10

Troubleshooting Charts

This section contains detailed troubleshooting flowcharts. These charts should be used as a guide in determining the problem areas. They are not a substitute for knowledge of circuit operation and astute troubleshooting techniques. It is advisable to refer to the related detailed circuit descriptions in the theory section prior to troubleshooting a radio.

Most troubleshooting charts end up by pointing to an IC to replace. It is not always noted, but is good practice to verify supplies and grounds to the affected IC and to trace continuity to the malfunctioning signal and related circuitry before replacing any IC. For instance, if a clock signal is not available at a destination IC, continuity from the source IC should be checked before replacing the source IC.

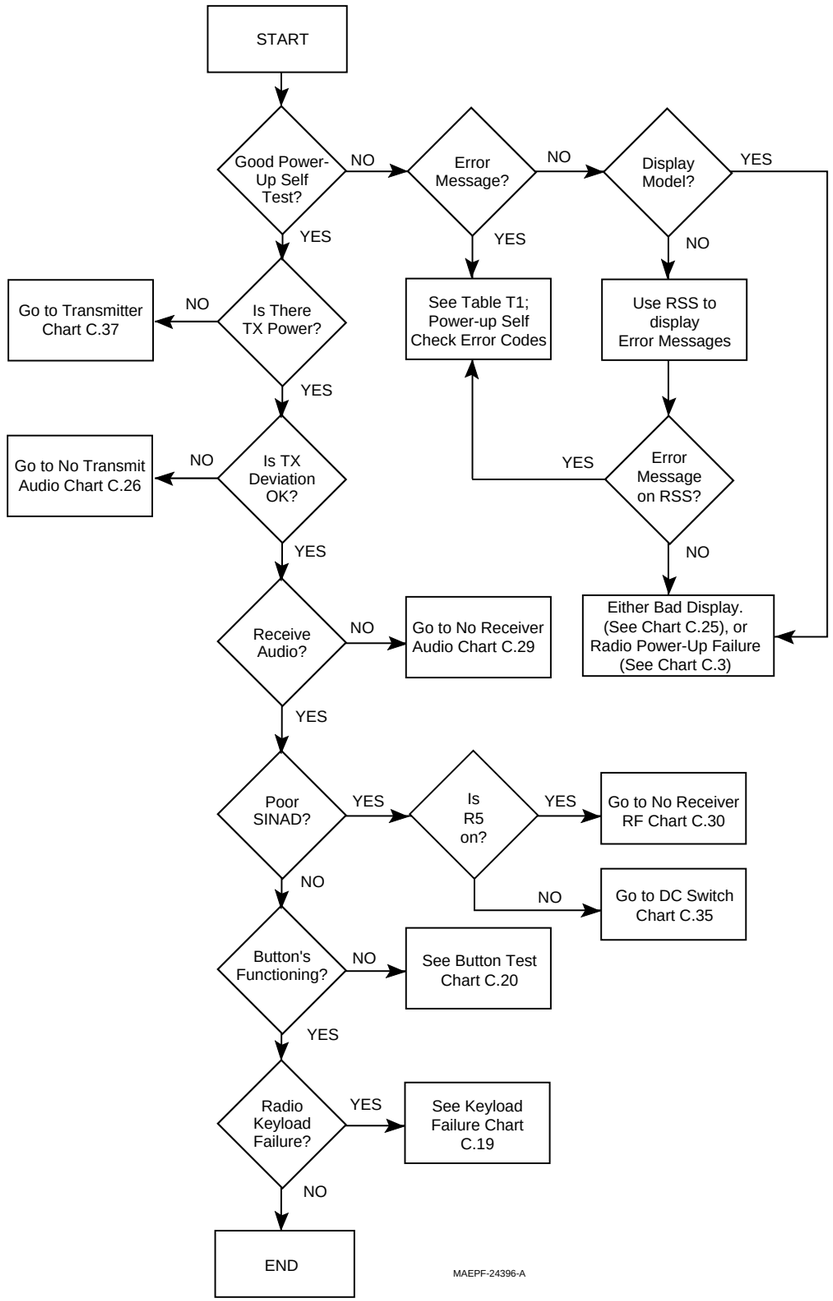


Chart 1 . 800MHz Radio Main Troubleshooting Chart

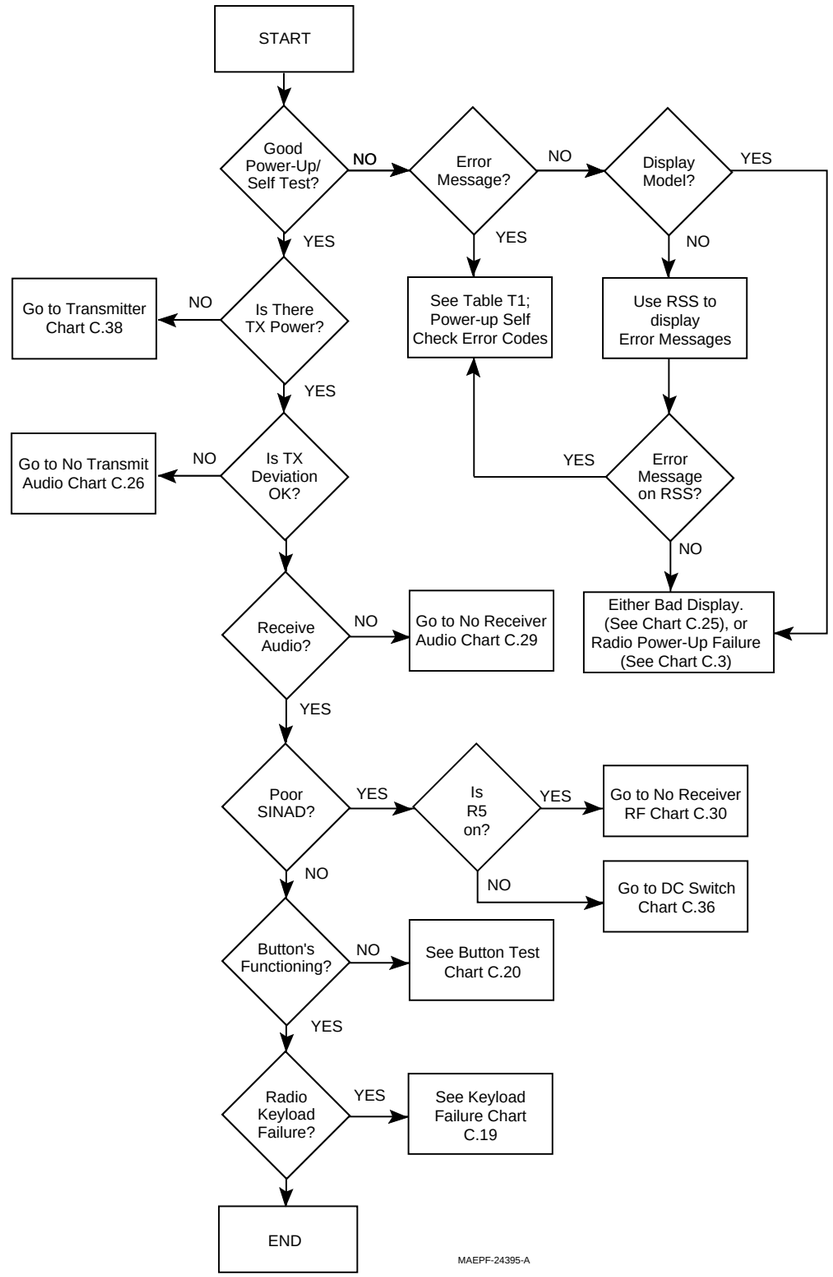
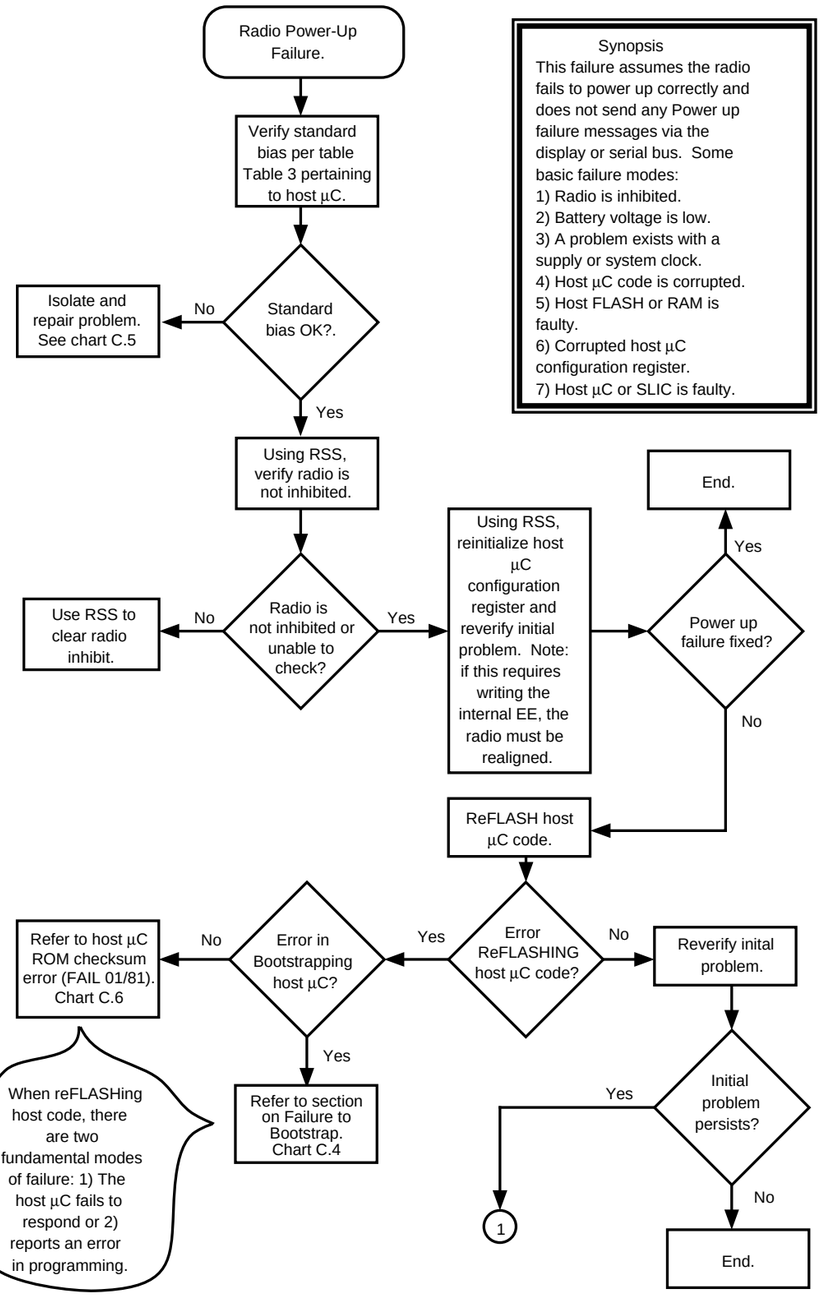


Chart 2 . VHF/UHF Radio Main Troubleshooting Chart



Synopsis

This failure assumes the radio fails to power up correctly and does not send any Power up failure messages via the display or serial bus. Some basic failure modes:

1) Radio is inhibited.
2) Battery voltage is low.
3) A problem exists with a supply or system clock.
4) Host µC code is corrupted.
5) Host FLASH or RAM is faulty.
6) Corrupted host µC configuration register.
7) Host µC or SLIC is faulty.

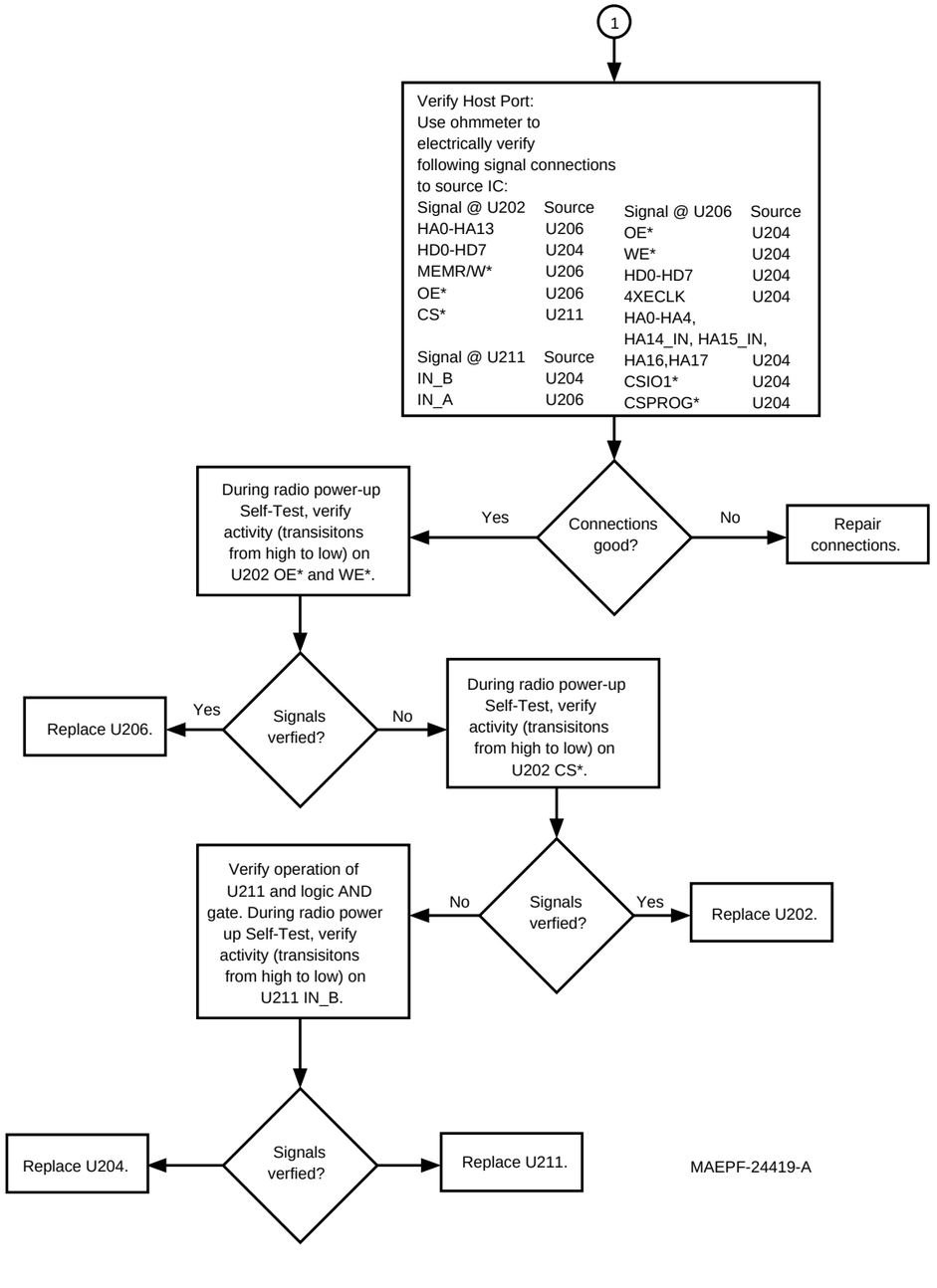


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Chart 3 . Radio Power-Up Fail

