ERICSSON

LBI-38602A

Mobile Communications

EDACS® M–PA™ UHF SYSTEM MODEL PORTABLE FM RADIO

TABLE OF CONTENTS

Maintenance Manual

TABLE OF CONTENTS

NOTE

SPECIFICATIONS *

GENERAL

Frequency Bands	403 - 423 MHz 450 - 470 MHz
Oscillator Stability	2.5 ppm
Operating Temperature Range	-30°C to + 60°C
Maximum Relative Humidity	90% at 55°C
Battery Voltage	7.5 Vdc (nominal)
Dimensions (H x W x D)	
less battery, knobs and antenna	140 x 69 x 38 mm (5.52 x 2.72 x 1.50")
with Extra High Cap. Battery	232 x 69 x 40 mm (9.15 x 2.72 x 1.58")
Weight	
less battery	540 grams (19 ounces)
with Extra High Cap. Battery	907 grams (32 ounces)

TRANSMITTER

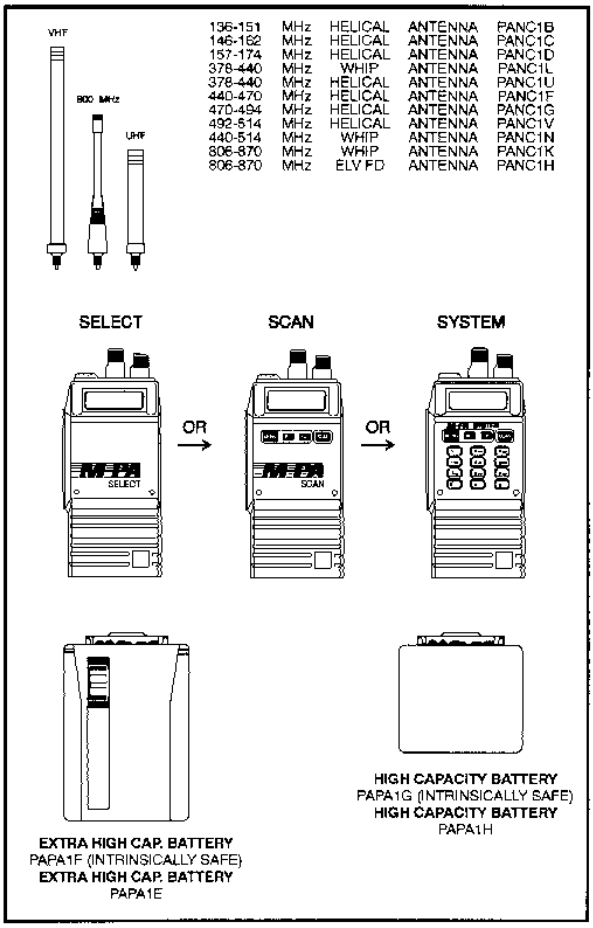
Frequency Range	403 - 423 MHz 450 - 470 MHz
Maximum Frequency Separation	20 MHz (no degradation)
FM Deviation	±5 kHz
High/Low RF Power Output	5 Watts / 1 Watt (programmable on a per channel basis)
FM Hum and Noise	-45dB (companion receiver)
Spurious and Harmonic Emissions	-74 dBc
Audio Response	+ 1 to -3dB (6 dB/octave pre-emphasis from 300 to 3 kHz)
Audio Distortion	less than 3% (at 1000 Hz tone, 3 kHz deviation)

RECEIVER

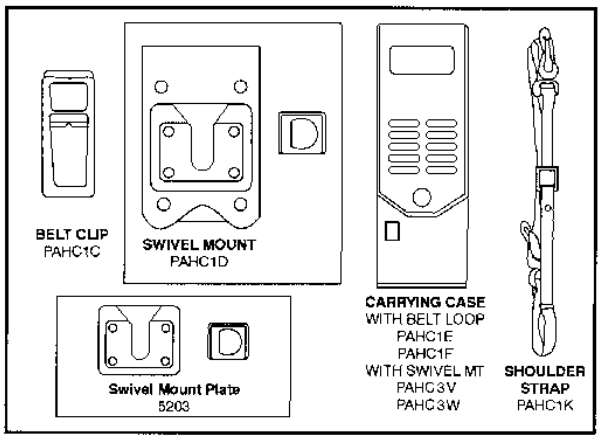
Frequency Range	403 - 423 MHz 450 - 470 MHz
Maximum Frequency Separation	20 MHz (no degradation)
Sensitivity (12 dB SINAD)	-116 dBm (0.35 µV)
Adjacent Channel Selectivity (typical)	-75 dB at 25 kHz
Critical Squelch	10 dB SINAD
Intermodulation (typical)	-75 dB
Spurious and Image Rejection	-75 dB
Audio Output (24 ohms load impedance)	500 mW (less than 5% distortion)

* These specifications are intended primarily for the use of the serviceman. See the appropriate Specifications Sheet for the complete specifications.

