



Quality

Service

Value

# **Sandown Wireless USA E.F.J. Catalog**

**Choice**

# *Mobiles*



**EFJohnson<sup>®</sup>**

# 5300 Series

VHF  
UHF  
800 MHz

**ANALOG/DIGITAL MOBILE RADIO**

- APCO Project 25 Compatible – Trunked and Conventional
- SMARTNET® and SmartZone®
- Analog FM
- Encryption

For over 80 years, EFJohnson has been at the forefront of the communications industry. Our subscriber radios are used throughout the world by military, police, fire, paramedics, and homeland security professionals.

The 5300 Series Analog/Digital Mobile Radio provides Project 25 compatibility along with SMARTNET®/SmartZone® capability to meet the needs of federal, state, and local government users, as well as business, industrial and public safety applications. Switching between SMARTNET/SmartZone Project 25 and conventional analog equipment is simple – just turn the channel knob.

#### **Multiple Protocol Compatibility:**

– **Project 25 CAI (Common Air Interface)** enables users to communicate with other Project 25 compatible radios. The 5300 supports Project 25 trunked and conventional communications, as well as Motorola® ASTRO® trunking.

– **SMARTNET® II and SmartZone® Trunking Protocols** are supported.

**Backward Compatibility** provides the flexibility to communicate in both narrow and wideband analog channels, in addition to narrowband digital.



**Forward Compatibility** is provided via a scalable design that allows new features and applications to be integrated into the existing radio platform.

**Encrypted Communications** for wideband legacy systems and narrowband operation. DES and DES-XL™ enable secure voice communications in wideband channels; Project 25 DES-OFB and AES encryption provide secure communication in narrowband channels.

**Multiple System Select** is an advanced feature that enables the user to simply change the communications protocol from analog to digital by pressing a button.

**Over-The-Air-Rekeying (OTAR) option** enables encryption keys and other related key management messages to be securely sent through the air from a key management facility (KMF).

**Handheld Controller Option** provides DTMF operation as well as all the functions of a control head.

**Field Programmable Capability** provides National Telecommunications and Information Administration (NTIA) agencies the ability to reprogram conventional frequencies, CTCSS, DCS, and talkgroups into the radio's memory.

**10-Character Alphanumeric Display** provides a backlit visual display of the radio's channel or talkgroup on the front of the radio. Tilt viewing angle allows for easy viewing anywhere in the vehicle and in any light condition.

**100-Watt Option** allows extra power for VHF communication systems.

**PC Programmability:** Program an unlimited number of radios with the click of a mouse, using EFJohnson's PC Configure™ application – support both mobile and portable platforms in a single configuration software package.

**Rotary Knobs** mounted on the front of the mobile provide easy channel and volume adjustment.

**Optional Remote Mounting** gives more flexibility for installation in tight spaces. Available as a factory ordered option.



Project 25  
Trunking

SMARTNET®  
SmartZone®  
Digital

Project 25  
Conventional

SMARTNET®  
SmartZone®

Conventional

# 5300 SERIES

## ANALOG/DIGITAL MOBILE RADIO

All Specifications are typical and subject to normal manufacturing tolerances.

| MODEL NUMBER               | 531X  | 532X  | 533X/6X   | 538X         |
|----------------------------|---|---|---|--------------|
| GENERAL                    | VHF   | VHF   | UHF   | 800 MHz      |
| Frequency Range            | 136–174 MHz   | 146–174 MHz   | 380–470 MHz<br>403–470 MHz                          | 806–870 MHz  |
| Zones/Channels             | 16/16   |   |   |              |
| Mounting                   | Dash-mount, Remote-mount                                    |   |   |              |
| Input Voltage              | 13.6 VDC (negative ground)                                  |   |   |              |
| Dimensions (HxWxD)         | 2.1" x 7.15" x 8.3"<br>(5.3 cm x 18.2 cm x 21.1 cm)         | 2.1" x 7.15" x 13.75"<br>(5.3 cm x 18.2 cm x 34.9 cm) | 2.1" x 7.15" x 8.3"<br>(5.3 cm x 18.2 cm x 21.1 cm) |              |
| Weight                     | 5 lbs. 4 oz. (2.38 kg)                                      | 8 lbs. 6 oz. (3.78 kg)                                | 5 lbs. 4 oz. (2.38 kg)                              |              |
| Case                       | Metal—black   |   |   |              |
| Temperature Range          | –30°C to +60°C  |   |   |              |
| Current Drain @ 13.8V:     | Standby<br>Received @ Rated Audio<br>Transmit @ Rated Power |   |   |              |
|                            | 13.2 A  | 27.5 A  | 13.2 A  | 13.2 A       |
| Channel Spacing            | 12.5, 15, 25, 30 kHz  | 12.5, 15, 25, 30 kHz                                  | 12.5, 25 kHz  | 12.5, 25 kHz |
| Voice Digital Mode:        | IMBE™ 4.4 kbps  |   |   |              |
| Voice Coding               | 180 msec  |   |   |              |
| Frame Re-sync Interval     | RS, Golay, Hamming  |   |   |              |
| Error Correction Method    |   |   |   |              |
| FCC Type Acceptance Number | ATH2425317  | ATH2425326  | ATH2425330  | ATH2425384   |
| Canada                     | 933 195 573A  | —   | —   | 933 195 671A |

### RECEIVER Typical Performance Specifications (Measurements per TIA 603 Standards)

|                                      |                |          |          |          |
|--------------------------------------|----------------|----------|----------|----------|
| Sensitivity: Digital Mode: 5% BER**  | 0.35 µV        |          |          |          |
| Analog Mode: 12 dB SINAD             | 0.35 µV        |          |          |          |
| Selectivity                          | –75 dB         |          |          |          |
| Spurious & Image Rejection           | –75 dB         |          |          |          |
| Intermodulation                      | –75 dB         | –75 dB   | –77 dB   | –73 dB   |
| Audio Output Power                   | 12W            |          |          |          |
| Audio Distortion (at 1000 Hz)        | <3%            |          |          |          |
| Frequency Stability (–30°C to +60°C) | ±2.5 ppm       | ±2.5 ppm | ±2.5 ppm | ±1.5 ppm |
| Maximum Frequency Separation         | Full bandsplit |          |          |          |

### TRANSMITTER Typical Performance Specifications (Measurements per TIA 603 Standards)

|                                      |                                    |                   |                 |                                    |
|--------------------------------------|------------------------------------|-------------------|-----------------|------------------------------------|
| RF Power Output                      | 10W–50W variable                   | 50W–100W variable | 7W–15W variable | 10W–35W variable                   |
| Spurious & Harmonic Emissions        | –70                                | –70               | –70             | –60                                |
| FM Hum & Noise (Wideband)            | –45 dB                             |                   |                 |                                    |
| Emission Designators                 | 8K10F1E, 11K0F3E, 16K0F3E, 20K0F1E |                   |                 | 8K10F1E, 14K0F3E, 16K0F3E, 20K0F1E |
| Audio Distortion (at 1000 Hz)        | <3%                                |                   |                 |                                    |
| Audio Response (1000 Hz ref.)        | 300–3000 Hz                        |                   |                 |                                    |
| Frequency Stability (–30°C to +60°C) | ±2.5 ppm                           | ±2.5 ppm          | ±2.5 ppm        | ±1.5 ppm                           |
| Modulation Limiting:                 |                                    |                   |                 |                                    |
| Wideband Analog                      | 5 kHz                              |                   |                 | 5 kHz                              |
| Narrowband Analog                    | 2.5 kHz                            |                   |                 | 2.5 kHz                            |
| Maximum Frequency Separation         | Full bandsplit                     |                   |                 |                                    |

\*\* Measured in digital mode per TIA 102.CAAA and TIA 102.CAAB standards.

| ENVIRONMENTAL SPECIFICATIONS |                  |                  |                  |                  |
|------------------------------|------------------|------------------|------------------|------------------|
| Environment                  | Mil Spec 810C    | Mil Spec 810D    | Mil Spec 810E    | Mil Spec 810F    |
|                              | Method Procedure | Method Procedure | Method Procedure | Method Procedure |
| Low Pressure                 | 500.1 I          | 500.2 I          | 500.3 II         | 500.4 II         |
| High Temp.                   | 501.1 I, II      | 501.2 I, II      | 501.3 I, II      | 501.4 I, II      |
| Low Temp.                    | 502.1 I          | 502.2 I          | 502.3 I          | 502.4 I          |
| Temp. Shock                  | 503.1 I          | 503.2 I          | 503.3 I          | 503.4 I          |
| Solar Radiation              | 505.1 I          | 505.2 I          | 505.3 I          | 505.4 I          |
| Rain/BlowRain                | 506.1 I, II      | 506.2 I, II      | 506.3 I, II      | 506.4 I, II      |
| Humidity                     | 507.1 II         | 507.2 II(5)      | 507.3 II(5)      |                  |
| Salt Fog                     | 509.1 I          | 509.2 I          | 509.3 I          |                  |
| Dust and Sand                | 510.1 I          | 510.2 I          | 510.3 I, II      | 510.4 I, II      |
| Vibration                    | 514.2 VIII(W)    | 514.3 I(10)      | 514.4 I(10)      | 514.5 I(24)      |
| Shock                        | 516.2 I, II, V   | 516.3 I, IV, VI  | 516.4 I, IV, VI  | 516.5 I, IV, VI  |

### ENCRYPTION OPTIONS

|                                   |  |
|-----------------------------------|--|
| Supported Encryption Algorithms   | DES, DES-XL™, DES-OFB, AES   |
| Encryption Algorithm Capacity     | 4 minimum  |
| Encryption Keys/Radio             | 16 Common Key Reference (CKR)<br>16 Physical Identifier (PID)                          |
| Encryption Frame Re-sync Interval | P25 CAI 360 msec   |
| Encryption Keying                 | External Key Loader, OTAR  |
| Synchronization                   | CFB – Cipher Feedback<br>XL – Counter Addressing<br>OFB – Output Feedback              |
| Vector Generator                  | National Institute of Standards and Technology (NIST) approved random number generator |
| Encryption Type                   | Digital  |
| Key Erasure                       | Keyboard Command   |
| Code Key Initialization           | Internal pseudorandom generator  |
| Standards                         | FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197   |

### ACCESSORIES

- 12-Watt External Speaker
- Remote-Mount Conversion Kit
- Handheld Controller
- Dual Control Head Kit
- Desk Microphone
- Lockable Mounting Tray
- Power Supply



100W Option with Handheld Controller and External Speaker

**EFJohnson®**

# 5300 Series

531x – VHF  
533x/6x – UHF  
538x – 800 MHz

**ANALOG/DIGITAL MOTORCYCLE RADIO**

## Project 25 Compatible – Trunked and Conventional SMARTNET® and SmartZone® Analog/Digital Radio

The 5300 Analog/Digital Mobile Radio's high-quality connection that you are accustomed to using in your patrol car is now available in a remote-mount application for use on a motorcycle.

### **Multiple Protocol Compatibility:**

– **Project 25 CAI (Common Air Interface)** enables users to communicate with other Project 25 compatible radio equipment. The 5300 supports Project 25 trunked and conventional communications, as well as Motorola® ASTRO® trunking.

– **SMARTNET® II and SmartZone® Trunking Protocols** are supported on the Series 5300 motorcycle radio.

**Backward Compatibility** provides the flexibility to communicate in both narrow and wideband analog channels, in addition to narrowband digital.

**Forward Compatibility** is provided via a scalable design that allows new features and applications to integrate into the existing radio platform.

**Encrypted Communications** for wideband legacy systems and narrowband operation. DES and DES-XL™ enable secure voice communications in wideband channels; Project 25 DES-OFB and AES encryption provide secure communication in narrowband channels.

**Standardized Connection** allows easy interface with other industry standard motorcycle headsets and kits.



**10-Character Adjustable Display** lets you regulate the viewing angle electronically, enabling you to easily read it under any light condition.

**Weather-Resistant Control Head** (MIL 810) has six programmable function keys including a high-visibility embedded emergency button.

**Noise-Cancelling Weather-Resistant Microphone** and weather-resistant attenuated speaker are standard features.

**Rotary On-Off/Volume Switch** provides easy control of the on/off and volume functions.

**VHF, UHF, and 800 MHz** frequencies are offered to fit in with your current system.



Project 25  
Trunking

SMARTNET®  
SmartZone®  
Digital

Project 25  
Conventional

SMARTNET®  
SmartZone®

Conventional

# 5300 SERIES

## ANALOG/DIGITAL MOTORCYCLE RADIO

All Specifications are typical and subject to normal manufacturing tolerances.

| MODEL NUMBER   | 5310   | 5330/60                              | 5380             |
|--|--|--------------------------------------|------------------|
| <b>GENERAL</b>   | <b>VHF</b>                                       | <b>UHF</b>                           | <b>800 MHz</b>   |
| Frequency Range  | 136–174 MHz                                      | 380–470 MHz<br>403–470 MHz           | 806–870 MHz      |
| Zones/Channels   | 16/16  |                                      |                  |
| Mounting   | Remote-mount                                     |                                      |                  |
| Input Voltage  | 13.6 VDC (negative ground)                       |                                      |                  |
| Dimensions (HxWxD): Radio  | 2.1" x 7.15" x 8.3" (5.3 cm x 18.2 cm x 21.1 cm) |                                      |                  |
| Remote Control Head  | 2.1" x 7.15" x 3.1" (5.3 cm x 18.2 cm x 7.9 cm)  |                                      |                  |
| Weight: Radio  | 5 lbs. 4 oz. (2.38 kg)                           |                                      |                  |
| Remote Control Head  | 1 lb. 1 oz. (0.48 kg)                            |                                      |                  |
| Case   | Metal—black                                      |                                      |                  |
| Temperature Range  | –30°C to +60°C                                   |                                      |                  |
| Current Drain @ 13.8V: Standby   | 0.6 A  |                                      |                  |
| Received @ Rated Audio   | 2.7 A  |                                      |                  |
| Transmit @ Rated Power   | 13.2 A   |                                      |                  |
| Channel Spacing  | 12.5, 15, 25, 30 kHz                             | 12.5, 25 kHz                         | 12.5, 25 kHz     |
| Voice Digital Mode: Voice Coding   | IMBE™ 4.4 kbps                                   |                                      |                  |
| Frame Re-sync Interval   | 180 msec   |                                      |                  |
| Error Correction Method  | RS, Golay, Hamming                               |                                      |                  |
| FCC Type Acceptance Number   | ATH2425317                                       | ATH2425330                           | ATH2425384       |
| Canada   | 933 195 573A                                     | —                                    | 933 195 671A     |
| <b>RECEIVER</b> Typical Performance Specifications (Measurements per TIA 603 Standards)    |  |                                      |                  |
| Sensitivity: Digital Mode: 5% BER**  | 0.35 µV  |                                      |                  |
| Analog Mode: 12 dB SINAD   | 0.35 µV  |                                      |                  |
| Selectivity  | –75 dB   |                                      |                  |
| Spurious & Image Rejection   | –75 dB   |                                      |                  |
| Intermodulation  | –75 dB   | –77 dB                               | –73 dB           |
| Audio Output Power   | 12W  |                                      |                  |
| Audio Distortion (at 1000 Hz)  | <3%  |                                      |                  |
| Frequency Stability (–30°C to +60°C)   | ±2.5 ppm   | ±2.5 ppm                             | ±1.5 ppm         |
| Maximum Frequency Separation   | Full bandsplit                                   |                                      |                  |
| <b>TRANSMITTER</b> Typical Performance Specifications (Measurements per TIA 603 Standards) |  |                                      |                  |
| RF Power Output  | 10W–50W variable                                 | 7W–15W variable                      | 10W–35W variable |
| Spurious & Harmonic Emissions  | –70  | –70                                  | –60              |
| FM Hum & Noise (Wideband)  | –45 dB   |                                      |                  |
| Emission Designators   | 8K10F1E, 11K0F3E, 16K0F3E, 20K0F1E               | 8K10F1E, 14K0F3E<br>16K0F3E, 20K0F1E |                  |
| Audio Distortion (at 1000 Hz)  | <3%  |                                      |                  |
| Audio Response (1000 Hz ref.)  | 300–3000 Hz                                      |                                      |                  |
| Frequency Stability (–30°C to +60°C)   | ±2.5 ppm   | ±2.5 ppm                             | ±1.5 ppm         |
| Modulation Limiting:   |  |                                      |                  |
| Wideband Analog  | 5 kHz  |                                      | 5 kHz            |
| Narrowband Analog  | 2.5 kHz  |                                      | 2.5 kHz          |
| Maximum Frequency Separation   | Full bandsplit                                   |                                      |                  |

