SPECTRUM COMMUNICATIONS
1055 W. GERMANTOWN PK.
NORRISTOWN, PA. 19401
215 - 631 - 1710

TIMER RESET TONE ANNUNCIATOR BOARD

TRA-1

1.0 DESCRIPTION

The TRA-1 is an all solid state circuit which triggers the repeater ID tone oscillator to signal the operator that the proper amount of time has elapsed to reset the repeater time-out timer. When a signal is received, the repeater will be instantly triggered in the normal fashion. When the signal is dropped, however, the TRA-1 will delay the repeater "Reset" for some time (set by R3). At the end of this delay, the TRA-1 keys the ID tone oscillator for a short "beep" (beep length set by R4) to signify that enough time has elapsed to reset the time-out timer. The TRA-1 thus provides a variable time-delay for reset of the timer, and an annunciator to alert the operator that reset has occurred. This is a very effective measure to elminate "tail-gating" on the repeater and allow time for breakers to enter between transmissions. If a user transmits before the "beep", he may "time-out" the repeater if his transmission plus the previous transmission's time exceeds the repeater's time-out time.

2.0 INSTALLATION

When used with the SCR1000 repeater, the TRA-1 should be mounted on the chassis side wall near the COR-TIMER-CONTROL board (CTC100). The terminals on the TRA-1 should be wired to the designated terminals on the CTC100 - see the TRA-1 component layout drawing. (NOTE: SCR1000 users - remove jumper between E305 and E307 on the CTC100 before installing the TRA-1.)

Key the repeater in the normal fashion and note that a beep is produced on the transmitted output sometime after the input signal is removed. Adjust R4 for the desired beep duration, then adjust R3 for the desired amount of delay before beeping. The TRA-1 is now adjusted properly, and the repeater "Hang" timer should be used to effect any change in the overall "Hang" time.

If the TRA-1 is used with other repeaters, it should be wired directly in line with the signal which triggers the timer circuits. The TRA-1 is designed to work with standard TTL levels on all inputs and outputs, but can only drive one TTL load. Also, some signal inversion might have to be provided in the interface to accomadate the TRA-1 logic sense. See the theory of operation.

3.0 THEORY OF OPERATION

NOTE: In the discussion that follows, the expression "logic HI" refers to a voltage which is approximately 5VDC, while "logic LO" refers to a voltage which is approximately OVDC.

The conditioned squelch voltage (either from the receiver or a COR board such as the CTC100) is applied to terminal E1 of the TRA-1. When a signal is received, the level into E1 will go "LO", driving pin 3 of IC1 "HI". This "HI" Signal charges C2 almost instantly through CR1. This "HI" on C2 (and thus pins 5&6 of U1) causes pin 4 of U1 to go "LO", triggering the main timers in the repeater control circuitry.

When the signal disappears, the conditioned squelch voltage into E1 goes "HI", causing pin 3 of U1 to go "LO". This in turn causes C2 to discharge slowly through R3. When the voltage on C2 reaches the threshold voltage of U1 (1.6-3.0 volts), pin 4 of U1 goes "HI", resetting the time-out timer in the COR control circuits. (It is assumed here that the time-out timer **was** configured to reset immediately upon loss of input signal).At the same time that pin 4 of U1 goes "HI", a pulse, whose width is set by R4 and C3, is coupled into pin 9 of U1. If E6 is also "HI" (indicating no ID is in progress), E5 will go "LO" for the duration of the pulse on pin 9, and will trigger the tone oscillator in the ID circuit. The normal "Hang" timer in the repeater will keep the transmitter on during this time. (The TRA-1 does not affect the "Hang" timer of the CTC100 board.) The net effect of the whole curcuit is that E4 will go "LO" instantly following E1, but will not go "HI" until some delay time after E1 goes "HI". The "beep" is triggered at the end of this delay (set by R3) and the repeater's time-out timer is simultaneously reset.

