

DESCRIPTION

The Dual Priority Scan is designed to monitor selected or designated channels in the Phoenix-SX mobile radios.

A Scan/Display Board located behind the Phoenix-SX radio front panel, provides control and display circuits for user selection of the following operating characteristics:

Channel Scan

- Any or all available channels (up to 16) may be selected for scanning.
- The scanned channels may be anywhere within the frequency band of the radio.

Dual Priority

- Priority 1 - The scan locks on this channel whenever a signal is present.
- Priority 2 - The scan locks on this channel except when a signal is present on the Priority 1 channel.

The Dual Priority Scan/Display board provides the following unique user features:

Front Panel Programming

- Select any of 16 channels for scanning.
- Establish Priority channels.
- Easy addition/deletion of channels to/from the Scan list.
- Easy channel selection.

The Dual Priority Scan/Display board also provides the following status displays:

- Selected transmit channel
- Channel being received
- Scan ON (red)
- Priority 1 channel being received (yellow)
- Priority 2 channel being received (green)
- Channel busy indicator (yellow)

Frequency Selection

The selection of channel frequencies is controlled by the CHANNEL select switches. When the CHANNEL up (^) switch is pressed, the display will be

incremented and when the CHANNEL down (v) switch is pressed, the display will be decremented. If a switch is held for less than 660 milliseconds, the display is incremented/decremented to the next channel. If the display is on Channel 16, then it will be reset to Channel 1 when the up switch is pressed. If the CHANNEL select switch is held in, the channel display will ramp (up or down) until the switch is released. When the switch is released, the synthesizer is loaded with the frequency bit code corresponding to the indicated channel.

NOTE

If any switch is pressed while the radio is keyed (PTT), the microcomputer will ignore the switch command and take no action.

Channel Memory

In radios equipped with a type 8749 microcomputer, channel memory allows channel selection and display at any time. It is not dependent upon switched A+ (ignition turn on). Channel memory is enabled by removing W801 and adding insulated DA jumper from H63 to H64 - all on the Interconnect/Synthesizer board.

In radios equipped with a type 8049 microcomputer a separate 5 volt regulator, U2, on the display board, supplies current for channel memory. When the type 8049 microcomputer is used, J4 is connected to J810, J3 is connected to J811, and R832 is removed.

SCAN OPERATION

1. Front Programmable Priority (Option G0)

Three momentary push buttons on the display board are used to control SCAN functions. The SCAN ON/OFF button is a toggle type function which changes the SCAN state; on if off and off if already on. The ADD and DELETE buttons are used to select channels to be scanned. To add or delete a channel, the scan must be turned off. Use channel up (^) or down (v) buttons to select channels (1-16). A channel may be added by pressing ADD button once (Non-Priority). That channel will appear on the SCANNED CHANNEL DISPLAY. To add a level 2 Priority channel, press ADD button twice. PRI 2 indicator will come on. To select a level 1 Priority channel, press ADD button three times. PRI 1 indicator will come on. Any channel may be removed from SCAN by pressing the DELETE button once.