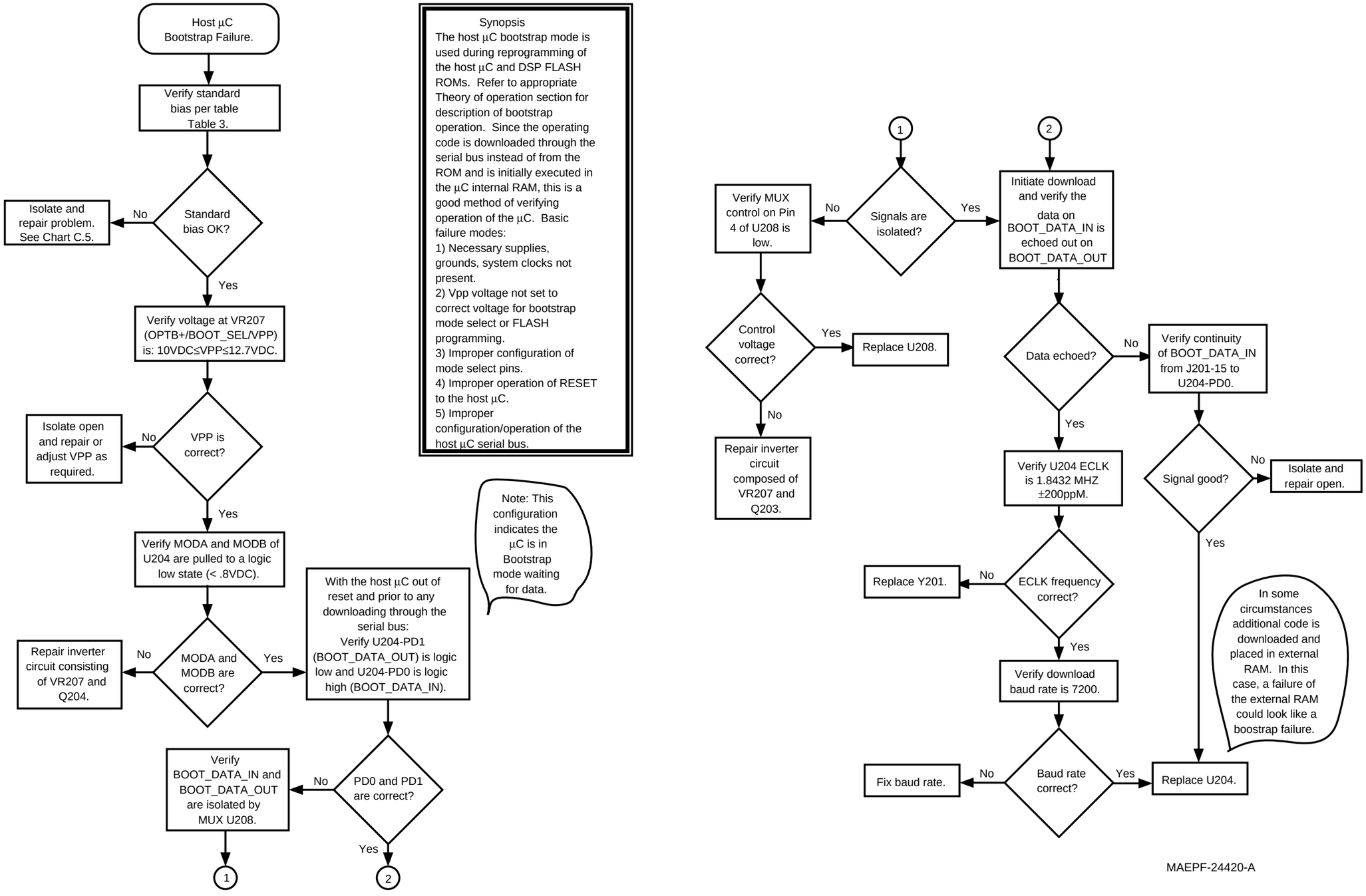


Chart 4 . Bootstrap Fail

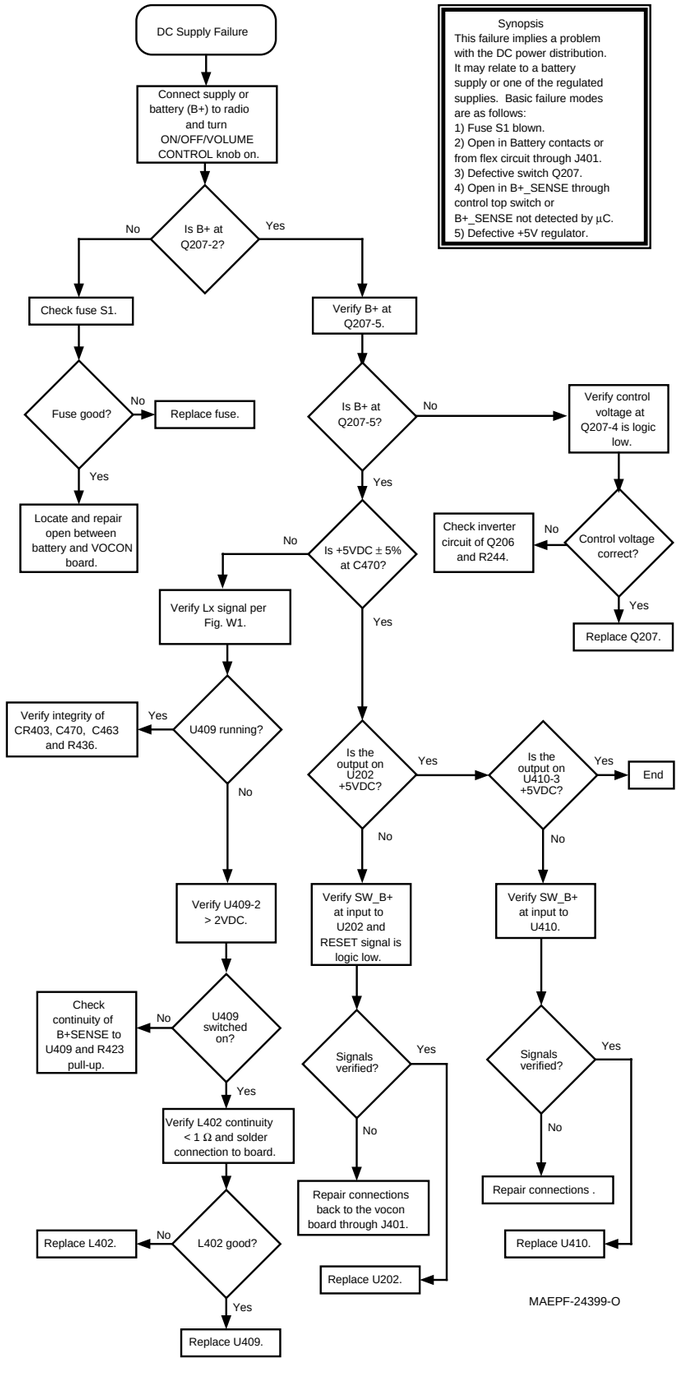


Chart 5 . DC Supply Failure

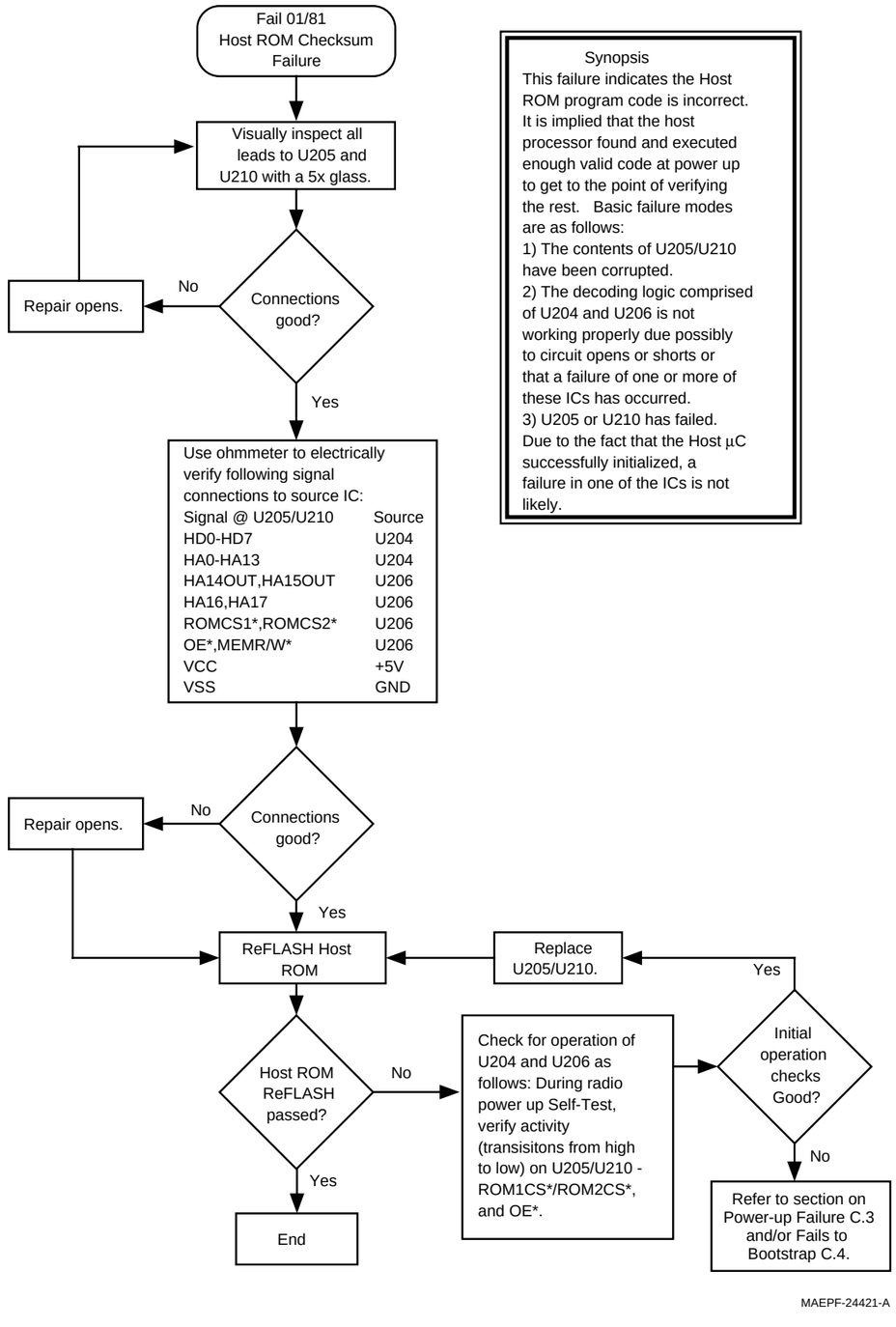


Chart 6 . 01/81 Host ROM Checksum Failure

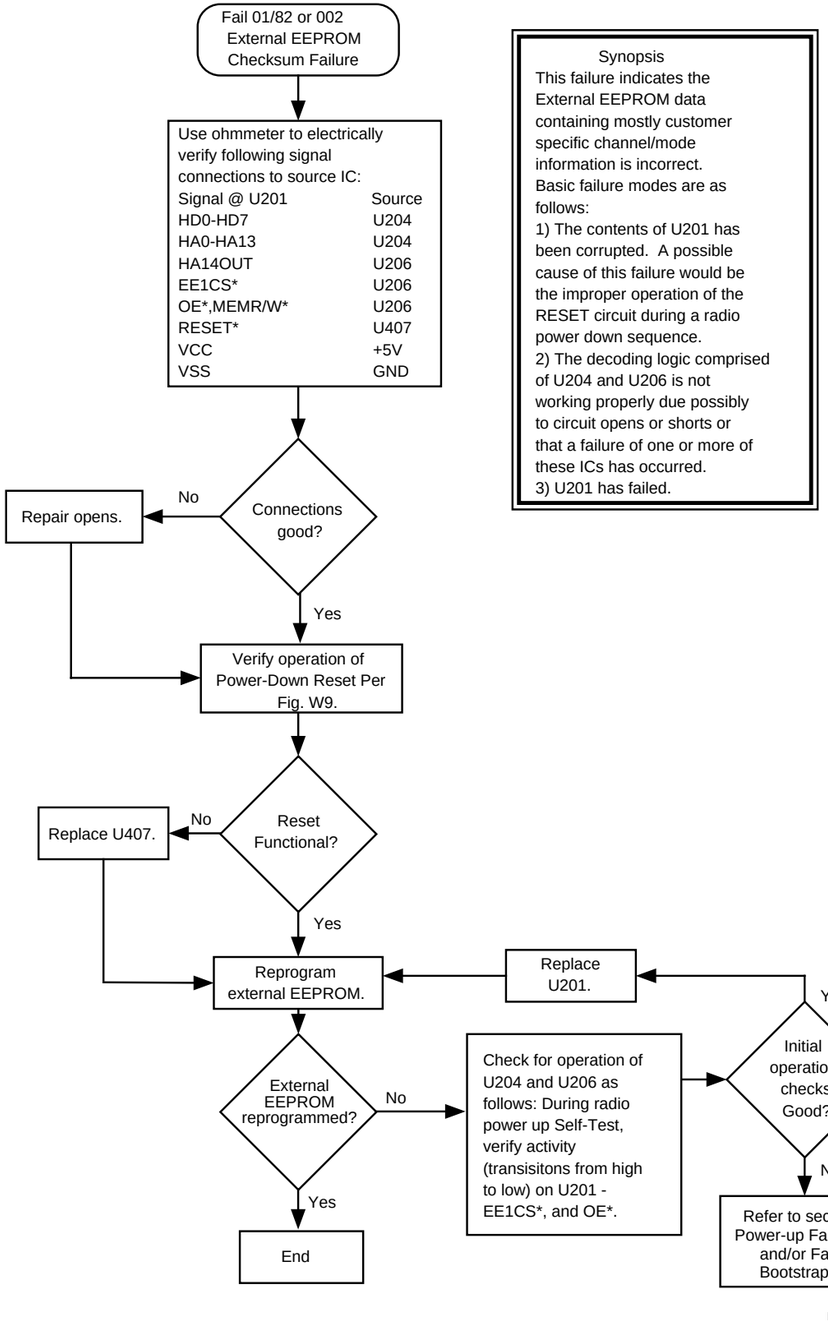


Chart 7 . 01/82 or 002, External EEPROM Checksum Failure

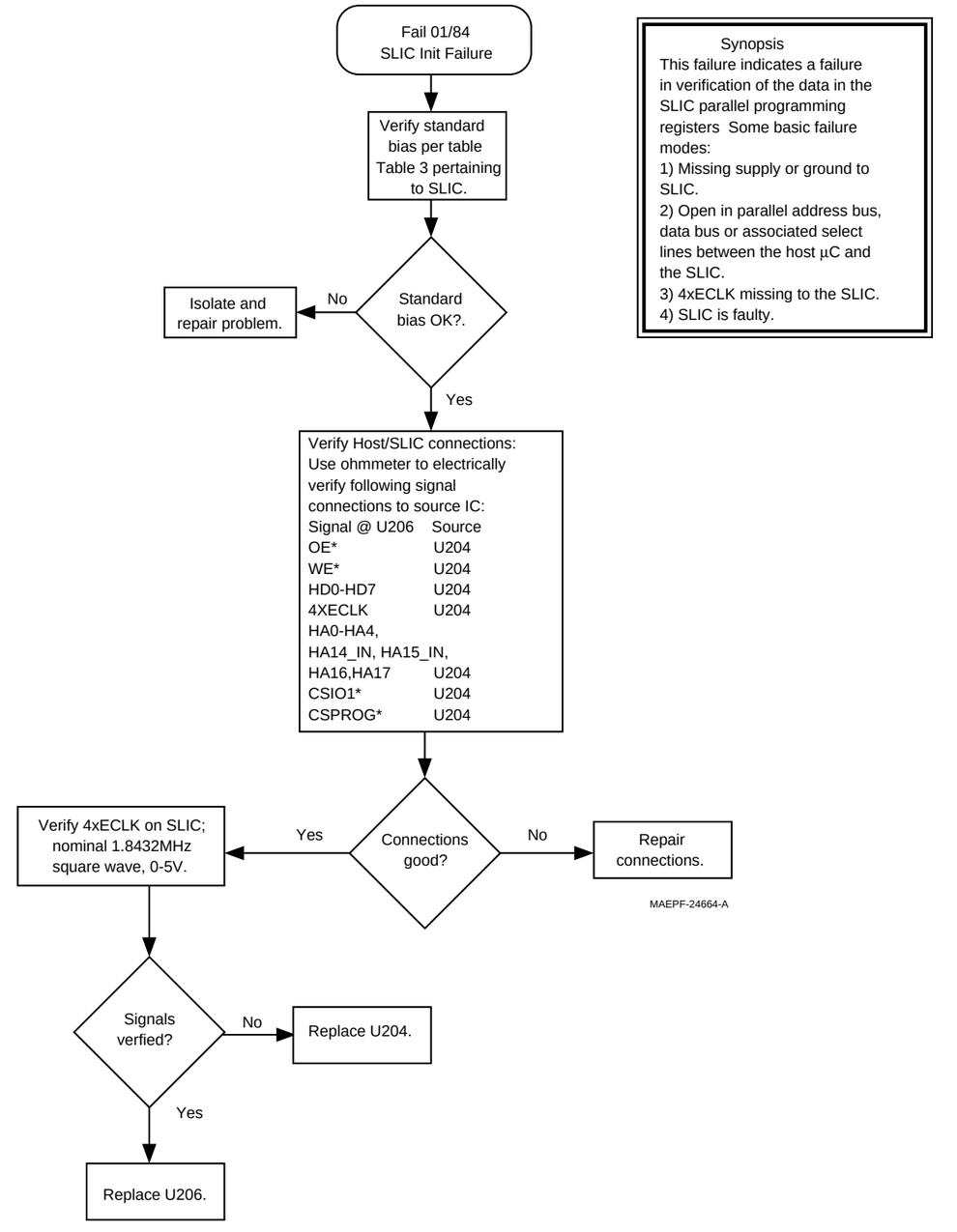


Chart 8 . 01/84 SLIC Initialization Failure

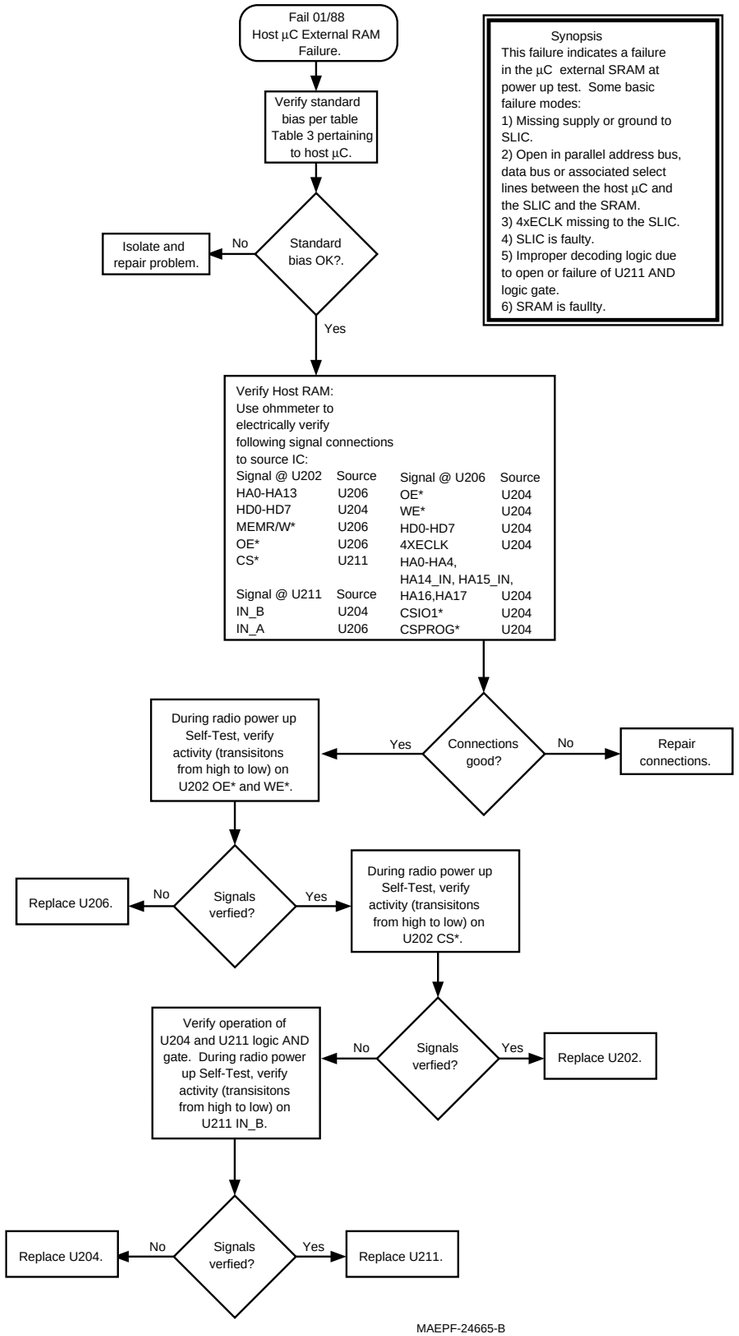


Chart 9 . 01/88 MCU (Host µC) External SRAM Failure

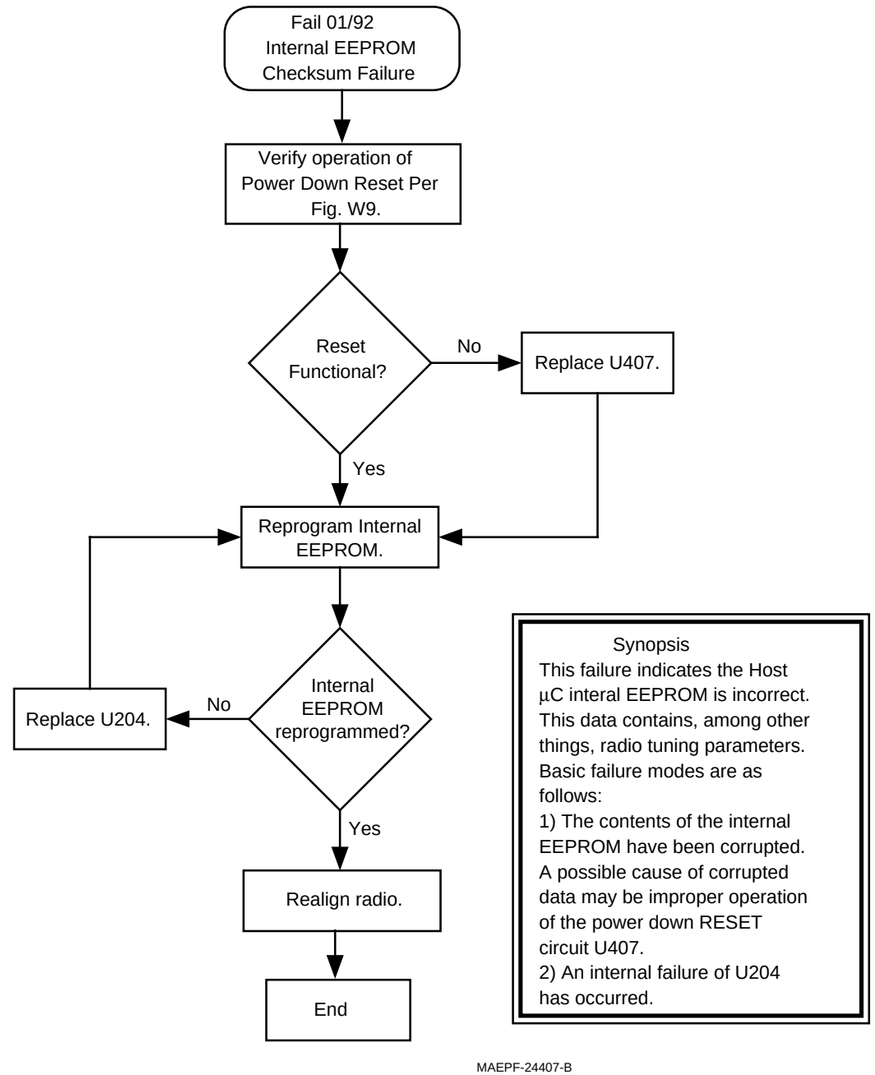


Chart 10 . 01/92, Internal EEPROM Checksum Failure

