MIDLAND LMR
LAND MOBILE RADIO

SYNTECH™-II

Synthesized Radio.

2-Way FM Communications

OPERATOR'S MANUAL

INTRODUCTION

The MIDLAND SYN-TECH II is a fully synthesized, computerized, FM land mobile two-way radio. Either the entire transceiver may be mounted under the dashboard, or just its control head. In the latter case, the radio portion is mounted in a remote location such as the trunk or under a seat. In either case, operation is the same.

Instructions herein describe operation of the SYN-TECH II equipped with the Standard Control Panel. Refer to a separate document for operation of the Deluxe Control Panel.

BASIC CONTROLS

PWR/VOL KNOB

Clockwise rotation increases volume of received messages. When rotated fully counter-clockwise into the click, the radio power is switched off.

SQUELCH KNOB

Adjust to mute annoying noise in the absence of message signals. When turned fully counterclockwise, the squelch function is disabled. At approximately one-quarter turn clockwise, muting occurs. At this threshold point, weak message signals will "break" squelch; but so will interference. The further clockwise the SQUELCH control is set from the threshold point, the less sensitive the radio becomes and the stronger the message signal (and interference) must be to "break" squelch and be heard.

CHANNEL KNOB

Turn clockwise to scroll up through channels, turn counterclockwise to scroll down through channels. There are no rotation stops, so the knob can be rotated continuously. Each detent scrolls one channel and produces a short beep through the speaker.

Optional Incremental Channel Selector: If your radio is equipped with a CHANNEL KNOB that turns only one-eighth turn in each direction, doing so increments or decrements channels once. Release and turn again to step once more, or turn and hold for one second to scroll in the respective direction.

PUSH-TO-TALK BAR (on the hand microphone)

Transmit mode (talk mode) is initiated when pressed. The TX indicator will illuminate and the radio will emit your voice signals on the channel that appears in the CH/GRP DISPLAY.

INDICATORS

MON

Illuminates/extinguishes when the MON push button is pressed.

PRI1

Flashes when the PRI1 channel is sampled for traffic (Priority Sampling active). Glows steadily when traffic on the PRI1 channel captures radio reception, and during PRI1 programming.

PRI2

Flashes when the PRI2 channel is sampled for traffic (Priority Sampling active). Glows steadily when traffic on the PRI2 channels captures reception from the normal channel or from channel scan, and during PRI2 programming.

TX

Illuminates when the radio is on the air (transmitting).

BUSY

Illuminates when a message signal is detected, or any other time the Squelch threshold "breaks" (see SQUELCH above).

CH/GRP DISPLAY

Usually, a channel number ranging from 1 to 320, that the radio is presently operating on, is displayed. While scanning, or while in the Channel-Group Selection mode, or while in the Expander Programming/Review modes; the active group designator (1 through 16) appears with a dash (–). The dash flashes while scanning.

