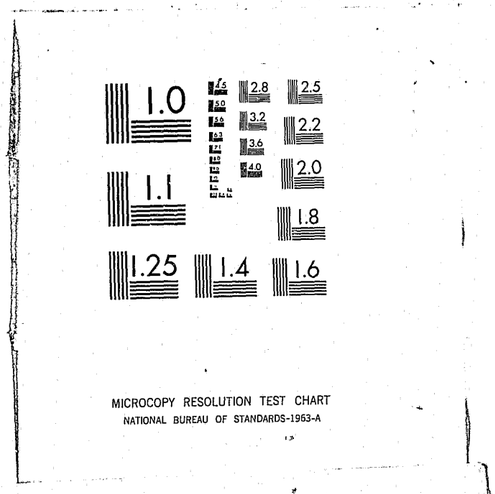

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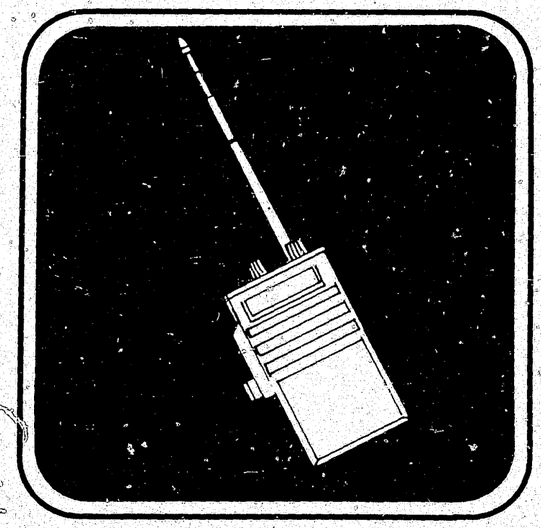
Police Personal FM Transceivers Report



Volume I
Executive Summary

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 nontechnical terms the capabilities of available equipment.

The **Technology Assessment Program Information Center (TAPIC)** operated by the International Association of Chiefs of Police (IACP), which supervises a national compliance testing program conducted by independent agencies. The standards developed by LESL serve as performance bench marks against which commercial equipment is measured. The facilities, personnel, and testing capabilities of the independent laboratories are evaluated by LESL prior to testing each item of equipment, and LESL helps the Information Center staff review and analyze data. Test results are published in Consumer Product Reports designed to help justice system procurement officials make informed purchasing decisions.

All publications issued by the National Institute of Justice, including those of the Technology Assessment Program, are available from the National Criminal Justice Reference Service (NCJRS), which serves as a central information and reference source for the nation's criminal justice community. For further information, or to register with NCJRS, write to the National Institute of Justice, National Criminal Justice Reference Service, Washington, DC 20531.

Paul Cascarano, Assistant Director
National Institute of Justice

POLICE PERSONAL FM TRANSCEIVERS REPORT

VOLUME I: EXECUTIVE SUMMARY

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

UNDER

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NATIONAL INSTITUTE OF JUSTICE

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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INTRODUCTION

The personal FM radio transceiver, at a rapidly increasing rate, is becoming a basic component of every law enforcement communications system. The need for this equipment and for more comprehensive information on personal transceivers was highlighted in two 1976 surveys as the top priority needs in the area of law enforcement communications. The surveys, "The Police Communications Equipment Survey of 1976", conducted by the Law Enforcement Standards Laboratory of the National Bureau of Standards, and the "Law Enforcement Equipment Survey" conducted by the IACP, specifically identified the need for personal transceiver equipment guidelines, performance standards and comparative performance data.

In consideration of the surveys and the additional information received through correspondence and personal contacts with officials concerned with law enforcement communications equipment problems, the IACP's Technology Assessment Program Advisory Council (TAPAC) recommended that a transceiver testing program be undertaken by the Technology Assessment Program Information Center (TAPIC) at the IACP. The program was initiated in 1978 with, as a principal objective, the development of comprehensive comparative performance data on personal FM transceivers for law enforcement use.

Twenty-six transceivers were tested in accordance with the detailed test procedures of the National Institute of Justice law enforcement equipment standard "Personal FM Transceivers". The test results were compared to the minimum performance requirements specified in the standard to determine compliance or noncompliance of the transceiver with each requirement.

This document provides an overall compliance summary of the transceivers tested and includes a one-page summary for each of the twenty-six transceivers showing whether the transceiver did or did not meet the specified minimum performance requirement of each characteristic tested. Data summarized are of tests conducted under ambient test conditions and, as appropriate, under conditions of extremes of temperature, humidity, vibration, and high and low operating voltages. Each transceiver summary page also contains a brief description of the transceiver, the manufacturer's published specifications, the performance requirement of the standard for tests under standard conditions at ambient temperature and percentage compliance figures for all transceivers.

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.

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.

TEST RESULTS

Comprehensive data compiled in measurements of twenty-six transceiver characteristics are summarized for this report. The data represent transceiver performance under ambient temperature conditions, conditions of high and low operating voltages, vibration and extremes of humidity and temperature. To facilitate use of the test data, summaries have been prepared in two formats.

(1) Tables 1 and 2 are quick reference summaries. The tables list each transceiver characteristic and indicate the compliance or noncompliance of each transceiver with the requirements of the Standard. Results are given for ambient (A) temperature tests and for tests under conditions of environmental (E) extremes.

Transceiver Types I and III are listed in Table 1, and Type II in Table 2.

(2) The Appendix contains a more detailed compliance summary of each of the transceivers tested. The summaries appear in numerical order according to identification numbers shown in Tables 1 and 2.

The one-page summary for each transceiver contains the following:

a. Listing of each transceiver characteristic along with performance requirements of the Standard at ambient temperature.

b. Manufacturers' specifications.

c. Indication that the transceiver was or was not in compliance with requirements of the Standard under each test condition specified in the Standard.

d. Percentage compliance of all transceivers with each performance requirement.

It is important to note that each transceiver was tested to the performance specifications set forth in the Standard and not with reference to the manufacturer's specifications or to specifications set forth in other available transceiver standards. The performance specifications of some manufacturers may be more stringent than those set forth in the Standard while others may be less stringent. Compliance summaries made are with reference to the Standard only. However, comments with references to the requirement of other standards or requirements of the FCC will appear in the section "Compliance Summary and Comments".

