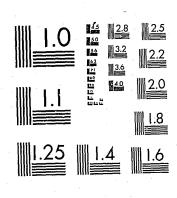
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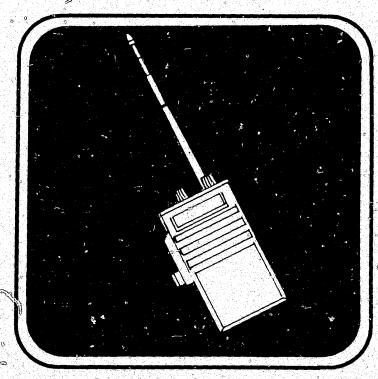


Technology Assessment Program INFORMATION CENTER

Police
Personal
FM Transceivers
Report

່ Volume I Executive Summary

80420



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.

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

The program operates through:

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

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

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.

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Paul Cascarano, Assistant Director National Institute of Justice 80420

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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

Test results and analyses herein do not represent product approval or endorsement by the National Institute of Justice, the U.S. Department of Justice; the National Bureau of Standards, the U.S. Department of Commerce; the IACP; or the laboratories which conducted the equipment testing.

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FOREWORD

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

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

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

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

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

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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 Tyr s 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.

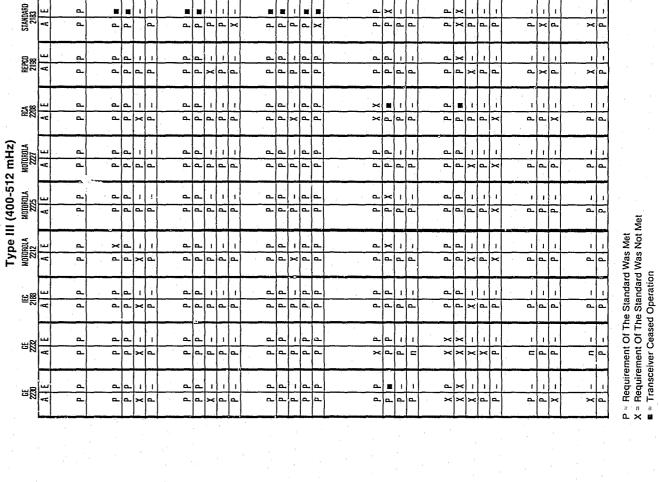
The one-page summary for each transceiver contains the following:

- 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".

SUMMARY TABLE 1 TRANSCEIVER COMPLIANCE

(Requirements Specified in NILECJ-STD-0209.00)



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TABLE 2 TRANSCEIVER COMPLIANCE SUMMARY

(Requirements Specified in NILECJ-STD-0209.00)

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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 $\frac{\text{Signal} + \text{Noise} + \text{Distortion}}{\text{Noise} + \text{Distortion}}.$ 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 humid ty 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 deemphasis 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 Squelched (A) 100%

(E) 81% (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)

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%

(E) 80%

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				TEST	RESUL	TS				IANCE OF
	· .	1		. EN	VIRONM	ENTAL				DIOS WITH
Regency					EXTRE					(%)
Micro-Com MCPH-406	AR.	ν_					Γ,1			(70)
Micro com Morn 400	O N	1 2 N		- 111	ا <u></u> ا	HUMIDITY C, 90% RH)				JA J
	NCE STA	A T	J. C.	C) URE	8 8	28		_	JRE	S
	C EA	53	TA	30 AT	45 AT	¥ 6	ш	01	T A∏	ES
Type II (150-174 mHz)	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	AMBIENT TENPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+50°C) TEMPERATURE	н <u>т</u> ен ни (50°С,	VOL TAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
	품증품	PEC	E H	SE	25 25	효형	딍	IBF	88	ΣĘ
TRANSCEIVER CHARACTERISTIC	- ZZF	ΣS	ΑF	JF.	エト	H	3	>	8F	· mm
RECEIVER	1 1 1 1 1 1 1 1									
MEGLIVEN						-			:	
SINAD Sensitivity	0.5 uV max.	0.25 uV	Р	Р	Р	Р	x	_	100	72
Selectivity-			·				``			
Usable Bandwidth	5 kHz min.	l i	P	Р	P	Р	-	-	100	68
Adjacent Channel Selectivity	70 dB min.	75 dB	X	Χ.	Х	X	-	-	88	68
Spurious Response Attenuation Intermodulation Attenuation	60 dB min.	55 dB 60 dB	X	_		-	-	·-	54	-
Squelch-	bu de min.	lon ap	^	-	-	-		-	81	-
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	p	P	. Р	Р	P	· -	100	64
Tight Squelch Sensitivity	4.0 uV max.	1	Р	Ø	8	Ø	-		100	72
Squelch Block	5.0 kHz max.		Р	-	-	-	-	-	85	-
Squelch Attack Time	150 ms max.		Р	-		-	-	-	100	-
Squelch Release Time	250 ms max.		P	-			-	-	85	
Audio Frequency- Audio Output Power-Speaker	500 mW min.	E00 -14	n	P		P	_P		100	81
Audio Distortion-Speaker	10% max.	500 mW	P X	P	P X	X	-	-	100 81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	χ̂		_ ^		-	_	58	-
Audio Hum and Noise-Unsquelched	40 dB min.	1.0, 12.00	P	ър	Р	Р	_	-	100	81
-Squelched	50 dB min.		Р	Р	Р	P'	-	-	96	73
TDANCHITTED										
TRANSMITTER] -]		•						
RF Carrier-										
Carrier Output Power (Variance)	-0.3, +1 dB		Х	Р	Р	Р	P	-	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	Р	P	X	P	Р	χ	100	40
AM Hum and Noise	34 dB min.		Р	-	-	-	-	-	100	-
Carrier Attack Time	100 ms max.		· P·	-	-	[-	-	-	100	- :
Audio Frequency Modulation- Audio Frequency Harmonic Distortion	5% max.		Р	P	Р	_		_	77	80
FM Hur 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	Ρ :	-	-	_	-	l - I	69	_
Modulation Limiting	5 kHz max.	5 kHz	Р	_		· -	-	-	65	-,
Electromagnetic Compatability-										
Radiated Spurious Emissions	43 dB min.	55 dB	Р		-	-	-	1 - 1	96	-
Sideband Spectrum-10 kHz -20 kHz	30 dB min.		P P	-	-	-	-		86 86	-
Antenna Radiation Efficiency	60 dB min.	1 1	P	_		_	[]	_	67	_
Ansenia hadravion brilierency	200]]	· •	-				_	. 07	
ENVIRONMENTAL SPECIFICATIONS			Ì							
Temperature	-30, +60°C	-30,+60°C			[1	
Humidity	50°C, 90% RH	40°C,95%RH			<u> </u>		ل_ا	Щ		

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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.

a = 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 $\pm 30^{\circ}$ C and $\pm 60^{\circ}$ C, and humidity condition of $\pm 50^{\circ}$ C and $\pm 90^{\circ}$ C relative humidity.

Tran	sceiver No.: 2181	:			TEST	RESUL	.TS				IANCE OF
					EN	VIRONM				NIJ S	DIOS WITH
Rege		₽ 2				EXIKE	ME9				(%)
micr	ro-Com MCPH-251	PA PA	- × =				F. €				
		H ⊢ N		щ	. پين	ပြယ္က	급			щ	L ₹
		STEN	N K	5	0 5	85	100		=	ä	<u>5</u> .
		₹ ₩2	5H	₽₩	₩ ₩ ₩	1₹\	\$ 0	照	ĭ	₽¥	돌일
	Type II (150-174 mHz)	Ö.I.	E :			7 12	ر ج	[절	Æ		8 5
		PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH	VOLTAGE	VIBRATION	AMBIENT TEMPERA'TURE	ENVIRONMENTAL EXTREMES
	TRANSCEIVER CHARACTERISTIC	<u> </u>	žσ	۷⊢	<u> </u>	エト	エン	>	>	ΑL	- шш
RECE	EIVER							Ì			
SINA	AD Sensitivity	0.5 uV max.	0.25 uV	P	Р	P	Ρ	Х	- ,	100	72
Sel e	ectivity-					:					:
	sable Bandwidth	5 kHz min.		Р	8	X	Х	-	-	100	68
	ijacent Channel Selectivity	70 dB min.	75 dB	X	8	•	8	[-	43-	88	68
	ourious Response Attenuation	60 dB min.	55 dB	X		-	-	-	-	54	<u> -</u>
	termodulation Attenuation	60 dB min.	60 dB	X	-	-	-	-	-	81	- '
	elch-			_	_	١ ـ					، مم
	nreshold Squelch Sensitivity	0.4 uV max.	0,25 uV	P	8	P	X	P	-	100	64
	ght Squelch Sensitivity quelch Block	4.0 uV max. 5.0 kHz max.	i	P	, w	. P	X	-	-	100 85	72
	quelch Attack Time	150 ms max.	·	P	-	-	-	-	-	100	-
	welch Release Time	250 ms max.		P	! -	-	-	-	_	85	_
	io Frequency-	250 ms max.		•	-] .	-	_	-	, 03	
	idio Output Power-Speaker	500 mW min.	500 mW	. р	P	X	l x	Р	_	100	81
	idio Distortion-Speaker	10% max.	10%	X	P	P	P	-	-	81	76
. Au	dio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	Х	-	-	_	- 1	-	58	
Au	dio Hum and Noise-Unsquelched	40 dB min.		P	Р	P	P	-	-	100	81
	-Squel ched	50 dB min.		Ρ.	·Р	P	Х	-	-	96	73
	lour Tran			'	1	1	1				
IKAN	<u>ISMITTER</u>										
RF C	Carrier-										
Ca	rrier Output Power (Variance)	-0.3, +1 dB		Х	a	X	Х	8	_	58	72
	rrier Frequency Tolerance	0.0005%	0.0005%	P	8	P	P	8	Р	100	40
AM	Hum and Noise	34 dB min.	-	P.	-	1 -	-	-	-	100	- '
	rrier Attack Time	100 ms max.	1	Р	-	- 1	-	-	-	100	-
	o Frequency Modulation-						. [1			
	dio Frequency Harmonic Distortion	- 10 111-700	<u> </u>	p	4	P	-	-		77	80
	Hum and Noise Level	40 dB min.	50 dB	P	<u>a</u>	P	Р	-	Р	58	50
Au	dio Frequency Response	+1, -3 dB	+1,-3 dB	X	-	, -	-	-	-	27	-
	equency Deviation	4.75k ±5%	5 kHz	P	-	-	-		-	69	-
MO Flac	dulation Limiting tromagnetic Compatability-	5 kHz max.	5 kHz	, P	-	-	-	-	-	65	-
Pa Pa	diated Spurious Emissions	43 dB min.	55 dB	Р		1		Ì	_	96	
	deband Spectrum-10 kHz	30 dB min.	מט פט	P	-	-	-	-	-	86	_
31	-20 kHz	60 dB min.		P			_	-	[86	_
Ante	nna Radiation Efficiency	20%		X		l -	-	-		67	
				•			_			0,	
EN	IVIRONMENTAL SPECIFICATIONS										
	Temperature	-30, +60°C	-30, +60°C			[
	Humidity	50°C, 90% RH	40°C,95%RH			Ļ		L			<u> </u>

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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				TEST	RESUL	TS			COMPL	IANCE OF
		·								DIOS WITH
				E.N	VIRONM					TANDARD
Standard Communications	2				EXTRE	משויי				(%)
C831 L	OF DA	S				TY RH)				יר
	m F K	Hin	, щ	~₩	ပြည	12%			Щ	Į į
	STEN	E.Y	E	85	85	100		8	E	色。
	\$ D C	2F	₽\ \	₩.	± 5	∮ °,	띯	ĭ	₽ ₩	
Type II (150-174 mHz)	GIZ	HI	HEI PEI PEI	Ų.	표표	± လ	F	Æ	田田	REI
	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDIN (50°C, 90% F	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
TRANSCEIVER CHARACTERISTIC	- a & F	ΣS	∢⊢	<u> </u>	エト	E~	-	_	4 F	— шш
RECEIVER										
RECEIVER									'	
SINAD Sensitivity	0.5 UV max.	0.5 uV*	Р.	P	P.	р.	P	-	100	72
Selectivity-	,,,,,,,,,					,				
Usable Bandwidth	5 kHz min.	7 kHz	Р	P	P	P	-		100	68
Adjacent Channel Selectivity	70 dB min.		P	P	Ρ.	P	-	-	88	68
Spurious Response Attenuation	60 dB min.	55 dB	X	-	-	-		-	54	-
Intermodulation Attenuation	60 dB min.	45 dB	Ρ.		-	-	-	-	81	· =
Sque1ch-			_	_		[_			100	
Threshold Squelch Sensitivity	0.4 uV max.	0.35 uV	P.	P	P	P	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.	1	P. P	Р	P	P	-	-	100 85	72
Squelch Block	5.0 kHz max.	}	p.	-	_	_	<u> </u>	-	100	_
Squelch Attack Time Squelch Release Time	250 ms max.	[X	-	_	-	_	-	85	_
Audio Frequency-	LJU IIIS IIIAX.		^	_		-		_	03	_
Audio Output Power-Speaker	500 mW min.	800 mW	р	p	P	р	Р	<u>-</u>	100	81
Audio Distortion-Speaker	10% max.	10%	P	þ	P	P		_	81	76
Audio Frequency Response-Speaker	-10. +2 dB	-10, +2 dB	Х	<u>.</u>			-	-	58	-
Audio Hum and Noise-Unsquelched	40 dB min.	,	P	P	P	P	-	-	100	81
-Squelched	50 dB min.		Р	P	Р	Р	-	-]	96	73
]
TRANSMITTER					ĺ					
RF Carrier-					1					
Carrier Output Power (Variance)	-0.3, +1 dB	.]	P	P	P	Р	Р		58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	X	X	X	P	P	100	40
AM Hum and Noise	34 dB min.	0.0005%	p .	^			<u>'</u>	-	100	<u> </u>
Carrier Attack Time	100 ms max.	(Р	12		_	_	_	100	-
Audio Frequency Modulation-										
Audio Frequency Harmonic Distortion		10%	X	Р	Р		-	-	77	80
FM Hum and Noise Level	40 dB min.	40 dB	P	P	Р	Х	-	Р	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	,-	-	-	-	-	27	- (
Frequency Deviation	4.75k ±5%	5 kHz	X	-		-	-	-	69 65	-
Modulation Limiting	5 kHz max.	5 kHz	X	-		-,	-] -]	00	-
Electromagnetic Compatability-	42 40	ا مد مدا		'		\ . ·			06	
Radiated Spurious Emissions Sideband Spectrum-10 kHz	43 dB min.	48 dB	P	-	-	-	-	-	96 86	-
-20 kHz	30 dB min. 60 dB min.		P P	_	_	-	_	-	86	
Antenna Radiation Efficiency	120%		P	_	_	-	_	-	67	-
thream improved at the land	1200		٠,			"			Ų.,	
ENVIRONMENTAL SPECIFICATIONS		<u> </u>								
Temperature	-30, +60°C					,			, 1	
Humidity	50°C, 90% RH			·	<u> </u>		<u> </u>			

P = Requirement of the NIJ Standard was met.