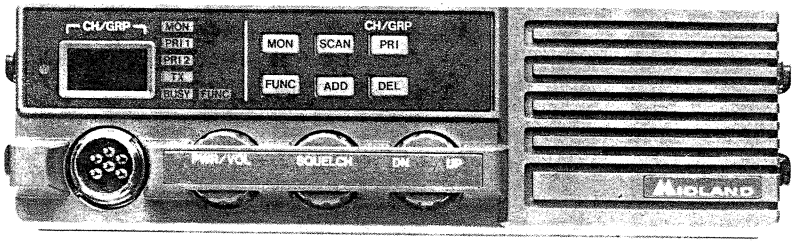

Fig. 1

SYN-TECH II STANDARD CONTROL PANEL

STANDARD PUSH BUTTON FUNCTIONS

BUTTON	AVAILABLE WHEN...	FUNCTION & USE	INDICATION
MON	in any mode except Expander Programming	**CHANNEL MONITOR ON/OFF** Press to disable coded squelch feature. Press again to enable.	MON indicator lights
FUNC	1. in any mode except Expander Prog./Review	**SELECT SECOND FUNCTION** Press before another push button (within five seconds) to activate its second function (white lettering).	FUNC indicator lights
	2. in Expander Programming or Expander Review	**TOGGLE EXPANDER PROGRAM/ REVIEW MODES** Press to switch from Expander Programming mode to Expander Review mode or vice-versa.	FUNC indicator lights when in Expander Review mode.
SCAN	in Main mode	**SCAN FEATURE ON/OFF** Press to initiate channel scan. The radio will sequentially scan for traffic on all channels in the active channel-group. Press ADD to scan more channels (Scan Expander). Scan will pause where traffic is detected. When the radio is keyed with scan active, it will transmit on the last busy channel (or PRI1 channel*). To exit scan mode, press SCAN again (the Scan Expander will reset). To bump a busy channel off of scan, momentarily press DEL while scan is locked on that channel.	Active group designator appears, plus the dash (–) flashes. While traffic is detected, its channel appears and flashes.
ADD Immediate	1. in Main mode	**RETURN ONE OMITTED CHANNEL** Select a channel that has been omitted from scan (see Omit Busy Channel), then press ADD to return it to the scan sequence.	DISPLAY flashes twice
	2. Scanning	**SCAN EXPANDER ON** Press to add all channel-groups in the Expander List to the group being scanned.	Added channel groups roll in the display.
1-sec. hold	1. Scanning	**RETURN ALL OMITTED CHANNELS** All channels omitted from the scan sequence during scan will be replaced. This function may* also occur when you exit scan mode or switch the radio off.	Two beeps

BUTTON	AVAILABLE WHEN...	FUNCTION & USE	INDICATION
ADD 1-sec. hold continued	2. in Main mode	**INITIATE SCAN EXPANDER PROGRAMMING MODE** Programming mode for creating a list of channel-groups whose channels will supplement (expand) the scan sequence. Initiate this mode, select a channel-group with the CHANNEL KNOB, then press ADD to place the group into the list. Repeat for up to eight groups. This mode will time out in five seconds of push button inactivity. FUNC may be pressed to access Expander Review mode.	MON, PRI1, PRI2, TX, and BUSY indicators all illuminate and radio reception ceases.
PRI Immediate	in any mode except Expander Programming	**PRIORITY SAMPLING ON/OFF** Press to enable background traffic checking on two channels (PRI1 and PRI2) previously assigned to the active channel-group. When a message occurs on the PRI2 channel, reception is captured from the normal channel (or scanning), but PRI1 checking continues. Message reception is always fully captured by traffic on the PRI1 channel.	PRI1 and PRI2 indicators flash. Either will light continuously when reception is captured on that channel.
1-sec. hold	in any mode except Expander Programming	**INITIATE PRIORITY PROGRAMMING MODE** The PRI1 and PRI2 channels can be assigned to the active channel-group (or reviewed only*) while in this mode.	PRI1 indicator lights and the previously programmed PRI1 channel appears.
		1. PRI1 programming is first. Rotate the CHANNEL KNOB to select any channel for assignment, then press PRI to assign displayed channel as PRI1.	PRI1 extinguishes and PRI2 lights plus previously assigned PRI2 channel (if any) appears.
		2. Rotate CHANNEL KNOB to select desired PRI2, then press PRI again to assign displayed channel as PRI2.	PRI2 extinguishes and normal operation retunes.

BUTTON	AVAILABLE WHEN...	FUNCTION & USE	INDICATION
PRI 2nd function (CH/GRP)	in any mode except Expander Programming (press FUNC first)	**INITIATE CHANNEL-GROUP SELECTION MODE** Radio channels are segregated in groups and only the channels of the selected group can be used at any one time. Rotate the CHANNEL KNOB to select a channel-group for use. Key the transmitter, or press FUNC and PRI(CH/GRP), to deactivate Channel-Group selection mode.	The channel number in the display is replaced with the active channel group number and a dash (—).
DEL Immediate	1. Scanning	**OMIT BUSY CHANNEL** When locked on a busy channel in scan mode, press DEL to omit the busy channel from the scan sequence.	Scanning resumes.
	2. Expander Review mode only	**OMIT DISPLAYED GROUP** While in Expander Review mode, select a channel-group to delete from the Expander list using the CHANNEL KNOB. Press DEL to delete the displayed group.	Display changes to the next group in list and the omitted group no longer appears in the review scroll.
1-sec. hold	Expander Review mode only	**CLEAR EXPANDER LIST** Deletes the entire Expander List, returns main mode operation. * As programmed by service personnel	The channel displayed before the Expander Programming mode initiated reappears.

