

Airborne and Ground Air Traffic Control
Radio Communications Equipment
Technical Characteristics

Volume II

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Task 2 and Task 4

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PREFACE

This report has been compiled in accordance
with the requirements set forth in contract

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of the

FEDERAL AVIATION AGENCY

to the

RCA SERVICE COMPANY

March, 1959

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SECTION A

INTRODUCTION

1. Scope. The Federal Aviation Agency, Washington, D. C., through its Bureau of Research and Development, awarded the Air Traffic Control Communications Contract FAA/BRD-60 to the Radio Corporation of America Service Company, Cherry Hill, New Jersey. This contract was performed in conjunction with the counterpart Navigational-Aid Equipment Contract FAA/BRD-61; the joint effort was known as Project DANCE (Domestic Airways Navigation and Communication Evaluations).

Contract FAA/BRD-60 provides on a national scale, the air traffic control communications information required to determine the optimum utilization of present communications equipment. In addition, information supplied by this contract may be utilized in the development of air traffic control communications concepts, doctrine, frequency allocation procedures, and in the formulation of parameters for the proposed automatic or semi-automatic air traffic control communications environment.

Specifically, Contract FAA/BRD-60 was divided into four tasks:

Task 1, Airborne Equipment Distribution, contains tabulations defining the quantity and distribution of airborne LF, MF, HF, VHF, and UHF communications equipment presently in use in the three fleets (Military, Commercial, and General Aviation) comprising the aviation community.

Task 2, Airborne Equipment Characteristics, contains a detailed laboratory analysis under standard test conditions of a representative number of significant types of airborne VHF and UHF radio communications equipment. A realistic determination was made of actual equipment operating characteristics by performing field tests and when the results were compared with laboratory findings, the degree of degradation was determined.

Task 3, Ground Equipment Distribution, indicates the geographic distribution, through a series of maps, of the ground communications stations presently in use for air traffic control purposes. Each air traffic control station displayed on the geographic distribution maps is entered on either enroute or terminal tabulations which define the function and quantity of each type VHF and/or UHF communications equipment at that station.

Task 4, Ground Equipment Characteristics, is a tabulation of technical characteristics of the ground radio equipment presently employed in air traffic control communications.

Volume II of Contract FAA/BRD-60 contains Task 2 and Task 4, inclusive.

2. Data Sources. Data was obtained through the following primary sources:

USA:

Through the Office of the Chief Signal Officer, Combat Development and Operations Division, Signal Aviation Branch. This office processed requests for technical manuals, laboratory test data, and other technical information relating to equipments used by the Army.

USN:

Through the Office of the Chief, Bureau of Aeronautics, Avionics Division. This office processed requests for technical manuals, laboratory test data, and other technical information relating to equipments used by the Navy.

USAF:

Through Headquarters, United States Air Force, Office of the Director for Maintenance Engineering, and through Headquarters, Airways and Air Communications Service. These offices processed requests for technical manuals, laboratory test data, and other technical information relating to equipments used by the Air Force.

Airlines:

Through the offices of the individual communications directors, managers, or superintendents, and Aeronautical Radio, Incorporated. Aeronautical Radio, Incorporated, supplied the bulk of the ground equipment technical information required for ARINC stations. This was supplemented by information obtained from commercial manufacturers.

Other Commercial Carriers, General Aviation Fleet, State and Municipal:

For these categories of operators, technical information was obtained from commercial equipment manufacturers and individual operators.

FAA:

Through the Bureau of Facilities, Systems Equipment Division, Communications Engineering Branch. Technical information for equipments concerned was obtained from manuals maintained in this office.

ASD:

This facility (Airborne Systems Division, Defense Electronics Products, Radio Corporation of America) performed all laboratory and field testing of the significant airborne equipments and supplied the detailed analysis of each of the significant equipment types.

Miscellaneous:

In addition to these primary sources, additional technical information was obtained from technical libraries of the military departments, the Library of Congress, the National Archives, commercial repair stations serving the general aviation community, and from individuals.

3. Format. Formats used for data presentation have been carefully designed to be complete, easy to read, and as self-explanatory as possible. Bar-graphs have been used extensively in presenting the results of laboratory testing of significant airborne equipments. Tabulated information originally requiring a large typing area has been photo-reduced to single page size in order to eliminate fold-out sheets.
4. References. References are found in Volume II, FAA/BRD-60, Section D. Included in this section are applicable extracts from appropriate RTCA and RCA papers governing certain laboratory tests performed under this contract.

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AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

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SECTION B

AIRBORNE COMMUNICATIONS EQUIPMENT CHARACTERISTICS

(Task 2)

1. General and Statistical Information.

a. Introduction - The Airborne Systems Division provided assistance to the RCA Service Company under Task 2 of the Federal Aviation Agency Contract No. FAA/BRD-60, Data Analysis of Airborne Communications Equipment. Under this contract, the responsibilities of the Airborne Systems Division included:

(1). Determination of the sampling rates of the various airborne communication equipments in civil and military use.

(2). Performance of laboratory and field tests in accordance with the contract and applicable papers of the Radio Technical Commission on Aeronautics.

(3). Collection and tabulation of the accumulated data for use by the FAA.

(4). Analysis of the individual and weighted characteristics with the intent of ascertaining factors which contribute to degradation of performance.

b. Test Program.

(1). Selection of Samples - The determination of the equipments and numbers of samples to be tested was based on a consideration of the various equipment types to be investigated and the time period involved. It was determined that approximately 100 communication equipments could be tested in the laboratory and in the field. This number would include the following equipment functions: (1). UHF Transmitters, (2). UHF Receivers, (3). VHF Transmitters, and (4). VHF Receivers which are new, in use, and "ready for issue" (RFI).

The tabulation of airborne communication equipments prepared by the RCA Service Company was used to prepare separate lists for the four equipment functions. The numerical quantities were weighted according to approximated use as follows:

<u>CATEGORY OF EQUIPMENT</u>	<u>WEIGHTING FACTOR</u>
Commercial Airlines (AL)	20
Military (MIL)	5
General Aviation Fleet (G)	1

The three equipments of each function with the highest weighted quantities were selected for the test program. In each of the UHF Functions, however, the selection was limited to two equipments which represented about 90% of the numerical total. (Note: UHF equipments were all military and the numerical and weighted ratings are the same.) This permitted increasing the number of VHF equipments from three to four for each function. Additions to the selections were made at FAA request. The breakdown of the final selections is as follows:

UHF Transmitters-----2 equipments (2 MIL)
UHF Receivers-----2 equipments (2 MIL)
VHF Transmitters-----5 equipments (2 MIL, 1 AL, 2 G)
VHF Receivers-----6 equipments (2 MIL, 1 AL, 3 G)

New equipments were obtained from various government and commercial sources. In-Use equipments were those actually installed and being used in operating aircraft. RFI equipments were those that had been received for repair-adjustment and were available for installation or replacement.

(2). Test Methods - Tests of the equipment characteristics, itemized under Task 2 of the contract, were conducted in accordance with the following Radio Technical Commission on Aeronautics papers:

87-55/DO-64 - Minimum Performance Standards - Airborne
Radio Communication Receiving Equipment.

88-55/DO-65 - Minimum Performance Standards - Airborne
Radio Communication Transmitting Equipment.

In addition, susceptibility of receivers to radar-type signals was determined by methods developed at RCA.

The tests prescribed in the above listed papers provide a common denominator by which equipments can be evaluated. Certain of the tests, however, are considered to be measures of design parameters, and therefore were performed in the laboratory on only one equipment of each type. These tests were:

Transmitters - Residual Radiation
Spurious Radiation

Receivers - Spurious Responses
Cross Modulation
Desensitization
Emission of RF Energy
Radar Interference Susceptibility

The transmitter carrier noise test, although considered to be a test of a design feature, was performed in the laboratory and in the field.

The following tests were performed according to RCA specifications.

Transmitters. Channel Repeatability

An actual channel frequency was measured. The transmitter was detuned to the frequency furthest away in the range, then reset to the original nominal frequency and the actual frequency was measured again. The deviation in actual frequency was recorded as a measure of channel repeatability.

Transmitter. Channel Accuracy

The initial and repeated actual frequencies measured under Channel Repeatability were averaged, and the difference between the nominal frequency and the numerical average of the two measured frequencies was recorded as a measure of channel accuracy. The applicable military or manufacturer's specifications were used to determine the actual equipment performance.

Receiver. Channel Repeatability

A signal of 25 microvolts, modulated 30 percent at 1,000 cps, was injected into the receiver and the signal generator tuned until receiver peak power output was obtained. The receiver was detuned to the frequency furthest away in the range, then reset to the original nominal frequency, and the new power output was recorded. The change in the receiver power output was noted as a percentage of the original receiver power level.

Receiver Response to Radar-Type Signals

A modulated RF signal was injected into the receiver and adjusted to produce receiver peak output. The RF signal was removed and a radar-type signal having a level of 3.5 volts (open circuit) and pulse modulated at 1000 pulses per second with a 0.5 microsecond pulse width was applied over the range from 100 to 2000 mc. The receiver was considered to be susceptible to the radar signals when the rated output was exceeded.

(3). Test Equipment - The following equipments were used in the test program:

LABORATORY TESTS

<u>Equipment</u>	<u>Model</u>
Amplitude Modulation Monitors (2)	New London 252

Wattmeter (2)
 Phantom Microphone
 Electronic Frequency Counter
 Frequency Converter Unit
 Frequency Converter Unit
 Oscilloscope
 Preamp Plug-in Unit
 Distortion Analyzer
 Transfer Oscillator
 Audio Oscillator
 Signal Generator, VHF
 Output Power Meter
 VTVM
 VTVM
 Multimeter

Bird (43)

 HP524B
 HP525A
 HP525B
 Tektronix 545
 Tektronix 53/54C
 HP330B
 HP54-A
 HP201B
 HP608C
 GR-583A
 Ballantine 300
 RCA WV-97A
 Simpson 260

FIELD TESTS

Equipment

 Electronic Frequency Counter
 Frequency Converter Unit
 Frequency Converter Unit
 Oscilloscope
 Preamp Plug-in Unit
 Distortion Analyzer
 Transfer Oscillator
 Amplitude Modulation Monitor (2)
 Audio Oscillator
 Signal Generator, VHF
 D.C. Power Supply
 Phantom Microphone
 Wattmeter, RF
 Output Power Meter
 VTVM
 VTVM
 VTVM
 Volt Meter, D.C.
 Multimeter
 Variac

Model

 HP524B
 HP525B
 HP525A
 Tektronix 545
 Tektronix 53/54C
 HP330B
 HP540A
 New London 252
 HP200C
 HP608C
 Perkins M60V

 Thuline 612
 GR 583A
 HP400D
 Ballantine 300
 RCA WV-97A
 Weston 931
 Simpson 260
 GR

(4). Laboratory and Field Tests - Tests of new equipments were made in the laboratory at Camden, New Jersey. In-Use and RFI equipments were tested in the field in accordance with the following itinerary:

<u>Dates</u>	<u>Facility Visited</u>
9/28 - 10/5	Monmouth County Airfield, Belmar, N. J.
10/6 - 10/19	McGuire AFB, N. J.
10/28 - 11/4	Maxwell AFB, Ala.
11/5 - 11/6	Fort Rucker, Ala.
12/16 - 1/5	Miami Int'l. Airport

The navigation equipments were tested in the field at various facilities, some of which are included in the preceding list. The results are included in Report FAA/BRD-61.

It was intended to test equipments at facilities which handled relatively large numbers of the selected types. The choice of facilities was restricted, however, by the allotted time, distance to facilities, availability of equipment, and cooperation of the agency to be visited. The latter two factors were determined from a survey made by the Airborne Systems Division.

As expected, the greatest difficulty was encountered in obtaining general fleet equipments for field tests. Because of the private-shop type of facility for the maintenance of these equipments, there is no established, periodic check-up for such equipments, and it was often necessary to wait for them to be brought into the shop for servicing. This made it very difficult to obtain RFI samples for testing.

c. Test Results .

(1). General - The data taken in the laboratory and in the field, called raw data, was processed in order to arrive at a logical and orderly presentation of useful information discussed and evaluated in following sections. The final individual and composite graphs are discussed for each equipment by function. These graphs are included in this report.

(a). Presentation of Data.

1. Reduced Data - The reduction of the basic data permits a comparison of equipments on the basis of how well they meet their requirements. RTCA requirements are used for this purpose where applicable. However, as in selectivity, where the RTCA requirement is not applicable, the pertinent military or manufacturer's requirement is used. The average, or arithmetic mean, of the measurements of any characteristic is simply converted into a percentage, setting the specification (or standard) requirement equal to 100%. For example, with a rated power output of 9 watts, an average power output of 12 watts would be $100\% + 3/9 = 133\%$. Similarly, an average power output of 8 watts would be equivalent to $100\% - 1/9 = 89\%$.

As another example, consider sensitivity. Sensitivities less than the rated or required maximum value are considered desirable. Thus, a sensitivity of 4 microvolts, where 5 microvolts maximum is specified, is the equivalent of $100\% + 1/5 = 120\%$. A sensitivity of 7 microvolts is equal to $100\% - 2/5 = 60\%$.

One graph for each function shows a plot of the reduced values of those characteristics which contribute significantly to degradation of equipment performance.

2. Weighted Data - In order to obtain an estimate of equipment degradation and to make a comparison of the overall performance of equipments by function or by category (Military, Commercial Airlines, or General Aviation Fleet), the performance characteristics of the transmitters and receivers were weighted on the basis of their estimated relative importance to overall performances. The following is a sample weighting chart:

<u>Transmitters</u>	<u>Weighting</u>	<u>Receivers</u>	<u>Weighting</u>
Channel Accuracy	25%	Sensitivity	25%
Modulation Characteristics	25%	Selectivity	25%
Power Output	25%	Gain	10%
Audio Distortion	15%	Audio Frequency	
		Response	10%
Channel Selection Time	10%	Distortion	10%
		Channel Selection	
		Time	10%
		AVC	10%

The total weight values were graphed for New, In-Use, and RFI equipment status. A single plot of the weighted values for all the communication equipments tested is also included. Caution must be exercised in comparing equipments on the basis of weighted values, because many equipments did not have common characteristics, and the weighting had to be redistributed accordingly.

3. Basic Data - The arithmetic means and standard deviations were computed from the basic data obtained for each performance characteristic from New, In-Use, and RFI equipments. The bars in the graphs indicate the average values. The standard deviations are tabulated on the applicable graphs.

4. Interference Measurements - Interference measurements were made in RCA's Interference Laboratory at Camden, New Jersey. The raw data, presented in tabular form, have been consolidated into a single table for each equipment. The information includes the applicable contract and RTCA paragraph numbers, the investigated frequency ranges and frequencies to which the equipments are tuned during measurements, the performance standard or requirements, and the extent to which the equipment failed to meet the requirement, if at all.

(b). Survey of Field Facilities.

A checklist of facility maintenance information was prepared to help the RCA engineers and technicians in the field in determining factors contributing to equipment degradation. The information requested applied to the equipment (numbers, spares, failures, time between failures, ease of maintenance, etc.), test facilities and equipment (types, test procedures, calibrations), and personnel (types, experience).

(c). Confidence Limits.

Table 1, Pages 205 through 263, shows confidence curves, based on Student's t- distribution, for various sample sizes. To illustrate the use of the curves, for 80% confidence and a sample size of 3, the ordinate (\bar{x}) is ± 1.34 . The product of this ordinate and the sample standard deviation gives the range of values in which the mean of the total population, from which the sample was taken, can be found with a probability of 0.80. In Table 1, the limits for confidence levels of 90%, 80%, and 70% are given for the performance characteristics.

(2). Evaluation.

(a). UHF Transmitters.

1. UT-1.

a. Reduced and Weighted Data - As shown on Page B-22, the averages for UHF Transmitter UT-1 performance characteristics surpass the RTCA requirements except in the following respects: power output (In-Use) at 399.9 mc and modulation capability at minimum and maximum rated input (In-Use). Only in power output and channel accuracy is there significant degradation in performance of In-Use equipment as compared with the New or

RFI equipment. Of particular interest is the fact that the UT-1 transmitter has considerably higher power output near mid-frequency than at either end of the range, where performance is near-marginal. Modulation capability is also observed to be near-marginal.

The weighted data, Page B-23, demonstrates clearly the degradation in performance which can be related to the differences in power output and channel accuracy.

b. Basic Data - Page B-24 shows the pronounced peak in power at mid-range and the slightly lower power found in In-Use equipment than in New or RFI equipment. The average deviations from the nominal transmitter frequencies are shown on Page B-25. It is interesting to note that, while the greatest average frequency deviations occur among the In-Use equipment, the standard deviations are smallest for this condition. From this it can be deduced that all the errors are negative. The large standard deviations for the other conditions, with their smaller average frequency deviations, indicate both positive and negative errors.

Page B-26 shows a slight average drop in percent modulation for In-Use equipment. The standard deviations denote a close grouping of data for New equipment, but a large spread for RFI and, especially, In-Use equipment. The third group of bars represents the percent modulation attained with no distortion for the maximum input signal. The levels of input signal so determined are all less than the specified minimum rated input level of 0.10 volt.

From Page B-27, it can be seen that the In-Use carrier modulation changes less over the prescribed audio band than New or RFI modulation. On the other hand, the sidetone response for In-Use equipment varies more (although not significantly) than in the other conditions.

The audio distortion, Page B-28, is considerably less than the specified maximum of 25% of the demodulated output. However, at the low end of the spectrum, the modulation levels averaged only about 63%. Even at 1000 cps and at the high end of the spectrum, minimum modulation levels of 85% were not always attained.

Channel selection, or change time, which was measured for the worst possible condition, averaged 5 seconds or less; this is well under the RTCA specified maximum of 8 seconds.

c. Design Data - Page B-30 illustrates the carrier noise level with respect to the demodulated output obtained when the output signal is modulated at 1000 cps. Although this characteristic was not included among the reduced values, the average levels in all three conditions are better than the RTCA acceptable level. However, the standard deviations indicate that some equipments may be marginal.

Channel repeatability, a measure of how well the transmitter returns to the same frequency, is shown on Page B-31. The poorest results occurred for the In-Use condition at mid-band. Generally, the greatest spread of results occurred at mid-band and among In-Use equipments.

In the test for interference characteristics, Page B-32, the UT-1 transmitter failed the residual radiation test. The spurious radiation test for RF interference outside the band from -50 kc to +50 kc of the carrier showed interference at several discrete frequencies in the test range.

2. UT-2.

a. Reduced and Weighted Data - From Page B-34, Percent Specified Performance, it may be seen that the UT-2 transmitters met all the indicated test requirements except for modulation capability in which the results were marginal. No degradation trends are clear except possibly for power output, modulation and sidetone variation with audio frequency. The weighted performance graphed on Page B-35 confirms the relatively insignificant degradation of In-Use equipment.

b. Basic Data - Page B-36 shows In-Use and RFI equipment to have somewhat lower power output than New equipments. The channel accuracy of all the UT-2's tested, Page B-37, appeared to fall well within the limits of the applicable military specification. In general, the accuracy appears to be better at the higher frequencies. From Page B-38 it can be seen that the required percentage of modulation was attainable at both minimum and maximum rated input levels. The third set of bars on Page B-38 shows that, in nearly all cases an input signal below the rated minimum level produced the required 85% modulation with no distortion. On Page B-39, the actual deviations in modulation and sidetone output are shown to be well below the allowable level. The audio distortion in the demodulated output, Page B-40, is also considerably lower than the RTCA acceptable level; however, in some equipments modulation was somewhat less than 85%, particularly at 400 cps. Channel selection time was found to be fairly constant at about 4 seconds, Page B-41.

c. Design Data - In carrier noise level, Page B-42, the In-Use and RFI signal-plus-noise to noise ratio fell off from that of New equipment and dropped slightly below the minimum of 35 db required by the RTCA paper. Under channel repeatability, Page B-43, the maximum average deviation was 1.5 kc, which, together with its standard deviation of ± 4.3 kc, is not excessive. The UT-2 tested for interference met the RTCA requirements except at one point above the high end of the frequency range, Page B-44.

(b), UHF Receivers.

1. UR-1.

a. Reduced and Weighted Data From Page B-46 it can be seen that the averages obtained for the characteristics of the UR-1 receivers failed to meet the specification requirements only in sensitivity and selectivity (New, 6 db-down). Degradation is evident in In-Use equipment (see Page B-47). RFI equipments also showed degradation, almost entirely influenced by the sensitivity measurements.

b. Basic Data - Pages B-48 through B-50 show AF response, AVC characteristics, and receiver gain data, the requirements for which were met satisfactorily. Distortion, Page B-51, also met the requirements, but the standard deviation data indicates marginal performance of individual equipments. Page B-52 shows the failure of the UR-1 equipment to meet the sensitivity requirement, particularly in the RFI condition at the low and high frequencies and in In-Use condition at the high frequency. The selectivity data, Page B-53, indicates marginal performance, although the standard deviations indicate a fairly wide spread of the data for the 6 db-down bandwidths. Channel selection time was found to take about 5 seconds, as shown on Page B-54.

c. Design Data - The signal-plus-noise to noise ratios, Page B-55, show improvement in the In-Use condition, although the spread of data in this condition was found to be large. Channel repeatability, Page B-56, is shown as the percent change in audio power output when a channel is detuned and reset one time. The overall change is negligible, even considering the largest standard deviation which was obtained in the RFI condition at the high end of the band. The results of the interference tests, shown on Page B-57, indicate failure to meet fully the RTCA requirements, except for cable conducted interference. Probable susceptibility to radar-type signals was found at four frequencies (242, 249, 252, and 255 mc), all at the low end of the receiver band.

2. UR-2.

a. Reduced and Weighted Data - The reduced data on Page B-60 indicates satisfactory performance except at the 6 db-down bandwidth of selectivity. The 6 db-down bandwidth for RFI equipment is just below the borderline. The weighted data, Page B-61, indicates a constancy of performance for New, In-Use, and RFI, UR-2's. A slight, although insignificant improvement with In-Use equipment is indicated.

b. Basic Data - Pages B-62 through B-66 and Page B-68 show the data obtained for AF response, AVC characteristics, gain, distortion, sensitivity, and channel selection time, all requirements for which were met satisfactorily. A study of the selectivity curves on Page B-67 shows that the

bandwidth at the 6 db-down points is somewhat narrower than specified. On the other hand, the bandwidth at the 60 db-down points is desirably below the maximum requirement, except for RFI equipment, which showed a very large scattering of data.

c. Design Data - The noise level requirement was met satisfactorily, Page B-69. Channel repeatability, Page B-70, shows small changes in audio power output between settings of a channel except at the high-frequency end. The results would appear to indicate some degradation with use. The interference tests summarized on Page B-71, indicate failure to meet the RTCA requirements at discrete points for spurious response, desensitization, cross-modulation, and antenna conducted interference. No susceptibility to radar-type signals from 100 to 2000 mc is indicated.

(c). VHF Transmitters.

1. VT-1.

a. Reduced and Weighted Data - From Page B-74 it can be seen that the VT-1 transmitters failed to meet the RTCA requirement for modulation capability at minimum rated input. There is no requirement for modulation capability at maximum rated input. The carrier power output was also found to be marginal with respect to its rated output of 25 watts. The weighted data, Page B-75, indicates some degradation of performance for In-Use equipment.

b. Basic Data - Page B-76 shows that the power output of New VT-1's averaged over 30 watts. The In-Use power output was less, and the RFI average at the high end of the frequency range fell below the required output. The averages of channel accuracy, Page B-77, were found to be satisfactory, although the standard deviations for In-Use and RFI equipments were high. The modulation attainable with the minimum rated input was found to average about 50%, Page B-78. However, the test to determine the maximum undistorted modulation revealed a capability of about 65% with an average input of about 0.4 volt. Audio-frequency response and distortion results, Pages B-79 and B-80, were well within the requirements. The channel selection time of about 3 seconds, Page B-81, was lower than that of either of the UHF transmitters.

c. Design Data - Only among the New equipments was the average carrier noise level found acceptable, Page B-82. The average of In-Use equipment fell to almost 10 db below the required minimum of 35 db. The data in this condition were widely scattered; however, the RFI average, 7 db below the minimum, had a very small standard deviation. Page B-83 shows that the VT-1 is capable of very good channel repeatability. The interference tests, Page B-84, were met satisfactorily.

2. VT-2.

a. Reduced and Weighted Data - The reduced data on Page B-86 shows that the VT-2 complies with all the requirements except for modulation capability and channel accuracy (high frequency only). The weighted performance data on Page B-87 indicates a slight degradation from New to In-Use condition, while RFI equipment shows somewhat poorer performance than the In-Use equipment.

b. Basic Data - The average carrier power output, greater than the required 5 watts throughout the frequency range, as shown on Page B-88, is higher at the middle and high end of the range than at the low end. Channel accuracy, Page B-89, shows the greatest deviation at the high end of the frequency range for In-Use and RFI equipments. The standard deviations indicate a fairly large spread of data throughout the range. A maximum frequency deviation of 10 kc was used as the basis for comparing the VT-2 with other VHF transmitters in this characteristic, since the pertinent military specification had no applicable requirement. The modulation capability, Page B-90, was about 50% with minimum rated input (0.8 volt) and about 72% with maximum rated input (1.2 volts). However, the results of the test V3 show that an undistorted modulation of about 85% was attainable with an input voltage slightly greater than the rated maximum. Both the modulation and sidetone frequency response characteristics, Page B-91, showed less than 1 db variation. Audio frequency distortion was found to be less than 7% on the average, Page B-92, with nearly 85% modulation attainable. Page B-93 shows channel selection time capability of about 4 seconds.

c. Design Data - The carrier noise level requirement of -35 db was met, as shown on Page B-94, although the New equipment data indicates ratios of over 50 db. Channel repeatability, Page B-95, showed maximum deviations of 0.30 kc for RFI equipment at the low end of the frequency range. All other deviations average 0.10 kc or less. The interference tests, tabulated on Page B-96, were met satisfactorily except for spurious radiation outside the band ± 50 kc from the carrier frequency. Spurious frequencies were found at 35.5, 70.3, 84.3, 142.0, and 320.0 mc with a carrier frequency of 106.38 mc and were found at 101, 119, 252, 301, and 350 mc with the carrier frequency at 150.5 mc.

3. VT-3.

a. Reduced and Weighted Data - The VT-3 transmitter is tuned over a 2 mc band within its frequency range. Channel accuracy is not critical in this instance, and has been omitted from the tests performed. Since no changing of transmitter frequency is possible in the air, channel selection time is also superfluous. Reduction of the data is limited to power output, AF distortion, and modulation frequency response. These were weighted 60%, 20%, and 20%, respectively, for the purpose of obtaining weighted values for New,

In-Use, and RFI comparison. No specification exists for percent modulation obtainable for minimum and maximum inputs. Instead, the results are shown for the maximum undistorted modulation obtained. The input levels required are listed on the graph for AF response.

Page B-98 indicates the failure of the VT-3 to meet the power output requirement, averaging overall about 70% of the manufacturer's rated minimum output. The weighted performance, Page B-99, indicates no degradation of performance.

b. Basic Data - The carrier power output, Page B-100, shows that New equipment has a decidedly lower output than In-Use or RFI equipment. In all cases, the power output requirement was not met. No requirement existed for modulation capability versus input. However, tests were run which showed, Page B-101, a maximum undistorted capability of about 65% for input signal of about 0.9 volt. Modulation and sidetone variation versus frequency, Page B-102, and audio frequency distortion, Page B-103, met the RTCA requirements, except that 85% modulation could not be attained for the latter test.

c. Design Data - The RTCA carrier noise level requirement was met, Page B-104, although the In-Use average was marginal. Moreover, the standard deviations indicated a wide spread of data obtained in each of the three conditions. The results of the interference tests, tabulated on Page B-105, show that the VT-3 tested failed to meet the spurious radiation requirement at 15 points in the test range.

4. VT-4.

a. Reduced and Weighted Data - The reduced data on Page B-108, indicates that New equipment has a high power output, but In-Use and RFI VT-4's fall below the manufacturer's rated output. Also, New VT-4's have a high audio distortion and deviation of modulation and AF output voltage with frequency. There is insufficient data to permit correlation of the apparent trends. Channel selection **time** has been arbitrarily set at 175%. This corresponds to two seconds, **which is** assumed to be the average time for switching channels on the VT-4. It is **included** to permit comparison with the UHF transmitters. Modulation capability requirements are not available, and a test for undistorted modulation capability was performed and included in the basic data graphs. The weighted performance shown on Page B-109 indicates no degradation of equipment performance. However, it is important to note the variations of the individual characteristics, the influence of which is lost in the weighting.

b. Basic Data - On Page B-110, it may be seen that the power output for New equipment was substantially higher than the manufacturer's rated minimum level of 0.5 watt. However, the levels of both In-Use and RFI equipment were lower than the minimum. Channel accuracy, Page B-111

was reduced on the basis of the ± 10 kc limits specified for UHF transmitters with 100 kc channel spacing. The VT-4 met this requirement satisfactorily, although RFI units were found to have about five times the frequency deviation found for New and In-Use units. No minimum or maximum input for modulation capability was specified by the manufacturer; however, the test for maximum undistorted modulation capability, Page B-112, revealed a modulation capability of about 50% for an input voltage of about 0.1 volt. On Page B-113, it may be seen that the modulation deviation for New units averaged about 1 db more than the RTCA maximum acceptable level of 6 db. New and In-Use units had deviations of about 3.5 db. Audio frequency distortion shown on Page B-114, was less than the RTCA required maximum of 25%; but modulation levels attained during this test were considerably below 85%, with average values ranging from 35 to 72%.

c. Design Data - The average carrier noise levels, Page B-115, for which the RTCA requirement is 35 db minimum, shows a drop from 42 to 36 to 30 db in going from New to In-Use to RFI status. The interference tests for residual and spurious radiation were met satisfactorily, as shown on Page B-116.

5. VT-5.

a. Reduced and Weighted Data - The reduced data of Page B-118 shows that the VT-5 met all the requirements except for power output at the low end of the band (In-Use) and for audio distortion at 400 cps (New). The extent of these failures was small, and the weighted performance data of Page B-119 indicates a high overall performance with some degradation of In-Use and RFI units.

b. Basic Data - Power output data on Page B-120 shows results obtained with different power supplies. The reduced or performance ratings are based on the manufacturer's power rating for the particular power supply. In-Use equipment at the low-frequency test point failed to meet the minimum power output requirement by about 5%. A laboratory test made on a single VT-5 with two different power supplies confirmed the rated-power-output capabilities. Channel accuracy, Page B-121, was within about 4 kc of the nominal frequency. Limits of ± 10 kc were applied for uniformity with the requirements for other VHF transmitters. In the absence of modulation capability requirements, tests were performed to determine the maximum undistorted modulation capability. For New units, Page B-122, average undistorted modulation of 65% was obtained; for In-Use units, 55%; and for RFI equipment, 56%. The average input voltage was about 0.2 volt. The AF response deviation requirements were met for both modulation and sidetone, as shown on Page B-123. The AF frequency distortion requirements, Page B-124, were met satisfactorily except for New units at 400 cps, which had an average distortion of 25.6%, only 0.6% over the RTCA maximum acceptable level. As in most other VHF equipments, modulation levels of 85% were not attainable; levels ranged from as low as 13.8% to 55.7% for the test conditions.

c. Design Data - Although In-Use and RFI units had an average signal-plus-noise to noise ratio of about 47 db, Page B-125, 12 db over the RTCA minimum acceptable level of 35 db, New units had an average of only 28 db with a wide spread of data about this point, indicated by a standard deviation of ± 10 . Channel repeatability, Page B-126, was good, as expected for the selector switch arrangement employed. Interference tests, Page B-127, were met except for spurious radiation outside a band ± 50 kc from the carrier frequency. Spurious radiation was found at 89, 147, 150, and 608 mc.

(d). VHF Receivers.

1. VR-1.

a. Reduced and Weighted Data - Page B-130 shows that the gain of the VR-1 was so poor it could not be plotted on the reduced scale. For weighting purposes, it was arbitrarily assigned a value of -100%. The In-Use equipment failed the sensitivity test at the high end of the frequency band; RFI equipment failed at the low, middle, and high frequencies. The equipment was also off performance at the 60 db-down points for selectivity. The RFI units were found to have excessive audio distortion with 20 microvolts input at 400 cps. The poor sensitivity accounts for the low RFI weighted performance on Page B-131. In-Use performance also indicates degraded performance, although not as severe.

b. Basic Data - The audio frequency response requirement was met satisfactorily, Page B-132, with In-Use equipment found to be better than New equipment. The average AVC variation, Page B-133, of about 4 db was well below the RTCA specified maximum level of 10 db. The gain measurements, Page B-134, reveal the difficulty of performing such a test on the VR-1. Not only was the data found to be widely dispersed, but the input voltages required to produce the manufacturer's rated output was, in most instances, far in excess of the RTCA maximum acceptable level of 20 microvolts. This data indicates that the selectivity curve is extremely irregular, and the nominal receiver frequency may lie in a deep trough of the curve. It was found that, by detuning the receiver slightly, it was often possible to reduce the input voltage to an acceptable level. RFI equipments failed to meet the distortion tests at both audio test frequencies of 400 and 1000 cps and with a carrier input of 20 microvolts, Page B-135.

The RTCA sensitivity requirement of 5 microvolts was not met by either RFI equipment at any of the three test frequencies or by In-Use equipment at the highest frequency; see Page B-136. Here again, measurements are apparently affected by the exact position of the center frequency with respect to the variations in the selectivity curve. The manufacturer's bandwidth ratings of 40 kc minimum 6 db-down and 80 kc maximum 60 db-down were used in reducing the measured data. Any comparison of selectivity characteristics between receivers should take into account the actual measurements rather than the reduced values. The selectivity at both levels met the require-

ments, as shown on Page B-137. Channel selection time, Page B-138, was consistent at 5 seconds for New, In-Use, and RFI equipments.

c. Design Data - The RTCA noise level requirement of 25 db minimum was not met by RFI units tested at RF input levels of 100 microvolts. New and In-Use units met the requirement satisfactorily, as shown on Page B-139. Channel repeatability, Page B-140, (calculated on the basis of change in audio output power when the receiver is restored to the original frequency after a single detuning), indicates negligible change (less than 2%) for New and In-Use equipments. RFI units show a greater change, up to 12%. All the interference tests were met, Page B-141, except for cable-conducted interference, where emission was found at 21.5 mc on the +28 volt line.

2. VR-2.

a. Reduced and Weighted Data - From Page B-144, it can be seen that the VR-2 receivers did not meet the requirements for gain (New and In-Use), sensitivity, (New at 127 mc), and selectivity (In-Use and RFI at the 6 db-down point). Overall performance, excluding the gain characteristic, was good. Some degradation with use is evident, Page B-145.

b. Basic Data - The audio frequency response variation of less than 2 db, Page B-146, is well under the RTCA maximum acceptable level of 6 db. The AVC deviations averaged, overall, about 4 db less than RTCA maximum acceptable of 10 db, Page B-147. From Page B-148, it is evident that the RTCA maximum level of 20 microvolts for the gain requirement was exceeded considerably for New and In-Use equipment. RFI equipment met the requirement satisfactorily. The receivers met the audio distortion requirement satisfactorily, Page B-149. New equipment failed the sensitivity test, Page B-150, at mid-frequency with an average sensitivity of about 6 microvolts. The standard deviation for this test shows a large scattering of data. Performance at the high frequency end of the band was marginal. The selectivity test results, Page B-151, show marginal specification compliance at the 6 db-down level, where the average bandwidth was found to be nearly 100 kc. At the 60 db-down level, the bandwidth was about 250 kc, much narrower than the military requirement for maximum bandwidth of 400 kc.

c. Design Data - The receiver noise level requirement was met satisfactorily, as shown on Page B-152, actual ratios averaging 35 db and over. The equipment audio power output changed 10% or less, on the average, when the receiver was restored to the original frequency after a single detuning, Page B-153. The unit subjected to interference tests failed to meet the requirements as follows:

Spurious Response: In the band ± 80 kc about F_c and in the bands from $F_c + 80$ kc to $F_c + 533$ kc and from $F_c - 80$ kc to $F_c - 217$ kc.

Cable Conducted Interference: Emission found at 8.4 and 16.7 mc.

Antenna Conducted Interference: Emission found at 8.4, 430, 712, and 1134 mc.

3. VR-3.

a. Reduced and Weighted Data - Page B-156 shows that the VR-3 equipments met with all applicable RTCA requirements except for bandwidth at the 60 db-down level. Channel selection time was not included, since channel cannot be selected with this equipment. Page B-157 indicates better performance of In-Use equipment than either of the others.

b. Basic Data - AF distortion averaged 2.5 db below the RTCA maximum acceptable level of 6 db, as shown on Page B-158. The RTCA requirement of 10 db maximum AVC variation was met satisfactorily; In-Use equipment performed best, with only 6 db variation, Page B-159. The average input of about 14 microvolts obtained in the gain tests, Page B-160, was below the RTCA maximum acceptable level of 20 microvolts. Distortion, Page B-161, was found to be about 7%, well below the maximum acceptable level of 25%. Average sensitivity, as seen on Page B-162, was less than 3 microvolts. Selectivity measurement, Page B-163, indicated bandwidths of about 100 kc at the 6 db-down level, and about 290 kc at the 60 db-down level. The reduced values were based on the RTCA values for continuously-tuned receivers with 100 kc spacing. The 100 kc spacing was assumed to permit comparison with receivers used for the same purpose.

c. Design Data - On Page B-164, it can be seen that for the signal-plus noise to noise ratio, the minimum acceptable level of 25 db was met easily. Actual average values ranged from about 35 to over 50 db. The unit subjected to the interference tests was evaluated, as were the other VHF receivers in this report, for interference characteristics on the basis of 100 kc channel spacing. The results of the tests, shown on Pages B-165 and B-166, indicate failure to meet the requirements as follows:

Spurious Response: At $F_C + 80$ kc and at $F_C - 80$ kc; between $F_C - 80$ kc and $F_C - 232.2$ kc.

Desensitization: At $F_C + 100$ kc and at $F_C - 100$ kc.

Cross Modulation: Output less than 10 db less at $F_C \pm 100$ kc with 20 and 1,000 microvolts input and at $F_C \pm 200$ kc with 2,000 and 20,000 microvolts input.

Antenna-Conducted Interference: Emission greater than 400 microwatts at 134.0 mc when tuned to 148.0 mc.

Susceptibility to Radar-Type Signals: Probable susceptibility found at 133, 220, and 370 mc.

4. VR-4.

a. Reduced and Weighted Data - The percent specified performance, Page B-168, indicates that the VR-4 failed to meet the RTCA requirements for AF response, AVC characteristics, and 60 db-down bandwidth. There is marginal performance in distortion and in gain for RFI equipment. The weighted data on Page B-169, denotes apparent degradation of the receivers with use.

b. Basic Data - The VR-4 had over 13 db variation in audio frequency response, Page B-170. This is 7 db more than the RTCA acceptable level. The average AVC output variation, Page B-171, exceeded the RTCA maximum level by 1 to 6 db. New and In Use units averaged about 5.5 microvolts in the gain test, Page B-172, but RFI equipment averaged 21.5 microvolts, 1.5 more than the acceptable level. Only RFI units failed to meet the maximum acceptable distortion level of 25%. New and In-Use units met the distortion requirement satisfactorily, as shown on Page B-173. The sensitivity requirement of 5 microvolts maximum was met satisfactorily. Page B-174, although In-Use equipment was less sensitive than New. Page B-175 shows average bandwidths of about 70 kc at the 6 db-down level, and about 450 kc at the 60 db-down level. The manufacturer's bandwidth ratings were met at the 60 db-down level, but were not met at the 6 db-down level. The RTCA specified bandwidths for 100 kc spaced channels were applied, however, to provide a uniform basis for comparison with the other continuously variable VHF receivers.

c. Design Data - The RTCA minimum signal-plus-noise to noise level was met satisfactorily, as shown on Page B-176. However, the interference tests, Pages B-177 and B-178, revealed failure to meet the requirements as follows:

Cross Modulation: Receiver output less than 10 db less at F_c - 100 kc.

Antenna Conducted Interference: Emission exceeded 400 micro-micro-watts at 116.5, 349, 469, and 585 mc with F_c - 108 mc; 126, 379, 512 mc with F_c - 118 mc.

Susceptibility to Radar-Type Signals: Probable susceptibility to signals of 124.6 to 143.0 mc, 170.0 to 197.5 mc, 178.0 to 206.0 mc, 223.0 to 261.5 mc, 228.0 to 260.5 mc, 241.0 to 277.5 mc, 340.0 to 395.0 mc, 690.0 to 798.5 mc, and 450.0 mc, 840.0 mc.

5. VR-5.

a. Reduced and Weighted Data - Page B-180 shows poor performance with respect to the applied requirements for AF response, AVC characteristics, and selectivity at the 60 db-down level (RTCA requirements). Marginal performance is indicated at 100 cps in the distortion test. The weighted performance, Page B-181, indicates In-Use performance to be somewhat inferior to that of New and RFI equipment.

b. Basic Data - The average AF response variation for New, In-Use, and RFI equipments exceeded the maximum acceptable level, as shown on Page B-182. The AVC maximum requirement was met by New equipment, Page B-183, but exceeded by 14 db by In-Use equipment and by 1.5 db by RFI equipment. The gain test results, shown on Page B-184, met the RTCA maximum acceptable level of 20 microvolts satisfactorily. In-Use equipment, however, showed a marked deterioration from New capabilities. The distortion requirement was met satisfactorily, Page B-185, although the maximum of 25% distortion was obtained with both New and In-Use equipments. Sensitivity was satisfactory, Page B-186. Selectivity measurements, shown on Page B-187, revealed a narrow 6 db-down bandwidth of 60-70 kc, and a 60 db-down bandwidth of 450 kc. While these results are more nearly in accord with the manufacturer's data, a comparison with the RTCA requirement for 100 kc channel spacing indicates acceptable 6 db bandwidth, but a 60 db bandwidth almost three times the specified maximum of 160 db.

c. Design Data - The signal-plus-noise to noise levels, Page B-188, ranged from about 36 to 45 db, well above the minimum acceptable level of 25 db. The results of the interference tests, shown on Page B-189, revealed failure to meet the requirements as follows:

Spurious Response: At $F_c \pm 80$ kc and $F_c \pm 160$ kc and between $F_c - 80$ kc and $F_c - 261$ kc.

Cross Modulation: Output less than 10 db less at $F_c \pm 100$ kc.

Antenna Conducted Interference: Emission greater than 400 micro-microwatts at 402, 545, 675, and 1070 mc.

6. VR-6.

a. Reduced and Weighted Data - The percent specified performance graph, Page B-192, shows failure of the VR-6 receiver to meet requirements for AVC characteristics (New and In-Use), gain, and bandwidth at the 60 db-down level. Selectivity performance was based on the RTCA requirement, however, and the basic data should be studied if bandwidth is to be considered. Further comment is included under Basic Data, below. The weighted performance on Page B-193 indicates fairly consistent performance with only slight overall degradation of In-Use equipment. The gain characteristic was assigned a value of -1.0 for computational purposes.

b. Basic Data - The RTCA requirement for AF response was met satisfactorily, as shown on Page B-194. The AVC requirement, however, was not met; both New and In-Use equipment exceeded the RTCA maximum acceptable variation, Page B-195. The VR-6 receivers failed to meet the gain requirement, Page B-196, some requiring extremely large input signals to produce the rated output. This may indicate a selectivity curve with large variations, although not as excessive as that indicated for the VR-1. The

distortion and sensitivity requirements were met satisfactorily, as shown on Pages B-197 and B-198. The 6 db bandwidth is considered acceptable on the basis of the RTCA 40 kc minimum requirement. However, the average 6 db bandwidth, Page B-199, of the equipments tested was over 100 kc. Thus, while the 60 db-down requirement based on 100 kc channel spacing was used to reduce and weight the data, it appears that 100 kc spacing with the VR-6 would not be advisable.

c. Design Data - The RTCA minimum acceptable signal-plus-noise to noise level of 25 db was exceeded by all VR-6's, Page B-200, except In-Use units with 100 microvolts input. The ratios for these were about 20 db. The interference tests, results of which are shown on Pages B-201 and B-202, revealed failure to meet the following requirements on the basis of 100 kc channel spacing:

Spurious Response: Output less than 60 db greater at $F_c \pm 80$ kc, between $F_c + 80$ kc and $F_c + 100$ kc, between $F_c - 80$ kc and $F_c - 268$ kc, at 15.5, 16.5, 16.6, 18.5, 49.5, 74.5, 149, 144, 265, 287, 404, 425, 538, and 560 mc.

Desensitization: Output changed more than 8 db at $F_c \pm 100$ kc; between $F_c - 100$ kc and $F_c - 169$ kc; between $F_c + 100$ kc and $F_c + 134$ kc.

Cross Modulation: Undesired signal less than 10 db less at $F_c - 100$ kc and at $F_c \pm 200$ kc.

Antenna Conducted Interference: Emission greater than 400 microwatts at 136, 210, 275, 415, 555, and 692 mc for $F_c - 126$ mc.

Susceptibility to Radar-Type Signals: Probable susceptibility was found at 19 frequencies ranging from 100.0 to 560.0 mc.

(e). VHF Transmitters, Maximum Undistorted Modulation.

Many of the VHF transmitters did not have distortion requirements for minimum and maximum rated inputs. Tests were performed to determine the maximum undistorted modulation that could be obtained for the transmitters. The results of these tests are plotted on Page B-203. Undistorted modulation capabilities ranging from 44% to 90% were thus attained. The input voltages necessary to produce this modulation are also plotted. These show a range of from 0.01 to almost 1.5 volts.

(f). Weighted Values.

All the weighted values obtained for the UHF and VHF transmitters and receivers are plotted together on Page B-204. Among the transmitters, there is no clear trend, although there is some degradation indicated for In-Use equipment. In view of the juggling of weighting factors because of differences

in the equipment and lack of ratings, it is considered more valid to examine the actual results of the tests for each characteristic. The receivers show a more pronounced degradation of performance for In-Use equipment, extending as well to RFI equipments. There is considerable doubt, however, that RFI values can be used in arriving at any definite conclusions because of the types and extent of maintenance discussed in the next section.

(g). Survey of Field Conditions.

Information obtained about the various maintenance facilities (test equipment, personnel, records, etc.) is tabulated on Pages B-265 through B-267. As expected, the data indicates that the commercial air lines maintain the best facilities, keep adequate spare parts, keep the best records, have the more experienced men, and employ better maintenance and checkout procedures. Most military facilities keep few records. Repair shops for general fleet equipment are similar, generally, to radio and TV repair shops. They keep few spare parts, because of the diversity of equipment handled, and keep no maintenance records.

The commercial air lines give their repaired equipment installation, pre-flight, and ramp checks. The general fleet equipment is usually repaired only to remedy the cause of failure, and receives no further check. This was also true in some of the military facilities; thus, the RFI equipments tested could not be used as a gauge of the extent to which used equipment performance could be improved. In some instances this equipment could be classed as virtually New equipment, in others as In-Use equipment. Where repaired equipments had been re-aligned or adjusted, performance often approached that of New equipment.

d. Conclusions - The general lack of maintenance and overhaul records, except for the Commercial Airlines and some military stations, do not enable any statistically significant evaluations of factors contributing to the degradation of performance. The data collected in the field survey of the activities visited in the test program do, however, permit the observation that the most important factors contributing to equipment failures are:

- (1). TUBES (Variously estimated between 40% and 90% as cause of failure).
- (2). MECHANICAL PARTS (Tuner drives, blower motors, dynamotors, etc.).
- (3). MISALIGNMENT (Observed principally by military personnel).
- (4). UNKNOWN (Equipment reported defective is satisfactory in bench checks - observed principally by the air lines).

The best assurance of high performance can be achieved by adherence to the following:

(1). Procure equipment in accordance with specifications which carefully spell out the requirements. (NOTE: Military equipment purchased under military specifications rated high among the weighted values.)

(2). Perform periodic maintenance and checkout procedures, as is done by the commercial air lines. This should include equipment realignment, if feasible.

From the comparison of the weighted values for New, In-Use, and RFI equipments, a slight degradation in performance is observed for the In-Use equipment. However, the population mean for any characteristic falls within certain ranges which are based on the confidence limit for small samples. In most instances, this results in a probability of overlap of the means such that the degradation indicated is not considered to be statistically significant.

SECTION B

AIRBORNE COMMUNICATIONS EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

2. Laboratory and Field Test Data

a. UT-1, UHF Transmitter

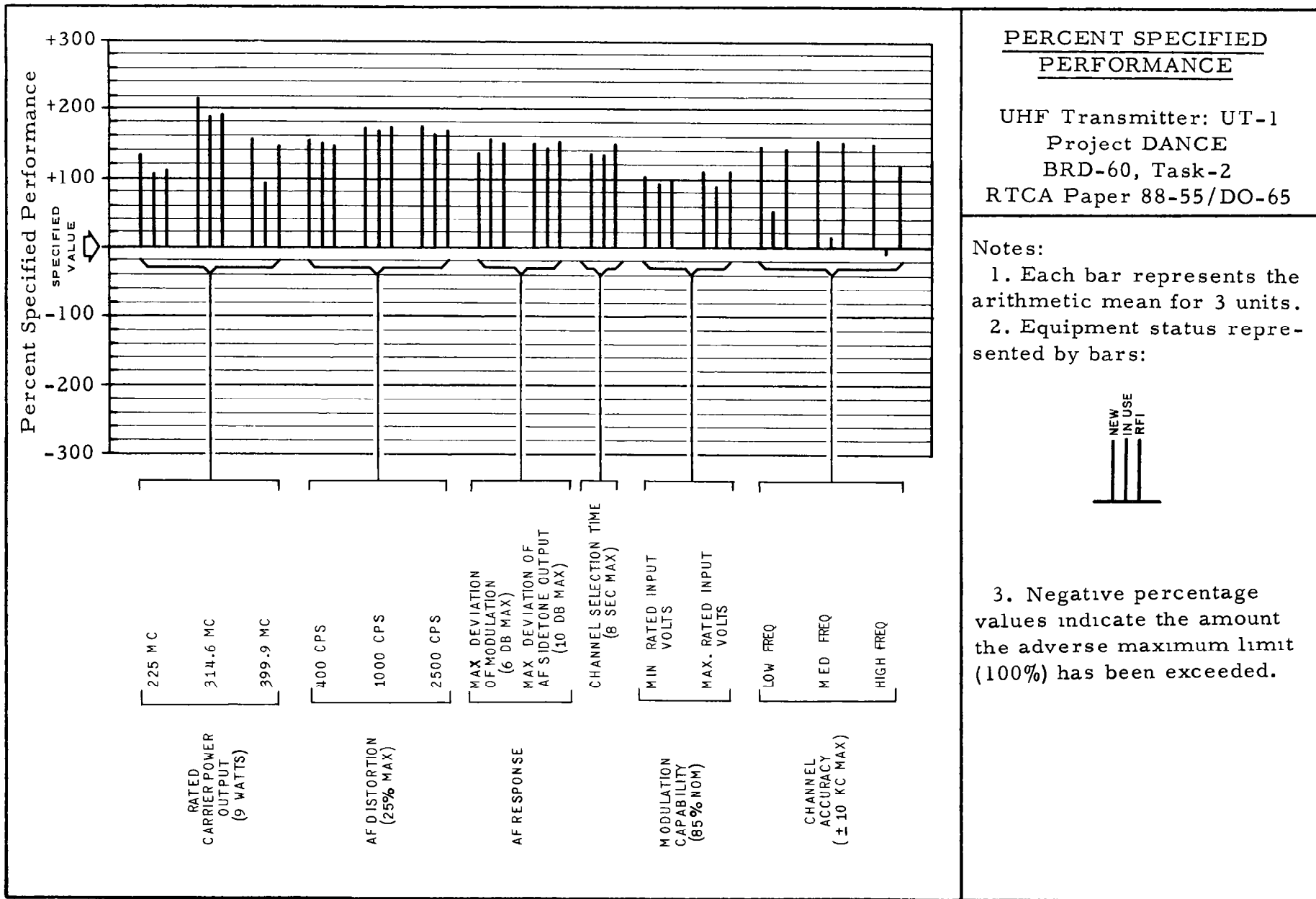
General:

Frequency Range:	225.0 - 399.9 mc
Means of Frequency Control:	Crystal
Total Number of Channels:	1750
Number of Channels Available at Operator's Position:	18 plus 1 guard
Means of Frequency Selection:	Rotary Switch

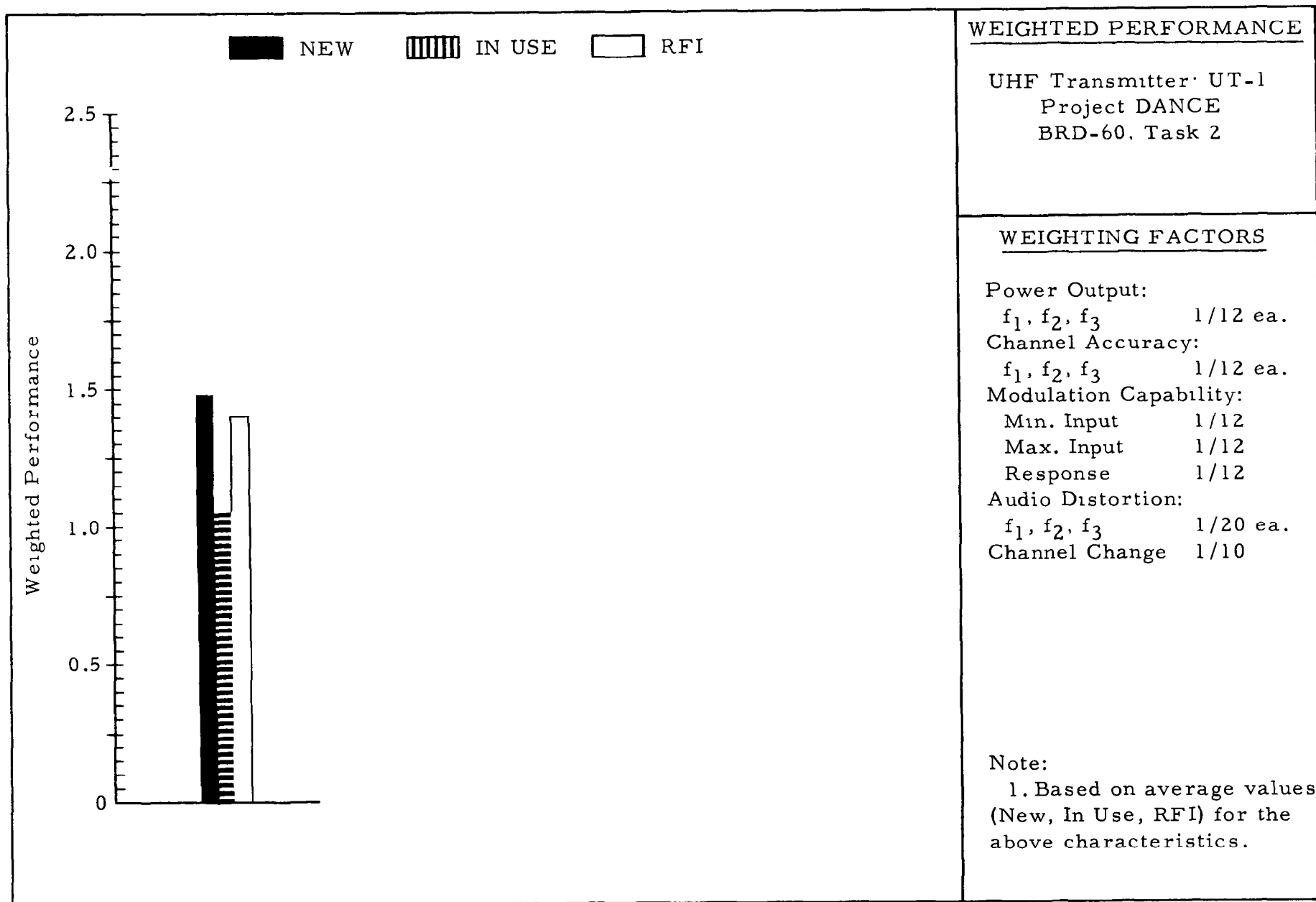
Technical:

Page

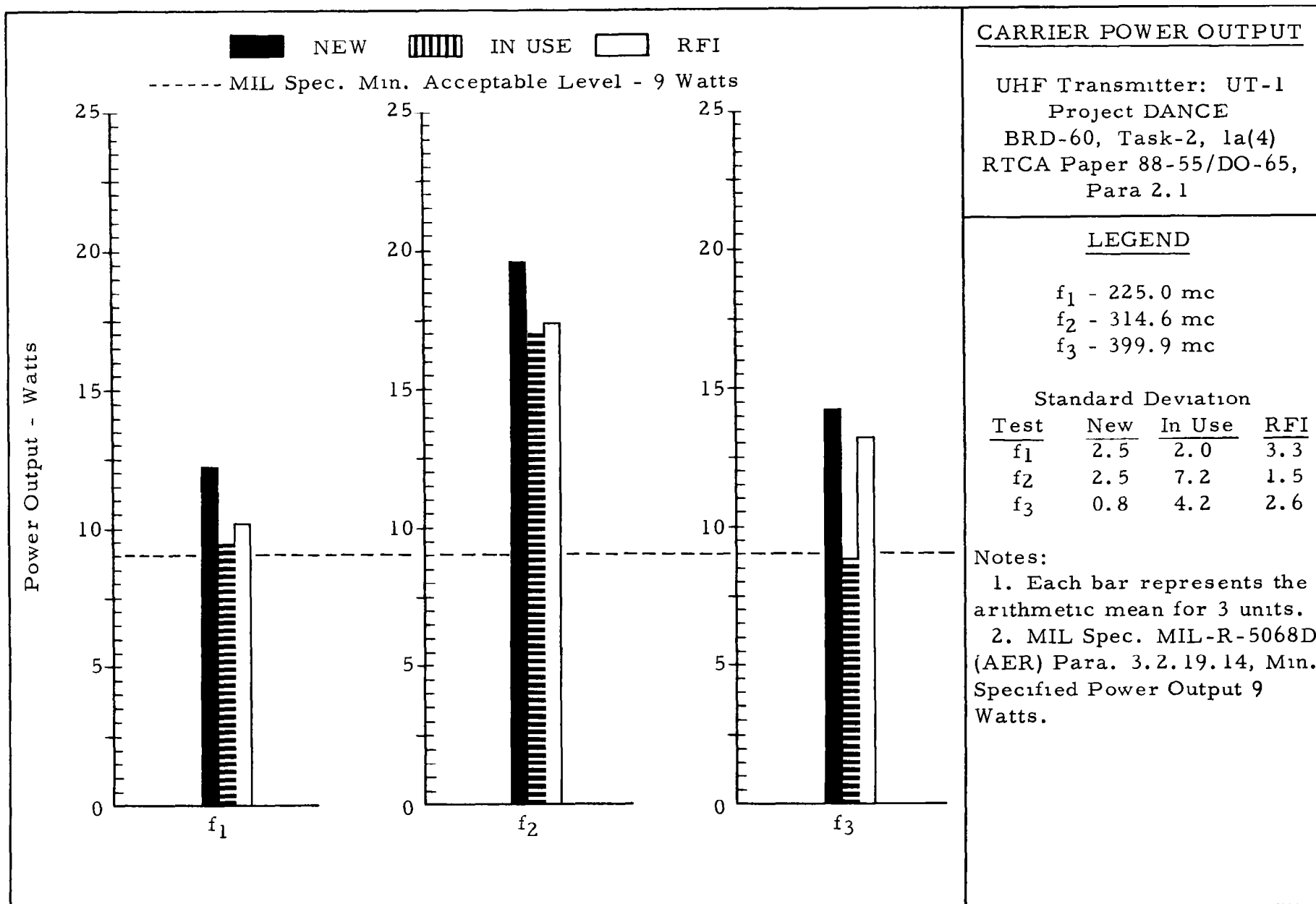
Percent Specified Performance	B-22
Weighted Performance	B-23
Carrier Power Output	B-24
Channel Accuracy	B-25
Modulation Capability	B-26
Audio Frequency Response	B-27
Audio Frequency Distortion	B-28
Channel Selection Time	B-29
Carrier Noise Level	B-30
Channel Repeatability	B-31
Interference Tests	B-32



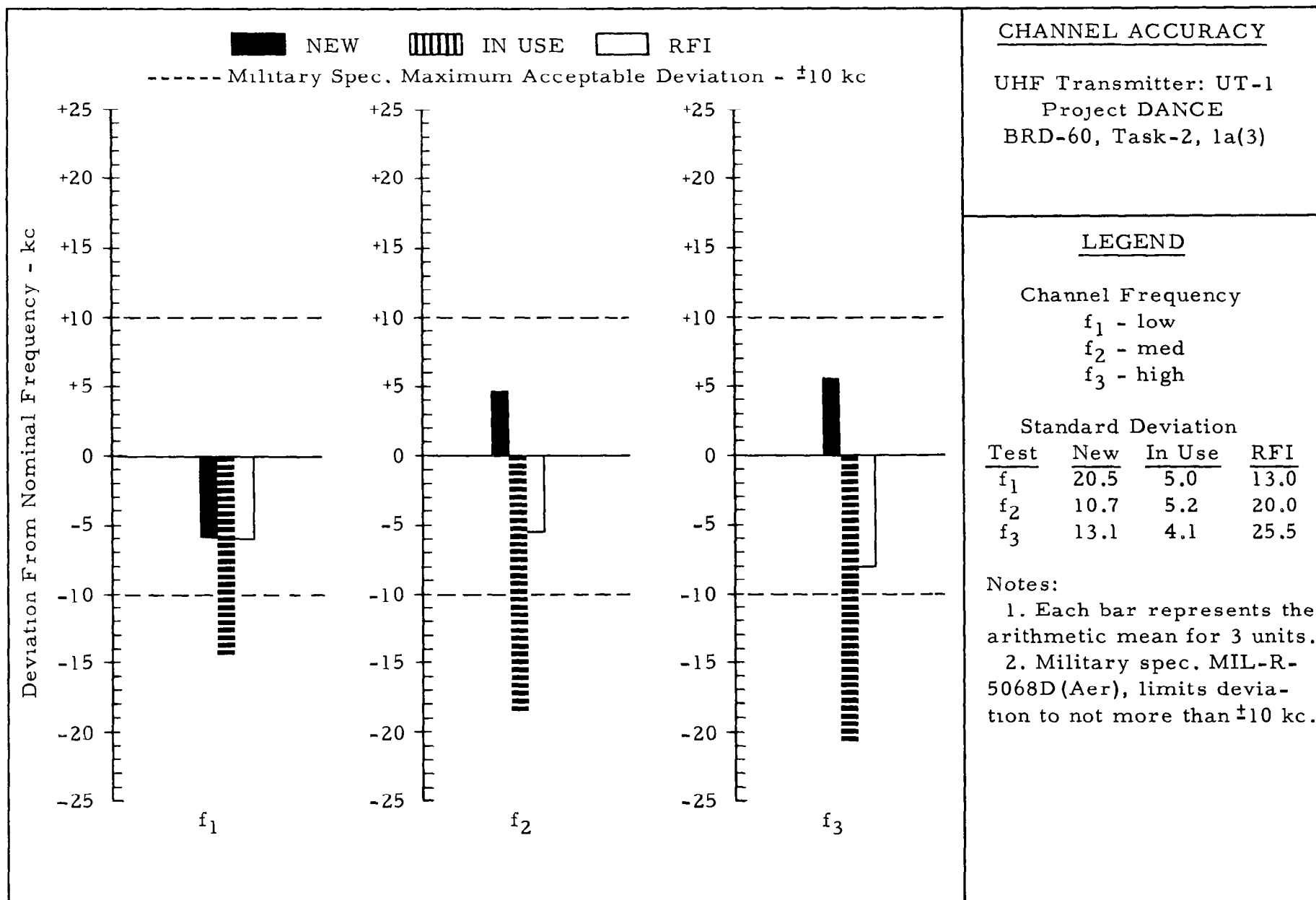
PERCENT SPECIFIED PERFORMANCE - UHF TRANSMITTER - UT-1



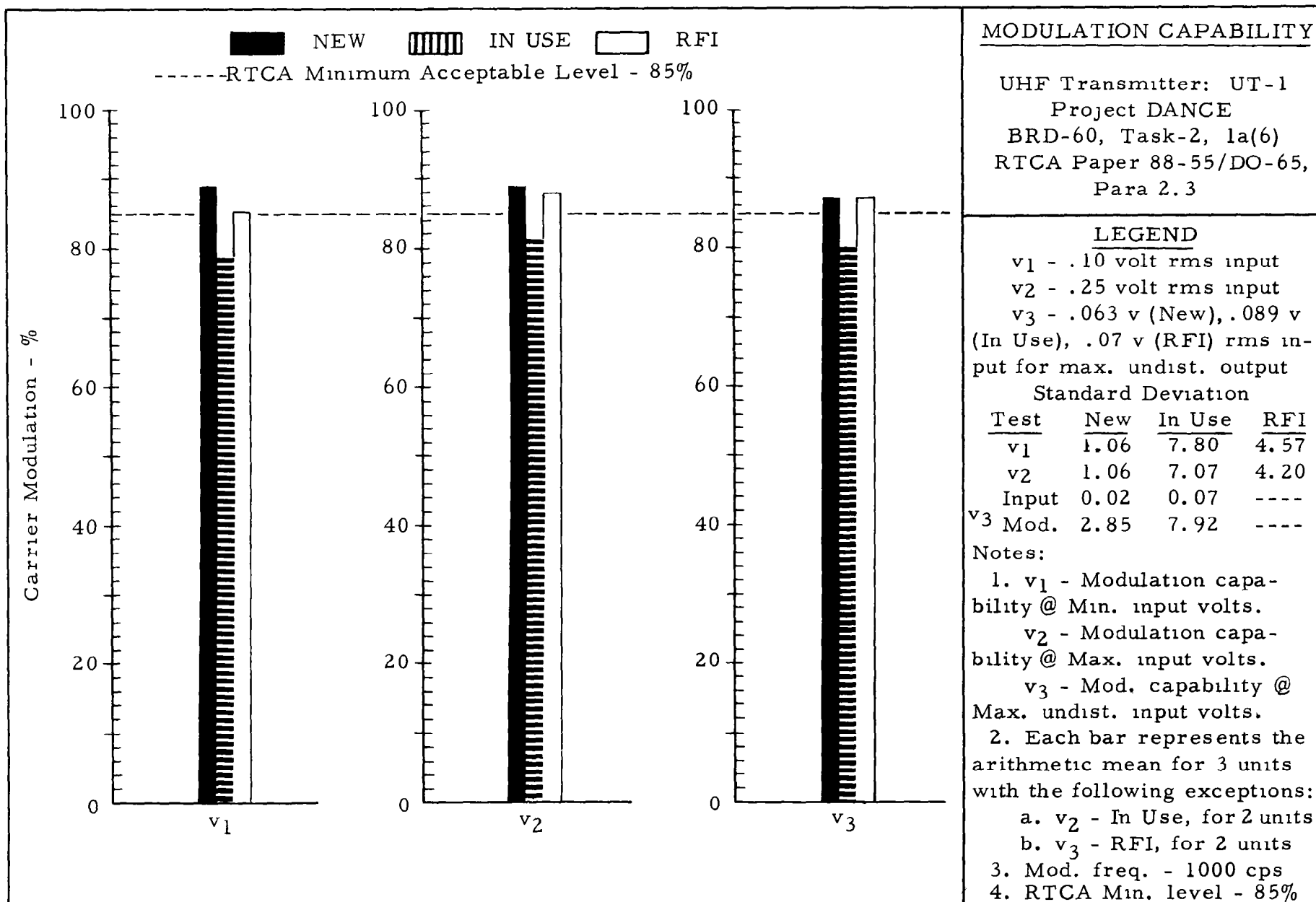
WEIGHTED PERFORMANCE - UHF TRANSMITTER - UT-1



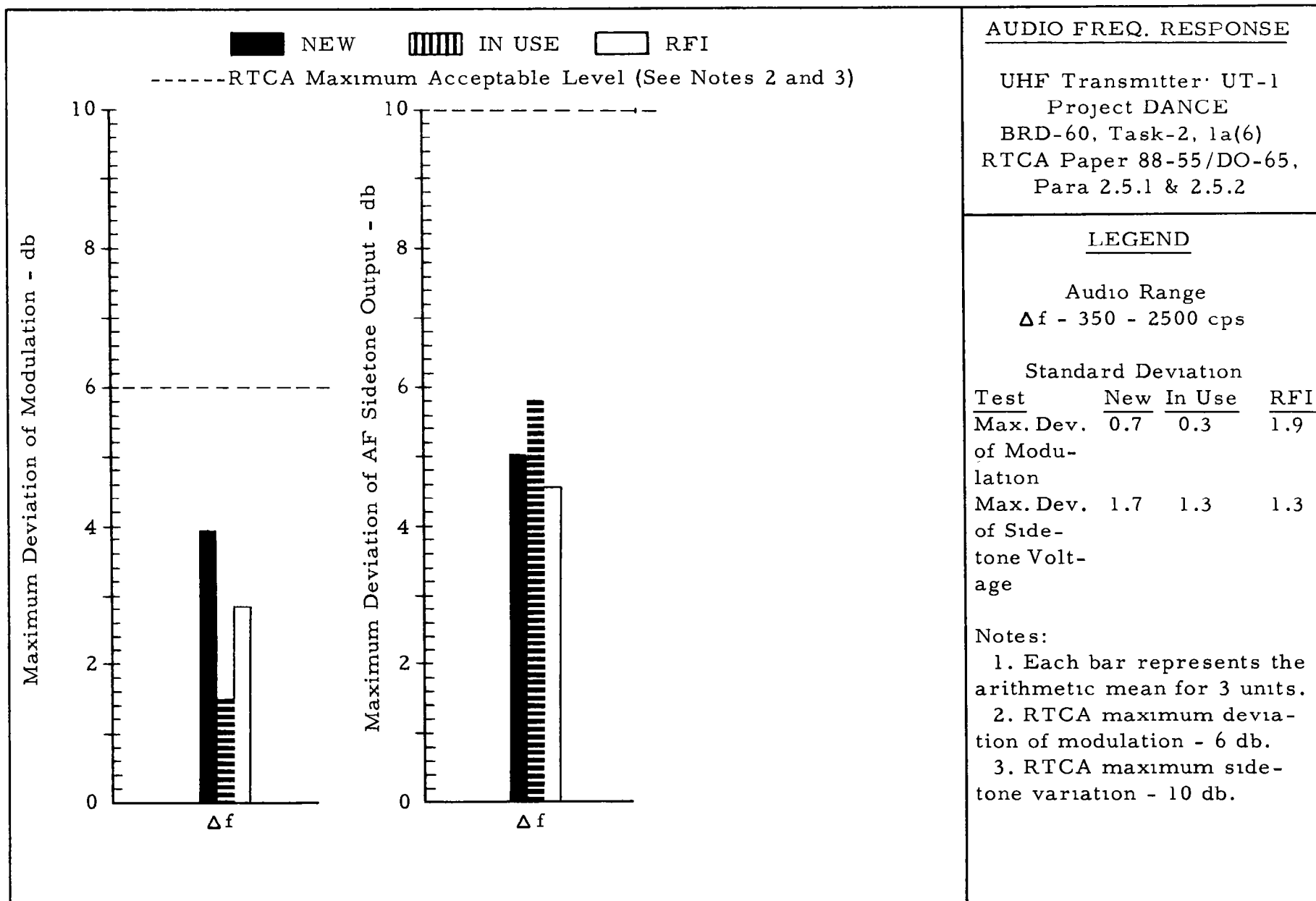
CARRIER POWER OUTPUT - UHF TRANSMITTER - UT-1



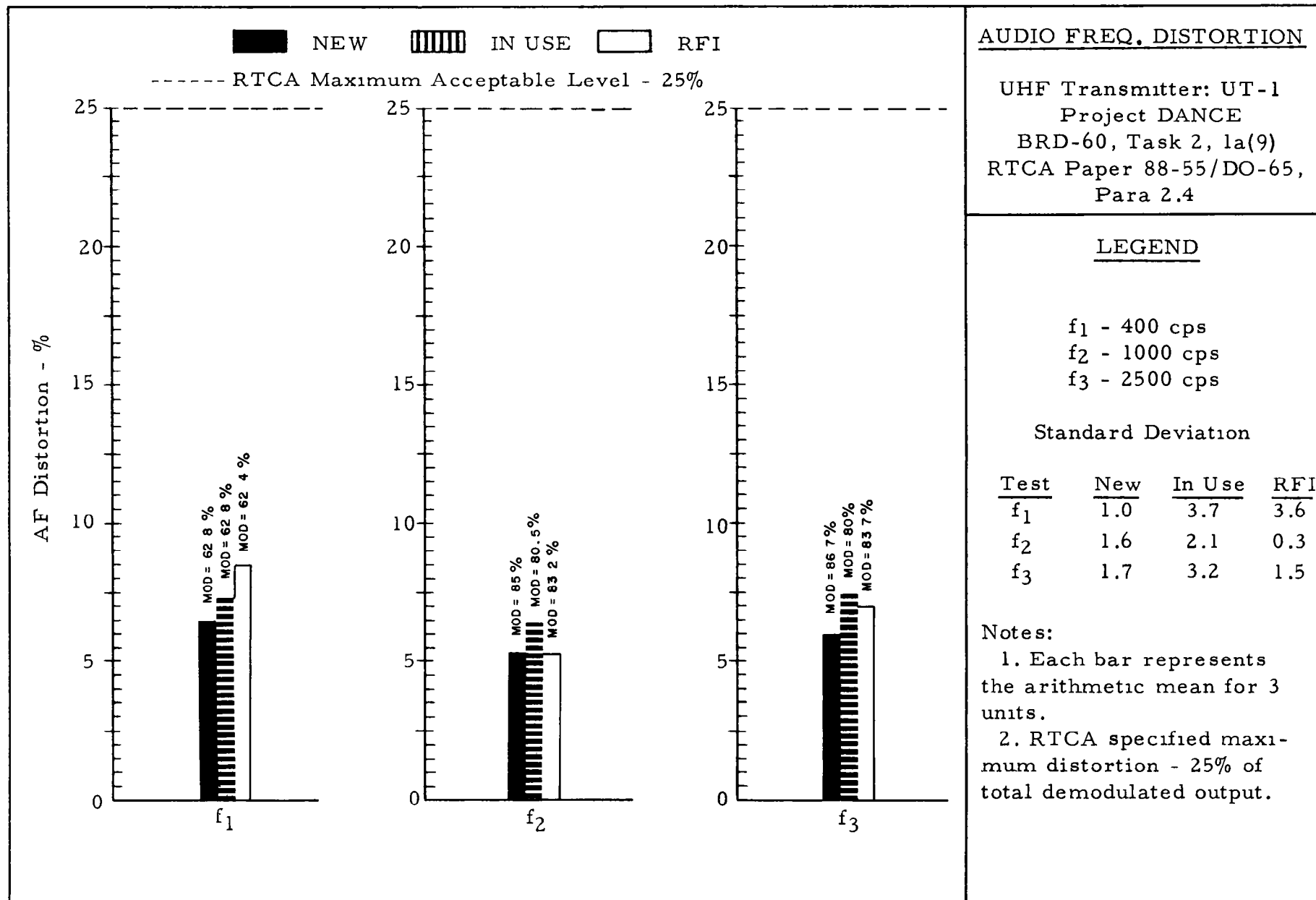
CHANNEL ACCURACY - UHF TRANSMITTER - UT-1



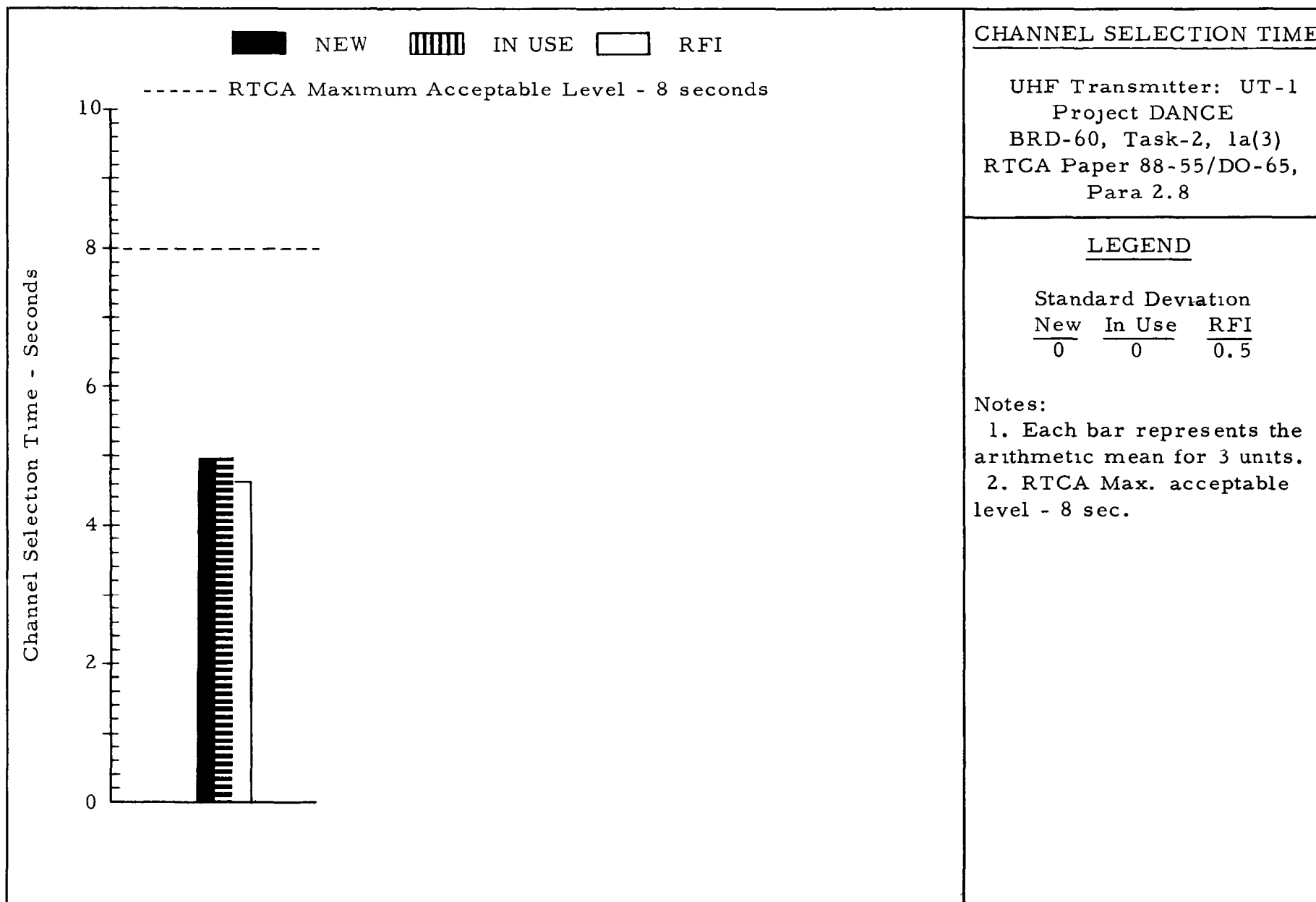
MODULATION CAPABILITY - UHF TRANSMITTER - UT-1



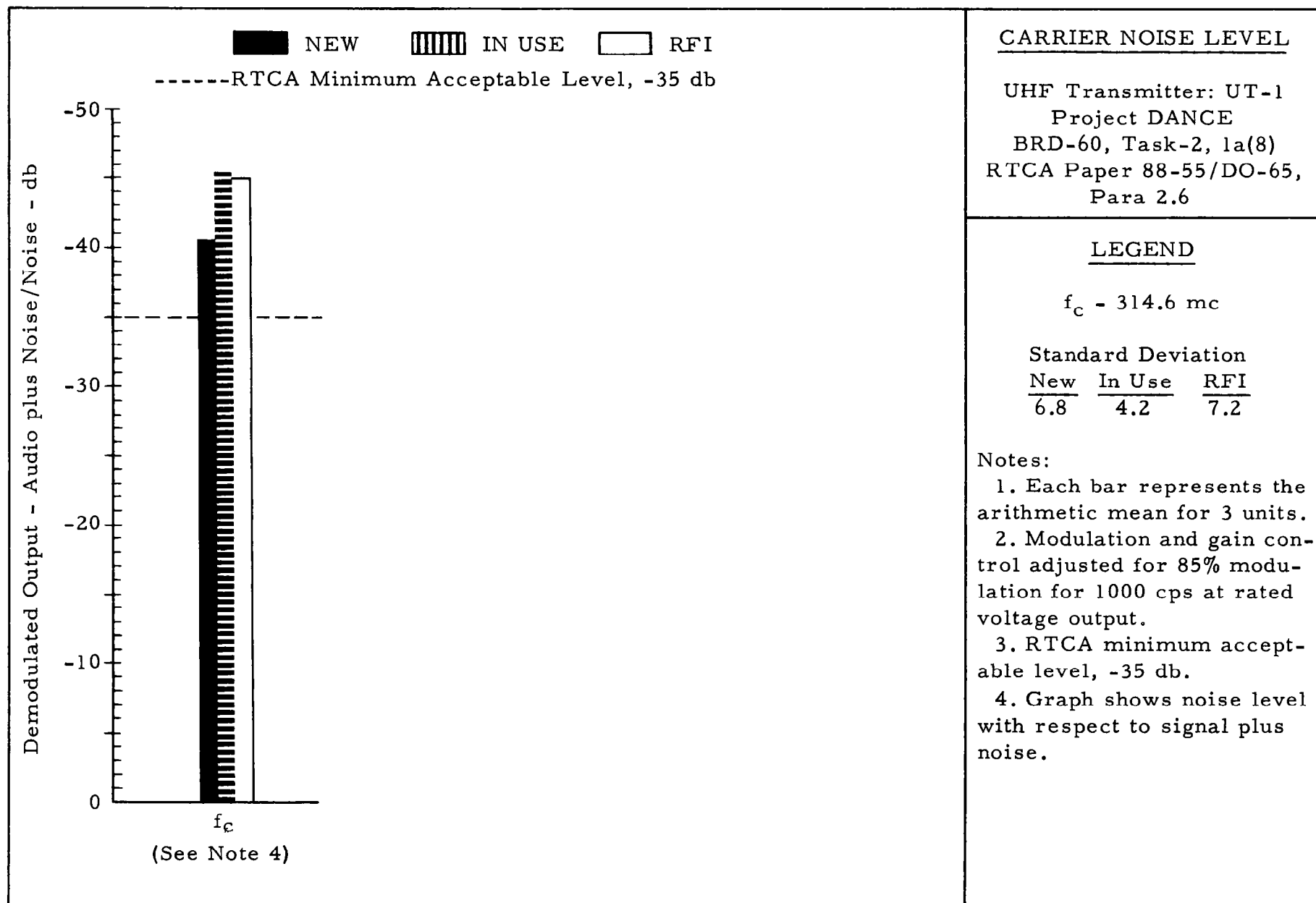
AUDIO FREQUENCY RESPONSE - UHF TRANSMITTER - UT-1



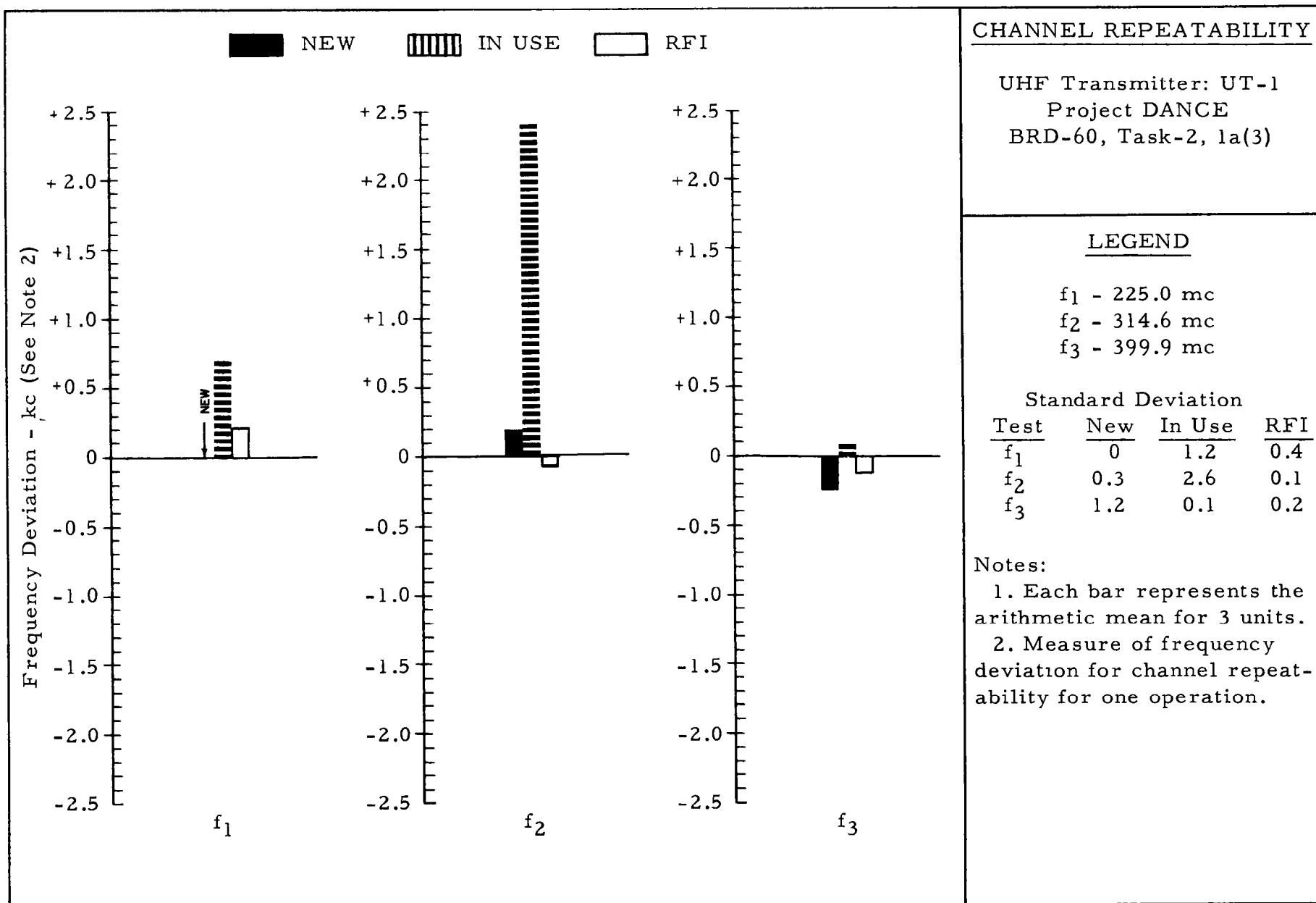
AUDIO FREQUENCY DISTORTION - UHF TRANSMITTER - UT-1



CHANNEL SELECTION TIME - UHF TRANSMITTER - UT-1



CARRIER NOISE LEVEL - UHF TRANSMITTER - UT-1



CHANNEL REPEATABILITY - UHF TRANSMITTER - UT-1

INTERFERENCE TESTS

UHF Transmitter: UT-1
 Project DANCE
 BRD-60. Task-2
 RTCA Paper 88-55/DO-65

Test	Carrier F. (mc)		RTCA Performance Standards	Results	Performance Standards Met
<u>Residual Radiation</u> Contract Para: 1.a.(7) RTCA Para: 2.2	314.6		R.F. Output: ≤ 0.02 micro- microwatts at carrier frequency.	R.F. Output: 1.6 micro- microwatts at carrier frequency.	No
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(a)	314.6		R.F. Output within band of ± 25 kc and ± 50 kc from carrier frequency: ≤ 125 milliwatts. ≥ 25 db	R.F. Output: < 17.25 milli- watts within band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc. > 30 db within band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(b)	225.0 314.6 399.9		R.F. Output outside band of ± 50 kc from carrier: Carrier Freq. (mc) 225.0 ≥ 54 db 314.6 ≥ 55 db 399.9 ≥ 52 db	R.F. Output: Carrier Freq. (mc) 225.0 > 54 db except at 452 and 678 mc. 314.6 > 55 db except at 628 and 1255 mc. 399.9 > 52 db except at 801 and 1194 mc.	Partially

INTERFERENCE TESTS - UHF TRANSMITTER - UT-1

SECTION B

AIRBORNE COMMUNICATIONS EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

2. Laboratory and Field Test Data

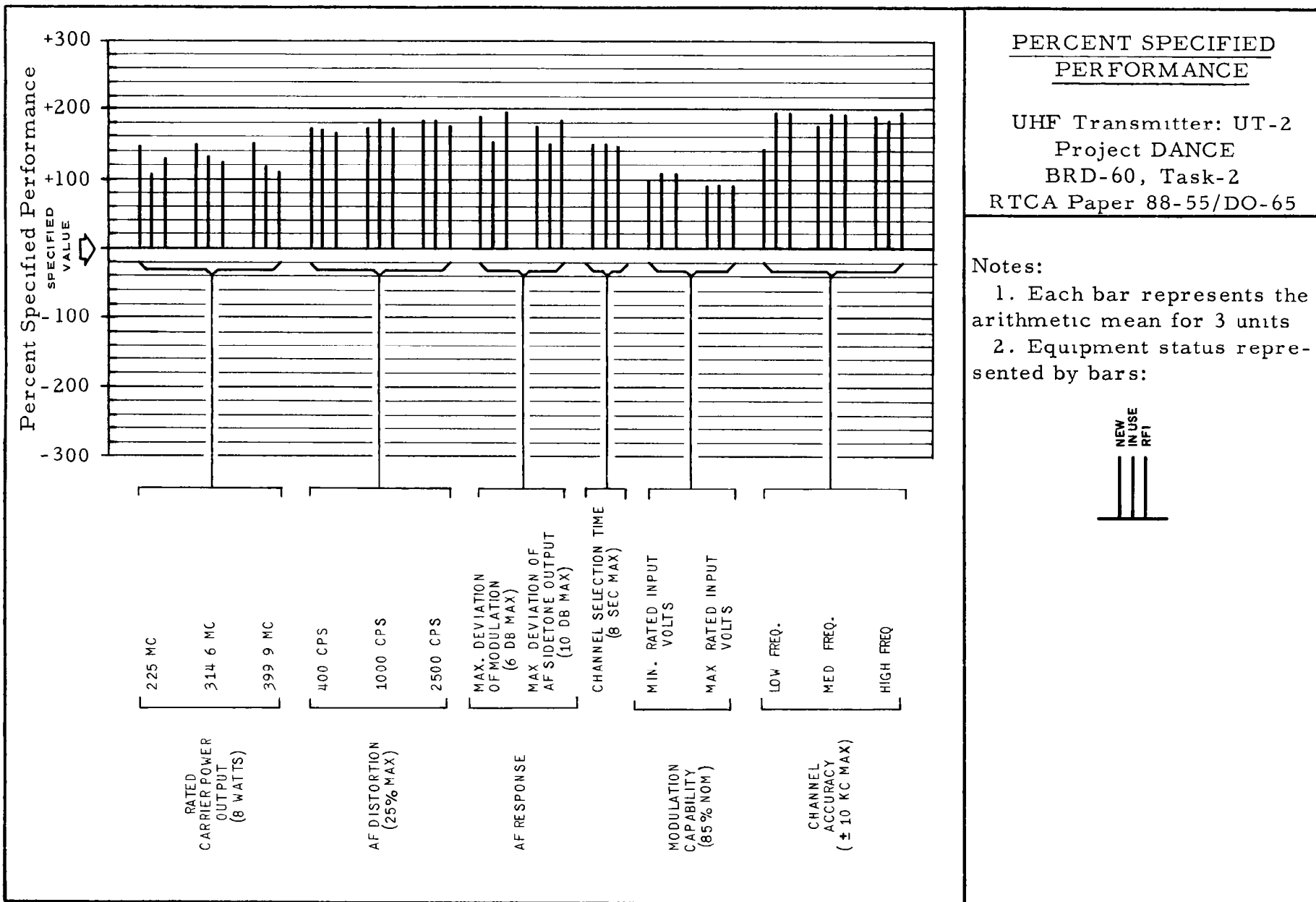
b. UT-2, UHF Transmitter

General:

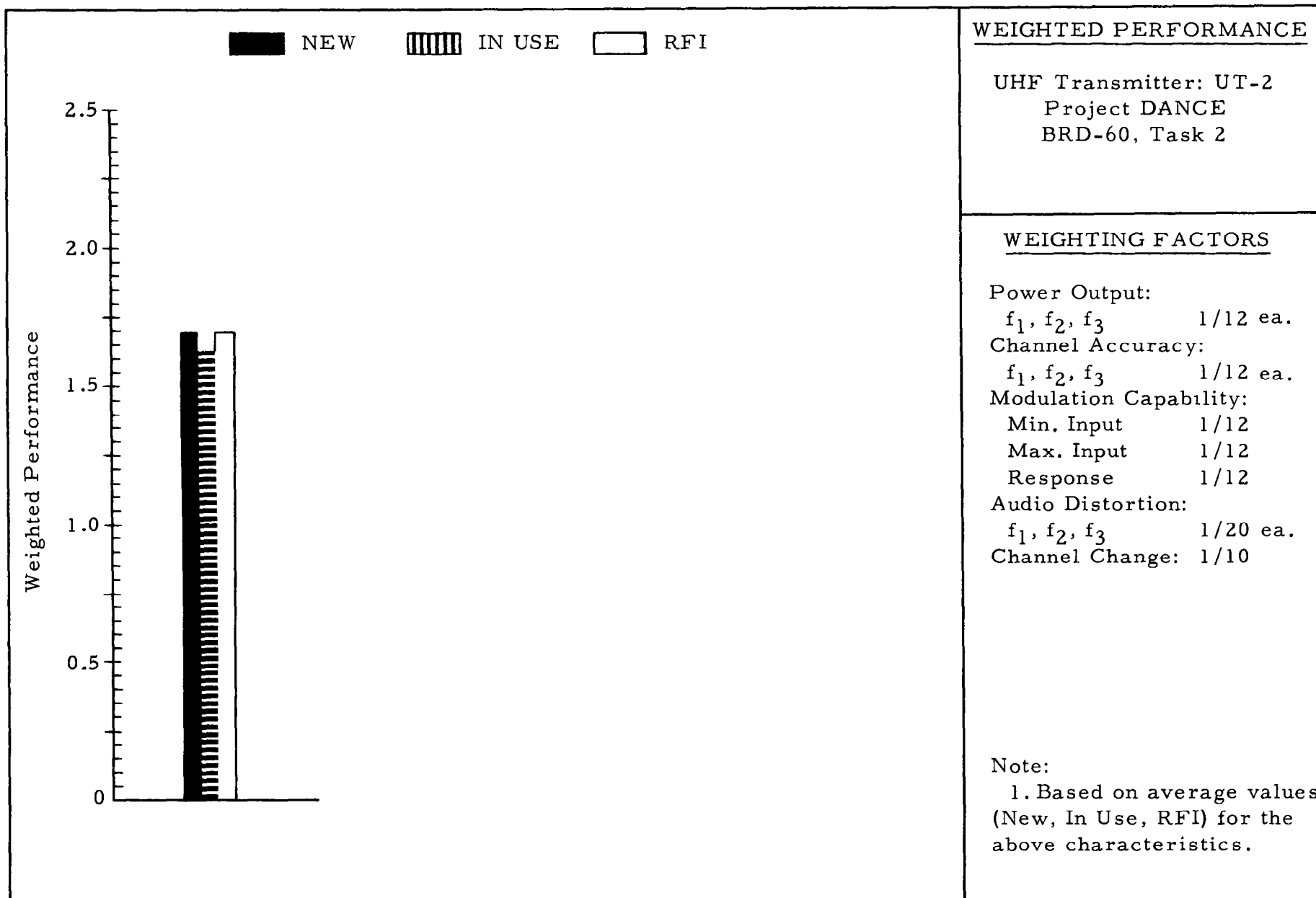
Frequency Range:	225.0 - 399.9 mc
Means of Frequency Control:	Crystal
Total Number of Channels:	1750
Number of Channels Available at Operator's Position:	20 plus 1 guard
Means of Frequency Selection:	Rotary Switch

Technical:

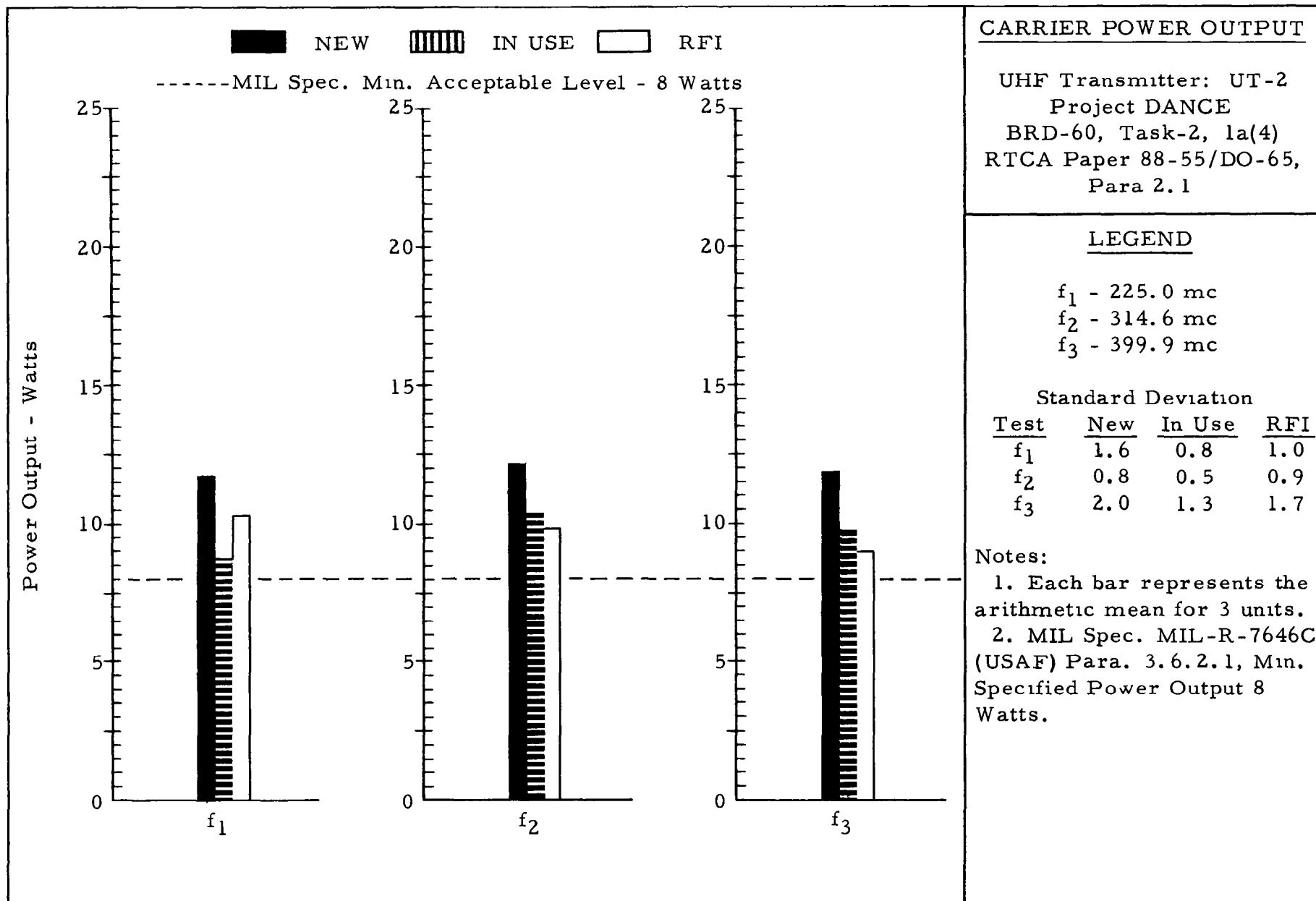
	<u>Page</u>
Percent Specified Performance	B-34
Weighted Performance	B-35
Carrier Power Output	B-36
Channel Accuracy	B-37
Modulation Capability	B-38
Audio Frequency Response	B-39
Audio Frequency Distortion	B-40
Channel Selection Time	B-41
Carrier Noise Level	B-42
Channel Repeatability	B-43
Interference Tests	B-44



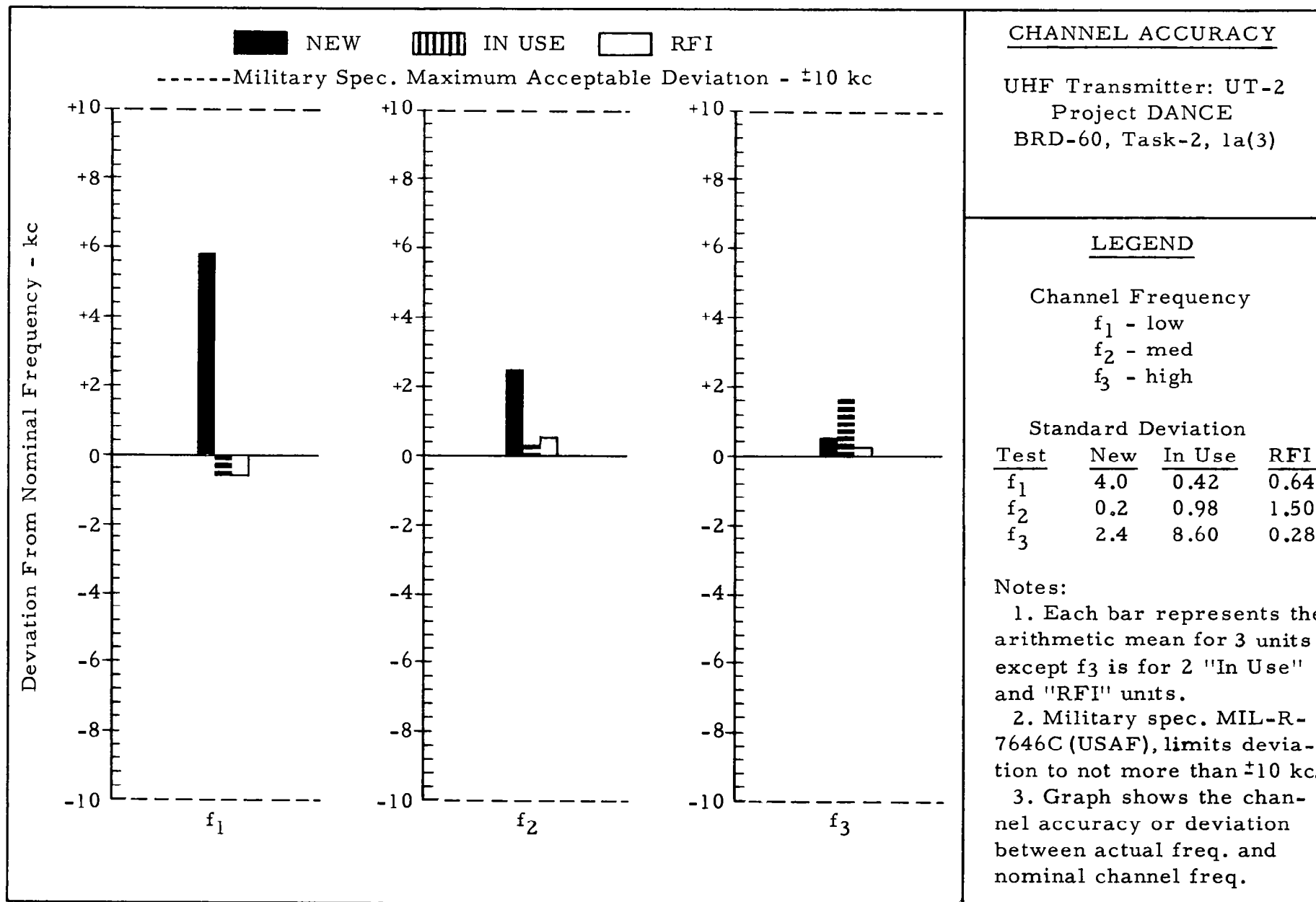
PERCENT SPECIFIED PERFORMANCE - UHF TRANSMITTER - UT-2



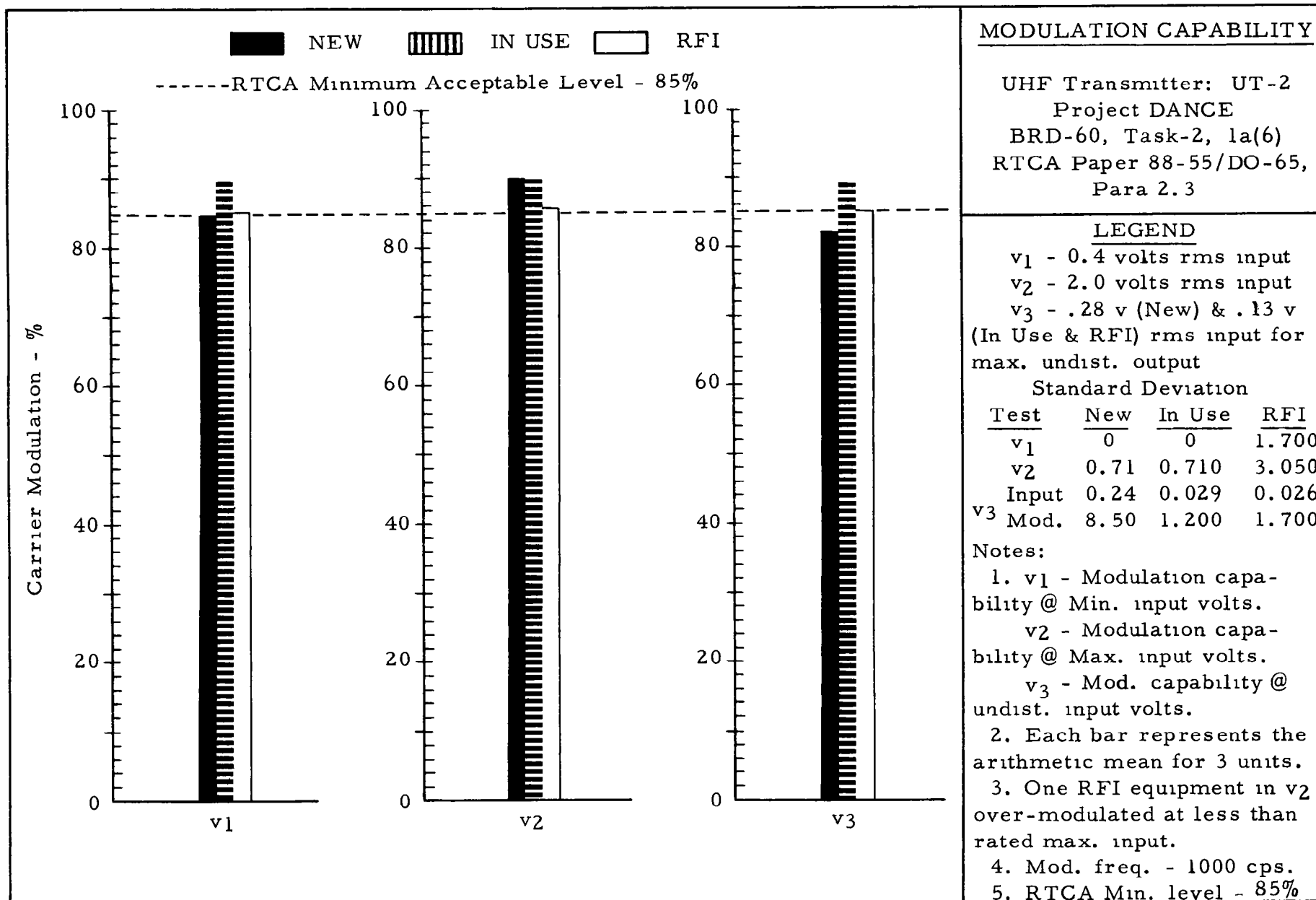
WEIGHTED PERFORMANCE - UHF TRANSMITTER - UT-2