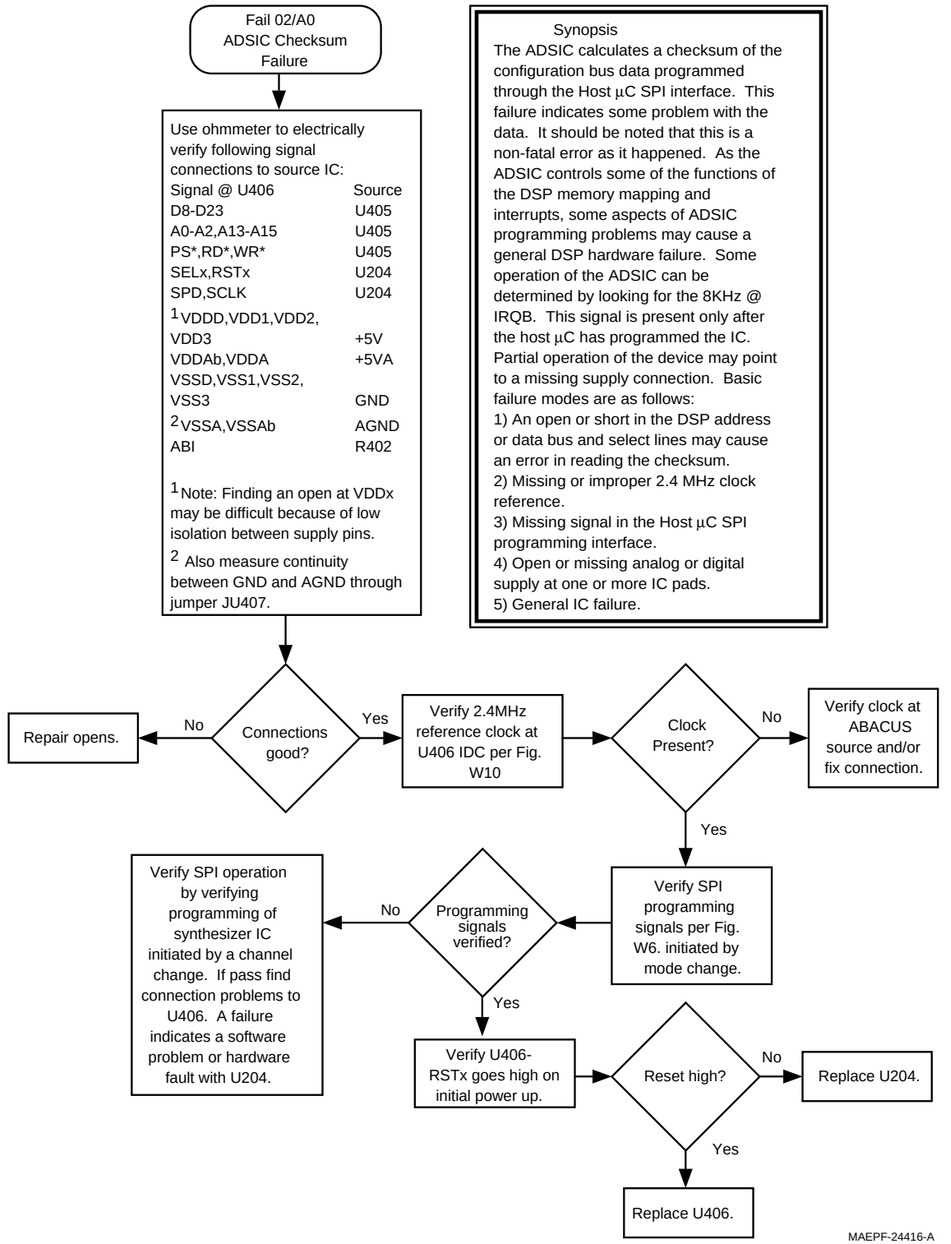


Chart 11 . 02/A0, ADSIC Checksum Faiure

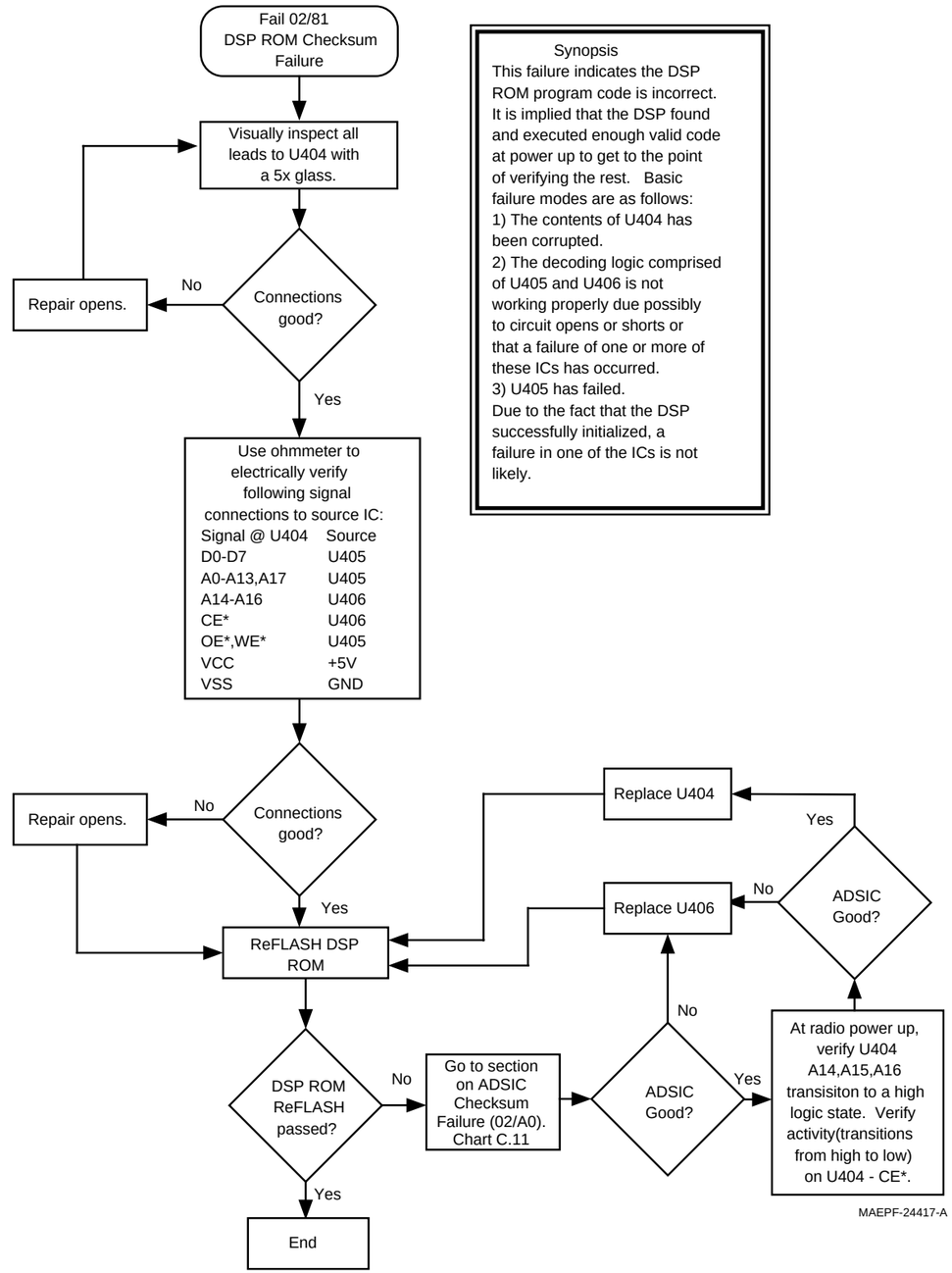


Chart 12 . 02/81, DSP ROM Checksum Failure

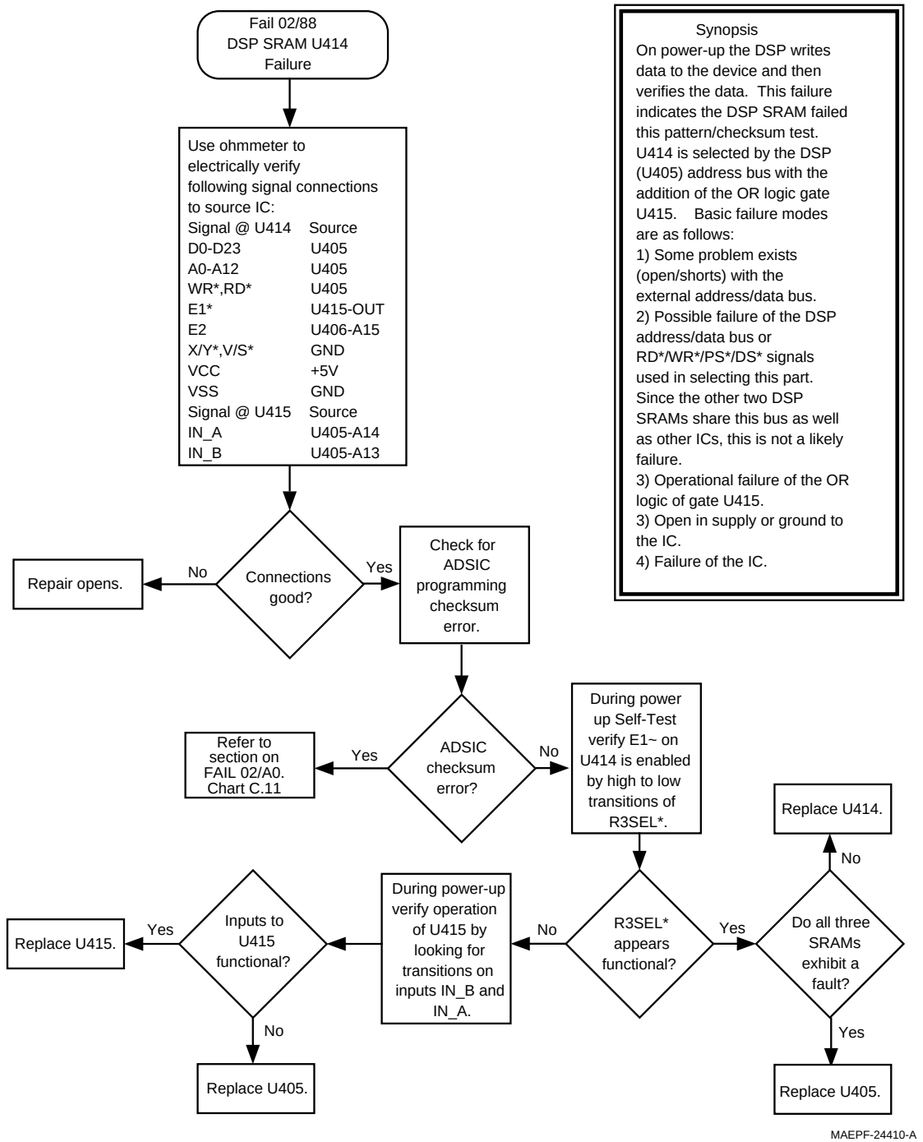


Chart 13 . 02/88, DSP External SRAM Failure U414

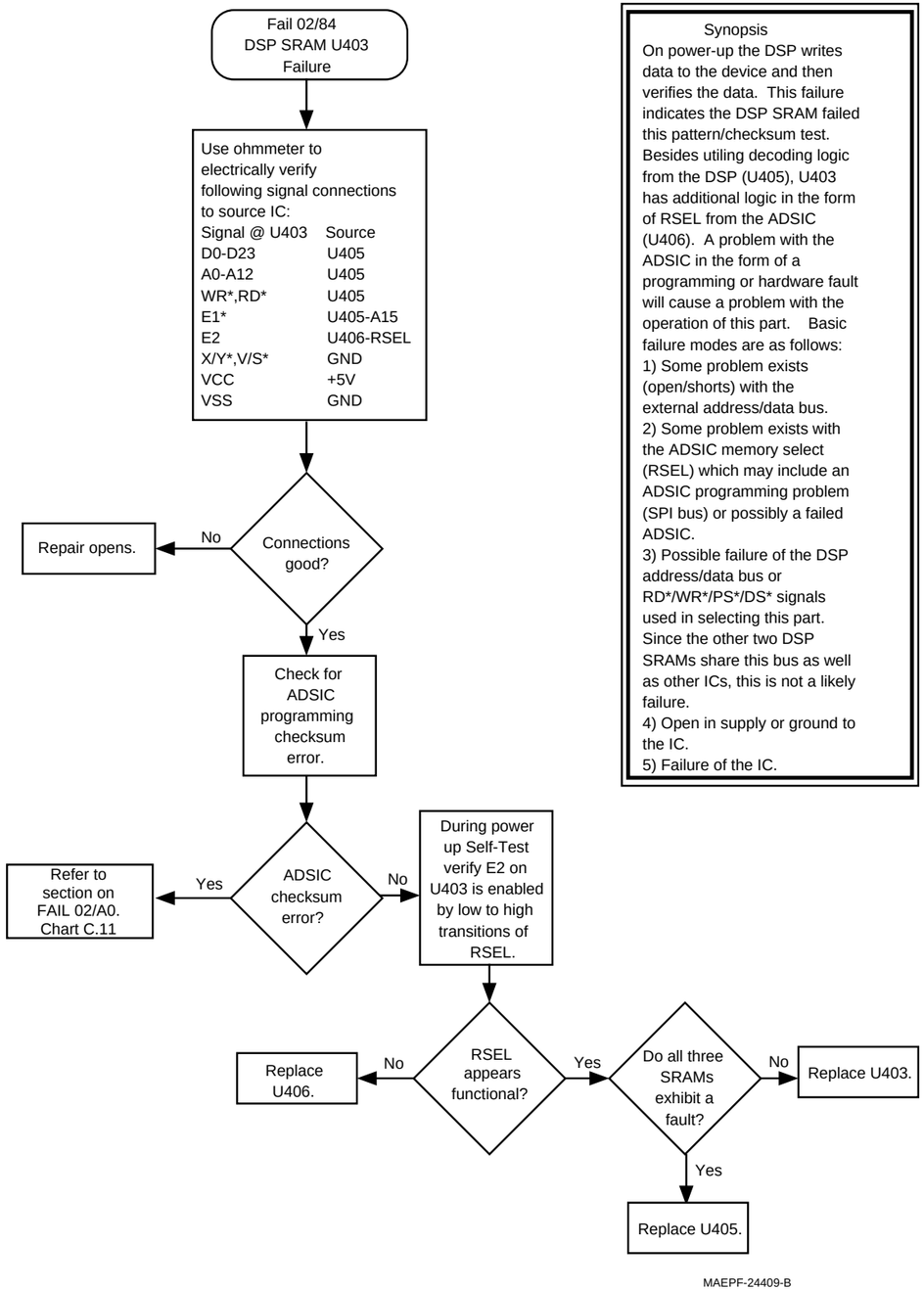


Chart 14 . 02/84, DSP External SRAM Failure U403

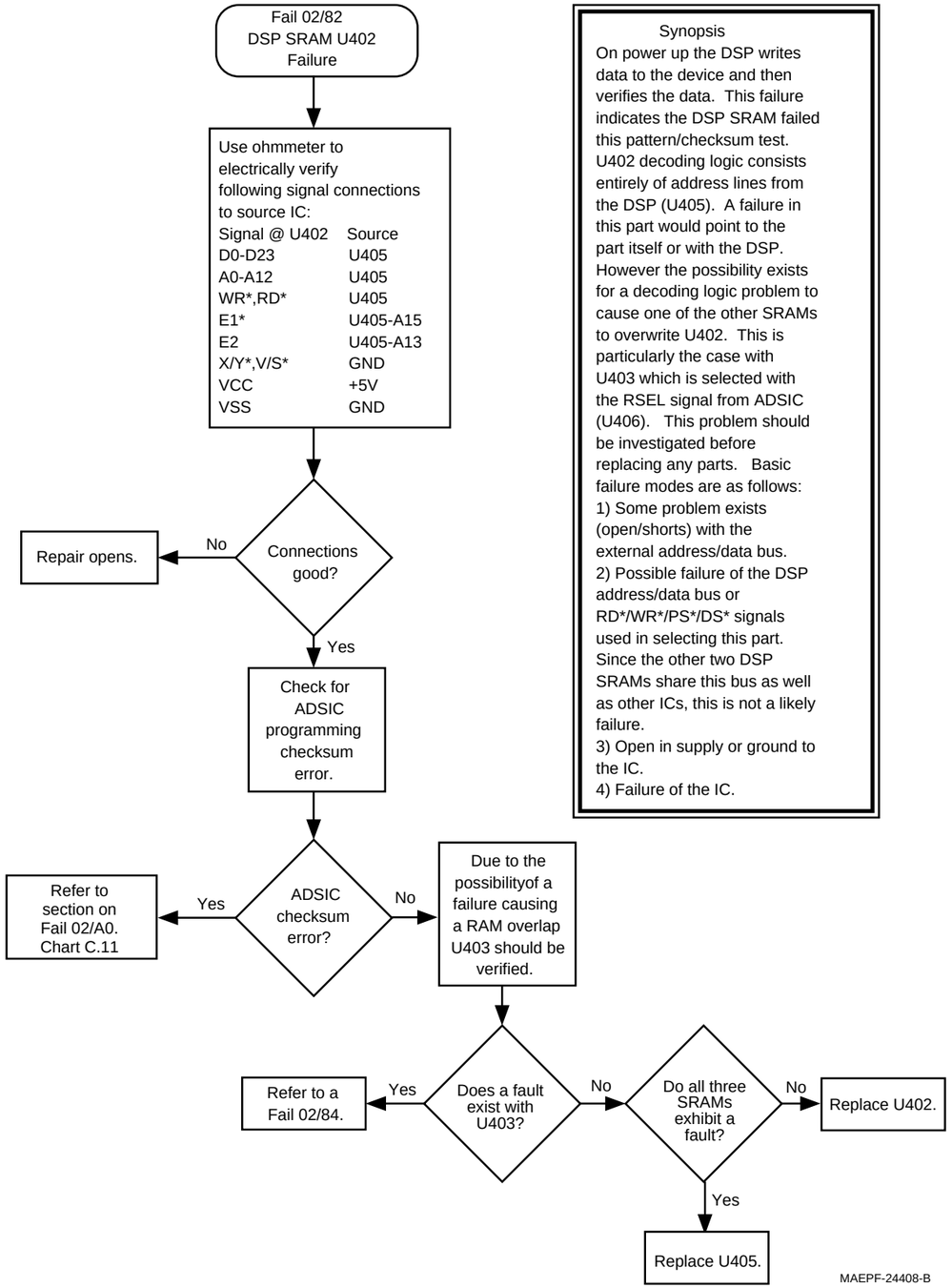


Chart 15 . 02/82, DSP External SRAM Failure U402

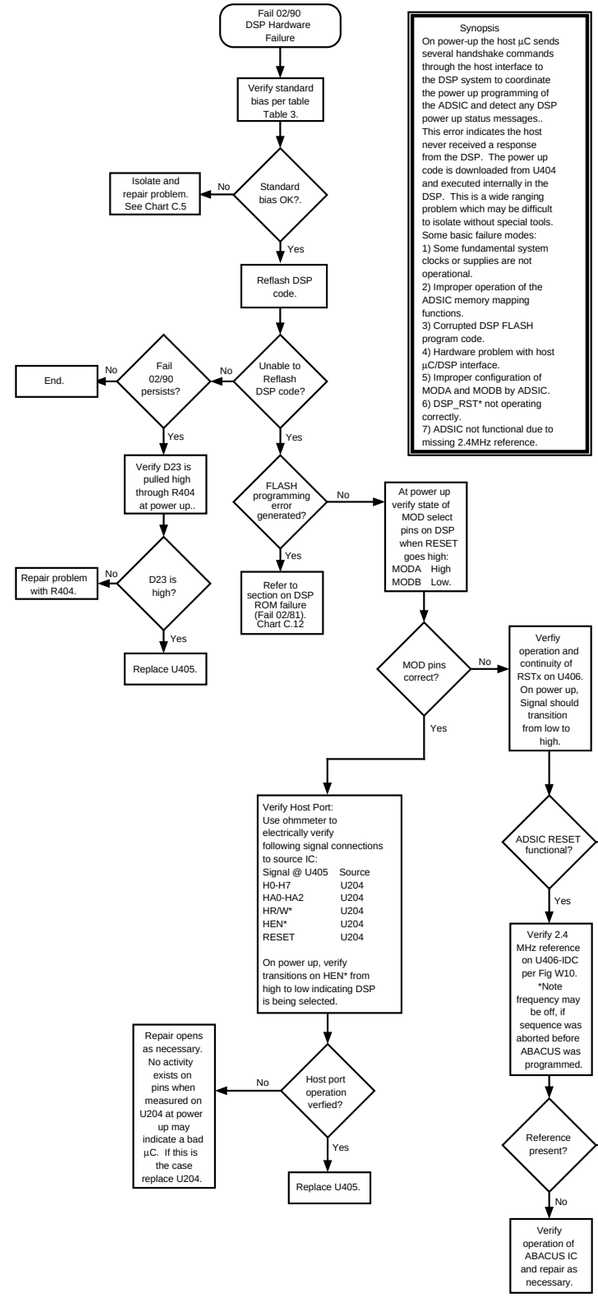
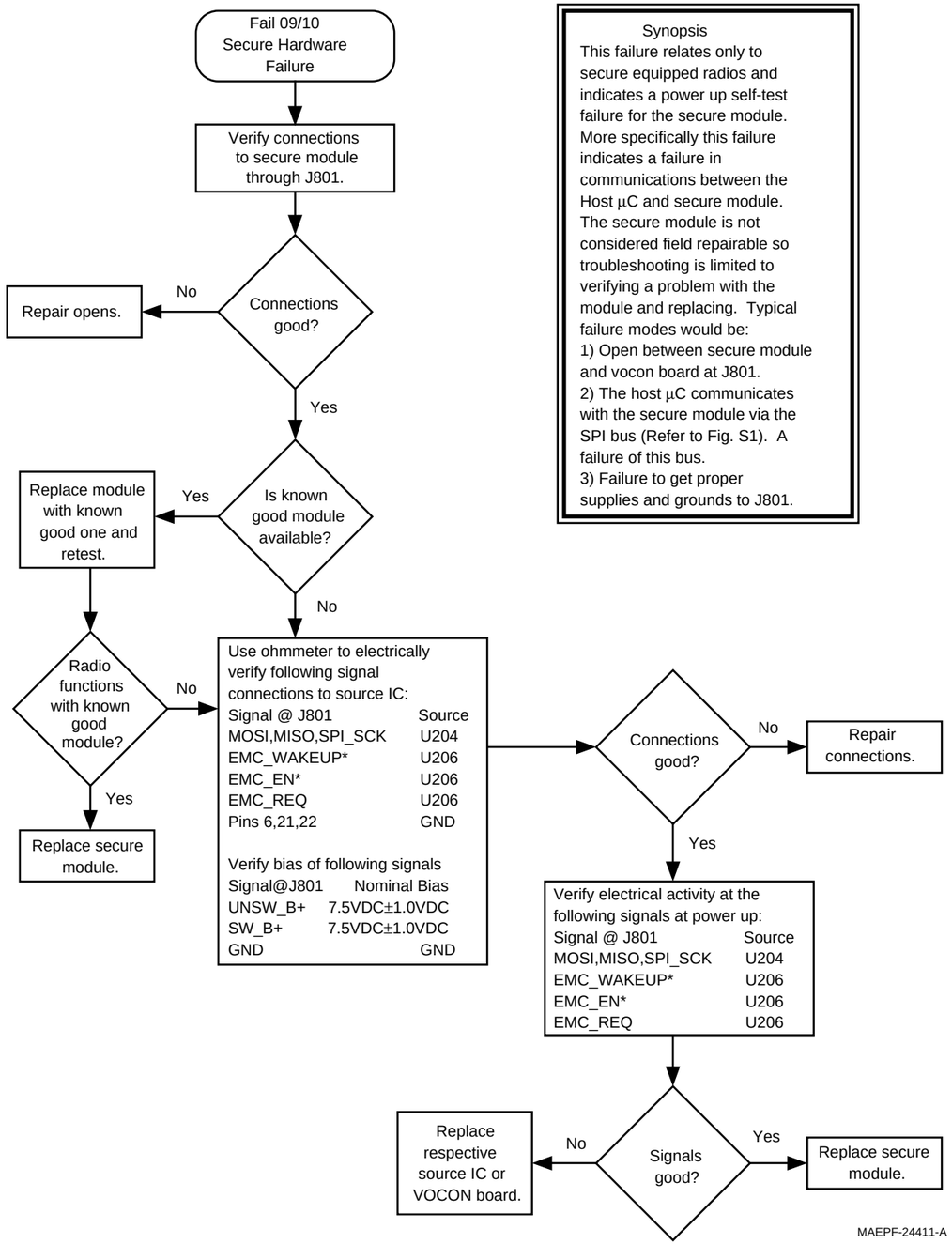


Chart 16 . 02/90, General DSP Hardware Failure

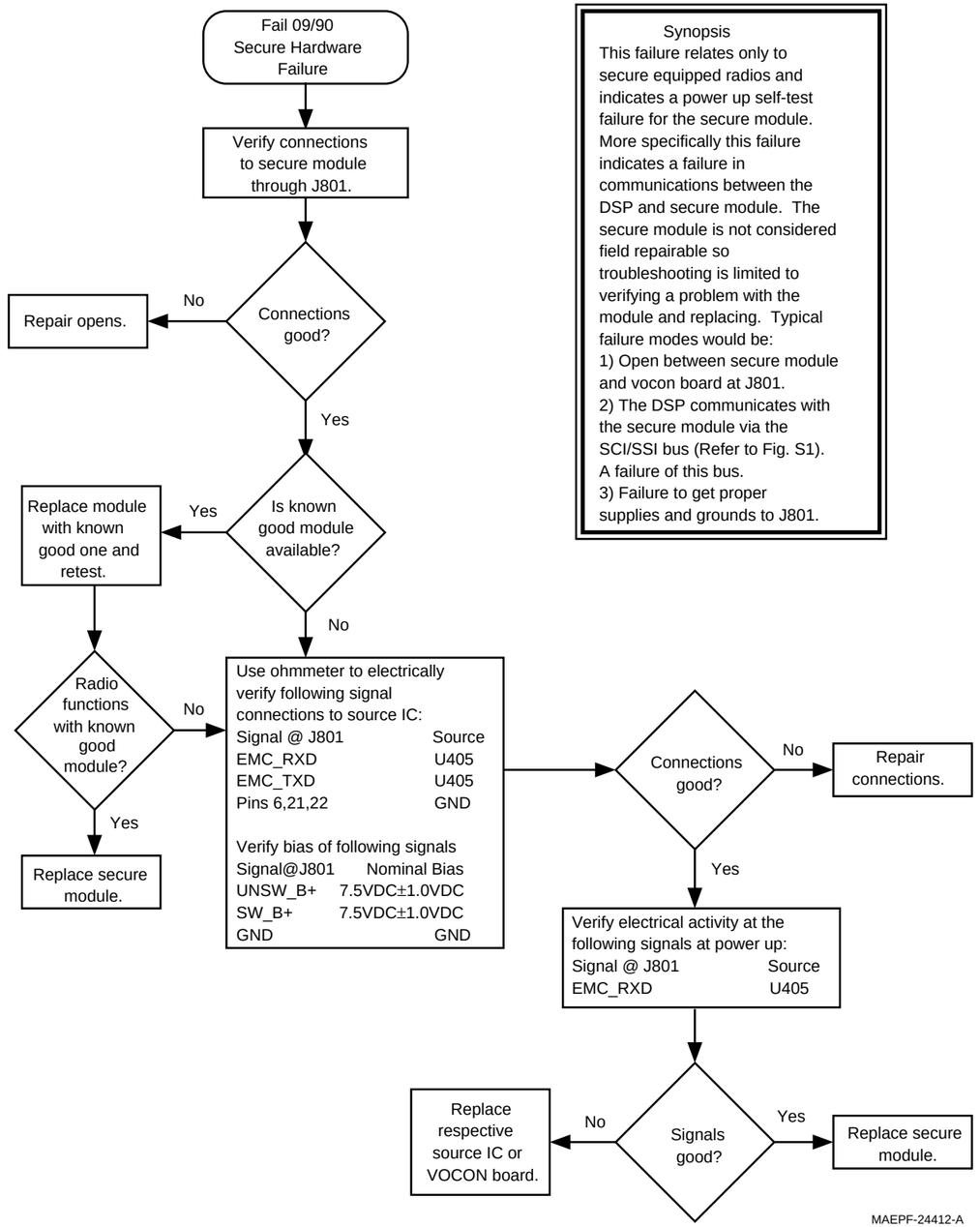


Synopsis

This failure relates only to secure equipped radios and indicates a power up self-test failure for the secure module. More specifically this failure indicates a failure in communications between the Host µC and secure module. The secure module is not considered field repairable so troubleshooting is limited to verifying a problem with the module and replacing. Typical failure modes would be:

1) Open between secure module and vocon board at J801.
2) The host µC communicates with the secure module via the SPI bus (Refer to Fig. S1). A failure of this bus.
3) Failure to get proper supplies and grounds to J801.