BASIC OPERATION

Certain controls and functions of the SYN-TECH II provide simple, basic two-way communications operation. This operation will be described, first, in this section. Later, the supplemental features, such as channel scan and priority sampling will be discussed.

TO TURN THE RADIO ON:

1. Rotate the SQUELCH control fully counterclockwise. After initial adjustment, it is not necessary to repeat this step.
2. Rotate the PWR/VOL knob clockwise to release it from the power-off detent. The CH/GRP display will illuminate and show the last selected channel.

   One short beep will be heard if the radio self-test is successful. If "E00" through "E12" appear in the channel display augmented with beeping, the radio requires service.

3. Press the MON push button. The MON indicator will illuminate.

4. Set the PWR/VOL control for comfortable volume.

5. Wait until no messages are present on the channel, then rotate the SQUELCH control until the rushing sound ceases. At this position, sensitivity of the radio receiver is maximum. If weak non-message interference is heard later, rotate the SQUELCH control a little further clockwise to "tighten" squelch. Remember: the further clockwise the SQUELCH control is set, the less sensitive the radio receiver is and, consequently, the closer you must be to the transmitter to hear its messages. After initial adjustment, it is not necessary to repeat this step.

6. Press the MON push button again to activate the coded squelch feature (coded squelch blocks unwanted messages not originating from your system). The MON indicator will extinguish. If your radio system is not equipped with coded squelch, the MON push button has no effect.

   If your transceiver is equipped with the MIDLAND Switched Hang-Up Box, the coded squelch feature will not be active until the Hang-Up Box Switch is set to the ON position and the hand microphone is in the clip.

CHANNEL SELECTION:

Rotate the channel selector knob to select the desired channel (contact your dispatcher or dealer for details of channel usage). The selected channel number will appear in the channel display.

If your radio is programmed with many channels, it may be necessary to select a channel group within which your the desired channel can be found, first. Refer to the GROUP SELECT section below.

The SYN-TECH II has the capability to sample two Priority Channels, as described hereinafter. If you wish to select either Priority Channel (PRI1 or PRI2) quickly, simply press and hold the PRI button for one second to initiate the Priority-Channel Programming Mode. In that mode, normal operation commences on the Priority channel appearing in the display.

MESSAGE RECEIPT (RECEIVE):

If a message signal is on the channel appearing on the DISPLAY and you are within radio-range (distance limit), you will hear it in the loud-speaker.

NOTE: Your radio may be equipped to block communications from radios not in your radio system (coded squelch feature); or it may even block calls from your system that are not directed to you (selective call feature).

SENDING A MESSAGE (TRANSMIT):

1. Press the MON push button to deactivate the coded squelch feature. If your transceiver is equipped with the MIDLAND Switched Hang-Up Box; simply lift the hand microphone from the Box, instead.

   If your radio system is not equipped with coded squelch, skip this step.

2. Listen to assure the selected channel is clear.

3. Hold the hand microphone close to your mouth, press the Push-To-Talk Bar on the hand microphone to initiate transmit mode (the TX indicator will illuminate), then announce your message in a normal voice. Release the Push-To-Talk Bar when finished speaking to hear the reply.

4. When your conversation is complete, press the MON button again to engage the coded squelch feature if your radio is so equipped.

SECONDARY FEATURES

The mode of basic operation described above is the radio default and will be entitled, hereinafter; "Main mode". Secondary features are enhancements to basic operation and are accessible by special push buttons on the front panel.

CHANNEL-GROUP SELECTION:

If your radio is programmed to operate on many channels, the channels may be organized in groups. The CHANNEL KNOB can select only the channels within the active channel-group. To select a channel in another channel-group, it may be necessary to select a new active group, first, as follows:

1. Turn off the Scan feature, if it's on.

2. Press the FUNC push button. This instructs the radio to respond to the second function (labeled in white) of the next-pressed button. You will have five seconds to press the next button.

3. Press the PRI (CH/GRP) push button. The group-select mode will be initiated and the active group number will appear in the channel display with a dash (—). The radio will continue to operate normally in the last channel.

   Note: Pressing the Push-To-Talk Bar on the hand microphone will deactivate the Group-Select mode.