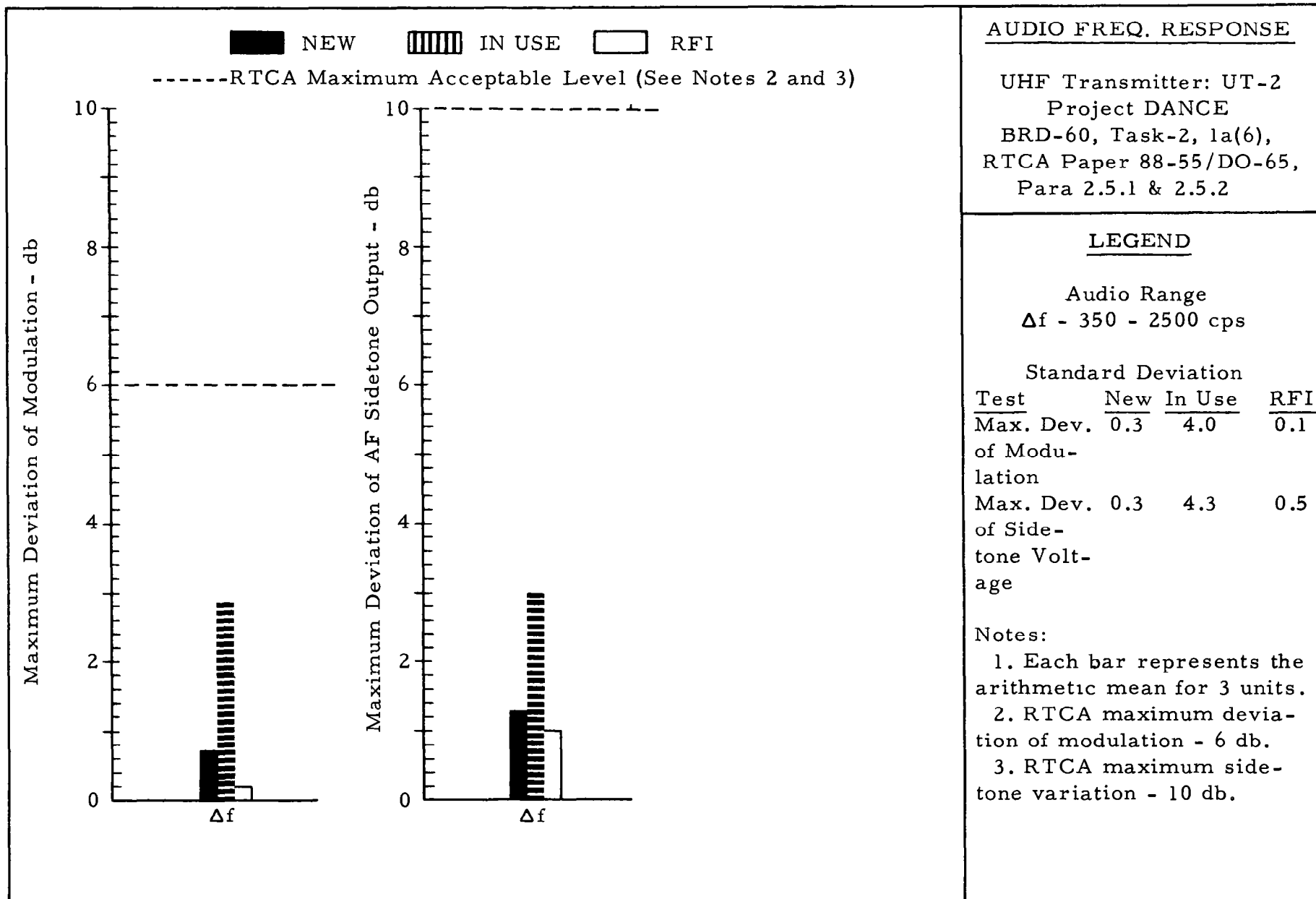
CARRIER POWER OUTPUT - UHF TRANSMITTER - UT-2



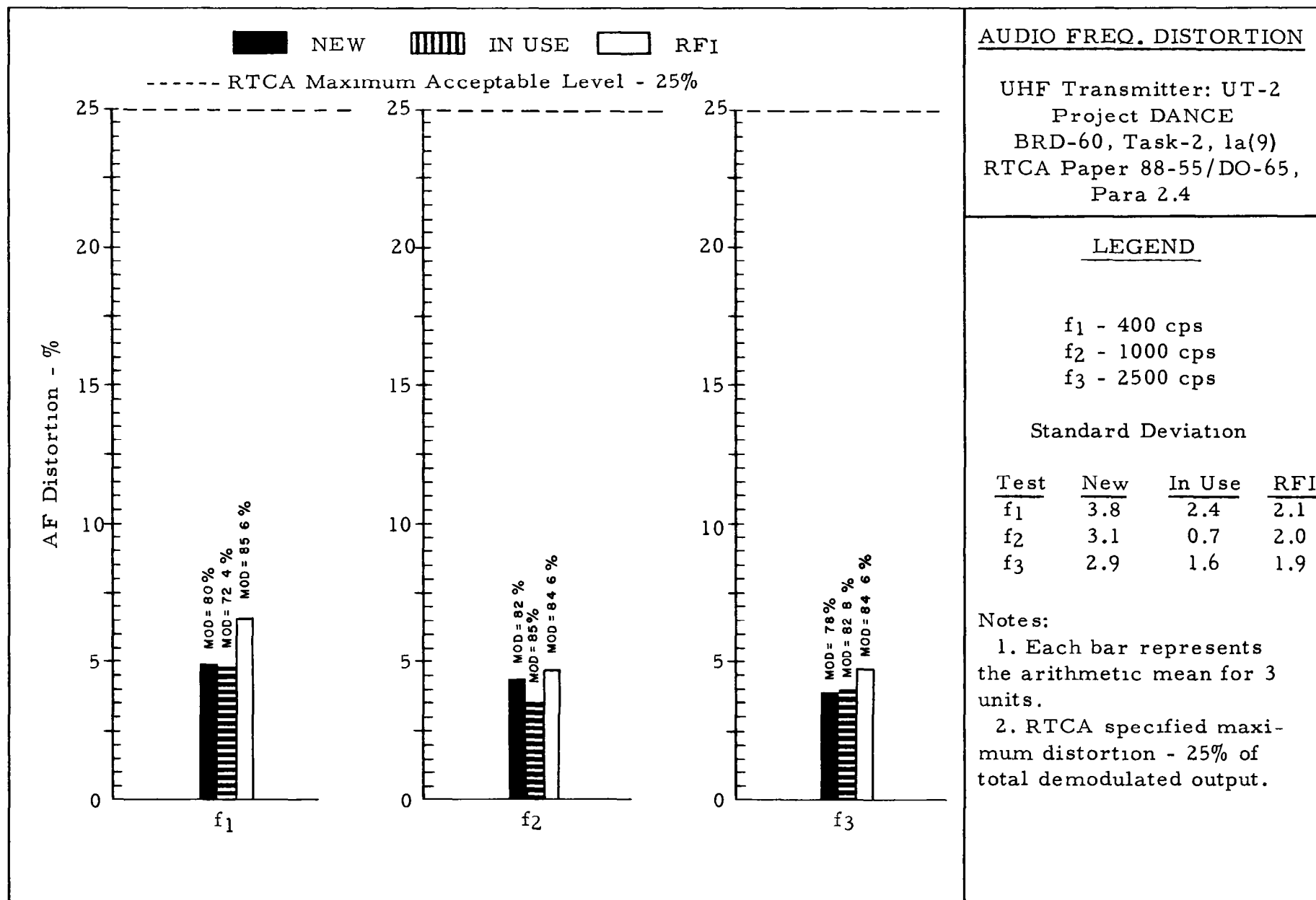
CHANNEL ACCURACY - UHF TRANSMITTER - UT-2



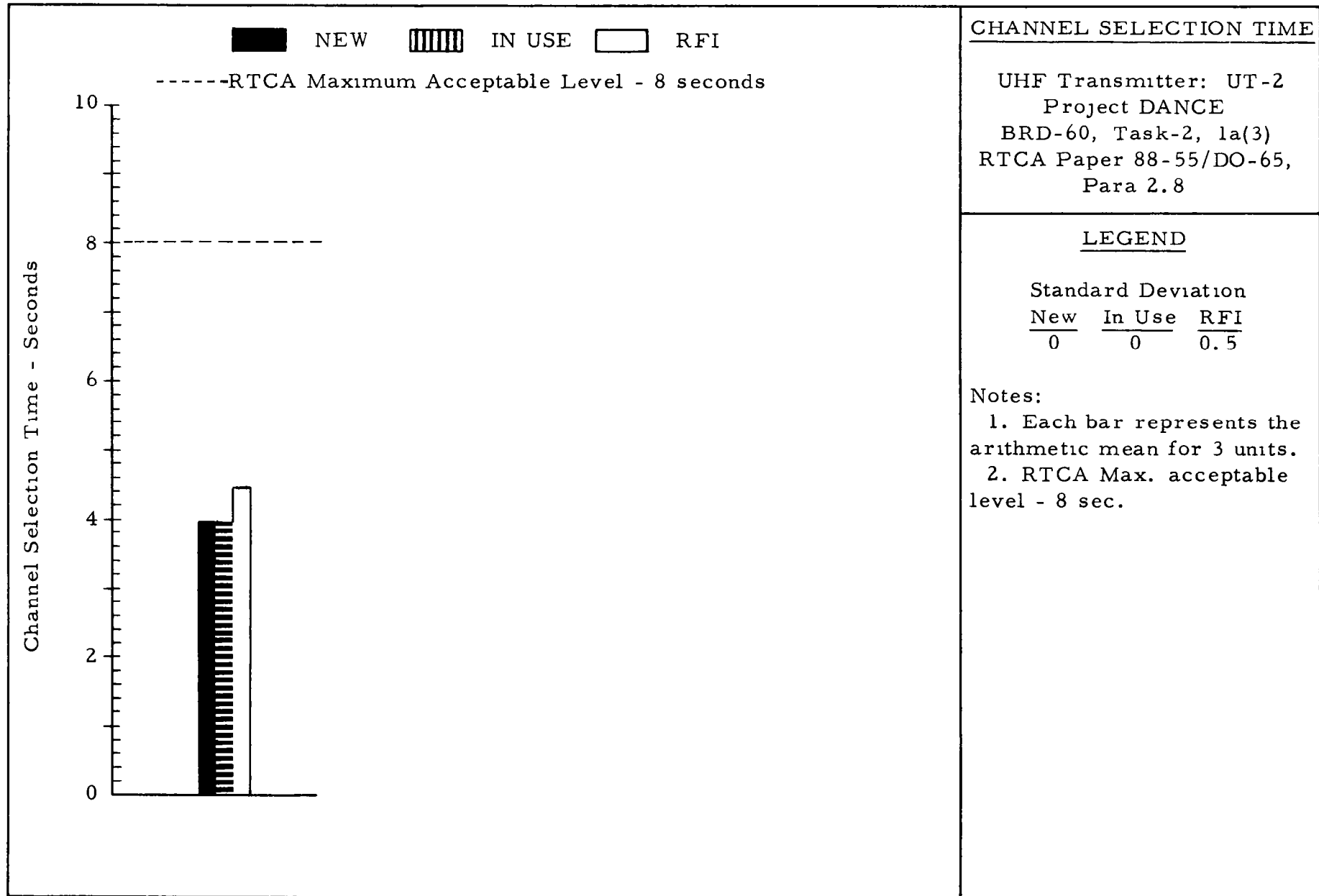
MODULATION CAPABILITY - UHF TRANSMITTER - UT-2



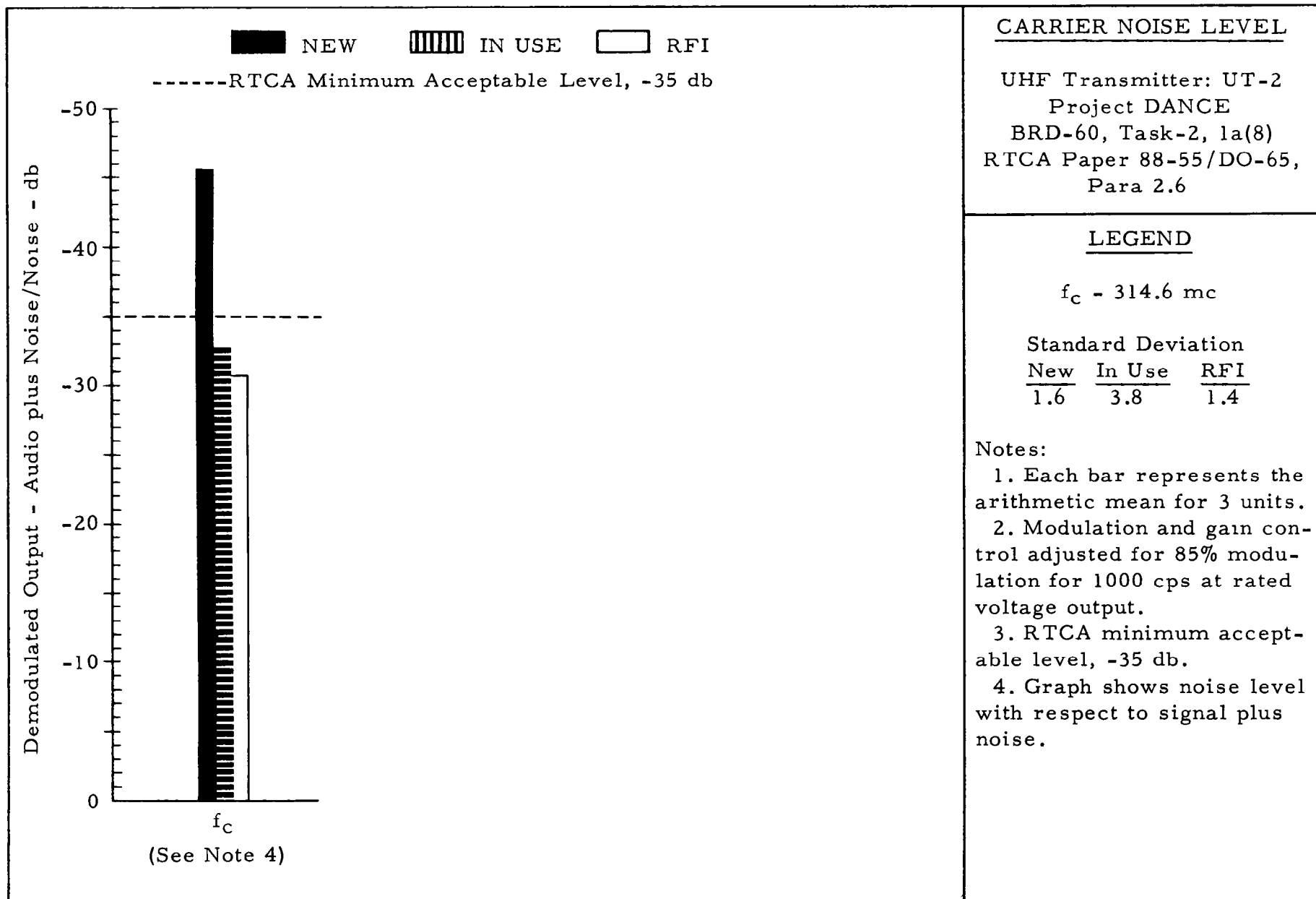
AUDIO FREQUENCY RESPONSE - UHF TRANSMITTER - UT-2



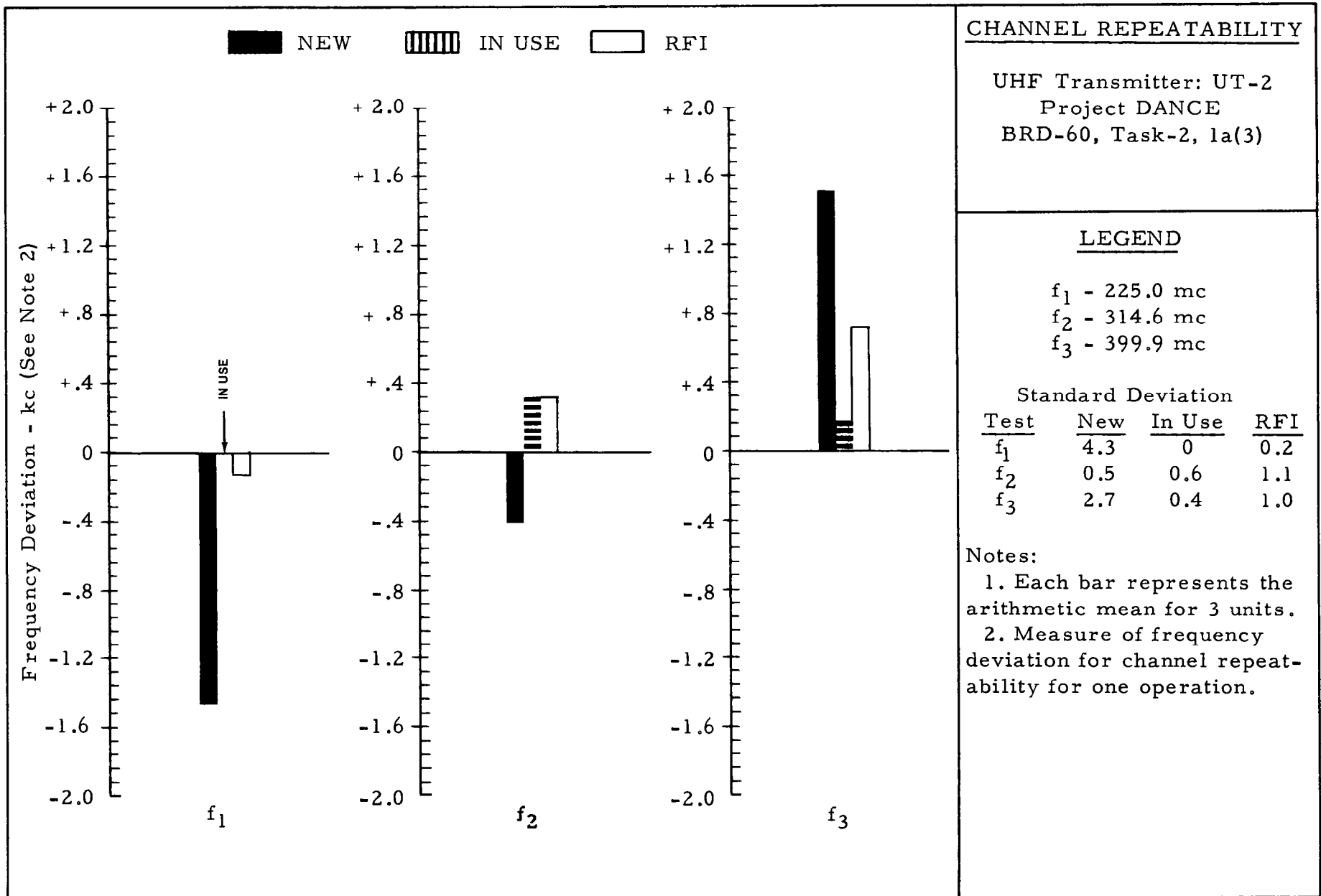
AUDIO FREQUENCY DISTORTION - UHF TRANSMITTER - UT-2



CHANNEL SELECTION TIME - UHF TRANSMITTER - UT-2



CARRIER NOISE LEVEL - UHF TRANSMITTER - UT-2



CHANNEL REPEATABILITY - UHF TRANSMITTER - UT-2

INTERFERENCE TESTS

UHF Transmitter: UT-2
Project DANCE
BRD-60. Task-2
RTCA Paper 88-55/DO-65

Test	Carrier F. (mc)		RTCA Performance Standards	Results	Performance Standards Met
<u>Residual Radiation</u> Contract Para: 1.a.(7) RTCA Para: 2.2	314.6		R.F. Output: ≤ 0.02 micro- microwatts at carrier freq.	R.F. Output: < 0.02 micro- microwatts at carrier freq.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(a)	314.6		R.F. Output within band of ± 25 kc and ± 50 kc from carrier frequency: ≤ 125 milliwatts. ≥ 25 db	R.F. Output: < 6.5 microwatts band of F_c $+ 25$ kc to $F_c + 50$ kc and F_c $- 25$ kc to $F_c - 50$ kc. > 60 db within band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to $- 50$ kc.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(b)	225.0 314.6 399.9		R.F. Output outside band of ± 50 kc from carrier: Carrier Freq. (mc) 225.0 ≥ 53 db 314.6 ≥ 51 db 399.9 ≥ 53 db	Carrier Freq. (mc) 225.0 > 53 db 314.6 > 51 db 399.9 > 53 db except at 405 mc	Partially

INTERFERENCE TESTS - UHF TRANSMITTER - UT-2

SECTION B

AIRBORNE COMMUNICATIONS EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

3. Laboratory and Field Test Data

a. UR-1, UHF Receiver

General:

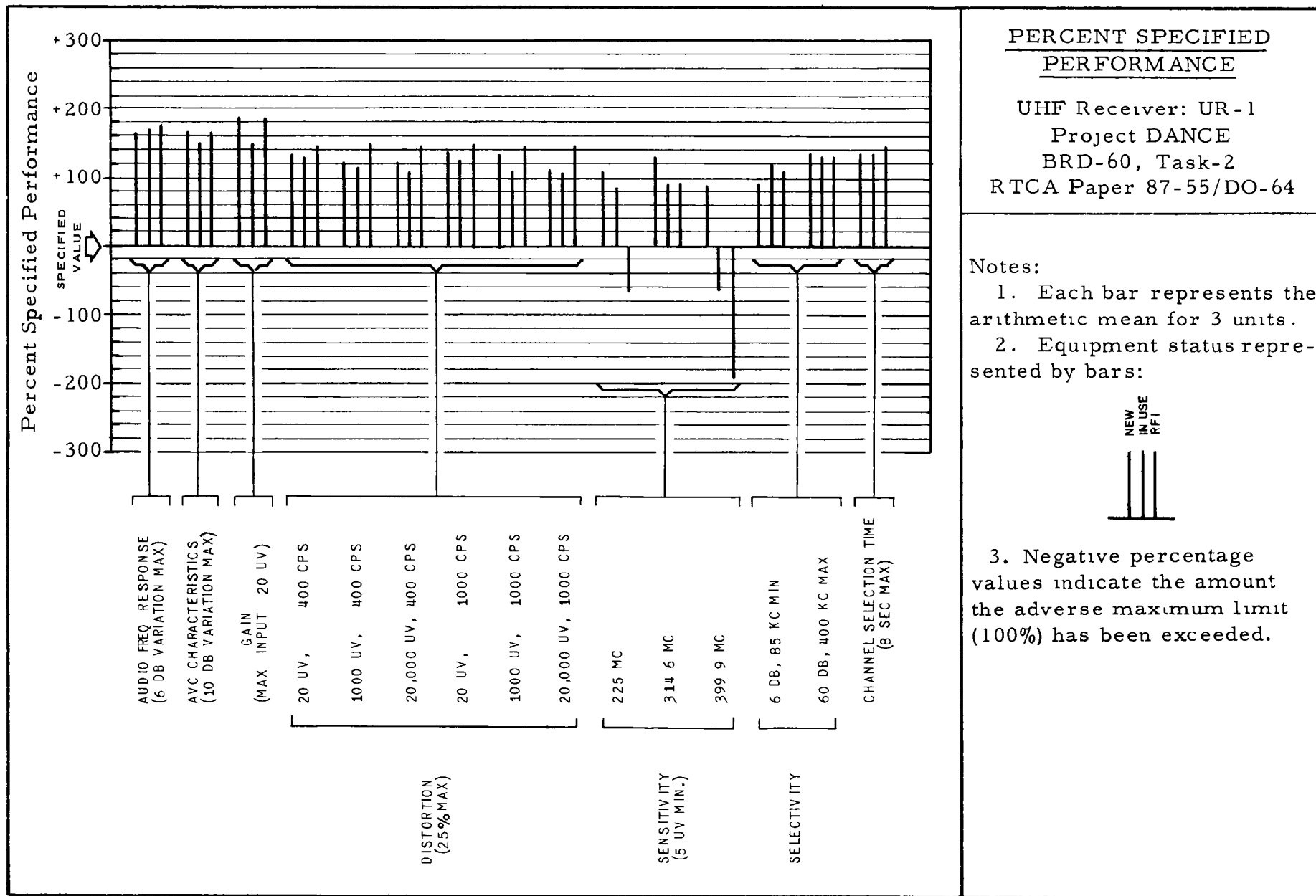
Frequency Range:	225.0 - 399.9 mc
Means of Frequency Selection:	Discrete Tuning
Total Number of Channels:	1750
Number of Channels Available at Operator's Position:	18 plus 1 guard
Means of Channel Selection:	Rotary Switch

Technical:

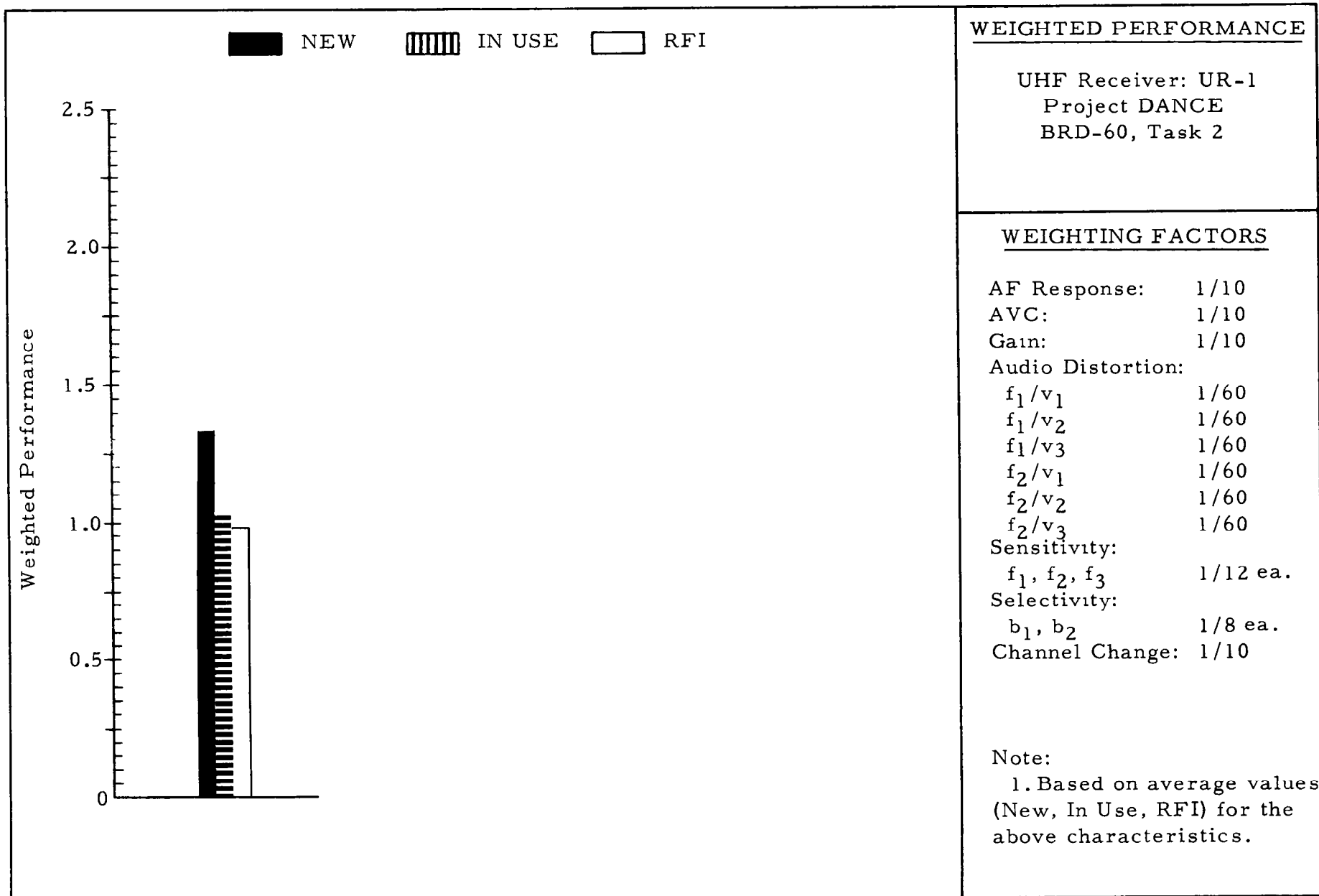
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Percent Specified Performance	B-46
Weighted Performance	B-47
Audio Frequency Response	B-48
AVC Characteristics	B-49
Gain	B-50
Distortion	B-51
Sensitivity	B-52
Selectivity	B-53
Channel Selection Time	B-54
Noise Level	B-55
Channel Repeatability	B-56
Interference Tests	B-57-

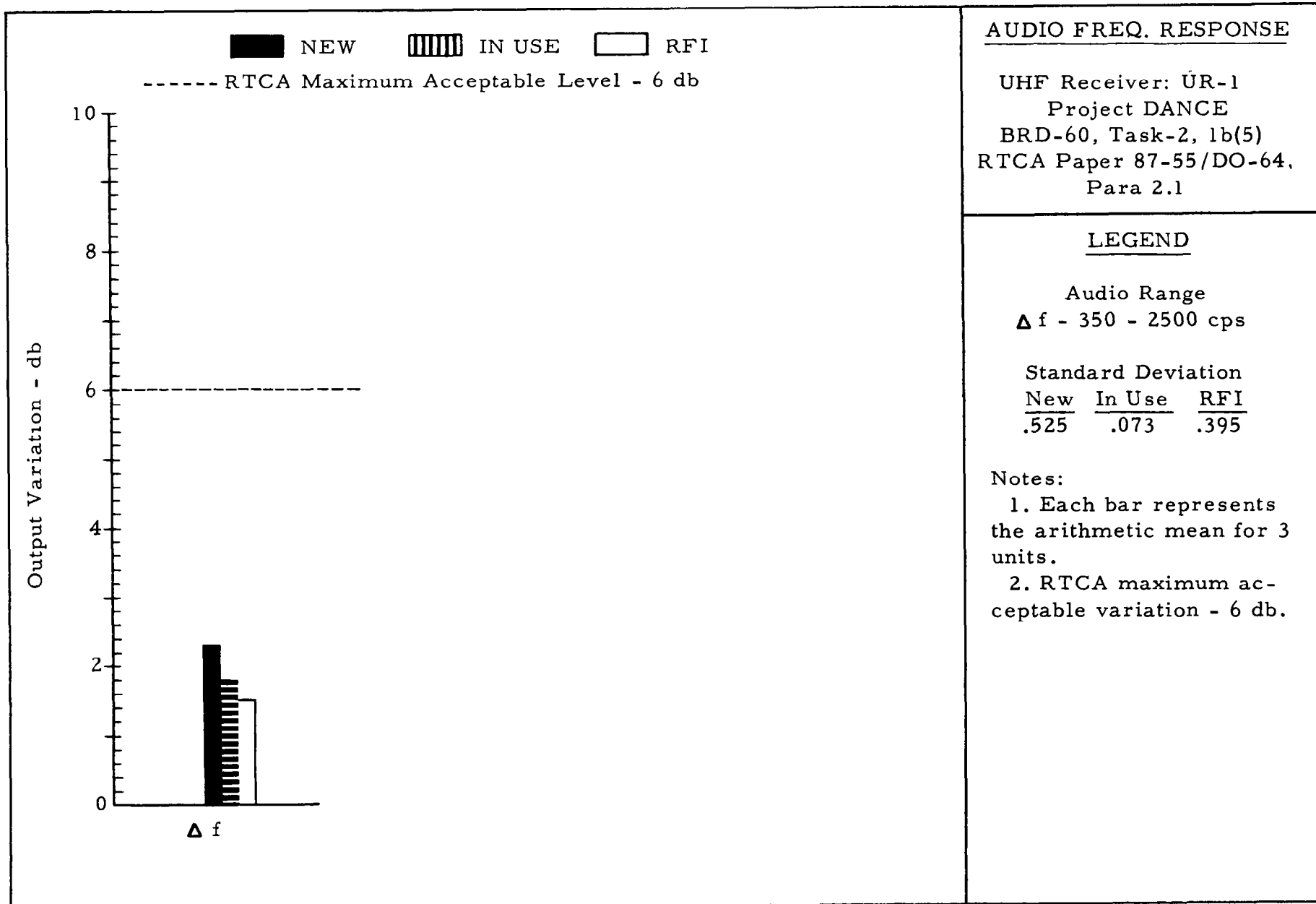
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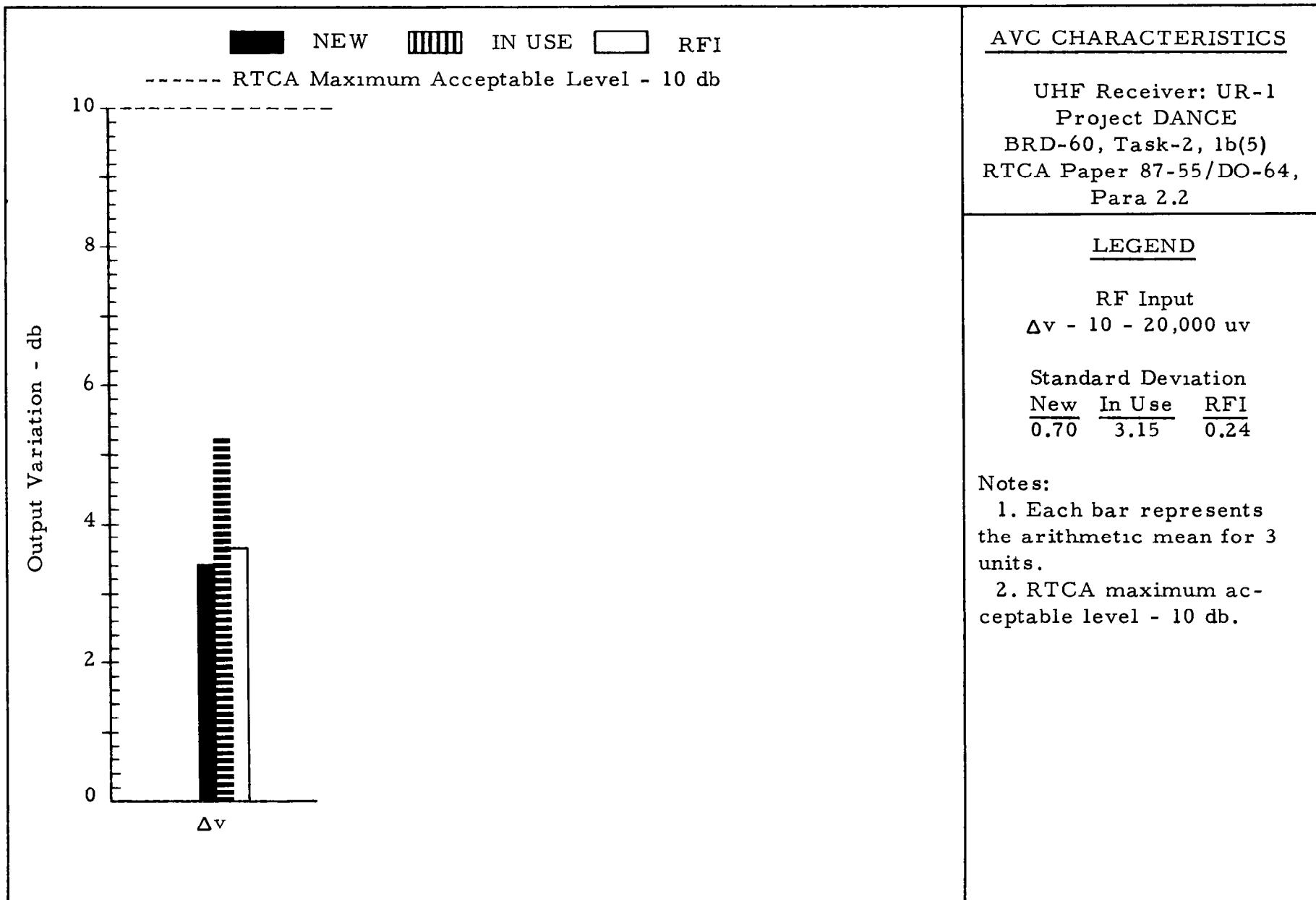
PERCENT SPECIFIED PERFORMANCE - UHF RECEIVER - UR-1



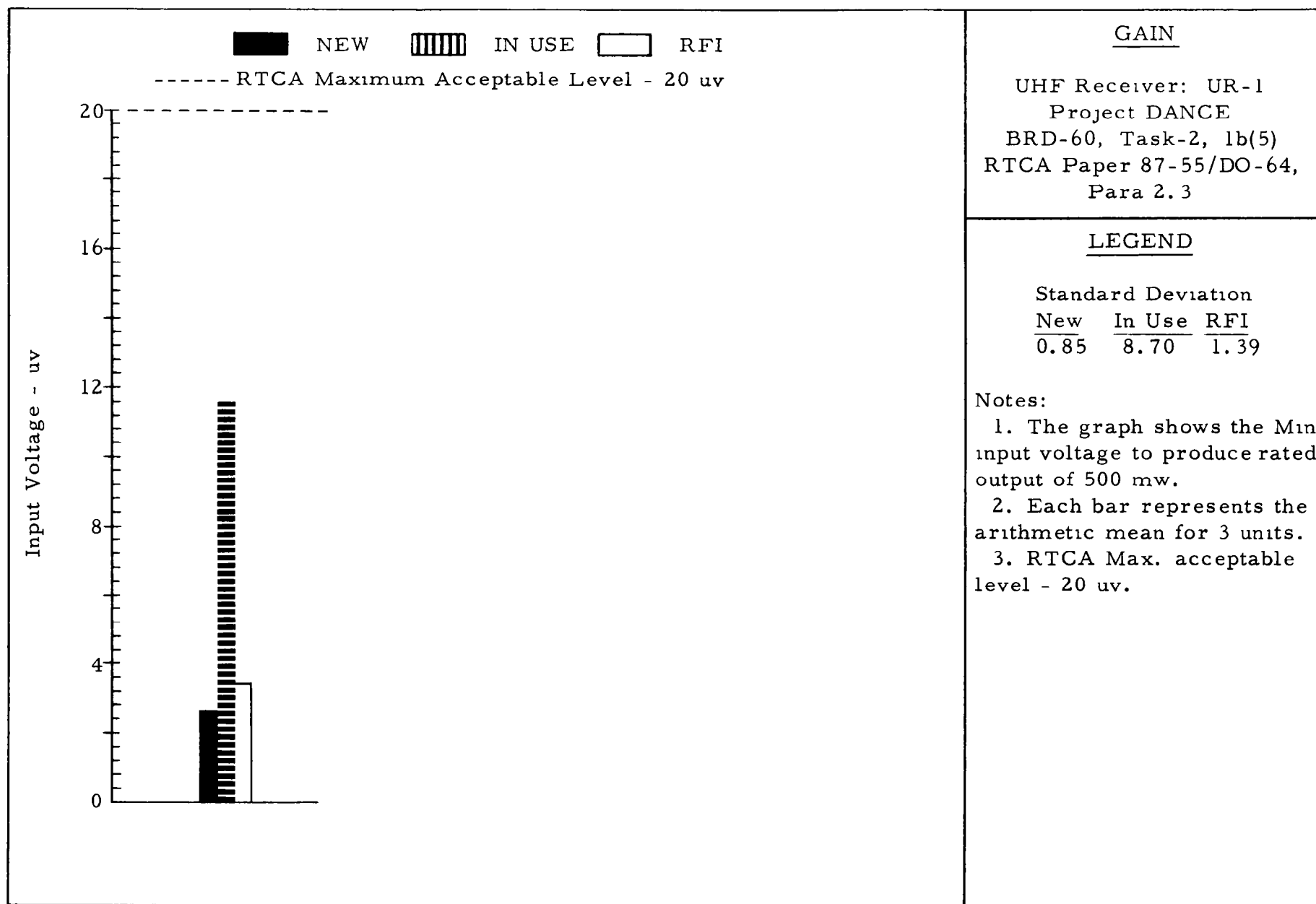
WEIGHTED PERFORMANCE - UHF RECEIVER - UR-1



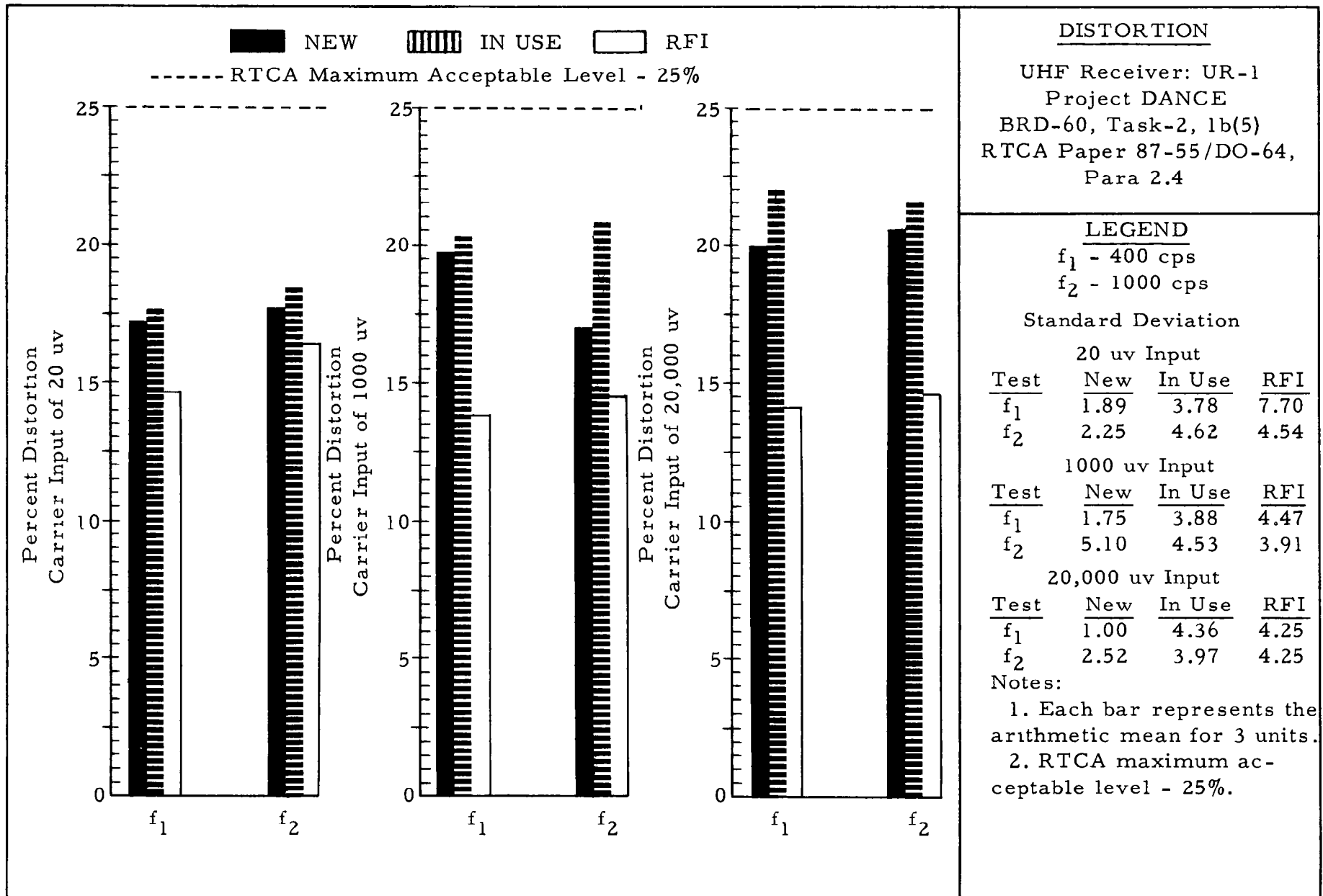
AUDIO FREQUENCY RESPONSE - UHF RECEIVER - UR-1



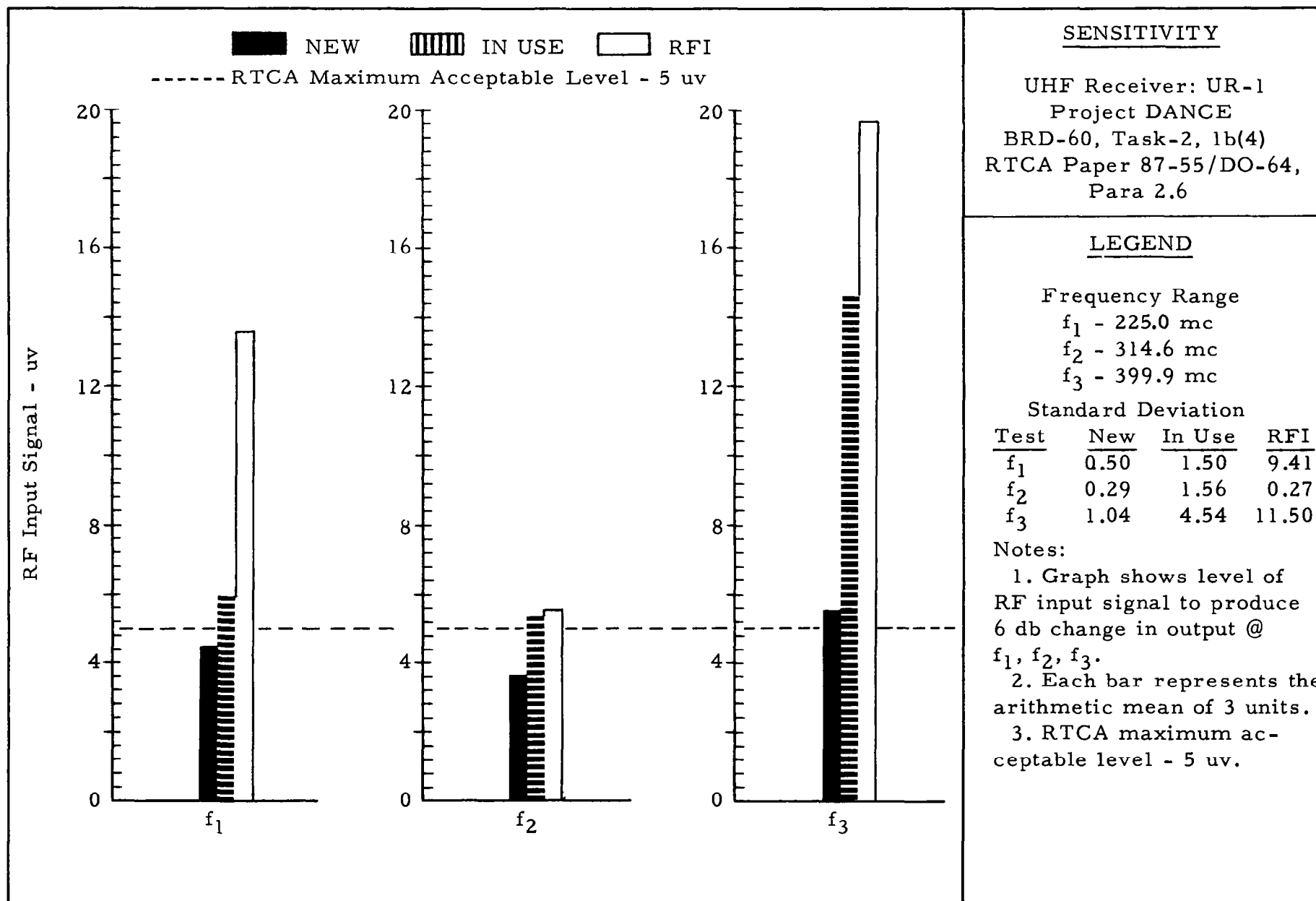
AVC CHARACTERISTICS - UHF RECEIVER - UR-1



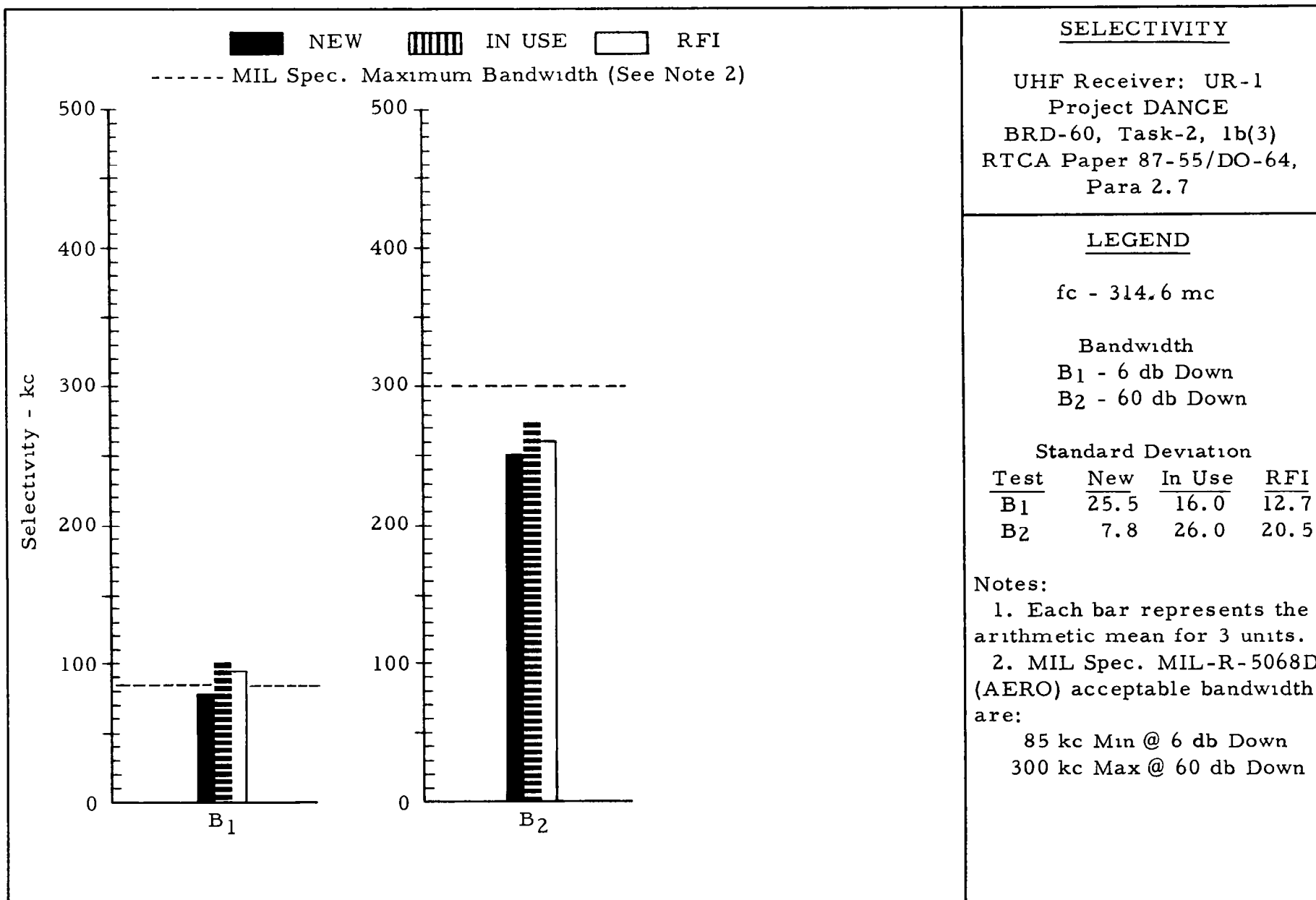
GAIN - UHF RECEIVER - UR-1



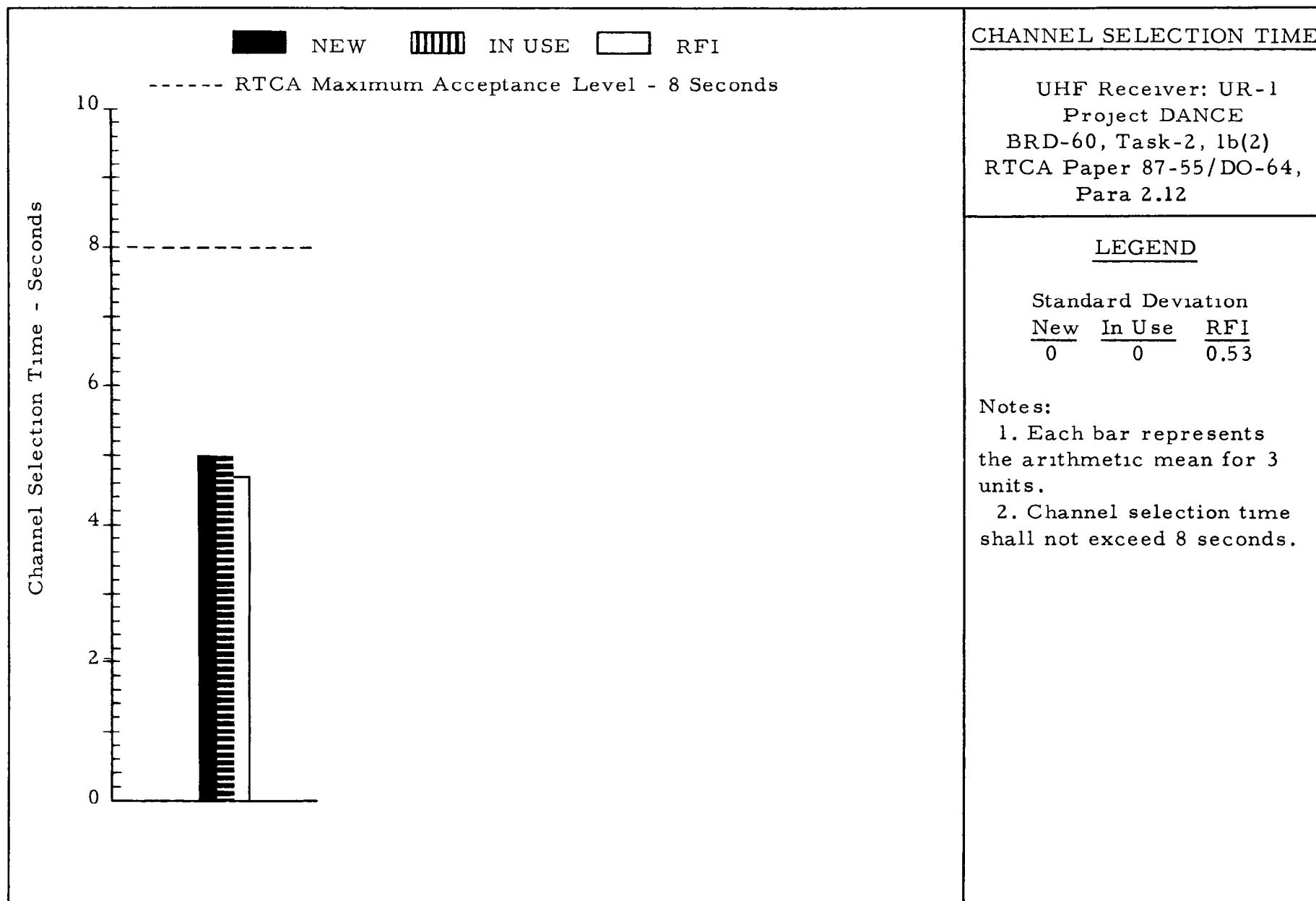
DISTORTION - UHF RECEIVER - UR-1



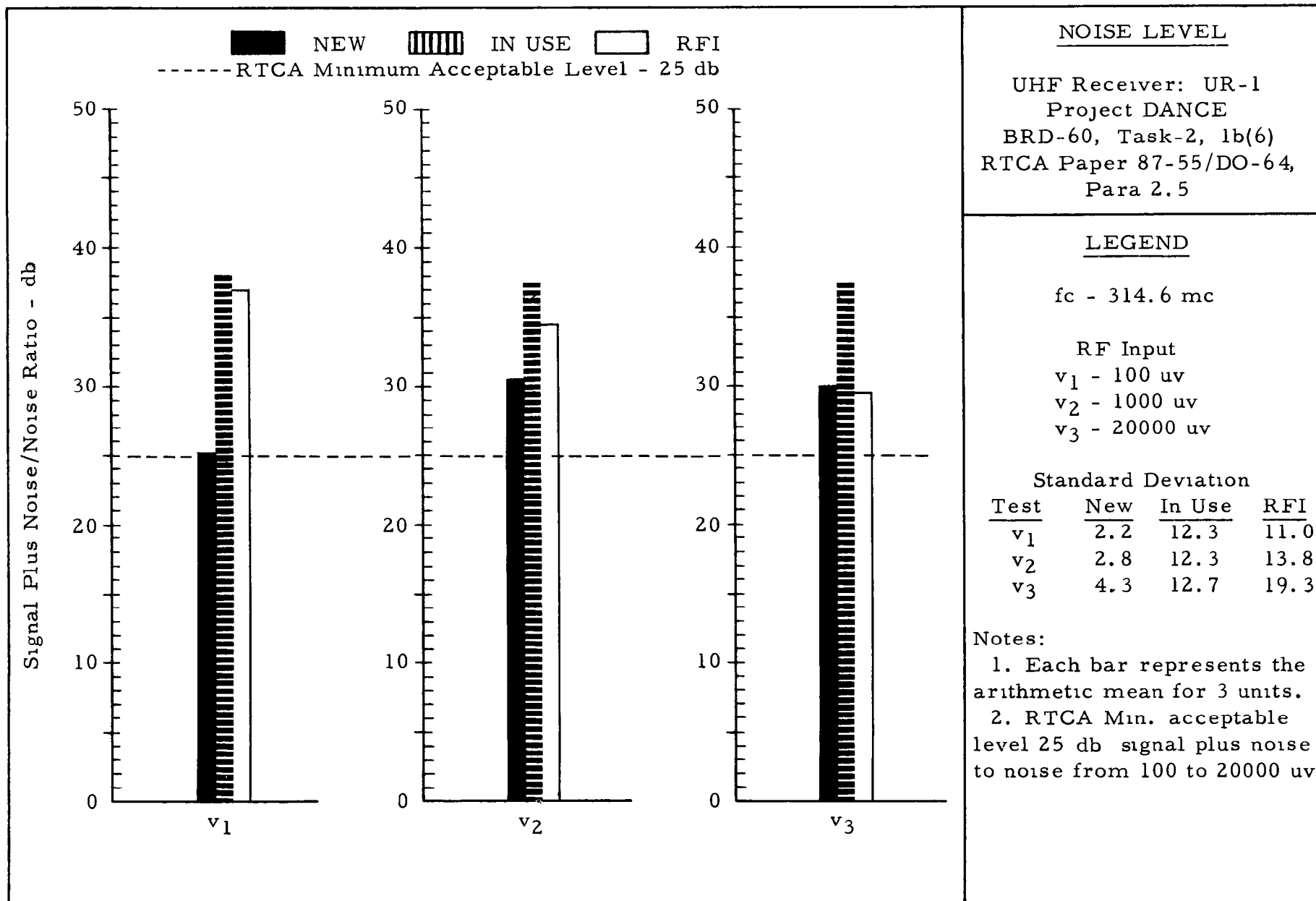
SENSITIVITY - UHF RECEIVER - UR-1



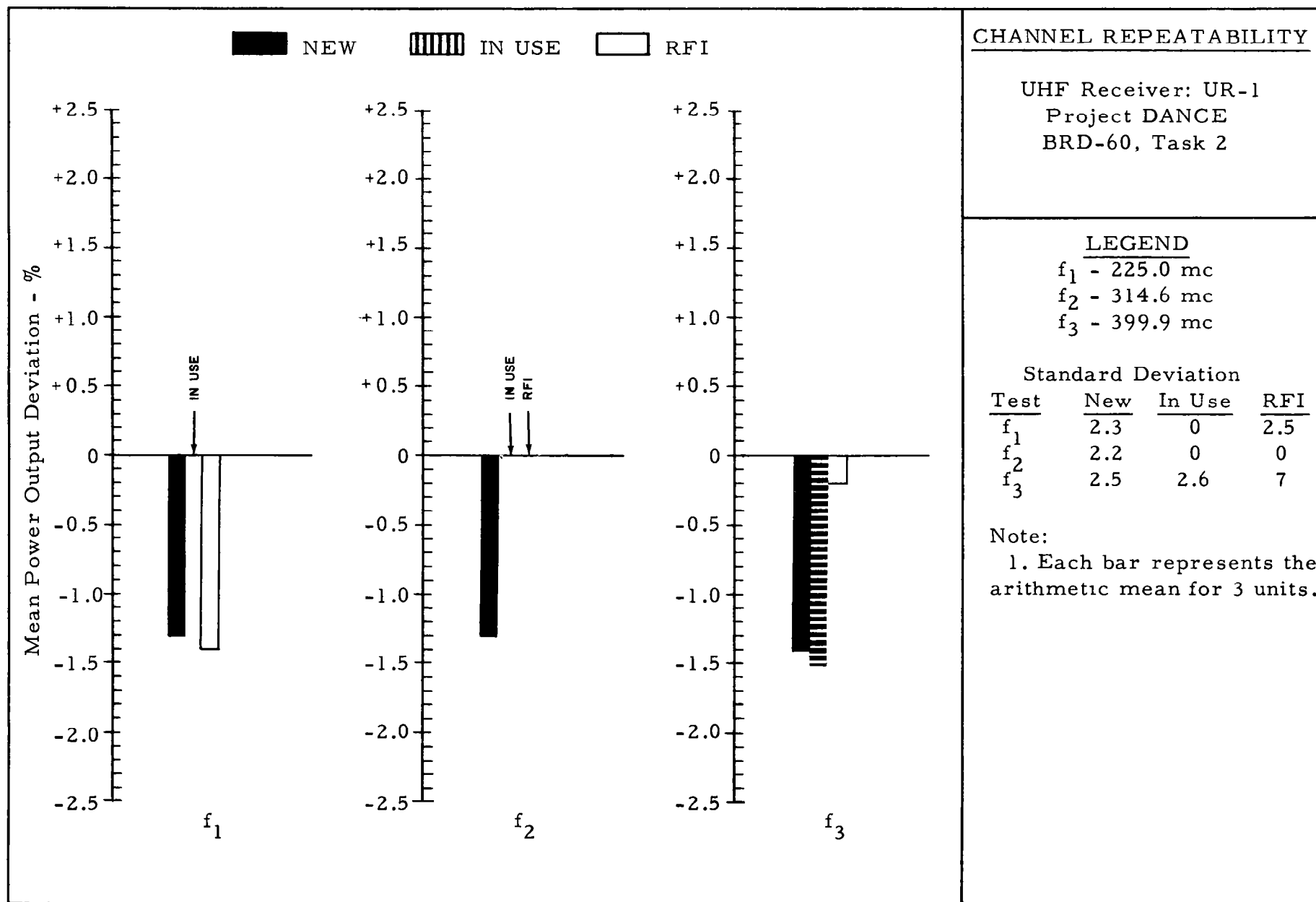
SELECTIVITY - UHF RECEIVER - UR-1



CHANNEL SELECTION TIME - UHF RECEIVER - UR-1



NOISE LEVEL - UHF RECEIVER - UR-1



CHANNEL REPEATABILITY - UHF RECEIVER - UR-1

INTERFERENCE TESTS

UHF Receiver: UR-1
 Project DANCE
 BRD-60. Task-2
 RTCA Paper 87-55/DO-64

Test	Frequency (Mc)	F_c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Spurious Response</u> Contract Para. 1.b.(9) RTCA Para. 2.8(b)	.19 to 940	310.638	Acceptable level excluding band within $F_c \pm 80$ kc: ≥ 60 db	Actual Level: < 60 db at F_c $+80$ kc. ≤ 60 db between F_c $+80$ kc and $F_c + 116$ kc. All other frequencies within performance standards.	Partially
<u>Desensitization</u> Contract Para. 1.b.(7) RTCA Para. 2.10(b)	225 to 399.9	314.6	Acceptable level excluding band within $F_c \pm 100$ kc: ≤ 8 db	Actual Level: < 8 db at F_c $+100$ kc. > 8 db at $F_c - 100$ kc. $= 8$ db at $F_c - 126$ kc. All other frequencies within performance standards.	Partially
<u>Cross Modulation</u> Contract Para. 1.b.(7) RTCA Para. 2.9.(b)	$F_c \pm 100$ kc $F_c \pm 200$ kc	329.3	Acceptable level: ≥ 10 db.	Actual Level: > 10 db at F_c $+100$ kc. < 10 db at $F_c - 100$ kc and $F_c \pm 200$ kc.	Partially
<u>Cable Conducted Interference</u> Contract Para. 1.b.(8) RTCA Para. 2.11(a)	.15 to 25	225.0 399.9	Acceptable emission: ≤ 200 microvolts.	Actual emission on 28v line: $F_c = 225.0$ Mc < 200 micro- volts. $F_c = 399.9$ Mc < 200 microvolts. All frequencies within performance standards.	Yes

INTERFERENCE TESTS - UHF RECEIVER - UR-1

Test	Frequency (Mc)	F _c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Antenna Conducted</u> <u>Interference</u> Contract Para. 1.b.(8) RTCA Para. 2.11(b)	.15 to 1500	225.0 314.6 399.9	Acceptable emission: ≤ 400 micro-micro watts	Actual emission: F _c = 225.0 Mc. <400 micro-micro watts except at 224 Mc. = 400 micro-micro watts at 742 Mc. F _c = 314.6 Mc <400 micro- micro watts except at 224 and 1154 Mc F _c = 399.9 Mc <400 micro-micro watts except at 224 and 742 Mc.	Partially

Test	Contract Para.	F _c (Mc)	Probable Susceptibility	Relation to Frequency Synthesis
Susceptibility to Radar Type signals	1.b.(7)	314.6	242, 249, 252, and 255 Mc	None

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

3. Laboratory and Field Test Data

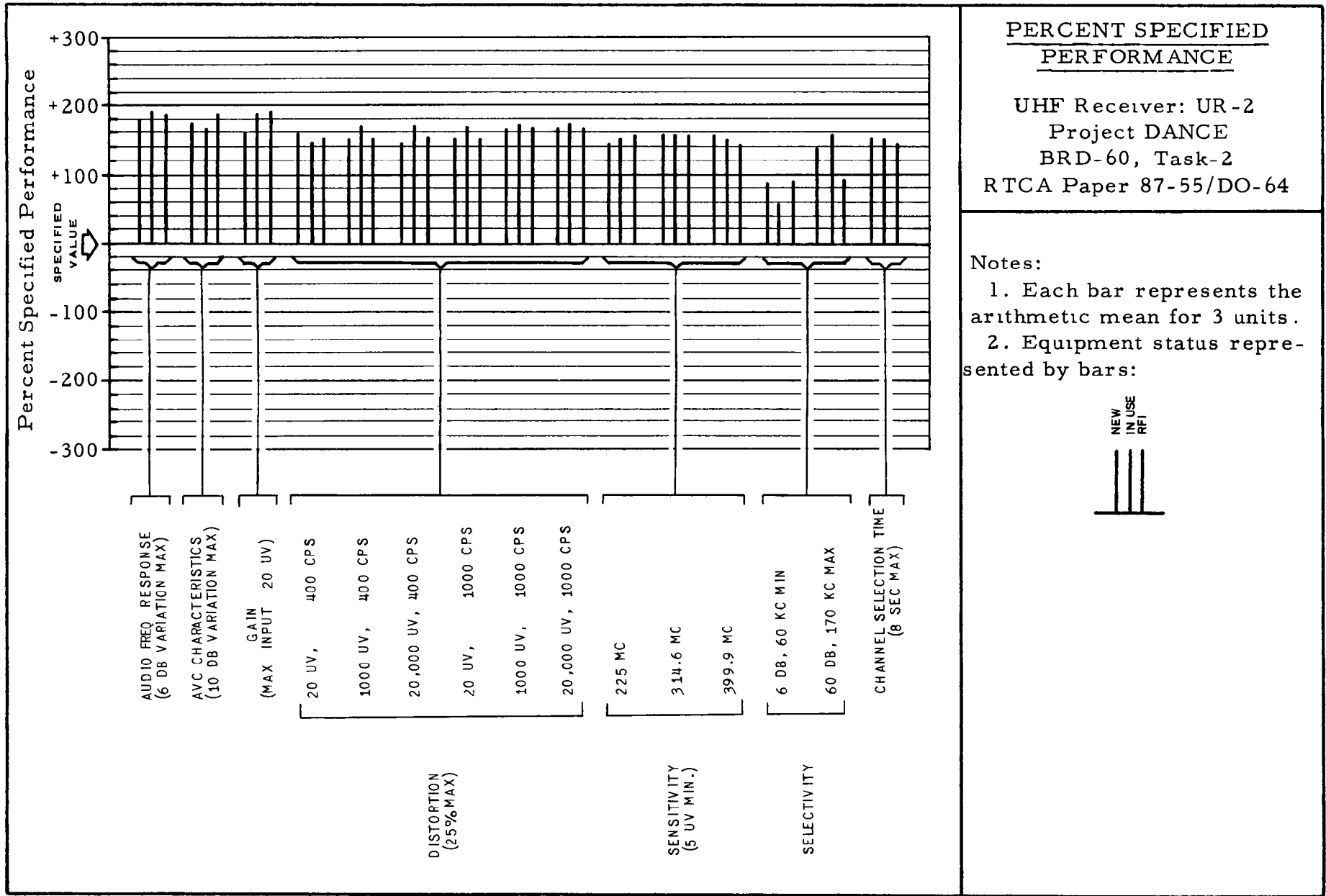
b. UR-2, UHF Receiver

General:

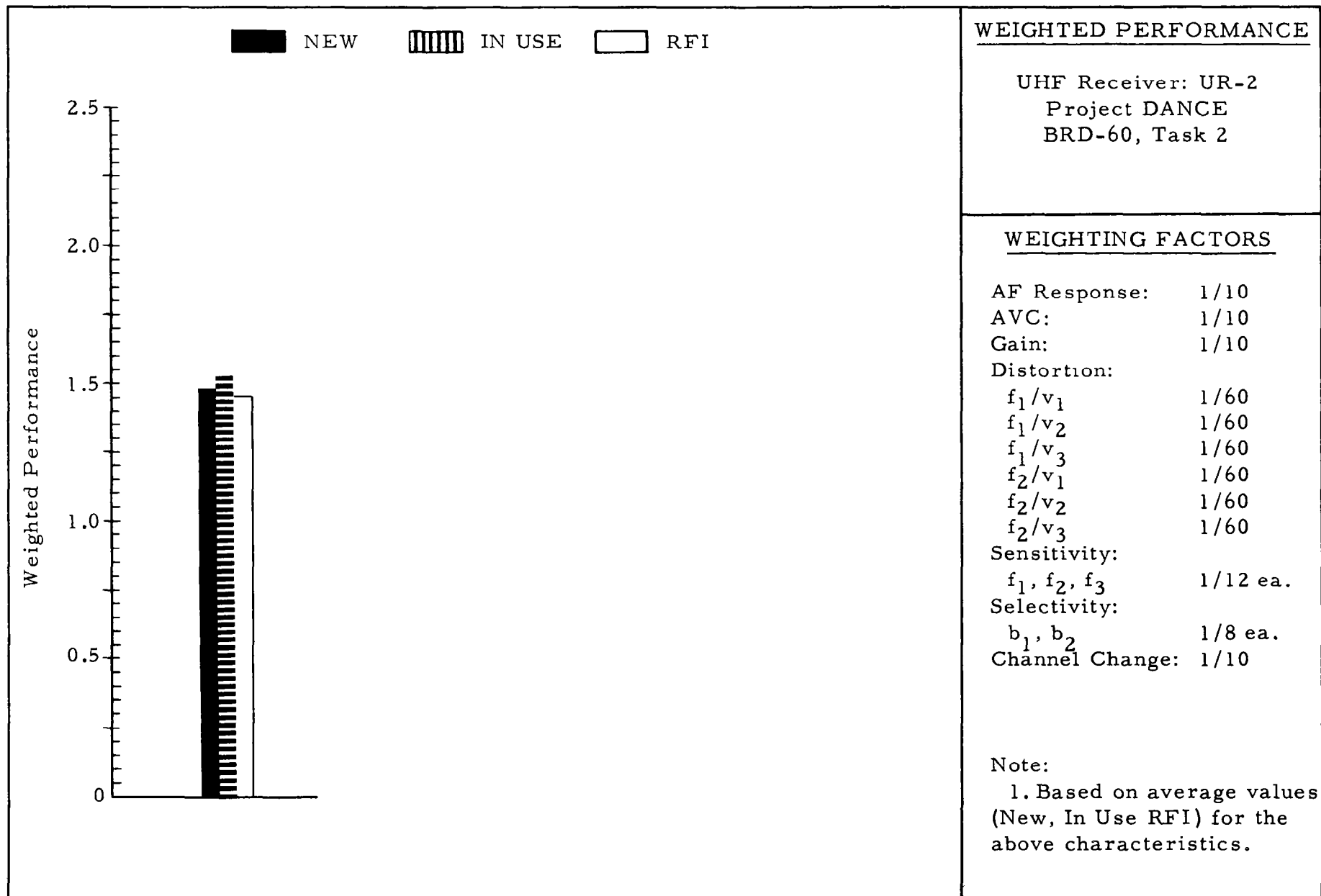
Frequency Range:	225.0 - 399.9 mc
Means of Frequency Selection:	Discrete Tuning
Total Number of Channels:	1750
Number of Channels Available at Operator's Position:	20 plus 1 guard
Means of Channel Selection:	Rotary Switch

Technical:

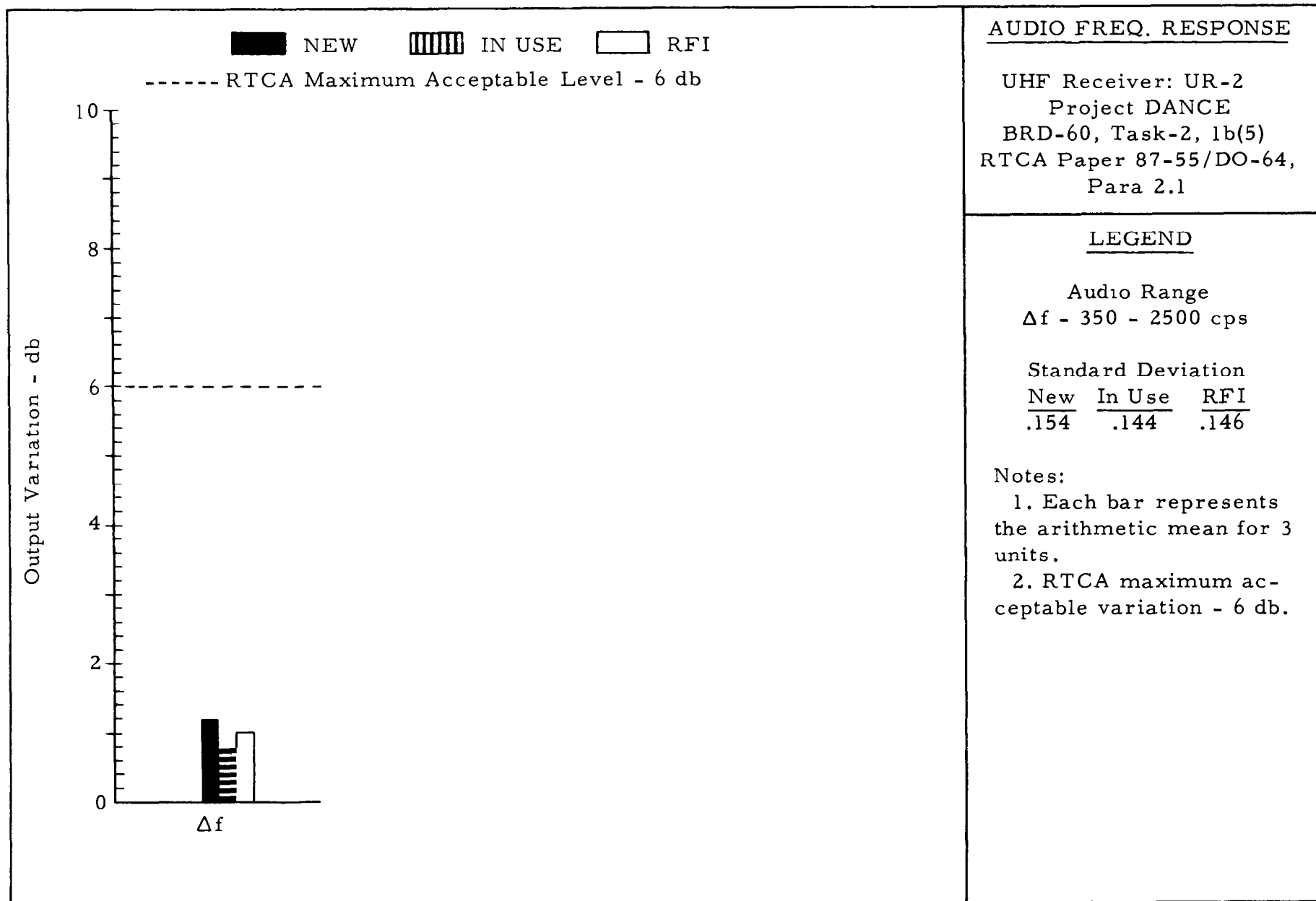
	<u>Page</u>
Percent Specified Performance	B-60
Weighted Performance	B-61
Audio Frequency Response	B-62
AVC Characteristics	B-63
Gain	B-64
Distortion	B-65
Sensitivity	B-66
Selectivity	B-67
Channel Selection Time	B-68
Noise Level	B-69
Channel Repeatability	B-70
Interference Tests	B-71-
	72



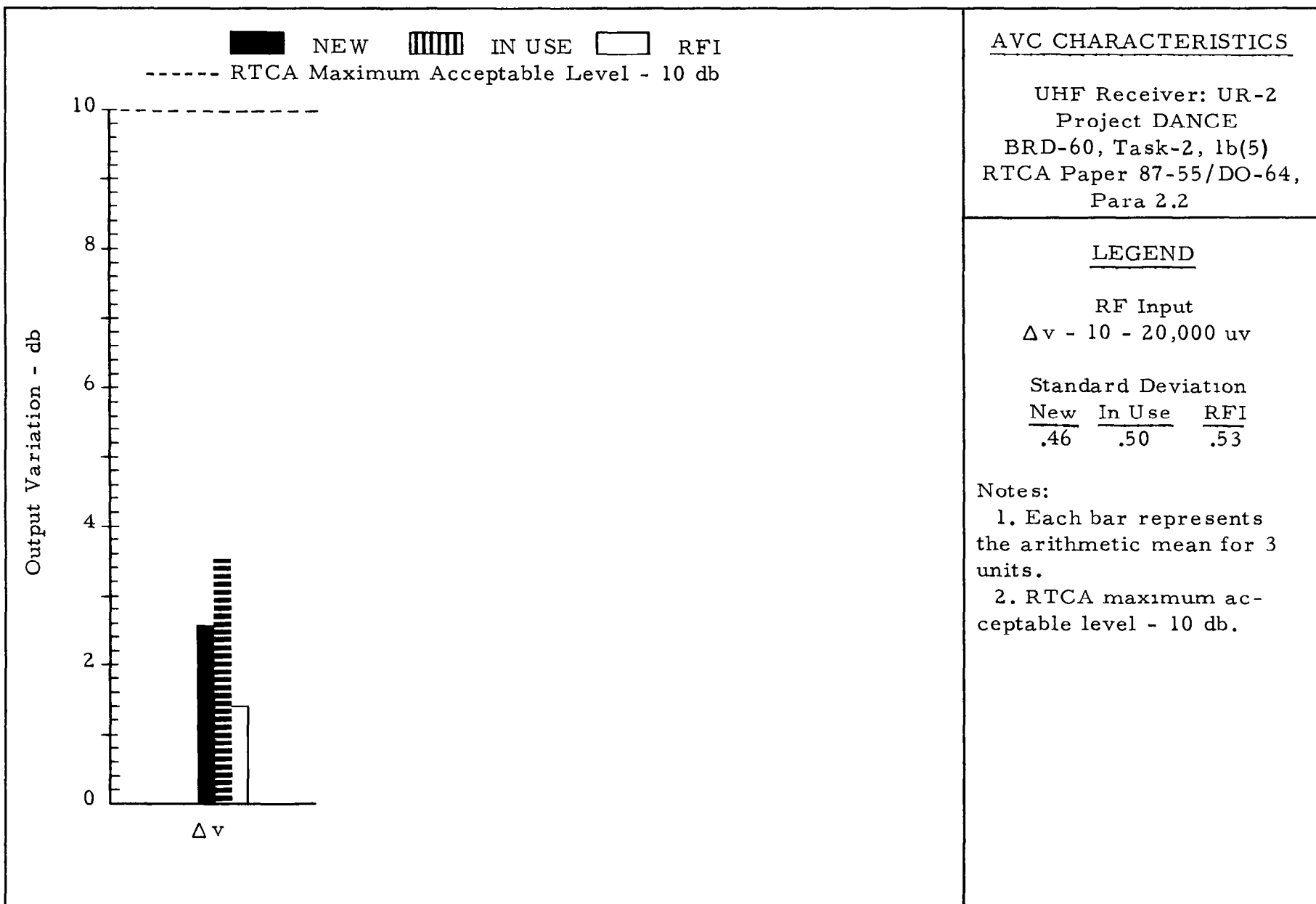
PERCENT SPECIFIED PERFORMANCE - UHF RECEIVER - UR-2



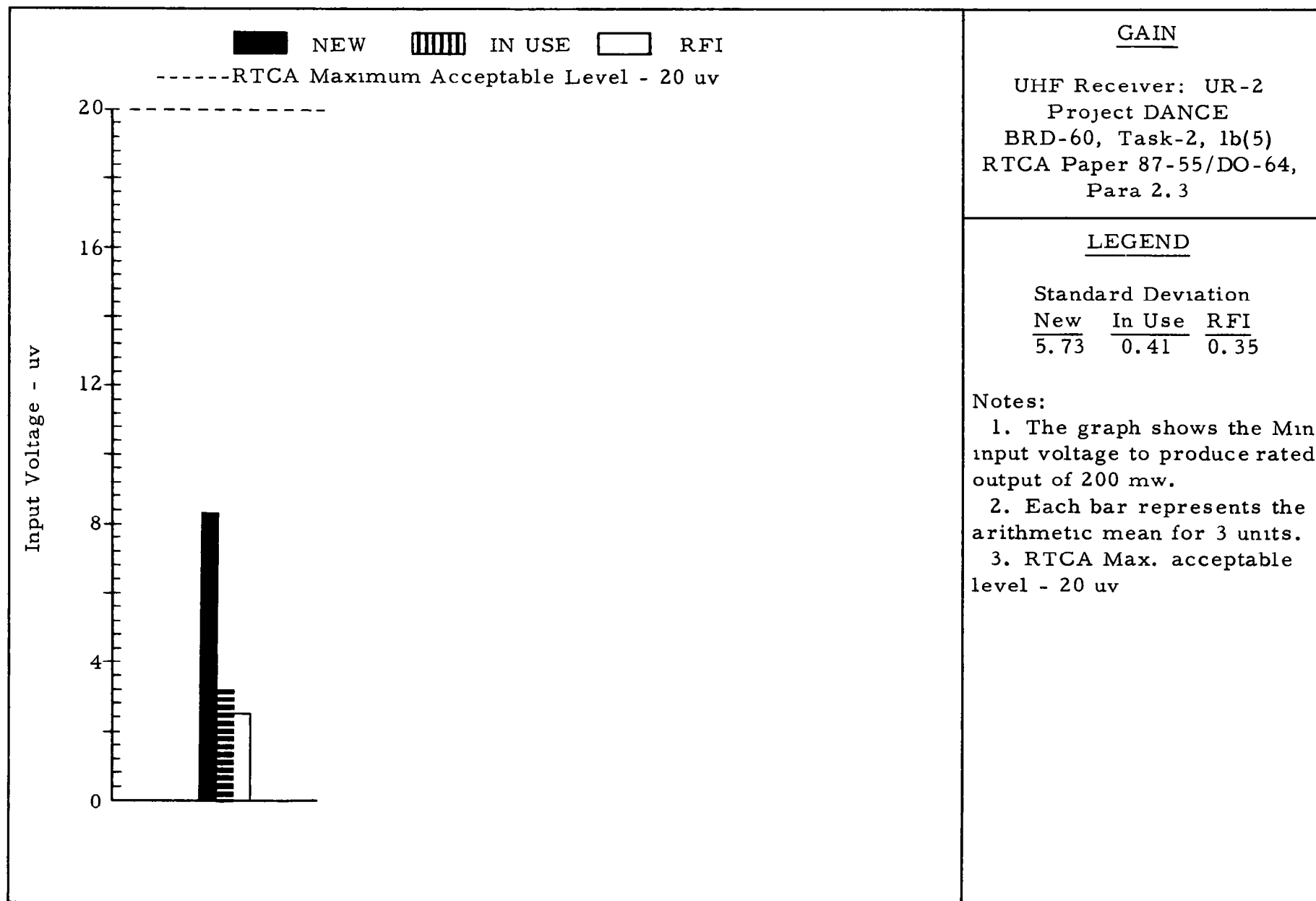
WEIGHTED PERFORMANCE - UHF RECEIVER - UR-2



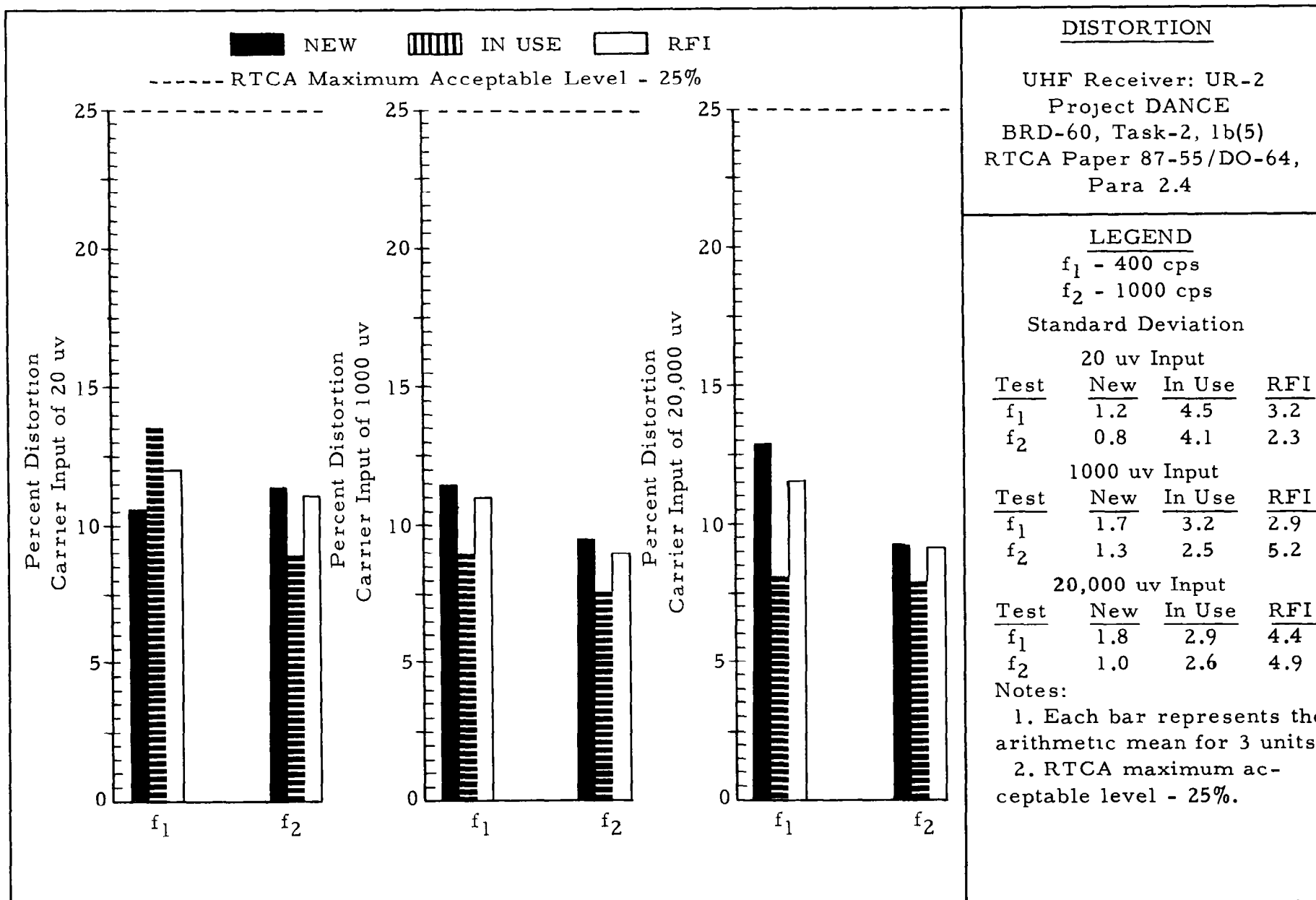
AUDIO FREQUENCY RESPONSE - UHF RECEIVER - UR-2



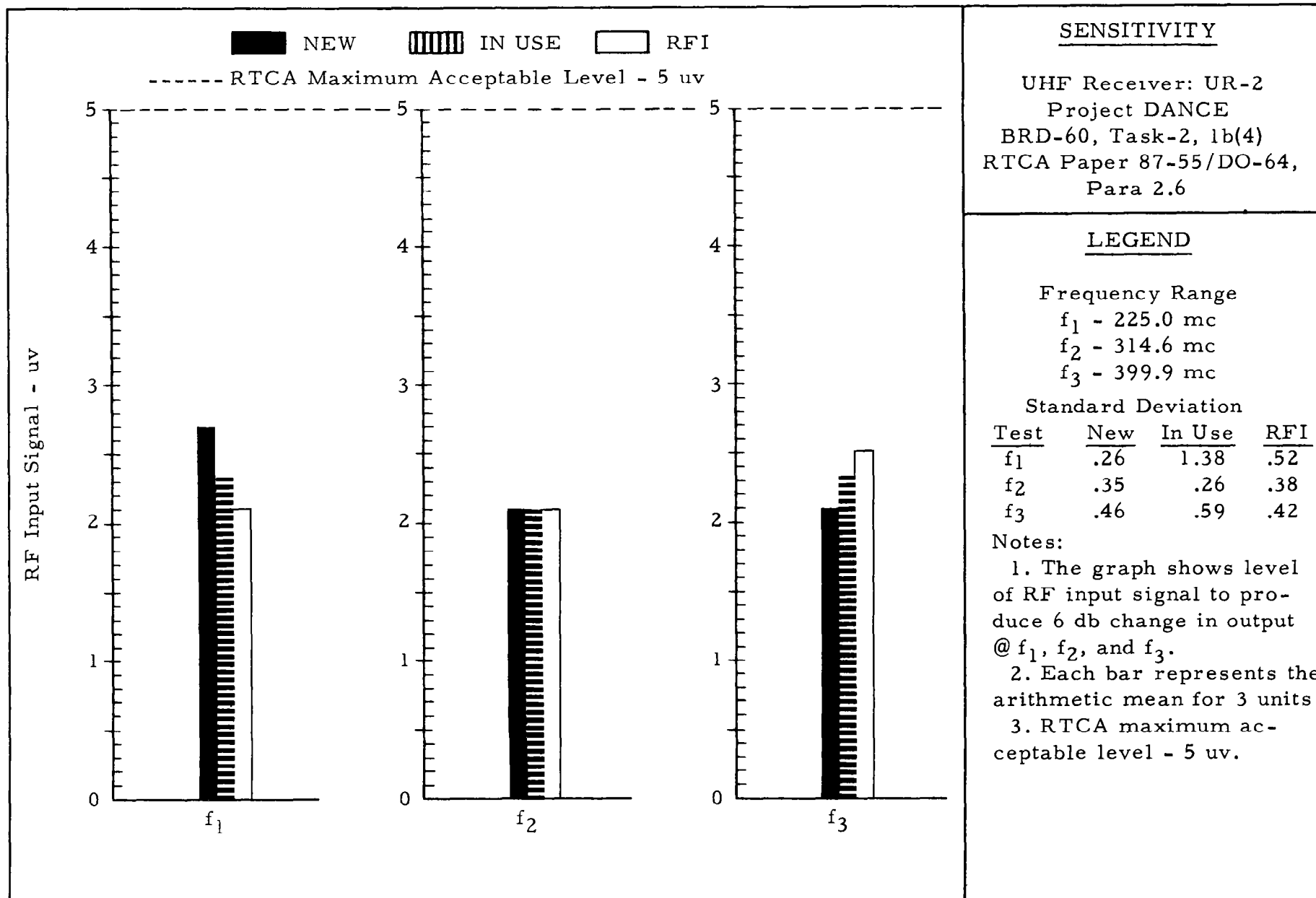
AVC CHARACTERISTICS - UHF RECEIVER - UR-2



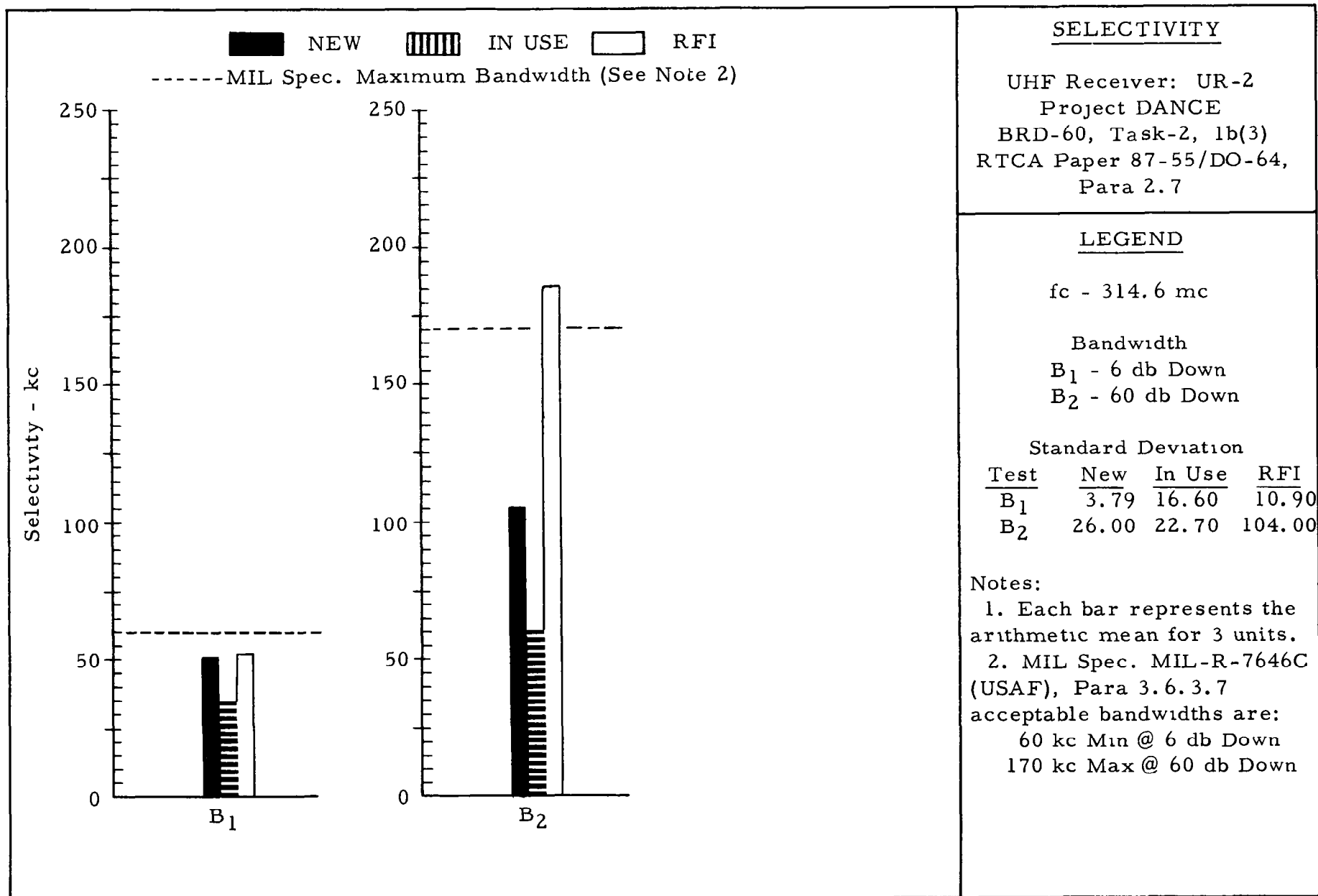
GAIN - UHF RECEIVER - UR-2



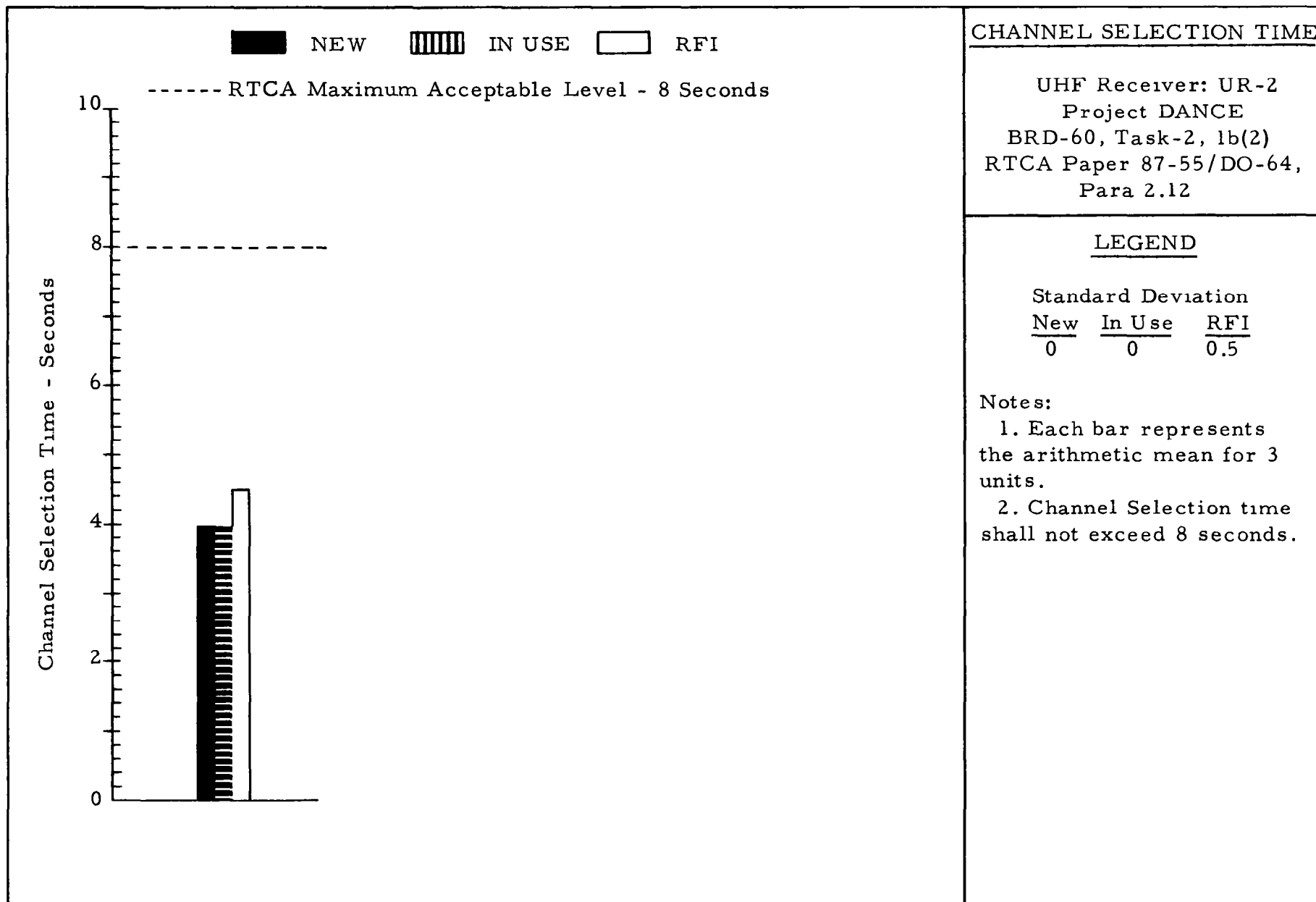
DISTORTION - UHF RECEIVER - UR-2



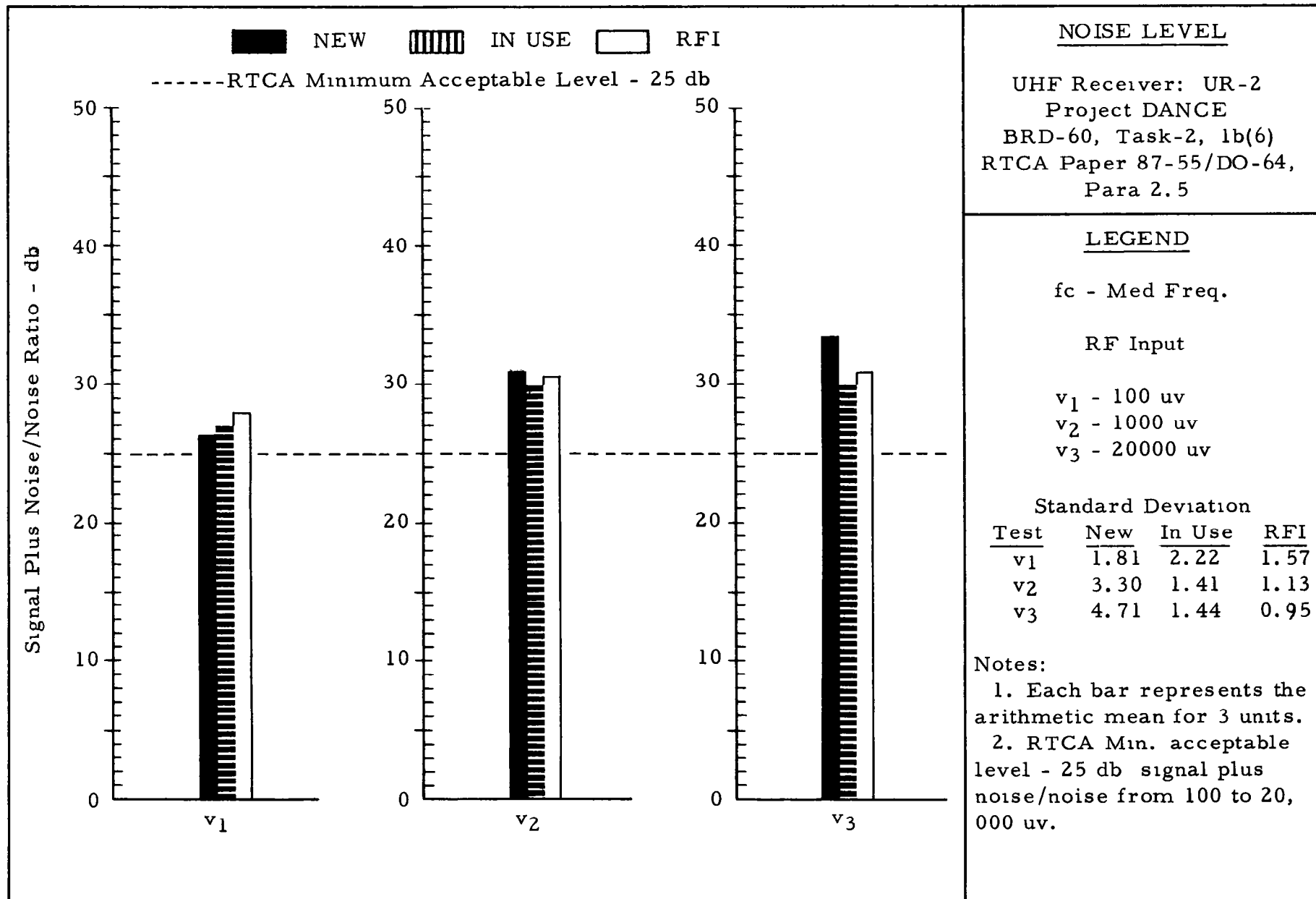
SENSITIVITY - UHF RECEIVER - UR-2



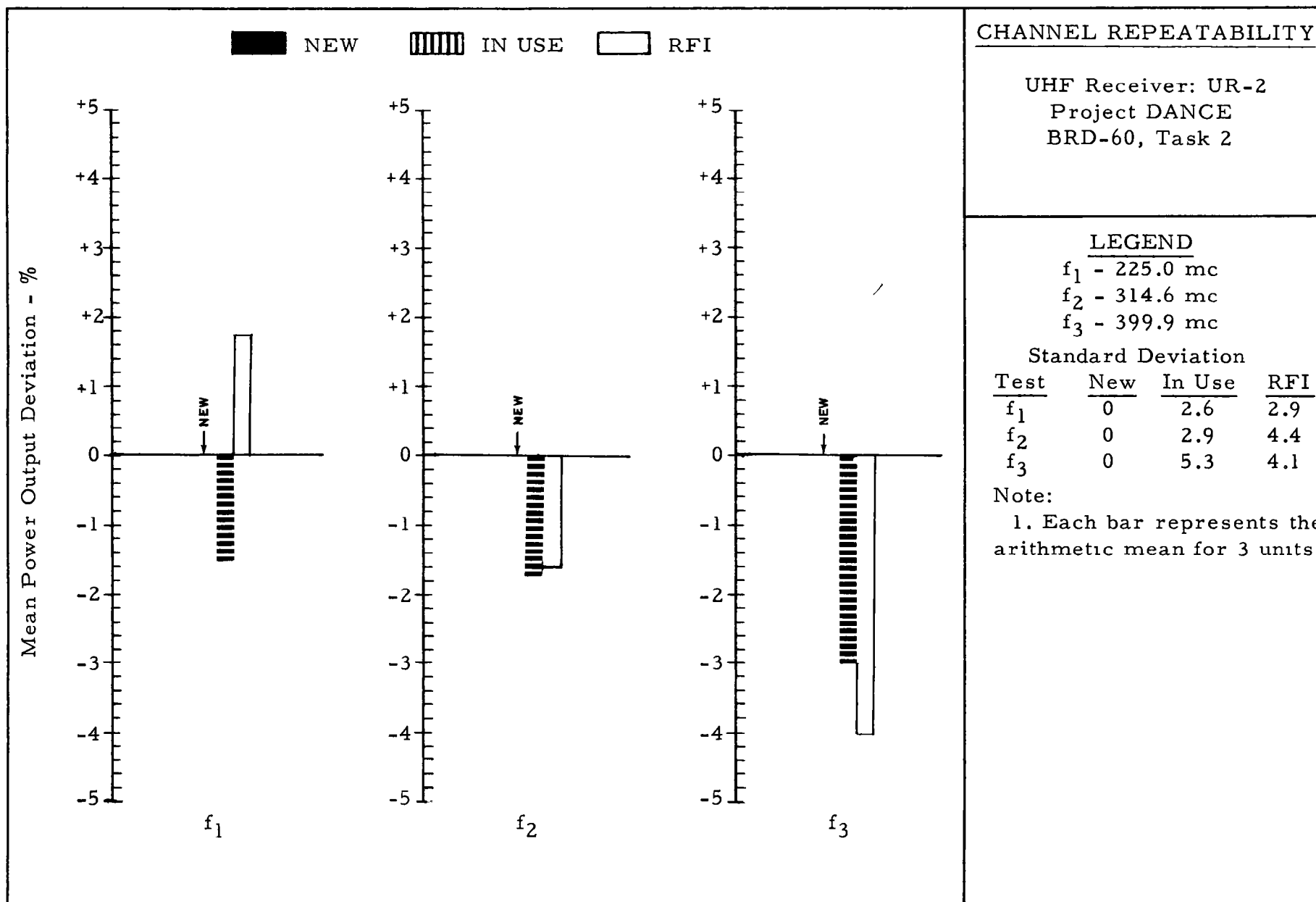
SELECTIVITY - UHF RECEIVER - UR-2



CHANNEL SELECTION TIME - UHF RECEIVER - UR-2



NOISE LEVEL - UHF RECEIVER - UR-2



CHANNEL REPEATABILITY - UHF RECEIVER - UR-2

INTERFERENCE TESTS

UHF Receiver: UR-2
 Project DANCE
 BRD-60 Task-2
 RTCA Paper 87-55/DO-64

Test	Frequency (Mc)	F_c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Spurious Response</u> Contract Para: 1.b.(9) RTCA Para: 2.8(b)	.19 to 940	314.6	Acceptable level excluding band within $F_c \pm 80$ kc: ≥ 60 db.	Actual Level: > 60 db at $F_c + 80$ kc. ≤ 60 db between $F_c - 80$ kc and $F_c - 90$ kc. All other frequencies within performance standards.	Partially
<u>Desensitization</u> Contract Para: 1.b.(7) RTCA Para: 2.10(b)	225 to 399.9	314.624	Acceptable Level excluding band within $F_c \pm 100$ kc: ≤ 8 db	Actual Level: > 8 db at $F_c \pm 100$ kc. All other frequencies within performance standards.	Partially
<u>Cross Modulation</u> Contract Para: 1.b.(7) RTCA Para: 2.9(b)	$F_c \pm 100$ kc $F_c \pm 200$ kc	314.6	Acceptable Level: ≥ 10 db.	Actual Level: < 10 db at $F_c \pm 100$ kc. > 10 db at $F_c \pm 200$ kc.	Partially