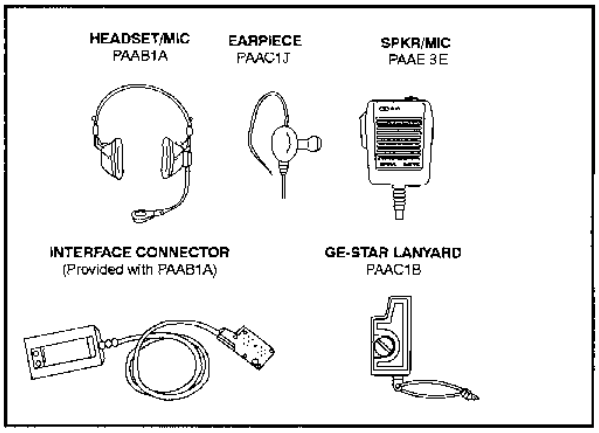
Radios, Antennas, Batteries



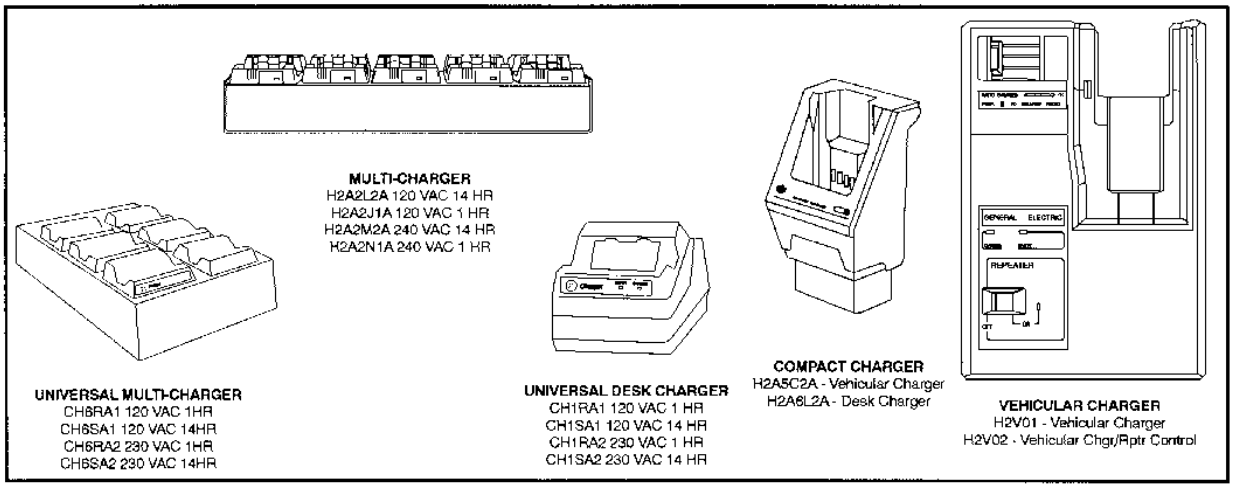
Carrying Accessories



Audio Accessories



Chargers



INTRODUCTION

The EDACS M-PA UHF System model radio is a high quality microprocessor controlled synthesized portable FM radio. The unit complements the digitally trunked system by providing a small, rugged, easy to operate and easy to program portable radio for the UHF trunking environment. The radio also provides conventional communications in the UHF spectrum. The unit meets or exceeds all APCO 16 portable radio equipment requirements for digitally trunked and conventional communications.

Trunked and conventional operation with the EDACS M-PA radio is highlighted by its programming versatility. Many features are PC programmable. This allows tailored operation of the portable radio to meet the needs of the radio system and the individual users.

The EDACS M-PA System model personality allows up to 50 systems with 16 groups each, or 16 systems with 50 groups each, to be programmed and selected. Up to 48 conventional channels can be stored in the radio. Ninety-nine special calls can be stored. Special calls include individual and telephone interconnect calls. DTMF operation is supported by the front panel 16-button keypad.

Radios operating in the trunk mode monitor a common control channel from the site for channel assignments. This designated control channel is the digital data link to/from the radio and the site controller.

Working channels are allocated by the site via the control channel. Working channels carry the actual voice signal. The allocated working channel may change several times during a communication sequence. This change, if needed, occurs at the start of a transmission sequence (at PTT time) under the supervision of the site. Working channel access time is typically 250 milliseconds and does not exceed 500 milliseconds as specified by the APCO 16 requirements.

When trunking operation is not wanted or is not possible, the unit can operate in the conventional mode. In the conventional mode, the radio operates on 25 kHz allocated channels.

TRUNKED FEATURES

Features which specifically apply to trunked mode operation are listed below.

- **Programmable Multiple System Capability** - Selection of up to 50 maximum systems (with 16 groups each) is capable. The radio can operate on different trunked sites or on different systems on the same site.
- **Programmable Multiple Group Capability** - The radio can communicate with many groups within a system. A maximum of 50 groups per system can be assigned and selected.

  The user pre-programs (via PC computer) the unit so the Control Knob makes the group or group selection. If the Control Knob is programmed for group selection, up to 16 groups can be selected; up to 50 systems can then be selected by the STEP button. If the Control Knob is programmed for system selection, up to 16 systems can be selected; up to 50 groups can then be selected via the STEP button.
- **Programmable Group Call Capability** - The unit can simultaneously call all units within a group.
- **Special Call Mode** - Trunked operation allows communication via special (individual) calls. Up to 99 special calls can be pre-programmed into the radio.
- **Remote Dynamic Regrouping Capability** - The dispatch center can regroup radios for multi-agency communications.
- **Remote Disable** - If lost or stolen, the unit may be remotely disabled by the System Manager.

TRUNKED AND CONVENTIONAL FEATURES

The M-PA System model radio has the following features that apply to both trunked and conventional operation. Up to 48 conventional channels can be programmed into the radio.

- **Rotary Control Knob** - The 16-position top-mounted control allows easy selection of systems, groups or conventional channels, according to how the unit is programmed.
- **Volume Control Knob** - This rotatable control provides quick and easy adjustments to the volume level. Minimum volume levels can be programmed into the unit. This feature prevents missed calls due to a low volume setting.
- **Backlit Liquid Crystal Display** - The 8-digit alphanumeric display provides programmable customization and feedback to the operator of various operating conditions. Icons (flags) located above and below the digits alert the operator to various radio conditions such as no control channel, conventional mode enabled, transmitter in operation and a low battery condition. Backlighting can be enabled or disabled on a per channel or per group basis.