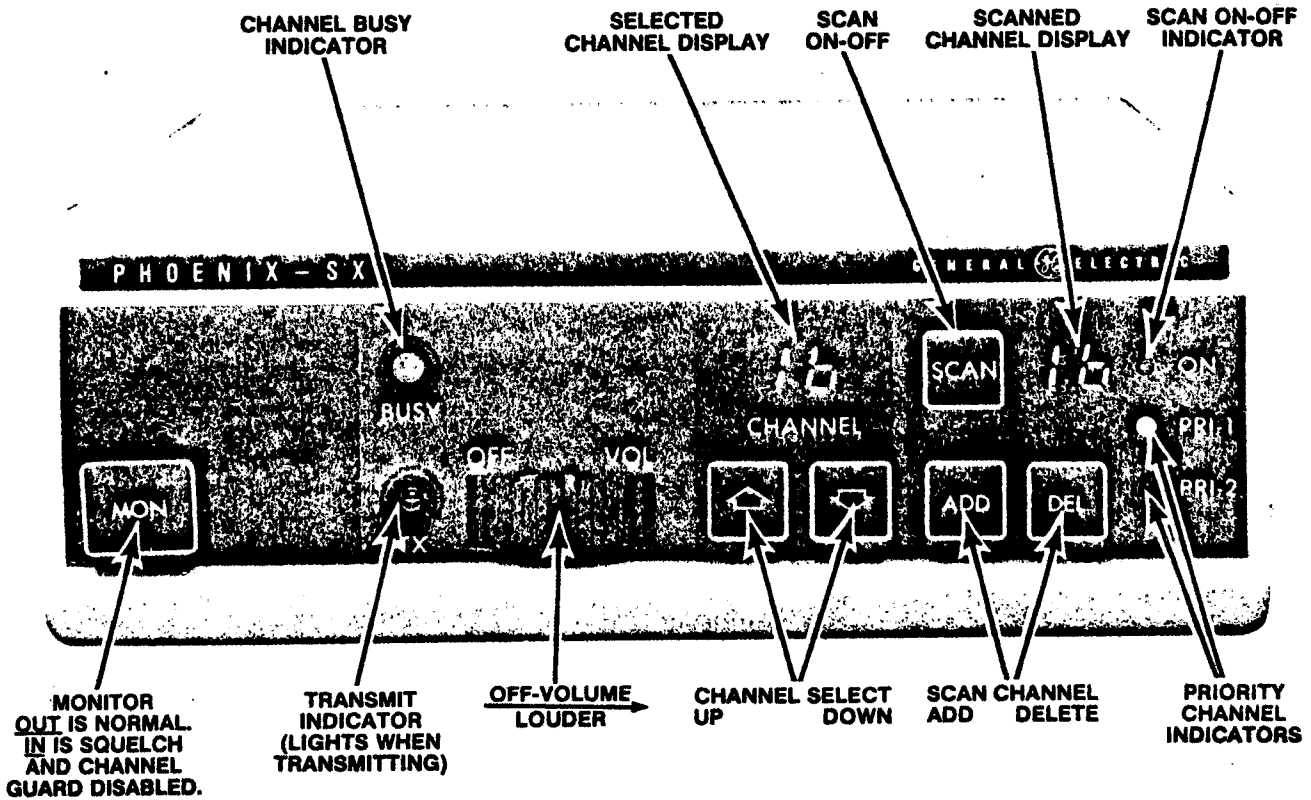


Figure 1 - Phoenix-SX With Programmable Scan

NOTE

A channel may be removed from SCAN when SCAN is ON if there is a carrier present on that channel.

2. Fixed Priority - Set in EEPROM (Option G1)

The Non-Priority and Level 2 Priority channels are selected, added or deleted as described for Front Programmable Priority.

The Level 1 Priority channel is programmed and fixed in the EEPROM in Channel 1 in the factory and can only be changed by reprogramming the EEPROM. Refer to PHOENIX-SX programming instructions for details.

3. Fixed Priority - Set by Channel Selection (Option G2)

The Non-Priority and Level 2 Priority channels are selected, added or deleted as described for Front Programmable Priority.

The Level 1 Priority follows the SELECTED channel when SCAN is turned on. To change, select another channel.

Scanning

It should be noted that, if desired, all 16 channels can be scanned with or without priority level. When SCAN is turned on, scanning of the selected channels starts immediately. Scan time is approximately 100 milliseconds per channel. If no carrier is on any scanning channel, then the order of scan is as follows:

N-N-N-N-P1-P2-N-N-N-N-P1-P1-N-N-N-N-P1-P2

where N is a scanning channel, P1 is the Level 1 Priority channel and P2 is the Level 2 Priority channel. As an example, consider channels 1-8 to be the scanned channels, with P1 being Channel 1 and P2 being Channel 8. The scanning order then would be:

N-N-N-N-P1-P2-N-N-N-N-P1-P2-N-N
 1 2 3 4 1 8 5 6 7 8 1 8 1 2

since it takes approximately 100 milliseconds to scan each channel, then the Priority channels are sampled every 500 milliseconds and the Non-Priority channels get sampled at least once every 2 seconds.