INTERFERENCE TESTS - UHF RECEIVER - UR-2

Test	Frequency (Mc)	F _c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Cable Conducted Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(a)	.15 to 25	225.1	Acceptable Emission: ≤ 200 microvolts	Actual Emission: F _c = 225.1 mc < 200 microvolts All frequencies within per- formance standards	Partially
<u>Antenna Conducted Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(b)	.15 to 1500	225.1 314.6 379.9	Acceptable Emission: ≤ 400 micro-microwatts	Actual Emission: F _c = 225.1 < 400 micro-microwatts. F _c = 314.6 < 400 micro-micro watts. F _c = 379.9 < 400 micro-microwatts except at 245 and 611 mc. All other frequencies within perform- ance standards.	Partially

Test	Contract Para.	F _c (Mc)	Probable Susceptibility	Relation to Frequency Synthesis
Susceptibility to Radar Type signals.	1.b.(7)	314.6	None over the frequency range of 100 to 2000 mc.	(Not applicable)

INTERFERENCE TESTS - UHF RECEIVER - UR-2

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

4. Laboratory and Field Test Data

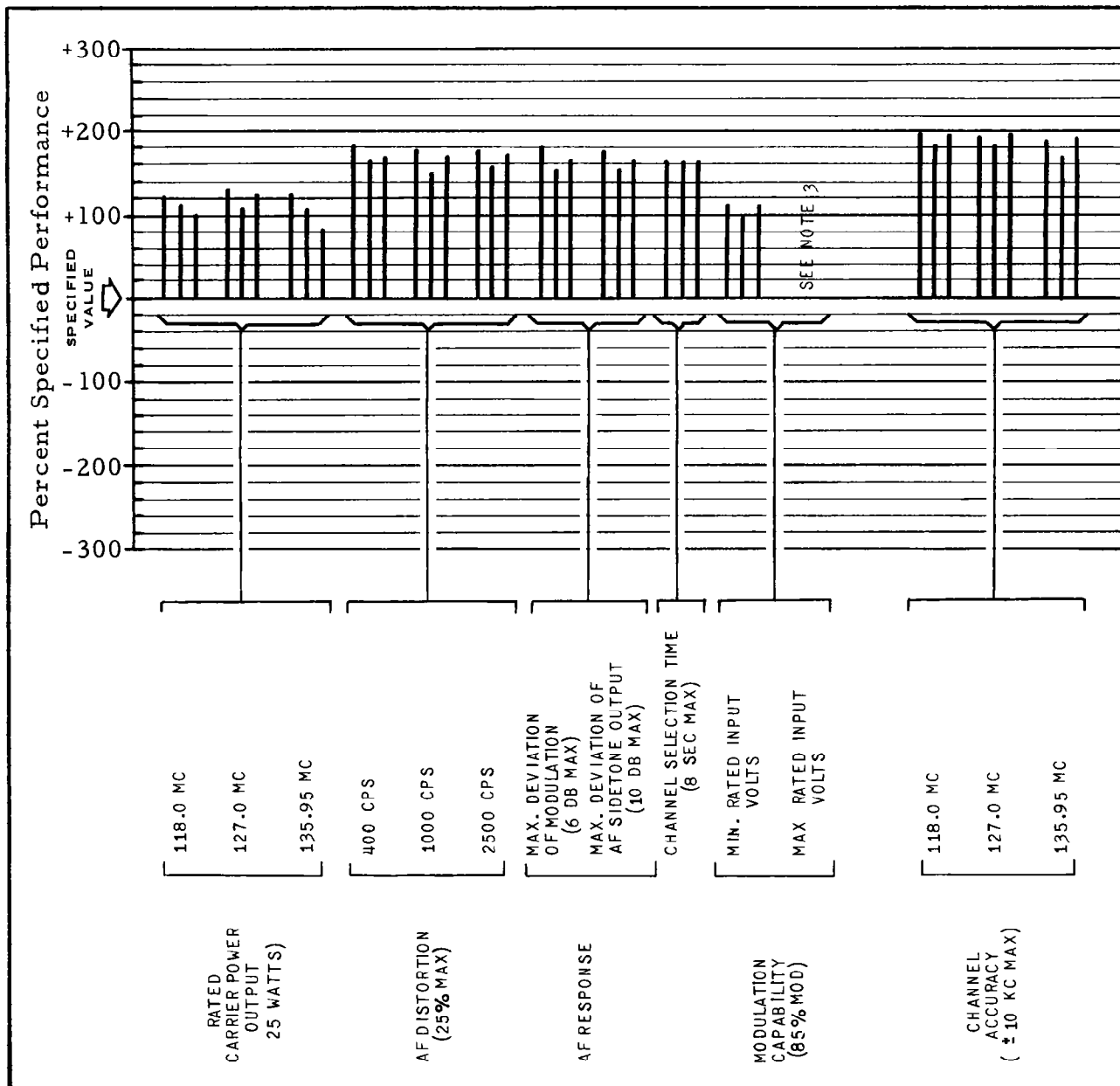
a. VT-1, VHF Transmitter

General:

Frequency Range:	118 - 135.95 mc
Means of Frequency Control:	Crystal
Total Number of Channels:	360
Number of Channels Available at Operator's Position:	360
Means of Frequency Selection:	Rotary Switch

Technical:

	<u>Page</u>
Percent Specified Performance	B-74
Weighted Performance	B-75
Carrier Power Output	B-76
Channel Accuracy	B-77
Modulation Capability	B-78
Audio Frequency Response	B-79
Audio Frequency Distortion	B-80
Channel Selection Time	B-81
Carrier Noise Level	B-82
Channel Repeatability	B-83
Interference Tests	B-84



PERCENT SPECIFIED PERFORMANCE

VHF Transmitter: VT-1
Project DANCE
BRD-60, Task-2
RTCA Paper 88-55/DO-65

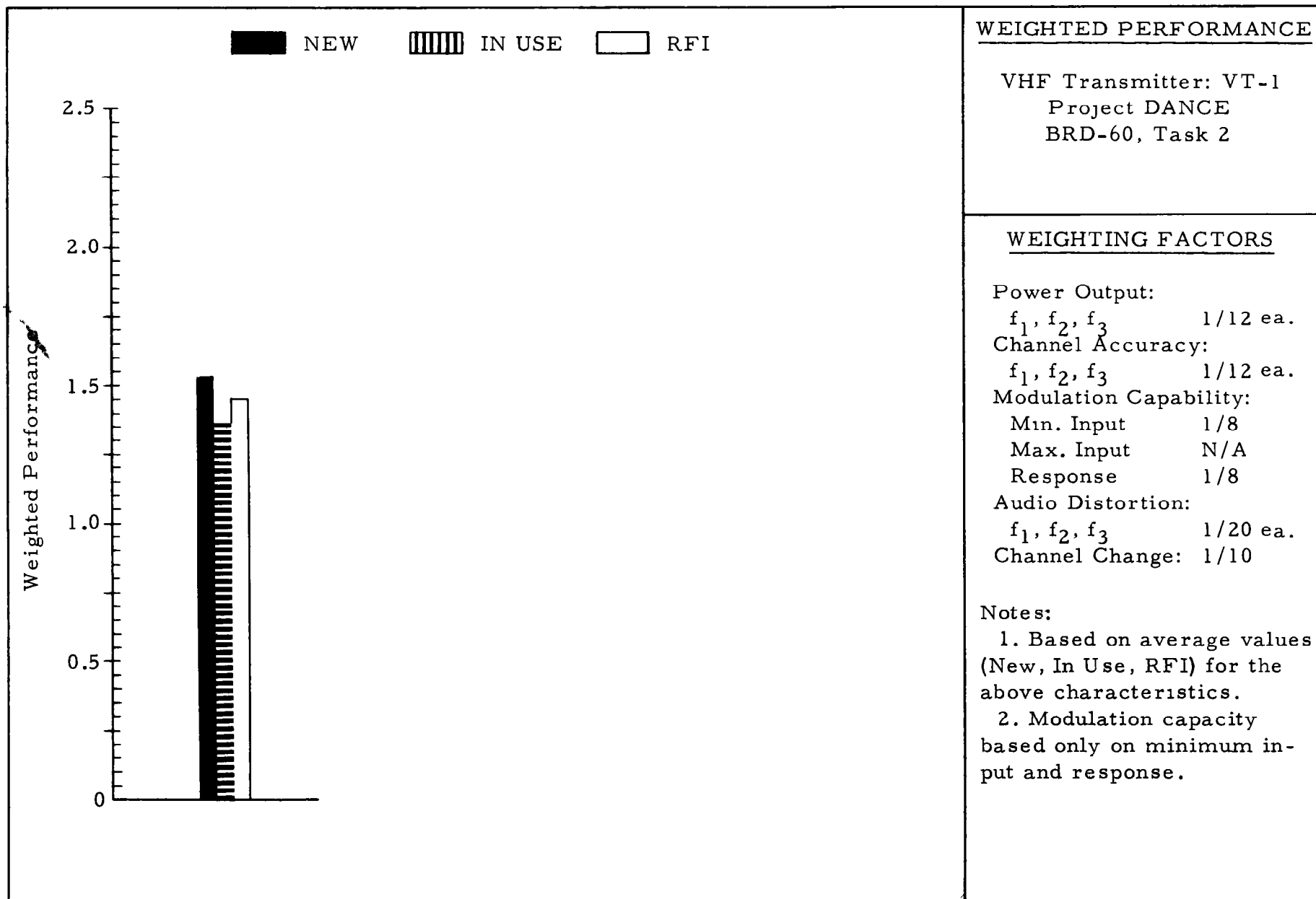
Notes:

1. Each bar represents the arithmetic mean for 3 units.
2. Equipment status represented by bars:

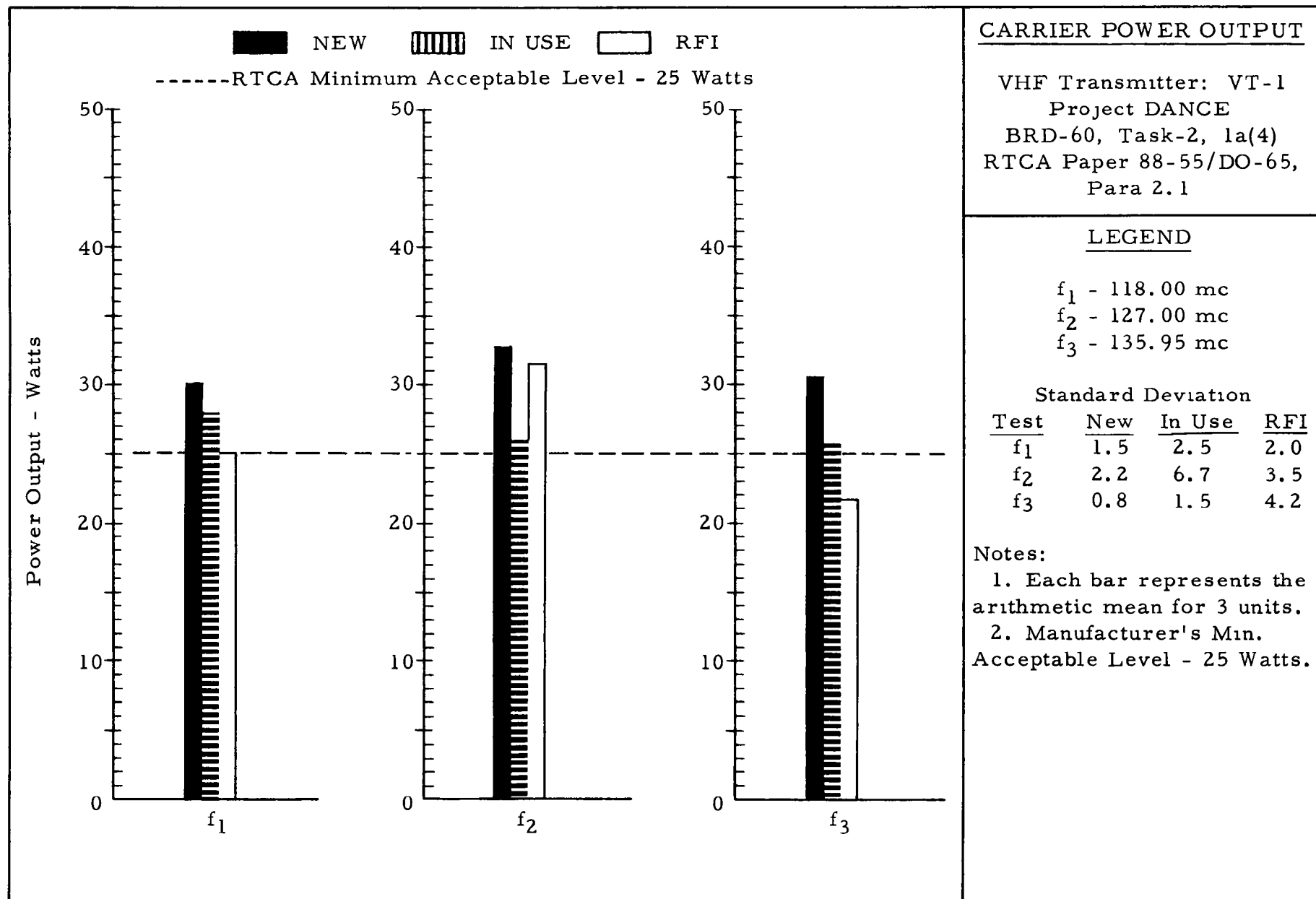


3. No maximum values specified in manufacturer's literature or military specifications.

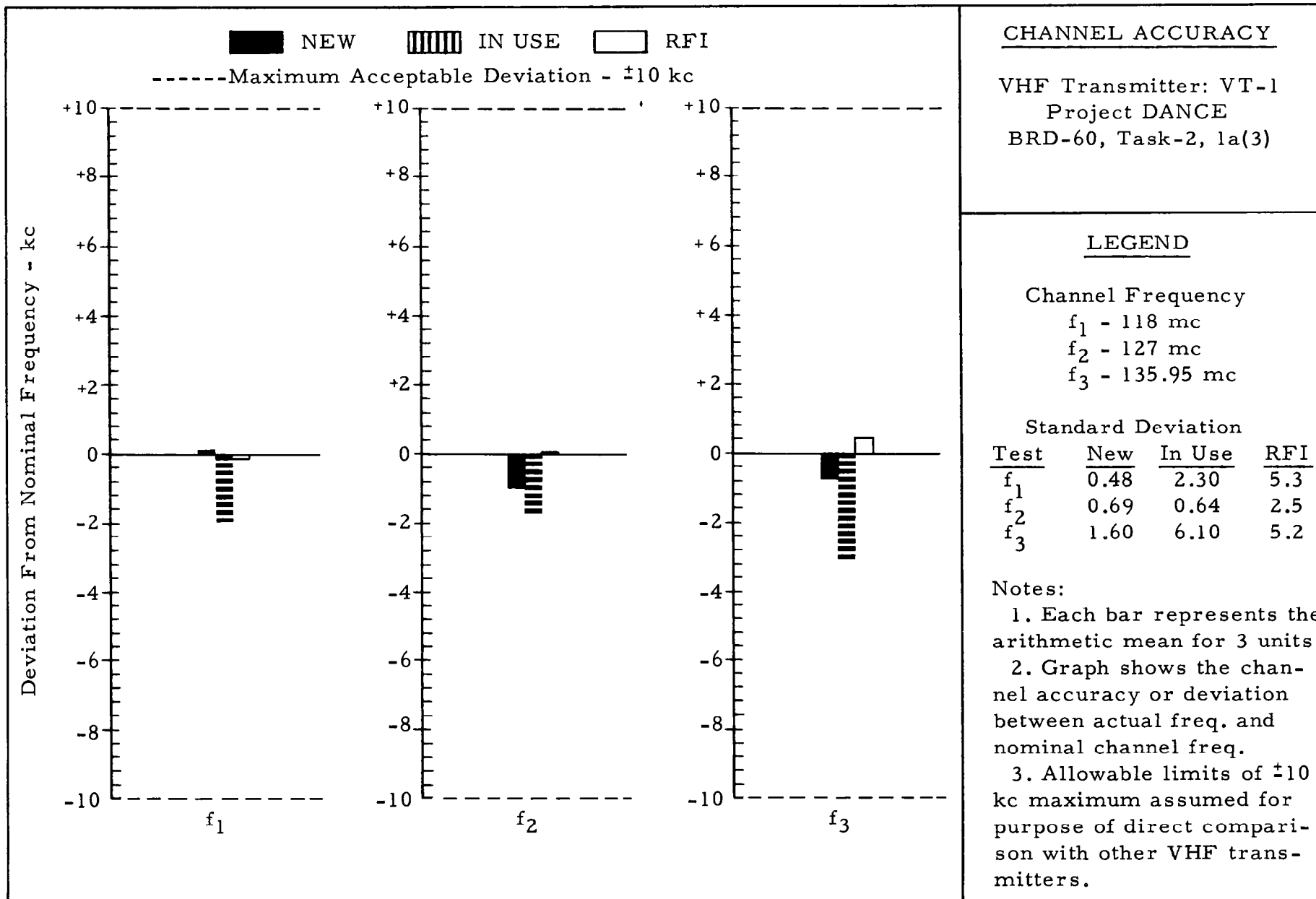
PERCENT SPECIFIED PERFORMANCE - VHF TRANSMITTER - VT-1



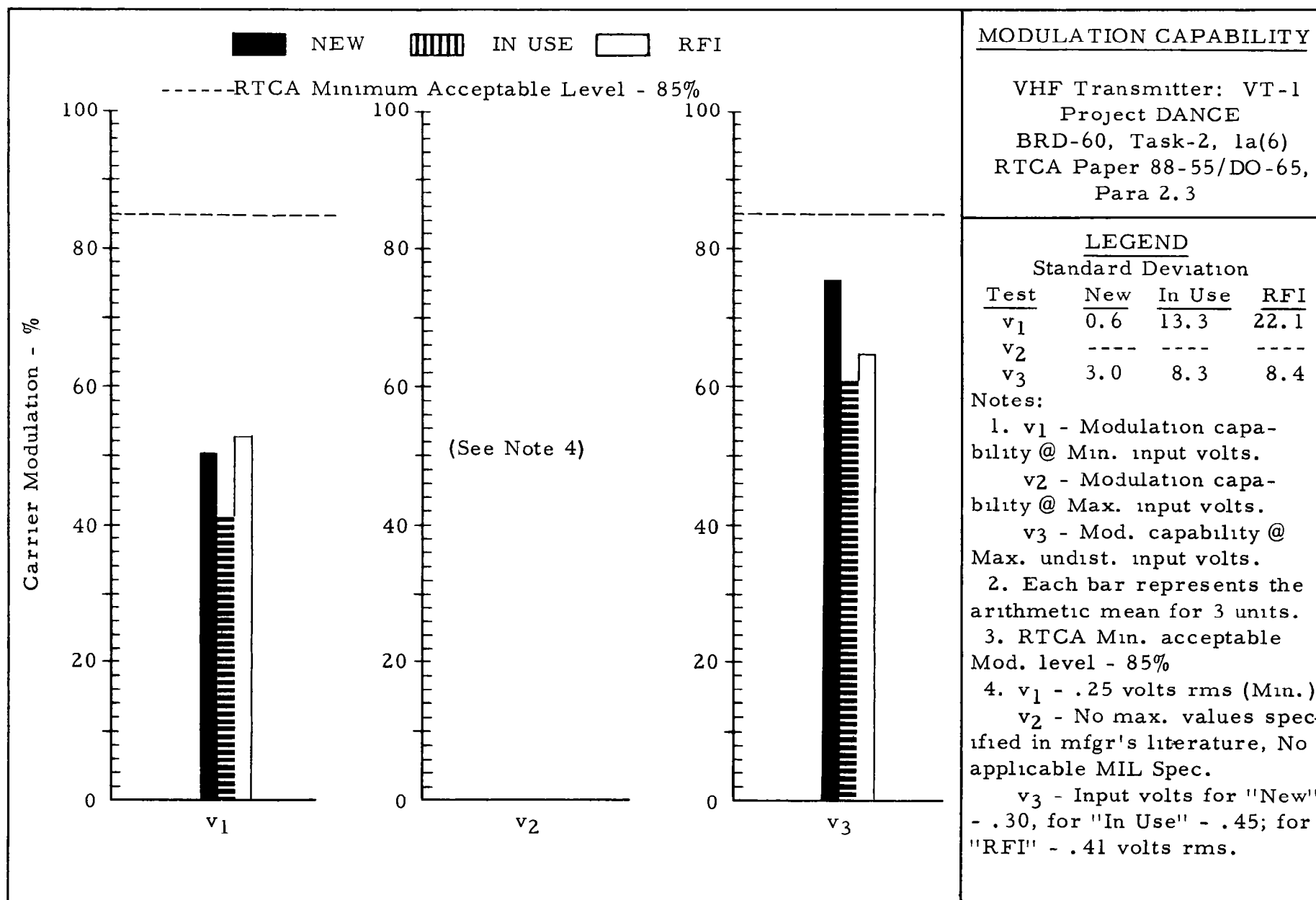
WEIGHTED PERFORMANCE - VHF TRANSMITTER - VT-1



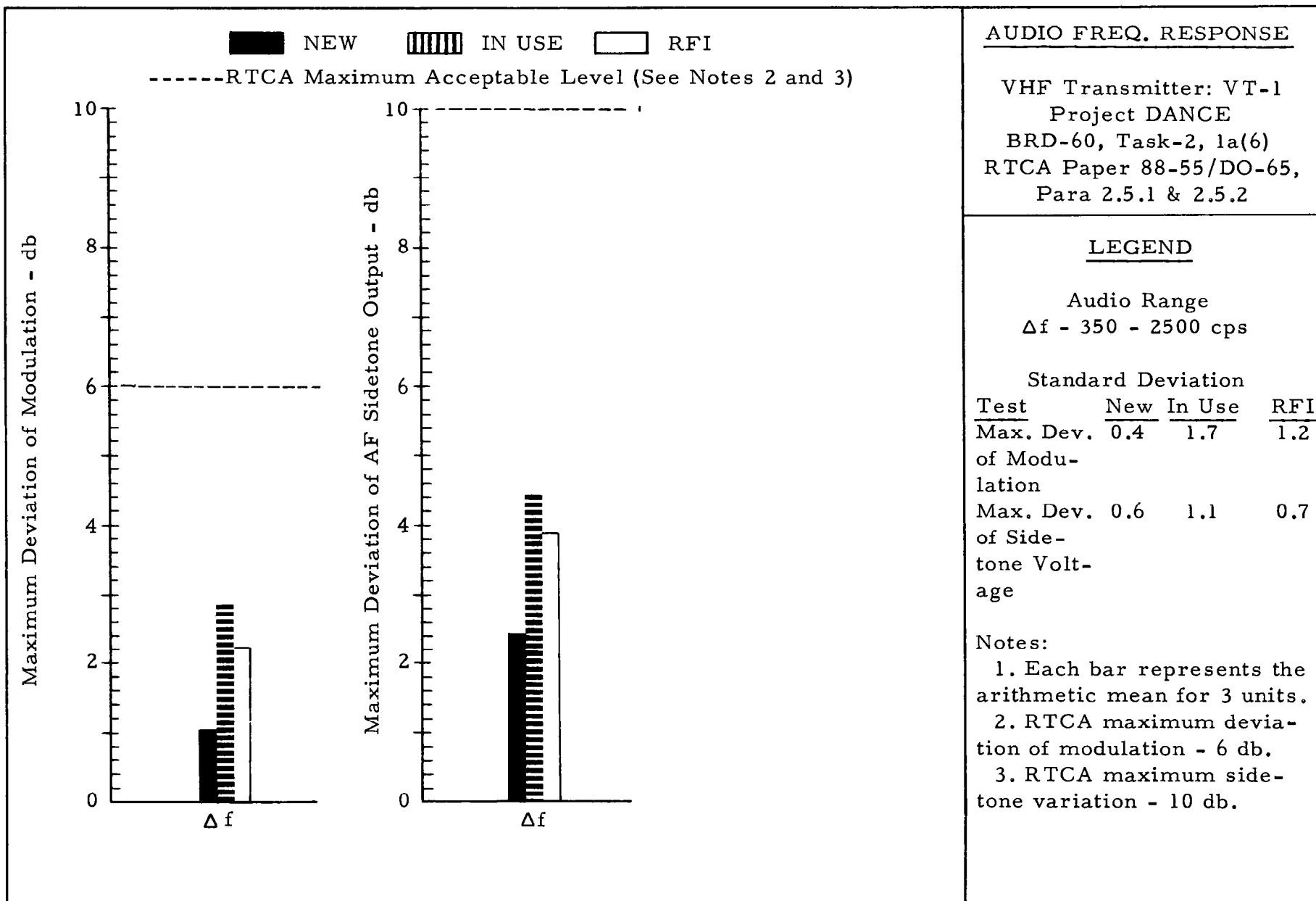
CARRIER POWER OUTPUT - VHF TRANSMITTER - VT-1



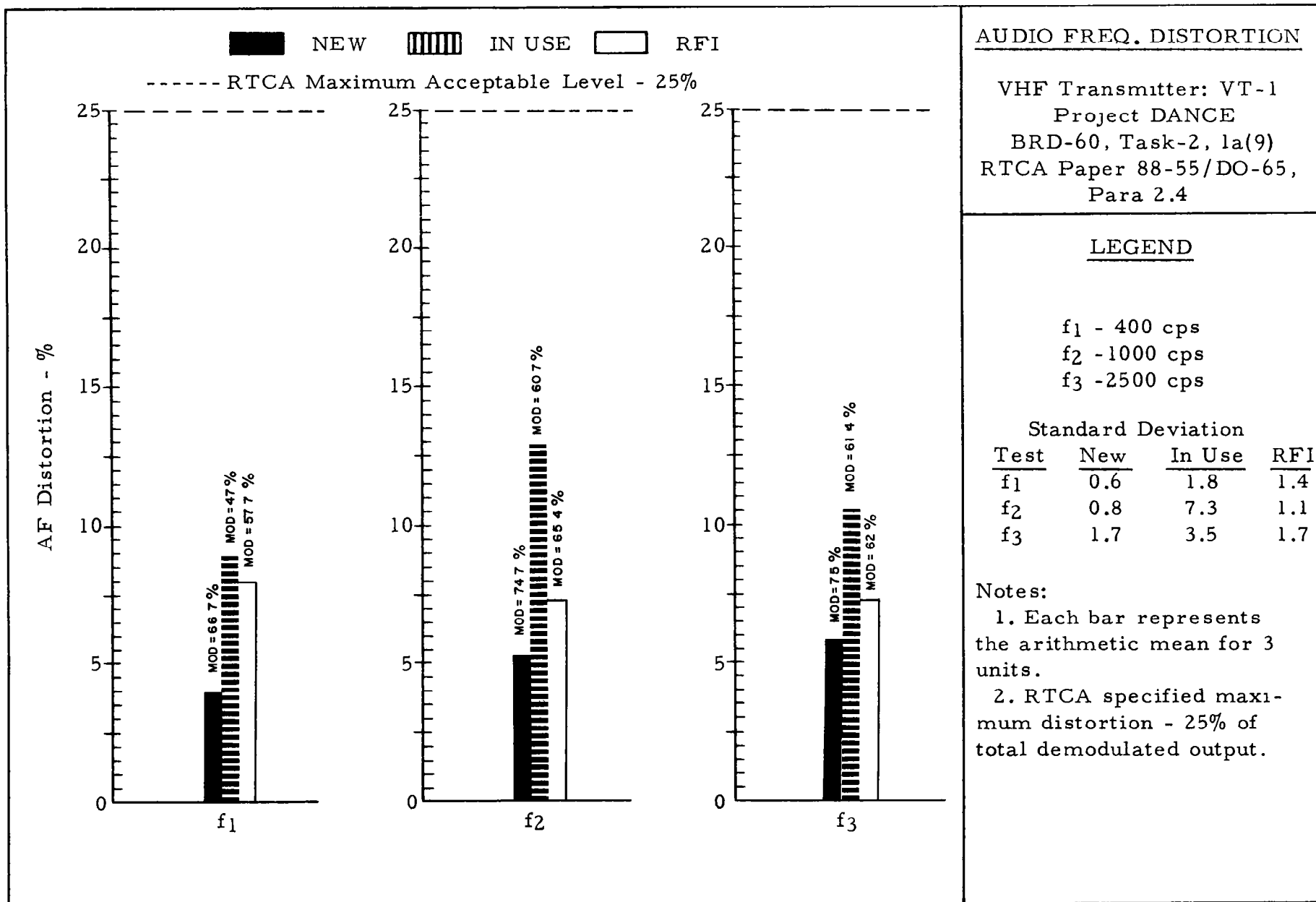
CHANNEL ACCURACY - VHF TRANSMITTER - VT-1



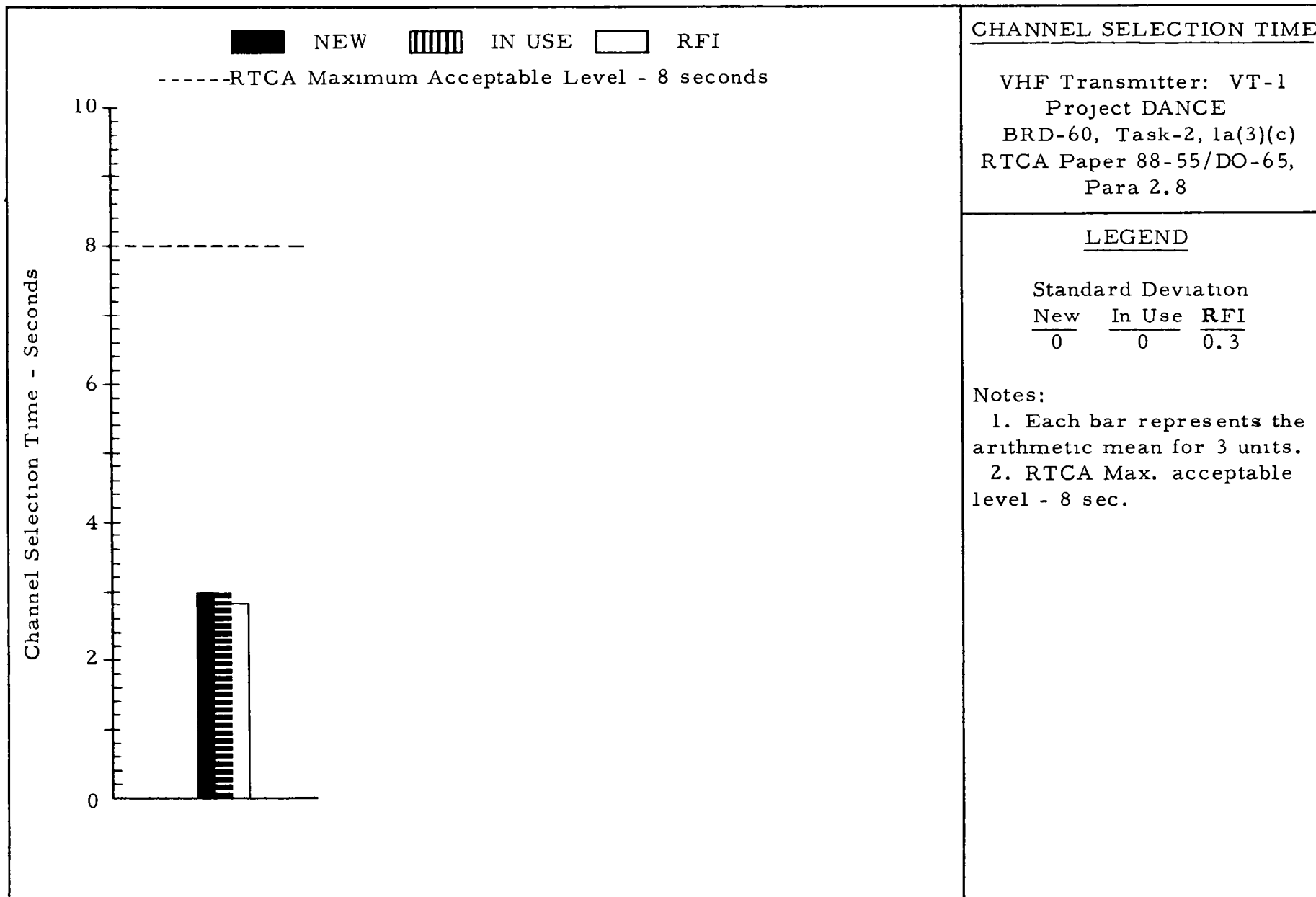
MODULATION CAPABILITY - VHF TRANSMITTER - VT-1



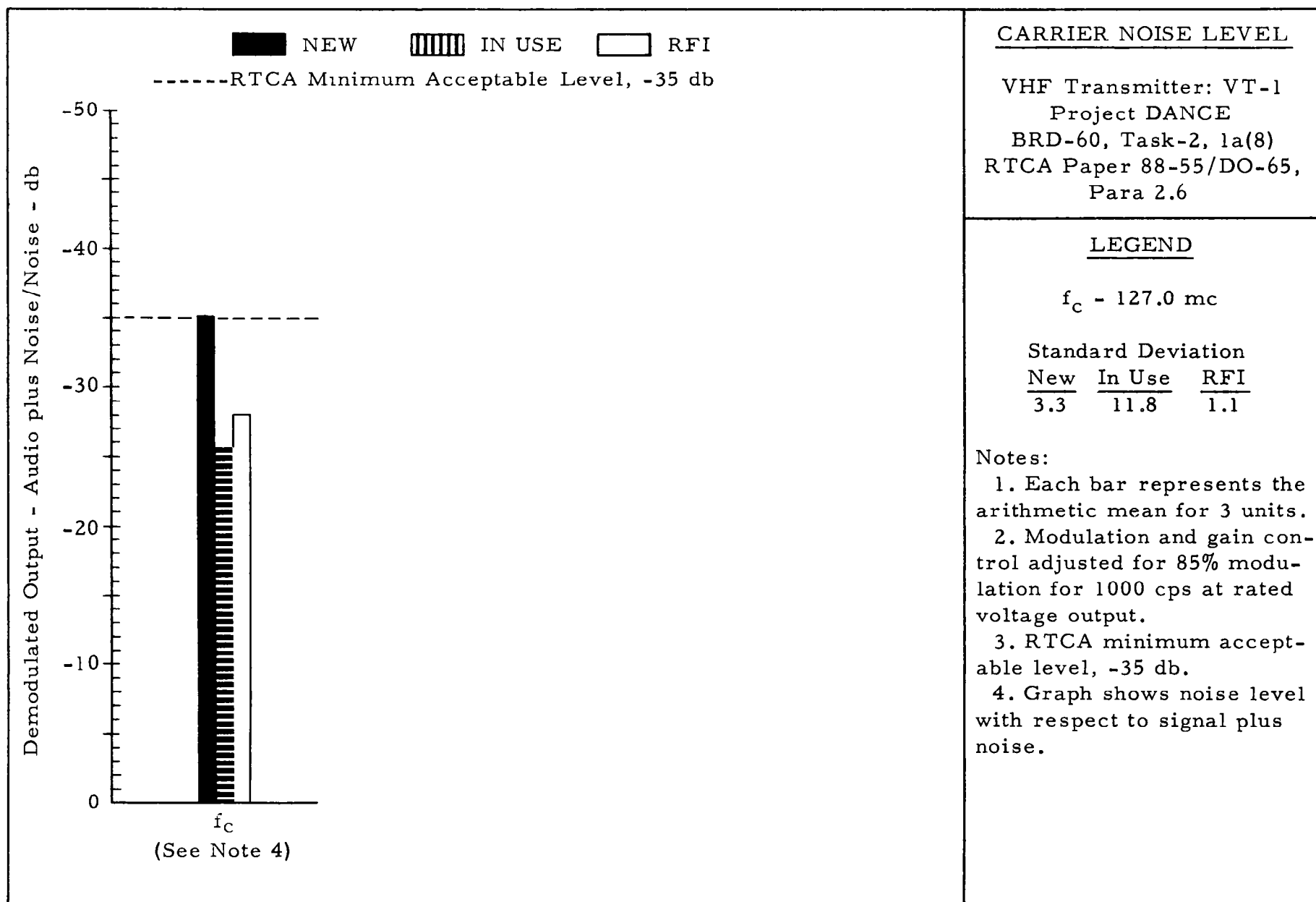
AUDIO FREQUENCY RESPONSE - VHF TRANSMITTER - VT-1



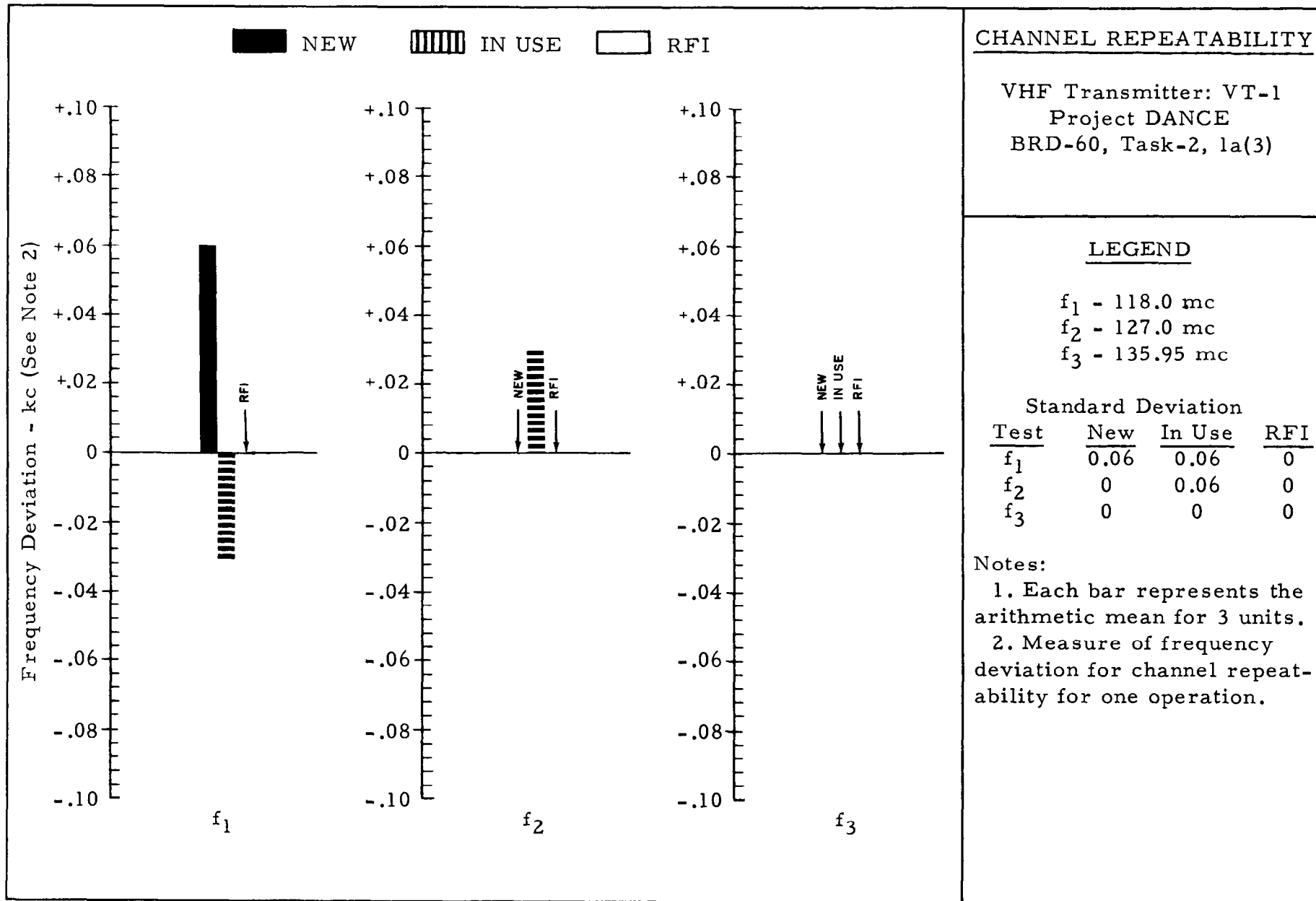
AUDIO FREQUENCY DISTORTION - VHF TRANSMITTER - VT-1



CHANNEL SELECTION TIME - VHF TRANSMITTER - VT-1



CARRIER NOISE LEVEL - VHF TRANSMITTER - VT-1



CHANNEL REPEATABILITY - VHF TRANSMITTER - VT-1

INTERFERENCE TESTS

VHF Transmitter: VT-1
 Project DANCE
 BRD-60 Task 2
 RTCA Paper 88-55/DO-65

Test	Carrier F. (mc)		RTCA Performance Standards	Results	Performance Standards Met
<u>Residual Radiation</u> Contract Para: 1.a. (7) RTCA Para: 2.2	127.5		R.F. Output: ≤ 0.02 micro- microwatts at carrier freq.	R.F. Output: < 0.02 micro- microwatts at carrier freq.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(a)	127.5		R.F. output within band of ± 25 kc and ± 50 kc from carrier Frequency: ≤ 125 milliwatts ≥ 25 db	R.F. Output: < 340 microwatts within band of $F_c + 25$ kc to F_c $+ 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc. > 50 db band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.5 RTCA Para: 2.7(b)	118.0 127.5 135.95		R.F. output outside band of 50 kc from carrier: Carrier Freq. (mc) 118.0 ≥ 58 db 127.5 ≥ 58 db 135.95 ≥ 58 db	R.F. Output: Carrier Freq. (mc) 118.0 > 58 db 127.5 > 58 db 135.95 > 58 db	Yes

INTERFERENCE TESTS - VHF TRANSMITTER - VT-1

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

4. Laboratory and Field Test Data

b. VT-2, VHF Transmitter

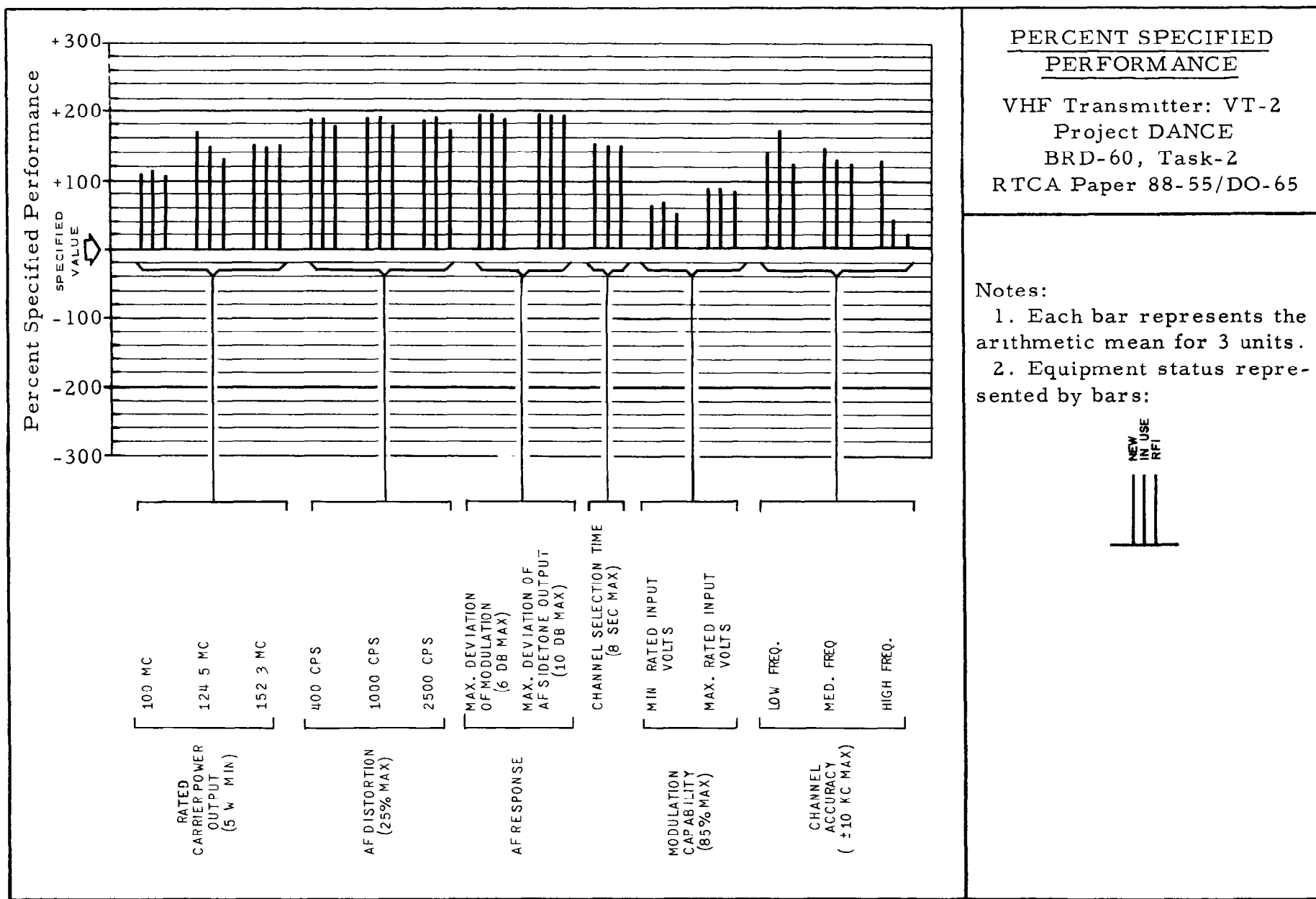
General:

Frequency Range:	100 - 156 mc
Means of Frequency Control:	Crystal
Total Number of Channels:	48
Number of Channels Available at Operator's Position:	48
Means of Frequency Selection:	Push Button

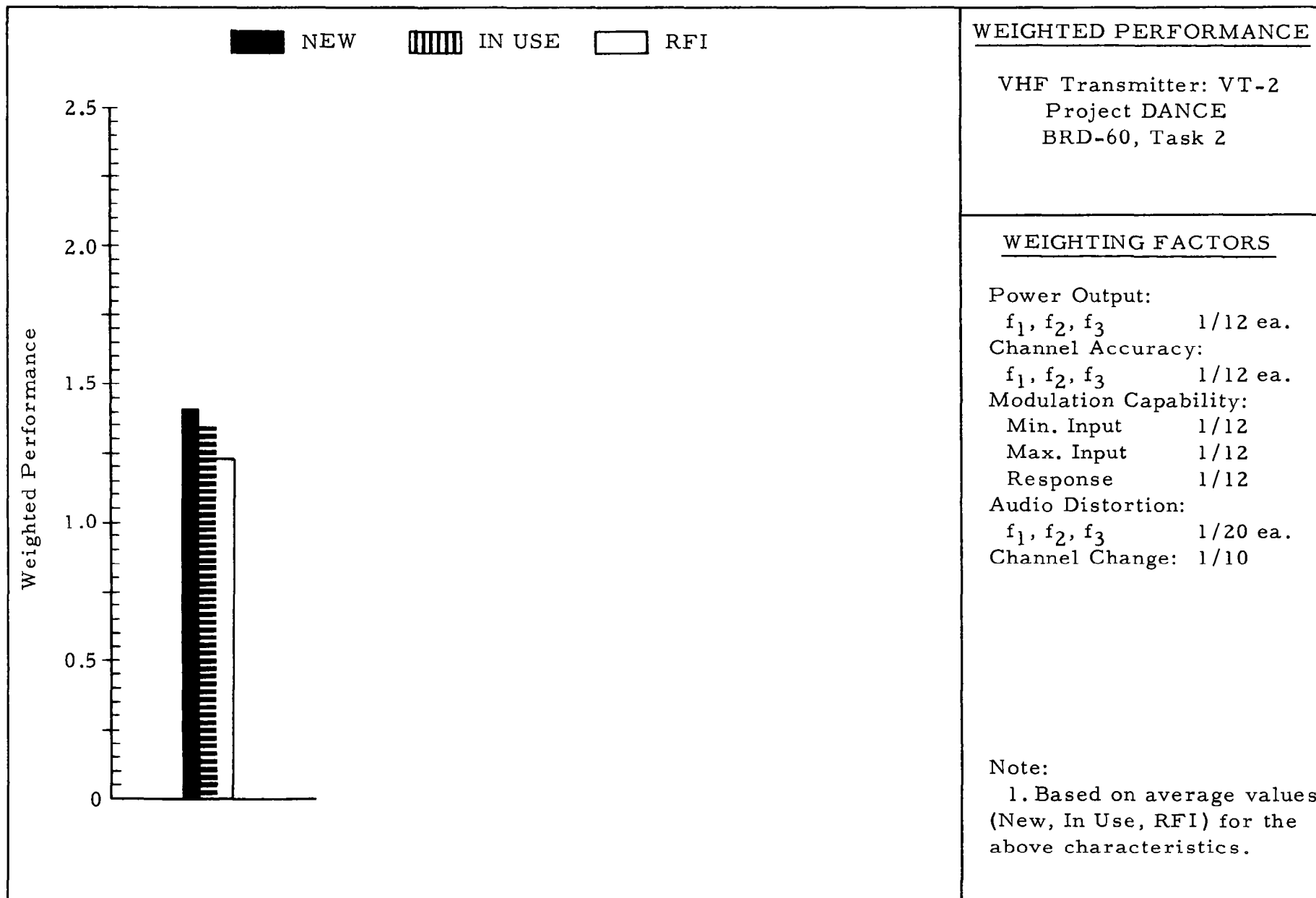
Technical:

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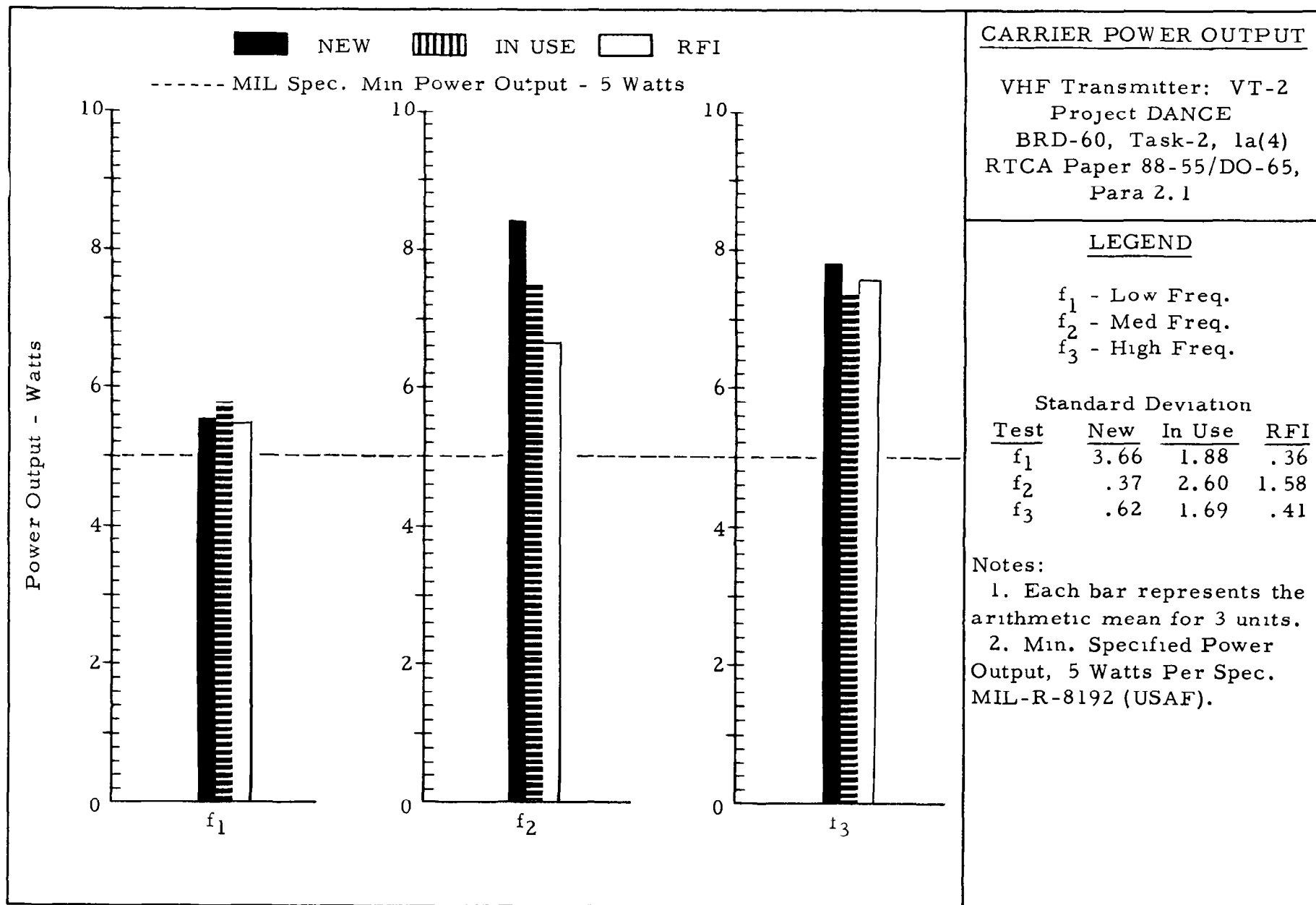
Percent Specified Performance	B-86
Weighted Performance	B-87
Carrier Power Output	B-88
Channel Accuracy	B-89
Modulation Capability	B-90
Audio Frequency Response	B-91
Audio Frequency Distortion	B-92
Channel Selection Time	B-93
Carrier Noise Level	B-94
Channel Repeatability	B-95
Interference Tests	B-96



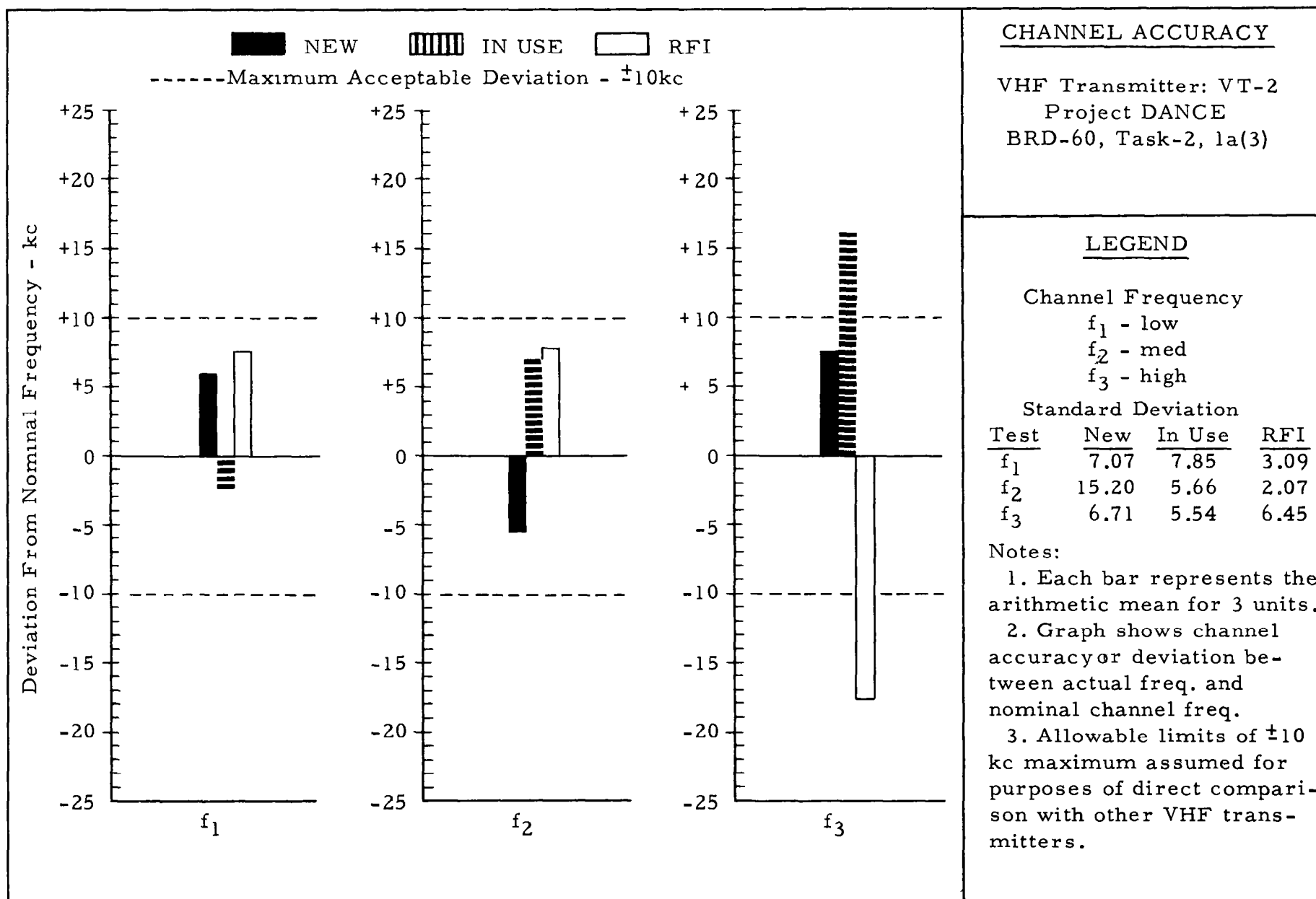
PERCENT SPECIFIED PERFORMANCE - VHF TRANSMITTER - VT-2



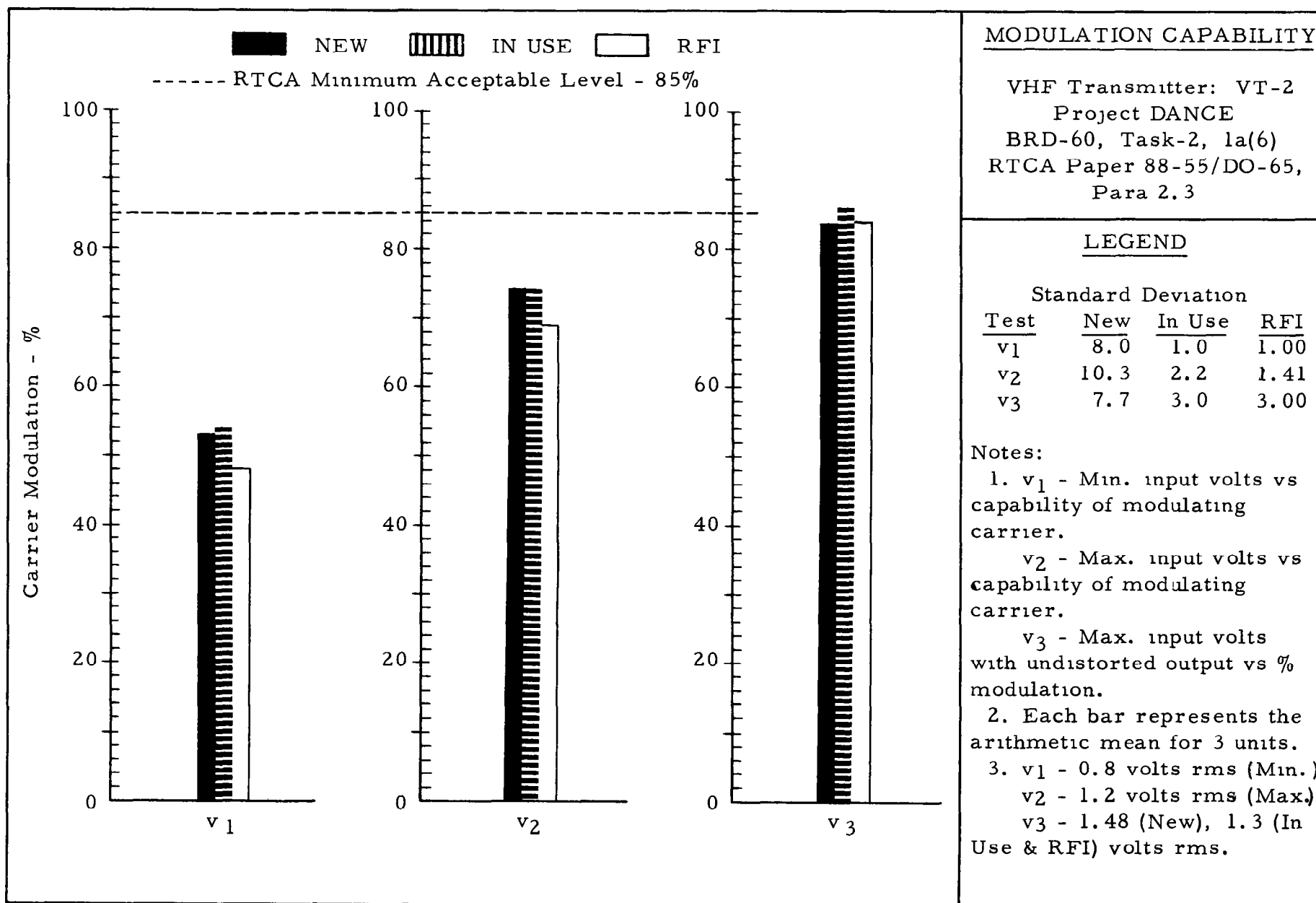
WEIGHTED PERFORMANCE - VHF TRANSMITTER - VT-2



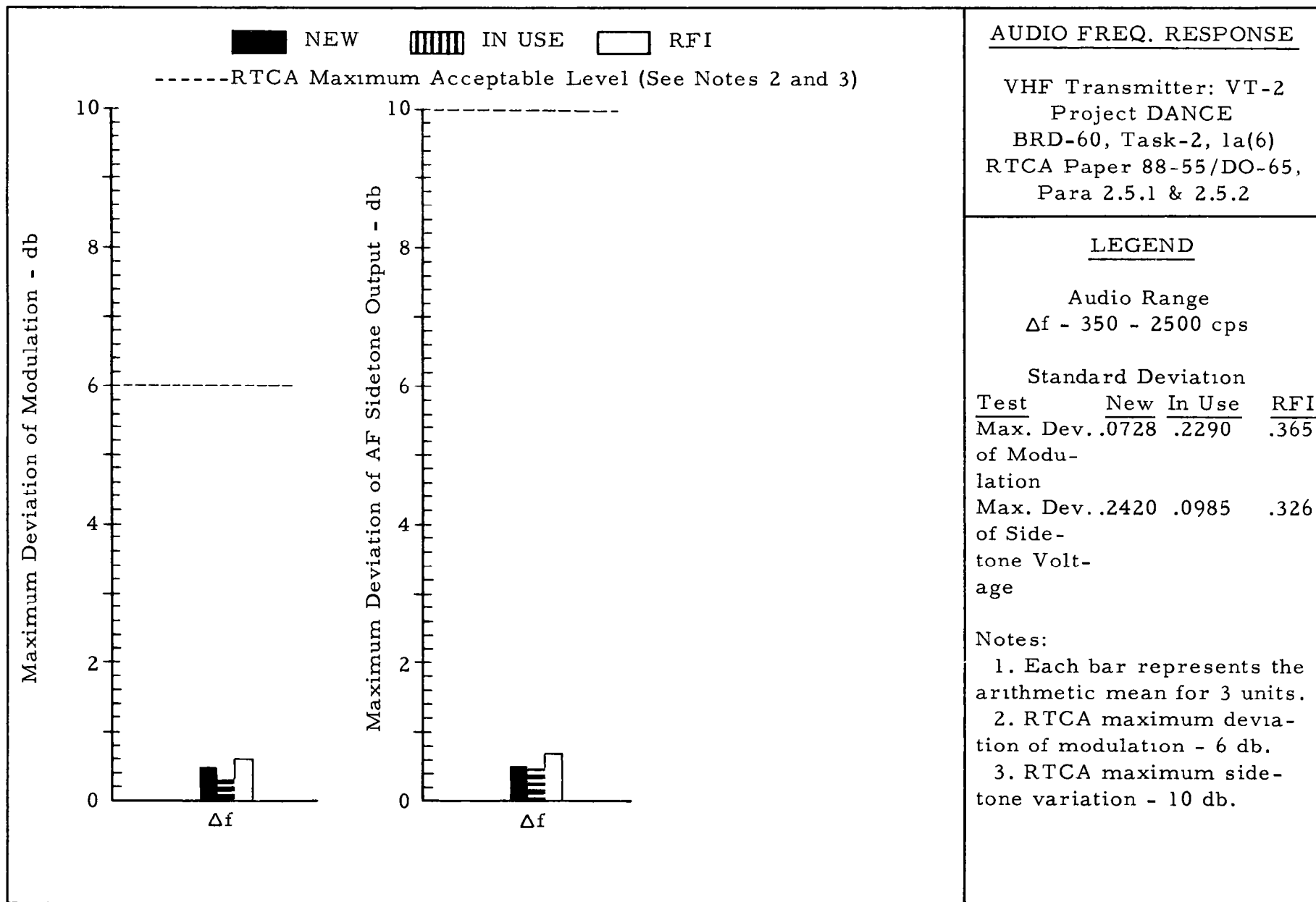
CARRIER POWER OUTPUT - VHF TRANSMITTER - VT-2



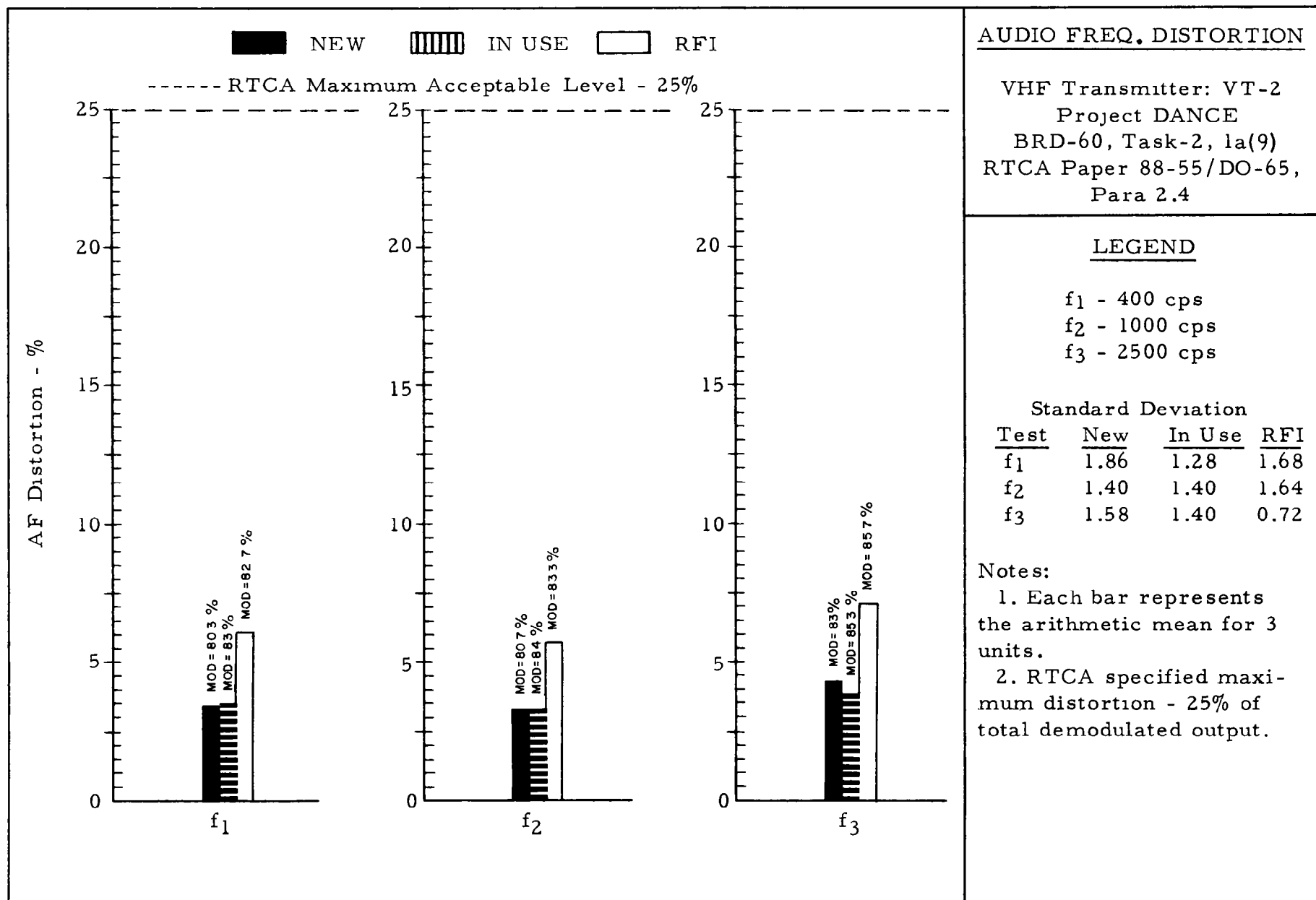
CHANNEL ACCURACY - VHF TRANSMITTER - VT-2



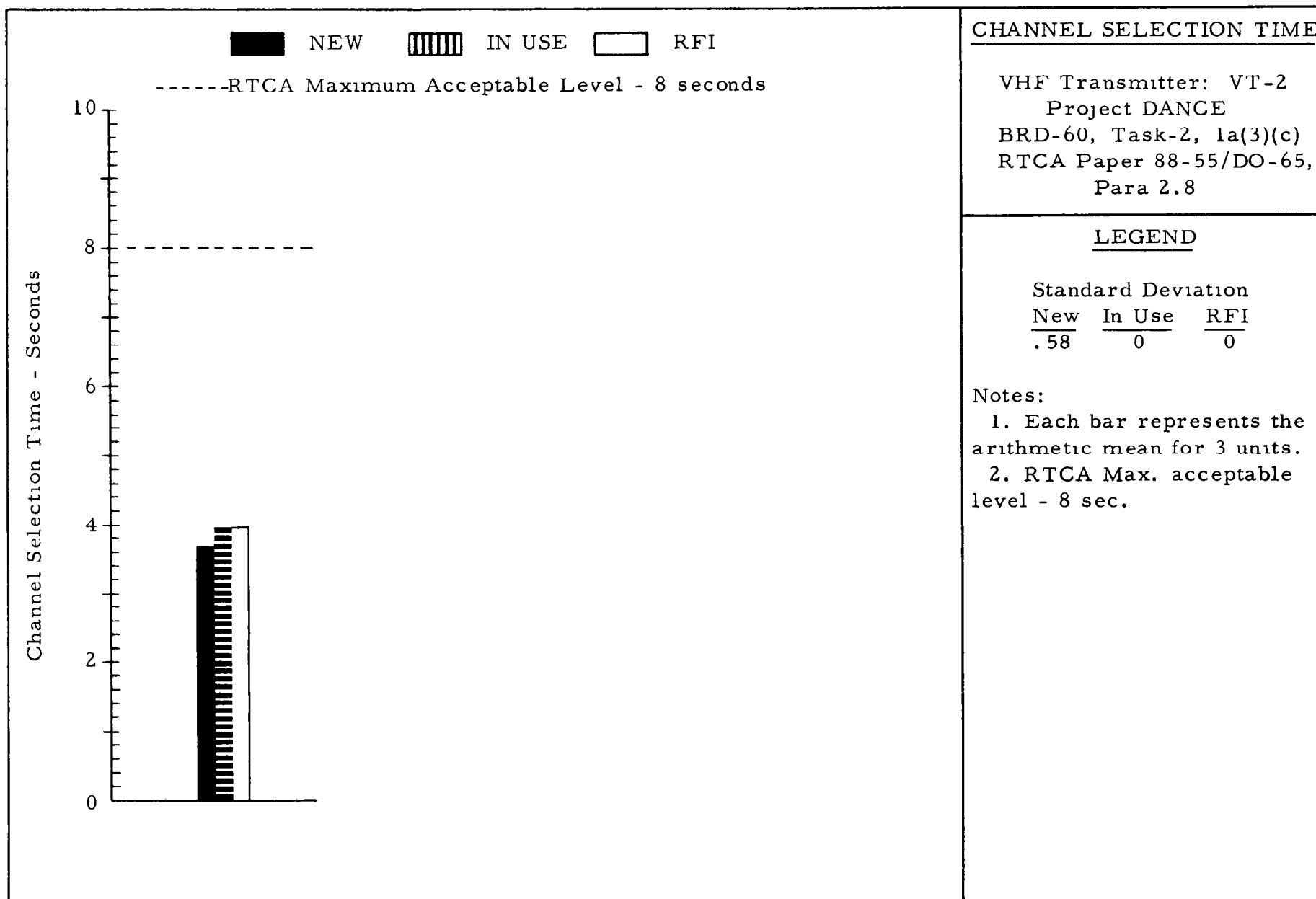
MODULATION CAPABILITY - VHF TRANSMITTER - VT-2



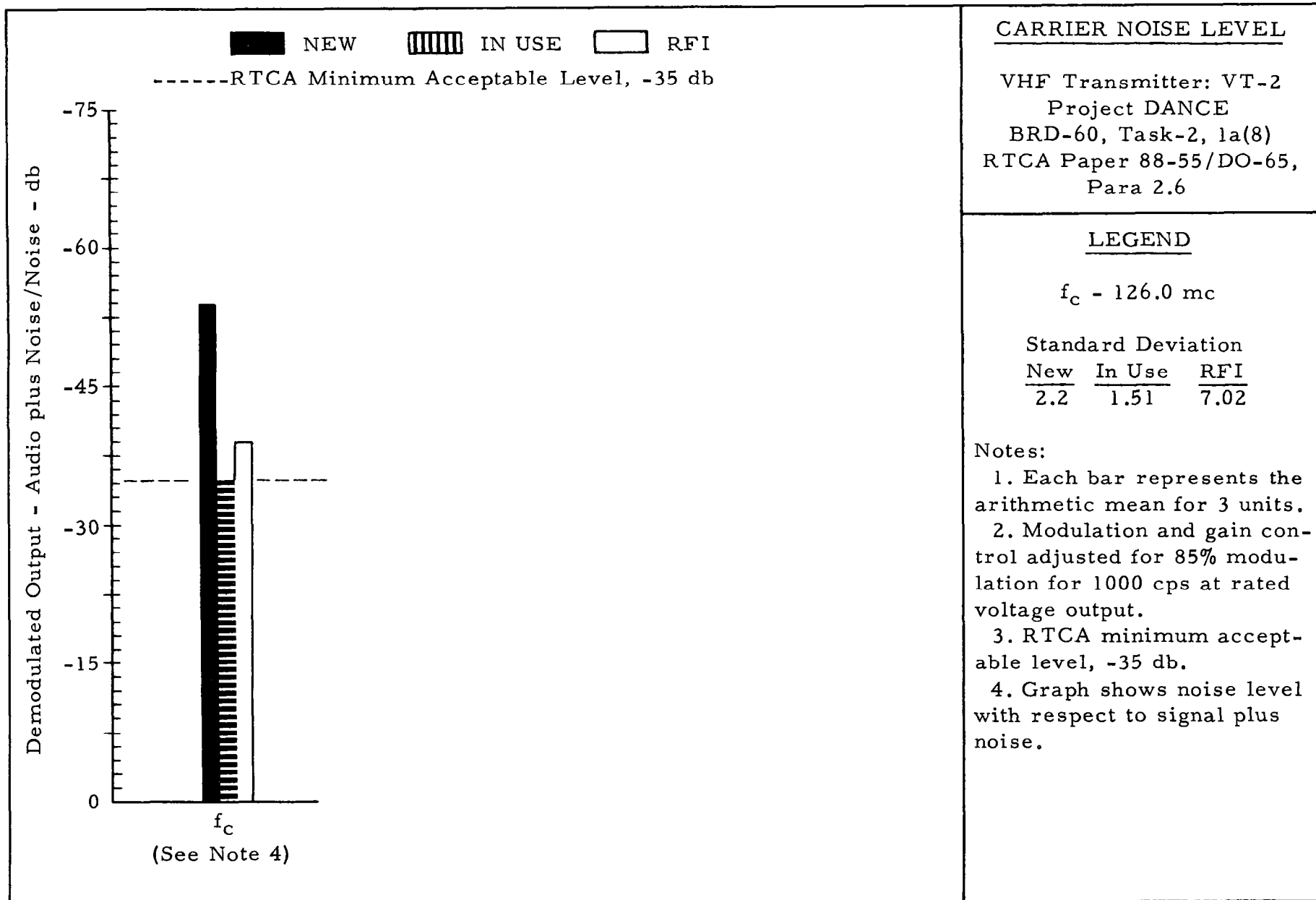
AUDIO FREQUENCY RESPONSE - VHF TRANSMITTER - VT-2



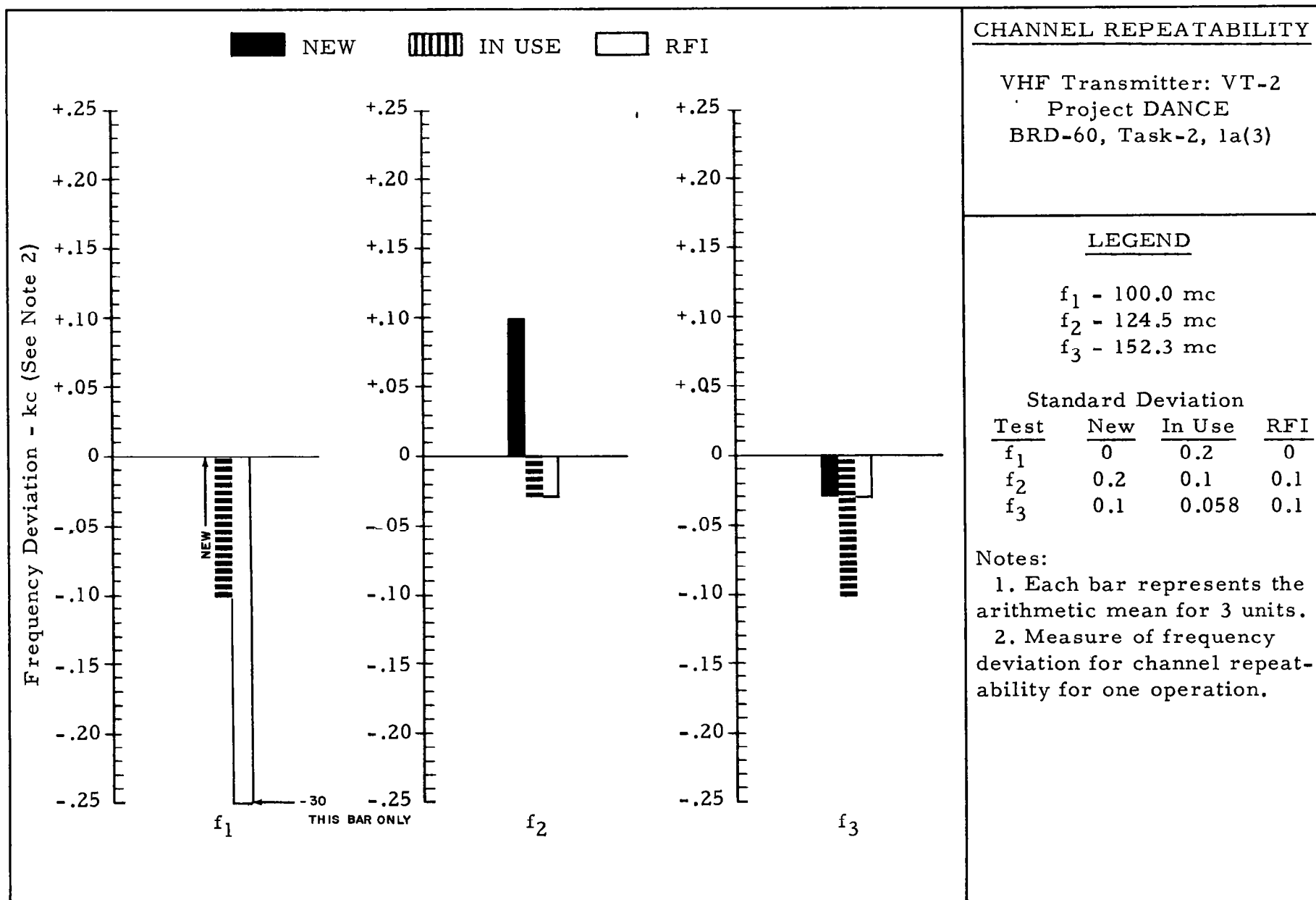
AUDIO FREQUENCY DISTORTION - VHF TRANSMITTER - VT-2



CHANNEL SELECTION TIME - VHF TRANSMITTER - VT-2



CARRIER NOISE LEVEL - VHF TRANSMITTER - VT-2



CHANNEL REPEATABILITY - VHF TRANSMITTER - VT-2

INTERFERENCE TESTS

VHF Transmitter: VT-2
 Project DANCE
 BRD-60. Task-2
 RTCA Paper 88-55/DO-65

Test	Carrier F (mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Residual Radiation</u> Contract Para: 1.a.(7) RTCA Para: 2.2	150.5	R.F. Output: $\leq .02$ micro- microwatts at carrier frequency.	R.F. Output: $< .02$ micro- microwatts at carrier frequency.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(a)	150.5	R.F. output within band of ± 25 kc and ± 50 kc from carrier Frequency: ≤ 125 milliwatts ≥ 25 db	R.F. Output: $< .578$ milliwatts within band of $F_c + 25$ kc to F_c $+ 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc. > 43 db within band of $F_c +$ 25 kc to $F_c + 30$ kc and $F_c - 25$ kc to $F_c - 50$ kc.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(b)	106.38 150.5	R.F. output outside band of ± 50 kc from carrier: Carrier Freq. (mc) 106.38 ≥ 47 db 150.5 ≥ 54 db	R.F. Outputs Carrier Freq. (mc) 106.38 > 47 db except at 35.5, 70.3, 84.3, 142.0, and 320 mc 150.5 > 54 db except at 101, 119, 252, 301, and 350 mc.	Partially

INTERFERENCE TESTS - VHF TRANSMITTER - VT-2

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

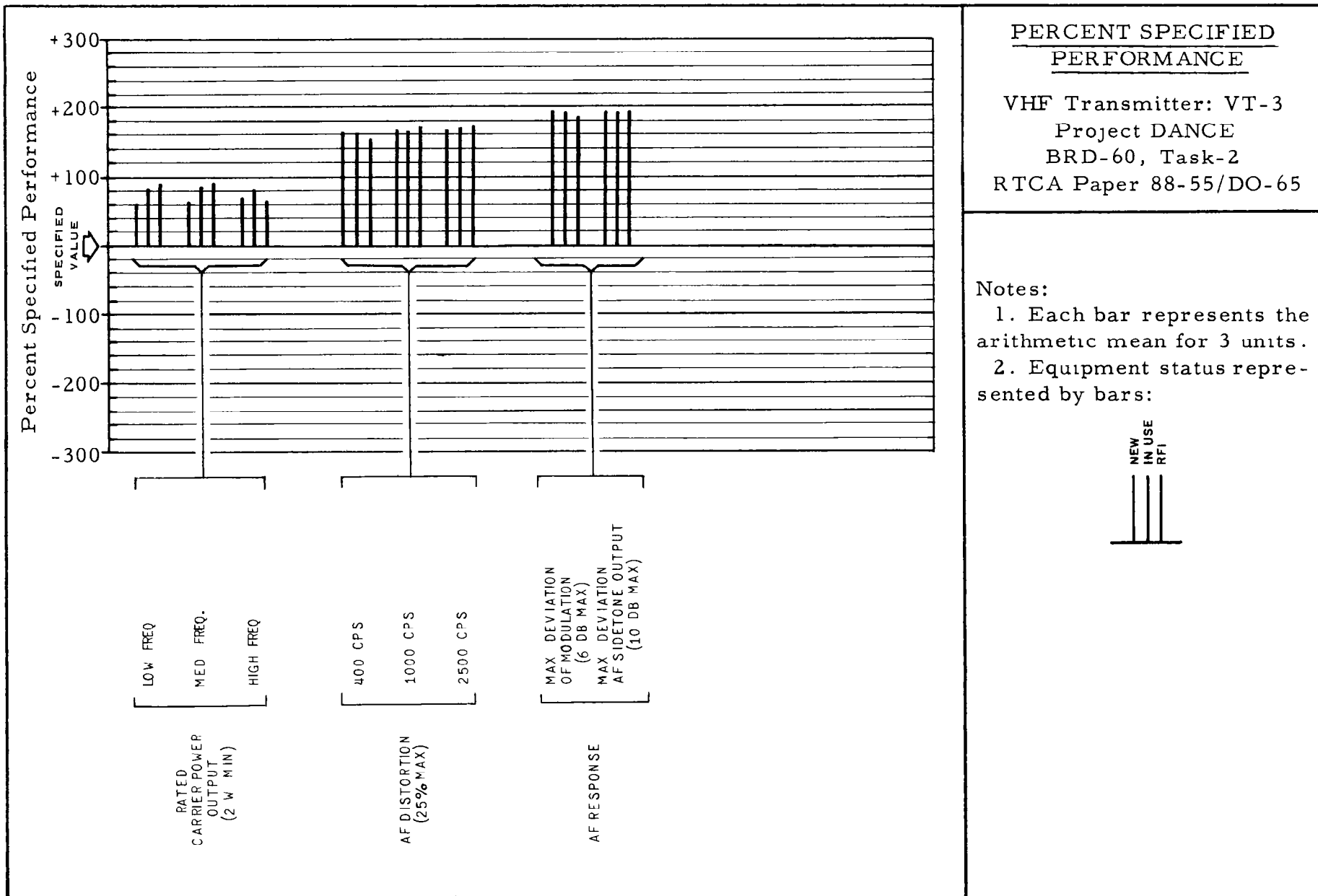
4. Laboratory and Field Test Data

c. VT-3, VHF Transmitter

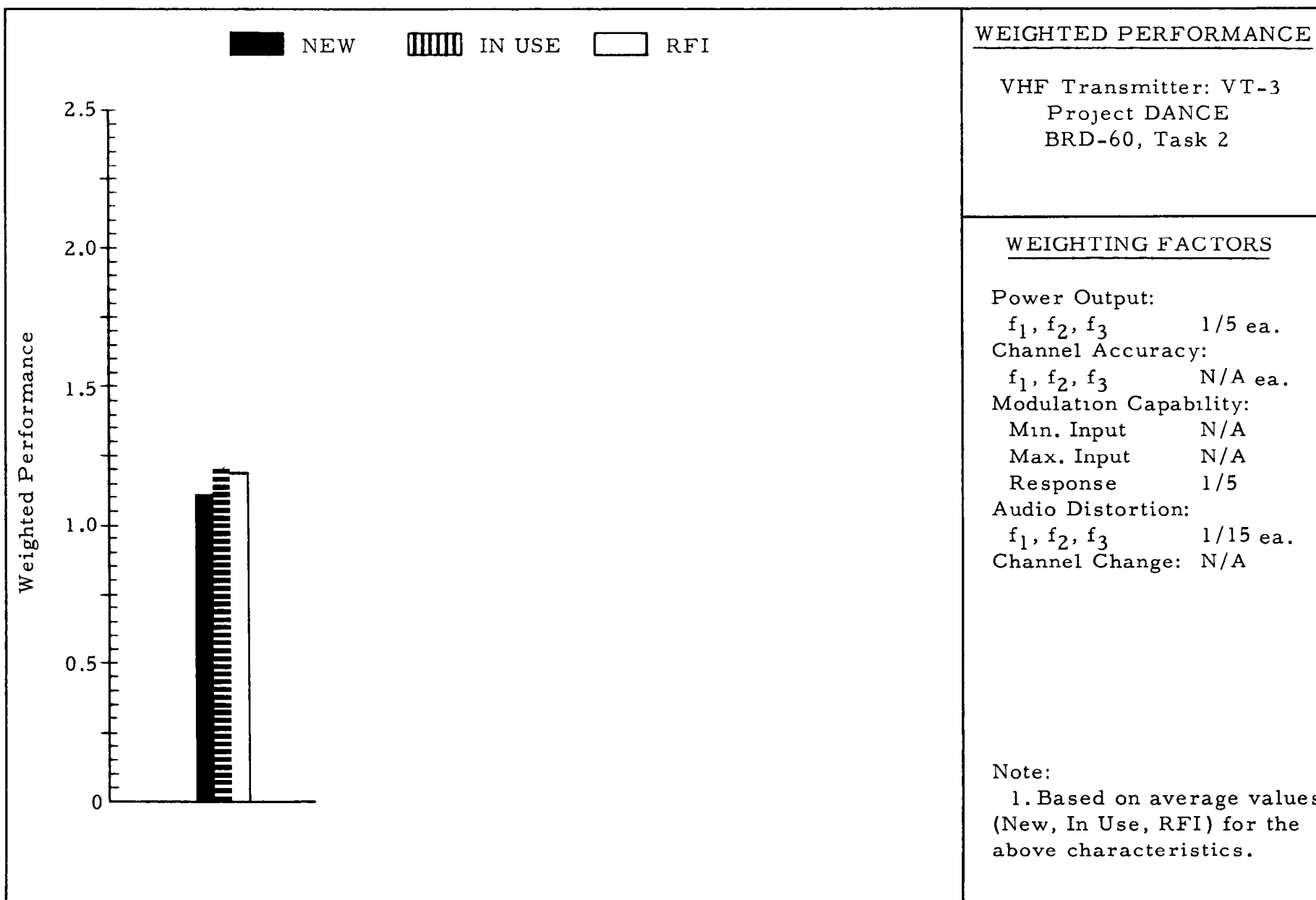
General:

Frequency Range:	T-11: 116 - 132 mc T-13: 132 - 148 mc 125 - 132 mc (with addition of capacity plate.)
Means of Frequency Control:	Crystal
Total Number of Channels:	5
Number of Channels Available at Operator's Position:	5 (in any 2 mc band located between frequency range)
Means of Frequency Selection:	Rotary Switch

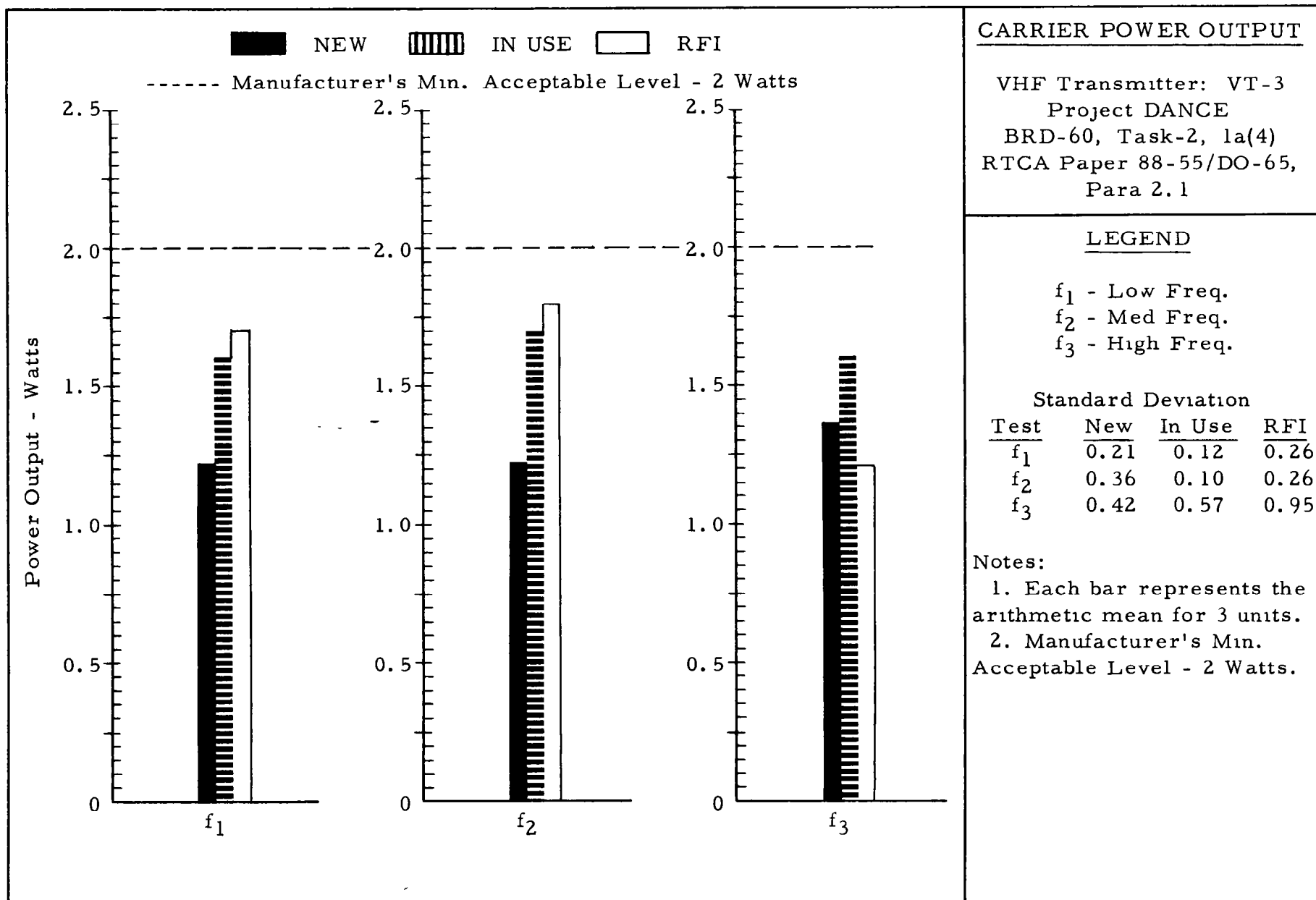
Technical:	<u>Page</u>
Percent Specified Performance	B-98
Weighted Performance	B-99
Carrier Power Output	B-100
Modulation Capability	B-101
Audio Frequency Response	B-102
Audio Frequency Distortion	B-103
Carrier Noise Level	B-104
Interference Tests	B-105



PERCENT SPECIFIED PERFORMANCE - VHF TRANSMITTER - VT-3



WEIGHTED PERFORMANCE - VHF TRANSMITTER - VT-3



CARRIER POWER OUTPUT

VHF Transmitter: VT-3
 Project DANCE
 BRD-60, Task-2, 1a(4)
 RTCA Paper 88-55/DO-65,
 Para 2.1

LEGEND

f_1 - Low Freq.
 f_2 - Med Freq.
 f_3 - High Freq.

