

SECTION 1 GENERAL INFORMATION

1.1 SCOPE OF MANUAL

This service manual contains alignment and service information for the E.F. Johnson 5100-Series portable digital transceivers.

1.2 TRANSCEIVER DESCRIPTION

1.2.1 GENERAL

The 5100-series portable digital transceivers have multiple system select capability to allow operation in various types of radio systems (see next sections). Models are available for operation in the following frequency ranges: VHF 136-174 MHz, UHF low 403-470 MHz, UHF high 450-512 MHz, and 800 MHz 806-870 MHz. Repeater talk-around, which allows transmitting on the receive frequency, is also available with all bands. Power output is user switchable for low and high levels as follows:

VHF - 1 and 5 watts
 UHF - 1 and 4 watts
 800 MHz - 3 watts only

1.2.2 ANALOG/DIGITAL OPERATION

The 5100-series transceivers use a digital signal processor (DSP) to provide the signal modulation required to operate on the following types of channels. This provides backwards compatibility with existing equipment and also the ability to operate on various types of radio systems.

Narrow Band Analog - FM modulation is used with a maximum deviation of 2.5 kHz. This mode is usually used in systems with a channel spacing of 12.5 kHz.

Wideband Analog - FM modulation is used with a maximum deviation of 5 kHz. This mode is usually used in systems where the channel spacing is 25 kHz or 30 kHz.

Project 25 Digital - Operates on Project 25 compatible systems. The voice is digitized, error corrected,

optionally encrypted, and then transmitted using C4FM modulation according to the Project 25 standard. This mode uses a channel spacing of 12.5 kHz.

1.2.3 OPERATING PROTOCOLS

The 5100-series transceivers can be programmed for all the following operating protocols. Refer to Section 2 for more operation information.

- Conventional analog
- Conventional Project 25 (digital)
- Trunked Project 25 (digital)
- SMARTNET™/SmartZone® analog or Proj 25 (digital)
- Multi-Net® trunked (analog)

1.2.4 18-KEY/6-KEY MODELS

Both 18-key and 6-key models are available. The 18-key version includes number keys 0-9 for making telephone calls, entering unit or group ID numbers, and keypad programming. The other keys (*, #, and F1-F4) have dual functions. They can be assigned a function using the programming software and are also used to navigate through menus. The 6-key models have keys below the display which are programmable function keys, and also keys that are used for menu navigation.

1.2.5 SYSTEMS, CHANNELS, AND ZONES

A zone and channel are selected to place and receive calls. The following describes the relationship between systems, channels, and zones.

Systems

A system as used with this transceiver is a collection of channels (talk groups) belonging to the same repeater site. A system defines all the parameters and protocol definitions required to access a site. Up to 1 conventional system and 15 SMARTNET/SmartZone systems can be programmed (16 total).