TABLE 1
TRANSCEIVER COMPLIANCE SUMMARY
(Requirements Specified in NILECJ-STD-0209.00)

Type III (400-512 mHz)

	GE 2230		GE 2202		ITC 2108		MOTOROLA 2212		MOTOROLA 2225		MOTOROLA 2227		RCA 2206		REPCO 2158		STANDARD 2163	
	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E
RECEIVER REQUIREMENTS																		
SINAD Sensitivity	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Selectivity																		
Usable Bandwidth	P	P	P	P	P	P	P	X	P	P	P	P	P	P	P	P	P	■
Adjacent Channel Selectivity	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Spurious Response Attenuation	P	P	X	–	X	–	X	–	P	–	P	–	X	–	P	–	P	■
Intermodulation Attenuation	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Squelch																		
Threshold Squelch Sensitivity	P	P	P	P	P	P	P	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	P	P	P	P	■
Squelch Block	X	–	P	–	P	–	P	–	P	–	P	–	P	–	X	–	P	–
Squelch Attack Time	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Squelch Release Time	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	X	–
Audio Frequency																		
Audio Output Power-Speaker	P	■	P	P	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	P	P	P	■
Audio Frequency Response-Speaker	P	–	X	–	P	–	X	–	P	–	P	–	X	–	P	–	P	–
Audio Hum and Noise-Unsquelched	P	■	P	P	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	P	P	P	X	■
TRANSMITTER REQUIREMENTS																		
RF Carrier																		
Carrier Output Power	X	■	X	X	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Carrier Frequency Tolerance	P	■	P	P	P	P	P	X	P	P	P	P	P	■	P	P	P	X
AM Hum and Noise	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Carrier Attack Time	P	–	P	–	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	P	P	P	P
FM Hum and Noise Level	X	■	X	X	X	–	X	–	P	–	X	–	P	■	P	X	X	X
Audio Frequency Response	X	–	X	–	X	–	X	–	P	–	X	–	P	–	P	–	X	–
Frequency Deviation	X	–	P	–	P	–	P	–	P	–	P	–	X	–	P	–	P	–
Modulation Limiting	P	–	P	–	P	–	X	–	X	–	X	–	X	–	P	–	P	–
Electromagnetic Compatibility																		
Radiated Spurious Emissions	n	–	n	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Sideband Spectrum Separation—10kHz	P	–	P	–	P	–	P	–	P	–	P	–	P	–	X	–	X	–
—20kHz	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–

Type I (25-50 mHz)

	GE 2234		REPCO 2192	
	A	E	A	E
RECEIVER REQUIREMENTS				
SINAD Sensitivity	P	■	P	P
Selectivity				
Usable Bandwidth	P	■	P	P
Adjacent Channel Selectivity	P	■	P	P
Spurious Response Attenuation	P	–	P	–
Intermodulation Attenuation	X	–	P	–
Squelch				
Threshold Squelch Sensitivity	P	■	P	X
Tight Squelch Sensitivity	P	■	P	P
Squelch Block	X	–	P	–
Squelch Attack Time	P	–	P	–
Squelch Release Time	P	–	P	–
Audio Frequency				
Audio Output Power-Speaker	P	■	P	P
Audio Distortion-Speaker	P	■	P	P
Audio Frequency Response-Speaker	P	–	X	–
Audio Hum and Noise-Unsquelched	P	■	P	P
-Squelched	P	■	P	P
TRANSMITTER REQUIREMENTS				
RF Carrier				
Carrier Output Power	X	■	X	X
Carrier Frequency Tolerance	P	■	P	P
AM Hum and Noise	P	–	P	–
Carrier Attack Time	P	–	P	–
Audio Frequency Modulation				
Audio Frequency Harmonic Distortion	P	■	P	P
FM Hum and Noise Level	X	■	X	X
Audio Frequency Response	X	–	X	–
Frequency Deviation	X	–	P	–
Modulation Limiting	P	–	P	–
Electromagnetic Compatibility				
Radiated Spurious Emissions	n	–	P	–
Sideband Spectrum Separation—10kHz	P	–	P	–
—20kHz	P	–	P	–
Antenna				
Radiation Efficiency	N/A	–	N/A	–
Power Test Degradation	P	–	P	–

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

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

TABLE 2
TRANSCEIVER COMPLIANCE SUMMARY

(Requirements Specified in NILECJ-STD-0209.00)

Type II (150-174 mHz)

	GE 2231		GE 2233		IEC 2166		IEC 2167		Motorola 2213		Motorola 2224		Motorola 2226		RCA 2207		Regency 2180		Regency 2181		REPCO 2201		REPCO 2195		Standard 2182		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	■	P	X	P	P	P	P	P	X	P	P
Selectivity	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
Usable Bandwidth	X	n	P	■	P	P	P	■	P	P	P	P	P	P	P	■	X	X	X	■	P	P	P	P	P	P	P	P	X	P
Adjacent Channel Selectivity	P	–	P	■	P	–	P	–	X	–	P	–	P	–	P	–	X	–	X	–	P	–	P	–	X	–	P	–	X	–
Spurious Response Attenuation	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	X	–	X	–	P	–	X	–	P	–	P	–	P	–
Intermodulation Attenuation	P	–	P	–	P	–	P	–	P	–	P	–	X	–	P	–	X	–	X	–	P	–	X	–	P	–	P	–	P	–
Squelch	P	n	P	X	P	X	P	■	P	P	P	P	P	P	P	■	P	X	P	■	P	X	P	P	P	P	P	P	P	P
Threshold Squelch Sensitivity	P	n	P	P	P	P	P	■	P	P	P	P	P	P	P	■	P	X	P	■	P	X	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	X	P	■	P	X	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	–	X	–	P	–	P	–
Squelch Release Time	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	X	–	P	–	P	–
Audio Frequency	P	n	P	P	P	P	P	■	P	P	P	P	P	P	P	■	P	X	P	■	P	X	P	P	P	P	P	P	P	P
Audio Output Power-Speaker	P	n	P	P	P	P	P	■	P	P	P	P	P	P	P	■	P	X	P	■	P	X	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	X	P	P	P	P	P	P	X	P
Audio Frequency Response-Speaker	P	–	P	–	P	–	P	–	X	–	X	–	P	–	P	–	X	–	X	–	P	–	X	–	X	–	P	–	X	–
Audio Hum and Noise-Unsquelched	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
-Squelched	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
TRANSMITTER REQUIREMENTS																														
RF Carrier	P	n	P	X	P	P	P	X	P	P	P	P	P	P	P	■	P	X	P	■	P	X	P	P	P	P	P	P	P	P
Carrier Output Power	P	■	P	P	P	P	P	■	P	P	P	P	P	P	P	■	P	X	P	■	P	X	P	P	P	P	P	P	P	P
Carrier Frequency Tolerance	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
AM Hum and Noise	P	–	P	–	P	–	P	–	P	–	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	X	n	P	X	P	P	X	■	X	P	P	P	P	P	P	■	P	X	P	■	P	X	P	P	P	P	P	P	P	P
Audio Frequency Harmonic Distortion	X	■	X	X	P	P	P	■	P	P	P	P	P	P	P	■	P	X	P	■	P	X	P	P	P	P	P	P	P	P
FM Hum and Noise Level	X	–	X	–	P	–	P	–	P	–	P	–	P	–	P	–	X	–	X	–	P	–	X	–	P	–	P	–	P	–
Audio Frequency Response	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Frequency Deviation	P	–	X	–	P	–	P	–	X	–	P	–	X	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Modulation Limiting	P	–	P	–	P	–	P	–	X	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Electromagnetic Compatability	n	–	X	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	n	–	n	–	P	–	P	–	P	–
Radiated Spurious Emissions	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Sideband Spectrum Separation—10kHz	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
—20kHz	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–
Antenna																														
Radiation Efficiency	n	–	X	–	P	–	X	–	P	–	X	–	P	–	P	–	P	–	P	–	P	–	n	–	P	–	P	–	P	–
Power Test Degradation	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–	P	–