\*\* Measured in digital mode per TIA 102.CAAA and TIA 102.CAAB standards.

| ENVIRONMENTAL SPECIFICATIONS |               |           |               |           |               |           |               |           |
|------------------------------|---------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|
| Environment                  | Mil Spec 810C |           | Mil Spec 810D |           | Mil Spec 810E |           | Mil Spec 810F |           |
|                              | Method        | Procedure | Method        | Procedure | Method        | Procedure | Method        | Procedure |
| Low Pressure                 | 500.1         | I         | 500.2         | I         | 500.3         | II        | 500.4         | II        |
| High Temp.                   | 501.1         | I, II     | 501.2         | I, II     | 501.3         | I, II     | 501.4         | I, II     |
| Low Temp.                    | 502.1         | I         | 502.2         | I         | 502.3         | I         | 502.4         | I         |
| Temp. Shock                  | 503.1         | I         | 503.2         | I         | 503.3         | I         | 503.4         | I         |
| Solar Radiation              | 505.1         | I         | 505.2         | I         | 505.3         | I         | 505.4         | I         |
| Rain/Blow/Rain               | 506.1         | I, II     | 506.2         | I, II     | 506.3         | I, II     | 506.4         | I, II     |
| Humidity                     | 507.1         | II        | 507.2         | II(5)     | 507.3         | II(5)     |               |           |
| Salt Fog                     | 509.1         | I         | 509.2         | I         | 509.3         | I         |               |           |
| Dust and Sand                | 510.1         | I         | 510.2         | I         | 510.3         | I, II     | 510.4         | I, II     |
| Vibration                    | 514.2         | VIII(W)   | 514.3         | I(10)     | 514.4         | I(10)     | 514.5         | I(24)     |
| Shock                        | 516.2         | I, II, V  | 516.3         | I, IV, VI | 516.4         | I, IV, VI | 516.5         | I, IV, VI |

| ENCRYPTION OPTIONS                |  |
|-----------------------------------|--|
| Supported Encryption Algorithms   | DES, DES-XL™, DES-OFB, AES   |
| Encryption Algorithm Capacity     | 4 minimum  |
| Encryption Keys/Radio             | 16 Common Key Reference (CKR)<br>16 Physical Identifier (PID)                          |
| Encryption Frame Re-sync Interval | P25 CAI 360 msec   |
| Encryption Keying                 | External Key Loader, OTAR  |
| Synchronization                   | CFB — Cipher Feedback<br>XL — Counter Addressing<br>OFB — Output Feedback              |
| Vector Generator                  | National Institute of Standards and Technology (NIST) approved random number generator |
| Encryption Type                   | Digital  |
| Key Erasure                       | Keyboard Command   |
| Code Key Initialization           | Internal pseudorandom generator  |
| Standards                         | FIPS 46-3, FIPS 81, FIPS 140-2*, FIPS 197  |

\* Pending

| ACCESSORIES  |
|--|
| <ul style="list-style-type: none"> <li>Weather Resistant External Speaker</li> <li>Weather Resistant Noise Cancelling Microphone</li> <li>Motorcycle Mounting Bracket</li> </ul> |



Motorcycle Mounting Bracket with Mic Hang-Up and WR Noise Cancelling Mic



Rear View of Motorcycle Mounting Bracket with Mic Hang-Up



# 5300 Series

## HANDHELD CONTROLLER

**ANALOG/DIGITAL MOBILE RADIO**

## Handheld Controller

The Handheld Controller (HHC) is a discreet alternative for the traditional, full-featured remote control head of the EFJohnson® 5300 Series mobile. Designed primarily for use by law enforcement agencies and surveillance missions, the HHC gives you full radio functionality right in the palm of your hand. The Handheld Controller is available with any of the remote-mount 5300 models, eg. 53x8 or 53x6 in VHF, UHF, and 800 MHz frequencies.

### **Features:**

- LCD provides all display functions of the 5300 control head (dash or remote)
- Multi-level display and keypad back-lighting (off, low and high)
- Multi-function LED indicator
- Replicates all control functions (six programmable function buttons) of the 5300 Series mobile
- Volume up/down buttons
- Channel/zone select buttons

### **Adds Additional Functionality to the 5300 Series mobile:**

- Dedicated emergency button
- Dedicated encryption button
- Numeric keypad

### **Optional Interface Box:**

- Provides line level recording interface for transmit and receive audio
- Programming and encryption keyload interface
- Simplifies external speaker wiring

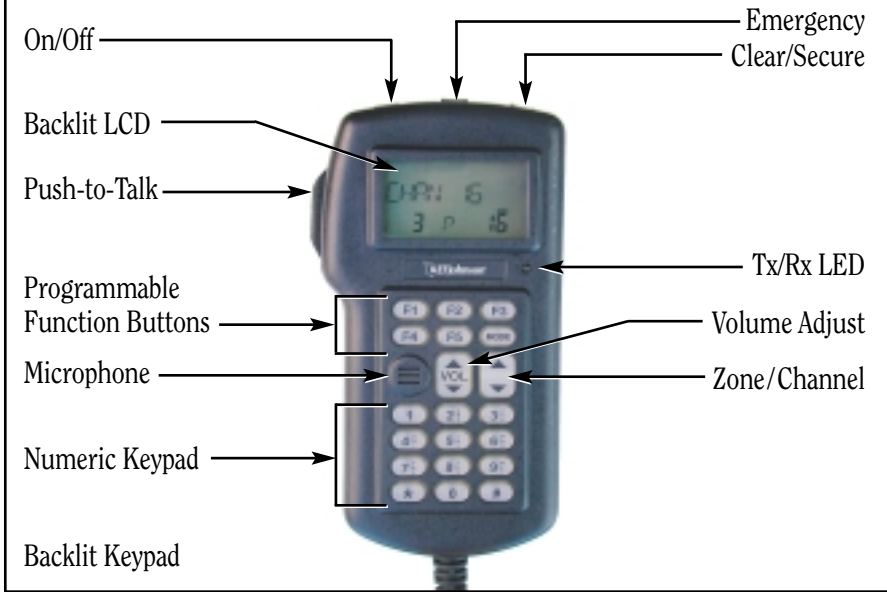


# 5300 SERIES

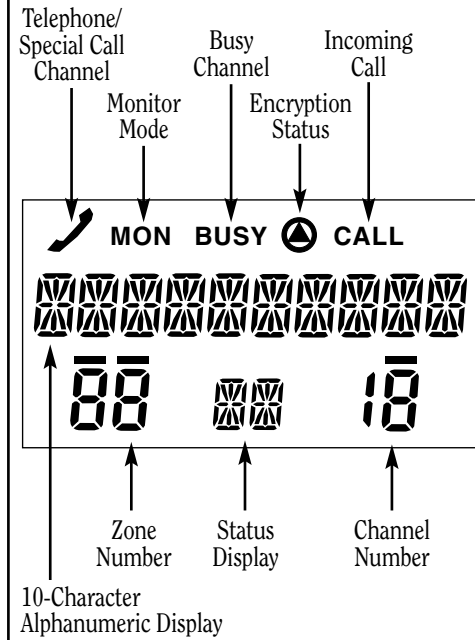
## ANALOG/DIGITAL MOBILE RADIO

All Specifications are typical and subject to normal manufacturing tolerances.

### HANDHELD CONTROLLER CONTROLS



### LED DISPLAY



Handheld Controller with 5300 100-watt trunk-mount mobile and junction box; pictured with external speaker (PN 250-0151-005), which is ordered separately.



# 5300 Series

## TRANSIT MOBILE RADIO SYSTEM

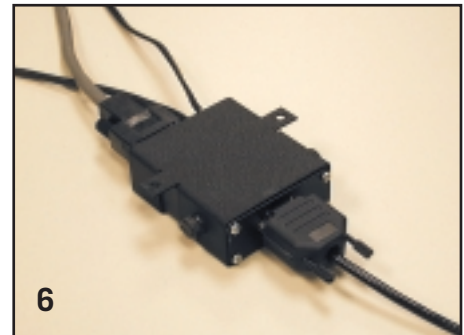
### PUBLIC ADDRESS INTERFACE SYSTEM KIT



The EFJohnson® Transit Mobile Radio System Kit is an integrated communications and information solution that addresses mission-critical safety and security requirements of the public transportation market. The radio system will enhance communications capabilities by adding a direct connection and critical interoperability between the transportation department and surrounding public safety agencies. During an emergency or critical situation, you can be assured that the communications link to emergency services is always accessible and reliable.

**5300 SMARTNET® trunked radio system.**  
**Interoperability** with public safety agencies.  
**Emergency button** alerts dispatch center that emergency assistance is required.  
**Superb voice quality and clarity.**  
**Provides up-to-date and confidential information** to dispatchers regarding current operations, making it possible to make on-the-spot critical decisions without compromising the efficiency of operations.  
**Allows the operator to quickly broadcast** greetings, upcoming bus stops, and safety messages to passengers.

1. 5300 Mobile (sold separately)
2. Remote Amp Interface Box
3. Remote Radio Control Head
4. 3-Watt External Speaker
5. 25' Remote Cable
6. 25' Audio Interface/Remote Head Interface Cable
7. Local Audio Interface Box
8. PTT Adapter Box
9. Handset with Cradle
10. Headset



### 5300 TRANSIT MOBILE RADIO SYSTEM KIT 250-5300-900

- 1. Remote Amp Interface Box**  
Connects radio to public address system and remote control head. Amplifies up to 15 watts for external PA interface.
- 2. Remote Radio Control Head**  
Compact design enables easy control from front of the vehicle, while the 5300 radio is at a different location.
- 3. 3-Watt External Speaker**  
Environmentally sealed. Meets Mil 810 specs for shock, vibration, and driven rain. Provides three watts of audio power for noisy environments.
- 4. 25' Remote Cable**  
Provides connection between the Remote Control Head and the Remote Amp Interface Box.
- 5. 25' Audio Interface/Remote Head Interface Cable**  
9-pin 25-foot cable connects the Local Audio Interface Box and the Remote Head Interface Box.
- 6. Local Audio Interface Box**  
Connects external speaker box, armored cable handset, and push-to-talk headset.
- 7. PTT Adapter Box**  
Provides push-to-talk function for the headset. Includes mounting bracket.
- 8. Handset with Cradle**  
Unamplified with dynamic transmitter and 3.5' straight armored cable. PTT button on handset.
- 9. Headset**  
Ultra-lightweight headset with boom microphone.
- 10. Lockable Mounting Bracket**  
Includes mounting tray, two keys, and all necessary hardware.

# PC CONFIGURE™

## PROGRAMMING SOFTWARE

# 5100 SERIES

# 5300 SERIES

EFJohnson's PC Configure™ software is the most user-friendly programming software for public safety and service radio users. Program all of your EFJohnson® mobile and portable radios quickly and easily with the same software package. With minimal setup time or training, PC Configure gives you the flexibility to program your EFJohnson® 5100 Series Portable and 5300 Series Mobile radios for any encryption or system type installed on the radio.

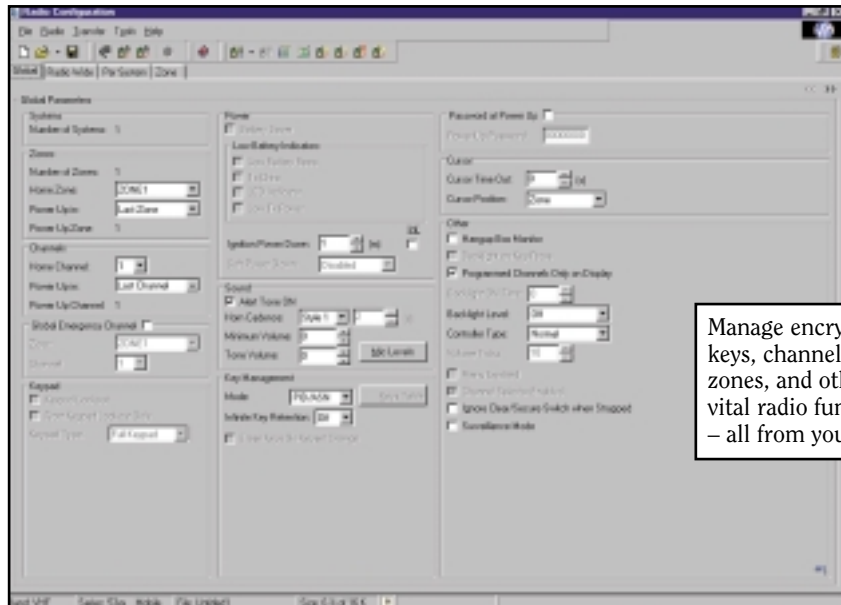
PC Configure is a Windows®-based application. With its intuitive and unique graphical display, PC Configure allows you to re-flash radios much faster than any other radio programming software. PC Configure's "remember" function stores previously programmed parameters (such as software version or options) and recalls them for future use.

### Advantages

- Minimize your learning curve with an intuitive graphical interface
- Configure mobile and portable radios with a single software package
- Switch between radio and system parameters, and program zone and channel properties with the click of a mouse
- Program your radios in analog conventional, Multi-Net®, Project 25 conventional and trunking, and SMARTNET®/SmartZone®
- Use one template to program multiple radios – simply change unit IDs and download the file to each radio

### Computer Requirements

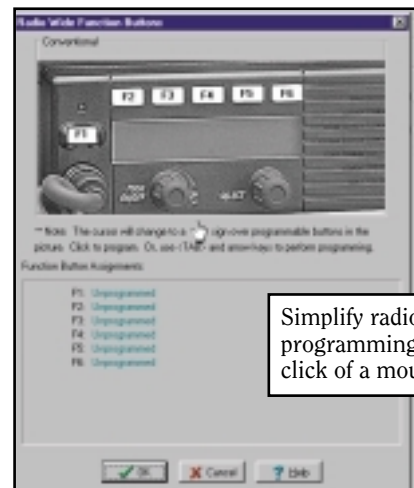
800 MHz Pentium or greater  
128 MB RAM  
40 MB hard disk space  
CD-ROM drive



Manage encryption keys, channels, zones, and other vital radio functions – all from your PC

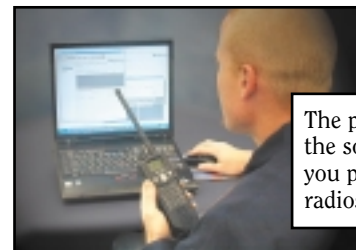


Simplify radio programming with a click of a mouse



### EFJohnson

For over 80 years, EFJohnson has been at the forefront of the communications industry. Our subscriber radios are used throughout the world by military, police, fire, paramedics, and homeland security professionals.



The portability of the software lets you program your radios anywhere.



