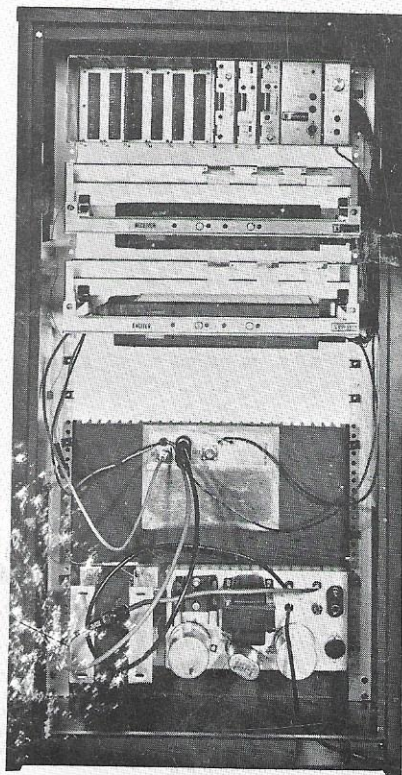


# SERVICE MANUAL

**JOHNSON**  
**1000 SERIES REPEATER**

450-512 MHz

UHF-FM



1000 SERIES REPEATER  
117 VAC, 75 WATT  
PART NO. 242-1000-XXX

2nd Printing  
Covers "B" Models  
June, 1979

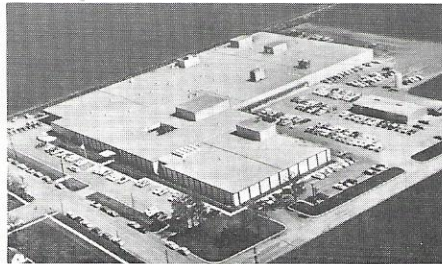
**JOHNSON**  
**1000 SERIES REPEATER**

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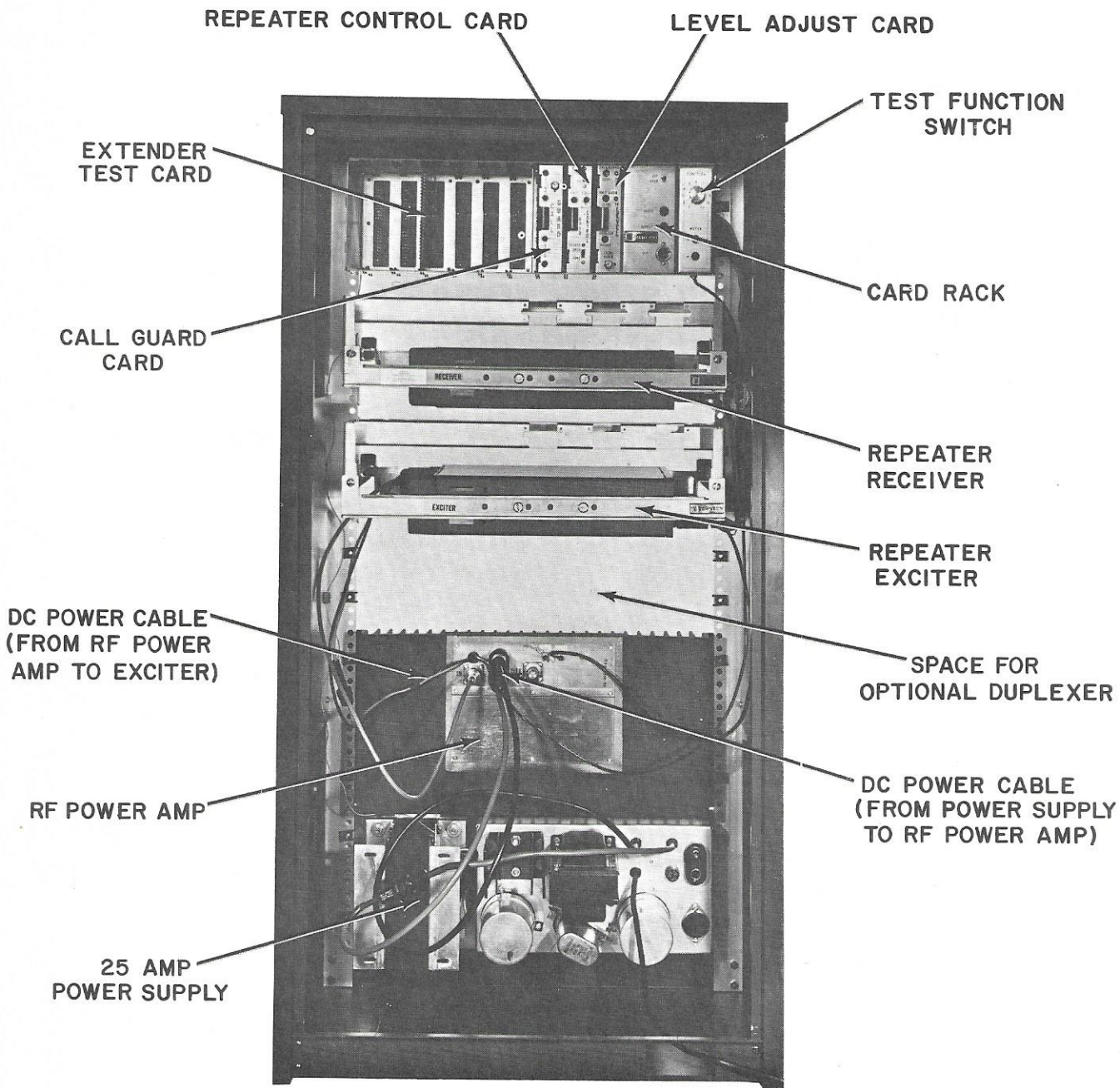
450-512 MHz