- **16-Button Keypad** - This front panel keypad allows easy operator control of functions such as system or group selection, scan operation, special call mode, and manual dialing for telephone interconnect and/or individual calls.
- **Scan Operation** - Trunked groups and conventional channels can be scanned. Trunked groups which have been previously added to the scan list (via the operator) may be scanned. In conventional mode, the radio may be configured for a fixed priority-one channel, the selected channel as priority-one, a fixed scan list, or a front keypad programmed scan list. Dual-priority scan is supported in conventional mode.
- **Telephone Interconnect** - Special call mode allows the operator to select and send pre-programmed telephone calls. Telephone interconnect is performed by the site. DTMF operation is supported by the front panel keypad.
- **Programmable via the Universal Device Connector (UDC**) - The entire operation of the radio can be field customized by programming the unit using an IBM PC or compatible computer. The programmed personality is stored in a battery (internal lithium) backed-up RAM.
- **Simple Remote Control Capability** - External accessories can be connected to the UDC such as a headset, a speaker-mic or a lanyard. Connection of the speaker-mic allows the operator to remotely control PTT operation and audio level of the external speaker. An antenna jack is located on the UDC for the connection of a remote mounted antenna such as when the radio is used in a vehicular charger or repeater.
- **Emergency Signalling Feature** - Pressing a single recessed button instantly sends an alert message on a pre-programmed channel. The radio ID number is transmitted and the unit is given top priority in the system. Emergency signalling can also be enabled by a lanyard connected to the UDC.
- **Programmable Carrier Control Timer** - A programmable transmit time will automatically disable the transmitter and provide an alerting tone after time-out. This feature prevents radio damage and unnecessary channel traffic in the event of a "stuck" mic. CCT is reset on every PTT and the alert tone is removed upon release of the PTT button.
- **Programmable Transmitter Power Levels** - Transmitter power level (high or low) is PC programmable into the radio such that it is automatically selected channel-by-channel.
- **Automatic Squelch** - Squelch operation in the trunked mode is automatically controlled. In conventional operation, squelch threshold can be programmed on a per channel basis. Squelch circuits are designed so that annoying squelch pops, which may occur at the end of a received message, are minimized.
- **Programmable Multi-Tone Channel Guard (CTCSS)** - Channel Guard tone frequencies within the range of 67 Hz to 210.7 Hz, including all of the standard EIA frequencies, may be programmed, encoded and decoded.
- **Programmable Multi-Code Digital Channel Guard** - Similar capability as with Tone Channel Guard is provided.
- **Two-Tone Sequential (T99) Decode** - Selective calling decode is enabled or disabled on each individual channel. Two sets of three unique decodes are available to allow large systems the capability of individual and group calls. Sets are selectable on a per system basis.
- **Channel Busy Lockout** - Personality information includes the capability to prevent the transmitter from operating on a channel where carrier activity is present. The channel busy indicator, the "BSY" flag, is active during this time. This feature is selectable on an overall radio basis.
- **Repeater Talkaround** - Allows communication with another portable or mobile radio when out of range of the repeater.
- **Alert Tones** - Alert tones prompt the operator of various radio conditions such as channel access, CCT time-out or a low battery.
- **Self-Test** - At power-up the unit automatically performs a diagnostic test on itself and reports any found errors via the LCD.

DESCRIPTION

The EDACS M-PA portable radio consists of two major assemblies, the Front and Rear Covers. These two assemblies house all of the units RF, analog and digital circuitry in the weather resistant die-cast aluminum case. The assemblies are electrically interconnected by two single-in-line type connectors.

The battery pack slides and locks on to the bottom of the unit. The on/off switch for the radio is located on the battery pack. Battery packs are available in several different capacities.

The antenna screws on to the top of the unit. A side antenna connection is also provided at the UDC for an external antenna or for test purposes. This UDC antenna connection is utilized when the radio is locked in the vehicular charger or repeater.

REAR COVER ASSEMBLY

The Rear Cover Assembly houses the RF Board in the die-cast aluminum case. The complete assembly consists of the UHF RF Board, aluminum case, top antenna jack, side (UDC) antenna jack, an RF Board shield and various hardware.

The RF Board circuitry includes the transmitter, receiver and the frequency synthesizer. This FM circuitry is under complete control of the microprocessor circuits. Controlling data sent to this assembly from the Control Board includes serial synthesizer data loading, band switch data, transmitter/receiver enabling and a transmitter power level signal. The RF Board outputs the FM demodulated audio/data and a synthesizer lock status line to the Control Board. During transmitter operation, the RF power appears at the top antenna jack (or the UDC jack if the appropriate adapter plug is inserted). The Rear Cover Assembly maintenance manual contains a detailed circuit analysis, mechanical, outline and schematic diagrams for this assembly.

FRONT COVER ASSEMBLY

The Front Cover Assembly houses all of the operating controls and the digital control circuitry for the radio. Major items include the Control, LCD and Emergency Switch Boards along with the Keypad, UDC and Speaker Flex circuits. In addition, the speaker, microphone and Battery Plate are a part of this assembly. The complete assembly is housed in the die-cast aluminum front cover.

The 16-button keypad on the front panel allows easy operator control of system or group selection, scan operation, special call mode and manual DTMF dialing.

The Front Cover Assembly maintenance manual has an interconnection diagram for all of the above boards and flex circuits. It also contains a detailed circuit analysis, mechanical, outline and schematic diagrams for this assembly.

ANTENNAS

Antennas are selected based on the operating frequency range of the radio. Table 1 lists the available antennas which mount into the antenna jack on the top of the radio. An external antenna can be connected to the unit via the UDC.

Table l - Antenna Option And Part Numbers

USABLE FREQ. RANGE (MHz)	OPTION NUMBER	PART NUMBER
403 - 440	PANC1U	19B234804P10
440 - 470	PANC1F	19B234804P12

BATTERIES

The battery pack connects to the bottom of the unit and delivers a nominal 7.5 Volts dc to the radio. A recessed on/off switch for the radio is located on the battery pack. An internal fuse located in the radio's Battery Plate protects the radio and battery from excessive current draw.

Nickel-cadmium battery packs available for use with the radio include medium and extra high capacity.

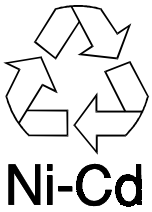
Radio contacts located on the top of the pack include switched power, ground, the speaker enabling contacts and a continuous power contact. In addition, four contacts are located on the rear of the battery pack. These four contacts provide connections to the slip-in type chargers or vehicular chargers/repeaters while the battery pack is still connected to the unit. The battery charging contacts are diode protected from external shorts.