# SMA

## SUBSCRIBER MANAGEMENT ASSISTANT

The EFJohnson® Subscriber Management Assistant (SMA) is a versatile tool, but its predominant function is for fast and easy encryption key loading. Since the SMA uses PDA technology in a ruggedized case, it can be used in almost any environment. The SMA connects to an EFJohnson or Motorola® radio via a serial interface. All configuration and modifications are completed through the serial interface. It uses the FIPS validated SEM security algorithms for all security functions, including AES and DES. With its Microsoft Windows® based graphical user interface, the SMA will have you configuring your radios right away.

### *The SMA enables you to:*

- Generate a random DES Key or AES Keys for download to the EFJohnson and Motorola portable radios that are in CKR mode
- Enter your own AES or DES key for download into a portable radio

- Use the Microsoft SQL CE database for storage of security parameters such as AES and DES keys
- Read radio key set information
- Erase all keys from a radio
- Retrieve hardware revision information from the radio
- Select a key set and make that key set active, modify and set KEK parameters, set KMF parameters on the radio, and set or modify RSI parameters
- Create a new database containing security parameters such as AES and DES keys
- Delete or modify an existing database containing security parameters such as AES and DES keys
- Encrypt all keys stored in the SQL CE using a 256-bit AES key



For keyloading functionality, the SMA connects to radios via a special keyloader cable.



# *Mobile Pricing*



**EFJohnson<sup>®</sup>**



# 5300 Series

## PRICE LIST

### ANALOG/DIGITAL MOBILE RADIO

APCO PROJECT 25/SMARTNET®/SMARTZONE®

CONTINUED

| SOFTWARE CONTROL OPTIONS: (May select up to four options) |   |
|---|---|
| <b>05</b>   | = DES / P25 DES-OFB encryption . . . . . \$ 550                                 |
| <b>06</b>   | = DES / DES-XL™ / P25 DES-OFB encryption . . . . . 750                          |
| <b>07</b>   | = DES / P25 DES-OFB / AES encryption . . . . . 750                              |
| <b>08</b>   | = DES / DES-XL / P25 DES-OFB / AES encryption . . . . . 950                     |
| <b>11</b>   | = Project 25 OTAR Conventional and Trunking . . . . . 750                       |
| <b>13</b>   | = Project 25 Data Conventional . . . . . 135                                    |
| <b>14</b>   | = Project 25 Data Trunking* (Requires System Option #3 P25 Trunking) . . 135    |
| <b>50</b>   | = Zone Fail-Site Lock (Requires System Option #2 SmartZone or higher) . . . 150 |

| ENTER & ADD PRICES  |
|---|
| (Up to four software control options per radio may be ordered.) |
| \$  |
| \$  |
| \$  |
| \$  |

**Total Software Control Options**  
Copy price of all Software Control Options to page SN-5, Section 6, to calculate total radio price.

|    |
|----|
| \$ |
|----|

|                      |                      |                      |                      |   |                      |                      |   |                      |                      |   |                      |                      |                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|---|----------------------|----------------------|---|----------------------|----------------------|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | - | <input type="text"/> | <input type="text"/> | - | <input type="text"/> | <input type="text"/> | - | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
|----------------------|----------------------|----------------------|----------------------|---|----------------------|----------------------|---|----------------------|----------------------|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|

(List in numerical order. List only Software Control Options requested. Leave remaining boxes blank.)

Copy Software Control Option numbers to page SN-5 to complete the model string number.

\* Future option.

**NOTE:** As a result of the current P25 AES OTAR standard not being NIST certified, any order to EFJohnson for Software Control Options 07, 08, and 11 simultaneously, would require a waiver from the customer deeming FIPS 140-2 approval not applicable.

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### ACCESSORIES

| Configuration  | Part Number  | Price  |
|--|--------------|--------|
| <b>Audio Accessories and Key Caps</b>  |              |        |
| Standard microphone  | 250-0740-310 | \$ 100 |
| Desktop microphone   | 589-0012-021 | 115    |
| DTMF environmentally-sealed WR805 microphone   | 587-9650-015 | 230    |
| DTMF standard microphone   | 589-0016-028 | 199    |
| Noise cancelling, weather resistant microphone   | 589-0016-592 | 145    |
| 5" remote speaker, environmental sealed  | 250-0151-006 | 54     |
| Motorcycle attenuated 5" speaker, environmental sealed   | 250-0151-015 | 74     |
| Handheld Controller 5" remote speaker, environmental sealed  | 250-0151-005 | 54     |
| Key cap kit  | 587-5300-001 | 30     |
| <b>Cables/Wiring</b>   |              |        |
| Hardware and 22' DC cable  | 023-9750-010 | \$ 40  |
| Accessory wire kit (required for horn honk and ignition sense)   | 023-9750-011 | 18     |
| <b>Mounting Hardware</b>   |              |        |
| Standard mounting bracket  | 023-9750-012 | \$ 15  |
| Lockable mounting tray   | 585-7000-185 | 90     |
| Remote control head mounting bracket   | 017-2226-050 | 15     |
| Mounting bracket for 100W radio  | 017-9700-009 | 20     |
| Motorcycle mounting bracket with microphone hang-up  | 250-5300-083 | 40     |
| <b>Antenna</b>   |              |        |
| 800 MHz roof-mount antenna   | 585-1155-011 | \$ 58  |
| Roof mount 1/4-wave whip tunable from 136 MHz to 870 MHz.<br>(Includes detached male N-connector to be soldered by installer.<br>Requires 3/4" mounting hole. Installation instructions included.<br>No adapter required.) | 501-0012-001 | 52     |
| Magnetic mount 1/4-wave whip tunable from 136 MHz to 870 MHz.<br>(Soldered male N-connector installed at factory. Removable<br>rubber protective boot included.)   | 501-0012-011 | 89     |
| <b>Remote-Mount Accessories</b>  |              |        |
| Remote radio control head, includes mounting bracket   | 023-5300-081 | \$ 750 |
| Handheld Controller (HHC) kit (Includes HHC, junction box, cable.<br>Requires remote speaker 250-0151-005. Must order separately.)   | 250-5300-101 | 1,208  |
| Transit Mobile Radio System kit  | 250-5300-900 | 1,800  |
| 17' remote cable   | 597-2002-262 | 250    |
| 50' remote cable   | 597-2002-263 | 399    |
| HHC 17' remote cable   | 597-2002-267 | 199    |
| Motorcycle 8' remote cable   | 597-2002-259 | 250    |
| <b>Dash-Mount Accessories</b>  |              |        |
| 5300 Remote Control Head kit, single or dual (includes RCH,<br>mounting bracket, blank radio front panel, cabling)   | 250-5300-001 | \$ 999 |
| <b>Siren Control Accessories</b>   |              |        |
| Siren controller kit (without loudspeaker)   | 250-5300-100 | \$ 999 |
| Siren loudspeaker (Model TS100 for lightbar installation)  | 585-5300-007 | 250    |
| Siren loudspeaker (Model MC100, compact for behind grill installation)   | 585-5300-009 | 300    |
| Siren wire kit   | 023-5300-101 | 50     |

Continued on next page.

### ACCESSORIES (CONT.)

| Configuration   | Part Number    | Price   |
|---|----------------|---------|
| <b>Control Station Accessories</b>  |                |         |
| 15 amp 120 volt power supply  | 250-4001-202   | \$ 295  |
| 15 amp 230 volt power supply  | 250-4001-204   | 295     |
| <b>Subscriber Management Assistant</b>  |                |         |
| <i>EFJohnson's handheld PDA device that currently supports encryption key loading functionality.</i>  |                |         |
| SMA   | 250-5000-945   | \$ 3200 |
| (Includes HP iPAQ h5550 PocketPC PDA; PDA-DB9 adapter cable; ruggedized PDA case; PDA cradle; PDA charger; charger adapter; operating manual; Microsoft® Active Sync OS; encryption features and software: AES, DES, DES-XL™, DES-OFB, CKR/SLN) |                |         |
| Mobile Key Loader Cable   | 023-5000-950   | 250     |
| <b>Encryption Accessories for 3rd Party Keyloading Systems</b>  |                |         |
| Key Loader cable  | 585-5000-938   | \$ 275  |
| <b>Programming Accessories</b>  |                |         |
| PCConfigure programming kit (software, cable, manual) for Windows   | 250-5000-004   | \$ 495  |
| Remote Programming Interface box (RPI Box)  | 023-5300-000   | 278     |
| Radio programming cable   | 023-5300-005   | 99      |
| Interface cable to connect RPI to computer, DB-9 M-F  | 597-5900-002   | 50      |
| Programmer adapter for HHC  | 023-5300-140   | 200     |
| PCTune tuning software  | 023-9998-499   | 275     |
| PCConfigure programming software  | 023-9998-488   | 350     |
| <b>Factory Services</b>   |                |         |
| 1-year extended warranty  | 299-0045-016   | \$ 31   |
| 2-year extended warranty  | 299-0045-012   | 55      |
| 3-year extended warranty  | 299-0045-028   | 117     |
| <b>Manuals</b>  |                |         |
| Quick Reference Guide   | 002-5300-000   | \$ 14   |
| Operator's manual (full detail on CD)   | 002-5300-009CD | 14      |
| Service manual (on CD)  | 001-5300-008CD | 42      |
| Training CD   | 299-TRNG-5300  | 50      |

# *Portables*



**EFJohnson<sup>®</sup>**

# 5100 Series

VHF  
UHF  
800 MHz

ANALOG/DIGITAL PORTABLE RADIO

- APCO Project 25 Compatible – Trunked and Conventional
- SMARTNET® and SmartZone®
- Analog FM
- Encryption

For over 80 years, EFJohnson has been at the forefront of the communications industry. Our subscriber radios are used throughout the world by military, police, fire, paramedics, and homeland security professionals.

EFJohnson designed the 5100 series Analog/Digital Encrypted Portable Radio to be rugged, lightweight, and versatile. It ensures seamless communications in a powerful software-defined unit that is easy on your body and your budget. Whether you need a radio to perform on a single-protocol system or part of many systems with different protocols, the 5100 is the solution.

The 5100 series meets the requirements of the NTIA Narrowband Mandate, and the 5100 series is compliant with FCC rules for narrowband operation. The 5100 meets narrowband requirements for both analog and Project 25 digital formats, and supports mixed-mode operation. EFJohnson supports legacy systems, while providing a seamless transition to narrowband operation.

Available in VHF, UHF, and 800 bands, the 5100 serves the needs of federal, state and local government, and public service customers.

#### **Multiple Protocol Compatibility:**

– **Project 25 CAI (Common Air Interface)** enables users to communicate with other Project 25 compatible radios. The 5100 supports Project 25 trunked and conventional communications, as well as Motorola® ASTRO® trunking.

– **SMARTNET® II and SmartZone® Trunking Protocols** are supported.

**Encrypted Communications** for wide-band legacy systems and narrowband operation. DES and DES-XL™ enable secure voice communications in wide-band channels; Project 25 DES-OFB and AES encryption provides secure communication in narrowband channels.

**Multiple System Select** is an advanced feature that enables the user to simply change the communications protocol from analog to digital by pressing a button. The 5100 provides for up to 512 channel/talkgroups.

**Over-The-Air-Rekeying (OTAR) option** enables encryption keys and other related key management messages to be securely sent through the air from a key management facility (KMF).

**Field Programmable Capability** provides National Telecommunications and Information Administration (NTIA) agencies the ability to reprogram conventional frequencies, CTCSS, DCS, and talkgroups into the radio's memory.

**Backward Compatibility** provides the flexibility to communicate in both narrow and wideband analog channels, in addition to narrowband digital. **Forward Compatibility** is provided via a scalable design that allows new features and applications to integrate into the existing radio platform.

**Alphanumeric Display** provides a large, LCD backlit display that is easy to read from any angle.

**DTMF Compatibility** enables the user to operate remote control devices or access telephone interconnect systems.



**Ergonomically-Designed Rotary Knobs** allow easy access and help the user distinguish between the talkgroup/channel knob and volume knob.

**Keypad** enables users to call individual radios, groups or fleets.

**PC Programmability:** Program an unlimited number of radios with the click of a mouse, using EFJohnson's PC Configure™ application – support both mobile and portable platforms in a single configuration software package.

**Factory Mutual Approved** intrinsically safe for use in hazardous areas.



Project 25  
Trunking

SMARTNET®  
SmartZone®  
Digital

Project 25  
Conventional

SMARTNET®  
SmartZone®

Conventional

# 5100 SERIES

## ANALOG/DIGITAL PORTABLE RADIO



All Specifications are typical and subject to normal manufacturing tolerances.

| MODEL NUMBER                     | 511X  | 512X/514X                                 | 518X             |
|----------------------------------|---|---|------------------|
| <b>GENERAL</b>                   | <b>VHF</b>                                      | <b>UHF</b>                                | <b>800 MHz</b>   |
| Frequency Range                  | 136–174 MHz                                     | 380–470 MHz<br>403–470 MHz<br>450–512 MHz | 806–870 MHz      |
| RF Power Output                  | 5W/1W   | 4W/1W                                     | 3W/1W            |
| Zones/Channels                   | Up to 512 Talkgroups/Channels                   |   |                  |
| Voice Digital Mode               | IMBE™ 4.4 kbps                                  |   |                  |
| Voice Coding                     | 180 msec.                                       |   |                  |
| Frame Re-sync Interval           | RS, Golay, Hamming                              |   |                  |
| Error Correction Method          | 7.2 V   |   |                  |
| Input Voltage                    | 6.7" x 2.52" x 1.9" (6.4 cm x 17.0 cm x 4.8 cm) |   |                  |
| Dimensions (w/o antenna) (HxWxD) | 24 oz. (675 g)                                  |   |                  |
| Weight (with standard battery)   | Polycarbonate—black, yellow, orange             |   |                  |
| Case                             | –30°C to +60°C                                  |   |                  |
| Temperature Range                | 12.5 kHz, 25 kHz, 30 kHz                        | 12.5 kHz, 25 kHz                          | 12.5 kHz, 25 kHz |
| Channel Spacing                  | ATH242510                                       | ATH2425130<br>ATH2425140                  | ATH2425180       |
| FCC Type Acceptance Number       | 933196846A                                      | 966B-2425130<br>933B-2425140              | 933B-2425180     |
| Canada                           |   |   |                  |

### RECEIVER Typical Performance Specifications (Measurements per TIA 603 Standards)

|                                      |                          |                |          |
|--------------------------------------|--------------------------|----------------|----------|
| Sensitivity                          | Digital Mode: 5% BER**   | 0.25 µV        |          |
|                                      | Analog Mode: 12 dB SINAD | 0.25 µV        |          |
| Selectivity                          |                          | –75 dB         |          |
| Spurious & Image Rejection           |                          | –75 dB         |          |
| Intermodulation                      |                          | –78 dB         | –74 dB   |
| Audio Output Power                   |                          | 500 mW         |          |
| Audio Distortion (at 1000 Hz)        |                          | 2%             |          |
| Frequency Stability (–30°C to +60°C) |                          | ±2.0 ppm       | ±1.5 ppm |
| Maximum Frequency Separation         |                          | Full bandsplit |          |

### TRANSMITTER Typical Performance Specifications (Measurements per TIA 603 Standards)

|                                      |                           |                           |          |
|--------------------------------------|---------------------------|---------------------------|----------|
| RF Power Output                      | 5W/1W                     | 4W/1W                     | 3W/1W    |
| Spurious & Harmonic Emissions        | –70                       | –70                       | –60      |
| FM Hum & Noise (Wideband)            | –45 dB                    |                           |          |
| Emission Designators                 | 16K0F3E, 11K0F3E, 8K10F1E | 16K0F3E, 14K0F3E, 8K10F1E |          |
| Audio Distortion (at 1000 Hz)        | 2%                        |                           |          |
| Audio Response (1000 Hz ref.)        | 300–3000 Hz               |                           |          |
| Frequency Stability (–30°C to +60°C) | ±2.0 ppm                  | ±2.0 ppm                  | ±1.5 ppm |
| Modulation Limiting:                 | Wideband Analog           | 5 kHz                     |          |
|                                      | Narrowband Analog         | 2.5 kHz                   |          |
| Maximum Frequency Separation         | Full bandsplit            |                           |          |

\*\* Measured in digital mode per TIA 102.CAAA and TIA 102.CAAB standards.