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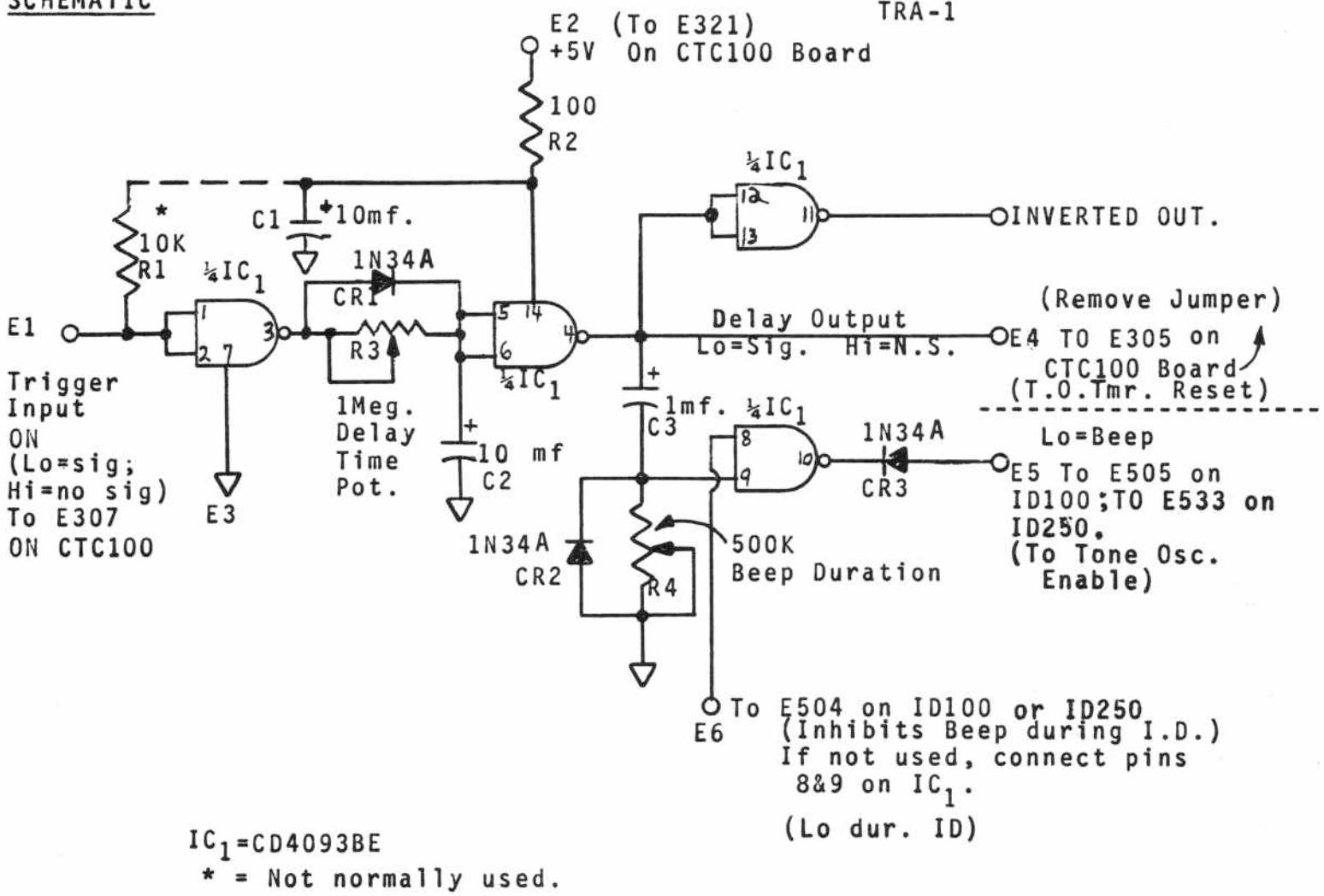
TIMER RESET ANNUNCIATOR SCHEMATIC

TRA-1



IC_1=CD4093BE

* = Not normally used.

