

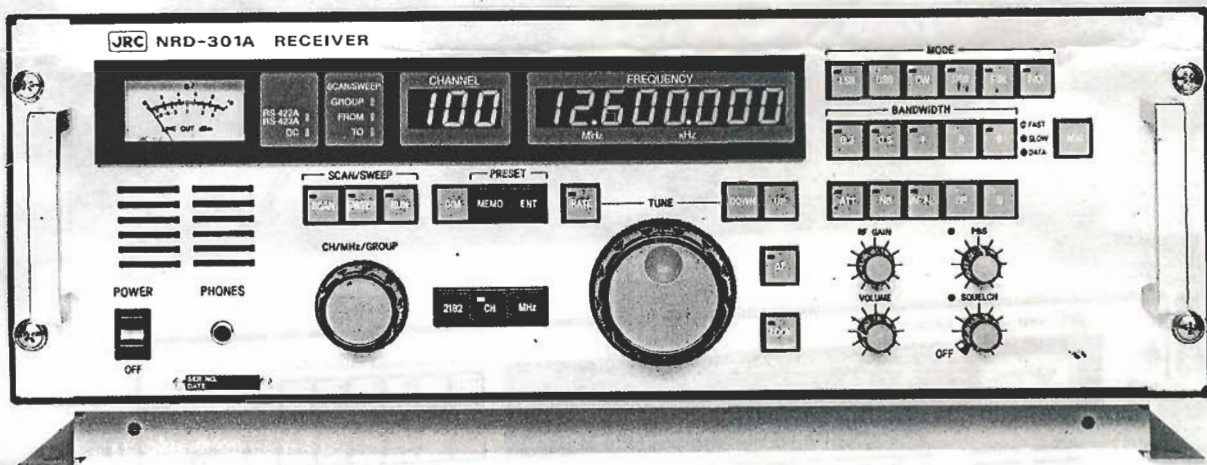
# JRC MF/HF RECEIVER NRD-301A





# NRD-301A

Model NRD-301A is a high grade MF/HF receiver designed for use in the fields of the maritime mobile, land mobile, aeronautical, point to point and monitoring services. The Receiver employs the latest frequency synthesizer technology, Direct Digital Synthesizer (DDS), for pure signal generation and quick response at frequency change. Furthermore, high stable temperature-compensated crystal oscillator (TCXO) is employed for extremely high frequency stability and accuracy of the frequency setting, resulting best reception of single sideband (SSB), or data communications such as weather facsimile.



## Features

### 1Hz-Step Frequency Synthesizer

The frequency synthesizer circuit employing one-chip DDS IC enables 1Hz-step synthesis. The synthesizer assures easy and quick fine tuning.

### Electronic Double Tuning Circuit

The electronic double tuning circuit selects only the desired frequency signals, enhancing effective sensitivity.

### Wide Dynamic Range

The Receiver employs six bands of double tuning circuits and common-gate balanced FET mixer at its front end for wide dynamic range and excellent two-signal characteristics.

### 300 Built-in Preset Channels

Maximum 300 preset channels, storing frequency, reception mode, bandwidth, AGC, and ATT data in each channel, are available.

### Anti-Interference Function

Pass Band Shift (PBS) function eliminates interference signals near the desired frequency.

### Noise Blanker

Noise blanker circuit reduces cyclic or sporadic atmospheric pulse noise during rainfall or snowfall. The AF filter improves signal to noise ratio during noisy signal reception.

### Built-in Speaker

The built-in speaker assures excellent reception without use of any other speaker.

### Complete Plug-in Construction

Plug-in type printed circuit boards assure easy maintenance.

## Specification

- **Receiving frequency range**  
90kHz to 29.999999MHz

- **Receiving system**  
Double superheterodyne with up-conversion system using a phase-locked digital frequency synthesizer.  
1st IF : 70.455MHz  
2nd IF : 455kHz

- **Reception modes**  
CW (A1A), MCW (A2A, H2A), DSB (A3E), USB/LSB (R3E, H3E, J3E), FSK (F1B, J2B), FAX (F3C).

- **Preset channel capacity**  
300 channels (frequency, reception mode, bandwidth, AGC and ATT)

- **Display of receiving frequency**  
8-digit LED (10MHz digit to 1Hz digit)

- **Tuning method**
  - MHz-band setting knob, automatic up/down quick feed switch, and main tuning knob (in 1Hz, 10Hz, 100Hz, 1kHz, 5kHz, 9kHz, 10kHz, or 100kHz steps)
  - Preset tuning to any desired 300 preset frequencies.