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

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

COMPLIANCE SUMMARY AND COMMENTS

The percentage figures in this summary represent transceiver compliance with the performance requirements of the Standard under ambient (A) temperature test conditions and under test conditions of environmental (E) extremes of temperature and humidity and vibration. Except as noted otherwise, the (A) percentages are based on a total twenty-six transceivers and the (E) percentages are based on a total twenty-five transceivers. All environmental testing of one transceiver was not completed. Results of the tests made at high and low voltages specified in the Standard are included in the environmental (E) tabulations.

Receiver Sensitivity (A) 100% (E) 72%

Receiver sensitivity is universally regarded as one of the more important criteria of radio receiver performance. Several definitions of sensitivity and methods of receiver sensitivity measurement are in general usage in the communications industry. The applicable sensitivity measurement in the Standard is "SINAD Sensitivity", which is the ratio, expressed in decibels of $\frac{\text{Signal + Noise + Distortion}}{\text{Noise + Distortion}}$. The Standard specifies that measurements be made at a 12 dB SINAD ratio with an audio output power reference of 500 milliwatts. Measurement made in this manner indicates the usable sensitivity of the transceiver.

The Standard specifies a measurement method varying slightly from that in EIA Standard RS-316-B, by stipulating that the sensitivity measurement shall be made with reference to an output power of 500 milliwatts rather than to each receiver's rated audio power output as in EIA-316-B. The procedure specified in the Standard provides comparative performance data since all transceiver sensitivity measurements are made with reference to the same minimum acceptable audio output power of 500 milliwatts.

The SINAD sensitivity specified by most transceiver manufacturers is well below the 0.5 microvolt SINAD set as a maximum value in the Standard. All of the transceivers tested met the sensitivity requirement under ambient temperature conditions.

Four transceivers failed to meet the sensitivity requirement at a voltage 20% below nominal battery voltage, at which voltage a SINAD sensitivity of 0.7 uV is allowed. Three transceivers tested under extremes of temperature and humidity either produced no audio output or failed to produce the 500 milliwatts minimum output required.

In making decisions with reference to FM receiver sensitivity specifications or requirements, two points are worthy of consideration by the equipment purchaser. First, if the transceiver is to be used in a geographical area where it will not be subjected to extremes of temperature or humidity, lesser performance requirements might be specified for the environmental tests depending upon the conditions applicable the specific equipment user. Second,

sensitivity, in general terms, is an indication of the ability of a receiver to respond properly to weak RF signals. In rural areas where extended range from a transmitter is often required good sensitivity is a necessary requirement. However, in an urban environment congested with interfering signals and man-made radio frequency noises receiver sensitivity becomes less important since the full receiver sensitivity may not be usable because of the interfering radio frequency noises.

Receiver Selectivity

Selectivity is the extent to which a receiver is capable of differentiating between the desired signal and signals at other frequencies. Four characteristics — Usable Bandwidth, Adjacent Channel Selectivity, Spurious Response Attenuation, and Intermodulation Attenuation — are measured to determine the overall quality of receiver's selectivity. Of the twenty-six transceivers tested only six (23%) complied with all four of the selectivity requirements of the Standard. As will be noted, the selectivity requirements of the Standard are somewhat more stringent than those of EIA Standard RS-316-B.

a. Usable Bandwidth (A) 100% (E) 68%

A 20% reduction in bandwidth under high temperature or high humidity test conditions is allowed by the Standard. Under these test conditions three transceivers ceased functioning, but recovered operation under ambient temperature conditions. The reduction in usable bandwidth exceeded 20% in eight transceivers.

b. Adjacent Channel Selectivity (A) 88% (E) 68%

The Standard requires a minimum Adjacent Channel Selectivity Attenuation of 60 dB for transceiver Types I and II and 70 dB for Type III. EIA RS-316-B requires 50 dB attenuation, except the 40 dB is acceptable if protective alerting circuits are used in the transceiver. Eight of the transceivers did not meet the more stringent requirements of the Standard, three under ambient test conditions, plus five additional under conditions of environmental extremes.

c. Spurious Response Attenuation (A) 54% (E) NA

Spurious response is the output of a receiver caused by signals at a frequency other than that to which the receiver is tuned. Compliance with Spurious Response Attenuation requirement was the least satisfactory of the selectivity characteristics, with twelve transceivers failing to meet the minimum performance requirement. Again, the more stringent requirement of the Standard is noted. The Spurious Response Attenuation requirement is 30 dB in RS-316-B versus 70 dB for Type I transceivers and 60 dB for transceiver Types II and III in the Standard.

d. Intermodualtion Attenuation (A) 81% (E) NA

The requirement in RS-316-B is 40 dB as compared to the 60 and 70 dB requirements of the test Standard. It is noted, however, that all of the Type III transceivers tested met the more stringent Intermodulation Attenuation requirements of the Standard, as did twelve (71%) of the total transceivers of Types I and II.