DESCRIPTION: A Standard Communications transceiver Model C831L06AU1X1 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.

Transceiver ceased operation or output was too low for measurement. (see note)
 = No environmental test required.

[&]amp; = Transceiver ceased operation.

X = Requirement of the NIJ Standard was not met.

^{- =} No environmental test required.

^{*}Referenced to 20 dB of quieting.

										
Transceiver No.: 2183				TEST	RESUL	.TS		1		IANCE OF
				EN	VIRONM	ENTAL				DIOS WITH TANDARD
Standard Communications	e .			ļ ·	EXTRE	MES				(%)
C731L	JAR.	ν ₋				し立				<u> </u>
	ANE	ER.	. ш	~ w	О ш	☆ ≈			. ш	Į į
	SEN	'UR	, E	S H	8 5	28		z	ä	
	E A A	251	FE	84.30	£.₹	출학	넺	윤	F\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	L S S
Type III (400-512 mHz)	Ö. I.	HE CE	PEL		포띺	±0	M	R.	E	REF
TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
TRANSCEPTER CHARACTERISTIC				-=:-			-	-		
RECEIVER			:							
SINAD Sensitivity	0.5 uV max.	0.45 uV	Р	Р	Р	Р	Р	-	100	72
Selectivity- Usable Bandwidth	5 kills min	7 0 1.11-		_					100	60
Adjacent Channel Selectivity	5 kHz min. 60 dB min.	7.0 kHz 48 dB	P	6	P	P	-	-	100 88	68 68
Spurious Response Attenuation	60 dB min.	55 dB	X	- "	r - ;			-	54	- 1
Intermodulation Attenuation	60 dB min.	1	p	_	_		-	_	81	-
Squelch-	. .					[
Threshold Squelch Sensitivity	0.4 uV max.	0.20 uV	P	Œ	Þ	Р	Р	-	100	64
Tight Squelch Sensitivity Squelch Block	4.0 uV max.	20 dB	Р	8	P	P:	-	-	100	72
Squelch Attack Time	5.0 kHz max. 150 ms max.	1	P		-	-	-	-	85 100	-
Squelch Release Time	250 ms max.	1.	X I		_	-		_	85	-
Audio Frequency-	and ind indix.]	^			_			03	-
Audio Output Power-Speaker	500 mW min.	1000 mW	p	Ø	P	P	P	-	100	81
Audio Distortion-Speaker	10% max.		Р	Ø	P	P	-	- 1	81	76
Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched	-10, +2 dB	-10, +2 dB	P	-	-	-	-	-	58	- [
-Squelched	40 dB min. 50 dB min.)	P.	8	P	Р	-	-	100	81
oquerenea	ov ab min.		χ	8	P	P	-	-	96	73
TRANSMITTER			٠,				.]			·
RF Carrier-				-					:	
Carrier Output Power (Variance)	-0.3, +1 dB		Р	P	P	P	Р	_	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	χ	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	Γα.			_ '						
FM Hum and Noise Level	140 dB min.	10% 48 dB	P	P	Р	-	-	-	77	80
Audio Frequency Response	+1, -3 dB	+1, -3 dB	X P	X	. X	X	-	P	58 27	50
Frequency Deviation	4.75k ±5%	5 kHz	р	_		-	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	_			_	-	65	
Electromagnetic Compatability-								.		
Radiated Spurious Emissions	43 dB min.	48 dB	. Р	-	-	-	-	-	96	-
Sideband Spectrum-10 kHz -20 kHz	30 dB min. 60 dB min.		X	-	- 1	-	-	-	86	-
Antenna Radiation Efficiency	50%	-	P X	-	-	<u>-</u>	-	- -	86 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.

DESCRIPTION: A Standard Communications transceiver Model C731L06AUlXi 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				TEST	RESUL	.TS			IANCE OF
				EN	VIRONM	MENTAL			DIOS WITH
IEC Electronics Corporation	ė				EXTRE	MES			(%)
LE-100-16B2	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	S				> -			
	AN	101	щ	~щ	ပြည္မ	12.5		Щ.	TT
	SES	AT.	~ £	0 5	85	1200	1 18	1 2	₽ _′
	L E E	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOL TAGE VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
Type II (150-174 mHz)	OH.	D S	JE 4PE	₩	포벌	33	¥ \%	A E	55
TRANSCEIVER CHARACTERISTIC	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	MAN	TEN TEN	96	三五	(5E)		A E	EE
THE HOOLETEN OF HIS OF ENTERING									
RECEIVER								l	
CINAD Consitiuity	0 5	0.35 uV*	P	р	P	P	р	100	72
SINAD Sensitivity Selectivity-	0.5 uV max.	0.35 uv"	P	P .	۲		-	100	'
Usable Bandwidth	5 kHz min.	7.5 kHz	Þ	Р	Х	X	- -	100	68
Adjacent Channel Selectivity	70 dB min.	80 dB	P	Р	Р	P	- -	88	68
Spurious Response Attenuation	60 dB min.	80 dB	P			-	- -	54	-
Intermodulation Attenuation	60 dB min.	65 dB	Р		-	-	- -	81	-
Squelch- Threshold Squelch Sensitivity	0.4 uV max.	0.18 uV	.P	Х	Р	Р	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 P	-	-	-	-	100	! -
Squelch Release Time Audio Frequency-	250 ms max.		P	-	-	-	- -	85	-
Audio Output Power-Speaker	500 mW min.	500 mW	P	P	Р	Р	Р.	100	81
Audio Distortion-Speaker	10% max.	10%	P	Р	Р	P	- -	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10,+2 dB	Р	-	-	-	- -	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		P	P	P	Р	- -	100	81 73
-Squelched	50 dB min.		Р	"		Р	- -	96	/3
TRANSMITTER				Į				1 1	
			-		[
RF Carrier-	0 0 11 40				_		_P _	E0	72
Carrier Output Power (Variance) Carrier Frequency Tolerance	~0.3, +1 dB 0.0005%	0.0005%	P	P	P	P	PP	58 100	40
AM Hum and Noise	34 dB min.	0.0003%	P		- 1		- -	100	-
Carrier Attack Time	100 ms max.		Р			-	- -	100	(. - . (
Audio Frequency Modulation-	· ·		-						
Audio Frequency Harmonic Distortion		10%	P.	P	P	-	- -	77	80
FM Hum and Noise Level	40 dB min. +1, -3 dB	45 dB	P	P ·	P -	. P	- P	58	50
Audio Frequency Response Frequency Deviation	4.75k ±5%	+1,-3 dB 5 kHz	P	_] -	<u>-</u>		69	-
Modulation Limiting	5 kHz max.	5 kHz	P		-	_	- -	65	-
Electromagnetic Compatability-			1						
Radiated Spurious Emissions	43 dB min.	53 dB	P	-	-	-	- -	96	-
Sideband Spectrum-10 kHz	30 dB min.		Р	-	-	-	- -	86	-
-20 kHz Antenna Radiation Efficiency	60 dB min.]	P P	-	_	_		67] - [
Quecula vaniacion Elliciench	L.V/0		r		-			-	
ENVIRONMENTAL SPECIFICATIONS		:							
Temperature	-30, +60°C					1	l. [1	[
Humidity	50°C, 90% RH	l		1	L	l			

Transceiver ceased operation.No environmental test required.

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 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.

	TRANSCEIVER NO.: 2187			<u> </u>	TEST	RESUL	TC	 -	COMPI	IANCE OF
						VIRON			-ALL RA	ADIOS WITH STANDARD
	IEC Electronics Corporation LE-100-12B2	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD				EXTRE		,	110	(%)
	LL-100-12B2	T OI	ION	ш	~ш	<u>С</u> ш	FE		Ш	TAL
		MANC EMEN J ST	TCAT	L AN	300C	14600 17UR	MIM 90%			MEN
	Type II (150-174 mHz)	FOR	MANUFACTURER'S SPECIFICATION	IEN.	LOW (-30°C) TEMPERATURE	H PER	HIGH HUMIDITY (50°C, 90% RH)	VOL TAGE	AMBIENT TEMPERATU	ENVIRONMENTAL EXTREMES
	TRANSCEIVER CHARACTERISTIC	THE THE	MAN	AMBIENT TEMPERATURE	골든	HIGH (+60°C) TEMPERATURE	HIG (50	VOL	AMBIENT TEMPERATURE	EXT
	RECEIVER			-						
	SINAD Sensitivity Selectivity-	0.5 uV max.	0.35 uV*	Р	. Р	Р	0	P -	100	72
	Usable Bandwidth	5 kHz min.	7.5 kHz	Р	Р	Х	0	- -	100	68
	Adjacant Channel Selectivity Spurious Response Attenuation	70 dB min. 60 dB min.	80 dB 80 dB	P P	P -	P	<u> </u>	- -	88 54	68
		60 dB min.	65 dB	Р	-	-	-	- -	81	-
	Threshold Squelch Sensitivity	0.4 uV max.	0.18 uV	Р	P:	Р	Q	Pj-	100	64
	Tight Squelch Sensitivity Squelch Block	4.0 uV max. 5.0 kHz max.		P	P -	, Р	8	<u>- -</u>	100 85	72
	Squeich Attack Time	150 ms max.	· .	P	_	-	_	- -	100	1 - 1
	Squelch Release Time	250 ms max.		Р	-	-	-	- -	85	-
•	Audio Frequency- Audio Output Power-Speaker	500 mW min.	500 mW	р	P	P	8	Р	100	81
	Audio Distortion-Speaker	10% max.	10%	Р	P	Р	A	- -	81	76
	Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched	-10, +2 dB 40 dB min.	-10, +2 dB	P	p p	- P	- 8	- -	100	81
	-Squelched	50 dB min.		P	P	P	ä	- -	96	73
	TRANSMITTER	:			-					
	RF Carrier-					, 1	.		1	{ · · }
	Carrier Output Power (Variance) Carrier Frequency Tolerance	-0.3, +1 dB	0.0054	X	P	P	8	P -	58	72
	AM Hum and Noise	0.0005% 34 dB min.	0.0005%	P. ·P	P -	P -	1	PP	100	40
	Carrier Attack Time	100 ms max.		Р	-	-	-	- -	100	-
. 1	Audio Frequency Modulation-									
	Audio Frequency Harmonic Distortion FM Hum and Noise Level	140 dB min.	10% 45 dB	P	P	P I	- I	- -	77 58	80
i.	Audio Frequency Response	+1, -3 dB	+1, -3 dB	Х	_		-	-1-	27	-
	Frequency Deviation	4.75k ±5%	5 kHz	Х		-	-	, -{-	69	- 1
1	Modulation Limiting	5 kHz max.	5 kHz	Р	-	-	-	- -	65	-
•	Electromagnetic Compatability- Radiated Spurious Emissions	43 dB min.	53 dB	Р	_	_		_ _	96	_
	Sideband Spectrum-10 kHz	30 dB min.	-0 -0	P	-	-	_	- -	86	-
	-20 kHz	60 dB min.		P		,- <u> </u>	٠- ا	- -	86	-
F	Antenna Radiation Efficiency	20%		X	-	-		- -	67	-
	ENVIRONMENTAL SPECIFICATIONS							.	1	
	Temperature	-30, +60°C	-30, +60°C	· ·						
	Humidity	50°C, 90% RH								L

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2188					RESUL			ALL RA	IANCE OF DIOS WITH
IEC Electronics Corporation	. RD			EN	VIRONM	MES			TANDARD (%)
LE-100-42B2	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30 ^O C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	No	AMB I ENT TEMPERATURE	ENVIRONMENTAL EXTREMES
Type III (400-512 mHz)	FORM	UFAC	TENT IPERA	(-3	H (+	ян ни ос,	VOLTAGE	PERA	TREME
TRANSCEIVER CHARACTERISTIC	REG	MAN	AMB	40	HIG	HI (50	8 5	W P	EX
RECEIVER									
SINAD Sensitivity Selectivity-	0.5 uV max.	0.5 uV*	P ·	Р	Р	P	P -	100	72
Usable Bandwidth Adjacent Channel Selectivity Spurious Response Attenuation Intermodulation Attenuation	5 kHz min. 60 dB min. 60 dB min. 60 dB min.	7.5 kHz 80 dB 70 dB 65 dB	P P X P	P P - -	P P -	P P. -	- - - -	100 88 54 81	68 68 - -
Squelch- Threshold Squelch Sensitivity Tight Squelch Sensitivity Squelch Block Squelch Attack Time Squelch Release Time	0.4 uV max. 4.0 uV max. 5.0 kHz max. 150 ms max. 250 ms max.	0.25 uV	Р Р Р Р	р Р - -	P P - -	P P 	P -	100 100 85 100 85	64 72 - -
Audio Frequency- Audio Output Power-Speaker Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsqueiched -Squeiched	500 mW min. 10% max. -10, +2 dB 40 dB min. 50 dB min.	500 mW 10% -10, +2 dB	P P P P	P - P P	P P - P	P P P	P -	100 81 58 100 96	81 76 - 81 73
TRANSMITTER									
RF Carrier- Carrier Output Power (Variance) Carrier Frequency Tolerance AM Hum and Noise Carrier Attack Time Audio Frequency Modulation-	-0.3, +1 dB 0.0005% 34 dB min. 100 ms max.	0.0005%	P P P	р Р 	P P -	P P -	P -	58 100 100 100	72 40 - -
Audio Frequency Harmonic Distortic FM Hum and Noise Level Audio Frequency Response Frequency Deviation	40 dB min. +1, -3 dB 4.75k ±5%	10% 45 dB +1, -3 dB 5 kHz	P P X P	P P -	P P -	P -	- F	27 69	80 50 - -
Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz	5 kHz max. 43 dB min. 30 dB min. 60 dB min.	5 kHz 53 dB	P P P		-			96 86 86	-
Antenna Radiation Efficiency	50%		Р	-	-	_	- -	67	
ENVIRONMENTAL SPECIFICATIONS Temperature Humidity	-30, +60°C 50°C, 90% RH	-30, +60°C	:						

^{0 =} Transceiver ceased operation.

