IMPROVED PK-232 THRESHOLD DETECTOR

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Although the PK-232 is an excellent multi-mode controller, it's performance on the HF bands in the presence of noise, static crashes, adjacent channel "splatter" and off-channel signals can be significantly improved. This article describes a simple modification to the PK-232 threshold detector which significantly reduces the number of false characters or "garbage" printed due to undesirable noise and signals.

The PK-232 uses a simple amplitude level comparator to compare the amplitude of the received signal which passes through the input limiter and band-pass filter to a front panel adjustable threshold. When a signal exceeding the pre-set threshold is detected, the circuit generates the active low /CD signal to indicate to the PK-232's microprocessor that data has been received and illuminates the front panel DCD LED. Unfortunately, noise, static crashes, and off-channel signals will also pass through the input limiter and band-pass filter and if of sufficient amplitude, cause the threshold detector to recognize them as valid data, resulting in garbage on the terminal display.

The PK-232 threshold detector consists of a logarithmic amplifier (U34B), low-pass filter (R126/C51) with a corner frequency of 240 Hz, a threshold detector (U34A), and a transistor switch (Q11) as shown in Fig. 1. The low-pass filter reduces false triggering of the threshold comparator by noise pulses and adjacent channel splatter which falls within the pass-band of the receiver and the PK-232 input filters, and thus reduces the amount of false characters produced. A significant improvement in the performance of the threshold detector can be realized by reducing the low-pass filter corner frequency to approximately 140 Hz.

The modification was designed for ease of installation without removal of the circuit board from the chassis and to permit restoration of the PK-232 to the factory configuration if desired. The modification consists of increasing the value of C51 from 3.3 uF to 5.5 uF by adding a 2.2 uF/10 WVDC tantalum capacitor in parallel with C-51 as shown in Fig. 1. A Radio Shack part number 272-1435, 2.2 uF/35 WVDC capacitor may be substituted.

Be sure to observe proper electrostatic discharge (ESD) precautions when performing this modification. Turn off DC power to the unit and remove all connectors from the rear of the PK-232. Remove the six phillips head cover retention screws from the sides and rear of the unit and remove the cover by sliding rearward to clear the CW KEY jacks and carefully lift the front of the cover upwards and towards the rear. Unplug the battery backup connector (used on older units) and complete the removal of the cover. Position the chassis on a qualified ESD work surface with the front panel facing you. Using Fig. 2 as a

reference, locate C51, R126 and R131 which are located directly forward of the RX IN/AUDIO 2 jack (J5). Trim the leads of the 2.2 uF capacitor to 3/8-inch and form to span resistors R127 and R130. Using a 700-degree grounded tip soldering iron, solder the positive lead of the capacitor to the forward pad of R126 and the negative lead to the forward pad of R131 (near C51). Reattach the backup battery connector and reassemble the cover to the chassis by reversing the removal procedure.

After the PK-232 has been reinstalled in the station it will be necessary to re-enter all preset parameters if the backup battery was disconnected. Power up the station HF receiver and the PK-232 and select the HF RTTY mode and set the PK-232 THRESHOLD control to the 12 o'clock position. Tune in a 45 baud RTTY signal, set the receiver volume to a comfortable listening level and adjust the threshold control until the DCD LED just extinguishes, then increase the control clockwise approximately 15 degrees. The DCD LED should remain illuminated and clean copy should be observed on the terminal display. Now detune the receiver slightly off frequency until only a mark or space signal is observed on the bar graph TUNE indicator and note that the DCD LED extinguishes. The THRESHOLD control may require a slight adjustment.

During normal operation of the PK-232 with the modification installed, you will observe that when the desired signal terminates transmission, the DCD LED will abruptly extinguish and noise, static crashes, and out of channel splatter will not trigger the threshold circuit and there will not be any garbage displayed on the terminal display.

While the PK-232 design does not provide anti-space and anti-CW capabilities associated with older analog terminal units and "Green-Key Iron Monsters", this modification will significantly reduce the amount of garbage on the terminal display in the presence of extraneous noise and absence of a desired signal in all modes.

