

SRM9000 Series Product Manual



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SRM9000 Trunk and PMR Mobile Radio Product Manual

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1. INTRODUCTION

The Simoco SRM9000 family of analogue mobile radios is designed to meet the needs for high quality, efficient and flexible mobile communication solutions.

The Transceiver utilises the latest DSP technology providing a compact, reliable, versatile, radio capable of supplying different mobile radio solutions in an ever-changing communications market.

The SRM9000 Family is a powerful new force in Mobile Radio and Fleet Communications that targets customers' current radio requirements with the flexibility to be adapted as their needs change.

The SRM9000 range comprises a common transceiver platform with four plug-and-play style, upgradeable User Interface Controllers to address different market segments: from simple voice communication to demanding system requirements.

The common transceiver platform is fully field-configurable for PMR or Trunked applications via a Windows-based programmer.

General functionality includes: CTCSS, FFSK, Selcall, DTMF signalling, 12.5/20/25KHz selectable channel spacing, 1-25W RF output, MAP27 Data port, User Phonebooks and Memories and Simple User Interfaces.

The SRM9000 has an Ignition Sense input and power-down timer for intelligent on/off switching effectively making the radio an integral part of the vehicles operation. 1 digital I/O is also available for basic remote commands.

The SRM9000 platform is designed for easy mounting in local or remote situations. It encases a single radio PCB in a heavy-duty aluminium frame, leaving plenty of room for internal options. The Option board has facility for:

- Extensive IO and data applications;
- GPS and AVL applications;
- VOX Handfree (for any version that does not have it as standard).

The Transceiver is available in several variants from 66MHz to 530MHz.

Type Approvals will be obtained in key Simoco countries.

2. VARIANTS AVAILABLE + FACILITIES

2.1 General

All the radio may be programmed as PMR or Trunked. SRM9025 and SRM9030 are Dual Mode and are PMR, MPT1327 or User Selectable at the same time.

2.1.1 SRM9005 = PMR / Trunk Telemetry Version

SRM9005 is tailored for Conventional PMR or MPT1327 Trunked data applications. It is the right answer to all your data applications: telemetry, alarm systems, AVL systems with/without GPS receiver, fleet data dispatcher systems.

2.1.2 SRM9010 Dual Mode = PMR / Trunk Basic Version

SRM9010 is a low tier PMR or MPT 1327 transceiver ideal for light industry or simple voice applications but offering signalling systems at an exceptional and unexpected level for this range of market.

It comes with an extremely compact, single digit display microphone.

PMR version has 10 channels, CTCSS, ANI, Mic In/Out of cradle selcall, fixed selcall encode masks channel dependent, 8 selcall decoders, 10 fixed Scanning/Voting/Multi-ax groups.

Trunk version has 10 memories supporting any valid MPT dialstrings, up to 10 prestored memory addresses, incoming voice calls, call in absence, last 8 missed calls queue.

2.1.3 SRM9020 Dual Mode = PMR / Trunk Enhanced Version

SRM9020 is a mid tier PMR or MPT 1327 transceiver ideal for small business or fleet users.

It comes with a six characters starburst alphanumeric LCD display microphone.

The SRM9020 PMR adds to SRM9010 PMR with 100 channels, selcall + status with alphanumeric phonebook, 4 programmable function buttons, 99 fixed and 1 user Scan/voting/multi-ax group, who is calling and status messages display.

The SRM9020 Trunk adds to the SRM9010 Trunk with 100 User Phonebook, Status button to access separate outgoing Alpha status list and Menu Button to access call-in-absence and recall last dialled numbers.

2.1.4 SRM9025 Dual Mode = PMR + Trunk Systems Handset Version

SRM9025 is a high tier PMR or MPT 1327 transceiver ideal for systems or big fleet users, with the unique facility of a handset configuration.

The Handset provides 2x12 characters display, 12-button numeric keypad, 4 Function buttons, plus Send and End buttons, and standard VOX Handsfree operation.

The PMR version has 1000 channels with full Alpha tagging, free format selcall, free dialling selcall, 250 entry user editable selcall addressbook, 100 entry status phonebook, DTMF and 124 fixed and 4 User Scan/voting/multi-ax Groups.

The Trunk version has 250 entry editable alpha-Phonebook and Status lists, SDM/EDM and traffic channel data capability, ability to receive single slot alphanumeric text messages, MPT1343 7 digits ANN numbering system, dynamic group assignments, talkgroup operation.

2.1.5 SRM9030 Dual Mode = PMR + Trunk Systems Control Head Version

SRM9030 is a high tier PMR or MPT 1327 transceiver ideal for systems or big fleet users, with the unique facility of a control head with the biggest display available on the market.

The SRM9030 expands on the Handset version in both PMR and Trunk application by offering more functionality through its larger 8x14 character graphic display.

2.1.6 Common Features for All Versions

Feature:	Model:	9005	9010	9020	9025	9030
Control		None or Serial or Parallel if Option Brd	Display Microphone	Display Microphone	Display Handset	Control Unit with Microphone
Display		-	1 digit LED	6 digit LCD	2x12 char starburst LCD	8x14 char graphic LCD
Adjustable Display Illumination		-	Yes	Yes	Yes	-
Buttons and Keys		-	Vol Up/Down Select	Vol Up/Down 4 Function	Up/Down 6 Function 12 Keypad Menu + Scroll	6 Function 12 Keypad Send/End Menu + Scroll
Speaker		-	Yes	Yes	Yes	Yes
Frequency Bands		66-88MHz, 136-174MHz, 174-235MHz, 335-400MHz, 400-450MHz, 440-500MHz, 470-530MHz				
Channel Spacing		12.5/20/25kHz				
Menu driven		-	-	-	Yes	Yes
Customisable Menus		-	-	-	Yes	Yes

2.2 Conventional-PMR Variants

Feature:	Model:	9005	9010	9020	9025	9030
Channels		1000	10	100	1000	1000
Signalling		CTCSS	CTCSS basic Decode ANI Encode Fixed Encode	CTCSS Selcall + Phonebook	CTCSS Selcall + Phonebook	CTCSS Selcall + Phonebook
Attack Operation		-	Yes	Yes	Yes	Yes
DTMF Encode		-	-	-	Yes	Yes
PTT Limit Timer with warning beeps		Yes				
PTT Inhibit on Busy		Yes				
Voting		Yes				
Dual-Watch		Yes				
Scanning		10 fixed groups	10 fixed groups	99 fixed, 1 user	124 fixed, 4 user	124 fixed, 4 user
Priority Scanning		Yes				
Nuisance Delete		-	-	Yes	Yes	Yes
Multiax		Yes				
Ignition Sense Input		Yes				
VOX Handsfree		-	Option	Option	Yes	Option
Mod/Demod Fctn		Option	-	-	-	-
1 Digital I/O		Yes	Yes	Yes	Yes	Yes
8 IO (max two analogue)		Option	Option	Option	Option	Option
600 Ohm Interface		Option	Option	Option	Option	Option
Internal GPS		Option	Option	Option	Option	Option

2.3 Trunked Variants

Feature:	Model:	9005	9010	9020	9025	9030
Channels	1024 channels in 50 sub-bands					
Frequency Bands	Specifically : 136-174MHz, 400-450MHz and possible in all other bands					
Background Hunt and Vote-Now	Yes	Yes	Yes	Yes	Yes	
Trunk Personalities	2	2	2	2	2	
MPT1343 dialstrings	Yes	Yes	Yes	Yes	Yes	
ANN Numbering	-	-	-	Yes	Yes	
Memories	10	10	100	250	250	
User Phonebook	-	-	Yes	Yes	Yes	
Alpha Status List	-	-	Yes	Yes	Yes	
SDM/EDMs	Yes	-	-	Yes	Yes	
NPDs	Yes	-	-	Yes	Yes	
Prescribed Data	Yes	-	-	Yes	Yes	
Attack Operation	-	Yes	Yes	Yes	Yes	
Ignition Sense Input	Yes	Yes	Yes	Yes	Yes	
Mod/Demod Fctn	Option	-	-	-	-	
VOX Handsfree	-	Option	Option	Yes	Option	
1 Digital I/O	Yes	Yes	Yes	Yes	Yes	
8 IO (max two analogue)	Option	Option	Option	Option	Option	
600 Ohm Interface	Option	Option	Option	Option	Option	
Internal GPS	Option	Option	Option	Option	Option	

3. TECHNICAL SPECIFICATIONS

For complete Technical Specs refer to Appendix A

Essential Information:

SRM9000 Frequency Band Designators

E0	66 - 88 MHz
AC	136 - 174 MHz
K	174 - 235 MHz (split band)
R	335 - 400 MHz (split band)
TK	400 - 450 MHz (Tx only to 440MHz)
UW	440 - 500 MHz
WR	470 - 530 MHz

All bands are 12.5/20/25KHz channel spacing (selectable per-channel).

All bands support 5KHz / 6.25KHz frequency raster

RF Output power is 2 level (High/Low) between 1W and 25W (selectable per-channel).

RF Sensitivity: better than 0.3μV for 12dB SINAD (VHF and UHF)

Approx Size and Weight:

Transceiver:	56 x 170 x 165 mm (HxWxD)	1.8 kg
9010 Microphone	82 x 57 x 38 mm (HxWxD)	200 g
9020 Microphone	96 x 68 x 44 mm (HxWxD)	200 g
9025 Handset	165 x 52 x 30 mm (HxWxD)	200 g
9030 Control Unit	65 x 188 x 45 mm (HxWxD)	210 g
9030 Microphone	82 x 57 x 38 mm (HxWxD)	200 g

4. PRODUCT DESCRIPTIONS

The SRM9000 series of radios all use a common Transceiver.

The radio version is determined by which Microphone / Control Unit is plugged into the Transceiver and whether it is programmed for Trunk or PMR operation.

This section firstly describes the various components of the radio and then the functionality available in each version.

4.1 Transceiver and SRM9005 Unit

Applicable to models:

9005	9010	9020	9025 PMR	9030 PMR
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The Transceiver consists of a single main PCB separated into Digital circuitry, General RF circuitry and RF-output stage. This is mounted on a subframe and inserted into the Transceiver case. Five screws securely hold the PCB between the inside case and the subframe in the upper part of the case.

The case has moulded end-caps with special coatings to ensure EMC/EMI protection and waterproofing.

The Rear End-cap has a 50 ohm Antenna BNC and a male DB15 connector.

The Front End-cap has a 8-pin RJ45 Microphone / Control Unit connector.

The lower part of the case is where the various Option PCBs are fitted. The Rear End-cap has two openings for 8-pin RJ45 connectors which are 'punched-out' as required for interface with the Option PCBs.

Mounting is via four screw holes on the Transceiver case flange. An optional cradle kit is available if the Transceiver needs to be regularly removed.

When this Transceiver is used in a stand-alone configuration (ie. without Speaker or Microphone / Control Unit) then it is called a SRM9005 (PMR or Trunk) Transceiver.



SRM9005 – Common Transceiver Platform

4.2 SRM9010

The SRM9010 is a low tier PMR or MPT 1327 transceiver ideal for light industry or simple voice applications but offering signalling systems at an exceptional and unexpected level for this range of market.

The SRM9010 Radio consists of a Transceiver Module, a Speaker and a Simple Control Microphone.

4.2.1 SRM9010 Microphone



The SRM9010 Microphone has five buttons and a single digit LED display.

The 1 digit display show the working channel and the transmit mode.

The Select Button scrolls the channel list.

The Volume up & down buttons increase and decrease the speech volume level.

Special Functions:

Pressing the “Select” button while the On/Off button is held down will step through the Display illumination levels.

Pressing the Up/Down buttons while the On/Off button is held down will vary the Alert Tone Level in relation to the current Volume setting.

Note: The radio will turn off if the On/Off button is held for more than a few seconds without another button being pressed.

The Microphone has a Hook Switch that may used to perform certain functions whenever the Microphone is placed on, or removed from its cradle.

Documents:

The following additional documentation is available for this radio:

SRM9010 PMR & Trunking Operating Guide.

SRM9000 Installation Sheet.

Options:

The SRM9010 may have the following Option PCB fitted:

- VOX Handsfree
- GPS module
- Parallel IO expansion
- 2/4 Wire 600 Ohm Balanced Interface

4.2.2 9010 PMR Features and Facilities

- Volume Up/Down and separate adjustment of Alert Level
- Adjustment of Display Brightness
- Up to 10 Channels or 10 fixed Scan/Vote/Multi-ax Groups
- CTCSS
- 8 Selcall Decoders
- ANI Selcall Encode
- Mic In/Out cradle Selcall Encode
- 1 Fixed Selcall Encode Channel dependent or 1 digital Input
- 1 digital Output
- Transmit Limit timer
- Busy channel Lockout

4.2.3 SRM9010 Trunk Features and Facilities

- Volume Up/Down and separate adjustment of Alert Level
- Adjustment of Display Brightness
- Up to 10 Prestored Memory addresses
- Any valid MPT dialstrings.
- Incoming Voice Calls
- Call-in-Absence
- Last 8 missed calls queue

4.3 SRM9020

The SRM9020 is a dual mode mid tier radio for the user who has a small fleet or medium needs for voice communication.

The SRM9020 radio consists of a Transceiver Module, a speaker and a Control Microphone that expands the function set of the SRM9010, providing 4 programmable buttons and a user friendly 6 characters starburst alphanumeric LCD display.

4.3.1 SRM9020 Microphone



The Microphone has :

- a 6 character 'Starburst' LCD display for Names and Numbers.
- two side buttons for Volume Up and Down
- a top mounted On/Off button
- four programmable function buttons
- standard PTT and Microphone functionality

Documents:

The following additional documentation is available for this radio:

SRM9020 Conventional and Trunking Operating Guide

SRM9000 Installation Sheet.

Options:

The SRM9020 may have the following Option PCB fitted:

- VOX Handsfree
- GPS module
- Parallel IO expansion
- 2/4 Wire 600 Ohm Balanced Interface

4.3.2 SRM9020 PMR Features and Facilities

- Up to 100 channels (Normal, Voting, Scan, Multiax)
- 99 fixed Scan groups and 1x User Scan group with priority
- 4 programmable function buttons
- CTCSS
- Transmit Limit Timer (settable in seconds)
- Busy Channel lockout
- Selcall + Status Encode/Decode using Alphanumeric Phonebook
- Tone burst
- 1 Digital I/O

4.3.3 SRM9020 Trunk Features and Facilities

- 100 entry Alphanumeric Phonebook
- Status Button to access separate outgoing Alpha Status list
- Menu button to access Call-in-Absence and RECALL last dialled numbers
- Combined Call/Clear button
- Any valid MPT dialstrings
- 1 Digital I/O

4.4 SRM9025

The SRM9025 is a dual mode high tier radio for the user who has a big fleet or “systems” need for voice communication.

The SRM9025 Radio consists of a Transceiver Module, a speaker and a Handset that expands the function set of the SRM9020, providing full keypad and a user friendly 2line x 12 characters alphanumeric LCD display.

4.4.1 SRM9025 Handset

The SRM9025 Radio consists of a Transceiver Module, Speaker and a Handset Controller.

The Handset provides the following facilities:

- 2 line x 12 character graphic Display for Phonebook, RSSI, Menu displays, etc.
- Display and Keypad illumination.
- ‘PWR’ button for Switch On/Off.
- ‘SND’ button for placing a call.
- ‘END’ button for End-call / Backspace / Clear / etc.
- ‘M (RCL in the picture)’ button for Menu selection.
- ‘SEL (STO in the picture)’ button for Selection confirmation (in Menus).
- ‘FCN’ and ‘□ (CLR in the picture)’ button for programmable functions.
- Up/Down buttons for scrolling through lists / menus / etc.
- 12 key ITU style alphanumeric keypad.
- Side mounted PTT button.
- Earpiece and Mic for Handset use.
- Front facing Mic for VOX Handsfree. The handset may be used in a normal “Handset” mode (held to the head for private conversations) - or like a fist-mic (with the Speaker remaining enabled)

The SRM9025 has a Voice-Operated Handsfree built into the Handset as standard. A front-facing mic element below the keypad is used to receive audio when the Microphone is in its cradle.

Documents:

The following additional documentation is available for this radio:

SRM9025 Conventional and Trunking Operating Guide;
SRM9000 Installation Sheet.

Options:

The SRM9025 may have the following Option PCBs fitted:

- Parallel IO expansion
- GPS module
- 2/4 Wire 600 Ohm Balanced Interface



4.4.2 SRM9025 PMR Features and Facilities

- 1000 channels (simplex, half-duplex, voting, com-repeater, multiax) with Alpha names
- Four User editable Scan Groups, 124 fixed scan groups
- 12 button Keypad for channel-change, selcall, DTMF
- 250 Separate Selcall-Identity and 100 Selcall-Status phonebook lists.
- User-Editable Selcall-Identity list.
- Free selcall format
- Free Selcall dialling
- DTMF
- VOX Handsfree

4.4.3 SRM9025 Trunk Features and Facilities

- 250 User-editable Alphanumeric Phonebook
- Separate incoming and outgoing Alpha Status lists
- 12 button Keypad for dialling and DTMF
- 20 (0...19) Quick-dial Memories
- Any valid MPT dialstrings
- SDM/EDM and traffic data channel capability
- Ability to receive single slot alphanumeric text messages
- MPT1343 7 digits ANN numbering system
- Incoming Call-Queuing (Calls automatically go into "Missed-Calls" queue for answer at operators convenience)
- Busy Mode set/clear
- Request and Cancel Call-back status's.
- Abbreviated dialling
- Dynamic group assignment
- Talkgroup operation
- VOX Handsfree
- Dual Mode operation (full-PMR facilities)

4.5 SRM9030

The SRM9030 is a dual mode high tier radio for the user who has a big fleet or “systems” need for voice communication.

