

MODEL NRD-545

SERVICE MANUAL

JRC *Japan Radio Co., Ltd.*



DSP RECEIVER

INTRODUCTION

This manual describes the basic operating principles of the NRD-545DSP receiver and items required for its maintenance. Please refer to the User Manual supplied with the equipment for how to operate and handle the NRD-545.

The NRD-545 consists of eight units. Each circuit has been designed to minimize the number of locations that might require adjustment with the passage of time, and so increase operating stability. It is therefore only necessary to service the equipment according to the instructions contained in this manual when a fault becomes apparent.

Please refer to the table of units and be sure to enter the name and type on the form when ordering replacement unit.

Please refer to the parts lists and enter the unit type, part No., type, and code when ordering parts.

CONTENTS

1.	SPECIFICATIONS	1
2.	FRONT PANEL AND REAR PANEL	3
2-1	FRONT PANEL	3
2-2	REAR PANEL	4
3.	LAYOUT OF UNITS	5
4.	ASSEMBLY DRAWING	6
5.	BLOCK DIAGRAM	7
6.	DESCRIPTION OF CIRCUITS	8
6-1	OUTLINE OF BLOCKS	8
6-2	DESCRIPTION OF UNITS	9
7.	ADJUSTMENT	15
7-1	PREPARATION	15
7-2	CBD-1363 POWER CIRCUIT	16
7-3	CDE-860 DISPLAY UNIT	17
7-4	CGK-160 REF/DDS UNIT	19
7-5	CGA-184 LOOP1 UNIT	20
7-6	CDA-752 DSP UNIT	21
7-7	CFH-71 1ST IF UNIT	22
7-8	CFL-356 RF TUNE UNIT	25
7-9	INTEGRATED ADJUSTMENTS	26
7-10	CHE-199 WIDEBAND CONVERTER UNIT	34
8.	TROUBLESHOOTING	41
8-1	SIMPLE PROBLEMS	41
8-2	MORE SERIOUS PROBLEMS	42
8-3	MAINTENANCE	43
9.	CIRCUIT DIAGRAM AND PCB LAYOUT	44
9-1	CIRCUIT DIAGRAM	44
9-2	PCB LAYOUT	56

9-3	DC VOLTAGE FOR EACH TRANSISTOR	72
9-4	DC VOLTAGE FOR EACH IC	76
10.	OPTIONAL UNITS	86
10-1	INTRODUCTION	86
10-2	REMOVING COVERS	89
10-3	REMOVING INTERNAL UNITS	90
10-4	FASTENING COVERS	90
11.	LEVEL DIAGRAM	91
12.	PARTS LIST	92

1. SPECIFICATIONS

- (1) **Operating frequency range** With optional board CHE-199 installed:
 NRD-545J: 0.1~252.9MHz, 255.1~261.9MHz
 266.1~270.9MHz, 275.1~379.9MHz
 382.1~411.9MHz, 415.1~809.9MHz
 834.1~859.9MHz, 889.1~914.9MHz
 960.1~1999.999MHz
 NRD-545G: 0.1~1999.999MHz
 NRD-545U: 0.1~823.9MHz, 849.1~868.9MHz
 894.1~1849.9MHz, 1910.1~1929.9MHz
 1990.1~1999.999MHz
- (2) **Modes of Reception** USB, LSB, CW, RTTY, AM, FM, WFM (with optional board installed)
 (Note: USB, LSB, CW, and RTTY modes are available at below 30MHz. WFM mode is available at 30MHz or more.)
- (3) **Frequency stability** ± 10 ppm or less after 5 to 60 minutes warm-up period;
 ± 2 ppm per hour or less from then on
 ± 0.5 ppm (with optional TCXO mounted)
- (4) **Minimum tuning step** 1Hz
 (10Hz, 100Hz, 1kHz, 5kHz, 6.25kHz, 9kHz, 10kHz, 12.5kHz, 20kHz, 25kHz, 30kHz, 50kHz, 100kHz steps available)
- (5) **Memory Capacity** 1000 channels /
 (frequency, mode, bandwidth, ATT, AGC, and tuning step)
- (6) **Receiving system** Triple superheterodyne
 1st IF: 70.455MHz
 2nd IF: 455kHz
 3rd IF: 20.22kHz
- (7) **Sensitivity**