- **Sensitivity**

Frequency	Mode	CW	DSB	USB/LSB
90 to 200kHz		20 $\mu$ V or less	60 $\mu$ V or less	—
200 to 1600kHz		10 $\mu$ V or less	30 $\mu$ V or less	—
1.6 to 29.999999MHz		2 $\mu$ V or less	6 $\mu$ V or less	3 $\mu$ V or less

Bandwidth : 3kHz, Output : 100mW, CW : (S+N)/N = 20dB  
DSB : (S+N)/N = 20dB, 1kHz 30% modulation  
USB/LSB : (S+N+D)/(N+D) = 20dB

- **Selectivity**

Bandwidth	Attenuation	6dB Bandwidth	60dB Bandwidth
6kHz		4.5 to 7.0kHz	14kHz or narrower
3kHz		2.4 to 3.0kHz	4.1kHz or narrower
1kHz (option)		1.0 to 1.5kHz	3.0kHz or narrower
0.5kHz		0.45 to 0.6kHz	2.0kHz or narrower
0.3kHz (option)		0.27 to 0.3kHz	1.1kHz or narrower

- **Frequency stability**

After 1 minute warm-up period,  
Within  $\pm 20$ Hz (receiving frequency is 13MHz or lower)  
Within  $\pm 50$ Hz (receiving frequency is 13MHz and higher)

- **Spurious response**

Image frequency rejection ratio 70dB or more  
Intermediate frequency rejection ratio 80dB or more  
Other spurious response 70dB or more

- **Blocking**

When an unwanted signal at a spacing of more than 3kHz (receiving frequency: 1606.5 to 26175kHz) / 4kHz (receiving frequency: 90 to 1606.5kHz, 26175kHz to 29999.999kHz) from the desired signal is applied to the desired signal input voltage of 10  $\mu$ V, the unwanted signal input voltage that suppresses the output of the desired signal by 3dB is 10mV or more.

- **Overall distortion**

The ratio of 1000Hz output to its unwanted frequency component is 20dB or more under condition where output level is set to 500mW by an input level of 30  $\mu$ V.

- **AGC characteristic**

The variation of the audio frequency output for the antenna input of 3  $\mu$ V to 100mV is 10dB or less.

- **Conducted spurious emission**

The power emitted from the antenna terminal is 4000  $\mu$ W or less.

- **Nominal input impedance: 50 ohms, unbalanced**

- **Radio frequency attenuator: Approx. 20dB**

- **Auxiliary functions**

Scan, sweep, squelch, noise blanker, dimmer, S meter, line meter, self-test, built-in loud speaker, AGC selection, PBS, AF filter.

- **Variable range of PBS (pass band shift)**

Bandwidth	*0.3kHz	0.5kHz	*1kHz	3kHz	6kHz
Variable Range	$\pm 0.12$ kHz	$\pm 0.2$ kHz	$\pm 0.5$ kHz	$\pm 1.2$ kHz	$\pm 2.0$ kHz

\* 0.3kHz and 1kHz filter are optional.

- **AF filter**

Item	Mode	CW/USB/LSB	FSK
Nominal center frequency		800Hz	1700Hz

- **Variable range of BFO and clarifier**

BFO :  $\pm 9.999$ kHz (1Hz step)  
Clarifier :  $\pm 200$  Hz (1Hz step)

- **Audio frequency output**

Internal speaker output : 1W or more  
External speaker output : 1W or more (8-ohm unbalanced)  
Headphone output : 10mW or more (600-ohm balanced)

- **Line output**

-10 to +10dBm (600-ohms balanced)

- **Remote control on RS-422A**

1) Code : NRZ, ASCII  
2) Transmission Rate : 4800 bit/s  
3) Method of communication : Full duplex  
4) Control item : Receiving frequency, reception mode (FSI)

- **Remote control on RS-423A**

1) Code : NRZ, ASCII  
2) Check : Even parity check  
3) Transmission rate : 4800 bit/s  
4) Method of communication : Full duplex  
5) Control items  
a) Receiving frequency b) Reception mode c) Bandwidth  
d) AGC e) ATT f) BFO & Clarifier  
g) Noise blanker h) RF gain i) Channel  
j) Self-test k) Remote l) Status request  
m) Hold n) PBS o) Scan  
p) Sweep q) Squelch r) High pass filter  
6) Supervising items  
a) Status b) Self-test results  
c) Scan stop information d) Sweep stop information

- **Power requirements**

AC100/110/115/220/230V/240V  $\pm 10\%$ , single-phase 50/60Hz. Power consumption is approximately 50VA  
DC24V +30%, -10%. Power consumption is approximately 36W (automatic switching from AC to DC).