The SRM9030 radio consists of a Transceiver unit that may be mounted in the vehicle boot or under a seat, and an Alphanumeric Control Unit that is designed to mount on the vehicle console or within view and reach of the driver. A microphone connects to the Control Head and a speaker connects to the Transceiver to provide the audio interface.

4.5.1 SRM9030 Control Head



The Control Head has the following features:

- Buttons down right side of display (F1-F4) are programmable (Up to 6 characters can be displayed on the screen as labels next to the buttons)
- Scroll Rocker Button allows Scrolling through lists (via the Left/Right arrows) and different Menu access (via the Up/Down arrows).
- Numeric Keypad is used to enter numbers directly.
- The 'Green Handset' button completes keypad entries, or selects the displayed entry.
- The 'Crossed Red Handset' button Backspaces/Clears keypad entries, or reverts back to the Main Menu, or Ends the current Call.
- Channel Indicator LED indicates Rx / Tx activity.
- A large 8 line x 14 character graphic Display for Names, Numbers, Button Labels and special Symbols.
- A Volume Knob with position indicator.
- Push On/Off Control as part of Volume knob.
- A Special Function Button (F5) that may be programmed for special operation.
- An extra Function Button (F6) that may be programmed for special operation is available on the top of the microphone.

The Microphone is a traditional configuration with only PTT, Cradle and Mic Audio functionality.

Documents:

The following additional documentation is available for this radio:

SRM9030 Conventional and Trunking Operating Guide;
SRM9000 Installation Sheet.

Options:

The SRM9030 may have the following Options fitted:

- VOX Handsfree
- Parallel IO expansion
- 2/4 Wire 600 Ohm Balanced Interface
- GPS Receiver

4.5.2 SRM9030 PMR Features and Facilities

The following Conventional-PMR facilities are available:

- Up to 1000 channels.
- 124 Fixed and 4 User-editable Scan/Voting/Multi-ax Groups with Nuisance Delete.
- Flexible Selcall tonesets and formatting compatible with most systems.
- User defined tone set.
- 250 entry, User-editable Selcall Phonebook.
- 100 entry Status Phonebook.
- 8 deep Stored-Calls queue.
- DTMF Encode.
- CTCSS.
- Transmit Limit Timer.
- Busy Channel lockout.
- 1 Digital I/O.

4.5.3 SRM9030 Trunk Features and Facilities

The following Trunking facilities are available:

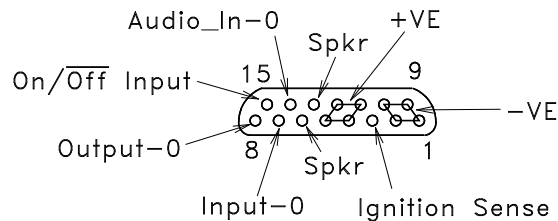
- Up to 250 User Editable Phonebook.
- Any valid MPT1327/43 call types
- Status, SDM/EDM and Traffic Channel Data capability
- Diversion, Busy, Call-Queuing, Call-in-Absence facilities
- MPT1343, 7 digit ANN Numbering Systems
- Dynamic Group Assignments
- Talkgroup operation
- Data messages and Job-Message operation

5. FUNCTION DESCRIPTIONS

5.1 Common Features and Facilities

5.1.1 Standard Transceiver Connectors

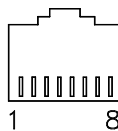
The Rear End-cap has a male DB15 connector :



Viewed looking into Connector
on rear of Transceiver

<u>Name</u>	<u>DB15 Pin numbers</u>
-VE (Gnd)	1, 2, 9, 10
+VE (+13.8V)	4, 5, 11, 12
Speaker	6, 13
General Input-0 (PTT/RTS)	7
General Output-0 (CD/CTS)	8
Ignition Sense Input	3
On/Off input	15
Audio_In0 (Handsfree Mic)	14

The Front End-cap has a 8 pin RJ45 Microphone / Control Unit / Programming connector :



Viewed looking into
Connector on front of Transceiver

<u>Name</u>	<u>Front Pin numbers</u>
Tx-Data (0,5V)	1
Rx-Data (0,5V)	2
On/Off input	3
Mic Ground	4
+13.8V (Switched OP)	5
Handset Audio OP (De-emp)	6
GROUND	7
Mic Audio IP (Pre-emp)	8

5.1.2 Ignition Sense Switch-on / Switch-off

The SRM9000 is able to be switched on automatically when the driver starts the vehicle in the morning.

When the Ignition-Sense Input (on DB15 connector) is taken from a low (0 Volt) to a high (approx greater than ½ Supply Voltage) state the radio can switch on.

Special Application : This line can be used in conjunction with the Power-Down Timer to switch the radio off again, after a short period when the Ignition-Sense line returns low.

The Power-Down Timer is continually reset by the Ignition-Sense input. This means that if the Power-Down Timer is set to a low value (eg. 1 minute) then the radio will switch off shortly after (eg. 1 minute) the Ignition-Sense Input goes low (unless delayed by genuine user activity)

5.1.3 Power-Down Timer Switch-off

The Power-Down Timer allows the SRM9000 to be switched off automatically after a period of user inactivity. Accuracy is to within a few seconds (referenced to the main oscillator stability of +/- 2.5ppm)

The following actions reset this timer:

- Any button/key press including PTT and hookswitch activity.
- Volume adjustment.
- Ignition-Sense Input being high (see above).
- Radio reset (eg. switch-on or if Control Head removed / reconnected, etc.)

The FPP has the following parameters affecting this function:

- Power-Down after N minutes
Range is from 0 to 1440 minutes, 0 = disabled, max = 24hrs

User Switch-Off overrides this function.

Permanent Power Option disable this function.

5.1.4 Alert Tone Level Setting

The Alert Tone level (beep tones, ring tones, etc) can be set up independently of the Audio Volume level.

The Alert Tone volume varies with the Audio volume setting, but is subject to special Max and Min parameters. This means that the Alert Tone volume increases as the volume is increased - but can be limited to a preset maximum level, and also limited so that it cannot be fully turned off.

The Maximum and Minimum values can only be set by the Programmer.

Adjustment range is from 10 (minimum) to 31 (maximum).

(The minimum limit of 10 is imposed so that Alert Tones cannot be completely turned off.

If no tones are desired then the Programmer can disable these completely).

An Alert Offset value (set by the Programmer) sets the initial offset between the Audio and Alert Volume settings. Adjustment range is from -31 (minimum) to +31 (maximum). 0 means that Alert volume = speech volume level.

This value may be adjusted by the user versions.

5.1.5 Menu Structure : SRM9025 / 30 Versions

Applicable to models:

			9025 PMR	9030 PMR
--	--	--	----------	----------

The SRM9025 and SRM9030 radios have a two-level Menu Structure accessible via the Up/Down scroll buttons (on SRM9030) or the 'M' button (on SRM9025 radio).

The first level of Menus provides access to all the "normal" usage functions.

The second level is accessible through the 'Setup' menu and allows less regular functions to be accessed.

The programmer allows some of the menus to be moved between the two levels - or menus may be deleted from the User lists altogether.

eg 1: **Typical PMR Structure :**

CHANNEL		Channel selection
Selcall Phonebook		Selcall Recipient Selection
Status List		Status message selection
Stored Calls		Missed Selcalls and received Status calls
Mute		Mute level setting
Setup	User Options	Keybeeps, DTMF & Illumination On/Off,
	Alert Volume	'Beep' tone level setting
	Contrast	Display Contrast Adjustment
	Information	Programmer File description, SW version, etc
	Selcall Edit	Edit entries in Selcall Phonebook list
	Network	Change to Trunk Mode (Dual Mode Radios only)

eg 2: **Typical Trunk Structure :**

PHONEBOOK		Main Display
Stored Calls		Missed Voice calls and received Status + Data Msgs
Recall		Last 8 placed calls
Status		List of sendable Status Messages
Setup>	User Options	Keybeeps, DTMF & Illumination on/off selection
	Group	Group Calls or Group Membership
	Call Type	Emergency, Priority, Diversion, etc Call facilities
	Information	Programmer File description, SW version and Trunk ID
	PhBook Edit	Allows Phonebook entries to be changed
	Contrast	Display contrast adjustment.
	Alert Volume	'Beep' tone level setting
	Network	Trunk Network-1/2 or Conventional Channel selection

Lower level Menus revert to the current TOP menu after a time of user inactivity (ie. no buttons pressed).

Note: Even if the "Setup" Menu is not programmed (and therefore not accessible via the Menu system), it can still be accessed by a special Dialstring : "*52#"

5.1.6 DTMF Encode

Applicable to models:

			9025 PMR	9030 PMR
--	--	--	----------	----------

The SRM9000 supports DTMF encode via the keypad:

TONES	1209Hz	1336Hz	1477Hz
697Hz	1	2	3
770Hz	4	5	6
852Hz	7	8	9
941Hz	*	0	#

In PMR versions the DTMF facility can be enabled via a “DTMF” Function Button that enables the keypad to send DTMF tones when the buttons are pressed.

In Trunk versions the DTMF keypad facility can be enabled whenever the radio is in a Voice Call or via a DTMF Function button.

For more detailed information refer to the Operating Guide for the specific radios.

DTMF Tone timing is set by the Programmer and tones have defined lengths and gaps (unlike systems that send the tone as long as the button is pressed).

Programmer Parameters affecting DTMF Operation are:

- DTMF Enabled/Disabled
- Link-Establishment-Lime (prior to first tone). Range from 0 to 10000 sec.
- Tone Period. Range from 0 to 2550 sec.
- Inter-Tone Gap. Range from 0 to 2550 sec.
- Lead-Out-Delay (Hang time after last tone). Range from 0 to 9999 sec.

5.1.7 Transmitter Power Levels

The SRM9000 Transceiver has a “High Power” level and a “Low Power” level.

Each channel may be individually selected as either High or Low power (by the Programmer).

The Programmer allows both the “High Power” and the “Low Power” levels to be selected from the following values:

1W, 2W, 2.5W, 4W, 5W, 6W, 8W, 10W, 15W, 20W, 25W.

Other than above, no limitations are placed on the Low and High Power levels by the Transceiver. ie. Low Power may be set higher than High Power.

The Programmer may impose limits based on country specific requirements.

See also the Low-Power Input function (page 31) and the Low-Power Button function (page 69).

5.1.8 External Inputs

The SRM9000 standard one Input (Input-0) on the Transceiver rear DB15 connector and up to eight extra Inputs on the Parallel IO Option Board.

Inputs may be assigned a **Function** (by the Programmer) that is actioned when the line goes Active.

The Programmer can assign the Input as being either :

- **Active-Low** (Function actioned when input goes to Low state), or
 - **Active-High** (Function actioned when input goes to High state)
- and can have a **Debounce-Time** (between 1ms and 30,000ms) specified.

The **Debounce** can be independently applied to the:

- **Set transition**

- eg. Low going transition on an Active-Low specified input or
 High going transition on an Active-High specified input.

- **Clear transition**

- eg. High going transition on an Active-Low specified input or
 Low going transition on an Active-High specified input.

Note that Input **Functions** can be of two types:

- **“Single-Action” Function:** The action is performed when the Input goes Active. The Inactive transition has no effect.
 eg. Channel-Change, Send Selcall, Send Status, etc
- **“Start/Stop” Function:** The action is maintained while the Input is Active and stopped when the Input becomes Inactive.
 eg. Speaker-Mute, PTT, etc

The assigned Function is executed :

- after the Debounce Time (if Debounce-on-Set is selected), or
 - Immediately (if Debounce-on-Set is not selected)
- when the Input changes (from the Inactive state) to the Active state

Start/Stop Functions will be stopped :

- after the Debounce Time (if Debounce-on-Clear is selected), or

- Immediately (if Debounce-on-Clear is not selected)
when the Input changes (from the Inactive state) to the Active state

Either Debounce-on-Set or the Debounce-on-Clear should be set otherwise the input will not be debounced and function jitter may occur, causing multiple executions.

5.1.9 External Input Functions

The following functions are available for assignment to External Inputs.

5.1.9.1 Reset Input : PMR

Type : Single Action Function.

This function performs the same operation as if the User had pressed a Control Head button programmed with this function.

See Page 67 for details.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.2 Channel Up/Down Inputs: PMR

Type: Single Action Function.

This function performs the same operation as if the User had pressed a Control Head button programmed with this function.

See Page 68 for details.

There are no key repeats associated with this input function.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.3 Goto Channel A..D Input : PMR

Type: Single Action Function.

This function causes the radio to go to the Current Assigned A, B, C or D channel.

The Programmer can initialise the A..D channels and these will be used for this function unless they have been redefined by the User.

eg. The radio initially had Goto-A programmed to Channel 2. Activating the rear Goto-A Input would select channel 2.

The User manually selects channel 10 and presses (and holds) the Goto-A Button to re-define it as Channel 10. Activating the Goto-A input will now select channel 10.

Note: The Input Function does not return to original channel on second press, or redefine the channel if held.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.4 Special Encode 1...8 Input : PMR

Type: Single Action Function.

This function performs the same operation as if the User had pressed a Control Head button programmed with this function.

See Page 68 for details.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.5 Volume Up/Down Input : PMR and Trunking

Type: Single Action Function.

This function performs the same operation as if the User had pressed a Control Head button programmed with this function.

There are no key repeats associated with this input function.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.6 PTT-Mic, -Data, -ExtMic, -ExtData Input : PMR and Trunking

Type: Start/Stop Function.

This function switches the radio to Transmit on the current channel while held active.

The source of the transmit audio and the filtering applied, is determined by which function is selected (see description of Analogue Inputs on page 35).

PTT Selected	Audio Source	Audio Compression	Pre-Emphasis Applied
PTT-Mic	Front Connector	Yes	Yes
PTT-Data	Front Connector	No	No
PTT-ExtMic	Rear Input(s)	Yes	Yes
PTT-ExtData	Rear Input(s)	No	No

Note 1: This Input and User-PTT interact in the following manner:

- The Transmitter is activated if Input or User-PTT is activated.
- The first line to be released (External-PTT or User-PTT) will cause the radio to stop transmitting.
- If the Input is deactivated while User-PTT is still held, then the transmitter may momentarily switch off, but User-PTT will resume.
- If User-PTT is released while the Input is still activated, then transmit will cease until either the Input de/re-activates or User-PTT is again pressed.

Note 2: In Trunking Radio the PTT Input line is ignored if radio is not on a Traffic channel.

Programming Recommendation:

Set the Debounce time to at least 16ms (suggest 20ms)

Do not select "Debounce-on-Set"

Select "Debounce-on-Clear"

This will cause the radio to switch to Transmit as soon as the Input is asserted and switch the Transmitter off 16ms after Input is de-asserted.

Audio presented at the rear input is delayed by approximately 16ms as it passes through the DSP, so the PTT-release time should be set to at least 16ms (or the Transmitter will go off before all the signal has been transmitted).

5.1.9.7 RTS/PTT Input : Trunking

Type: Single and Start/Stop Function.

This function will make a NPD (*31*) call to the dialstring in the FPP “Data Identity” when the radio is not on a Traffic Channel.

If the radio is in process of setting up a user requested call, then the Input will be ignored until the radio is on the Traffic Channel.

Once the radio is on a Traffic Channel, its operation is same as the “PTT-Data” function described above.

eg. If the radio is idle (on a Control Channel) and the Input is asserted briefly (longer than Debounce time if Debounce-on-Set selected), then the radio will request a NPD call to the “Data Identity” address. Once the channel has been allocated, subsequent activations will cause the radio to transmit.

This function is designed to be used with the “CTS” Output function (see page 34) to implement a basic external NPD data interface.

Recommendation: Same as for PTT-Data, -ExtData above.

5.1.9.8 Repeater-Defeat Input: PMR

Type: Start/Stop Function.

This function changes the radio Tx and Rx frequencies and CTCSS tones (same as Repeater-Defeat Button Function – see page 69) while held active.

Mixing the External Input and Button Function causes interaction as follows:

- Function Button toggles function on each button press.
- External Input enables function on Set and deactivates function on Clear.

The Chevron (shown next to the RepDef Function Button label) always shows the true state of the function.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.9 Mic Mute Input : PMR and Trunking

Type: Start/Stop Function.

This function causes the Microphone audio to be muted when held active.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Clear

5.1.9.10 Speaker Mute Input : PMR and Trunking

Type: Start/Stop Function.

This function causes the Speaker audio to be muted when held active.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Clear

5.1.9.11 CTCSS-Defeat Input : PMR

Type: Start/Stop Function.

This function causes the CTCSS tone checking on the current channel to be disabled (same as CTCSS-Defeat Button Function – see page 66) while held active.

Mixing the External Input and Button Function causes interaction as follows:

- Function Button toggles function on each button press.
- External Input enables function on Set and deactivates function on Clear.

The Chevron (shown next to the CTCSS Function Button label) always shows the true state of the function.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.12 Low-Power Input : PMR

Type: Start/Stop Function.

This function causes the Transmit power on the current channel to be set to the Low-Power level (same as Low-Power Button Function – see page 69) while held active.