The chargers utilize an internal thermistor in the battery pack to sense temperature and automatically control charge rate of the battery. This allows for a maximum charge rate without overheating the Ni-Cads. All battery packs can be charged in less than 1 1/2 hours with the rapid type chargers. Nominal full charge time in a standard charger is 14 hours. The Service Section contains a detailed outline and schematic diagram of a typical battery pack. Further service information for the battery packs is also presented in the Service Section.

Chargers are available with nominal charge times of 1 (rapid) and 14 (standard) hours. Combinations include single (1) and multi (5) position, standard and rapid charge units. In addition, the vehicular chargers/repeaters simultaneously charge the battery while the radio is operating.

Battery packs are shipped partially charged to the customer. After receipt, or if the battery pack has been stored for any length of time, it should be fully charged before placing into service. A fully charged battery pack should provide an open terminal voltage greater than 7.5 Volts. A fully discharged battery pack should be no less than 6 Volts. When the battery pack drops below approximately 6.8 Volts the low battery "BAT" flag will be displayed and a 500 Hz alert tone will sound indicating the battery pack needs charging.

RECHARGEABLE BATTERY PACK DISPOSAL



The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal. Call Toll Free 1-800-822-9362 for information and /or procedures for returning rechargeable batteries in your state.

UNIVERSAL DEVICE CONNECTOR

The UDC is located on the side of radio. Various equipment such as the audio accessories is interfaced by this connector. The UDC provides an excellent first-check-point for the initial bench check without the need to disassemble the unit. Table 2 lists all pins and their appropriate function. The radio senses the resistance value between UDC pins 9 and 1 and switches the appropriate circuits to provide proper radio-to-accessory operation.

Table 2 - UDC Pin Functions

PIN	NAME	INPUT OR OUTPUT	USE
1	GROUND	-----	Case Ground
3	UDC RX AUDIO	Output	Test Point For Speaker Audio
4	SW BATT	Output	Switched Accessory Power
5	EXT PTT	Input	External Microphone PTT Input
6	TX DATA	Input	For Programming
7	RX DATA	Output	For Programming
8	SPARE		
9	UDC VOLT	-----	Option/Accessory Sense Pin
10	T/R	Output	Low = Transmit, High = Receive
11	UDC MUTE	Output	Low = Audio Muted
12	EXT MIC HI	Input	External Microphone Audio Input
13	EXT EMER	Input	Lanyard Connection
34	UDC DISCR	Output	Test Point For RX Audio

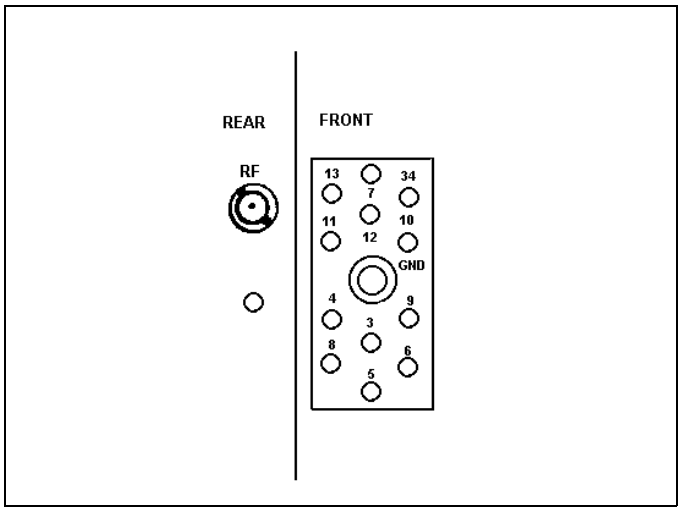


Figure 1 - UDC Pin-Out

PROGRAMMING

The radio is programmed using an IBM PC or compatible computer. For field programming software is provided on 5-1/4 floppy and 3-1/2 inch disks. The Programming Manual and Software is TQ-3340. This software uses a series of screens and windows to guide you through a programming session. See TQ-3340 for further details on programming of the unit.

OPERATION

The EDACS M-PA System model Operators Manual, LBI-38407, gives complete details on the operation of the unit. Operating procedures are summarized below.

ANTENNA/RADIO/BATTERY ASSEMBLY

If necessary assemble the radio, battery and antenna into one unit as shown in Figure 2.

1. The antenna (or an antenna adapter) should be inserted into the top jack. Turn the antenna clockwise until it is fully seated. If desired the RF Test Connector can be used in placed of the top antenna. Make sure the antenna jack is properly terminated before attempting a transmission.
2. Slide the battery pack (or the dummy battery for bench checks) onto the bottom of unit until it locks into place.
3. The unit can now be powered-up and tested.

ALERT TONES

The radio uses three basic alert tones to indicate various operating conditions.

500 Hz - Trunked Failure Tone - Generated when a trunked failure occurs (call denied, failed confirmation). - Low battery alert.

1000 Hz - Alert Tone - Generated when a key is pressed and a status change occurs.
- Channel Access tone - Generated when the radio is clear to transmit on the assigned channel.

2500 Hz - Call Queued Tone - Generated when a call is queued.

SELF-TEST

During the power-up sequence, the radio will perform a personality self-test and a pre-programmed test during which all segments of the LCD will be displayed momentarily. When the radio passes the self-test, it will begin operation on the selected group or channel.

If the radio fails the self-test "PERS ERR" will be displayed. If this happens, the radio requires reprogramming or service.

TRUNKED OPERATION

Digital trunking mode means fast access during busy hours. In this mode the user selects a communications group and the communication channel is allocated through digital signalling with the site.

To Receive A Message

1. Slide the ON/OFF switch on the battery pack to the ON position. The radio will initiate and complete the self-test after which the system name and "NC" flag will be displayed until a control channel is found. When the control channel is located, the "NC' flag disappears and the group name is displayed.
2. Set the Volume Control to mid range.
3. Use the Control Knob or STEP Button to select the desired operating system and/or group (dependent upon programming). The display indicates the selected group name.
4. The radio is now ready to receive messages.
5. When the radio receives a group call, it unsquelches on the assigned channel and lights the "BSY" flag. The group name or the originators ID (depending on programming) is displayed.

   See "Special Calls" for details on the reception of individual calls.