	USB, LSB, CW, RTTY	AM	FM	WFM
0.1~0.499999MHz	14dB μ (5 μ V)	24dB μ (15.8 μ V)	—	—
0.5~1.599999MHz	6dB μ (2 μ V)	16dB μ (6.3 μ V)	—	—
1.6~29.999999MHz	-10dB μ (0.32 μ V)	6dB μ (2 μ V)	-6dB μ (0.5 μ V)	—
30~1000MHz	—	10dB μ (3.2 μ V)	-2dB μ (0.8 μ V)	6dB μ (2 μ V)
1260~1300MHz	—	10dB μ (3.2 μ V)	-2dB μ (0.8 μ V)	—

Bandwidth: USB/LSB/CW/RTTY/AM: 2.4kHz

S/N: 10dB, Modulation: 400Hz, 30% (when measuring AM), 12dB SINAD (when measuring FM and WFM).

Note: The sensitivity of 30MHz or more measured with CHE-199 UNIT installed.

(8) Selectivity

	Bandwidth	6dB	60dB
WIDE	4.5kHz	4.5kHz or more	8kHz or less
INTER	2.4kHz	2.4kHz or more	5kHz or less
NARROW	1kHz	1kHz or more	4kHz or less
FM	10kHz	10kHz or more	—

The WIDE, INTER, and NARROW are only examples. The bandwidth can be set as desired between 0.01 and 9.99kHz (except for AMS, FM, and WFM).

- (9) Dynamic range 106dB (IF bandwidth: 300Hz)
- (10) Image rejection 70dB or more
- (11) Spurious response 60dB or more
- (12) IF rejection 70dB or more
- (13) PBS variable range ± 2.3 kHz (50Hz steps)
- (14) NOTCH attenuation 40dB or more
- (15) NOTCH variable range ± 2.5 kHz (10Hz steps)
- (16) NOTCH tracking range ± 10 kHz
- (17) Antenna impedance 50 Ω (Lo-Z terminal)
600 Ω (Hi-Z terminal)
- (18) Attenuator Approx. 20dB
- (19) AGC characteristics 10dB or less variation in audio-frequency output in relation to a change between 3 μ V and 100mV antenna input
Release time: 40mS to 5.1S (20mS steps)
- (20) Audio frequency output Speaker output: 1W or more (4 Ω load, 10% distortion)
Line output and recording output: 1mW or more (600 Ω load, 10% distortion)
- (21) RS-232C interface Baud rate: 4800 baud
(character structure: 1 start bit, 8 data bits, no-parity bit, 1 stop bit)
- (22) Power requirements AC 100/120/220/240V $\pm 10\%$, 40VA or less
DC 12 to 16V (standard 13.8V) 30W or less
- (23) Dimensions 330 (w) \times 130 (143) (h) \times 285 (327) (d) mm
Valus in parentheses include projections.
- (24) Weight Approx. 7.5kg

