I. GENERAL

The SSC Model 224B is a true universal two-tone sequential or burst tone decoder capable of being easily field programmed via dip switch and tuned to any existing two-tone sequential or single tone format operating between 250Hz and 3050Hz.

Tone acceptance is guaranteed by the ability to independently select tone decode times, independently adjust the frequencies anywhere in the range and to separately select the desired intertone delay limit. The group call function may be used on either the first or second tone or inhibited. Burst tone decoding is provided by removal of one diode. Hook sw. Control is reversible.

Pulsing is eliminated by interlocking the outputs of two independent tone filters and detectors while preserving the decode function in the presence of voice or other extraneous tones.

The Model 224BY is designed as a self-contained under-dash add-on to existing mobile radios where the only connections are to power source, speaker leads and a normally closed mini-horn switch. Additional momentary and latched contacts are available for operating external options such as blower and horn, and to provide interlock signals. Unbalanced provisions have been made for adding a transponder.

The Model 234AA is an uncased version of the 224BY and is intended for mounting within host equipment.

II. OPERATIONAL SCENARIO

The radio receiver power and volume controls are turned on for the SSC decoder to receive selective calls. Set noise squelch for normal operation.

With the "MONITOR RESET" switch in the extended "MUTE" position and the radio microphone on the hook, the radio speaker will remain muted until either the operator removes the mic from the hanger, or depresses the "MONITOR" switch, or another station selectively calls the local station with a proper encoded signal.

If selectively called, the decoder will respond by momentarily sounding the buzzer (if provided) and by blowing the vehicle horn (if connected and if the operator had depressed the "HORN BLOW" switch).

In addition, the red "CALL" lamp will illuminate and together with the unmuted speaker will remain operational until reset either by removing the mic or by calling the "MONITOR RESET" switch or by twice pushing the "MONITOR RESET" switch so that it winds up in the extended "MUTE" position.

If the SSC Decoder happens to be in the "MONITOR" mode when a selective call is received, the optional buzzer and horn will sound momentarily and the "CALL" lamp will illuminate and remain on until reset by one of the above-mentioned means.

III. SPECIFICATIONS

Signal Format: Two-Tone Sequential with optional single tone group call or optional single burst tone.

Input Level: 1mW to 10mW.

Frequency Range: Each tone independently continuously tunable from 250Hz to 3050Hz in two independent dip switched bands.

Decode Bandwidth: 1.5kHz with stability, 5kHz. Balanced, D.C. isolated 160mohms 2W dummy speaker load in muted condition, 2.5K in decoded condition. Unbalanced and greater than 0.5mVohm with coupling transformer and load resistor deleted.

Tone Acceptance Formulas:

- Tone 1: Greater than 70mS, or 300mS, independently dip switch selectable.
- Tone 2: Greater than 70mS or 300mS, independently dip switch selectable.

Intermodulation Limit: 100mS for 400mS dip switch selectable window before start of second tone.

Tone 2: Greater than 70mS or 300mS independently switch selectable.

Group Call Operation: Selectable, disable or greater than 4.9 seconds of either tone 1 or tone 2 but not both.

Single burst tone operation afforded by synchronously tuning both tone filters and removing latched interlock from.

Other timing values obtained by changing appropriate resistors.

Supply Voltage: 10.8V to 20VDC.

Current, Stand-by: 2mA nominal.

Current, Latched: 6mA nominal.

Current, Max.: 140mA nominal during second tone alarm.

Decode Indication: Bright red LED on front panel.

Operating Temperature Range: -40°C to +85°C.

Enclosure Size: 3-1/8"W x 4-1/16"D x 1-5/16"H plus mounting bracket and connector with mating cable.


IV. MOUNTING CONSIDERATIONS

Locate a convenient surface under the dash of the vehicle or attach to the host radio where the mounting bracket may be secured leaving room for passenger knees and still within easy reach of the operator. Refer to the mobile installation drawing on the back page for all necessary connections.

V. INSTALLATION AND ADJUSTMENTS

Before installing, open the cover of the 224BY and program the decoder according to the Dip Switch Programming Chart. This will be determined by the associated encoder format.