### BATTERIES

| Battery Type                | Dimensions (HxWxD)  | Weight                   | Part Number  | Approx. Life (5/5/90) (With Encryption/Without Encryption) |
|-----------------------------|---------------------|--------------------------|--------------|--|
| Extra-High Capacity NiMH    | 6.0" x 2.3" x 0.85" | 0.81 lbs                 | 589-5100-360 | 12 hrs/13 hrs  |
| Extra-High Capacity NiMH FM | 6.0" x 2.3" x 0.85" | 0.81 lbs                 | 589-5100-361 | 12 hrs/13 hrs  |
| Alkaline Battery Clamshell  | 7.2" x 2.6" x 2.0"  | 0.98 lbs (w/12 AA batt.) | 250-5100-280 | 14-16 hrs/16-18 hrs  |

### ENVIRONMENTAL SPECIFICATIONS

| Environment     | Mil Spec 810C |           | Mil Spec 810D |           | Mil Spec 810E |           | Mil Spec 810F |           |
|-----------------|---------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|
|                 | Method        | Procedure | Method        | Procedure | Method        | Procedure | Method        | Procedure |
| Low Pressure    | 500.1         | I         | 500.2         | II        | 500.3         | II        | 500.4         | II        |
| High Temp.      | 501.1         | I, II     | 501.2         | I, II     | 501.3         | I, II     | 501.4         | I, II     |
| Low Temp.       | 502.1         | I         | 502.2         | I, II     | 502.3         | I, II     | 502.4         | I, II     |
| Temp. Shock     | 503.1         | I         | 503.2         | I         | 503.3         | I         | 503.4         | I         |
| Solar Radiation | 505.1         | I         | 505.2         | I         | 505.3         | I         | 505.4         | I         |
| Rain/BlowRain   | 506.1         | I, II     | 506.2         | I, II     | 506.3         | I, II     | 506.4         | I, II     |
| Humidity        | 507.1         | II        | 507.2         | II, III   | 507.3         | II, III   |               |           |
| Salt Fog        | 509.1         | I         | 509.2         | I         | 509.3         | I         |               |           |
| Dust and Sand   | 510.1         | I         | 510.2         | I         | 510.3         | I         | 510.4         | I         |
| Vibration       | 514.2         | VII, VIII | 514.3         | I(8)      | 514.4         | I(8)      | 514.5         | I(24)     |
| Shock           | 516.2         | I, II, V  | 516.3         | I, IV, VI | 516.4         | I, IV, VI | 516.5         | I, IV, VI |

### ENCRYPTION OPTIONS

|                                   |  |
|-----------------------------------|--|
| Supported Encryption Algorithms   | DES, DES-XL™, DES-OFB, AES   |
| Encryption Algorithm Capacity     | 4 minimum  |
| Encryption Keys/Radio             | 16 Common Key Reference (CKR)<br>16 Physical Identifier (PID)                          |
| Encryption Frame Re-sync Interval | P25 CAI 360 msec   |
| Encryption Keying                 | External Key Loader, OTAR  |
| Synchronization                   | CFB – Cipher Feedback<br>XL – Counter Addressing<br>OFB – Output Feedback              |
| Vector Generator                  | National Institute of Standards and Technology (NIST) approved random number generator |
| Encryption Type                   | Digital  |
| Key Erasure                       | Keyboard Command   |
| Code Key Initialization           | Internal pseudorandom generator  |
| Standards                         | FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197   |

### ACCESSORIES

- Vehicular, Single & Multi-Unit Rapid Chargers
- Speaker-Microphone
- Public Safety Speaker-Mic
- Earphone
- Lightweight Headset
- Leather Cases, Belt Clip
- Programming Accessories

### FACTORY MUTUAL APPROVALS

FM-approved models, batteries, and accessories as indicated on price pages.

#### Intrinsically Safe

|           |   |   |
|-----------|---|---|
| Class I   | Division 1 An area where there is or could be an explosive atmosphere most of the time in normal conditions.                        | C Ethylene <sup>1</sup><br>D Propane, Methane   |
| Class II  |   | E Conductive metal<br>F Carbonaceous material coal, coke dust<br>G Grain dust and flour |
| Class III | Division 1 Location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used. | Ignitable fibers or flyings   |

#### Non-Incendive

|         |  |  |
|---------|--|--|
| Class I | Division 2 An area where an explosive atmosphere exists only as a result of a fault. | A Acetylene<br>B Hydrogen<br>C Ethylene <sup>1</sup><br>D Propane, Methane |
|---------|--|--|

<sup>1</sup> Group C Ethylene **NOT** FM approved for models with DES-XL encryption.



# 5100 Series

## ACCESSORIES

### ***Value-Added Features & Accessories***

#### ***High Visibility Housing***



***Customers have been asking for it, now we have it! The 5100 portable with high visibility housing.***

An ideal solution for fire departments, public safety, construction, and other applications where a bright, easy-to-find radio is a real plus.

The high visibility housing is introduced in yellow or orange

polycarbonate and maintains the same high Public Safety standards of durability as our standard black housing.



# 5100 SERIES ACCESSORIES

## Speaker Microphone

*... ideal for  
public safety*

### The 5100 Alkaline Battery Clamshell Assembly

*...when recharging isn't possible.*



*Our solution for the wildland and forest fire service, the Alkaline Battery Clamshell. The Alkaline Battery Clamshell is a substitute for the standard battery pack in applications where a battery charger is unavailable. The Clamshell holds twelve AA size alkaline batteries in a compact package.*



**Alkaline Battery Assembly  
Part Number 250-5100-280**



*The Public Safety Speaker Microphone (part number 589-0015-058) is specially designed for fire and police application, although it can serve for any department where better coverage is desirable. The 800 MHz antenna, which is located on the microphone, ensures better signal as it is not guarded by the body of its user.*

*A volume knob adds to the convenience of this accessory.*

*Antenna must be ordered separately.*

1. 800 MHz 1/2-Wave Antenna (501-0105-013)
2. 800 MHz 1/4-Wave Antenna (501-0105-012)

*A full line of accessories is available for the 5100 Multi-Protocol Portable:*

- Single- and Multi-Unit Rapid Chargers
- Alkaline Battery Clamshell Assembly
- Extra-High Capacity Battery, standard and intrinsically safe
- Public Safety Speaker-Microphone (800 MHz)
- Speaker-Microphone
- Leather Cases
- Lightweight Headset
- Programming Accessories
- Battery Eliminator
- Belt Clip
- Earphone
- Vehicular Charger



# 7700 Series

CONVENTIONAL/SMARTNET®/SMARTZONE® PORTABLE

7780 – 800 MHz  
7781 – 800 MHz

## SMARTNET®/SmartZone® Compatible Analog Trunked Portable Radio

The 7700 Series 800 MHz portable radio is truly state-of-the-art, delivering 3 watts of RF power for maximum coverage. It is a multi-mode radio which can be simultaneously programmed with up to 256 channels (with the correct options) in conventional analog wide, conventional analog narrow, trunked SMARTNET® II, or trunked SmartZone®. The 7780 is backed by a full 1-year warranty and meets MIL STD 810 C/D specifications for shock and vibration.

### Standard Features

- 256 Modes
- Six Programmable Buttons
- 1300mAh Battery
- FM Approved (7781 Version)
- Belt Clip
- Antenna

### Conventional Features

- Repeater Talkaround
- PL/DPL/Carrier Squelch
- DTMF Tone Generator (full keypad)
- Dual Priority Scan
- Scan (auto, pre-programmed, operator selectable scan)

### Type II Trunking Features

- 20 Trunked Systems
- Talkgroup Calls
- PTT-ID
- Call Alert™ Decode/Private Conversation™ Decode
- Call Alert Encode
- Dual Mode Scan
- Failsoft by Talkgroup
- Telephone Interconnect
- Telephone Interconnect Encode
- Selective Radio Inhibit
- Priority Monitor Scan
- Emergency Alarm/Call
- Emergency with Voice to Follow
- Dynamic Regrouping
- RX Site Indicator
- Emergency Receive Indicator
- Status/Message
- Out of Range Indicator
- SmartZone Adjacent Control Channel
- SmartZone Full Spectrum Scan
- SmartZone Voice on Control
- SmartZone Automatic Site Registration
- SmartZone RSSI Operation
- SmartZone Busy Override
- SmartZone Preferred Site
- SmartZone Forced Site Search
- SmartZone Site Lock/Unlock



SMARTNET®  
SmartZone®

Conventional

# 7700 SERIES

## CONVENTIONAL/SMARTNET®/SMARTZONE® PORTABLE

All Specifications are typical and subject to normal manufacturing tolerances.

| MODEL #                                      |            | 7780/7781  |  |
|--|------------|--|--|
| GENERAL                                      |            | 800 MHz  |  |
| Frequency Range                              | Transmit   | 806–824 MHz  |  |
|  | Receive    | 851–869 MHz  |  |
|  | Talkaround | 851–869 MHz  |  |
| RF Power Output                              |            | High: 3W/Low: 1W   |  |
| Systems/Groups                               |            | Any combination of systems or groups up to 256           |  |
| Battery Capacity                             |            | 1300 mAh   |  |
| Input Voltage                                |            | 7.5 VDC (nominal)  |  |
| Dimensions (HxWxD)                           |            | 6.5" x 2.2" x 1.2" with battery<br>(166mm x 56mm x 30mm) |  |
| Weight                                       |            | 18 oz (515 g) with battery                               |  |
| Temperature Range                            |            | –30°C to +60°C   |  |
| Channel Spacing                              |            | 25 kHz   |  |
| FCC Type Acceptance Number                   |            | ATH2428150-2   |  |
| FCC Compliance                               |            | Parts 15, 90   |  |
| Canada                                       |            | 933195564A   |  |
| RECEIVER (Measurements per TIA Standards)    |            |  |  |
| Sensitivity: 12 dB SINAD                     |            | 0.35 µV  |  |
| Selectivity                                  |            | –68 dB   |  |
| Spurious & Image Rejection                   |            | –68 dB   |  |
| Intermodulation                              |            | –68 dB   |  |
| Audio Output Power                           |            | More than 500 mW internal                                |  |
| Audio Distortion                             |            | <3%  |  |
| Audio Response (1000 Hz ref.)                |            | +1, –3 dB from 6 dB/octave de-emphasis per standard TIA  |  |
| Frequency Stability (–30°C to +60°C)         |            | ±1.5 ppm   |  |
| Maximum Frequency Separation                 |            | 18 MHz   |  |
| TRANSMITTER (Measurements per TIA Standards) |            |  |  |
| RF Power Output                              |            | High: 3W/Low: 1W   |  |
| Spurious & Harmonic Emissions                |            | –60 dB   |  |
| FM Hum & Noise (Companion)*                  |            | –40 dB   |  |
| Emission Designators                         |            | 16K0F3E  |  |
| Audio Distortion                             |            | <3%  |  |
| Audio Response (1000 Hz ref.)                |            | +1, –3 dB from 6 dB/octave de-emphasis per standard TIA  |  |
| Frequency Stability (–30°C to +60°C)         |            | ±1.5 ppm   |  |
| Maximum Frequency Separation                 |            | 18 MHz (no degradation); 63 MHz talkaround               |  |

| ENVIRONMENTAL SPECIFICATIONS |               |           |               |               |               |               |
|------------------------------|---------------|-----------|---------------|---------------|---------------|---------------|
| Environment                  | Mil Spec 810C |           | Mil Spec 810D |               | Mil Spec 810E |               |
|                              | Method        | Procedure | Method        | Procedure     | Method        | Procedure     |
| Low Pressure                 | 500.1         | I         | 500.2         | II            | 500.3         | II            |
| High Temp.                   | 501.1         | I         | 501.2         | I(A1), II     | 501.3         | I(A1), II     |
| Low Temp.                    | 502.1         | I         | 502.2         | I(C3), II(C1) | 502.3         | I(C3), II(C1) |
| Temp. Shock                  | 503.1         | I         | 503.2         | I(A1,C2)      | 503.3         | I(A1,C2)      |
| Solar Radiation              | 505.1         | I         | 505.2         | I             | 505.3         | I             |
| Rain                         | 506.1         | N/A       | 506.2         | II            | 506.3         | II            |
| Humidity                     | 507.1         | II        | 507.2         | II, III       | 507.3         | II, III       |
| Salt Fog                     | 509.1         | I         | 509.2         | I             | 509.3         | I             |
| Dust                         | 510.1         | I         | 510.2         | I             | 510.3         | I             |
| Vibration                    | 514.2         | VII, VIII | 514.3         | I(8)          | 514.4         | I(8)          |
| Shock                        | 516.2         | I, II, V  | 516.3         | I, IV, VI     | 516.4         | I, IV, VI     |

### FACTORY MUTUAL APPROVALS

For hazardous areas. Approved by Factory Mutual as Intrinsically Safe for Class I, II & III, Division 1, Groups C, D, E, F and G; and as Non-Incendive for Class I, Division 2, Groups A, B, C and D, with E.F. Johnson 587-8150-136 battery.

### ACCESSORIES

- Standard Battery
- Intrinsically-Safe Battery
- Battery Eliminator
- Single-Unit Rapid Charger
- Speaker Microphone
- Earphone
- Earphone Adapter
- Leather Case
- Belt Clip
- Leather Belt Loop
- Programming Accessories

\* Unit may not meet this spec if used with battery eliminator.



# PC CONFIGURE™

## PROGRAMMING SOFTWARE

# 5100 SERIES

# 5300 SERIES

EFJohnson's PC Configure™ software is the most user-friendly programming software for public safety and service radio users. Program all of your EFJohnson® mobile and portable radios quickly and easily with the same software package. With minimal setup time or training, PC Configure gives you the flexibility to program your EFJohnson® 5100 Series Portable and 5300 Series Mobile radios for any encryption or system type installed on the radio.

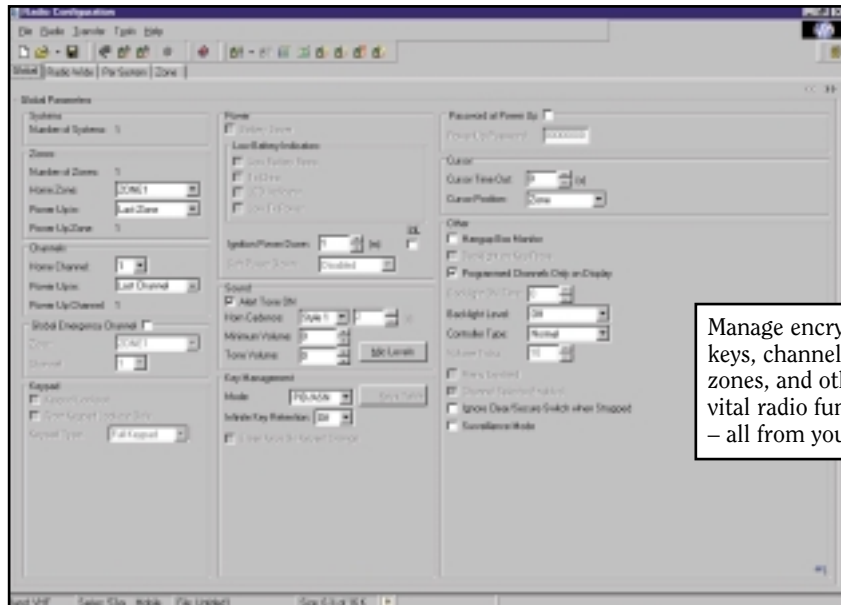
PC Configure is a Windows®-based application. With its intuitive and unique graphical display, PC Configure allows you to re-flash radios much faster than any other radio programming software. PC Configure's "remember" function stores previously programmed parameters (such as software version or options) and recalls them for future use.