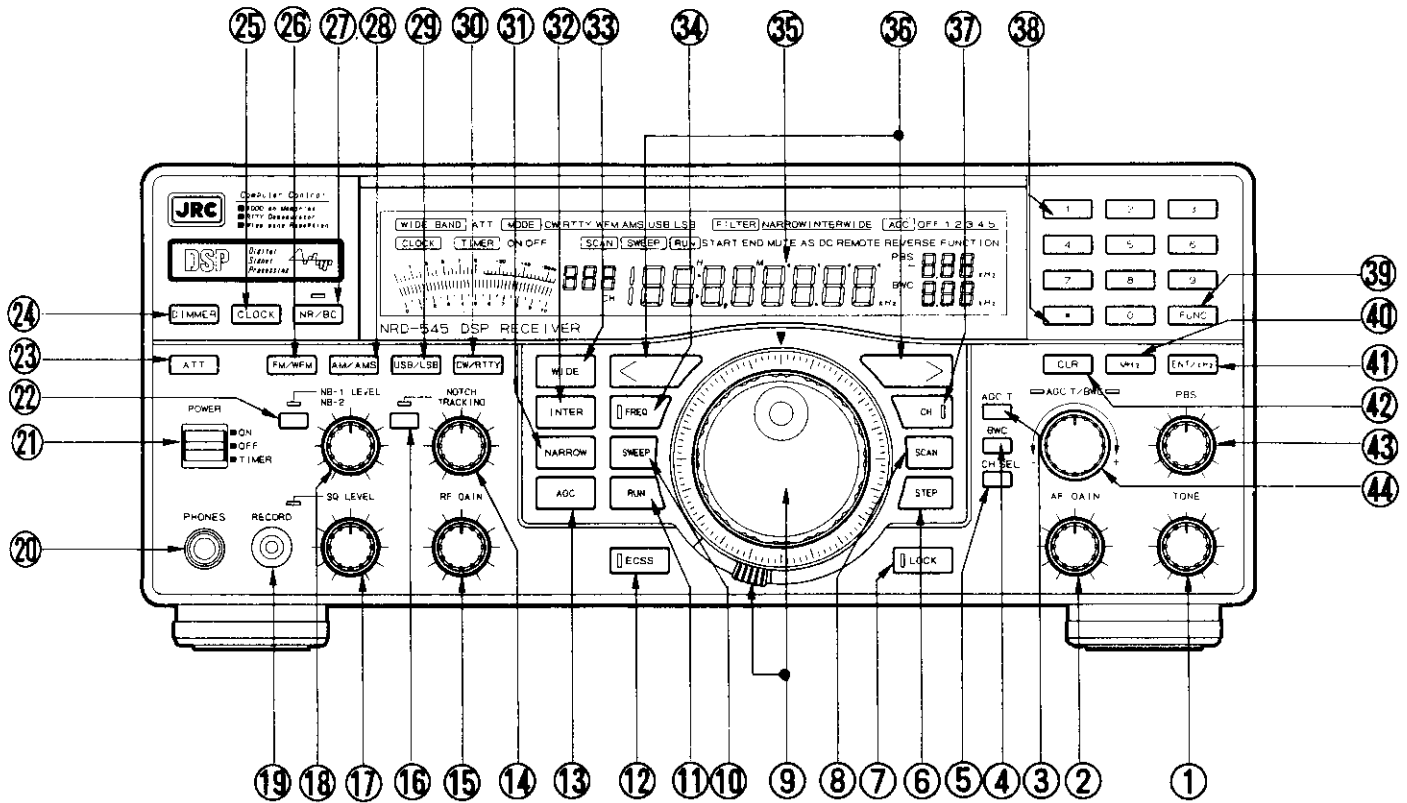
24
23
22
21
20

Notes: 1. Specifications and appearance, etc., are subject to change without prior notice.

2. In the event of a mismatch between the manual and operation of the actual equipment, operation of the actual equipment takes precedence.