To Send A Message

1. Turn the radio on, set the receive audio level and select the desired group.
2. Observe the display for the absence of the "BSY" indicator to ensure no one is transmitting on the selected group.

3. Press and hold the PTT bar. The radio will then perform the necessary signalling required to obtain a communication channel.

4. When the channel has been acquired, the "TX" and "BSY" flags are displayed and the channel access tone is heard.

5. Hold the radio approximately three inches from your mouth and speak into the microphone.

6. Release the PTT bar when the transmission is complete. Note that if the Carrier Control Timer is enabled, the radio will unkey and an alert tone will sound if the transmission exceeds the set time.

7. Listen for a reply.

Emergency Operation (Trunked Mode)

Receiving An Emergency Call

1. If the radio receives an Emergency Channel Assignment in trunked mode, an alert tone sounds and the "EMG" flag starts flashing. The operator should follow standard emergency procedures.

Sending An Emergency Call

1. To enable an emergency transmission, press and hold the Emergency Button for approximately one second. The radio transmits an emergency message until an Emergency Channel Assignment is received. Upon receipt, the "EMG" flag is displayed and the radio begins operation on the assigned group.

2. Press the PTT bar and speak into the microphone in a normal voice.

3. Release the PTT bar when the transmission is complete and listen for a reply.

4. When the radio receives a normal group channel assignment, it will return to the previously selected group.

Dynamic Regrouping

Dynamic Regrouping is a feature which allows the System Manager to dynamically program new groups into selected radios. Upon development of the regrouping plan, the site controller sends each radio the regroup plan number, knob setting(s), and activate/deactivate commands.

When the radio is regrouped, it will alert the user and the display will indicate "REGRP nn" (nn = 01 - 08 depending upon the Control Knob setting).

If a regroup (with deselect capability) is active on the selected system, the user may also select the regroup mode by pushing the Monitor Button which will toggle back and forth between group and regroup modes for each programmed setting of the Control Knob.

CONVENTIONAL OPERATION

For conventional operation the user selects a channel programmed for conventional use and communicates on that channel. When the radio is operating on a conventional channel, the "CNV" status flag appears in the display.

To Receive A Message

1. Slide the ON/OFF switch on the battery pack to the ON position.

2. Use the Control Knob to select the desired operating channel.

3. Press the Monitor Button to disable squelch and adjust the Volume Control for the desired listening level.

4. The radio is now ready to receive messages.

To Send A Message

1. Turn the radio on, set the audio level and select the desired channel.

2. Observe the display for the absence of the "BSY" indicator to ensure that no one is transmitting on the selected channel. NEVER interrupt another transmission. If Channel Busy Lockout is enabled, the unit will not transmit if the channel is busy at PTT time.

3. Press and hold the PTT bar, the "TX" flag will be displayed. Speak into the microphone in a normal voice. Release the PTT bar when the transmission is complete. The "TX" flag will go out and radio will return to the receive mode. Note that if the Carrier Control Timer is enabled, the radio will unkey and an alert tone will sound if the transmission exceeds the set time.

Emergency Operation (Conventional Mode)

1. Press the Emergency Button. If programmed, the radio will switch to the pre-programmed emergency channel, turn-on the "EMG" flag and perform GESTAR emergency signalling. When GE-STAR signalling is complete the radio will switch back to the selected channel for communication.

SCAN OPERATION - TRUNKED MODE

Groups which have been previously added to the scan list may be scanned using this feature.

All scan channels are retained in memory when the battery pack is removed. The radio will not scan when the "EMG" flag is on.

Adding (Deleting) Groups To (From) The Scan List

1. Scan must be off to add (delete) groups to (from) the list. Note the presence of the "SCN" flag if scan is enabled. If necessary, toggle scan operation off by pressing the SCAN Button on the front panel.
2. Select the desired group to be added (deleted) to (from) the list with the STEP Button and Control Knob. If the group is presently on the list, the "S" flag will be on.
3. Toggle the "S" flag on or off by pressing the 2nd Button and then the A/D Button (shifted SCAN Button) on the front panel. When the "S" flag is on, the group is on the scan list.

Using Scan

1. To toggle scan operation on, press the SCAN Button. The "SCN" status flag will turn on when the radio is scanning.
2. When a group on the list receives a channel assignment, the radio unsquelches on the assigned channel and the group name is displayed.

   Pressing the PTT Button when scan is enabled will cause the radio to place the call on the selected group.

   If the 2nd and A/D Buttons are pressed while a scanned call is being received, the group will be deleted from the scan list.
3. To toggle scan operation off, press the SCAN Button. The radio will resume operation on the selected group.

SCAN OPERATlON - CONVENTIONAL MODE

In conventional mode, the radio may be programmed for a fixed priority-one channel, the selected channel as priority-one, a fixed scan list, or a front keypad programmed scan list. The radio supports dual-priority scan operation.

Scan rate will vary depending upon the number of channels on the scan list and whether or not Channel Guard is programmed. Fewer channels will result in a faster scan rate. All scan functions are retained in memory when the battery pack is disconnected. The radio will not scan when the "EMG" flag is on.

Scan operation is determined by the following programmed conditions:

- **Dual-Priority Programmed** - The priority-one, priority-two and the remaining channels will be scanned. Once a carrier is detected and if programmed, the correct Channel Guard is decoded, the LCD will indicate the channel. Sampling of the priority-one and or two channel carrier, regardless of Channel Guard, be detected while a non-priority channel is being received, the display name is updated, the applicable status indicator, "1" or "2" lights, and the channel is switched to the priority channel.
- **Non-Priority Programmed** - Once a carrier is detected, and if programmed, the correct Channel Guard is decoded, the display will indicate the detected channel. Scanning will stop and the radio will remain on the channel until the carrier ceases. Scanning will then resume with the selected channel name displayed.