### Advantages

- Minimize your learning curve with an intuitive graphical interface
- Configure mobile and portable radios with a single software package
- Switch between radio and system parameters, and program zone and channel properties with the click of a mouse
- Program your radios in analog conventional, Multi-Net®, Project 25 conventional and trunking, and SMARTNET®/SmartZone®
- Use one template to program multiple radios – simply change unit IDs and download the file to each radio

### Computer Requirements

800 MHz Pentium or greater  
128 MB RAM  
40 MB hard disk space  
CD-ROM drive



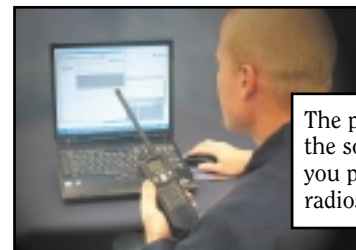
Manage encryption keys, channels, zones, and other vital radio functions – all from your PC



Simplify radio programming with a click of a mouse

### EFJohnson

For over 80 years, EFJohnson has been at the forefront of the communications industry. Our subscriber radios are used throughout the world by military, police, fire, paramedics, and homeland security professionals.



The portability of the software lets you program your radios anywhere.



# SMA

## SUBSCRIBER MANAGEMENT ASSISTANT

The EFJohnson® Subscriber Management Assistant (SMA) is a versatile tool, but its predominant function is for fast and easy encryption key loading. Since the SMA uses PDA technology in a ruggedized case, it can be used in almost any environment. The SMA connects to an EFJohnson or Motorola® radio via a serial interface. All configuration and modifications are completed through the serial interface. It uses the FIPS validated SEM security algorithms for all security functions, including AES and DES. With its Microsoft Windows® based graphical user interface, the SMA will have you configuring your radios right away.

### *The SMA enables you to:*

- Generate a random DES Key or AES Keys for download to the EFJohnson and Motorola portable radios that are in CKR mode
- Enter your own AES or DES key for download into a portable radio

- Use the Microsoft SQL CE database for storage of security parameters such as AES and DES keys
- Read radio key set information
- Erase all keys from a radio
- Retrieve hardware revision information from the radio
- Select a key set and make that key set active, modify and set KEK parameters, set KMF parameters on the radio, and set or modify RSI parameters
- Create a new database containing security parameters such as AES and DES keys
- Delete or modify an existing database containing security parameters such as AES and DES keys
- Encrypt all keys stored in the SQL CE using a 256-bit AES key



For keyloading functionality, the SMA connects to radios via a special keyloader cable.



# *Portable Pricing*



**EFJohnson<sup>®</sup>**

# 5100 Series

## PRICE LIST

### ANALOG/DIGITAL PORTABLE RADIO

APCO PROJECT 25/SMARTNET®/SMARTZONE®



**FACTORY MUTUAL APPROVALS — 51x6 and 51x7 models only**  
 For hazardous areas. Approved by Factory Mutual as Intrinsically Safe for Class I, II & III, Division 1, Groups C, D, E, F, & G; and as Non-Incendive for Class I, Division 2, Groups A, B, C, & D, with 587-5100-361 battery. DES-XL not FM approved for Group C Ethylene.

To determine the 5100 model to order, choose ONE option from each box (with the exception of the Software Control Option box). Carry the option numbers to the bottom of the page where you will build the model string. The model string will be used for ordering. To determine the price, carry the price of the base model and each option to the column at the right. Total all prices at the bottom to determine the radio list price. Base model includes radio, 512 channels/talkgroups, and standard belt clip.

| BASE MODEL: (Select one)  |   | PRICE    | ENTER & ADD PRICES OF SELECTED BASE MODEL & OPTIONS FROM BOXES ON THE LEFT: |
|---|---|----------|---|
| 5112  | = VHF, 5W, 136-174 MHz, Non-DTMF Keypad   | \$ 1,644 |   |
| 5113  | = VHF, 5W, 136-174 MHz, DTMF Keypad   | 1,891    |   |
| 5122†   | = UHF, 4W, 380-470 MHz, Non-DTMF Keypad   | 1,644    |   |
| 5123†   | = UHF, 4W, 380-470 MHz, DTMF Keypad   | 1,891    |   |
| 5132  | = UHF, 4W, 403-470 MHz, Non-DTMF Keypad   | 1,644    |   |
| 5133  | = UHF, 4W, 403-470 MHz, DTMF Keypad   | 1,891    |   |
| 5142  | = UHF, 4W, 450-512 MHz, Non-DTMF Keypad   | 1,644    |   |
| 5143  | = UHF, 4W, 450-512 MHz, DTMF Keypad   | 1,891    |   |
| 5182  | = 800, 3W, 806-870 MHz, Non-DTMF Keypad   | 1,644    |   |
| 5183  | = 800, 3W, 806-870 MHz, DTMF Keypad   | 1,891    |   |
| 5116  | = Intrinsically-safe, VHF, 5W, 136-174 MHz, Non-DTMF Keypad   | \$ 1,693 |   |
| 5117  | = Intrinsically-safe, VHF, 5W, 136-174 MHz, DTMF Keypad   | 1,940    |   |
| 5126†   | = Intrinsically-safe, UHF, 4W, 380-470 MHz, Non-DTMF Keypad   | 1,693    |   |
| 5127†   | = Intrinsically-safe, UHF, 4W, 380-470 MHz, DTMF Keypad   | 1,940    |   |
| 5136  | = Intrinsically-safe, UHF, 4W, 403-470 MHz, Non-DTMF Keypad   | 1,693    |   |
| 5137  | = Intrinsically-safe, UHF, 4W, 403-470 MHz, DTMF Keypad   | 1,940    |   |
| 5146  | = Intrinsically-safe, UHF, 4W, 450-512 MHz, Non-DTMF Keypad   | 1,693    |   |
| 5147  | = Intrinsically-safe, UHF, 4W, 450-512 MHz, DTMF Keypad   | 1,940    |   |
| 5186  | = Intrinsically-safe, 800, 3W, 806-870 MHz, Non-DTMF Keypad   | 1,693    |   |
| 5187  | = Intrinsically-safe, 800, 3W, 806-870 MHz, DTMF Keypad   | 1,940    |   |
| <b>ANTENNA:</b> (Select one) If ordering additional quantities, see 5100 Accessories price page.  |   |          | \$  |
| 2   | 1 = VHF-136-151 MHz   | N/C      | \$  |
|   | 2 = VHF-151-162 MHz   | N/C      |   |
|   | 3 = VHF-162-174 MHz   | N/C      |   |
|   | 4 = UHF-380-520 MHz   | N/C      |   |
| 6   | 6 = VHF-136-174 MHz (wideband)  | \$ 16    | \$  |
|   | 8 = 800 MHz   | N/C      |   |
| 9   | 9 = 800 MHz 1/4 wave  | N/C      | \$  |
|   |   |          |   |
| <b>BATTERY:</b> (Select one) If ordering additional quantities, see 5100 Accessories price page.  |   |          | \$  |
| 3   | 1 = Extra-high capacity NiMH  | N/C      | \$  |
|   | 2 = Alkaline Battery Clamshell  | \$ 148   |   |
|   | 6 = Intrinsically-safe extra-high capacity NiMH (Required for 51x6 and 51x7 base models)  | N/C      |   |
| <b>HIGH VISIBILITY HOUSING:</b> (Select one)  |   |          | \$  |
| 4   | 0 = Black housing   | N/C      | \$  |
|   | 1 = Yellow housing  | \$ 25    |   |
|   | 2 = Orange housing  | .25      |   |
| <b>PROTOCOL:</b> (Select one)   |   |          | \$  |
| 5   | 1 = Analog FM   | N/C      | \$  |
|   | 2 = Project 25 Digital CAI (Common Air Interface) (Includes #1 Analog FM enabled)   | \$ 412   |   |
| <b>SYSTEM OPTIONS:</b> (Select one)   |   |          | \$  |
| 6   | 0 = Conventional  | \$ 640   | \$  |
|   | 1 = SMARTNET® II Trunking (Includes #0 Conventional enabled)  | .594     |   |
|   | 2 = SmartZone® Trunking (Includes #1 SMARTNET II Trunking, #0 Conventional, and STAR [SmartZone Transfer Area Roaming] enabled) | .891     |   |
| 3 = Project 25 Trunking (Includes #2 SmartZone, #1 SMARTNET II, #0 Conventional, and STAR enabled)  | 1149  | \$       |   |
| <b>SOFTWARE CONTROL OPTIONS:</b>  |   |          | (Price from page SN-2)  |
| 7   | <b>(Continued on page SN-2.) CARRY MODEL NUMBERS AND PRICES FROM PAGE SN-2 TO APPROPRIATE BOXES ON THIS PAGE.</b>               |          | \$  |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div> <div style="margin-left: 20px;"> <p>PRICE OF RADIO: → \$</p> </div> </div> |   |          | \$  |

† Federal market only.

(List in numerical order. List only Software Control Options requested. Leave remaining boxes blank.)

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# 5100 Series

## PRICE LIST

### ANALOG/DIGITAL PORTABLE RADIO

APCO PROJECT 25/SMARTNET®/SMARTZONE®

CONTINUED

| SOFTWARE CONTROL OPTIONS: (May select up to four options)                   |        |
|---|--------|
| 06 = DES/P25 DES-OFB encryption   | \$ 550 |
| 08 = DES/P25 DES-OFB/AES encryption   | .750   |
| 09 = DES/DES-XL™/DES-OFB encryption   | .750   |
| 10 = DES/DES-XL/DES-OFB/AES encryption                                      | .950   |
| 11 = Project 25 OTAR Conventional and Trunking                              | .750   |
| 13 = Project 25 Data Conventional   | .143   |
| 14 = Project 25 Data Trunking* (Requires System Option #3 P25 Trunking)     | .143   |
| 30 = Keypad Programming (US Federal Government only)                        | .49    |
| 50 = Zone Fail-Site Lock (Requires opt. #2 SmartZone in SYSTEM OPTIONS box) | .150   |

| ENTER & ADD PRICES  |
|---|
| (Up to four software control options per radio may be ordered.) |
| \$  |
| \$  |
| \$  |
| \$  |

**Total Software Control Options**  
Copy price of all Software Control Options to page SN-1, Section 7, to calculate total radio price.

|    |
|----|
| \$ |
|----|

-   -   -

(List in numerical order. List only Software Control Options requested. Leave remaining boxes blank.)

Copy Software Control Option numbers to page SN-1 to complete the model string number.

\* Future option.

**NOTE:** As a result of the current P25 AES OTAR standard not being NIST certified, any order to EFJohnson for Software Control Options 08, 10, and 11 simultaneously, would require a waiver from the customer deeming FIPS 140-2 approval not applicable.

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### ACCESSORIES

| Part Number                      | Description   | Price  |
|----------------------------------|---|--------|
| <b>Antennas</b>                  |   |        |
| 501-0017-100                     | VHF Antenna, 136-174 MHz, dipole, red core (wideband)   | \$ 46  |
| 501-0017-101                     | VHF Antenna, 136-151 MHz, helical, yellow core  | 30     |
| 501-0017-103                     | VHF Antenna, 151-162 MHz, helical, black core   | 30     |
| 501-0017-105                     | VHF Antenna, 162-174 MHz, helical, blue core  | 30     |
| 501-0017-107                     | UHF Antenna, 380-520 MHz, 1/4-wave whip   | 30     |
| 501-0105-012                     | 800 MHz Antenna, 806-870 MHz, 1/4-wave whip   | 30     |
| 501-0105-013                     | 800 MHz Antenna, 806-870 MHz, 1/2-wave whip   | 30     |
| <b>Audio Accessories</b>         |   |        |
| 589-0015-057†                    | Speaker Microphone  | \$ 130 |
| 589-0015-058†                    | Public Safety Speaker Microphone (Available only for 800 MHz. Must order antenna separately.)                   | 265    |
| 589-0015-059†                    | Lightweight Headset with In-Line PTT (requires 589-5100-051 adapter)  | 113    |
| 589-5100-057†                    | Coil Cord Earphone Kit with Right Angle Plug (requires 589-0015-057 speaker microphone)                         | 70     |
| 589-5100-059†                    | Coil Cord Earphone Kit with Straight Plug (requires 589-0015-057)   | 70     |
| 589-5100-053†                    | 1-Wire Earphone Kit (requires 589-5100-051 adapter)   | 82     |
| 589-5100-055†                    | 2-Wire Palm Mic Kit (requires 589-5100-051 adapter)   | 230    |
| 589-5100-051†                    | Earphone/Headset Adapter w/3.5mm plug   | 86     |
| <b>Batteries</b>                 |   |        |
| 587-5100-360                     | Extra-High Capacity Battery Pack, NiMH  | \$ 100 |
| 587-5100-361†                    | Extra-High Capacity Battery Pack, NiMH, I/S   | 123    |
| 250-5100-280                     | Alkaline Battery Clamshell Assembly   | 148    |
| 587-5100-100                     | Battery Eliminator  | 65     |
| <b>Charger Kits</b>              |   |        |
| 585-5100-260                     | Vehicular Travel Charger (includes mounting bracket)  | \$ 120 |
| 250-5100-210                     | Charger Kit with Switching Power Supply, USA AC Cord<br><i>Includes 585-5100-210 and 585-5100-230</i>           | 150    |
| 250-5100-215                     | Charger/Conditioner Kit with Switching Pwr Supply, USA AC Cord<br><i>Includes 585-5100-215 and 585-5100-230</i> | 180    |
| 250-5100-220                     | Charger Kit with Switching Power Supply, EURO AC Cord   | 150    |
| 250-5100-225                     | Charger/Conditioner Kit with Switching Pwr Supply, EURO AC Cord   | 180    |
| 250-5100-240                     | 4-Unit Charger Kit, USA AC Cord<br><i>Includes 585-5100-240 and four 585-5100-210</i>                           | 550    |
| 250-5100-245                     | 4-Unit Charger/Conditioner Kit, USA AC Cord<br><i>Includes 585-5100-240 and four 585-5100-215</i>               | 580    |
| 250-5100-250                     | 4-Unit Charger Kit, EURO AC Cord  | 550    |
| 250-5100-255                     | 4-Unit Charger/Conditioner Kit, EURO AC Cord  | 580    |
| 585-5100-245                     | Docking Station Wall-Mount Bracket  | 75     |
| <b>Charger Replacement Parts</b> |   |        |
| 585-5100-210                     | Single-Unit Rapid Desktop Charger w/o Power Supply  | \$ 115 |
| 585-5100-215                     | Single-Unit Rapid Charger/Conditioner w/o Power Supply  | 130    |
| 585-5100-240                     | 4-Unit Docking Station with Power Supply (requires 585-5100-210 or -215 chargers)                               | 180    |
| 585-5100-230                     | Switching Power Supply 15V, 1.3A (120/230V) for -210/-215 Chgr (requires 597-1001-152 power cord)               | 45     |
| 585-5100-250                     | Switching Power Supply 15V, 4.5A (120/230V) for -240 Docking Station (requires 597-1001-152 power cord)         | 45     |
| 597-1001-152                     | Power Cord AC   | 5      |

† Factory Mutual approved.



Continued on next page.

