

MIL-R-55499B (CR)
AMENDMENT 1
17 March 1987

MILITARY SPECIFICATION

RADIO SET AN/PRC-77() AND (UNITS OF)

This amendment forms a part of Military Specification MIL-R-55499B(EL), dated 30 August 1974, and is approved for use within the Communications-Electronics Command, Department of the Army and is available for use by all Departments and Agencies of the Department of Defense.

PAGES 1 thru 3

1.1, delete "Harness, Electrical Equipment ST-138()/PRC-25."

2.1, under SPECIFICATIONS, Federal:

delete all cited documents.

under SPECIFICATIONS, Military:

delete "MIL-B-117 Bags, Interior Packaging."

under SPECIFICATIONS, Standards:

delete "MIL-STD-129 Marking for Shipment and Storage."

delete "MIL-STD-147 Palletized Unit Loads (40"X48" 4-Way Partial and 4-Way Pallets)."

delete "MIL-STD-726 Packaging Requirements Code."

add "MIL-STD-454 Standard General Requirements for Electronic Equipment."

under DRAWINGS, US Army Electronics Command:

change "US Army Electronics Command" to "US Army Communications-Electronics Command."

delete "SC-DL-447208 Drawing and Data List for Harness Electrical Equipment ST-138()/PRC-25."

add "SPI AG00000047 Special Packaging Instruction."

1 of 15

AMSC N/A

FSC 5820

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MIL-R-55499 B (CR)
AMENDMENT 1

add the following:

"OTHER DOCUMENTS

US Army Communications-Electronics Command

SEL Form 1183 Systems Safety Verification Check List."

3. REQUIREMENTS, change "US Army Electronics Command" to "US Army Communications-Electronics Command."

PAGE 4

3.1, change the last sentence to read as follows:

"In addition to the units covered by this specification, Antenna AT-271 ()/PRC and Handset H-250()/U are part of Radio Set AN/PRC-77()."

3.2, add the following at the end of the paragraph:

"In addition, one first article sample shall be subjected to the Electro-magnetic Test of 4.18, for informational purposes only."

3.3, delete entry "ST-138 ()/PRC-25 SC-DL-447208" in the table.

change "USAECOM" to "USACECOM."

PAGE 5

3.9, change the second sentence to read:

"The final paint film on Type I surfaces of Receiver-Transmitter, Radio RT-841()/PRC-77 shall be Type II Lusterless Green 383 CARC. The final paint film on Type I surfaces of Antenna AT-892()/PRC-25 and Support, Antenna AB-591()/PRC-25 shall be Type II Lusterless Forest Green alkyd enamel. Both colors shall match color chips provided by the procuring agency (See 6.6)."

PAGE 8

3.16, delete the last sentence.

MIL-R-55499 B (CR)
AMENDMENT 1

PAGE 9

3.17.1c, in the table:

add NOTE 4 as follows:

"NOTE 4: At temperature extremes (-40°F and +150°F) the distortion shall not exceed 10% for the 1.0 mW output and 18% for the 4.0 mW output."

change the Distortion Measurement entry to read as follows:

"Distortion 3.19.2 4.9.2 (See Note 4)."

add NOTE 5 as follows:

"NOTE 5: At temperature extremes (-40°F and +150°F), the limits for RF Power Output shall be:

<u>FREQ (MHz)</u>	<u>RF Power Output (W)</u>	
	<u>12.5/15 Vdc</u>	<u>10 Vdc</u>
30 - 33.95	1.25	0.5
34 - 49.95	1.4	0.5
50 - 52.95	1.25	0.5
53 - 70.95	1.2	0.35
71 - 75.95	1.05	0.35."

change the RF Power Output Measurement entry to read as follows:

"RF Power Output 3.20.1 4.11.1 (See Note 5)."

PAGE 13

3.19.10, change "0.50" one place and "0.5" two places to "0.7."

PAGE 14

3.19.15, delete "3.19.7."