^{- =} No environmental test required.

^{*}Sensitivity is specified to 20 dB quieting.

^{@ =} Transceiver ceased operation.

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

^{- =} 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.

TOANGGETUED NO. 01.00											
TRANSCEIVER NO.: 2192				TEST	RESUL	TS			COMPL	IANCE OF	1
	1				VIRON					DIOS WITH	1
REPCO RPX 50	e e			-	EXTRE					STANDARD (%)	
Kt A 30	O.F.	S Z			T	≽⊋		-1		i 	1
	NT TAN	RER	w	—:u	S Fi	TI S		- 1	ų ų	I E	l
	AAN SEE	ES	=	8 =	91	MI 8		중	TE I	NEN	
Type I (25-50 mHz)	FORM	MANUFACTURER'S SPECIFICATION	PERA	(-3 PERA	H + ERA	₹,	VOLTAGE	VIBRATION	FENT	RON	
TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MAN	AMBIENT TEMPERATURE	LOW (~30°2) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	707	VIB	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES	l
RECEIVER											
SINAD Sensitivity	0.5	0.05		_	_ `	_					l
Selectivity-	0.5 uV max.	0.25 uV	P	P	Р	Р	P	-	100	72	
Usable Bandwidth	5 kHz min.	7.5 kHz	P	Р	Р	Р	-	_	100	68	1
Adjacent Channel Selectivity Spurious Response Attenuation	60 dB min.	70 dB	P	. Р	Р	Р	-	-	88	68	l
Intermodulation Attenuation	70 dB min. 70 dB min.	85 dB 70 dB	P P	_	-		-	-	54 81	- ' -	-
Squelch-	J. O GD MITH.	/ C db				-	-	-	01	-	ĺ
Threshold Squelch Sensitivity	0.3 uV max.	0.15 uV	Р	P	р	χ	P		100	64	
Tight Squelch Sensitivity Squelch Block	3.0 uV max. 5.0 kHz max.		P	Р	Р	Р	-	-	100	72.	1
Squelch Attack Time	150 ms max.		P. P		- -	-	-		85 100	-	
Squelch Release Time	250 ms max.		P	-	_		-	_	85	_	
Audio Frequency- Audio Output Power-Speaker	500 11	F00 11		_	_						
Audio Distortion-Speaker	500 mW min. 10% max.	500 mW 8%	P P	P	P P	P P	Р		100	81	
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2dB	X	-	-	-	_	-	81 58	. 76 -	ĺ
Audio Hum and Noise-Unsquelched	40 dB max.		Р	. Р	p	Р	-	_ [100	81	
-Squelched	50 dB max.		P	Р	P	P	-	-	96	73	ĺ
TRANSMITTER]									
RF Carrier-							Ì		. :		
Carrier Output Power (Variance)	-0.3, +1 dB		Х	P.	Р	Р	x	_	58	72	
Carrier Frequency Tolerance	0.002% max.	0.001%	P	P	P	Р	P	Р	100	40	
AM Hum and Noise Carrier Attack Time	34 dB min.		P	-		-	-	-	100	- [
Audio Frequency Modulation-	100 ms max.	}	P	-	-	-	-	- [100	,=	
Audio Frequency Harmonic Distortion	5% max.	5%	Р	Р	Р	_	-	_	77	80	
FM Hum and Noise Level	40 dB min.	50 dB	X	. X	Х	Р	-	Р	58	50	
Audio Frequency Response Frequency Deviation	+1, -3 dB 4.75k ± 5%	+1, -3 dB	X	· -	-	-	- 1	-	27	-	
Modulation Limiting	5 kHz max.	5 kHz 5 kHz	P	-	_	-	-		69 65	-	
Electromagnetic Compatability-		"	. '	-		-	-	7	03	-	
Radiated Spurious Emissions	43 dB min.	47 dB	P	·-	-	-		-	96		
Sideband Spectrum-10 kHz -20 kHz	25 dB min. 50 dB min.		P	÷	-	-	-	-	86	· - ·	
Antenna Radiation Efficiency	N/A		N/A		-	-	=]		86 N/A	-	
ENVIRONMENTAL SPECIFICATIONS				[: 1			Į.			
Temperature	-30, +60°C	-30, +60°C							1		
Humidity	50 ⁰ C, 90% RH			:	1	1	.				

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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

w	-	·	· ·					-	COMPI	IANCE OF
Transceiver No.: 2195		.			RESUL					DIOS WITH
	'			EN	VIRONM	IENTAL				TANDARD
REPCO					EXTRE	MES				(%)
TEK-10	AR	S			l					
TER 10	08	- N		141	<u>ا</u>	RH)		٠.		A A
	- 3255	RE I	품	(2)		28	1 1	'	35	\ \{\cdot\}
	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	[E 2	드	1 30 F	5 1	E 9	اسا	Ö	_ <u>_ </u>	₩ S
Type II (150-174 mHz)	N SER	I FA	E E	ER.		ن =	멸	AT	EE	25
Type 11 (130-174 mile)	R - 00 - 00 - 00 - 00 - 00 - 00 - 00 -	MANUFACTURER'S SPECIFICATION	BI MP	≥ E	윤윤	풍잉	VOL TAGE	VIBRATION	M M	٦X
TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	₩ G S	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDI) (50°C, 90% F	의	Ι.	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER					1	ĺ				
	١, , ,,		_	_		-			- a - '	
SINAD Sensitivity	0.5 uV max.	0.35 uV	Р	Р	P	Р	X	-	100	72
Selectivity-	F 1-11-]	_ '] _				1.00	CO
Usable Bandwidth	5 kHz min.	7.0 kHz 70 dB	P P	P	P P	P P	-		100 88	68
Adjacent Channel Selectivity Spurious Response Attenuation	70 dB min. 60 dB min.	70 dB	P	r -	-	P	-	-	54	68
Intermodulation Attenuation	60 dB min.	1.0 4.0	X	_	-		-	_	81	_
Souelch-	up min.	,	7		}				J.	_
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P	Р	P	Р	P	-	100	64
Tight Squelch Sensitivity	4.0 uV max.		P	P	Р	Р	-	-	100	72
Squelch Block	5.0 kHz max.		P	_	-	-	-	-	85	-
Squelch Attack Time	150 ms max.	[P	-	-	l	-	-	100	-
Squelch Release Time	250 ms max.		Х		-	-	-	-	85	-
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	750 mW	Р	P	, Р	P	Р	-	100	81
Audio Distortion-Speaker	10% max.	10%	Р	P	Р	P .	-	-	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB		-	-	-	-	-	58	- 01
Audio Hum and Noise-Unsquelched	40 dB min.		P	Р	. Р	Р	-	-	100	81
-Squelched	50 dB min.		Р	Р	Р	Р	-	_	96	73
TRANSMITTER								[-		
Promotive 1 Test				1.5	Ĭ.			[
RF Carrier-						[:	· '
Carrier Output Power (Variance)	-0.3 +1 dB	<u> </u> -	P	Р	P	P	Р	_ '	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	Р	Þ	P	P	P	Χ.	100	40
AM Hum and Noise	34 dB min.		р	-	-	-	_	- 1	100	-
Carrier Attack Time	100 ms max.	1 1	Ρ.		-	-] - '	100	-
Audio Frequency Modulation-				_	١					
Audio Frequency Harmonic Distortion		6%	X	P	X	=	-	-	77	80
FM Hum and Noise Level	40 dB min.	50 dB	X	Х	X	P		P	58	50
Audio Frequency Response	+1, -3 dB 4.75k ±5%	+1,-3db 5 kHz	P X	-	-	-	-	-	27 69	
Frequency Deviation	4.75K -5% 5 kHz max.	5 KHZ 5 KHZ	X P	-	_	<u>-</u>	-		65	-
Modulation Limiting Electromagnetic Compatability-	ο κπε max.	U KIZ	Υ.	-	-	-	-	-	ŲĢ	-
Radiated Spurious Emissions	A2 dB min	47 dB	,	٠	_	_	_		96	4
Sideband Spectrum-10 kHz	43 dB min. 30 dB min.	"' ub	n P		-	<u> </u>	_	<u> </u>	86	_
-20 kHz	60 dB min.	1	P		-	-	_	-	86	
Antenna Radiation Efficiency	20%		n	_	_	_	_	_	67	_
The second secon		.		1	1				, ·	
ENVIRONMENTAL SPECIFICATIONS	4					'				
Temperature		-30, +60°C								
Humidity	50°C, 90% RH									

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.

 ⁼ Transceiver ceased operation. = No environmental test required.

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

^{0 =} Transceiver ceased operation.- = No environmental test required.

n = No test was conducted.

										
Transceiver No.: 2198				TEST	RESUL	TS.				IANCE OF
	1		1	EN	VIRON	MENTAL				DIOS WITH
REPCO					EXTRE					STANDARD (%)
RPX450	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	S			T		-	_		
	으문	MANUFACTURER' SPECIFICATION		İ	_	돌				=
	TALE	H H H	<u> </u>	C. H	유	2 % D 12	1		H.	<u>E</u>
	N S S S	1 25	₽	8구	8 ₂	188		8	1 2	l ≅ v
Type III (400-512 mHz)	\$8.5	N SE	Z Z	ოგ	±\%	로 •	18	F	₽\$	88
13 pc 111 (400-312 mm2)	E	<u>⇒</u> 5	150		물	표의	≤	E I	밀밀	E E
TRANSCEIVER CHARACTERISTIC	日常芸	\$ 5	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDIT (50°C, 90% R	YOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
		1	-	=:-	1=-	1	1-		4 -	шш
RECEIVER			ļ	. ,				1 1		1
	1		ĺ				1	1 1		1.
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	l p	Р	P	P	-	100	72
Selectivity-					`				1	-
Usable Bandwidth	5 kHz min.	7.5 kHz	Р	, P	Р	Р	-	I- I	100	68
Adjacent Channel Selectivity	60 dB min.	70 dB	Р	Р	P	Р	-	-	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.	ł . I	P	P	P	Р	-	-	100	72
Squelch Block	5.0 kHz max.	'	X		-	-	[-	i- I	85	-
Squelch Attack Time	150 ms max.	.	Р	-	-	'	-	-	100	-
Squelch Release Time	250 ms max.	1	P	-	-	-	-	-	85	
Audio Frequency-										
Audio Output Power-Speaker	500 mW min.	600 mW	Р	P,	P	Р	P	-	100	81
Audio Distortion-Speaker	10% max.	8%	Р	Р	Р	P	-	-	81	76
Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched	-10, +2 dB	-10, +2 dB	P	-	-	- 1		-	58	-
-Squelched	40 dB min.	. 1	P	P	Р	Р	-	-	100	81
-3querched	50 dB min.		P	P	P	P.	-	-	96	73
TRANSMITTER	:	1 [1			ļ	-	
		1	İ	ĺ		- 1				
RF Carrier-					-	- 1		1		
Carrier Output Power (Variance)	-0.3, +1 dB	<u> </u>	Р	.p	Р	Р	P		58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P		P	100	40
AM Hum and Noise	34 dB min.		5		-	[-	100	-
Carrier Attack Time	100 ms max.		P	_	_	_	_		100	·
Audio Frequency Modulation-	1		.	- [~ . \	-		- 1	100	
Audio Frequency Harmonic Distortion	5% max.	5%	Р	Р	Р	_	_	_	77	80
FM Hum and Noise Level	40 dB min.	50 dB	P	Х	χĺ	x		Р	58	50
Audio Frequency Response		+1, -3 dB	X			- 1	- [-	27	-
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	_	-	-	69	-
Modulation Limiting	5 kHz max.	5 kHz	P	-	-	- 1	-	-	65	-
Electromagnetic Compatability-		'				l	1		- "	
Radiated Spurious Emissions	43 dB min.	49 dB	P		-	-	-	-	96	.
Sideband Spectrum-10 kHz	30 dB min.		X	-	-	-	-	- 1	86	
-20 kHz	60 dB min.	: [Р	-	-	-	-	-	86	-
Antenna Radiation Efficiency	50%		X	-	-	¹-	-	-	67	
ENVIDONMENTAL CRECIFICATIONS				- [ĺ	.	.		1	
ENVIRONMENTAL SPECIFICATIONS	00 000		. :	. [- 1		.			
Temperature	-30, +60°C	-30, +60℃	.				-		. [-
Humidity	50°C, 90% RH			. }	- 1		.	. }	-	, 1