Mixing the External Input and Button Function causes interaction as follows:

- Function Button toggles function on each button press.
- External Input enables function on Set and deactivates function on Clear.

The Chevron (shown next to the LoPwr Function Button label) always shows the true state of the function.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.13 Squelch-Defeat Input : PMR

Type: Start/Stop Function.

This function causes the radio to ignore the Carrier Mute on the current channel (same as Squelch-Defeat Button Function – see page 66) while held active.

Mixing the External Input and Button Function causes interaction as follows:

- Function Button toggles function on each button press.
- External Input enables function on Set and deactivates function on Clear.

The Chevron (shown next to the SqlDef Function Button label) always shows the true state of the function.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Clear

5.1.9.14 Alarm Input : PMR

Type: Single Action Function.

This function causes the radio to activate its Attack Function (same as PMR Alarm Button Function – see page 69) when it goes active.

Recommend: Active Low, Debounce = 1500ms, Debounce-on-Set

5.1.9.15 Alarm Input : Trunking

Type: Single Action Function.

This function causes the radio to send the dialstring stored in the “Emergency Identity” field in the FPP (same as Trunking Alarm Button Function – see page 77) when it goes active.

Recommend: Active Low, Debounce = 1500ms, Debounce-on-Set

5.1.9.16 External-Alert Input : Trunking

Type: Start/Stop Function.

This function causes the External-Alert function to be enabled (same as External-Alert Button Function – see page 68) while held active.

Mixing the External Input and Button Function causes interaction as follows:

- Function Button toggles function on each button press.
 - External Input enables function on Set and deactivates function on Clear.
- The Chevron (shown next to the ExAlrt Function Button label) always shows the true state of the function.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.17 Handsfree Input : PMR and Trunking

Type: Start/Stop Function.

This function causes the Handsfree Function to be enabled (same as HandsFree Button Function – see page 69) while held active.

Mixing the External Input and Button Function causes interaction as follows:

- Function Button toggles function on each button press.
 - External Input enables function on Set and deactivates function on Clear.
- The Chevron (shown next to the HFree Function Button label) always shows the true state of the function.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.9.18 Call-1..4 Inputs : Trunking

Type: Single Action Function.

This function causes the radio to place a call to the dialstring stored in SFD 1, 2, 3 or 4 (same as Call-1..4 Button Function – see page 77) when it goes active.

Recommend: Active Low, Debounce = 50ms, Debounce-on-Set

5.1.10 External Outputs

The SRM9000 has one Digital Output (Output-0) on the Transceiver rear DB15 connector and up to eight extra Outputs on the Parallel IO Option Board.

Outputs may be assigned a **Function** (by the Programmer) that will set the line Low (active) under certain conditions.

Note 1: Outputs have open-collector transistor drivers and are by default Active-Low.

Note 2: Outputs are released when the radio is switched off, but re-activated to their previous state a few seconds after power-on.

5.1.11 External Output Functions

The following functions are available for assignment to External Outputs.

5.1.11.1 Transmit Output : PMR

This Output function activates whenever the radio is Transmitting RF.

5.1.11.2 Carrier-Detect Output : PMR

This Output function activates whenever the radio is receiving a RF carrier.

5.1.11.3 Valid-Signal Output : PMR

This Output function activates whenever the radio is receiving a valid signal.

A Valid Signal is different depending on type of channel selected:

Channel	Valid Signal if:
No CTCSS, No Selcall	RF Carrier above Mute
CTCSS, No Selcall	RF above Mute plus correct CTCSS
Selcall, No CTCSS	RF above Mute and Selcall Mute open
CTCSS and Selcall	RF above Mute with correct CTCSS and Selcall Mute open.

5.1.11.4 External-Alert Output : PMR

This Output function activates when a selcall is received that activates the External Alert function. The Output is switched on and off in time with the Alert Ring tone.

The External Alert output is de-activated:

- when the External-Alert Timer (from initiating Selcall) expires.
- when the radio receives another selcall stopping all alerts or just the External-Alert.
- when the User answers the call.
- when another function cancelling the Alerts occurs.

5.1.11.5 External-Alert Output: Trunking

This Output function activates when a call is received. The Output is switched on and off in time with the Alert Ring tone.

The “External Alert Delay” FPP parameter specifies how soon the output becomes active after the call is received

The External Alert output is de-activated:

- when the User answers the call.
- when the Network times out and the call is cancelled.

5.1.11.6 Music-Mute Output : PMR

This Output function activates whenever a valid signal is being received.

This includes:

- during User-PTT
- while Valid Signal (see description under “Valid Signal” on page 33)
- while Alerting from a Decoded Selcall.

5.1.11.7 Music-Mute Output : Trunking

This Output function activates whenever the radio is alerting (incoming or outgoing call) and while on a Voice Traffic Channel.

It is not active for keybeeps , errorbeeps, or during NPD data calls.

5.1.11.8 Decode-1..4 Outputs : PMR

This Output function is activated when Selcall Decode 1, 2, 3 or 4 is received.

The Output is de-activated when the same Decode is received with an appended Reset tone.

5.1.11.9 Status-1, 3, 5, 7 Outputs : Trunking

This Output function is activated when Status 1, 3, 5 or 7 is received.

The Output is de-activated when the N+1 Status is received (ie Status 2, 4, 6 or 8).

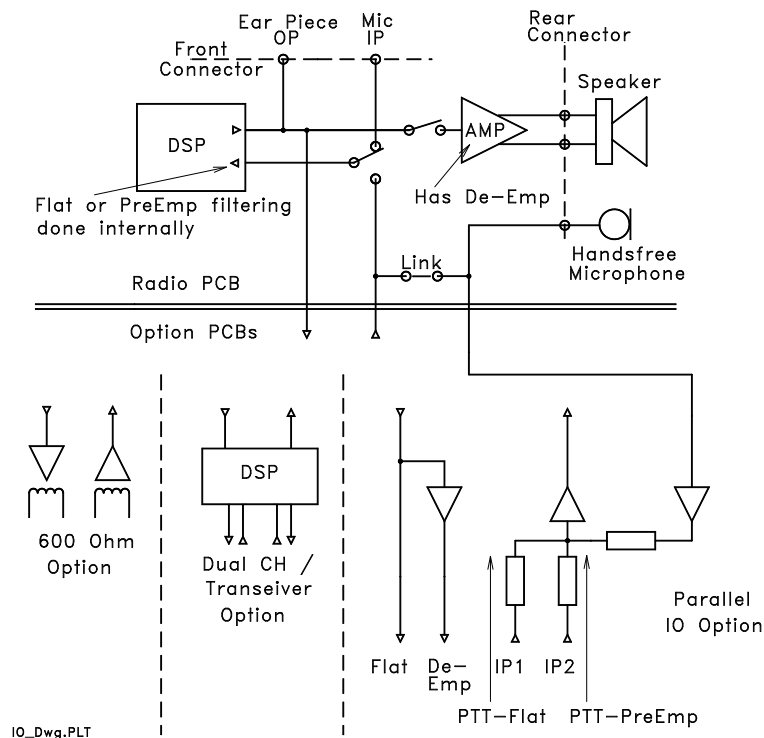
5.1.11.10 CTS Output : Trunking

This function is activated whenever the radio is in a NPD call.

It is designed to be used in conjunction with the RTS/PTT Input Function (page 30).

5.1.12 Analogue Inputs and Outputs

The SRM9000 Audio paths are shown in the diagram below :



The Audio Input to the Radio DSP is normally switched between the Front connector and the Handsfree input. The Handsfree Audio is routed via the Options connector and doubles as Option input when an Option PCB is fitted.

Audio is always passed in and out of the DSP as flat audio (no Pre- or De-Emphasis).

Received audio has the de-emphasis added by Hardware at the appropriate end point (eg. Audio amp, Earpiece amp, etc).

Audio to be transmitted, is passed to the DSP as flat audio.

Four different PTT commands are available:

- PTT-Mic (Audio is sourced from front connector, compressed and pre-emphasised).
- PTT-Data (Audio is sourced from front connector, not compressed and no pre-emphasis) –
- PTT-Ext (Audio is sourced from Option PCB, compressed and pre-emphasised).
- PTT-ExtData (Audio is sourced from Option PCB, not compressed and no pre-emphasis)

5.1.13 Options

The SRM9000 Transceiver has great flexibility in its handling of Option boards. The entire bottom half of the case is available for various option PCBs. A multi-pin internal connector provides interconnection to the Main Radio board.

Two RJ45 punch-outs on the rear end-cap allow the external connections to be made to the various options.

The following Options are available:

- Handsfree Option (housed on Main Radio PCB)
- Parallel Input/Output Option (Type-1 IO Option)
- GPS Option (Fits on Type-1 IO Option Brd)
- 2/4 Wire 600 Ohm Interface Option
- Type-2 IO Option (for Dual Control Heads or Dual Transceivers)

5.2 PMR Functions

5.2.1 Channels

Applicable to models:

9005	9010	9020	9025	9030
------	------	------	------	------

A SRM9000 Channel may be of one of the following forms:

- Normal
- Scan Group
- Voting Group
- Multiax Group

Normal Channels have the following parameters:

- Name and Number.
- Rx and (optional) Tx Frequency.
- 12.5 / 20 / 25kHz Channel Spacing selection.
- Separate Rx and Tx CTCSS.
- Hi/Lo Tx Power select.
- Community Repeater Yes/No select.
- Hidden Yes/No select (eg. if channel is only available to Scan, Vote or Multiax Groups, and not otherwise selectable by the user).
- Separate Rx and Tx Lockout flags (for closed Selcall operation).
- Selcall Enabled Yes/No selection, and Open / Closed Selcall operation.
- Which Selcall Encode Mask to use on the channel.
- Which of the eight Selcall Decodes are enabled on the channel.

Scan Groups have the following parameters:

- Name and Number
- a list of (15) Normal Channels making up the group.
- Priority Channel field
- Select whether Selcall-Scanning is enabled
- see Scanning description below.

Voting Groups have the following parameters:

- Name and Number
- a list of Normal Channels making up the group.
- see Voting description on page 42.

Multiax Groups have the following parameters:

- Name and Number
- a list of Normal Channels making up the group.
- see Multiax description on page 43.

5.3 Scan Function

Applicable to models:

9005	9010	9020	9025	9030
------	------	------	------	------

Scanning consists of sequentially searching up to 15 channels for a valid signal (RF+privacy tone). When found the radio will stop on that channel until the signal disappears again.

The Microphone needs to be in cradle for the radio to scan.

While listening on the channel, the User can PTT on that channel. After the signal disappears the radio will remain listening on the channel for a programmable time (typically 3 seconds) before resuming scanning.

PTT is inhibited while the Mic is in cradle.

A **“Nuisance-Delete”** or **“Skip”** function allows unwanted channels to be temporarily deleted from the scan list. Changing Groups or exiting Scan restores the list. This function is only accessible from the Scan Menu.

If a **Priority Channel** is assigned then the radio will interleave a check of this channel between each other channel check. The radio will also check the Priority Channel every few seconds while stopped on another channel. If a signal is found on the Priority Channel then the radio will switch to that channel immediately.

The Priority Channel is automatically selected when the Microphone is removed from cradle.

A **Selcall-Scanning** option can be enabled (individually for each Group) so the radio will only stop on a channel if it receives a valid selcall Decode on that channel, otherwise the channel is ignored.

SRM9010 Scanning : Scan Groups are assigned to channel locations in the SRM9010. This allows up to 10 Fixed Scan Groups to be selected.

When a Scan Group is selected, the assigned channel number flashes while scanning, or displays a steady channel number (units digit) when a site is selected.

Nuisance-Delete and User editing of scan groups is not supported.

SRM9020 Scanning : Scan Groups are assigned to channel locations in the SRM9020. This allows up to 100 Fixed Scan Groups to be selected.

When a Scan Group is selected the assigned channel name flashes while scanning and displays a steady channel name when a site is selected.

Nuisance-Delete and User editing of scan groups is not supported.

SRM9025 and SRM9030 Scanning : Scanning is enabled via a SCAN function button. 4 User editable Scan Groups and 124 Fixed Scan Groups can be selected from this menu. Scan Group and Channel Names and Numbers are shown to provide the user a clear indication of which group is being scanned and which channel (if any) is currently selected. Channels with unwanted activity can be temporarily deleted using the Nuisance-Delete feature.

The User can add, delete or change the priority channel assignment in any of the User-editable Scan Groups.

5.3.1 Scan Facility of the Radios in more Detail

5.3.1.1 Scanning on SRM9010

Because of the absence of Function Buttons on the SRM9010, Scan-Groups can be assigned to Channel Positions (by the FPP). This allows a Scan-Group to be selected in the same way that a normal channel is selected.

While the Scan-Group is selected the radio searches the programmed channels and stops if a signal is found.

While scanning the Channel-Position number is shown flashing in the display. When the radio is stopped on a channel the stopped Channel Number is displayed (non-flashing).

PTT is on the programmed Priority-Channel, or if no Priority-Channel is defined then Mic-off-hook will select the scan channel last received on, or if none then the first channel entered in the group.

Programming Recommendation: SRM9010 Scan-Groups should be set up with a “Priority Channel” defined.

This ensures that the radio transmits on a known channel whenever PTT is pressed. Nuisance-Delete and User-Editing of Scan-Groups is not available on the SRM9010.

5.3.1.2 Scanning on SRM9030

In the SRM9030 Scan-Groups can only be assigned as ‘Hidden’ channel-entries (The FPP ensures this). This means that Scan-Groups will not show up in the normal Channel List – they will only be accessible via the Scan Menu.

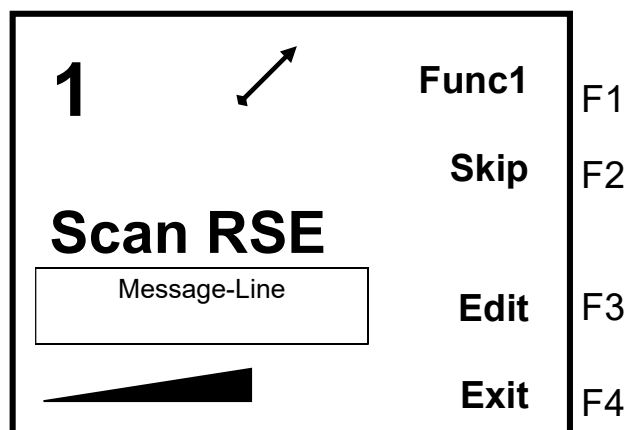
The SRM9030 has 4 User-Editable Scan-Groups and up to 124 Fixed Scan-Groups (assuming no Vote or Multi-ax groups are assigned).

In the normal Channel Menu, the display has four indicators (‘1’, ‘2’, ‘3’ and ‘4’) that appear (between the F1 and F2 Label-Texts) showing which of the User Scan-Groups (1...4) the displayed channel is a member of.

Scanning is activated by pressing the “Scan” Function Button, and the display changes to the Scan Menu.

5.3.2 Scan Menu

The display shows the name of the current Scan-Group (“Scan RSE”), which can be changed using the Left/Right Scroll Buttons. The Scan-Group Number (1...4 if User Scan-Group, or blank for Fixed Scan-Groups) is shown at top-left in the display.



While the Scan Menu is displayed the radio is scanning the selected Scan-Group.

The Scan Menu does not time-out. Normal exit is via F4 (Exit).

The RSSI indicator shows the received signal strength as the radio is scanning.

While scanning the Message-Line is blank and the “rotating arrow” symbol is shown.

The F1 Function button has the same assignment as in the normal Channel Menu. This allows special functions (eg. Selcalls, etc.) to be used whilst scanning. The F5 (Orange

button) and F6 (on Microphone) are also still active. The F2, F3 and F4 buttons are reassigned as shown above.

When stopped on a channel, the Message-Line shows the name of the selected site, and the “rotating arrow” symbol is replaced by the Speaker symbol.

“Skip” temporarily deletes the channel from the Scan-Group.

Skip is only shown when stopped on a channel and the Mic is in Cradle.

The Priority Channel cannot be skipped.

“Edit” opens up the Scan-Edit menu for the selected Scan-Group and allows Channels to be added, deleted or set as the priority channel (see below).

While listening on the channel, the User can PTT on that channel (display shows selected site on the Message-Line). After the signal disappears (or Microphone is placed back in Cradle) the radio will remain listening on the channel for a programmable time (“Scan Restart Timer” typically = 3 seconds) before resuming scanning.

The Microphone needs to be in cradle for the radio to scan. Removing the Microphone from Cradle is a good way of stopping scan on a particular channel. However the ‘Out-of-Cradle Timer’ will cause an alert if the Mic is left off hook for too long.

If the radio is not stopped on a channel (and no Priority channel is defined and the Mic is removed from Cradle), then the channel shown on the display prior to “Scan” being activated is selected.

DTMF (if enabled) is only active when the Mic is out of cradle.

Up/Down Scroll Buttons allow access to the other normal menus (not Main Channel Menu).

The Keypad may not be used for quick channel change (eg. 456#) in this Menu.

5.3.3 Scan-Edit Menu

In the Scan-Edit Menu the display shows the full Channel List (Names) and the Message-Line shows either “Member”, “Priority” or is blank for channels that are not scanned.

The Function buttons are: F1=Prty, F2=Del, F3=Add, F4=OK

“Prty” makes the displayed Channel the Priority Channel (replacing any previous Priority Channel assignment, which is then made a normal member of the group).

