


**ASB-1036 (APU-0017)**

## Service Bulletin

**Amateur Radio Division**
**Subject: TS-450S - Driver Transistor Parts Change**
**Date: December 8, 1993**

The 2SC2509 driver transistors are no longer available. They have been discontinued by the manufacturer. A substitute transistor (2SC3133) is available but requires some minor circuit changes. These changes are detailed below.

### Parts Required:

| Qty | Description               | Kenwood Part No. | Circuit Description |
|-----|---------------------------|------------------|---------------------|
| 2   | Driver Transistor         | 2SC3133          | Q2, Q3              |
| 2   | 330 1W Carbon resistors   | RC05GF2H331J     | R8, R9              |
| 1   | .047 uF Ceramic capacitor | C91-0119-05      | C2                  |
| 2   | 220 pF Ceramic capacitor  | CC45SL2H221J     | C64,C65             |
| 1   | 560 pF Ceramic capacitor  | CC45SL2H561J     | C63                 |

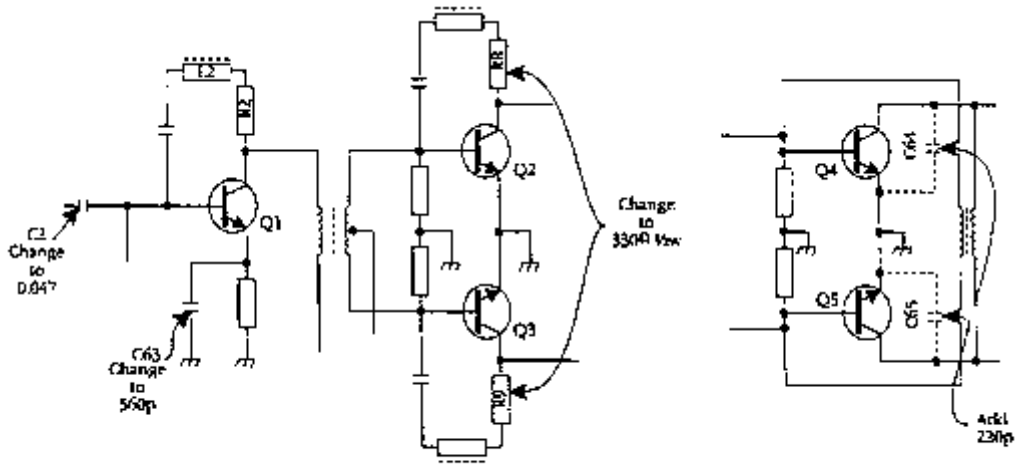
### Procedure:

Make the following changes on the HF Final Unit (X45-3400-XX)

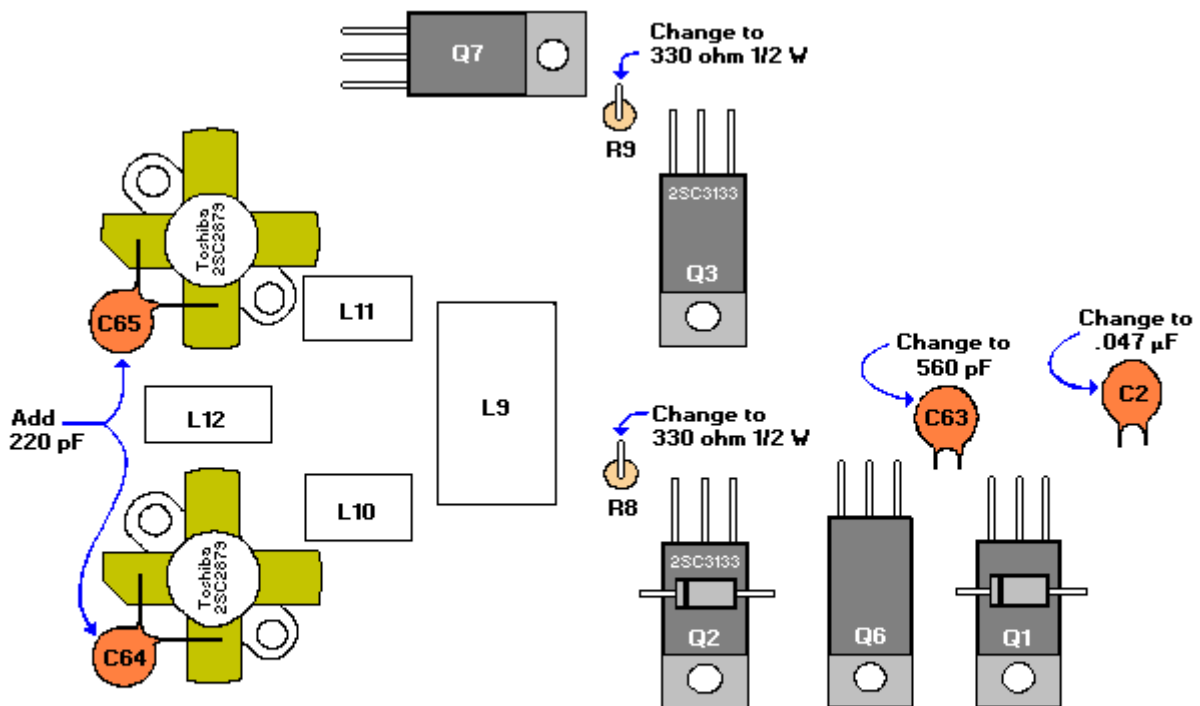
1. Change C2 to 0.047 uF. This is connected to the base of Q1
2. Change C63 to 560 pF. This is connected to the Emitter of Q1
3. Change R8 and R9 to 330 Ohm. These are connected to the collectors of Q2,Q3
4. Add 220 pF caps (C64,C65) from the collector to emitter of Q4 and Q5
5. After install of the new driver transistors (2SC3133) readjust the bias current according to the instructions contained in the service manual.

### Note:

C64 and C65 should be soldered directly to the collector and emitter pins of the final Transistors Q4 and Q5.



HF Final Unit (X45-3400-XX)



TS-450S/690S Final Unit (X45-3400-XX)  
Component Side View

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Time required for this modification is 60 minutes or less.

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