4. Rotate the CHANNEL KNOB to select the desired channel group. The group designator will appear in the channel display, followed by a dash (—), and a short beep will be audible as the groups change.

5. Deactivate the Group-Select mode by waiting five seconds or by pressing the FUNC push button followed by the PRI (CH/GRP) push button. The Main mode will return and the radio will operate on the channels in the new group. You may now rotate the CHANNEL KNOB to select the channel you wish to use in the new group.

PRIORITY SAMPLING:

If you must constantly listen to a particular channel to receive calls or pages but most of your outgoing communications are on another channel, the SYN-TECH II is equipped with a priority channel sampling feature that allows you to hear calls while staying in your outgoing channel. Priority sampling works in the background while Main mode (or Scan mode) operation commences.

When the Priority Sampling feature is active, radio reception repeatedly jumps to the predetermined priority channel for a moment to electronically check for traffic. The resulting interruptions to reception of the Main mode channel are to short that they are virtually unnoticeable. If traffic is detected on the priority channel, reception stays on that channel until the message is complete.

The SYN-TECH II Priority Sampling feature actually has two priority channels, arranged in hierarchy, for much greater flexibility. These channels are denoted PRI1 and PRI2. When active, Priority Sampling tests PRI1 channel twice for every one test of PRI2. When traffic is detected on PRI2, reception is captured from the Main mode channel, but sampling of PRI1 continues. If traffic is detected on PRI1, reception is captured fully.

Using Priority Sampling:

1. While in Main mode, momentarily press the PRI push button. The PRI1 and PRI2 indicators will flash to indicate Priority Sampling is checking their respective channels. If PRI2 is unassigned, its indicator will stay dark.

   If traffic is detected on either the PRI1 channel or the PRI2 channel, the respective indicator will light continuously, the BUSY indicator will illuminate, its channel number will appear in the DISPLAY, distinguishing beeps will sound, and the message will become audible. PRI1 sounds two short beeps; PRI2 sounds one.

   Shortly after the message is complete and the channel is clear, normal operation will resume.

2. To reply to a message received on a priority channel, simply press the Push-To-Talk bar and speak. The radio will transmit on the PRI1 channel (unless programmed otherwise by service personnel).

3. To disable Priority Sampling, momentarily press PRI again.

Selecting Priority Channels:

If service personnel have not pre-assigned PRI1 and PRI2 of the active channel-group, you may do so. If only PRI2 is blank, you may assign just it. The assignments that you make will not change when you select a new active group, unless PRI channels of the new group were pre-assigned; in which case, the service personnels' choice will become operational.
To assign PRI1 and PRI2, to just review them, or to use this programming mode for quick selection of the Priority Channels:

1. From the Main mode, press and hold the PRI push button for one second to initiate the Priority-Channel Programming Mode. You will hear a short beep, the PRI1 indicator will illuminate, and previous PRI1 channel assignment will appear in the DISPLAY.

   NOTE: If PRI1 was never assigned, the Main mode channel will become PRI1. Also, unlike PRI2, PRI1 cannot be cleared — only replaced.

2. If PRI1 of the active channel-group was not pre-assigned by service personnel programming, you may select any channel with the CHANNEL KNOB.

3. Momentarily press PRI again to program the displayed channel as PRI1 of the active channel-group. The PRI1 indicator will extinguish and the PRI2 indicator will illuminate. Previous PRI2 assignment (if any) will appear in the DISPLAY.

4. If PRI2 for the active channel-group was pre-assigned by service-personnel programming, it will appear in the DISPLAY and you will not be able to change it. If PRI2 was not pre-assigned, the DISPLAY will be blank until you choose a PRI2 channel with the CHANNEL KNOB. If you wish to make PRI2 inoperative again later; access this mode, then press DEL. The DISPLAY will again extinguish.

5. Press PRI again to assign the displayed channel (or blank) as PRI2 of the active group. The PRI2 indicator will extinguish and Main mode operation will return.

SCAN OPERATION:

The Main mode forces you to operate on one channel at any one time. If you need to operate on more than one channel, the scan feature is very useful.

When the scan feature is enabled, the receiver rapidly tunes to many channels, one at a time, to electronically check for traffic. When a signal is detected on a scanned channel, scan pauses and the message becomes audible. Your subsequent response will transmit on that channel.

