

## SERVICE BULLETIN Amateur Radio Division

SUBJECT TS-940S MRF-485 Driver Transistor Notes

DATE January 16, 1992

Some MRF-485 transistors are being supplied by Motorola with a Green or Blue color ranking. If these transistors are installed without modifying the driver bias circuit there is a very strong possibility that they will fail within a very short time frame.

These high gain transistors cause the circuit to become unstable which can cause the circuit to break into self oscillation, and therefore self-destruct.

### Recommendations:

Use of Red, Orange, or Yellow hfe color rankings is recommend. These lower gain transistors work just fine and do not suffer from the circuit instability problem. If you are only able to obtain the higher gain transistors you will need to modify the varistor/temperature compensation circuit on the final unit (X45-1400-00) by changing R16 from 1.2K to 2.2K ohms.

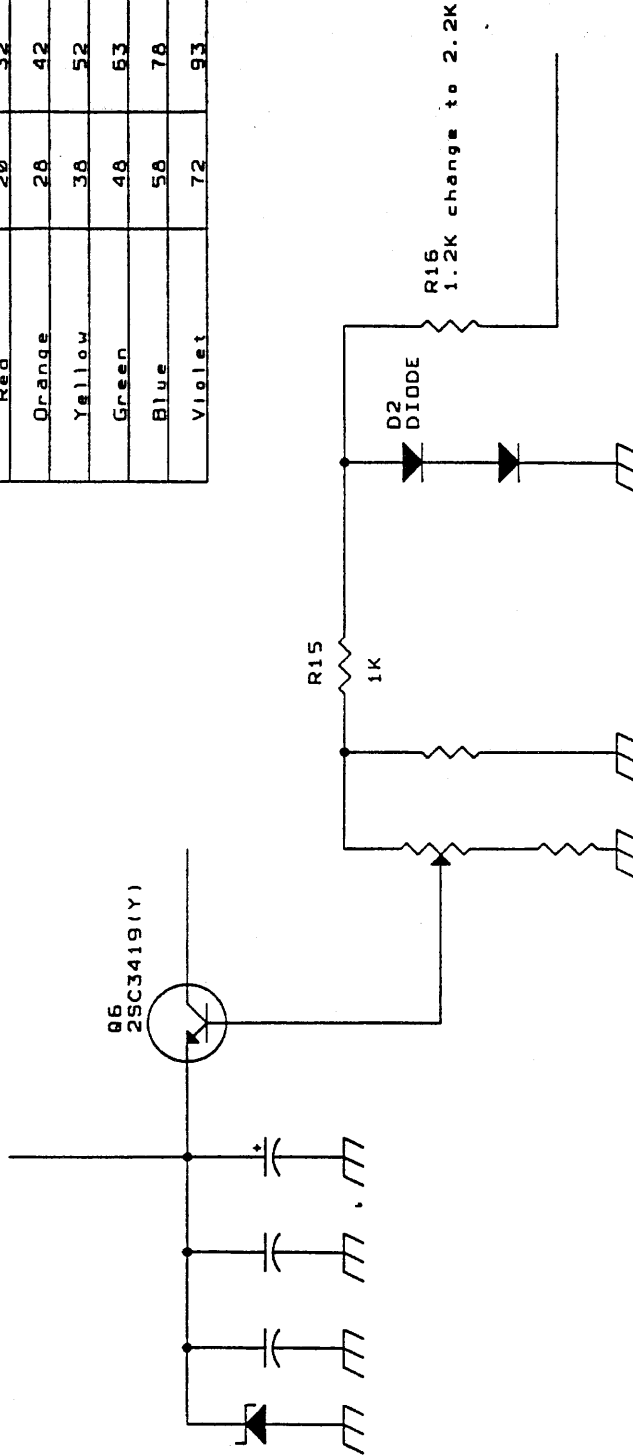
During its production the TS-940S used two different varistor values. The original part was an STV3H (O). It was changed in mid-production to an SV-03YS. R15 was changed from an 820 ohm resistor to a 1K ohm resistor at the same time. Therefore the countermeasure differs depending upon the serial number of the radio.

Serial number lot	Varistor D2	R15	R16	MRF485 Green or higher rank
106XXXX or earlier	STV3H(O)	820	1.2K	See "Caution below"
107XXXX or later	SV-03YS	1K	2.2K	Change R16 from 1.2K to 2.2 K

**Caution:** If using a Green or higher hfe rank one of the above countermeasures must be taken depending upon the serial number of the set. After replacing the drivers check the bias current. We recommend transmitting for 1 hour in the SSB mode with no modulation into a dummy load. After this time frame check the bias current. It must not exceed 300 mA on the original radio. If the current changes you must change R16 from 1.2K to 2.2K.

MRF485 hfe Color Codes

Color range	Limits	
	MIN	MAX
Red	20	32
Orange	26	42
Yellow	36	52
Green	46	63
Blue	56	76
Violet	72	93



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