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### ACCESSORIES (CONT.)

| Part Number     | Description  | Price   |
|-----------------|--|---|
|                 | <b>Carrying Accessories</b>  |   |
| 585-5100-120    | Leather Case with belt flap  | \$ 70   |
| 585-5100-121    | Leather Case for use with Alkaline Battery Clamshell, with belt flap   | 70  |
| 585-5100-122    | Leather Case with 3" D-Swivel belt loop  | 70  |
| 585-5100-125    | Nylon Case w/D-Swivel Leather Belt Loop-black  | 60  |
| 585-5100-126    | Nylon Case w/D-Swivel Leather Belt Loop-yellow   | 60  |
| 585-5100-135    | 100% Nylon Case with D-Swivel Nylon Belt Loop-black  | 60  |
| 585-5100-127    | D-Swivel Button  | 26  |
| 585-5100-130    | Leather 2.5" Belt Loop w/D-Swivel attachment   | 15  |
| 585-5100-132    | Leather 3" Belt Loop w/D-Swivel attachment   | 15  |
| 585-5100-128    | Belt Clip 2 1/2" (standard), spring loaded   | 15  |
| 585-5100-129    | Belt Clip 3" (standard), spring loaded   | 15  |
|                 | <b>Subscriber Management Assistant</b>   |   |
|                 | <i>EFJohnson's handheld PDA device that currently supports encryption key loading functionality.</i>   |   |
| 250-5000-945    | SMA<br>(Includes HP iPAQ h5550 PocketPC PDA; PDA-DB9 adapter cable; ruggedized PDA case; PDA cradle; PDA charger; charger adapter; operating manual; Microsoft® Active Sync OS; encryption features and software: AES, DES, DES-XL™, DES-OFB, CKR/SLN) | \$ 3200   |
| 023-5000-940    | Portable Key Loader Cable  | 275   |
|                 | <b>Encryption Accessories for 3rd Party Keyloading Systems</b>   |   |
| 585-5000-932    | Key Loader Cable   | \$ 275  |
|                 | <b>Interoperability Equipment</b>  |   |
| 250-5000-88x    | Tactical Interoperability Kit (TIK)<br>A cost-effective, portable solution to fill communication gaps caused by differing radio systems or loss of range.  | See TIK price page for full description and pricing |
|                 | <b>Programming Accessories</b>   |   |
| 250-5100-003    | PC Configure Programming Kit (023-5100-920 cable, software & manual on CD)   | \$ 495  |
| 023-9998-488    | PCConfigure Programming Software   | 350   |
| 023-5100-920    | Radio Personality Programming Cable, radio to computer   | 120   |
| 023-5100-930    | Radio Personality Cloning Cable, radio to radio (radio must have Flash code 1.5.0 or later and be programmed using PCConfigure 1.17 or later.)   | 300   |
| 250-5100-005    | PCTune Kit (includes PCTune software, radio cable, and audio cable)  | 399   |
| 023-9998-499    | PCTune Tuning Software   | 275   |
| 023-5100-940    | PCTune Cable   | 156   |
| 023-5100-950    | PCTune Audio Cable   | 22  |
| 023-5100-955    | Test Jumper Cable, UI board to logic board   | 175   |
| 515-3102-050    | SMA to BNC, F to F adapter   | 80  |
|                 | <b>Factory Services</b>  |   |
| 299-0045-017    | 1-year Extended Warranty   | \$ 36   |
| 299-0045-013    | 2-year Extended Warranty   | 55  |
| 299-0045-029    | 3-year Extended Warranty   | 121   |
|                 | <b>Manuals</b>   |   |
| 002-5100-001    | Quick Reference Guide  | \$ 14   |
| 002-5100-1005CD | Operators Manual (full detail)   | 14  |
| 001-5100-0014CD | Service Manual (also contains operator's information)  | 42  |
| 299-TRNG-5100   | Training CD  | 50  |

# 7700 Series

## PRICING INFORMATION

### SMARTNET®/SMARTZONE® 7780/7781 SERIES 800 MHz PORTABLE

**3 watts; 806-824 MHz Transmit, 851-869 MHz Receive  
(Transmit in Talkaround)  
Up to 256 Channels  
NPSPAC**



#### FACTORY MUTUAL APPROVALS

For hazardous areas. Approved by Factory Mutual as Intrinsically Safe for Class I, II, & III, Division 1, Groups C, D, E, F, & G; and as Non-Incendive for Class I, Division 2, Groups A, B, C, & D, with 587-8150-136 battery.

The 7700 Series 800 MHz analog SMARTNET®/SmartZone® portable radios are synthesized, field programmable, microprocessor controlled portable transceivers, outputting 3.0 or 1.0 watt of RF power. The 7700 Series has a full array of standard features in each of

its three operational modes: conventional analog SMARTNET II, and SmartZone. All of these portable models meet the MIL STD 810 environmental specifications. The 7700 Series is available in two models: DTMF keypad and the 3-key model. An intrinsically-safe version

(7781) is also available.

The EEPROMs are externally programmed with a personal computer, EFJohnson® radio programming software, and interface equipment.

### PORTABLE RADIO PACKAGE WITH ACCESSORIES

Portable package includes the radio, battery, antenna, and belt clip. Portable can be ordered with or without rapid charger base and power supply. A software license is included in the price of each radio. See the 7700 Series Accessories page (on back) for additional accessories.

| Configuration                            | Portable With Charger |  | Portable Without Charger |          |
|--|-----------------------|--|--------------------------|----------|
|  | Part Number           | Price  | Part Number              | Price    |
| 7780 SMARTNET®II 800 MHz 3-key, 3W       | 242-7780-302-X        | \$ 1,225   | 242-7780-302             | \$ 1,105 |
| 7780 SMARTNET®II 800 MHz keypad, 3W      | 242-7780-303-X        | 1,225  | 242-7780-303             | 1,105    |
| 7780 SmartZone® 800 MHz 3-key, 3W        | 242-7780-502-X        | \$ 1,525   | 242-7780-502             | \$ 1,405 |
| 7780 SmartZone® 800 MHz keypad, 3W       | 242-7780-503-X        | 1,525  | 242-7780-503             | 1,405    |
| 7781 I.S. SMARTNET®II 800 MHz 3-key, 3W  | 242-7781-302-X        | \$ 1,255   | 242-7781-302             | \$ 1,135 |
| 7781 I.S. SMARTNET®II 800 MHz keypad, 3W | 242-7781-303-X        | 1,255  | 242-7781-303             | 1,135    |
| 7781 I.S. SmartZone® 800 MHz 3-key, 3W   | 242-7781-502-X        | \$ 1,555   | 242-7781-502             | \$ 1,435 |
| 7781 I.S. SmartZone® 800 MHz keypad, 3W  | 242-7781-503-X        | 1,555  | 242-7781-503             | 1,435    |
|  |                       | "X" digit = "A" if PS is 120 VAC<br>"B" if PS is 230 VAC |                          |          |

### PORTABLE RADIO PACKAGE with Zone Fail-Site Lock

Portable Radio Package with Zone Fail-Site Lock when ordered with Charger includes the rapid charger base and 120VAC power supply.

| Configuration                           | Portable With Charger |          | Portable Without Charger |          |
|---|-----------------------|----------|--------------------------|----------|
|   | Part Number           | Price    | Part Number              | Price    |
| 7780 SmartZone® 800 MHz 3-key, 3W       | 242-7780-502-D        | \$ 1,675 | 242-7780-502-C           | \$ 1,555 |
| 7780 SmartZone® 800 MHz keypad, 3W      | 242-7780-503-D        | 1,675    | 242-7780-503-C           | 1,555    |
| 7781 I.S. SmartZone® 800 MHz 3-key, 3W  | 242-7781-502-D        | \$ 1,705 | 242-7781-502-C           | \$ 1,585 |
| 7781 I.S. SmartZone® 800 MHz keypad, 3W | 242-7781-503-D        | 1,705    | 242-7781-503-C           | 1,585    |

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EFFECTIVE OCTOBER 15, 2003  
Supersedes January 4, 2002  
Prices subject to change without notice.

SN-11

# 7700 Series

## PRICING INFORMATION

### SMARTNET®/SMARTZONE® 7700 SERIES PORTABLE ACCESSORIES

| Configuration   | Part Number   | Price |
|---|---------------|-------|
| <b>Batteries/Accessories</b>  |               |       |
| Nickel metal hydride high-capacity battery  | 587-8150-135  | \$ 95 |
| Intrinsically-safe, nickel metal hydride battery  | 587-8150-136† | 150   |
| Battery eliminator  | 585-5020-031  | 96    |
| <b>Chargers</b>   |               |       |
| Rapid charger base (must order separate power supply)                                   | 585-5020-020  | 84    |
| 120 VAC power supply  | 585-5020-021  | 38    |
| 230 VAC power supply  | 585-5020-022  | 38    |
| 6-Unit rapid charger  | 888-3505-001  | 650   |
| <b>Antenna</b>  |               |       |
| Flexible antenna – 800 MHz  | 585-5000-053† | 50    |
| <b>Audio Accessories</b>  |               |       |
| Speaker-microphone with coil cord, heavy-duty   | 589-0015-047† | 125   |
| Earphone adapter  | 585-5000-051† | 48    |
| Earphone (for 589-0015-047 and 585-5000-051)  | 589-9003-004† | 18    |
| Heavy-duty earphone with coil cord  | 250-0881-003  | 96    |
| Coil Cord Earphone Kit with right angle plug (requires 589-0015-047 speaker microphone) | 589-5100-057† | 70    |
| Coil Cord Earphone Kit with straight plug (requires 589-0015-047)                       | 589-5100-059† | 70    |
| Lightweight headset with inline PTT   | 589-0015-048  | 149   |
| <b>Carrying Accessories</b>   |               |       |
| Leather case with D-swivel  | 585-5000-052  | 54    |
| Belt loop for D-swivel  | 023-8790-130  | 26    |
| D-swivel for attachment to portable   | 250-5810-123  | 44    |
| Belt clip   | 585-5000-054† | 24    |
| <b>Programming Accessories</b>  |               |       |
| PCConfigure Programming Kit (software, cable, RPI box, manual) for Windows              | 250-7780-002  | 549   |
| Remote programming interface (RPI Box)  | 023-9800-000  | 278   |
| Interface cable to connect RPI to computer, DB-9 M-F                                    | 597-5900-002  | 50    |
| Programming cable, RPI to radio   | 597-2002-122  | 99    |
| PCConfigure programming software  | 023-9998-488  | 350   |
| PCTune tuning software  | 023-9998-477  | 275   |
| <b>Manuels</b>  |               |       |
| Operator's manual   | 002-7780-500  | 14    |
| Operator's manual-Intrinsically Safe  | 002-7781-5001 | 14    |
| Service manual  | 001-7780-501  | 42    |

† Factory Mutual approved.

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# *Infrastructure*



**EFJohnson<sup>®</sup>**

# 2600 Series

## DIGITAL REPEATER/BASESTATION

26x1 – VHF  
26x4 – UHF

The **26x1 VHF and 26x4 UHF repeaters** fulfill the demanding requirements of private system operators with features including:

The **Netelligent™ connectivity option** utilizes Voice over Internet Protocol (VoIP) technology to enable intelligent network communications without costly and complex centralized switching equipment.

**Dual mode operation** meets the requirements of Project 25 digital operation and TIA 603 analog operation.

**High reliability** for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

**Compact design** allows efficient use of space. A five-channel repeater, combiner, duplexer, and multicoupler can fit in one eight-foot standard rack.

**PC programmability** of operating frequency, output power and other functions provides quick installation capability.

**Multiple network interfaces** support network communications over standard 4-wire interface or via advanced VoIP Ethernet interface.

**Conservative design** of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

**Dual synthesizers** with  $\pm 1.0$  part per million stability assure on-frequency operation of transmitter and receiver.

**Front panel status** indicators show operating status and diagnostic information for rapid evaluation and servicing.

**Modular construction** provides flexible expansion capability and easier maintenance.

**Comprehensive tuning** software guides the service technician through all the detailed tuneup and setup procedures.

**Excellent performance** specifications suitable for today's crowded spectrum environment and heavily loaded sites.

**Flash memory** allows updating of radio operating software via PC to meet future needs.

**Signaling choices** of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater option.



APCO 25  
Conventional

Conventional

# 2600 SERIES

## DIGITAL REPEATER/BASESTATION

All Specifications are typical and subject to normal manufacturing tolerances.

| <b>MODEL #</b>                       | <b>26X1</b>   |                | <b>26X4</b>   |                |
|--------------------------------------|---|----------------|---|----------------|
| <b>GENERAL</b>                       | <b>ANALOG</b>   | <b>DIGITAL</b> | <b>ANALOG</b>   | <b>DIGITAL</b> |
| Mounting                             | 19" rack or shelf   |                |   |                |
| Dimensions (HxWxD)                   | 9.0" x 17.0" x 20.9" (23cm x 43cm x 53cm)                         |                |   |                |
| Weight                               | 66 lbs. (29.95 kg)  |                |   |                |
| Temperature Range                    | -30°C to +60°C  |                |   |                |
| Input Voltage                        | 100 to 240 VAC  |                |   |                |
| Input Frequency                      | 50 to 60 Hz   |                |   |                |
| Power Requirements                   | At 110 W – 560 Watts<br>At 25 W – 170 Watts<br>Standby – 45 Watts |                | At 110 W – 457 Watts<br>At 25 W – 170 Watts<br>Standby – 45 Watts |                |
| Frequency Resolution                 | 5/6.25 kHz  |                | 6.25 kHz  |                |
| FCC Type Acceptance Number           | ATH2422001-1  |                | ATH2422004-1  |                |
| FCC Compliance                       | Parts 15, 90  |                | Parts 15, 90  |                |
| <b>RECEIVER</b>                      | <b>ANALOG</b>   | <b>DIGITAL</b> | <b>ANALOG</b>   | <b>DIGITAL</b> |
| Channel Spacing                      | 30/25/15/12.5 kHz   | 12.5 kHz       | 25/12.5 kHz   | 12.5 kHz       |
| Frequency Range                      | 132–150, 150–178 MHz  |                | 380–400, 400–430, 430–470, 470–512 MHz                            |                |
| Sensitivity: 12 dB SINAD             | 0.25µV  | N/A            | 0.25µV  | N/A            |
| Sensitivity: for 5% BER              | N/A   | 0.25µV         | N/A   | 0.25µV         |
| Selectivity                          | -85/-80 dB  | -60 dB         | -90/-75 dB  | -60 dB         |
| Signal Displacement Bandwidth        | ± 2 kHz/± 1 kHz   | ± 1 kHz        | ± 2 kHz/± 1 kHz   | ± 1 kHz        |
| Frequency Stability (-30°C to +60°C) | ±1.0 PPM  |                | ±1.0 PPM  |                |
| Intermodulation Rejection            | -85 dB  |                | -85 dB  |                |
| Spurious & Image Rejection           | -95 dB  |                | -100 dB   |                |
| Audio Response (1000 Hz ref.)        | +1, -3 dB TIA   | As per TIA     | +1, -3 dB TIA   | As per TIA     |
| Audio Distortion (at 1000 Hz)        | Less than 3% @<br>0.5W/16 ohms                                    | As per TIA     | Less than 3%<br>0.5W/16 ohms                                      | As per TIA     |
| Hum and Noise (TIA)                  | -50 dB  |                | -50 dB  |                |
| RF Input Impedance                   | 50 ohms   |                | 50 ohms   |                |
| <b>TRANSMITTER</b>                   | <b>ANALOG</b>   | <b>DIGITAL</b> | <b>ANALOG</b>   | <b>DIGITAL</b> |
| Frequency Range                      | 132–150, 150–178 MHz  |                | 380–400, 400–430, 430–470, 470–512 MHz                            |                |
| RF Output Power                      | 25 to 110 Watts   |                | 25 to 110 Watts   |                |
| Duty Cycle                           | 100%  |                | 100%  |                |
| Output Impedance                     | 50 ohm  |                | 50 ohm  |                |
| Spurious Emissions                   | -90 dBc   |                | -90 dBc   |                |
| Harmonic Emissions                   | -90 dBc   |                | -90 dBc   |                |
| Maximum Deviation                    | ± 5 kHz/± 2.5 kHz   | ± 3110 Hz      | ± 5 kHz/± 2.5 kHz   | ± 3110 Hz      |
| Audio Response                       | +1, -3 dB TIA   | As per TIA     | +1, -3 dB TIA   | As per TIA     |
| Audio Distortion                     | Less than 2%  | As per TIA     | Less than 2%  | As per TIA     |
| Emission Designators                 | 11K0F3E, 16K0F3E  | 8K10F1E        | 11K0F3E, 16K0F3E  | 8K10F1E        |
| Hum & Noise (TIA)                    | -50 /-55 dB   |                | -50 /-55 dB   |                |
| Frequency Stability (-30°C to +60°C) | ±1.0 PPM  |                | ±1.0 PPM  |                |



Five Channels and 7-Foot Rack

### STANDARDS COMPLIANCE

EFJohnson's radio repeaters comply with the following standard specifications:  
**P25 Digital Operation:** TIA/TSB 102.CAAB  
**Analog FM Operation:** TIA/EIA 603  
**EMI/EMC:** NTIA Manual Chapter 5  
 FCC Part 90  
 FCC Part 15  
**PSTN Line Isolation:** FCC Part 68 (USA)



# 2600 Series

## DIGITAL REPEATER/BASESTATION

2607 – 700 MHz  
2608 – 800 MHz

The **2607 700 MHz and 2608 800 MHz repeaters** fulfill the demanding requirements of private system operators with features including:

The **Netelligent™ connectivity option** utilizes Voice over Internet Protocol (VoIP) technology to enable intelligent network communications without costly and complex centralized switching equipment.