Adding (Deleting) Channels To (From) The Scan List

1. Scan must be off to add (delete) channels to (from) the scan list. Press the SCAN key if the "SCN" status flag is on.
2. Select the desired channel using the Control Knob and/or STEP key.
3. Press the 2nd then A/D keys repeatedly (or hold the A/D key down after pressing 2nd) until the desired priority indicator appears: "S" for non-priority, "2" for priority-two, "1" for a priority-one, or no indicator to remove the channel from the scan list. One of the following messages may be momentarily displayed:
   - "SCAN DIS" - The scan option is disabled. The radio can not scan unless reprogrammed.
   - "FIXED P1" - This programmed option has designated the priority-one channel. The priority designation cannot be moved or deleted.
   - "FIXD LST" - The fixed scan list option is enabled. Channels cannot be added (deleted) to (from) the scan list.
4. To add (delete) additional channels, repeat steps 2 and 3.

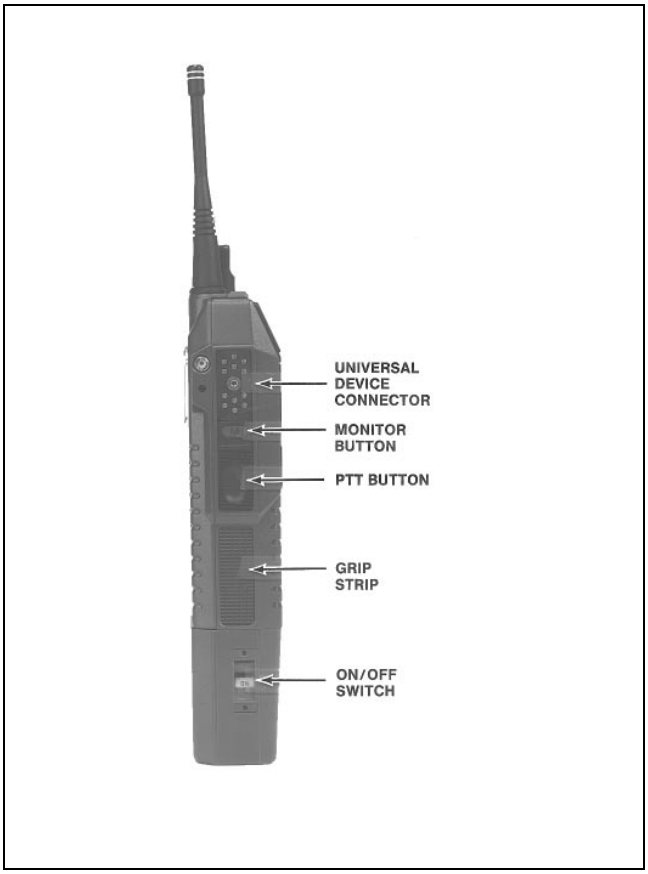


Figure 2 - Operating Controls

Using Scan

Toggle scan on or off by pressing the SCAN key. The "SCN" flag appears when the radio is scanning.

SPECIAL CALLS

Up to 99 special calls can be prestored in the unit. Special calls include individual calls and telephone inter-connect calls. These calls are handled via the unit's special call mode.

Receiving An Individual Call

When an individual call (call directed only to the radio) is received, the radio unsquelches on the assigned channel with the "BSY" flag displayed. The message "*INDV*", originators ID, or caller's name is displayed and the "MSG" flag flashes.

Responding to the call prior to the programmed call-back time-out will automatically direct the call to the originating unit.

If no response is returned, "MSG" will remain flashing. To call the unit back, press SPC. The originator's ID or name will be displayed. Follow the instructions for sending a special call.

Sending A Special Call

Special calls may be placed with the radio. Use the following procedure:

1. Select a special call by following step a or b:

   a. Enter the special call's table location number via the 12-button keypad and press the SPC key. Note that table location number 1 is the last received individual caller's ID number. Location number 2 is the last received group caller's ID number. Table locations 3 and higher allow access to the pre-programmed special call list in the radio's personality. If no individual calls or group calls have been received, the first two special call table locations will be blank. If a table location number larger than the special call table is entered, the display indicates "RANGE" and the trunked failure tone sounds.

b. Press and release the SPC key. An alert tone sounds and the "SPC" flag lights. The display changes from the selected group to the special call display.

   Press the STEP or 2nd-STEP keys to scroll through the special call menu until the desired special call name appears in the display.

2. Press and hold the PTT bar. The radio performs the necessary signalling required to obtain a communication channel. When the signalling is complete the "TX" flag turns on and the channel access tone sounds. Speak into the microphone in a normal voice.

3. Release the PTT bar when the transmission is complete. Listen for a reply and repeat step 2 as necessary.

4. When the call is finished, the radio remains in the special call menu for a programmed amount of time. To return to the group selection, press and release the SPC key. The radio switches to the previously selected group.

Menu Call From Keypad

1. Enter the radio's individual identification number (the radio to be called) from the keypad or recall a previously stored number.

2. Press and hold the PTT bar. The radio will perform necessary signalling required, the "TX" flag will turn on, and the channel access tone sounds. Speak into the microphone in a normal voice.

3. Release the PTT bar when the transmission is complete. Listen for a reply.

4. When the call is compete, the display will continue to show the radio's group ID until the special call time-out expires. To return to group selection, press and release the SPC key and the radio will return to the previously selected group.

Telephone Interconnect Call

Telephone calls can be placed with the radio through the special call failure. Use the following procedure to initiate and complete telephone calls:

1. Press and release the SPC key. The alert tone sounds, the "SPC" flag lights and the display changes from the selected group to one of the special call displays.

2. Press the STEP or 2nd-STEP keys to scroll through the special menu until the desired telephone interconnect appears in the display.

3. Press and release the PTT bar. The dial-tone, followed by DTMF tones will be heard.

4. Press the PTT bar to speak when the call is answered. Unlike a regular telephone, you may not talk and listen at the same time.

5. To hang-up, press and release the SPC key. Pressing the Monitor Button also hangs up the call. The radio will return to the group menu.

Manual Telephone Interconnect Call

1. Enter the telephone number from the keypad. Up to 31 digits can be entered, with the last eight being displayed.

2. Enter an asterisk (*) from the keypad. This indicates to the radio that the call will be an interconnect type.

3. Press and release the PTT bar to initiate the call. After necessary signalling is complete, the "BSY" flag turns on and the channel access tone sounds. The radio enters receive mode.