Chart 17 . 09/10, Secure Hardware Failure



Synopsis

This failure relates only to secure equipped radios and indicates a power up self-test failure for the secure module. More specifically this failure indicates a failure in communications between the DSP and secure module. The secure module is not considered field repairable so troubleshooting is limited to verifying a problem with the module and replacing. Typical failure modes would be:

1) Open between secure module and vocon board at J801.
2) The DSP communicates with the secure module via the SCI/SSI bus (Refer to Fig. S1). A failure of this bus.
3) Failure to get proper supplies and grounds to J801.

Chart 18 . 09/90, Secure Hardware Failure

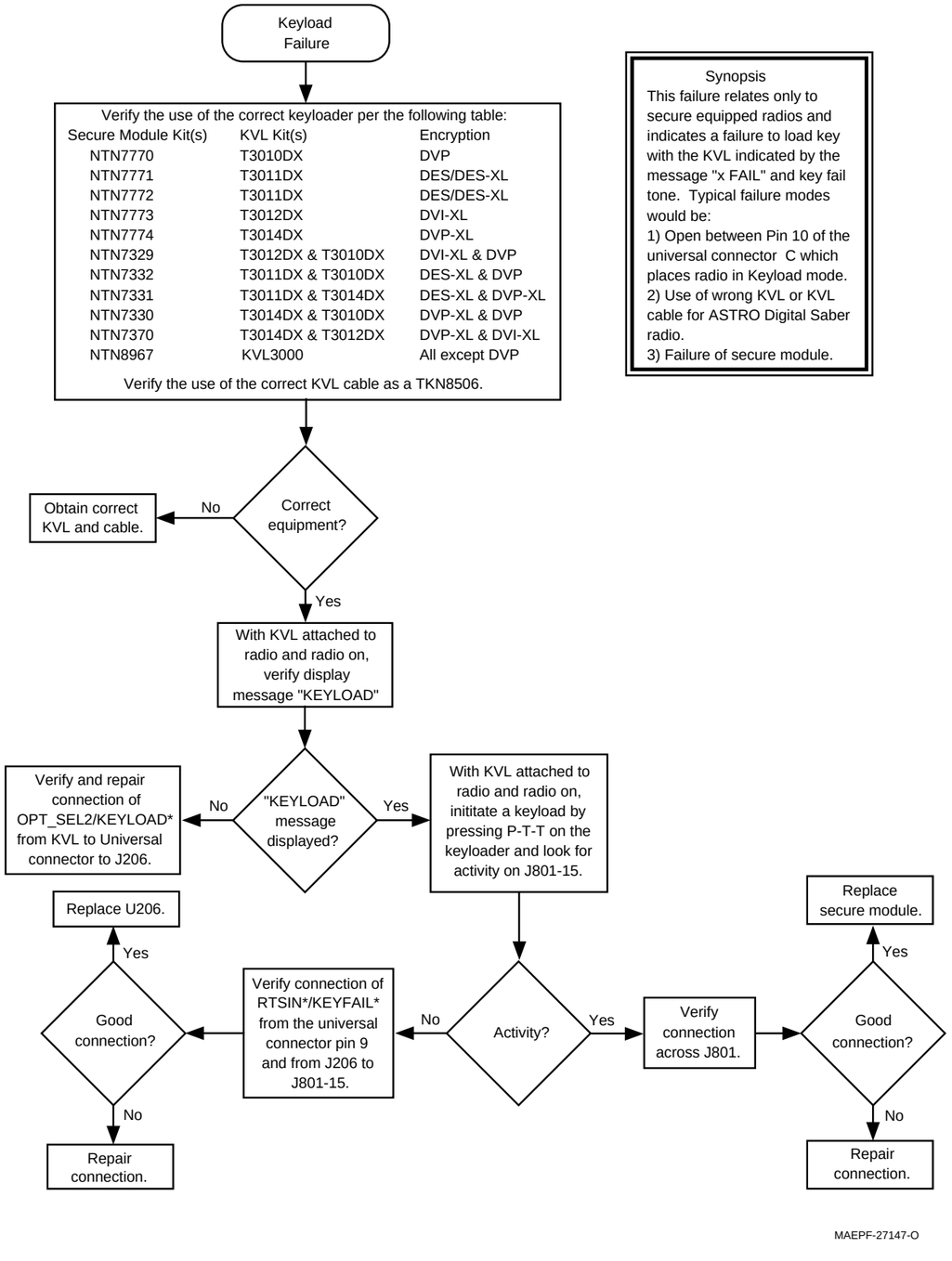


Chart 19 . Key Load Fail

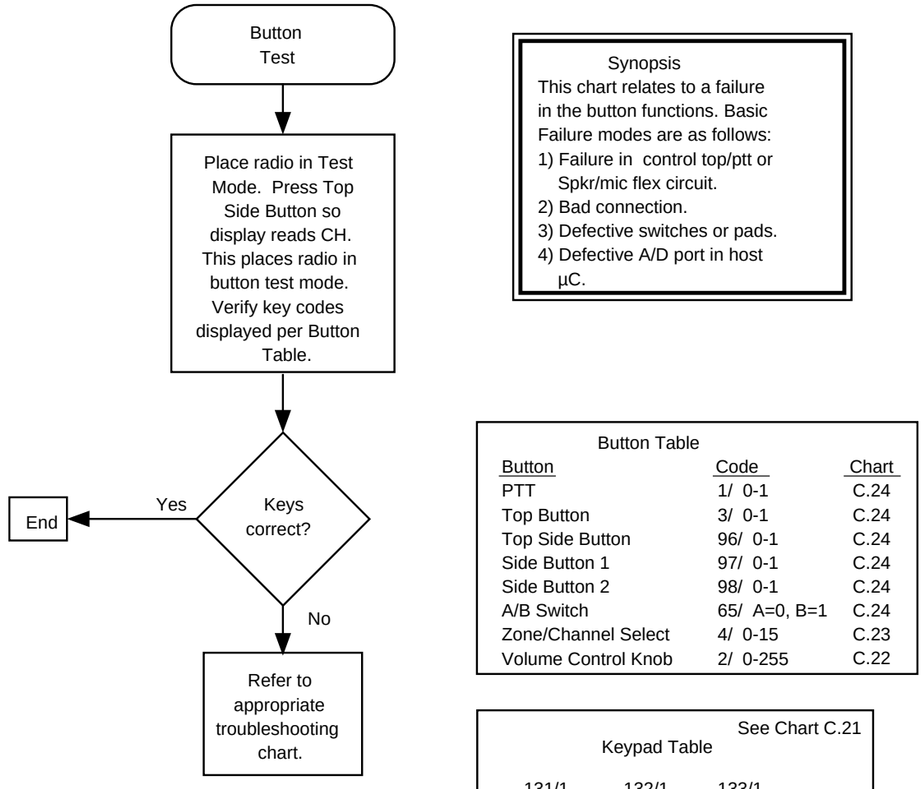
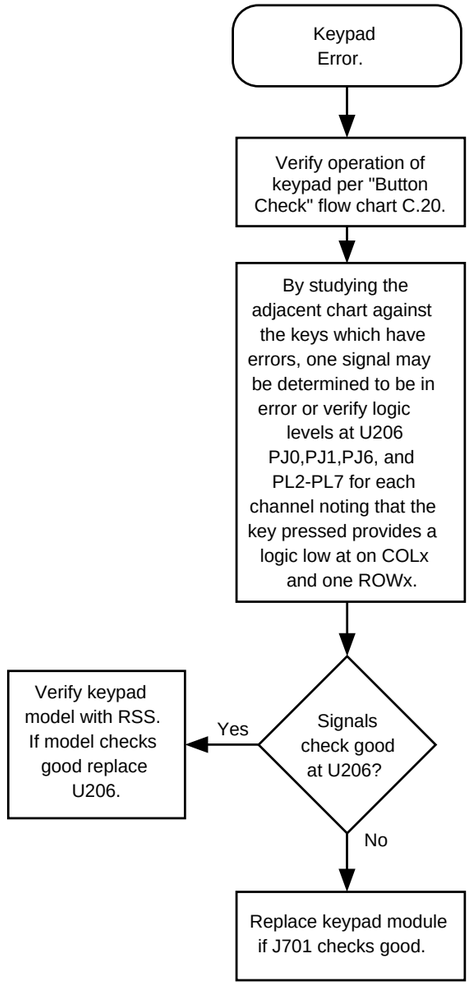


Chart 20 . Button Test



Synopsis
This chart relates to a failure in reading the keypad. Basic Failure modes are as follows:
1) Failure in flex circuit.
2) Bad connection.
3) Defective keypad.
4) Defective port in SLIC.

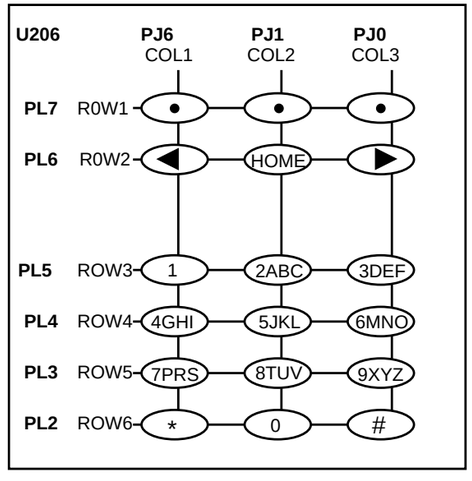


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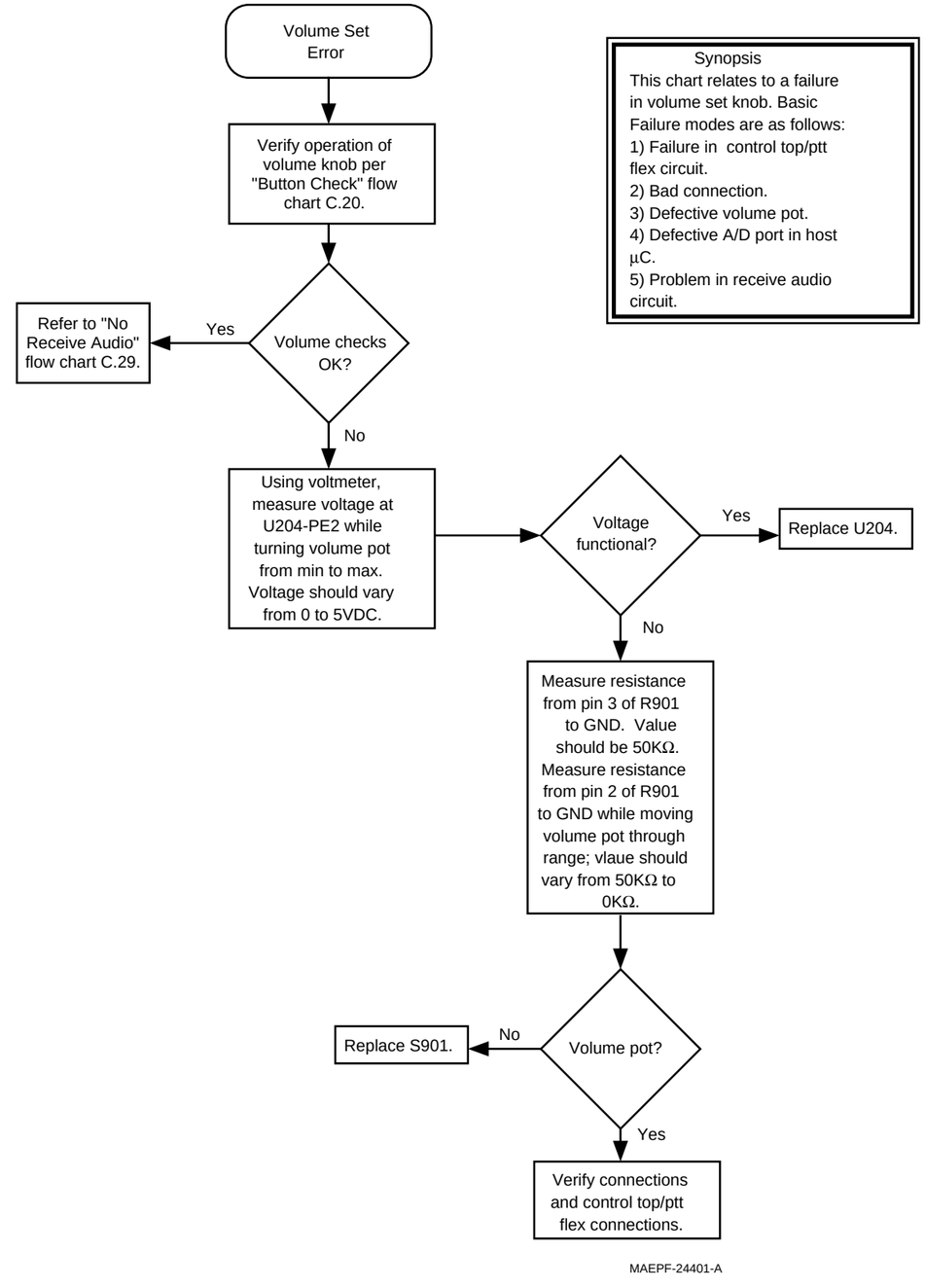
Chart 21 . Keypad Error



Synopsis
This chart relates to a failure in volume set knob. Basic Failure modes are as follows:
1) Failure in control top/ptt flex circuit.
2) Bad connection.
3) Defective volume pot.
4) Defective A/D port in host µC.
5) Problem in receive audio circuit.

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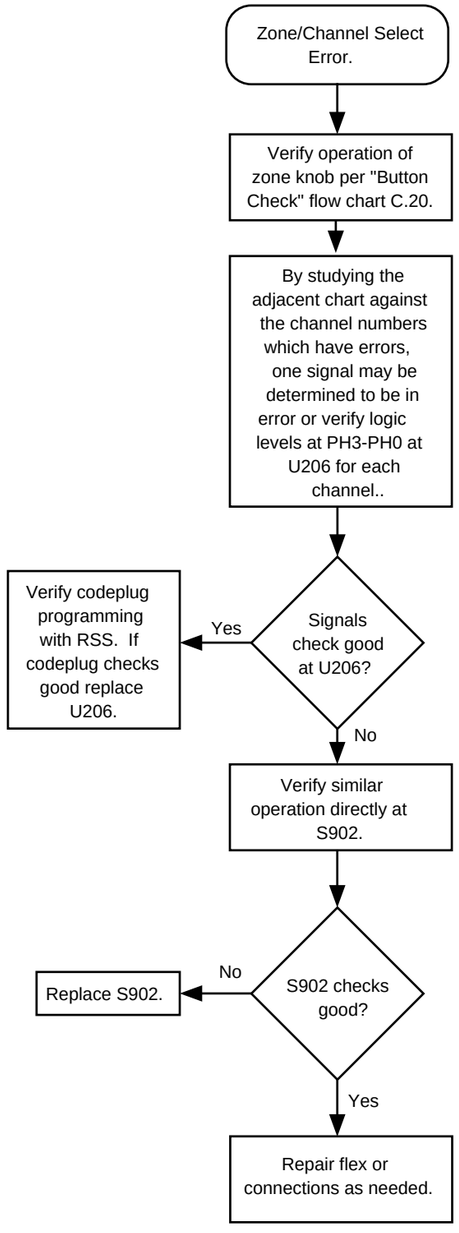
Chart 22 . Volume Set Error

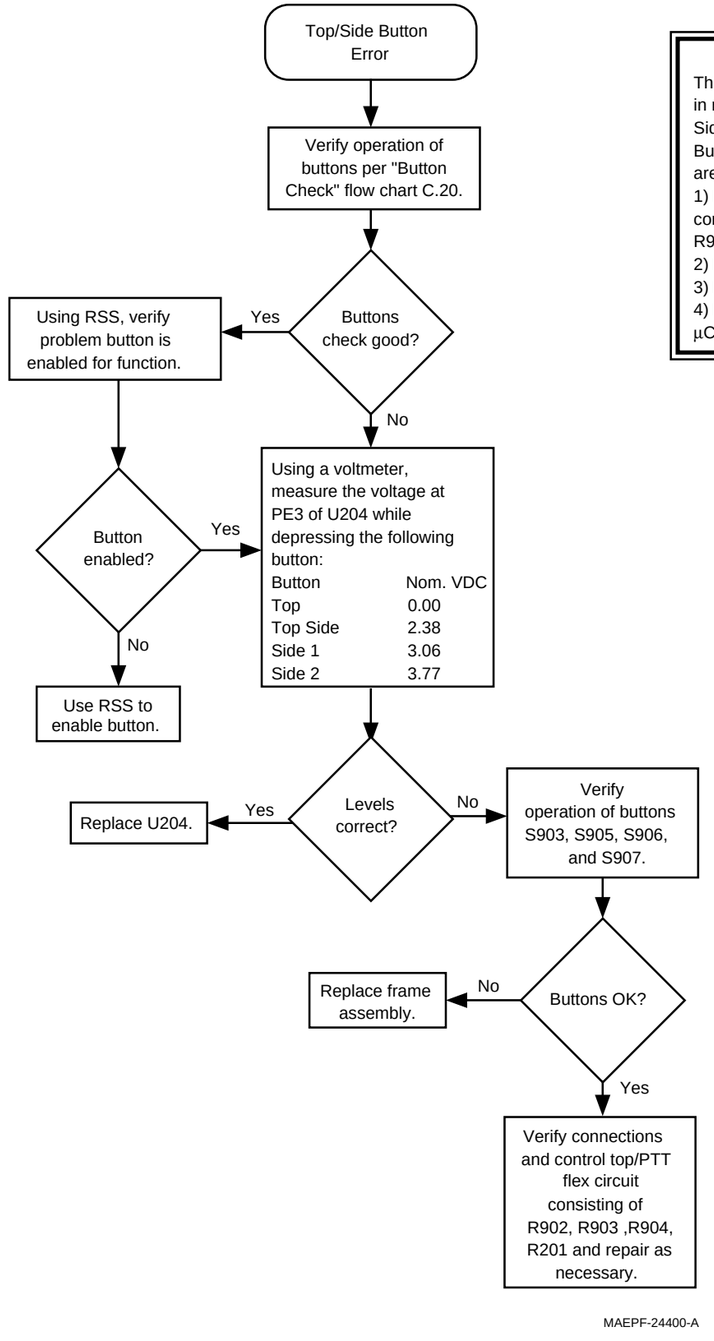


Synopsis

This chart relates to a failure in reading the zone/channel select knob. Basic Failure modes are as follows:
1) Failure in flex circuit.
2) Bad connection.
3) Defective switch.
4) Defective port in SLIC.