“Add” adds the displayed Channel. If the Scan-Group is full, then error-beeps sound.

“Del” removes the displayed Channel.

“OK” exits back to Scan Menu (like Red-Handset).

Up/Down Scroll Buttons are disabled.

Keypad allows Channel-Change strings (eg. 456# → Channel 456) to valid channels that may be included in the Scan Group (ie. not Vote or Multiax channels).

5.3.4 FPP Scan Options

The Programmer allows the following parameters to be set that affect the operation of the Scan Function:

Scan Restart Time: This is the delay time that the radio remains tuned to a channel after the Carrier has disappeared.

Priority Check Interval: This is the time between checks of the Priority Channel whilst listening to another channel.

Out-of-Cradle Time: This is the time that the Microphone may remain off hook (without PTTing and without receiving a signal) before the alert sounds (to remind the user to place the Mic back in cradle).

5.4 Voting Function

Applicable to models:

9005	9010	9020	9025	9030
------	------	------	------	------

Voting is activated as soon as a Vote Group is selected (just like a normal channel) - see page 37.

Voting consists of sequentially searching up to 15 Normal Channels for a valid signal. When a signal is found, the radio waits for the Link-Establishment-Time (LET) and then scans all channels in the group once more. It then selects the channel with the strongest signal to listen to. Once this signal has been present for more than ½ second the channel is confirmed for Transmit, meaning the User can PTT on this channel. All subsequent PTTs will be on this channel, until the process repeats.

When the signal disappears the radio will stay on the channel for the Revote-Dwell-Time (RDT) before restarting its search. This means that short breaks in the conversation (eg between overs) will be ignored and the whole conversation can be carried out on the same base site.

While the radio is waiting for the LET to expire, it is tuned to the last voted site. If the signal on this site exceeds a Programmer defined threshold, the radio will open up its audio and abort the rest of the vote process. This means that (in strong signal areas) the radio will select a suitable site almost instantaneously.

The **Programmer** allows the following parameters to be set that affect the operation of the Voting Function:

Display Vote/Multi-ax Channel – Yes/No : When the radio has selected a site for Receive/Transmit then the Site Name or Number is displayed (if possible).

Stop-Voting while off-Cradle – Yes/No : This suspends the voting process until the Microphone is placed back on hook. This forces an entire conversation to take place on one site.

Vote Without CTCSS – Yes/No : This allows CTCSS to be ignored during the voting process – thus speeding up the vote if there is no likelihood of interfering channels.

Link-Establishment-Time [Range from 0 to 2550ms] : This is the time that the radio waits for all sites to be up) after detecting an initial signal. This allows all base signals to be at full power when the radio measures and compares the signal strengths.

ReVote-Dwell-Time [Range from 0 to 2550ms] : This is the time that the radio waits (after loss of Signal) before restarting to vote.

Voting Mute Level [Range from 0 to 15] : This is the Mute level used on voting channels. This level is set independently from Normal channels to remove it from User adjustment.

Override Sensitivity [Range from -110dBm to -65dBm, or disabled] : If a the last voted site is found to be greater than this level, then the voting process is cut-short and the channel selected immediately.

5.5 MULTIAX Function

Applicable to models:

9005	9010	9020	9025	9030
------	------	------	------	------

A MutiAx (Multiple Access) channel is effectively a list of Community Repeater Channels.

While there is no signal present, the radio scans all channels for a signal.

When a signal is found, the radio checks it for CTCSS and, if correct, listens on that channel, allowing PTT if the user PTTs.

If a non-valid CTCSS is detected, the radio resumes scanning.

When the user presses PTT (if not already listening on a channel) then the radio searches for the first free channel and transmits there.

This allows the traffic capacity of a Community Repeater site to be increased by simply adding co-sited community repeaters. The radio does all the hard work of determining which channel to listen to or to use.

The **Programmer** allows the following parameters to be set that affect Multiax operation:

Display Vote/Multiax Channel – Yes/No : When the radio has selected a Base for Receive/Transmit then the Base Name is displayed on the display Message Line.

5.6 Dual-Watch Channel

Applicable to models:

9005	9010	9020	9025	9030
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The Dual-Watch function allows the radio to periodically monitor a single Dual-Watch (DW) Channel for a signal above mute threshold.

The function only monitors the DW Channel on Normal channels (ie. not for Voting, Multiax or Scanning channels).

Dual-Watch FPP parameters:

- DW Channel (blank or channel number)
- DW Interval (range from 0.5 to 25.5s)
- DW Pause Time (range from 1 to 10s)

The DW functionality defaults to ON after being FPPed (if the DW Channel is defined).

The User may disable the DW functionality by setting the “Dual Watch” selection to OFF (eg. in SRM9030 Setup : User_Options Screen).

When there is no signal on the Current (displayed) Normal Channel, the radio scans the current and DW channel.

If listening on the Current Channel, the radio checks the DW channel at the “DW Interval” rate.

If a signal is found on the DW channel, then the radio listens there while signal is present, plus the “DW Pause Time”. (It does not monitor the current channel).

User PTT will occur on the Current Channel (except when receiving a signal on the DW channel). (The radio does not monitor the DW channel during Transmit).

Selcalls will be sent on the Current channel (if not receiving on the DW channel), or, on the DW channel (if receiving on the DW channel). This also applies to queued selcalls. Queuing rules are applied at time of sending the selcall to air.

DW is paused while the radio is in the CALLED or ON-CALL state (eg. Crochet-Icon shown or flashing on SRM9030 Control Head).

Note : It is not recommended to use CTCSS with the Dual-Watch function, as an extended gap in the audio will occur on return to the Current channel (after checking the DW channel) due to the CTCSS decode time.

5.6.1 Dual-Watch on SRM9010

There is generally no indication whether Dual-Watch is active or not.

When no signal is present on the Dual-Watch channel, the radio displays the Current channel number.

When a signal is present on the Dual-Watch channel the display changes to the DW channel number (least-significant-digit).

5.6.2 Dual-Watch on SRM9030

When Dual-Watch is enabled, the Message-Line in the Main Channel Screen will show the DW Channel number and “Dual Watch” text.

When receiving (or Transmitting) on the DW channel, the display shows the DW Channel Name and/or number.

5.7 PTT Limit, PTT Inhibit and Conversation Timers

Applicable to models:

9005	9010	9020	9025	9030
------	------	------	------	------

The PTT function can be set up for special operation by the programmer:

- PTT Inhibit : disallows Transmit when receiving a signal. This may be used to stop users interrupting other transmissions.
 Note 1 : All channels assigned as “Community Repeaters” have PTT inhibit when another User Group is accessing the channel.
 Note 2 : Care must be taken to ensure that PTT inhibit does not interfere with Selcall Acknowledges.
- PTT Limit Timer : sets a limit on a single continuous transmission. The last 10 seconds may have warning beeps to indicate Transmit will cease.
- Re-PTT Timer : this imposes a time limit between successive transmissions.
- Conversation and Re-Conversation Timers : these limit the total length of a conversation (multiple overs) and the time before a conversation can be re-started.
 When the User initially PTTs the Conversation Timer is started. When this timer expires the Re-Conversation Timer is started. The User may PTT while the Conversation Timer is running but not while the Re-Conversation Timer is running.

5.8 Selcall

Applicable to models:

9005	9010	9020	9025	9030
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The Selcall facilities are common for all the SRM9000 mobile variants. The level of functionality is determined by the capabilities of the user interface on the Controller.
ie. Transceiver implements same selcall functions for all radio models, but the User can only access certain functions, depending on whether Mic, Handset, or Control Head are fitted.

General features of the Selcall system are :

- Encodes and Decodes are assignable per channel.
- Selcall may be individually enabled on any channel, plus Open/Closed Selcall selection.
- Multiple Decodes provide more flexibility for setting up user features.
- 1 of 250 programmable Encodes per channel.
- each Encode may individually have the following attributes set:
 - each digit may be 1 of 4 tone periods.
 - each digit may be 1 of 2 tone sets.
 - Lead-in and Lead-out delay.
 - Queue/Inhibit on Busy/Carrier options
- Up to 8 Decodes that may be individually enabled on a per-channel basis.
- Encode and Decode sequences may be up to 20 digits and have up to 8 Variable Identity and 4 Variable Status digits.
- Freeform selcall available from Keypad
- Tone Burst
- Group Tone and Reset Tone handling and “3rd Tone Reset” facility.
- ANIs on PTT On/Off and/or Microphone In/Out of Cradle
- Two Encode sequences may be concatenated.
- Auto-Acknowledge and Auto-resend if a specified Decode is not received.
- Stun and Revive.

The SRM9000 supports the following Tone Sets:

- CCIR : CML, ST500, Sigtec, Sepac,
- CCIRH : Sigtec
- EEA : CML, ST500, Sigtec, Sepac
- EIA : ST500, Sigtec, Sepac
- ZVEI : CML, ST500
- ZVEI-1, ZVEI-2 : Sigtec, Sepac
- ZVEI-3 : ST500/CML, Sigtec, Sepac
- DZVEI : ST500/CML
- NATEL : Sigtec
- User Defined Tone set

Supported Tone Periods (ms) :

20, 33, 40, 60, 70, 80, 100, 120, 140, 150, 200, 210, 250, 255

See also :

- Input Functions : Reset (page 28), Special Encodes (page 28)
- Output Functions : Decode 1...4 (page 34)
- Button Functions : Monitor/Reset (page 67), Reset (page 67), Send-CE (page 67), Send-2 (page 67), Special-Encodes (page 68), External-Alert (page 68).

5.8.1 Selcall Masks

A Selcall Mask defines the on-air format.

This Mask contains fields for:

- Own Address (I) up to 8 digits in length
- Variable ID Digits (#) up to 8 digits in length
- Variable Status Digits (*) up to 4 digits in length
- Multiple Gaps (-)

These fields may be interspersed with fixed digits in the definition of the Encode or Decode Mask. A maximum of 20 digits is allowed in any Mask.

The Mask also contains fields for assigning the Tone-Duration and Toneset (Encode Mask only) for each tone in the Mask.

Eg.

Selcall Encode Mask	
Mask	12-####IIII-**
Duration	22200000000100
Toneset	22211111111111
Options	
Link Establish Time	250 mS
LeadOut Delay	100 mS
<input type="button" value="Open"/>	Selcall Mute when sent
Queuing	<input type="button" value="Queue on Bus"/>
Re-send after	0 S if Decode 1 not recvd
Maximum Re-sends	0
Append Encode	0
Encode Number	3
Own Id : 1234 Toneset 1 : CML_CCIR Toneset 2 : CML_EEA Duration 0 : 20 mSec Duration 1 : 40 mSec Duration 2 : 100 mSec Duration 3 : 40 mSec	
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Separate Masks exist for:

- 250 x Channel-Encodes which may be individually assigned to one or more channels (see above example)
- 8x Decodes which may be individually enabled on any one (or more) channels (see examples below).

Eg. Per-Channel assignment:

The **Channel Editor** dialog box is shown with the following settings:

- Channel Number:** 51
- Name:** Mt Beth
- Ch Options:** Selcall
- Selcall Enabled:** ☒
- Open Selcall:** ☒
- Rx Lockout:** ☐
- Tx Lockout:** ☐
- Selcall Encode:** 5
- Active Decodes:**
 - ☒ Decode 1
 - ☒ Decode 2
 - ☒ Decode 3
 - ☐ Decode 4
 - ☐ Decode 5
 - ☐ Decode 6
 - ☐ Decode 7
 - ☒ Decode 8

Buttons: OK, Cancel

Eg. Decode Mask definition and Options:

The **Decode Mask** dialog box is shown with the following settings:

- Mask:** IIII####-**
- Duration:** 00000000100
- Decode Number:** 2
- Own Id:** 1234
- Toneset:** CML_CCIR
- Duration 0:** 20 mSec
- Duration 1:** 40 mSec
- Duration 2:** 100 mSec
- Duration 3:** 40 mSec
- Start:** [Dropdown] Alert: Ring for 30 s
- No:** [Dropdown] External Alert for 0 s after 0 s
- Acknowledge with Selcall Encode:** 1 after 2 s
- Selcall Mute:** No Change
- DoTimed Reset:** ☐
- CALLED Icon:** Flashing
- Store Call on Alert Timeout:** ☒
- User PTT:** No Change
- Mobile:** No Change

Buttons: OK, Cancel

Acknowledge Masks use one of the 250 Encode Masks (see above example)

8 x Special-Encodes similarly reference any of the Encode Masks.

ANI functionality is provided by PTT On/Off and/or Microphone In- and Out-of-Cradle facilities.

eg.

The screenshot shows the 'SRM9000 FPP PMR MOBILE - [Channel Options]' window. The menu bar includes 'File', 'View', 'Options', and 'Help'. Below the menu bar is a toolbar with icons for a microphone, speaker, and other functions. The main area is divided into several sections:

- Microphone Options:**
 - Tx Limit Timer: 60
 - Re-PTT Limit Timer: 0
 - Conversation Timer: 0
 - Re-conversation Timer: 0
 - ☐ Transmit Inhibit
 - ☒ Tx Limit Beeps
- PTT On:**
 - ☐ UnMute Selcall
 - Send Encode: 5
 - Hold-Off (Sec): 60
- PTT Off:**
 - Send Encode: []
 - Hold-Off (Sec): []
- Mic In Cradle:**
 - ☐ Mute CTCSS
 - ☒ Mute Selcall
 - ☒ Clear On-Call Indicator
 - ☒ Do Timed Reset
 - Send Encode: 6
- Mic Out of Cradle:**
 - ☐ UnMute CTCSS
 - ☒ UnMute Selcall
 - ☒ Set On-Call Indicator
 - ☐ Mute External Speaker
 - Send Encode: 7

At the bottom, a status bar reads: 'Minimum period of time between PTT-on encodes sent. 1 - 999 Sec (0 = disabled)'.

5.8.2 User Selcall Facilities

In the SRM9000 the User can vary both the destination Identity and the Status. Two lists may be provided (version dependent) so that these may be set separately and individually. The Phonebook allows the User to select different destination IDs with up to 8 Variable ID Digits (VIDs).

The Status List allows the User to select different Status to send to the selected destination. Status may have up to 4 Variable Status Digits (VSDs).

The Programmer has maximum length parameters for User-entered VIDs and User-entered VSDs.

If more than the maximum VIDs are entered then the selcall is treated as Free-form. Entering more than the maximum VSDs is classed as an error and the entry will be ignored.

In the descriptions below:

- "current Phonebook entry" refers to the entry that would be seen if the Phonebook menu were displayed (if applicable to radio variant)
- "current Status value" is a stored value set by the User from a list or keypad entry (if applicable to radio variant).

5.8.3 Sending Encodes

When an Encode is sent the fields within the Mask are filled in the following manner:

- I field (Own-ID) are inserted from the Own-ID entry from the FPP file.
- # field (Variable ID Digits) are inserted from a defined location (Radio variant specific, eg. from “current Phonebook entry” on SRM9030).
- * field (Variable Status Digits) are inserted from the “saved Status value” which has been selected by the user.

5.8.4 Freeform Selcalls

User entered selcalls (greater than the allowed Max Number of VID digits) are treated as freeform selcalls.

Toneset and Duration information is taken from the equivalent digit position in the Channel-Encode Mask.

If more freeform digits are entered than are specified in the CE Mask, then the information for the last digit (in CE Mask) is used for all remaining digits.

5.8.5 Re-send until Acknowledge

When the “Re-send if Decode-N is not received within X seconds” option is enabled on an Encode, the radio performs as follows:

- The time (X) is measured from when the Encode is actually sent (eg. for queueable Encodes)
- When a re-send occurs, any queued Encodes (possibly submitted in the last X sec) will be sent before the Re-send-Encode.
- When the Decode-N is received, all its assigned actions (eg. alerts, etc) will be performed.

5.8.6 Append Encode-N

The “Append Encode-N” option allows many varied forms of encode sequences to be created using two or more Encodes.

When the option is enabled, the radio simply sends the indicated Encode when the current Encode Lead-out-Delay has expired.

All the parameters of the Appended-Encode are processed as per normal.

User entered freeform digits will ignore the Appended Encode and it will not to be appended to the freeform sequence.

If appended Encodes create a recursive loop, then the On/Off button may be used to exit (and turn the radio off).

5.8.7 Encode Queuing

Selcall queuing is dependent on the following:

- whether “Tx-Inhibit” is activated in the FPP;
- which “Queuing” option is selected (for the particular Encode) in the FPP.

If the **Tx-Inhibit** option is set and the current channel has a RF carrier, then a submitted Encode will not be sent.

If the per-Encode **Queuing: “Inhibit on Busy”** option is selected, a submitted Encode will only be sent if the channel is not “Busy” (see below). If Busy, then the Encode will be discarded.

If the per-Encode **Queuing: “Queue on Busy”** option is selected, a submitted Encode will be sent immediately if the channel is not “Busy” (see below). If Busy, the Encode is queued until the channel is no longer Busy. Only one Encode can be queued at any time.

If the per-Encode **Queuing: “Inhibit on Carrier”** option is selected, a submitted Encode will only be sent if the channel is free. If a Carrier exists, then the Encode will be discarded.

If the per-Encode **Queuing: “Queue on Carrier”** option is selected, a submitted Encode will be sent immediately if the channel is free. If a Carrier exists, the Encode is queued until the channel is free. Only one Encode can be queued at any time.

The above description also applies to Delayed-Acks and repeated-Encodes.