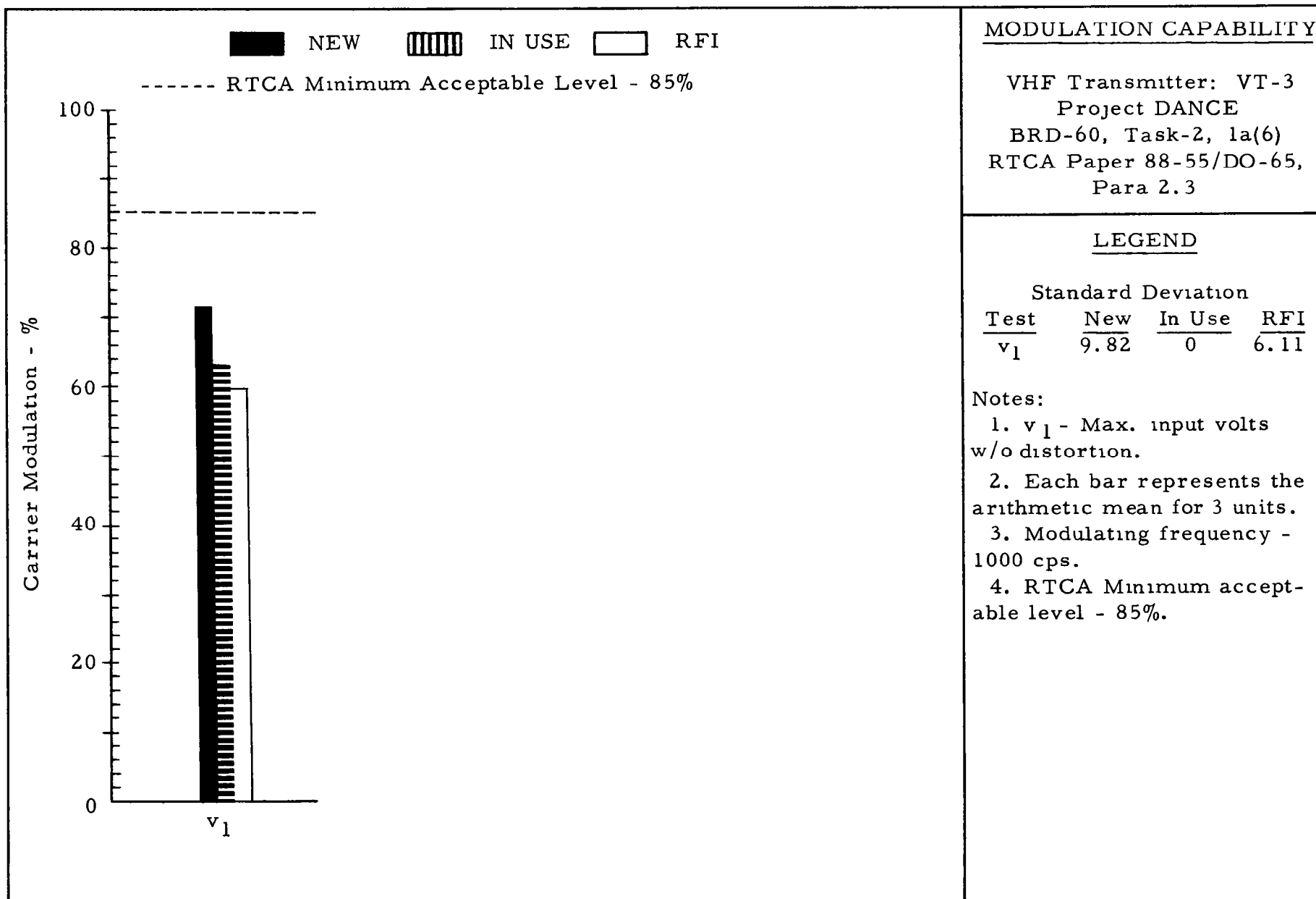
Standard Deviation

Test	New	In Use	RFI
f_1	0.21	0.12	0.26
f_2	0.36	0.10	0.26
f_3	0.42	0.57	0.95

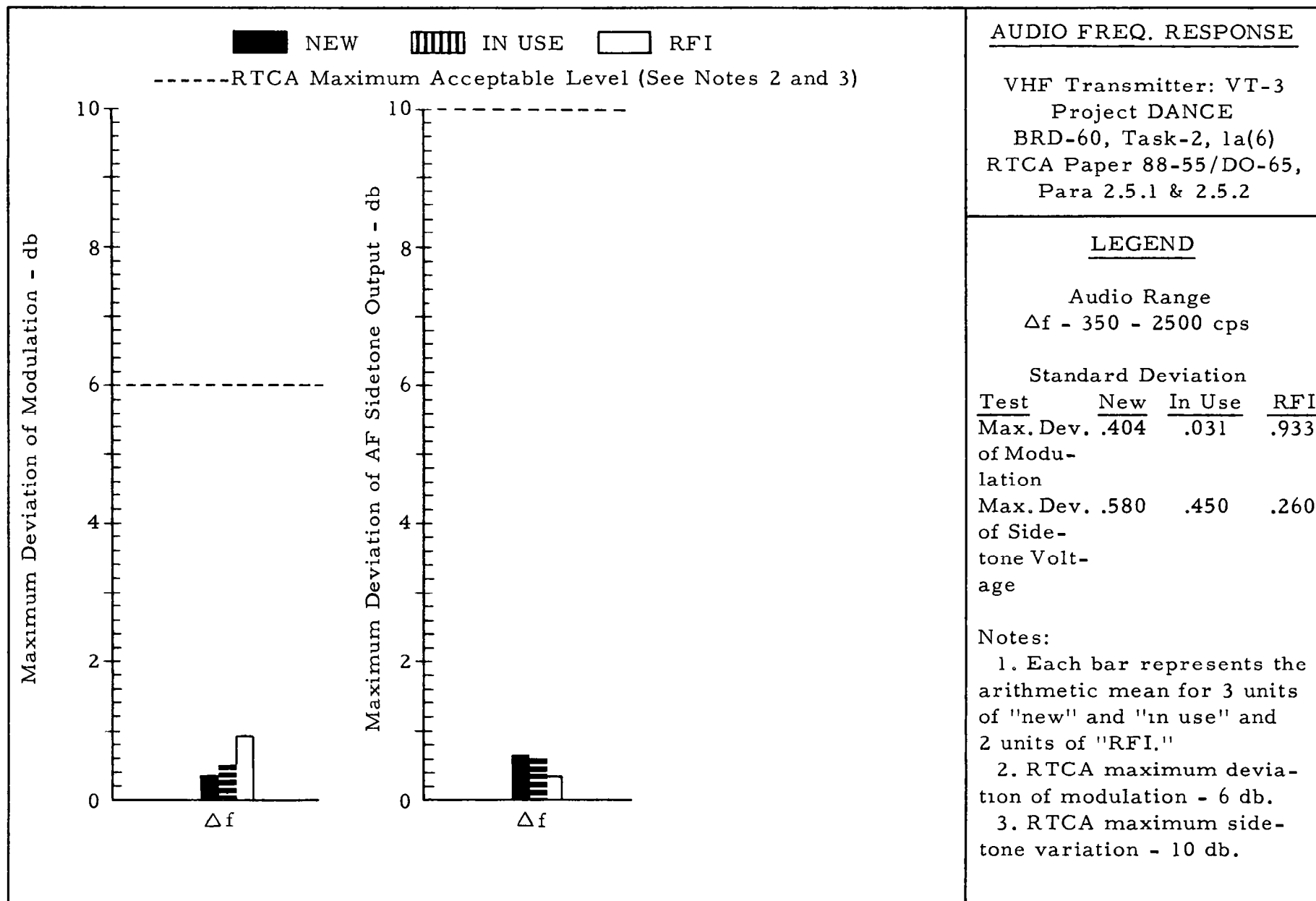
Notes:

1. Each bar represents the arithmetic mean for 3 units.
2. Manufacturer's Min. Acceptable Level - 2 Watts.

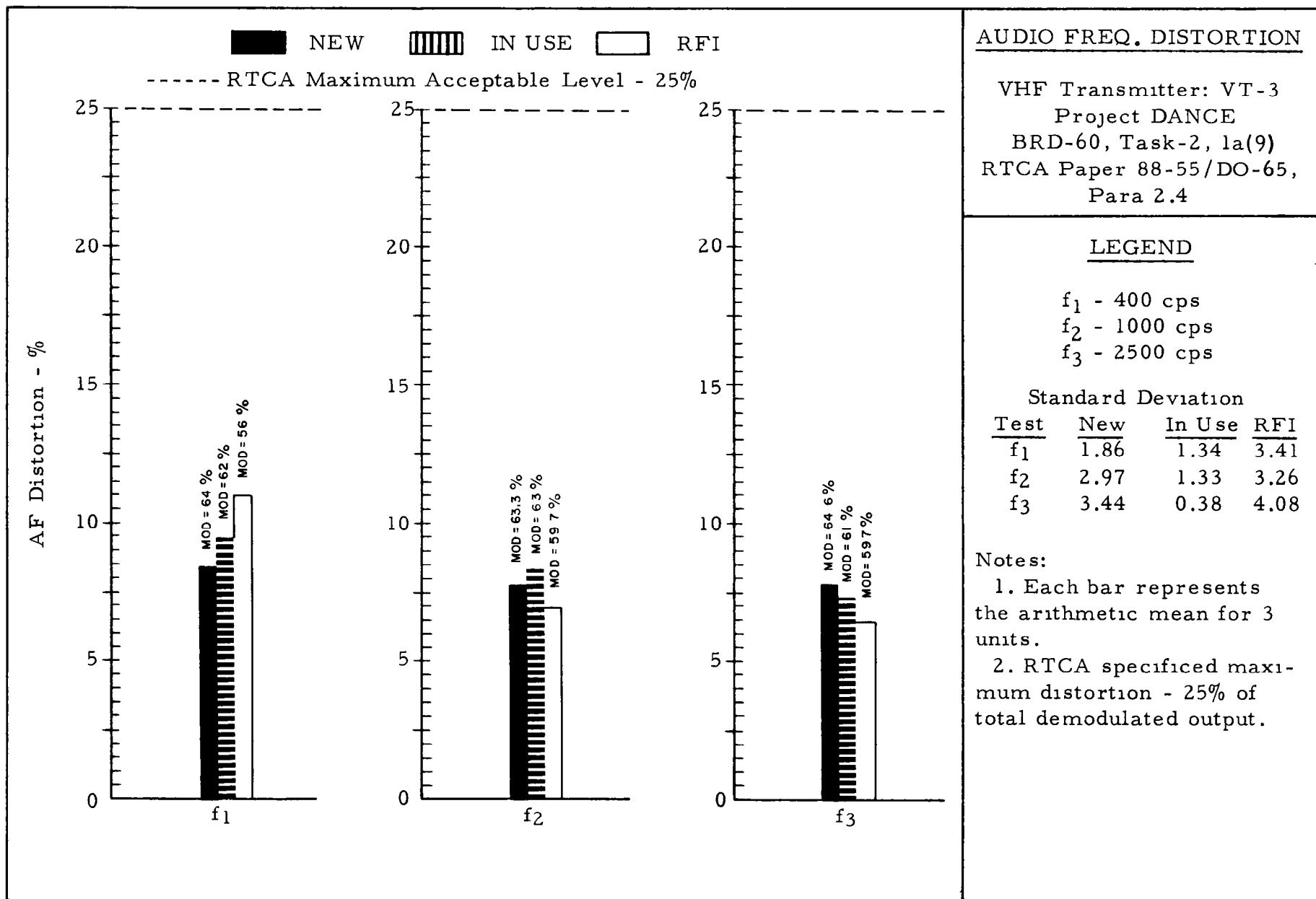
CARRIER POWER OUTPUT - VHF TRANSMITTER - VT-3



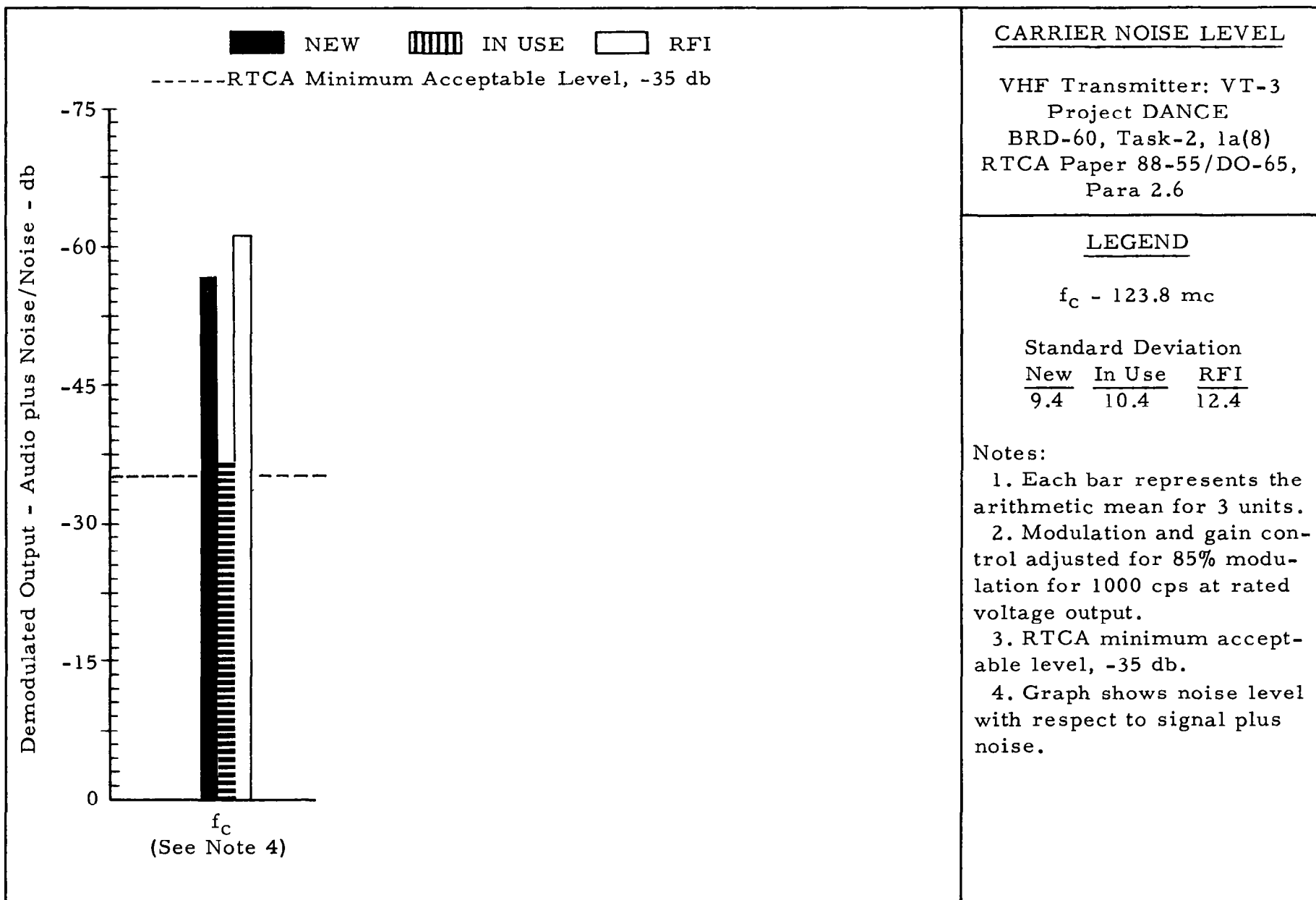
MODULATION CAPABILITY - VHF TRANSMITTER - VT-3



AUDIO FREQUENCY RESPONSE - VHF TRANSMITTER - VT-3



AUDIO FREQUENCY DISTORTION - VHF TRANSMITTER - VT-3



CARRIER NOISE LEVEL - VHF TRANSMITTER - VT-3

INTERFERENCE TESTS

VHF Transmitter: VT-3
 Project DANCE
 BRD-60. Task-2
 RTCA Paper 88-55/DO-65

Test	Carrier F. (mc)		RTCA Performance Standards	Results	Performance Standards Met
<u>Residual Radiation</u> Contract Para: 1.a.(7) RTCA Para: 2.2	126.18		R.F. Output: $\leq .02$ micro- microwatts at carrier frequency.	R.F. Output: $< .02$ micro- microwatts at carrier frequency.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(a)	126.18		R.F. output within band of ± 25 kc and ± 50 kc from carrier Frequency: ≤ 125 milliwatts ≥ 25 db	R.F. Output: $< .23$ milliwatts within band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to F_c $- 50$ kc. > 40 db within band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(b)	126.8		R.F. Output outside band of ± 50 kc from carrier frequency: ≥ 47 db.	R.F. Output: < 47 db except at: 21, 42, 56, 63, 84, 106, 119.5, 132, 147, 167.5, 188, 209.5, 232, 253, and 376.5 mc.	No

INTERFERENCE TESTS - VHF TRANSMITTER - VT-3

SECTION B
AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

4. Laboratory and Field Test Data

d. VT-4, VHF Transmitter

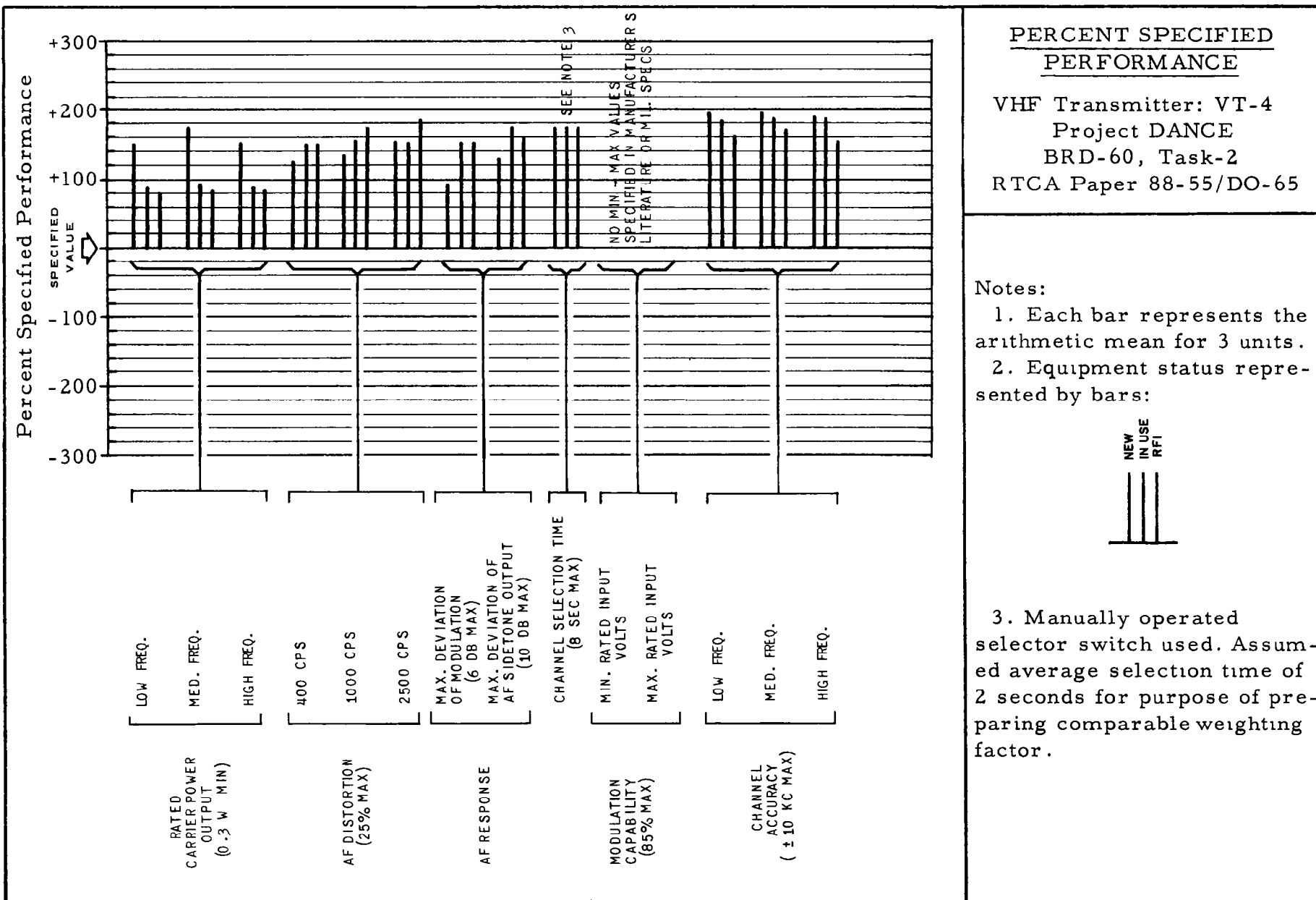
General:

Frequency Range:	108 - 126.7 mc
Means of Frequency Control:	Crystal
Total Number of Channels:	12
Number of Channels Available at Operator's Position:	12 (if crystals are in all channels)
Means of Frequency Selection:	Rotary Switch

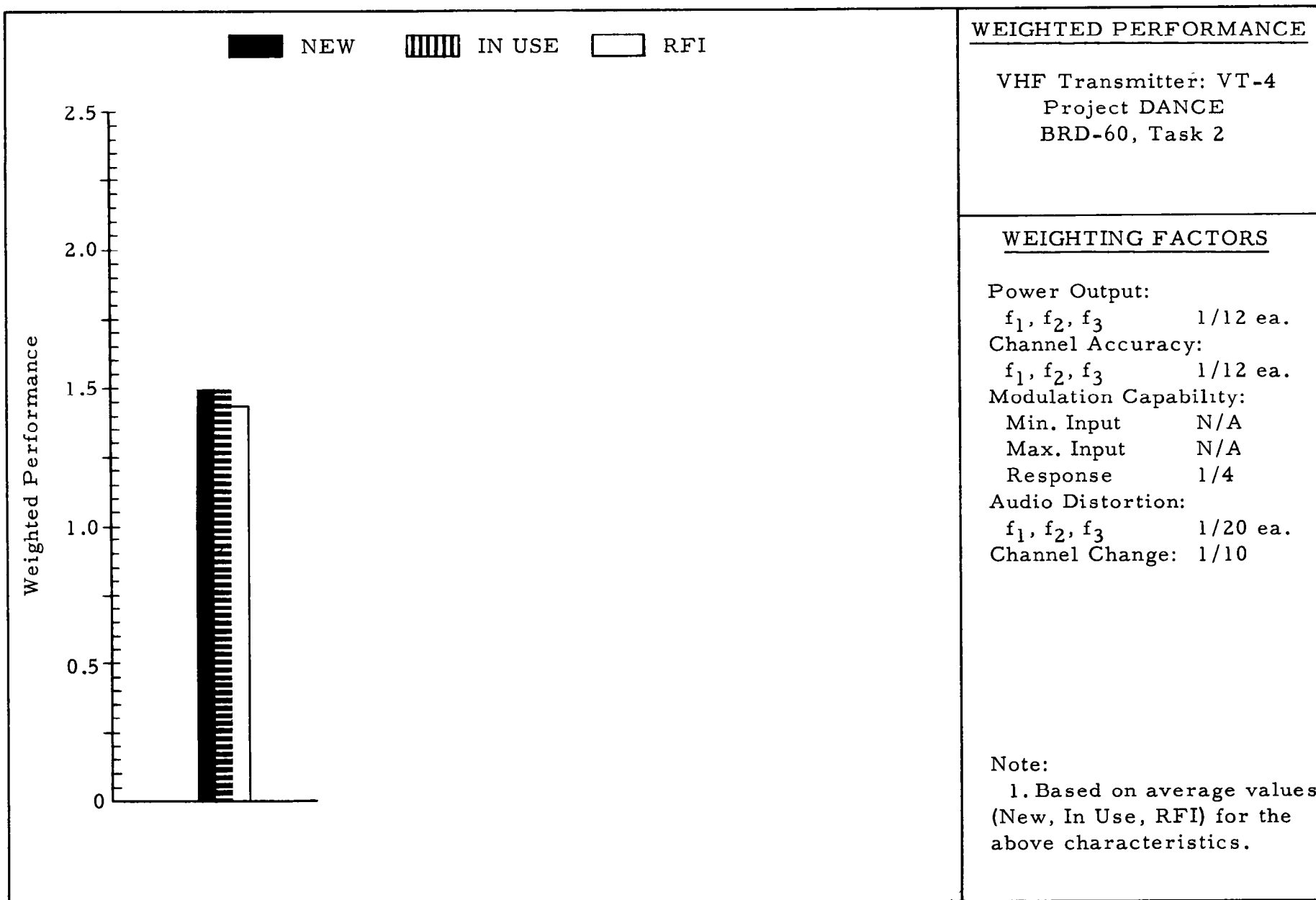
Technical:

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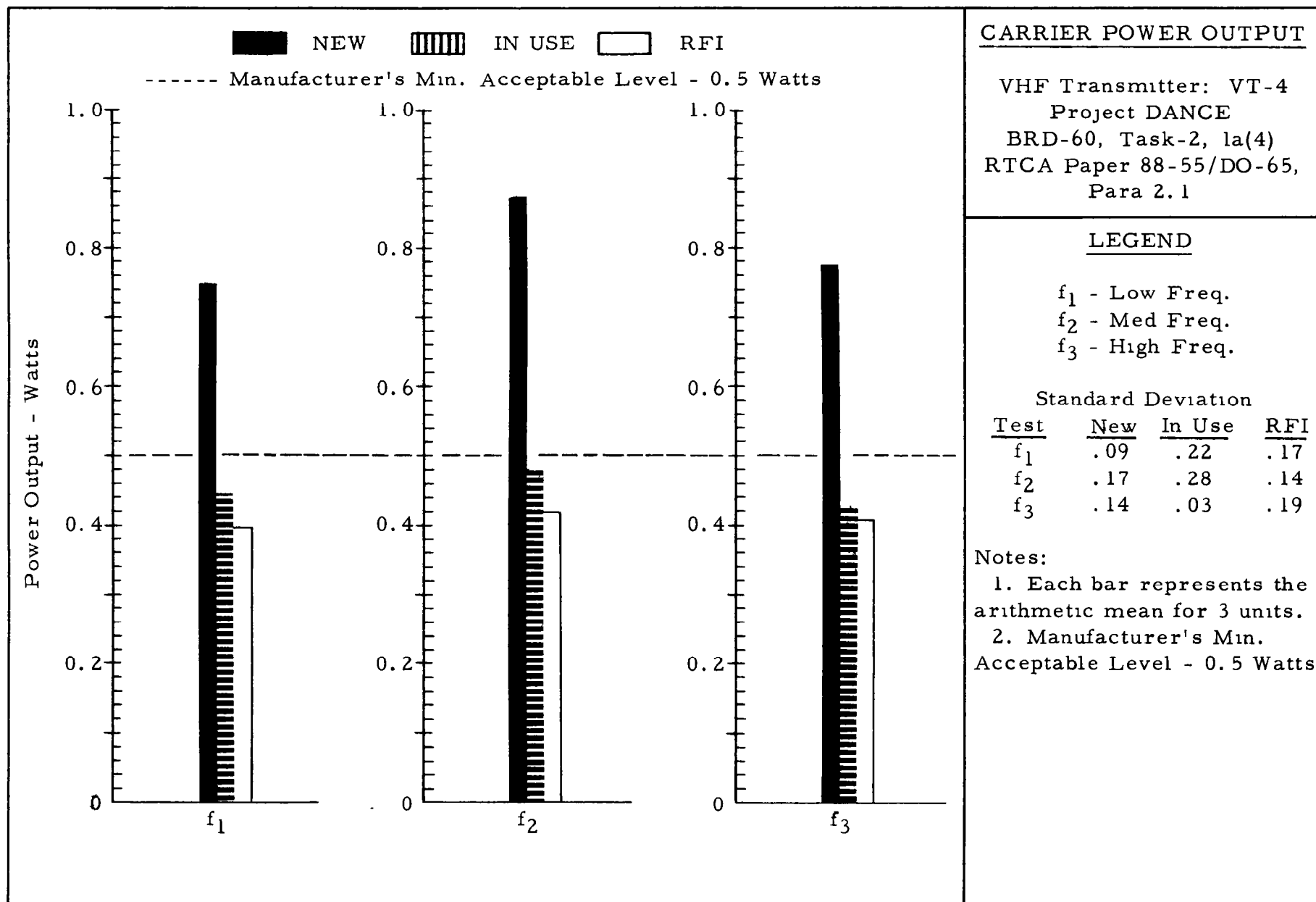
Percent Specified Performance	B-108
Weighted Performance	B-109
Carrier Power Output	B-110
Channel Accuracy	B-111
Modulation Capability	B-112
Audio Frequency Response	B-113
Audio Frequency Distortion	B-114
Carrier Noise Level	B-115
Interference Tests	B-116



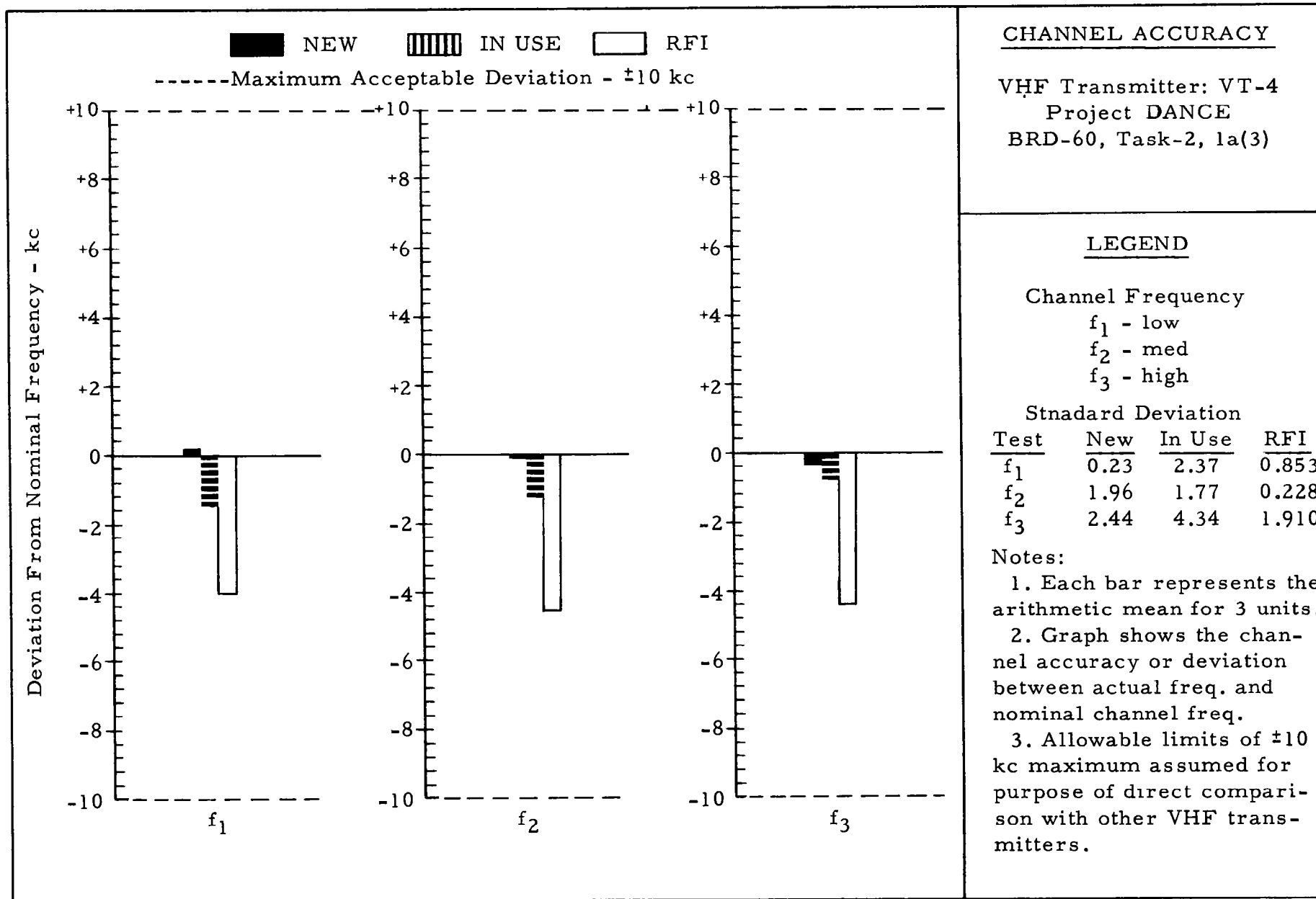
PERCENT SPECIFIED PERFORMANCE - VHF TRANSMITTER - VT-4



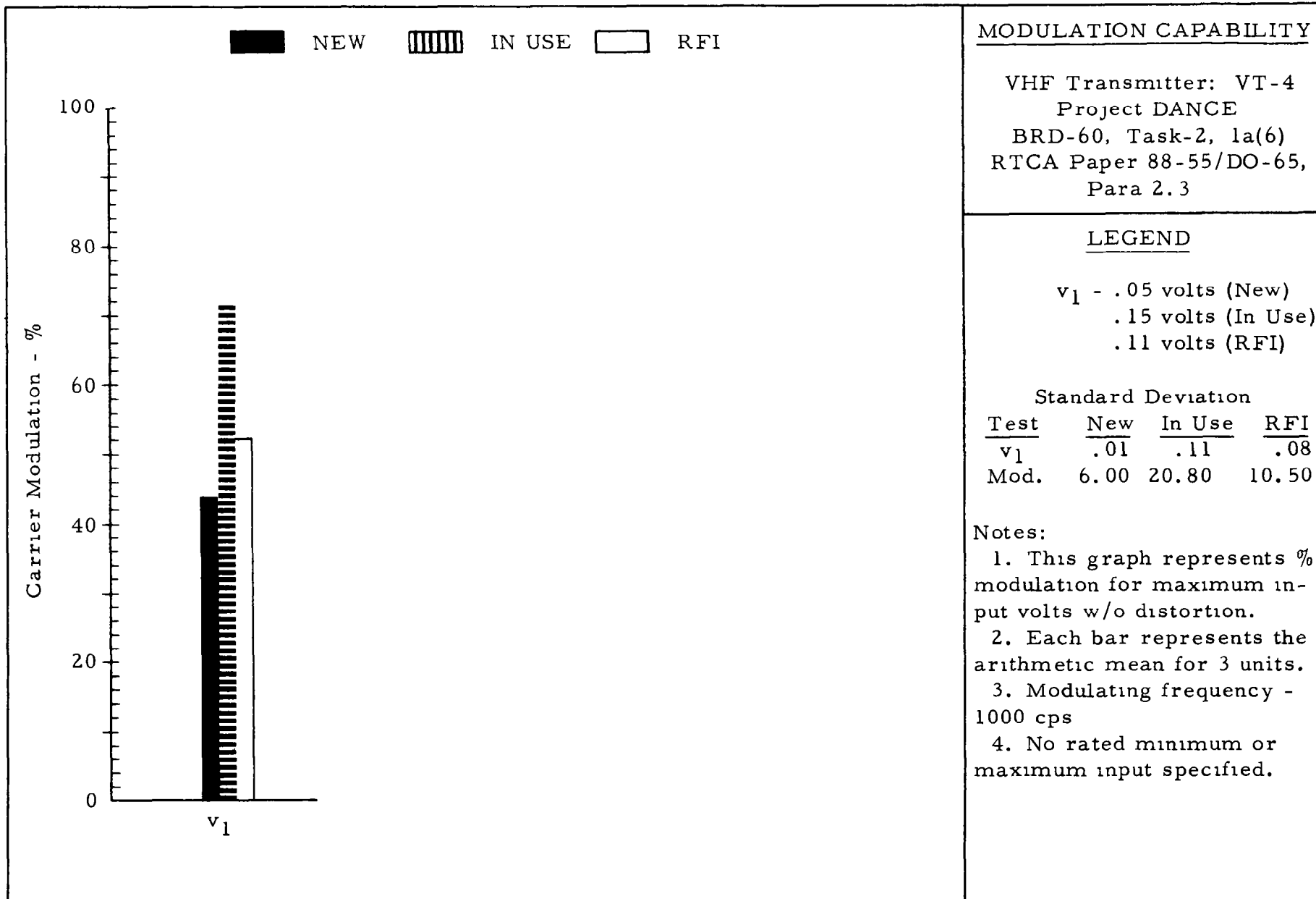
WEIGHTED PERFORMANCE - VHF TRANSMITTER - VT-4



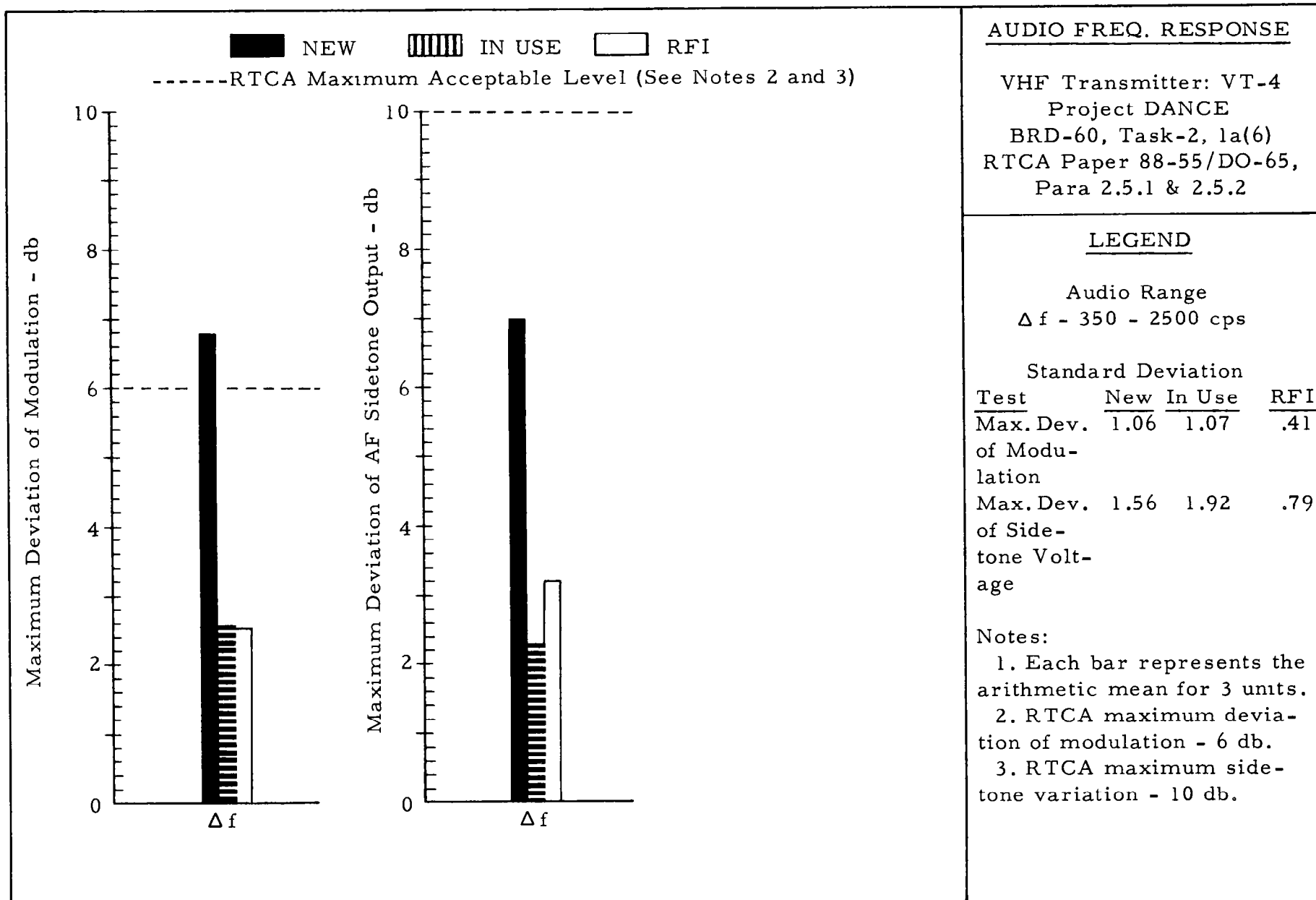
CARRIER POWER OUTPUT - VHF TRANSMITTER - VT-4



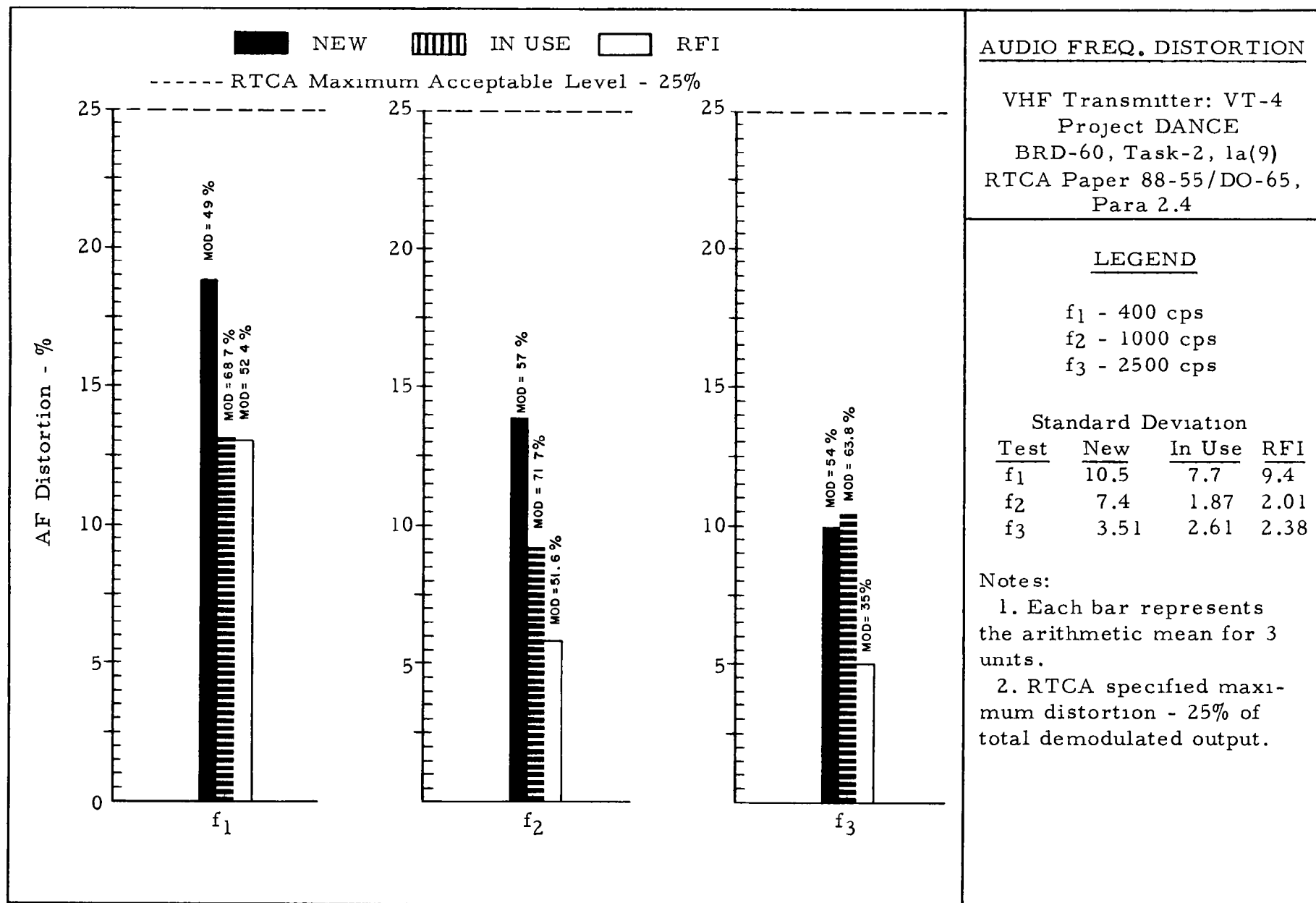
CHANNEL ACCURACY - VHF TRANSMITTER - VT-4



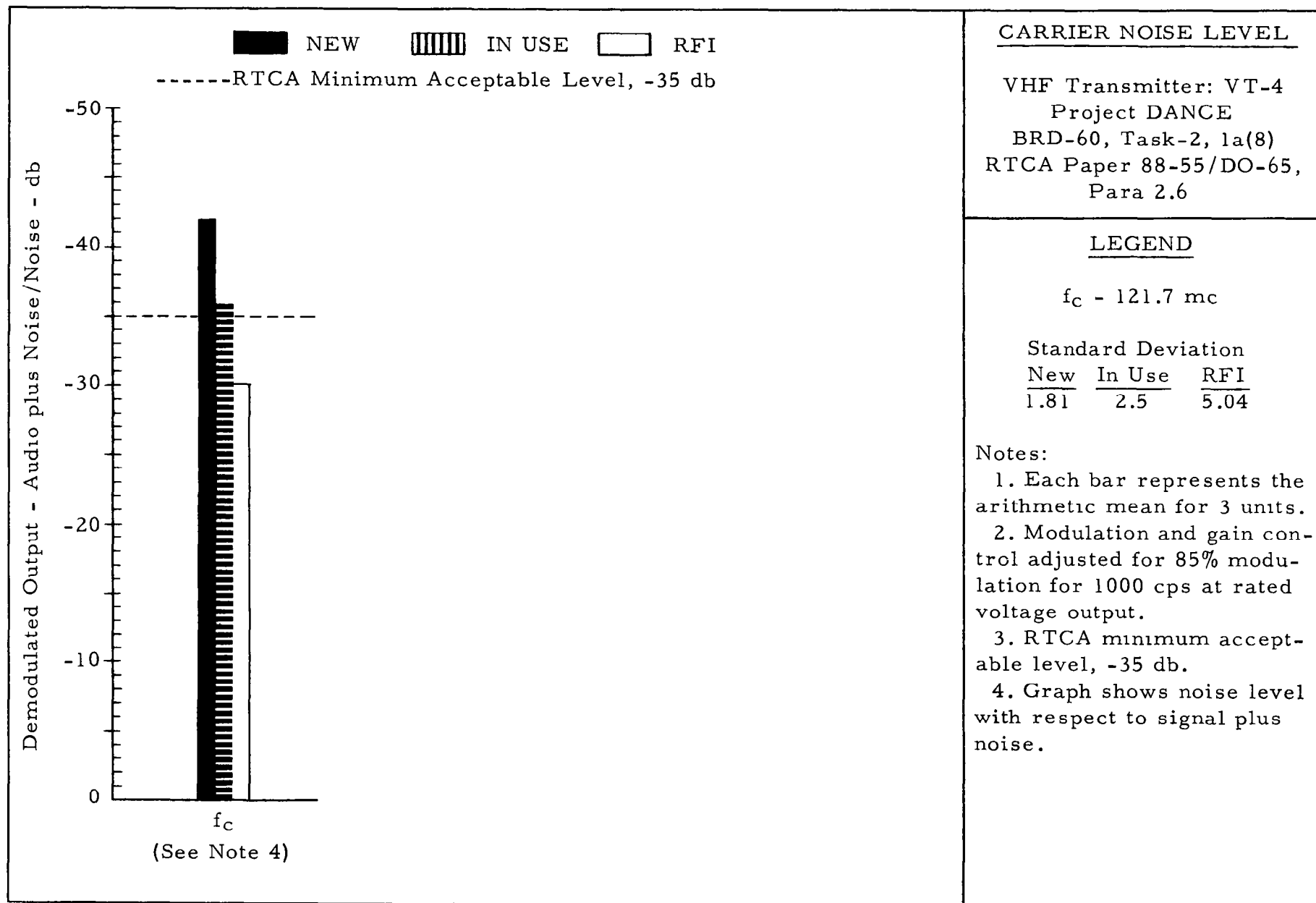
MODULATION CAPABILITY - VHF TRANSMITTER - VT-4



AUDIO FREQUENCY RESPONSE - VHF TRANSMITTER - VT-4



AUDIO FREQUENCY DISTORTION - VHF TRANSMITTER - VT-4



CARRIER NOISE LEVEL - VHF TRANSMITTER - VT-4

INTERFERENCE TESTS

VHF Transmitter: VT-4
Project DANCE
BRD-60. Task-2
RTCA Paper 87-55/DO-65

Test	Carrier F. (mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Residual Radiation</u> Contract Para: 1.a.(7) RTCA Para: 2.2	122.5	R.F. Output: $\leq .02$ micro- microwatts at carrier frequency.	R.F. Output: $< .02$ micro- microwatts at carrier frequency.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(a)	122.5	R.F. output within band of ± 25 kc and ± 50 kc from carrier Frequency: ≤ 125 milliwatts ≥ 25 db	R.F. Output: $< .075$ milli- watts within band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc. > 40 db within band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(b)	122.5	R.F. Output outside band of ± 50 kc from carrier frequency: ≥ 46 db.	R.F. Output: > 46 db.	Yes

INTERFERENCE TESTS - VHF TRANSMITTER - VT-4

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

4. Laboratory and Field Test Data

e. VT-5, VHF Transmitter

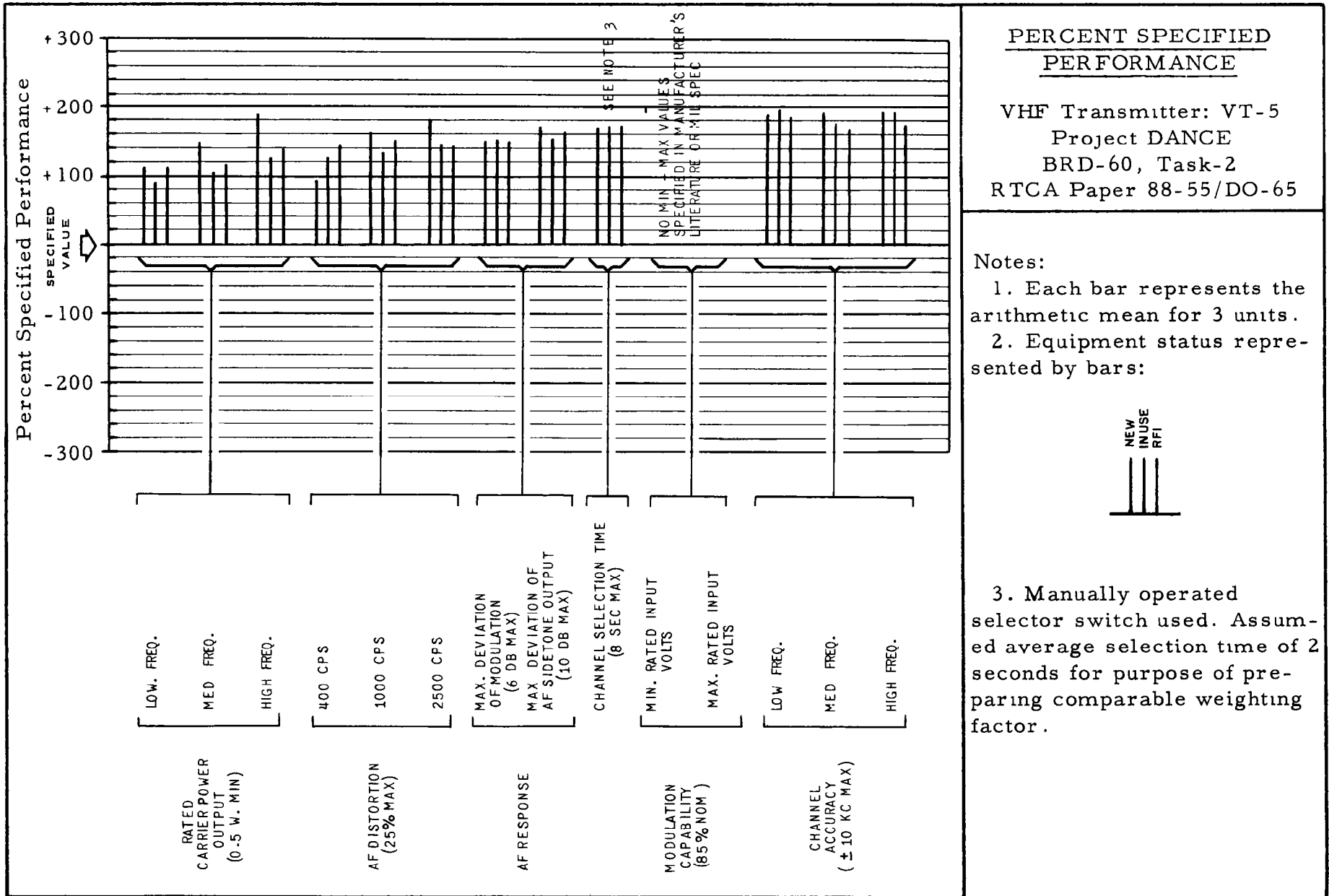
General:

Frequency Range:	118.0 - 126.7 mc
Means of Frequency Control:	Crystal
Total Number of Channels:	27
Number of Channels Available at Operator's Position:	27 (for all complement of crystals)
Means of Frequency Selection:	Rotary Switch

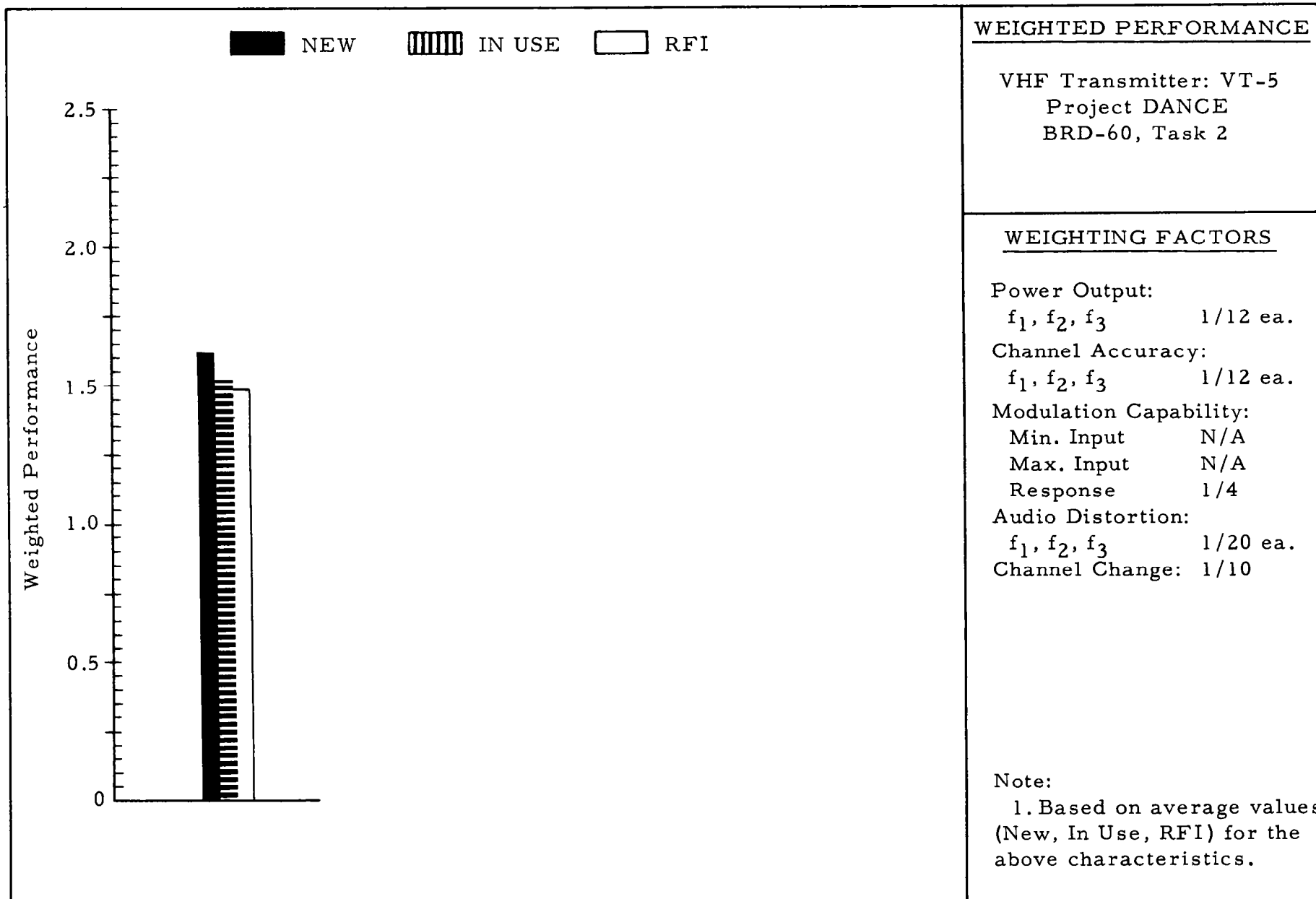
Technical:

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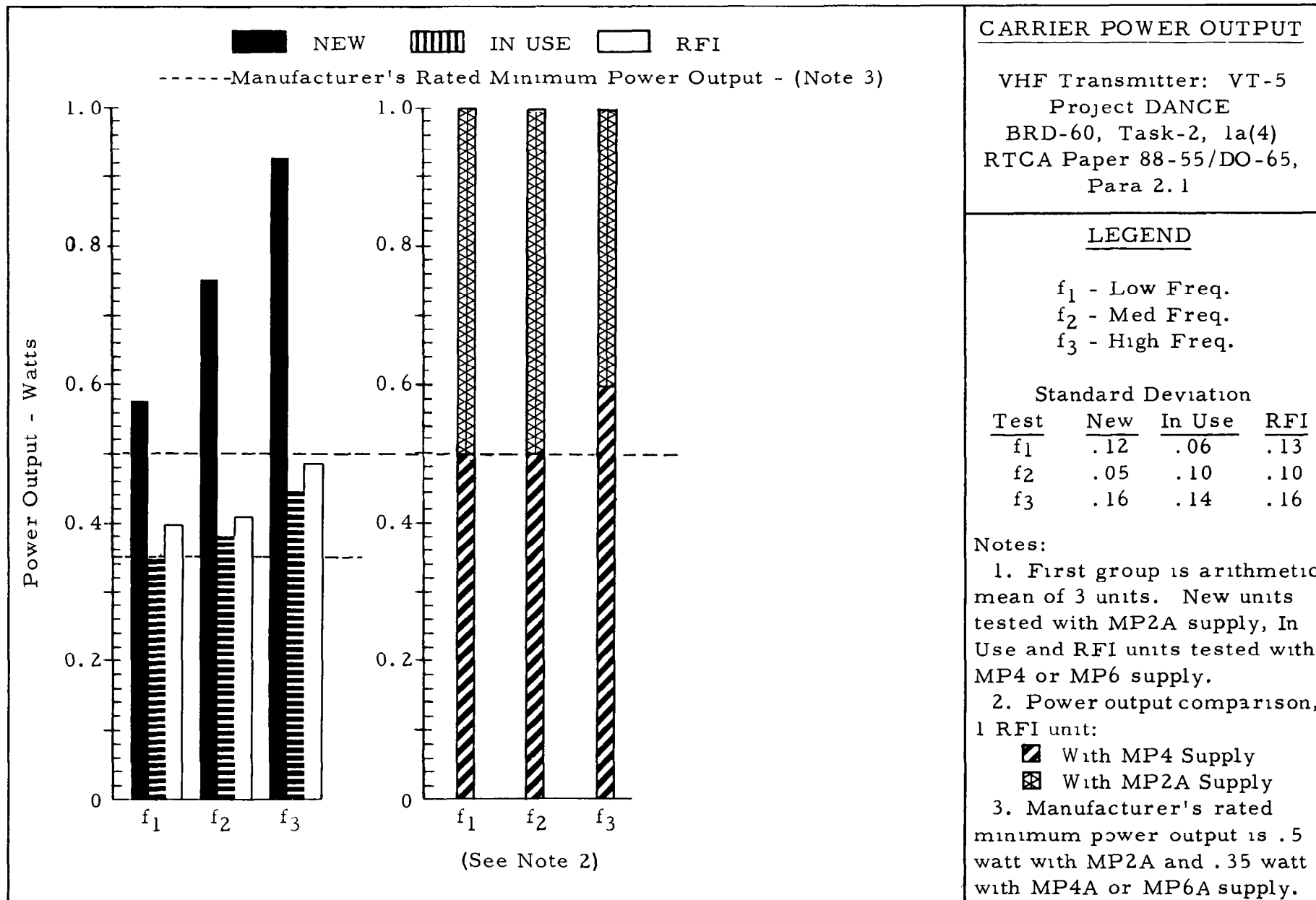
Percent Specified Performance	B-118
Weighted Performance	B-119
Carrier Power Output	B-120
Channel Accuracy	B-121
Modulation Capability	B-122
Audio Frequency Response	B-123
Audio Frequency Distortion	B-124
Carrier Noise Level	B-125
Channel Repeatability	B-126
Interference Tests	B-127



PERCENT SPECIFIED PERFORMANCE - VHF TRANSMITTER - VT-5



WEIGHTED PERFORMANCE - VHF TRANSMITTER - VT-5



CARRIER POWER OUTPUT

VHF Transmitter: VT-5
 Project DANCE
 BRD-60, Task-2, 1a(4)
 RTCA Paper 88-55/DO-65,
 Para 2.1

LEGEND

f₁ - Low Freq.
 f₂ - Med Freq.
 f₃ - High Freq.

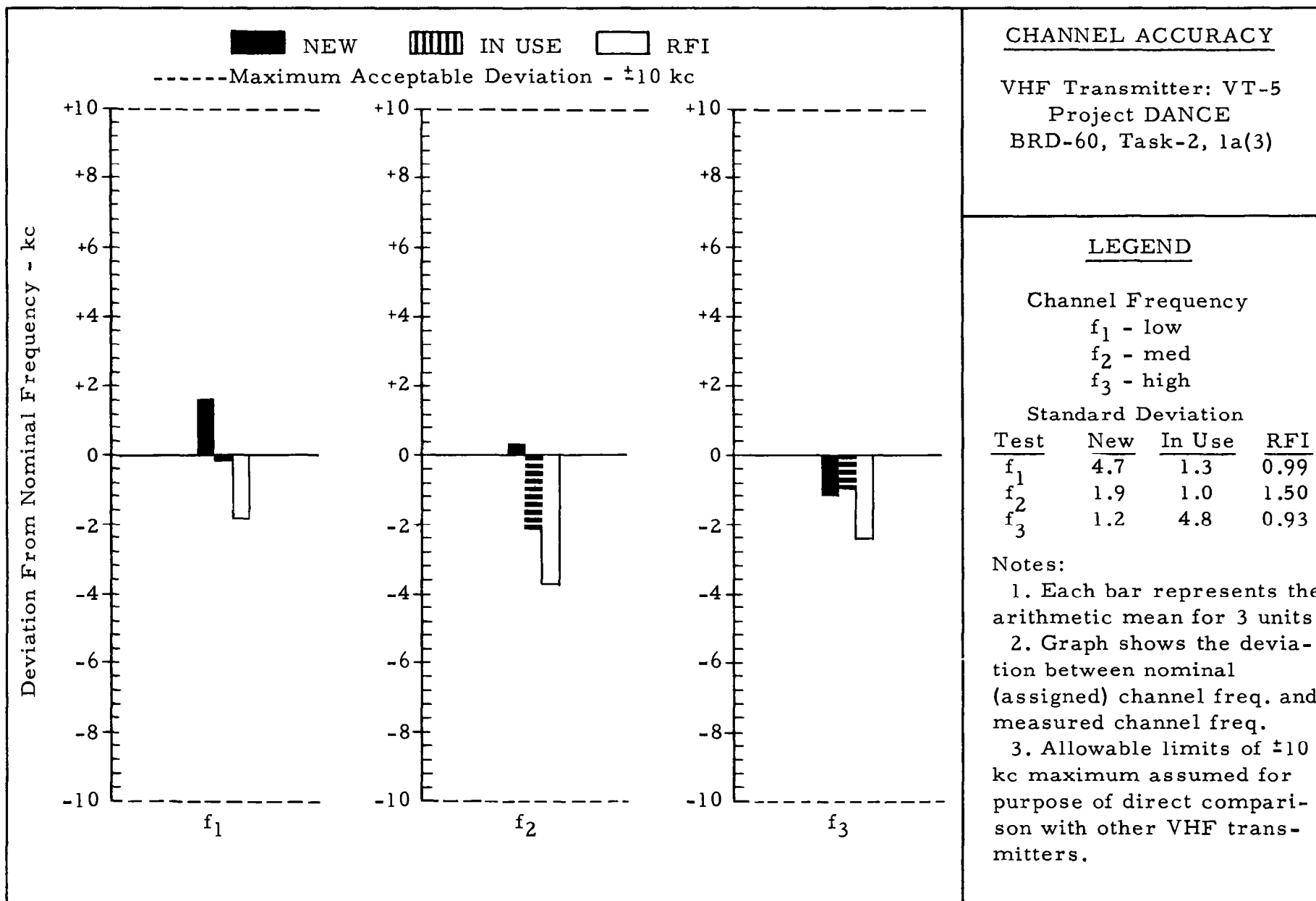
Standard Deviation

Test	New	In Use	RFI
f ₁	.12	.06	.13
f ₂	.05	.10	.10
f ₃	.16	.14	.16

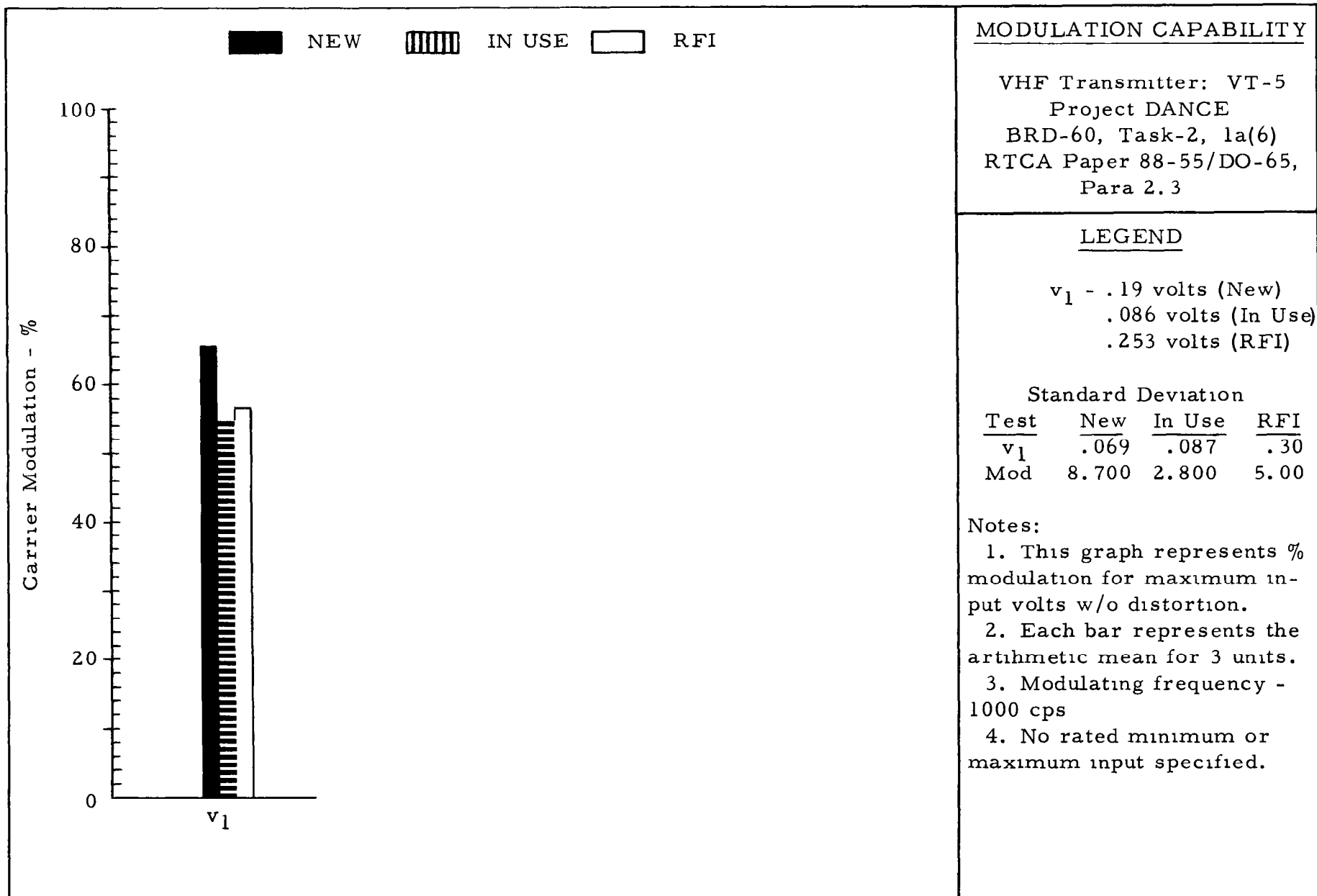
Notes:

1. First group is arithmetic mean of 3 units. New units tested with MP2A supply, In Use and RFI units tested with MP4 or MP6 supply.
2. Power output comparison, 1 RFI unit:
 - With MP4 Supply
 - With MP2A Supply
3. Manufacturer's rated minimum power output is .5 watt with MP2A and .35 watt with MP4A or MP6A supply.

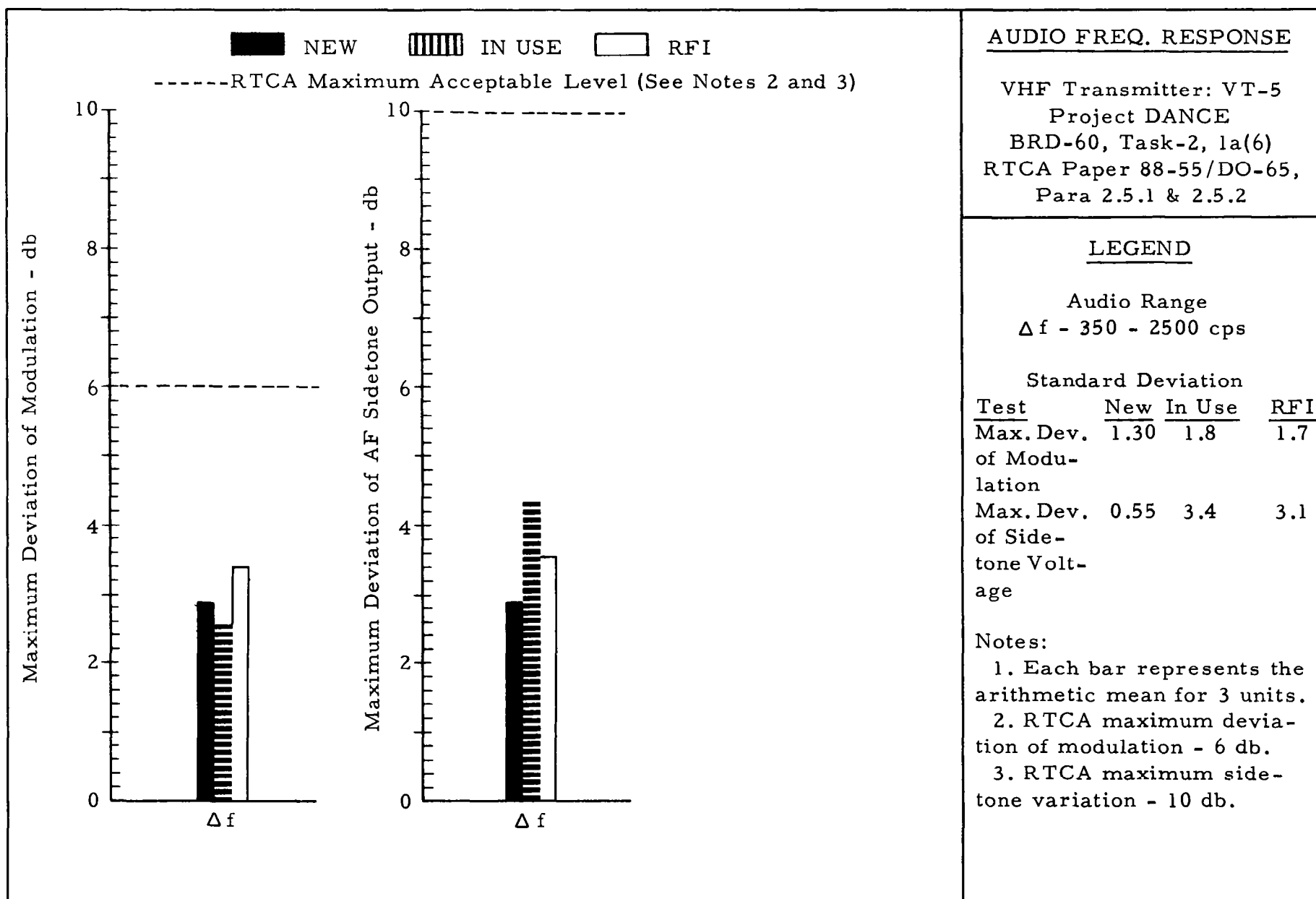
CARRIER POWER OUTPUT - VHF TRANSMITTER - VT-5



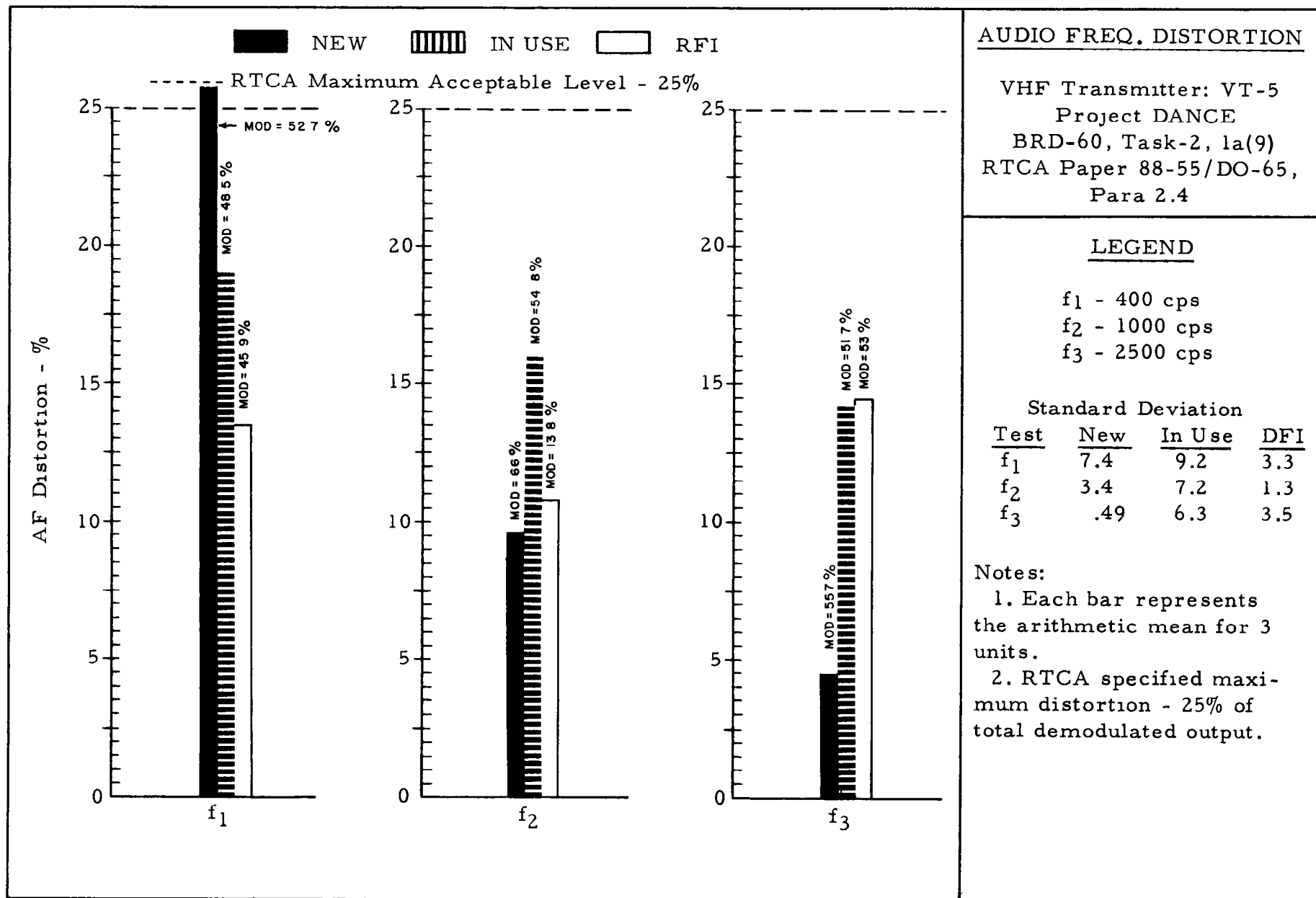
CHANNEL ACCURACY - VHF TRANSMITTER - VT-5



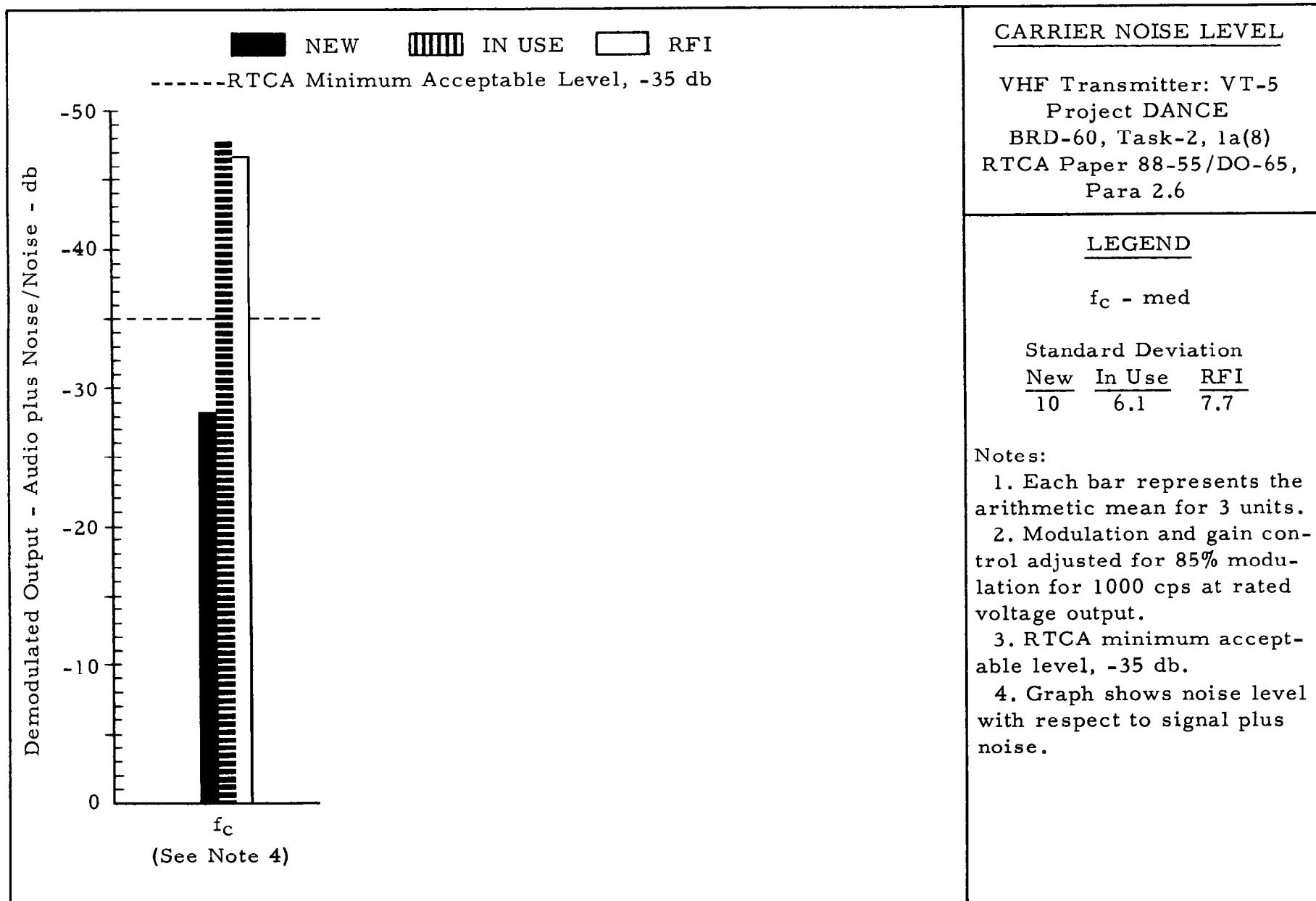
MODULATION CAPABILITY - VHF TRANSMITTER - VT-5



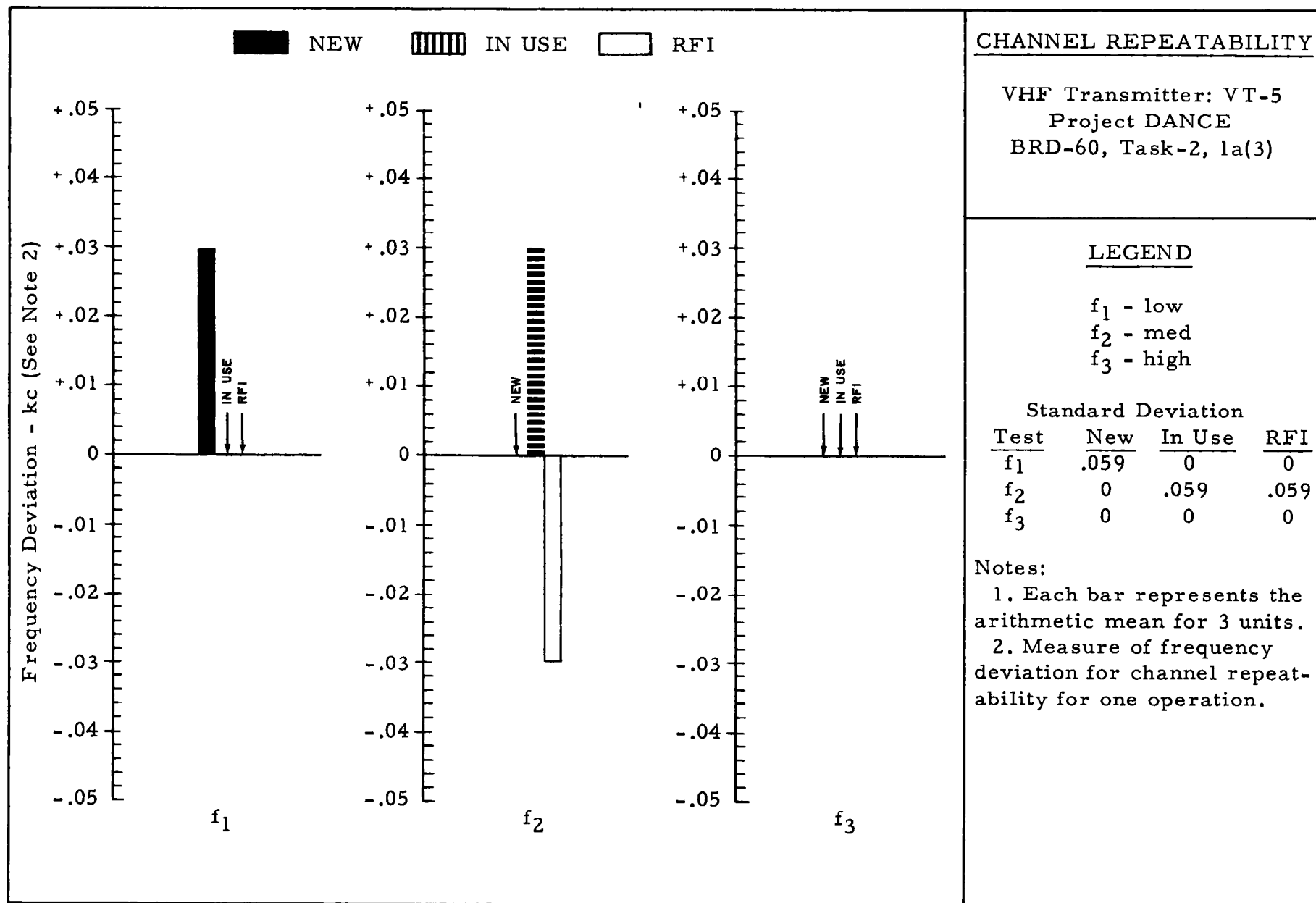
AUDIO FREQUENCY RESPONSE - VHF TRANSMITTER - VT-5



AUDIO FREQUENCY DISTORTION - VHF TRANSMITTER - VT-5



CARRIER NOISE LEVEL - VHF TRANSMITTER - VT-5



CHANNEL REPEATABILITY

VHF Transmitter: VT-5
Project DANCE
BRD-60, Task-2, 1a(3)

LEGEND

f_1 - low
 f_2 - med
 f_3 - high

Standard Deviation

Test	New	In Use	RFI
f_1	.059	0	0
f_2	0	.059	.059
f_3	0	0	0

Notes:

- Each bar represents the arithmetic mean for 3 units.
- Measure of frequency deviation for channel repeatability for one operation.

CHANNEL REPEATABILITY - VHF TRANSMITTER - VT-5

INTERFERENCE TESTS

VHF Transmitter: VT-5
Project DANCE
BRD-60. Task-2
RTCA Paper 88-55/DO-65

Test	Carrier F. (mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Residual Radiation</u> Contract Para: 1.a.(7) RTCA Para: 2.2	126.7	R.F. Output: $\leq .02$ micro- microwatts at carrier frequency.	R.F. Output: $< .02$ micro- microwatts.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(a)	126.7	R.F. output within band of ± 25 kc and ± 50 kc from carrier Frequency: ≤ 125 milliwatts ≥ 25 db	R.F. Output: $< .1$ milliwatts within band of $F_c + 25$ kc to F_c $+ 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc. > 40 db within band of $F_c + 25$ kc to $F_c + 50$ kc and $F_c - 25$ kc to $F_c - 50$ kc.	Yes
<u>Spurious Radiation</u> Contract Para: 1.a.(5) RTCA Para: 2.7(b)	118.1 120.5 126.7	R.F. output outside band of ± 50 kc from carrier frequency: Carrier Freq: (mc) 118.1 ≥ 46 db 120.5 ≥ 41 db 126.7 ≥ 43 db	R.F. Output: Carrier Freq: (mc) 118.1 > 46 db except at 89, 147, and 175 mc. 120.5 > 41 db except at 150 and 608 mc. 126.7 > 43 db	Partially

INTERFERENCE TESTS - VHF TRANSMITTER - VT-5

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

5. Laboratory and Field Test Data

a. VR-1, VHF Receiver

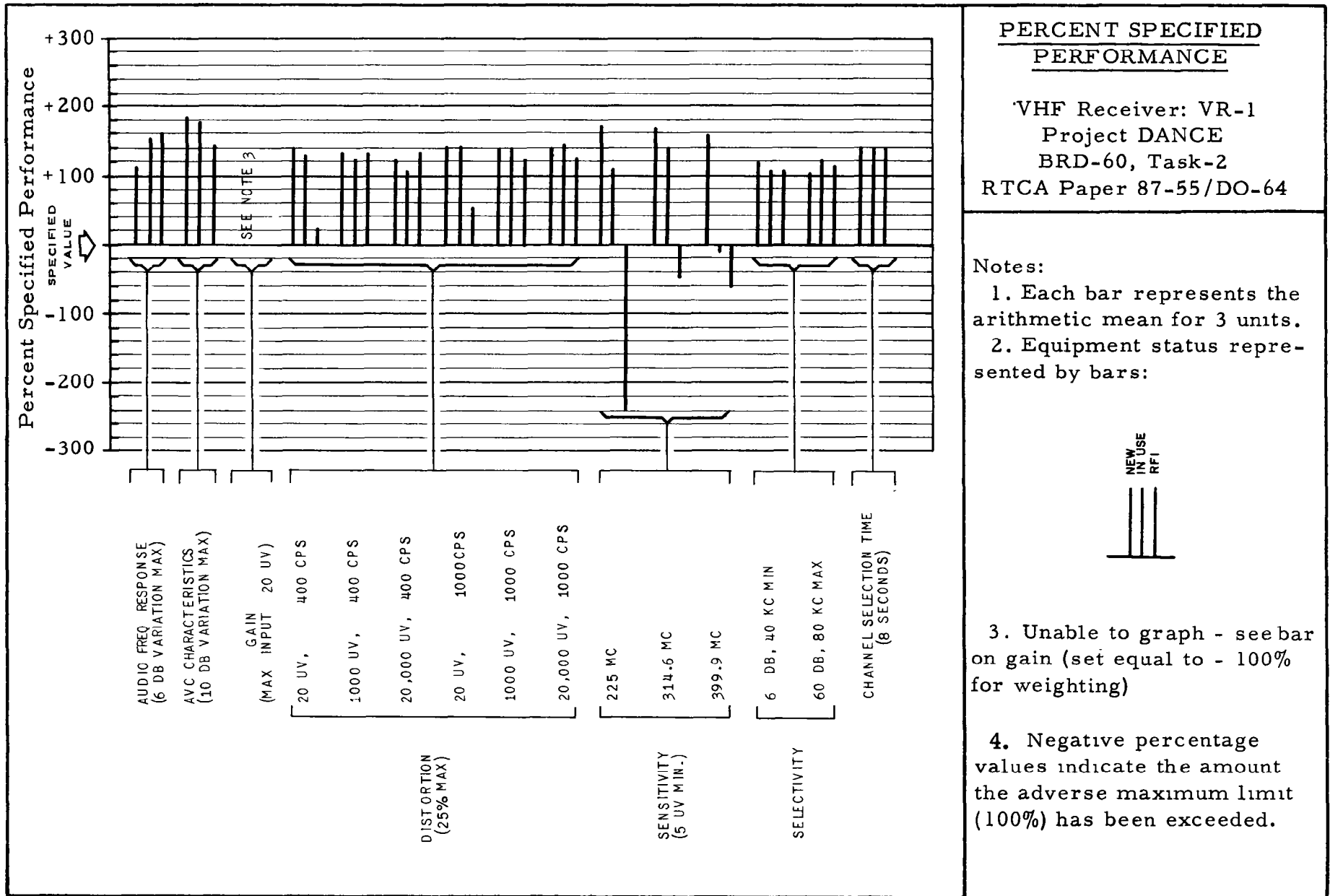
General:

Frequency Range:	118 - 135.95 mc
Means of Frequency Selection:	Discrete Tuning
Total Number of Channels:	360
Number of Channels Available at Operator's Position:	360
Means of Channel Selection:	Rotary Switch

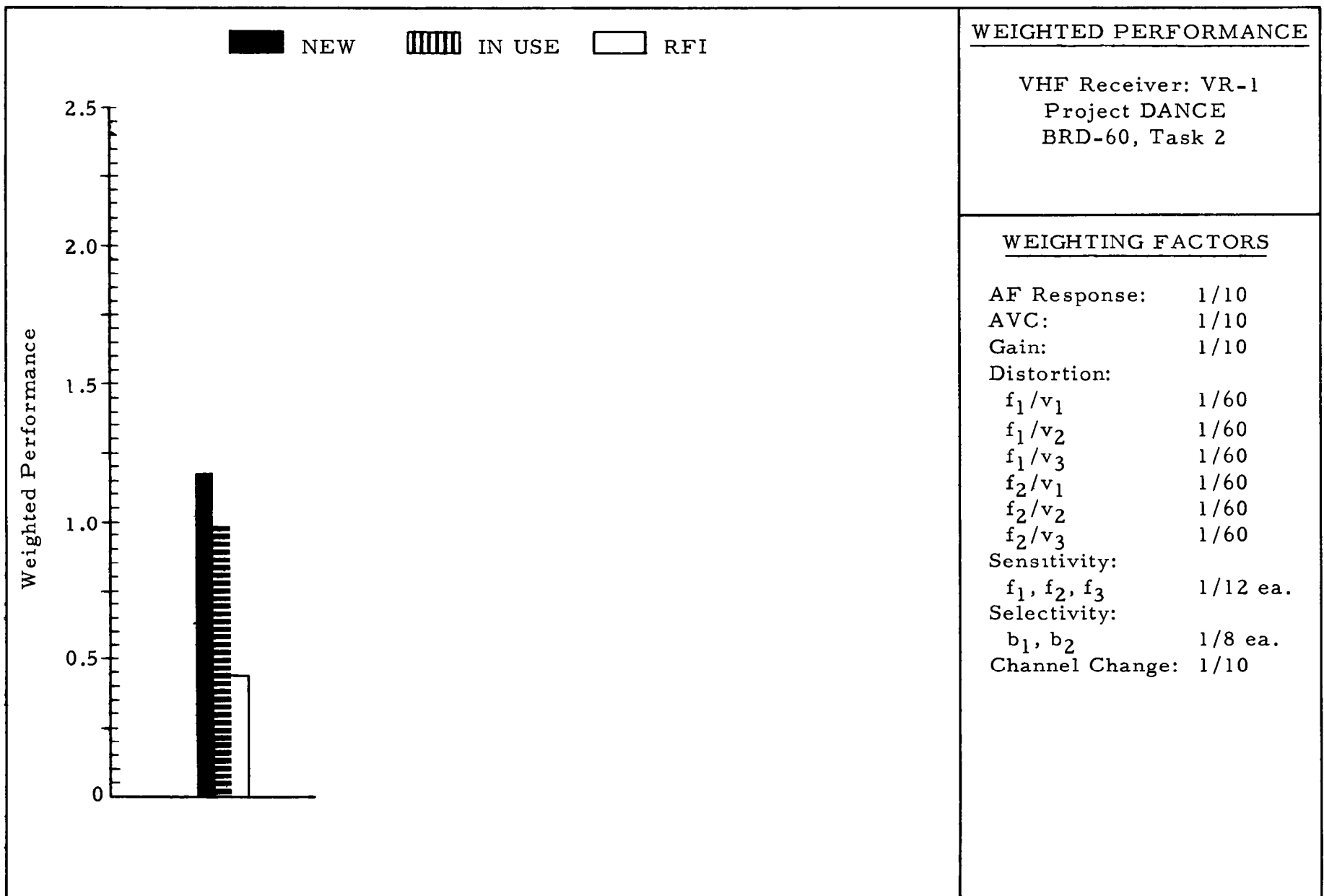
Technical:

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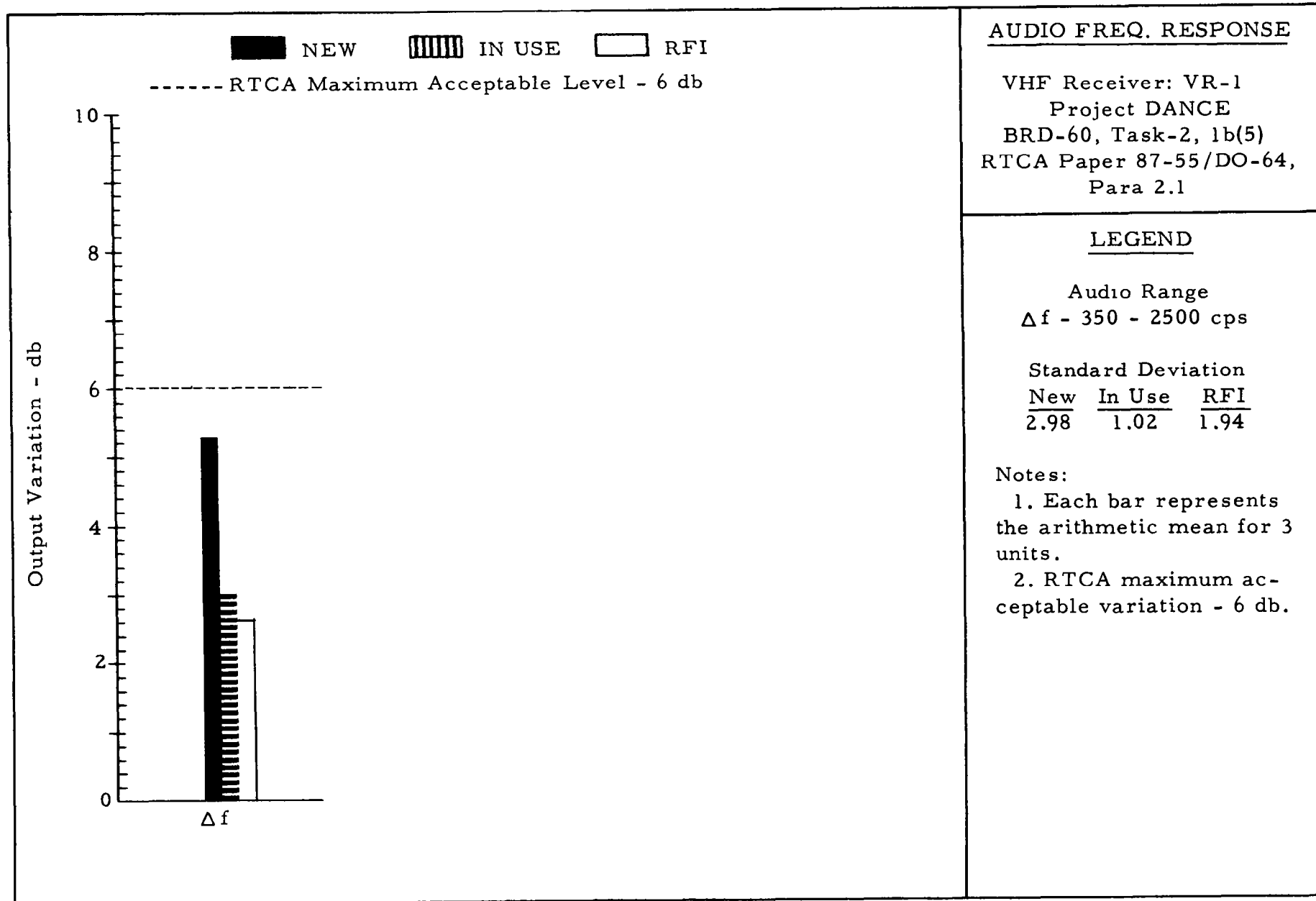
Percent Specified Performance	B-130
Weighted Performance	B-131
Audio Frequency Response	B-132
AVC Characteristics	B-133
Gain	B-134
Distortion	B-135
Sensitivity	B-136
Selectivity	B-137
Channel Selection Time	B-138
Noise Level	B-139
Channel Repeatability	B-140
Interference Tests	B-141 - 142



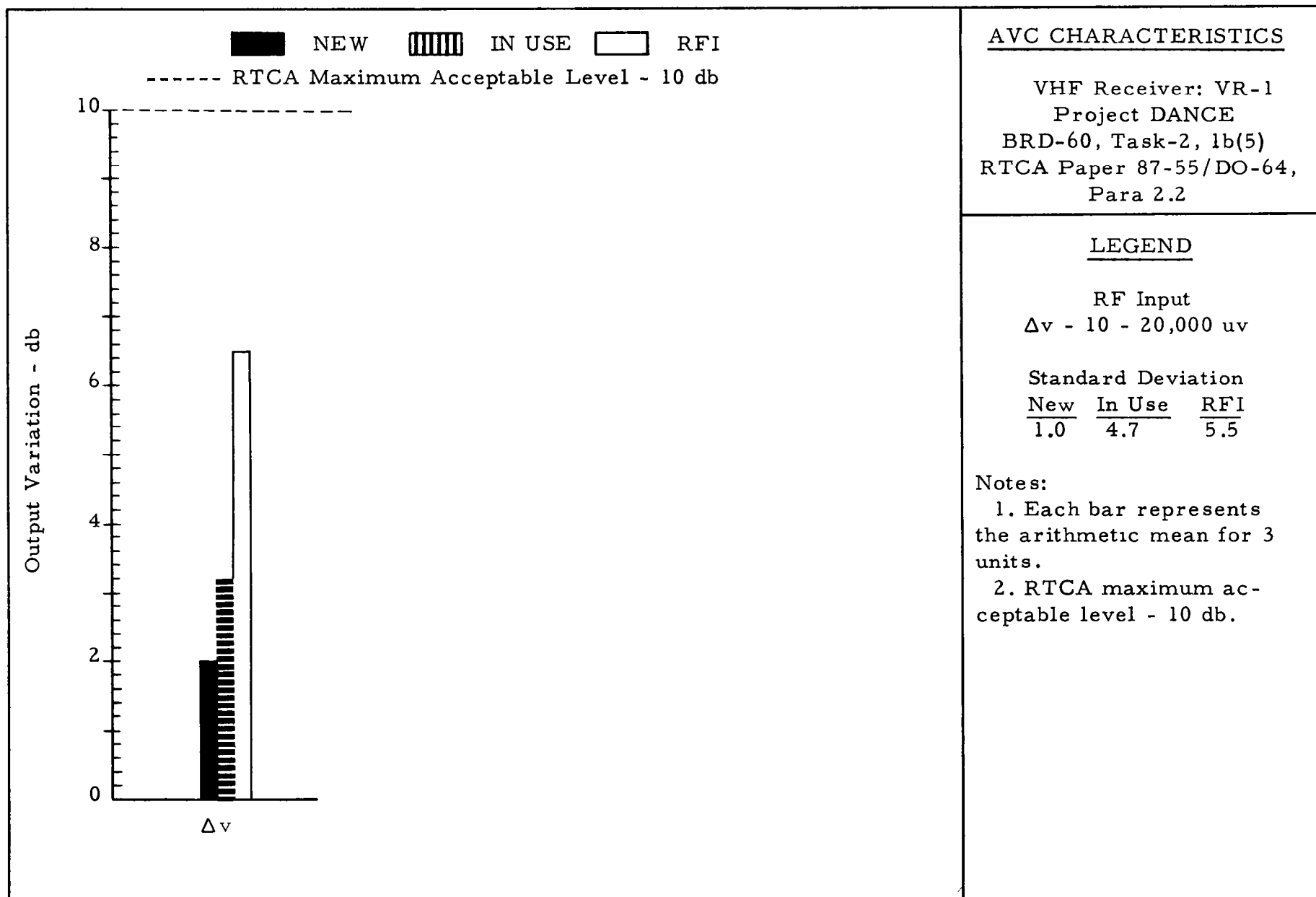
PERCENT SPECIFIED PERFORMANCE - VHF RECEIVER - VR-1



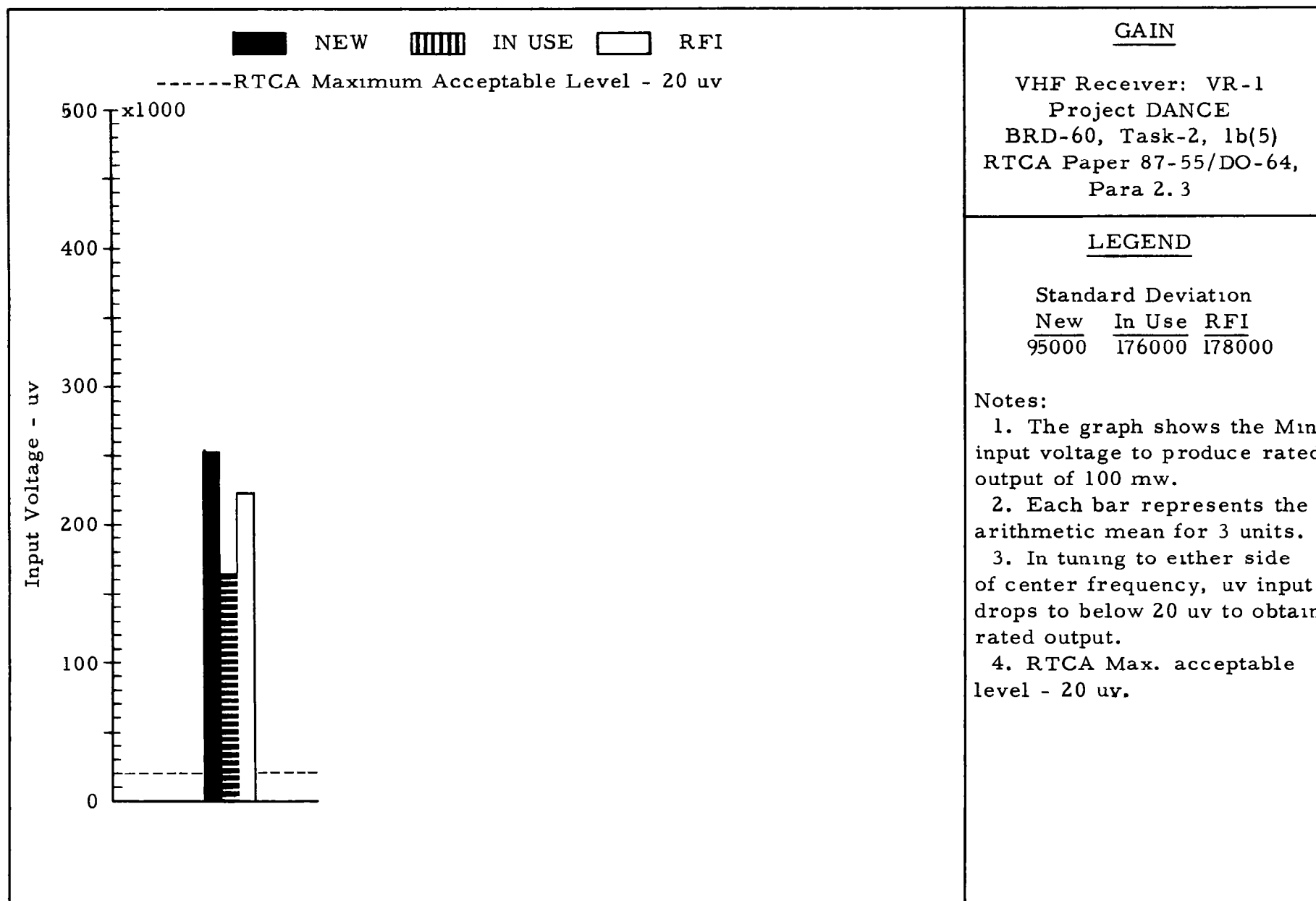
WEIGHTED PERFORMANCE - VHF RECEIVER - VR-1



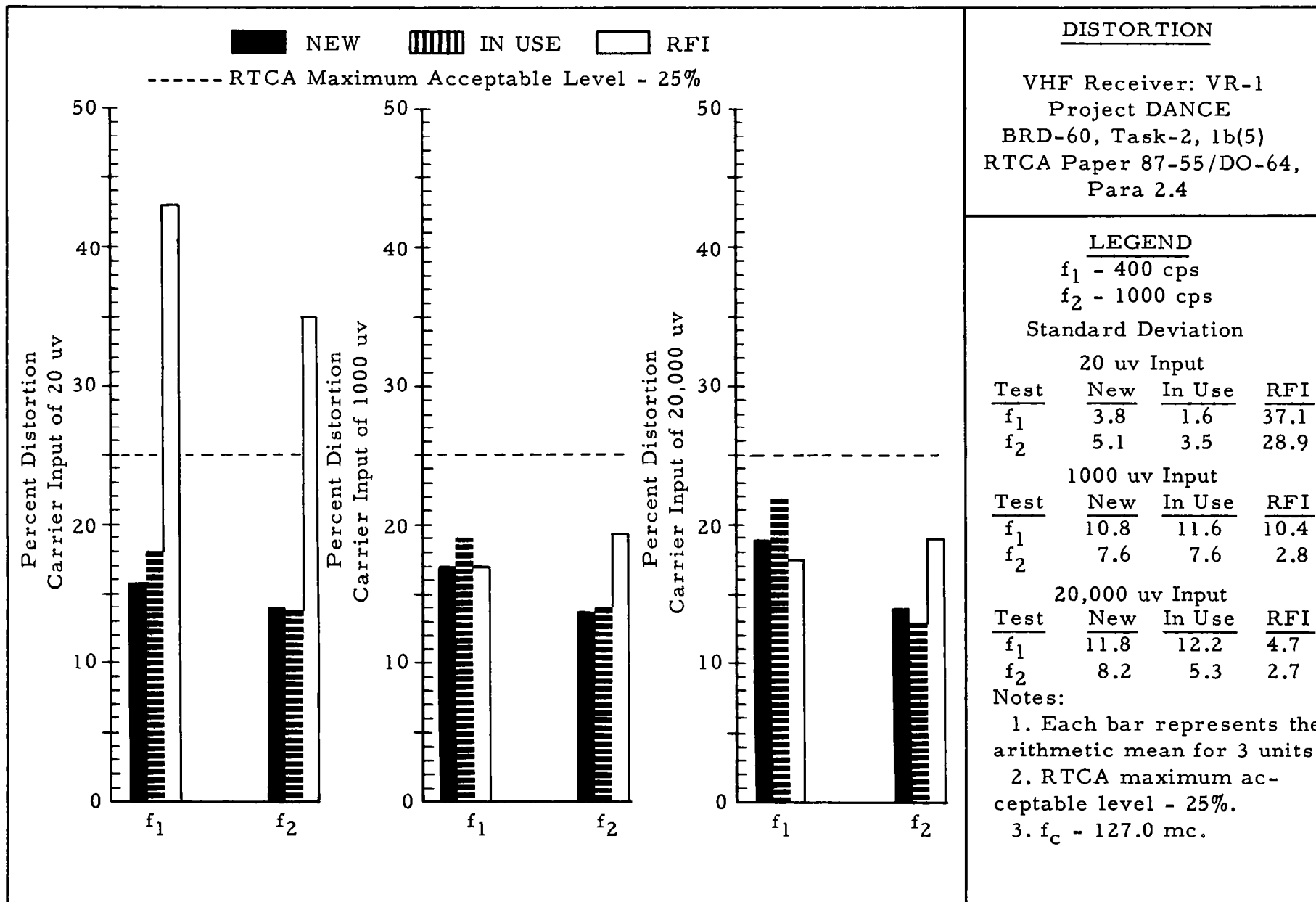
AUDIO FREQUENCY RESPONSE - VHF RECEIVER - VR-1



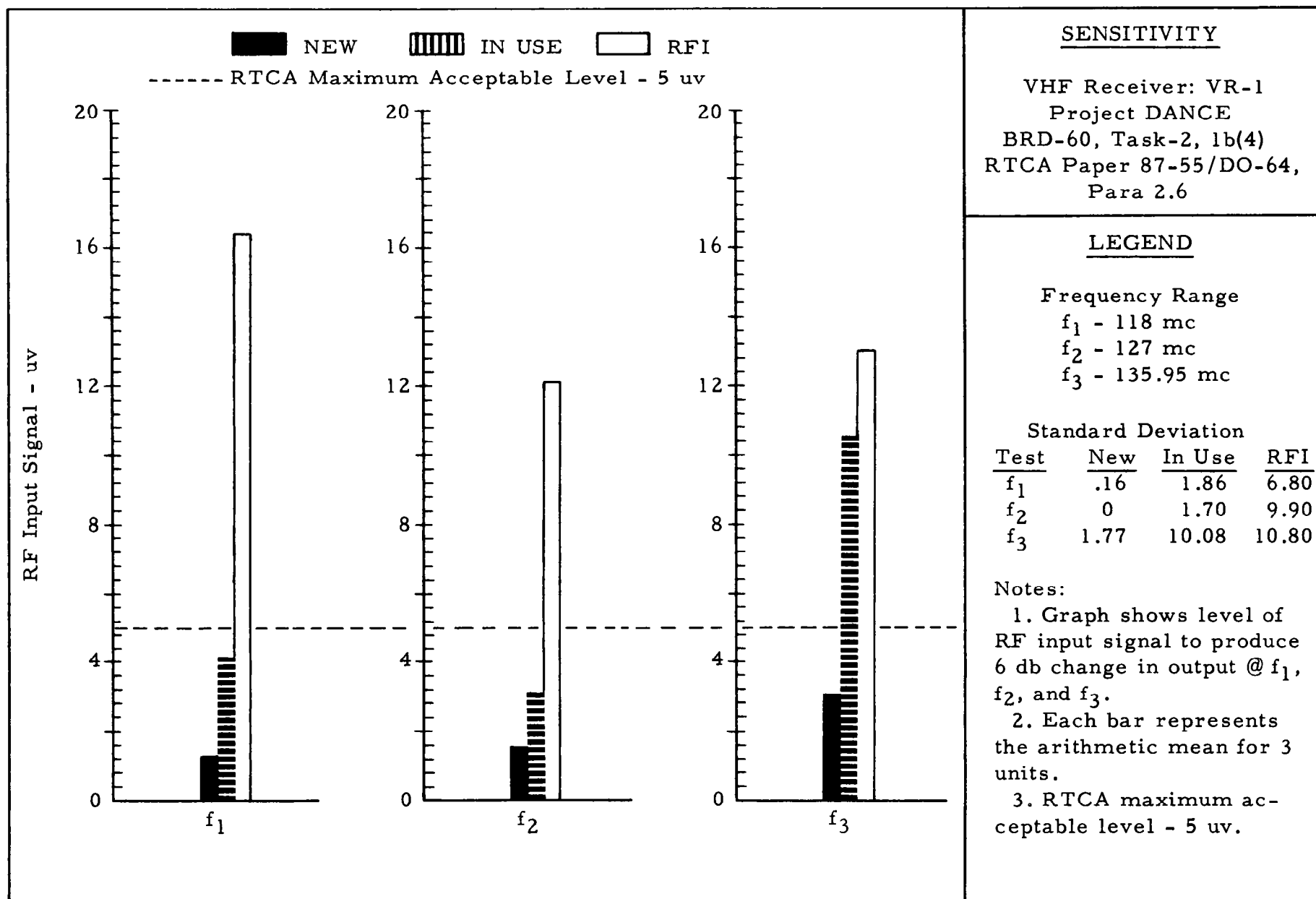
AVC CHARACTERISTICS - VHF RECEIVER - VR-1