Determine the following parameters:

1) Frequency of Tone 1
2) Frequency of Tone 2
3) Length of Tone 1
4) Space between Tone 1 & Tone 2
5) Length of Tone 2
6) If group call is used, which tone.
7) If single burst tone, select tone.
8) Hook sw. Control logic, see Note 5.

Locate the seven section dip switch on the 224BY board. Program the required format as required according to the Dip Switch Programming Chart.

The group call option is factory strapped for "None." If group call is desired on either the first or second tone, consult the schematic, option note 2, and instructions and consult the assembly drawing for location of the group call strapping.

Following the decoder programming and strapping procedure in the above, prepare to tune the decoder to the exact required frequencies.

To set tone #1, use factory supplied jumper between J1 and J2, this will cause tone filter #1 to oscillate at the decode frequency. Connect a counter or scope with frequency standard reference to the jumper for observation of frequency. Adjust R7 (20 turn pot) for desired tone frequency. Remove the jumper and reconnect between J1 and J3 to cause tone filter #2 to oscillate. Repeat the tuning procedure while editing tone 2 for desired tone frequency. Tune both filters to the same frequency for single burst tone decoding. (Cont. on page 4).
VI. LIMITED FIVE YEAR WARRANTY

All cataloged SSC products are warranted for five years for replacement of defective parts and two years for labor.

This warranty is specifically limited to correction of the defects by factory repair or replacement of the faulty equipment or parts. Any unauthorized alteration or modification of the equipment or damage caused by external sources will void the warranty.

All warranty repairs must be performed at the SSC factory in Hayward, California. No credit will be given for unauthorized repair work attempted by the customer. In-warranty merchandise must be shipped to the factory freight prepaid and will be returned freight prepaid.

Equipment for repair may be returned to the factory without prior written authorization; however, it is required that a note be sent with the packing list briefly describing the nature of the defect. Customer authorization must be included for out-of-warranty equipment before repairs can be made.

Non-warranty repairs will be billed at prevailing labor rates plus parts if not covered.

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**BASIC PARTS LIST, P.C. BOARD T-224BY**

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**Reference** | **Qty.** | **Description**
--- | --- | ---
R52 | 1 | 2.2K 5% 1/8 or 1/4W CF
R41 | 1 | 220 ohm, 5% 1/8 or 1/4W CF
R15, R34 | 2 | 10K, 1W
R4, R23, R43 | 3 | 2.4K
P36, P35 | 2 | 5.6K
R1, R51, R21 | 2 | 10K
R48, R49 | 2 | 3.9K
R18, R37 | 2 | 39K
R20 | 1 | 43K
R17, R36, R6, R25 | 1 | 100K
R5, R24 | 2 | 180K
R42 | 1 | 560K
R22, R9 | 1 | 680K
R2 | 1 | 6.8K
R12, R31 | 2 | 10K
R9, R36 | 2 | 22K
R39 | 1 | 910K
R44, R46 | 2 | 1K, 1/8W CF
R47 | 1 | 1K, 1/4W CF
R10, R13, R29, R32, R8, R9, R27 | 4 | 10K, 1% RN55 D or C
R1, R14, R30, R33 | 2 | 22K, 1% RN55 D or C
R50 | 1 | 16 ohm, 5% 2W CC
R7, R26 | 2 | 22K, 5% 1/4W C.F.
R45 | 4 | CAPACITORS
C19, C18, C21 | 1 | 0.001uf, 20V 100V, C Disc
C6, C13 | 2 | 0.1uf, 20V 16V, Tant
C7, C14, C5, C12, C22, C20, C8 | 6 | 0.2uf, 20V 16V, Tant
CZ, 8, 15, 17, 16, 9 | 6 | 1uf, 20V 50K CRT
C4, C11, C3, C10 | 4 | 10uf, 10V 16V, Tant
S8, S9 Ref. | 2 | Button, Black (For S8, S9) #FSC
S8, S9 | 2 | 2PDT Latching, Push-On, Push-Off
IC-1, IC-2 | 2 | 8040N
IC3 | 1 | Operational Amplifier #LM324CN
SCR-1 | 1 | SCR TIC-44 / 2N5060 / C103Y
T1 | 1 | TRANSFORMER
T1 | 1 | Centinal, 4TTM016
S1-7 | 1 | DIGITAL #CTS-206-7
S8, S9 | 2 | PNP Latching, Push-On, Push-Off