Channel	RTA3	RTA2	RTA1	RTA0
1	0	0	0	0
2	0	0	0	1
3	0	0	1	0
4	0	0	1	1
5	0	1	0	0
6	0	1	0	1
7	0	1	1	0
8	0	1	1	1
9	1	0	0	0
10	1	0	0	1
11	1	0	1	0
12	1	0	1	1
13	1	1	0	0
14	1	1	0	1
15	1	1	1	0
16	1	1	1	1

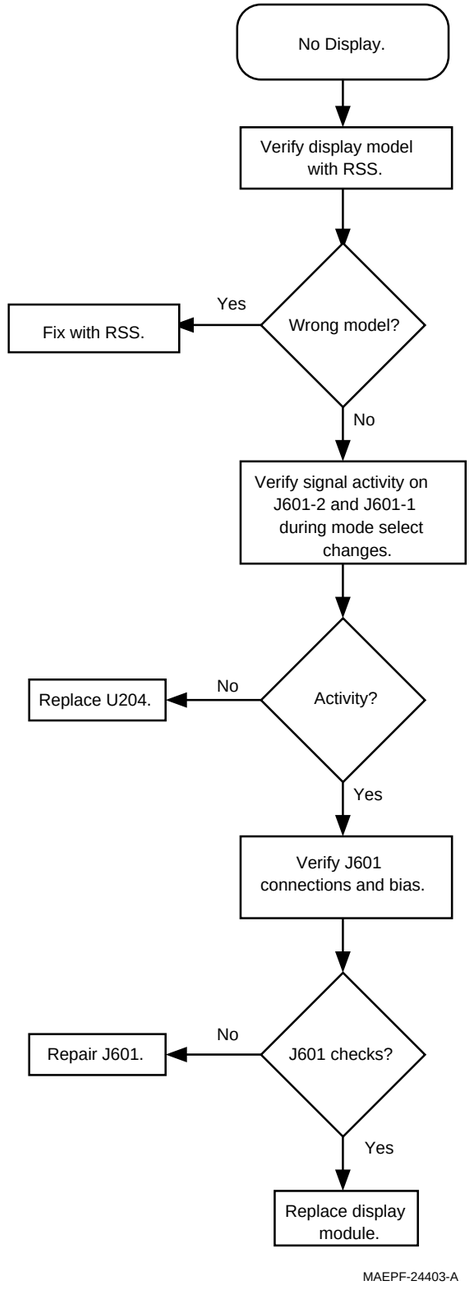
Chart 23 . Zone/Channel Select Error



Synopsis

This chart relates to a failure in reading the buttons: Top, Top Side, Side Button 1, or Side Button 2. Basic Failure modes are as follows:
1) Failure in flex circuit consisting of R902, R903, R904, R201.
2) Bad connection.
3) Defective switch.
4) Defective A/D port in host µC.

Chart 24 . Top/Side Button Error



Synopsis

This chart relates to a failure in the display. The display is considered not field repairable and must be replaced as a uint. Basic Failure modes are as follows:

1) Non-display model radio.
2) Bad connection.
3) Defective μC.

