ERICSSON

Mobile Communications

EDACS™ MTD SERIES
800 MHz
DATA ONLY

TABLE OF CONTENTS

Maintenance Manual

TABLE OF CONTENTS

SPECIFICATIONS*

GENERAL

Operating Voltage	13.8 volts ±20%
Battery Drain	
Transmit	4 amperes (maximum)
Receive	0.65 amperes (maximum)
Channel Spacing	25 kHz
Frequency Stability	± 2.5 PPM (±0.00025%)
Temperature Range	-30°C to +60°C (-22°F to +140°F)
Dimensions (H x W x D) (Less Accessories)	
Height	43.5mm (1.7 inches)
Width	160.2mm (6.3 inches)
Depth	184mm (7.25 inches)
Weight	1.34 kg (47.5 ounces)
Antenna Impedance	50 ohms

TRANSMITTER

Frequency Range	806-821 MHz (851-866 MHz Talkaround)
Output Power	10 Watts (20% duty cycle, EIA)
Spurious and Harmonics	-16 dBm (maximum)
Modulation Limiting	± 5 kHz
Hum and Noise	- 45 dB (maximum)

RECEIVER

Frequency Range	851-866 MHz
Acceptable Frequency Displacement	± 2.5 kHz (minimum)
Sensitivity (12 dB SINAD)	-116 dBm (typical)
Spurious Response	70 dB minimum
Adjacent Channel Selectivity	68 dB minimum at 25 kHz
Intermodulation	65 dB minimum

* These specifications are intended primarily for use by service personnel. Refer to the appropriate Specifications Sheet for complete specifications.

GENERAL DESCRIPTION

The EDACS MTD Series mobile is a synthesized, wideband radio that uses integrated circuits and microcomputer technology to provide high performance trunked operation. The radio operates in the 806 to 821 MHz (transmit) and 851 to 866 MHz (receive) trunking bands. The trunking signalling format is based on 9600 baud high-speed digital coding which provides a typical system access time of 1/3 second.

This MTD mobile radio is designed for 10 watts RF power output. A power detection circuit locataed just before the antenna connector keeps the output power constant over changing voltage and temperature conditions.

The 800 MHz band is allocated to use contiguous 25 kHz spaced channels and 45.0125 MHz transmit-receive offset. The IF filters in the radio have been designed accordingly. In addition, the frequency determining element (TCXO) has a stability of 2.5 PPM over the operating temperature range ensuring operation in the specified channel bandwidth.

All radio functions are stored in a programmable electrically erasable PROM (EEPROM). The radio is field programmable using an IBM compatible personal computer with the following equipment:

- Serial Programming Interface Module TQ-3370
- Programming Cable TQ-3354, and
- MTD Programming Software TQ-3349

With the interface equipment and software, the computer can be used to program (or reprogram) customer system frequencies and options. Programming is done through the radio's DB9 input connector.

The MTD radio assembly consists of the following circuit boards and assemblies:

- RF Board A2 (19D902123G16)
- Audio Board A3 (19D902304G3)
- Logic Board A1 (19D902151G3)

The circuit boards are mounted in a main casting to provide easy access for servicing. Interconnect plugs are used to connect the boards to eliminate pinched wires and other wiring problems.

RF BOARD

The RF board includes the programmable frequency synthesizer, transmitter and receiver circuitry and PIN diode TX-RX switch.

Synthesizer

First mixer injection and transmitter exciter drive is derived from the synthesizer circuit. The synthesizer consists of the VCO, prescaler IC, PLL IC, and reference oscillator (TCXO). The logic board serially loads channel frequency information into the PLL IC.

Transmitter

The transmitter circuit consists of a broadband exciter fed by the frequency synthesizer and a broadband power amplifier module. The output of the power amplifier is fed through a PIN switch circuit and a low-pass filter to the antenna cable. The transmitter is designed to operate over the 806 to 821 MHz range. A power control circuit senses the output at the antenna port and varies the exciter bias to keep the RF power constant over varying operating conditions.

Receiver

The receiver is a dual conversion superheterodyne with a first intermediate frequency of 45.0125 MHz and a second intermediate frequency of 455 kHz. A quadrature detector is used to recover the audio from the carrier. The receiver is designed with fixed RF filters to operate over the entire 851 to 866 MHz range without retuning.