   If interconnect signalling is not successful, the radio will return to the idle mode with the telephone number displayed until the time-out expires or another system or group is selected.

4. When the call is answered, press the PTT bar and speak into the microphone.

5. Release the PTT bar and listen for a reply.

6. When the call is complete, press the SPC button.

OPERATING TIPS

Antenna location and condition is important when using a UHF radio. Operating the radio in low areas of terrain, under power lines or bridges, inside of a vehicle or in a metal or steel framed buildings can severely reduce the range of the unit. Mountains and building can also reduce the range of the unit.

In areas where transmission or reception is poor, some improvement may be obtained by insuring that the antenna is vertical. Moving a few yards in another direction or moving to a higher elevation may also improve communication. Vehicular operation can be aided with the use of an externally mounted antenna.

Battery condition is another critical factor in the trouble free operation of a portable radio. Observe the procedures listed in the Service Section to insure the battery packs do not develop a reduced capacity condition.

INTRINSICALLY SAFE USAGE

Selected portable radios with appropriate factory installed F4 Options are certified as Intrinsically Safe by the Factory Mutual Research Corporation for use in Class I, Division 1 or 2, hazardous locations in the presence of Groups C and D atmospheres; non-incendive Class I, Division 2, hazardous locations in the presence of Groups A, B, C, and D atmospheres.

Hazardous locations are defined in the National Electrical Code. Useful standards NFPA 437A and NFPA 437M for the classifications of hazardous areas may be ordered from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

ACCESSORIES

The accessories listed below are approved for use with intrinsically safe radios. Use of accessories other than those listed voids Factory Mutual approval.

- PAAB1A (19B801508P3) Headset/Microphone
- PAAC1A (19B801508P2) Earpiece Kit
- PAAC1B (19B801508P8) GE-STAR Lanyard
- PAAE1A (19B801508P1) Speaker/Microphone
- PAAE1B (19B801508P4) Speaker/Microphone with GE-STAR Lanyard
- PAAE1C (19B801508P6) Speaker/Microphone/ Antenna

MAINTENANCE

The EDACS M-PA System model radio is a very reliable unit and will normally provide many years of trouble free service. The recommended Preventive Maintenance procedures listed below should be performed when a technician comes in contact with a unit.

Service Section LBI-38604 contains disassembly/reassembly procedures and detailed service procedures which will aid in board or component level troubleshooting.

PREVENTIVE MAINTENANCE

Antenna

The antenna and antenna contact should be kept clean and free from dirt or corrosion. If the antenna contact should become dirty or corroded, communication range could be reduced.

Batteries

Insure the battery packs are properly maintained. Do not over or under charge the batteries on a regular basis. Insure the contacts are clean and free of corrosion.

Mechanical

Since portable radio units are subject to shock and vibration, check for loose plugs, knobs, screws, etc.

Transmitter Check

Check transmit frequency and deviation. Normally these checks are made when the unit is first put into operation. They should be repeated after the first month of operation, then annually.

Receiver Check

Receiver sensitivity should be checked periodically as an indication of overall receiver operation.

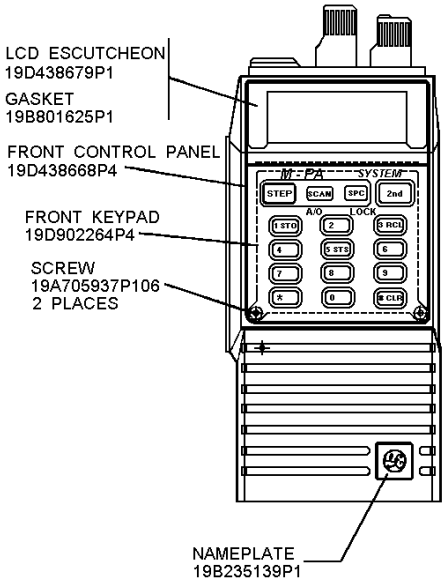
Cleaning

If the unit requires an external cleaning use mild soap and a damp cloth. Avoid abrasive cleaners or chemicals which may damage the plastic or rubber surfaces on the unit.

ERICSSON GE

Ericsson GE Mobile Communications Inc.
Mountain View Road • Lynchburg, Virginia 24502

Printed in U.S.A.



(19D438678, Sh. 2, Rev. 10)