Receiver Squelch

The receiver squelch circuit functions to prevent a receiver from producing audio output power in the absence of a radio frequency input signals.

a. Threshold Squelch Sensitivity (A) 100% (E) 64%

b. Tight Squelch Sensitivity (A) 100% (E) 72%

c. Squelch Block (A) 85% (E) NA

d. Squelch Attack (A) 100% (E) NA

e. Squelch Release Time (A) 85% (E) NA

Receiver Audio Frequency

The four receiver characteristics bearing on the quality of the voice frequencies reproduced by a transceiver are Audio Output Power, Audio Distortion, Audio Frequency Response, and Audio Hum and Noise.

a. Audio Output Power (A) 100% (E) 81%

All transceivers tested met the required minimum Audio Output Power of 500 milliwatts when tested at voltages varying +10% and -20% from nominal operating voltage of the transceiver. Two transceivers did not meet the requirement under environmental extremes of low temperature, two at high humidity, and one at high temperature.

b. Audio Distortion (A) 81% (E) 76%

The five transceivers which did not meet the Audio Distortion requirement under ambient temperature conditions were all of Type II. Seventeen (65%) of the transceivers complied with all Audio Distortion requirements.

c. Audio Frequency Response (A) 58% (E) NA

Audio Frequency Response denotes the degree of closeness with which the audio output of a receiver follows a 6 dB/octave de-emphasis curve with constant frequency deviation over a given continuous frequency range. The frequency range stipulated by both the Standard and EIA Standard RS-316-B is 300 to 3000 Hz. All manufacturers specify the 300-3000 Hz frequency response. The allowable variation from the standard de-emphasis curve is +2, -10 dB with 1000 Hz used as the reference frequency. Only fifteen (58%) of the twenty-six transceivers tested met this requirement. The problem areas were at 300 Hz where the audio frequency output power of seven transceivers was not within the allowable +2, -10 dB tolerance, and at 3000 Hz where five units did not test within the allowable tolerance. Noncompliance was most prominent among Type II transceivers, which accounted for 8 of 11 (73%) of the noncompliance.

d. Audio Hum and Noise-

Unsquelched	(A) 100%	(E) 81%
Squelched	(A) 96%	(E) 73%

Audio Hum and Noise is the audio frequency power measured at the output terminals of a receiver having an unmodulated radio frequency signal input.

In overall summary of the Receiver Audio Frequency tests, only nine (35%) of the transceivers tested met all requirements of the four characteristics. The principal problem area was Audio Frequency Response, particularly at 300 Hz.

Some equipment manufacturers, commenting on the results of the transceiver tests, indicated that the low frequencies are deliberately attenuated in some equipment to improve rejection of CTCSS (Continuous Tone Coded Squelch System) tones. They feel that this attenuation of frequencies at the lower end of the voice frequency range has minimal effect on intelligibility of the transmitted signal and is of overall benefit because of the availability of the additional tone-provided services.

Transmitter RF Carrier

Transmitter RF Carrier parameters are established by the FCC. The performance requirements specified in the Standard meet or exceed those given in the Rules and Regulations of the FCC. Transmitter RF Carrier characteristics of major concern are Carrier Output Power and Carrier Frequency Tolerance.

a. Carrier Output Power (A) 58% (E) 72%

Twenty-four (92%) of the transceivers maintained Carrier Output Power within allowed tolerances at operating voltages 10% and 20% below nominal operating voltage. Overall, fourteen (54%) of the transceivers complied with all Carrier Frequency requirements of the Standard.

The comments with reference to Carrier Output Power measurements which follow may be of assistance to the prospective equipment purchaser in further evaluation of the test results.

The Standard specifies that the measured Carrier Output Power shall be within -0.3 dB, +1 dB of the manufacturer's rated (nominal) Carrier Output Power. Rules and Regulations of the FCC state that the Carrier Output Power shall not exceed by 20% the manufacturer's rated power. An output power less than rated is allowed by the FCC. The EIA Standard RS-316-B specifies that the manufacturer's rating of Carrier Output Power shall not be higher than that measured.

Recapitulating the test results in accordance with the requirements stated above results in the following: All transmitters tested under ambient test conditions were in compliance with FCC regulations except one which tested 73% above the manufacturer's Carrier Output Power rating. Only eleven (42%) of the transmitters tested under ambient test conditions were in compliance with requirements of the EIA Standard RS-316-B since the Carrier Output Power of

fifteen measured less than the manufacturer's rated output power. Of the fifteen transceivers, not meeting the EIA standard, five meet the requirement of the Standard since the Carrier Output Power measured did not fall below the -0.3 dB of nominal power allowed by the Standard.

b. Carrier Frequency Tolerance (A) 100% (E) 40%

One transceiver did not meet the Carrier Frequency Tolerance requirement when tested at a voltage -15% below nominal operating voltage. Fourteen additional transceivers did not meet the requirements specified for tests under environmental extremes.

The FCC and test standards do not specify a Carrier Frequency Tolerance less stringent under conditions of environmental extremes than under ambient conditions. Most of the transceiver performance requirements are less stringent under conditions of environmental extremes.

Of particular note are the five transceivers that did not meet the frequency stability vibration requirement. The vibration test specified in the Standard is more stringent than that required, for instance, by EIA RS-316-B, in that the Standard requires that the frequency stability measurements be made during the vibration cycle, not after completion of the vibration cycle. Stability of the carrier frequency of five transceivers was within allowable limits after completion of the required vibration cycles but not during the vibration cycle. This may indicate that the transceivers performance would, in all probability, not be affected by carrying the transceiver on the body of a person, but that performance could be affected if the transceiver were mounted in a vehicle where it would be subjected to vehicle vibration.

c. AM Hum and Noise Level (A) 100% (E) NA

This is the amplitude modulation present on an unmodulated carrier.

d. Carrier Attack Time (A) 100% (E) NA

Transmitter Audio Frequency Modulation

Five measurements that indicate the overall quality of the audio frequency modulation of the transceiver transmitter are Audio Frequency Harmonic Distorition, FM Hum and Noise, Audio Frequency Response, Frequency Deviation, and Modulation Limiting. Taken collectively, the test results indicate that transceiver performance was least satisfactory in this general performance area. Only one (4%) of twenty-six transceivers tested met all performance requirements of the five tests. One additional transceiver showed good compliance, with only one measurement failing by a small margin to meet the requirement of the Standard.

a. Audio Frequency Harmonic Distortion (A) 77% (E) 80%

This is the change in the harmonic content of the input signal as the result of passing through the transmitter circuits. A 5% distortion is allowed by the Standard under ambient test conditions and 9% at extremes of temperature and humidity. This requirement is more stringent than that of the EIA-316-B Standard which allows an audio frequency distortion of 10%. Seventeen (65%) of the transceivers met all requirements of the Standard.

b. FM Hum and Noise (A) 58% (E) 50%

FM Hum and Noise is a measure of the frequency modulation present on an unmodulated carrier. Overall, only ten (38%) of the transceivers tested met all the FM Hum and Noise requirements.

c. Audio Frequency Response (A) 27% (E) NA

Transmitter Audio Frequency Response is the degree of precision with which a transmitter responds to a designated audio frequency level. The generally accepted requirement, as specified in the Standard, the EIA RS-316-B standard and others, is that the audio frequency response shall not vary more than +1, -3 dB from a true 6 dB per octave pre-emphasis characteristic from 0.3 to 3 kHz as referred to the 1 kHz level, with the exception that a 6 dB per octave roll-off from 2.5 to 3 kHz may be present.