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				TEST	RESUL	.TS				IANCE OF DIOS WITH
REPCO	SO CO		•	EN	VIRONM EXTRE				NIJS	TANDARD
RPX 150	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	URE	oc) URE	0°C) URE	HIGH HUMIDITY (50°C, 90% RH)		z	URE	ENTAL
Type II (150-174 mHz)	RFORMA QUIREM E NIJ	NUFACT	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	3H HUM	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
TRANSCEIVER CHARACTERISTIC	<u> </u>	SP	AM	일	보민	H (5)	0	Y	AM	EX
RECEIVER		. ,							· .	
SINAD Sensitivity Selectivity-	0.5 uV max.	0.30 uV	P	P	P	. Р	Р		100	72
Usable Bandwidth Adjacent Channel Selectivity Spurious Response Attenuation Intermodulation Attenuation Squelch-	5 kHz min. 70 dB min. 60 dB min. 60 dB min.	7.5 kHz 80 dB 60 dB 65 dB	P P P	P P -	P P -	P P -			1 00 88 54 81	68 68 - -
Threshold Squelch Sensitivity Tight Squelch Sensitivity Squelch Block Squelch Attack Time Squelch Release Time	0.4 uV max. 4.0 uV max. 5.0 kHz max. 150 ms max. 250 ms max.	0.25 uV	P P P P	P P - -	P P - -	8 8 - -	P - -		100 100 85 100 85	64 72 - - -
Audio Frequency- Audio Output Power-Speaker Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched	500 mW min. 10% max. -10, +2 dB 40 dB min. 50 dB min.	600 mW 10% -10, +2 dB	P P X P	P P P	P P - P P	P P - P X	P - - -	1 1 1 1	100 81 58 100 96	81 76 - 81 73
TRANSMITTER			:							
RF Carrier- Carrier Output Power (Variance) Carrier Frequency Tolerance AM Hum and Noise Carrier Attack Time	-0.3, +1 dB 0.0005% 34 dB min. 100 ms max.	X 0.0005%	X P P	χ P -	X P -	X P -	X P -	- P -	58 100 100 100	72 40 - -
Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Frequency Deviation Modulation Limiting Electromagnetic Compatability-	5% max. 40 dB min. +1, -3 dB 4.75k ±5% 5 kHz max.	50 dB +1, -3 dB 5 kHz 5 kHz	P X X X	P P - -	P P - -	- P - -	-	P	77 58 27 69 65	80 50 - -
Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency	43 dB min. 30 dB min. 60 dB min. 20%	54 dB	P X X P	- - - -		-	-	1 1 1	96 87 87 65	1 1 1
ENVIRONMENTAL SPECIFICATIONS Temperature Humidity	-30, +60°C 50°C, 90% RH	-30,+60 ⁰ C								

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.

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

Transceiver ceased operation.No environmental test required.

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

Transceiver ceased operation.No environmental test required.

TEST RESULTS	Twanscoius No + 2205		r - i							COMP	Y' NOT OF
STANDARD STANDARD	Transceiver No.: 2205		•		TEST	RESUL	.TS				
Mini-COM HH-400-C			[[EN						
SINAD Sensitivity Selectivity- Selectivity- Selectivity- Usable Bandwidth 5 kHz min. 70 dB min.		l e				EXTRE	MES		1		
SINAD Sensitivity	Mini-COM HH-400-C	PA PA	ا حد إ				>字				i -
SINAD Sensitivity Selectivity- Selectivity- Selectivity- Usable Bandwidth 5 kHz min. 70 dB min.		A P N	# E	ш	ωш	C m	F 2			ш] E
SINAD Sensitivity Selectivity- Selectivity- Selectivity- Usable Bandwidth 5 kHz min. 70 dB min.		SHE	A T R	<u></u>	ပ္မည	88	12%	[2	U.R.	l B
SINAD Sensitivity		A P D] 5:: [F ¥ i	34 AT	4 t	50	ا بيرا	음	TA.	ESE
SINAD Sensitivity Selectivity- Selectivity- Selectivity- Usable Bandwidth 5 kHz min. 70 dB min.	Type II (150-174 mHz)	EHZ	HIS	PER	- E	- H	ည်	A	RA.	PER	REP
SINAD Sensitivity Selectivity- Selectivity- Selectivity- Usable Bandwidth 5 kHz min. 70 dB min.	TO ANGOSTUSE ON A DACTED TO TA	없었품	NA B	윤교	종집	25	50.15	님	B	8 2	NX NX
SINAD Sensitivity	TRANSCEIVER CHARACTERISTIC		ΣΝ	A F	7 -	= -	==	>	>	ΑL	шш
SINAD Sensitivity	RECEIVER	1	} }					1 1			i ·
Selectivity- Usable Bandwidth 5 kHz min. 70 dB m	TLULT III		{	[-	}	}	1			
Selectivity- Usable Bandwidth SkHz min. 70 dB min.	SINAD Sensitivity	0.5 uV max.	lo.30 uv* l	p l	Р	P	Р	P	_	100	72
Adjacent Channel Selectivity Spurious Response Attenuation Soule Britannel Selectivity Spurious Response Attenuation Soule Britannel Soule Britannel Squelch Threshold Squelch Sensitivity The Squelch Sensitivity Squelch Sensitivity Squelch Squelch Sensitivity Squelch Squelch Sensitivity Squelch											
Spurious Response Attenuation			} }					-			1 1
Tithermodulation Attenuation Squelch Squelch Squelch Squelch Sensitivity Squelch State Squelch			1		Р	·P		{- {			
Squelch Threshold Squelch Sensitivity O.4 uV max O.25 uV P P P P P D O O O O O O O O O			55 dB	X	-	-		-	-		1 1
Threshold Squelch Sensitivity		bu dB min.			-	_	-	-	-	81	-
Tight Squelch Sensitivity		0 4 0 7	0 25	ا و	D	n	р	اا		100	64
Squelch Block Squelch Attack Time Squelch Release Time Squelch Release Time Squelch Release Time Squelch Release Time Squelch Release Time State Sta			0.23 47					[
Squelch Attack Time] -		٠.			_	_		1
Squelch Release Time			{ {			-		i _ i	- 1		1.1
Audio Frequency- Audio Output Power-Speaker Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched Addio Frequency Frequency Audio Frequency Response -10, +2 dB -	Squelch Release Time		1 . (· -	_		_	-		-
Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched]					i i				
Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched -		500 mW min.	500 mW		P			P	-	100	
Audio Hum and Noise-Unsquelched -Squelched -Squelchede -Squelche			1		P	. Р	Р	-	-		
TRANSMITTER	Audio Humand Maisa Umagualahad		-10, +2 dB					-	1 1		
TRANSMITTER RF Carrier- Carrier Output Power (Variance) -0.3, +1 dB 0.0005% P X P P P D D D D D D D) i					-	-		
RF Carrier- Carrier Output Power (Variance) Carrier Tequency Tolerance AM Hum and Noise Carrier Attack Time Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Frequency Response Audio Frequency Response Audio Frequency Response Audio Frequency Response Audio Frequency Response Frequency Deviation Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz Carrier Attack Time Antenna Radiation Efficiency -30, +60°C -30, +60°C -30, +60°C -30, +60°C -30, +60°C -30, +60°C -58	-Squereneu	jou as min.	[Р	Y	P		-	-	96	1 /3
Carrier Output Power (Variance) Carrier Frequency Tolerance Carrier Frequency Tolerance AM Hum and Noise 34 dB min. 100 ms max. Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response H1, -3 dB H1, -3 dB X P P P P F 100 40 Audio Frequency Response H1, -3 dB X P P P P P P P P P	TRANSMITTER		ł			[[. [li		
Carrier Output Power (Variance) Carrier Frequency Tolerance Carrier Frequency Tolerance AM Hum and Noise 34 dB min. 100 ms max. Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response H1, -3 dB H1, -3 dB X P P P P F 100 40 Audio Frequency Response H1, -3 dB X P P P P P P P P P		}					·] [. 1
Carrier Frequency Tolerance			}					'	ÌΪ		
AM Hum and Noise Carrier Attack Time Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Frequency Response Frequency Deviation Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS Temperature 34 dB min. 100 ms max. P P P 100 100 100	Carrier Output Power (Variance)		l i		į ·				-		
Carrier Attack Time	Carrier Frequency Tolerance		0.0005%		Х	1 ' 1	1	Р	1 1		1 ' 1
Audio Frequency Modulation— Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Audio Frequency Response 40 dB min. 50 dB 70 P 71 80 72 P 73 B0 74 dB min. 75 dB 76 KHz 77 B0 78 B0 79 P 70 B0 70 B0 70 B0 70 B0 71 B0 72 B0 73 B0 74 B0 75 kB 76 B1 77 B0 77 B0 77 B0 78 B0 78 B2 79 P 70 B1 70 B2 70 B2 71 B2 72 B2 73 B3 74 B3 75 KHz 75 KHz 76 B2 77 B3 78 B0 78 B2 79 P 70 B2 70 B3 7			1		-		1	-	i I		-
Audio Frequency Harmonic Distortion		100 ms max.	. [Ρ.	-	-	-	-	-	100	- 1
FM Hum and Noise Level Audio Frequency Response Frequency Deviation Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS Temperature 40 dB min. 50 dB X P P P P P P S8 50	Audio Frequency Harmonic Distortion	59 may		D .	n .					77	gn
Audio Frequency Response Frequency Deviation Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS Temperature +1, -3 dB	FM Hum and Noise Level		50 dB					-	[[
## Frequency Deviation 4.75k ±5% 5 kHz P - - - - 69 -					l ' .			- 1	1 1		1 1
Modulation Limiting 5 kHz max. 5 kHz X 65 - 65 - 65 - 65 65 - 67 - 65 - 67 - 65 - 67 - 67 - 67 - 67 - 67 - 67 - 67 - 67 - 67 - 65 - 67 - 67 - 67 - 67 - 67 - 67 - 67 - 67 - 67 - 67 - 67	Frequency Deviation				-		_	_	-		1 6
Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS Temperature 43 dB min. 55 dB P 96 - 86 86 67 67 67 67 67 67	Modulation Limiting					-	-	-	-		-
Sideband Spectrum-10 kHz						}		. '			
-20 kHz 60 dB min. Antenna Radiation Efficiency 20% P 86 - 67 - 67 - 67 - 67 - 67 - 6			55 dB			-	1	-	-		-
Antenna Radiation Efficiency 20% P 67 - 67 - 67 - 67 - 67 - 67 - 6					-	l .		-	-		1 1
ENVIRONMENTAL SPECIFICATIONS Temperature -30, +60°C -30, +60°C			}			-	1	j -	-		-
Temperature -30, +60°C -30, +60°C	Ameenia Radiacion Elliciency	20%	1 1	Ą	-	-	-	-]- [6/	-
Temperature -30, +60°C -30, +60°C	ENVIRONMENTAL SPECIFICATIONS										
Humidity 50°C, 90% RH 40℃ 95% RH		-30, +60°C	-30, +60°C).		1				
			40°C 95% RH			1					

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2206					RESUL				ANCE OF
Wilson	Q.			EN	VIRONM EXTREM	1ES		NIJ S	TANDARD %)
Mini-COM HH-250-C4	SE NT OF TANDAR	RER'S TION	Æ	C.) RE	oc) RE	DITY % RH)		IRE	ENTAL
Type II (150-174 mHz)	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
	ERFC EQU:	AANU	AMB I TEMP	TEMP	HIGH	55°	VOLT	AMBI	EXTE
TRANSCEIVER CHARACTERISTIC	447								
RECEIVER								7.00	70
SINAD Sensitivity Selectivity-	0.5 uV max.	0.3 uV*	P	P	P	P	X -	100	72
Usable Bandwidth Adjacent Channel Selectivity	5 kHz min. 70 dB min.	70 dB	P P	P	l P	P	- - - -	100	68 68
Spurious Response Attenuation	60 dB min.	55 dB	X	-	-	-	- - -	54 81	-
Intermodulation Attenuation Squelch-	60 dB min.		P		-		1	.	50
Threshold Squelch Sensitivity Tight Squelch Sensitivity	0.4 uV max. 4.0 uV max.	0.25 uV	P P	P P	P P	P	P - - -		64 72
Squelch Block	5.0 kHz max.		P P	-	-	-	<u> - -</u>	85 100	
Squelch Attack Time Squelch Release Time	150 ms max. 250 ms max.		P	-	-	-		85	-
Audio Frequency- Audio Output Power-Speaker	500 mW min.	500 mW	Р	P	P	p ·	P -		81 76
Audio Distortion-Speaker Audio Frequency Response-Speaker	10% max. -10, +2 dB	10% -10, +2 dB	X	P -	X -	P -	-	58	-
Audio Hum and Noise-Unsquelched -Squelched	40 dB min. 50 dB min.		P P	P P	P	P	-	100	81 73
TRANSMITTER									
RF Carrier- Carrier Output Power (Variance)	-0.3, +1 dB		P	P	P	P	p	- 58	72
Carrier Frequency Tolerance	0.0005% 34 dB min.	0.0005%	P P	X	X -	P _	3.	100 100	40
AM Hum and Noise 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. +1, -3 dB	50 dB +1, -3 dB	X	P -	P	P _	1 1	58 - 27	50
Audio Frequency Response Frequency Deviation	4.75k ±5%	5 kHz	X	-	-	-	-	- 69 - 65	
Modulation Limiting Electromagnetic Compatability-	5 kHz max.	5 kHz	P	-	1 7	1			
Radiated Spurious Emissions Sideband Spectrum-10 kHz	43 dB min.	55 dB	P	-	=	-	-	- 96 - 86	
-20 kHz Antenna Radiation Efficiency	60 dB min.		P	-	i	-	-	- 86 - 67	- -
ENVIRONMENTAL SPECIFICATIONS Temperature	-30, +60°C	-30, +600							
Humidity	50°C, 90% RH	40°C, 95%RI	1	1			لحبك		

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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.