MIL-R-55499B (CR)
AMENDMENT 1

PAGE 15

3.19.26, change the first sentence to read: "The response at 30 Hz shall be within +0.5 db and -3.0 db of the 1000Hz reference."

3.19.27, add to end of paragraph: "and with volume control set at maximum."

PAGE 16

After 3.20.1 add 3.20.1.1 as follows:

"3.20.1.1 RF Power Loading (See 4.11.1.1). - The RF power amplifier shall be capable of being operated without evidence of damage to the output transistor when the antenna connector J2 is terminated with a short or open circuit load for a period of one minute."

3.20.3, add "3.0" before "+0.8, -0.5."

PAGE 17

3.20.4.1, add "for input voltage ranges of 10.0 thru 15.0 Vdc" at the end of the first sentence.

3.20.6.2, change table to read:

<u>Audio Modulation Frequency (Hz)</u>	<u>Deviation Above and Below Carrier Frequency (KHz)</u>
30	6 + 4, -2
100	6 + 4, -1
500	6 + 4, -1
1000	6 + 4, -1
2000	6 + 4, -1
3000	6 + 4, -1
10000	6 + 3, -1.5
20000	6 + 1.5, -2

add "(See 4.11.6.2)" after title of paragraph.

PAGE 18

3.20.8, add "for input voltage ranges of 10.0 thru 15.0 Vdc" at the end of the first sentence.

MIL-R-55499B (CR)
AMENDMENT 1

PAGE 20

3.20.23, change the first sentence to read: "The response at 30Hz shall be within +1.0 db and -3.0 db of the 1000 Hz reference."

PAGE 22

3.25, delete in its entirety.

PAGE 23

After 3.36 add the following four paragraphs:

"3.37 Systems Safety Engineering (See 4.26). -

3.37.1 Personnel Hazards. - Personnel hazards shall be kept to a minimum. The criteria of MIL-STD-454, Requirements 1 and 8 shall be made applicable for tasks and efforts such as the selection of parts, the complete manufacturing and assembly process, and any product baseline configuration changes that may be implemented during the course of the contract. Verification that compliance with this requirement has been achieved shall be through a visual inspection in accordance with 4.26.

3.37.2 Edge Rounding Exposed. - Exposed edges shall be rounded to a minimum radius of 0.04 inch (1mm), and exposed corners to a minimum of 0.5 inch (13mm).

3.37.3 Radioactive Materials. - Radioactive materials shall not be used."

PAGE 24

4.2a, replace "preparation for delivery" with "packaging."

4.2c, 4.2c(1) and 4.2c(2) delete in their entirety and replace with the following:

"c. Quality conformance inspection of equipment before packaging (See 4.5).

d. Packaging inspection (See 4.21)."

4.3, change "paragraph 4.19" to "4.18 and 4.19."

PAGE 25

4.4, replace "preparation for delivery" with "packaging."

4.5, replace "Preparation for Delivery" with "Packaging" in title.

MIL-R-55499B (CR)
AMENDMENT 1

PAGE 26

4.5.1, delete and substitute the following:

"4.5.1 Group A Inspection. - Each unit (and each subassembly and assembly identified in Table III) on contract or purchase order shall be inspected for conformance to the inspections specified in Table III. The order of inspection of the subassemblies and assemblies and units (end equipment) shall be as follows:

a. Prior to their assembly into the end equipment, the assemblies and subassemblies identified in Table III shall be subjected to a 100% visual/mechanical and electrical inspection by the contractor for conformance with the inspection requirements provided in Table III.

b. After completion of the above 100% inspection by the contractor, discrete lots shall be formed from the subassemblies and assemblies which passed the 100% inspection and these shall be subjected to sampling inspection (Table III and 3.29, Electrical and Mechanical Interchangeability) by the contractor utilizing the procedures of MIL-STD-105 using general inspection levels and AQL's indicated in Table III (Quality Assurance Verification). Factors of lot composition not defined herein, or in the contract or purchase order, shall be in accordance with MIL-STD-105.

c. Assemblies from the discrete lots which have passed the above Quality Assurance Verification Inspection shall be assembled into the end equipments which shall then be subjected by the contractor to the pre-conditioning requirements of 3.26 and a 100% visual/mechanical and electrical inspection in accordance with Table III in an order satisfactory to the Government with the Operational Test performed last (See 6.4).