Failure to comply with the Audio Frequency Response requirement was the single most frequent shortcoming of all transceiver characteristics tested. Seven (27%) of the transceivers met the requirement at the 300 Hz test point, eight (31%) at the 500 Hz test point, fifteen (58%) at the 2500 Hz test point, eleven (46%) at the 3000 Hz test point. The closeness with which the transmitter Audio Frequency Response follows the prescribed pre-emphasis curve bears directly on the quality of the audio signal reproduced by the radio receiver.

As has been mentioned previously, some transceiver manufacturers have advised that the lower audio frequencies are deliberately attenuated in some items of equipment to improve the performance of CTCSS (Continuous Tone Coded Squelch System) components that are designed to operate at the lower end of the voice frequency range. Although none of the transceivers tested was equipped with CTCSS or other similar options most of the transceivers tested were adaptable to the use of this optional equipment.

d. Frequency Deviation (A) 69% (E) NA

Frequency Deviation in the types of transceivers tested is limited to a maximum of 5 kHz by Rules and Regulations of the FCC. The FCC specifies no minimum. The Standard stipulates that the deviation shall be within 5% of 4.75 kHz, which means the deviation must fall

within the range of 4.5125 to 4.9875 kHz. The reason for this more stringent requirement is to set a lower limit of frequency deviation. Other factors being equal, the greater the modulation (without exceeding the 5 kHz maximum allowed by the FCC) the better the quality of the transmitter signal.

Of the eight transceivers which did not meet the requirement of the Standard, the deviation of six was below the specified 4.5125 kHz minimum.

e. Modulation Limiting (A) 65% (E) NA

Both Frequency Deviation and Modulation Limiting are adjustable in the transceivers. In accordance with guidelines established for this testing program, the transceivers were tested as received and no effort was made to determine whether or not the Frequency Deviation and Modulation Limiting could be adjusted to bring performance within requirements of the Standard or the FCC.

Electromagnetic Compatability

a. Radiated Spurious Emissions (A) 96% (E) NA

b. Sideband Spectrum (A) 78% (E) NA

The Standard requires that sideband spectrum attenuation measurements be made of sideband amplitudes located plus and minus 10 kHz and 20 kHz from the center frequency. Sideband performance specifications of manufacturers may be based on measurements made at points located elsewhere in the sideband spectrum. The point of measurement is frequently identified in terms of percentage of the authorized bandwidth.

Antenna

a. Radiation Efficiency (A) 67% (E) NA

Radiation Efficiency of an antenna is the ratio of the effective radiated power of a transmitter-antenna system to the transmitter output power as measured into a 50 ohm load. The Standard does not require an Antenna Radiation Efficiency test for Type I transceivers. The acceptable Radiation Efficiency for Type II transceivers is 20% and for Type III 50%. Nine (69%) of thirteen Type II transceivers tested met the 20% efficiency requirement and five (63%) of eight Type III met the 50% efficiency requirement.

b. Power Test Degradation (A) 100% (E) NA

Battery

Battery Service Life tests were conducted by operating the transceivers through the 10-10-80 duty cycle (10% receive, 10% transmit, 80% standby) with an interval timer. Since the Standard requirement is based on an 8-hour battery at this duty cycle only one transceiver, equipped with an 8-hour battery, met the requirement of the Standard, and this only at ambient and low temperature tests. Each transceiver was equipped with the battery normally supplied with the

transceiver. Higher capacity batteries are available as options for most of the transceivers tested. The battery test data is not complete due to some transceiver operational problems encountered in the testing operation. For these reasons, the battery test data is considered to be of limited value in assessing the service life of Ni-Cad batteries in the transceivers tested.

A program is underway to provide more comprehensive service life data on the variety of Ni-Cad batteries available for use in FM personal transceivers. The batteries are being tested in accordance with the procedures set forth in the NILECJ Standard 0211.00, "Batteries for Personal/Portable Transceivers".

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2180

Regency
Micro-Com MCPH-406

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.25 uV	P	P	P	P	X	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.		P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	75 dB	X	X	X	X	-	-	88	68
Spurious Response Attenuation	60 dB min.	55 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	60 dB	X	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	@	@	@	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	X	P	X	X	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	X	P	P	X	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.		P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	55 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30,+60°C								
Humidity	50°C, 90% RH	40°C,95%RH								

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation. (See note)
- = No environmental test required.

NOTE: 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.

DESCRIPTION: A Regency Micro-Com series transceiver Model MCPH-406 with 1 channel and 4 watts of rf output power. Models are available with up to 6-channel capacity and output powers of 2.5 or 4 watts. Power is supplied by a 10.8-volt, 500 mAh enclosed Ni-Cad battery. Connector receptacles are standard for remote operation of speaker, microphone and push-to-talk switch.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2181

Regency
Micro-Com MCPH-251

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.25 uV	P	P	P	P	X	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.		P	@	X	X	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	75 dB	X	@	@	@	-	-	88	68
Spurious Response Attenuation	60 dB min.	55 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	60 dB	X	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	@	P	X	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	@	P	X	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	X	X	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	X	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	X	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	@	X	X	@	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	@	P	P	@	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.		P	@	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	P	@	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	55 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		X	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH	40°C,95%RH								

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation or output was too low for measurement. (see note)
- = No environmental test required.

NOTE: The manufacturer has advised that this transceiver is not in production.

DESCRIPTION: A Regency Micro-Com series transceiver Model MCPH-251 with 1 channel and 2.5 watts of rf output power. Models are available with up to 6-channel capacity and output powers of 2.5 or 4 watts. Power is supplied by a 10.8-volt, 500 mAh enclosed Ni-Cad battery. Connector receptacles are standard for remote operation of speaker, microphone and push-to-talk switch.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2182

Standard Communications
C831L

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 UV max.	0.5 uV*	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.		P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	55 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	45 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.35 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		X	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	800 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	X	X	X	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	10%	X	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	40 dB	P	P	P	X	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	X	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	48 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C									
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A Standard Communications transceiver Model C831LO6AU1X1 with 3 channels and 3 watts of rf output power. Models are available with up to 6-channel capacity and output power up to 3 watts. Power options include a 12.5-volt, 450 mAh detachable Ni-Cad battery mercury or alkaline cells. Power may be supplied through an external power input jack. Connector receptacles are standard for remote operation of speaker, microphone and push-to-talk switch and operation of the transceiver in a companion vehicular console.