^{@ =} Transceiver ceased operation.- = No environmental test required.

^{*}Referenced to 20 dB of quieting.

Transceiver ceased operation.No environmental test required.

^{*}Referenced to 20 dB of quieting.

Transceiver No.: 2207	·										
774113CC17C1 HO 2207				TES	T RESU	LTS				IANCE OF	
DCA				E	NVIRON	MENTAL			ALL R	ADIOS WIT	Н
RCA TACTEC HCB36AA12	8		1.		EXTRE				เหม	STANDARD	
MOTEO MODDONATE	OF TDA	S N	1		1	∓ ⊊	1				\dashv
	TAN	TEST 1	٣	\;\tau_\tau_\tau_\tau_\tau_\tau_\tau_\tau_	Ω W	12.8			ш	K	.
	AAN 3 S	₽8	₽	8 2	182	MI 9		3	ž	E.	1
Type II (150-174 mHz)	FOR	MANUFACTURER'S SPECIFICATION	ENT	(-3 ERA	±\$	₹,	AGE	Ä	ERAT	RON	
TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANI	AMB1ENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES	
RECEIVER											\dashv
SINAD Sensitivity	0.5 uV max.	0.25 uV									
Selectivity-	0.5 uv max.	U.25 UV	P	P	P	2	Р	-	100	72	-
Usable Bandwidth	5 kHz min.	8.0 kHz	P	Р	P	8		_	100	-	
Adjacent Channel Selectivity	70 dB min.	80 dB	P	P	P	ā	. 1	-	88	68 68	
Spurious Response Attenuation Intermodulation Astenuation	60 dB min.	75 dB	P	-	-	- 1	-	-	54		1
Squelch-	60 dB min.	70 dB	P	-	-	-	-	-	81	-	-
Threshold Squelch Sensitivity	0.4 uV max.	0.18 uV	P	Р		. 1					
Tight Squelch Sensitivity	4.0 uV max.	0.,0 4	P	. p	P P	8		-	100 100	64 72	
Squelch Block Squelch Attack Time	5.0 kHz max.		P		-	-		_	85	, / <u>.</u>	
Squelch Release Time	150 ms max.		P	-	-	-	-	-	100		1
Audio Frequency-	250 ms max.		P	·	-	- {	-	-	85		1
Audio Output Power-Speaker	500 mW min.	500 mW	P	р	Р	اما		_	100		
Audio Distortion-Speaker	10% max.	5%	P	P	P	8		-	100	81 76	
Audio Frequency Response-Speaker	[-10. +2 dB	-10,+2 dB	P		-	-	- 1	-	58	, 70	
Audio Hum and Noise-Unsquelched -Squelched	40 dB min.	l i	Р	Ρ.	P	@		-	100	81	ŀ
-squerened	50 dB min.		P	P	P	- 🛭	-	-	96	73	
TRANSMITTER				.		.					
RF Carrier-		' '	į		-		-				İ
Carrier Output Power (Variance) Carrier Frequency Tolerance	-0.3, +1 dB		Р	P	Р	Р	р .	-	58	72	1
AM Hum and Noise	0.0005%	0.0005%	Р	P.	P	Р	P	-	100	40	
Carrier Attack Time	34 dB min. 100 ms max.	ļ. j	P	-	-	-	-		100	-	l
Audio Frequency Modulation-	[P	-	- [-	- -	-	100	-	
Audio Frequency Harmonic Distortion	5% max.	3%	Р	Р	Р	_	_ [.		77	80	
FM Hum and Noise Level Audio Frequency Response	40 dB min.	50 dB	P	P	P	P	- ;		58	50	
Frequency Deviation	+1, -3 dB	+1, -3 dB	Ρ.	-	-	- 1	- -	- 1	27	-	
Modulation Limiting	4.75k ±5% 5 kHz max.	5 kHz	P	- 1	- [-	- -		69	-	
Electromagnetic Compatability-	J KHZ IIIdX.	5 kHz	X	-		-	- -	.	65	-	
Radiated Spurious Emissions	43 dB min.	58 dB	Р	_	_	_	_ _		96		
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	- 1			86	_	
-20 kHz Antenna Radiation Efficiency	60 dB min. 20%		P	-	-	-	- -	. .	86	-	
ENVIRONMENTAL SPECIFICATIONS				-	-	-	- -		67	-	
rature	-30, +60°C	-30,+60°C	1		.	.			1		
Landity	50°C, 90% RH	39,700 6	1				. }		1		
					. 1	ì	1	1	, Į	. 1	

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

DESCRIPTION: This is an RCA TACTEC series transceiver Model HCB36AAl2 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		·			RESUL					IANCE OF
200	۾ ا			EN	VIRONM EXTRE				NIJ S	TANDARD
RCA TACTEC HCB54AA12	E T OF ANDAR	ER'S ION	ш	~ш	Сш	IT RH)			ш	TAL
	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	LION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
Type III (400-512 mHz)	RFOF QUIF E NJ	NUF/	BIEN	M PEF	GH MPE	36 68	LTA(BRA	BIEN	VIRC
TRANSCEIVER CHARACTERISTIC	표恕폰	S A A	AM	먹은	보브	H (2)	8	VI	AM	EXE
RECEIVER										:
SINAD Sensitivity Selectivity-	0.5 uV max.	0.35 uV	Р	P	P	P	Р	-	100	72
Usable Bandwidth Adjacent Channel Selectivity	5 kHz min. 60 dB min.	8.0 kHz 75 dB	P P	P P	P	P	- -	-	100 88	68 68
Spurious Response Attenuation	60 dB min.	70 dB	X	-	-	-	-	-	54	-
Intermodulation Attenuation Squelch-	60 dB min.	70 dB	Р	-	-	-		-	81	-
Threshold Squelch Sensitivity Tight Squelch Sensitivity	0.4 uV max. 4.0 uV max.	0.25 uV	P P	P	P	P.	P -	- -	100 100	64 72
Squelch Block Squelch Attack Time	5.0 kHz max. 150 ms max.		P P	- '	-	-	 -	<u>-</u>	85 100	-
Squelch Release Time Audio Frequency-	250 ms max.		р	-	_	=	-	-	85	
Audio Output Power-Speaker	500 mW min.	500 mW	P P	P	P	P	Р	-	100	81
Audio Distortion-Speaker Audio Frequency Response-Speaker	10% max. -10, +2 dB	5% -10, +2 dB	X	P -	P -	P -	-	- 1	81 58	76
Audio Hum and Noise-Unsquelched -Squelched	40 dB min. 50 dB min.		P P	P P	P P	P P	-	-	100 96	81 73
TRANSMITTER	- ':		. [
RF Carrier-	-									
Carrier Output Power (Variance) Carrier Frequency Tolerance	-0.3, +1 dB	0.0005%	X P	P ·	P	X	P	- Р	58 100	72 40
AM Hum and Noise	34 dB min.	0.0003%	P	-	-	_	-	1-1	100	
Carrier Attack Time Audio Frequency Modulation-	100 ms max.		Р	-	-		-	-	100	-
Audio Frequency Harmonic Distortion FM Hum and Noise Level	5% max. 40 dB min.	3% 50 dB	P P	P P	P P	- B	-	p	77 58	80 50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	P	· <u>-</u>		-	-	-	27	-
Frequency Deviation Modulation Limiting	4.75k ±5% 5 kHz max.	5 kHz 5 kHz	PX	-	-		-	-	69 65	_
Electromagnetic Compatability-										
Radiated Spurious Emissions Sideband Spectrum-10 kHz	43 dB min. 30 dB min.	53 dB	P	-	- -	-	-	-	96 86	-
-20 kHz Antenna Radiation Efficiency	60 dB min.		X P	<u>.</u>	-	-	- -	-	86 67	-
ENVIRONMENTAL SPECIFICATIONS		:								
Temperature	-30, +60°C	-30, +60°C				1		1 1		
Humidity	50°C, 90% RH					·	<u> </u>	\perp		

Transceiver ceased operation.No environmental test required.

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 RCA TACTEC series transceiver Model HC"54AA12 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.

Transceiver No.: 2212			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
7 2772				TES	T RESU	LTS			COMP	LIANCE OF	-
Motorola					NVIRON		_		ALL R	ADIOS WIT	ГΗ
HT-220			1		EXTRE				MIT	STANDARD	- [
	N O L	% N				≥ €					ᅱ
	NAC!	URE	l B	SC H	28	15%			RE	N A	-
Type III (400-512 mHz)	ORM/ IREA	ACT	RAT	-30 RAT	C+6	Ĕ,	병		t ¤TU	NWE	
TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES	
		Z S	+ & F	25	모	포또	2	5	E E	EXE	
RECEIVER											7
SINAD Sensitivity	0.5 uV max.	0.35 uV	P	P	Р						
Selectivity- Usable Bandwidth	· ['		1			₽	P	-	100	72	
Adjacent Channel Selectivity	5 kHz min. 60 dB min.	7.5 kHz 60 dB	P	X	Р	p ·	-	-	100	68	
Spurious Response Attenuation Intermodulation Attenuation	60 dB min.	74 dB	X	-	P _	Р _	-	-	88 54	68	
Squelch-	60 dB min.	60 dB	P	-	-	- 1	-	-	81	-	
Threshold Squelch Sensitivity Tight Squelch Sensitivity	0.4 uV max.	0.24 uV	P	P	P	P	Р	_	100		
Squeich Block	4.0 uV max. 5.0 kHz max.		P	P	P	p			100	64 72	
Squelch Attack Time Squelch Release Time	150 ms max.		P	<u>-</u>	-	-	1	-	85	-	
Audio Frequency-	250 ms max.		Р	-	-	-	-	-	100 85	-	
Audio Output Power-Speaker Audio Distortion-Speaker	500 mW min.	500 mW	P	P						-	
Audio Frequency Response-Sponkow	10% max.	10%	P	P	P		. 1	-	100	81 76	
Audio Hum and Noise-Unsquelched	-10, +2 dB 40 dB min.	-10, +2 dB	X	-	-	-	- .	-	58	-	
-Squelched	50 dB min.		P	P P	P		- :	-	100 96	81	١.
TRANSMITTER		1 1			.	.	_ .		90	73	
RF Carrier-					.	.		1			
Carrier Output Power (Variance)	-0.3, +1 dB		Р		_						
Carrier Frequency Tolerance AM Hum and Noise	0.0005%	0.0005%	P	P	PX		P -	; .	58	72	
Carrier Attack Time	34 dB min. 100 ms max.		Р	-	_	1.	1		100	40	
Audio Frequency Modulation-			P	-	-	-	- -		100		٠.
Audio Frequency Harmonic Distortion FM Hum and Noise Level	5% max.	10%	P	P	Р	_	. _		77		
Audio Frequency Response	40 dB min. +1, -3 dB	11 2 40	P	Р	P	Р -	- 1	7	58	80 50	
Frequency Deviation	4.75k ±5%	+1,-3 dB	X	-	-	- -	1 -		27	-	
Modulation Limiting Electromagnetic Compatability-	5 kHz max.	5 kHz	x	- 1	-	- -			69	-,	
Radiated Spurious Emissions	43 dB min.	40 10		- 1		- -	-	1	65	-	
Sideband Spectrum-10 kHz	30 dB min.	49 dB	P P	-	-	- -	-		96	-	
-20 kHz Antenna Radiation Efficiency	60 dB min.		P	-	-	- -	-		86	=	
	50%		Р	-		- -	-		67	-	
ENVIRONMENTAL SPECIFICATIONS Temperature											
Humidita	-30, +60°C 50°C, 90% RH	-30, +60°C	.					-			
	U, JUN KII		. 1	I	- 1	1	1	1 .	1		

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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. Switching functions is available. The transceiver is also available in a "slimline" housing as Model H24FFN.