To Enable Scan:

1. Select the desired channel-group as described above.

2. Press the SCAN push button. The group designator will begin flashing to indicate scan is in progress. All channels in the active channel-group, plus any groups added by enabling Scan Expander (see ADDING GROUPS TO SCAN below), are scanned.

3. When a signal is detected, scanning will stop and the channel number will flash in the DISPLAY while you hear the message. Scanning will automatically resume a short time after the message signal ceases; or you can turn the channel selector in the UP direction to restart scan.

4. Press the Push-To-Talk bar on the hand microphone to respond. The radio will transmit on the scan-stopped channel, even after scanning has resumed (provided traffic has not stopped scan on another channel). If Priority Sampling is also active, your message will transmit on the PRI1 channel, instead.

   Note: When initiating a call, disable scan first by pressing the SCAN button, then select the desired channel.

To Omit A Busy Channel:

A typical problem occurs when a channel with high communications traffic volume is scanned: the receiver will lock on that channel too much and other channels will be neglected. If you do not expect a call on a busy channel, wait for the receiver to lock on the channel, then press the DEL push button. Receiver scan will now bypass the busy channel, even if you select another channel-group.

To put all omitted channels back into the scan sequence, press the ADD push button for at least one second. All channels will return and a short beep will sound. Also,

depending on service personnel programming, the omitted channels may return when — 1) you turn Scan mode off. 2) you turn off the radio.

If you wish to restore only one omitted channel at a time, select it while in Main mode, then press ADD. The DISPLAY will blink twice.

To Turn The Scan Feature Off:

Press the SCAN push button again.

To Expand The Scan Sequence:

As default, the SYN-TECH II Channel Scan feature scans all channels in the active channel-group. If you wish to scan more channel-groups, engage the Scan Expander by pressing the ADD push button momentarily while scanning.

Programming The Scan Expander:

You may construct a list of channel-groups that will be scanned in conjunction with the active group when the ADD push button is pressed while scanning.

1. If Scan is on, return to the Main mode by pressing SCAN.
2. Press the ADD push button for one second to initiate the Expander Programming mode. The MON, PRI1, PRI2, TX, and BUSY indicators all will illuminate, the active channel-group will appear, and radio reception will cease. If you do not press any buttons nor turn the CHANNEL KNOB within five seconds, the radio will switch back to the Main mode.
3. Use the CHANNEL KNOB to select a channel-group.
4. Press the ADD push button to assign the displayed channel-group to the Expander List. The next channel-group number will appear.
5. Repeat steps 2 and 3 for each channel-group you wish to assign, up to a maximum of eight.
6. REVIEW/DELETE. All channel-groups in the list can be scrolled for review and deletion, when the Expander Review mode is active. To access this mode, press the FUNC push button while in the Expander Programming mode. The FUNC indicator will illuminate. Again, you have five seconds to turn the CHANNEL KNOB or press DEL or FUNC push buttons.

   Turn the CHANNEL KNOB to scroll through the list. Press the DEL push button to remove the group appearing in the display from the list. If you wish to clear the entire list, press and hold DEL for one second.

   Press the FUNC push button to return the Expander Programming mode if desired, or just wait five seconds to return to the Main mode.

OTHER VARIATIONS TO RADIO OPERATIONS

JOINED PRIORITY-SCAN

Programming by service personnel may have provided you with the ability to enable Priority plus Scan with one push button, the PRI button. If so, Priority Sampling without Scan is not possible. Operation is exactly the same as if both PRI and SCAN modes were active simultaneously in a standard configuration.

BEEPS

Audible beeps that accompany push button and CHANNEL KNOB activation may be programmed for high or low volume, or off, by service personnel. Also programmable, in the same manner: PRI channel beeps, power-up beeps, Time-Out Timer and BCLO alerts (see below), and Selective Signaling alerts (see Optional Features). Each beep set can be programmed separately.

TRANSMITTER TIME-OUT

A maximum transmission timer may be employed to prevent transmitter overuse. If, while sending a long message, a loud alert tone sounds and the transmitter shuts down; you have exceeded this timer interval and it is advisable to let the transmitter cool for a minute before sending another message.

OFF-HOOK SCAN STOP

Programming by service personnel may have provided you with automatic scan-stop (and Priority sampling stop) upon activation of the Monitor function (by pressing the MON push button or by lifting the hand microphone). Programming determines whether scanning stops on the PRI1 channel or the channel that scan last stopped on.