NOTE: Assemblies are not required to undergo further visual/mechanical and electrical inspection as a part of the contractor's 100% Group A Inspection of the end equipment.

d. After completion of the above 100% inspection by the contractor, discrete lots shall be formed from units which passed the 100% inspection and these shall be subjected to sampling inspection by the contractor utilizing the procedures of MIL-STD-105 using the general inspection levels and AQL's indicated in Table III. Group A electrical inspection of the end equipment shall be performed in accordance with Table III in an order satisfactory to the Government with the Operational Test performed last (See 6.4).

NOTE: Assemblies and subassemblies are not required to undergo further visual/mechanical and electrical inspection as part of the above contractor's sampling inspection of the end equipment."

MIL-R-55499B (CR)
AMENDMENT 1

PAGE 28

TABLE III - GROUP A INSPECTION,

delete "Harness ST-138()/PRC-25	1.0%	4.0%."
delete "Modulation Capability	3.20.6	4.11.6."
add "Deviation	3.20.16	4.11.16."

PAGE 30

TABLE IV - GROUP B INSPECTION,

add after "Input Power Consumption": "Modulation Capability 3.20.6
4.11.6."

add asterisks in Table IV next to:

"Interchangeability, Dimensional RT-841/PRC-77 Chassis
(less Plug-in Modules),"

"Interchangeability, Dimensional, Modules" and

"Interchangeability, Electrical, Modules."

add the following at the end of Table IV:

"*to be performed as an in-process inspection prior to installation of
modules into the chassis. Where required, modules may be adjusted during
interchangeability test in test fixtures."

PAGE 31

TABLE V - GROUP C INSPECTION,

in Subgroup I, delete "Audio Response	3.20.15	4.11.15."
delete "Deviation	3.20.16	4.11.16."

after "Subgroup III (See 4.5.3.1.3)," add "(See Note 3)."

PAGE 32

TABLE V - GROUP C INSPECTION,

Subgroup III, after "Bag CW-503()/PRC-25 "delete "and Harness
ST-138()/PRC-25."

Subgroup VI, delete "Radio Frequency Interference	3.30	4.18."
add "Systems Safety	3.37	4.26."

MIL-R-55499B (CR)
AMENDMENT 1

PAGES 33 and 34

4.5.3.1, add the following at the end of the paragraph:

"Each unit selected for inspection in the following Subgroups shall be subjected to each and every test of the respective Subgroup."

4.5.3.2, delete in its entirety.

PAGE 41

4.9.6, change "0.35" to "0.40" in the fifth sentence.

PAGE 42

4.9.7, replace "Add the upper and lower limits to determine overall catching range." with "The sum of the upper catching range and the lower catching range is the overall catching range."

add the following at the end of the paragraph:

"This test shall be performed at input voltages of 10.0, 12.5 and 15.0 Vdc."

4.9.10, in three places change "0.5" to "0.7."

PAGE 43

4.9.12 and 4.9.13, change the measuring point for the Receiver VFO frequencies from "A39-J4" to "A44-J2."

PAGES 43 and 44

4.9.15, change Test List to read:

- "a. Audio Output Power (4.9.3)
- b. Sensitivity (4.9.1)
- c. Distortion (4.9.2)
- d. Squelch Sensitivity (4.9.6, omit testing at 41.00 and 65.00 MHz.)

MIL-R-55499B (CR)
AMENDMENT 1

- e. Wide Band Audio Output (4.9.25)
- f. Wide Band Audio Response (4.9.26)."

PAGE 45

4.9.23, replace "Cap CW-922/GR shall be used" with "Cap, Electrical CW-922()/GRC with insulating disc over center post of antenna mount shall be used."