*Referenced to 20 dB of quieting.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2183

Standard Communications
C731L

Type III (400-512 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.45 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.0 kHz	P	Ø	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	48 dB	P	Ø	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	55 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.		P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.20 uV	P	Ø	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.	20 dB	P	Ø	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		X	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	1000 mW	P	Ø	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.		P	Ø	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	Ø	P	P	-	-	100	81
-Squelched	50 dB min.		X	Ø	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	X	X	X	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	10%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	48 dB	X	X	X	X	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	48 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		X	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		X	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A Standard Communications transceiver Model C731L06AU1X1 with 2 channels and 6 watts of rf output power. Models are available with up to 6-channel capacity and output power of 2 watts. The unit is powered by a 12.5-volt, 450 mAh enclosed Ni-Cad battery. Power may be supplied through an external power input jack or by Ni-Cad, mercury or alkaline cells. Connector receptacles are standard for remote operation of speaker, microphone and push-to-talk switch and operation of the transceiver in a companion vehicular console.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2186

IEC Electronics Corporation
LE-100-16B2

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV*	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	X	X	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	80 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	80 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	65 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.18 uV	P	X	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10,+2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	10%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	45 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	53 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C									
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: An IEC Electronics Corporation transceiver LE-100-16B2 with 1 channel and 6 watts of rf output power. Models are available with up to 12-channel capacity and output powers of 1, 2 or 6 watts, and switchable 1 watt or 6 watt output. Power options include 9.6-volt, 540 mAh detachable Ni-Cad battery, or disposable mercury or alkaline batteries.

*Sensitivity is specified to 20 dB quieting.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2187

IEC Electronics Corporation
LE-100-12B2

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV*	P	P	P	@	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	X	@	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	80 dB	P	P	P	@	-	-	88	68
Spurious Response Attenuation	60 dB min.	80 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	65 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.18 uV	P	P	P	@	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	@	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	@	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	@	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	@	-	-	100	81
-Squelched	50 dB min.		P	P	P	@	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	P	P	@	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	@	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	10%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	45 dB	P	P	P	@	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	X	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	53 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		X	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: An IEC Electronics Corporation transceiver Model LE-100-12B2 with 1 channel and 2.0 watts of rf output power. Models are available with up to 12-channel capacity and output powers of 1, 2 or 6 watts, and switchable output of 1 watt or 6 watts. Power options include a 9.6-volt, 540 mAh detachable Ni-Cad battery or disposable mercury or alkaline batteries.

*Sensitivity is specified to 20 dB quieting.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2188

IEC Electronics Corporation
LE-100-42B2

Type III (400-512 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.5 uV*	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	80 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	70 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	65 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	10%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	45 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	53 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: An IEC Electronics Corporation transceiver Model LE-100-42B2 with 1 channel and 2 watts of rf output power. Models are available with up to 12-channel capacity and output powers of 2 or 6 watts. Power options include a 9.6-volt, 540 mAh detachable Ni-Cad battery or disposable mercury or alkaline batteries.

*Referenced to 20 dB of quieting.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2192

REPCO
RPX 50

Type I (25-50 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.25 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	70 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	70 dB min.	85 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	70 dB min.	70 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.3 uV max.	0.15 uV	P	P	P	X	P	-	100	64
Tight Squelch Sensitivity	3.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	8%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB max.		P	P	P	P	-	-	100	81
-Squelched	50 dB max.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	P	P	P	X	-	58	72
Carrier Frequency Tolerance	0.002% max.	0.001%	P	P	P	P	P	-	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	5%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	X	X	X	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ± 5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	47 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	25 dB min.		P	-	-	-	-	-	86	-
-20 kHz	50 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	N/A		N/A	-	-	-	-	-	N/A	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A REPCO RPX 50 series transceiver Model RPX 50 HGC with 2 channels and 3 watts of rf output power. Models are available with up to 6-channel capacity and output power adjustable from 3 to 6 watts. Power options include 450 or 650 mAh detachable Ni-Cad batteries.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2195

REPCO
TEK-10

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	X	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.0 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	70 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	70 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.		X	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		X	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	750 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	X	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	6%	X	P	X	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	X	X	X	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	X	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	47 dB	n	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		n	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
n = No test was conducted.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A REPCO TEK-10 transceiver model with a single transmit and receive channel and 2.2 watts of rf output power. Models are available with up to 5-channel capacity and output powers of 0.5, 1.6, 2.2 and 4.0 watts. Power options include a 500 mAh detachable Ni-Cad battery, mercury battery pack or "AA" alkaline cells.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2198

REPCO
RPX450

Type III (400-512 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	70 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	60 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	60 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		X	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	600 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	8%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	5%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	P	X	X	X	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	49 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		X	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		X	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A REPCO RPX series transceiver Model RPX450HGC with 2 channels and 2 watts of rf output power. Models are available with up to 6-channel capacity and output powers of 0.2-0.4, 1.0-2.0, and 2.0-4.0, 450 or 650 mAh detachable Ni-Cad batteries. Tone calling option to access repeaters is available.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2201

REPCO
RPX 150

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.30 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	80 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	60 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	65 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	@	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	@	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	600 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	X	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB	X	X	X	X	X	X	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.		P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	X	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	X	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	54 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		X	-	-	-	-	-	87	-
-20 kHz	60 dB min.		X	-	-	-	-	-	87	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	65	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30,+60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A REPCO RPX 150 series transceiver Model RPX 150 HGC with 2 channels and 3 watts of rf output power. Models are available with up to 6-channel capacity and output powers variable from 1-2 and 3-6 watts. Power options include 450 and 650 mAh detachable Ni-Cad batteries.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2205

Wilson
Mini-COM HH-400-C

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.30 uV*	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.		P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	70 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	55 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.			-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		X	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	X	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	X	P	P	P	-	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.		P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	X	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	55 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH	40°C 95% RH								

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: This is a Wilson Mini-COM series transceiver Model HH-400-C with 1 channel and 4 watts of rf output power. Models are available with up to 6-channel capacity and output powers of 2.5 or 4 watts. Power is supplied by a 10.8-volt, 500 mAh enclosed Ni-Cad battery. Connector receptacles are standard for remote operation of speaker, microphone and push-to-talk switch.

*Referenced to 20 dB of quieting.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2206

Wilson
Mini-COM HH-250-C4

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.3 uV*	P	P	P	P	X	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.		P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	70 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	55 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.		P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	X	P	X	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	X	X	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.		P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	X	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	X	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	55 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH	40°C, 95%RH								

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A Wilson Mini-COM series transceiver Model HH-250-C4 with 1 channel and 2.5 watts of rf output power. Models are available with up to 6-channel capacity and output powers of 2.5 or 4 watts. Power is supplied by a 10.8-volt, 500 mAh enclosed Ni-Cad battery. Connector receptacles are standard for remote operation of speaker, microphone and push-to-talk switch.