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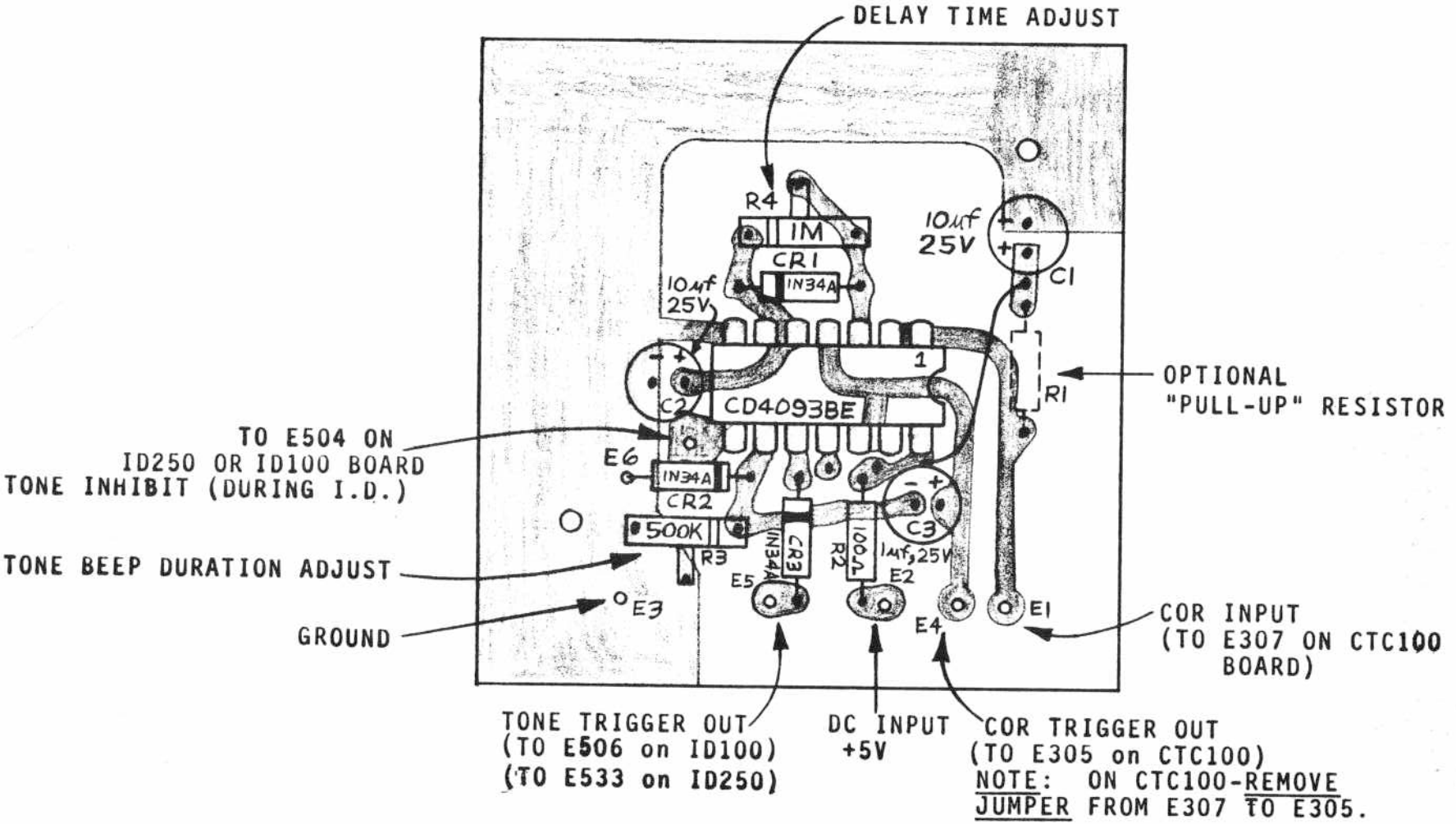
TRA-1
COMPONENT LAYOUT

(COMPONENT SIDE VIEW)



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