Chart 25 . No Display

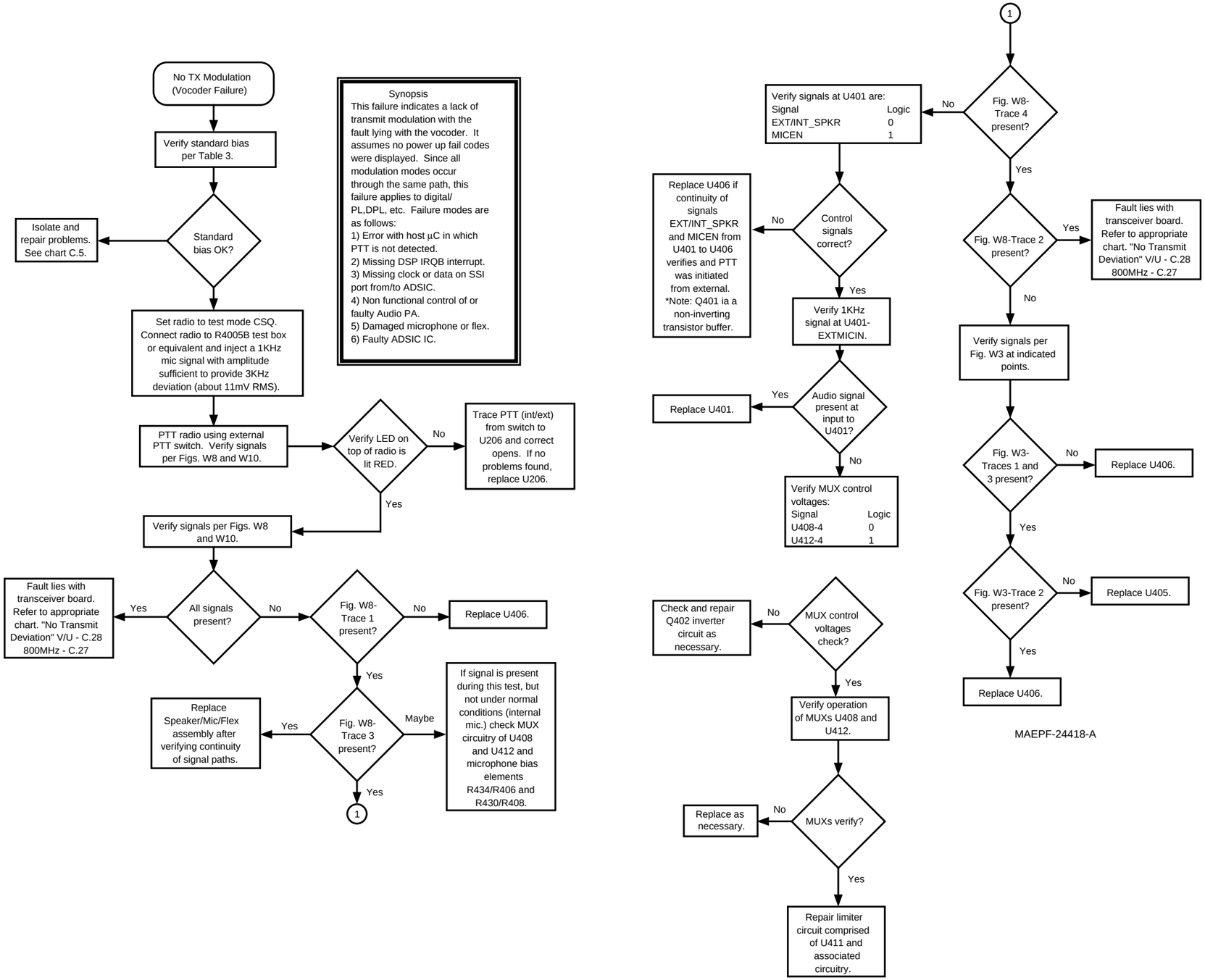


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Chart 26 . No TX Modulation

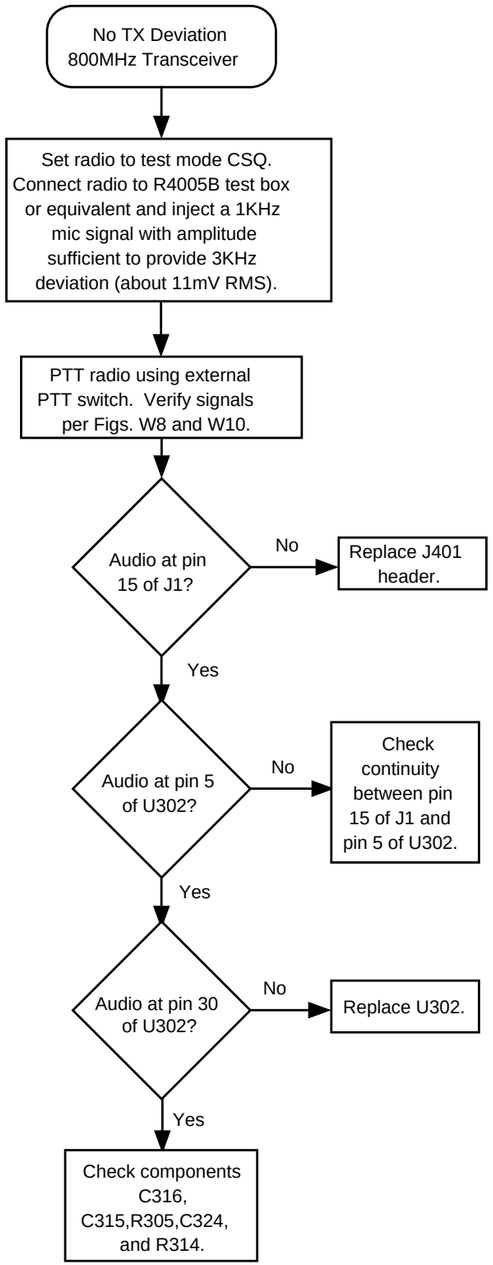

Chart 27 . 800MHz No TX Deviation

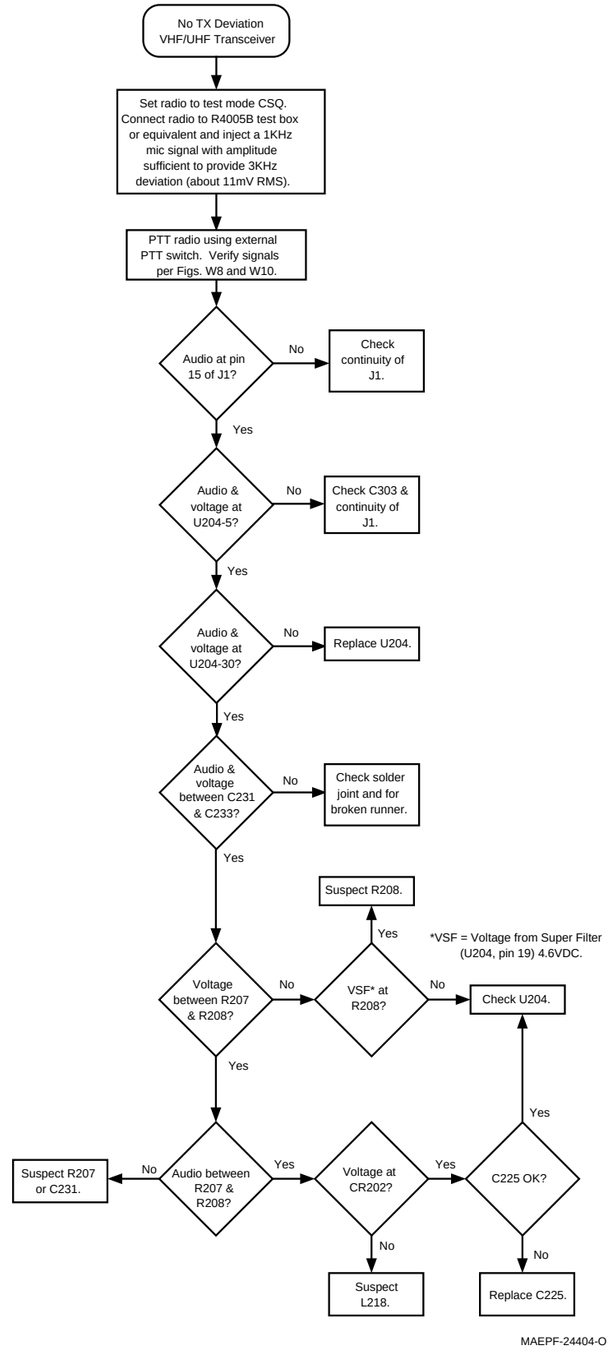

Chart 28 . VHF/UHF No TX Deviation

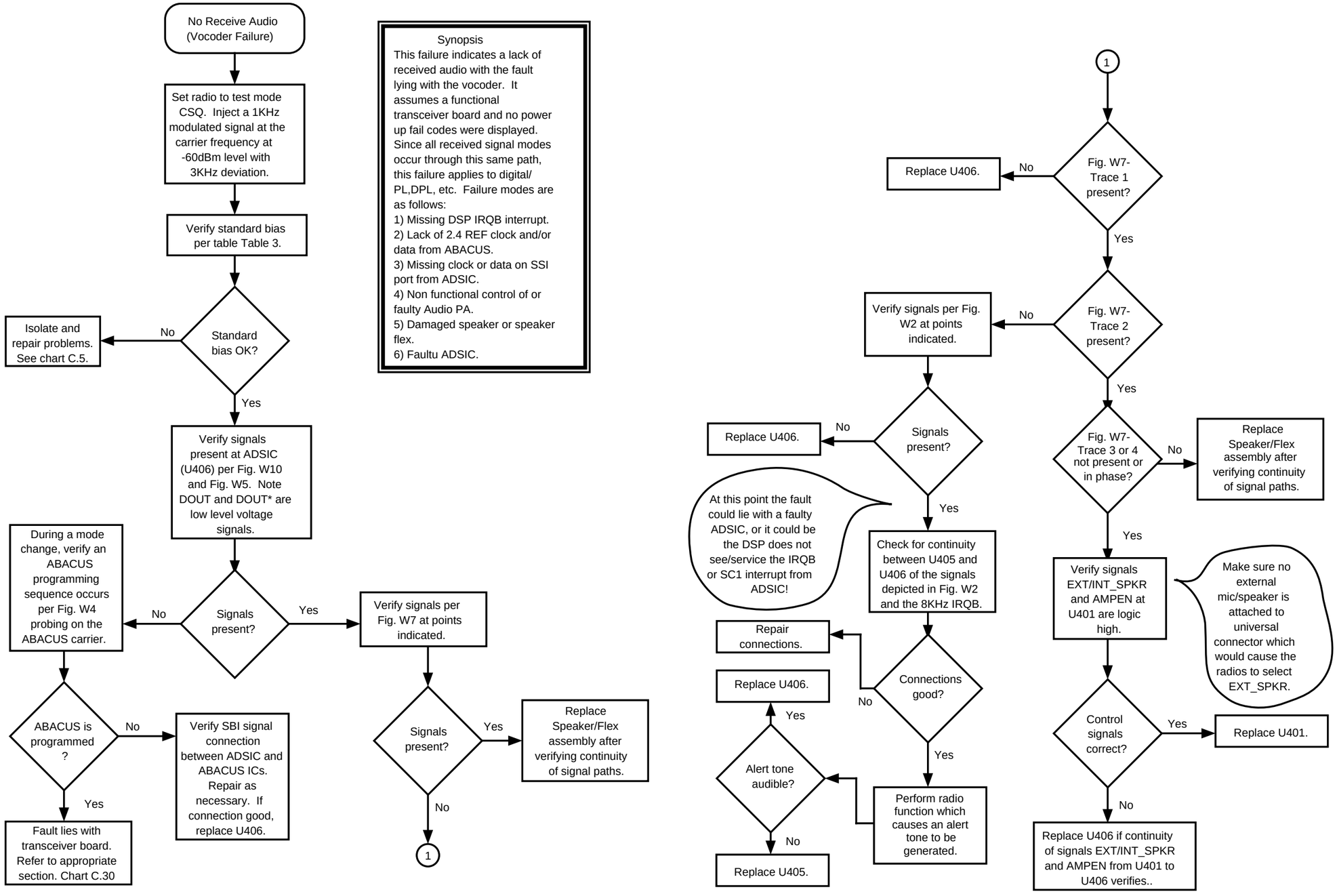

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Chart 29 . No RX Audio

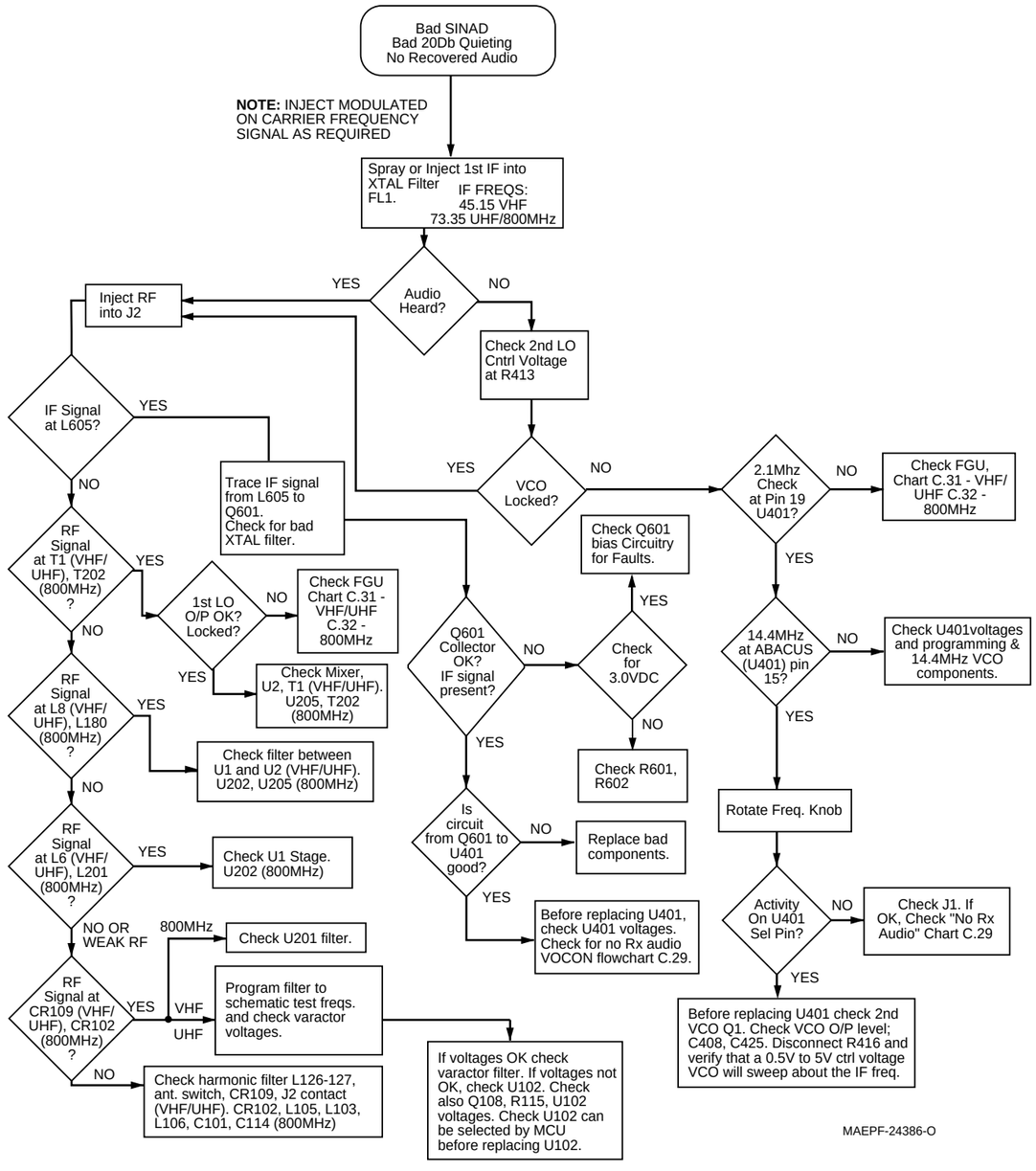
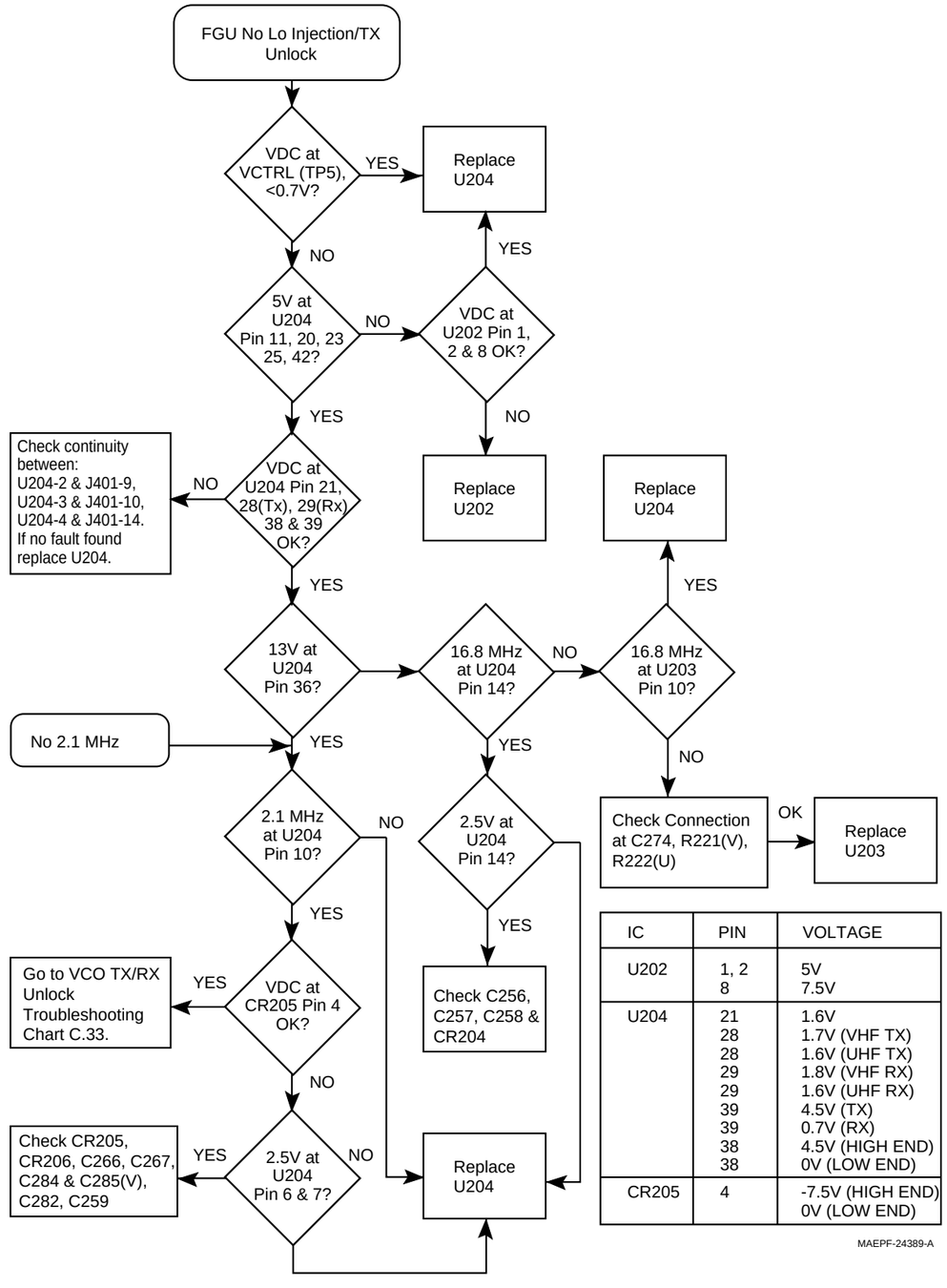


Chart 30 . VHF/UHF/800MHz Receiver RF



IC	PIN	VOLTAGE
U202	1, 2 8	5V 7.5V
U204	21 28 28 29 29 39 39 38 38	1.6V 1.7V (VHF TX) 1.6V (UHF TX) 1.8V (VHF RX) 1.6V (UHF RX) 4.5V (TX) 0.7V (RX) 4.5V (HIGH END) 0V (LOW END)
CR205	4	-7.5V (HIGH END) 0V (LOW END)

Chart 31 . VHF/UHF Frequency Generation Unit (FGU)

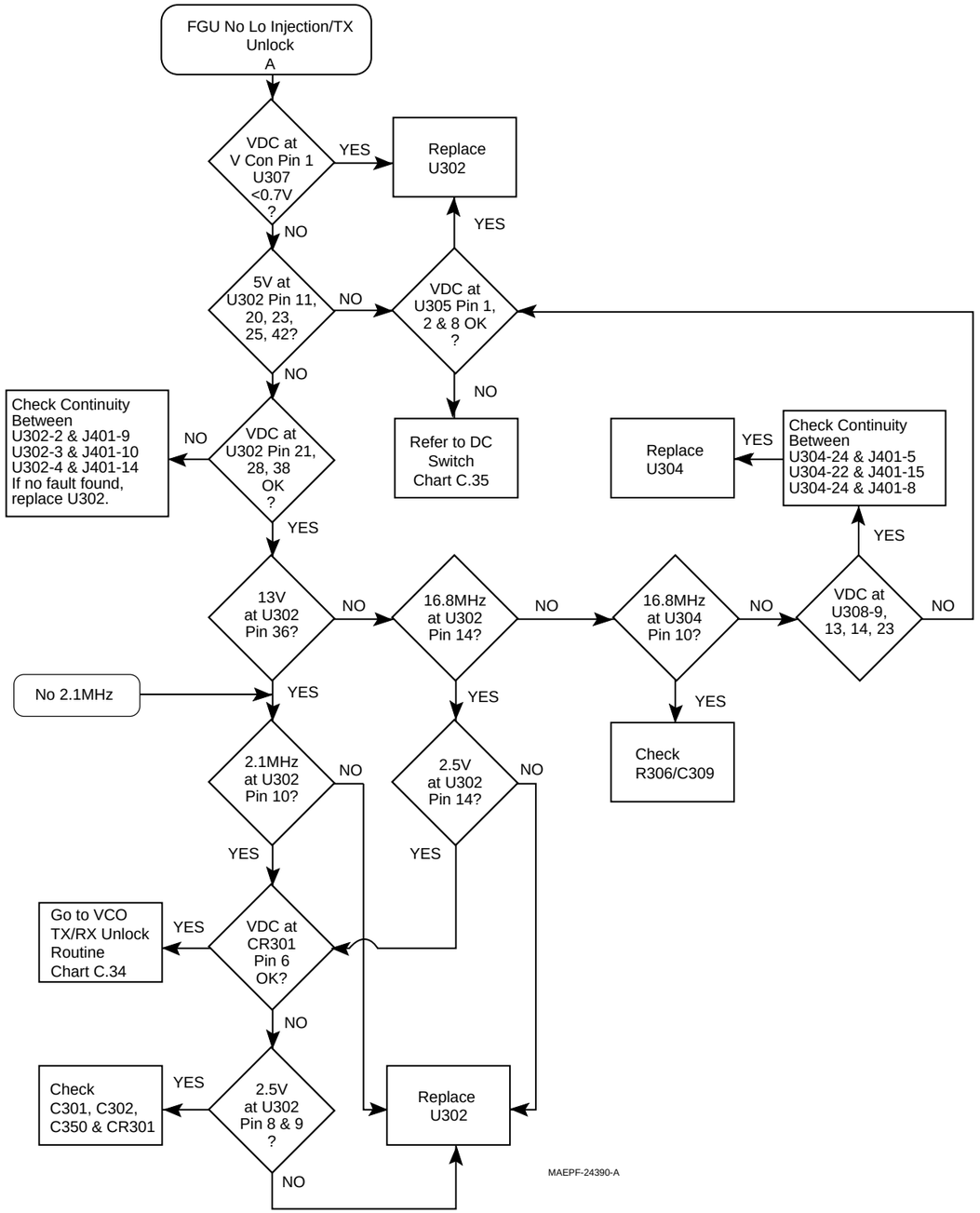


Chart 32 . 800MHz Frequency Generation Unit (FGU)

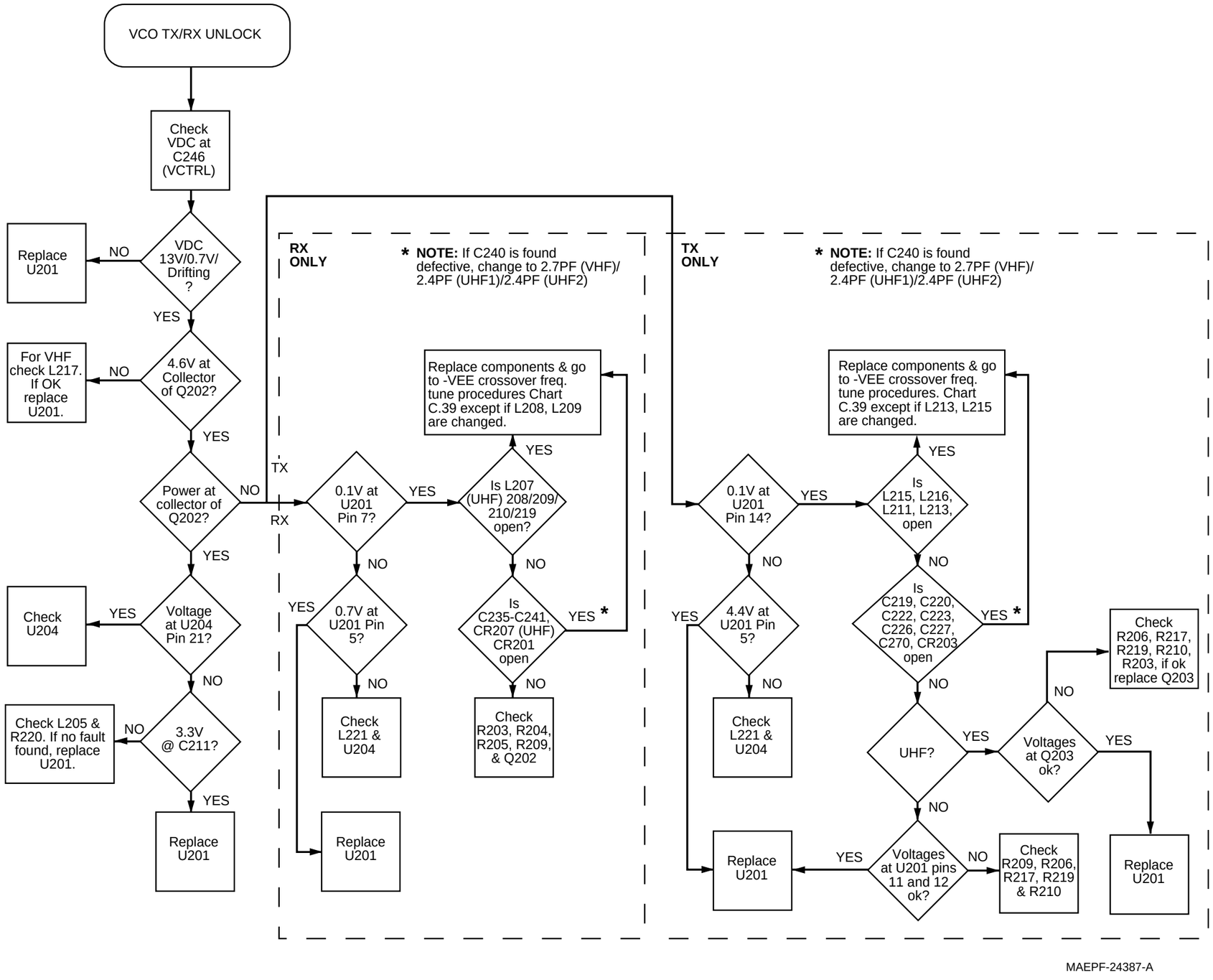


Chart 33 . VHF/UHF Voltage Controlled Oscillator (VCO)