*Referenced to 20 dB of quieting.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2207

RCA
TACTEC HCB36AA12

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.25 uV	P	P	P	Ø	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	8.0 kHz	P	P	P	Ø	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	80 dB	P	P	P	Ø	-	-	88	68
Spurious Response Attenuation	60 dB min.	75 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	70 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.18 uV	P	P	P	Ø	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	Ø	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	Ø	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	P	P	Ø	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10,+2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	Ø	-	-	100	81
-Squelched	50 dB min.		P	P	P	Ø	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	3%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	58 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30,+60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: This is an RCA TACTEC series transceiver Model HCB36AA12 with 1 channel and 6 watts of rf output power. Models are available in 1, 2 or 6 channels and output powers of 2 or 6 watts. Power options include 9.6-volt, 250, 500 or 700 mAh detachable Ni-Cad batteries. All models include an earphone jack. Dual front end option permits two-frequency simultaneous reception.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2208

RCA
TACTEC HCB54AA12

Type III (400-512 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	8.0 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	75 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	70 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	70 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	P	P	X	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	Ø	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	3%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	P	P	P	Ø	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	53 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		X	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: An RCA TACTEC series transceiver Model HCB54AA12 with 1 channel and 4 watts of rf output power. Models are available in 1, 2 or 6-channels and output powers of 1.2 or 4 watts. Power options include 9.6-volt, 250, 500 or 700 mAh detachable Ni-Cad batteries or alkaline batteries are also available. All models include an earphone jack. Dual front end option permits two-frequency simultaneous reception.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2212

Motorola
HT-220

Type III (400-512 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	X	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	60 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	74 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	60 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.24 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	X	X	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	10%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.		P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	49 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A Motorola HT-220 series transceiver Model H34FFN with 2 channels and 4 watts of rf output power. Models are available with up to 4-channel capacity and output powers of 2 or 4 watts. Power options include a 15-volt, 450 mAh enclosed Ni-Cad battery or a disposable mercury battery pack. Options include connector receptacles for remote operation of a speaker. Tone signaling for switching functions is available. The transceiver is also available in a "slimline" housing as Model H24FFN.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2213

Motorola
HT 200

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.25 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.0 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	80 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	50 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	60 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.18 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB		X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	X	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	10%	X	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	46 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: This is a Motorola HT 200 series transceiver "Slimline" Model H23FFN with 1 channel and 1.8 watts of rf output power. Models are available with up to 2-channel capacity and output powers of 1.8 watts with 15 volt, 225 mAh Ni-Cad battery or 1.0 watt with disposable mercury battery. Options include connector receptacle for remote operation of speaker. Tone signaling pad for remote control functions is also available.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2224

Motorola
MX 320-360

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS: AMBIENT TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: LOW (-30°C) TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: HIGH (+60°C) TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: HIGH HUMIDITY (50°C, 90% RH)	TEST RESULTS: ENVIRONMENTAL EXTREMES: VOLTAGE	TEST RESULTS: ENVIRONMENTAL EXTREMES: VIBRATION	COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%): AMBIENT TEMPERATURE	COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%): ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	95 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	80 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	80 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	X	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	3%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	60 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	71 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		X	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: This is a Motorola MX 320-360 series transceiver Model MX 320-H33AAU with 2 channels and 2.5 watts of rf output power. Models are available with up to 8-channel capacity and output powers of 1, 2.5 or 6 watts. Power options include 7.5-volt light, medium, high and ultra-high capacity detachable Ni-Cad batteries. All transceivers are of universal design with connector receptacles for remote operations of speaker, microphone and push-to-talk switch and operation of the transceiver in a companion vehicular console.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2225

Motorola
MX 320-360

Type III (400-512 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS: AMBIENT TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: LOW (-30°C) TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: HIGH (+60°C) TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: HIGH HUMIDITY (50°C, 90% RH)	TEST RESULTS: ENVIRONMENTAL EXTREMES: VOLTAGE	TEST RESULTS: ENVIRONMENTAL EXTREMES: VIBRATION	COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%): AMBIENT TEMPERATURE	COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%): ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	60 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	50 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	60 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	10%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
Rf Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	X	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	10%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	49 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A Motorola MX 320-360 series transceiver Model MX 330-H44AAU with 2 channels and 5 watts of rf output power. Models are available with up to 8-channel capacity and output powers of 1, 2 or 5 watts. Power options include 7.5-volt light, medium, high and ultra-high capacity detachable Ni-Cad batteries. All transceivers are of universal design with connector receptacles for remote operation of speaker, microphone and push-to-talk switch and operation of the transceiver in a companion vehicular console. Transceivers are available in 5 different housing sizes.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2226

Motorola
MT 500

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.25 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.0 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	80 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	75 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	70 dB	X	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.18 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	3%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	55 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	50 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: This is a Motorola MT 500 series transceiver universal Model H33BBU with 2 channels and 5 watts of rf output power. Models are available with up to 8-channel capacity and output powers of 2 or 5 watts. Power options include a 15-volt, 450 mAh enclosed Ni-Cad battery or mercury battery.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2227

Motorola
MT 500

Type III (400-512 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.5 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	70 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	70 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	70 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	3%	P	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	55 dB	P	P	P	P	-	P	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	X	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	50 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		P	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: This is a Motorola MT 500 series transceiver universal Model H34BBU with 2 channels and 4 watts of rf output power. Models are available with up to 8-channel capacity and output powers of 1.5 or 4 watts. Power options include 15-volt, 450 mAh enclosed Ni-Cad battery or disposable mercury battery. Transmit tone for repeater activation is available. The MT 500 series is available in either standard or "slimline" housing.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2230

General Electric
MASTR "PE" PE65RB

Type III (400-512 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	70 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	60 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	65 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.2 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		X	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10,+2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	P	X	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	X	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	8%	X	P	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	X	X	X	X	-	X	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	50 dB	P	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		X	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		X	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A General Electric MASTR Personal "PE" series transceiver Model PE65RB with 2 channels and 4.5 watts of rf output power. Models are available with 2, 5 or 8-channel capacity and output powers of 1, 3.5 or 4 watts. Power options include 500 or 700 mAh detachable Ni-Cad batteries. Dual front end capability option permits operation of the radio cross-band or in-band on wide-spaced frequencies.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2231

General Electric
MASTR MVP

Type II (150-170 mHz)