- **Temperature range and relative humidity**

-10°C to 50°C, 95% at +35°C

## Standard Components

Item	Model or code	Qty	Remarks
Receiver	NRD-301A	1	
Power cable	6ZCJD00005	1	Approx. 2 m
BK cable	MPKC03108	1	Approx. 1.2 m
ANT connector	M-P-5	1	
Spare parts	6ZXJD00172	1 set	
Instruction manual		1	

-Spare parts include: BK relay (one of each type), Hexagon socket screw keys, and fuses (as many as those actually used.)

## Optional Components

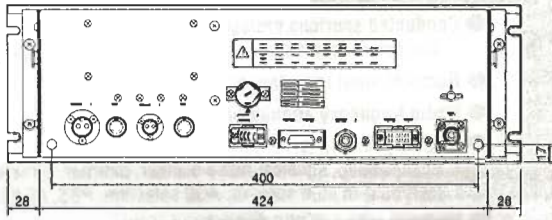
Item	Model or code	Remarks
Cabinet	MPBX10832	For desk-top type
DC power cable	MPKC01741	DC 24 V Approx. 1.2m
Headphones	ST-3	600 ohm
External speaker	NVA-92L	8 ohms, 2W
Extension card for maintenance	CMH-905	For PCBs excepting CPU board
Extension card for maintenance	CMH-909	For CPU board
Preset timer	NDH-95	
Preset timer cabinet	MPBX10828	For NDH-95
Filter	YF455FMB	0.3 kHz bandwidth
	YF455DE	1.0 kHz bandwidth



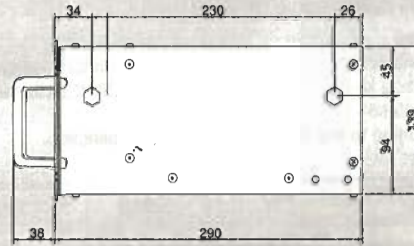
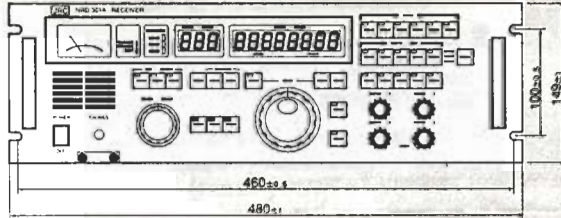
# DIMENSIONS(mm) & WEIGHT

## Console-mount type

Weight Approx. 7.5kg

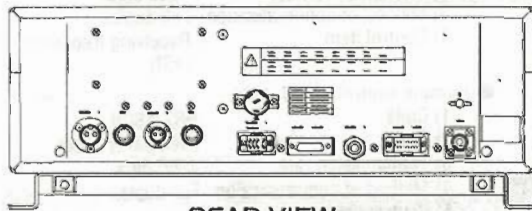


REAR VIEW

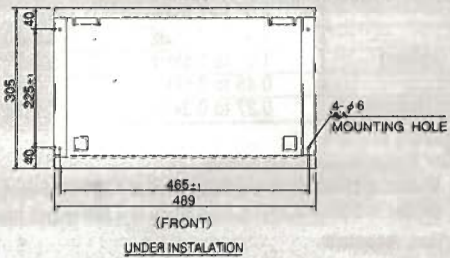


## Desk-mount type

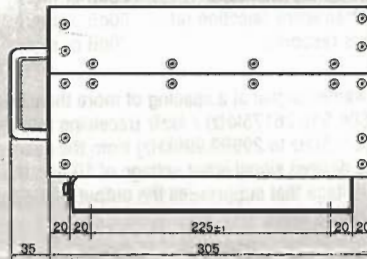
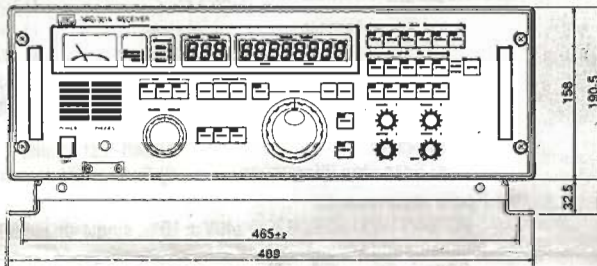
Weight Approx. 12kg



REAR VIEW



UNDER INSTALLATION



Specifications subject to change without notice.

For further information, contact:

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