**Dual mode operation** meets the requirements of Project 25 digital operation and TIA 603 analog operation.

**High reliability** for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

**Compact design** allows efficient use of space. A five-channel repeater, combiner, duplexer, and multicoupler can fit in one eight-foot standard rack.

**PC programmability** of operating frequency, output power and other functions provides quick installation capability.

**Multiple network interfaces** support network communications over standard 4-wire interface or via advanced VoIP Ethernet interface.

**Conservative design** of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

**Dual synthesizers** with  $\pm 1.0$  part per million stability ( $\pm 0.1$  ppm 700 MHz) assure on-frequency operation of transmitter and receiver.

**Front panel status** indicators show operating status and diagnostic information for rapid evaluation and servicing.

**Modular construction** provides flexible expansion capability and easier maintenance.

**Comprehensive tuning** software guides the service technician through all the detailed tuneup and setup procedures.

**Excellent performance** specifications suitable for today's crowded spectrum environment and heavily loaded sites.

**Flash memory** allows updating of radio operating software via PC to meet future needs.

**Signaling choices** of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater option.



APCO 25  
Conventional

Conventional

# 2600 SERIES

## DIGITAL REPEATER/BASESTATION

All Specifications are typical and subject to normal manufacturing tolerances.

| MODEL #                              | 2607 <sup>†</sup>   | 2608 <sup>†</sup>         |            |
|--------------------------------------|---|---------------------------|------------|
| GENERAL                              | DIGITAL   | ANALOG                    | DIGITAL    |
| Mounting                             | 19" rack or shelf   |                           |            |
| Dimensions (HxWxD)                   | 9.0" x 17.0" x 20.9" (23cm x 43cm x 53cm)                     |                           |            |
| Weight                               | 66.0 lbs. (29.95 kg)  |                           |            |
| Temperature Range                    | -30°C to +60°C  |                           |            |
| Input Voltage                        | 100 to 240 VAC  |                           |            |
| Input Frequency                      | 50-60 Hz  |                           |            |
| Power Requirements                   | At 175 W – 680 Watts; At 75 W – 450 Watts; Standby – 45 Watts |                           |            |
| Frequency Resolution                 | 12.5 kHz  |                           |            |
| FCC Type Acceptance Number           | Pending <sup>†</sup>  | Pending <sup>†</sup>      |            |
| FCC Compliance                       | Parts 15, 90  |                           |            |
| RECEIVER                             | DIGITAL   | ANALOG                    | DIGITAL    |
| Frequency Range                      | 792–806 MHz   | 806–825 MHz               |            |
| Channel Spacing                      | 12.5 kHz  | 25/12.5 kHz               | 12.5 kHz   |
| Sensitivity: 12 dB SINAD             | N/A   | 0.35µV                    | N/A        |
| Sensitivity: for 5% BER              | 0.35µV  | N/A                       | 0.35µV     |
| Selectivity                          | -60dB   | -85/-80dB                 | -60dB      |
| Signal Displacement Bandwidth        | ± 1 kHz   | ± 2 kHz/± 1 kHz           | ± 1 kHz    |
| Frequency Stability (-30°C to +60°C) | ±1.0 PPM  |                           |            |
| Intermodulation Rejection            | -80 dB  |                           |            |
| Spurious & Image Rejection           | -90 dB  |                           |            |
| Audio Response (1000 Hz ref.)        | As per TIA  | +1, -3 dB TIA             | As per TIA |
| Audio Distortion (at 1000 Hz)        | As per TIA  | Less than 3%              | As per TIA |
| Hum and Noise (TIA)                  | -45 dB  |                           |            |
| RF Input Impedance                   | 50 ohms   |                           |            |
| TRANSMITTER                          | DIGITAL   | ANALOG                    | DIGITAL    |
| Frequency Range                      | 762–776 MHz   | 851–870 MHz               |            |
| RF Output Power                      | 75 to 175 Watts   |                           |            |
| Duty Cycle                           | 100%  |                           |            |
| Output Impedance                     | 50 ohm  |                           |            |
| Spurious Emissions                   | -90dBc  |                           |            |
| Harmonic Emissions                   | -90dBc  |                           |            |
| Maximum Deviation                    | ±3110 Hz  | ±5.0 kHz/±3110 Hz         |            |
| Audio Response                       | As per TIA  | +1, -3 dB TIA             | As per TIA |
| Audio Distortion                     | As per TIA  | Less than 2%              | As per TIA |
| Emission Designators                 | 8K10F1E   | 16K0F3E, 14K0F3E, 11K0F3E | 8K10F1E    |
| Hum & Noise (TIA)                    | -45 dB/-50 dB   |                           |            |
| Frequency Stability (-30°C to +60°C) | ±0.1 PPM  | ±1.0 PPM                  |            |



Five Channels and 7-Foot Rack

### STANDARDS COMPLIANCE

EFJohnson's radio repeaters comply with the following standard specifications:  
**P25 Digital Operation:** TIA/TSB 102.CAAB  
**Analog FM Operation:** TIA/EIA 603  
**EMI/EMC:** NTIA Manual Chapter 5  
 FCC Part 90  
 FCC Part 15  
**PSTN Line Isolation:** FCC Part 68 (USA)

<sup>†</sup> This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.



# 2000 Series

## REPEATER/STATION

2008 – 800 MHz  
2009 – 900 MHz

### LTR-Net® Repeater LTR® Repeater Community Repeater Universal Station

The 2000 Series 800 and 900 MHz repeater fulfills the demanding requirements of SMR and private system operators. Features include:

**High reliability** for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

**Compact design** allows efficient use of space. Five repeaters, a combiner, duplexer and multicoupler can fit in one seven-foot standard rack.

**PC programmability** of operating frequency, output power and other functions provides quick installation capability.

**Remote alarms** – diagnostic and alarm reports can be programmed to transmit on RF channels to alert system manager of site or radio problems.

**Conservative design** of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

**Dual synthesizers** with  $\pm 0.1$  (900 MHz) and  $\pm 1.0$  (800 MHz) part per million stability assure on-frequency operation of transmitter and receiver.

**Front panel status** indicators show operating status and diagnostic information for rapid evaluation and servicing.

**Modular construction** provides flexible expansion capability and easier maintenance.

**Comprehensive tuning** software guides the service technician through all the detailed tuneup and setup procedures.

**Excellent performance** specifications suitable for today's crowded spectrum environment and heavily loaded sites.

**Flash memory** allows updating of radio operating software via PC to meet future needs.

**Enhanced LTR-Net® features**, such as auto-registration, wide-area group and private calls, selective radio

inhibit, telephone interconnect, and other specialized call types, are available in the LTR-Net repeater model.

**Telephone interconnect** options are a feature of the LTR® repeater model. Several levels of functionality are available from over dial to DID with voice prompts, networking, and call detail memory for up to 5000 telephone calls.

**Signaling choices** of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater.

**Interface to vendor equipment** for signaling and control is offered with the universal station.



LTR-Net™

LTR®

Conventional

# 2000 SERIES

## REPEATER/STATION

All Specifications are typical and subject to normal manufacturing tolerances.

| MODEL #   | 2008  | 2009  |
|---|---|---|
| GENERAL   | 800 MHz   | 900 MHz   |
| Mounting  | 19" rack or shelf   |   |
| Dimensions (HxWxD)                                  | 9.0" x 17.0" x 20.9<br>(23cm x 43cm x 53cm)                 |   |
| Weight  | 63 lbs. (28.58 kg)  |   |
| Temperature Range                                   | -30°C to +60°C*   |   |
| Input Voltage                                       | 100 to 240 VAC auto switchable                              | 100 to 240 VAC, 50-60 Hz                                    |
| Input Frequency                                     | 47 to 63 Hz   | 47 to 63 Hz   |
| Power Requirements                                  | @175W - 680 watts<br>@75W - 445 watts<br>Standby - 45 watts | @160W - 680 watts<br>@75W - 390 watts<br>Standby - 47 watts |
| Channel Spacing                                     | 25 kHz  | 25 kHz  |
| Frequency Resolution                                | 12.5 kHz  | 12.5 kHz  |
| FCC Type Acceptance Number                          | ATH2422008-1  | ATH2422009-1  |
| FCC Compliance                                      | Parts 15, 90  | Parts 15, 90  |
| Canada  | 933 194 294A  | 933 222 135A  |
| <b>RECEIVER</b> (Measurements per TIA Standards)    |   |   |
| Frequency Range                                     | 806-824 MHz   | 896-901 MHz   |
| Sensitivity: 12 dB SINAD                            | 0.35 µV   | 0.35 µV   |
| Selectivity   | -85 dB  | -75 dB  |
| Signal Displacement Bandwidth                       | ± 2.0 kHz   | ± 1.5 kHz   |
| Spurious & Image Rejection                          | -90 dB  | -90 dB  |
| Offset Channel Selectivity                          | -20 dB  | N/A   |
| Intermodulation                                     | -80 dB  | -75 dB  |
| Local Audio Output Power                            | 0.5 watts   | 0.5 watts   |
| Audio Distortion (at 1000 Hz)                       | Less than 3%  | Less than 3%  |
| Audio Response (1000 Hz ref.)                       | +1, -3 dB TIA   | +1, -3 dB TIA   |
| Hum and Noise (TIA)                                 | -45 dB  | -45 dB  |
| Frequency Stability (-30°C to +60°C)                | ± 1.0 ppm   | ± 0.1 ppm   |
| <b>TRANSMITTER</b> (Measurements per TIA Standards) |   |   |
| Frequency Range                                     | 851-869 MHz   | 935-940 MHz   |
| RF Output Power                                     | 75 to 175 watts   | 75 to 160 watts   |
| Duty Cycle  | 100%  | 100%  |
| Spurious Emissions                                  | -90 dBc   | -90 dBc   |
| Harmonic Emissions                                  | -90 dBc   | -90 dBc   |
| Audio Response                                      | +1, -3 dB TIA   | +1, -3 dB TIA   |
| Audio Distortion                                    | Less than 2%  | Less than 2%  |
| Hum & Noise (TIA)                                   | -45 dB  | -45 dB  |
| Frequency Spread                                    | 6 MHz   | 5 MHz   |
| Frequency Stability (-30°C to +60°C)                | ± 1.0 ppm   | ± 0.1 ppm   |
| FCC Emission Designators                            | 14K0F3E, 14K0F3D, 14K0F1D<br>16K0F3E, 16K0F3D, 16K0F1D      | 11K0F3E, 11K0F1D  |

\* Temperature range for Model 38A Repeater Panel is 0° to +60°C.



Five Channels and 7-Foot Rack



Model 38 Repeater Panel is included in the Community Repeater package



# 2000 Series

## 2001 – VHF

### COMMUNITY REPEATER/UNIVERSAL STATION

#### 2001 VHF Community Repeater/Universal Station

The **2001 VHF repeaters** fulfill the demanding requirements of private system operators with features including:

**High reliability** for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

**Compact design** allows efficient use of space. A five-channel repeater, combiner, duplexer, and multicoupler can fit in one eight-foot standard rack.

**PC programmability** of operating frequency, output power and other functions provides quick installation capability.

**Remote alarms** – diagnostic and alarm reports can be programmed to transmit on RF channels to alert system manager of site or radio problems.

**Conservative design** of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

**Dual synthesizers** with  $\pm 2.5$  part per million stability assure on-frequency operation of transmitter and receiver.

**Front panel status** indicators show operating status and diagnostic information for rapid evaluation and servicing.

**Modular construction** provides flexible expansion capability and easier maintenance.

**Comprehensive tuning** software guides the service technician through all the detailed tuneup and setup procedures.

**Excellent performance** specifications suitable for today's crowded spectrum environment and heavily loaded sites.

**Flash memory** allows updating of radio operating software via PC to meet future needs.

**Signaling choices** of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater.



# 2000 SERIES

## COMMUNITY REPEATER/UNIVERSAL STATION

All Specifications are typical and subject to normal manufacturing tolerances.

| <b>MODEL #</b>  | <b>2001</b>   |               |
|---|---|---------------|
| <b>GENERAL</b>  | <b>12.5 KHz</b>   | <b>25 KHz</b> |
| Mounting  | 19" rack or shelf   |               |
| Dimensions (HxWxD)                                      | 9.0" x 17.0" x 20.9" (23cm x 43cm x 53cm)                         |               |
| Weight  | 66 lbs. (29.95 kg)  |               |
| Temperature Range                                       | -30°C to +60°C*   |               |
| Input Voltage   | 100 to 240 VAC  |               |
| Input Frequency   | 50 to 60 Hz   |               |
| Power Requirements                                      | At 110 W - 560 watts<br>at 25 W - 170 watts<br>Standby - 45 watts |               |
| Frequency Resolution                                    | 5/6.25 kHz  |               |
| FCC Type Acceptance Number                              | ATH2422001-1  |               |
| FCC Compliance  | Parts 15, 90  |               |
| Canada  | 933195702A  |               |
| <b>RECEIVER</b> (Measurements per TIA 603 Standards)    |   |               |
| Channel Spacing   | 12.5/15 kHz   | 25/30 kHz     |
| Frequency Range   | 150-178 MHz   |               |
| Sensitivity: 12 dB EIA SINAD                            | 0.25 µV   |               |
| Selectivity   | -80 dB  | -85 dB        |
| Signal Displacement Bandwidth                           | ± 1 kHz   | ± 2 kHz       |
| Spurious & Image Rejection                              | -100 dB   |               |
| Intermodulation EIA SINAD                               | -85 dB  |               |
| Local Audio Output Power                                | 0.5 watts/16 ohms   |               |
| Audio Distortion (at 1000 Hz)                           | Less than 3% at 0.5 watts/16 ohms                                 |               |
| Audio Response (1000 Hz ref.)                           | +1, -3 dB TIA   |               |
| Hum and Noise (TIA)                                     | -50 dB  |               |
| Frequency Stability (-30°C to +60°C)                    | ±1/2.5 PPM  |               |
| <b>TRANSMITTER</b> (Measurements per TIA 603 Standards) |   |               |
| Frequency Range   | 150-178 MHz   |               |
| RF Output Power   | 25 to 110 watts   |               |
| Duty Cycle  | 100%  |               |
| Output Impedance  | 50 Ohm  |               |
| Spurious Emissions                                      | -90 dBc   |               |
| Harmonic Emissions                                      | -90 dBc   |               |
| Audio Response  | +1, -3 dB TIA   |               |
| Audio Distortion  | Less than 2%  |               |
| Hum & Noise (TIA)                                       | -50 dB  | -55 dB        |
| Emission Designators                                    | 16K0F3E, 11K0F3E  |               |
| Frequency Spread  | 6 MHz   |               |
| Frequency Stability (-30°C to +60°C)                    | ±1/2.5 PPM  |               |



Five Channels and 7-Foot Rack



The Model 38 repeater panel comes with the 2001 VHF community repeater.