TRANSCEIVER CHARACTERISTIC

	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.25 uV	P	n	n	n	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.0 kHz	P	n	n	n	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	75 dB	X	n	n	n	-	-	88	68
Spurious Response Attenuation	60 dB min.	70 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	60 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.15 uV	P	n	n	n	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	n	n	n	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	n	n	n	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	n	n	n	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10,+2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	n	n	n	-	-	100	81
-Squelched	50 dB min.		P	n	n	n	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		P	n	n	n	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	n	n	n	P	X	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	8%	X	n	n	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	55 dB	X	n	n	n	-	X	58	50
Audio Frequency Response	+1, -3 dB	+1,-3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	60 dB	n	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		n	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30,+60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
n = No test was conducted.
Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A General Electric MASTR MVP series transceiver Model PY56YB with 2 channels and 2 watts of rf output power. Models are available with up to 6-channel capacity and output powers of 2 or 5 watts. Power options include 500 or 700 mAh detachable Ni-Cad batteries. The MVP radio is designed for local control with a built-in speaker/microphone and push-to-talk operation.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2232

General Electric
MASTR MVP PY65YB

Type III (450-512 mHz)

TRANSCEIVER CHARACTERISTIC

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS: AMBIENT TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: LOW (-30°C) TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: HIGH (+60°C) TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: HIGH HUMIDITY (50°C, 90% RH)	TEST RESULTS: ENVIRONMENTAL EXTREMES: VOLTAGE	TEST RESULTS: ENVIRONMENTAL EXTREMES: VIBRATION	COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%): AMBIENT TEMPERATURE	COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%): ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7 kHz	P	P	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	70 dB	P	P	P	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	60 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	60 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		P	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	P	-	-	100	81
-Squelched	50 dB min.		P	P	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		n	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	8%	X	X	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	40 dB	X	X	X	X	-	X	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	X	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	50 dB	n	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		n	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30, +60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
n = No test was conducted.

Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: This is a General Electric MASTR MVP series transceiver Model PY65YB with 2 channels and 4 watts of rf output power. Models are available with up to 6-channel capacity and output powers of 1 or 4 watts. Power options include 500 or 700 mAh detachable Ni-Cad batteries. Options include connector receptacles for charging battery in a companion vehicular console. The MVP radio is designed for local control with built-in speaker/microphone and push-to-talk operation.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2233

General Electric
MASTR "PE"

Type II (150-174 mHz)

TRANSCEIVER CHARACTERISTIC

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS: AMBIENT TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: LOW (-30°C) TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: HIGH (+60°C) TEMPERATURE	TEST RESULTS: ENVIRONMENTAL EXTREMES: HIGH HUMIDITY (50°C, 90% RH)	TEST RESULTS: ENVIRONMENTAL EXTREMES: VOLTAGE	TEST RESULTS: ENVIRONMENTAL EXTREMES: VIBRATION	COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%): AMBIENT TEMPERATURE	COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%): ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	7.0 kHz	P	P	Ø	P	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	85 dB	P	Ø	Ø	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	80 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	60 dB min.	75 dB	P	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	P	Ø	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		X	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	P	P	P	-	100	81
Audio Distortion-Speaker	10% max	5%	X	P	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	Ø	P	P	-	-	100	81
-Squelched	50 dB min.		P	Ø	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB	-0.3,+1 dB	X	P	P	P	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P	P	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.	8%	P	X	P	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	55 dB	X	X	P	P	-	X	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	X	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	50 dB	X	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	-	-	86	-
-20 kHz	60 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	20%		X	-	-	-	-	-	67	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30,+60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
n = No test was conducted.

Ø = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A General Electric MASTR Personal "PE" series transceiver Model PE66RB with 2 channels and 5 watts of rf output power. Models are available with 2, 5 or 8-channel capacity and output powers of 1, 2 or 5 watts. Power options include 500 or 700 mAh detachable Ni-Cad batteries. Dual front end capability option permits operation of the radio cross-band or in-band on wide-spaced frequencies.

FM TRANSCEIVER TEST RESULTS

TRANSCEIVER NO.: 2234

General Electric
MASTR "PE" PE54RB

Type I (25-50 mHz)

TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	TEST RESULTS						COMPLIANCE OF ALL RADIOS WITH NIJ STANDARD (%)	
				ENVIRONMENTAL EXTREMES						
			AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5 uV max.	0.25 uV	P	@	P	P	P	-	100	72
Selectivity-										
Usable Bandwidth	5 kHz min.	6.5 kHz	P	@	P	P	-	-	100	68
Adjacent Channel Selectivity	60 dB min.	60 dB	P	@	P	P	-	-	88	68
Spurious Response Attenuation	70 dB min.	70 dB	P	-	-	-	-	-	54	-
Intermodulation Attenuation	70 dB min.	70 dB	X	-	-	-	-	-	81	-
Squelch-										
Threshold Squelch Sensitivity	0.3 uV max.	0.15 uV	P	@	P	P	P	-	100	64
Tight Squelch Sensitivity	3.0 uV max.		P	@	P	P	-	-	100	72
Squelch Block	5.0 kHz max.		X	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		P	-	-	-	-	-	100	-
Squelch Release Time	250 ms max.		P	-	-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	500 mW	P	@	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.	5%	P	@	P	P	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	@	P	P	-	-	100	81
-Squelched	50 dB min.		P	@	P	P	-	-	96	73
TRANSMITTER										
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		X	@	@	P	P	-	58	72
Carrier Frequency Tolerance	0.002%	0.002%	P	@	@	P	P	X	100	40
AM Hum and Noise	34 dB min.		P	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		P	-	-	-	-	-	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion	5% max.		P	@	@	-	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	X	@	@	P	-	X	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X	-	-	-	-	-	27	-
Frequency Deviation	4.75k ±5%	0-5 kHz	X	-	-	-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	-	-	-	65	-
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	47 dB	n	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz	25 dB min		P	-	-	-	-	-	86	-
-20 kHz	50 dB min.		P	-	-	-	-	-	86	-
Antenna Radiation Efficiency	N/A		N/A	-	-	-	-	-	N/A	-
ENVIRONMENTAL SPECIFICATIONS										
Temperature	-30, +60°C	-30,+60°C								
Humidity	50°C, 90% RH									

P = Requirement of the NIJ Standard was met.
X = Requirement of the NIJ Standard was not met.
n = No test was conducted.
@ = Transceiver ceased operation.
- = No environmental test required.

DESCRIPTION: A General Electric MASTR "PE" series transceiver Model PE54RB with 2 channels and 2 watts of rf output power. Models are available with up to 8-channel capacity and output powers of 2 or 5 watts. Power options include 500 or 700 mAh detachable Ni-Cad batteries. Dual front end capability option permits operation of the radio cross-band or in-band on wide-spaced frequencies.

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

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