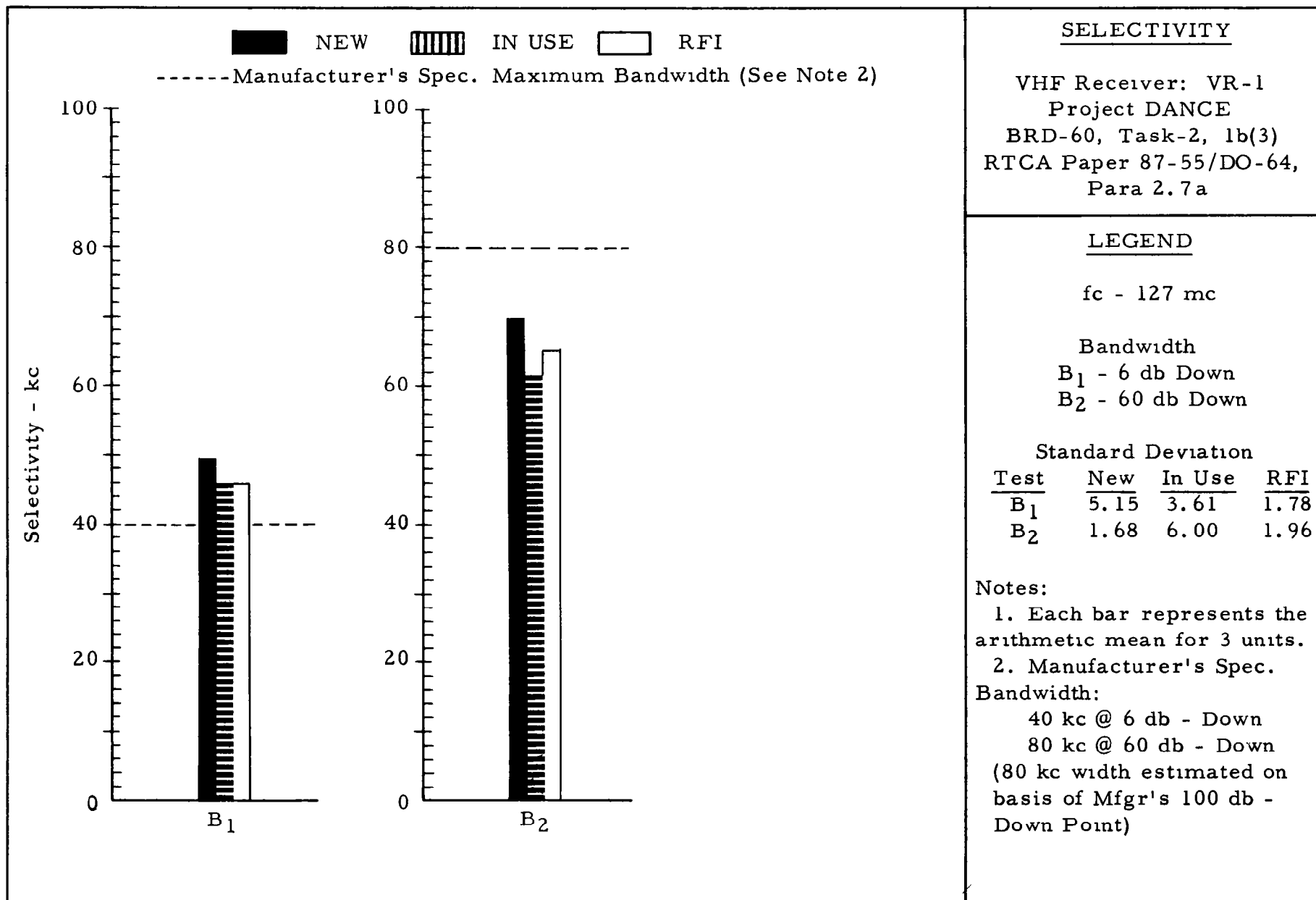
GAIN - VHF RECEIVER - VR-1



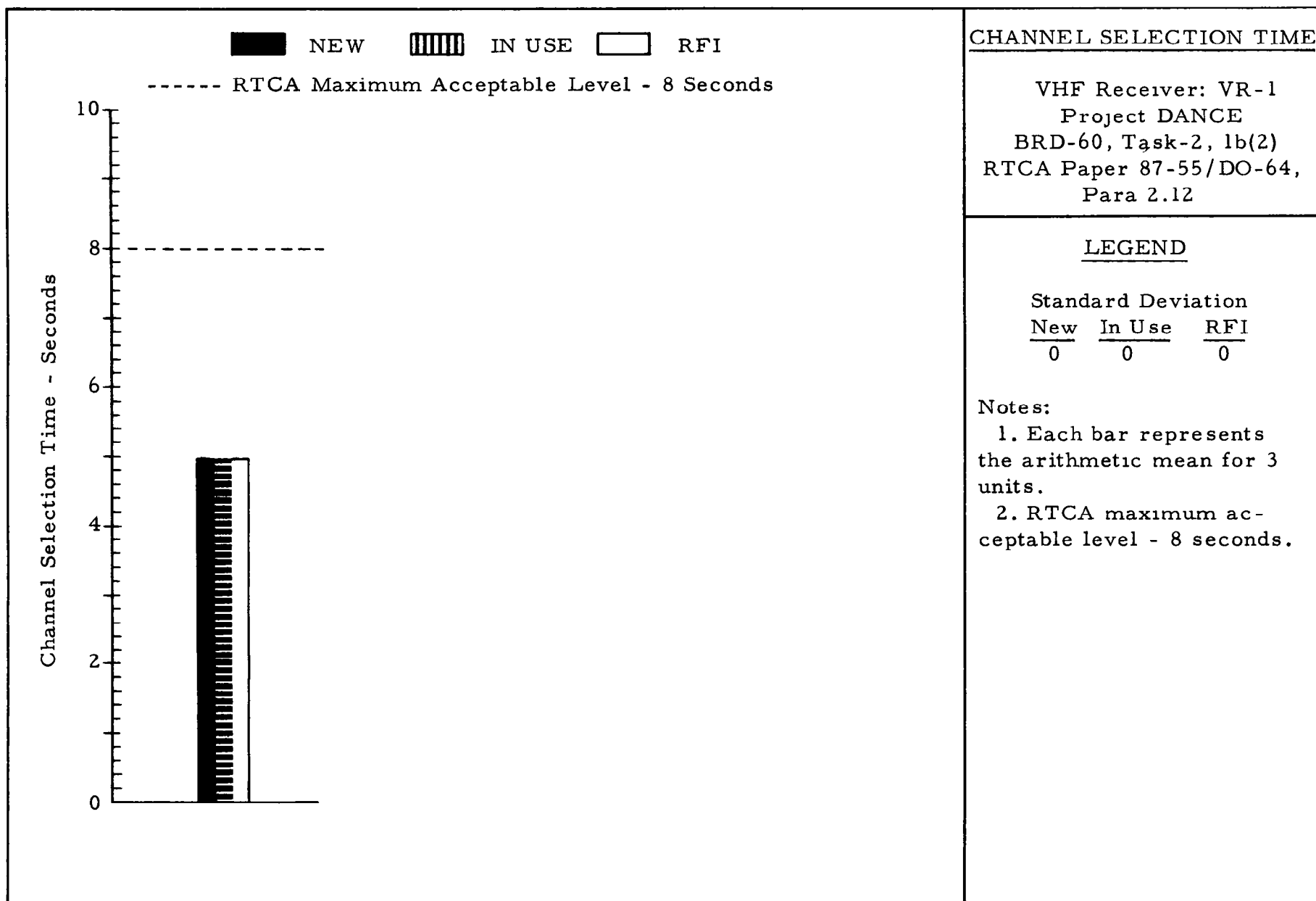
DISTORTION - VHF RECEIVER - VR-1



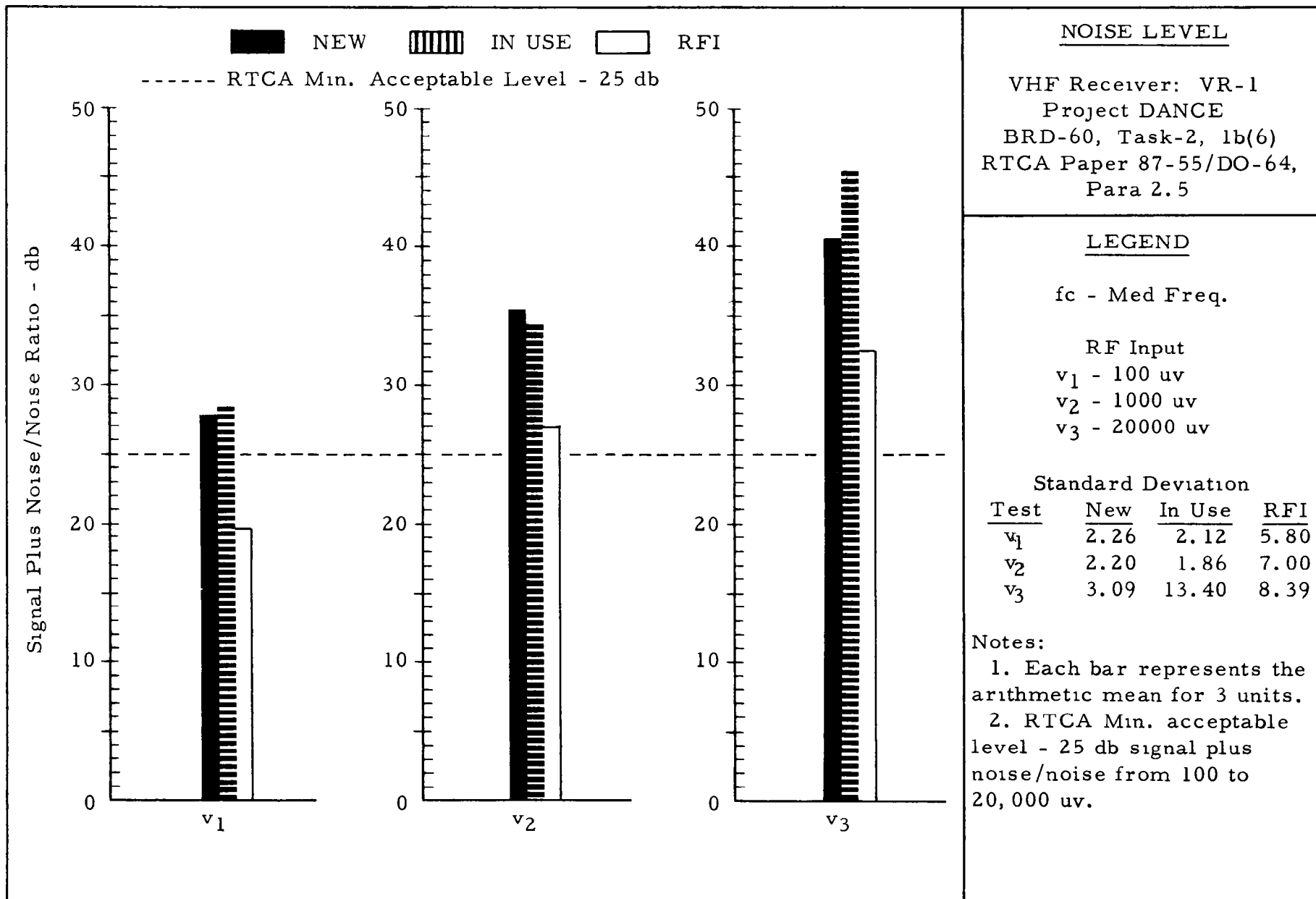
SENSITIVITY - VHF RECEIVER - VR-1



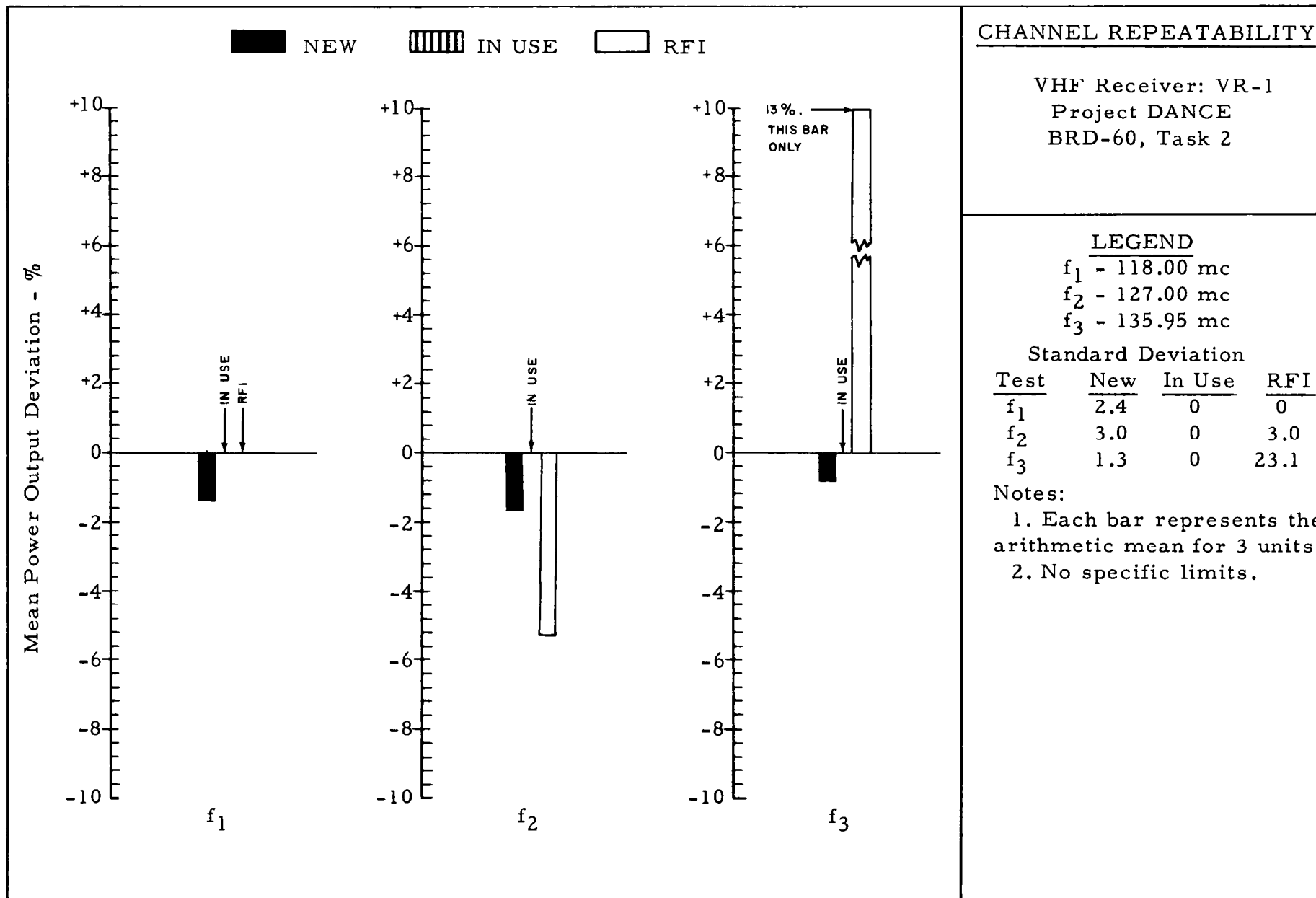
SELECTIVITY - VHF RECEIVER - VR-1



CHANNEL SELECTION TIME - VHF RECEIVER - VR-1



NOISE LEVEL - VHF RECEIVER - VR-1



CHANNEL REPEATABILITY - VHF RECEIVER - VR-1

INTERFERENCE TESTS

VHF Receiver: VR-1
 Project DANCE
 BRD-60. Task 2
 RTCA Paper 87-55/DO-64

Test	Frequency (Mc)	F_c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Spurious Response</u> Contract Para: 1.b.(9) RTCA Para: 2.8(b)	.19 to 940	127.513	Acceptable level excluding band within $F_c \pm 80$ kc: ≥ 60 db	Actual Level: > 60 db at $F_c \pm 80$ kc. All frequencies within performance standards	Yes
<u>Desensitization</u> Contract Para: 1.b.(7) RTCA Para: 2.10(b)	118 to 135.9	127.5	Acceptable level excluding band within $F_c \pm 100$ kc: ≤ 8 db	Actual Level: < 8 db at $F_c \pm 100$ kc. All frequencies within performance standards	Yes
<u>Cross Modulation</u> Contract Para: 1.b.(7) RTCA Para: 2.9(c)	$F_c \pm 50$ kc $F_c \pm 100$ kc	127.0	Acceptable Level: ≥ 10 db.	Actual Level: > 10 db at $F_c \pm 50$ kc and $F_c \pm 100$ kc. All frequencies within performance standards. Note: Reference power level used was available power (40 mw at $F_c \pm 50$ kc and 46 mw at $F_c \pm 100$ kc) and not rated power, rated power could not be obtained with performance stdr. volt level	Yes

INTERFERENCE TESTS - VHF RECEIVER - VR-1

Test	Frequency (Mc)	F _c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Cable Conducted Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(a)	.15 to 25	118.0 127.5 135.9	Acceptable Emission: ≤ 200 microvolts.	Actual emission on +28 volt line: F _c = 118 Mc. < 200 microvolts. F _c = 127.5 Mc. < 200 microvolts except at 21.5 Mc F _c = 135.9 Mc. < 200 microvolts. All other frequencies within performance standards.	Partially
<u>Antenna Conducted Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(b)	.15 to 1500	118.0 127.5 135.9	Acceptable Emission: ≤ 400 micro-microwatts.	Actual Emission: F _c = 118 Mc. < 400 micro-microwatts. F _c = 127.5 Mc. < 400 micro-microwatts. F _c = 135.9 Mc. < 400 micro-microwatts. All frequencies within performance standards.	Yes

Test	Contract Para.	F _c (Mc)	Probable Susceptibility	Relation to Frequency Synthesis
Susceptibility to Radar Type signals.	1.b.(7)	118 127.5 135.9	None over frequency range from 100 to 2000 mc	(Not applicable)

SECTION B
AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

5. Laboratory and Field Test Data

b. VR-2, VHF Receiver

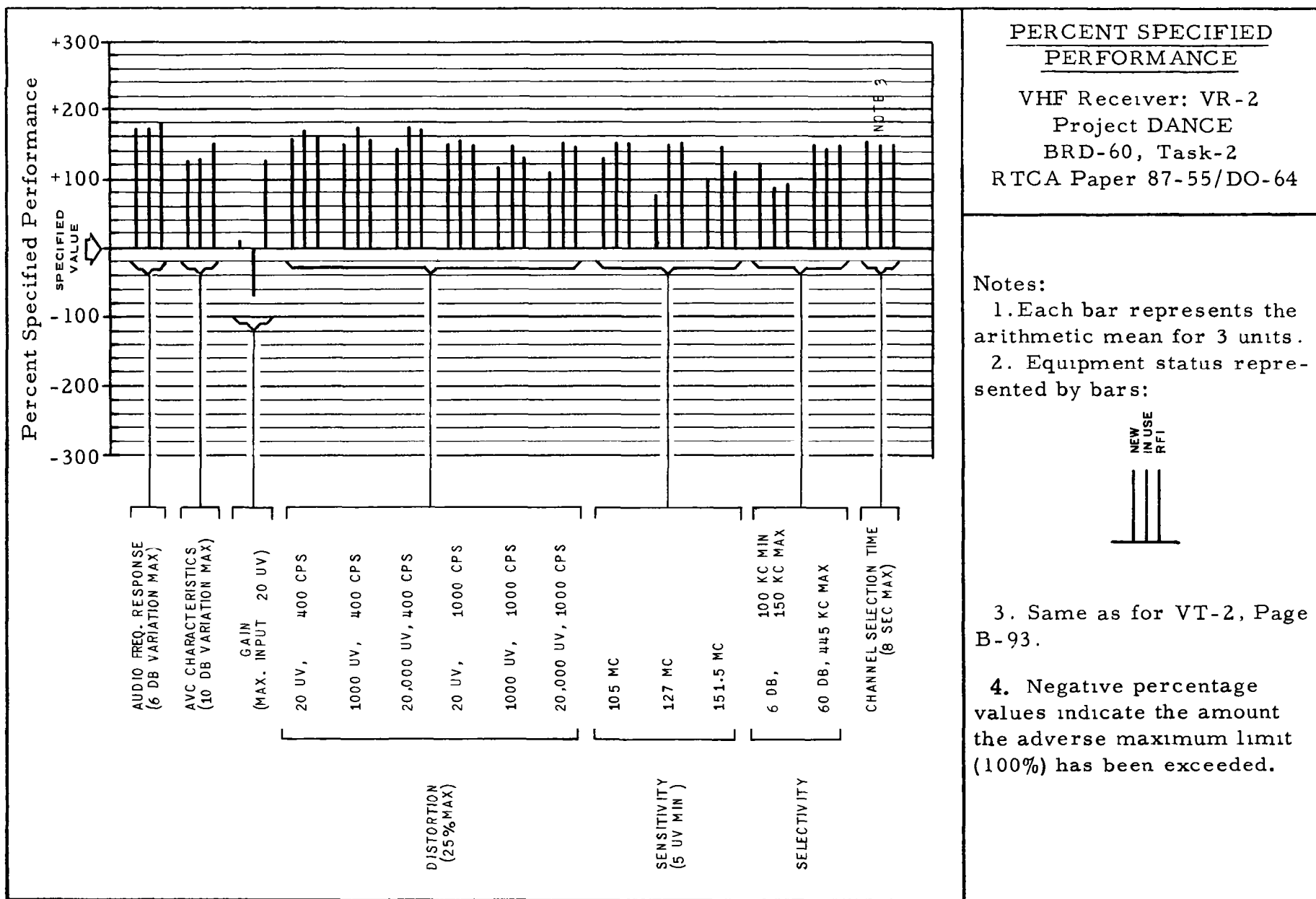
General:

Frequency Range:	100 - 156 mc
Means of Frequency Selection:	Discrete Tuning
Total Number of Channels:	310
Number of Channels Available at Operator's Position:	8
Means of Channel Selection:	Push Button

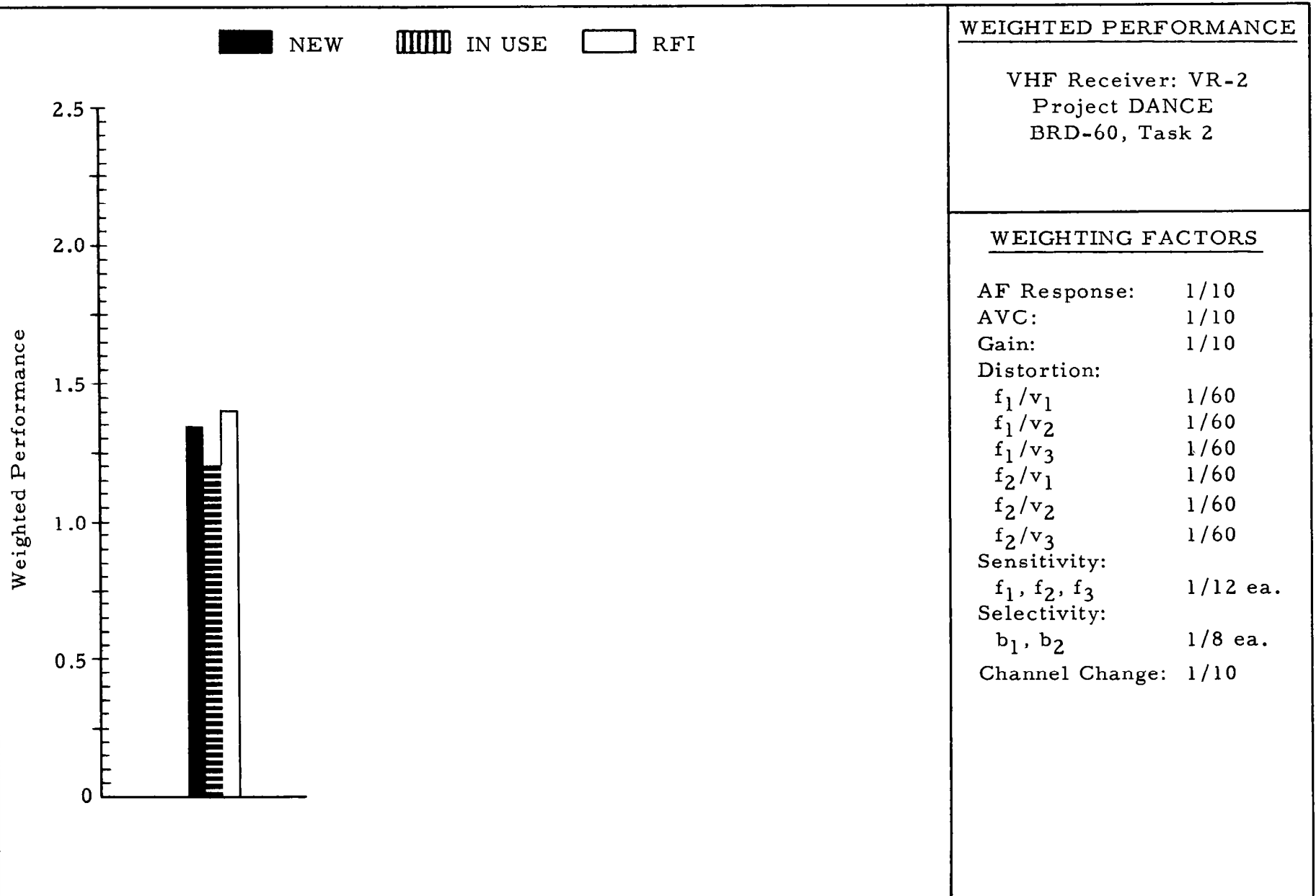
Technical:

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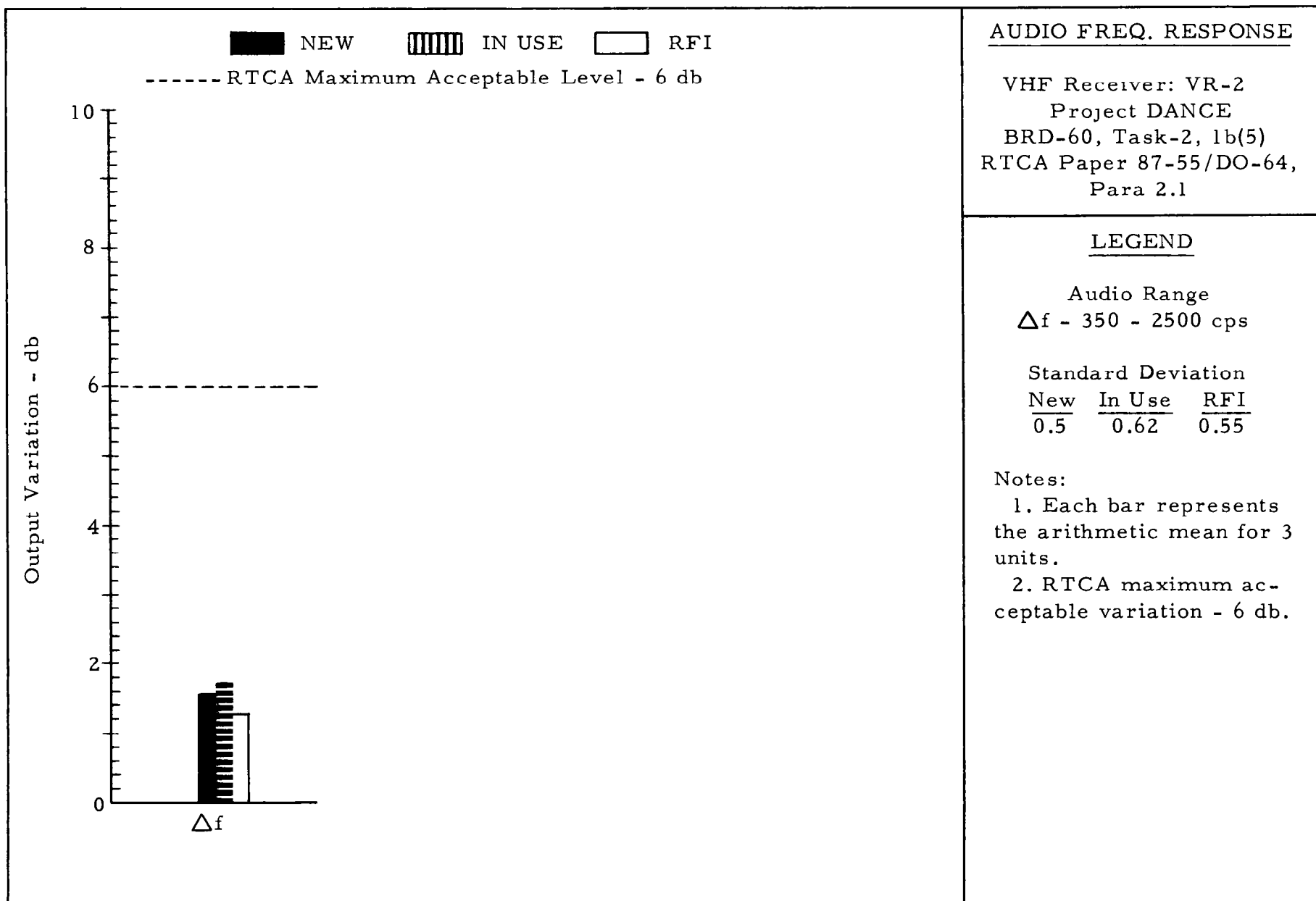
Percent Specified Performance	B-144
Weighted Performance	B-145
Audio Frequency Response	B-146
AVC Characteristics	B-147
Gain	B-148
Distortion	B-149
Sensitivity	B-150
Selectivity	B-151
Noise Level	B-152
Channel Repeatability	B-153
Interference Tests	B-154- 154a



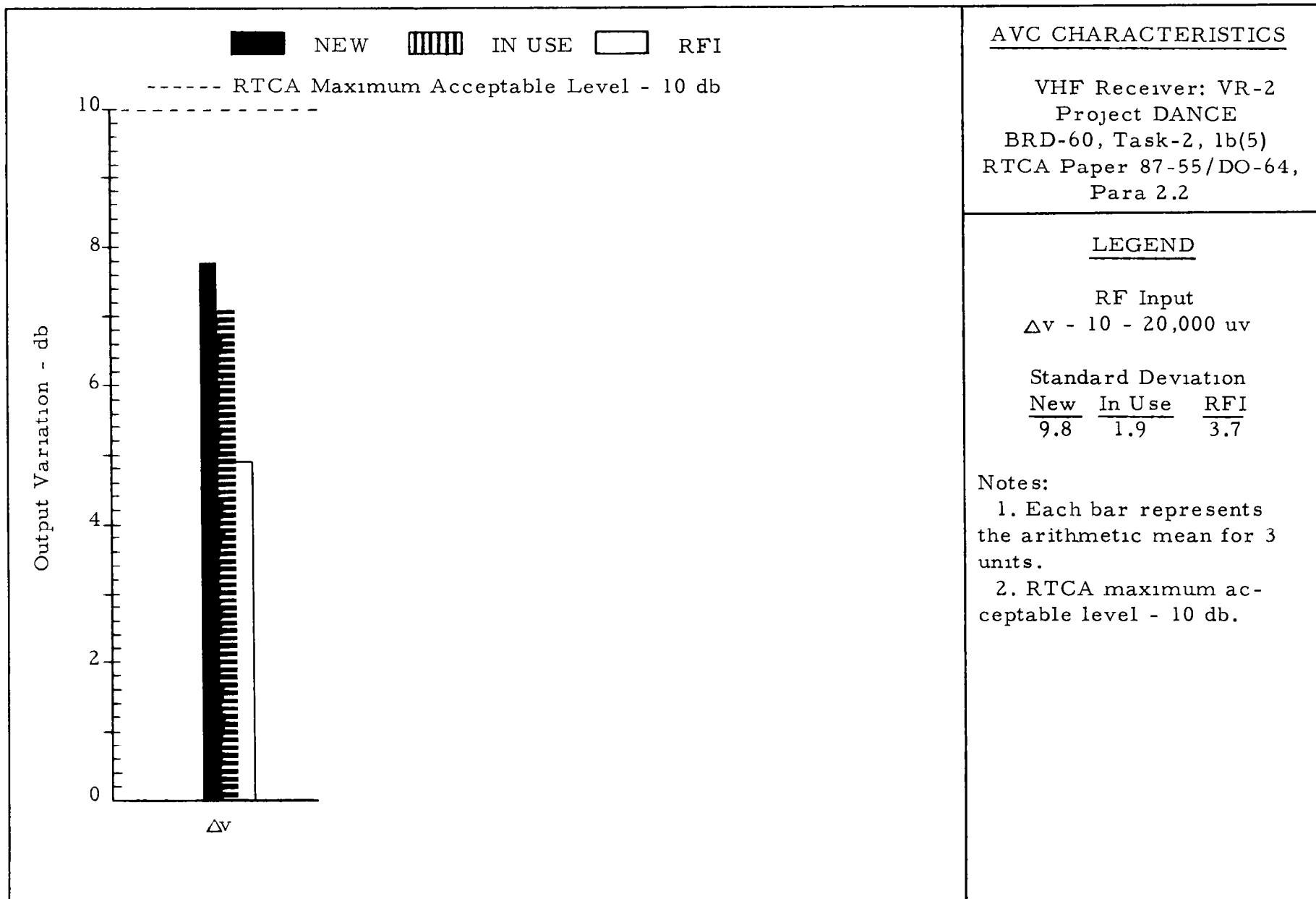
PERCENT SPECIFIED PERFORMANCE - VHF RECEIVER - VR-2



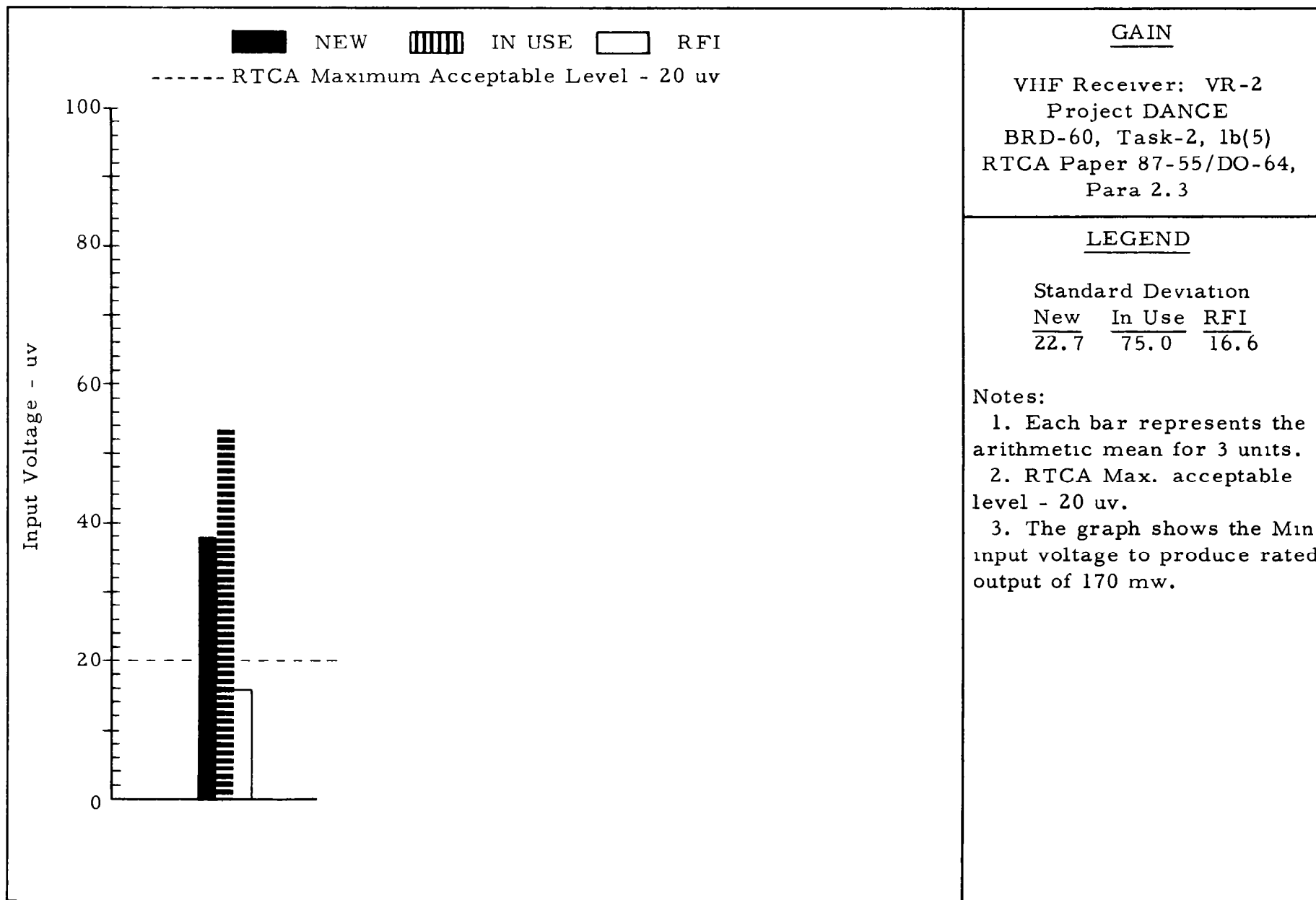
WEIGHTED PERFORMANCE - VHF RECEIVER - VR-2



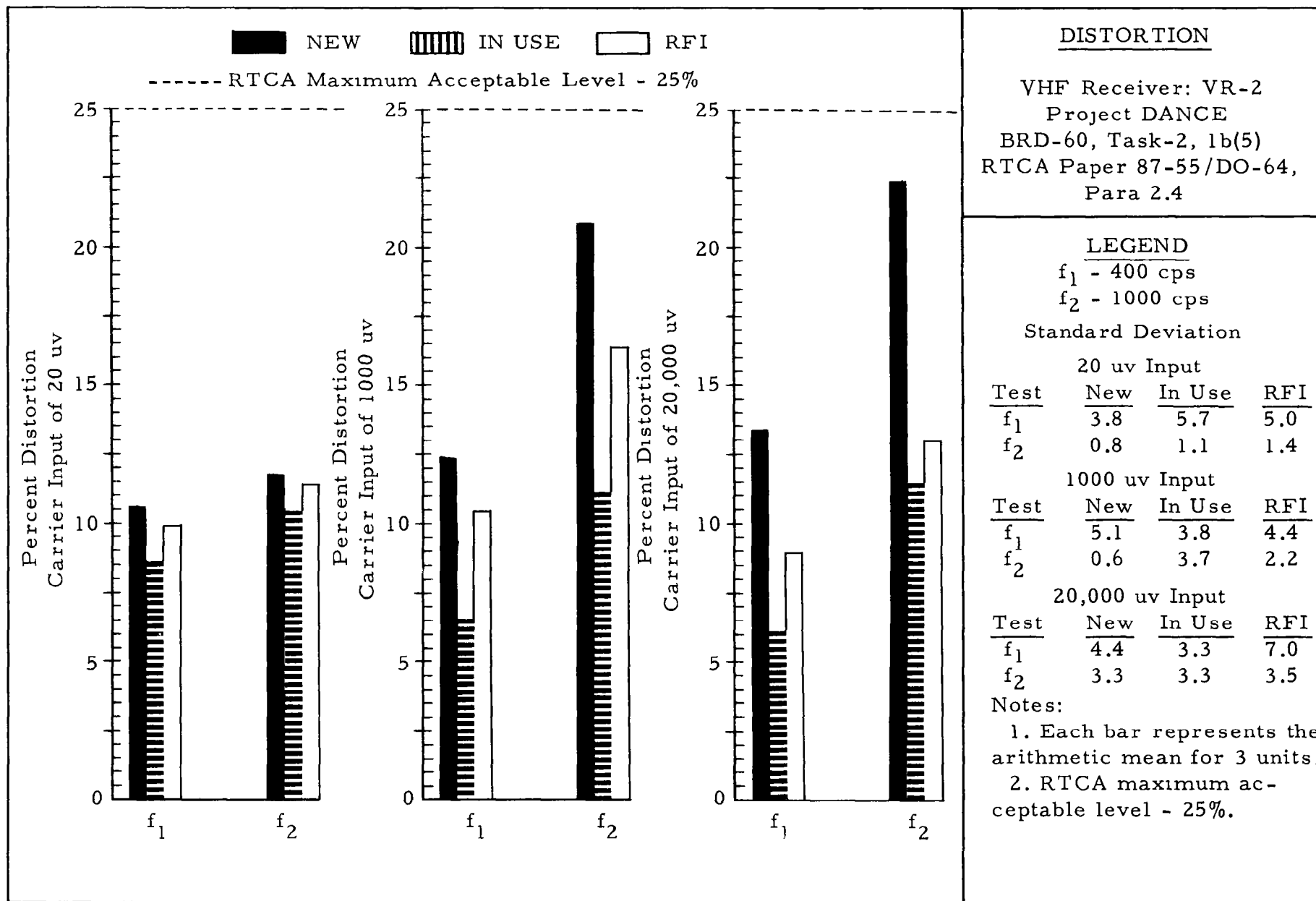
AUDIO FREQUENCY RESPONSE - VHF RECEIVER - VR-2



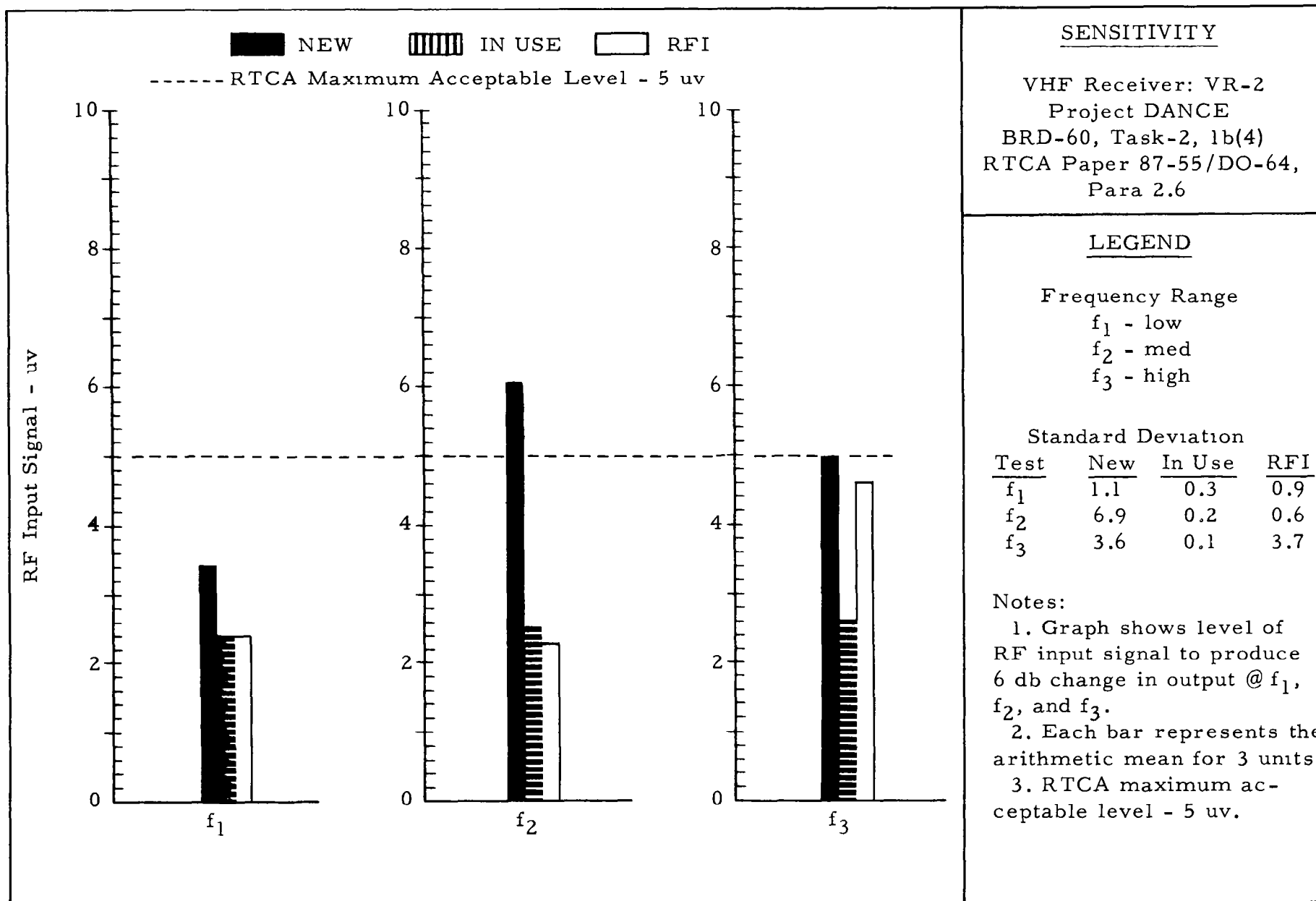
AVC CHARACTERISTICS - VHF RECEIVER - VR-2



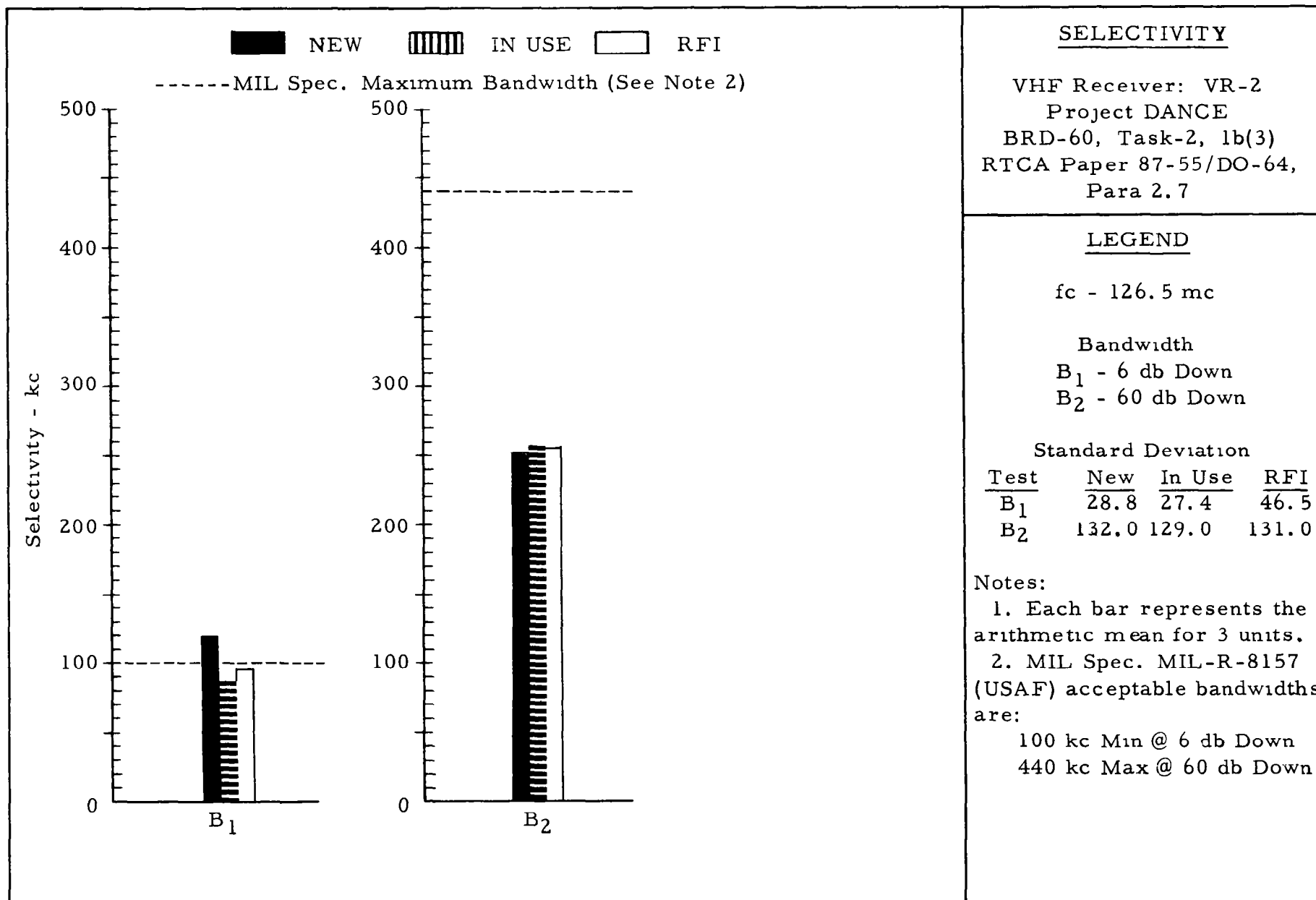
GAIN - VHF RECEIVER - VR-2



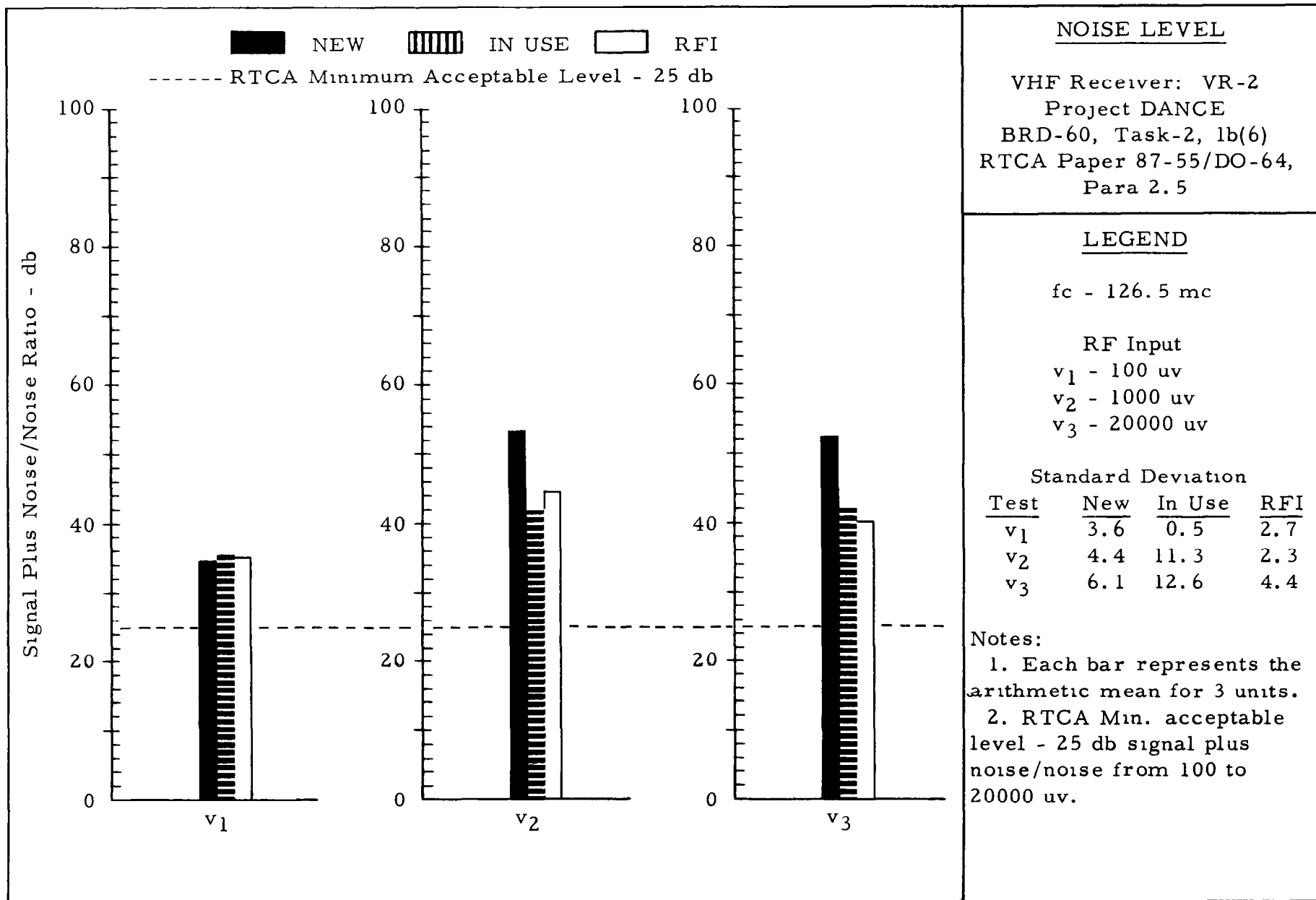
DISTORTION - VHF RECEIVER - VR-2



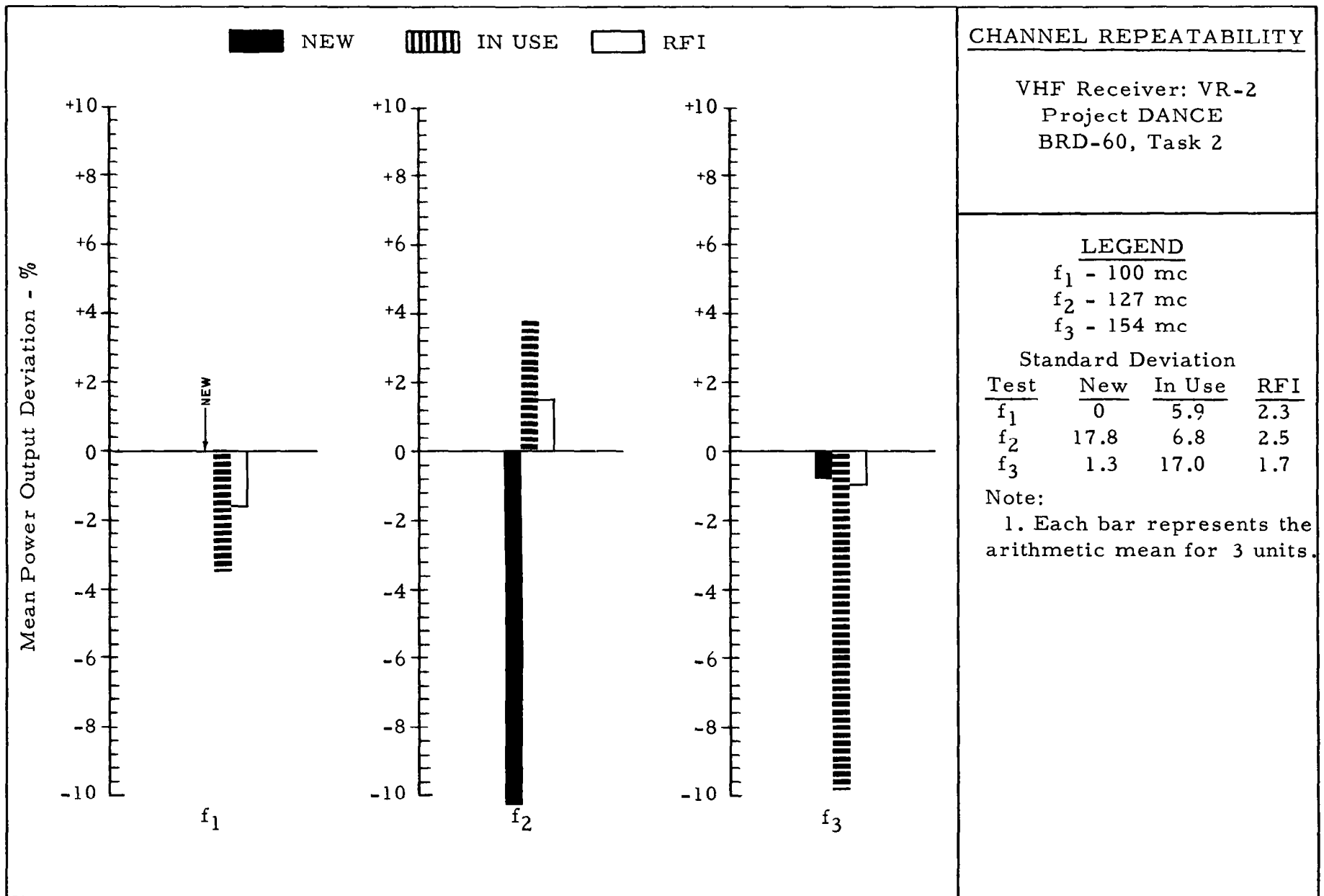
SENSITIVITY - VHF RECEIVER - VR-2



SELECTIVITY - VHF RECEIVER - VR-2



NOISE LEVEL - VHF RECEIVER - VR-2



CHANNEL REPEATABILITY - VHF RECEIVER - VR-2

INTERFERENCE TESTS

VHF Receiver: VR-2
 Project DANCE
 BRD-60. Task 2
 RTCA Paper 87-55/DO-64

Test	Frequency (Mc)	F_c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Spurious Response</u> Contract Para: 1.b.(9) RTCA Para: 2.8(b)	.19 to 940	129.17	Acceptable level excluding band within $F_c \pm 80$ kc: ≥ 60 db.	Actual Level: < 60 db at $F_c \pm 80$ kc. ≤ 60 db between $F_c + 80$ kc and $F_c + 533$ kc, and between $F_c - 80$ kc and $F_c - 217$ kc. All other frequencies within performance standards	Partially
<u>Desensitization</u> Contract Para: 1.b.(7) RTCA Para: 2 10(b)	100 to 156	129.164	Acceptable level excluding band within $F_c \pm 100$ kc: ≤ 8 db.	Actual level: < 8 db at $F_c \pm 100$ kc. All other frequencies within performance standards.	Yes
<u>Cross Modulation</u> Contract Para: 1.b.(7) RTCA Para: 2.9(b)	$F_c \pm 100$ kc $F_c \pm 200$ kc	127.943	Acceptable level: ≥ 10 db.	Actual Level: > 10 db.	Yes

INTERFERENCE TESTS - VHF RECEIVER - VR-2

Test	Frequency (Mc)	F _c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Cable Conducted Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(a)	.15 to 25	154.0	Acceptable Emission: ≤ 200 microvolts.	Actual emission on +28v line: F _c = 154.0 mc. < 200 microvolts except at 8.4 and 16.7 Mc. All other frequencies within performance standards	Partially
<u>Antenna Conducted Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(b)	.15 to 1500	154.0	Acceptable Emission: ≤ 400 micro-microwatts.	Actual emission: < 400 micro-microwatts except at: 8.4, 430, 712, and 1134 Mc. All other frequencies at performance standards.	Partially

Test	Contract Para.	F _c (Mc)	Probable Susceptibility	Relation to Frequency Synthesis
Susceptibility to Radar Type signals	1.b.(7)	154.0	None over the frequency range of 100 to 2000 Mc.	(Not applicable)

SECTION B
AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

5. Laboratory and Field Test Data

c. VR-3, VHF Receiver

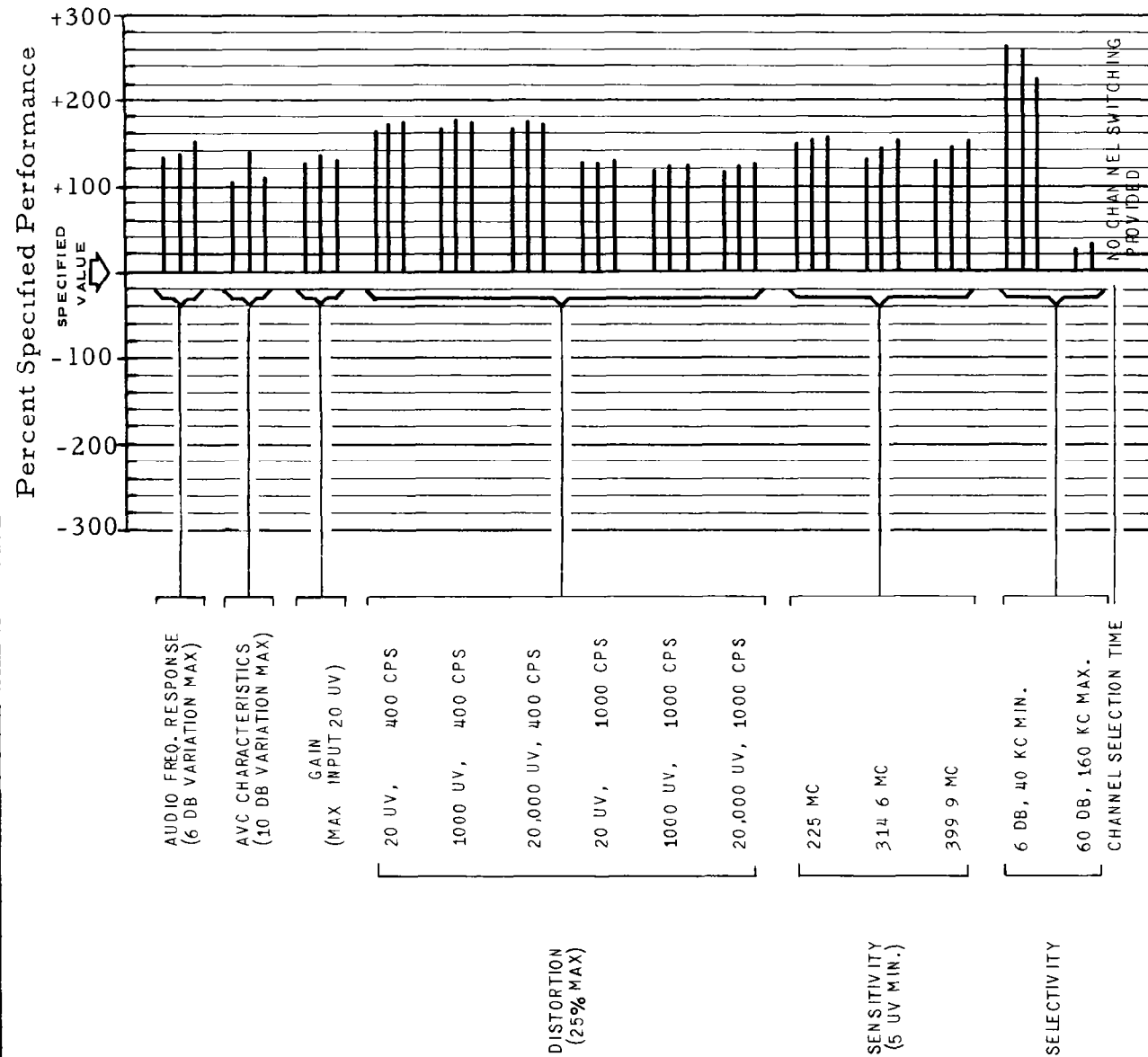
General:

Frequency Range:	118 - 148 mc
Means of Frequency Selection:	Continuously Tunable

Technical:

Page

Percent Specified Performance.	B-156
Weighted Performance	B-157
Audio Frequency Response.	B-158
AVC Characteristics.	B-159
Gain.	B-160
Distortion.	B-161
Sensitivity.	B-162
Selectivity.	B-163
Noise Level.	B-164
Interference Tests	B-165- 166

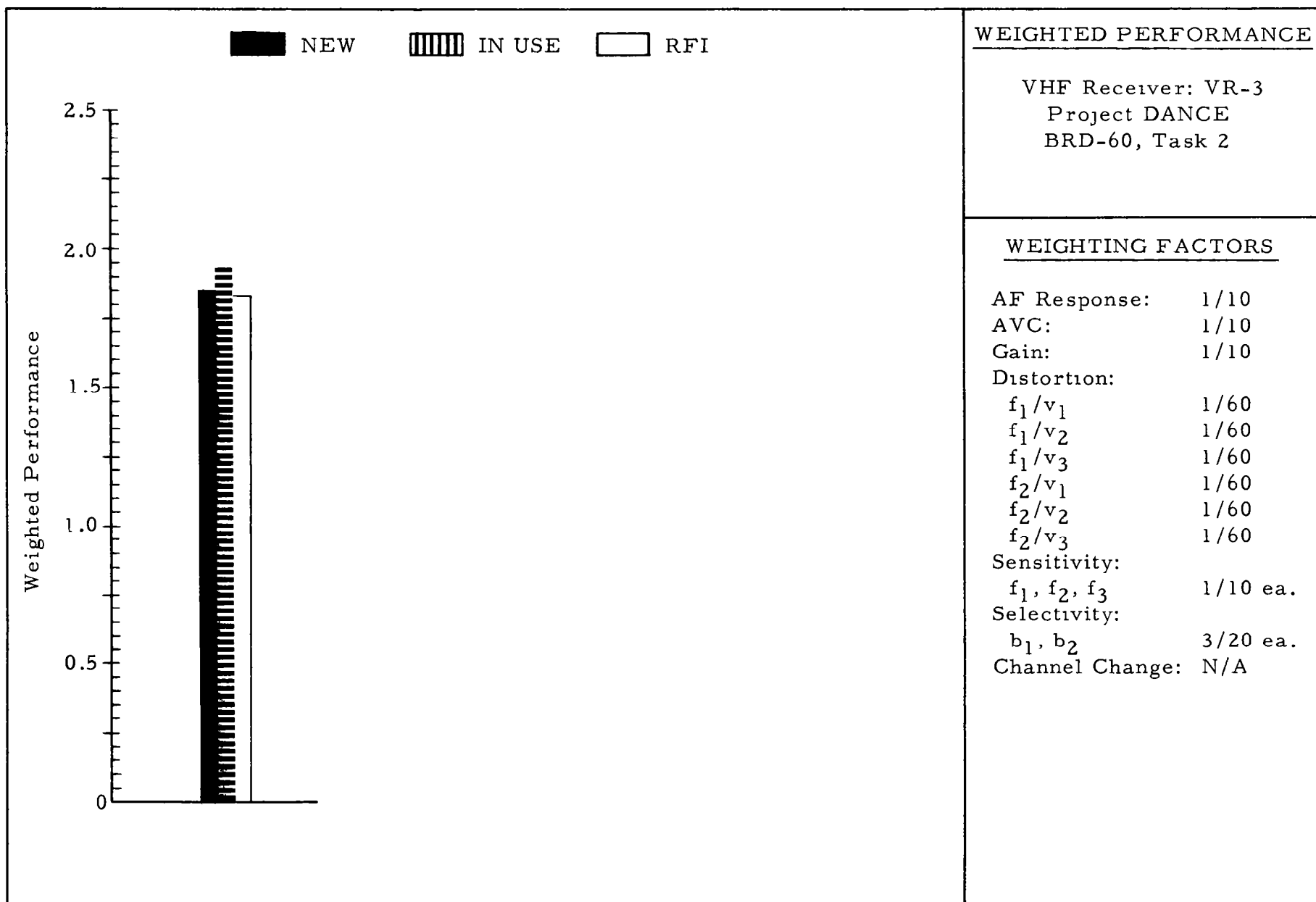


PERCENT SPECIFIED PERFORMANCE

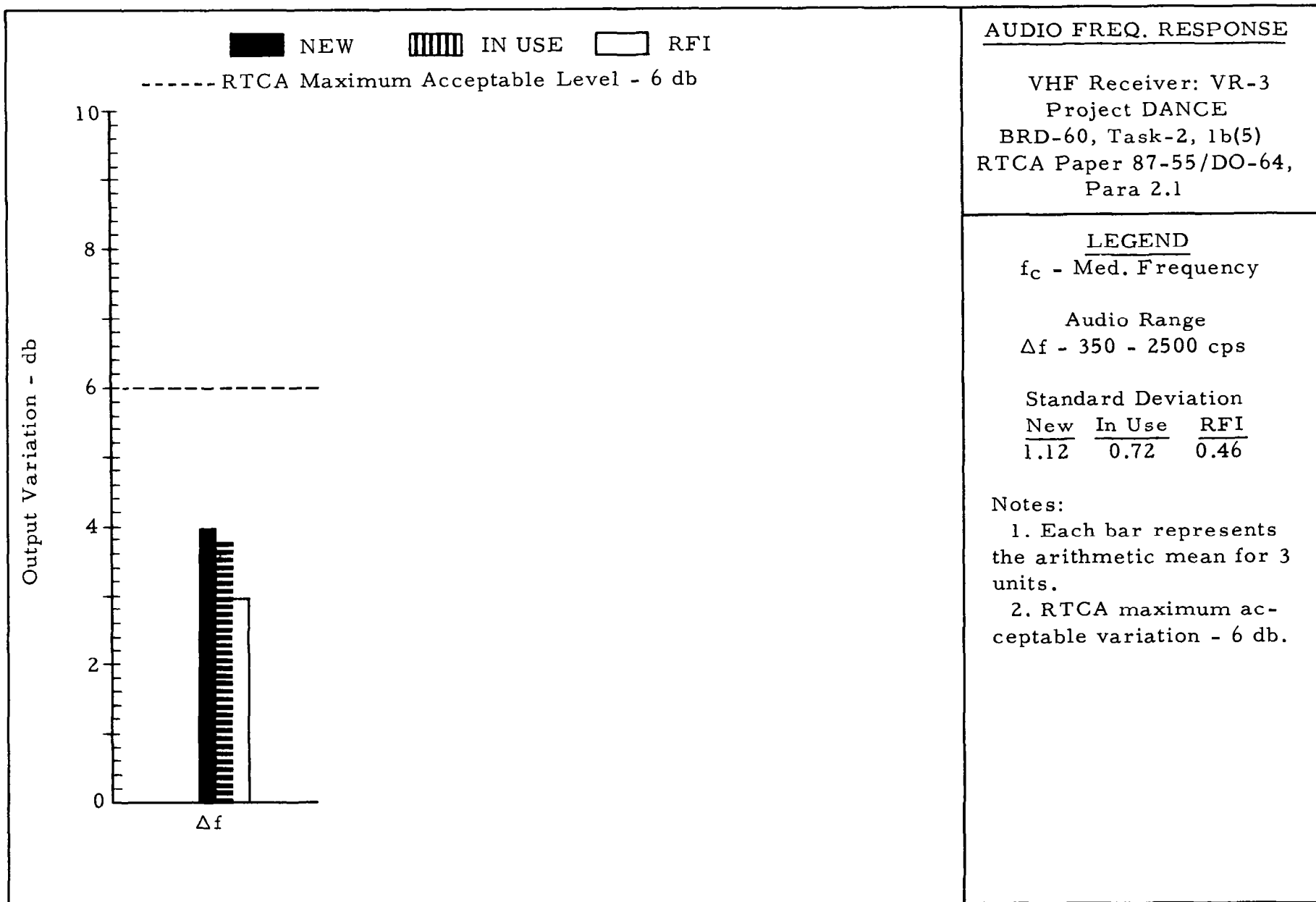
VHF Receiver: VR-3
Project DANCE
BRD-60, Task-2
RTCA Paper 87-55/DO-64

Notes:

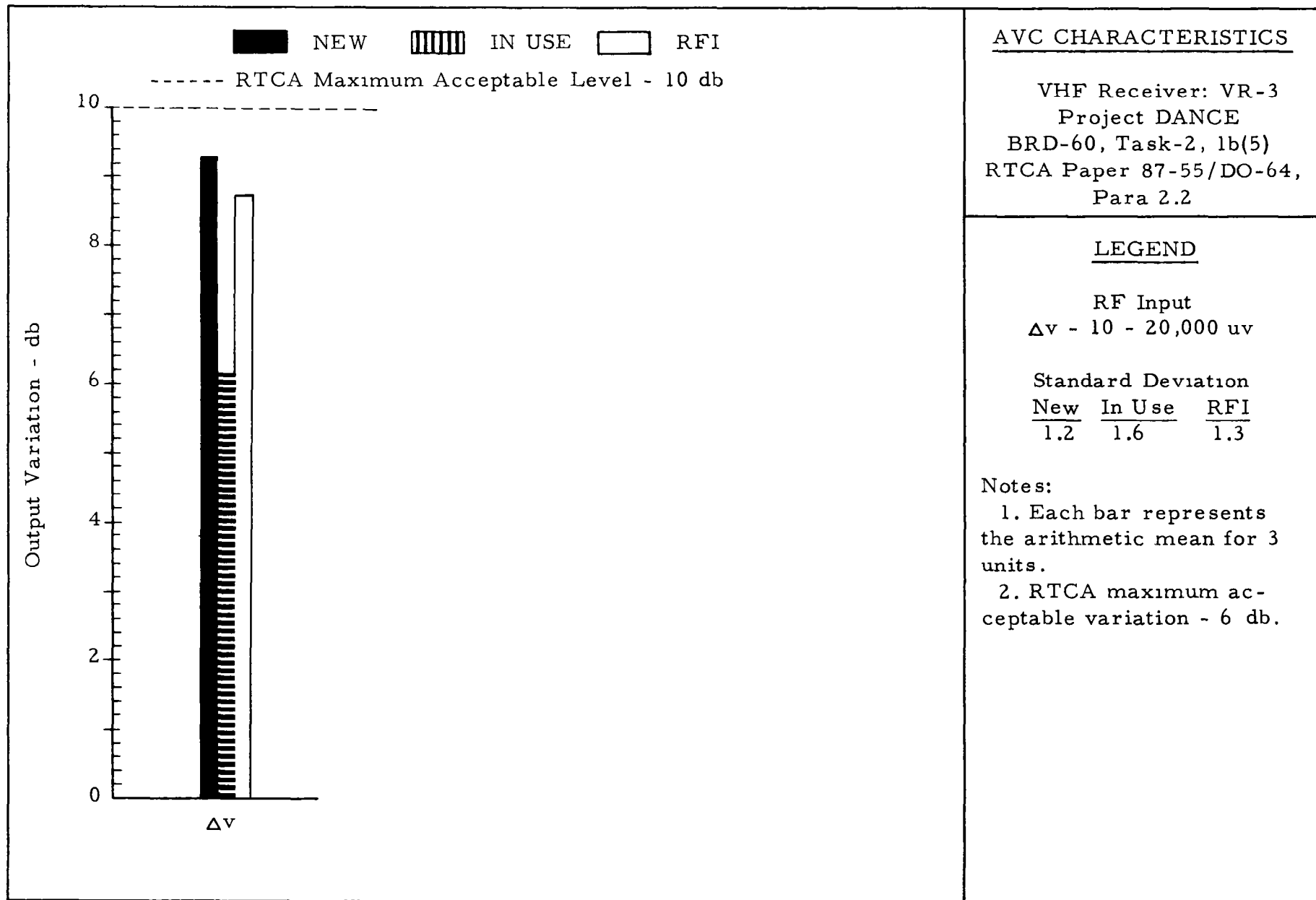
1. Each bar represents the arithmetic mean for 3 units
2. Equipment status represented by bars:



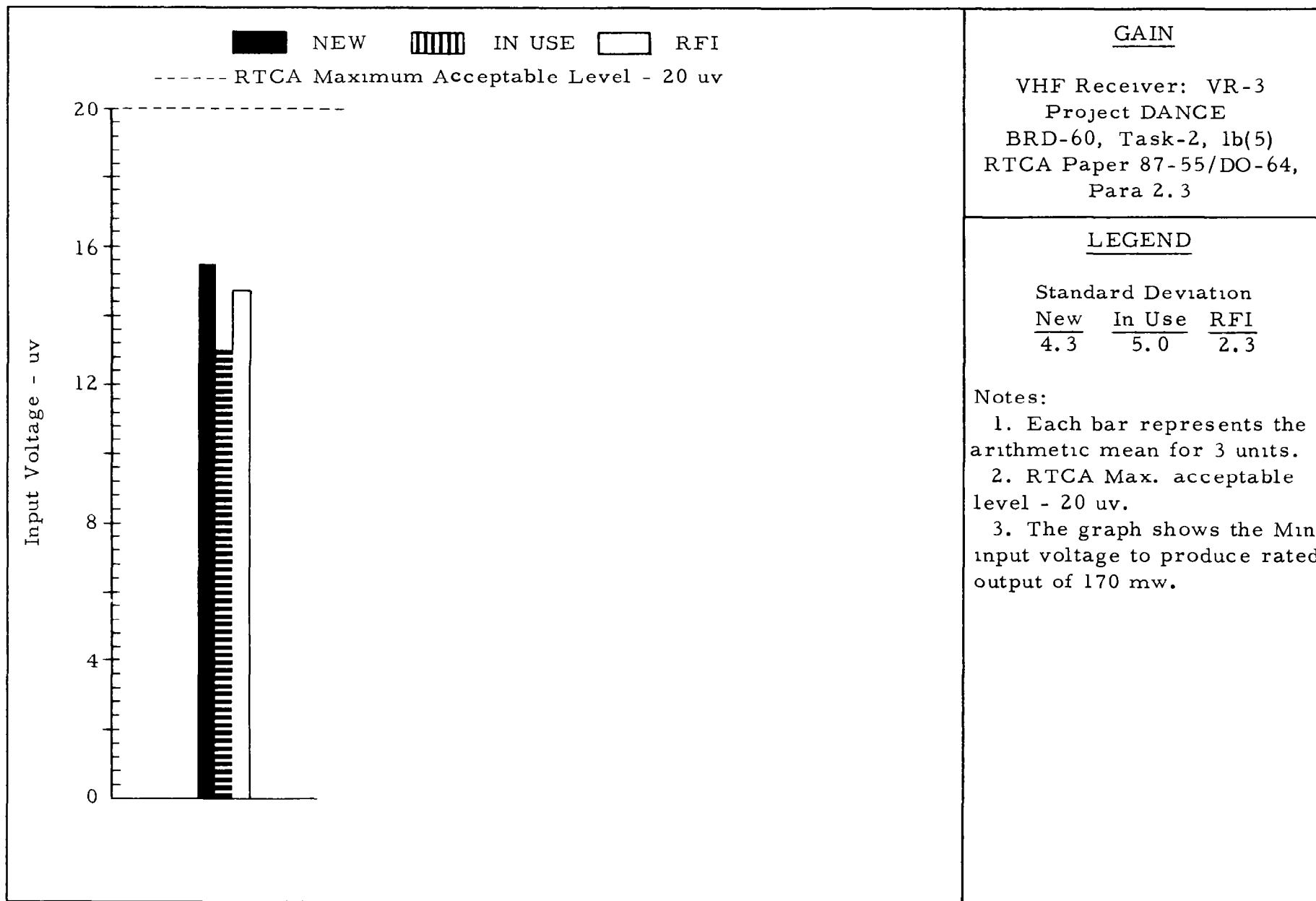
WEIGHTED PERFORMANCE - VHF RECEIVER - VR-3



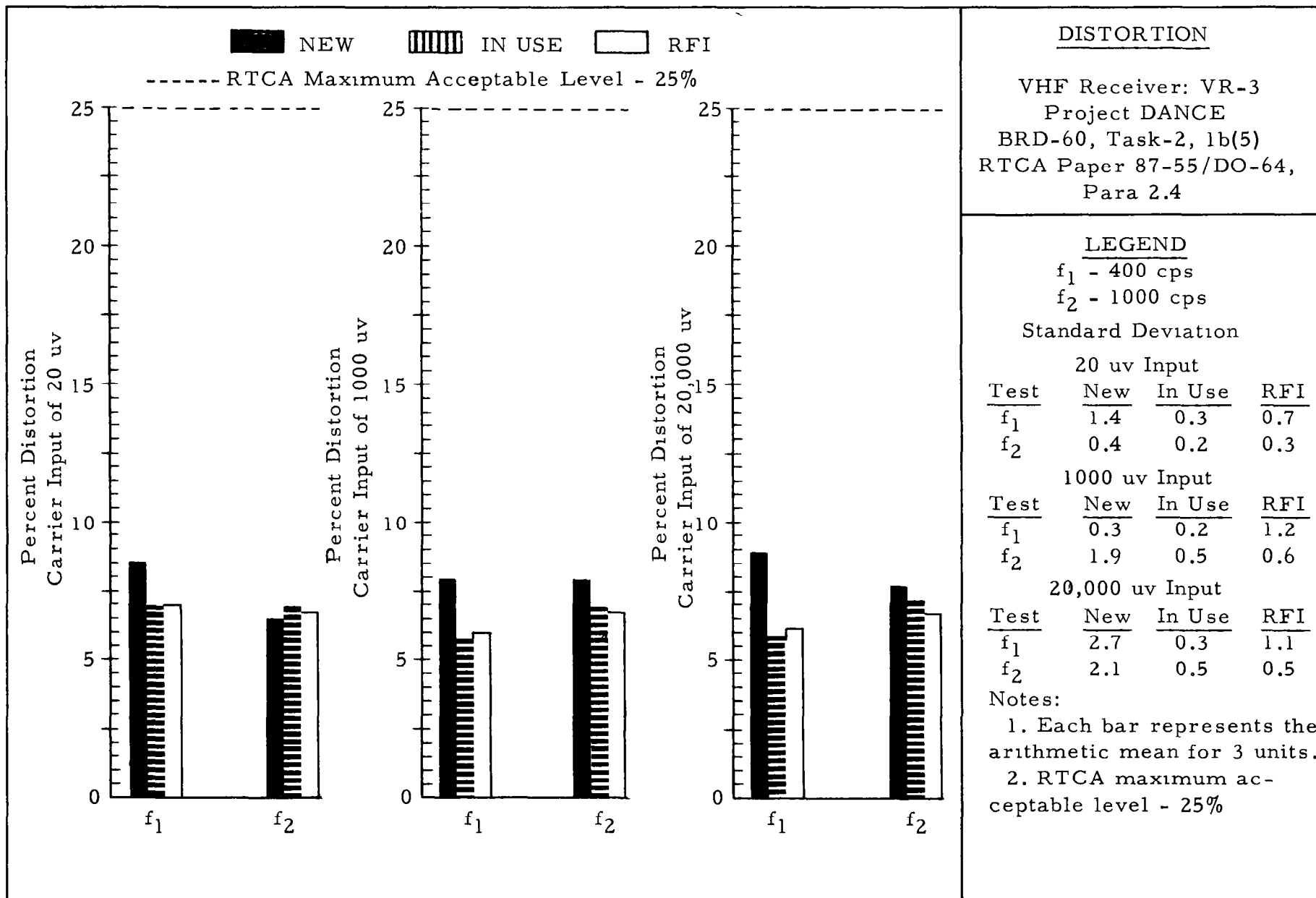
AUDIO FREQUENCY RESPONSE - VHF RECEIVER - VR-3



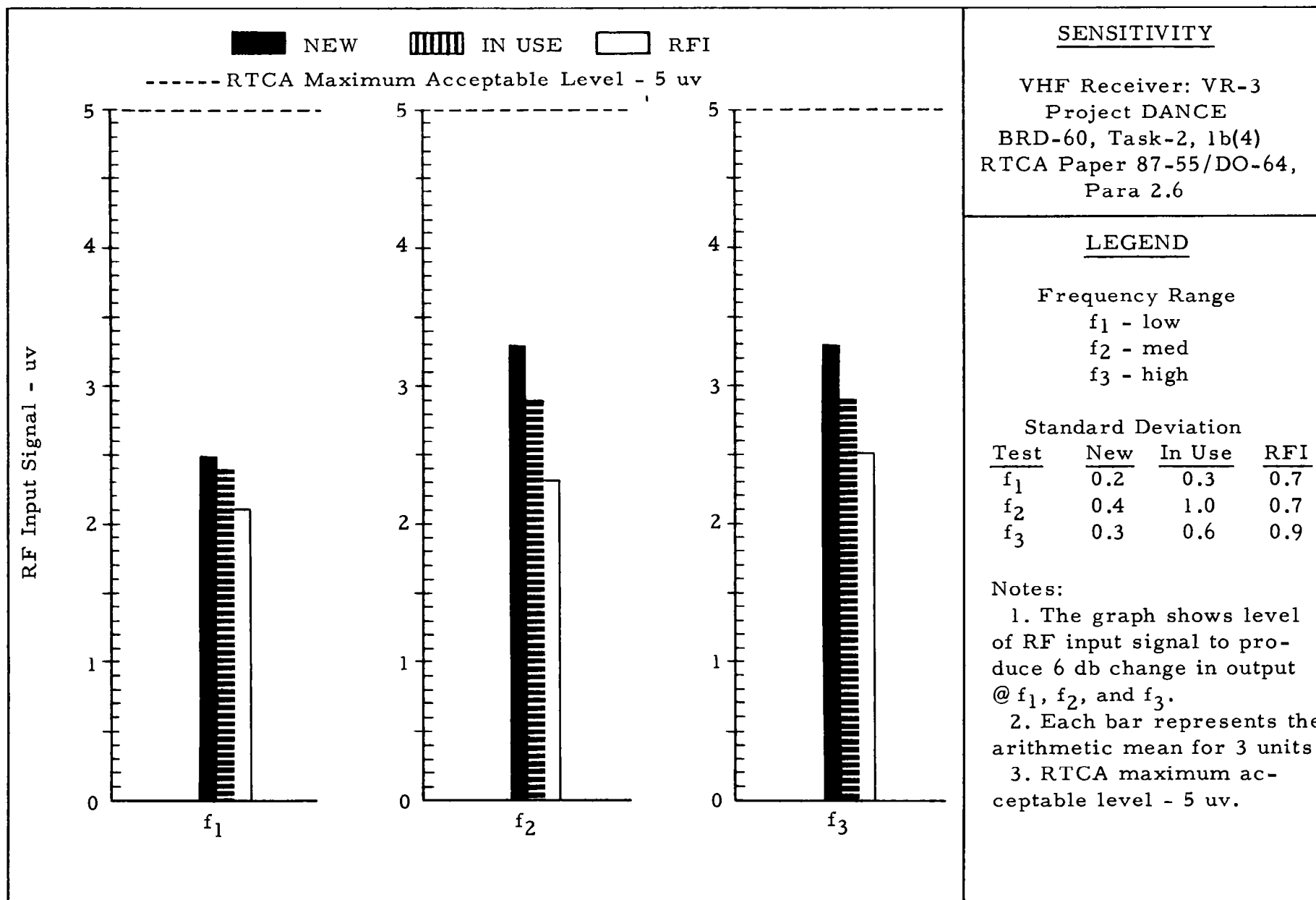
AVC CHARACTERISTICS - VHF RECEIVER - VR-3



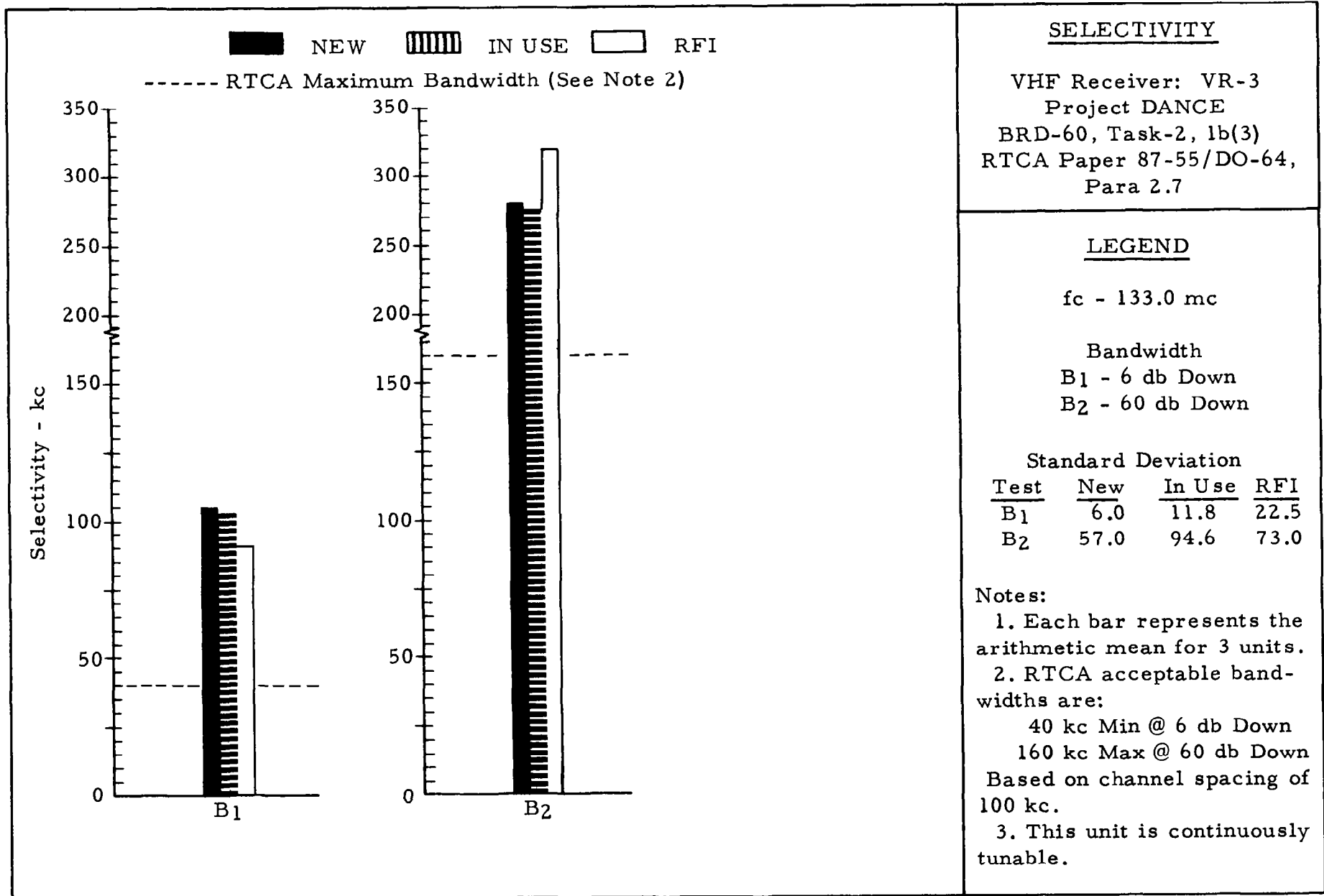
GAIN - VHF RECEIVER - VR-3



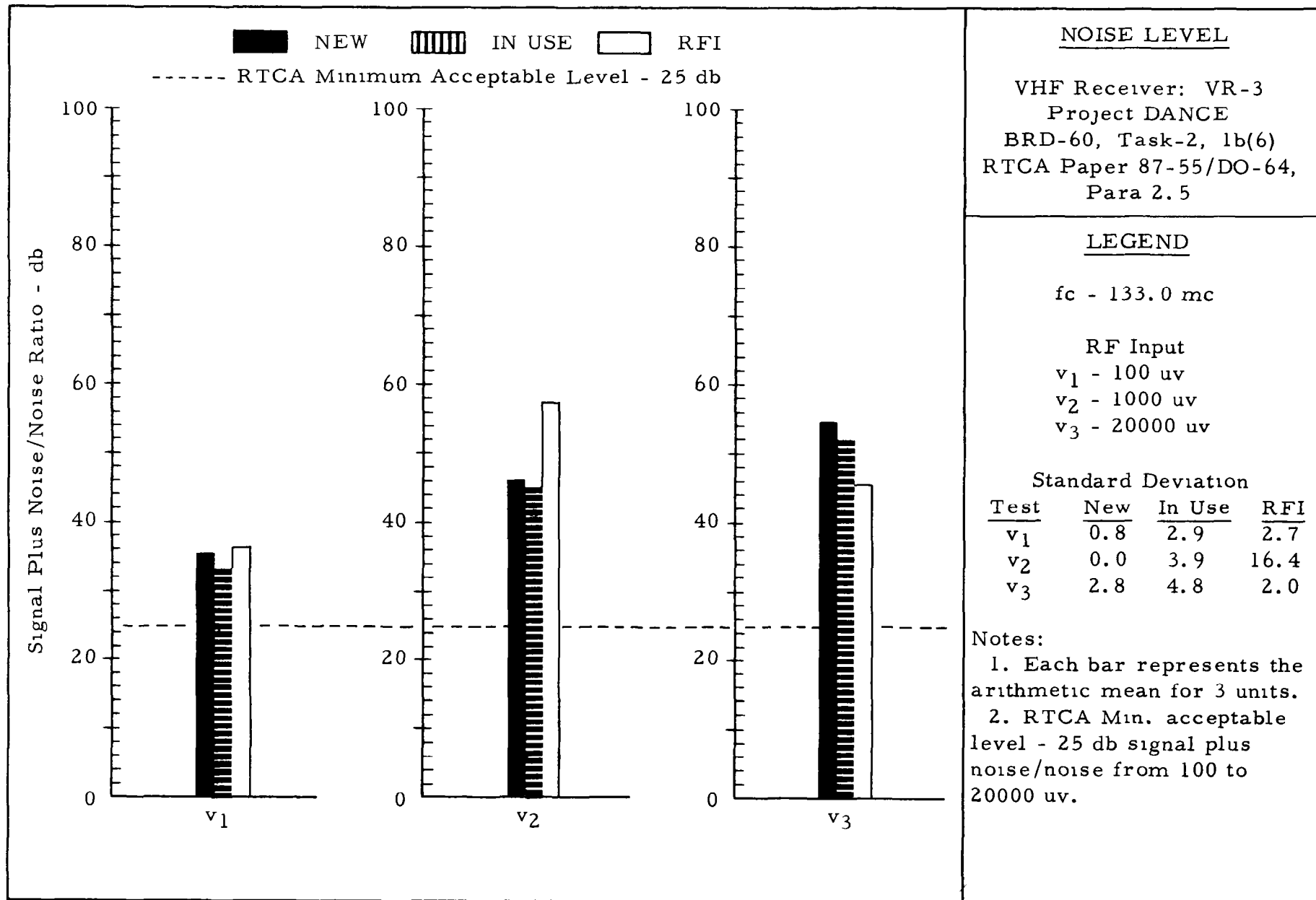
DISTORTION - VHF RECEIVER - VR-3



SENSITIVITY - VHF RECEIVER - VR-3



SELECTIVITY - VHF RECEIVER - VR-3



NOISE LEVEL - VHF RECEIVER - VR-3

INTERFERENCE TESTS

VHF Receiver: VR-3
Project DANCE
BRD-60. Task-2
RTCA Paper 87-55/DO-64

Test	Frequency (Mc)	F _c (Mc)	RTCA Performance Standards	Results	Performance
<u>Spurious Response</u> Contract Para: 1.b.(9) RTCA Para: 2.8(b)	.09 to 1000	133.0	Acceptable level excluding band within F _c ± 80 kc: ≥ 60 db.	Actual Level: < 60 db at F _c ± 80 kc. ≤ 60 db between -80 kc and F _c -232.2 kc. 80 db at F _c + 169.3 kc. All other frequencies within perform- ance standards.	No
<u>Desensitization</u> Contract Para: 1.b.(7) RTCA Para: 2.10(b)	118 to 148	133.0	Acceptable level excluding band within F _c ± 100 kc: ≤ 8 db.	Actual Level: > 8 db at F _c ± 100 kc. All other fre- quencies within performance standards.	Partially
<u>Cross Modulation</u> Contract Para: 1.b.(7) RTCA Para: 2.9(b)	F _c ± 100 kc F _c ± 200 kc	133.0	Acceptable level: ≥ 10 db.	Actual Level: < 10 db.	No

INTERFERENCE TESTS - VHF RECEIVER - VR-3

Test	Frequency (Mc)	F _c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Cable Conducted Interference</u> Contract Para 1.b.(8) RTCA Para:2.11(a)	.15 to 25	133.0	Acceptable Emission: ≤ 200 microvolts.	Actual emission on +28v and -28 v line: < 200 microvolts. All frequencies within performance standards.	Yes
<u>Antenna Conducted Interference</u> Contract Para 1.b.(8) RTCA Para:2.11(b)	.09 to 1500	118.0 133.0 148.0	Acceptable Emission: ≤ 400 micro-microwatts.	Actual emission: F _c = 118.0 mc. < 400 micro-microwatts. F _c = 133.0 Mc. < 400 micro-microwatts. F _c = 148.0 Mc. < 400 micro-microwatts except at 134.0 Mc. All other frequencies within performance standards.	Partially

Test	Contract Para.	F _c (Mc)	Probable Susceptibility	Relation to Frequency Synthesis												
Susceptibility to Radar Type signals.	1.b.(7)	133.0	<div>Radar Type Signal (mc)</div> <div>133</div> <div>220</div> <div>370</div>	<div>The following lists the relationship between a radar type signal and the receiver oscillator frequency (118.0 mc) which will produce a spurious output near the intermediate frequency (15 mc) of the receiver:</div> <table><tr><th>Radar Type Signal (<u>Harmonic</u>)</th><th>Receiver Oscillator (<u>Harmonic</u>)</th><th>Intermediate Frequency (<u>mc</u>)</th></tr><tr><td>1 st and</td><td>1 st</td><td>approx. 15</td></tr><tr><td>1 st and</td><td>2 nd</td><td>" 16</td></tr><tr><td>1 st and</td><td>3 rd</td><td>" 16</td></tr></table>	Radar Type Signal (<u>Harmonic</u>)	Receiver Oscillator (<u>Harmonic</u>)	Intermediate Frequency (<u>mc</u>)	1 st and	1 st	approx. 15	1 st and	2 nd	" 16	1 st and	3 rd	" 16
Radar Type Signal (<u>Harmonic</u>)	Receiver Oscillator (<u>Harmonic</u>)	Intermediate Frequency (<u>mc</u>)														
1 st and	1 st	approx. 15														
1 st and	2 nd	" 16														
1 st and	3 rd	" 16														

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

5. Laboratory and Field Test Data

d. VR-4, VHF Receiver

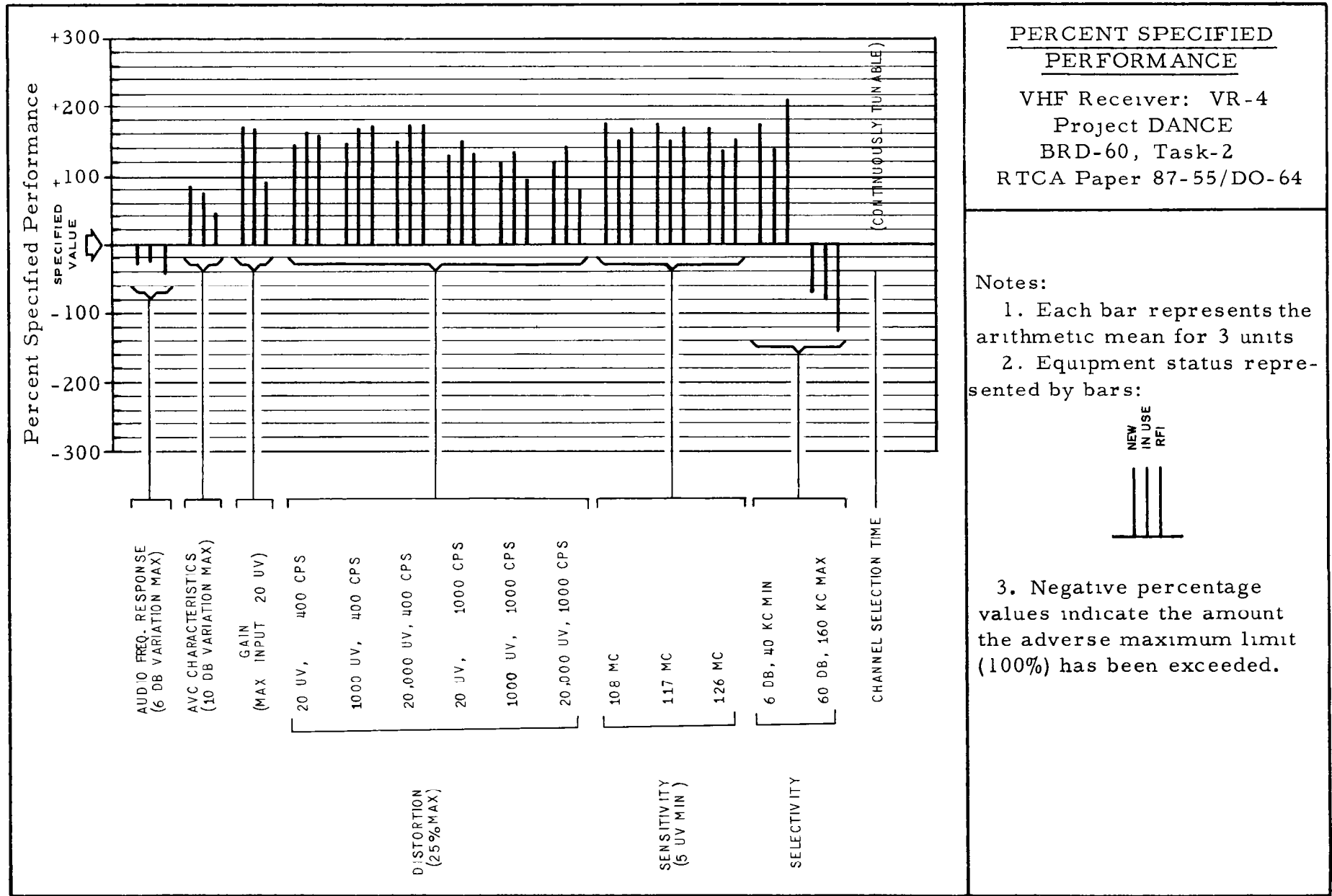
General:

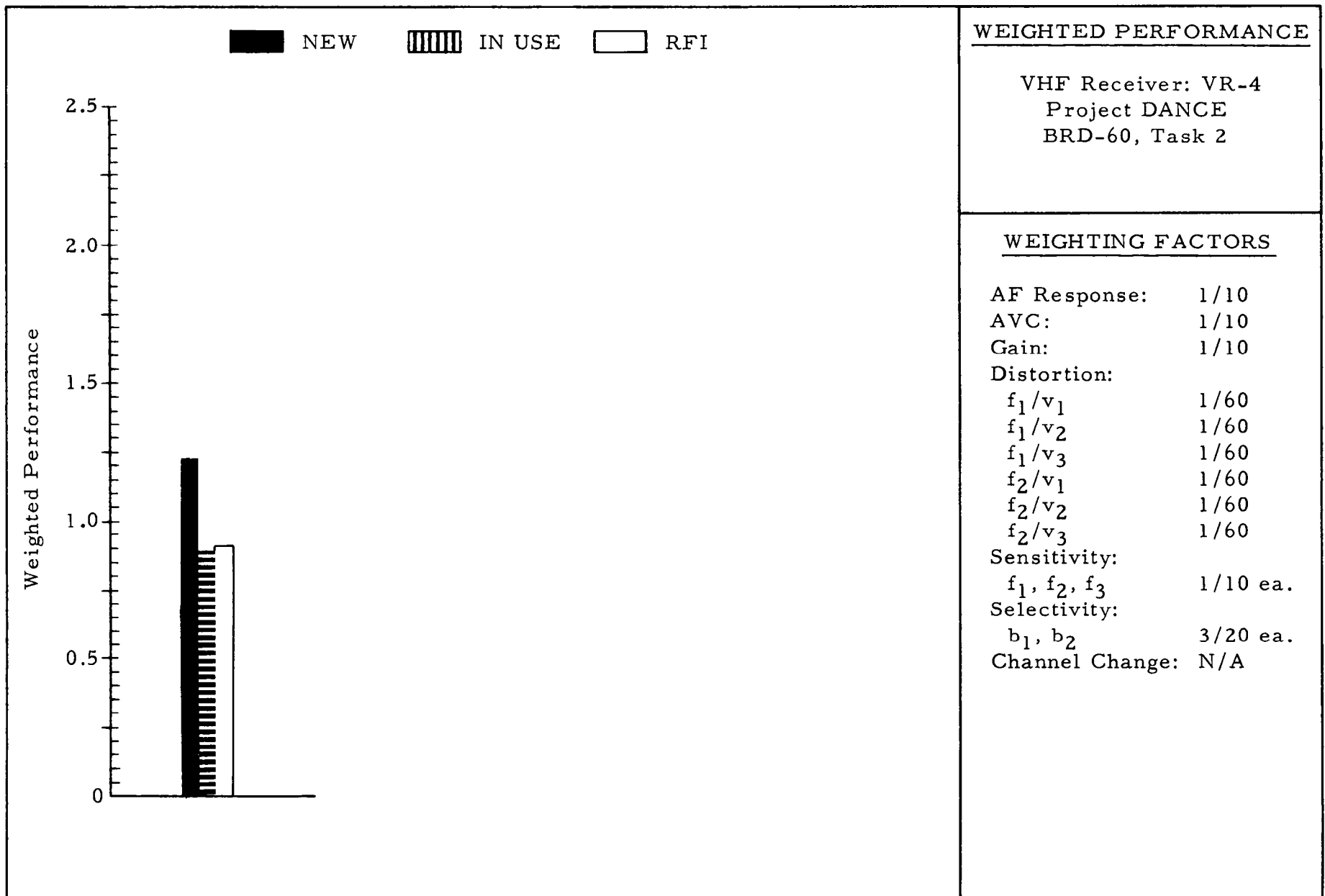
Frequency Range:	108 - 126.7 mc
Means of Frequency Selection:	Continuously Tunable

Technical:

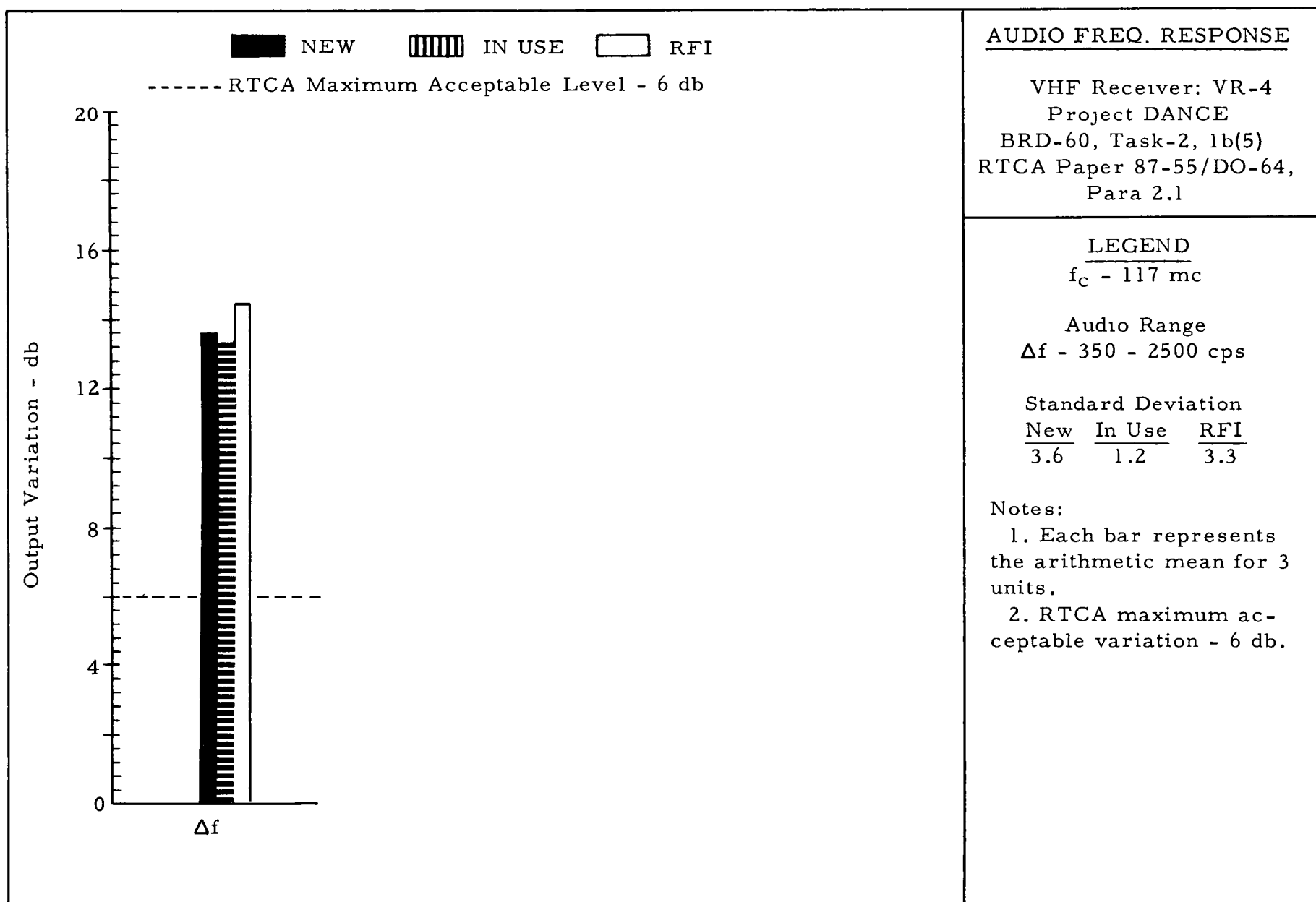
Page

Percent Specified Performance	B-168
Weighted Performance	B-169
Audio Frequency Response	B-170
AVC Characteristics	B-171
Gain	B-172
Distortion	B-173
Sensitivity	B-174
Selectivity	B-175
Noise Level	B-176
Interference Tests	B-177- 178