The above queuing operation is also valid on Community Repeater and Multi-ax channels.

5.8.8 Busy Indication

A channel is busy as defined below:

Channel Type	Busy	Not Busy
No CTCSS defined and Selcall not active	Never	Always
CTCSS on Rx freq and Selcall not active	Signal with incorrect CTCSS	Channel free or Signal with correct CTCSS
No CTCSS defined and Selcall active on Channel	<u>Closed-Selcall Operation</u> when Selcall Mute is Closed. <u>Open-Selcall Operation</u> Never	<u>Closed-Selcall Operation</u> when Selcall Mute is Open, or Channel free. <u>Open-Selcall Operation</u> Always
CTCSS on Rx freq and Selcall active on Channel	<u>Closed-Selcall Operation</u> when Selcall Mute is Closed, or invalid CTCSS received. <u>Open-Selcall Operation</u> Signal with incorrect CTCSS being received.	<u>Closed-Selcall Operation</u> when Selcall Mute is Open, or sig with correct CTCSS or Channel free. <u>Open-Selcall Operation</u> Channel free or Signal with correct CTCSS.

5.8.9 Receiving Decodes

When a selcall is received that matches one of the active Decodes on the current channel, the assigned actions are performed (alerts, acknowledges, etc) and then the Variable ID Digits (VIDs) and Variable Status Digits (VSDs) are passed to the User Interface for appropriate display. If the User interface is simple (eg. the SRM9010) then this may mean no further action is taken.

5.8.10 GROUP-Tone Handling

When a Decode is received containing a Group-Tone replacing one or more digits, the respective Decode actions are performed with the following exceptions:

- An Alternate Alert is sounded once (only if the Alerts are enabled for that Decode Response).
- PTT may be optionally inhibited.
- No Acknowledge is sent (override of Decode Response setting)
- Timed-Reset is not performed (override of Decode Response setting)
- The “ON-CALL” indicator is set (if the Decode did not have the “CALLED” indicator ignored)

The Programmer contains the following global parameters pertaining to all Decodes:

- PTT Inhibit ← Tick box
- Group-Alert Tone = [Ring, Bip, 2xBip, Beep, Urgent] once

5.8.11 3rd Tone Reset and RESET-Tone Handling

This section describes operation:

- If Third-Tone-Reset is enabled, and the first 3 tones of an active Decode are received (but Decode is not received in full).
- If an active Decode is received with an appended Reset-Tone.
- If an active Decode is received containing a Group-Tone and an appended Reset-Tone.

When one of the above events occur the SRM9000 performs the actions associated with the Programmers global Third-Tone-Reset and Reset-Tone parameters:

- Enable CTCSS Mute ← Tick box
- Close Selcall Mute ← Tick box
- Stop Alerts ← Tick box
- Re-Enable PTT ← Tick box
- Clear CALLED State ← Tick box

5.8.12 Acknowledges

If a Decode is received containing VIDs, then these are copied to the VID field of the Acknowledge Encode (if applicable).

If an Acknowledge Encode has VIDs, but the triggering Decode does not have VIDs, then the Acknowledge VIDs will be set to zero for sending.

VSDs in an Acknowledge will be set from the “saved Status value” in the radio.

Any queued Encodes will be canceled when an Acknowledge is sent.

5.8.13 Automatic-Number-Identification (ANI)

If an ANI contains VIDs and/or VSDs then these will be taken from the “current Phonebook entry” and “saved Status value” respectively.

If the current Phonebook entry is a free-form selcall then the ANI VIDs will be set to zero.

Any queued Encodes will be canceled when an ANI is sent.

5.8.14 Received Status Digits

A Tick-Box option allows the VSDs in a received Decode to be copied to the “saved Status value”.

If such a Decode occurs then the “saved Status value” is overwritten in a right-justified fashion (and padded with leading zeros if necessary).

5.8.15 Alerts

Alert tones (and External Alerts) started by received Decodes can be reset by any of the following events:

- PTT pressed.
- Mic placed in or out of Cradle.
- Reset Function button is pressed.
- The Crossed-Handset is pressed (SRM9030)
- A Decode is received with the Stop-Alerts option set.

5.8.16 Stun/Revive

When a Decode is received with the STUN option set, then the radio will behave as follows:

- The radio will send an Acknowledge (if programmed)
- All User controls are disabled, including rear PTT (except On/Off)
- Audio is muted
- Display shows “STUNNED”
- Radio stays on current channel

Once STUNNED the radio may be REVIVED only when:

- A Decode is received with the REVIVE option set
- The radio is reprogrammed

Note: It is not valid to send a “stunned” radio selcalls as it may behave unpredictably when Revived. Any such selcalls received will not outwardly affect the “stunned” radio.

5.8.17 SRM9030 Selcall Facilities

There are several functions (SEND-2, Special-Encode-1...8) that simply send the assigned selcall sequence when the Function Button is pressed.

A "Channel-Encode" may be assigned on a per-channel basis and is the sequence sent when the Green-Handset button is pressed.

In the descriptions below:

- "current Phonebook entry" refers to the entry that would be seen if the Phonebook menu were displayed;
- "current Status value" is a stored value used whenever Status digits are sent.

5.8.18 No Variable ID Digits and No Variable Status Digits

If no Variable digits are used (ie. Max Number of Variable ID Digits = 0, and Number of User-Enterable Status Digits = 0), the Phonebook contains full encode strings and these are only used for sending selcalls. These selcalls are the same on all channels (on which selcall is enabled).

So to send selcalls in this situation:

- The User can scroll through the Phonebook and press the Green-Handset button when the desired name is displayed to send that selcall.
- From the Phonebook Menu (and the Main Channel Menu) the User can use the Keyboard to enter selcall strings and then press Green-Handset to send the free-form sequence.
- From the Main Menu pressing the Green-Handset will send the Channel-Encode.

The Status Menu is also not used in this situation.

The radio will only respond to the Decodes (active on set channel) as per the assigned actions in the Programmer menus.

5.8.19 Phonebooks and Status Lists - General

In the SRM9000 the User can vary both the destination Identity and the Status. Two lists are provided so that these may be set separately and individually. The Phonebook allows the User to select different destination IDs with up to 8 Variable ID Digits (VIDs).

The Status List allows the User to select different Status's to send to the selected destination. Status may have up to 4 Variable Status Digits (VSDs).

If one or both of these facilities are not required, then the relevant Menu(s) may be omitted from the User Menu List – and thus hidden from the user.

The Programmer has maximum length parameters for User-entered VIDs and User-entered VSDs. If the user enters more than the allowable VIDs then the sequence will be treated as free-form entry. If the user enters more than the allowable VSDs then an error tone will be sounded and the entry will be ignored.

In the following descriptions the number of VIDs is set to 4 and the number of VSDs is set to 3 (to simplify the examples).

5.8.20 Phonebook Menu : Setting the Destination Identity and Sending an Encode

The encode string may contain Variable Digits so that the destination Identity may be selected (within a given encode format) by the User.

The Phonebook is used to store the VIDs (and associated Names) of the different destinations.

eg. Channel-Encode = 1234#####, means that Phonebook entries with 4 or less digits may be inserted into the '####' field (with leading zeros to make up the required number of digits)

eg: 678 inserted as 0678

2222 inserted as 2222

90 inserted as 0090

If the displayed Phonebook entry has a valid number of digits (for insertion into Channel-Encode VID field – eg. 4 or less) then this value will be used. If the entry is bigger than allowable then it will be sent as a free-form selcall.

Once the desired destination is displayed, pressing the Green-Handset button will insert it into the Channel-Encode and send it.

The Phonebook Menu may be exited leaving the displayed destination current for later use. The menu will re-enter at the same point.

Alternatively, (from the Phonebook or Main Channel menu) the destination may be directly entered from the Keypad by pressing a valid number of digits (for insertion into Channel-Encode VID field – eg. 4 or less digits) and then the Green-Handset button to send it. (If the entry is bigger than allowable then it will be sent as a free-form selcall).

The maximum number of free-form digits that may be entered is set by the FPP.

If the user enters more than the allowable digits then an error tone will be sounded and the entry will be ignored

Note 1: If the Channel-Encode also contains Status digits then these will be automatically inserted from the “saved Status value” just prior to sending – see below.

Note 2: A Phonebook entry with blank digits field may be used and will send to the last sent address.

Note 3: Any Encode string that contains VIDs, will have the “current Phonebook entry” inserted when sending. This includes the Channel-Encode, Special-Encodes and ANI.

Note 4: If different Encodes specify fewer than the defined Maximum number of User-entered VIDs, then the entered value will be inserted into the Encode in a right-justified manner (ie. the leftmost digits will be truncated to make the entry fit into the defined VIDs).
eg. Channel-Encode = 1234#####, SEND-2 Encode = 123400##, a Phonebook (or keypad) entry of 5678 would send as 12345678 if the Channel-Encode is sent and 12340078 if SEND-2 is sent.

5.8.21 Status Menu : Setting the Status value and Sending an Encode

The Status Menu is used to store the Variable Status Digits (VSDs) and associated text meanings. The User can select or enter values into the “saved Status value” and send Encodes from this menu.

When the encode string contains Status Digits, the “saved Status value” is inserted into the Encode just prior to sending. This applies to any sent Encode including the Channel-Encode, Special-Encodes, ANI and Acknowledges.

eg. Channel-Encode = 12345***, means that the Status Menu entries with 3 or less digits may be inserted into the '***' field (overwriting previous digit position).

eg: 678 inserted as 678

then 22 inserted as 622

then 0 inserted as 620

then 700 inserted as 700

If the displayed Status Menu entry has a valid number of digits (for insertion into Channel-Encode VSD field – eg. 3 or less in this example) then this value may be used.

Once the desired Status is displayed, pressing the Green-Handset button will save it as the “saved Status value” and then insert it into the Channel-Encode and send it.

Pressing ‘OK’ (F4) will save it, but not send a selcall.

If the entry is bigger than allowable then an error tone will sound and the entry will be ignored.

Alternatively, the Status may be directly entered from the Keypad by pressing a valid number of digits (for insertion into Channel-Encode VSD field – eg. 3 or less digits in this example) and then

- ‘*’ or ‘OK’ to save it as the “saved Status value” – but not send it, or
- Green-Handset button to save it and send it in the Channel-Encode.

If more than the allowable number of VSDs are entered then an error tone will sound and the entry will be ignored.

Note 1: If the Channel-Encode also contains Variable ID digits then these will be automatically inserted from the “current Phonebook entry” just prior to sending – see above.

Note 2: A Status Menu entry with blank digits field may be used and will send the current “saved Status value” if displayed when the Green-Handset button is pressed.

Note 3: If a selcall is received matching a Decode mask using VSDs, then the received VSDs will be copied into the “saved Status value” (same as if the user and entered them).

Note 4: The VSDs are retained during power-off/on.

Note 5: If different Encodes specify fewer than the defined Maximum number of User-entered VSDs, then the entered value will be inserted into the Encode in a right-justified manner (ie. the leftmost digits will be truncated to make the entry fit into the defined VSDs).
eg. Channel-Encode = 12345***, SEND-2 Encode = 123450**, a “saved Status value of 678 would send as 12345678 if the Channel-Encode is sent and 12345078 if SEND-2 is sent.

5.8.22 Combining Variable ID and Variable Status Digits

Both Destination ID digits and Status digits may be active in an encode. When this is the case, the VIDs will be taken from the “current Phonebook entry” and the VSDs will be taken from the “saved Status value” when the encode is sent.

Eg. 1234#####-** takes 4 VIDs from the Phonebook and combines 2 VSDs from the “saved Status value”.

5.8.23 Keypad entries in Phonebook , Status and Main Menus

Below are some examples of key sequences in different menus.

Following settings have been assumed:

Maximum Number of Variable ID Digits = 4

Maximum number of Variable Status Digits = 3

5.8.23.1.1.1.1 Menu			Entry
Main	PhBk	Stat	
✓	✓		Green-Handset = send Channel Encode with “current Phonebook entry” and “saved Status value”
		✓	Green-Handset = send Channel Encode with “current Phonebook entry” and displayed Status
✓	✓		nnnn Green-Handset = send Channel Encode with VIDs=nnnn and “saved Status value”
✓	✓		nnnn...n Green-Handset = send free-form selcall
	✓		nnnn...n # = send free-form selcall
		✓	nnn OK = set “saved Status digits” to nnn
✓	✓	✓	nnn * = set “saved Status digits” to nnn
✓	✓	✓	nnn * Green-Handset = set and send Channel Encode with “current Phonebook entry”
✓			nnn # = Change to Channel nnn

5.8.24 Decode with Variable Digits

The SRM9000 has 8 Decodes that can individually enabled on a per-channel basis. Any of these Decodes may contain up to 8 Variable ID Digits (VIDs) and/or up to 4 Variable Status Digits (VSDs).

When a selcall is received matching one of these decodes, the assigned actions are performed (alerts, acknowledgements, etc), then the VIDs and/or VSDs are passed through the Phonebook and/or Status List to see if matching entries are found.

If the “CALL” indicator is not activated the matched Name and/or Status description (or raw digits if no match found) are displayed on the screen. The display is restored (cleared) only when the Crossed-Handset is pressed.

If the “CALL” indicator is SET or FLASHING the matched Name and/or Status description (or raw digits if no match found) are displayed on the screen. The display is restored (cleared) automatically when the “CALL” indicator is cleared.

5.8.25 Stored Calls

The Stored Calls Menu is used if the User does not answer an alerting selcall, or if a Status message is received.

Entries will be placed in the Stored-Calls Menu under the following conditions:

- The User does not answer the Call, (and the “Store Call on Alert Time-out” option is set for the received Decode*).
- A Decode is received with VSDs.

The Stored Calls menu retains the eight most recent entries, unless entries have been specifically deleted by the User.

Note: If another Decode (with an Alert-Tone selected) is received while a previous Decode's Alert-Timer has not yet expired, then this will cancel the "Store Call on Alert Time-out" option of the previous decode. ie. The new alert will sound, canceling the previous alert and not storing an entry in the Stored-Calls Menu.

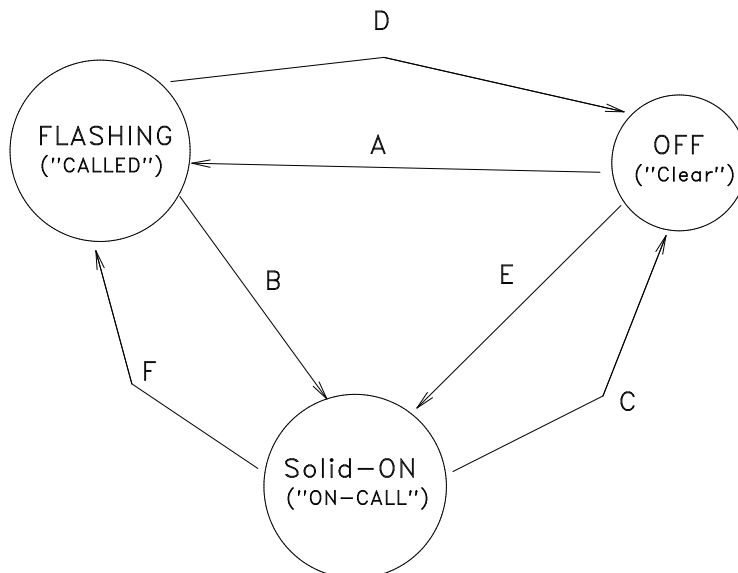
5.8.26 Operation of the "CALL" Indicator

The "CALL" indicator is a crochet symbol shown on the display. It may be used to indicate various states of a selcall conversation.

The "CALL" indicator has the following states:

- OFF = not in a call
- FLASHING = selcall has been received but not answered (ie. Radio has been "Called")
- Solid-ON = selcall has been received and answered (ie. User is "On-Call")

The CALL indicator may be set FLASHING, set ON or CLEARed by various events in the radio. The simplest way to show the operation is via the following diagram:



5.8.27 CALL Indicator States and Transitions

The following events trigger changes from one state to another:

Event	Transition					
Decode of a selcall with the FLASH CALL option set	A					F
Decode of a selcall with the SET CALL option set		B			E	
Decode of a selcall with the CLEAR CALL option set			C	D		
Mic removal from Cradle If the Mic out of Cradle : SET CALL option is enabled		B			E	
Mic return to Cradle If the Mic in Cradle : CLEAR CALL option is enabled			C	D		
User PTT If the SET-CALL-if-Flashing option is enabled		B				
Timed Reset occurs If the CLEAR CALL option is enabled			C	D		
Channel Change (unconditional)			C			
Channel Change If the CLEAR-CALL-if-Flashing option is enabled				D		
RESET Function Button (or Crossed-Handset) is pressed If Alerts are stopped and no backspacing on edit-line			C	D		
Monitor/Reset Function Button If Alerts are stopped.			C	D		

The FLASHING CALL and Solid-ON-CALL indicator states are CLEARED by Switch-off/on.

Example of usage - Consider the following sequence of events:

- A Selcall is decoded that has the set FLASHING option enabled.
- The radio starts to “ring” (assuming Ring Alert Tone is also enabled), and displays the flashing CALL indicator, and displays the Name of the calling party (obtained from Phonebook look-up)
- The User picks Up the Microphone
- The radio stops “ringing” and displays a solid CALL indicator.
- The User has the conversation and replaces the Microphone back on its Cradle.
- The CALL indicator is extinguished and the display restored to what it was prior to receiving the selcall.