PAGE 46

4.9.26, replace "15Hz" with "30Hz."

4.9.27, add the following at the end of the paragraph:

"Volume control shall be set at maximum."

PAGE 48

4.11, replace Test Frequencies listed for 4.11.9 with the following:

"Each 50 KHz step from 30.00 MHz thru 30.95 MHz,
Each 50 KHz step from 41.00 MHz thru 41.95 MHz,
Each 50 KHz step from 51.00 MHz thru 53.95 MHz, at 42.00 and 65.00 MHz and
at each 50 KHz step from 75.00 MHz thru 75.95 MHz."

PAGE 49

4.11.1, delete the third and fourth sentences.

After 4.11.1 add 4.11.1.1 as follows:

"4.11.1.1 RF Power Loading (See 3.20.1.1). - The transmitter shall again be operated under standard test conditions at 41.00 MHz except the transmitter output at the BNC antenna connector J2 will in turn be terminated in a short circuit for one minute and in an open circuit for one minute. The receiver-transmitter shall then be placed in the receive mode for not greater than ten minutes before returning it to the transmit mode (under standard test conditions) and repeating the RF Power Output measurement at 41.00 MHz. Measure to determine compliance with 3.20.1.1."

MIL-R-55499B (CR)
AMENDMENT 1

PAGES 50 and 51

4.11.4.1, add the following at the end of the paragraph: "This test shall be performed at input voltages of 10.0, 12.5 and 15.0 Vdc."

4.11.6.2, change to read:

"4.11.6.2 Wide Band Deviation (See 3.20.6.2). - The transmitter shall be operated under standard test conditions, except the 4.7 volt peak to peak audio input shall be applied to the wide band input circuit (Terminal R of connector J3) and Terminal L of the front panel power connector J3 shall be grounded. The transmitter frequency deviation above and below the carrier frequency shall be measured at audio modulating frequencies 30, 100, 500, 1000, 2000, 3000, 10000 and 20000 Hz, and shall meet the requirements of 3.20.6.2. Measure for compliance on any channel on the low band and any channel on the high band except those channels exempted in 3.20.6.2."

4.11.7, change to read:

"4.11.7 Transmitter Catching Range (See 3.20.7). - The receiver-transmitter in the transmit mode, shall be operated under standard test conditions with the dial frequency set to 30.00 MHz. Do not apply any external modulation. Disable the 150 Hz Tone Modulation by connecting a ground to test terminal A23-J3. The transmitter frequency shall be within ± 3.5 KHz of the dial setting. With an auxiliary power supply apply a voltage to the A39 test point, J3, sufficient to increase the transmitter frequency 650 KHz to 30.65 MHz. Key the transmitter off and on three times, noting that the transmitter frequency returns to 30.65 MHz ± 200 Hz. This test must be successful on three out of three tries. Repeat the above procedure except reduce the transmitter frequency 650 KHz. Repeat the above procedure at 75.95 MHz."

4.11.8, add the following at the end of the paragraph: "This test shall be performed at input voltages of 10.0, 12.5 and 15.0 Vdc."

4.11.9, change the cited Test Frequencies to read:

"Each 50 KHz step from 30.00 MHz thru 30.95 MHz,
Each 50 KHz step from 41.00 MHz thru 41.95 MHz,
Each 50 KHz step from 51.00 MHz thru 53.95 MHz, at 42.00 and 65.00 MHz and
at each 50 KHz step from 75.00 MHz thru 75.95 MHz."

PAGE 53

4.11.11, change the Test List to read:

"a. RF Power Output (4.11.1). Omit short and open circuit antenna termination test (4.11.1.1) and testing at 42.00 and 65.00 MHz.

b. Tone Oscillator, Frequency and Modulation (4.11.2 and 4.11.3).

c. Frequency Accuracy (4.11.9). Perform at ten randomly selected frequencies."

MIL-R-55499B (CR)
AMENDMENT 1

PAGE 56

4.11.23, replace "15" with "30."