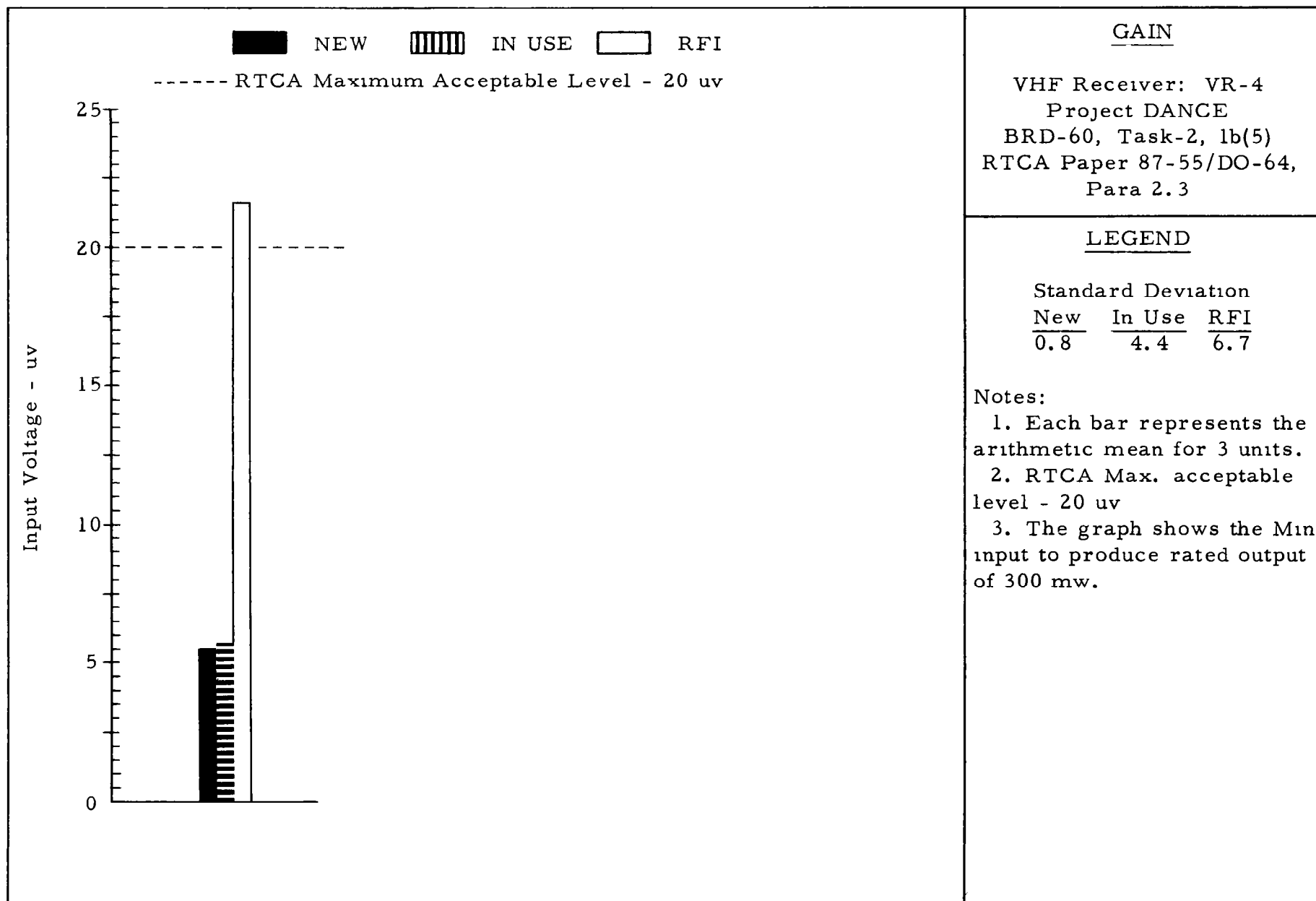




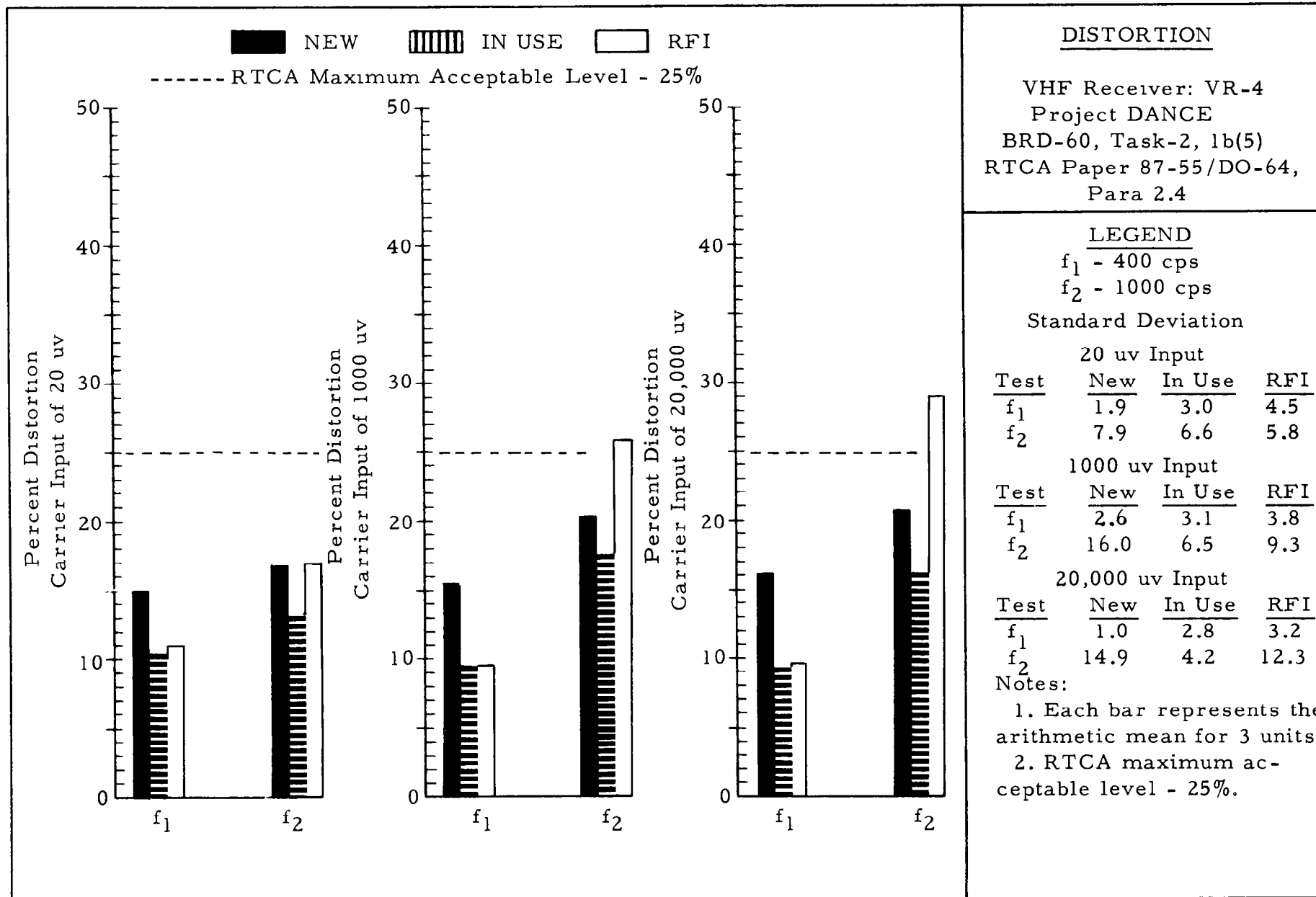
WEIGHTED PERFORMANCE - VHF RECEIVER - VR-4



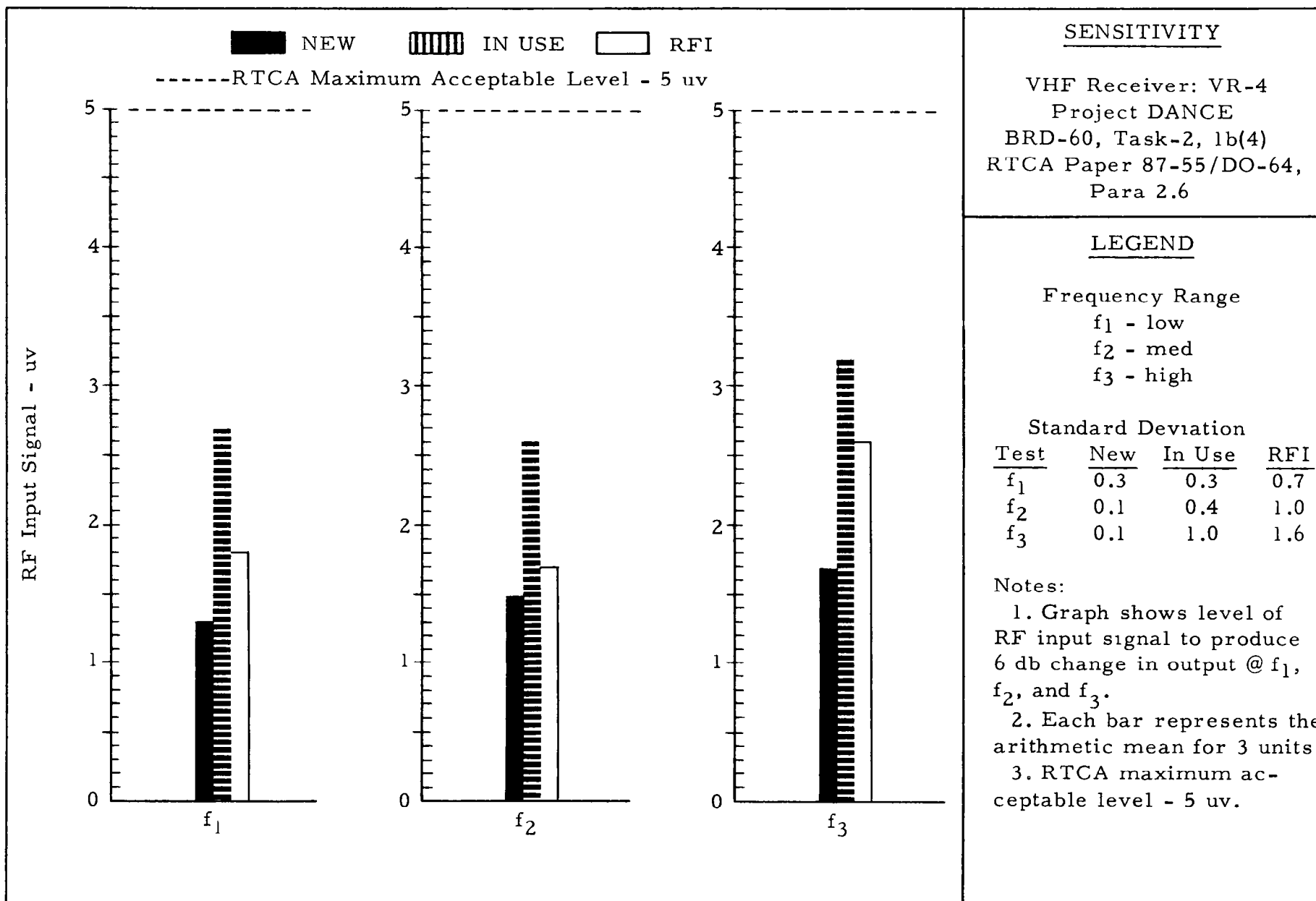
AUDIO FREQUENCY RESPONSE - VHF RECEIVER - VR-4



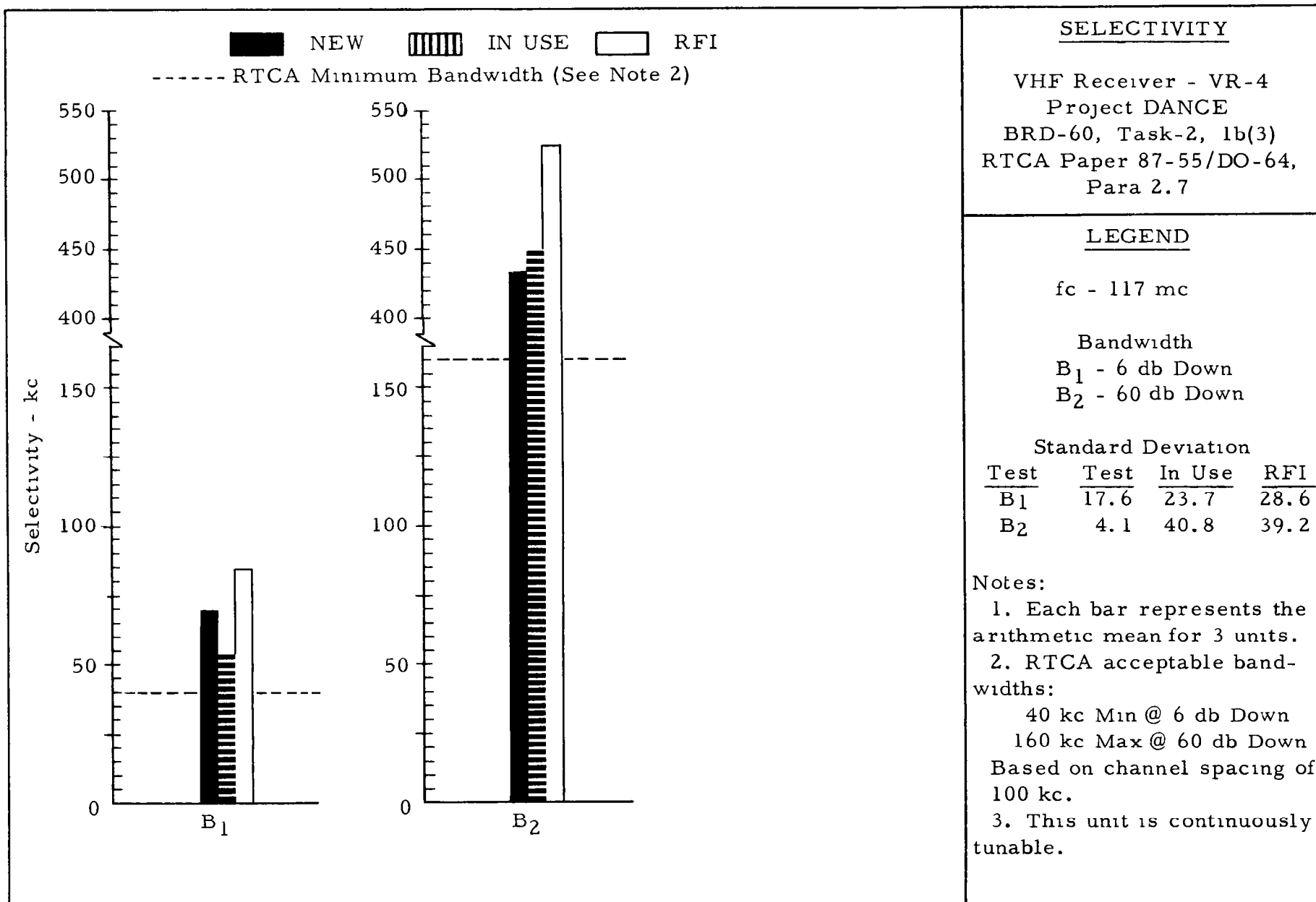
GAIN - VHF RECEIVER - VR-4



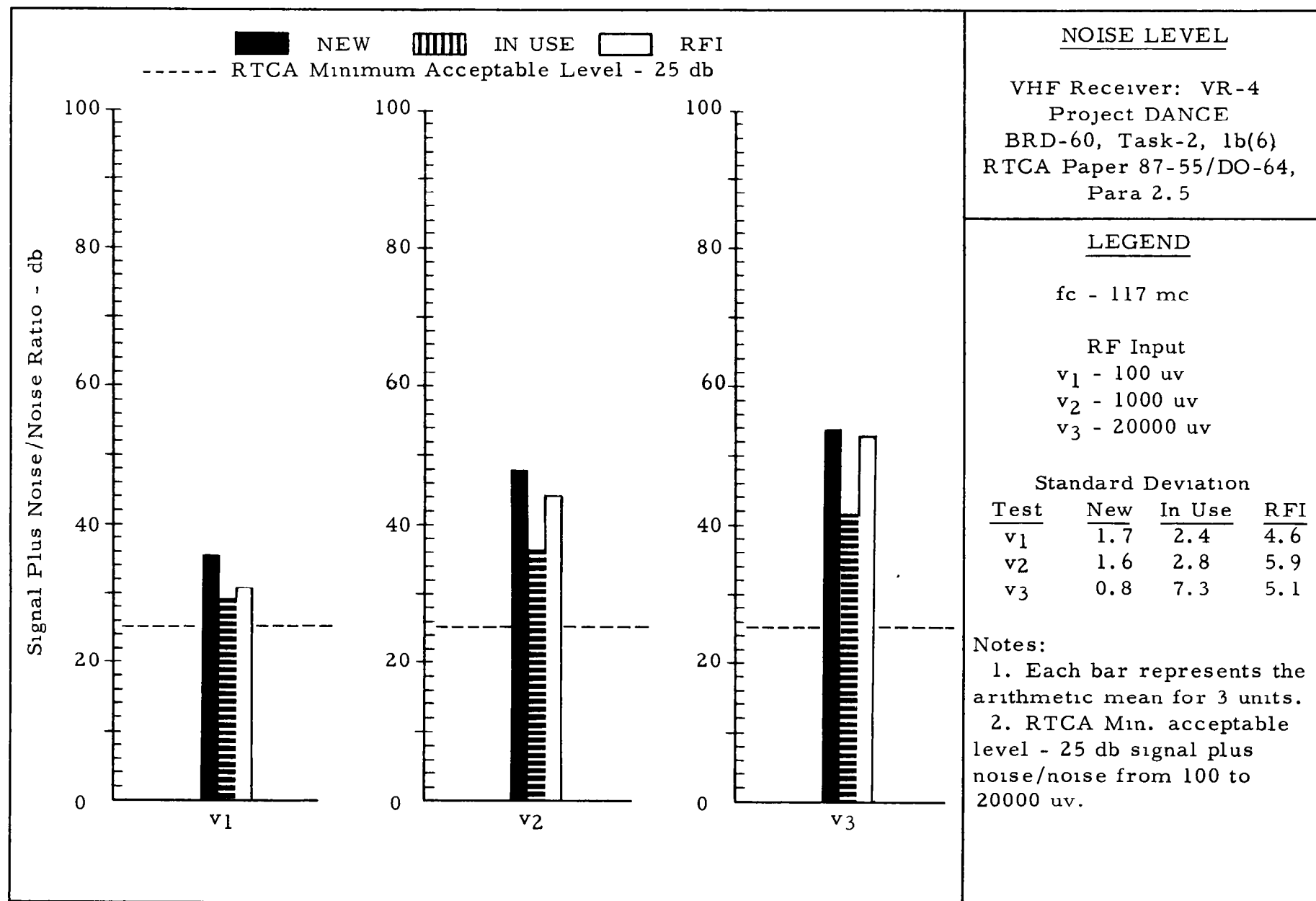
DISTORTION - VHF RECEIVER - VR-4



SENSITIVITY - VHF RECEIVER - VR-4



SELECTIVITY - VHF RECEIVER - VR-4



NOISE LEVEL - VHF RECEIVER - VR-4

INTERFERENCE TESTS

VHF Receiver: VR-4
Project DANCE
BRD-60. Task-2
RTCA Paper 87-55/DO-64

Test	Frequency (Mc)	F _c (Mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Spurious Response</u> Contract Para: 1.b. 9 RTCA Para: 2.8. b	.19 to 940	126.0	Acceptable level excluding band within F _c ±80 kc: ≥ 60 db.	Actual Level: ≥ 60 db at F _c ± 80 kc. except at 142 Mc. All other frequencies within performance standards.	Yes
<u>Desensitization</u> Contract Para: 1.b.(7) RTCA Para: 2.10(b)	108.0 to 126.5	126.0	Acceptable level excluding band within F _c ±100 kc: ≤ 8 db.	Actual Level: < 8 db at F _c ± 100 kc. ≤ 8 db between F _c +100 kc and F _c +147 kc, and between F _c -100 kc and F _c -203 kc. All other frequen- cies within performance standards.	Yes
<u>Cross Modulation</u> Contract Para: 1.b.(7) RTCA Para: 2.9(b)	F _c ±100 kc F _c ±200 kc	122	Acceptable level: ≥ 10 db.	Actual Level: < 10 db at F _c -100 kc. > 10 db at F _c +100kc and F _c ±200 kc.	Partially
<u>Cable Conducted Interference</u> Contract Para: 1.b. 8 RTCA Para: 2.11(a)	.15 to 25	126	Acceptable emission: ≤ 200 microvolts	Actual emission on +13 volt line: < 200 microvolts. All frequencies within perform- ance standards.	Yes

INTERFERENCE TESTS - VHF RECEIVER - VR-4

Test	Frequency (mc)	F _c (mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Antenna Conducted</u> <u>Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(b)	.15 to 1500		Acceptable emission: ≤ 400 micro-microwatts.	Actual Emission: F _c = 108 mc. < 400 micro-microwatts except at: 116.5, 349, 469 and 585 mc. F _c = 118 mc. < 400 micro-microwatts except at: 126, 379, and 512 kc. All other frequencies within performance standards	Partially

Test	Contract Para.	F _c (mc)	Probable Susceptibility	Relation to Frequency Synthesis
Susceptibility to Radar Type signals.	1.b.(7)	126	When receiver is tuned within the band from 108 to 126 mc, the receiver will probably be susceptible to the following range of frequencies: <div style="text-align: center;"> Radar Type Signals (mc) </div> 124.6 to 143.0 170.0 to 197.5 178.0 to 206.0 223.0 to 261.5 228.0 to 260.5 241.0 to 277.5 340.0 to 395.0 690.0 to 798.5 450.0 840.0	The following lists the relationship between a radar type signal and the receiver oscillator frequency (134.5 mc) which will produce a spurious output near the intermediate frequency (8.5 mc) or the image frequency (143 mc) of the receiver: <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> Radar Type Signal (Harmonic) </div> <div style="text-align: center;"> Receiver & Oscillator (Harmonic) </div> <div style="text-align: center;"> Inter- mediate Freq. (mc) </div> <div style="text-align: center;"> Image Freq. (mc) </div> </div> 1 st 1 st X 3 rd 2 nd X 2 nd 2 nd X 1 st 2 nd X 1 st 3 rd X 1 st 2 nd X 1 st 3 rd X 1 st 6 th X No relation to frequency synthesis No relation to frequency synthesis

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

5. Laboratory and Field Test Data

e. VR-5, VHF Receiver

General:

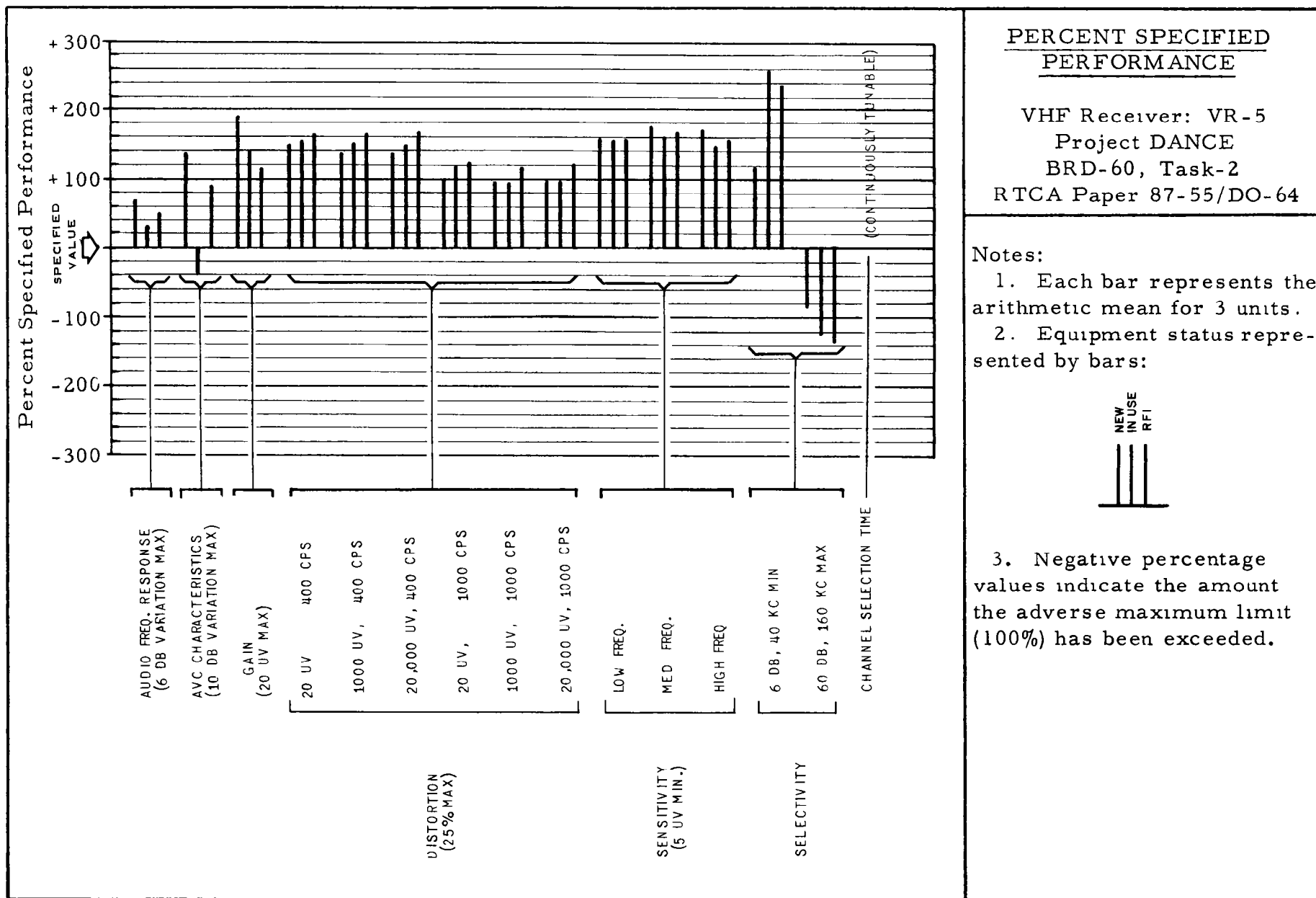
Frequency Range:	108 - 126.7 mc
Means of Frequency Selection:	Continuously Tunable

Technical:

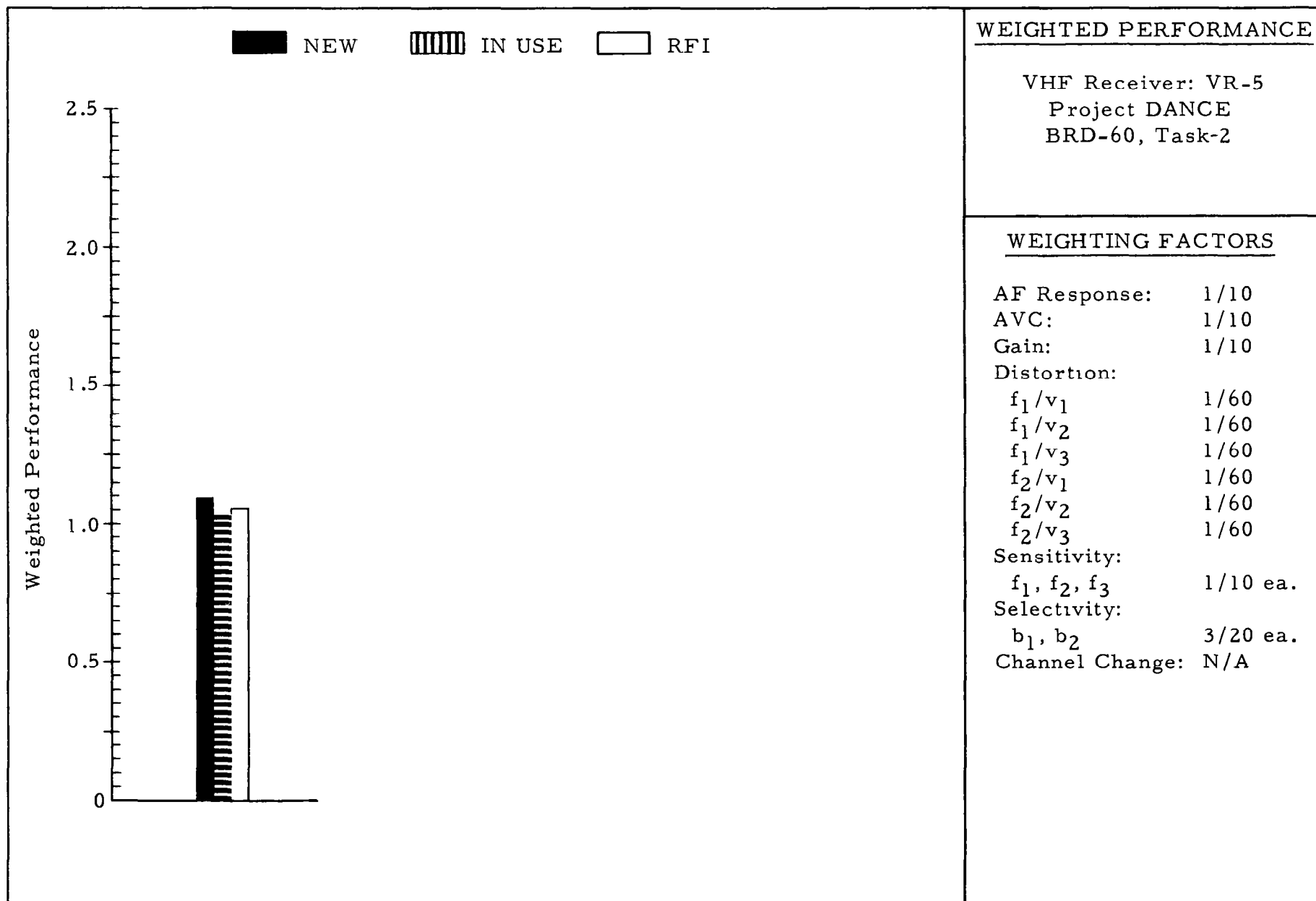
Page

Percent Specified Performance	B-180
Weighted Performance	B-181
Audio Frequency Response	B-182
AVC Characteristics	B-183
Gain	B-184
Distortion	B-185
Sensitivity	B-186
Selectivity	B-187
Noise Level	B-188
Interference Tests	B-189 - 190

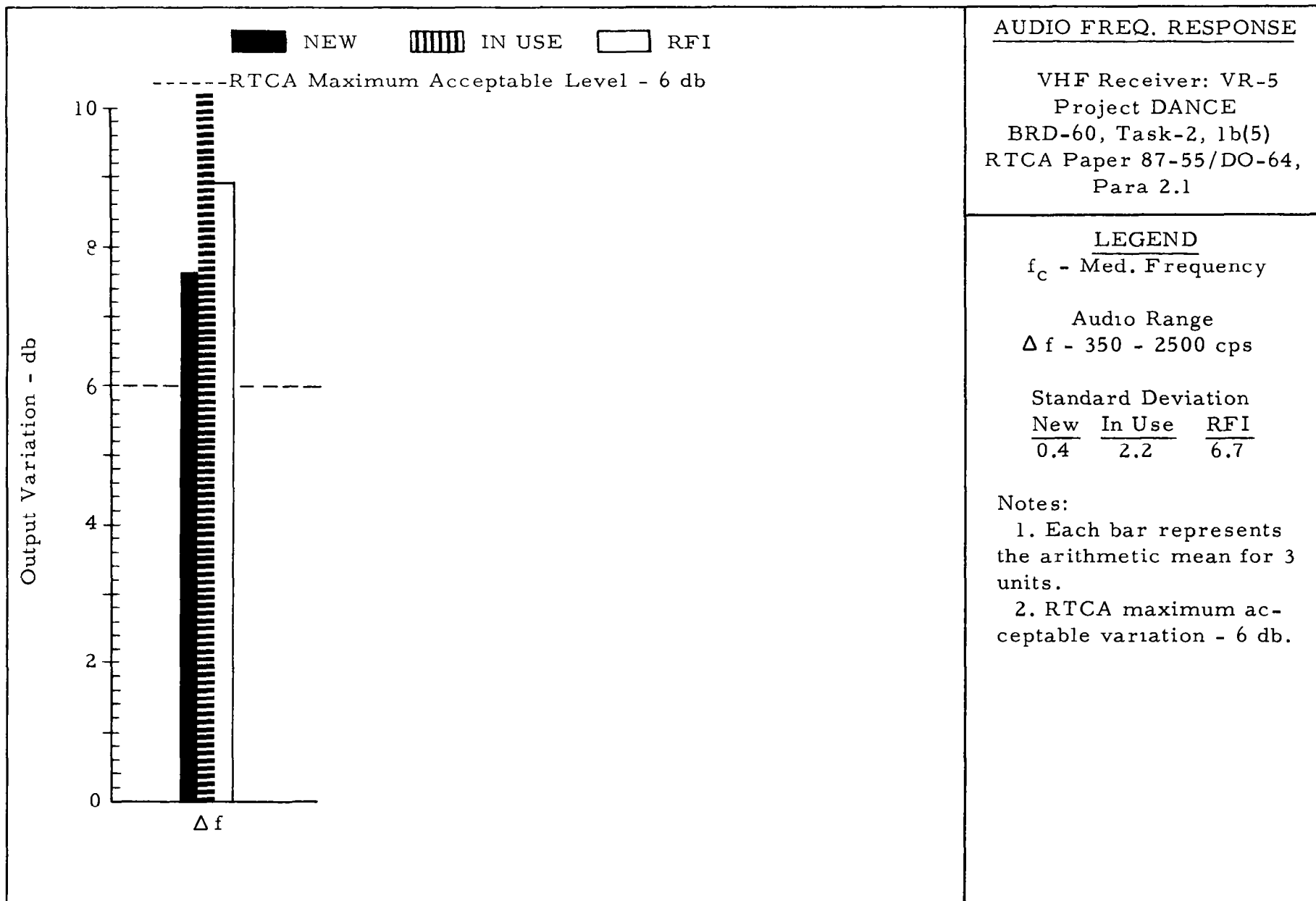
Figure B-5(e)



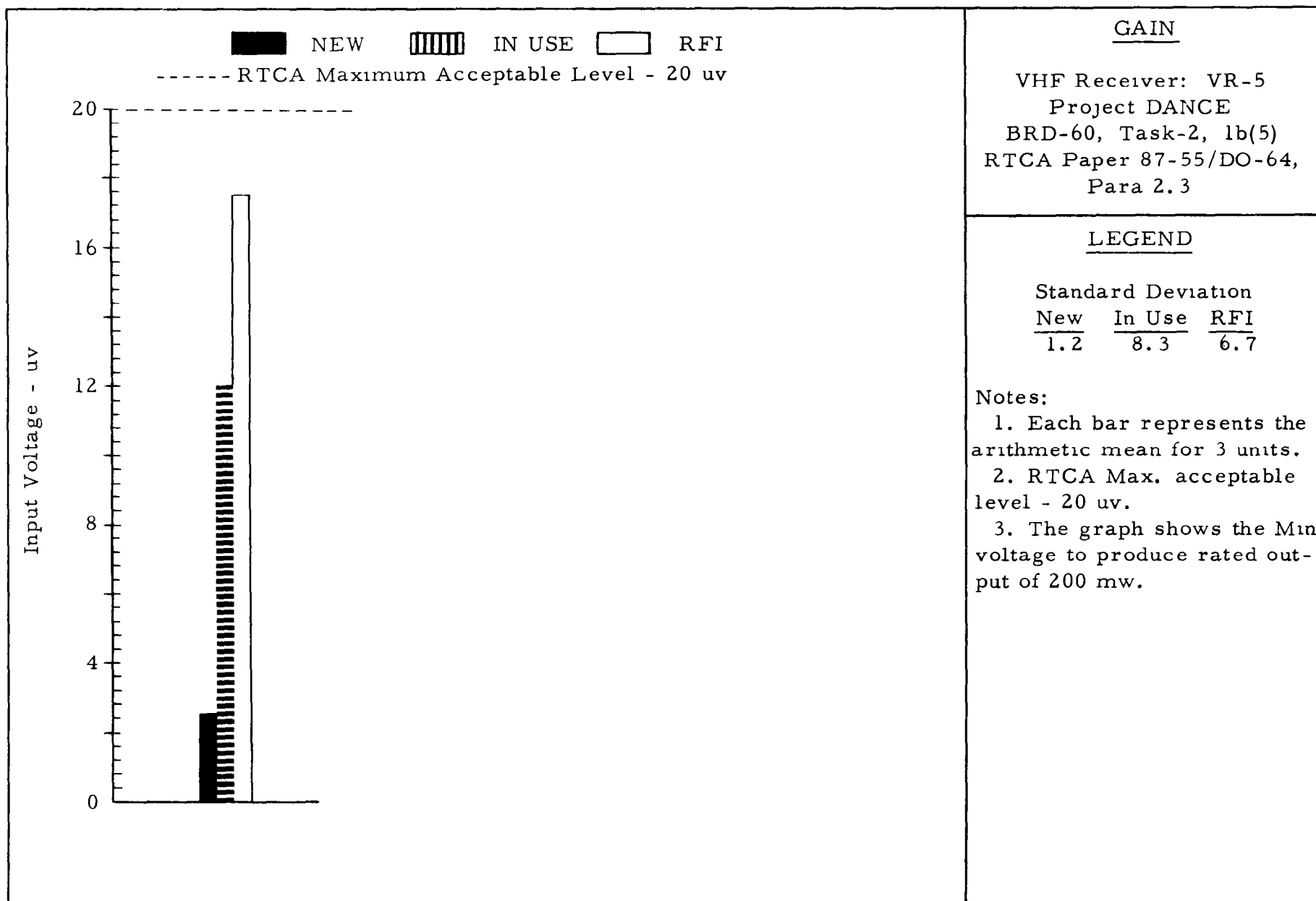
PERCENT SPECIFIED PERFORMANCE - VHF RECEIVER - VR-5



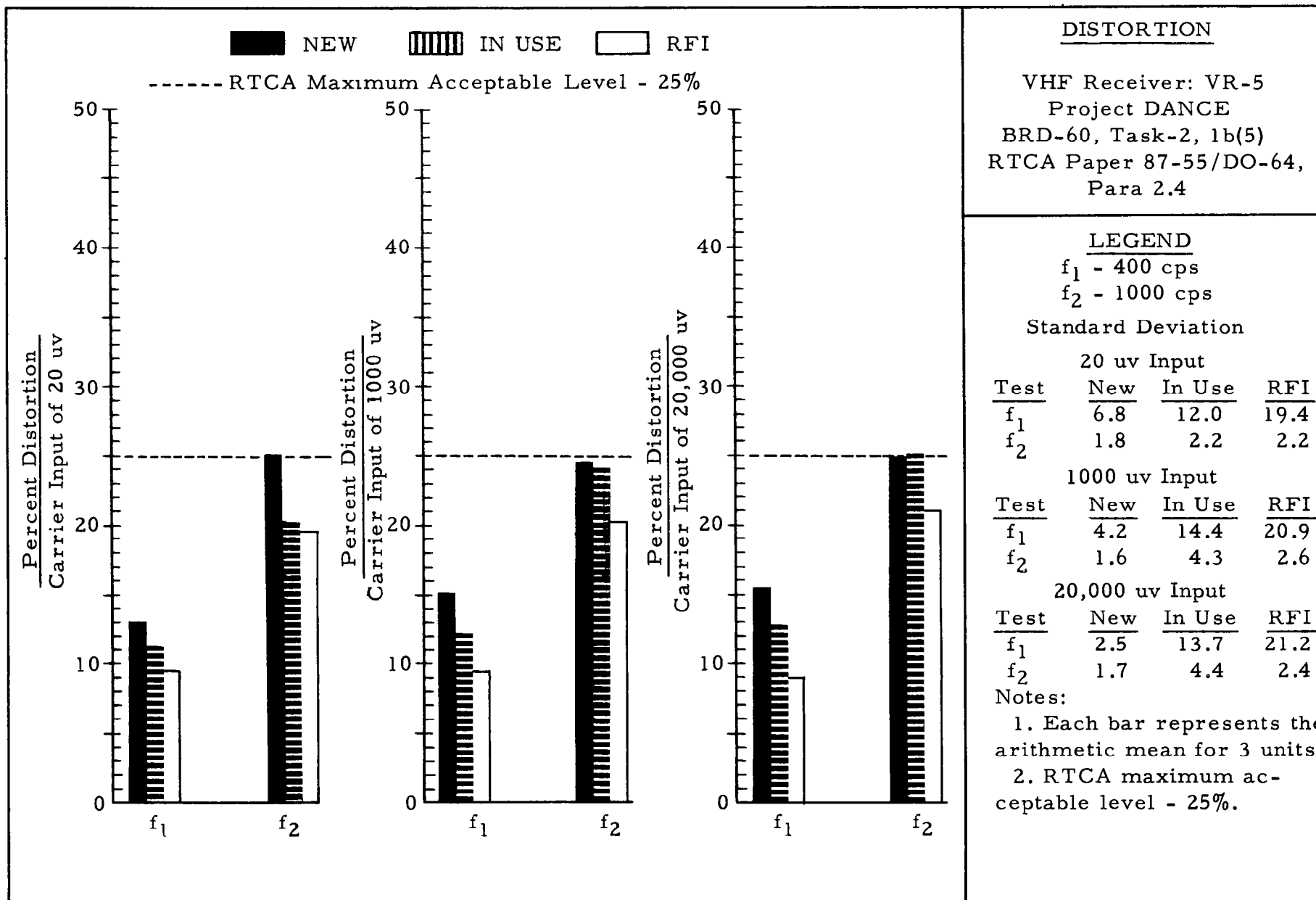
WEIGHTED PERFORMANCE - VHF RECEIVER - VR-5



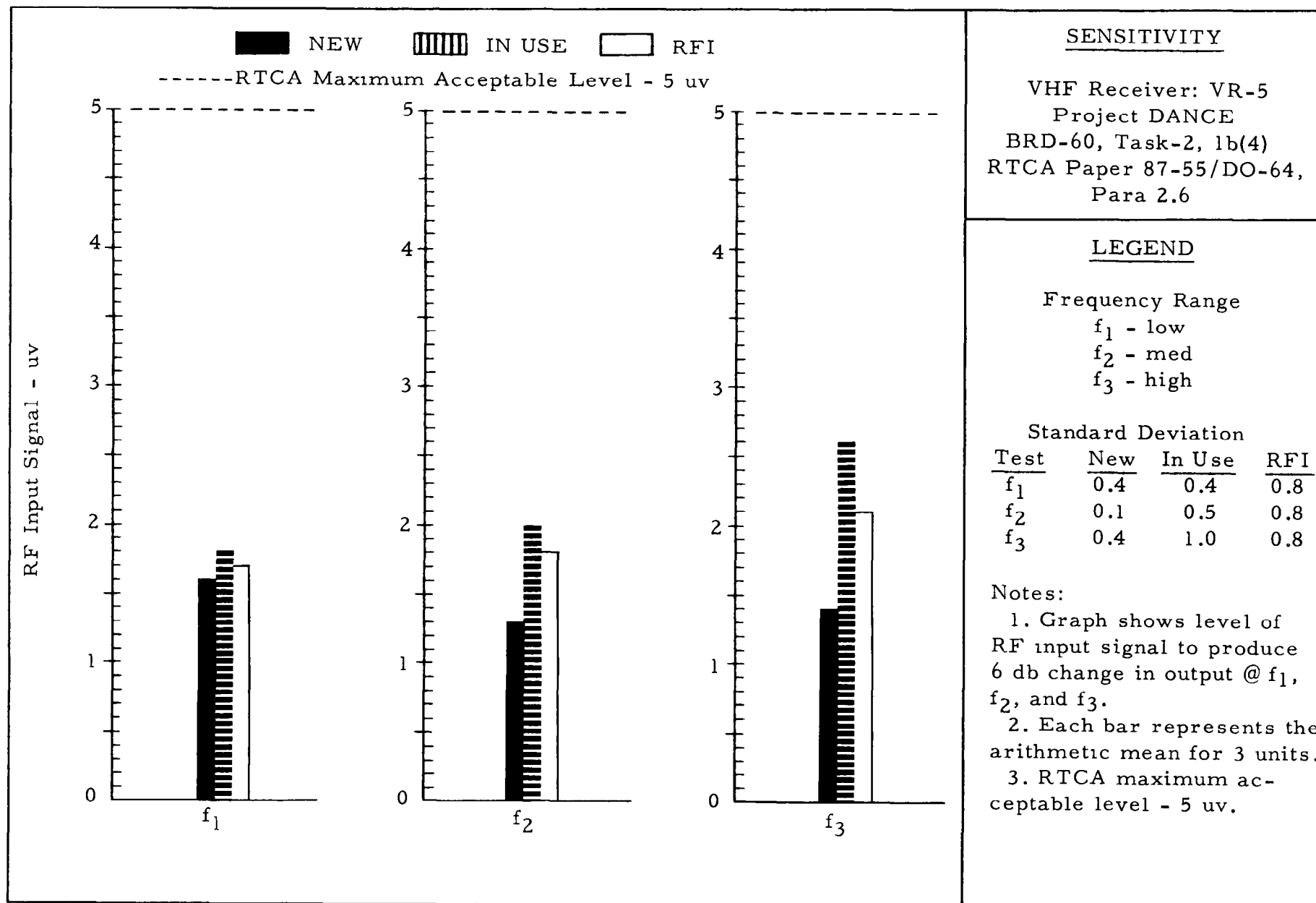
AUDIO FREQUENCY RESPONSE - VHF RECEIVER - VR-5



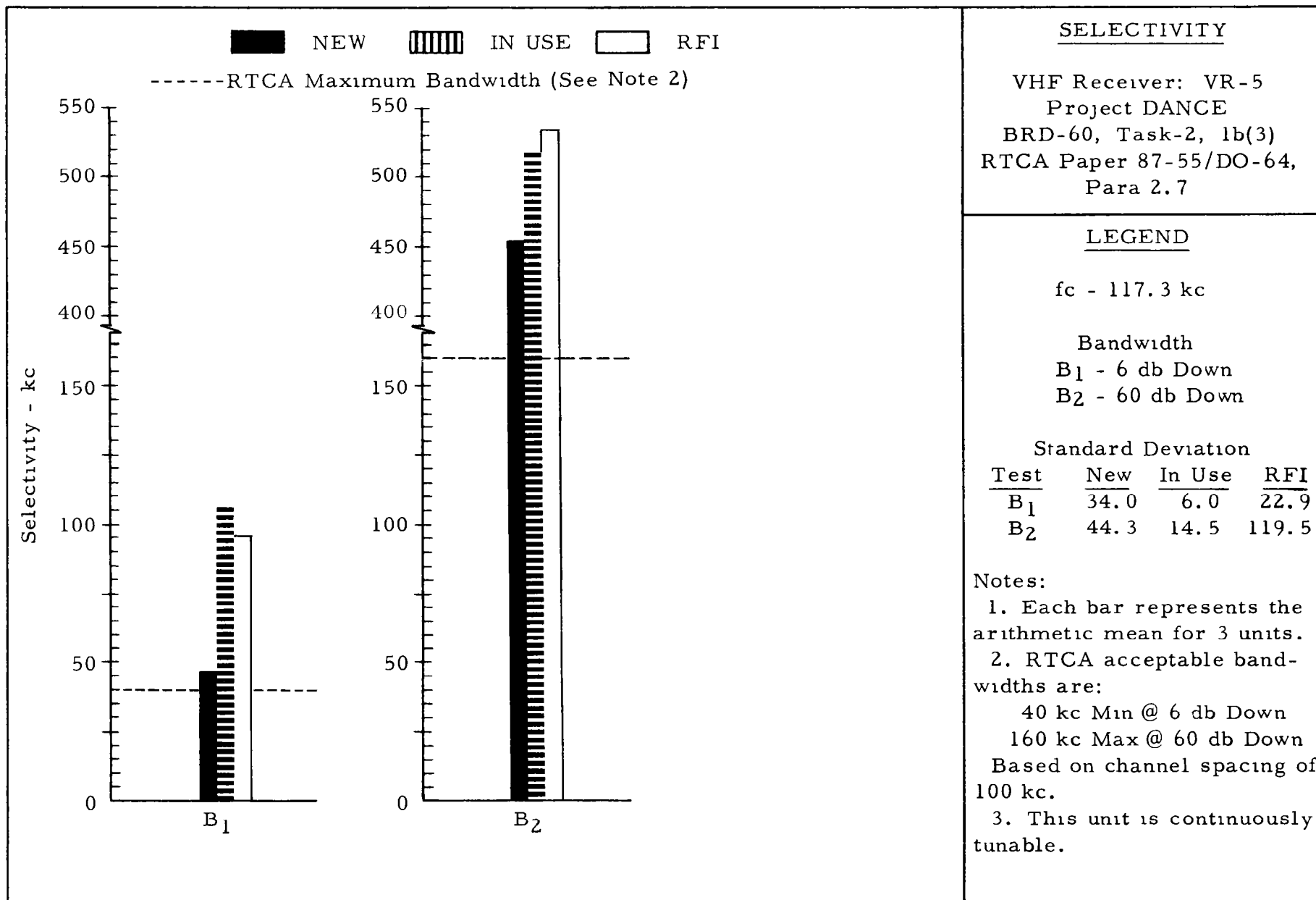
GAIN - VHF RECEIVER - VR-5



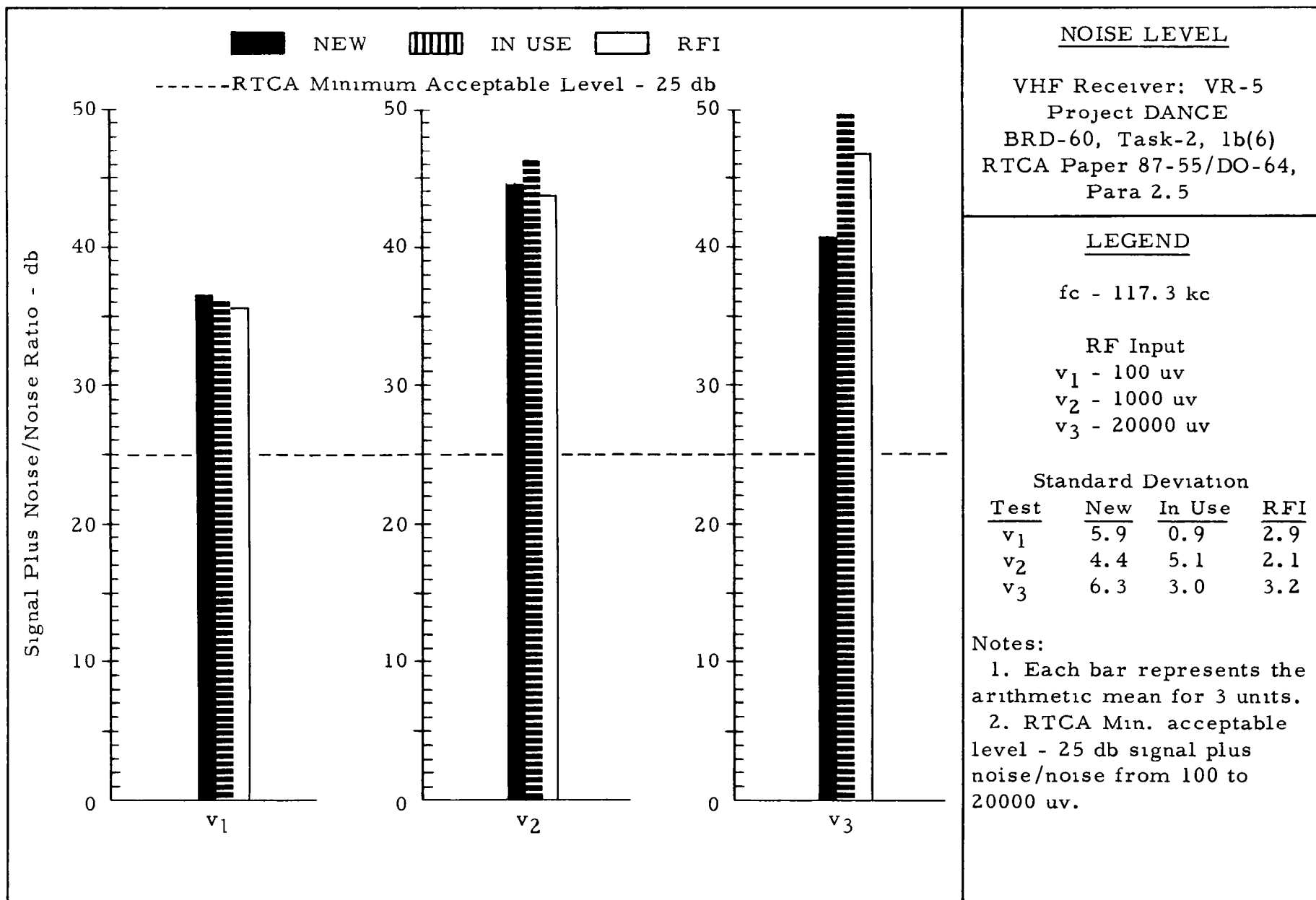
DISTORTION - VHF RECEIVER - VR-5



SENSITIVITY - VHF RECEIVER - VR-5



SELECTIVITY - VHF RECEIVER - VR-5



NOISE LEVEL - VHF RECEIVER - VR-5

INTERFERENCE TESTS

VHF Receiver: VR-5
 Project DANCE
 BRD-60. Task-2
 RTCA Paper 87-55/DO-64

Test	Frequency (mc)	F_c (mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Spurious Response</u> Contract Para: 1.b.(9) RTCA Para: 2.8(b)	.19 to 940	126.0	Acceptable level excluding band within $F_c \pm 80$ kc: ≥ 60 db.	Actual Level: < 60 db at $F_c \pm 80$ kc and $F_c \pm 160$ kc. ≤ 60 db between $F_c - 80$ kc and $F_c - 261$ kc and between $F_c + 80$ kc and $F_c + 164.9$ kc. All other frequencies within performance standards.	Partially
<u>Desensitization</u> Contract Para: 1.b.(7) RTCA Para: 2.10(b)	108 to 135.9	126.0	Acceptable level excluding band within $F_c \pm 100$ kc: ≤ 8 db.	Actual Level: < 8 db at $F_c \pm 100$ kc. ≤ 8 db between $F_c + 100$ kc and $F_c + 112$ kc and $F_c - 100$ kc and $F_c - 200$ kc. All other frequencies within performance standards.	Yes
<u>Cross Modulation</u> Contract Para: 1.b.(7) RTCA Para: 2.9(b)	$F_c \pm 100$ kc $F_c \pm 200$ kc	122.0	Acceptable Level: ≥ 10 db.	Actual Level: < 10 db at $F_c \pm 100$ kc. > 10 db at $F_c \pm 200$ kc.	Partially

INTERFERENCE TESTS - VHF RECEIVER - VR-5

Test	Frequency (mc)	F_c (mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Cable Conducted Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(a)	.15 to 25	126.0	Acceptable Emission: ≤ 200 microvolts.	Actual Emission: $F_c = 126.0$ mc. < 200 microvolts. All frequencies within performance standards.	Yes
<u>Antenna Conducted Interference</u> Contract Para: 1.b.(8) RTCA Para: 2.11(b)	.15 to 1500	126.0	Acceptable Emission: ≤ 400 micro-microwatts.	Actual Emission: < 400 micro-microwatts except at 402, 545, 675 and 1070 mc. All other frequencies within performance standards.	Partially

Test	Contract Para.	F_c (mc)	Probable Susceptibility	Relation to Frequency Synthesis
Susceptibility to Radar Type signals.	1.b.(7)	110.1	102 to 144 mc	None

INTERFERENCE TESTS - VHF RECEIVER - VR-5

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

Sub-Section

5. Laboratory and Field Test Data

f. VR-6, VHF Receiver

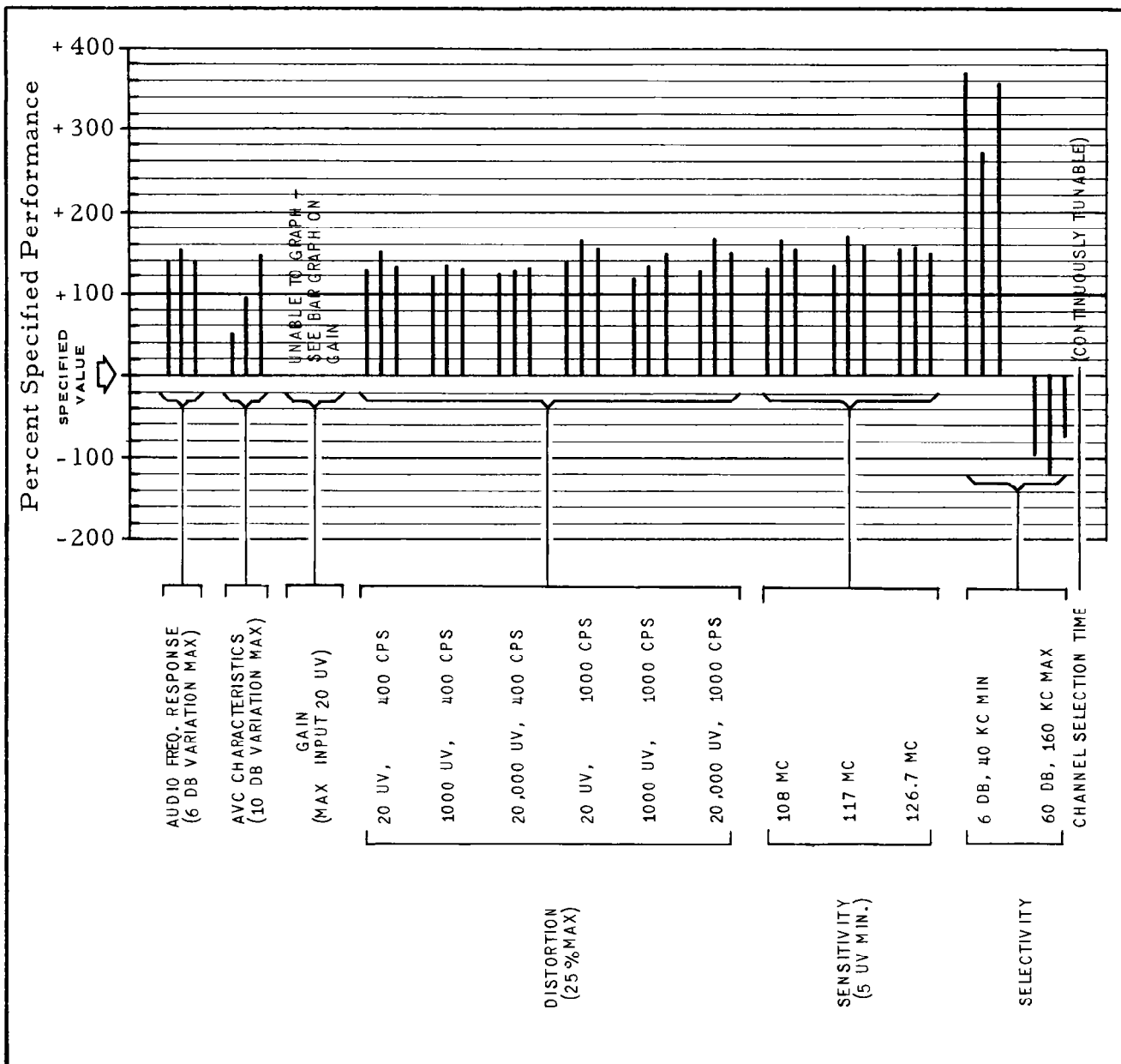
General:

Frequency Range:	108 - 127.0 mc
Means of Frequency Selection:	Continuously Tunable

Technical:

Page

Percent Specified Performance	B-192
Weighted Performance	B-193
Audio Frequency Response	B-194
AVC Characteristics	B-195
Gain	B-196
Distortion	B-197
Sensitivity	B-198
Selectivity	B-199
Noise Level	B-200
Interference Tests	B-201-
	202-
	202a



PERCENT SPECIFIED PERFORMANCE

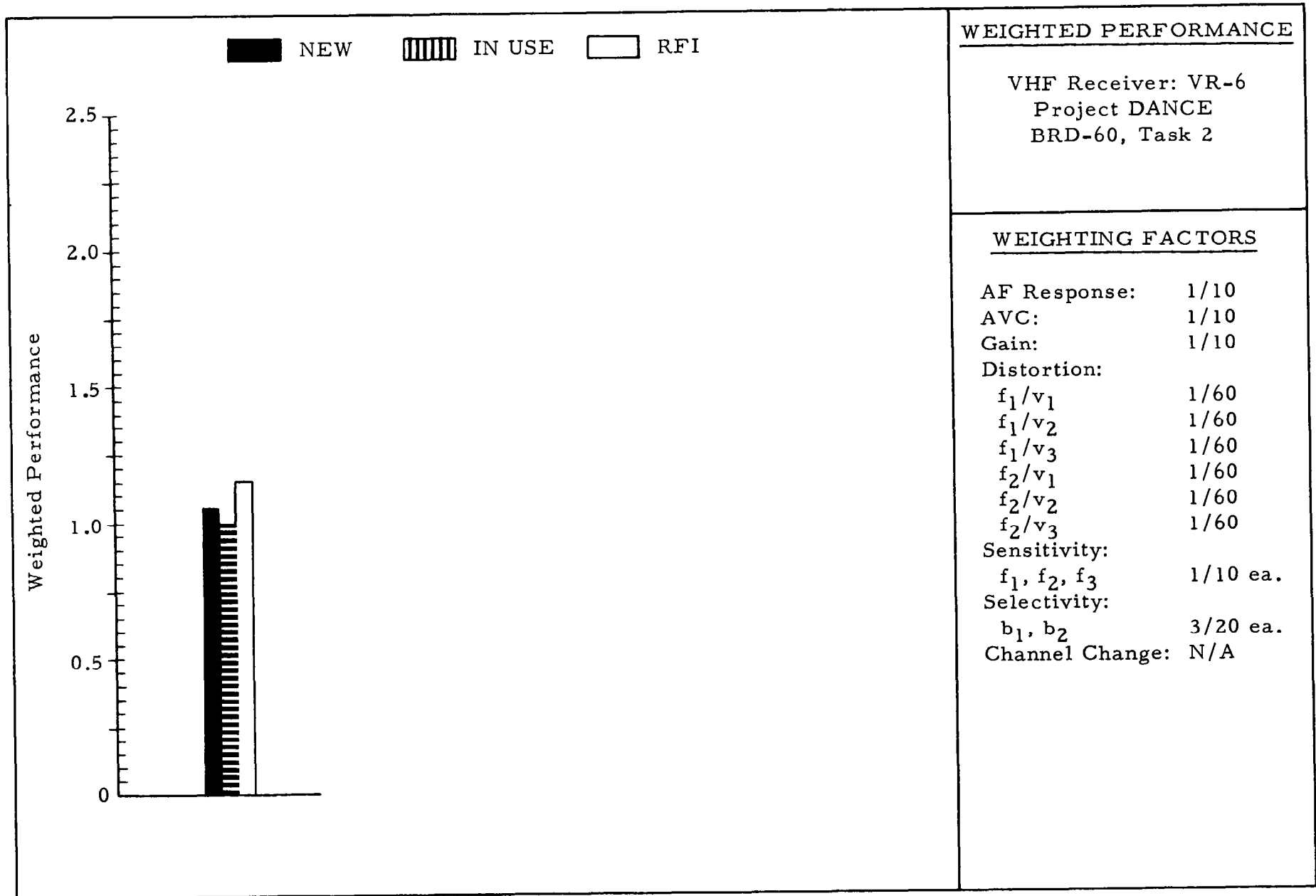
VHF Receiver: VR-6
Project DANCE
BRD-60, Task-2
RTCA Paper 87-55/DO-64

Notes:

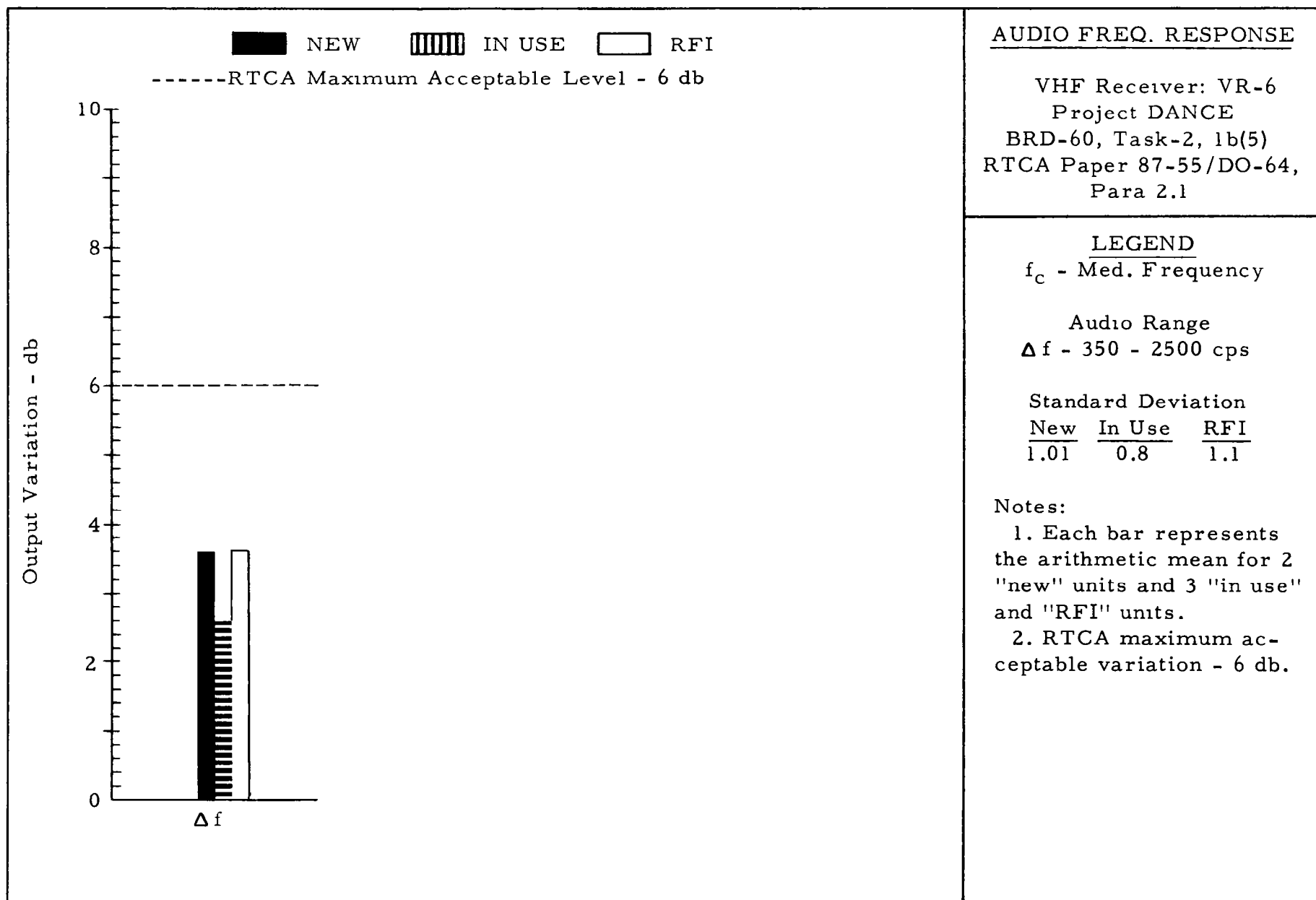
1. Each bar represents average for 2 "NEW" units; and 3 each "In Use" and "RFI" units.
2. Equipment status represented by bars.



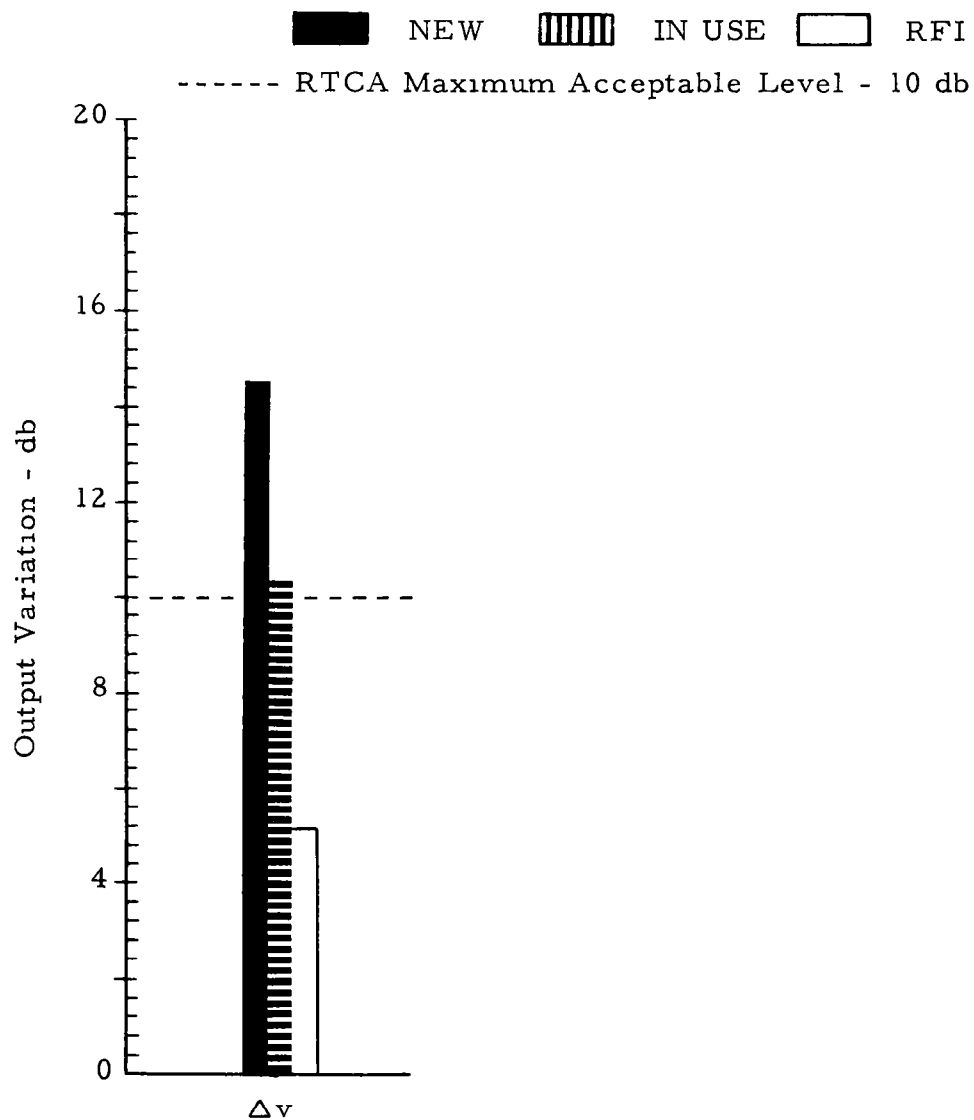
3. Negative percentage values indicate the amount the adverse maximum limit (100%) has been exceeded.



WEIGHTED PERFORMANCE - VHF RECEIVER - VR-6



AUDIO FREQUENCY RESPONSE - VHF RECEIVER - VR-6



AVC CHARACTERISTICS

VHF Receiver: VR-6
 Project DANCE
 BRD-60, Task-2, 1b(5)
 RTCA Paper 87-55/DO-64,
 Para 2.2

LEGEND

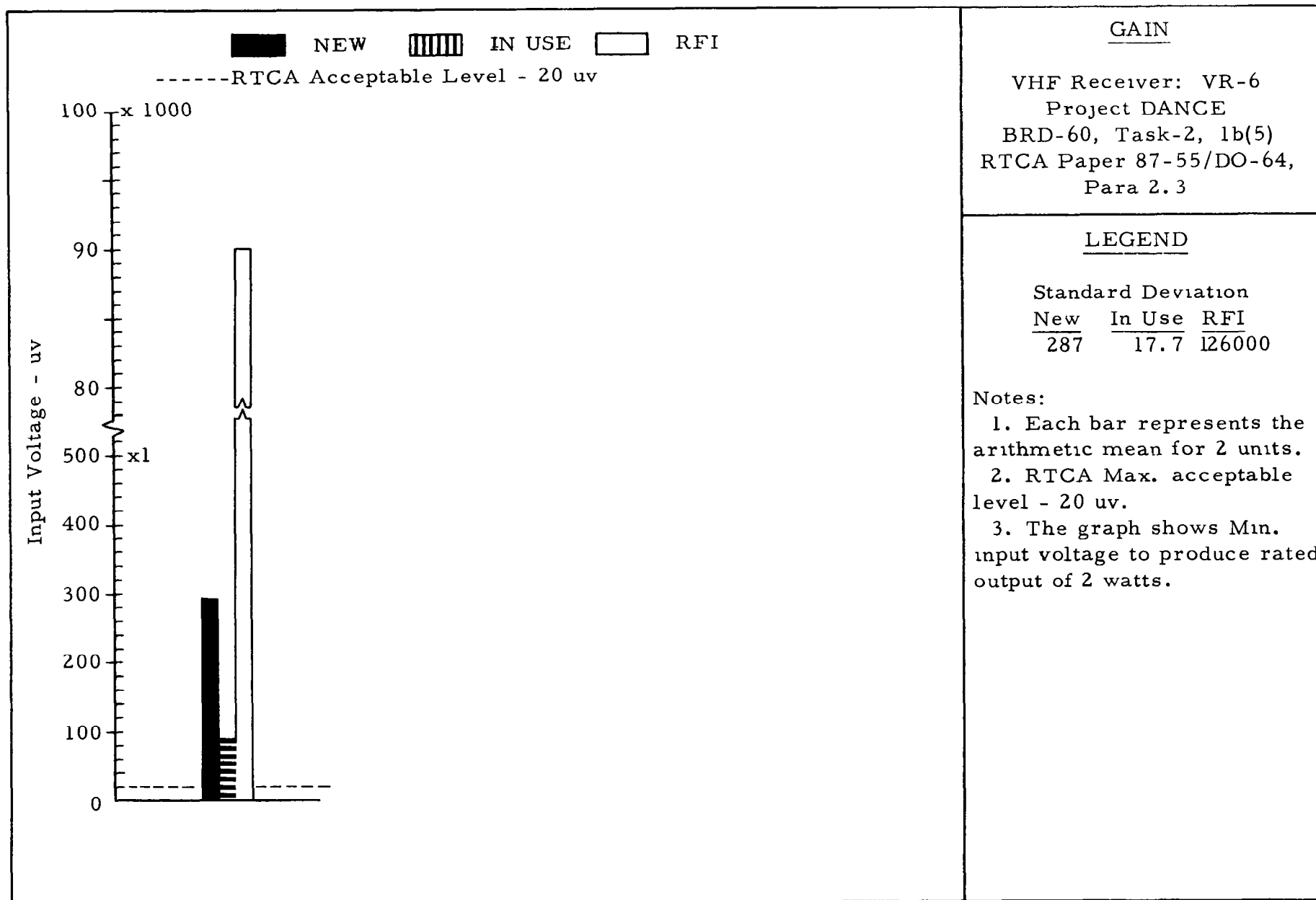
RF Input
 Δv - 10 - 20,000 uv

Standard Deviation

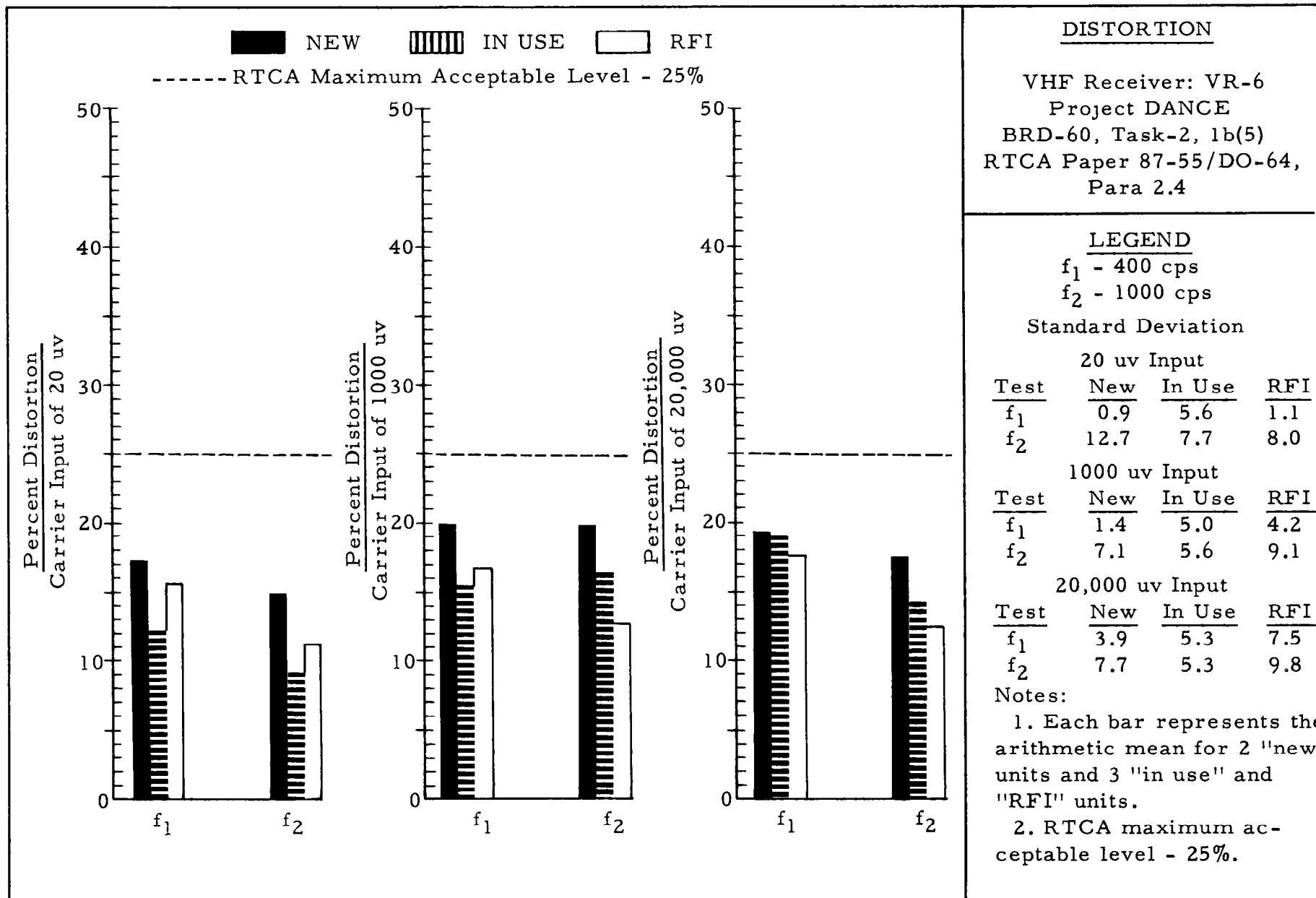
New	In Use	RFI
15.8	8.2	1.5

Notes:

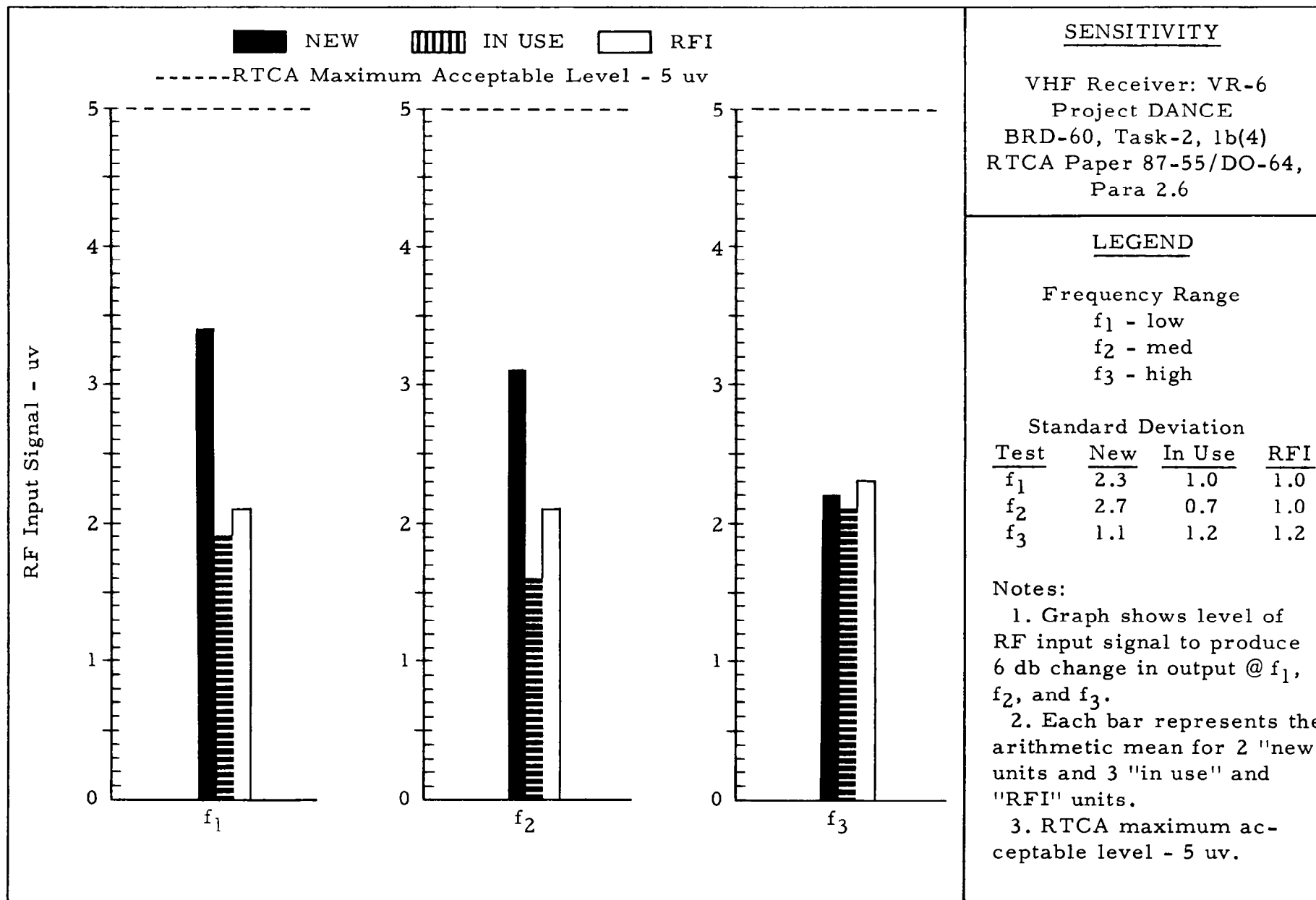
- Each bar represents the arithmetic mean for 2 "New" units; represents the arithmetic mean for 3 "In Use" and 3 "RFI" units.
- RTCA maximum acceptable variation - 10 db.



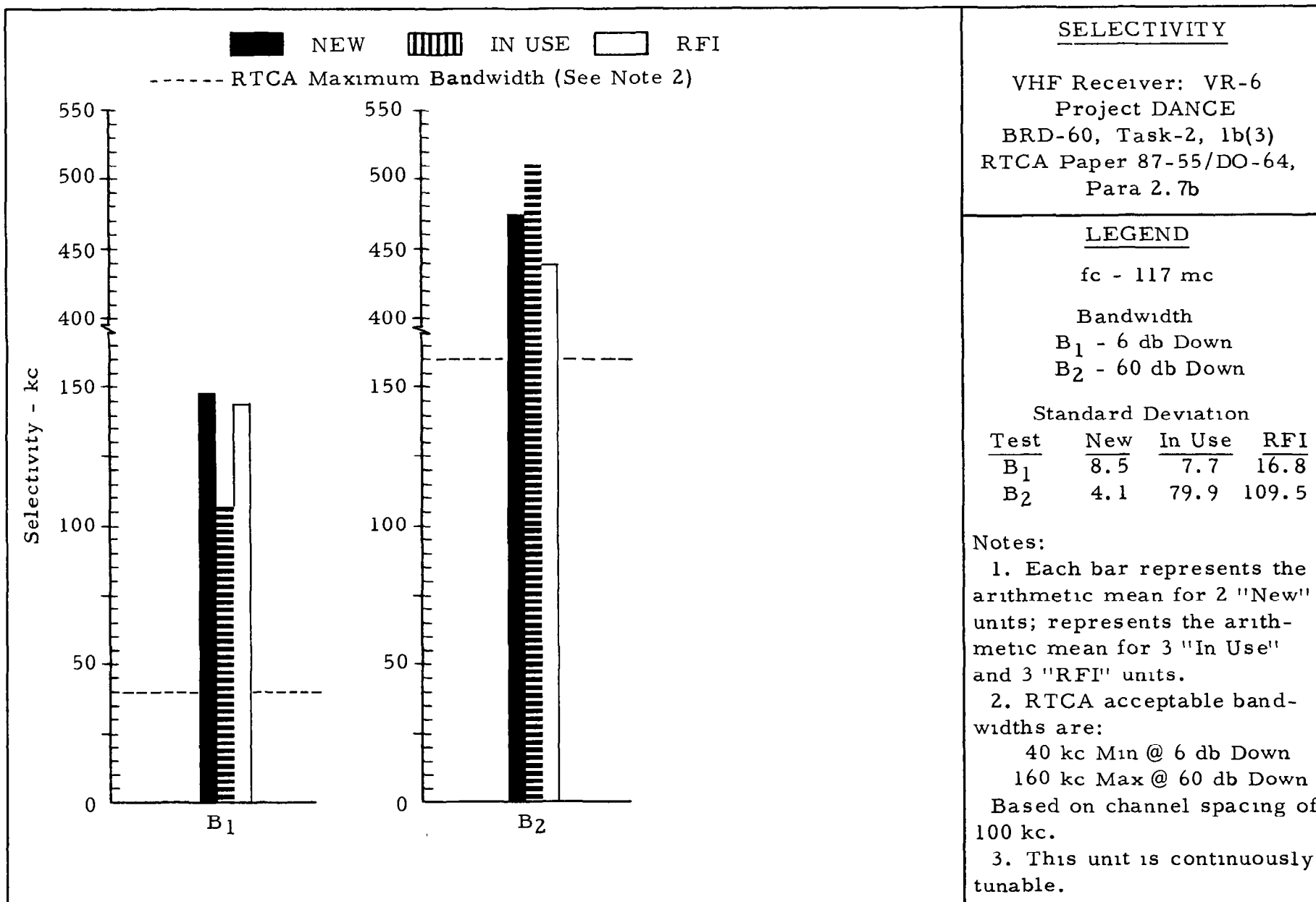
GAIN - VHF RECEIVER - VR-6



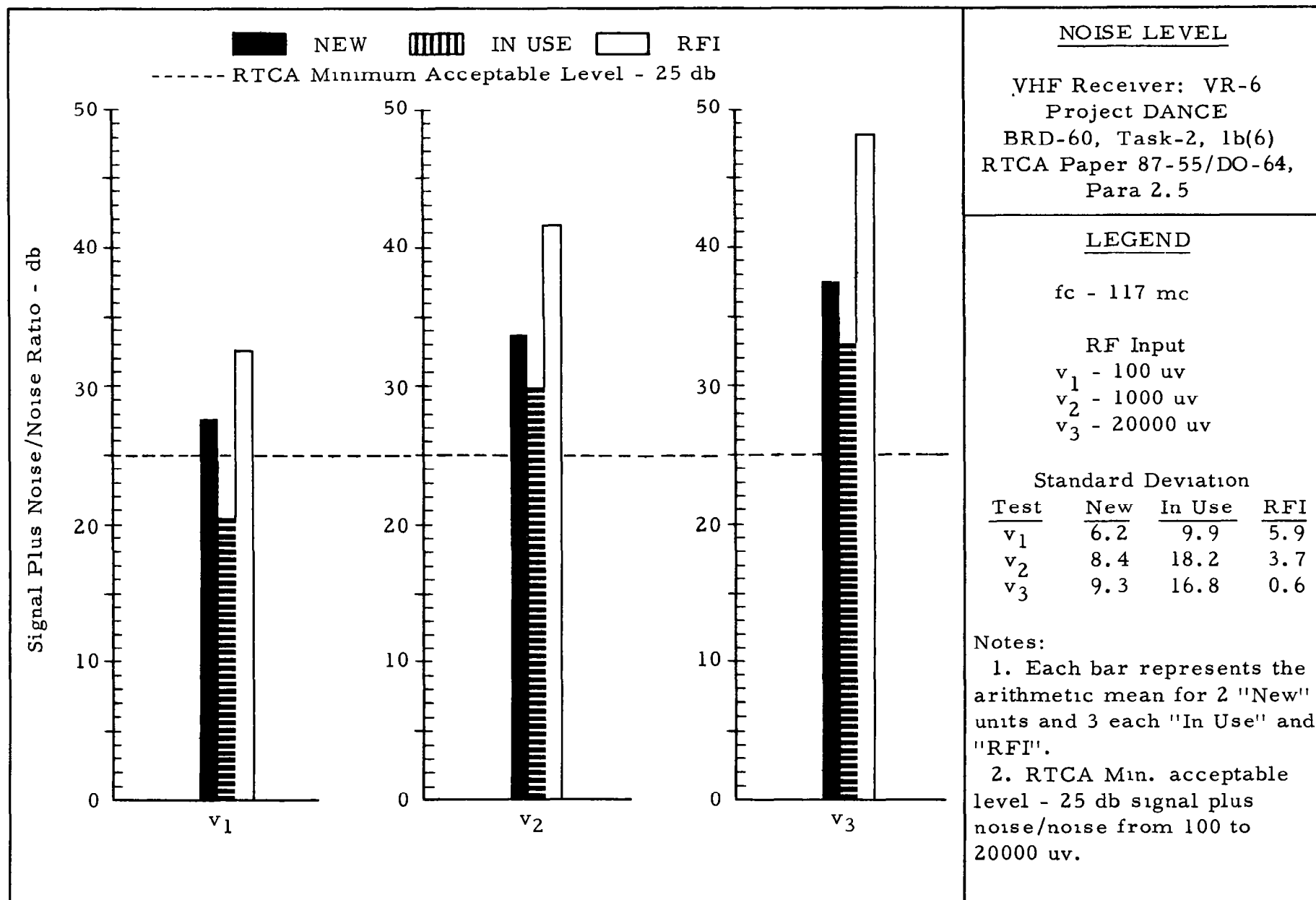
DISTORTION - VHF RECEIVER - VR-6



SENSITIVITY - VHF RECEIVER - VR-6



SELECTIVITY - VHF RECEIVER - VR-6



NOISE LEVEL - VHF RECEIVER - VR-6

INTERFERENCE TESTS

VHF Receiver: VR-6
 Project DANCE
 BRD-60. Task-2
 RTCA Paper 87-55/DO-64

Test	Frequency (mc)	F_c (mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Spurious Response</u> Contract Para: 1.b.(9) RTCA Para: 2.8(b)	.19 to 940	126.0	Acceptable level excluding band within $F_c \pm 80$ kc: ≥ 60 db.	Actual Level: < 60 db at $F_c \pm 80$ kc. ≤ 60 db between $F_c + 80$ kc, $F_c + 199$ kc and between $F_c - 80$ kc and $F_c - 268$ kc. Also, < 60 db at: 15.5, 16.5, 16.6, 18.5, 49.5, 74.5, 144, 149, 265, 287, 404, 425, 538, and 560 mc. All other frequencies within performance standards.	No
<u>Desensitization</u> Contract Para: 1.b.(7) RTCA Para: 2.10(b)	108 to 126	126.0	Acceptable level excluding band within $F_c \pm 100$ kc: ≤ 8 db.	Actual Level: > 8 db at $F_c \pm 100$ kc. ≥ 8 db between $F_c - 100$ kc and $F_c - 169$ kc and between $F_c + 100$ kc and $F_c + 134$ kc. All other frequencies within performance standards.	Partially
<u>Cross Modulation</u> Contract Para: 1.b.(7) RTCA Para: 2.9(b)	$F_c \pm 100$ kc $F_c \pm 200$ kc	23.107	Acceptable Level: ≥ 10 db.	Actual Level: > 10 db at $F_c + 100$ kc. < 10 db at $F_c - 100$ kc. and $F_c \pm 200$ kc. Note: Reference power used was available power (.7 watts)	Partially

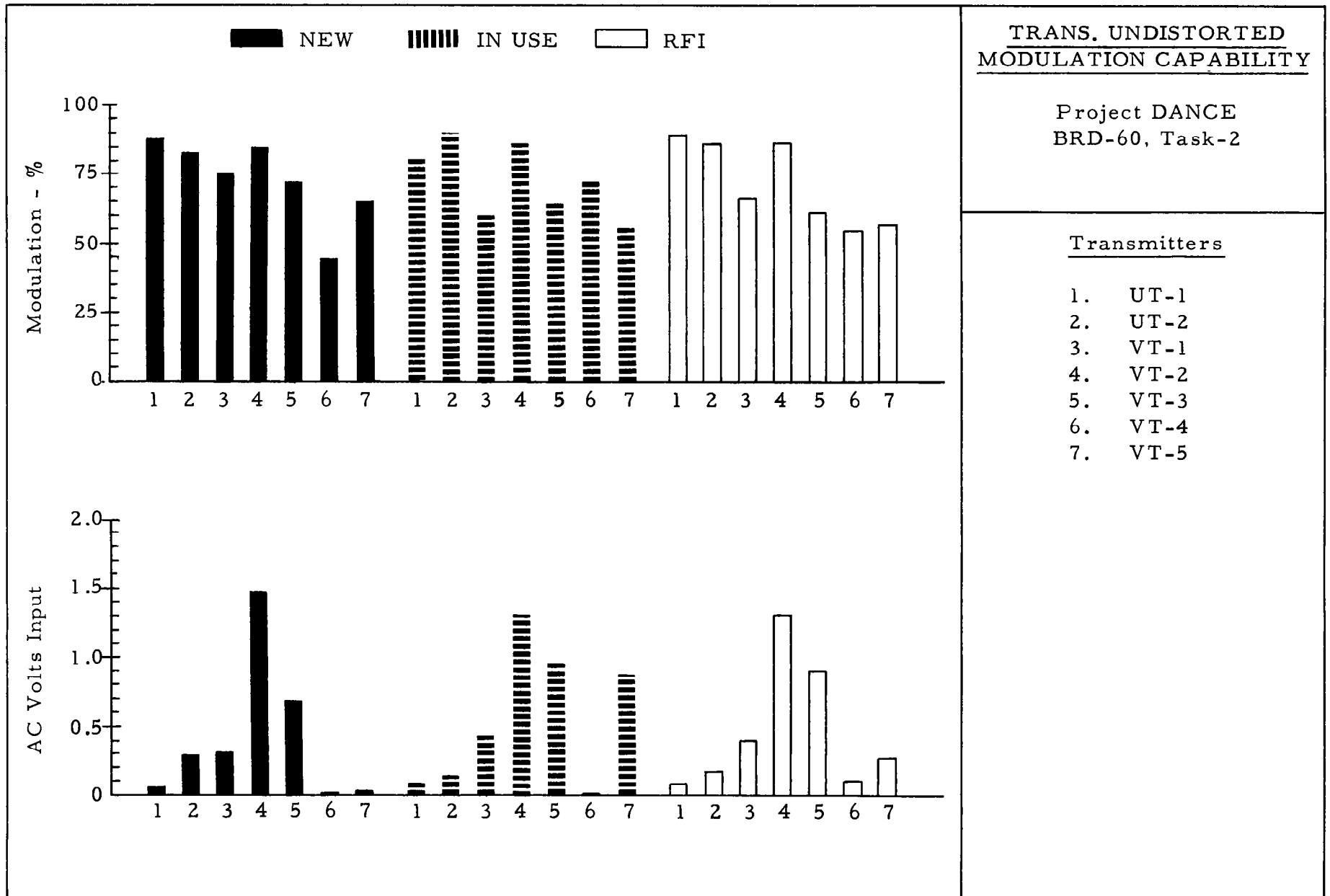
INTERFERENCE TESTS - VHF RECEIVER - VR-6

Test	Frequency (mc)	F _c (mc)	RTCA Performance Standards	Results	Performance Standards Met
<u>Cross Modulation</u>				(cont'd) at $F_c \pm 100$ kc and not rated power. Rated power could not be obtained with performance standards voltage level. Rated power (20 watts) was obtained at $F_c \pm 200$ kc.	
<u>Cable Conducted Interference</u> Contract Para:1.b.(8) RTCA Para:2.11(a)	.15 to 25	126.0	Acceptable Emission: ≤ 200 microvolts.	Actual emission on +28v line: $F_c = 126 < 200$ microvolts. All frequencies within performance standards.	Yes
<u>Antenna Conducted Interference</u> Contract Para:1.b.(8) RTCA Para:2.11(b)	.15 to 1500	126.0	Acceptable Emission: ≤ 400 micro-microwatts.	Actual Emission: ≤ 400 micro-microwatts except at: 136, 260, 275, 415, 555, and 692 mc. All other frequencies within performance standards.	Partially

Test	Contract Para.	F _c (mc)	Probable Susceptibility	Relation to Frequency Synthesis
Susceptibility to Radar Type Signals.	1.b.(7)	126.0		The following lists the relationship between a radar type signal and the receiver oscillator frequency which will produce a spurious output which will be near the intermediate

INTERFERENCE TESTS - VHF RECEIVER - VR-6

Test	Contract Para.	F _c (mc)	Probable Susceptibility	Relation to Frequency Synthesis
				(cont'd)
				frequency (10.7 mc) or the image frequency (147.4 mc) of the receiver, or the receiver frequency (126 mc).
				Inter-
			Radar Type Signal (mc)	Radar Type Signal (Harmonic) Receiver Oscillator Freq. (Harmonic) Inter-mediate Freq. (mc) Image Freq. (mc)
			100.0	4 th 4 th 146.6
			106.0	4 th 3 rd 13.9
			112.0	6 th 5 th 11.5
			116.5	6 th 4 th 152.2
			130.0	2 nd 3 rd 150.1
			187.0	3 rd 3 rd 151.0
			210.0	2 nd 2 nd 146.6
			260.0	1 st 2 nd 13.4
			283.0	1 st 2 nd 9.6
			337.0	2 nd 4 th
			348.0	2 nd 4 th 149.2
			485.0	2 nd 6 th 148.9
			560.0	1 st 3 rd 149.1
			113.0	No relation to Frequency Synthesis
			119.5	No relation to Frequency Synthesis
			160.0	No relation to Frequency Synthesis
			200.0	No relation to Frequency Synthesis
			245.0	No relation to Frequency Synthesis
			400.0	No relation to Frequency Synthesis



Transmitters

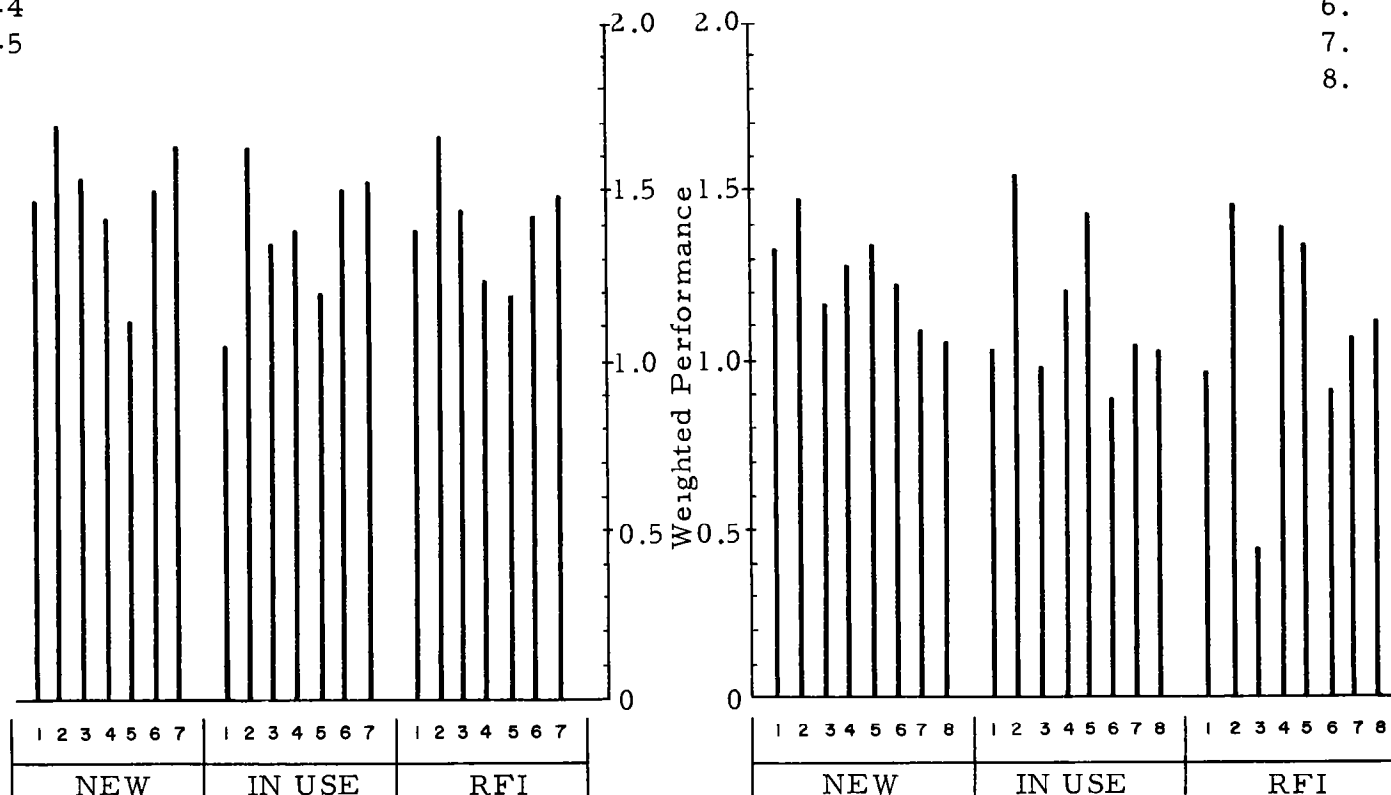
1. UT-1
2. UT-2
3. VT-1
4. VT-2
- *5. VT-3
- *6. VT-4
- *7. VT-5

COMMUNICATION EQUIPMENT
WEIGHTED PERFORMANCE

Project DANCE
BRD-60, TASK-2

Receivers

1. UR-1
2. UR-2
3. VR-1
4. VR-2
5. VR-3
6. VR-4
7. VR-5
8. VR-6



NOTE: Asterisk (*) denotes weighting factor restricted. See applicable weighted performance graph.