UHF-FM

117 VAC OPERATED  
75 WATT RF OUTPUT  
PART NO. 242-1000-XXX



The E. F. Johnson Company designs, manufacturers, and sells two-way radio equipment primarily for the land mobile and mobiletelephone radio services. Land mobile systems are licensed for public safety, business, industrial, and transportation use. Electronic components are designed and manufactured for sale to the communications equipment industry and manufacturers of other electronic devices. The Company also designs and manufacturers citizens band radios for the personal communications market.



1000 SERIES REPEATER

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# SECTION 1 GENERAL INFORMATION

## 1.1 SCOPE OF MANUAL

This service manual contains installation, service, alignment and part number information for the Johnson 1000 series UHF repeater, Part No. 242-1000-XXX. This manual covers the 1000 "B" model which has an improved exciter and power amplifier. The "B" model can be distinguished from the early "A" model by a "B" revision letter on the identification sticker located on the brace plate inside the repeater cabinet (see paragraph 1.4). Optional accessories such as tone remote control and CW identifier are covered in separate service literature (see Table 1-1).

## 1.2 REPEATER DESCRIPTION

The Johnson 1000 is a UHF, FM repeater operating on one channel in the 450-512 MHz frequency range. Power output is adjustable from 30-75 watts continuous duty.

The 1000 repeater can be ordered as a single user or community repeater by selecting it with or without Call Guard®. When set up as a single-user repeater, the repeater is activated by the receiver squelch circuit or by a subaudible tone if either the decode or decode/encode Call Guard card is used. When set up as a community repeater, the repeater is activated by any one of up to 16 separate subaudible tones. Up to four decode Call Guard cards can be used, each containing four separate, fully tuneable Call Guards. Also available with this configuration is the decode/encode Call Guard (see paragraph 1.3.3). Refer to Table 1-1 for accessories available with the 1000 repeater and for the part number of applicable installation and service literature.

## 1.3 ACCESSORY DESCRIPTION

### 1.3.1 Tone Remote Control (Part No. 250-0762-XXX)

The tone remote control system provides remote control of the repeater via a 600 ohm telephone line (DC continuity not required). The system consists of a console at the control point and a control rack mounted in the repeater cabinet. The tone remote repeater kit contains all the components needed to interface the tone remote card rack with the repeater card rack.

### 1.3.2 Decode Call Guard Card (Part No. 023-3823-050)

This card contains four separate Call Guards and is optional with the repeater. Up to four cards can be installed to decode up to sixteen separate Call Guard tones. A logic level change is produced when a tone is decoded and this level change causes the repeater to key. No tone is generated except for alignment purposes so the same Call Guard tone received is retransmitted. A five position switch on the front panel switches each Call Guard to the encode mode for alignment purposes and ON-OFF switches on the PC board allow each Call Guard to be turned off if not used.