4.11.24, replace the last two sentences with:

"The wide band input circuit impedance shall be measured at 30 Hz, 1000 Hz and 10000 Hz to establish compliance with 3.20.24 on any two channels on the low band and any two channels on the high band when in the transmit mode."

PAGE 59

In heading at top of page, change: "MIL-R-55400B(EL)" to "MIL-R-55499B(EL)."

4.14, change to read:

"4.14 Inspection for Interchangeability. - Receiver-Transmitter RT-841()/PRC-77, including Battery Box CY-2562()/PRC-25, shall be tested as stated below for compliance with the requirements of 3.29. The inspection required by 4.14.1 and 4.14.2 shall be performed as an in-process inspection prior to the installation of modules in the chassis and shall conform to the procedures for small sample inspection of MIL-STD-105 using special inspection level S-4 at AQL 4.0%. The mechanical dimensions and electrical performance required by the mechanical gage drawings and electrical test requirement drawings shall be measured for compliance with the interchangeability requirement. Modules which fail to meet specified gage or test requirement limits shall be considered not acceptable. Radio sets which fail to meet the dimensional interchangeability requirement shall be considered to have failed the interchangeability requirement. The following dimensions or performance shall be gaged or measured."

PAGE 60

4.15, delete "Harness, Electrical Equipment ST-138()/PRC and."

4.16, second sentence, after "The bag" delete "and harness."

Table VI, delete "AND HARNESS" in title.

4.21, delete in its entirety and substitute the following:

"4.21 Packaging Inspection. - Packaging inspection requirements specified herein are classified as follows:

- a. First Article Inspection of Packaging.
- b. Quality Conformance Inspection of Packaging.

MIL-R-55499B (CR)
AMENDMENT 1

4.21.1 First Article Inspection of Packaging. - Unless otherwise specified in the contract, First Article Inspection of Packaging shall be in accordance with the Unit Pack Design Validation Requirements of MIL-P-116.

4.21.2 Quality Conformation Inspection of Packaging. -

4.21.2.1 Materials inspection. - All materials to be used in packaging shall be inspected in accordance with the applicable material specification.

4.21.2.2 Preservation inspection. - Inspection of preservation and interior markings shall be in accordance with group A and B Quality Conformance Inspection Requirements of MIL-P-116. Lot formation and sampling procedures shall be as specified therein.

4.21.2.3 Packing inspection. - Inspection of packing and the marking for shipment and storage shall consist of the examinations specified in Table VII, "PACKING INSPECTION PROVISIONS." Lot formation shall consist of all packs made of the same materials during an identifiable period and submitted at one time for acceptance. Sampling procedures shall be in accordance with MIL-STD-105, using a single sampling plan and Acceptable Quality Level of 4.0 percent defective."

TABLE VII - PACKING INSPECTION PROVISIONS

NO.	CHARACTERISTIC	METHOD OF INSPECTION
101	Intermediate container not specified	Visual
102	Improper closure of intermediate container	Visual
103	Shipping containers not in accordance with specification	Visual
104	Excessive cube	Visual
105	Improper blocking and bracing	Visual
106	Closure not in accordance with specification	Visual
107	Weight and size exceed container limitations	Weight & Measure
108	Strapping not in accordance with specification, incorrectly applied, omitted	Visual
109	Marking omitted, incorrect, or illegible	Visual

MIL-R-55499B (CR)
AMENDMENT 1

PAGE 62

4.22, delete in its entirety.

After 4.25 add 4.26 as follows:

"4.26 Safety Inspection (See 3.37). - An inspection shall be performed to verify compliance with those portions of 3.37 which can be determined visually. Using SEL Form 1183 verify that the requirements of 3.37 are met."

PAGES 62 thru 68

5. PREPARATION FOR DELIVERY, delete in its entirety and replace with the following:

"5. PACKAGING

5.1 Packaging Requirements. - The requirements for packaging shall be in accordance with SPI AG00000047."

PAGE 69

6.1, replace "as part of Radio Sets AN/VRC-53() and AN/GRC-125()" with "as part of Radio Sets AN/VRC-64() and AN/GRC-160()."