Diode Switch

As the same antenna port is used for the receiver input and the transmitter power output, a PIN diode switch is used to connect these stages together. High RF isolation is provided to the receiver input when the transmitter is powered to prevent receiver damage. The transmitter is isolated during receive to minimize signal losses to the receiver.

AUDIO BOARD

All of the data signals to and from the transceiver are processed by the audio board. Functions provided by the audio board circuitry include the receiver noise squelch, received data filtering and amplification, transmit data filtering and amplification, transmit deviation limiting, received high speed (9600 baud) data filtering and limiting and tramsit data wave shaping.

LOGIC BOARD

The logic board contains the microprocessor and associated support circuitry, EEPROM field programmable memory, EPROM software, a custom high-speed data modem IC and DAC. This board provides all the signalling functions (9600 baud high - speed and subaudible low-speed data generation and detection) as well as alert tones, data loading for the transceiver synthesizer, and control of transmit and receive. The individual radio personality is field programmable using the Electrically Erasable PROM (EEPROM).

ACCESSORIES AND OPTIONS

SQUELCH TAIL ELIMINATION (STE) (Conventional Mode)

STE is used with Channel Guard to eliminate squelch tails. The STE burst is transmitted when the microphone PTT is released. The receiving radio decodes the burst and mutes the receiver audio for 250 ms. This mute time allows the transmission to end and to mute the squelch tail. The radio looks for STE on the received signal when the radio is either in an on-hook or off-hook condition. The STE is enabled for transmit and/or receive by PC programming the radio's personality.

PC PROGRAMMING OPTIONS

The radio is programmed using an IBM compatible personal computer equipped with an RS-232 connector. Option TQ-3370 provides the RS-232 serial interfacae unit and the cable between the PC and the unit. Programming cable TQ-3354 is used between TQ-3370 and the MTD Data Only Radio.

NOISE SUPPRESSION KIT OPTION

Noise Suppression Kit Option PD1A (19A148539G1) is available for installations where excessive alternator or electrical noises present on the power cable do no permit the radio to operate properly.

REMOTE DATA TERMINAL OPTION

The Remote Data Terminal Option is required for data operation over the RF to and from a mobile data terminal. The Remote Data Interface (RDI) Option (19A149654P1) transfers the data between the radio and the Remote Data Terminal.

POWER CABLE

A spare 9-foot power cable Option CC7F (19B801358P2) is available for installations requiring more than the standard 9-foot cable.

SYSTEM DESCRIPTION

The MTD 800 MHz (digitally trunked) Data Only radio system provides fast access to available RF channels and a degree of privacy due to selective signalling. This also eliminates annoyance of other system user's conversations while ensuring that intended calls are not missed.

The system uses 9600 baud high-speed digital signalling to identify individual units and user groups. The programming used to determine transmit encoded groups and decoded received groups is contained in the personality EEPROM contained in the mobile. This information is individually programmed to each user's needs via the PC programming for the radio.