FM TRANSCEIVER TEST RESULTS

Transcriver No.: 2213 Test results Completion Com				:						
Notorola	TRANSCEIVER NO.: 2213		,		TEST	RESUL	.TS			
SINAD Sensitivity Selectivity Selectiv					EN			•		
SINAD Sensitivity Selectivity Selectiv	Motorola	₽				EXTRE	MES			(%)
SINAD Sensitivity Selectivity Selectiv	HT 200	OF DA	S				×Ĥ			
SINAD Sensitivity Selectivity Selectiv		₩⊢A	H H H	щ	Ç₩.	ပြည္ဆုိ	12%		L W	Ĭ ¥
SINAD Sensitivity Selectivity Selectiv		ST	D A	Ë	85	100 100	120	z		₩
SINAD Sensitivity Selectivity Selectiv	T 1250 274 41 3	I SER	FI P	R A	₹.	± ₹	₹.	병	₽₩	N N N
SINAD Sensitivity Selectivity Selectiv	Type II (150-1/4 mHz)	C I N	HI I	PE		ェ塭	#0	A A	ⅡⅡ	N. P. E. E.
SINAD Sensitivity Selectivity Selectiv	TRANSCEIVER CHARACTERISTIC	PER	SPE	TEP	즐슨	불현	HIG (50	팅		
SINAD Sensitivity	The state of the s								-	
Selectivity-	RECEIVER									<u> </u>
Selectivity-	SINAD Sensitivity	0.5 uV may	0 25 111	p	D	D	D		100	72
Usable Bandwidth		Joseph Max.	J u	· ·	'] ['		100	'-
Adjacent Channel Selectivity		5 kHz min.	7.0 kHz	Р	, Р	P	Р		100	
Intermodulation Attenuation 60 dB min.	Adjacent Channel Selectivity	1		•	P	P	Р			68
Thermodulation Attenuation	Spurious Response Attenuation					-	-	1 1	1 .	
Threshold Squelch Sensitivity 7		60 dB min.	60 dB	P	- '	-	-	- -	81	
Tight Squelch Sensitivity Squelch Block Squelch Attack Time Squelch Release Time Audio Frequency Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched TRANSMITTER RF Carrier- Carrier Frequency Tolerance Audio Frequency Squelched AM Hum and Noise Carrier Attack Time Audio Frequency Bosponse-Speaker Audio Hum and Noise Squelched TRANSMITTER RF Carrier- Carrier Frequency Tolerance AM Hum and Noise AM Hum and Noise Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Frequency Besponse Frequency Besponse Frequency Beviation Audio Frequency Response Frequency Beviation Audio Frequency Emissions Sideband Spectrum-10 kHz Audio Bmin. Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS		O A DV may	n 18 11V	p i	b .	D	р	_ ام ا	100	64
Squelch Block Squelch Attack Time Squelch Release Time 250 ms max. P			0.10 111							
Squelch Attack Time			1	, ,	-	<u> </u>	·			1
Audio Frequency— Audio Output Power—Speaker Audio Distortion—Speaker Audio Frequency Response—Speaker Audio Frequency Response—Speaker Audio Hum and Noise—Unsquelched ——Squelched ——Squel					-	-	, -	- -		-
Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched -Squelched -Squelched -Squelched -Squelched -O.3, +1 dB Carrier Output Power (Variance) Carrier Frequency Tolerance AM Hum and Noise Carrier Attack Time Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Audio Frequency Response Frequency Deviation Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS 500 mW min. 10% p P P P P P P - 81 76 X 58 1000 81 X 1000 81 X 96 X P P P P P P P P P P P P P P P P P P		250 ms max.		P	- '	-	-	- -	85	j [.] -
Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched -O.3, +1 dB -O.0005% -O.3, +1 dB -O.0005% -O.0005% -O.0005% -O.0005% -O.0005% -O.0005% -O.0005% -O.0005% -O.0005% -O.0005% -O.00005% -O.0005% -O.0005% -O.0005% -O.0005% -O.0005% -O.0005% -O.00005% -O.0005% -O.00005% -O.00005% -O.000000000000000000000000000000000000	Audio Frequency-				_	_	_		, , , ,	
Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched -	Audio Output Power-Speaker									
Audio Hum and Noise-Unsquelched -Squelched -Squelched 50 dB min. P	Audio Distortion-Speaker	10% max.	10%	•	•	Ρ				1
TRANSMITTER	Audio Hum and Noise-Unsquelched	40 dR min				P		1 1.		1
RF Carrier- Carrier Output Power (Variance) -0.3, +1 dB 0.0005% P X P P P P P D D D D D]					1 I	1 '	
RF Carrier- Carrier Output Power (Variance) Carrier Frequency Tolerance AM Hum and Noise Carrier Attack Time Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response FF Hum and Noise Level Audio Frequency Response Frequency Deviation Modulation Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS X P P P P P P P P P P P P P P P P P P							•			:
Carrier Output Power (Variance)	TRANSMITTER									
Carrier Frequency Tolerance 0.0005% 0.0005% 0.0005% P X P P <t< td=""><td>RF Carrier-</td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td></t<>	RF Carrier-						-			
Carrier Frequency Tolerance								P -		
Carrier Attack Time	Carrier Frequency Tolerance		0.0005%		X	P		1 1		
Audio Frequency Modulation— Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Audio Frequency Response 40 dB min. 50 dB P P P P P P P P P P P P P P P P P P P					-					1
Audio Frequency Harmonic Distortion		IOU MS MAX.	,	Ρ,	-	-	-,	- -	100	_
Addition FM Hum and Noise Level 40 dB min. 50 dB P P P P P P P P P	Audio Frequency Harmonic Distortion	5% max	10%	x l	Р	Р	_	_ _	77	80
Audio Frequency Response +1, -3 dB +1, -3 dB X - <td>FM Hum and Noise Level</td> <td>40 dB min.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td>	FM Hum and Noise Level	40 dB min.								1
Frequency Deviation 4.75k ±5% 5 kHz P - - - - 69 - Modulation Limiting 5 kHz max X - - - - - - 65 - Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz 43 dB min. 46 dB P - - - - 96 - Sideband Spectrum-10 kHz -20 kHz 30 dB min. P - - - - - 86 - Antenna Radiation Efficiency 20% P - - - - - 67 - ENVIRONMENTAL SPECIFICATIONS -				• • •		-		1 1	1	-
Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS 43 dB min. 46 dB P 96 - 86 - 86 - 67 - 67 - 67	Frequency Deviation	4.75k ±5%	5 kHz	Р	-	-	-	-	1	-
Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency ENVIRONMENTAL SPECIFICATIONS 43 dB min. 30 dB min. 60 dB min. P 86 86 - 67 - 67 - 67 - 67	Modulation Limiting	5 kHz max.	5 kHz	Х	-	-	-	- -	65	-
Sideband Spectrum-10 kHz		12 40	16 40	n					06	
-20 kHz 60 dB min. P 86 - 67 - 67 - 67 - 67 - 67 - 6			140 ap]	-	l 1	1	l -
Antenna Radiation Efficiency 20% P 67 - ENVIRONMENTAL SPECIFICATIONS		,	. '			-				_
					- ,		-	- -	1 -	-
	ENVIRONMENTAL SPECIFICATIONS		-1			1 .	1.	:		
		-30, +60°C	-30, +60°C							1,
Humidity 50°C, 90% RH			,							

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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.

 ⁼ Transceiver ceased operation. = No environmental test required.

Transceiver ceased operation.No environmental test required.

TRANSCEIVER NO.: 2224	<u> </u>										
				TES	T RESU	LTS			COMP	LIANCE OF	
Motorola MX 320-360	IF ARD	S		E	NVIRON EXTRE	MES	-		ALL R	ADIOS WIT STANDARD (%)	H
	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)		z	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES	
Type II (150-174 mHz)	FORM	JFAC 1FI	ERA	(-30 ERA1	ER#	₹°	岁		RAT	ONM	1
TRANSCEIVER CHARACTERISTIC	PER	MANU	AMBI	EWP	TEMP	11.05 50.04	VOL TAGE	VIBRATION	MB IE	NVIR	
RECEIVER						1		7	∢⊢		\dashv
SINAD Sensitivity Selectivity-	0.5 uV max.	0.35 uV	P	P	P	Р	P	-	100	72	
Usable Bandwidth Adjacent Channel Selectivity Spurious Response Attenuation Intermodulation Attenuation Squelch-	5 kHz min. 70 dB min. 60 dB min. 60 dB min.	7.5 kHz 95 dB 80 dB 80 dB	P P P	P P -	P P -	P P -	-	-	100 88 54 81	68 68 -	
Threshold Squelch Sensitivity Tight Squelch Sensitivity Squelch Block Squelch Attack Time Squelch Release Time Audio Frequency-	0.4 uV max. 4.0 uV max. 5.0 kHz max. 150 ms max. 250 ms max.	0.25 uV	P P P P	P P - -	P	P P -	-	-	100 100 85 100 85	64 72 -	
Audio Output Power-Speaker Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched	500 mW min. 10% max. -10, +2 dB 40 dB min. 50 dB min.	500 mW 5% -10,+2 dB	P P X P	P P - P	P P P P P P P P P P P P P P P P P P P	P P P	P -	-	100 81 58 100	81 76 - 81	
TRANSMITTER							- -		96	73	
RF Carrier- Carrier Output Power (Variance) Carrier Frequency Tolerance AM Hum and Noise Carrier Attack Time Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Frequency Deviation Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency	-0.3, +1 dB 0.0005% 34 dB min. 100 ms max. 5% max. 40 dB min. +1, -3 dB 4.75k ±5% 5 kHz max. 43 dB min. 30 dB min. 60 dB min.	0.0005% 3% 60 dB +1, -3 dB 5 kHz 5 kHz 71 dB	P P P P P P P P P P P P P P P P P P P	P P P	P P P	P P P	P - P	1	58 00 00 00 00 77 58 27 69 65 96 86 86 86	72 40 - - 80 50 - -	
ENVIRONMENTAL SPECIFICATIONS Temperature Humidity	-30, +60°C 50°C, 90% RH	-30, +60°C				-	- -		67	_	

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

FM TRANSCEIVER TEST RESULTS

Transceiver No.: 2225				TEST	PESUL	.TS			IANCE OF
				EN	VIRON	IENTAL			DIOS WITH
Motorola		-]	EXTRE	MES		"""	(%)
MX 320-360	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	· ν_			T	. =		 	1
HA 320-300	10°2	MANUFACTURER'S SPECIFICATION			<u> </u>	품			Ar
	NA C	I RE	188	S 2 2	0 %	28	l I_	2	
	A W	1 5 5	L F	SE SE	1 A E	돌	<u>é</u>		≅s:
Type III (400-512 mHz)	A R R F	I PA	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDIT (50°C, 90% R	VOLTAGE	AMBIENT TEMPERATURE	ENVIRONMENTAI EXTREMES
ijpo ili (100 ota ililia)	E 5	58	MP	- E	골윤	풍임	띒	I I	I Z
TRANSCEIVER CHARACTERISTIC	2 2 E	S A	E E		皇田	Ŧ5	명탕	E E	EE
									
RECEIVER						:			
	-						-		`
SINAD Sensitivity	0.5 uV max.	0.35 uV	Ρ.	Р	P	P	P -	100	72
Selectivity-		İ							
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	Р	- -	88	68
Spurious Response Attenuation Intermodulation Attenuation	60 dB min.	50 dB	Р	-	-	-	1 1	54	· •
Squelch-	60 dB min.	60 dB	Р	-	-	-	- -	81	
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	Р	P	Р	Р	P -	100	64
Tight Squelch Sensitivity	4.0 uV max.	10.20 41	P	P	P	p		100	72
Squelch Block	5.0 kHz max.		P	-	_	-	- -	85	'-
Squelch Attack Time	150 ms max.	· ·	Р		-	_	- -	100	_
Squelch Release Time	250 ms max.	1 1	P		-	-	- -	85	-
Audio Frequency-						, ,		· ·	
Audio Output Power-Speaker	500 mW min.	500 mW	ър	P	Р	P	P -	100	81
Audio Distortion-Speaker	10% max.	10%	P	Р	· p	P	- -	81	76
Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	Р	-	-		- -	58	-
Audio Hum and Noise-Unsquelched	40 dB min.		Р	P	Р	Р.	- -	100	81
-Squelched	50 dB min.		P	P	Р	Р	- -	96	73
TRANCHITTER				,	ĺ		1 (1 1
TRANSMITTER		.							
Rf Carrier-								1	·
Carrier Output Power (Variance)	-0.3, +1 dB		Р	P	P.	P	p _	58	72
Carrier Frequency Tolerance	0.0005%	0.0005%	P	x	P	P	PP	100	40
AM Hum and Noise	34 dB min.	0.0003/6	P	_ ^			[] [100	-
Carrier Attack Time	100 ms max.	1	P	_	_	_	- -	100	
Audio Frequency Modulation-]			1	}
Audio Frequency Harmonic Distort	ion 5% max.	10%	p.	Р	P	-	- -	77	80
FM Hum and Noise Level	40 dB min.	50 dB	p	Ρ.	Р	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	χ		-	-	- -	65	-
Electromagnetic Compatability-	12 dp	49 dB	р	-	!	_	_ _	96	
Radiated Spurious Emissions	43 dB min.	49 05	P		-	_		86	-
Sideband Spectrum-10 kHz -20 kHz	60 dB min.		P	_	-	-		86	-
Antenna Radiation Efficiency	150%		p		-	-		67	
modific margarith Efficiency	30%	ł · · · i	'	-		1	-	"	
ENVIRONMENTAL SPECIFICATIONS					†				
Temperature	-30, +60°C	-30,+60°C				1		1.	
Humidity	50°C, 90% RH			1	1			1	

 ⁼ 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 ultrahigh capacity detachable Ni-Cad batteries. All transceivers are of universal design with and operation of the transceiver in a companion vehicular console.

Transceiver ceased operation. No environmental test required.

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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.

