.002% of nominal	0.00087 %	
	Temperature -30°C	BP	0.002% of nominal	N	*2
	+60°C	BP	0.002% of nominal	N	*2
	Humidity 50°C, 90% RH	BT	0.002% of nominal	0.00058 %	
	Vibration	BV	0.002% of nominal	N	*3
5.5.1.3	AM Hum and Noise Level	BF	34 dB min. attenuation	66.6 dB	
5.5.1.4	Carrier Attack Time	BG	100 ms max.	4 ms	

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FM TRANSCEIVER TEST DATA (continued)

ITEM NO.: 2234

TRANSCEIVER CHARACTERISTIC (25-50 mHz)		REF.	PERFORMANCE REQUIREMENT DEC-'78 NILECJ-STD-0209.00	TEST RESULTS	NOTES
5.5.2 TRANSMITTER AUDIO FREQUENCY MODULATION					
5.5.2.1	Audio Frequency Harmonic Distortion	BH	5% max.	3.2 %	
	Temperature Stability				
	-30°C	BQ	9% max.	N	*2
	+60°C	BQ	9% max.	N	*2
5.5.2.2	FM Hum and Noise Level	BI	40 dB min. attenuation	34.1 dB	*
	FM Hum and Noise Stability				
	Temperature -30°C	BO	34 dB min. attenuation	N	*2
	+60°C	BO	34 dB min. attenuation	N	*2
	Humidity 50°C, 90% RH	BS	34 dB min. attenuation	36.2 dB	
	Vibration	BU	25 dB min. attenuation	N	*3
5.5.2.3	Audio Frequency Response				
	300 Hz		-10.5 dB (+1, -3 dB)	-21.1 dB	*
	500 Hz		-6.0 dB (+1, -3 dB)	-12.0 dB	*
	1000 Hz		0 dB 0 dB	0.0 dB	
	2500 Hz		+8.0 dB (+1, -3 dB)	+9.4 dB	*
	3000 Hz		+9.5 dB (+1, -4.6 dB)	-8.5 dB	*
5.5.2.4	Frequency Deviation	BJ	Limits: 4.5125 - 4.9875 kHz	4.00 kHz	*
5.5.2.5	Modulation Limiting				
	300 Hz	BJ	5 kHz	2.77 kHz	
	500 Hz	BJ	5 kHz	3.87 kHz	
	1000 Hz	BJ	5 kHz	3.92 kHz	
	2500 Hz	BJ	5 kHz	3.70 kHz	
	3000 Hz	BJ	5 kHz	3.25 kHz	
5.5.3 TRANSMITTER ELECTROMAGNETIC COMPATIBILITY					
5.5.3.1	Radiated Spurious Emissions	BK	43 dB min. attenuation	n	4
5.5.3.2	Sideband Spectrum -				
	±10 kHz Freq. Separation	BL	25 dB min. attenuation	36.0 dB	
	±20 kHz Freq. Separation	BM	50 dB min. attenuation	60.0 dB	
5.6 ANTENNA					
5.6.1	Radiation Efficiency	CA	N/A	N/A	4
	Power Test Degradation	CB	2 dB max.	0 dB	
5.7 BATTERY (NI-CAD)					
	Service Life: 20 to 30°C	DA	8 hrs.	3 hrs. 0 min.	
	-30°C	DB	2 hrs.	n	1
	+60°C	DC	7 hrs.	n	2

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FM TRANSCEIVER TEST DATA (continued)

NOTES AND COMMENTS

ITEM NO.: 2234

1. The receiver failed to produce 500 mW of audio at -30°C but operated normally during post room temperature check.
2. The transmitter failed to produce RF output power at +60°C and -30°C but operated normally during post room temperature check.
3. The transmitter produced intermittent RF output during vibration but operated normally during non-vibration spot check.
4. The transmitter failed to operate during radiated spurious emission test. (Last test to be performed.)

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