Note: The Message Line (on 9030) will also show “Called” or “On-Call” (reflecting the CALL indicator state) when it is not displaying anything else.

5.8.28 Programmer Facilities

The Programmer SW should allow the following options to be activated:

Decode Parameters

Decode [1, 2, 3, 4, 5, 6, 7, 8]

Decode Mask and Tone Durations : [2x20 char fields to define]

[Start, Stop, No] Alert: [Ring, Bip, 2xBip, Beep, Urgent] for [X] s

X= 1..2550, 0=continuous

Store Call on Alert Time-out ← Tick box

[Start, Stop, No-change] Ext Alert for [X]s after [Y]s delay $\leftarrow X=1..250, Y=0..250$

[Open, Close, No-change] Selcall Mute

[Set, Clear, Flash, No-change] CALLED Icon

[Inhibit, Re-enable, No-change] User PTT

Acknowledge with Encode [blank, 1...250] after [X]s $\leftarrow X=0..250$

[Stun, Revive, No-change] Mobile

Trigger Timed-Reset ← Tick box

Timed Reset Parameters

Timed-Reset Timer Value [0...255] sec (blank=disabled)

Enable CTCSS Mute ← Tick box

Close Selcall Mute ← Tick box

Stop Alerts ← Tick box

Re-Enable PTT ← Tick box

Clear CALLED state ← Tick box

Non-Talk-Timer ← Tick box

Pause Timer while off-cradle ← Tick box

3rd Tone Reset and Reset-Tone Parameters

Enable CTCSS Mute ← Tick box

Close Selcall Mute ← Tick box

Stop Alerts ← Tick box

Re-Enable PTT ← Tick box

Clear CALLED State ← Tick box

Group-Tone Parameters

PTT Inhibit ← Tick box

Group-Alert Tone = [Ring, Bip, 2xBip, Beep, Urgent] once

Encode Parameters

Encode [1 ... 250]

Encode Mask, Tone Durations and Toneset: [3x20 char fields to define]

Link Establishment Time : [X]ms \leftarrow X= 0ms to 2550ms

Lead out Delay : [X]ms ← X= 0ms to 2550ms

[Open, Close, No-change] Selcall Mute

Queuing : [Ignore, Queue on Busy, Inhibit on Busy]

Resend after [X]s if Decode [none, 1...8] is not received ← X= 1 to 2550s
(0=disabled)

Maximum Resends = [X] \leftarrow X= 0...60, or continuous

Append Encode [none, 1...250]

PTT-On Parameters (Pre-ANI)

Unmute Selcall ← Tick box

Send Encode [blank, 1...250] held-off by [1...999]s (0=disabled)

PTT-Off Parameters (Post-ANI)

Send Encode [blank, 1...250] held-off by [1...999]s (0=disabled)

Mic Out-Of-Cradle Parameters (Microphone-ANI)

Unmute Selcall ← Tick box

Set ON-CALL state ← Tick box

Send Encode [blank, 1...250]

Mic In-Cradle Parameters (Microphone-ANI)

Mute Selcall ← Tick box

Clear ON-CALL state ← Tick box

Do Timed-Reset Functions ← Tick box

Send Encode [blank, 1...250]

Per-Channel Selection Parameters

Selcall Enabled ← Tick box

Open Selcall ← Tick box

Rx- and Tx-Lockout (Selcall) ← Tick boxes

SEND-CE Function uses Encode [1...250]

Active Decodes: [1, 2, 3, ..., 8] ← Tick boxes

Global Selcall Parameters

Encode Tonesets [2x Drop_down_List]

Decode Toneset [Drop_down_List]

Tone Duration 0 = [20 ... 2550]ms

Tone Duration 1 = [20 ... 2550]ms

Tone Duration 2 = [20 ... 2550]ms

Tone Duration 3 = [20 ... 2550]ms

User-Defined Toneset : frequencies for 0...9 and A...F

SEND-2 Function uses Encode [1...250]

Special Encode-1 uses Encode [1...250]

Special Encode-2 uses Encode [1...250]

Special Encode-3 uses Encode [1...250]

Special Encode-4 uses Encode [1...250]

Special Encode-5 uses Encode [1...250]

Special Encode-6 uses Encode [1...250]

Special Encode-7 uses Encode [1...250]

Special Encode-8 uses Encode [1...250]

Own-ID = [X] ← X=8-digit string (Inserted as 'I' digits in Selcall Masks)

Freedial Selcalls [Yes, No]

Decode with CTCSS [Yes, No]

3rd Tone Reset [Yes, No]

Alternate assignment of 'Repeat', 'Group' and 'Reset' Tones

Copy Decode Status Digits to Encodes: [Yes, No]

Max Number of Variable ID Digits: 0...8

Selcall-ID-List (250 entries) : relates IDs to alpha Names. These are inserted as the Variable '#' digits in the Transmit (Encode) Selcall Mask, or matched with the Variable '#' digits in the Decode Selcall Mask.

Number of User-Enterable Status Digits: 0...4

Selcall Status-List (100 entries) : relates Status Digits alpha Descriptions. These are inserted as the Variable '*' digits in the Transmit (Encode) Selcall Mask, or matched with the Variable '*' digits in the Decode Selcall Mask.

5.9 Audio Mutes

The SRM9000 has three different Mutes that may be set / cleared / toggled independently at various times and by various functions.

Terminology:

The radio is said to be “Muted” when the speaker audio is off.

The radio is “Unmuted” means that speaker audio can be heard.

A Mute is said to be “Open” when it is not impeding speaker audio.

If a Mute is “Closed” then it is impeding speaker audio.

The **Carrier-Mute** (also called **Squelch**) is primarily affected by the received signal. If the signal is above the Mute threshold then the Carrier-Mute will open.

The **CTCSS-Mute** is controlled by received CTCSS tone (or DCS signaling). The CTCSS-Mute is closed when an invalid CTCSS tone (or none) is being received on a channel which requires CTCSS.

The **Selcall-Mute** is controlled by various selcall parameters that may be active on the channel (see below)

Depending on the channel type, all of the above mutes may affect the speaker audio.

5.9.1 Channels and Mute

Carrier-Mute is applicable on all channels. The user may defeat the Carrier-Mute via the Squelch-Defeat Function Button.

If a channel does not have a Rx-CTCSS tone defined then the CTCSS-Mute is not applicable on that channel. If defined, then the CTCSS-Mute will only be open if a valid CTCSS tone is being received. The User may defeat the CTCSS-Mute via the CTCSS-Defeat Function Button.

Community-Repeater (and Multiplx) channels may not have their CTCSS-Mute manually defeated.

The Selcall-Mute is only applicable to channels that have Selcall enabled on them.

The screenshot shows the 'Channel Editor' dialog box with the 'Selcall' tab selected. At the top, 'Channel Number' is 45 and 'Name' is 'Test Channel'. Below the tabs, there are two main sections. The left section contains four checkboxes: 'Selcall Enabled' (checked), 'Open Selcall' (checked), 'Rx Lockout' (unchecked), and 'Tx Lockout' (unchecked). Below these is a 'Selcall Encode' field with the value '0'. The right section, titled 'Active Decodes', contains eight checkboxes arranged in two columns: 'Decode 1' through 'Decode 8', all of which are unchecked. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

If Selcall is enabled, then the “**Open Selcall**” parameter defaults the Selcall-Mute to open for all conditions. It cannot then be closed by any other actions (on that channel).

On a “**Closed Selcall**” channel (ie. Open-Selcall not selected) the User may manually open or toggle the Selcall-Mute by various special functions (eg. Monitor/Reset function or Channel-change, etc)

The “**Rx Lockout**” parameter is only valid for Closed Selcall (ie. not Open Selcall) channels. If selected the User may not manually open the Selcall mute to listen to the channel. The Selcall Mute can only be opened by a received selcall.

The “**Tx Lockout**” parameter stops the User PTTing unless (s)he has been selcalled and is in a “Call”. It does not affect the mutes.

The following table shows which Mutes are active on particular channels. All active Mutes must be open to have speaker audio present:

Channel Type	Carrier-Mute	CTCSS-Mute	Selcall-Mute
No CTCSS, No Selcall	✓		
CTCSS, No Selcall	✓	✓	
No CTCSS, Selcall	✓		✓
CTCSS and Selcall	✓	✓	✓

5.9.2 Functions Affecting Mutes

5.9.2.1 Assignable User Functions

The following functions can be assigned to buttons:

Squelch Defeat Function (see page 66) affects Carrier-Mute

CTCSS Defeat Function (see page 66) affects CTCSS-Mute

Monitor/Reset Function (see page 67) affects Selcall-Mute

RESET Function (see page 67) affects Selcall-Mute

5.9.2.2 Channel-Change

The following options may be selected to occur on a channel-change:

- Mute Audio : Closes the Carrier-Mute if defeated by the User
- Mute CTCSS : Closes the CTCSS-Mute if defeated by the User
- Mute Selcall : Closes the Selcall-Mute

5.9.2.3 Microphone Actions

The following actions can be selected to happen:

- Open CTCSS-Mute when Microphone removed from Cradle
- Open Selcall-Mute when Microphone removed from Cradle
- Open Selcall-Mute when PTT is pressed
- Close CTCSS-Mute when Microphone returned to Cradle
- Close Selcall-Mute when Microphone returned to Cradle

5.9.2.4 Timed Reset occurs

The following actions can be selected to happen:

- Mute CTCSS : Closes the CTCSS-Mute if defeated by the User
- Mute Selcall : Closes the Selcall-Mute

5.9.2.5 A Selcall Decode is received

If a Decode is received with either the “Open” or “Close” Selcall-Mute option enabled, then Selcall-Mute will be set appropriately.

5.9.2.6 A Selcall Decode is received with and appended RESET tone.

The following actions can be selected to happen:

- Mute CTCSS : Closes the CTCSS-Mute if defeated by the User
- Mute Selcall : Closes the Selcall-Mute

5.9.2.7 Third-Tone Reset is active

The Selcall-Mute is closed when this function is enabled and the first 3 tones of an active Decode are received (but the full decode is not received).

5.10 Programmer Facilities

Applicable to models:

9005	9010	9020	9025	9030
------	------	------	------	------

The programmer provides the following facilities:

- Frequency Band selection
- Timer selections (Backlight, Power-down, Menu, Message)
- Keypad dialling and Call Timer disabling
- Max / Min Volume and Alert level parameters
- Function Button Assignments
- Primary and Secondary Menu selections
- Channel definitions (frequencies, CTCSS, Names, Numbers, type, etc)
- Power-on options (special Channel, special Text)
- Channel-change actions
- Scan and Dual-Watch parameters
- Vot and Multiax parameters
- PTT and Cradle Options (ANIs, muting, PTT-Limit and Conversation timers)
- DTMF Tone periods, gaps, definitions
- Selcall parameters and IDs
- Selcall Phonebook definitions
- Status list definitions
- Alarm / Attack operation
- Customisation of radio messages and menus

5.10.1 Function Button Assignments

Applicable to models:

9005		9020	9025	9030
------	--	------	------	------

The programmer allows the Functions listed below to be assigned to various Function Buttons on all radio versions except the SRM9010.

External Inputs may also be assigned special Functions – see description on page 28.

5.10.1.1 Squelch Defeat Button Function

Only valid on a non-Community-Repeater (or Multiax) Channel.

This function toggles the state of the Carrier-Mute, allowing the User to monitor the channel (if CTCSS and Selcall mutes are not active).

If defeated (mute open), selecting a Community-Repeater Channel will cancel the “Defeat” function (ie. close the mute).

A Chevron appears next to the Button Label on the SRM9030 display indicating that the function is active.

See also description of SRM9000 Mutes on page 46.

5.10.1.2 CTCSS Defeat Button Function

Only valid on a non-Community-Repeater (or Multiax) Channel.

This function toggles the state of the CTCSS-Mute, allowing the User to monitor the channel (if Selcall and Carrier mutes are not active).

If defeated (mute open), selecting a Community-Repeater Channel will cancel the “Defeat” function (ie. close the mute).

A Chevron appears next to the Button Label on the SRM9030 display indicating that the function is active.

See also description of SRM9000 Mutes on page 46.

5.10.1.3 Monitor/Reset Button Function

This function toggles the Selcall-Mute on a Selcall channel (if Receiver-Lockout is not active).

On a Receiver-Lockout Channel where the Selcall-Mute has been opened by a received Selcall, this button will close the Selcall-Mute again.

On an Open-Selcall Channel the Monitor/Reset Function has no effect.

The button Chevron (on the SRM9030) shows when the Selcall-Mute is defeated (open).

See also description of SRM9000 Mutes on page 46.

5.10.1.4 Reset Button Function

This function performs several other tasks as well as closing the Selcall-Mute.

In order of priority, it:

- stops Alerts (if any Alerts are sounding)
- performs a Backspace (if there is a User entry pending)
- switches back to the Main Menu (if in a lower menu)
- de-queues a selcall (if a selcall is queued)
- Closes the Selcall-, CTCSS- and Carrier-Mutes (if defeated by the user) and clears the Variable-Digits display area (if applicable).

5.10.1.5 Scan Button Function

This function activates Scanning on SRM9025/30 radio models.

See description of Scan Functionality on page 38.

5.10.1.6 Send-CE (Channel-Encode) Button Function

This function sends the Channel-Encode selcall defined for the current channel. The Channel-Encode is individually assigned for each Selcall Channel and may be any one of the 250 Encodes available.

If the current channel does not have selcall enabled then the button is ignored.

See description of Selcall Functions on page 45.

5.10.1.7 Send-2 Button Function

This function sends a selcall that is common for all selcall channels. The Send-2 encode may be selected from any of the 250 Encodes available.

If the current channel does not have selcall enabled then the button is ignored.

See description of Selcall Functions on page 45.

5.10.1.8 Transpond-Disable or Ack-Defeat Button Function

This function toggles the radios ability to send a selcall Acknowledge when a selcall Decode is received (that was setup to send an Ack).

The button Chevron (on the SRM9030) shows when the Selcall-Mute is defeated (open).

5.10.1.9 Mute Button Function

This function allows the radio Carrier-Mute level to be adjusted.

On SRM9025 and SRM9030 radios it displays the Mute Setup menu Screen and shows the mute level on the current channel.

On a Normal Channel, the Mute level can be adjusted between the lower and upper limits (set up by the Programmer).

The Mute level is displayed but cannot be adjusted on Voting Channels.

The mute level cannot be adjusted to zero on Community Repeater channels or Multiax channels.

See also description of SRM9000 Mutes on page 46.

5.10.1.10 External Alert Button Function

The External Alert Output (see page 33) can be activated when a selcall Decode is received.

This Button Function allows the External-Alert facility to be toggled off (and on again on second press).

A Chevron appears next to the Button Label on the SRM9030 display indicating that the function is active (ie, that the Alerts are enabled).

See also separate document describing SRM9000 Selcall functionality.

5.10.1.11 Channel-Up/Down Button Functions

These functions allow the Channel-Up or Channel-Down keys to be additionally assigned to other buttons (eg. F6 on SRM9030 Microphone).

The Channel is incremented or decremented whenever the button is pressed. If pressed and held, the function auto repeats.

5.10.1.12 Goto Channel A..D Button Functions

The Goto-Channel functions allow the User to quickly go to a frequently used channel.

The Programmer sets up the channels initially, but they may be re-defined by the User.

The Assigned Channel is selected on the first press. (The chevron on the SRM9030 display shows that the function is active). The original channel is restored on the second press.

If the button is pressed and held for approximately 2 seconds, then the current channel is made the Assigned Channel.

See also the Goto-Channel Input Function on page 28.

5.10.1.13 Special Encodes 1...8 Button Functions

These Functions allow dedicated Encodes to be assigned to Function Buttons. A Special-Encode may be assigned to any of the 250 Selcall Encodes.

See also the Special Encode Input Function on page 28.

5.10.1.14 Alarm Button Function

This button is used to put the radio into “Attack-Mode”.

The Programmer assigns a “Button Debounce” time, so that the Button must be held down for more than this time before the Attack Mode (see below) is initiated.

5.10.1.15 Repeater-Defeat or Talk-Around Button Function

This function will change the Transmit and Receive frequencies (and CTCSS tones) so that a local Repeater can be bypassed.

The Programmer provides the following options for this function:

- Swap Transmit and Receive frequencies
- Make Transmit Frequency same as Receive Frequency.
- Make Receive Frequency same as Transmit Frequency.

The assigned Repeater-Defeat functionality is toggled on/off on subsequent button presses.

A Chevron appears next to the Button Label on the SRM9030 display indicating that the function is active.

This function is cleared by channel change.

See also the Repeater-Defeat Input Function on page 30.

5.10.1.16 Low Power Button Function

This function allows the User to toggle the Transmit Power between the level assigned in the Channel-Table and the “Low Power” setting. (See description of SRM9000 Power Levels on page 26)

A Chevron appears next to the Button Label on the SRM9030 display indicating that the function is active (ie. Low Power is selected).

This function is unaffected by channel change.

See also the Low-Power Input Function on page 31.

5.10.1.17 Handsfree Button Function

This function may be used to toggle the Handsfree facility On and Off.

A Chevron appears next to the Button Label on the SRM9030 display indicating that the function is active (ie. Handsfree is selected).

5.10.1.18 DTMF Button Function

This button allows the User to toggle the Keypad (SRM9025 and SRM9030 only) in and out of DTMF mode.