Figure 3 - System Model Front Panel And Keypad

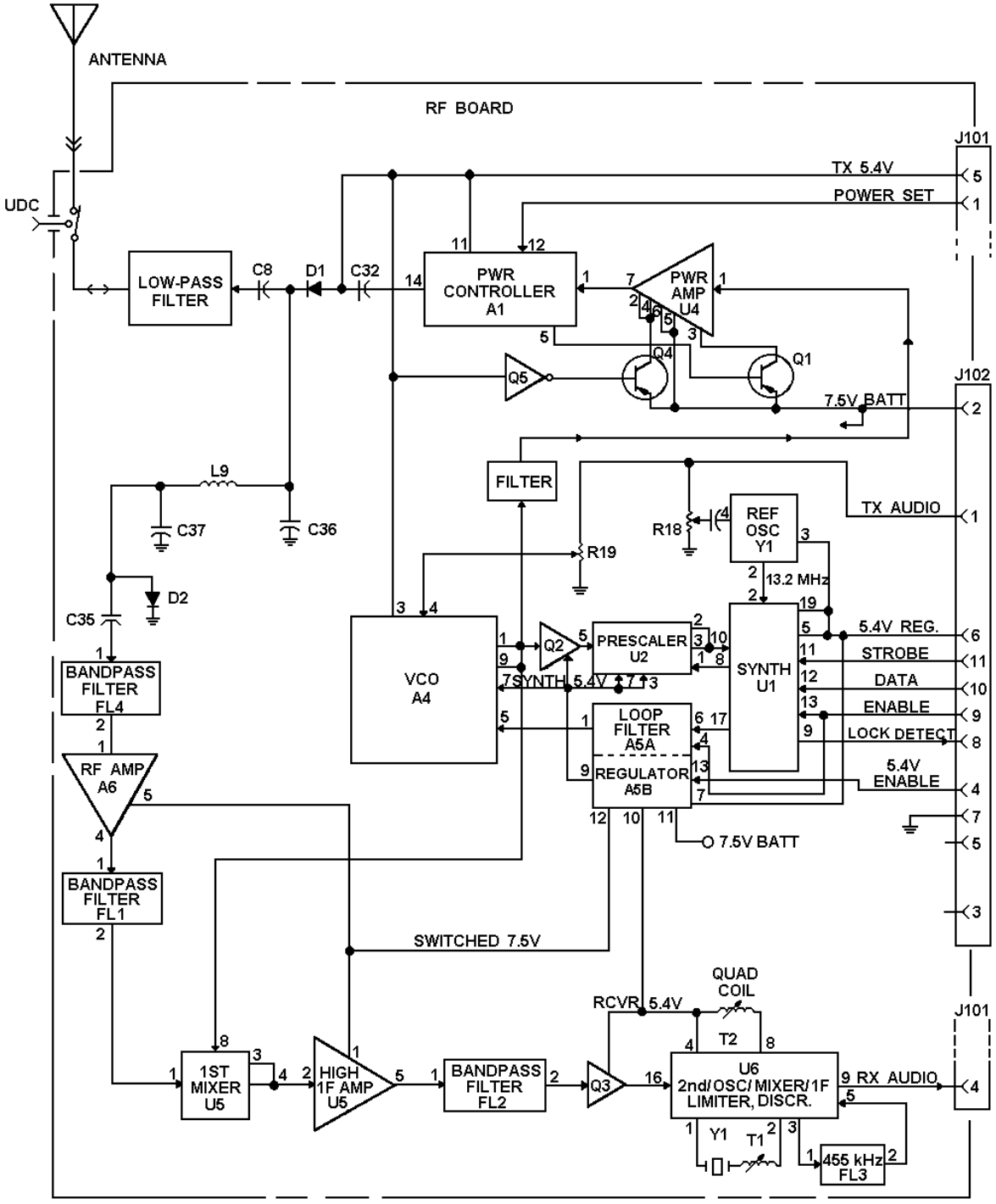


Figure 4 - Rear Cover Assembly

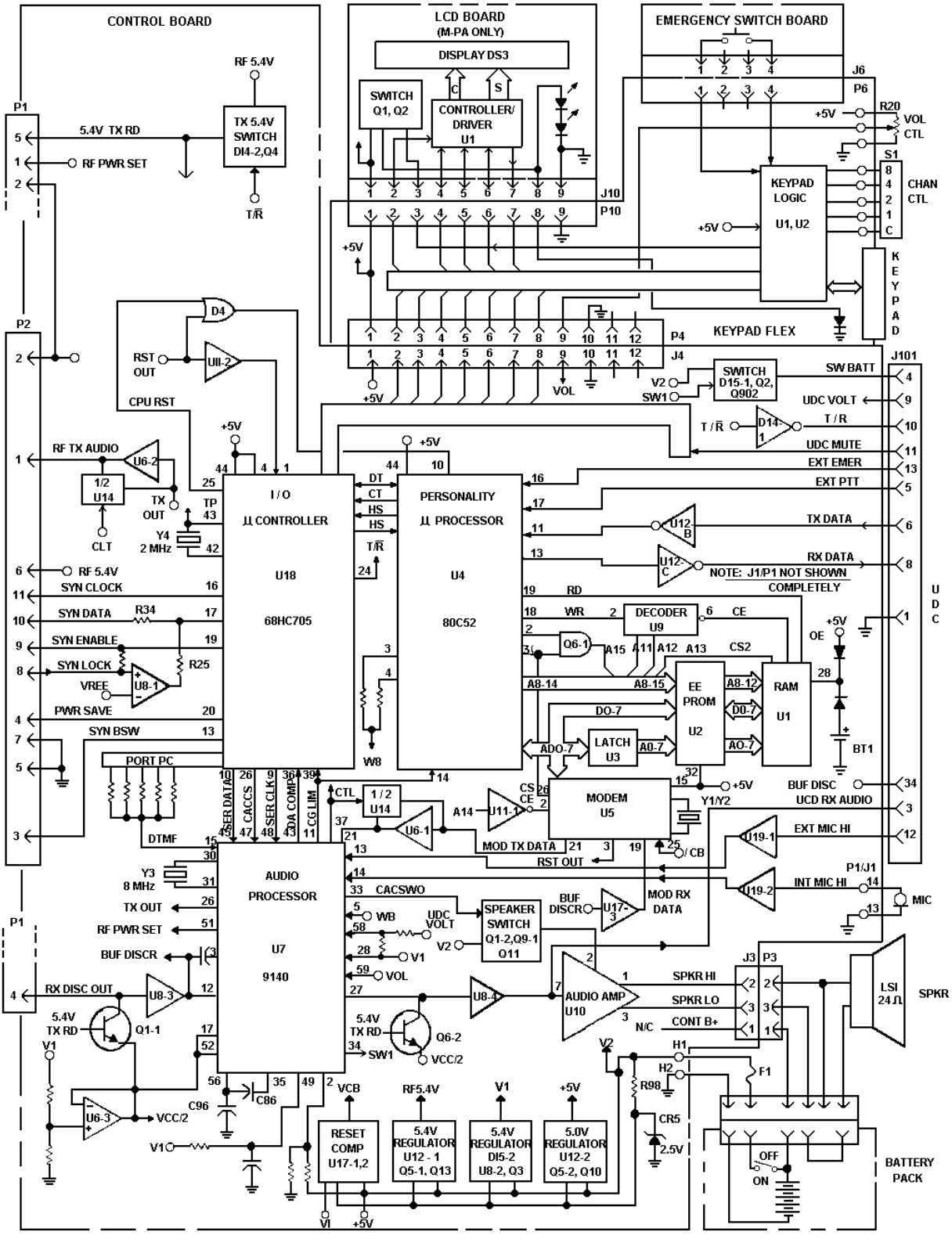


Figure 5 - Front Cover Assembly