\* Temperature range for Model 38A Repeater Panel is 0° to +60°C.



# 2000 Series

2004 – UHF

COMMUNITY REPEATER/UNIVERSAL STATION

## 2004 UHF Community Repeater/Universal Station

The **2000 Series UHF repeater** fulfills the demanding requirements of SMR and private system operators with features including:

**High reliability** for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

**Compact design** allows efficient use of space. A five-channel repeater, a combiner, duplexer and multicoupler can fit in one seven-foot standard rack.

**PC programmability** of operating frequency, output power and other functions provides quick installation capability.

**Remote alarms** – diagnostic and alarm reports can be programmed to transmit on RF channels to alert system manager of site or radio problems.

**Conservative design** of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

**Dual synthesizers** with  $\pm 1.0$  part per million stability assure on-frequency operation of transmitter and receiver.

**Front panel status** indicators show operating status and diagnostic information for rapid evaluation and servicing.

**Modular construction** provides flexible expansion capability and easier maintenance.

**Comprehensive tuning** software guides the service technician through all the detailed tuneup and setup procedures.

**Excellent performance** specifications suitable for today's crowded spectrum environment and heavily loaded sites.

**Flash memory** allows updating of radio operating software via PC to meet future needs.

**Signaling choices** of 38 CTCSS/22 DCS or 50 CTCSS/18 DCS formats are available with the community repeater.



# 2000 SERIES

## COMMUNITY REPEATER/UNIVERSAL STATION

All Specifications are typical and subject to normal manufacturing tolerances.

| MODEL #   | 2004  |                           |
|---|---|---------------------------|
| GENERAL   | 12.5 KHz  | 25 KHz                    |
| Mounting  | 19" rack or shelf   |                           |
| Dimensions (HxWxD)                                      | 9.0" x 17.0" x 20.9<br>(23cm x 43cm x 53cm)                 |                           |
| Weight  | 66 lbs. (29.95 kg)  |                           |
| Temperature Range                                       | -30°C to +60°C*   |                           |
| Input Voltage   | 100 to 240 VAC  |                           |
| Input Frequency   | 50 to 60 Hz   |                           |
| Power Requirements                                      | @110W – 457 watts<br>@25W – 170 watts<br>Standby – 45 watts |                           |
| Frequency Resolution                                    | 6.25 kHz  |                           |
| FCC Type Acceptance Number                              | ATH2422004-1  | ATH2422004                |
| FCC Compliance  | Parts 15, 90  |                           |
| Canada  | Pending   |                           |
| <b>RECEIVER</b> (Measurements per TIA 603 Standards)    |   |                           |
| Channel Spacing   | 12.5 kHz  | 25 kHz                    |
| Frequency Range   | 400–512 MHz   |                           |
| Sensitivity: 12 dB SINAD                                | 0.35 µV   |                           |
| Selectivity   | -85 dB  | -90 dB                    |
| Signal Displacement Bandwidth                           | ± 1.0 kHz   | ± 2.0 kHz                 |
| Spurious & Image Rejection                              | -100 dB   |                           |
| Intermodulation   | -85 dB  |                           |
| Local Audio Output Power                                | 0.5 watts   |                           |
| Audio Distortion (at 1000 Hz)                           | Less than 3%  |                           |
| Audio Response (1000 Hz ref.)                           | +1, -3 dB TIA   |                           |
| Hum and Noise (TIA)                                     | -50 dB  |                           |
| Frequency Stability (-30°C to +60°C)                    | ± 1.0 ppm   |                           |
| <b>TRANSMITTER</b> (Measurements per TIA 603 Standards) |   |                           |
| Frequency Range   | 400–512 MHz   |                           |
| RF Output Power   | 25 to 110 watts   |                           |
| Duty Cycle  | 100%  |                           |
| Spurious Emissions                                      | -90 dBc   |                           |
| Harmonic Emissions                                      | -90 dBc   |                           |
| Audio Response  | +1, -3 dB TIA   |                           |
| Audio Distortion  | Less than 2%  |                           |
| Hum & Noise (TIA)                                       | -50 dB  | -55 dB                    |
| Frequency Spread  | 6 MHz   |                           |
| Frequency Stability (-30°C to +60°C)                    | ± 1.0 ppm   |                           |
| FCC Emission Designators                                | Pending   | 16KOF3E, 16KOF1D, 16KOF3D |



Five Channels and 7-Foot Rack



The Model 38 repeater panel comes with the 2004 UHF community repeater.

\* Temperature range for Model 38A Repeater Panel is 0° to +60°C.



# 2000 Series

LTR® REPEATER

2004 – UHF

## 2004 UHF LTR® Repeater

The **2000 Series UHF LTR® repeater** fulfills the demanding requirements of SMR and private system operators with features including:

**High reliability** for worry-free operation is assured with conservative design, efficient PA heat sink and continuous performance monitoring.

**Compact design** allows efficient use of space. A five-channel repeater, a combiner, duplexer and multicoupler can fit in one seven-foot standard rack.

**PC programmability** of operating frequency, output power and other functions provides quick installation capability.

**Remote alarms** – diagnostic and alarm reports can be programmed to transmit on RF channels to alert system manager of site or radio problems.

**Conservative design** of power amplifier circuitry uses multiple devices for maximum heat transfer and minimum operating temperatures for long life.

**Dual synthesizers** with  $\pm 1.0$  part per million stability assure on-frequency operation of transmitter and receiver.

**Front panel status** indicators show operating status and diagnostic information for rapid evaluation and servicing.

**Modular construction** provides flexible expansion capability and easier maintenance.

**Comprehensive tuning** software guides the service technician through all the detailed tuneup and setup procedures.

**Excellent performance** specifications suitable for today's crowded spectrum environment and heavily loaded sites.

**Flash memory** allows updating of radio operating software via PC to meet future needs.

**Telephone interconnect** options are a feature of the LTR repeater model when used with the Viking® Network Controller (VNC). Several levels of functionality are available from overdial to DID with voice prompts, networking, and call detail memory for up to 5000 telephone calls.



# 2000 SERIES

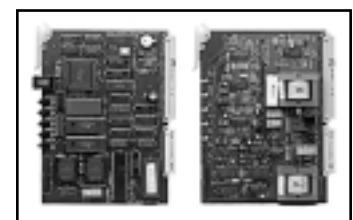
## LTR® REPEATER

All Specifications are typical and subject to normal manufacturing tolerances.

| MODEL #   | 2004  |                           |
|---|---|---------------------------|
| GENERAL   | 12.5 KHz  | 25 KHz                    |
| Mounting  | 19" rack or shelf   |                           |
| Dimensions (HxWxD)                                      | 9.0" x 17.0" x 20.9<br>(23cm x 43cm x 53cm)                 |                           |
| Weight  | 66 lbs. (29.95 kg)  |                           |
| Temperature Range                                       | -30°C to +60°C  |                           |
| Input Voltage   | 100 to 240 VAC  |                           |
| Input Frequency   | 50 to 60 Hz   |                           |
| Power Requirements                                      | @110W – 457 watts<br>@25W – 170 watts<br>Standby – 45 watts |                           |
| Frequency Resolution                                    | 6.25 kHz  |                           |
| FCC Type Acceptance Number                              | ATH2422004-1  | ATH2422004                |
| FCC Compliance  | Parts 15, 90  |                           |
| Canada  | Pending   |                           |
| <b>RECEIVER</b> (Measurements per TIA 603 Standards)    |   |                           |
| Channel Spacing   | 12.5 kHz  | 25 kHz                    |
| Frequency Range   | 400–512 MHz   |                           |
| Sensitivity: 12 dB SINAD                                | 0.35 µV   |                           |
| Selectivity   | -85 dB  | -90 dB                    |
| Signal Displacement Bandwidth                           | ± 1.0 kHz   | ± 2.0 kHz                 |
| Spurious & Image Rejection                              | -100 dB   |                           |
| Intermodulation   | -85 dB  |                           |
| Local Audio Output Power                                | 0.5 watts   |                           |
| Audio Distortion (at 1000 Hz)                           | Less than 3%  |                           |
| Audio Response (1000 Hz ref.)                           | +1, -3 dB TIA   |                           |
| Hum and Noise (TIA)                                     | -50 dB  |                           |
| Frequency Stability (-30°C to +60°C)                    | ± 1.0 ppm   |                           |
| <b>TRANSMITTER</b> (Measurements per TIA 603 Standards) |   |                           |
| Frequency Range   | 400–512 MHz   |                           |
| RF Output Power   | 25 to 110 watts   |                           |
| Duty Cycle  | 100%  |                           |
| Spurious Emissions                                      | -90 dBc   |                           |
| Harmonic Emissions                                      | -90 dBc   |                           |
| Audio Response  | +1, -3 dB TIA   |                           |
| Audio Distortion  | Less than 2%  |                           |
| Hum & Noise (TIA)                                       | -50 dB  | -55 dB                    |
| Frequency Spread  | 6 MHz   |                           |
| Frequency Stability (-30°C to +60°C)                    | ± 1.0 ppm   |                           |
| FCC Emission Designators                                | Pending   | 16KOF3E, 16KOF1D, 16KOF3D |



Five Channels and 7-Foot Rack



Viking Network Controller (VNC) provides DTMF interconnect and easy to implement networking features to your LTR system.



# 2000 Series

## MODEL 38 REPEATER PANEL

The Model 38 repeater logic panel adds a variety of control functions to the 2000 Series repeaters. Designed primarily for enhanced management of SMR systems, the Model 38 panel controls system access, call time, cross-tone or cross-code encoding, and tracks

user air time. Model 38 functions are programmable through DTMF or RS-232 ports, and most functions are programmable on/off per user.

*Tone/code validation* enables or disables remote users over the air.

*Air-time keeper* totals the air time for each user.

*Privacy mode* prevents users from jumping in during transmitter hang time.

*Programmable functions* include hang time, time-out timer, Morse code ID interval, and many others.



# 2000 Series

## MODEL 38 REPEATER PANEL

### TECHNICAL SPECIFICATIONS

| MODEL DESIGNATOR         | MODEL 38   |
|--------------------------|--|
| <b>GENERAL</b>           |  |
| Adjustments              | Four adjustments from rear panel:<br>Input Level; CTCSS Encode Level; Output Level; Squelch.   |
| Indicators               | Power; Carrier; Decode; Encode; Transmit; DTMF   |
| Local Programming Port   | Front panel audio jack for local DTMF programmer   |
| Serial Data Port         | RS-232 compatible levels   |
| Interface                | Tx data, Rx data, common ground  |
| Handshake                | Follows XON/OFF protocol   |
| Baud Rate                | Selectable: 150; 300; 600; 1200; 2400; 4800; 9600  |
| Rear Switches            | Audio Input Level (high low),<br>Audio Input (flat de-emphasized),<br>CTCSS Output Level (high low),<br>CTCSS (Output flat de-emphasized)<br>Audio Output Level (high low),<br>COR (internal/external); COR Polarity (positive/negative) |
| Long Digit Reset         | A single DTMF digit received by the Model 38 for 15 seconds may be used to reset the Model 38 remotely.  |
| ToneLock                 | ToneLock decodes a CTCSS tone with a receiver quieting level of 3 dB SINAD after initial acquisition.  |
| COR Input Range          | Adjustable threshold of 0 to 7V DC.<br>Level must change by at least 1 volt between carrier and no carrier conditions.   |
| Squelch Tail Elimination | Model 38 transmits a 180° phase reversal for 150 ms.<br>Model 38 decodes mobile's reverse phase burst.   |
| Operating Temperature    | 0 to 65° C   |
| <b>DECODER</b>           |  |
| Frequency Range          | 67 to 250.3 Hz   |
| Number of Tones          | 38   |
| Number of Digital Codes  | 22   |
| Bandwidth                | 1.5%   |
| Hold Time                | 0.2 to 2.5 seconds adjustable  |
| Tone Acquisition         | 0.12 seconds   |
| <b>ENCODER</b>           |  |
| Frequency Accuracy       | 0.1 Hz   |
| Frequency Stability      | Crystal controlled   |
| <b>TONE ENCODER</b>      |  |
| Morse ID Frequency       | 1200 Hz; adjustable $\pm$ 800 Hz   |
| Beep Frequency           | 1000 Hz; adjustable 400 to 4000 Hz   |
| DTMF Encoder             | Standard DTMF tones  |

| MODEL 38 PROGRAMMABLE FUNCTIONS |   |
|---------------------------------|---|
| Programming Validation          | DTMF or RS-232.   |
| Privacy Mode                    | Enable/disable per user.<br>Locks out other users during Tx hold time. Programming on/off per tone code.  |
| Reserve Mode                    | Reserves tone code of disabled user. Programmable on/off per user.  |
| Encode Select                   | Encode tone code programmable to any tone code per user.  |
| Encode On Off                   | Encode tone code can be enabled/disabled during the Tx hold time. Programmable on/off per user.   |
| DTMF Regeneration               | Long DTMF "*" mutes audio and enables DTMF regeneration. All received digits regenerated until DTMF time-out expires (adjustable). Ideal for DTMF paging or for use with a phone patch. |
| DTMF Time-Out                   | 1 to 9 seconds.   |
| Temporary Cross                 | Allows mobiles on different tones codes to converse. Programmable on/off per user.  |
| Last User ID                    | Sends last user's number in DTMF when user unkeys. Programmable on/off per user.  |
| Morse ID                        | 0 to 8 characters programmable per user.  |
| Morse ID Interval               | 1 to 99 minutes.  |
| ID Frequency                    | 400 to 2000 Hz.   |
| Readback ID Mode                | Reads back user's Morse ID.   |
| Courtesy Beep                   | Sent when user unkeys. Programmable on/off per user.  |
| Beep Frequency                  | 400 to 4000 Hz.   |
| Tx Hold Time                    | 0.0 to 9.9 sec. in 0.1 sec. steps.  |
| CTCSS Hold Time                 | 0.2 to 2.5 seconds.   |
| Alarm Code                      | 0 to 8-digit DTMF with warble alert. With or without any tone code.   |
| Call Time Limit                 | 1 to 99 minutes.  |
| Idle Duration                   | Requires user to remain idle to reset call timer, 1 to 99 seconds.  |
| Hog Penalty                     | 10 to 9990 seconds.   |
| Setup Procedure                 | Test modes for system adjustments.  |
| User Time Counter               | Up to 250 hours per tone code.  |
| Clear Time Counter              | Clear one or all time counters.   |
| Air-Time Retrieval              | Slow Morse code or DTMF. Compatible with Zetron, CSI or ComSpec DTMF decoder.   |



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