TDANSCETUED NO.									
TRANSCEIVER NO.: 2226				TES	T RESU	LTS		COMP	LIANCE OF
Motorola				E	NVIRON	ΜΕΝΤΔ		── ALL R	ADIOS WITH
MT 500	2			1	EXTRE		_	NIJ	STANDARD
	OF	S			1	1. 5	1		(%)
	A H N	1 2 2	<u>П</u>	~ш	10] <u>E</u> ₩	1 1] ¥
	NE AN	1 58	1 5	0 %	8 5	0 0 0		z 🖁	l k
Type II (150-174 mHz)	J. S. S. S. S. S. S. S. S. S. S. S. S. S.	ŞĒ	R A	RA3	#£	₹°	1 11	P F	IS S
	E OU.	MANUFACTURER'S SPECIFICATION	ME A		노핕	HO.	Ž	ER LA	85
TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	A A	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOL TAGE	VIBRAIION AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
RECEIVER				-			-	4-	шш
					1				1.
SINAD Sensitivity Selectivity-	0.5 uV max.	0.25 uV	P	P	Р	P	_P _	3.00	
Usable Bandwidth		-			'	, r	-	100	72
Adjacent Channel Selectivity	5 kHz min. 70 dB min.	7.0 kHz	P	Р	Р	р	- -	100	68
Spurious Response Attenuation	60 dB min.	80 dB 75 dB	P	Р	Р	Р	- -	1 100	68
Intermodulation Attenuation	60 dB min.	70 dB	PX		-	-		54	-
Squelch-		, o ab	^	-	-	-	- -	81	1 - 1
Threshold Squelch Sensitivity Tight Squelch Sensitivity	0.4 uV max.	0.18 uV	Р	Р	P	Р		1,,,,	1 . 1
Squelch Block	[4.0 uV max.		P	P	P	P	P -	100	64 72
Squelch Attack Time	5.0 kHz max.	1	Р	- 1	- 1	-	- -	85	-
Squeich Release Time	150 ms max. 250 ms max.	1	P	-	-	- 1	-1-	100	-
Audio Frequency-	250 ms max.	1	P	- [-	-	-1-	85	-
Audio Output Power-Speaker	500 mW min.	500 mW	P	Р		_	_	-	
Audio Distortion-Speaker Audio Frequency Response-Speaker	10% max.	5%	p	P	P	P	P -	100	81
Audio Hum and Noise-Unsquelched	-10, +2 dB	-10, +2 dB	Р	- 1	- []	P	- -	81 58	76
-Squelched	40 dB min. 50 dB min.	1. 1	P	p	P	Р	1.	100	81
	JO UB MIN.		. Р	P	P	P	- -	96	73
TRANSMITTER		[1				
RF Carrier-		1			- 1		1		. [
Carrier Output Power (Variance)	-0.3, +1 dB	1			- [1	1	- 1
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P	P	P -	58	72
AM Hum and Noise	34 dB min.	0.0005%	P	Ρ.	P	P .	PP	100	40
Carrier Attack Time Audio Frequency Modulation-	100 ms max.		F	- 1	-	-	- -	100	-
Audio Frequency Harmonic Distortion		1	.	·	-	-	- -	100	-
	5% max.	3%	Р	Р	Р	_	- -	77	80
Audio Frequency Response	40 dB min. +1, -3 dB	55 dB	Р	P	P	_	- P	58	50
rrequency Deviation	4.75k ±5%	+1, -3 dB 5 kHz	X	-		-	- -	27	-
Modulation Limiting	5 kHz max.	5 kHz	P	-		- -	- -	69	[-
Electromagnetic Compatability- Radiated Spurious Emissions		[,	- 1	-	-	-	- -	65	- 1
	43 dB min.	50 dB	Р	- 1	_	_ ,	_ _	06	1
-20 64-	30 dB min.		P	-	- 1		- -	96) 86	-
Antenna Radiation Essiaia	60 dB min. 20%		P	-	Į.	Į	- -	86	-
			Р	-	- .	- '	- -	67	-
ENVIRONMENTAL SPECIFICATIONS Temperature	• _		1.		. -			1	
Humi di +	-30, +60°C	-30, +60°C		}		. .		.	
taran da karantan da karantan da karantan da karantan da karantan da karantan da karantan da karantan da karan	50°C, 90% RH			}	- {				

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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

	1			· ——————					
Transceiver No.: 2227				TEST	RESUL	TS			IANCE OF
				EN	VIRONM	ENTAL			DIOS WITH
Motorola		[]			EXTRE				(%)
MT 500	AR.	ν				. ~		 	
		2 N			S	~ 돌		1.4	I E I
	STA	A E	8	(28	88	28		J. S.	
	EMA	52	⊢ A T	30°A	+6(AT!	3 9	미미	P A	ES
Type III (400-512 mHz)	NIN	E H	E E	- E	_ H	ۍ ≖	A A	E E	25
	8.00 m	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	VOLTAGE VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
TRANSCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	ΣS	₹F		宝芹	모반	> >	₹ F	ត់ល
RECEIVER	1							i .	
SINAD Sensitivity	0.5 uV max.	0.35 uV	р.	·p	P	р	Р -	100	72
Selectivity-	U.S UV Max.	0.55 uv		•		٠ ا			'-
Usable Bandwidth	5 kHz min.	7.5 kHz	Р.	ŗ.	P	P	_ _	100	68
Adjacent Channel Selectivity	60 dB min.	70 dB	Р	P	P	P	_ ,	88	68
Spurious Response Attenuation	60 dB min.	70 dB	Ρ.	-	_ ·	-	- -	54	-
Intermodulation Attenuation	60 dB min.	70 dB	P	.	-	-		81	-
Squelch-							1	1	
Threshold Squelch Sensitivity	0.4 uV max.	0.25 uV	P.	Р	Р	Р	P -	100	64
Tight Squelch Sensitivity	4.0 uV max.	'	P	, Р	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-	500 -U	500 mW	Р	Р	Р	P	Р -	100	81
Audio Output Power-Speaker	500 mW min. 10% max.	5% IIW	P	P	P	P		81	76
Audio Distortion-Speaker Audio Frequency Response-Speaker	-10, +2 dB	-10, +2 dB	Ρĺ	-	_		- -	58	'-
Audio Hum and Noise-Unsquelched	40 dB min.	10, 12 00	þ l	Р	Р	Р	_ _	100	81
-Squelched	50 dB min.	'	P	P	p	P	- -	96	73
oquationas .	33 33 11(11)	1 1			. `		1 1		1 1
TRANSMITTER		1 1							
				:					
RF Carrier-]	_	_	_				72
Carrier Output Power (Variance)	-0.3, +1 dB	0.00054	P	P	P	P	P - P P	58 100	40
Carrier Frequency Tolerance	0.0005%	0.0005%	P	P	P -	. P	P P	100	+0
AM Hum and Noise	34 dB min. 100 ms max.		P	-	_	_		100	-
Carrier Attack Time	TOU MS Max.		r	-		_	- -	100	
Audio Frequency Modulation- Audio Frequency Harmonic Distortion	5% max.	3%	Р	P	Р		_ _	77	l 80 l
FM Hum and Noise Level	40 dB min.	55 dB	P	P	Р	Р	_ p	58	50
Audio Frequency Response	+1, -3 dB	+1, -3 dB	χ	_	_		- -	27	- 1
Frequency Deviation	4.75k ±5%	5 kHz	P	-	-	-	- -	69	-
Modulation Limiting	5 kHz max.	5 kHz	Х	-	-	-	- -	65	-
Electromagnetic Compatability-		1						1	\
Radiated Spurious Emissions	43 dB min.	50 dB	Р	-			- -	96	-
Sideband Spectrum-10 kHz	30 dB min.		P	-	-	-	- -	86	-
-20 kHz	60 dB min.		P	-	-	-		86	-
Antenna Radia* n Efficiency	50%	}	P	-				67	-
CHAIDONNENTS: CDECIFICATIONS	1							1 .	
ENVIRONMENTAL SPECIFICATIONS Temperature	-30, +60°C	-30, +60°C	.	. '					[
Humidity	50°C, 90% RH	[55, 155 6]							
munitar of	30 0, 30% KI	1	نـــــا		L				

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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.

^{@ =} Transceiver ceased operation.- = No environmental test required.

Transceiver ceased operation. No environmental test required.

Transceiver No.: 2230		T	T	Tre	T DEC.	LTC			COUR	Tance c-
			 		T RESU				ALL D	LIANCE OF ADIOS WIT
General Electric			1	` E	NVIRON				NT.I	STANDARD
MASTR "PE" PE65RB					EXTRE	MES				(%)
The state of the s	0.0	S ×	1		T	> 🗭	T	T		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	A A E		l w	_ nu	(C) m	<u> _</u>		i l		l ₹
	A H S	25		0 5	185	128	ĺ	2	<u> </u>	E
Type III (400-512 mHz)	I J	SAF	FE	-3 RA	E E	HUMIDITY 3, 90% RH)	띯	읩	T A	E S
	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	BIE ME) H	표필	150 20	VOL TAGE	VIBRATION	品品	I SE
TRANSCEIVER CHARACTERISTIC	무말	S A A	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUN (50°C, 9	Š	VIB	AMBIENT TEMPERATURE	ENVI RONMENTAL EXTREMES
RECEIVER										
SINAD Sensitivity	0.5	0.05 11								1
Selectivity-	0.5 max.	0.35 uV	P	Р	P	P	P	-	100	72
Usable Bandwidth	5 kHz min.	7 kHz	P							
Adjacent Channel Selectivity	60 dB min.	70 dB	P	P	P	P	-	-	100	68
Spurious Response Attenuation	60 dB min.	60 dB	ĺχ		-	P ~	-	-	88 54	68
Intermodulation Attenuation Squelch-	60 dB min.	65 dB	P	i		_			54 81	
Threshold Squelch Sensitivity		1	1	1				-	Q1	-
Tight Squelch Sensitivity	0.4 uV max.	0.2 uV	P	Р	P	Р	Р	-	100	64
Squeich Block	4.0 uV max. 5.0 kHz max.		P	Р	P	Р	-	-	100	72
Squelch Attack Time	150 ms max.		X	-	· - i	-	-	-	85	
Squeich Release Time	250 ms max.		P	- 1			-	-	100	_
Audio Frequency-	250 ms max.		P	-	-	- 1	·- [-	85	i -
Audio Output Power-Speaker	500 mW min.	500 mW	Р	Р		_				
Audio Distortion-Speaker	10% max.	5%	P	P	P	P P	P	-	100	81
Audio Frequency Response-Speaker	-10, +2 dB	-10,+2 dB	P	_	[]	_	- 1	-	81 58	76
Audio Hum and Noise-Unsquelched	40 dB min.	,	P	Р	P	P	-	-	100	81
-Squelched	50 dB min.		Р	р	Р	P		_	96	73
TRANSMITTER						. 1			- 20	, /,3
				. }			l	-	.	
RF Carrier-]		ļ		1	ĺ		i	
Carrier Output Power (Variance)	-0.3, +1 dB		Р	P.	- x		. 1	·]		
Carrier Frequency Tolerance	0.0005%	0.0005%	Р	F	P	P		- x	58	72
AM Hum and Noise Carrier Attack Time	34 dB min.		P	_		. ,		^	100	40
Audio Frequency Modulation-	100 ms max.	[•]	P	-	-	- 1	_ :		100	- 1
Audio Frequency Harmonic Distortion	 ca	1	1	ļ	ļ	- 1	- 1	.	.00	-
rM Hum and Noise Level		8%	X	P	Р	- j		-	77	80
Audio Frequency Response	40 dB min. +1, -3 dB	50 dB	X	X	X			(58	50
Frequency Deviation	4.75k ±5%	+1, -3 dB 5 kHz	X	-	- 1	1	- -		27	
Modulation Limiting	5 kHz max.	5 kHz	P	-			- -	1	69	
Electromagnetic Compatability-	= , HING HILLA	1 1112	P	- 1	- [-	- -	-	65	-
Radiated Spurious Emissions	43 dB min.	50 dB	Р	_		Í			05	
Sideband Spectrum-10 kHz	30 dB min.		Р	_	-		- -		95	-
-20 kHz Antenna Radiation Efficiency	60 dB min.		x I	_	_		- -	- 1	86 86	- 1
Autocinia Nadiacion ETTICIENCY	50%		X	- 1		- 1			67	-
ENVIRONMENTAL SPECIFICATIONS				1			.] ~		٠	-
Temperature	30 16000	20 .520-				1				
Humidity	-30, +60°C 50°C, 90% RH	-30, +60°C								
· · ·	50 0, 50% KH					. -	1	1		. 1

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			-	TEST	RESUL	TS	1		IANCE OF
General Electric MASTR MVP	IRD			EN	V I RONM EXTREI	MES	:	NIJS	DIOS WITH TANDARD (%)
	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	URE	JOC.) URE	10°C) TURE	HUMIDITY C, 90% RH)	N N	URE	ENVI RONMENTAL EXTREMES
Type II (150-170 mHz)	FORMA UIREN	UFACT	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUN (50°C, 9	VOLTAGE VIBRATION	AMBIENT TEMPERATURE	/I RONN
TRANSCEIVER CHARACTERISTIC	PER THE	MAN	AME TEN		当中	HE 02	<u> </u>	₩ H H H	EXE
RECEIVER									
SINAD Sensitivity Selectivity-	0.5 uV max.	0.25 uV	P	n ·	n	n	P -	100	72
Usable Bandwidth Adjacent Channel Selectivity Spurious Response Attenuation Intermodulation Attenuation Squelch-	5 kHz min. 70 dB min. 60 dB min. 60 dB min.	7.0 kHz 75 dB 70 dB 60 dB	P X P P	n n -	n n -	n .	 	1 00 88 54 81	68 68 - -
Threshold Squelch Sensitivity Tight Squelch Sensitivity Squelch Block Squelch Attack Time Squelch Release Time	0.4 uV max. 4.0 uV max. 5.0 kHz max. 150 ms max. 250 ms max.	0.15 uV	P P P P	n n -	n n - -	n n - -	P - 	100 100 85 100 85	64 72 - - -
Audio Frequency- Audio Output Power-Speaker Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched	500 mW min. 10% max. -10, +2 dB 40 dB min. 50 dB min.	500 mW 5% -10,+2 dB	P P P P	n n - n	n n - n	n n n n	P	100 81 58 100 96	81 76 - 81 73
TRANSMITTER									
RF Carrier- Carrier Output Power (Variance) Carrier Frequency Tolerance AM Hum and Noise Carrier Attack Time	-0.3, +1 dB 0.0005% 34 dB min. 100 ms max.	0.0005%	P P P	n n - -	n n 	n n -	P - X	58 100 100 100	72 40 -
Audio Frequency Modulation— Audio Frequency Harmonic Distortic FM Hum and Noise Level Audio Frequency Response Frequency Deviation Modulation Limiting	5% max. 40 dB min. +1, -3 dB 4.75k ±5% 5 kHz max.	8% 55 dB +1,-3 dB 5 kHz 5 kHz	X X X P P	n n - -	n n - -	- n -	- X 	77 58 27 69 65	80 50 - -
Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency	43 dB min. 30 dB min. 60 dB min. 20%	60 dB	n P P n	-	-	-		96 86 86 67	-
ENVIRONMENTAL SPECIFICATIONS Temperature Humidity	-30, +60°C 50°C, 90% RH	-30,460°C	, ,						

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

Transceiver ceased operation.No environmental test required.