A Chevron appears next to the Button Label on the SRM9030 display indicating that the function is active (ie. Keypad is in DTMF mode).

See description of DTMF Function on page 25.

5.10.1.19 PMR Attack Mode

In PMR operation the Attack function transmits continuously or for 15 seconds every 30 seconds. An emergency-selcall may be sent as part of the transmission.

The Programmer has the following parameters:

- “Attack” function must be assigned to an Input or Function Button to activate Attack-Mode.
- Attack Channel Number (uses this channel when in Attack-Mode).
- Select “Covert” or “Fist-Mic” as audio source.
- Selection of how the radio transmits (15s Tx + 15s Rx, or continuous Tx).
- Selection of how long the radio should remain in Attack-Mode (in 30 sec increments). A value of zero indicates indefinite operation.
- Display Operation (Frozen or Blank) while in Attack-Mode.
- Selection of the Selcall Encode to send at start of each transmission (or every 30 sec).

Attack-Mode is exited (and radio performs a cold-start) when the specified Attack-Time has elapsed - or a Reset Selcall Decode is received - or power is removed from the radio. The time starts on the first activation of the Attack function and is not restarted by successive button presses.

5.11 Trunk Functions

5.11.1 Call Types

Applicable to models:

9005	9010	9020	9025	9030
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The following **call types** are supported:

- MPT1343 Unit, Fleet/Unit, Prefix/Fleet/Unit numbering
- ANN Unit and Fleet/Unit numbering
- Normal, Priority (*8*...), Emergency (*9*...) Voice Calls
- Group and Broadcast (*11*...) calls
- PSTN, PABX and Abbreviated (**nn) dialling
- Status (*0n*...) Calls
- SDM (*2*ID*...) Calls
- Diversion, Busy, Call-Queuing, Call-back
- 20x Short-form-dialling (from User Memories 0 to 19)

The following MPT1343 **dialstrings** are supported:

- 2 and 3 digit in-fleet Unit or Group dialling (eg. 200#)
- 6 and 7 digit inter-fleet Fleet/Unit or Group dialling (eg. 2001200#)
- 9 and 10 digit inter-prefix Prefix/Fleet/Unit of Group dialling (eg. 2012001200#)
- 0# to 9#, 10# to 19# = dial string in Shortform Memory 0...19
- 03#, 04#, 05#, 06# = Branch Exchange Operator call
- 100#, 1n1# (n = 1 to 9) and 999# Network Operator Services (MPT1343 Sect 8.2.7)
- 1000# to 8999# = PABX calls
- 20000# to 29999# and 90000# to 99999# = PABX calls
- *# = call termination
- *0# and #0# = Callback and Cancel-Callback to preset "Dispatcher Identity"
- *0n# and *0nn# = Status calls to preset "Dispatcher Identity"
- *0*addr# and #0*addr# = Callback and Cancel-Callback to addr
- *0n*addr, *0nn*addr = Status message to addr
- *11*Grp_addr# = Broadcast Call modifier for Grp_addr
- *1981#, *1982# and *1987# = Priority, Emergency and Normal ALLI calls
- *2*data*addr# = Data call to addr
- *2*data# = Data call to preset "Data Identity"
- *31*addr# = NPD Data call to addr
- *41*addr#, *411*addr# and *412*addr# = own diversion facilities
- #41#, #411# and #412# = cancel own diversion facilities
- *44*xx*yy#, *441*xx*yy# and *442*xx*yy# = third-party diversion facilities
- #45#, #451# and #452# = cancel incoming diversions
- *48# and #48# = Enable/Disable Call-Queuing
- *49#, *491# and *492# = Set Do-not-disturb mode
- #49#, #491# and #492# = Cancel Do-not-disturb mode
- *5n*GroupAddr# = User assignable Group Membership. (n=0..7)
- *50# = toggle Channel Monitor (RSSI[dBm], Chan No, Syscode, reason for change)
- *52# = access "SETUP" Menu

- *6n# (n = 0...9) = goto PMR Channel n
- *71#, *72# = change networks
- *8*addr = Priority call to addr
- *9*addr = Emergency call to addr
- **0# to **49# = abbreviated calls in TSC

5.11.2 Call Memories or “User Phonebook”

Applicable to models:

9005	9010	9020	9025	9030
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The SRM9000 Trunk radios have operation centred around the Call Memories programmed in the radios as the “User Phonebook”. 250 entries are possible but the User Interface (ie. 9010/20 Mics) may limit access to these. The first 20 entries (numbered 0 to 19) are Quick-Dial or Short-Form memories that can be dialled from a keypad.

The SRM9005 can place calls using the Call-1 to Call-4 Input functions which reference into the first 4 Call Memories (0 to 3) in the Phonebook. Alternatively, all addresses are available via MAP27 serial control.

The SRM9010 allows the first 10 Call Memories to be scrolled through using the “Select” button. The display shows the current memory number (0 to 9) selected.

The SRM9020 can scroll through all entered Call Memories (up to 100), or place calls directly to a Call Memory (0 to 4) using the Direct Call button Functions.

The SRM9025 and SRM9030 have full access to the Phonebook with the Alpha aliasing available on the display. Dialling numbers less than 20 accesses the 0 to 19 Call Memories, while above 20 the MPT defined dialstrings are used.

5.11.3 Status Messages

The SRM9000 has separate Alpha lists (up to 12 characters for each Status) for 30 incoming and 30 outgoing MPT Status messages. Only the SRM9025 and SRM9030 are able to display them.

Received Status messages are stored in the Stored Messages Menu.

Sendable Status's can be accessed from the Status Menu in SRM9020, SRM9025 and SRM9030 versions. They can also be sent directly from the Keypad (SRM9025 and SRM9030) using the Status dialstrings.

The Phonebook can also store Status message dialstrings for sending. This allows the SRM9010 to send Status messages.

5.11.4 SDM / EDM Data Reception

The SRM9000 Transceiver can receive SDM and EDM data messages – however only the SRM9025 and SRM9030 Controllers can store and display them.

Received Data messages are stored in the Stored Messages Menu.

SDMs can be sent directly from the Keypad (SRM9025 and SRM9030) using the *2... dialstrings for sending numeric information.

The Phonebook can also store Data message dialstrings for sending. This allows the SRM9010 and SRM9020 to send fixed Data messages.

5.11.5 Call-Timer Display

During a Voice Call, a Call-Timer is displayed (some versions only) showing call timing.

If the Trunk Network transmits the Call-Duration information (in a Maintenance message) then the Call timer will count Down from the Network supplied value to zero (at which time the call will terminate). The last 10 seconds of the call will be accompanied by beep tones indicating that the call is about to end.

If the Trunk Network does not transmit Call-Duration information, then the display will count up from zero – until the Network clears the call. Unless the Network generates the pending termination beeps, there will be no indication that the call is about to end.

5.11.6 Microphone PTT Functions

When the radio is participating in a Voice Call (not a Broadcast Call), the PTT will activate the Transmitter.

If the radio is not in a call, pressing the PTT may (controlled by Programmer “PTT Call Request” parameter) set up a call to the displayed identity or the current Phonebook entry.

5.11.7 Radio Identities

The Programmer has several Identities that may be set up:

- Own Identity = MPT1343 (or ANN) identity that the radio will respond to for all individually addressed calls.
- Dispatcher Identity is used for the *0# (CallBack), #0# (Cancel-CB) functions and *0nn# Status Call functions.
- Data Identity is used for *2*Data# type dialstrings and when a NPD call is requested using the RTS/PTT Input function (see page 30)
- Emergency Identity contains the dialstring called when the Alarm Function Button (page 77) or the Alarm Input Function (page 31) activates Attack-Mode operation (page 77). This field may contain Call modifiers plus address (eg. *9*20) to make specialised calls.

5.11.8 Groups

The SRM9000 has a number of Group addresses that it will respond to when the system makes a Group Call:

- 8 **Fixed Groups** that are setup by the Programmer.
- 8 **User editable Groups** (using the *50*... to *57*... dialstrings)
- 8 **Dynamic Groups** that may be assigned by the Network.

The radio has two parameters controlling calls placed to Groups:

- The **Highest Group Number** (HGN) limits the radio from calling only Groups in the range 90 to HGM or 900 to HGM (in own fleet).
- The **Own Fleet Group Identity** is used, in conjunction with the Prefix from the “Radio Identity” field and the two or three digit Group number, for making Group Calls.

Talk-Groups Operation (simulates a PMR system on a Trunk Network) is possible by setting up the radio in a particular fashion.

5.11.9 External Alert

An External-Alert Output (see page 34) may be activated a brief time (set by Programmer) after the Speaker Alerts start sounding.

5.11.10 Diversion Facilities

The Programmer has several parameters governing Call Diversions:

5.11.10.1 Setting up Diversions

Placing Diversion Calls can be enabled by the Programmer.

This allows the radio to send the *41*... (etc) dialstrings to the Trunk Network to divert incoming calls to a different address.

If disabled the radio will not allow these strings to be sent.

When the SRM9000 has sent a voice diversion string (*41*... or *411*...) that has been acknowledged by the Trunk Network, a "Diverted" message is displayed (not on SRM9011).

When the Voice diversion is cancelled (#41# or #411#), then the message is removed.

3rd Party Diversion Calls can also be enabled by the Programmer.

These are dialstrings with the *44*...(etc) used to divert (or change the diversion of) other radios on the Trunk Network.

If disabled then these dialstrings will not be actioned.

5.11.10.2 Calling a Diverted Radio

Two Programmer parameters (Voice and Data calls) control what happened when the SRM9000 calls a radio that has a diversion set up.

"Automatic" Divert means that the radio will call the diversion address immediately. It is supplied by the Trunk Network, without the User knowing that the called radio is diverted.

"Manual" means that the radio will beep and pause (for the "Menu Timer" period), and require the User to press PTT (or Green-Handset on SRM9030) before calling the diverted address.

"Disabled" means that the call will fail as soon as the Trunk Network advises the radio of the pending diversion.

All Voice calls are covered by the "Voice Call Divert" parameter.

Status, SDM, EDM and NPD calls are covered by the "Data Call Divert" parameter.

5.11.11 Queue Call while Out-of-Service

If a call is placed while the SRM9000 radio is not in Service, the radio will hold the request and place the call as soon as the radio regains service. This allows calls to be initiated (eg. in an underground carpark) and the radio will place the call as soon as the vehicle drives into the open.

5.11.12 Programmer Facilities

Applicable to models:

9005	9010	9020	9025	9030
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Trunk programming is a two stage process. A **Network File** must be selected first, then the **User Customisable Parameters** can be set.

The **Network File** contains predefined parameters relating to the Trunk Network that the radio is to operate on. This file is set up specifically for a particular Network and should not generally be altered by the user. It contains Frequency and Channel definitions, Numbering conventions (MPT, ANN, etc), syscode validations, Hunting, Timer and Error-limit parameters.

As the Network File parameters are not generally changed by Customers, a special Password is needed to gain access to the Network level of the Programmer.

The **User Customisable Parameters** include:

- Timer selections (Backlight, Power-down, Menu, Message)
- Keypad dialling and Call Timer disabling
- Max / Min Volume and Alert levels
- Function Button Assignments
- Primary and Secondary Menu selections
- Individual and Group Identities
- Trunk call facilities
- Call diversion parameters
- Phonebook definitions
- Status list definitions
- Alarm / Attack operation
- Customisation of radio messages and menus

5.11.12.1 Service Beep

A beep tone may be generated whenever the radio gains Service, or regains Service after loss of Service for more than 3 seconds. This facility can be turned on or off by the Programmer.

5.11.12.2 Partial- and Full-Off-Air-Call-Set-Up Systems

The SRM9000 can operate on both types of systems.

The Full-Of-Air-Call-Set-Up (FOACSU) Programmer parameter allows the radio to operate on FOACSU Networks, where the call must be answered before being allocated a Traffic Channel.

If this parameter is not selected, the radio will automatically answer an incoming call (as required by Partial-Off-Air-Call-Set-Up (POACSU) networks).

5.11.12.3 Facilities

Certain Trunking facilities may be enabled or disabled by the Programmer:

- **Inter-Fleet Individual Calls** allows calls to be made to other Trunking fleets.
- **Inter-Fleet Group Calls** allows calls to be made to other fleets Groups.
- **ShortDial PSTN** allows calls to the Trunk Short-Form-Dial memories (via the **n# dialstring).
- **Freedial PSTN** allows calls to be made to the Telephone system. This applies to Keypad entered numbers and Phonebook entries.
- **PABX Calls** allows calls to be placed to the Trunking PABX addresses.
- **Include Calls** allows voice calls to be made while already engaged in a call on a Traffic Channel.
- **Short Data Calls** allows the radio to receive and send SDM / EDM Control Channel data messages.
- **Data Calls** allows the radio to receive and make Non-Prescribed-Data (NPD) calls.
- **Speech Calls** allows the radio to receive and make Voice Calls.
- **Status Calls** allows the radio to receive and make Status calls.

Most of these facilities require that the Trunk Network support the facility as well.

5.11.12.4 AAD (Acquisition Authorisation Data) Menu

This menu can be used to only allow the radio to operate (Register on) on certain syscodes, or in certain Zones or Areas (based on the breakup of the syscode defined in the Network File).

If **“None”** is specified, then the entry does not apply and all syscodes are valid (provided they match the National/Regional Identity field set up in the Network File).

If **“Zone”** or **“Area”** is specified the Zone or Area address must be entered in the associated Data field. The radio will reject sites that do not match these entries.

If **“Full”** is specified the full syscode must be entered in the associated Data field. The radio will reject sites that do not match these entries.

Refer MPT1434 Section 9.3.4.2.3.

5.11.12.5 NDD (Network Dependent Data) Menu

This menu can be used to tell the radio, which sites (based on syscode) to preferentially register on.

Eight “Entries” are available, each with a Priority, Length and Data field.

The **Priority** field sets the priority of the “Entry”.

The **Length** is the number of bits of the syscode that need to match the **Data** field.

A site whose last “Length” bits match the Data field for a Priority1 “Entry” will be chosen in preference to a similar match for a Priority2 “Entry”.

Refer MPT1434 Section 9.3.4.2.3.

5.11.13 Function Button Assignments

Applicable to models:

9005	9010	9020	9025	9030
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The programmer allows the Functions listed below to be assigned to various Function Buttons on all radio versions except the SRM9005/SRM9010.

External Inputs may also be assigned special Functions – see description on page 28.

5.11.13.1 Call Button Function

This function will place a call to the displayed identity or current Phonebook entry.

It functionally equivalent to the Green-Handset on the SRM9030 or the SND button on the SRM9025).

5.11.13.2 Left, Right Button Functions

These buttons allow the Left or Right Scroll function (in the SRM9030) which scrolls through the entries in the current Menu Screen, to be assigned to other buttons (eg. F6 button on SRM9030 Microphone).

5.11.13.3 Call-1..4 Button Functions

These functions allow direct call addresses to be assigned to Function buttons, allowing frequently called identities to have their own dedicated button (eg. DEPOT)

Call-1 actions the dialstrings in SFD-1 (which is Phonebook location #1)

Call-2 actions the dialstrings in SFD-2 (which is Phonebook location #2)

etc.

5.11.13.4 External-Alert Button Function

This function toggles the External Alert Output Function (page 34) on and off.

A Chevron appears next to the Button Label on the SM9030 display indicating that the function is active (ie. that the Alerts are enabled).

5.11.13.5 Handsfree Button Function

This function may be used to toggle the Handsfree facility On and Off.

A Chevron appears next to the Button Label on the SRM9030 display indicating that the function is active (ie. Handsfree is selected).

5.11.13.6 Alarm / Attack Button Function

This button is used to put the radio into “Attack-Mode”.

The Programmer assigns a “Button Debounce” time, so that the Button must be held down for more than this time before the Attack Function (see page 77) is initiated.

5.11.14 Trunk Attack Mode

In Trunking operation the Attack function places a call to the identity specified in the “Emergency Dialstring”. The radio makes a number of calls at a specified interval.

The Programmer has the following parameters:

- “Attack” function must be assigned to an Input or Function Button to activate Attack-Mode.
- Emergency Dialstring (any valid MPT dialstring).
- Select “Covert” or “Fist-Mic” as audio source.
- Selection of duration of the Emergency Call.
- Selection of Inter-call time (ie. between call placements).
- Selection of how many times to repeat the sequence.
- Disabling the radio to receive Group Calls during Attack-Mode (so attacker does not hear what actions may be occurring as a result of the Attack situation).
- Display Operation (Frozen or Blank) while in Attack-Mode.

Attack-Mode is exited (and radio performs a cold-start) when the specified number of calls have been completed - or power is removed from the radio.

6. Options and Ancillaries

6.1 Quick-Release Transceiver Cradle Kit

Applicable to models:

9005	9010	9020	9025	9030
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This kit provides a mounting cradle to allow the Transceiver to be quickly removed without having to undo unnecessary screws.

The cradle allows the Transceiver to be removed using a single-handed operation. The Transceiver inserts into the rear of the cradle and is held in place by a separate Key-piece that clips into position.

An extra hole is provided to allow the cradle and Key-piece to be padlocked together so that the Transceiver cannot be removed.

The kit contains the mounting cradle, Key-piece and mounting screws.

Fitting and Installation instructions are available separately from Simoco.