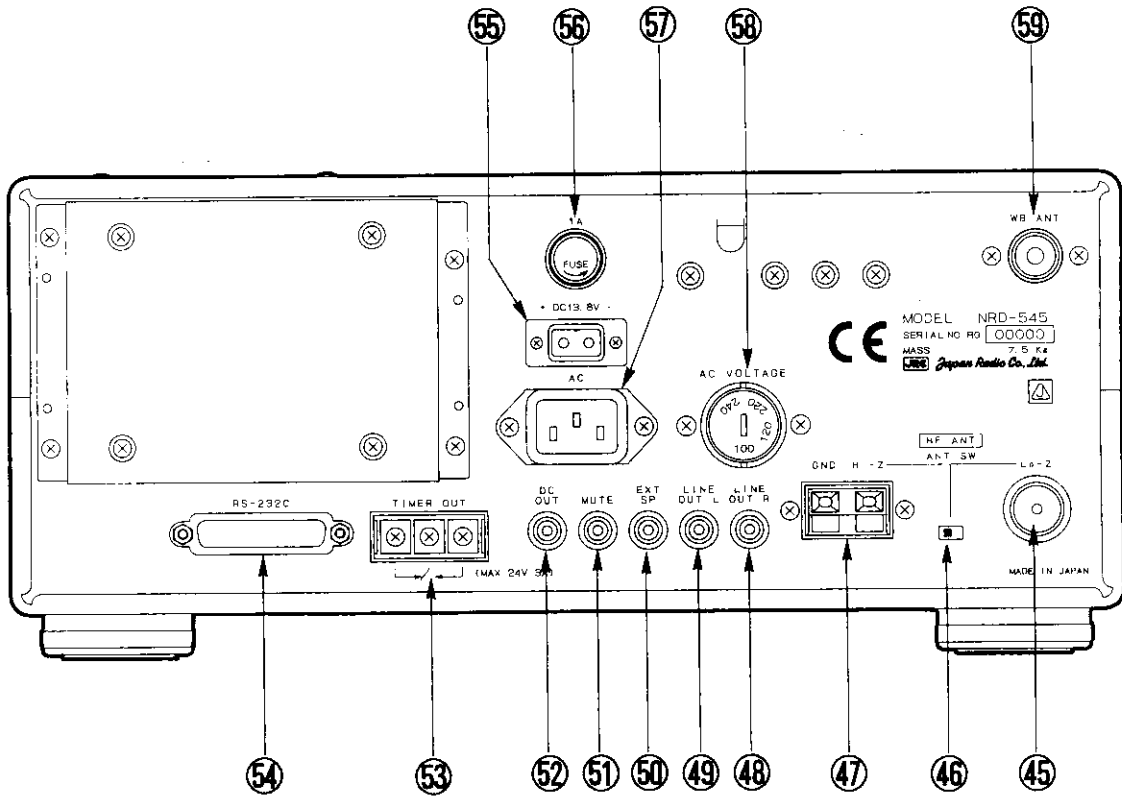
2. FRONT PANEL AND REAR PANEL

2-1 FRONT PANEL



- | | | |
|----------------------------------|---|--------------------------------|
| ① TONE control | ⑱ SQ LEVEL (squelch level) control | ⑳ NARROW button |
| ② AF GAIN control | ㉀ NB LEVEL (noise blanker level) control | ㉁ INTER button |
| ③ AGC T button | ㉁ RECORD jack | ㉂ WIDE button |
| ④ BWC (bandwidth control) button | ㉂ PHONES jack | ㉃ FREQ (frequency) button |
| ⑤ CH SEL (channel select) button | ㉃ POWER switch | ㉄ LCD display |
| ⑥ STEP button | ㉄ NB (noise blanker) button | ㉅ > (UP) and < (DOWN) button |
| ⑦ LOCK button | ㉅ ATT (attenuator) button | ㉆ CH (channel) button |
| ⑧ SCAN button | ㉆ DIMMER button | ㉇ Numerical keypad |
| ⑨ Tuning control/torque control | ㉇ CLOCK button | ㉈ FUNC (function) button |
| ⑩ SWEEP button | ㉈ FM/WFM button | ㉉ MHz button |
| ⑪ RUN button | ㉉ NR/BC (noise reduction/beat canceller) button | ㊱ ENT/kHz button |
| ⑫ ECSS button | ㊱ AM/AMS button | ㊲ CLR (clear) button |
| ⑬ AGC button | ㊲ USB/LSB button | ㊳ PBS (passband shift) control |
| ⑭ NOTCH control | ㊲ CW/RTTY button | ㊴ FINE control |
| ⑮ RF GAIN control | | |
| ⑯ NOTCH button | | |

2-2 REAR PANEL



- | | | | |
|----|------------------------------------|----|-------------------------------------|
| ④⑤ | ANT Lo-Z (low-impedance) connector | ⑤③ | TIMER OUT terminal |
| ④⑥ | ANT SW (antenna switch) | ⑤④ | RS-232C connector |
| ④⑦ | ANT Hi-Z (high-impedance) terminal | ⑤⑤ | DC power connector |
| ④⑧ | LINE OUT R jack | ⑤⑥ | Fuse holder |
| ④⑨ | LINE OUT L jack | ⑤⑦ | AC power connector |
| ⑤① | MUTE jack | ⑤⑧ | Voltage selector |
| ⑤② | DC OUT (DC output) jack | ⑤⑨ | WB ANT (wideband antenna) connector |

3. LAYOUT OF UNITS