COMMUNICATION EQUIPMENT WEIGHTED PERFORMANCE

SECTION B

AIRBORNE COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 2)

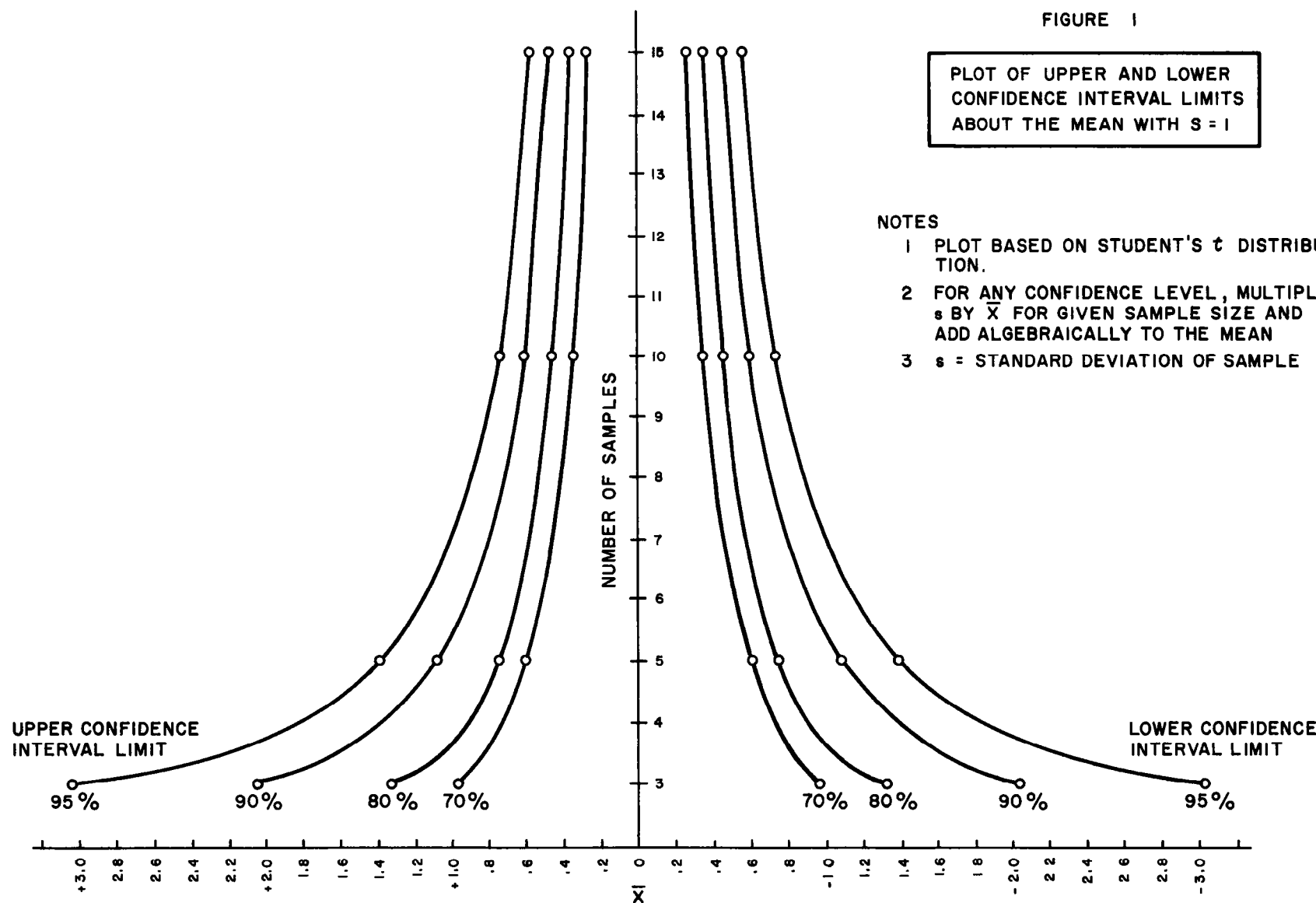
<u>Sub-Section</u>	<u>Page</u>
7. Tables	B-205-267
a. Confidence Limit Intervals For Communication Equip- ments. (Table 1)	B-206-263
b. Facility Maintenance Information. (Table 2)	B-265-267

FIGURE 1

PLOT OF UPPER AND LOWER
CONFIDENCE INTERVAL LIMITS
ABOUT THE MEAN WITH $S = 1$

NOTES

- 1 PLOT BASED ON STUDENT'S t DISTRIBUTION.
- 2 FOR ANY CONFIDENCE LEVEL, MULTIPLY s BY \bar{X} FOR GIVEN SAMPLE SIZE AND ADD ALGEBRAICALLY TO THE MEAN
- 3 s = STANDARD DEVIATION OF SAMPLE



PLOT OF CONFIDENCE INTERVAL LIMITS

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Carrier Power Output (Watts) Page B-24								
f1 (New)	12.2	2.5	2.04	5.1	1.34	3.4	1.0	2.5
f1 (In Use)	9.5	2.0	2.04	4.1	1.34	2.7	1.0	2.0
f1 (RFI)	10.1	3.3	2.04	6.7	1.34	4.4	1.0	3.3
f2 (New)	19.7	2.5	2.04	5.1	1.34	3.4	1.0	2.5
f2 (In Use)	17.0	7.2	2.04	15.0	1.34	9.7	1.0	7.2
f2 (RFI)	17.4	1.5	2.04	3.1	1.34	2.1	1.0	1.3
f3 (New)	14.2	0.7	2.04	1.5	1.34	.9	1.0	0.7
f3 (In Use)	9.7	4.2	2.04	8.6	1.34	5.6	1.0	4.2
f3 (RFI)	13.1	2.6	2.04	5.3	1.34	3.5	1.0	2.6
Channel Accuracy (Frequency Deviation-kc) Page B-25								
f1 (New)	- 5.7	20.5	2.04	42.0	1.34	27.5	1.0	20.5
f1 (In Use)	-14.2	5.5	2.04	11.4	1.34	7.4	1.0	5.5
f1 (RFI)	- 5.9	13.0	2.04	26.6	1.34	17.4	1.0	13.0
f2 (New)	4.4	10.7	2.04	21.8	1.34	14.3	1.0	10.7
f2 (In Use)	-18.5	5.2	2.04	10.8	1.34	7.0	1.0	5.2
f2 (RFI)	- 5.5	20.0	2.04	40.8	1.34	26.9	1.0	20.0
f3 (New)	5.5	13.1	2.04	26.7	1.34	17.6	1.0	13.1
f3 (In Use)	-20.8	4.1	2.04	8.4	1.34	5.5	1.0	4.1
f3 (RFI)	- 7.9	25.5	2.04	52.0	1.34	34.2	1.0	25.5

CONFIDENCE LIMIT INTERVALS - UHF TRANSMITTER - UT-1

[illegible]

CONFIDENCE LIMIT INTERVALS - UHF TRANSMITTER - UT-1

CONFIDENCE LIMIT INTERVALS - UHF TRANSMITTER - UT-1

CONFIDENCE LIMIT INTERVALS - UHF TRANSMITTER - UT-2

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Channel Accuracy (Frequency Deviation-kc) Page B-37								
f1 (New)	5.70	4.00	2.04	8.2	1.34	5.4	1.0	4.0
f1 (In Use)	-0.50	0.42	2.04	0.9	1.34	0.6	1.0	0.4
f1 (RFI)	-0.50	0.64	2.04	1.3	1.34	0.9	1.0	0.6
f2 (New)	2.45	0.20	2.04	0.4	1.34	0.3	1.0	0.2
f2 (In Use)	0.40	0.98	2.04	2.0	1.34	1.3	1.0	1.0
f2 (RFI)	0.50	1.50	2.04	3.1	1.34	2.0	1.0	1.5
f3 (New)	0.55	2.40	2.04	4.9	1.34	3.7	1.0	2.4
f3 (In Use)	1.55	8.60	-----	--Only	Two	Samples	Tested--	-----
f3 (RFI)	0.25	0.28	-----	--Only	Two	Samples	Tested--	-----
Audio Frequency Distortion (Percent) Page B-40								
f1 (New)	4.9	3.8	2.04	7.75	1.34	5.20	1.0	3.8
f1 (In Use)	4.8	2.4	2.04	4.90	1.34	3.20	1.0	2.4
f1 (RFI)	6.6	2.1	2.04	4.30	1.34	2.80	1.0	2.1
f2 (New)	4.4	3.1	2.04	6.30	1.34	4.10	1.0	3.1
f2 (In Use)	3.5	0.7	2.04	1.40	1.34	0.94	1.0	0.7
f2 (RFI)	4.8	2.0	2.04	4.10	1.34	2.70	1.0	2.0
f3 (New)	3.8	2.9	2.04	5.90	1.34	3.90	1.0	2.9
f3 (In Use)	4.0	1.6	2.04	3.30	1.34	2.10	1.0	1.6
f3 (RFI)	4.7	1.9	2.04	3.90	1.34	2.50	1.0	1.9

CONFIDENCE LIMIT INTERVALS - UHF TRANSMITTER - UT-2

[illegible]

CONFIDENCE LIMIT INTERVALS - UHF TRANSMITTER - UT-2

[illegible]

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Distortion (20 uv input) (Percent) Page B-51								
f1 (New)	17.2	1.89	2.04	3.86	1.34	2.53	1.0	1.89
f1 (In Use)	17.7	3.78	2.04	7.75	1.34	5.07	1.0	3.78
f1 (RFI)	14.6	7.70	2.04	15.73	1.34	10.30	1.0	7.70
f2 (New)	17.8	2.25	2.04	4.60	1.34	3.02	1.0	2.25
f2 (In Use)	18.4	4.62	2.04	9.50	1.34	6.20	1.0	4.62
f2 (RFI)	16.3	4.54	2.04	9.30	1.34	6.10	1.0	4.54
Distortion (1000 uv input) (Percent) Page B-51								
f1 (New)	19.8	1.75	2.04	3.58	1.34	2.34	1.0	1.75
f1 (In Use)	20.2	3.88	2.04	7.95	1.34	5.20	1.0	3.88
f1 (RFI)	13.9	4.47	2.04	9.15	1.34	6.00	1.0	4.47
f2 (New)	17.0	5.10	2.04	10.41	1.34	6.85	1.0	5.10
f2 (In Use)	20.9	4.53	2.04	9.30	1.34	6.06	1.0	4.53
f2 (RFI)	14.5	3.91	2.04	7.80	1.34	5.25	1.0	3.91
Distortion (20000 uv input) (Percent) Page B-51								
f1 (New)	20.0	1.00	2.04	2.04	1.34	1.34	1.0	1.00
f1 (In Use)	22.0	4.36	2.04	8.92	1.34	5.85	1.0	4.36
f1 (RFI)	14.2	4.25	2.04	8.70	1.34	5.70	1.0	4.25
f2 (New)	20.6	2.52	2.04	5.17	1.34	3.38	1.0	2.52
f2 (In Use)	21.5	3.97	2.04	8.15	1.34	5.32	1.0	3.97
f2 (RFI)	14.7	4.25	2.04	8.70	1.34	5.70	1.0	4.25

CONFIDENCE LIMIT INTERVALS - UHF RECEIVER - UR-1

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Sensitivity (RF Input-uv) Page B-52								
f1 (New)	4.5	0.50	2.04	1.02	1.34	0.67	1.0	0.50
f1 (In Use)	5.9	1.50	2.04	3.06	1.34	2.01	1.0	1.50
f1 (RFI)	13.4	9.41	2.04	19.20	1.34	12.60	1.0	9.41
f2 (New)	3.6	0.29	2.04	0.59	1.34	0.39	1.0	0.29
f2 (In Use)	5.2	1.56	2.04	3.19	1.34	2.09	1.0	1.56
f2 (RFI)	5.4	0.27	2.04	0.55	1.34	0.36	1.0	0.27
f3 (New)	5.4	1.04	2.04	2.12	1.34	1.39	1.0	1.04
f3 (In Use)	14.4	4.54	2.04	9.26	1.34	6.10	1.0	4.54
f3 (RFI)	19.6	11.50	2.04	23.45	1.34	15.40	1.0	11.50
Selectivity (Bandwidth-kc) Page B-53								
b1 (New)	79.0	25.5	2.04	52.0	1.34	34.2	1.0	25.5
b1 (In Use)	101.0	16.0	2.04	32.6	1.34	21.5	1.0	16.0
b1 (RFI)	92.0	12.7	2.04	25.9	1.34	17.0	1.0	12.7
b2 (New)	250.0	7.8	2.04	15.9	1.34	10.5	1.0	7.8
b2 (In Use)	275.0	26.0	2.04	53.0	1.34	34.9	1.0	26.0
b2 (RFI)	260.0	20.5	2.04	41.6	1.34	27.5	1.0	20.5
Channel Selection Time (Seconds) Page B-54								
(New)	5.0	0.00	2.04	0.00	1.34	0.00	1.0	0.00
(In Use)	5.0	0.00	2.04	0.00	1.34	0.00	1.0	0.00
(RFI)	4.7	0.53	2.04	1.08	1.34	0.71	1.0	0.53
End of tabulation - UR-1								

[illegible]

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Distortion (20 uv input) (Percent) Page B-65								
f1 (New)	10.6	1.2	2.04	2.45	1.34	1.61	1.0	1.2
f1 (In Use)	13.5	4.5	2.04	9.20	1.34	6.10	1.0	4.5
f1 (RFI)	12.0	3.2	2.04	6.50	1.34	4.30	1.0	3.2
f2 (New)	11.4	0.8	2.04	1.60	1.34	1.07	1.0	0.8
f2 (In Use)	8.8	4.1	2.04	8.40	1.34	5.50	1.0	4.1
f2 (RFI)	11.1	2.3	2.04	4.70	1.34	3.10	1.0	2.3
Distortion (1000 uv input) (Percent) Page B-65								
f1 (New)	11.4	1.7	2.04	3.46	1.34	2.28	1.0	1.7
f1 (In Use)	8.9	3.2	2.04	6.50	1.34	4.30	1.0	3.2
f1 (RFI)	11.1	2.9	2.04	5.90	1.34	3.90	1.0	2.9
f2 (New)	9.5	1.3	2.04	2.70	1.34	1.74	1.0	1.3
f2 (In Use)	7.6	2.5	2.04	5.10	1.34	3.35	1.0	2.5
f2 (RFI)	8.9	5.2	2.04	10.60	1.34	7.00	1.0	5.2
Distortion (20000 uv input) (Percent) Page B-65								
f1 (New)	13.0	1.8	2.04	3.70	1.34	2.40	1.0	1.8
f1 (In Use)	8.2	2.9	2.04	5.90	1.34	3.90	1.0	2.9
f1 (RFI)	11.6	4.4	2.04	9.00	1.34	5.90	1.0	4.4
f2 (New)	9.2	1.0	2.04	2.04	1.34	1.34	1.0	1.0
f2 (In Use)	7.8	2.6	2.04	5.30	1.34	3.50	1.0	2.6
f2 (RFI)	9.2	4.9	2.04	10.00	1.34	6.60	1.0	4.9

CONFIDENCE LIMIT INTERVALS - UHF RECEIVER - UR-2

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Sensitivity (RF Input-uv) Page B-66								
f1 (New)	2.6	0.26	2.04	0.53	1.34	.35	1.0	0.26
f1 (In Use)	2.3	1.38	2.04	2.80	1.34	1.80	1.0	1.38
f1 (RFI)	2.1	0.52	2.04	1.06	1.34	0.70	1.0	0.52
f2 (New)	2.1	0.35	2.04	0.71	1.34	0.47	1.0	0.35
f2 (In Use)	2.1	0.26	2.04	0.53	1.34	0.35	1.0	0.26
f2 (RFI)	2.1	0.38	2.04	0.76	1.34	0.52	1.0	0.38
f3 (New)	2.1	0.46	2.04	0.94	1.34	0.61	1.0	0.46
f3 (In Use)	2.3	0.59	2.04	1.20	1.34	0.78	1.0	0.59
f3 (RFI)	2.5	0.42	2.04	0.86	1.34	0.56	1.0	0.42
Selectivity (Bandwidth kc) Page B-67								
b1 (New)	51.0	3.79	2.04	7.7	1.34	4.9	1.0	3.79
b1 (In Use)	34.0	16.60	2.04	33.8	1.34	22.0	1.0	16.60
b1 (RFI)	52.0	10.90	2.04	22.2	1.34	14.4	1.0	10.90
b2 (New)	107.0	26.00	2.04	53.0	1.34	34.5	1.0	26.00
b2 (In Use)	71.0	22.70	2.04	46.3	1.34	30.2	1.0	22.70
b2 (RFI)	187.0	104.00	2.04	220.0	1.34	132.5	1.0	104.00
Channel Selection Time (Seconds) Page B-68								
(New)	4.0	0.0	2.04	0.00	1.34	.00	1.0	0.0
(In Use)	4.0	0.0	2.04	0.00	1.34	.00	1.0	0.0
(RFI)	4.5	0.5	2.04	1.02	1.34	.67	1.0	0.5
End of tabulation - UR-2								

CONFIDENCE LIMIT INTERVALS - UHF RECEIVER - UR-2

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Carrier Power Output (Watts) Page B-76								
f1 (New)	30.3	1.5	2.04	3.06	1.34	2.01	1.0	1.5
f1 (In Use)	27.8	2.5	2.04	5.10	1.34	3.36	1.0	2.5
f1 (RFI)	25.0	2.0	2.04	4.08	1.34	2.69	1.0	2.0
f2 (New)	32.9	2.2	2.04	4.50	1.34	2.96	1.0	2.2
f2 (In Use)	26.0	6.7	2.04	13.30	1.34	9.00	1.0	6.7
f2 (RFI)	31.2	3.5	2.04	7.13	1.34	4.70	1.0	3.5
f3 (New)	30.6	0.8	2.04	1.63	1.34	1.07	1.0	0.8
f3 (In Use)	25.7	1.5	2.04	3.06	1.34	2.01	1.0	1.5
f3 (RFI)	21.2	4.2	2.04	8.58	1.34	5.64	1.0	4.2
Channel Accuracy (Frequency Deviation-kc) Page B-77								
f1 (New)	0.07	0.48	2.04	0.98	1.34	0.64	1.0	0.48
f1 (In Use)	-1.98	2.30	2.04	4.70	1.34	3.10	1.0	2.30
f1 (RFI)	-0.13	5.30	2.04	10.80	1.34	7.12	1.0	5.30
f2 (New)	-1.00	0.69	2.04	1.40	1.34	0.93	1.0	0.69
f2 (In Use)	-1.72	0.64	2.04	1.30	1.34	0.86	1.0	0.64
f2 (RFI)	0.05	2.50	2.04	5.10	1.34	3.36	1.0	2.50
f3 (New)	-0.77	1.60	2.04	3.26	1.34	2.15	1.0	1.60
f3 (In Use)	-3.02	6.10	2.04	12.40	1.34	8.20	1.0	6.10
f3 (RFI)	0.40	5.20	2.04	10.60	1.34	7.00	1.0	5.20

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-1

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Modulation Capability (Percent) Page B-78								
v1 (New)	50.5	0.6	2.04	1.22	1.34	0.81	1.0	0.6
v1 (In Use)	41.2	13.3	2.04	27.10	1.34	17.84	1.0	13.3
v1 (RFI)	52.5	22.1	2.04	45.00	1.34	29.60	1.0	22.1
v3 (New)	75.2	3.0	2.04	6.12	1.34	4.03	1.0	3.0
v3 (In Use)	60.8	8.3	2.04	16.90	1.34	11.10	1.0	8.3
v3 (RFI)	65.2	8.4	2.04	17.10	1.34	11.25	1.0	8.4
Audio Frequency Response (Modulation Deviation-db) Page B-79								
(New)	1.07	0.4	2.04	0.82	1.34	0.54	1.0	0.4
(In Use)	2.86	1.7	2.04	3.46	1.34	2.28	1.0	1.7
(RFI)	2.23	1.2	2.04	2.45	1.34	1.61	1.0	1.2
Audio Frequency Response (Sidetone Output-db) Page B-79								
(New)	2.43	0.6	2.04	1.22	1.34	0.81	1.0	0.6
(In Use)	4.49	1.1	2.04	2.24	1.34	1.48	1.0	1.1
(RFI)	3.92	0.7	2.04	1.43	1.34	0.94	1.0	0.7

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-1

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-1

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Carrier Power Output (Watts) Page B-88								
f1 (New)	5.6	3.66	2.04	7.47	1.34	4.90	1.00	3.66
f1 (In Use)	5.9	1.88	2.04	3.83	1.34	2.52	1.00	1.88
f1 (RFI)	5.4	0.36	2.04	0.73	1.34	0.48	1.00	0.36
f2 (New)	8.4	0.37	2.04	0.75	1.34	0.50	1.00	0.37
f2 (In Use)	7.5	2.60	2.04	5.30	1.34	3.48	1.00	2.60
f2 (RFI)	6.7	1.58	2.04	3.22	1.34	2.12	1.00	1.58
f3 (New)	7.7	0.62	2.04	1.26	1.34	0.83	1.00	0.62
f3 (In Use)	7.4	1.69	2.04	3.45	1.34	2.27	1.00	1.69
f3 (RFI)	7.6	0.41	2.04	0.84	1.34	0.55	1.00	0.41
Modulation Capability (Percent) Page B-90								
v1 (New)	52.7	8.00	2.04	16.90	1.34	10.70	1.00	8.00
v1 (In Use)	54.0	1.00	-----	Only	Two	Samples	Tested--	-----
v1 (RFI)	48.0	1.00	2.04	2.04	1.34	1.34	1.00	1.00
v2 (New)	73.7	10.30	2.04	21.00	1.34	13.80	1.00	10.30
v2 (In Use)	74.0	2.20	-----	Only	Two	Samples	Tested--	-----
v2 (RFI)	69.0	1.41	2.04	2.87	1.34	1.89	1.00	1.41
v3 (New)	83.7	7.70	2.04	15.70	1.34	10.30	1.00	7.70
v3 (In Use)	86.0	3.00	2.04	6.12	1.34	4.02	1.00	3.00
v3 (RFI)	84.0	3.00	2.04	6.12	1.34	4.02	1.00	3.00

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-2

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val	Limits
Audio Frequency Response (Modulation Deviation-db) Page B-91								
(New)	.47	.073	2.04	.149	1.34	.098	1.00	.073
(In Use)	.30	.230	2.04	.468	1.34	.308	1.00	.230
(RFI)	.59	.365	2.04	.745	1.34	.488	1.00	.365
Audio Frequency Response (Sidetone Output-db) Page B-91								
(New)	.48	.242	2.04	.493	1.34	.324	1.00	.242
(In Use)	.47	.099	2.04	.202	1.34	.133	1.00	.099
(RFI)	.70	.326	2.04	.665	1.34	.437	1.00	.326
Channel Accuracy (Frequency Deviation-kc) Page B-89								
f1 (New)	6.00	7.07	2.04	14.40	1.34	9.48	1.00	7.07
f1 (In Use)	-2.50	7.85	2.04	16.00	1.34	10.50	1.00	7.85
f1 (RFI)	7.36	3.09	2.04	6.30	1.34	4.14	1.00	3.09
f2 (New)	-5.40	15.20	2.04	31.00	1.34	20.35	1.00	15.20
f2 (In Use)	7.00	5.66	2.04	11.55	1.34	7.60	1.00	5.66
f2 (RFI)	7.70	2.07	2.04	4.22	1.34	2.77	1.00	2.07
f3 (New)	7.30	6.71	2.04	13.70	1.34	9.00	1.00	6.71
f3 (In Use)	15.80	5.54	2.04	11.30	1.34	7.42	1.00	5.54
f3 (RFI)	-17.70	6.45	2.04	13.15	1.34	8.65	1.00	6.45

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-2

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Audio Frequency Distortion (Percent) Page B-92								
f1 (New)	3.4	1.86	2.04	3.80	1.34	2.49	1.00	1.86
f1 (In Use)	3.6	1.28	2.04	2.61	1.34	1.72	1.00	1.28
f1 (RFI)	6.1	1.68	2.04	3.43	1.34	2.25	1.00	1.68
f2 (New)	3.3	1.40	2.04	2.86	1.34	1.88	1.00	1.40
f2 (In Use)	3.3	1.40	2.04	2.86	1.34	1.88	1.00	1.40
f2 (RFI)	5.7	1.64	2.04	3.35	1.34	2.20	1.00	1.64
f3 (New)	4.2	1.58	2.04	3.22	1.34	2.11	1.00	1.58
f3 (In Use)	4.0	1.40	2.04	2.86	1.34	1.88	1.00	1.40
f3 (RFI)	6.9	0.72	2.04	1.47	1.34	0.97	1.00	0.72
Channel Selection Time (Seconds) Page B-93								
(New)	3.7	.58	2.04	1.18	1.34	0.77	1.00	0.58
(In Use)	4.0	.00	2.04	0.00	1.34	0.00	1.00	0.00
(RFI)	4.0	.00	2.04	0.00	1.34	0.00	1.00	0.00
Carrier Noise Level (Noise/Audio-db) Page B-94								
(New)	-54.0	2.20	2.04	4.5	1.34	2.95	1.00	2.20
(In Use)	35.0	1.51	2.04	3.4	1.34	2.02	1.00	1.51
(RFI)	39.2	7.02	2.04	14.3	1.34	9.40	1.00	7.02

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-2

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Carrier Power Output (Watts) Page B-100								
f1 (New)	1.24	.21	2.04	.430	1.34	.280	1.0	.21
f1 (In Use)	1.60	.12	2.04	.245	1.34	.162	1.0	.12
f1 (RFI)	1.70	.26	2.04	.530	1.34	.350	1.0	.26
f2 (New)	1.24	.36	2.04	.735	1.34	.480	1.0	.36
f2 (In Use)	1.70	.10	2.04	.200	1.34	.130	1.0	.10
f2 (RFI)	1.80	.26	2.04	.530	1.34	.350	1.0	.26
f3 (New)	1.36	.42	2.04	.860	1.34	.560	1.0	.42
f3 (In Use)	1.60	.57	2.04	1.160	1.34	.760	1.0	.57
f3 (RFI)	1.20	.95	2.04	1.940	1.34	1.270	1.0	.95
Modulation Capability (Percent) Page B-101								
v1 (New)	71.3	9.82	2.04	20.0	1.34	13.20	1.0	9.82
v1 (In Use)	63.0	0.00	2.04	00.0	1.34	00.00	1.0	0.00
v1 (RFI)	59.7	6.11	2.04	12.4	1.34	8.05	1.0	6.11
Audio Frequency Response (Modulation Deviation-db) Page B-102								
(New)	.37	.404	2.04	.82	1.34	.54	1.0	.40
(In Use)	.49	.031	2.04	.06	1.34	.04	1.0	.03
(RFI)	.94	.933	-----Only		Two	Samples	Tested--	-----

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Audio Frequency Response (Sidetone Output-db) Page B-102								
(New)	.67	.58	2.04	1.20	1.34	.78	1.0	.58
(In Use)	.63	.45	2.04	.92	1.34	.60	1.0	.45
(RFI)	.36	.26	-----	Only	Two	Samples	Tested	-----
Audio Frequency Distortion (Percent) Page B-103								
f1 (New)	8.4	1.86	2.04	3.800	1.34	2.490	1.0	1.86
f1 (In Use)	9.4	1.34	2.04	2.700	1.34	1.500	1.0	1.39
f1 (RFI)	10.9	3.41	2.04	6.950	1.34	4.570	1.0	3.41
f2 (New)	7.7	2.97	2.04	6.050	1.34	3.980	1.0	2.97
f2 (In Use)	8.3	1.33	2.04	2.710	1.34	1.780	1.0	1.33
f2 (RFI)	6.8	3.26	2.04	6.650	1.34	4.370	1.0	3.26
f3 (New)	7.7	3.44	2.04	7.030	1.34	4.610	1.0	3.44
f3 (In Use)	7.2	.38	2.04	.775	1.34	.510	1.0	.38
f3 (RFI)	6.4	4.08	2.04	8.350	1.34	5.450	1.0	4.08
Carrier Noise Level (Noise/Audio-db) Page B-104								
(New)	56.8	9.4	2.04	19.4	1.34	12.6	1.0	9.4
(In Use)	36.9	10.4	2.04	21.2	1.34	13.9	1.0	10.4
(RFI)	61.3	12.4	2.04	25.3	1.34	16.6	1.0	12.4
End of Tabulation - VT-3	-----	-----	-----	-----	-----	-----	-----	-----

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-3

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CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-4

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-4

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Carrier Power Output (Watts) Page B-120								
f1 (New)	.57	.12	2.04	.244	1.34	.161	1.0	.12
f1 (In Use)	.34	.06	2.04	.122	1.34	.080	1.0	.06
f1 (RFI)	.39	.13	2.04	.265	1.34	.174	1.0	.13
f2 (New)	.75	.05	2.04	.102	1.34	.067	1.0	.05
f2 (In Use)	.37	.10	2.04	.200	1.34	.130	1.0	.10
f2 (RFI)	.41	.10	2.04	.200	1.34	.130	1.0	.10
f3 (New)	.92	.16	2.04	.327	1.34	.214	1.0	.16
f3 (In Use)	.44	.14	2.04	.286	1.34	.188	1.0	.14
f3 (RFI)	.48	.16	2.04	.327	1.34	.214	1.0	.16
Channel Accuracy (Frequency Deviation-kc) Page B-121								
f1 (New)	1.6	4.70	2.04	9.60	1.34	6.30	1.0	4.70
f1 (In Use)	.1	1.30	2.04	2.65	1.34	1.74	1.0	1.30
f1 (RFI)	1.9	.99	2.04	2.00	1.34	1.30	1.0	.99
f2 (New)	.5	1.90	2.04	3.88	1.34	2.54	1.0	1.90
f2 (In Use)	2.1	1.00	2.04	2.00	1.34	1.30	1.0	1.00
f2 (RFI)	3.8	1.50	2.04	3.06	1.34	2.01	1.0	1.50
f3 (New)	1.1	1.20	2.04	2.45	1.34	1.61	1.0	1.20
f3 (In Use)	1.0	4.80	2.04	9.80	1.34	6.42	1.0	4.80
f3 (RFI)	2.4	.93	2.04	1.89	1.34	1.24	1.0	.93

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Audio Frequency Response (Modulation Deviation-db) Page B-123								
(New)	2.45	1.3	2.04	2.65	1.34	1.74	1.0	1.3
(In Use)	2.28	1.8	2.04	3.68	1.34	2.41	1.0	1.8
(RFI)	2.71	1.7	2.04	3.47	1.34	2.28	1.0	1.7
Audio Frequency Response (Sidetone Output-db) Page B-123								
(New)	2.90	.55	2.04	1.14	1.34	.735	1.0	.55
(In Use)	4.35	3.40	2.04	6.95	1.34	4.550	1.0	3.40
(RFI)	3.57	3.10	2.04	6.34	1.34	4.150	1.0	3.10
Audio Frequency Distortion (Percent) Page B-124								
f1 (New)	25.6	7.40	2.04	15.20	1.34	9.940	1.0	7.40
f1 (In Use)	18.7	9.20	2.04	18.80	1.34	12.300	1.0	9.20
f1 (RFI)	13.6	3.30	2.04	6.74	1.34	4.420	1.0	3.30
f1 (New)	9.6	3.40	2.04	6.93	1.34	4.560	1.0	3.40
f2 (In Use)	16.0	7.20	2.04	14.70	1.34	9.650	1.0	7.20
f2 (RFI)	10.7	1.30	2.04	2.65	1.34	1.740	1.0	1.30
f3 (New)	4.4	.49	2.04	1.00	1.34	.665	1.0	.49
f3 (In Use)	14.2	6.30	2.04	12.70	1.34	8.450	1.0	6.30
f3 (RFI)	14.5	3.50	2.04	7.14	1.34	4.700	1.0	3.50

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-5

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Carrier Noise Level (Noise/Audio-db) Page B-125								
(New)	28.3	10.0	2.04	20.40	1.34	13.40	1.0	10.0
(In Use)	47.8	6.1	2.04	12.45	1.34	8.18	1.0	6.1
(RFI)	46.5	7.7	2.04	15.70	1.34	10.30	1.0	7.7
Modulation Capability (Percent) Page B-122								
v1 (New)	66.0	8.7	2.04	17.72	1.34	11.65	1.0	8.7
v1 (In Use)	54.0	2.8	2.04	5.72	1.34	3.75	1.0	2.8
v1 (RFI)	56.0	5.0	2.04	10.20	1.34	6.70	1.0	5.0
Channel Repeatability (Deviation-kc) Page B-126								
f1 (New)	.03	.059	2.04	.12	1.34	.079	1.0	.059
f1 (In Use)	.00	.000	2.04	.00	1.34	.000	1.0	.000
f1 (RFI)	.00	.000	2.04	.00	1.34	.000	1.0	.000
f2 (New)	.00	.000	2.04	.00	1.34	.000	1.0	.000
f2 (In Use)	.03	.059	2.04	.12	1.34	.079	1.0	.059
f2 (RFI)	.03	.059	2.04	.12	1.34	.079	1.0	.059
f3 (New)	.00	.000	2.04	.00	1.34	.000	1.0	.000
f3 (In Use)	.00	.000	2.04	.00	1.34	.000	1.0	.000
f3 (RFI)	.00	.000	2.04	.00	1.34	.000	1.0	.000
End of Tabulation - VT-5 --								

CONFIDENCE LIMIT INTERVALS - VHF TRANSMITTER - VT-5

[illegible]

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Distortion (20 uv input) (Percent) Page B-135								
f1 (New)	15.9	3.8	2.04	7.75	1.34	5.10	1.0	3.8
f1 (In Use)	18.0	1.6	2.04	3.26	1.34	2.15	1.0	1.6
f1 (RFI)	43.0	37.1	2.04	76.00	1.34	45.60	1.0	37.1
f2 (New)	14.0	5.1	2.04	10.40	1.34	6.84	1.0	5.1
f2 (In Use)	13.8	3.5	2.04	7.16	1.34	4.70	1.0	3.5
f2 (RFI)	35.0	28.4	2.04	57.90	1.34	37.60	1.0	28.4
Distortion (1000 uv input) (Percent) Page B-135								
f1 (New)	17.1	10.8	2.04	22.0	1.34	14.50	1.0	10.8
f1 (In Use)	19.1	11.6	2.04	23.6	1.34	15.54	1.0	11.6
f1 (RFI)	17.0	10.4	2.04	21.2	1.34	13.98	1.0	10.4
f2 (New)	13.6	7.6	2.04	15.5	1.34	10.20	1.0	7.6
f2 (In Use)	13.9	7.6	2.04	15.5	1.34	10.20	1.0	7.6
f2 (RFI)	19.2	2.8	2.04	5.6	1.34	3.80	1.0	2.8
Distortion (20000 uv input) (Percent) Page B-135								
f1 (New)	18.8	11.8	2.04	24.1	1.34	15.8	1.0	11.8
f1 (In Use)	21.8	12.2	2.04	24.9	1.34	16.4	1.0	12.2
f1 (RFI)	17.3	4.7	2.04	9.6	1.34	6.3	1.0	4.7
f2 (New)	13.8	8.2	2.04	16.7	1.34	11.0	1.0	8.2
f2 (In Use)	12.8	5.3	2.04	10.8	1.34	7.1	1.0	5.3
f2 (RFI)	18.8	2.7	2.04	5.5	1.34	3.6	1.0	2.7

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-1

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Sensitivity (RF Input-uv) Page B-136								
f1 (New)	1.2	0.16	2.04	0.33	1.34	0.23	1.0	0.16
f1 (In Use)	4.2	1.86	2.04	3.80	1.34	2.50	1.0	1.86
f1 (RFI)	16.7	6.80	2.04	13.80	1.34	9.10	1.0	6.80
f2 (New)	1.4	0.00	2.04	0.00	1.34	0.00	1.0	0.00
f2 (In Use)	3.0	1.70	2.04	3.47	1.34	2.28	1.0	1.70
f2 (RFI)	12.2	9.90	2.04	20.20	1.34	13.20	1.0	9.90
f3 (New)	3.1	1.77	2.04	3.61	1.34	2.37	1.0	1.77
f3 (In Use)	10.6	10.08	2.04	20.40	1.34	13.50	1.0	10.08
f3 (RFI)	12.9	10.80	2.04	22.00	1.34	14.50	1.0	10.80
Selectivity (Bandwidth-kc) Page B-137								
b1 (New)	49.5	5.15	2.04	10.5	1.34	7.90	1.0	5.15
b1 (In Use)	46.0	3.61	2.04	7.4	1.34	4.80	1.0	3.61
b1 (RFI)	46.0	1.78	2.04	3.6	1.34	2.39	1.0	1.78
b2 (New)	71.0	1.68	2.04	3.4	1.34	2.25	1.0	1.68
b2 (In Use)	61.3	6.00	2.04	12.2	1.34	8.06	1.0	6.00
b2 (RFI)	65.0	1.96	2.04	4.0	1.34	2.63	1.0	1.96
Channel Selection Time (Seconds) Page B-138								
(New)	5.0	0.0	2.04	0.0	1.34	0.0	1.0	0.0
(In Use)	5.0	0.0	2.04	0.0	1.34	0.0	1.0	0.0
(RFI)	5.0	0.0	2.04	0.0	1.34	0.0	1.0	0.0
End of tabulation - VR-1								

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-1

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-2

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Distortion (20 uv input) (Percent) Page B-149								
f1 (New)	10.6	3.8	2.04	7.75	1.34	5.10	1.0	3.8
f1 (In Use)	8.6	5.7	2.04	11.60	1.34	7.25	1.0	5.7
f1 (RFI)	9.9	5.0	2.04	10.20	1.34	6.70	1.0	5.0
f2 (New)	11.7	0.8	2.04	1.63	1.34	1.07	1.0	0.8
f2 (In Use)	10.4	1.1	2.04	2.25	1.34	1.47	1.0	1.1
f2 (RFI)	11.3	1.4	2.04	2.85	1.34	1.88	1.0	1.4
Distortion (1000 uv input) (Percent) Page B-149								
f1 (New)	12.3	5.1	2.04	10.40	1.34	6.85	1.0	5.1
f1 (In Use)	6.6	3.8	2.04	7.75	1.34	5.10	1.0	3.8
f1 (RFI)	10.5	4.4	2.04	9.00	1.34	5.90	1.0	4.4
f2 (New)	20.9	0.6	2.04	1.22	1.34	.80	1.0	0.6
f2 (In Use)	11.6	3.7	2.04	7.60	1.34	4.96	1.0	3.7
f2 (RFI)	16.3	2.2	2.04	4.50	1.34	2.95	1.0	2.2
Distortion (20000 uv input) (Percent) Page B-149								
f1 (New)	13.4	4.4	2.04	9.00	1.34	5.90	1.0	4.4
f1 (In Use)	6.2	3.3	2.04	6.75	1.34	4.42	1.0	3.3
f1 (RFI)	8.9	7.0	2.04	14.28	1.34	9.40	1.0	7.0
f2 (New)	22.4	3.3	2.04	6.75	1.34	4.42	1.0	3.3
f2 (In Use)	11.5	3.3	2.04	6.75	1.34	4.42	1.0	3.3
f2 (RFI)	13.0	3.5	2.04	7.15	1.34	4.70	1.0	3.5

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-2

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Sensitivity (RF Input-uv) Page B-150								
f1 (New)	3.4	1.1	2.04	2.24	1.34	1.48	1.0	1.1
f1 (In Use)	2.4	0.3	2.04	.60	1.34	0.41	1.0	0.3
f1 (RFI)	2.4	0.9	2.04	1.80	1.34	1.20	1.0	0.9
f2 (New)	6.2	6.9	2.04	14.00	1.34	9.25	1.0	6.9
f2 (In Use)	2.5	0.2	2.04	.41	1.34	0.27	1.0	0.2
f2 (RFI)	2.3	0.6	2.04	1.22	1.34	0.81	1.0	0.6
f3 (New)	5.0	3.6	2.04	7.33	1.34	4.82	1.0	3.6
f3 (In Use)	2.6	0.1	2.04	.20	1.34	0.13	1.0	0.1
f3 (RFI)	4.6	3.7	2.04	7.55	1.34	4.96	1.0	3.7
Selectivity (Bandwidth-kc) Page B-151								
b1 (New)	120	28.8	2.04	57.7	1.34	38.6	1.0	28.8
b1 (In Use)	87	27.4	2.04	55.7	1.34	36.7	1.0	27.4
b1 (RFI)	97	46.5	2.04	94.8	1.34	62.4	1.0	46.5
b2 (New)	253	132.0	2.04	269.9	1.34	177.0	1.0	132.0
b2 (In Use)	257	129.0	2.04	263.0	1.34	173.0	1.0	129.0
b2 (RFI)	255	131.0	2.04	266.0	1.34	178.0	1.0	131.0
End of tabulation - VR-2	-----	-----	-----	-----	-----	-----	-----	-----

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-2

[illegible]

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Distortion (20 uv Input) (Percent) Page B-161								
f1 (New)	8.6	1.4	2.04	2.85	1.34	1.88	1.0	1.4
f1 (In Use)	6.9	0.3	2.04	0.61	1.34	0.41	1.0	0.3
f1 (RFI)	6.9	0.7	2.04	1.42	1.34	0.94	1.0	0.7
f2 (New)	6.5	0.4	2.04	0.82	1.34	0.53	1.0	0.4
f2 (In Use)	6.9	0.2	2.04	0.40	1.34	0.27	1.0	0.2
f2 (RFI)	6.6	0.3	2.04	0.60	1.34	0.41	1.0	0.3
Distortion (1000 uv Input) (Percent) Page B-161								
f1 (New)	7.8	0.3	2.04	0.60	1.34	0.41	1.0	0.3
f1 (In Use)	5.6	0.2	2.04	0.40	1.34	0.27	1.0	0.2
f1 (RFI)	6.0	1.2	2.04	2.44	1.34	1.61	1.0	1.2
f2 (New)	7.8	1.9	2.04	3.86	1.34	2.55	1.0	1.9
f2 (In Use)	6.9	0.5	2.04	1.02	1.34	0.67	1.0	0.5
f2 (RFI)	6.8	0.6	2.04	1.22	1.34	0.80	1.0	0.6
Distortion (20000 uv Input) (Percent) Page B-161								
f1 (New)	8.9	2.7	2.04	5.50	1.34	3.62	1.0	2.7
f1 (In Use)	5.9	0.3	2.04	0.60	1.34	0.41	1.0	0.3
f1 (RFI)	6.1	1.1	2.04	2.24	1.34	3.63	1.0	1.1
f2 (New)	7.6	2.1	2.04	4.28	1.34	2.81	1.0	2.1
f2 (In Use)	7.2	0.5	2.04	1.02	1.34	0.67	1.0	0.5
f2 (RFI)	6.6	0.5	2.04	1.02	1.34	0.67	1.0	0.5

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-3

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Sensitivity (RF Input-uv) Page B-162								
f1 (New)	2.5	0.2	2.04	0.41	1.34	0.27	1.0	0.2
f1 (In Use)	2.4	0.3	2.04	0.61	1.34	0.40	1.0	0.3
f1 (RFI)	2.1	0.7	2.04	1.43	1.34	0.94	1.0	0.7
f2 (New)	3.3	0.4	2.04	0.82	1.34	0.54	1.0	0.4
f2 (In Use)	2.9	1.0	2.04	2.04	1.34	1.34	1.0	1.0
f2 (RFI)	2.3	0.7	2.04	1.43	1.34	0.94	1.0	0.7
f3 (New)	3.3	0.3	2.04	0.61	1.34	0.40	1.0	0.3
f3 (In Use)	2.9	0.6	2.04	1.22	1.34	0.86	1.0	0.6
f3 (RFI)	2.5	0.9	2.04	1.84	1.34	1.23	1.0	0.9
Selectivity (Bandwidth-kc) Page B-163								
b1 (New)	105.0	6.0	2.04	12.25	1.34	8.06	1.0	6.0
b1 (In Use)	104.0	11.8	2.04	24.20	1.34	15.82	1.0	11.8
b1 (RFI)	91.0	22.5	2.04	46.00	1.34	27.70	1.0	22.5
b2 (New)	279.0	57.0	2.04	116.00	1.34	70.10	1.0	57.0
b2 (In Use)	275.0	94.6	2.04	192.00	1.34	116.20	1.0	94.6
b2 (RFI)	321.0	73.0	2.04	149.00	1.34	90.00	1.0	73.0
End of Tabulation - VR-3 ---								

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-3

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Audio Frequency Response (Output Variation-db) Page B-170								
(New)	13.6	3.6	2.04	7.35	1.34	4.83	1.0	3.6
(In Use)	13.4	1.2	2.04	2.45	1.34	1.61	1.0	1.2
(RFI)	14.4	3.3	2.04	6.73	1.34	4.42	1.0	3.3
AVC Characteristics (Output Variation-db) Page B-171								
(New)	11.30	1.3	2.04	2.65	1.34	1.75	1.0	1.3
(In Use)	12.64	3.6	2.04	7.33	1.34	1.75	1.0	3.6
(RFI)	15.80	3.5	2.04	7.13	1.34	1.75	1.0	3.5
Gain (Minimum Input-uv) Page B-172								
(New)	5.6	0.8	2.04	1.63	1.34	1.07	1.0	0.8
(In Use)	5.7	4.4	2.04	8.97	1.34	5.88	1.0	4.4
(RFI)	21.5	6.7	2.04	13.15	1.34	8.98	1.0	6.7
Selectivity (Bandwidth-kc) Page B-175								
b1 (New)	68.3	17.6	2.04	35.90	1.34	23.60	1.0	17.6
b1 (In Use)	53.7	23.7	2.04	48.30	1.34	31.70	1.0	23.7
b1 (RFI)	83.2	28.6	2.04	58.30	1.34	38.30	1.0	28.6
b2 (New)	433.3	4.1	2.04	8.37	1.34	5.50	1.0	4.1
b2 (In Use)	449.8	40.8	2.04	83.30	1.34	50.48	1.0	40.8
b2 (RFI)	523.7	39.2	2.04	80.00	1.34	52.60	1.0	39.2

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-4

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Distortion (20 uv input) (Percent) Page B-173								
f1 (New)	17.0	1.9	2.04	3.87	1.34	2.55	1.0	1.9
f1 (In Use)	13.2	3.0	2.04	6.12	1.34	4.02	1.0	3.0
f1 (RFI)	17.0	4.5	2.04	9.18	1.34	6.03	1.0	4.5
f2 (New)	15.2	1.9	2.04	3.87	1.34	2.55	1.0	1.9
f2 (In Use)	10.3	6.6	2.04	13.45	1.34	8.85	1.0	6.6
f2 (RFI)	10.9	5.8	2.04	11.82	1.34	7.78	1.0	5.8
Distortion (1000 uv input) (Percent) Page B-173								
f1 (New)	20.5	2.6	2.04	5.30	1.34	3.48	1.0	2.6
f1 (In Use)	17.5	3.1	2.04	6.33	1.34	4.15	1.0	3.1
f1 (RFI)	25.6	3.8	2.04	7.75	1.34	5.09	1.0	3.8
f2 (New)	15.5	16.0	2.04	32.70	1.34	21.50	1.0	16.0
f2 (In Use)	9.6	6.5	2.04	13.25	1.34	8.72	1.0	6.5
f2 (RFI)	9.6	9.3	2.04	18.95	1.34	12.45	1.0	9.3
Distortion (20000 uv input) (Percent) Page B-173								
f1 (New)	20.8	1.0	2.04	2.04	1.34	1.34	1.0	1.0
f1 (In Use)	16.3	2.8	2.04	5.71	1.34	3.75	1.0	2.8
f1 (RFI)	29.0	3.2	2.04	6.53	1.34	4.28	1.0	3.2
f2 (New)	16.2	14.9	2.04	30.40	1.34	20.00	1.0	14.9
f2 (In Use)	9.3	4.2	2.04	8.58	1.34	5.63	1.0	4.2
f2 (RFI)	9.6	12.3	2.04	25.10	1.34	16.50	1.0	12.3

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-4

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Receiver Noise Level (Ratio-db) Page B-176								
v1 (New)	35.8	1.7	2.04	3.47	1.34	2.28	1.0	1.7
v1 (In Use)	29.3	2.4	2.04	4.90	1.34	3.22	1.0	2.4
v1 (RFI)	32.0	4.6	2.04	9.38	1.34	6.18	1.0	4.6
v2 (New)	48.3	1.6	2.04	3.27	1.34	2.15	1.0	1.6
v2 (In Use)	37.0	2.8	2.04	5.71	1.34	3.75	1.0	2.8
v2 (RFI)	44.9	5.9	2.04	12.10	1.34	7.90	1.0	5.9
v3 (New)	54.4	0.8	2.04	1.63	1.34	1.07	1.0	0.8
v3 (In Use)	40.8	7.3	2.04	14.90	1.34	9.77	1.0	7.3
v3 (RFI)	52.0	5.1	2.04	10.40	1.34	6.83	1.0	5.1
Sensitivity (RF Input) Page B-174								
f1 (New)	1.3	0.3	2.04	0.612	1.34	0.402	1.0	0.3
f1 (In Use)	2.7	0.3	2.04	0.612	1.34	0.402	1.0	0.3
f1 (RFI)	1.8	0.7	2.04	1.430	1.34	0.938	1.0	0.7
f2 (New)	1.5	0.1	2.04	0.204	1.34	0.134	1.0	0.1
f2 (In Use)	2.6	0.4	2.04	0.816	1.34	0.536	1.0	0.4
f2 (RFI)	1.7	1.0	2.04	2.040	1.34	1.340	1.0	1.0
f3 (New)	1.7	0.1	2.04	0.204	1.34	0.134	1.0	0.1
f3 (In Use)	3.2	1.0	2.04	2.040	1.34	1.340	1.0	1.0
f3 (RFI)	2.6	1.6	2.04	3.270	1.34	2.150	1.0	1.6
End of tabulation - VR-4								

[illegible]

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Distortion (20 un input) (Percent) Page B-185								
f1 (New)	16.0	6.8	2.04	13.80	1.34	9.30	1.0	6.8
f1 (In Use)	11.2	12.0	2.04	24.40	1.34	16.10	1.0	12.0
f1 (RFI)	9.5	19.4	2.04	39.50	1.34	26.00	1.0	19.4
f2 (New)	25.1	1.8	2.04	3.66	1.34	2.42	1.0	1.8
f2 (In Use)	20.5	2.2	2.04	4.48	1.34	2.95	1.0	2.2
f2 (RFI)	19.5	2.2	2.04	4.48	1.34	2.95	1.0	2.2
Distortion (1000 uv input) (Percent) Page B-185								
f1 (New)	15.2	4.2	2.04	8.55	1.34	5.65	1.0	4.2
f1 (In Use)	12.2	14.4	2.04	28.40	1.34	19.30	1.0	14.4
f1 (RFI)	9.3	20.9	2.04	43.50	1.34	28.00	1.0	20.9
f2 (New)	24.8	1.6	2.04	3.26	1.34	2.15	1.0	1.6
f2 (In Use)	24.2	4.3	2.04	8.76	1.34	5.77	1.0	4.3
f2 (RFI)	20.2	2.6	2.04	5.30	1.34	3.49	1.0	2.6
Distortion (20000 uv input) (Percent) Page B-185								
f1 (New)	15.5	2.5	2.04	5.10	1.34	3.35	1.0	2.5
f1 (In Use)	12.8	13.7	2.04	27.90	1.34	18.40	1.0	13.7
f1 (RFI)	9.0	21.2	2.04	42.60	1.34	28.50	1.0	21.2
f2 (New)	25.0	1.7	2.04	3.45	1.34	2.29	1.0	1.7
f2 (In Use)	25.2	4.4	2.04	8.96	1.34	5.90	1.0	4.4
f2 (RFI)	21.0	2.4	2.04	4.90	1.34	32.20	1.0	2.4

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-5

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Sensitivity (RF Input-uv) Page B-186								
f1 (New)	1.6	0.4	2.04	0.81	1.34	0.54	1.0	0.4
f1 (In Use)	1.8	0.4	2.04	0.81	1.34	0.54	1.0	0.4
f1 (RFI)	1.7	0.8	2.04	1.63	1.34	1.07	1.0	0.8
f2 (New)	1.3	0.1	2.04	0.20	1.34	0.13	1.0	0.1
f2 (In Use)	2.0	0.5	2.04	1.02	1.34	.67	1.0	0.5
f2 (RFI)	1.8	0.8	2.04	1.63	1.34	1.07	1.0	0.8
f3 (New)	1.4	0.4	2.04	0.81	1.34	0.54	1.0	0.4
f3 (In Use)	2.6	1.0	2.04	2.04	1.34	1.34	1.0	1.0
f3 (RFI)	2.1	0.8	2.04	1.63	1.34	1.07	1.0	0.8
Selectivity (Bandwidth-kc) Page B-187								
b1 (New)	48.0	34.0	2.04	69.4	1.34	45.60	1.0	34.0
b1 (In Use)	105.0	6.0	2.04	12.2	1.34	8.05	1.0	6.0
b1 (RFI)	95.0	22.9	2.04	46.6	1.34	30.70	1.0	22.9
b2 (New)	455.0	44.3	2.04	90.1	1.34	59.50	1.0	44.3
b2 (In Use)	519.0	14.5	2.04	29.6	1.34	19.40	1.0	14.5
b2 (RFI)	533.0	119.5	2.04	242.0	1.34	159.80	1.0	119.5
End of Tabulation - VR-5 --								

[illegible]

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Distortion (20 uv Input) (Percent) Page B-197								
f1 (New)	17.4	0.9	-----	Only	Two	Samples	Tested--	-----
f1 (In Use)	12.1	5.6	2.04	11.40	1.34	7.50	1.0	5.6
f1 (RFI)	15.6	1.1	2.04	2.25	1.34	1.48	1.0	1.1
f2 (New)	15.0	12.7	-----	Only	Two	Samples	Tested--	-----
f2 (In Use)	9.1	7.7	2.04	15.70	1.34	10.30	1.0	7.7
f2 (RFI)	11.0	8.0	2.04	16.30	1.34	10.70	1.0	8.0
Distortion (1000 uv Input) (Percent) Page B-197								
f1 (New)	20.0	1.4	-----	Only	Two	Samples	Tested--	-----
f1 (In Use)	15.6	5.0	2.04	10.2	1.34	0.67	1.0	5.0
f1 (RFI)	16.8	4.2	2.04	8.6	1.34	5.63	1.0	4.2
f2 (New)	20.0	7.1	-----	Only	Two	Samples	Tested--	-----
f2 (In Use)	15.2	5.6	2.04	11.4	1.34	7.53	1.0	5.6
f2 (RFI)	11.6	9.1	2.04	18.6	1.34	12.20	1.0	9.1
Distortion (20000 uv Input) (Percent) Page B-197								
f1 (New)	19.2	3.9	-----	Only	Two	Samples	Tested--	-----
f1 (In Use)	19.0	5.3	2.04	10.8	1.34	7.12	1.0	5.3
f1 (RFI)	17.4	7.5	2.04	15.3	1.34	10.05	1.0	7.5
f2 (New)	17.4	7.7	-----	Only	Two	Samples	Tested--	-----
f2 (In Use)	14.2	5.3	2.04	10.8	1.34	7.10	1.0	5.3
f2 (RFI)	12.5	9.8	2.04	20.0	1.34	13.15	1.0	9.8

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-6

	Mean	Standard Deviation	90%		80%		70%	
			Ord. Val.	Limits	Ord. Val.	Limits	Ord. Val.	Limits
Sensitivity (RF Input-uv) Page B-198								
f1 (New)	3.4	2.3	-----	Only	Two	Samples	Tested--	-----
f1 (In Use)	1.9	1.0	2.04	2.04	1.34	1.34	1.0	1.0
f1 (RFI)	2.1	1.0	2.04	2.04	1.34	1.34	1.0	1.0
f2 (New)	3.1	2.7	-----	Only	Two	Samples	Tested--	-----
f2 (In Use)	1.6	0.7	2.04	1.42	1.34	0.94	1.0	0.7
f2 (RFI)	2.1	1.0	2.04	2.04	1.34	1.34	1.0	1.0
f3 (New)	3.1	1.1	-----	Only	Two	Samples	Tested--	-----
f3 (In Use)	1.6	1.2	2.04	2.45	1.34	1.61	1.0	1.2
f3 (RFI)	2.1	1.2	2.04	2.45	1.34	1.61	1.0	1.2
Selectivity (Bandwidth-kc) Page B-199								
b1 (New)	148.0	8.5	-----	Only	Two	Samples	Tested--	-----
b1 (In Use)	107.0	7.7	2.04	16.7	1.34	13.0	1.0	7.7
b1 (RFI)	143.0	16.8	2.04	34.4	1.34	22.5	1.0	16.8
b2 (New)	475.0	4.1	-----	Only	Two	Samples	Tested--	-----
b2 (In Use)	512.0	79.9	2.04	163.0	1.34	106.0	1.0	79.9
b2 (RFI)	440.0	109.5	2.04	224.0	1.34	147.0	1.0	109.5
End of Tabulation - VR-6								

CONFIDENCE LIMIT INTERVALS - VHF RECEIVER - VR-6

TABLE 2

FACILITY MAINTENANCE INFORMATION

Facility	1	2	3	4
1. Equip. Category Serviced	AL	MIL	MIL	MIL
2. Equipment Type	Comm.-Nav.	Comm.-Nav.	Comm.	Comm.-Nav.
3. Number Maint. Personnel	15	26	7	5
4. Type of Personnel	Civ.	Mil.	Civ.-Mil.	Civ.-Mil.
5. Average Experience	10 years	6 years		
6. Type of Test Equipment	Lab. standard	Lab. standard		
7. Test Equipment Calibrate	As needed	3,6 months (most overdue)		
8. Maintenance Capability	Overhaul	Major	Major	Major
9. Maintenance Records	Excellent	Very little	None	None
10. Equipment Serviced (pertinent to program)	VR-1	UT-1, UR-1 UT-2, UR-2	VT-3, VR-3	UT-1, UR-1
11. Causes of Failure	1. Tubes (50%) 2. None apparent 3. Miscellaneous	1. Est. mis- alignment (80%) 2. Tubes		
12. Equipment Checks	Preflight ramp check every 30 hrs. Overhaul (3 months)	"Periodic per AF T. O."	Failures only	Failures only
13. Specifications & Procedures	RTCA	AF T. O.'s	T. O.'s, IB's	AF T. O.'s

FACILITY MAINTENANCE INFORMATION

TABLE 2

FACILITY MAINTENANCE INFORMATION

Facility	5	6	7	8
1. Equip. Category Serviced	MIL	AL	AL (Cargo)	MIL
2. Equipment Type	Comm.-Nav.	Comm.-Nav.	Comm.-Nav.	Comm.-Nav.
3. Number Maint. Personnel	49	61	11	12
4. Type of Personnel	Civ.-Mil.	Civ.	Civ.	
5. Average Experience		10 years		6 years
6. Type of Test Equipment	Unauthorized	Lab. standard	Lab. standard	Lab. standard
7. Test Equipment Calibrate	6 months (most overdue)	Frequently	During use	Upon failure
8. Maintenance Capability	Major	Overhaul	Overhaul	Minor
9. Maintenance Records	Good	Very good	Very good	None
10. Equipment Serviced (pertinent to program)	UT-1, UR-1 VT-2, VR-2		VT-1	
11. Causes of Failure	1. Tubes (80%) 2. Mechanical drive and blower motor (UT-1, UR-1)	1. Tubes (60%) 2. None apparent (30%)	1. Tubes 2. None apparent	1. Tubes (60%) 2. Misalign- ment (40%)
12. Equipment Checks	Nav. - occasional Comm. - 2 to 4 months	Preflight periodic time overhaul	Preflight peri- odic post-in- stallation ramp- check	Preflight peri- odic bench check (failure only)
13. Specifications & Procedures	T. O.'s	T. O.'s	1. T. O.'s 2. RTCA	T. O.'s

FACILITY MAINTENANCE INFORMATION

TABLE 2

FACILITY MAINTENANCE INFORMATION

Facility	9	10	11	12
1. Equip. Category Serviced	G	AL-G	G	AL
2. Equipment Type	Comm.-Nav.	Comm.-Nav.	Comm.-Nav.	Comm.-Nav.
3. Number Maint. Personnel	1	8	5	7
4. Type of Personnel	Owner-repairman	Civ.	Civ.	Civ.
5. Average Experience	5 years	10 years		10 years
6. Type of Test Equipment	General service	Lab. standard	Lab. standard	Lab. standard
7. Test Equipment Calibrate	In use	When needed	When needed	Monthly
8. Maintenance Capability	Major	Overhaul	Overhaul	Overhaul
9. Maintenance Records	None	Good (on contract work only)	None	Excellent (for overhaul records)
10. Equipment Serviced (pertinent to program)	All types	All types	All types	
11. Causes of Failure				1. Tubes (30%) 2. Miscellaneous (70%)
12. Equipment Checks	Bench check in shop Operational after installation	Operational periodic and time overhaul on contract work	Failures only	Periodic operational
13. Specifications & Procedures	IB's	T. O.'s, IB's	T. O.'s, IB's	T. O.'s

FACILITY MAINTENANCE INFORMATION

SECTION C

GROUND COMMUNICATIONS
EQUIPMENT CHARACTERISTICS

(Task 4)

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C-2. ATC Ground Communications Equipment, VHF Receivers, Technical Characteristics	C-5-8
C-3. ATC Ground Communications Equipment, UHF Transmitters, Technical Characteristics	C-9
C-4. ATC Ground Communications Equipment, UHF Receivers, Technical Characteristics	C-10

EQUIPMENT NOMENCLATURE AND MANUFACTURER	FREQUENCY RANGE MC	MEANS OF FREQUENCY CONTROL	CHANNELS		POWER OUTPUT WATTS	SPURIOUS RADIATION DB	CARRIER NOISE DB	MODULATION CHARACTERISTICS					REMARKS
			AVAILABLE	PRESET				TYPE OF EMISSION	MODULATION %	AUDIO DISTORTION %	AUDIO RESPONSE		
											DB	CYCLES	
AN/ARC-1 (RT-18) Western Electric	100-156	Crystal	any 9 + guard	9 +guard	8			A2, A3	100		±1 5	200-2500	
AN/ARC-3 (T-67) Sylvania	100-156	Crystal	any 8	8	8			A2, A3	95		±2	300-4000	
AN/ARC-5 Western Electric	100-156	Crystal	any 4	4	10			A3			±2	400-3500	
AN/TRC-42 (T-558)	116-132	Crystal	any 1	1	10			A3	100			300-4000	
AN/TRC-47 (T-593)	132-150	Crystal	any 1	1	7			A3	100			300-4000	
AN/URT-7 (T-336) Rauland-Borg	115-156	Crystal	any 4	1	30			A2, A3	100		±3	300-3500	
ARC-3 * O'Brien													* Used by ARINC, no information available
AVTG-200X R C A	100-156	Crystal	any 2*	2	50		-40	A2, A3	100	10	±3	200-3000	* Within 0.8% in frequency
AVTG-50R R C A	118-132	Crystal	any 2*	2	50			A2, A3	100	10	±3	150-4000	* Not more than 1mc apart
BC-625 Bendix	100-156	Crystal	any 4	4*	9			A2, A3	100				* Some ARINC units are single channel only
BC-625A Bendix	100-156	Crystal	any 4	4*	9			A2, A3	100				* Some ARINC units are single channel only
BC-640 Bendix	100-156	Crystal	any 1	1	50			A2, A3					
BC-640A Bendix	100-156	Crystal	any 1	1	50			A2, A3					
BC-640B Bendix	100-156	Crystal	any 1	1	50			A2, A3					
BC-640D Bendix	100-156	Crystal	any 1	1	50			A2, A3					
BC-797 Radio Receptor	116-126 25	Crystal	any 1	1	50		-34	A3	100	12	±10	100-3000	
BC-797B Radio Receptor	116-126 25	Crystal	any 1	1	50		-34	A3	100	12	±10	100-3000	
Composite *													* No specifications available Each one different
Custom Built *													* No specifications available Each one different
GR-400 Northwest Airlines	118-132	Crystal	any 4	4	100			A3	100	5			Channel selection time 10 seconds
GT-101 O'Brien	100-160	Crystal	any 1	1	10			A3					
LC-1 Lake Central Airlines	125-130 9	Crystal	any 1	1	60			A3					
Lear Special *													* Used by ARINC, no information available
NEL-201 National Electronics	110-130	Crystal	any 1	1	1			A3	90				
P-5 *	50-200	Crystal	any 4	4	50			A3	100		±3	200-3500	Channel selection time Instantaneous * Modified Wilcox 98A
P-5A *	50-200	Crystal	any 4	4	50			A3	100		±3	200-3500	Channel selection time Instantaneous * Modified Wilcox 98A

ATC Ground Communications Equipment, VHF Transmitters
TECHNICAL CHARACTERISTICS

EQUIPMENT NOMENCLATURE AND MANUFACTURER	FREQUENCY RANGE MC	MEANS OF FREQUENCY CONTROL	CHANNELS		POWER OUTPUT WATTS	SPURIOUS RADIATION DB	CARRIER NOISE DB	MODULATION CHARACTERISTICS					REMARKS
			AVAILABLE	PRESET				TYPE OF EMISSION	MODULATION %	AUDIO DISTORTION %	AUDIO RESPONSE		
											DB	CYCLES	
RAL-6 Robinson Air Lines	128 5-131.5	Crystal	any 1	1	50		-45	A3	100	9 5	±2	300-3000	
RT-226(AN/GRC-30) Lavoie	100-160	Synthesis		10	12			A2, A3	90				
SCR-522	100-156	Crystal	any 4	4	9			A2, A3	100				
SCR-522A	100-156	Crystal	any 4	4	9			A2, A3	100				
SCR-624	100-156	Crystal	any 4	4	9			A2, A3	100				
SCR-624C	100-156	Crystal	any 4	4	9			A2, A3	100				
TDQ R. C. A. Victor	115-156	Crystal	any 1	1	45		-40	A2, A3	100	10	±2	250-4000	
TDT Aircraft Accessories	115-156	Crystal	any 1	1	35			A2, A3	100		±2	200-4000	
TG-16 Bendix	118-132	Crystal	any 4	4	100		-40	A1, A2, A3	100	10	±3	300-3000	
TG-16A Bendix	118-132	Crystal	any 4	4	100		-40	A1, A2, A3	100	10	±3	300-3000	
TG-19 Bendix	108-136	Crystal	any 1	1*	50		-40	A3	95	10	±3	300-4000	* Available with two channels
TG-19A Bendix	108-136	Crystal	any 1	1*	50		-40	A3	95	10	±3	300-4000	* Available with two channels
TTA II Trans Texas Airways	100-156	Crystal	any 1	1	50			A3					
TUI Air Associates	126-132	Crystal	any 1	1	45			A3					
TUQ National	111-126 7	Crystal	any 5	5	50			A3	90	6			
TUQ-1 National	111-126 7	Crystal	any 5	5	50			A3	90	6			
TVE Shuttig	118-127	Crystal	any 1	1	8		-50	A3	90	3	±1 5	100-6000	
TV-3 Kaar Engineering	118-152	Crystal	any 2	2	50		-80	A3	100	7	±1 5	300-4000	
TV-3A Kaar Engineering	118-152	Crystal	any 2	2	50		-80	A3	100	7	±1 5	300-4000	
TV-5 Peer, Inc	118-127	Crystal	any 1	1	8		-50	A3	90	2		300-4000	
TV-6 Westinghouse	118-152	Crystal	any 1	1	50	-80	-50	A3	90	10	±3	300-3000	
TV-9 Spivey	118-127	Crystal	any 1	1	8		-50	A3	90	3	±1 5	100-6000	
Type 12 (T-11) Acft. Radio Corp	116-132	Crystal	any 5	5	2			A3	90				
T-67/ARC-3 Sylvania	100-156	Crystal	any 8	8	8			A2, A3	95		±2	300-4000	
VF-50 Erco	118-142	Crystal	any 1	1*	50			A3	95	10	±1 5	300-3500	* Also 4 crystals Not more than 0 5% from lowest frequency
VGTR-1 Narco	100-150	Crystal	any 1	1*	6 5			A3	100				* Available with two channels

ATC Ground Communications Equipment, VHF Transmitters
TECHNICAL CHARACTERISTICS

EQUIPMENT NOMENCLATURE AND MANUFACTURER	FREQUENCY RANGE MC	MEANS OF FREQUENCY CONTROL	CHANNELS		POWER OUTPUT WATTS	SPURIOUS RADIATION DB	CARRIER NOISE DB	MODULATION CHARACTERISTICS					REMARKS
			AVAILABLE	PRESET				TYPE OF EMISSION	MODULATION %	AUDIO DISTORTION %	AUDIO RESPONSE		
											DB	CYCLES	
VGTR-2 Narco	100-150	Crystal	any 1	1*	6 5			A3	100				* Available with two channels,
VH-200 Aerocom	118-132	Crystal	any 1	1	200		-35	A3	95	10			
VH-200A Aerocom	118-132	Crystal	any 1	1	200		-35	A3	95	10			
VT-9 West Coast Airlines	100-156	Crystal	any 1	1	10			A3	100				
17L (17L-4) Collins	118-135 95	Synthesis	360	360	25	-80	-35	A3	90	10	±3	300-10000	
242B-1 Collins	118-136	Crystal	any 2	2*	50		-40	A3	100	10	±2	150-3000	* Within 1% of each other,
242B-4 Collins	118-136	Crystal	any 4	4	50		-40	A3	100	10	±2	150-3000	
242E Collins	118-132	Crystal	any 1	1	50								
242F-2 Collins	108-152	Crystal	any 1	1	200	-80	-40	A3	90	10		300-10000	
242F-3 Collins	108-152	Crystal	any 2	2	50	-62	-40	A3	90	10	±2	300-3750	
242F-5 Collins	108-152	Crystal	any 1	1	50	-80	-45	A3	100	3			
242F-5CL Collins	108-152	Crystal	any 1	1	50	-80	-45	A3	100	3			
278 Comco	118-132	Crystal	any 1	1	4	-60		A3			±3	300-3000	
278-AC-E Comco	118-132	Crystal	any 1	1	4	-60		A3			±3	300-3000	
288-TE Comco	118-132	Crystal	any 1	1	4	-60		A3			±3	300-3000	
364-A Wilcox	118-136	Crystal	any 1	1	50		-40	A2, A3	100	10			
364-B Wilcox	118-136	Crystal	any 1	1	50		-40	A2, A3	100	10			
396-A Wilcox	118-132	Crystal	any 2	2	250		-45	A3	100		±2	200-2500	
396-A1 Wilcox	118-132	Crystal	any 2	2	250		-45	A3	100		±2	200-2500	
3043	6 meters	Crystal	any 6	6	6			A3	85				
3043X	6 meters	Crystal	any 1	1	6			A3	85				
3070	6 meters	Crystal	any 6	6	6			A3	85				
3073		Crystal	any 6	6	6			A3	85				
3073-XP		Crystal	any 1	1	6			A3	85				
3074		Crystal	any 6	6	6			A3	85				
3139-GA	112-132	Crystal	any 6	6	7			A3					

ATC Ground Communications Equipment, VHF Transmitters
TECHNICAL CHARACTERISTICS

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ATC Ground Communications Equipment, VHF Transmitters

TECHNICAL CHARACTERISTICS

EQUIPMENT NOMENCLATURE AND MANUFACTURER	FREQUENCY RANGE MC	MEANS OF FREQUENCY SELECTION	CHANNELS		SENSITIVITY		SELECTIVITY		DESENS DB	CROSS- MOD DB	NOISE LEVEL DB	SPURIOUS RESPONSE DB	AUDIO CHARACTERISTICS				REMARKS
			AVAILABLE	PRESET	UV	S N RATIO DB	-6 DB KC	-60 DB KC					RATED OUTPUT WATTS	DISTORTION %	RESPONSE		
															DB	CYCLES	
AN/ARC-1 Western Electric	100-156	Rotary Switch	any 9 + guard	9 + guard	3		140	360	2				0 4	10	±2 5	350-3000	
AN/ARC-3 Sylvania	100-156	Pushbutton	any 8	8	6	10	150	440			-40		1 3	8	±3	300-4000	
AN/ARC-5 Acft. Radio Corp	100-156	Pushbutton	any 4	4	6		140	400			-23		0 45	15	±4	400-3500	
AN/FRR-27 Comco	100-156	None	any 1	1	8	10	72	200					1 5		±2	300-3500	
AN/TRC-42	116-132	None	any 1	1	1	10	40	200				-80	1 0	8	±2	200-3000	
AN/TRC-47	132-150	None	any 1	1	2	10	40	200				-80	1 0	8	±2	200-3000	
AN/URR-21 Air Associates Inc	115-156	Rotary Switch	any 4	4	9		125	375					0 065		±1 5	250-4500	
AN/URR-27 National	105-190	Manual + 1 Preset		1	5	10	176	370			-40		0 06	7	±1 5	250-3500	
AR-2 Braniff Airlines	108-136	Manual											2 0				
BC-201A Radio Receptor	120-145	None	any 1	1	5	18	50	250					1 0		±1 5	200-2500	
BC-624	100-156	Pushbutton	any 4	4*	4	10	110	350				-74	0 5				* Some ARINC units are single channel.
BC-624A	100-156	Pushbutton	any 4	4*	4	10	110	350				-74	0 5				* Some ARINC units are single channel.
BC-624C	100-156	Pushbutton	any 4	4*	4	10	110	350				-74	0 5				* Some ARINC units are single channel.
BC-639	100-156	Manual			5	10	130	430				-80	1 0		±4	600-3000	
BC-639A	100-156	Manual			5	10	130	430				-80	1 0		±4	600-3000	
Composite *																	* ARINC only user. No specifications available
Custom Built *																	* No specifications available.
GR-101 *																	* ARINC only user. No specifications available.
Lear Special *																	* ARINC only user No specifications available.
Monitor Radio *																	* No specifications available
MR-71B Bendix	118-132	None	any 1	1	1	10	50	330				-60	3 0	10			
NEL-201 National Electronics	110-130	None	any 1	1	2	10	30	140					3 5				
PTC-145 Pye	118-135	Rotary Switch	any 4	2	1	10	30	100				-60	0 25		±3	300-3000	
RBK Hallicrafters	27 8-143	Manual			3 6	10							3 0	5	±3	40-10000	
RCK E H Scott	115-156	Rotary Switch	any 4	4	6	10	140	320				-78	0 6		±1	250-3000	RF radiation -82db
RCO Comco	100-156	None	any 1	1	7 5								0 5				

ATC Ground Communications Equipment, VHF Receivers
TECHNICAL CHARACTERISTICS

EQUIPMENT NOMENCLATURE AND MANUFACTURER	FREQUENCY RANGE MC	MEANS OF FREQUENCY SELECTION	CHANNELS		SENSITIVITY		SELECTIVITY		DESENS DB	CROSS- MOD DB	NOISE LEVEL DB	SPURIOUS RESPONSE DB	AUDIO CHARACTERISTICS				REMARKS
			AVAILABLE	PRESET	UV	S N RATIO DB	-6 DB KC	-60 DB KC					RATED OUTPUT WATTS	DISTORTION %	RESPONSE		
															DB	CYCLES	
RG-2 * Bendix																	* ARINC only user No specifications available.
RG-9 Bendix	118-135 9	None	any 1	1	2	6	40	84				-90	0 7	10	±2	250-3000	
RG-9A Bendix	118-135 9	None	any 1	1	2	6	40	84				-90	0 7	10	±2	250-3000	
RT-226(AN/GRC-30) Lavoie	100-160	Pushbutton	any 10	10	5	10	74	230					3 0				Channel selection time 10-30 sec
RUO	116-156				5	15	80	320				-45	1 0	2 5			
RUP Hallicrafters	108-142	Manual			5	15	42	200					1 0		±3	200-3000	
RUQ Collins	118-136	None	any 1	1	5	10	50	200					1 0				
RUR Wilcox	118-136	None	any 1	1	5	10	50	200	2	-6	-30	-80	1 0		±6	200-4000	
RUR-1 Wilcox	118-136	None	any 1	1	5	10	50	200	2	-6	-30	-80	1 0		±6	200-4000	
RVA Electrotechnic	108-152	None	any 1	1	2 5	10	50	200		-6	-35	-80	1 0		±4	200-4000	
RV-1 Munston	108-152	None	any 1	1	5	10	50	200		-6	-35	-80	1 0		±3 5	200-4000	
RV-1B Munston	108-152	None	any 1	1	5	10	50	200		-6	-35	-80	1 0		±3 5	200-4000	
RV-2 Servo Corp	50-200	Manual			2	10	25, 50, 75, 100, 150 *						2 0				* Selectable bandwidth
RV-3	108-152	None	any 1	1	5	10	40	100	2	-6	-10	-80	1 0		±3 5	200-4000	
RV-4 Gruen	108-152	None	any 1	1	5	10	40	100	2	-6	-10	-80	1 0		±3 5	200-4000	
RV-5 Vitro	108-152	Manual			5	10	100	360			-30	-80	1 0		±3	200-3000	
RV-6 Benrus	108-152	None	any 1	1	5	10	72	216	2	-6	-10	-80	1 0		±3 5	200-4000	
R-19/A R. C Acft Radio Corp	118-148	Manual			2			350					0 36				
R-28/ARC-5 Acft. Radio Corp	100-156	Pushbutton	any 4	4	7												
R-77/ARC-3 Sylvania	100-156	Pushbutton	any 8	8	6	10	150	440			-40		1 3	8	±3	300-4000	
R-5200 Servo	50-200	Manual			2	10	25, 50, 75, 100, 150 *						2 0				* Selectable bandwidth.
SCR-522 (BC-624) Bendix	100-156	Pushbutton	any 4	4*	4	10	110	350				-74	0 5				* Some ARINC units are single channel
SCR-522A Bendix	100-156	Pushbutton	any 4	4*	4	10	110	350				-74	0 5				* Some ARINC units are single channel
SCR-624 Bendix	100-156	Pushbutton	any 4	4*	4	10	110	350				-74	0 5				* Some ARINC units are single channel
SCR-624C Bendix	100-156	Pushbutton	any 4	4*	4	10	110	350				-74	0 5				* Some ARINC units are single channel
S-220A Shuttig	116-132	None	any 1	1	1	10	40	200			-10	-80	3 0		±2	200-3000	

ATC Ground Communications Equipment, VHF Receivers
TECHNICAL CHARACTERISTICS

EQUIPMENT NOMENCLATURE AND MANUFACTURER	FREQUENCY RANGE MC	MEANS OF FREQUENCY SELECTION	CHANNELS		SENSITIVITY		SELECTIVITY		DESENS DB	CROSS- MOD DB	NOISE LEVEL DB	SPURIOUS RESPONSE DB	AUDIO CHARACTERISTICS				REMARKS
			AVAILABLE	PRESET	UV	S/N RATIO DB	-6 DB KC	-60 DB KC					RATED OUTPUT WATTS	DISTORTION %	RESPONSE		
															DB	CYCLES	
TTA II *																	*ARINC only user. Probably mod military equip. Single channel, crystal controlled.
Type 12/R-15 A R C R-19	108-135 118-148	Manual			2			350					0.36				
VGTR-1 Narco	100-150	None	any 1	1*	1.5	6											* Also available with 2 channels
VGTR-2 Narco	100-150	None	any 1	1*	1.5	6											* Also available with 2 channels
VR-12 West Coast Airlines	100-156	Pushbutton	any 4	4	4	10	110	350				-74	0.5				
139-A Federal Tele	108-132	None	any 1	1	3	9	52	140				-100	1.0				
139-AB Federal Tele	108-132	None	any 1	1	3	9	52	140				-100	1.0				
139-AZ Federal Tele	108-132	None	any 1	1	3	9	52	140				-100	1.0				
139-A2 Federal Tele	108-132	None	any 1	1	3	9	52	140				-100	1.0				
139-BY Federal Tele.	118-136	None	any 1	1	1	10	52	150				-100	1.0		±3	350-3500	
139-BYA Federal Tele	118-136	None	any 1	1	1	10	52	150				-100	1.0		±3	350-3500	
139-B1 Federal Tele	118-136	None	any 1	1	1	10	52	150				-100	1.0		±3	350-3500	
278 Comco	118-152	Pushbutton	any 2	2	1	10	22	50			-10	-70	1.0		±1.5	400-2500	
278-AC-E Comco	118-152	Pushbutton	any 2	2	1	10	22	50			-10	-70	1.0		±1.5	300-3000	
278-3-ARE Comco	118-152	Pushbutton	any 2	2	1	10	22	50			-10	-70	1.0		±1.5	300-3000	
278-4-ARE Comco	118-152	Pushbutton	any 2	2	1	10	22	50			-10	-70	1.0		±1.5	300-3000	
32-E Erco	30-160	None	any 1	1	4		50	210					2.0				
358-R Erco	108-156	None	any 1	1	2	10	56	156				-60	2.0		±1.5	200-4000	
305-A Wilcox	118-136	None	any 1	1	1	6	100	270			-40	-105	1.0		±1.5	400-4000	
305-A1 Wilcox	118-136	None	any 1	1	1	6	100	270			-40	-105	1.0		±1.5	400-4000	
3043 Gonset	2 meters	Manual				6											* Used by ARINC. No specifications available.
3043X Gonset	2 meters	Manual															* Used by ARINC. No specifications available.
3070 Gonset	2 meters	Manual															* Used by ARINC. No specifications available.
3073 Gonset	2 meters	Manual															* Used by ARINC. No specifications available.
3073-XP Gonset	2 meters	Manual															* Used by ARINC. No specifications available.
3074 Gonset	2 meters	Manual															* Used by ARINC. No specifications available.

ATC Ground Communications Equipment, VHF Receivers
TECHNICAL CHARACTERISTICS

ATC Ground Communications Equipment, VHF Receivers

TECHNICAL CHARACTERISTICS

EQUIPMENT NOMENCLATURE AND MANUFACTURER	FREQUENCY RANGE MC	MEANS OF FREQUENCY CONTROL	CHANNELS		POWER OUTPUT WATTS	SPURIOUS RADIATION DB	CARRIER NOISE DB	MODULATION CHARACTERISTICS					REMARKS
			AVAILABLE	PRESET				TYPE OF EMISSION	MODULATION %	AUDIO DISTORTION %	AUDIO RESPONSE		
											DB	CYCLES	
AN/ARC-27 Collins	225-399 9	Synthesis	1750	18 - guard	9			A2, A3	95				Channel selection time 5 seconds
AN/ARC-34 Stromberg-Carlson	225-399 9	Synthesis	1750	20 + guard	10			A2, A3	100				Channel selection time 4 seconds
AN/ARC-60 Acft. Radio Corp	228-258	Crystal	any 8	8	0 5			A2, A3	90				TV-10 transverter
AN/FRC-25	225-399 9	Synthesis	1750	18 + guard	10			A2, A3	95				Channel selection time 5 seconds
AN/FRC-25B	225-399 9	Synthesis	1750	18 + guard	10			A2, A3	95				Channel selection time 5 seconds
AN/GRC-27 Collins	225-399 9	Synthesis	1750	10	100	-40	-40	A3	95	11	±1 5	400-3000	Channel selection time 2-7 seconds
AN/GRC-32 Collins	225-399 9	Synthesis	1750	18 + guard	10			A2, A3	95				Channel selection time 5 seconds
AN/GRC-32B Collins	225-399 9	Synthesis	1750	18 + guard	10			A2, A3	95				Channel selection time 5 seconds
AN/GRT-3 Radio Receptor	225-399 9	Crystal	any 1	1	100			A3	95	10	±2 5	400-3000	
RT-227 Lavoie	225-400	Pushbutton	any 10	10	12			A2, A3	90		±2	300-3500	Channel selection time 8 seconds
Type 220 Acft. Radio Corp	228-258	Crystal	any 8	8*	2			A3					* Within 4mc of each other
TDZ General Electric	225-399 9	Crystal	any 10	10	30			A2, A3	95	7			Channel selection time 30 seconds
TED Westinghouse	225-400	Crystal	any 4	1	15			A1, A2, A3	100		±3	300-3500	
TED-3 Westinghouse	225-400	Crystal	any 4	1	15			A2, A3	100		±3	300-3500	
TED-4 Westinghouse	225-400	Crystal	any 4	1	15			A2, A3	100		±3	300-3500	
T-217 Collins	225-399 9	Synthesis	1750	10	100	-40	-40	A3	95	11	±1 5	400-3000	Channel selection time 2-7 seconds
T-217A Collins	225-399 9	Synthesis	1750	10	100	-40	-40	A3	95	11	±1 5	400-3000	Channel selection time 2-7 seconds
T-217B Collins	225-399 9	Synthesis	1750	10	100	-40	-40	A3	95	11	±1 5	400-3000	Channel selection time 2-7 seconds
T-282/GR Radio Receptor	225-399 9	Crystal	any 1	1	100		-40	A3	95	10	*±2 0 ±2.5	200-20000 400-3000	* Wide and narrow band response respectively
T-282A/GR Radio Receptor	225-399 9	Crystal	any 1	1	100			A3	95	10	±2 5	400-3000	
T-282D/GR Radio Receptor	225-399 9	Crystal	any 1	1	100			A3	95	10	±2 5	400-3000	
361-T Erco	225-400	Crystal	any 1	1	100		-40	A3	95	6	±1 5	200-3000	
425-T Erco	225-400	Crystal	any 1	1	10			A3	95	10	±1.5	200-3500	

ATC Ground Communications Equipment, UHF Transmitters
TECHNICAL CHARACTERISTICS

EQUIPMENT NOMENCLATURE AND MANUFACTURER	FREQUENCY RANGE MC	MEANS OF FREQUENCY SELECTION	CHANNELS		SENSITIVITY		SELECTIVITY		DESENS DB	CROSS- MOD DB	NOISE LEVEL DB	SPURIOUS RESPONSE DB	AUDIO CHARACTERISTICS				REMARKS
			AVAILABLE	PRESET	UV	S/N RATIO DB	-6 DB KC	-60 DB KC					RATED OUTPUT WATTS	DISTORTION %	RESPONSE		
															DB	CYCLES	
AN/ARC-27 Collins	225-399.9	Rotary Switch	1750	18 + guard	5	6	90	300					2.0	15	±3	300-4000	Channel selection time 5 sec
AN/ARC-34 Stromberg-Carlson	225-399.9	Rotary Switch	1750	20	3	10	60	170				-80	0.2		±2	300-4000	Channel selection time 4 sec
AN/ARC-60 * Acft. Radio Corp.	228-258	Crystal	any 8	8													* Transverter, used with Type A R C. 12
AN/FRC-25	225-399.9	Rotary Switch	1750	18 + guard			90	250					0.5		±3	300-4000	Channel selection time 5 sec
AN/FRC-25B	225-399.9	Rotary Switch	1750	18 + guard			90	250					0.5		±3	300-4000	Channel selection time 5 sec
AN/GRC-27 Collins	225-399.9	Rotary Switch	1750	10	6	10	90	220					3.0	5	±4	200-20000	Channel selection time 2-7 sec
AN/GRC-32 Collins	225-399.9	Rotary Switch	1750	18 + guard	5	6	90	300					2.0	15	±3	300-4000	Channel selection time 5 sec
AN/GRC-32B Collins	225-399.9	Rotary Switch	1750	18 + guard			90	250					0.5		±3	300-4000	Channel selection time 5 sec
AN/GRR-7 Radio Receptor	225-399.9	None	any 1	1	3	10	90	230					1.0	15			
AN/URR-13 Federal	225-400	Manual	any 1	1*	8	10	70	190					0.6	7	±1.5	300-3000	* Switch selected "xtal" or "manual"
AN/URR-13A Federal	225-400	Manual	any 1	1*	8	10	70	190					0.6	7	±1.5	300-3000	* Switch selected "xtal" or "manual"
AN/URR-35 Federal	225-400	Manual	any 1	1*	8	10	80	170					0.6	7	±2	300-3000	* Switch selected "xtal" or "manual"
RT-227 Lavoie	225-400	Pushbutton	10	10	6	10	74	230					3.0		±2	300-3500	
R-278 Collins	225-399.9	Rotary Switch	1750	10	6	10	90	220					3.0	5	±4	200-20000	Channel selection time 2-7 sec
R-278A Collins	225-399.9	Rotary Switch	1750	10	6	10	90	220					3.0	5	±4	200-20000	Channel selection time 2-7 sec
R-278B Collins	225-399.9	Rotary Switch	1750	10	6	10	90	220					3.0	5	±4	200-20000	Channel selection time 2-7 sec
R-361/GR Radio Receptor	225-399.9	None	any 1	1	3	10	90	230				-80	1.0	15	±2.5	400-3000	
R-361A/GR Radio Receptor	225-399.9	None	any 1	1	3	10	90	230					1.0	15			
Type 220 * Acft. Radio Corp	228-258	Crystal	any 8	8													* Transverter, used with Type A. R. C. 12
362-R Erco	225-400	None	any 1	1	5	10	100	300				-60	2.0		±3	200-4000	

ATC Ground Communications Equipment, UHF Receivers
TECHNICAL CHARACTERISTICS

SECTION D

REFERENCES

<u>Sub-Section</u>	<u>Page</u>
1. Glossary of Airborne ATC Radio Communications Equipment (1) (2)	D-1-111
2. Abbreviations	D-113-116
3. Extracts from RTCA and RCA Papers	D-117-127
4. Associated Publications.	D-129

NOTES

(1) Channels Available is defined as the number of discrete operating frequencies which the equipment can directly provide by general switching or tuning methods, including decade switched channels (indicated as manual) and variable tuned channels (indicated as continuously tuned). In addition, Channels Available is not intended to mean the number of 50 kc, 100 kc, 300 kc, etc., channels confined within the specified operating range.

(2) Channels Preset is defined as the number of discrete operating frequencies which can be directly provided by a single control selector or pushbutton, but excluding those frequencies provided by multi-control decade selectors.

SECTION D

REFERENCES

1. Glossary of Airborne ATC Radio Communications Equipment.

A-68X	Receiver LF/HF
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Primary Use: Airborne reception of mcw and voice communications in air/air and air/ground service.

Frequency Range: 190 to 430 kc and 2300 to 6500 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 3 watts (approx)
Primary Power: 12 vdc
Manufacturer: Rex Bassett, Incorporated

ACR-1	Receiver VHF
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Primary Use: Airborne reception of voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Reisner Company

ACR-24

Receiver
HF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service.

Frequency Range: 2 to 18.5 mc
Channels Available: Basic---24, Modified---72
Channels Preset: 24/72
Channel Selection: Remote motor control
Output: 250 mw
Primary Power: 12/24 vdc
Manufacturer: PAMSCO Division of Pan American World Airways, Inc.

AD-7092C

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: .15 to 2 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote motor control
Output: 50 mw
Primary Power: 28 vdc and 115 vac 400 cycle 1 phase
Manufacturer: Marconi Instruments Ltd.

ADF-12, 12B

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: 200 to 1750 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 500 mw
Primary Power: 12 to 14 vdc
Manufacturer: Lear, Incorporated

ADF-14B

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: 190 to 1750 kc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: Dual: 100 mw and 3 watts each
Primary Power: 27.5 vdc
Manufacturer: Lear, Incorporated

ADF-15

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Lear, Incorporated

ADF-21, A

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated R-30 or R-30A. The military designation is AN/ARN-59.

Frequency Range: 190 to 1750 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 300 mw
Primary Power: 13.75/27.5 vdc
Manufacturer: Aircraft Radio Corporation

AK-51

Receiver-Transmitter
LF/MF/HF/VHF

Primary Use: Airborne two-way mcw and voice communications
in air/air and air/ground service.

	<u>Transmitter</u>	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 127 mc (approx)	3023.5 kc (fixed)	200 to 1500 kc in 2 bands
Channels Available:	7	1	Continuously tuned
Channels Preset:	7	1	None
Channel Selection:	Local switch	Local switch	Local tuning
Output:	2 watts (approx)	5 watts (approx)	2 to 3 watts (approx)
Primary Power:	12 vdc		
Manufacturer:	General Electric Company		

AMR-1, AMRL-1

Receiver
LF

Primary Use: Airborne reception of voice communications in air/
air and air/ground service. The AMRL-1 is the
AMR-1 with a loop added.

Frequency Range:	200 to 400 kc
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Local tuning
Output:	50 mw (min)
Primary Power:	Dry batteries
Manufacturer:	Lear, Incorporated

AMT-1	Transmitter HF
-------	-------------------

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 2.7 to 6.3 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 1.5 watts (approx)
Primary Power: Dry batteries
Manufacturer: Lear, Incorporated

AMT-12	Transmitter HF
--------	-------------------

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is the transmitter unit of Radio Set AMTR-12 or AMTRL-12.

Frequency Range: 2.7 to 6.3 mc
Channels Available: 1
Channels Preset: 1 (usually 3105 or 3023.5 kc)
Channel Selection: None
Output: 10 watts
Primary Power: 13 vdc
Manufacturer: Lear, Incorporated

AN/ARC-1, 1X, 1A, 1AX	Radio Set Transceiver VHF
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Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-18/ARC-1 or RT-18A/ARC-1.

Frequency Range: 100 to 156 mc
Channels Available: 10 plus a guard receive channel
Channels Preset: 10 plus a guard receive channel (50 plus a guard receive channel when modified for commercial airline use per CAATC #1050 Mod. Q.)
Channel Selection: Remote motor control (Collins autotune)
Output: Transmitter: 8 watts Receiver: Dual at 400 mw each
Primary Power: 26 vdc
Typical Mfg: Western Electric Company

AN/ARC-2, 2A

Radio Set
Transceiver
HF

Primary Use: Airborne two-way cw, mcw and voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-91/ARC-2 or RT-298/ARC-2A and associated control equipment.

Frequency Range: 2 to 9.05 mc
Channels Available: 8
Channels Preset: 8
Channel Selection: Local or remote motor control (Collins autotune)
Output: Transmitter: 15 to 30 watts
Receiver: 500 mw (max)
Primary Power: 26.5 vdc
Typical Mfgr: Collins Radio Company

AN/ARC-3, 3A

Radio Set
Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver unit is designated R-77, 77A, 77B/ARC-3 and the transmitter unit is designated T-67, 67A, 67B/ARC-3. This is the same as AN/ARC-36 and AN/ARC-49 Radio Sets except for number of channels.

Frequency Range: 100 to 156 mc
Channels Available: 8
Channels Preset: 8
Channel Selection: Remote relay switch
Output: Transmitter: 8 watts Receiver: 600 mw
Primary Power: 28 vdc
Typical Mfgr: Sylvania Electric Products, Incorporated

AN/ARC-5

Radio Set
Receiver-Transmitter
LF/MF/HF/VHF

Primary Use: Airborne two-way cw, mcw and voice communications in air/air and air/ground service. The system uses varying quantities of the following listed transmitters and receivers.

	<u>Transmitters</u>	<u>Receivers</u>
Frequency Range:	T-15/ARC .5 to .8 mc	R-23/ARC .19 to .55 mc
	T-16/ARC .8 to 1.3 mc	R-24/ARC .52 to 1.5 mc
	T-17/ARC 1.3 to 2.1 mc	R-25/ARC 1.3 to 3 mc
	T-18/ARC 2.1 to 3 mc	R-26/ARC 3 to 6 mc
	T-19/ARC 3 to 4 mc	R-27/ARC 6 to 9 mc
	T-20/ARC 4 to 5.3 mc	R-28/ARC 100 to 156 mc
	T-21/ARC 5.3 to 7 mc	
	T-22/ARC 7 to 9.1 mc	
	T-23/ARC 100 to 156 mc	

Channels Available: 1 preset on all except the T-23 which has 4 preset channels Continuous tuning on all except the R-28 which has 4 preset channels

Channel Selection: None except T-23 and R-28 are remotely crystal switched (motor drive)

Output: 40 watts cw, 13 watts voice on LMH/F or 6 watts voice on VHF 1 watt LMH/F and 450 mw VHF

Primary Power: 24 to 28 vdc

Typical Mfr: Aircraft Radio Corporation

AN/ARC-21

Radio Set
Transceiver
HF

Primary Use: Airborne two-way cw, mcw and voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-128/ARC-21. Frequency shift telegraphy can be added.

Frequency Range: 2 to 24 mc

Channels Available: 44000 manual

Channels Preset: 20

Channel Selection: Remote servo control

Output: Transmitter: 100 watts Receiver: 900 mw

Primary Power: 27.5 vdc / 27.5 vdc and 115 vac 380 to 1000 cycle
1 phase

Typical Mfr: Radio Corporation of America

AN/ARC-27, 27A

Radio Set
Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-178/ARC-27. This is a pressurized version of Radio Set AN/ARC-55.

Frequency Range: 225 to 399.9 mc

Channels Available: 1750 manual

Channels Preset: ARC-27: 18 plus a guard receive channel
ARC-27A: 20 plus a guard receive channel

Channel Selection: Remote motor control (Collins autopositioner)

Output: Transmitter: 9 watts Receiver: 2 watts (max)

Primary Power: 27.5 vdc

Typical Mfgr: Collins Radio Company

AN/ARC-33

Radio Set
Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-173/ARC-33.

Frequency Range: 225 to 400 mc

Channels Available: 1750 manual

Channels Preset: 20 plus a guard receive channel

Channel Selection: Remote switch selector

Output: Transmitter: 8 watts Receiver: 750 mw

Primary Power: 27.5 vdc

Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

AN/ARC-34

Radio Set
Receiver-Transmitter
UHF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-263/ARC-34 and R-567/ARC-34 under one dust cover.

Frequency Range: 225 to 299.9 mc

Channels Available: 1750 manual

Channels Preset: 20 plus a guard receive channel

Channel Selection: Remote servo selector and local manual selector

Output: Transmitter: 8 watts Receiver: 200 mw

Primary Power: 28 vdc

Typical Mfgr: Radio Corporation of America

AN/ARC-36Radio Set
Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver unit is designated R-428, A, B/ARC-36 and the transmitter unit is designated T-312, A, B/ARC-36. This is the same as AN/ARC-3 and AN/ARC-49 except for number of channels.

Frequency Range: 100 to 156 mc
Channels Available: 16
Channels Preset: 16
Channel Selection: Remote relay switch
Output: Transmitter: 8 watts Receiver: 600 mw
Primary Power: 28 vdc
Typical Mfgr: Sylvania Electric Products, Incorporated

AN/ARC-38Radio Set
Transceiver
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-311/ARC-38.

Frequency Range: 2 to 25 mc
Channels Available: 35000 manual
Channels Preset: 20
Channel Selection: Remote servo control (Collins autopositioner)
Output: Transmitter: 90 to 100 watts Receiver: 500 mw
Primary Power: 27.5 vdc and 115 vac 400 cycle
Typical Mfgr: Collins Radio Company

AN/ARC-39Radio Set
Receiver-Transmitter
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-427/ARC-39.

Frequency Range: 2 to 9.1 mc
Channels Available: 12
Channels Preset: 12
Channel Selection: Locally or remotely controlled autopositioner
Output: Transmitter: 10 watts Receiver: 800 mw (max)
Primary Power: 27.5 vdc
Typical Mfgr: Aircraft Radio Corporation

AN/ARC-48

Radio Set
Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-307/ARC-48.

Frequency Range: 233 to 243 mc

Channels Available: 4

Channels Preset: 4 transmitting and 3 plus a guard channel receiving

Channel Selection: Remote relay switch

Output: Transmitter: 2 watts Receiver: 150 mw

Primary Power: 28 vdc

Typical Mfg r: Telephonics Corporation

AN/ARC-49

Radio Set
Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver unit is designated R-608/ARC-49 and the transmitter unit is designated T-452/ARC-49. This is the same as AN/ARC-3 and AN/ARC-36 except for number of channels.

Frequency Range: 100 to 156 mc

Channels Available: 48

Channels Preset: 48

Channel Selection: Remote relay switch

Output: Transmitter: 8 watts Receiver: 600 mw

Primary Power: 28 vdc

Typical Mfg r: Sylvania Electric Products, Incorporated

AN/ARC-52, X

Radio Set
Receiver-Transmitter
UHF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-332/ARC-52 or RT-424/ARC-52X. This is a Navy replacement for the AN/ARC-27.

Frequency Range: 225 to 399.9 mc

Channels Available: 1750 manual

Channels Preset: 18 plus a guard receive channel

Channel Selection: Remote motor control

Output: Transmitter: 20 watts Receiver: 250 mw

Primary Power: 28 vdc and 115 vac 400 cycle 3 phase

Typical Mfg r: Collins Radio Company

AN/ARC-55, 55A

Radio Set
Receiver-Transmitter
UHF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-349/ARC-55. The AN/ARC-55 is an unpressurized version of the AN/ARC-27.

Frequency Range: 225 to 399.9 mc

Channels Available: 1750 manual plus a guard receive channel

Channels Preset: None

Channel Selection: Remote servo control (Collins autopositioner)

Output: Transmitter: 9 watts Receiver: 2 watts (max)

Primary Power: 27.5 vdc

Typical Mfgr: Collins Radio Company

AN/ARC-58

Radio Set
Receiver-Transmitter
HF

Primary Use: Airborne two-way mcw, voice and SSB communications in air/air and air/ground service. The receiver unit is designated R-761/ARC-58 and the transmitter unit is designated T-605/ARC-58.

Frequency Range: 2 to 29.999 mc

Channels Available: 28000 manual

Channels Preset: None

Channel Selection: Remote servo control

Output: Transmitter: 1000 watts (pep) Receiver: 200 mw

Primary Power: 27.5 vdc and 115 vac 300 to 1000 cycle 1 phase

Typical Mfgr: Collins Radio Company

AN/ARC-60

Radio Set
Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. Two CV-431/ARC-60 transmitters provide UHF transmission and UHF to VHF preselection. One R-508/ARC VHF receiver is used as a variable IF for acceptance of the UHF to VHF preselection output.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	228 to 258 mc	228 to 258 mc
Channels Available:	16	Continuously tuned
Channels Preset:	16	None
Channel Selection:	Remote relay switch	Remote manual tuning
Output:	.5 watts	360 mw (R-508 output)
Primary Power:	28 vdc	
Typical Mfgr:	Aircraft Radio Corporation	

AN/ARC-65

Radio Set
Receiver-Transmitter
HF

Primary Use: Airborne two-way cw, mcw, voice, SSB and frequency shift communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-400/ARC-65.

Frequency Range: 2 to 23.9995 mc

Channels Available: 20

Channels Preset: 20

Channel Selection: Remote

Output: Transmitter: 250 watts (pep) Receiver: 50 mw

Primary Power: 27.5 vdc and 110 vac 380 to 1000 cycle

Typical Mfgr: Radio Corporation of America

AN/ARC-66

Radio Set
Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter units are designated RT-423/ARC-66 and the receiver unit is designated R-567/ARC-34.

	<u>RT-423/ARC-66</u>	<u>R-567/ARC-34</u>
Frequency Range:	225 to 328.9 mc and 335.1 to 399.9 mc	238 to 248 mc
Channels Available:	1689 manual	1689 manual
Channels Preset:	20 plus a guard receive channel	1 guard receive channel
Channel Selection:	Remote motor control	Remote motor control
Output:	Transmitter: 8 watts Receivers: 200 mw each	
Primary Power:	26.5 vdc and 115 vac 400 cycle 3 phase	
Typical Mfgr:	Radio Corporation of America	

AN/ARN-6

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated R-101, A, B/ARN-6.

Frequency Range: 100 to 1750 kc

Channels Available: Continuously tuned

Channels Preset: None

Channel Selection: Remote manual tuning

Output: 50 mw (min)

Primary Power: 26.5 vdc

Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

AN/ARN-7Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated R-5/ARN-7 or R-5A/ARN-7.

Frequency Range: 100 to 1750 kc

Channels Available: Continuously tuned

Channels Preset: None

Channel Selection: Remote manual tuning

Output: 50 mw (min)

Primary Power: 14/28 vdc and 115 vac 400 cycle 1 phase

Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

AN/ARN-11Radio Compass
LF/MF/HF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low, standard broadcast and high frequency radio bands. The receiver unit is designated MN-26LB.

Frequency Range: 200 to 410 kc, 550 to 1200 kc and 2.9 to 6 mc

Channels Available: Continuously tuned

Channels Preset: None

Channel Selection: Remote manual tuning

Output: 50 mw (min)

Primary Power: 28 vdc

Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

AN/ARN-14, A, B, C, D, ERadio Receiving Set
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. The receiver unit is designated R-252,A,B/ARN-14; R-252C/ARN-14A; R-539/ARN-14B; R-540/ARN-14C; R-541/ARN-14D or R-()/ARN-14E. Full ILS instrumentation is provided when used with the AN/ARN-18. The commercial designation is 51R.

Frequency Range: 108 to 135.9 mc

Channels Available: 280 manual

Channels Preset: None

Channel Selection: Remote servo control

Output: Visual: dc cross pointer currents; Aural: 300 mw

Primary Power: 26.5 vdc / 26.5 vdc and 115 vac 400 cycle 1 phase

Typical Mfgr: Collins Radio Company

AN/ARN-30

Radio Receiving Set
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. Consists of a receiver unit, a converter unit and an amplifier unit. The receiver unit is designated R-445/ARN-30, the converter unit CV-217/ARN-30, and the filter amplifier AM-609/ARN-30. The commercial designation is Type 15C.

	<u>Receiver</u>	<u>Converter & Amplifier</u>
Frequency Range:	108 to 135 mc	30 to 10500 cps
Channels Available:	Continuously tuned	
Channels Preset:	None	
Channel Selection:	Remote manual tuning	
Output:	170 to 360 mw	150-0-150 microamperes dc
Primary Power:	28 vdc	
Typical Mfgr:	Aircraft Radio Corporation	

AN/ARN-30A

Radio Receiving Set
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. Consists of a receiver unit and a converter unit. The receiver unit is designated R-445/ARN-30A and the converter unit is designated CV-265/ARN-30A. The commercial designation is Type 15D.

	<u>Receiver</u>	<u>Converter</u>
Frequency Range:	108 to 135 mc	30 to 10500 cps
Channels Available:	Continuously tuned	
Channels Preset:	None	
Channel Selection:	Remote manual tuning	
Output:	170 to 360 mw	150-0-150 microamperes dc
Primary Power:	14/28 vdc	
Typical Mfgr:	Aircraft Radio Corporation	

AN/ARN-38

Radio Receiving Set
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. The receiver unit is designated R-605/ARN-38. Vertical guidance is provided by the AN/ARN-37.

Frequency Range: 108 to 135.9 mc
Channels Available: 280 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: Visual: Cross pointer currents Aural: 300 mw
Primary Power: 27.5 vdc and 115 vac 400 cycle
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

AN/ARN-41

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated R-637/ARN-41. The commercial designation is ADF-14.

Frequency Range: 190 to 1725 kc in 3 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 500 mw
Primary Power: 14/28 vdc
Typical Mfgr: Lear, Incorporated

AN/ARN-42

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: 190 to 1700 kc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output:
Primary Power: 27.5 vdc
Typical Mfgr: Lear, Incorporated

AN/ARN-44

Radio Compass
LF/MF/HF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low, standard broadcast and high frequency radio bands. The receiver unit is designated R-713/ARN-44.

Frequency Range: 2 to 3.5 mc and 200 to 1750 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Continuous tuning
Output: 50 mw (min)
Primary Power: 26.5 vdc
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

AN/ARN-54

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated R-787/ARN-54.

Frequency Range: 190 to 1750 kc in 3 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output:
Primary Power: 27.5 vdc
Typical Mfgr: Lear, Incorporated

AN/ARN-56

Radio Receiving Set
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. The receiver unit is designated R-811/ARN-56.

Frequency Range: 108 to 135.9 mc
Channels Available: 20 LOC, 80 VOR and 180 COMM
Channels Preset: None
Channel Selection:
Output: Visual: On VOR or ILS indicators ID-351/ARN, ID-387/ARN or ID-250/ARN
Aural:
Primary Power: 27.5 vdc and 115 vac 400 cycle 1 phase
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

AN/ARN-59

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated R-30/ADF-21A.

Frequency Range: 190 to 1750 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 300 mw
Primary Power: 27.5 vdc
Typical Mfgr: Aircraft Radio Corporation

AN/ARR-11

Radio Receiving Set
LF/MF/HF

Primary Use: Airborne reception of cw, mcw and voice communications in the low, standard broadcast and high frequency radio bands in air/air and air/ground service. The receiver unit is designated BC-348 (any except B, C or D)

Frequency Range: 200 to 500 kc and 1.5 to 18 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 10 mw
Primary Power: 24 vdc
Typical Mfgr: Radio Corporation of America

AN/ARR-15, 15A

Radio Receiving Set
MF/HF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. The receiver unit is designated R-105/ARR-15 or R-105A/ARR-15.

Frequency Range: 1.5 to 18.5 mc in 6 bands
Channels Available: Continuously variable (local only)
Channels Preset: 10 (local or remote)
Channel Selection: Local or remote motor control (autotune)
Output: 500 mw
Primary Power: 26.5 vdc
Typical Mfgr: Collins Radio Company

AN/ARR-40Radio Receiving Set
UHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. The receiver unit is designated R-550/ARR-40 and is used as back-up for AN/ARC-27.

Frequency Range: 329.3 to 335 mc
Channels Available: 20
Channels Preset: 20
Channel Selection: Remote motor control
Output: 250 mw
Primary Power: 28 vdc and 115 vac 400 cycle 1 phase
Typical Mfgr: Collins Radio Company

AN/ARR-41

Radio Receiving Set
LF/HF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. The receiver unit is designated R-648/ARR-41 and is similar in circuitry to the Collins 51J.

Frequency Range: 190 to 550 kc and 2 to 25 mc in 5 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Continuous manual tuning, local only
Output: 500 mw (max)
Primary Power: 27.5 vdc
Typical Mfgr: Collins Radio Company

AN/ART-13, 13A

Radio Transmitting Set
LF/HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. The transmitter unit is designated T-47/ART-13.

Frequency Range: 200 to 600 kc and 2 to 18.1 mc
Channels Available: Local: Continuously tuned Remote: 11
Channels Preset: 11
Channel Selection: Local or remote motor control (Collins autotune)
Output: 100 watts below 25000 ft. 50 watts above 25000 ft.
Primary Power: 28 vdc
Typical Mfgr: Collins Radio Company

AN/ART-13B

Radio Transmitting Set
LF/HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. The transmitter unit is designated T-412/ART-13B.

Frequency Range: 200 to 600 kc and 1.6 to 18.1 mc
Channels Available: Local: Continuously variable
Remote: 11/24
Channels Preset: 11/24
Channel Selection: Local or remote motor control (Collins autotune)
Output: 100 watts below 25000 feet
50 watts above 25000 feet
Primary Power: 28 vdc
Typical Mfgr: Collins Radio Company

AR-1

Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	121.5 to 122.9 mc	108 to 128 mc
Channels Available:	8	Continuously tuned
Channels Preset:	8	None
Channel Selection:	Local manual switch	Local manual tuning
Output:	2 watts	3 watts
Primary Power:	12/28 vdc	
Manufacturer:	Gonset Company	

AR-3, 3A	Receiver LF/MF
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Primary Use: Airborne reception of mcw and voice communications in the low and standard broadcast frequency radio bands in air/air and air/ground service.

Frequency Range: 200 to 400 kc & 540 to 1600 kc
Channels Available: Continuously tuned
Channels Preset: 1 (278 kc fixed)
Channel Selection: Local manual switch
Output: 100 mw
Primary Power: 1.5, 7.5 & 67.5 vdc from dry battery pack
Manufacturer: Harvey Wells, Incorporated

AR-4A	Receiver VHF
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Primary Use: Airborne reception of voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Springer Aircraft Radio Corporation

AR-96-23 (Airboy Junior)	Receiver LF
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Primary Use: Airborne reception of mcw and voice communications in the low frequency beacon band in air/ground service.

Frequency Range: 200 to 400 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 300 mw
Primary Power: 1.5 and 67.5 vdc (dry batteries)
Manufacturer: Mitchell Industries, Incorporated

AR-144**Receiver
HF**

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is generally used with the AT-144 high frequency transmitter.

Frequency Range: 2.1 to 18.5 mc
Channels Available: 144 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: 250 mw
Primary Power: 27.5 vdc
Manufacturer: Aeronautical Communications Equipment Company

AR-179**Transceiver
VHF**

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range: 118 to 135.9 mc
Channels Available: 180 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: Transmitter: 5 watts Receiver: 1.5 watts
Primary Power: 13.75/27.5 vdc
Manufacturer: Springer Aircraft Radio Corporation

ARB**Receiver
LF/MF/HF**

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. The receiver unit is designated as CRV-46151.

Frequency Range: 195 to 9050 kc
Channels Available: Continuously tuned in 4 bands
Channels Preset: None
Channel Selection: Local or remote manual tuning
Output: 10 mw
Primary Power: 28 vdc
Typical Mfgr: Radio Corporation of America

AS-1B, 1C, 2A, 2B

Receiver-Transmitter
LF/MF/HF

Primary Use: Airborne two-way voice communications in the low, standard broadcast and high frequency radio bands in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2.5 to 7.5 mc	200 to 1500 kc
Channels Available:	1	Continuously tuned
Channels Preset:	1 (usually 3105 kc)	None
Channel Selection:	None	Local manual tuning
Output:	12 watts	2.5 watts
Primary Power:	13.5 vdc	
Manufacturer:	General Electric Company	

AS-3A, B; 4AS3A1

Transceiver
LF/MF/VHF

Primary Use: Airborne two-way voice communications in the low, standard broadcast frequency and VHF radio bands in air/air and air/ground service. This is generally used with the AT-4-A transmitter as an AK-50 combination.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	121.5 to 122.9 mc	200 to 1500 kc
Channels Available:	6	Continuously tuned
Channels Preset:	6	None
Channel Selection:	Local manual switch	Local manual tuning
Output:	1.3 watts	2.5 watts
Primary Power:	12 vdc	
Manufacturer:	General Electric Company	

AT-3-A

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with the AS-1 () or AS-2 ().