 ⁼ Transceiver ceased operation. = No environmental test required.

n = No test was conducted.

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.

Transceiver No.: 2232			T	TEC	T DECU		·		COMP	LYANGE	_
		1			T RESU			_	ALL D	LIANCE OF	
General Electric	1.	1	ļ	ENVIRONMENTAL EXTREMES					ALL RADIOS WITH NIJ STANDARD		
MASTR MVP PY65YB	82	1						Í	MID	(%)	j
	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	1		1	T. =	T				_
	∺F§	유합	ш		10	HUMIDITY C, 90% RH)		ĺ		=	-
	SER	AT A	l R	20.85	10 8	20%	İ	i I	띮	E	1
Tuno III (450 510)	8 2	153	FE	85	195	₹8	1	5	2	一覧。	1
Type III (450-512 mHz)	O II	E F	E E	ER.	⊥≅] ≓ ∴	병		Z Z	N N N	1
TRANSCEIVER CHARACTERISTIC	2.50 中	20	B M	- Id	동 등	33	I	₽¥	띮띲		1
THANGOLIVER CHARACTERISTIC	2 % F	S S	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	НІСН НО (50°С,	VOLTAGE	VIBRATION	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES	-
RECEIVER					 		1-	-		шш	╛
]		1					İ	
SINAD Sensitivity	0 5 4				1 1						1
Selectivity-	0.5 uV max.	0.35 uV	P	р.	Р	P	Р	- 1	100	70	
Usable Bandwidth	T					• •	'	- [100	72	Į.
Adjacent Channel Selectivity	5 kHz min.	7 kHz	P	Р	l pl	P	- 1	-	100	60	
Spurious Response Attenuation	60 dB min.	70 dB	P	P	P	P	_	-	88	68 68	
Intermodulation Attenuation	60 dB min.	60 dB	X		-	-	-	_	54	08	ı
Squeich-	60 dB min.	60 dB	Ρj	-	_	- 1	_]	_	81		1
Threshold Squelch Sensitivity	0.4 uV max.	0.05 11.	.]			[ļ		٥.	-	
11900 Squeich Sensitivity	4.0 uV max.	0.25 uV	Р	P	P	P	Р	-	100	64	
Squeich Block	5.0 kHz max.		Р	Р	P	P		-	100	72	ļ
Squelch Attack Time	150 ms max.] }	P	-	-	-	-	-	85	-	
Squeich Release Time	250 ms max.		Р	-	- (- (- 1	-	100		
Audio Frequency-	Loo ins max.	1 1	Р	- 1	- j	-	- -	-	85	· -	ĺ
Audio Output Power-Speaker	500 mW min.	500 mW	Р	_ [- [- 1		- 1		
Audio Distortion-Speaker	10% max.	5%	P	P	Р		P	-	100	81	
Audio Frequency Response-Speaker	1-10. +2 dB	-10, +2 dB	P	P	P	,		-	81	76	1
Add to num and Noise-Unsquelched	40 dB min.	10, 12 05	P	- P	-	- 1	- [-		58	_	l
-Squelched	50 dB min.	1 . 1	5	P	P		- -	٠ `	100	81	ĺ
TRANSMITTER	71111	1 . 1.	· .	P	P	P	- -	-	96	73	ĺ
THURSTITIEN		[]		- 1	}·			.			
RF Carrier-				1	- 1	1	1	1			
Carrier Output Power (Variance)		l	1	1		- 1	-	1		ł	
Carrier Frequency Tolerance	-0.3, +1 dB	1	X	P	Р	Р	, _	1 .	58		
AM HUM and Noise	0.0005%	0.0005%	Ρ.	P	P	PF			00	72	
Carrier Attack Time	34 dB min.		P	[-	-	1.	4 .	00	40	
Audio Frequency Modulation	100 ms max.	} }	n	- {	- 1	- 1-			00	_	
Audio Frequency Harmonic Dictortion	59 may			-	I		-			- 1	
	40 dB min.	8%	Х	Х	P	- -	. _	1.	77	80	
Audio Frequency Response		40 dB	X	X	X	X -	l x	1	58	50	
rrequency Deviation	4.75k ±5%	+1, -3 dB 5 kHz	X	-		- -			27	-	
Modulation Limiting	5 kHz max.	5 kHz	X	- 1		- -	. -	1	69	_	
Electromagnetic Compatability-	KIIZ MAX.	3 KHZ	Р	-	-	- -	-	1	65	_	
Radiated Spurious Emissions	43 dB min.	50 dB	_ [.	!		.					
Sideband Spectrum-10 kHz	30 dB min.	22 00	n P	-	-	- -	- }	1 :	96	-	
	60 dB min.	. }	P	-	1	- -	-		86	-	
Antenna Radiation Efficiency	50%		n	-		- -	-		86	-	
ENVIRONMENTAL SPECIF CATIONS		· · · · · · · · · · · · · · · · · · ·	" [-	-	- -	-	(67	-	
	1		1	1	1 .		1	j			
Humanda.	-30, +60°C	30, +60°C		1		1.	1	ļ			
	50°C, 90% RH		- 1			- 1	1.	1		. 1	

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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 l 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				TEST	RESUL	.TS			IANCE OF DIOS WITH	
General Electric	Q.			EN	VIRONM EXTRE			NIJ STANDARD (%)		
MASTR "PE"	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	ION	tut.		Ω	rTY RH)			IA!	
	MANCI EMEN J ST/	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	C, 90% RH)	I ON	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES	
Type II (150-174 mHz)	RFORF SUIRE NIA	NUFAC	SIEN'	4 (-: MPER/	3H (-	3H C	VOL TAGE VIBRATION	31EN	VIRO	
TRANSCEIVER CHARACTERISTIC	<u> </u>	SPI	AMI	LOI	보면	нтен (50°с	VI	AMI	EE	
RECEIVER			:							
SINAD Sensitivity Selectivity-	0.5 uV max.	0.35 uV	Р	, P	Р	P	P -	100	72	
Usable Bandwidth Adjacent Channel Selectivity Spurious Response Attenuation	5 kHz min. 70 dB min. 60 dB min.	7.0 kHz 85 dB 80 dB 75 dB	P P P	P & -	64 63 -	P P -		1 00 88 54 81	68 68 -	
Intermodulation Attenuation Squelch-	60 dB min.	0.25 uV	r · p	 Р	- 8	P	P -	100	-	
Squelch Block Squelch Attack Time	0.4 uV max. 4.0 uV max. 5.0 kHz max. 150 ms max. 250 ms max.	0.25 uv	P X P	P -	P -	P		100 100 85 100 85	64 72 - -	
Audio Frequency- Audio Output Power-Speaker Audio Distortion-Speaker Audio Frequency Response-Speaker Audio Hum and Noise-Unsquelched -Squelched	500 mW min. 10% max -10, +2 dB 40 dB min. 50 dB min.	500 mW 5% -10, +2 dB	P X P P P	P P P R	P P - P	р Р - Р	P	100 81 58 100 96	81 76 - 81 73	
TRANSMITTER										
RF Carrier- Carrier Output Power (Variance) Carrier Frequency Tolerance AM Hum and Noise Carrier Attack Time	-0.3, +1 dB 0.0005% 34 dB min. 100 ms max.	-0.3,+1 dB 0.0005%	X P P	P P -	P P -	P P -	P - P	58 100 100 100	72 40 -	
Audio Frequency Modulation- Audio Frequency Harmonic Distortion FM Hum and Noise Level Audio Frequency Response Frequency Deviation	40 dB min. +1, -3 dB 4.75k ±5%	8% 55 dB +1, -3 dB 5 kHz	P X X	X X - -	P. P	р -	- X	77 58 27 69	80 50 - -	
Modulation Limiting Electromagnetic Compatability- Radiated Spurious Emissions Sideband Spectrum-10 kHz -20 kHz Antenna Radiation Efficiency	5 kHz max. 43 dB min. 30 dB min. 60 dB min. 20%	5 kHz 50 dB	X P P X				1 1 1	65 96 86 86 67	-	
ENVIRONMENTAL SPECIFICATIONS Temperature Humidity	-30, +60°C 50°C, 90% RH	-30,+60 ⁰ C		in the second se						

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 widespaced frequencies.

n = No test was conducted.

Transceiver ceased operation.= No environmental test required.

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

Transceiver ceased operation.No environmental test required.

n = No test was conducted.

		ححث حدث	,								
TRANSCEIV	ER NO.: 2234				TEST	RESUL	.TS		1		IANCE OF
			}		ENVIRONMENTAL				ALL RADIOS WITH NIJ STANDARD		
General E	lectric	9			r	EXTRE	MES		}		(%)
MASTR "PE		AR.	ν ₋			1	T =	П	-1	,	
		ANI	IO	ш	~ш	C III			{		
		SHE	AT A	UR	O'C UR	85	28	1 1	٤ ا	ž	
		A SHIP	25.	F.X	%-33	£.₹	[<u>\$</u> ° °	끯	Ħ	₽ \ 	\$ E
	Type I (25-50 mHz)	O'IN	CII	IEI PEI) H	포띺	±0	VOL TAGE	VIBRATION	HE	RE
TRAN	SCEIVER CHARACTERISTIC	PERFORMANCE REQUIREMENT OF THE NIJ STANDARD	MANUFACTURER'S SPECIFICATION	AMBIENT TEMPERATURE	LOW (-30°C) TEMPERATURE	HIGH (+60°C) TEMPERATURE	HIGH HUMIDITY (50°C, 90% RH)	힣	7	AMBIENT TEMPERATURE	ENVIRONMENTAL EXTREMES
							-				
RECEIVER									Ì		
SINAD Sen	sitivitv	0.5 uV max.	0.25 uV	Р	6	P	Р	P.	-	100	72
Selectivi			1			Ì					
	Bandwidth	5 kHz min.	6.5 kHz	P	Δ	Ρ.	P	-	-	100	68
	t Channel Selectivity	60 dB min.	60 dB	P.	4	Р	P	-	-	88	68
	s Response Attenuation Julation Attenuation	70 dB min. 70 dB min.	70 dB 70 dB	P	_		-	-	-	54 81	-
Sauelch-	iuracion Accenuacion	TO UB IIIII.	70 45	^.	. - .	-	} -		- 1	01	-
	ld Squelch Sensitivity	0.3 uV max.	0.15 uV	р	. 61	Р	Р	P	- 1	100	64
	quelch Sensitivity	3.0 uV max.		Р	8	P	P	1-	- 1	100	72
Squelch		5.0 kHz max.	} .	Χ	-	-	-	-	-	85	-
	Attack Time	150 ms max.	. 1	Р	-	 -	-	-	- 1	100	}
	Release Time	250 ms max.	} ' '	Р	-	-	-	-	-	85	- {
Audio Fre	queпсу- utput Power-Speaker	500	F00						1	100	.,
	istortion-Speaker	500 mW min.	500 mW	P	<u>8</u>	P	P P	P	-	100 81	81 76
	requency Response-Speaker	-10, +2 dB	-10, +2 dB		-	P		- -	_	58	70
	ım and Noise-Unsquelched	40 dB min.	-10, 12 00	P	- 6	P	P		_]	100	81
	-Squel ched	50 dB min.		P		P	P	- -	-	96	73
TRANSMITT	P D								- {		
Tradistri i	<u>-6</u>		}						.		
RF Carrie						}		1	1		
	Output Power (Variance)	-0.3, +1 dB	0000	X	4	8	P	P	-	58	72
	Frequency Tolerance	0.002%	0.002%	Р	8	@	Р	P	X	100	40
	Attack Time	34 dB min. 100 ms max.		P	- '	-	- 1	<u> -</u>	-	100 100	-
	quency Modulation-	TOO IIIS IIIAX.		P	-,	-		-	7	1.00	i - 1
	requency Harmonic Distortion	5% max.		р	8	6		-	-	77	80
FM Hum a	and Noise Level	40 dB min.	50 dB	Х	Ø	<u>a</u>	P	-	x l	58	50
	requency Response	+1, -3 dB	+1, -3 dB	Χ	-	-	-	-	- 1	27	-
	y Deviation	4.75k ±5%	0-5 kHz	Х	-	- 1]- [-	69	-
	ion Limiting gnetic Compatability-	5 kHz max.	5 kHz	Р	-	-	- .	-	-	65	-
	Spurious Emissions	43 dB min.	47 dB	_				1	-	96	
	Spectrum-10 kHz	125 dB min	T/ . UD.	n P	-	-	-	-	- 1	86	_
	-20 kHz	50 dB min.		P	-	-	} -	1-1	-	86	_
Antenna Ra	diation Efficiency	N/A		N/A	-	-		-	-	N/A	-
ENVIRON	MENTAL SPECIFICATIONS] }	•	-	
	perature	-30, +60°C	-30,+60°C				}	1	1		
	nidity	50°C, 90% RH							. [
							ــــــــــــــــــــــــــــــــــــــ	است			

P = Requirement of the NIJ Standard was met. X = Requirement of the NIJ Standard was not met.

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^{@ =} Transceiver ceased operation. - = No environmental test required.

n = No test was conducted.

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.

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