TRANSMITTER LOCK-OUT

Certain radio systems use special signaling formats that provide automatic traffic control by disabling your radio's transmitter when a channel is busy (also called Busy Channel Lock Out). If your radio system operates as such, more steps than mentioned above are necessary to send a message. Please contact your dealer for details.

INDEFINITE SCAN STOP

The SYN-TECH II can be programmed by service personnel for infinite scan hold. If so, scanning will stay on the channel on which it stops until you rotate the Channel Knob UP (clockwise).

OPTIONAL FEATURES

The SYN-TECH II can be equipped with many different features. Operation of all these features is described hereinafter, but only a few apply to your radio configuration. Mark only the items that apply to your radio.

☐ DIMMER

Your radio may be equipped with one of two dimmer features: automatic type or manual type. The automatic dimmer measures ambient light and adjusts display brightness accordingly. For the manual dimmer, a DIM button is provided. Each time you press it, High, Low, or Off intensities are toggled sequentially.

☐ PUBLIC ADDRESS

An external speaker is connected so that vocal announcements can be made using the SYN-TECH II hand microphone. Press PA to turn this feature on and off. When on, "PA" appears in the CH/GRP DISPLAY. The receiver will remain operational, but transmission will be inhibited. When you press the Push-To-Talk bar while the Public Address feature is on, your voice will broadcast through the external PA speaker.

☐ LOW POWER

Provides selection of High or Low RF output power (strength of the transmitted signal). Unless service personnel programming for the current channel restricts you to Low power only, you may select High or Low by pressing H/L. The LOW indicator will illuminate when Low power is selected.

☐ TALK-AROUND

Direct communications. When Talk-Around mode is activated by pressing DIR, your messages will be transmitted on the receive frequency of the selected channel instead of its transmit frequency. This allows you to bypass the repeater in your system and speak directly to another mobile (Note: The other mobile must also be in Talk-Around mode to transmit directly to you). The DIR indicator will illuminate when Talk-Around mode is on.

☐ SELECTIVE SIGNALING

If your system is equipped with selective calling capabilities, your dispatcher can call just your radio without disturbing other mobiles. Meanwhile, your radio will mask all communications (unless you lift the microphone from its Hang-Up or press MON). When called, an alert tone will sound and you will hear subsequent voice messages.

To enable this feature, press SET — the SET indicator will illuminate. When called, the CALL indicator will begin flashing until you press Push-To-Talk to initiate your response. Once called, other communications on the channel will no longer be masked out until you reset the Decoder by pressing SET twice.
If you spend much time outside, but near, your vehicle; you may wish to have its horn sound when your radio is called — simply press HORN as you step out. The HORN indicator will illuminate. Fifteen seconds after your radio receives a call, the horn will sound for five seconds.

☐ BURST TONE

Certain radio systems allow or require transmission of specific tones to connect you to a dispatcher or illuminate a call-waiting light on his control panel. Your radio will send this tone automatically whenever you press the Push-To-Talk bar to initiate transmission on any channel programmed to do so by service personnel. The tone will be audible in the radio speaker, and your voice will not be transmitted until the tone stops. If your radio is equipped with an ALRT button, you can disable this feature by pressing it. The ALRT indicator will then extinguish.

☐ DTMF A.N.I.

Automatic Number Identification. Certain radio systems require an identifying transmission of telephone — standard tones from your radio. This feature automatically sends your ID number when you press the Push-To-Talk bar, and the tones will be audible in the radio speaker when sent. If manual-A.N.I. has been enabled by service personnel programming, A.N.I. can be invoked by pressing MON for one second.
NOTE: Your voice will not be transmitted while the ID is transmitted. The ID number

☐ PRIVATE SQUELCH

The Private Squelch feature provides security to your conversations. Frequency inversion is used for voice scrambling, which renders your message unintelligible to another radio not equipped with a Private Squelch option.

Service personnel programming marks the channels on which scrambled transmission should occur. When you select those channels, Private Squelch will become active automatically and the CLR indicator will extinguish. If you wish, you may press P/C to turn off Private Squelch. If you select an unmarked channel, Private Squelch cannot be activated.