Once a carrier is detected, the Receive Channel display will light up with that channel. If the channel is a Non-Priority channel, and there are no Priority channels, then scanning is halted. If only a Level 2 Priority channel is present, then it is scanned every two seconds. If there is only a Level 1 Priority channel, then it is sampled every 500 milliseconds. If there are Level 1 and Level 2 Priority channels, the sample rate is 500 milliseconds, where P1 is sampled 3 times in succession and then P2 is sampled once.

Hang Time

If the carrier on a Non-Priority channel disappears before a carrier is detected on a Priority channel, then a 2-second hang time is applied before scanning is resumed. However, during this time the Priority channels are still being sampled. The hang time is to prevent fades from causing big gaps in the audio signals.

If a carrier is detected on a Priority channel during the sample period, then the channel is immediately switched to the Priority channel and either the PRI-1 or PRI-2 indicator will turn on. If the carrier is on Priority 1 channel, scanning is stopped until the carrier goes away (plus the 2-second hang time). If the carrier is on Priority 2 channel, then Level 1 Priority channel is still sampled every 500 milliseconds. If there is no Priority 1 channel then scanning is stopped until the carrier disappears. Once a carrier is detected on the Level 1 Priority channel, the channel is switched to Priority 1 regardless of what is being received on another channel (Non-Priority or Priority 2).

Other Operating Characteristics

1. When the microphone is removed from the hookswitch, scanning will stop and revert to the SELECTED channel.
2. When PTT is pressed, scanning will stop and revert to the SELECTED channel before the transmitter is keyed.
3. SCAN ignores the presence of Channel Guard. This means scanning is stopped as soon as a

carrier is detected and will remain on this channel regardless of whether the correct Channel Guard tone is present.

4. When scanning channels without a carrier, a slow squelch with hysteresis is used. This is why it takes 100 milliseconds on each channel. When sampling a Priority channel, a fast squelch circuit is switched in. If this squelch detects the Priority carrier, the Priority channel is switched in but the audio is muted until the slow squelch detects and the correct Channel Guard tone is present. This switching is done through the Hex D Flip-Flop which switches a capacitor in and out of the Squelch circuitry on the TR board. This same line is used to mute the audio signal while sampling the Priority channel to prevent speaker noise. The audio mute time is 50 milliseconds.

DISPLAYS

The Scan/Display board has four 7-segment displays, H1, H2, H3 and H4; a 7-segment display driver, U1, and a Hex D flip-flop, U2. H1-H2 show the selected channel and H3-H4 show the scan receive channel.

When SCAN is off, the Receive Channel display indicates if the selected channel is a scanning channel. If the selected channel is a scanning channel then the display shows the same number as the selected channel. If the selected channel is not a scanning channel, then the display is blank. When SCAN is on, the display indicates the channel currently being received. If there is no carrier on any of the scanning channels, the display will be blank.

Other displays are LED indicators H5, H6, H7 and H8. H5 is the SCAN ON/OFF indicator (red) and is lit when SCAN is on and is off when SCAN is off. H6 is the PRIORITY 1 indicator (yellow) and is on when the channel received is the Priority 1 channel. H7 is the PRIORITY 2 indicator (green) and is on when the channel received is the Priority 2 channel. These three indicators along with the tens digit of the selected and receive channel displays are driven from the Hex D flip-flop U2. H8 is the BUSY (CAS) indicator (yellow) and is driven from the squelch circuit on the associated transmitter/receiver board.