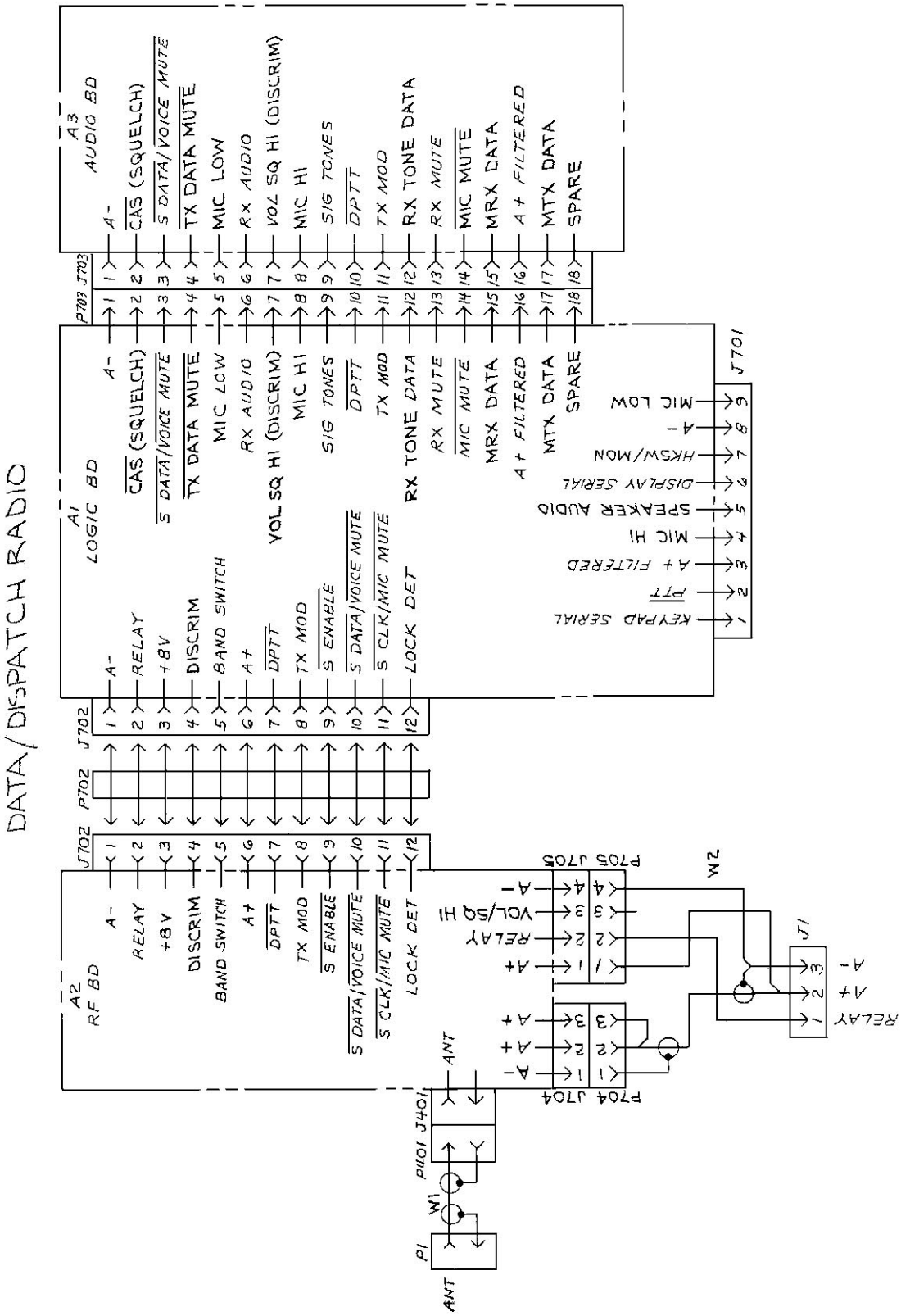
Typical system configuration consists of at least two repeater stations (with a maximum number of 20) and the associated mobiles. One repeater always is a control channel which is dedicated to sending out continuous control data and also to receive channel request data from the mobiles. When a mobile is first turned on, it scans the available list of frequencies programmed in the personality EEPROM for a control channel. When a control channel is found, the mobile locks onto the frequency and monitors the data for a channel assignment (incoming call).

When receiving a channel assignment (incoming call), the monitoring mobile immediately switches over to the assigned data channel and waits for a high-speed data confirmation message. Upon receipt of this message the data paths are unmuted and the user can complete the call.