6.2c and 6.2d, delete in their entirety and substitute the following:

"c. Level A or B Preservation and Packing (See Section 5).

d. When First Article Inspection Rough Handling tests are not required."

6.6, change to read:

"6.6 Color. - The color chip furnished by the procuring agency (3.9) may be obtained upon request to Commander, US Army Communications-Electronics Command, Procurement Directorate, Ft. Monmouth, NJ 07703-5008."

PAGE 70

6.8, delete in its entirety.

6.9, first sentence, change "dimensional and electrical gages" to "dimensional gages and electrical test requirement drawings."

last sentence, delete "provided with the government owned gages."

6.10, delete in its entirety and create new paragraphs as follows:

"6.10 Group D Inspection. - When the contract requires a Group D Inspection, the Inspection shall be performed in accordance with the Reliability Test Requirements of this Specification.

MIL-R-55499B (CR)
AMENDMENT 1

6.11 Level B Preservation. - When Level B Preservation is specified, this level of protection will only be used under known favorable conditions during transportation, storage and handling.

6.12 Environmental. - Environmental pollution prevention measures are contained in the applicable packaging material specifications. Refer to material specifications or preparing activity for recommended disposability methods."

PAGE 71

A3.1.1, delete "Modulation Capability 3.20.6 4.11.6 A4.1.2.4."

add "Audio Response 3.20.15 4.11.15 A4.1.2.4."

PAGE 87

B3.1.1, delete "Modulation Capability 3.20.6 4.11.6 B4.1.2.4."

add "Audio Response 3.20.15 4.11.15 B4.1.2.4."

PAGES 73 and 89

A4.1.1 and B4.1.1, replace "Temperature. . .40°C \pm 5°C (95°F to 113°F)" with "Temperature. . .Room Ambient."

PAGES 75 and 91

A4.1.1.3f and B4.1.1.3f, replace "1.0 VRMS or greater" with "0.9 VRMS or greater."

A4.1.2 and B4.1.2, replace "Temperature. . .40°C \pm 5°C (95°F to 113°F)" with "Temperature. . .Room Ambient."

PAGES 76 and 92

A4.1.2.4 and B4.1.2.4, change title to "Audio Response.-."

PAGES 76 and 93

A4.1.2.4b and B4.1.2.4b, change tables to read:

<u>"Modulation Freq. (Hz)</u>	<u>Deviation (db)</u> <u>(Ref. to 1000 Hz)</u>
300	+3/-6
500	+3/-6
1000	0
2000	+3/-6
3000	+3/-6

Deviation at 1000 Hz = 10 \pm 2 KHz."

MIL-R-55499B (CR)
AMENDMENT 1

PAGES 77 and 93

A4.1.2.5 and B4.1.2.5, change to read:

"a. Use the test set-up of Figure A3. The receiver-transmitter in the transmit mode shall be operated under standard test conditions with the dial frequency set to 30.00 MHz. Do not apply any external modulation.

b. Disable the 150 Hz Tone Modulation by connecting a ground to test terminal A23-J3. The transmitter frequency shall be within ± 3.5 KHz of the dial setting.

c. With an auxiliary power supply apply a voltage to the A39 test point, J3, sufficient to increase the transmitter frequency 650 KHz to 30.65 MHz.

d. Key the transmitter off and on three times, noting that the transmitter frequency returns to 30.65 MHz ± 200 Hz. This test must be successful on three out of three tries.

e. Repeat the above procedures except reduce the transmitter frequency 650 KHz.

f. Repeat the above procedures at 75.95 MHz."

PAGES 85 and 104

In FIGURE A3, TRANSMITTER TEST SET-UP #2 and in FIGURE B3, TRANSMITTER TEST SET-UP #2, change "Test Point A31-J4" to "Test Point A39-J3."

Custodian
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Preparing Activity
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(Project No. 5820-A813)