Frequency Range:	121.5 to 122.9 mc
Channels Available:	6
Channels Preset:	6
Channel Selection:	Local manual switch
Output:	1 watt
Primary Power:	12 vdc
Manufacturer:	General Electric Company

AT-4-A; 4AT4A1

Transmitter
HF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with the AS-3-A transceiver as an AK-50 combination.

Frequency Range: 2.5 to 7.5 mc (approx)
Channels Available: 1
Channels Preset: 1 (usually 3105 kc)
Channel Selection: None
Output: 5 watts
Primary Power: 12 vdc
Manufacturer: General Electric Company

AT-10

Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Sonar Company

AT-92-50 (Airboy Senior)

Receiver-Transmitter
LF/MF/VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	108 to 130 mc	200 to 400 kc & 550 to 1500 kc
Channels Available:	1	Continuously tuned
Channels Preset:	1	None
Channel Selection:	None	Local manual tuning
Output:	200 mw	500 mw
Primary Power:	1.5 and 135 vdc (dry batteries)	
Manufacturer:	Mitchell Industries, Incorporated	

AT-96-25	Receiver-Transmitter LF/HF	
Primary Use:	Airborne two-way voice communications in air/air and air/ground service.	
	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	6210 kc (fixed)	200 to 410 kc
Channels Available:	1	Continuously tuned
Channels Preset:	1	None
Channel Selection:	None	Local tuning
Output:	.6 watts	100 mw (max)
Primary Power:	1.5 to 67.5 vdc (dry batteries)	
Manufacturer:	Galvin Mfg. Corp., A Division of Motorola, Inc.	

AT-99-44-BH (Airliner)	Receiver-Transmitter LF/MF/HF/MKR-BN		
Primary Use:	Airborne two-way voice communications in air/air and air/ground service. This also provides marker beacon reception.		
	<u>Transmitter</u>	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	2 to 8 mc (approx)	200 to 400 kc & 550 to 1620 kc	75 mc fixed
Channels Available:	1	Continuously tuned	1
Channels Preset:	1 (usually 3105 kc)	6	1
Channel Selection:	None	Local manual tuning and push button	Local switch
Output:	10 watts	3 watts	Aural only
Primary Power:	14 vdc		
Manufacturer:	Galvin Mfg. Corp., A Division of Motorola, Inc.		

AT-99-45, A; AT-91-47 (Avigator Senior)	Receiver-Transmitter LF/MF/VHF/MKR-BN/*VOR		
Primary Use:	Airborne two-way VHF voice communications and reception of L/MF and marker beacon signals in air/air and air/ground service. *VOR attachment was optional.		
	<u>Transmitter</u>	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	108 to 130 mc	108 to 130 mc, 195 to 405 kc & 540 to 1500 kc in 3 bands	75 mc fixed
Channels Available:	6	Continuously tuned	1
Channels Preset:	6	None	1
Channel Selection:	Local switch	Local tuning	Local switch
Output:	3 watts	4 watts (max)	Aural only
Primary Power:	12 vdc		
Manufacturer:	Mitchell Industries, Incorporated		

AT-144

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is generally used with the AR-144 and STAR receivers.

Frequency Range: 1.6 to 22 mc
Channels Available: 144 manual
Channels Preset: None
Channel Selection: Remote ledex and motor control
Output: 100 watts
Primary Power: 27.5 vdc
Manufacturer: Aeronautical Communications Equipment Company

ATB

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. The transmitter unit is designated CRV-52233.

Frequency Range: 2.3 to 9.05 mc
Channels Available: 2
Channels Preset: 2
Channel Selection: Remote relay switch
Output: 20 watts voice; 25 watts cw
Primary Power: 27.5 vdc
Typical Mfg: Radio Corporation of America

ATOM

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a companion unit to the STAR receiver.

Frequency Range: 2 to 22 mc
Channels Available: 23 basic plus an external excitation input. (Generally the STAR receiver with 168 decade selected channels)
Channels Preset: 23
Channel Selection: Remote motor control (autopositioner)
Output: 100 watts
Primary Power: 27.5 vdc and 115 vac 400 cycle or 115 vac 400 cycle
Manufacturer: Aeronautical Communications Equipment Company

ATR-1	Receiver-Transmitter VHF
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Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Microlab

ATR-1	Transceiver LF/MF/HF
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Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 4 mc (approx)	200 to 1500 kc in 2 bands
Channels Available:	1	Continuously tuned
Channels Preset:	1	None
Channel Selection:	None	Local manual tuning
Output:	10 to 15 watts (approx)	1 to 5 watts (approx)
Primary Power:	12 vdc	
Manufacturer:	Raytheon/Belmont	

ATR-3-12	Transceiver LF/MF/HF
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Primary Use: Airborne two-way mcw and voice communications in the low, standard broadcast and high frequency radio bands in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2.5 to 7.5 mc (approx)	200 to 400 kc; 550 to 1600 kc
Channels Available:	1	Continuously tuned
Channels Preset:	1 (usually 3105 kc)	None
Channel Selection:	None	Local manual tuning
Output:	6 to 8 watts	3 watts
Primary Power:	12 vdc	
Manufacturer:	Harvey Wells, Incorporated	

AVR-15, 15A

Receiver
LF

Primary Use: Airborne reception of mcw and voice communications in air/ground service. This is generally used with the AVT-15 and 15A transmitters.

Frequency Range: 200 to 400 kc
Channels Available: Continuously tuned
Channels Preset: 1 (usually on 278 kc)
Channel Selection: Local manual tuning and switch
Output: 300 mw
Primary Power: AVR-15: 12 vdc AVR-15A: 6 vdc
Manufacturer: Radio Corporation of America

AVR-100

Receiver
LF/MF

Primary Use: Airborne reception of mcw and voice communications in air/ground service.

Frequency Range: 195 to 405 kc and 550 to 1500 kc
Channels Available: Continuously tuned in 2 bands
Channels Preset: 1 (usually on 278 kc)
Channel Selection: Local manual tuning and switch
Output: 50 to 100 mw
Primary Power: 1.5 and 67.5 vdc
Manufacturer: Radio Corporation of America

AVR-101

Receiver
LF

Primary Use: Airborne reception of mcw and voice communications in air/ground service.

Frequency Range: 195 to 405 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 50 to 100 mw
Primary Power: 1.5 and 67.5 vdc
Manufacturer: Radio Corporation of America

AVR-104

Receiver

LF

Primary Use: Airborne reception of mcw and voice communications in air/ground service. This consists of an RF unit and an IF-AF unit and is generally used with an AVT-111, 112 or 114 transmitter.

Frequency Range: 200 to 415 kc
Channels Available: Continuously tuned
Channels Preset: 1 (usually on 278 kc)
Channel Selection: Local manual tuning and switch
Output: 10 mw (min)
Primary Power: 1.4, 67.5 and 7.5 vdc
Manufacturer: Radio Corporation of America

AVT-15, 15A

Transmitter

HF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 2.5 to 6.7 mc
Channels Available: 2
Channels Preset: 2
Channel Selection: Local manual switch
Output: 7 watts
Primary Power: AVT-15: 12 vdc AVT-15A: 6 vdc
Manufacturer: Radio Corporation of America

AVT-23

Transmitter

HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service.

Frequency Range: 3 to 13 mc
Channels Available: 4
Channels Preset: 4
Channel Selection: Local or remote motor control
Output: 25 watts
Primary Power: 12/24 vdc
Manufacturer: Radio Corporation of America

AVT-114

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 121.5 to 122.9 mc
Channels Available: 6
Channels Preset: 6
Channel Selection: Local manual switch
Output: 6 watts
Primary Power: 6/12/24 vdc
Manufacturer: Radio Corporation of America

AVTR-116

Receiver-Transmitter
LF/VHF/MKR-BN

Primary Use: Airborne two-way reception of mcw and voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	121.5 to 122.9 mc	200 to 400 kc	75 mc fixed
Channels Available:	5	Continuously tuned	1
Channels Preset:	5	None	1
Channel Selection:	Local manual switch	Local manual switch	None
Output:	1 watt	50 to 250 mw	Aural only
Primary Power:	13 vdc		
Manufacturer:	Radio Corporation of America		

BC-1

Transceiver
LF/MF/HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	3023.5 kc (fixed)	200 to 1550 kc in 2 bands
Channels Available:	1	Continuously variable
Channels Preset:	1	None
Channel Selection:	None	Local manual tuning
Output:	6 watts (approx)	2 to 3 watts (approx)
Primary Power:	12 vdc	
Manufacturer:	Western Electric Company	

BC-348, H,J,K,L,M,N,O,P,Q,R

Radio Receiver

LF/MF/HF

Primary Use: Airborne reception of cw, mcw and voice communications in the low, standard broadcast and high frequency radio bands in air/air and air/ground service. This is the same as BC-224 () and is a part of Radio Receiving Set AN/ARR-11.

Frequency Range: 200 to 500 kc and 1.5 to 18 mc in 6 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 10 mw (min)
Primary Power: BC-348, H,K,L & R: 14/28 vdc All others: 28 vdc
Typical Mfr: Radio Corporation of America

BC-433B

Radio Compass

LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. This is the receiver unit of Radio Receiving Set SCR-269.

Frequency Range: 200 to 1750 kc in 3 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 50 mw
Primary Power: 14/28 vdc
Typical Mfr: Bendix Radio Div. of Bendix Aviation Company

BC-453A, B/SCR-274N

Receiver

LF

Primary Use: Airborne reception of mcw and voice communications in air/ground service. This is a receiver unit of the SCR-274N group.

Frequency Range: 190 to 550 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 10 mw (min)
Primary Power: 26 vdc
Typical Mfr: Western Electric Company

BC-454A, B/SCR-274N

Receiver

HF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is a receiver unit of the SCR-274N group.

Frequency Range: 3 to 6 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 10 mw (min)
Primary Power: 26 vdc
Typical Mfgr: Western Electric Company

BC-624A, AM, C

Receiver

VHF

Primary Use: Airborne reception of mcw and voice communications in air/air and air/ground service. This is the receiver unit of Radio Set SCR-522/542.

Frequency Range: 100 to 156 mc
Channels Available: 4
Channels Preset: 4
Channel Selection: Remotely controlled motor positioner
Output: 50 mw (min) 1 watt (max)
Primary Power: 12/24 vdc
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

BC-625A, AM

Transmitter

VHF

Primary Use: Airborne transmission of mcw and voice communications in air/air and air/ground service. This is the transmitter unit of Radio Set SCR-522/542.

Frequency Range: 100 to 156 mc
Channels Available: 4
Channels Preset: 4
Channel Selection: Remotely controlled motor positioner
Output: 8 to 10 watts
Primary Power: 12/24 vdc
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

BC-696A/SCR-274N

Transmitter

HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a transmitter unit of the SCR-274N group.

Frequency Range: 3 to 4 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 40 watts (max)
Primary Power: 26 vdc
Typical Mfgr: Western Electric Company

BC-946B/SCR-274N

Receiver

MF

Primary Use: Airborne reception of cw, mcw and voice communications in air/ground service. This is a receiver unit of the SCR-274N group.

Frequency Range: .52 to 1.5 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 10 mw (min)
Primary Power: 26 vdc
Typical Mfgr: Western Electric Company

BC-1206A, B, C

Receiver

LF

Primary Use: Airborne reception of voice communications in air/ground service. The commercial designation is the 438-3 or the 512 and 524.

Frequency Range: 200 to 400 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 300 mw
Primary Power: 28 vdc
Typical Mfgr: Detrola Corporation

BMT-2B	Transmitter VHF
Primary Use:	Airborne transmission of voice communications in air/air and air/ground service.
Frequency Range:	121.5 to 122.8 mc (approx)
Channels Available:	6
Channels Preset:	6
Channel Selection:	Local manual switch
Output:	3 watts (max)
Primary Power:	12 vdc
Manufacturer:	Skycrafter
BR-2	Receiver LF/MF/HF
Primary Use:	Airborne reception of mcw and voice communications in air/ground service.
Frequency Range:	
Channels Available:	
Channels Preset:	(TECHNICAL DATA NOT AVAILABLE)
Channel Selection:	
Output:	
Primary Power:	
Manufacturer:	Waller Manufacturing Company
BR-3	Receiver LF
Primary Use:	Airborne reception of mcw and voice communications in air/ground service.
Frequency Range:	
Channels Available:	
Channels Preset:	(TECHNICAL DATA NOT AVAILABLE)
Channel Selection:	
Output:	
Primary Power:	
Manufacturer:	Air Associates, Incorporated
BT-2	Transmitter LF/MF/HF
Primary Use:	Airborne transmission of voice communications in air/air and air/ground service.
Frequency Range:	
Channels Available:	
Channels Preset:	(TECHNICAL DATA NOT AVAILABLE)
Channel Selection:	
Output:	
Primary Power:	
Manufacturer:	Waller Manufacturing Company

C-2	Transmitter VHF
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Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: FranAir Company

C-3	Transmitter VHF
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Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 108 to 128 mc
Channels Available: (Unknown)
Channels Preset: (Unknown)
Channel Selection: (Unknown)
Output: 1 to 2.8 watts
Primary Power: 12 vdc
Manufacturer: FranAir Company

C-3-12	Receiver-Transmitter LF/MF/VHF
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Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	108 to 128 mc	200 to 1500 kc in 2 bands
Channels Available:	12	Continuously tuned
Channels Preset:	12	None
Channel Selection:	Local manual switch	Local manual tuning
Output:	2.8 watts	3 watts
Primary Power:	12 vdc	
Manufacturer:	FranAir Company	

C-10

Transmitter
HF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Aero Signal Labs. (formerly Aircraft Specialty Lines)

CA-2, 2A

Transceiver
LF/MF/HF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 7 mc	195 to 410 kc & 540 to 1610 kc
Channels Available:	1	Continuously tuned
Channels Preset:	1 (usually on 3105 kc)	None
Channel Selection:	None	Local manual tuning
Output:	15 watts	3 to 5 watts
Primary Power:	12 vdc	
Manufacturer:	Hallicrafters Company	

CA-4

Transceiver
LF/HF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 7 mc	195 to 410 kc
Channels Available:	1	Continuously tuned
Channels Preset:	1	None
Channel Selection:	None	Local manual tuning
Output:	15 watts	3 to 5 watts
Primary Power:	12 vdc	
Manufacturer:	Hallicrafters Company	

CMA-301

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: 150 to 2000 kc in 4 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote servo control
Output: 300 mw
Primary Power: 28 vdc, 26 vac 400 cycle and 115 vac 400 cycle
Manufacturer: Canadian Marconi

CR-2

Receiver-Transmitter
LF/MF/HF

Primary Use: Airborne two mcw and voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	3 to 7 mc (approx)	200 to 400 kc
Channels Available:	1	Continuously tuned
Channels Preset:	1 (usually on 3023.5 kc)	None
Channel Selection:	None	Local manual tuning
Output:	5 watts	50 mw (min)
Primary Power:	12 vdc	
Manufacturer:	Waller Manufacturing Company	

CTA-139A

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Motorola, Incorporated

CTA-140BS

Receiver
VHF

Primary Use: Airborne reception of mcw and voice communications in air/ground service.

Frequency Range:

Channels Available:

Channels Preset: (TECHNICAL DATA NOT AVAILABLE)

Channel Selection:

Output:

Primary Power:

Manufacturer: Motorola, Incorporated

CV-431/ARC-60

Converter-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This unit generates UHF voice transmission signals and converts received UHF signals to VHF by heterodyning and is used with the R-508/ARC receiver to form the AN/ARC-60 system. The commercial designation is TV-10/Type 12.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	228 to 258 mc	228 to 258 mc
Channels Available:	8	8
Channels Preset:	8	8
Channel Selection:	Remote relay switch	Remote relay switch
Output:	.5 watts	118 to 148 mc injection signal to an R-508/ARC receiver
Primary Power:	28 vdc	
Typical Mfgr:	Aircraft Radio Corporation	

DADF-1

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: 190 to 1750 kc

Channels Available: Continuously tuned

Channels Preset: None

Channel Selection: Remote manual tuning

Output: 250 mw

Primary Power: 14/28 vdc

Manufacturer: Dare, Incorporated

DF-2	Radio Compass LF/MF
Primary Use:	Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.
Frequency Range:	200 to 400 kc and 540 to 1620 kc
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Local manual tuning
Output:	300 mw
Primary Power:	9 vdc (6 - 1.5 volt "D" size dry cells)
Manufacturer:	Heath Company
DF-201	Radio Compass LF/MF
Primary Use:	Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated 51Y-1, 51Y-2 or 51Y-3.
Frequency Range:	90 to 1800 kc in 4 bands
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Remote servo drive tuning
Output:	100 mw
Primary Power:	27.5 vdc and 115 vac 400 cycle 1 phase
Manufacturer:	Collins Radio Company
DFA-70A, B	Radio Compass LF/MF
Primary Use:	Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.
Frequency Range:	90 to 1750 kc
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Remote motor drive tuning
Output:	(Unknown)
Primary Power:	27.5 vdc and 26/115 vac 400 cycle
Manufacturer:	Bendix Radio Div. of Bendix Radio Company

DTR-360A, A-1

Transceiver
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range: 118 to 135.95 mc
Channels Available: 180/360 manual
Channels Preset: None
Channel Selection: Remote ledex switch
Output: Transmitter: 15 watts Receiver: 8 watts (max)
Primary Power: 26 vdc
Manufacturer: Dare, Incorporated

DX-100

Transmitter
HF

Primary Use: Airborne transmission of cw and voice communications in air/air and air/ground service.

Frequency Range: 2 to 30 mc
Channels Available: Continuously tuned and 5 crystal controlled
Channels Preset: None
Channel Selection: Local manual tuning and local manual switch
Output: 100 to 125 watts voice; 120 to 140 watts cw
Primary Power: 115 vac 50/60 cycle 1 phase
Manufacturer: Heath Company

EX-60

Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range: 118 to 122.9 mc and 126 to 126.9 mc
Channels Available: 60 manual
Channels Preset: None
Channel Selection: Local manual switch
Output: Transmitter: 1.2 watts Receiver: 500 mw
Primary Power: 12/24 vdc
Manufacturer: King Radio Corporation

EX-90

Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range: 118 to 126.9 mc
Channels Available: 90 manual
Channels Preset: None
Channel Selection: Local manual switch
Output: Transmitter: 1.2 watts Receiver: 500 mw
Primary Power: 12/24 vdc
Manufacturer: King Radio Corporation

FA-101R

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service.

Frequency Range: 108 to 128 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 10 mw (approx)
Primary Power: 12 vdc
Manufacturer: FranAir Company

FTR

Transmitter
HF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Morrow Radio Manufacturing Company

LFR-1, 1L, 2, 2L, 3, 3L

Receiver
LF/MF

Primary Use: Airborne reception of mcw and voice communications in air/ground service.

Frequency Range: 200 to 400 kc and 550 to 1500 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 10 mw (min)
Primary Power: 13.5 vdc
Manufacturer: National Aeronautical Corporation

LNC-100A

Radio Set
Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver unit is designated 5611A and the transmitter unit 5640.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 131.95 mc	108 to 130.9 mc
Channels Available:	140 manual	240 manual
Channels Preset:	None	None
Channel Selection:	Local manual switch	Local manual switch
Output:	3 watts	5 watts
Primary Power:	14/28 vdc	
Manufacturer:	Lear, Incorporated	

LNC-100B

Radio Set
Receiver-Transmitter
VOR/LOC/VHF/MKR-BN

Primary Use: Airborne VOR/LOC/Marker Beacon instrumentation and two-way voice communications in air/air and air/ground service. This consists of a Model 5611 VHF receiver, a 5640 VHF transmitter and a 2374 navigation module.

	<u>Transmitter</u>	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	118 to 131.95 mc	108 to 130.9 mc	75 mc fixed
Channels Available:	140 manual	240 manual	1
Channels Preset:	None	None	1
Channel Selection:	Local switch	Local switch	Local switch
Output:	3 watts	5 watts	Aural only
Primary Power:	14/28 vdc		
Manufacturer:	Lear, Incorporated		

LNC-100C

Radio Set
Receiver-Transmitter
VOR/LOC/VHF/MKR-BN/ILS

Primary Use: Airborne navigation instrumentation and two-way voice communications in air/air and air/ground service. Consists of 2 - 5611 VHF receivers, 1 - 5640 transmitter, 1 - 2374 navigation module and 1 - 5607 glide slope receiver.

	<u>Transmitter</u>	<u>Receiver</u>	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	118 to 131.95 mc	108 to 130.9 mc	329.6 to 335 mc	75 mc fixed
Channels Available:	140 manual	480 manual	10	1
Channels Preset:	None	None	10	1
Channel Selection:	Local switch	Local switch	Local switch	Local switch
Output:	3 watts	5 watts		Aural only
Primary Power:	14/28 vdc			
Manufacturer:	Lear, Incorporated			

LNC-100D

Radio Set
Receiver-Transmitter
VOR/LOC/VHF/MKR-BN/ILS

Primary Use: Dual version of the LNC-100C airborne navigation instrumentation and two-way voice communications system. Consists of 2 - 5611 receivers, 2 - 5640 transmitters, 2 - 4087 indicators, 2 - 2374 navigation modules, and 1 - 5607 glide slope receiver.

	<u>Transmitter</u>	<u>Receiver</u>	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	118 to 131.95 mc	108 to 130.9 mc	329.6 to 335 mc	75 mc fixed
Channels Available:	280 manual	480 manual	10	1
Channels Preset:	None	None	10	1
Channel Selection:	Local switch	Local switch	Local switch	Local switch
Output:	3 watts	5 watts		Aural only
Primary Power:	14/28 vdc			
Manufacturer:	Lear, Incorporated			

LNC-200

Radio Set
Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This consists of a 2304 receiver-tuner, a 5516 receiver-amplifier and a 5639A transmitter.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 135.9 mc	108 to 135.9 mc
Channels Available:	360 manual	560 manual
Channels Preset:	None	None
Channel Selection:	Remote ledex switch	Remote ledex switch
Output:	8 to 10 watts	50 mw
Primary Power:	28 vdc	
Manufacturer:	Lear, Incorporated	

LR-5, 5A, 5B

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is part of the LTR-5 and LTRA-5 combinations.

Frequency Range: 108 to 127 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 3.5 watts
Primary Power: 14 vdc
Manufacturer: Lear, Incorporated

LR-6, 6A, 6N

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is a part of the LTR-6, LTRA-6, LTTR-6 or L3TR-6 combinations.

Frequency Range: 108 to 127 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 3.5 watts
Primary Power: 14 vdc
Manufacturer: Lear, Incorporated

LRA-5	Receiver LF/MF
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Primary Use: Airborne reception of mcw and voice communications in air/ground service. This is a part of the LTR-5 and LTRA-5 combinations.

Frequency Range: 200 to 1600 kc
 Channels Available: Continuously tuned
 Channels Preset: None
 Channel Selection: Local manual tuning
 Output: 3.5 watts
 Primary Power: 14 vdc
 Manufacturer: Lear, Incorporated

LRA-6A*, 6B	Receiver Adapter LF/MF/MKR-BN*
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Primary Use: Airborne reception of mcw and voice communications in air/ground service. This is part of the LTRA-6 combination. *Marker Beacon reception is provided by the LRA-6A only.

	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	200 to 1600 kc	75 mc fixed
Channels Available:	Continuously tuned	1
Channels Preset:	None	1
Channel Selection:	Local manual tuning	Local switch
Output:	1.5 watts	Aural only
Primary Power:	14/28 vdc	
Manufacturer:	Lear, Incorporated	

LTR-5	Receiver-Transmitter VHF
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Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. The receiver unit is designated LR-5B and the transmitter unit is designated RT-10C.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	121.5 to 122.9 mc	108 to 127 mc
Channels Available:	6	Continuously tuned
Channels Preset:	6	None
Channel Selection:	Local switch	Local manual tuning
Output:	2 watts	3.2 watts
Primary Power:	14 vdc	
Manufacturer:	Lear, Incorporated	

LTR-6	Receiver-Transmitter VHF
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Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. The receiver unit is designated LR-6 and the transmitter unit is designated RT-10E under one dust cover.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	120.5 to 124.5 mc	108 to 127 mc
Channels Available:	12	Continuously tuned
Channels Preset:	12	None
Channel Selection:	Local switch	Local manual tuning
Output:	2 watts	3.5 watts
Primary Power:	14/28 vdc	
Manufacturer:	Lear, Incorporated	

LTR-800	Receiver-Transmitter VHF
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Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter unit is designated Model 5672.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 147.95 mc	108 to 147.95 mc
Channels Available:	600 manual	800 manual
Channels Preset:	None	None
Channel Selection:	Remote ledex switch	Remote ledex switch
Output:	5 watts	2 watts
Primary Power:	14/28 vdc	
Manufacturer:	Lear, Incorporated	

LTRA-5	Receiver-Transmitter LF/MF/VHF
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Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. The receiver unit is designated LR-5B, the transmitter unit is designated RT-10C and the LF adapter is designated LRA-5 all under one dust cover.

	<u>Transmitter</u>	<u>Receivers</u>
Frequency Range:	121.5 to 122.9 mc	108 to 127 mc and 200 to 1600 kc
Channels Available:	3 or 6	Continuously tuned
Channels Preset:	3 or 6	None
Channel Selection:	Local switch	Local manual tuning
Output:	2 watts	3.5 watts
Primary Power:	14 vdc	
Manufacturer:	Lear, Incorporated	

LTRA-6	Receiver-Transmitter LF/MF/VHF/MKR-BN		
Primary Use:	Airborne two-way mcw and voice communications and reception of L/MF and marker beacon signals in air/air and air/ground service. The receiver unit is designated LR-6, the transmitter unit is designated RT-10E and the LF adapter is designated LRA-6A. They are all under one dust cover and are generally used with the VCA adapter for LOC and the LCP-5 or the 2214 converter for VOR.		
Frequency Range:	<u>Transmitter</u> 120.5 to 124.5 mc	<u>Receiver</u> 108 to 127 mc & 200 to 600 kc	<u>MKR-BN</u> 75 mc fixed
Channels Available:	12	Continuously tuned	1
Channels Preset:	12	None	1
Channel Selection:	Local switch	Local manual tuning	Local switch
Output:	2 watts	1.5 watts	Aural only
Primary Power:	14/28 vdc		
Manufacturer:	Lear, Incorporated		

LVTR-36	Receiver-Transmitter VHF	
Primary Use:	Airborne two-way voice communications in air/air and air/ground service.	
Frequency Range:	118.1 to 126.7 mc	
Channels Available:	36	
Channels Preset:	36	
Channel Selection:	Remote ledex switch	
Output:	Transmitter: 5 watts	Receiver: 500 mw
Primary Power:	14/28 vdc	
Manufacturer:	Lear, Incorporated	

MA-4	Receiver LF	
Primary Use:	Airborne reception of mcw and voice communications in air/ground service.	
Frequency Range:	200 to 400 kc	
Channels Available:	Continuously tuned	
Channels Preset:	1 (usually on 278 kc)	
Channel Selection:	Local switch and manual tuning	
Output:	(Unknown)	
Primary Power:	1.5 and 67.5 vdc dry batteries or battery pack	
Manufacturer:	Heath Company	

Mark V	Receiver-Transmitter
	VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This also provides an output to a VOA-3A omni-converter for VOR/LOC instrumentation.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 127 mc	108 to 127 mc
Channels Available:	90 manual	190 manual
Channels Preset:	None	None
Channel Selection:	Local switch	Local switch
Output:	5 watts	5 watts
Primary Power:	13.75/27.5 vdc	
Manufacturer:	National Aeronautical Corporation	

MC-6, 6A	Transceiver
	LF/MF/HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Rex Bassett, Incorporated

MK-1	Radio Compass
	LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: 200 to 1500 kc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 500 mw
Primary Power: 27 vdc
Manufacturer: Sperry Gyroscope Company

MN-26A, C, CA, N, W, X, Y

Radio Compass
LF/MF/HF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low, standard broadcast and high frequency radio bands.

Frequency Range: 150 to 1750 kc and 3.4 to 7 mc in 3 bands

Channels Available: Continuously tuned

Channels Preset: None

Channel Selection: Remote manual tuning

Output: 50 mw (min)

Primary Power: 14/28 vdc

Manufacturer: Bendix Radio Div. of Bendix Aviation Company

MN-26LB

Radio Compass
LF/MF/HF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low, standard broadcast and high frequency radio bands. This is the receiver unit of Radio Compass AN/ARN-11.

Frequency Range: 200 to 410 kc, 550 to 1200 kc and 2.9 to 6 mc

Channels Available: Continuously tuned

Channels Preset: None

Channel Selection: Remote manual tuning

Output: 50 mw (min)

Primary Power: 28 vdc

Manufacturer: Bendix Radio Div. of Bendix Aviation Company

MN-60

Receiver
LF

Primary Use: Airborne reception of mcw and voice communications in air/ground service.

Frequency Range:

Channels Available:

Channels Preset: (TECHNICAL DATA NOT AVAILABLE)

Channel Selection:

Output:

Primary Power:

Manufacturer: Allied

MN-62A	Radio Compass LF/MF
Primary Use:	Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.
Frequency Range:	100 to 1750 kc
Channels Available:	Continuously tuned in 4 bands
Channels Preset:	None
Channel Selection:	Remote manual tuning
Output:	500 mw
Primary Power:	14/28 vdc and 115 vac 400 cycle 1 phase
Manufacturer:	Bendix Radio Div. of Bendix Aviation Company

MN-85DB, F	Receiver VOR/LOC/VHF
Primary Use:	Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service.
Frequency Range:	108 to 135.9 mc
Channels Available:	280 manual
Channels Preset:	None
Channel Selection:	Remote motor control
Output:	Visual: VOR/LOC indicator currents; Aural: 200 mw
Primary Power:	27.5 vdc / 115 vac 300 to 1000 cycle 1 phase
Manufacturer:	Bendix Radio Div. of Bendix Aviation Company

P-2A	Transmitter VHF
Primary Use:	Airborne transmission of voice communications in air/air and air/ground service.
Frequency Range:	
Channels Available:	
Channels Preset:	(TECHNICAL DATA NOT AVAILABLE)
Channel Selection:	
Output:	
Primary Power:	
Typical Mfgr:	Aircraft Radio Corporation

P-11	Transmitter VHF
Primary Use:	Airborne transmission of voice communications in air/air and air/ground service
Frequency Range:	
Channels Available:	
Channels Preset:	(TECHNICAL DATA NOT AVAILABLE)
Channel Selection:	
Output:	
Primary Power:	
Typical Mfgr:	Bendix Radio Div. of Bendix Aviation Company

PAR-3A**Receiver
LF**

Primary Use: Airborne reception of voice communications in air/ground service.

Frequency Range: 195 to 410 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 125 mw
Primary Power: 1.5 and 67.5 vdc (dry batteries)
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

PAR-70A, B**Receiver
LF/MF**

Primary Use: Airborne reception of voice communications in air/ground service.

Frequency Range: 200 to 1500 kc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 100 mw
Primary Power: 70A: 12 vdc 70B: 24 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

PAT-40A, B**Transmitter
HF**

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 2.5 to 7.5 mc (approx)
Channels Available: 1
Channels Preset: 1 (usually 3105 kc)
Channel Selection: None
Output: 5 watts
Primary Power: 40A: 12 vdc 40B: 24 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

PAT-50A, B

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 121.5 to 122.9 mc
Channels Available: 5
Channels Preset: 5
Channel Selection: Local switch
Output: .35 watts
Primary Power: 50A: 12 vdc 50B: 24 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

PATR-10A, B

Transceiver
LF/MF/VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	121.5 to 122.9 mc	200 to 1500 kc in 2 bands
Channels Available:	5	Continuously tuned
Channels Preset:	5	None
Channel Selection:	Local switch	Local manual tuning
Output:	.35 watts	2 watts
Primary Power:	10A: 12 vdc 10B: 24 vdc	
Manufacturer:	Bendix Radio Div. of Bendix Aviation Company	

R-5, 5A, 5B/ARN-7

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. This is the receiver unit of Radio Compass AN/ARN-7.

Frequency Range: 100 to 1750 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 50 mw (min)
Primary Power: 14/28 vdc and 115 vac 400 cycle 1 phase
Typical Mfr: Bendix Radio Div. of Bendix Aviation Company

R-10A/Type 12	Receiver LF/MF
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Primary Use: Airborne reception of cw, mcw and voice communications in air/ground service. This is part of the A.R.C. Type 12 system.

Frequency Range: 520 to 1500 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 800 mw
Primary Power: 14/28 vdc
Manufacturer: Aircraft Radio Corporation

R-11A/Type 12	Receiver LF/MF
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Primary Use: Airborne reception of cw, mcw and voice communications in air/ground service. This is part of the A.R.C. Type 12 system.

Frequency Range: 190 to 550 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 800 mw
Primary Power: 14/28 vdc
Manufacturer: Aircraft Radio Corporation

R-13A, B/Type 15	Receiver VOR/LOC/VHF
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Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/ground service. This is generally used with a B-10 or B-13A/Type 15 converter to form the Type 15C or 15D VHF navigation system. The military designation is R-445/ARN-30().

Frequency Range: 108 to 135 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 170 to 360 mw
Primary Power: 14/28 vdc
Manufacturer: Aircraft Radio Corporation

R-15/Type 12Receiver
VHF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is part of the A.R.C. Type 12 system. The military designation is R-509/ARC.

Frequency Range: 108 to 135 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 360 mw
Primary Power: 14/28 vdc
Manufacturer: Aircraft Radio Corporation

R-19/Type 12Receiver
VHF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is part of the A.R.C. Type 12 system. The military designation is R-507/ARC or R-508/ARC.

Frequency Range: 118 to 148 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 360 mw
Primary Power: 14/28 vdc
Manufacturer: Aircraft Radio Corporation

R-22/Type 12Receiver
LF/MF

Primary Use: Airborne reception of mcw and voice communications in air/ground service. This is part of the A.R.C. Type 12 equipment.

Frequency Range: 540 to 1600 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 360 mw
Primary Power: 28 vdc
Manufacturer: Aircraft Radio Corporation

R-23, A/ARC-5

Receiver
LF

Primary Use: Airborne reception of cw, mcw and voice communications in air/ground service. This is a receiver unit of Radio Set AN/ARC-5.

Frequency Range: 190 to 550 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 1 watt
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-24/ARC-5

Receiver
LF/MF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is a receiver unit of Radio Set AN/ARC-5.

Frequency Range: 520 to 1500 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 1 watt (max)
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-25/ARC-5

Receiver
HF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is a receiver unit of Radio Set AN/ARC-5.

Frequency Range: 1.5 to 3 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 1 watt (max)
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-26/ARC-5**Receiver
HF**

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is a receiver unit of Radio Set AN/ARC-5.

Frequency Range: 3 to 6 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 1 watt
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-27/ARC-5**Receiver
HF**

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is a receiver unit of Radio Set AN/ARC-5.

Frequency Range: 6 to 9 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 1 watt (max)
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-28/ARC-5**Receiver
VHF**

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is a receiver unit of Radio Set AN/ARC-5.

Frequency Range: 100 to 156 mc
Channels Available: 4
Channels Preset: 4
Channel Selection: Remote motor switch
Output: 450 mw (max)
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-30, A/ADF-21	Radio Compass LF/MF
Primary Use:	Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. This is the receiver unit of ADF-21 (). The military designation is AN/ARN-59.
Frequency Range:	190 to 1750 kc
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Remote manual tuning
Output:	300 mw
Primary Power:	13.7/27.5 vdc
Manufacturer:	Aircraft Radio Corporation
R-32/Type 15	Receiver VHF
Primary Use:	Airborne reception of mcw and voice communications in air/air and air/ground service. This also provides output to the B-13A VOR converter in the Type 15E navigation system.
Frequency Range:	108 to 135 mc
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Remote manual tuning
Output:	360 mw
Primary Power:	14/28 vdc
Manufacturer:	Aircraft Radio Corporation
R-77, A, B/ARC-3	Receiver VHF
Primary Use:	Airborne reception of voice communications in air/air and air/ground service. This is the receiver unit of Radio Set AN/ARC-3.
Frequency Range:	100 to 156 mc
Channels Available:	8
Channels Preset:	8
Channel Selection:	Remote relay switch
Output:	600 mw
Primary Power:	28 vdc
Manufacturer:	Colonial Radio Corporation

R-101A, B/ARN-6

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. This is the receiver unit of AN/ARN-6 ADF system.

Frequency Range: 100 to 1750 kc

Channels Available: Continuously tuned

Channels Preset: None

Channel Selection: Remote manual tuning

Output: 50 mw (min)

Primary Power: 26.5 vdc

Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

R-105A/ARR-15

Receiver
HF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is a receiver unit of Radio Set AN/ARR-15 or AN/ARR-15A.

Frequency Range: 1.5 to 18.5 mc in 6 bands

Channels Available: Continuously variable (local only)

Channels Preset: 10 (local or remote)

Channel Selection: Local or remote motor control (autotune)

Output: 500 mw

Primary Power: 26.5 vdc

Typical Mfgr: Collins Radio Company

R-252A, B, C/ARN-14A

Receiver
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. This is part of Radio Receiving Set AN/ARN-14 and is generally used with the R-322A/ARN-18 glide slope receiver. The commercial designation is 51R-().

Frequency Range: 108 to 135.9 mc

Channels Available: 280 manual

Channels Preset: None

Channel Selection: Remote servo control

Output: Visual: dc cross pointer currents Aural: 300 mw

Primary Power: 26.5 vdc or 26.5 vdc and 115 vac 400 cycle

Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

R-428A, B/ARC-36

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is the receiver unit of Radio Set AN/ARC-36.

Frequency Range: 100 to 156 mc
Channels Available: 16
Channels Preset: 16
Channel Selection: Remote relay switch
Output: 600 mw
Primary Power: 28 vdc
Typical Mfgr: Sylvania Electric Products, Incorporated

R-445/ARN-30

Receiver
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. This is part of Radio Receiving Set AN/ARN-30 () and is generally used with a CV-265/ARN-30A VOR converter. The commercial designation is R-13/Type 15.

Frequency Range: 108 to 135 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 170 to 360 mw
Primary Power: 14/28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-507/ARC

Receiver
VHF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. The commercial designation is R-19/Type 12.

Frequency Range: 118 to 148 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 360 mw
Primary Power: 14 vdc
Typical Mfgr: Aircraft Radio Corporation

R-508/ARC

Receiver
VHF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is a receiver unit of AN/ARC-60 and is generally used with the CV-431/ARC-60 converter-transmitter for UHF reception. The commercial designation is R-19/Type 12.

Frequency Range: 118 to 148 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 360 mw
Primary Power: 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-509/ARC

Receiver
VHF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. The commercial designation is R-15/Type 12.

Frequency Range: 108 to 135 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 360 mw
Primary Power: 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-511/ARC

Receiver
LF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. The commercial designation is R-11/Type 12.

Frequency Range: 190 to 550 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 800 mw
Primary Power: 28 vdc
Typical Mfgr: Aircraft Radio Corporation

R-539/ARN-14B

Receiver
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. This is part of Radio Receiving Set AN/ARN-14B and is generally used with the AN/ARN-18 glide slope receiver. The commercial designation is 51R ().

Frequency Range: 108 to 135.9 mc

Channels Available: 280 manual

Channels Preset: None

Channel Selection: Remote servo control

Output: 300 mw

Primary Power: 26.5 vdc/26.5 vdc and 115 vac 400 cycle

Typical Mfgr: Collins Radio Company

R-540/ARN-14C

Receiver
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. This is part of Radio Receiving Set AN/ARN-14C and is generally used with the AN/ARN-18 glide slope receiver. The commercial designation is 51R ().

Frequency Range: 108 to 135.9 mc

Channels Available: 280 manual

Channels Preset: None

Channel Selection: Remote servo control

Output: 300 mw

Primary Power: 26.5 vdc/26.5 vdc and 115 vac 400 cycle

Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

R-541/ARN-14D

Receiver
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. This is part of Radio Receiving Set AN/ARN-14E and is generally used with AN/ARN-18 glide slope receiver. The commercial designation is 51R ().

Frequency Range: 108 to 135.9 mc

Channels Available: 280 manual

Channels Preset: None

Channel Selection: Remote servo control

Output: 300 mw

Primary Power: 26.5 vdc/26.5 vdc and 115 vac 400 cycle

Typical Mfgr: Collins Radio Company

R-550/ARR-40

Receiver
UHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is part of Radio Receiving Set AN/ARR-40 and is generally used with the AN/ARC-27 as back-up equipment.

Frequency Range: 329.3 to 335 mc
Channels Available: 20
Channels Preset: 20
Channel Selection: Remote motor control
Output: 250 mw
Primary Power: 28 vdc and 115 vac 400 cycle 1 phase
Typical Mfgr: Collins Radio Company

R-567/ARC-34

Receiver
UHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is the receiver unit of Radio Receiving Sets AN/ARC-34 and AN/ARC-66.

Frequency Range: 238 to 248 mc
Channels Available: 1 (guard)
Channels Preset: 1
Channel Selection: None
Output: 200 mw
Primary Power: 26.5 vdc and 115 vac 400 cycle 3 phase
Typical Mfgr: Radio Corporation of America

R-608/ARC-49

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is the receiver unit of Radio Receiving Set AN/ARC-49.

Frequency Range: 100 to 156 mc
Channels Available: 48
Channels Preset: 48
Channel Selection: Remote relay switch
Output: 600 mw
Primary Power: 28 vdc
Typical Mfgr: Sylvania Electric Products, Incorporated

R-637/ARN-41

Radio Compass
LF/MF

Primary Use: Airborne reception of mcw and voice communications in the low and standard broadcast frequency radio bands. This is the receiver unit of AN/ARN-41. The commercial designation is ADF-14.

Frequency Range: 190 to 1725 kc in 3 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 500 mw
Primary Power: 14/28 vdc
Typical Mfgr: Lear, Incorporated

R-648/ARR-41

Receiver
LF/HF

Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service. This is the receiver unit of Radio Receiving Set AN/ARR-41.

Frequency Range: 190 to 550 kc and 2 to 25 mc in 5 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Continuous manual tuning, local only
Output: 500 mw
Primary Power: 27.5 vdc
Typical Mfgr: Collins Radio Company

R-713/ARN-44

Radio Compass
LF/MF/HF

Primary Use: Airborne reception of mcw and voice communications in the low and standard broadcast frequency radio bands. This is the receiver unit of AN/ARN-44.

Frequency Range: 2 to 3.5 mc and 200 to 1750 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Continuous tuning
Output: 50 mw (min)
Primary Power: 26.5 vdc
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

R-761/ARC-58

Receiver
HF

Primary Use: Airborne reception of mcw, voice and SSB communications in air/air and air/ground service. This is the receiver unit of Radio Set AN/ARC-58.

Frequency Range: 2 to 29.999 mc
Channels Available: 28000 manual
Channels Preset: None
Channel Selection: Remote servo control
Output: 200 mw
Primary Power: 27.5 vdc and 115 vac 300 to 1000 cycle 1 phase
Typical Mfgr: Collins Radio Company

R-787/ARN-54

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. This is the receiver unit of AN/ARN-54.

Frequency Range: 190 to 1750 kc in 3 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: (Unknown)
Primary Power: 27.5 vdc
Typical Mfgr: Lear, Incorporated

R-811/ARN-56

Receiver
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. This is the receiver unit of Radio Receiving Set AN/ARN-56.

Frequency Range: 108 to 135.9 mc
Channels Available: 20 LOC, 80 VOR and 180 COMM
Channels Preset: None
Channel Selection: (Unknown)
Output: Visual: On VOR or ILS indicators ID-351/ARN, ID-387/ARN or ID-250/ARN
Aural:

Primary Power: 27.5 vdc and 115 vac 400 cycle 1 phase
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

RA-2C, D	Receiver HF
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Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service.

Frequency Range: 2.7 to 7 mc
Channels Available: 8/16
Channels Preset: 8/16
Channel Selection: Remote motor control
Output: 300 to 500 mw
Primary Power: 12/28 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

RA-10	Receiver LF/MF/HF
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Primary Use: Airborne reception of cw, mcw and voice communications in air/air and air/ground service.

Frequency Range: 150 to 1100 kc in 2 bands and
2000 to 10000 kc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 500 mw
Primary Power: 14/28 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

RA-18, 18B, 18C, 18C-2, 18C-3	Receiver VHF
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Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is generally used with a TA-18BB transmitter.

Frequency Range: 118 to 135.95 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: 100 to 200 mw
Primary Power: 27.5 vdc/27.5 vdc and 115 vac 400 cycle/ 27.5 vdc and 250 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

RA-21A	Receiver VHF
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Primary Use: Airborne reception of voice communications in air/air and air/ground service.

Frequency Range: 108 to 135.95 mc
Channels Available: 560 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: 100 mw
Primary Power: 27.5 vdc / 115 vac 300 to 1000 cycle 1 phase
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

RCBB	Receiver LF/MF/HF
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Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is generally used with a T-30 transmitter.

Frequency Range: 200 to 400 kc, 500 to 1200 kc and 2800 to 6700 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 500 mw
Primary Power: 12 vdc
Manufacturer: Lear, Incorporated

RDF-1, 1A, 1AB, 2, 2C	Radio Compass LF/MF
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Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. This may be used with the TR-1 VHF transmitter by Aero Signal Labs for two-way voice communications.

Frequency Range: 200 to 1600 kc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 3 watts
Primary Power: 12 vdc
Manufacturer: Aero Signal Labs (formerly Aircraft Specialty Lines)

RH-LB	Receiver VHF
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Primary Use: Airborne reception of voice communications in air/
air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer:

RS-1	Transmitter VHF
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Primary Use: Airborne transmission of voice communications in
air/air and air/ground service.

Frequency Range: 121.5 to 122.9 mc
Channels Available: 5
Channels Preset: 5
Channel Selection: Local manual switch
Output: 1.4 watts
Primary Power: 12 vdc
Manufacturer: Stroud Engineering Company

RT-10, A, B, C, D,	Transmitter VHF
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Primary Use: Airborne transmission of voice communications in
air/air and air/ground service. This is generally
used with the LR-5() receiver in the LTR-5 and
LTRA-5 combinations.

Frequency Range: 120.5 to 124.5 mc
Channels Available: 6
Channels Preset: 6
Channel Selection: Local switch
Output: 2 watts
Primary Power: 14/28 vdc
Manufacturer: Lear, Incorporated

RT-10E	Transmitter
	VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with the LR-6 receiver in the LTR-6, LTRA-6, LTTR-6 or L3TR-6 combinations.

Frequency Range: 120.5 to 124.5 mc
Channels Available: 12
Channels Preset: 12
Channel Selection: Local switch
Output: 2 watts
Primary Power: 14/28 vdc
Manufacturer: Lear, Incorporated

RT-11A	Receiver-Transmitter
	VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Transceiver 210 A.R.C.

Frequency Range: 118 to 135.95 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: Transmitter: 15 watts Receiver: 1 watt (max)
Primary Power: 14/28 vdc
Manufacturer: Aircraft Radio Corporation

RT-18, A/ARC-1	Receiver-Transmitter
	VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-1, 1A, 1X and 1AX.

Frequency Range: 100 to 156 mc
Channels Available: 10 plus a guard receive channel
Channels Preset: 10 plus a guard receive channel (50 plus a guard receive channel when modified for commercial airline use per CAATC #1050 Mod. Q.)
Channel Selection: Remote motor control (Collins autotune)
Output: Transmitter: 8 watts Receiver: Dual at 400 mw each
Primary Power: 26 vdc
Typical Mfg r: Western Electric Company

RT-91/ARC-2

Receiver-Transmitter
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-2.

Frequency Range: 2 to 9.05 mc
Channels Available: 8
Channels Preset: 8
Channel Selection: Local or remote motor control (Collins autotune)
Output: Transmitter: 15 to 30 watts Receiver: 100 mw
Primary Power: 26.5 vdc
Typical Mfgr: Collins Radio Company

RT-128/ARC-21

Receiver-Transmitter
HF

Primary Use: Airborne two-way cw, mcw and voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-21. Frequency shift telegraphy can be added.

Frequency Range: 2 to 23.9995 mc
Channels Available: 44000 manual
Channels Preset: 20
Channel Selection: Remote servo control
Output: Transmitter: 100 watts Receiver: 900 mw
Primary Power: 27.5 vdc/ 27.5 vdc and 115 vac 380 to 1000 cycle 1 phase
Typical Mfgr: Radio Corporation of America

RT-173/ARC-33

Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-33.

Frequency Range: 225 to 400 mc
Channels Available: 1750 manual
Channels Preset: 20 plus a guard receive channel
Channel Selection: Remote switch selector
Output: Transmitter: 8 watts Receiver: 750 mw (min)
Primary Power: 27.5 vdc
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

RT-178/ARC-27

Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-27.

Frequency Range: 225 to 399.9 mc
Channels Available: 1750 manual
Channels Preset: 18 plus a guard receive channel
Channel Selection: Remote motor control (Collins autopositioner)
Output: Transmitter: 9 watts Receiver: 2 watts (max)
Primary Power: 27.5 vdc
Typical Mfgr: Collins Radio Company

RT-263/ARC-34

Receiver-Transmitter
UHF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-34.

Frequency Range: 225 to 399.9 mc
Channels Available: 1750 manual
Channels Preset: 20 plus a guard receive channel
Channel Selection: Remote servo selector and local manual selector
Output: Transmitter: 8 watts Receiver: 200 mw
Primary Power: 28 vdc
Typical Mfgr: Radio Corporation of America

RT-298/ARC-2A

Transceiver
HF

Primary Use: Airborne two-way cw, mcw and voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-2A.

Frequency Range: 2 to 9.05 mc
Channels Available: 8
Channels Preset: 8
Channel Selection: Local or remote motor control (Collins autotune)
Output: Transmitter: 15 to 30 watts Receiver: 100 mw
Primary Power: 26.5 vdc
Typical Mfgr: Collins Radio Company

RT-307/ARC-48

Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-48.

Frequency Range: 233 to 243 mc
Channels Available: 4
Channels Preset: 4 transmitting and 3 plus a guard channel receiving
Channel Selection: Remote relay switch
Output: Transmitter: 2 watts Receiver: 150 mw
Primary Power: 28 vdc
Typical Mfgr: Telephonics Corporation

RT-311/ARC-38

Transceiver
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-38.

Frequency Range: 2 to 25 mc
Channels Available: 35000 manual
Channels Preset: 20
Channel Selection: Remote servo control (Collins autopositioner)
Output: Transmitter: 90 to 100 watts Receiver: 500 mw
Primary Power: 27.5 vdc and 115 vac 400 cycle
Typical Mfgr: Collins Radio Company

RT-332/ARC-52

Receiver-Transmitter
UHF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-52.

Frequency Range: 225 to 399.9 mc
Channels Available: 1750 manual
Channels Preset: 18 plus a guard receive channel
Channel Selection: Remote motor control
Output: Transmitter: 20 watts Receiver: 250 mw
Primary Power: 28 vdc and 115 vac 400 cycle 3 phase
Typical Mfgr: Collins Radio Company

RT-349/ARC-55

Receiver-Transmitter
UHF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-55 which is an unpressurized version of the AN/ARC-27.

Frequency Range: 225 to 399.9 mc
Channels Available: 1750 manual
Channels Preset: None
Channel Selection: Remote servo control (Collins autopositioner)
Output: Transmitter: 9 watts Receiver: 2 watts (max)
Primary Power: 27.5 vdc
Typical Mfr: Collins Radio Company

RT-400/ARC-65

Receiver-Transmitter
HF

Primary Use: Airborne two-way cw, mcw, voice, SSB and frequency shift communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-65.

Frequency Range: 2 to 23.9995 mc
Channels Available: 20
Channels Preset: 20
Channel Selection: Remote
Output: Transmitter: 250 watts (pep) Receiver: 50 mw
Primary Power: 27.5 vdc and 110 vac 380 to 1000 cycle 1 phase
Typical Mfr: Radio Corporation of America

RT-423/ARC-66

Receiver-Transmitter
UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-66.

Frequency Range: 225 to 328.9 mc and 335.1 to 399.9 mc
Channels Available: 1689 manual
Channels Preset: 20 plus a guard receive channel
Channel Selection: Remote motor control
Output: Transmitter: 8 watts Receiver: 200 mw
Primary Power: 26.5 vdc and 115 vac 400 cycle 3 phase
Typical Mfr: Radio Corporation of America

RT-424/ARC-52

Receiver-Transmitter
UHF

Primary Use: Airborne two-way mcw and voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-52X.

Frequency Range: 225 to 399.9 mc
Channels Available: 1750 manual
Channels Preset: 18 plus a guard receive channel
Channel Selection: Remote motor control
Output: Transmitter: 20 watts Receiver: 250 mw
Primary Power: 28 vdc and 115 vac 400 cycle 3 phase
Typical Mfgr: Collins Radio Company

RT-427/ARC-39

Receiver-Transmitter
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of Radio Set AN/ARC-39.

Frequency Range: 2 to 9.1 mc
Channels Available: 12
Channels Preset: 12
Channel Selection: Locally or remotely controlled autopositioner
Output: Transmitter: 10 watts Receiver: 800 mw (max)
Primary Power: 27.5 vdc
Typical Mfgr: Aircraft Radio Corporation

RTA-1B

Receiver-Transmitter
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The military designation is AN/ARC-9, 9X.

Frequency Range: 3105 to 6500 kc
Channels Available: 10
Channels Preset: 10
Channel Selection: Remote motor control
Output: Transmitter: 50 watts Receiver: 300 mw
Primary Power: 14/28 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

S-20R	Receiver
	LF

Primary Use: Airborne reception of mcw and voice communications in air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Hallicrafters Company

SARCOM	Transceiver
	VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	120 to 124 mc and 147 to 151 mc	120 to 124 mc and 147 to 151 mc
Channels Available:	9	Continuously tuned
Channels Preset:	9	None
Channel Selection:	Local manual switch	Local manual tuning
Output:	.5 watts	1 watt (max)
Primary Power:	6/12 vdc	
Manufacturer:	Reisner Company	

SCR-269, F, G	Radio Compass
	LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated BC-433 ().

Frequency Range: 200 to 1750 kc in 3 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 50 mw
Primary Power: 14/28 vdc and 115 vac 400 cycle 1 phase
Typical Mfgr: Bendix Radio Div. of Bendix Aviation Company

SCR-274N

Receiver-Transmitter
LF/MF/HF

Primary Use: Airborne two-way cw, mcw and voice communications in air/air and air/ground service. The system uses varying quantities of the following transmitters and receivers.

	<u>Transmitters</u>	<u>Receivers</u>
Frequency Range:	BC-457-A .19 to .55 mc	BC-946-B .52 to 1.5 mc
	BC-696-A 3 to 4 mc	BC-453-A,B .19 to .55 mc
	BC-458-A 5.3 to 7 mc	BC-454-A,B 3 to 6 mc
	BC-459-A 7 to 9.1 mc	BC-455-A,B 6 to 9.1 mc
Channels Available:	1 to 4(varies with mount)	Continuously tuned
Channels Preset:	1 to 4	
Channel Selection:	Remote manual switch	Remote manual tuning
Output:	40 watts (max)	10 mw (min)
Primary Power:	26 vdc	
Typical Mfr:	Western Electric Company	

SCR-522/542

Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The transmitter unit is designated BC-625A, AM and the receiver unit is designated BC-624A, AM or C.

Frequency Range:	100 to 156 mc	
Channels Available:	4	
Channels Preset:	4	
Channel Selection:	Remote motor control	
Output:	Transmitter: 8 to 10 watts	Receiver: 50 mw
Primary Power:	SCR-522: 24 vdc	SCR-542: 12 vdc
Typical Mfr:	Bendix Radio Div. of Bendix Aviation Company	

SR-9

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/
air and air/ground service.

Frequency Range:

Channels Available:

Channels Preset: (TECHNICAL DATA NOT AVAILABLE)

Channel Selection:

Output:

Primary Power:

Manufacturer: Sonar Company

STAR

Receiver
HF

Primary Use: Airborne reception of cw, mcw and voice communica-
tions in air/air and air/ground service. This is
generally used with the ATOM or AT-144 transmitters.

Frequency Range: 2 to 22 mc

Channels Available: 192 manual

Channels Preset: None

Channel Selection: Remote motor control

Output: 125 mw

Primary Power: 27.5 vdc and 115 vac 400 cycle

Manufacturer: Aeronautical Communications Equipment Company

SU-41D

Receiver
LF

Primary Use: Airborne reception of voice communications in air/
ground service.

Frequency Range: 195 to 420 kc

Channels Available: Continuously tuned

Channels Preset: None

Channel Selection: Local manual tuning

Output: 200 mw

Primary Power: 1.5 and 90 vdc (dry batteries)

Manufacturer: Airadio, Incorporated

SU-52A, B, C	Receiver LF/MF
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Primary Use: Airborne reception of mcw and voice communications in air/ground service.

Frequency Range: 195 to 1600 kc in 2 bands
 Channels Available: Continuously tuned
 Channels Preset: None
 Channel Selection: Local manual tuning
 Output: 300 mw
 Primary Power: SU-52A: 6 vdc SU-52B: 12 vdc SU-52C: 24 vdc
 Manufacturer: Airadio, Incorporated

SU-92	Transceiver LF/HF
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Primary Use: Airborne two-way mcw and voice communications in air/ground service.

Frequency Range:
 Channels Available:
 Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
 Channel Selection:
 Output:
 Primary Power:
 Manufacturer: Airadio, Incorporated

T-5-D, R	Transceiver HF
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Primary Use: Airborne two-way voice communications in air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 10 mc	2 to 10 mc
Channels Available:	5	5
Channels Preset:	5	5
Channel Selection:	T-5-D: Local T-5-R: Remote	T-5-D: Local T-5-R: Remote
Output:	35 watts	3 watts
Primary Power:	12/24 vdc	
Manufacturer:	Sun Air Electronics, Incorporated	

T-11A, B/Type 12

Transmitter
VHF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a transmitter unit of Radio Set A.R.C. Type 12. The military designation is T-365/ARC and T-366/ARC.

Frequency Range: 116 to 132 mc

Channels Available: 5

Channels Preset: 5

Channel Selection: Remote relay switch

Output: 2 watts (nominal)

Primary Power: 14/28 vdc

Manufacturer: Aircraft Radio Corporation

T-13A, B/Type 12

Transmitter
VHF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a transmitter unit of Radio Set A.R.C. Type 12. The military designation is T-363/ARC and T-364/ARC.

Frequency Range: 132 to 148 mc

Channels Available: 5

Channels Preset: 5

Channel Selection: Remote relay switch

Output: 2 watts (nominal)

Primary Power: 12/28 vdc

Manufacturer: Aircraft Radio Corporation

T-15/ARC-5

Transmitter
LF/MF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: .5 to .8 mc

Channels Available: 1

Channels Preset: 1

Channel Selection: None

Output: 13 watts voice; 40 watts cw

Primary Power: 24 to 28 vdc

Typical Mfgr: Aircraft Radio Corporation

T-16/ARC-5

Transmitter
MF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: .8 to 1.3 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 40 watts
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

T-17/ARC-5

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: 1.3 to 2.1 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 40 watts
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

T-18/ARC-5

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: 2.1 to 3 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 40 watts
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

T-19/ARC-5

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service.
This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: 3 to 4 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 40 watts
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

T-20/ARC-5

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service.
This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: 4 to 5.3 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 40 watts
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

T-21/ARC-5

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service.
This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: 5.3 to 7 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 40 watts
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

T-22/A.R.C.

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with R-15 or R-19/Type 12 VHF receivers.

Frequency Range: 118 to 127 mc
Channels Available: 20
Channels Preset: 20
Channel Selection: Remote relay switch
Output: 2.5 watts
Primary Power: 14/28 vdc
Manufacturer: Aircraft Radio Corporation

T-22/ARC-5

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: 7 to 9.1 mc
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 40 watts
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

T-23/ARC-5

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is a transmitter unit of Radio Set AN/ARC-5.

Frequency Range: 100 to 156 mc
Channels Available: 4
Channels Preset: 4
Channel Selection: Remote motor control
Output: 6 watts
Primary Power: 24 to 28 vdc
Typical Mfgr: Aircraft Radio Corporation

T-30-AB	Transmitter HF
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Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with the RCBB receiver.

Frequency Range: 2.9 to 6.5 mc
Channels Available: 2
Channels Preset: 2
Channel Selection: Local manual switch
Output: 16 to 20 watts
Primary Power: 12 vdc
Manufacturer: Lear, Incorporated

T-47/ART-13	Transmitter LF/HF
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Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is the transmitter unit of Radio Transmitting Set AN/ART-13, A.

Frequency Range: 200 to 600 kc and 2 to 18.1 mc
Channels Available: Local: continuously tuned Remote: 11
Channels Preset: 11
Channel Selection: Local or remote motor control (Collins autotune)
Output: 100 watts below 25000 ft 50 watts above 25000 ft
Primary Power: 28 vdc
Typical Mfgr: Collins Radio Company

T-67, A, B/ARC-3	Transmitter VHF
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Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is the transmitter unit of Radio Set AN/ARC-3.

Frequency Range: 100 to 156 mc
Channels Available: 8
Channels Preset: 8
Channel Selection: Remote relay switch
Output: 8 watts
Primary Power: 28 vdc
Typical Mfgr: Sylvania Electric Products, Incorporated

T-312A, B/ARC-36		Transmitter VHF	
Primary Use:	Airborne transmission of voice communications in air/air and air/ground service. This is the transmitter unit of Radio Set AN/ARC-36.		
Frequency Range:	100 to 156 mc		
Channels Available:	16		
Channels Preset:	16		
Channel Selection:	Remote relay switch		
Output:	8 watts		
Primary Power:	28 vdc		
Typical Mfgr:	Sylvania Electric Products, Incorporated		
T-363A/ARC, T-364A/ARC		Transmitter VHF	
Primary Use:	Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. The commercial designation is T-13A, B/Type 12.		
Frequency Range:	132 to 148 mc		
Channels Available:	5		
Channels Preset:	5		
Channel Selection:	Remote relay switch		
Output:	2 watts (nominal)		
Primary Power:	T-363: 28 vdc		T-364: 14 vdc
Typical Mfgr:	Aircraft Radio Corporation		
T-365A/ARC, T-366A/ARC		Transmitter VHF	
Primary Use:	Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. The commercial designation is T-11A, B/Type 12		
Frequency Range:	116 to 132 mc		
Channels Available:	5		
Channels Preset:	5		
Channel Selection:	Remote relay switch		
Output:	2 watts (nominal)		
Primary Power:	T-365: 14 vdc		T-366: 28 vdc
Typical Mfgr:	Aircraft Radio Corporation		

T-412/ART-13B

Transmitter
LF/HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service. This is the transmitter unit of Radio Transmitting Set AN/ART-13B.

Frequency Range: 200 to 600 kc and 1.6 to 18.1 mc
Channels Available: Local: Continuously tuned
Remote: 11/24
Channels Preset: 11/24
Channel Selection: Local or remote motor control (Collins autotune)
Output: 100 watts below 25000 feet
50 watts above 25000 feet
Primary Power: 28 vdc
Typical Mfgr: Collins Radio Company

T-452/ARC-49

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is the transmitter unit of Radio Set AN/ARC-49.

Frequency Range: 100 to 156 mc
Channels Available: 48
Channels Preset: 48
Channel Selection: Remote relay switch
Output: 8 watts
Primary Power: 28 vdc
Typical Mfgr: Sylvania Electric Products, Incorporated

T-605/ARC-58

Transmitter
HF

Primary Use: Airborne transmission of mcw, voice and SSB communications in air/air and air/ground service. This is the transmitter unit of Radio Set AN/ARC-58.

Frequency Range: 2 to 29.999 mc
Channels Available: 28000 manual
Channels Preset: None
Channel Selection: Remote servo control
Output: 1000 watts (pep)
Primary Power: 27.5 vdc and 115 vac 400 cycle 1 phase
Typical Mfgr: Collins Radio Company

TA-2J-12, 24

Transmitter
LF/HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service.

Frequency Range: 300 to 600 kc and 2 9 to 15 mc
Channels Available: 8
Channels Preset: 8
Channel Selection: Remote relay switch
Output: 75 watts mcw and voice; 100 watts cw
Primary Power: TA-2J-12: 12 vdc TA-2J-24: 24 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

TA-18BB

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with the RA-18() receiver.

Frequency Range: 118 to 135.95 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: 35 watts
Primary Power: 27 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

TA-20A, B	Transmitter VHF
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Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 118 to 135.95 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: 25 watts
Primary Power: 27.5 vdc / 27.5 vdc and 115 vac 300 to 1000 cycle
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

TA-21A	Transmitter VHF
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Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with the RA-21A VHF receiver.

Frequency Range: 118 to 135.95 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: 25 watts
Primary Power: 27.5 vdc / 115 vac 400 cycle 1 phase
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

TR-1	Transmitter VHF
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Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This unit may be used with the RDF-1, 2 direction finder receiver for two-way voice communications

Frequency Range: 108 to 135 mc
Channels Available: 10
Channels Preset: 10
Channel Selection: Local manual switch
Output: 1 watt
Primary Power: 12 vdc
Manufacturer: Aero Signal Labs (formerly Aircraft Specialty Lines)

TR-1B (PXer)	Transceiver
	LF/HF

Primary Use: Airborne two-way mcw and voice communications in air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 6 mc (approx)	195 to 405 kc
Channels Available:	1	Continuously tuned
Channels Preset:	1 (usually on 3105 kc)	None
Channel Selection:	None	Local manual tuning
Output:	5 watts	
Primary Power:	12 vdc	
Manufacturer:	Lear, Incorporated	

TR-102 (Air-O-Ear)	Transceiver
	VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	108 to 128 mc	108 to 128 mc
Channels Available:	23	Continuously tuned
Channels Preset:	23	None
Channel Selection:	Local switch	Local manual tuning
Output:	5 watts	8 watts
Primary Power:	14 vdc	
Manufacturer:	Nova-Tech, Incorporated	

TR-249	Transceiver
	LF/MF/HF

Primary Use: Airborne two-way voice communications in air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 4.5 mc	550 to 1600 kc and 2 to 4.5 mc
Channels Available:	5	5 (one is continuously tuned)
Channels Preset:	5	5
Channel Selection:	Local manual switch	Local manual switch
Output:	10 watts	3 watts
Primary Power:	12 vdc	
Manufacturer:	Kaar Engineering Corporation	

TRA-1A, B, C	Transmitter
	HF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 2 to 6 mc (approx)
 Channels Available: 1
 Channels Preset: 1 (usually on 3105 kc)
 Channel Selection: None
 Output: 6 to 8 watts
 Primary Power: TRA-1A: 6 vdc TRA-1B: 12 vdc TRA-1C: 24 vdc
 Manufacturer: Airadio, Incorporated

TRV-128	Transceiver
	VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	121.5 to 123.3 mc	112 to 128 mc
Channels Available:	6	Continuously tuned
Channels Preset:	6	None
Channel Selection:	Local manual switch	Local manual tuning
Output:	1 watt	600 mw
Primary Power:	6/12/24 vdc or 115 vac	
Manufacturer:	Skycrafters, Incorporated	

TV-10, A	Converter-Transmitter
	UHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This unit generates UHF voice transmission signals and converts received UHF signals to VHF by heterodyning and is generally used with an R-19/Type 12 VHF receiver. The military designation is CV-431/ARC-60.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	228 to 258 mc	228 to 258 mc
Channels Available:	8	8
Channels Preset:	8	8
Channel Selection:	Remote relay switch	Remote relay switch
Output:	TV-10: .5 watts	118 to 148 mc injection signal
	TV-10A: 1 watt	to an R-19/Type 12 receiver
Primary Power:	14/28 vdc	
Manufacturer:	Aircraft Radio Corporation	

VC-12, 12A, 12B (Simplexer)

Receiver-Transmitter

VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This can be used with the VOA-2, VOA-3 and VFA-1 for VOR/LOC instrumentation.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 127 mc	108 to 127 mc
Channels Available:	12	Continuously tuned
Channels Preset	12	None
Channel Selection:	Local manual switch	Local manual tuning
Output	.35 to .5 watts	175 mw (min)
Primary Power:	VC-12: 13.5 vdc	VC-12A 6.5 vdc VC-12B: 27 vdc
Manufacturer	National Aeronautical Corporation	

VC-27 (Simplexer)

Receiver-Transmitter

VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This can be used with the VOA-3 for VOR/LOC instrumentation.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 127 mc	108 to 127 mc
Channels Available:	27	Continuously tuned
Channels Preset:	27	None
Channel Selection:	Local manual switch	Local manual tuning
Output	.35 to .5 watts	175 mw (min)
Primary Power:	13.5/27 vdc	
Manufacturer:	National Aeronautical Corporation	

VHF-R5A, R-5R	Receiver
	VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service.

Frequency Range: 108 to 128 mc
 Channels Available: Continuously tuned
 Channels Preset: None
 Channel Selection: R-5A Local manual tuning
 R-5R Remote manual tuning
 Output: 3 watts
 Primary Power: 14/28 vdc
 Manufacturer: Dare, Incorporated

VHF-T-5, T-5A, T-5R	Transmitter
	VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service.

Frequency Range: 118 to 127 mc
 Channels Available: 22
 Channels Preset: 22
 Channel Selection: T-5, T-5A Local manual switch
 T-5R Remote ledex switch
 Output: 4 watts
 Primary Power: 14/28 vdc
 Manufacturer: Dare, Incorporated

VHT-1, 2, 3 (Superhomer/Omnihomer)	Receiver-Transmitter
	VOR/VHF

Primary Use: Airborne two-way voice communications and VOR in air/air and air/ground service.

	Transmitter	Receiver
Frequency Range:	108 to 126.5 mc	108 to 126.5 mc
Channels Available:	VHT-1, 2: 4, VHT-3 12	Continuously tuned
Channels Preset:	VHT-1, 2: 4, VHT-3 12	None
Channel Selection:	Local manual switch	Local manual tuning
Output:	.6 watts	175 mw
Primary Power	13.5 vdc	
Manufacturer	National Aeronautical Corporation	

VRA-1, 1A	Receiver VHF
Primary Use:	Airborne reception of voice communications in air/air and air/ground service. This is generally used with a VOA-1 VOR converter.
Frequency Range:	108 to 122 mc
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Local manual tuning
Output:	10 mw (min)
Primary Power:	VRA-1: 12/24 vdc VRA-1A: 6 vdc
Manufacturer:	National Aeronautical Corporation
VSR-1, 1A	Receiver VHF
Primary Use:	Airborne reception of voice communications in air/air and air/ground service. VSR-1 and VSR-1A are the receiver units of Radio Sets 1016 and 1016A respectively.
Frequency Range:	108 to 135.95 mc
Channels Available:	VSR-1: 90/560 manual VSR-1A: 90/180/360/560 manual
Channels Preset:	None
Channel Selection:	Remote ledex switch
Output:	VSR-1: 3 watts VSR-1A: 1.5 watts
Primary Power:	12/24 vdc
Manufacturer:	National Aeronautical Corporation
VST-1, 1A	Transmitter VHF
Primary Use:	Airborne transmission of voice communications in air/air and air/ground service. VST-1 and VST-1A are the transmitter units of Radio Sets 1016 and 1016A respectively.
Frequency Range:	118 to 135.95 mc
Channels Available:	VST-1: 90/360 manual VST-1A: 90/180/360 manual
Channels Preset:	None
Channel Selection:	Remote ledex switch
Output:	VST-1: 6 to 8 watts VST-1A: 5 to 7 watts
Primary Power:	12/24 vdc
Manufacturer:	National Aeronautical Corporation

VT A-1, 1A, 1B

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in
air/air and air/ground service.

Frequency Range: 121.5 to 122.9 mc
Channels Available: 6
Channels Preset: 6
Channel Selection: Local manual switch
Output: 3 watts (max)
Primary Power: VTA-1, 1B: 12 vdc VTA-1A: 6 vdc
Manufacturer: National Aeronautical Corporation

VT A-2

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in
air/air and air/ground service

Frequency Range: 121.5 to 122.9 mc
Channels Available: 8
Channels Preset: 8
Channel Selection: Local manual switch
Output: 3 watts (max)
Primary Power: 12 vdc
Manufacturer: National Aeronautical Corporation

VT A-3

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in
air/air and air/ground service.

Frequency Range: 118.1 to 126.9 mc
Channels Available: 28
Channels Preset: 28
Channel Selection: Local manual switch
Output: .5 to 7 watts
Primary Power: 13.75 vdc
Manufacturer: National Aeronautical Corporation

VTLR-1, 2Receiver-Transmitter
LF/MF/VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	121.5 to 123.1 mc	200 to 1500 kc
Channels Available:	8	Continuously tuned
Channels Preset:	8	None
Channel Selection:	Local manual switch	Local manual tuning
Output:	1 watt	
Primary Power:	13.5 vdc	
Manufacturer:	National Aeronautical Corporation	

VTR-1

(Omnigator Mark I)

Receiver-Transmitter
VOR/LOC/VHF/MKR-BN

Primary Use: Airborne VOR/LOC/Marker Beacon instrumentation and two-way voice communications in air/air and air/ground service. Visual instrumentation output is presented on a zero center course deviation indicator.

	<u>Transmitter</u>	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	121.5 to 122.9 mc	108 to 127 mc	75 mc fixed
Channels Available:	8	Continuously tuned	1
Channels Preset:	8	None	1
Channel Selection:	Local switch	Local tuning	None
Output:	3 watts	5 watts	5 watts
Primary Power:	12 to 14 vdc		
Manufacturer:	National Aeronautical Corporation		

VTR-2

(Omnigator Mark II)

Receiver-Transmitter
VOR/LOC/VHF/MKR-BN

Primary Use: Airborne VOR/LOC/Marker Beacon instrumentation and two-way voice communications in air/air and air/ground service. Visual instrumentation output is presented on a zero center course deviation indicator.

	<u>Transmitter</u>	<u>Receiver</u>	<u>MKR-BN</u>
Frequency Range:	108 to 127 mc	108 to 127 mc	75 mc fixed
Channels Available:	28	Continuously tuned	1
Channels Preset:	28	None	1
Channel Selection:	Local switch	Local tuning	None
Output:	3 watts	1 watt	1 watt
Primary Power:	12 to 14 vdc		
Manufacturer:	National Aeronautical Corporation		

5-DTR	Transceiver
	HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 10 mc	2 to 10 mc
Channels Available:	5	5
Channels Preset:	5	5
Channel Selection:	Local manual switch	Local manual switch
Output:	35 watts	3 watts
Primary Power:	14/28 vdc	
Manufacturer:	Sun Air Electronics, Incorporated	

5-RTR	Transceiver
	HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 10 mc	2 to 10 mc
Channels Available:	5	5
Channels Preset:	5	5
Channel Selection:	Remote ledex switch	Remote ledex switch
Output:	35 watts	3 watts
Primary Power:	14/28 vdc	
Manufacturer:	Sun Air Electronics, Incorporated	

11, Type	Radio Set
	Receiver-Transmitter
	LF/VHF

Primary Use: Airborne two-way cw, mcw and voice communications in air/air and air/ground service. This consists of an R-11A LF receiver and a T-11A VHF transmitter.

Frequency Range:
Channels Available: (SEE R-11A/Type 12 and T-11A/Type 12
Channels Preset: FOR ADDITIONAL DETAILS)
Channel Selection:
Output:
Primary Power:
Manufacturer: Aircraft Radio Corporation

12, Type

Radio Set
Receiver-Transmitter
LF/VHF

Primary Use: Airborne two-way cw, mcw and voice communications in air/air and air/ground service. This consists of an R-11A LF receiver, an R-15 or R-19 VHF receiver and a T-11A VHF transmitter.

Frequency Range:
Channels Available:
Channels Preset: (SEE R-11A/Type 12, R-15/Type 12, R-19/Type 12
Channel Selection: AND T-11A/Type 12 FOR ADDITIONAL DETAILS)
Output:
Primary Power:
Manufacturer: Aircraft Radio Corporation

15, Type

Radio Set
Receiver-Transmitter
VOR/LOC/VHF

Primary Use: Airborne two-way voice communications and VOR/LOC instrumentation in air/air and air/ground service. This consists of an R-13A, R-13B or R-32 VHF receiver and a B-10, B-10A or B-13A converter.

Frequency Range:
Channels Available:
Channels Preset: (SEE R-13A, 13B/Type 15, R-32/Type 15 and B-10
Channel Selection: B-10A or B-13A/Type 15 FOR ADDITIONAL
Output: DETAILS)
Primary Power:
Manufacturer: Aircraft Radio Corporation

17, Type	Radio Set Receiver-Transmitter VHF
Primary Use:	Airborne two-way voice communications in air/air and air/ground service. This consists of an R-15 VHF receiver and a T-11A VHF transmitter.
Frequency Range:	
Channels Available:	
Channels Preset:	(SEE R-15/Type 12 and T-11A/Type 12 FOR
Channel Selection:	ADDITIONAL DETAILS)
Output:	
Primary Power:	
Manufacturer:	Aircraft Radio Corporation
17K-1	Transmitter VHF
Primary Use:	Airborne transmission of voice communications in air/air and air/ground service.
Frequency Range:	122 to 132 mc
Channels Available:	5
Channels Preset:	None
Channel Selection:	Remote
Output:	5 watts (min)
Primary Power:	12/24 vdc
Manufacturer:	Collins Radio Company
17L-4, 6	Transmitter VHF
Primary Use:	Airborne transmission of voice communications in air/air and air/ground service. This is generally used with the 51-R or 51-X VHF receiver.
Frequency Range:	118 to 135.95 mc
Channels Available:	360 manual
Channels Preset:	None
Channel Selection:	Remote motor control (autopositioner)
Output:	25 watts
Primary Power:	27.5 vdc
Manufacturer:	Collins Radio Company

17L-8, 8A	Transmitter VHF
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Primary Use:	Airborne transmission of voice communications in air/air and air/ground service
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Frequency Range:	118 to 126 9 mc
Channels Available:	90 manual
Channels Preset:	None
Channel Selection	Local manual switch
Output	3 watts
Primary Power:	17L-8. 27.5 vdc 17L-8A 13.5/27.5 vdc
Manufacturer:	Collins Radio Company

17M-1	Transmitter VHF
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Primary Use:	Airborne transmission of voice communications in air/air and air/ground service. This is generally used with a 51X-1 or 51R-3 VHF receiver.
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Frequency Range:	118 to 136 mc
Channels Available:	360 manual
Channels Preset:	None
Channel Selection:	Remote motor control
Output	40 watts
Primary Power:	27.5 vdc
Manufacturer:	Collins Radio Company

18S-1,2,3,4,4A	Receiver-Transmitter HF
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Primary Use:	Airborne two-way cw and voice communications in air/air and air/ground service
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Frequency Range:	2 to 18.5 mc
Channels Available:	20
Channels Preset:	20
Channel Selection	Remote motor control (Collins autotune)
Output:	Transmitter: 100 watts Receiver: 50 mw
Primary Power:	28 vdc
Manufacturer:	Collins Radio Company

22-RTR

Transceiver
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 10 mc	2 to 10 mc
Channels Available:	22	22
Channels Preset:	22	22
Channel Selection:	Remote ledex switch	Remote ledex switch
Output:	35 watts	3 watts
Primary Power:	14/28 vdc	
Manufacturer:	Sun Air Electronics, Incorporated	

51R-1, 2, 3

Receiver
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. This is generally used with the 17L-2 transmitter.

Frequency Range:	108 to 135.9 mc
Channels Available:	280 manual
Channels Preset:	None
Channel Selection:	Remote motor control
Output:	300 mw
Primary Power:	26.5 vdc / 26.5 vdc and 115 vac 400 cycle
Manufacturer:	Collins Radio Company

51U

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This model received only minor production and was dropped in favor of the 51R receiver.

Frequency Range:	108 to 135.9 mc
Channels Available:	280 manual
Channels Preset:	(Unknown)
Channel Selection:	(Unknown)
Output:	300 mw
Primary Power:	26.5 vdc / 115 vac 400 cycle 1 phase
Manufacturer:	Collins Radio Company

51X-1A

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is generally used with the 17M () or 17L-4 transmitters.

Frequency Range: 118 to 135.95 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote motor control (autopositioner)
Output: 100 mw
Primary Power: 27.5 vdc and/or 115 vac 400 cycle
1 phase
Manufacturer: Collins Radio Company

51X-2

Receiver
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. This is generally used with a 17L-7 transmitter for two-way voice communications or with the 344A-1, B-1 converter for VOR/LOC instrumentation

Frequency Range: 108 to 151.95 mc
Channels Available: 880 manual
Channels Preset: None
Channel Selection: Remote motor control (autopositioner)
Output: 100 mw
Primary Power: 27.5 vdc and/or 115 vac 400 cycle
1 phase
Manufacturer: Collins Radio Company

51Y-1, 2, 3

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. This is the receiver unit of Radio Compass DF-201

Frequency Range: 90 to 1800 kc in 4 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote servo drive tuning
Output: 100 mw
Primary Power: 27.5 vdc and 115 vac 400 cycle 1 phase
Manufacturer: Collins Radio Company

66 (Avionics)

Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Avionics Company

90C, 90CR

Transceiver
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 127 mc	108 to 128 mc
Channels Available:	9	9
Channels Preset:	9	9
Channel Selection:	90C: Local switch 90CR: Remote switch	90C: Local switch 90CR: Remote switch
Output:		
Primary Power:	28 vdc	
Manufacturer:	Dare, Incorporated	

100 AX-12

Transmitter
HF

Primary Use: Airborne transmission of cw, mcw and voice communications in air/air and air/ground service.

Frequency Range:	1.5 to 18 mc	
Channels Available:	Basic---24	Modified---48
Channels Preset:	24/48	
Channel Selection:	Remote motor control	
Output:	100 watts	
Primary Power:	12/24 vdc	
Manufacturer:	PAMSCO Div. of Pan American World Airways, Inc	

117 (Ranger)

Receiver
LF

Primary Use: Airborne reception of mcw and voice communications in air/ground service

Frequency Range:	200 to 400 kc
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Local manual tuning
Output:	250 mw
Primary Power:	Dry batteries
Manufacturer:	Electronic Specialty Company

120-B, C (Ranger)

Receiver
LF/MF

Primary Use: Airborne reception of voice communications in air/
air and air/ground service.

Frequency Range: 195 to 1550 kc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 1 watt (min)
Primary Power: 12 vdc
Manufacturer: Electronic Specialty Company

200 (Aerotron)

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in
air/air and air/ground service.

Frequency Range: 112 to 136 mc
Channels Available: 10
Channels Preset: 10 (within any 2 mc segment)
Channel Selection: Local manual switch
Output: 1.7 watts
Primary Power: 6/12/24 vdc
Manufacturer: Aeronautical Electronics, Incorporated

209, B (Ranger)

Transceiver
LF/MF/HF

Primary Use: Airborne two-way voice communications in air/air
and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	3 to 7 mc (approx)	195 to 1500 kc in 2 bands
Channels Available:	1	Continuously tuned
Channels Preset:	1 (usually 3105 or 3023.5 kc	None
Channel Selection:	None	Local manual tuning
Output:	15 watts	3 watts (max)
Primary Power:	12 vdc	
Manufacturer:	Electronic Specialty Company	

210/A. R. C.

Transceiver
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver-transmitter unit is designated RT-11A.

Frequency Range: 118 to 135.95 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: Transmitter: 15 watts Receiver: 1 watt (max)
Primary Power: 14/28 vdc
Manufacturer: Aircraft Radio Corporation

210 (Ranger)

Transmitter
HF

Primary Use: Airborne transmission of voice communications in air/ground service.

Frequency Range: 3023.5 kc (fixed)
Channels Available: 1
Channels Preset: 1
Channel Selection: None
Output: 2 watts
Primary Power: 12 vdc
Manufacturer: Electronic Specialty Company

230-C

Transceiver
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 135.9 mc	118 to 135.9 mc
Channels Available:	360 manual	360 manual
Channels Preset:	None	None
Channel Selection:	Local manual switch	Local manual switch
Output:	4.5 watts	3 watts
Primary Power:	24 vdc	
Manufacturer:	Turner - Wright Company	

300 (Aerotron)**Receiver****VHF**

Primary Use: Airborne reception of voice communications in air/air and air/ground service.

Frequency Range: 108 to 127 mc (late models are 118 to 136)
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 3 watts
Primary Power: 6/12/24 vdc
Manufacturer: Aeronautical Electronics, Incorporated

361A**Receiver-Transmitter****VHF**

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver unit is designated 308B and the transmitter unit is designated 391A.

Frequency Range: 118.1 to 131.9 mc
Channels Available: 70 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: Transmitter: 50 watts Receiver: 50 mw
Primary Power: 14/28 vdc and 250 vdc
Manufacturer: Wilcox Electric Company

438-3**Receiver****LF**

Primary Use: Airborne reception of voice communications in air/ground service. The military designation is BC-1206 ().

Frequency Range: 200 to 400 kc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 300 mw
Primary Power: 28 vdc
Manufacturer: Detrola Corporation

440, A, B	Receiver-Transmitter VHF
Primary Use:	Airborne two-way voice communications in air/air and air/ground service. Consists of transmitter 96600 with receiver 96609 for the 440B and transmitter 96284 with receiver 96283 for the 440A systems. 440 and 440B are the same system.
Frequency Range:	118 to 135.9 mc
Channels Available:	180 manual
Channels Preset:	None
Channel Selection:	Remote ledex switch
Output:	Transmitter: 45 watts Receiver: 150/300 mw
Primary Power:	14/28 vdc
Manufacturer:	Wilcox Electric Company
501	Receiver LF
Primary Use:	Airborne reception of mcw and voice communications in air/ground service.
Frequency Range:	
Channels Available:	
Channels Preset:	(TECHNICAL DATA NOT AVAILABLE)
Channel Selection:	
Output:	
Primary Power:	
Manufacturer:	Setchell-Carlson Company
512, 524	Receiver LF
Primary Use:	Airborne reception of voice communications in air/ground service. The military designation is BC-1206 ().
Frequency Range:	200 to 400 kc
Channels Available:	Continuously tuned
Channels Preset:	None
Channel Selection:	Local manual tuning
Output:	300 mw
Primary Power:	28 vdc
Manufacturer:	Setchell-Carlson Company

618S-1, 1A

Receiver-Transmitter
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service.

Frequency Range: 2 to 25 mc
Channels Available: 144 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: Transmitter: 90 to 100 watts Receiver: 300 mw
Primary Power: 27.5 vdc and 115 vac 400 cycle 1 phase
Manufacturer: Collins Radio Company

701-A, C

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated 97289A.

Frequency Range: 90 to 1750 kc in 4 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 50 mw
Primary Power: 27.5 vdc / 115 vac 400 cycle 1 phase
Manufacturer: Wilcox Electric Company

704

Radio Set
Receiver-Transmitter
HF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This features two-unit construction with the receiver unit designated 704-R and the transmitter unit designated 704-TA.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	2 to 13.3 mc	2.1 to 18 mc
Channels Available:	10	20
Channels Preset:	10	20
Channel Selection:	Remote motor control	Remote motor control
Output:	40 watts	100 mw
Primary Power:	27.5 vdc, 250 vdc and 500 vdc	
Manufacturer:	Wilcox Electric Company	

705

Radio Receiving Set
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. The receiver unit is designated 97269.

Frequency Range: 108 to 135.95 mc
Channels Available: 560 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: 500 mw (max)
Primary Power: 27.5 vdc and 250 vdc
Manufacturer: Wilcox Electric Company

706, A

Radio Receiving Set
VOR/LOC/VHF

Primary Use: Airborne reception of voice communications and VOR/LOC navigation signals in air/air and air/ground service. The receiver units are designated 97298 or 97270. Features two-section construction with the receiver portion identical to the 705 VHF receiver. The converter portion provides VOR/LOC currents.

Frequency Range: 108 to 135.95 mc
Channels Available: 280/560 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: Visual: dc cross pointer currents Aural: 100 mw
Primary Power: 27.5 vdc, 250 vdc and 26 vac 400 cycle 1 phase
Manufacturer: Wilcox Electric Company

707

Radio Transmitting Set
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. The transmitter unit is designated 97271A.

Frequency Range: 118 to 135.95 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote motor control
Output: 20 to 30 watts
Primary Power: 27.5 vdc, 250 vdc and 500 vdc
Manufacturer: Wilcox Electric Company

730

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands. The receiver unit is designated 97409-400.

Frequency Range: 90 to 1750 kc in 4 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote servo tuning
Output: 50 mw
Primary Power: 27.5 vdc and 115 vac 400 cycle 1 phase
Manufacturer: Wilcox Electric Company

760 (Royal)

Radio Compass
LF/MF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: 150 to 1600 kc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 250 mw (max)
Primary Power: 9 vdc (6 "C" type dry cells)
Manufacturer: Zenith Radio Corporation

802 (Ranger)

Receiver-Transmitter
LF/MF/HF/VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service

Frequency Range:
Channels Available:
Channels Preset: (TECHNICAL DATA NOT AVAILABLE)
Channel Selection:
Output:
Primary Power:
Manufacturer: Electronic Specialty Company

1016 (Sapphire, VSC-1)

Radio Set
Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The transmitter is designated VST-1 and the receiver unit is designated VSR-1.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 135.95 mc	108 to 135.95 mc
Channels Available:	90/360 manual	90/560 manual
Channels Preset:	None	None
Channel Selection:	Remote ledex switch	Remote ledex switch
Output:	6 to 8 watts	3 watts
Primary Power:	12 to 14 vdc	
Manufacturer:	National Aeronautical Corporation	

1016A (Sapphire, VSC-2)

Radio Set
Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. The receiver unit is designated VSR-1A and the transmitter unit is designated VST-1A.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118 to 135.95 mc	108 to 135.95 mc
Channels Available:	90/180/360 manual	90/180/360/560 manual
Channels Preset:	None	None
Channel Selection:	Remote ledex switch	Remote ledex switch
Output:	5 to 7 watts	1.5 watts
Primary Power:	12/24 vdc	
Manufacturer:	National Aeronautical Corporation	

2209A, B

Receiver-Transmitter
VHF

Primary Use: Airborne two-way voice communications in air/air and air/ground service. This is the receiver-transmitter unit of the LVTR-36 communications system.

	<u>Transmitter</u>	<u>Receiver</u>
Frequency Range:	118.1 to 126.7 mc	118.1 to 126.7 mc
Channels Available:	36	36
Channels Preset:	36	36
Channel Selection:	Remote ledex switch	Remote ledex switch
Output:	3 to 4 watts	500 mw
Primary Power:	2209-A: 14 vdc	2209-B: 28 vdc
Manufacturer:	Lear, Incorporated	

2304

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is a tuner assembly used with the 5516 receiver-amplifier in the LNC-200 combination.

Frequency Range: 108 to 135.9 mc
Channels Available: 560 manual
Channels Preset: None
Channel Selection: Remote ledex switch
Output: 50 mw (output of the 5516 amplifier)
Primary Power: 28 vdc
Manufacturer: Lear, Incorporated

3007/3015

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. The 3015 is the current designation for the 3007.

Frequency Range: 108 to 128 mc
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 10 mw
Primary Power: 12 vdc and 180 vdc
Manufacturer: Gonset Company

3801

Receiver
LF/HF

Primary Use: Airborne reception of mcw and voice communications in air/air and air/ground service.

Frequency Range: 190 to 410 kc and 2.5 to 6.5 mc in 2 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Local manual tuning
Output: 1.2 watts
Primary Power: 12/24 vdc
Manufacturer: Bendix Radio Div. of Bendix Aviation Company

5610A

Radio Compass
LF

Primary Use: Airborne reception of ground transmitted voice and navigation signals in the low and standard broadcast frequency radio bands.

Frequency Range: 190 to 1725 kc in 3 bands
Channels Available: Continuously tuned
Channels Preset: None
Channel Selection: Remote manual tuning
Output: 50 mw
Primary Power: 115 vac 400 cycle 1 phase
Manufacturer: Lear, Incorporated

5611

Receiver
VHF

Primary Use: Airborne reception of voice communications in air/air and air/ground service. This is generally used with a 5640 transmitter as part of the LNC-100 system.

Frequency Range: 108 to 130.9 mc
Channels Available: 230 manual
Channels Preset: None
Channel Selection: Local manual switch
Output: 5 watts
Primary Power: 14/28 vdc
Manufacturer: Lear, Incorporated

5639A

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with the 2304 receiver as the LNC-200 combination.

Frequency Range: 118 to 135.9 mc
Channels Available: 360 manual
Channels Preset: None
Channel Selection: Remote ledex switch
Output: 8 to 10 watts
Primary Power: 28 vdc
Manufacturer: Lear, Incorporated

5640A

Transmitter
VHF

Primary Use: Airborne transmission of voice communications in air/air and air/ground service. This is generally used with a 5611A receiver as part of the LNC-100 A, B, C, or D combination.

Frequency Range: 118 to 131.95 mc
Channels Available: 90/140/180/280 manual
Channels Preset: None
Channel Selection: Local manual switch
Output: 3 watts
Primary Power: 14/28 vdc
Manufacturer: Lear, Incorporated

SECTION D
REFERENCES

2. Abbreviations. The following abbreviations have been used in FAA/BRD-60, Volume II:

<u>Abbreviation</u>	<u>Explanation</u>
AC (ac)	Alternating Current
Acft.	Aircraft
AF	Audio Frequency
AL	Commercial Airlines
approx	Approximately
ARINC	Aeronautical Radio, Incorporated
ASD	Airborne Systems Division
ATC	Air Traffic Control
AVC	Automatic Volume Control
BRD	Bureau of Research and Development
CAATC	Civil Aeronautics Air Traffic Control
Civ.	Civilian
COMM (Comm.)	Communications
Corp.	Corporation
cps	Cycles Per Second
cw	Continuous Wave
DB (db)	Decibel(s)
Dev.	Deviation
D.C. (dc)	Direct Current

<u>Abbreviation</u>	<u>Explanation</u>
DESENS	Desensitization
Div.	Division
ea.	Each
Equip.	Equipment
F (f)	Frequency
FAA	Federal Aviation Agency
f_c	Carrier (or Center) Frequency
FREQ. (Freq.)	Frequency
ft.	Feet
G	General Aviation Fleet
HF (hf)	High Frequency
IB	Instruction Bulletin
IF	Instrument Flight
ILS	Instrument Landing System
Inc.	Incorporated
KC (kc)	Kilocycle(s)
Labs	Laboratories
LF	Low Frequency
LOC	Localizer
Ltd.	Limited
Max (max)	Maximum
Mc (mc)	Megacycle(s)
mcw	Modulated Continuous Wave

<u>Abbreviation</u>	<u>Explanation</u>
Med (med)	Middle or Medium Frequency (usually used with low, med high)
MF	Medium Frequency
Mfg.	Manufacturing
Mfgr	Manufacturer
MIL (Mil)	Military
Min (min)	Minimum
MKR-BN	Marker Beacon
Mod. (Mod)	Modified, Modulating, Modulation
mw	Milliwatt
N/A	Not Applicable
Nav.	Navigation
Nom.	Nominal
Para	Paragraph
pep	Peak Envelope Power
ppm.	Parts Per Million
Ord.	Ordinate
RCA (R. C. A.)	Radio Corporation of America
RF (rf)	Radio Frequency
RFI	Ready for Issue (after routine maintenance)
rms	Root-Mean-Square
RTCA	Radio Technical Commission for Aeronautics
sec.	Seconds
S/N	Signal to Noise

<u>Abbreviation</u>	<u>Explanation</u>
Spec.	Specification
SSB	Single Side Band
Tele.	Telephone
T.O.	Technical Order
UHF (uhf)	Ultra High Frequency
Undist.	Undistorted
U.S.	United States
USA	United States Army
USAF	United States Air Force
USN	United States Navy
UV (uv)	Microvolt(s)
v	Volt(s)
vac	Volts Alternating Current
Val.	Value
Var.	Variation
vdc	Volts Direct Current
VHF	Very High Frequency
VOR	Very High Frequency Omnidirectional Range
vs	Versus
w/o	Without
xtal	Crystal

SECTION D
REFERENCES

3. Extracts from RTCA and RCA Papers.

A. RTCA Paper 87-55/DO-64, May 9, 1955

2.1 Audio-Frequency Response

The receiver audio output shall not vary more than 6 db when the level of an rf input signal modulated 30% is held constant at 50 uv and the modulation frequency varied over the audio-frequency range of 350-2500 cps. The response shall decrease below 350 cps and above 2500 cps.

2.2 AVC Characteristic

Between the limits of 10 uv and 20,000 uv input, the audio output shall not vary more than 10 db.

2.3 Gain

An input signal of not more than 20 uv shall produce a receiver output which is not less than the manufacturer's published rated output.

2.4 Distortion

The combined noise and distortion in the receiver output signal shall not exceed 25% at rated power output when the receiver input signal is modulated 85% and its level varied over the range from 20 uv to 20,000 uv. This requirement shall be met over the frequency range of 350 to 2500 cps.

2.5 Noise Level

The signal-to-noise ratio of the receiver output shall be at least 25 db over the rf input signal range of 100 uv to 20,000 uv. For this standard, the receiver gain shall be adjusted to produce rated output with the input signal modulated 30%.

When the equipment is designed for operation from an alternating current power source, the above standard shall be met over the range of power source frequencies for which the equipment is designed.

2.6 Sensitivity

The level of the input signal required to produce a signal plus noise-to-noise ratio of 6 db shall not exceed 5 uv.

2.7 Selectivity ^{1/}

(a) Receivers designed for selection of frequency channels in discrete increments.

- (1) The level of an input signal required to produce rated output shall not vary more than 6 db over the input signal frequency range:

From at least:

The assigned channel frequency $-.005\%$ of the assigned channel frequency minus the maximum positive departure of center response frequency from the assigned channel frequency under the temperature variation test.

To at least:

The assigned channel frequency $+.005\%$ of the assigned channel frequency plus the maximum negative departure of center response frequency from the assigned channel frequency under the temperature variation test.

- (2) The level of an input signal required to produce rated output shall be at least 60 db greater than the level required to produce rated output at the frequency of maximum response:

At a frequency equal to:

The assigned channel frequency plus the adjacent channel spacing for which the receiver is designed

^{1/} As of the date of this report, the spacing between frequency channels used for air traffic control communication within the band 118.1 to 126.7 Mc is 200 kc. Plans are being formulated for a reduction in spacing to 100 kc about 1955 and to 50 kc at a later date. The selectivity requirement for airborne receivers operating in this band is a function of the channel spacing in use.

-.005% of the assigned channel frequency minus the maximum positive departure of center response frequency from the assigned channel frequency occurring under the temperature variation test.

And at a frequency equal to:

The assigned channel frequency minus the adjacent channel spacing for which the receiver is designed +.005% of the assigned channel frequency plus the maximum negative departure of center response frequency from the assigned channel frequency occurring under the temperature variation test.

- (b) Receivers designed for selection of frequency channels through the use of continuous tuning methods.
 - (1) The level of an input signal required to produce rated output shall not vary more than 6 db over the input signal frequency range from at least -20 kc from center response frequency to at least +20 kc from center response frequency.
 - (2) The level of an input signal required to produce rated output shall be at least 60 db greater than the level required to produce rated output at the frequency of maximum response at frequencies of 160, 80, or 40 kc from the center response frequency in the case of receivers designed, respectively, for a 200, 100, or 50 kc spacing between adjacent channels.

2.8 Spurious Responses

The level of an input signal required to produce rated output shall be at least 60 db greater than that required to produce rated output at the frequency of maximum response when the frequency of the input signal is varied over the range of .190 to 940 Mc excluding the range within: .

- (b) ± 80 kc of the center response frequency in the case of receivers designed for 110 kc spacing between adjacent channels.

2.9 Cross Modulation

With the simultaneous application of an unmodulated carrier at center response frequency (desired signal) and a signal

modulated 30% at 1000 cps (undesired signal), the receiver output, due to cross modulation, shall be at least 10 db less than rated output under the following conditions:

Receiver Designed for Adjacent Channel Frequency Spacing of	Level of Desired Signal	Level of Undesired Signal	KC Off Resonance of Undesired Signal
(a) 200 kc	20 uv	1,000 uv	± 200
	2,000 uv	20,000 uv	± 400
(b) 100 kc	20 uv	1,000 uv	± 100
	2,000 uv	20,000 uv	± 200
(c) 50 kc	20 uv	1,000 uv	± 50
	2,000 uv	20,000 uv	± 100

2.10 Desensitization

The output of the receiver with a 20 uv signal at center response frequency shall not decrease more than 8 db in the presence of an unmodulated carrier having a level of 20,000 uv and a frequency between 118 Mc and 132 Mc but not including the frequencies within:

- (a) 200 kc of the carrier frequency in the case of receivers designed for 200 kc spacing between adjacent channels.
- (b) 100 kc of the carrier frequency in the case of receivers designed for 100 kc spacing between adjacent channels.

2.11 Emission of Radio-Frequency Energy

The emission of radio-frequency energy from the receiver over the frequency range of .190 to 1500 Mc shall not exceed the following:

- (a) Between any two cable terminals or any cable terminal and ground - 200 microvolts.
- (b) Across the test antenna or, in cases where the receiver is designed for a specific source impedance, across a resistive load equal to the source impedance for which the equipment is designed - 400 micromicrowatts.

2.12 Channel Selection Time

The time required for the equipment to effect a change from one channel to another shall not exceed 8 seconds.

B. RTCA Paper 88-55/DO-65, May 9, 1955

2.1 Rated Carrier Power Output

The transmitter shall be capable of delivering an unmodulated radio-frequency power equal to or greater than the manufacturer's rated carrier power output.

The power output shall be determined at the highest frequency for which the equipment is designed, the lowest frequency for which the equipment is designed, and within .5 Mc of the mid-frequency.

When the transmitter is designed to operate on more than one channel without readjustment of the tuning elements, the power output shall be determined at the high, mid and low frequencies of each of such ranges at the high, mid and low frequencies of the operating range of the transmitter.

NOTE: Auxiliary devices, such as spurious radiation filters, normally required or used in an aircraft installation shall be considered a part of the transmitter.

2.2 Residual Radiation

When all sources of primary power are connected to the transmitter but the microphone switch is in the "OPEN" position, the rf power output of the transmitter at the carrier frequency shall not exceed $.02 \times 10^{-12}$ watts.

2.3 Modulation Capability

The transmitter output carrier shall be capable of being amplitude modulated not less than 85% by an audio-frequency input signal of 1000 cps over the audio input voltage range for which the transmitter is designed.

2.4 Audio-Frequency Distortion

The combined distortion and noise in the demodulated output of the transmitter shall not exceed 25% of the total demodulated output at the modulation frequencies of 400, 1000 and 2500 cps when the level of the audio input to the transmitter is held constant at the value producing at least 85% modulation at 1000 cps.

NOTE: See Section 2.7 relating to spurious radiation standards.

2.5.1 Transmitter Modulation Fidelity

The percentage of modulation of the output carrier shall not vary more than 6 db when the frequency of the audio input signal is varied over the range of 350 to 2500 cps and the level of the audio input signal held constant at a prescribed value. The prescribed value shall be that noted at the frequency of maximum response which produces 85% modulation or the value immediately below that at which clipping or limiting action is present.

2.5.2 Sidetone

When sidetone output is provided, its audio-frequency response shall not vary more than 10 db over the range of 350 to 2500 cps when the level of the audio input to the transmitter is held constant at a prescribed value. The prescribed value shall be that noted at the frequency of maximum response which produces 85% modulation or the value immediately below that at which clipping or limiting action is present.

2.6 Carrier Noise Level

The demodulated noise on the transmitter output shall be at least 35 db below the demodulated output obtained when the output signal is modulated 85% at 1000 cps.

2.7 Spurious Radiation

The International Telecommunications Regulations and the Federal Communications Commission Regulations require that harmonic and other non-essential emissions from transmitters do not cause harmful interference. The Federal Communications Commission is considering the general problem of spurious and harmonic radiation, and more stringent standards may be required in the near future. It is recommended that, where practicable, the suppression of spurious radiations exceed the minimums set forth below.

The spurious radiation standards shall be met when the peak level of a voice signal input to the transmitter is at least 10 db above that which produces 85% modulation.

Radiation from the transmitter for a voice modulation at frequencies outside the band ± 25 kc from the assigned carrier frequency shall be as follows:

- (a) The transmitter output power on discrete frequencies within the bands from +25 kc to +50 kc from the assigned carrier frequency and from -25 kc to -50 kc from the assigned carrier frequency shall not exceed 125 milliwatts.
- (b) The transmitter output power on discrete frequencies outside the band ± 50 kc from the assigned carrier frequency shall not exceed 50 microwatts.

NOTE 1:

Auxiliary devices, such as spurious radiation filters, normally required or used in an aircraft installation shall be considered a part of the transmitter.

NOTE 2:

In some instances at frequencies over 20 Mc, spurious radiation from connecting cables, control leads, and power cables may exceed the spurious radiation from the antenna. Accordingly, it is desirable that an investigation be made to determine the presence or absence of such radiations. A satisfactory test procedure has not been developed at this time, however, at some later date, a procedure for measuring the effects of spurious radiations from the cabinet and leads may be included as a required test.

2.8 Channel Selection Time

The time required for the equipment to effect a change from one channel to another shall not exceed 8 seconds.

C. RCA Special Test Procedures

1. Airborne UHF-VHF Transmitters

(a) Channel Repeatability

An actual channel frequency is measured. The transmitter is detuned to the frequency furthest away in the range; then reset to the original nominal frequency and the actual frequency is measured again. The deviation in frequency is recorded as a measure of channel repeatability.

(b) Channel Accuracy

The actual and repeated frequencies measured in Channel Repeatability are averaged. The difference between the nominal frequency and the numerical average of the two measured frequencies is recorded as a measure of channel accuracy. The applicable military or manufacturer's specifications are used to determine the actual equipment performance.

2. Airborne UHF-VHF Receivers

(a) Channel Repeatability

A signal of 25 microvolts, modulated 30% at 1000 cycles per second is injected into the receiver and the signal generator tuned until receiver peak power output is obtained. The receiver is detuned to the frequency furthest away in the range, then reset to the original nominal frequency and receiver power output is measured again. The change in the receiver power output is noted as a percentage of the original receiver power level.

(b) Receiver Response to Radar Type Signals

A modulated RF signal is injected into the receiver and adjusted to produce receiver peak output. The RF signal is removed and a radar type signal having a level of 3.5 volts and pulse modulated at 1000 pulses per second with a 0.5 microsecond pulse width is applied over the range from 100 to 2000 megacycles. The receiver shall be considered to be susceptible to the radar signal(s) when the receiver rated output is exceeded.

SECTION D

REFERENCES

4. Associated Publications. The following publications have been used as references in the compilation of FAA/BRD-60, Volume II:
 - a. Airborne and Ground Air Traffic Control Radio Communications Equipment Distribution, Volume I, August, 1959. (One of two publications required by contract FAA/BRD-60)
 - b. Airborne Navigation Radio Equipment Distribution and Technical Characteristics, August, 1959. (A publication required by contract FAA/BRD-61)