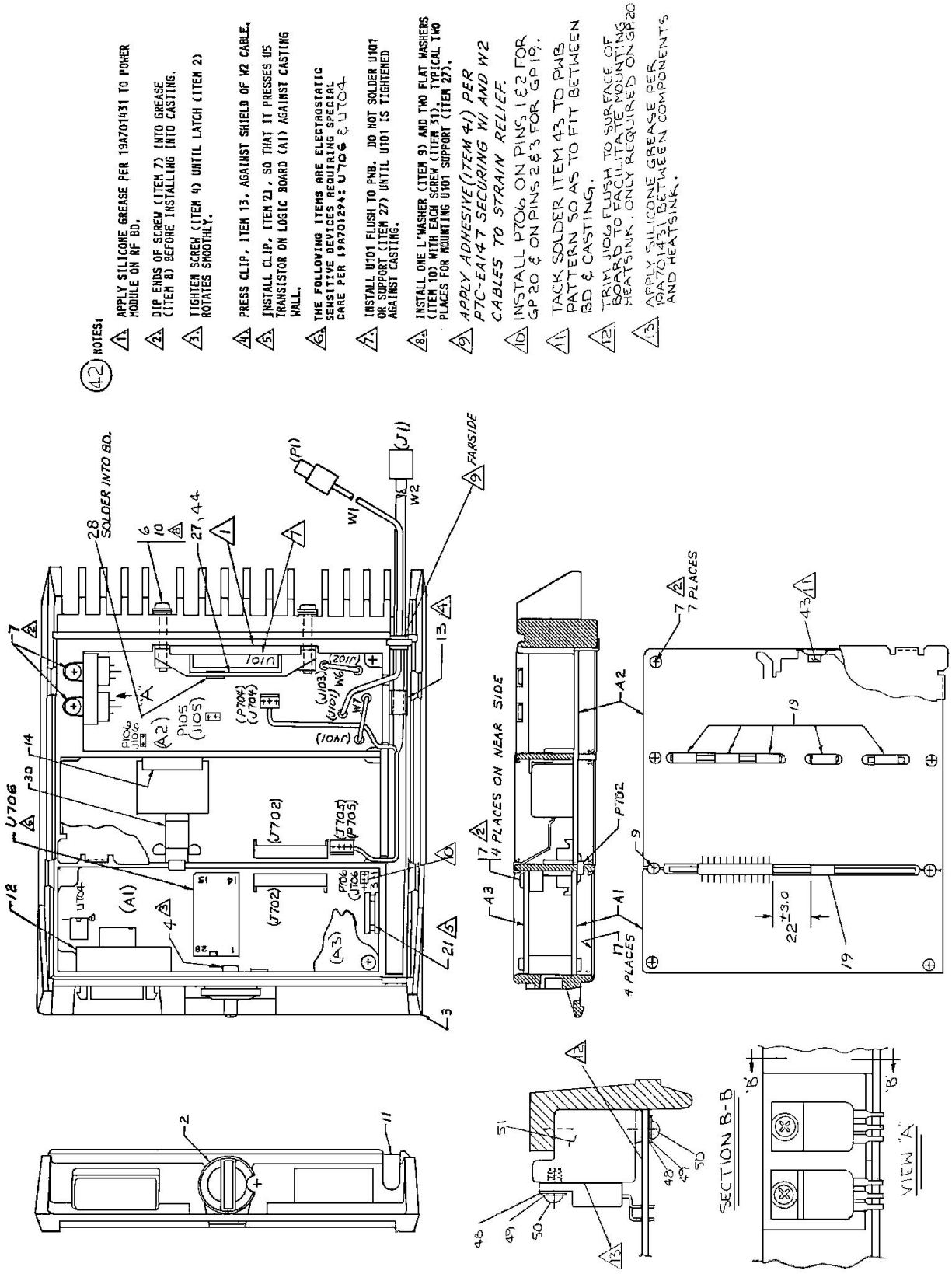
After the initiating mobile receives a channel assignment from the control station, it immediately switches frequency over to the assigned data channel and sends a burst of 9600 baud dotting.

MAINTENANCE

Maintenance information for the MTD Series 800 MHz Data Only mobile radio is provided in the Service Section Manual.



MTD SERIES 800 MHz, 10 WATT
DATA ONLY MOBILE RADIO
(19C851523, Sh. 4, Rev. 2)



MTD SERIES 800 MHz, 10 WATT
DATA ONLY MOBILE RADIO

(19C851519, Sh. 6, Rev.3)

MTD SERIES
800 MHz, 10 WATT
DATA ONLY MOBILE RADIO
19C851519G19

SYMBOL	PART NO.	DESCRIPTION
A1	19D902151G3	Logic Board.
A2	19D902123G16	RF Board.
A3	19D902304G3	Audio Board.
		- ASSOCIATED PARTS -
P105 and P106	19A702104P2	Connector.
P702	19B801359P5	Connector.
P706	19A702104P2	Connector.
W1	19A705301P3	RF Cable.
W2	19C851497P4	Power Cable.
W6 and W7	19A704884P2	RF Cable .
2	19C851505P2	Latch.
3	19D901728G1	Radio Casting.
4	19A705381P13008	Screw, Plastite.
7	19A702381P508	Screw, thread forming: No. 3.5-0.6 x 8.
9	19A700033P6	Lockwasher, external tooth, M3.5.
10	19A701312P5	Flatwasher: M3.5.
11	19C851497P2	Dummy plug.
12	19A704941P1	Dust cap.
13	19A704943P1	Clip.
17	19C851442P2	Cover.
19	19A705220P1	Clip.
21	19A705282P1	Clip.
28	19A705417P1	Ground contact.
31	19A702381P525	Screw, thread forming.
44	19B801382G2	Support.
48	N402P5B6	Plain washer.
49	N404P11B6	Lockwaasher.
50	N80P9005B6	Screw, machine.
51	19B801377G7	Heat sink.

* COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

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