### 1.3.3 Decode/Encode Call Guard Card (Part No. 023-3823-056)

This card allows the user to open the repeater with one tone and output the repeater with a second tone. This card has a decoding and an encoding Call Guard slaved together. Card outputs are available that provide a logic

TABLE 1-1  
JOHNSON 1000 ACCESSORIES

<u>Description</u>	<u>Part Number</u>	<u>Part Number of Service Literature</u>
Tone Remote Console	250-45xx-xxx	001-0762-001
Tone Remote Control Rack	250-0762-xxx	001-0762-001
Tone Remote Repeater Kit	023-3823-300	
Battery takeover/charger kit	023-3823-325	004-3823-001
Heavy Duty Microphone	250-0740-002	
Call Guard® Card (decode type)	023-3823-050	(Covered in this manual)
Call Guard® Card (decode/encode type)	023-3823-056	004-3823-055
CW Identifier Card	023-3823-330	004-3823-330
Power Failure Alarm Card	023-3988-001	004-3988-001
Outdoor Cabinet (for standard cabinet)	023-4061-001	004-4061-001
(for tall cabinet)	023-4061-002	
Receiver Shield/Filter Kit	023-3823-080	
Duplexer (3 MHz minimum separation)	532-4001-004	
PA to Duplexer Coaxial Cable (450-470 MHz)	597-3004-002	
(470-488 MHz)	597-3004-003	
(488-512 MHz)	597-3004-004	
2.5 PPM TCXO (transmit) ⚠	522-0xxx-xxx	
2.5 PPM TCXO (receive)	522-6xxx-xxx	
5 PPM TCX (receive) ⚠	521-6xxx-xxx	
TCXO (receive) Mounting Kit	023-3692-004	

⚠ The last six digits of the part number denote the channel frequency. Refer to the parts list for further details.

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level change when a tone is decoded. A switch on the front panel switches the decode Call Guard to the encode mode for alignment purposes and an ON-OFF switch on the PC board switches the Call Guard off if not used. This card can also be used to allow a single tone to open the audio to the tone remote control.

#### 1.3.4 CW Identifier Card (Part No. 023-3823-330)

This card provides automatic station identification by superimposing the station call sign in International Morse Code on the transmit audio. The identifier has an adjustable timer which controls the cycle time and other adjustments control the code speed and audio output level (deviation). The station call sign is programmed into a programmable read only memory (PROM) by the E. F. Johnson Company. Installation requires the installation of a simple wire harness on the back of the card rack.

#### 1.3.5 Power Failure Alarm Card (Part No. 023-3988-001)

When the repeater is functioning on standby power because of an AC power loss, this card superimposes a short duration tone on the transmit audio. An output is available that can be connected to the exciter power control circuit to switch the repeater to a lower power output level when on standby power. AC power is sampled from the clock sync output of the power supply and the interval between tones is adjusted by a potentiometer on the PC board. Installation requires the installation of a simple wire harness on the back of the card rack.

#### 1.3.6 Outdoor Cabinet (Part No. 023-4061-001/002)

The outdoor cabinet is a field installable, three-piece enclosure which attaches to the standard or tall indoor cabinet. The -002 version attaches to the tall repeater cabinet used when both the duplexer and tone remote rack are installed. The resulting weather resistant cabinet provides excellent protection from the elements under most conditions. However, the cabinet is not weatherproof since exceptionally high winds may force rain or snow into upper air vents or lower drain holes.

#### 1.3.7 Receiver Filter/Shield Kit (Part No. 023-3823-080)

This kit is a metal shield which surrounds the receiver to provide additional RFI protection. It is field installable and has filtered interface connections for each of the control wires. The SO-239 antenna jack must be removed and reinstalled in the shield and the receiver covers are no longer used.

## 1.4 REPEATER IDENTIFICATION MARKING

For repeater identification, a cloth identification sticker is attached to the brace plate inside the repeater cabinet. This sticker identifies the repeater model, revision letter, manufacture date, plant location and warranty number.

Example:

Model	Revision Letter	Manufacture Date	Plant	Warranty Number
1000	B	039	A	12987
		Month      Year	A = Waseca	

## 1.5 FACTORY CUSTOMER SERVICE

The Customer Service Department of the E. F. Johnson Company provides customer assistance on technical problems and the availability of local and factory repair facilities. If you write to the Customer Service Department, please include all information that may be helpful in solving your problem.

Contact: E. F. Johnson Company  
Customer Service Department  
206 2nd Avenue, S.W.  
Waseca, Minnesota 56093  
Phone: (507) 835-6366

## 1.6 FACTORY RETURNS

Repair service is normally available through local authorized Johnson Land Mobile Radio Service Centers and a list of regional service centers is available from the Customer Service Department on request. Do not return any equipment to the factory without authorization from the Customer Service Department. Return accessories used with the equipment so a complete diagnosis can be made.

## 1.7 REPLACEMENT PARTS

Commonly needed replacement parts are usually stocked by authorized Johnson Service Centers. When a part is not available locally it can be ordered from the Customer Service Department. For assistance in ordering or identifying parts, call (507) 835-6375 or 835-6376. When ordering, please supply the following information:

- Part number of part
- Description of part
- Quantity required
- Description of equipment part is from