6.2 Microphone/Control Unit Extension Lead

Applicable to models:

	9010	9020	9025	9030
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This lead allows the Transceiver to be placed up to 4.5 metres from Control Unit / Microphone. The lead is a 8-way RJ45 - RJ45 lead, and comes with a socket adapter to effectively create a 4.5m Male-Female extension lead.

The theoretical maximum separation between Transceiver and Controller is 20m in an ideal environment. Electrical noise reduces this separation such that recommended distance in a normal vehicle environment is about 5 metres.

6.3 VOX Handsfree Option

Applicable to models:

	9010	9020	9025	9030
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The Handsfree Option consists of a remote Microphone with lead.

On the SRM9010/20 the separate Handsfree-Mic lead plugs into a tail coming from the DB15 connector on the rear of the Transceiver. A small PCB mounted on the main Radio board processes the HF-Mic audio and feeds it to the main radio.

On the SRM9030 the VOX circuitry is contained in the Control Unit and the external Microphone plugs into it.

The SRM9025 Handset has an integral outward facing Handsfree Microphone that is enabled as indicated below.

The "Handsfree" option must be enabled by the FPP for this operation to work.

The Handsfree Mic is activated if the call is answered or placed, without taking the Fist-Mic/Handset off hook, or by a special Handsfree function button.

The Handsfree Mic is enabled by:

SRM9010 and SRM9020: PTT pressed while Mic still on hook

SRM9025: PTT while on-hook or 'H' button

SRM9030: PTT while on-hook or 'HFree' button

When the Handsfree Mic is enabled:

SRM9010/20 display shows “H” or similar.

SRM9025/30 display shows “H” near the RSSI bars.

Channel Scanning, voting, etc is disabled while the “H” is displayed. Operationally this can be likened to having the Fist-Mic off hook.

The Handsfree Mic is disabled by:

SRM9010 and SRM9020: ‘Clear’ pressed while “H” displayed

SRM9025: ‘H’ button pressed - or call terminated (Trunk mode)

SRM9030: ‘HFree’ button pressed - or call terminated (Trunk mode)

During any Handsfree conversation (ie. when ‘H’ displayed) the Fist-Mic can be taken off-hook and used in a normal Fist-Mic manner (with Handsfree Mic disabled). Handsfree-Mic operation is cancelled (and trunk call terminated) when the Fist-Mic placed back on hook.

6.4 Type-1 Parallel IO Expansion Option

Applicable to models:

9005	9010	9020	9025	9030
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This Option PCB provides eight IO lines and pre/de-emphasised audio to allow external interfacing to the radio. The Option PCB fits into the Transceiver Option Slot, and provides the following features and facilities:

- Two RJ45 connectors (Transceiver back cover must have both access slots punched out).
- 8x IO lines that may be selected as inputs or outputs by programmer.
- Flat receive and transmit audio
- Pre/De-emphasised receive and transmit audio.
- facility to fit a GPS receiver module.

Rear RJ45 Connector Pinouts are:

Pin No	Rear#1 Function	Rear#2 Function
1	IO#1	IO#5
2	IO#2	IO#6
3	IO#3	IO#7
4	IO#4	IO#8
5	+13.8V (Switched OP)	+13.8V (Switched OP)
6	Audio Output (Flat)	Audio Output (De-emp)
7	GROUND	GROUND
8	Audio Input (Flat)	Audio Input (Pre-emp)

The GPS receiver plugs onto the option board and is secured with four screws.

6.5 Internal GPS Option

Applicable to models:

9005	9010	9020	9025	9030
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This small GPS engine mounts on several Option PCBs to provide position reporting for Trunk and PMR applications.

The OEM GPS receiver engine connects to the Option PCB via a 8-pin header. The antenna connector is brought out the rear end-cap via a short cable.

The kit basically contains :

- GPS Engine
- Rear endcap with intermediate antenna cable
- GPS antenna
- mounting HW

A separate fitting and installation sheet is available from Simoco.

6.6 Cross-linked Cable

This RJ45-RJ45 cable is used with various applications to cross-connect or interconnect Transceivers or Control Units.

The cable is 0.5m long and is coloured Blue for easy recognition.

End-A Pin No	Comment	End-B Pin No
1	IO Line	2
2	IO Line	1
3	IO Line	3
4	IO Line	4
5	N.C. N.C.	5
6	→ Audio →	8
7	Ground	7
8	← Audio ←	6

6.7 600 Ohm Interface Option

Applicable to models:

9005	9010	9020	9025	9030
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This option provides a balanced 600Ω 2/4 wires audio interface and opto-isolated E and M lines.

The board is set up for 4 wires audio interface. It may be field modified for 2 wires audio operation if required.

RJ45 Connector Pinouts are:

Pin No	Rear#1 Function	Rear#2 Function
1	IO#1	E+ (IP#7)
2	IO#2	E- (IP#7)
3	IO#3	M+ (IP#8)
4	IO#4	M- (IP#8)
5	+13.8V (Switched OP)	4W _Output+ or 2W _Audio+
6	IO#5	4W _Output- or 2W _Audio-
7	GROUND	4W _Input+
8	IO#6	4W _Input-

6.8 Type-2 IO Option

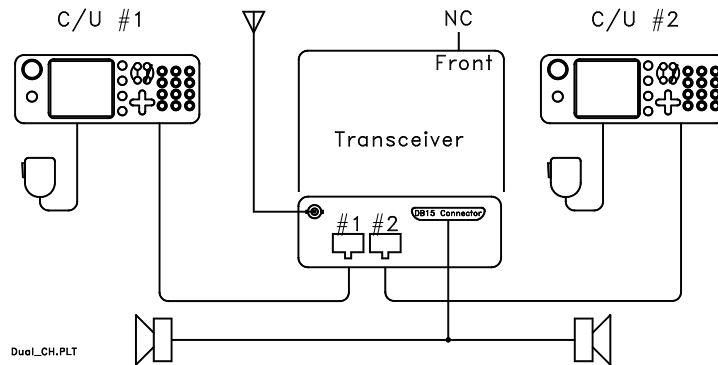
Applicable to models:

			9025	9030
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This Interface Board is designed specifically for multiple Transceivers and/or Control Heads.

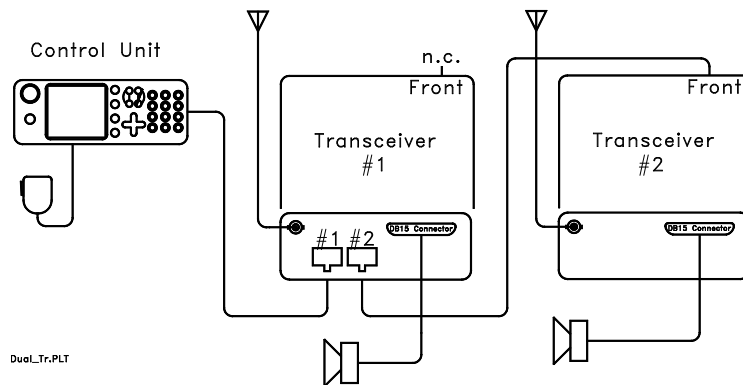
6.8.1 Dual Control Heads

Proposed interconnection :



6.8.2 Dual Transceivers

Proposed interconnection :



6.9 Desktop Base Kit

Applicable to models:

9005	9010	9020	9025	9030
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The Desktop Base kit provides a housing for the radio incorporating a 8Amp Power supply and speaker.

6.10 Service Manual

Applicable to models:

9005	9010	9020	9025	9030
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A Service Manual is available covering the Transceiver, SRM9010/20/30 Mics, SRM9025 Handset, SRM9030 Control Unit.

It covers:

- Service Policy
- Technical Specifications
- Hardware and Block level circuit descriptions
- Circuits and Component layouts
- Replaceable parts lists

6.11 Programmer Lead

Applicable to models:

9005	9010	9020	9025	9030
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The same programming lead as used for the PRM80 Series Radios is used for the SRM9000 Transceiver. The lead plugs into the front connector on the Transceiver.

The lead contains circuitry to convert the 0/5V data levels used by the Transceiver to RS232 compatible levels used by the programming computer. The circuitry is power from the Transceiver.

6.12 Programmer SW

Applicable to models:

9005	9010	9020	9025	9030
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Programming SW is available for PCs running Windows-95 (or equivalent) environments.

A programming lead (described above) is required.

The single SW application programs both Conventional-PMR and Trunk (and Dual-Mode) radio versions.

It has the facility to store and recall jobs from hard disk and read and write configurations to the Transceiver.

The programmer has the following User Levels:

- Basic Limited to Idents and Phonebooks, etc
- General General access to all user radio parameters
- Network Has extra capability to edit the Trunk Network Files

7. FEATURES / BENEFITS

General

Feature	Benefit
Common Transceiver for all versions	<ul style="list-style-type: none"> Minimal spares / change-over holding required for fleet using several variants of radio. Easy upgrades by changing controllers.
Smart Switch-on / off	<ul style="list-style-type: none"> The radio becomes an integral part of the vehicle, switching on when the vehicle is switched on. Auto switch-off means the user can forget about the radio without it running the battery flat if left on.
Controller Microphone (SRM9010/20 models)	<ul style="list-style-type: none"> Simple to Use. Ease of installation in limited-space interiors. All controls are in the palm of hand so radio can be controlled from outside vehicle (via stretchy curly cord). Display is easily readable because its right in front of user.
Handset (SRM9025 models)	<ul style="list-style-type: none"> Keypad for direct dialling is in-your-hand Ease of installation in limited-space interiors. All controls are in palm of hand so radio can be controlled from outside vehicle (via stretchy curly cord). Display is easily readable because its right in front of user Full Trunking and PMR operation means ultimate flexibility.
Alphanumeric Displays (SRM9020/30 models)	<ul style="list-style-type: none"> Channels, Selcalls, Identities and Status's can have real-world meaning - not just numbers.
Menu Driven User Interface (SRM9025/30 models)	<ul style="list-style-type: none"> keeps user interface simple Can provide much functionality in small chunks
Customisable Menu structure (SRM9025/30 models)	<ul style="list-style-type: none"> Unwanted menus do not clutter and unnecessarily complicate operation.
VOX Handsfree	<ul style="list-style-type: none"> Improves driver safety while operating radio Convenience as radio control is minimised Meets legal requirement for radio use while driving in many states

PMR Specific Features and Benefits

Large channel capability (10 on SRM9010, 100 on SRM9020, 1000 on SRM9025/30)	<ul style="list-style-type: none"> • Systems can be set up as required without radio limitations • Channel Numbers and Names can be meaningfully assigned
Scan, Vote, Multiax groups are selected like channels.	<ul style="list-style-type: none"> • The user need not be aware of the intricacies of the system configuration. All that is required is for the user to select a "Channel". • Especially useful in the "10 Channel" SRM9010.
User adjustable Scan Groups	<ul style="list-style-type: none"> • Scan groups can be altered to suit the requirement in the field - not requiring reprogramming.
Nuisance Delete for Scanning	<ul style="list-style-type: none"> • Allows unwanted channels to be temporarily deleted without permanently affecting the Scan Group.
Priority Scanning	<ul style="list-style-type: none"> • Important channels can always be monitored and used while scanning other channels.
PTT Limit Timer with warning tones	<ul style="list-style-type: none"> • Ensures that accidental PTT depressions do not block a channel.
Attack Operation	<ul style="list-style-type: none"> • Provides a more secure work environment

TRUNK Specific Features and Benefits

Vote-Now and Background Hunting	<ul style="list-style-type: none"> • Radio automatically tunes to the site providing the best coverage. • Automatically adapts to different Trunk systems whether Vote-now facility is used or not.
Both MPT1343 and 7-digit ANN Numbering systems supported	<ul style="list-style-type: none"> • Customer can choose to use the numbering system that best suits their operations
Calling via Memory locations (SRM9010 and 9020 models)	<ul style="list-style-type: none"> • Simplifies user interface. ie. The user need only associate with the Memory Name or Number and not the actual Trunking Dialstring. • Memories dialstring may provide special functions (eg. diversions, etc) in simple terms for user.
Full Dual-Mode Capability (SRM9025 and 9030 models)	<ul style="list-style-type: none"> • Radios can be operated when out of range of Trunk Network • Radios can communicate in different systems and User Groups (eg. Conventional PMR users and Trunk Users) • Selcall and PMR can be used to extend Trunk coverage using PMR based cell extenders.
Two Trunk Networks Supported	<ul style="list-style-type: none"> • Radio personality can be changed to operate on other Trunk Network if roaming into a different area.

8. SERVICE PHILOSOPHY

Level 2 Servicing should be carried out in the field and local Service Centres.

Mechanical Items listed in the Service Manual should be able to be replaced in the field.

A Board Exchange program is proposed to be introduced for the Transceiver allowing radio PCBs to be swapped quickly in the field and returned to the Simoco Central Service Centre for repair.

The Microphones and Handset can be repaired in the field to the level indicated in the Service Manual. Replacement PCBs are not available. If the PCB is damaged beyond repair then a new Mic or Handset may have to be purchased.

Level 3 Servicing will be carried out at the Simoco Central Service Centre.

9. SPARES

The Service Manual lists all replaceable items for the SRM9000.

Aside from the normal installation items the following spares are proposed to be available:

Transceiver

Item Description	Comment
Case	
Case End-caps	
Slide-in label for case	
Inner Separator Tray	
Screws	
Complete changeover PCBs	

Microphones

Item Description	9010	9020	9025	9030
Cable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Display	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Mic Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Switches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Case: Front and Rear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9030 Control Unit

Item Description	Comment
Case : Front and Rear	
Volume Knob	
Volume Pot	
Complete changeover Assy	

10. MANUFACTURING

The following items will be manufactured and tested by SIMOCO or Suppliers to Simoco overseas:

- Transceiver
- Option Boards
- Control Unit
- Microphone
- Handset
- Mounting Hardware

11. Appendix - A : Technical Specifications

GENERAL

Operation

Single or two frequency simplex

Modulation

Frequency modulation (phase) F3E

Supply Voltage Requirements

10.8 to 16.2V DC negative earth (13.8V nom.)

Current Consumption

	Mobile With Control Mic.	Mobile With Alpha Mic.	Mobile With Alpha Head
<u>Radio off:</u>	≤ 5mA	≤ 5mA	≤ 5mA
<u>Standby(squelched):</u>	≤ 200mA	≤ 210mA	≤ 210mA*
<u>RX Audio O/P:</u>			
300mW (not bridged)	≤ 450mA	≤ 470mA	≤ 500mA *
4.0W	≤ 1200mA	≤ 1220mA	≤ 1250mA *
<u>Transmit:</u>	VHF	UHF	
25W	≤ 6.5A	≤ 7.5A	
1W	≤ 2.0A	≤ 2.5A	

* Add 250mA to current consumption for Alpha Head with backlight on.

Frequency Bands

Band	Frequency Range	Band	Frequency Range
E0	66 - 88 MHz	TK	400 - 450MHz (Tx to 440MHz)
AC	136 - 174MHz	UW	440 - 500MHz
R1	335 - 375MHz	WR	470 - 530MHz
R2	370 - 400MHz		

Switching Bandwidth

Complete band without retuning

Channel Spacing

12.5 / 20 / 25KHz

Frequency StabilityBetter than ± 2.5 ppm**Operating Temperature**

-30°C to +60°C

Dimensions (mm)	Height	Width	Depth
Transceiver	56	170	165
9030 Alpha Control Head	65	188	45
9025 Alpha Display Handset	165	52	30
9020 Alpha Mic	96	68	44
9010/30 Microphone	82	57	38

Weight

Transceiver 1.8kg

Type Approval Compliance

The SRM9000 is designed to comply with the relevant sections of the following standards:

AS4925

ETS 300 086

ETS 300 113

ETS 300 219

ETS 300 279

IEC 529 level IP54

TRANSMITTER**Power Output**

High Power: 25W Adjustable down to 1W

Low Power: 1W Adjustable up to 25W

Transmitter Rise Time

Less than 50mS from operation of PTT

Duty Cycle

1 minute transmit : 4 minutes receive

Spurious Emissions

< 0.25 μ W (9kHz to 1GHz)

< 1.0 μ W (1GHz to 4GHz)

Residual Noise

60% deviation. CCITT Weighted >40dB

Audio Frequency Distortion

$\leq 3\%$ (at 60% deviation)

Audio Frequency Response

Within +1dB -3dB of a 6dB/octave pre-emphasis curve over 300 to 3000Hz
(2550Hz 12.5kHz channel spacing)

RECEIVER**Sensitivity**

$\leq 0.3\mu$ V PD (-117.5dBm) for 12dB SINAD

Adjacent Channel Selectivity

25kHz Channel Spacing > 73dB

12.5kHz Channel Spacing > 65dB

Intermodulation Rejection

ETS Method > 65dB

AS4295 Method > 70dB

Spurious Response Rejection

> 75dB

Blocking

> 95dB (± 1 MHz)

Conducted Spurious Emissions

< 2nW (-57dBm) 9kHz to 4GHz

FM Residual Noise (CCITT weighted)

25KHz: > 45dB

12.5KHz: > 40dB

Mute Range

Typically 6 to 25dB SINAD

Typical setting 5dB to 10dB SINAD

Audio Distortion

< 3% (1W / 4ohm)

<5% (4W / 4ohm)

Audio Frequency Response

Within +1dB to -3dB of a 6dB/octave de-emphasis curve

300 to 3000Hz (no CTCSS).

350 to 3000Hz (with CTCSS)

(2550Hz for 12.5kHz channel spacing).