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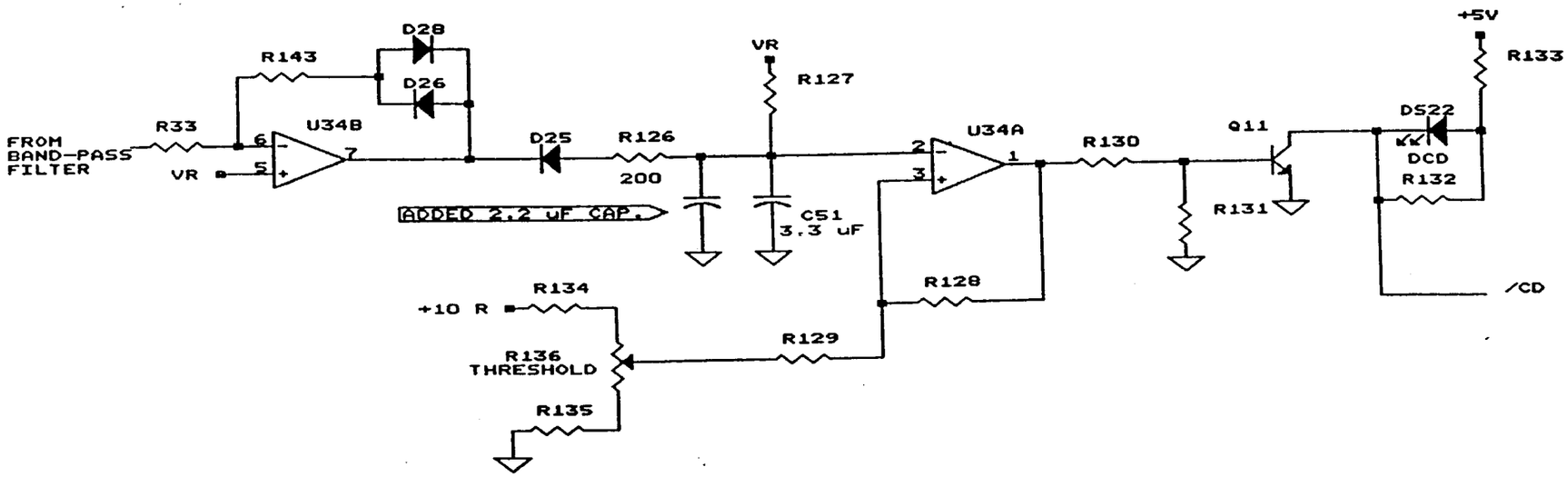

FIG. 1 SCHEMATIC, PK-232 THRESHOLD DETECTOR

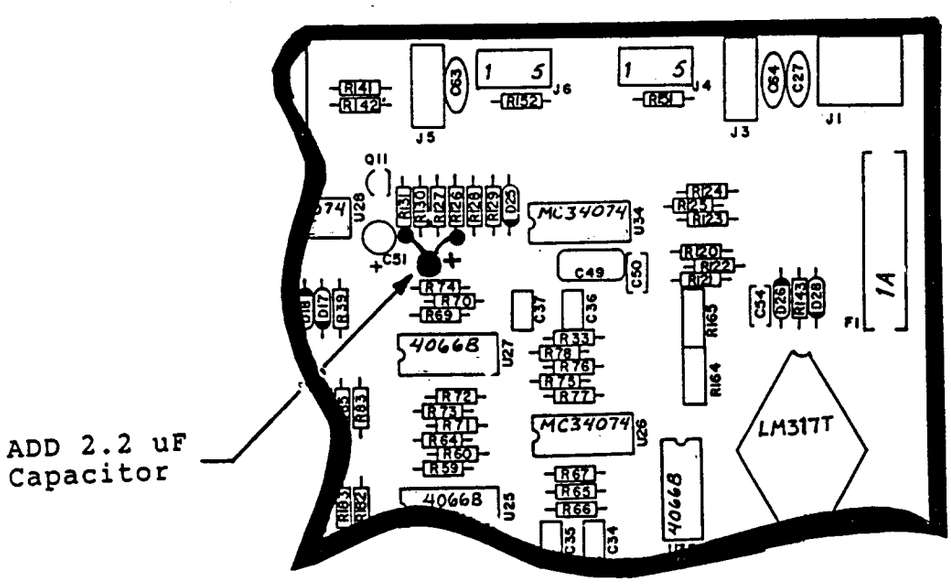

FIG. 2 COMPONENT LOCATION