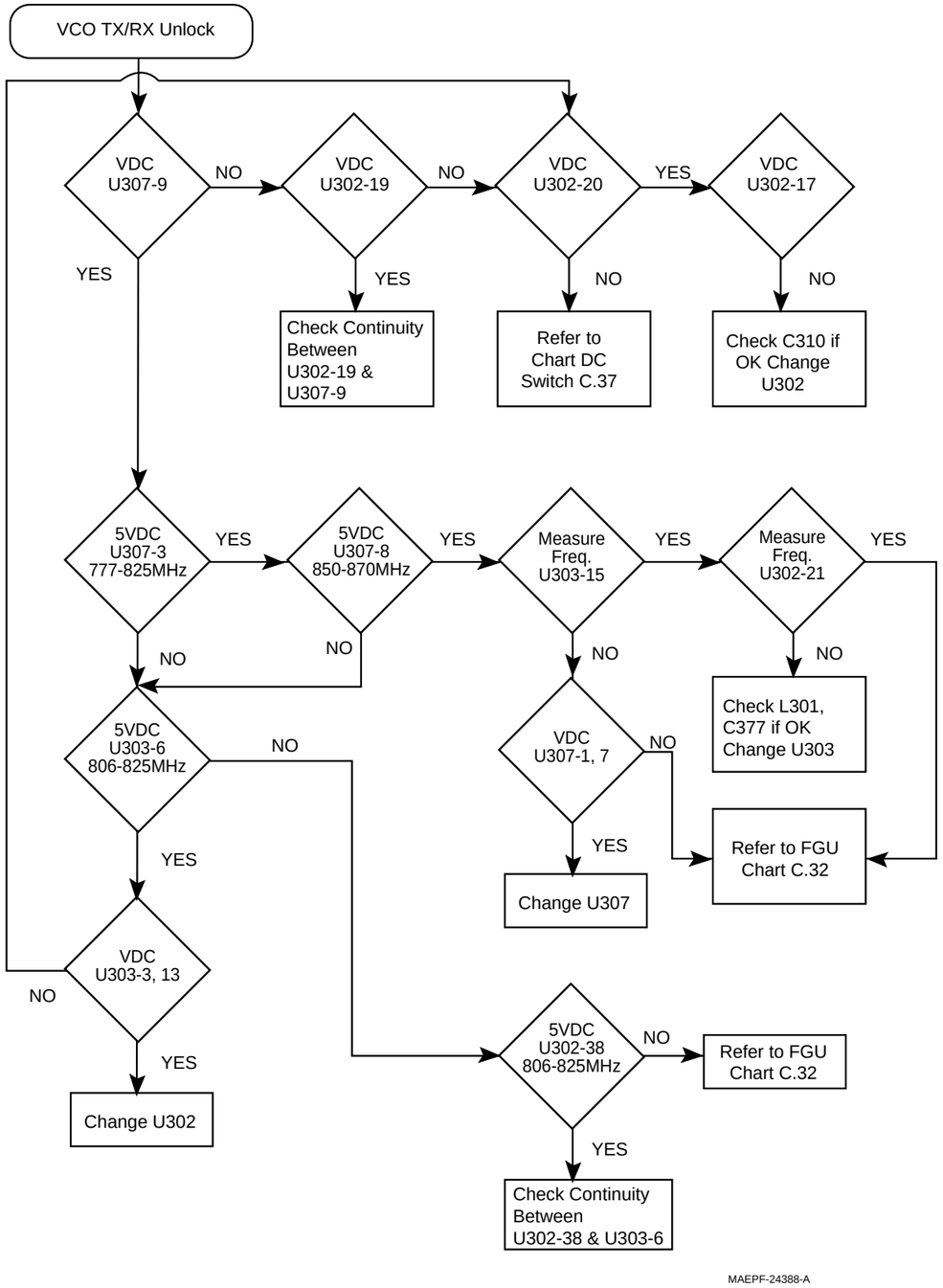


Chart 34 . 800MHz Voltage Controlled Oscillator (VCO)

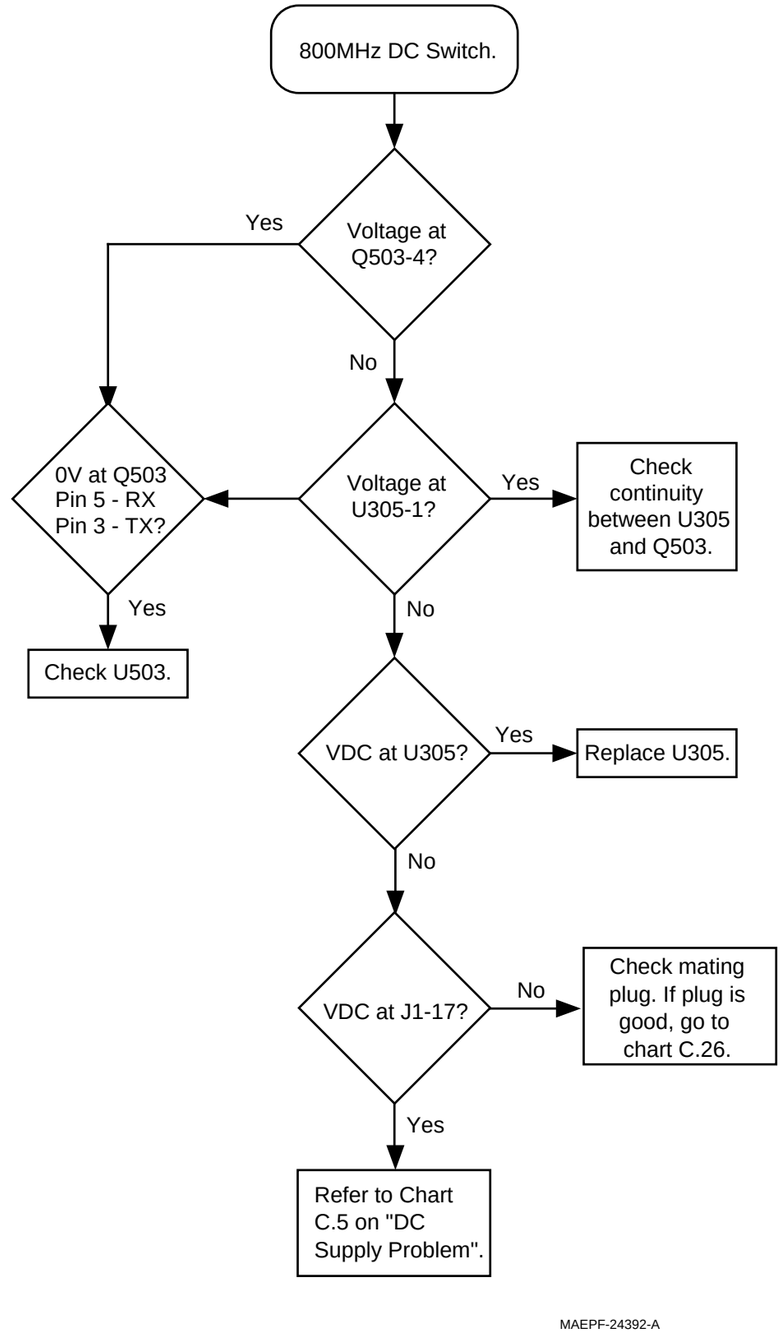
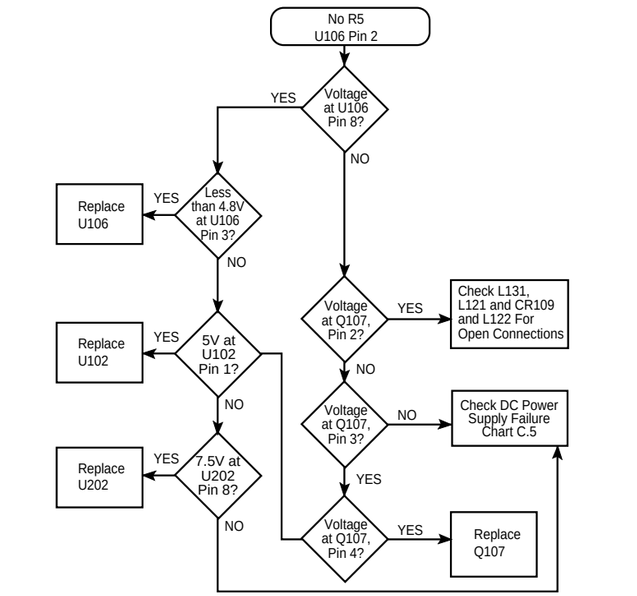


Chart 35 . 800MHz DC Switch



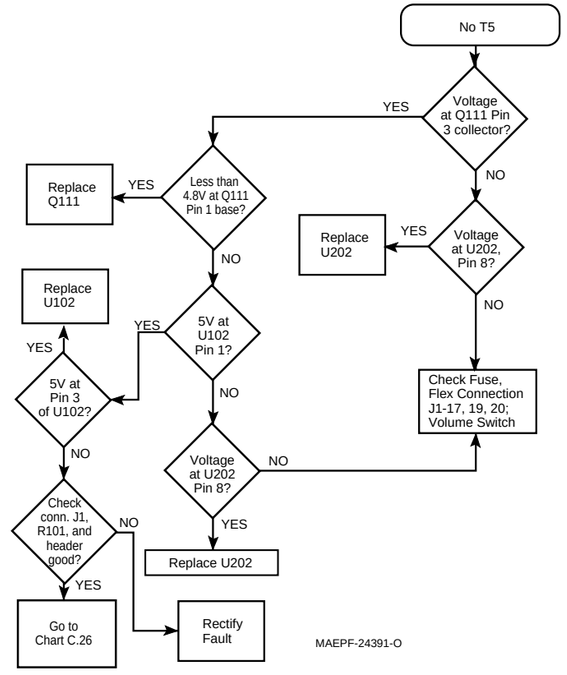


Chart 36 . VHF/UHF DC Switch

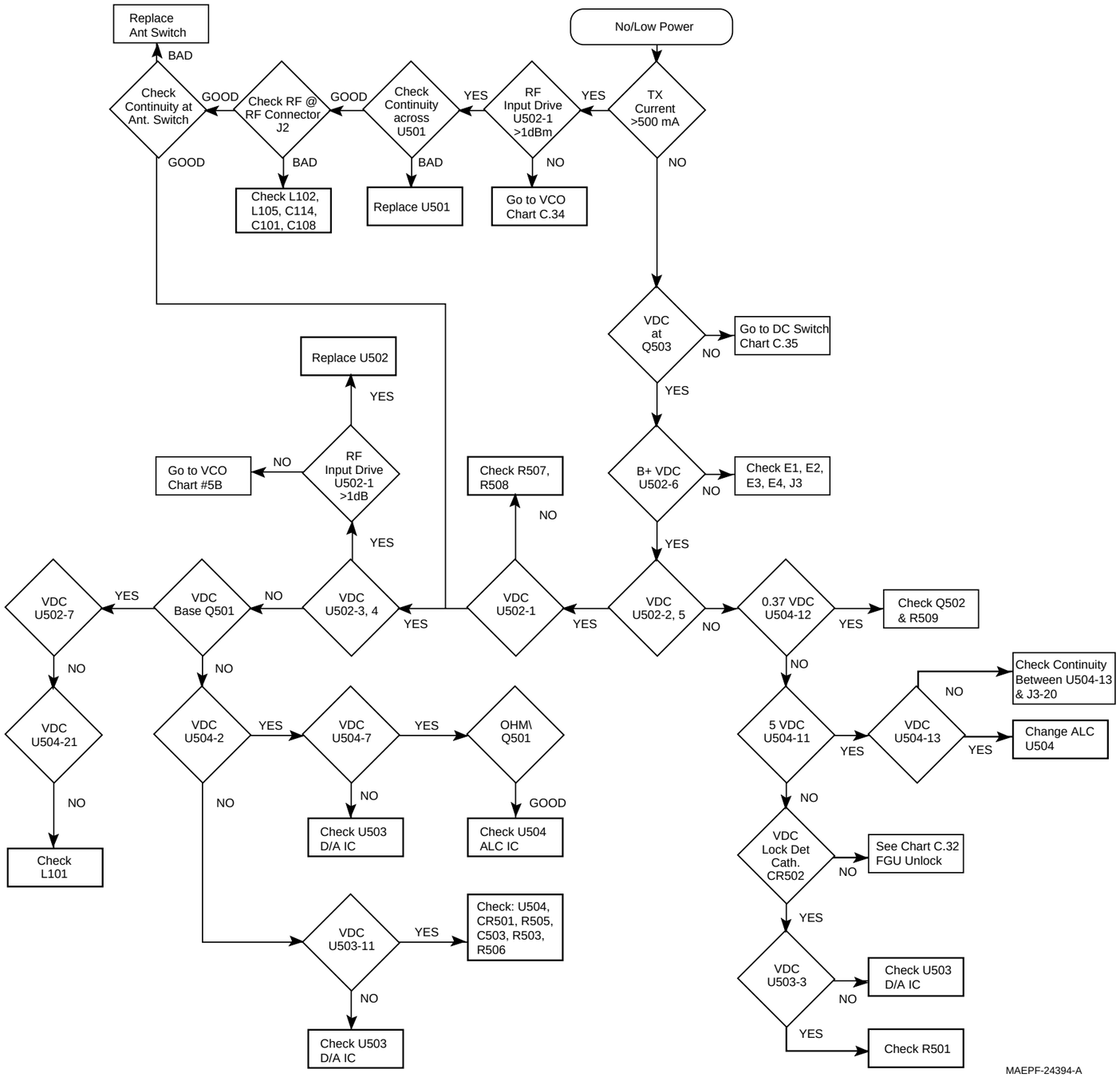


Chart 37 . 800MHz Transmitter RF

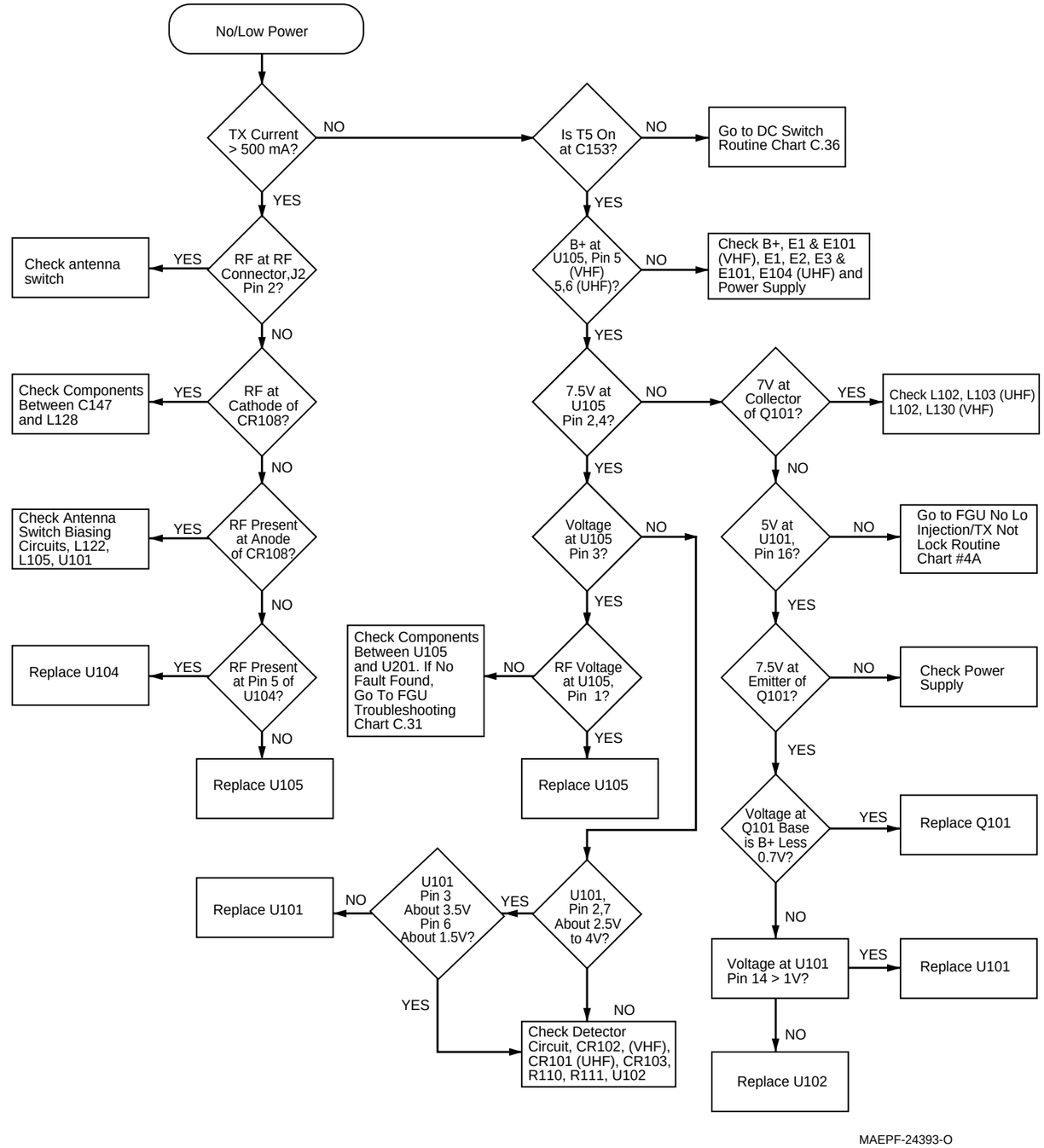


Chart 38 . VHF/UHF Transmitter RF

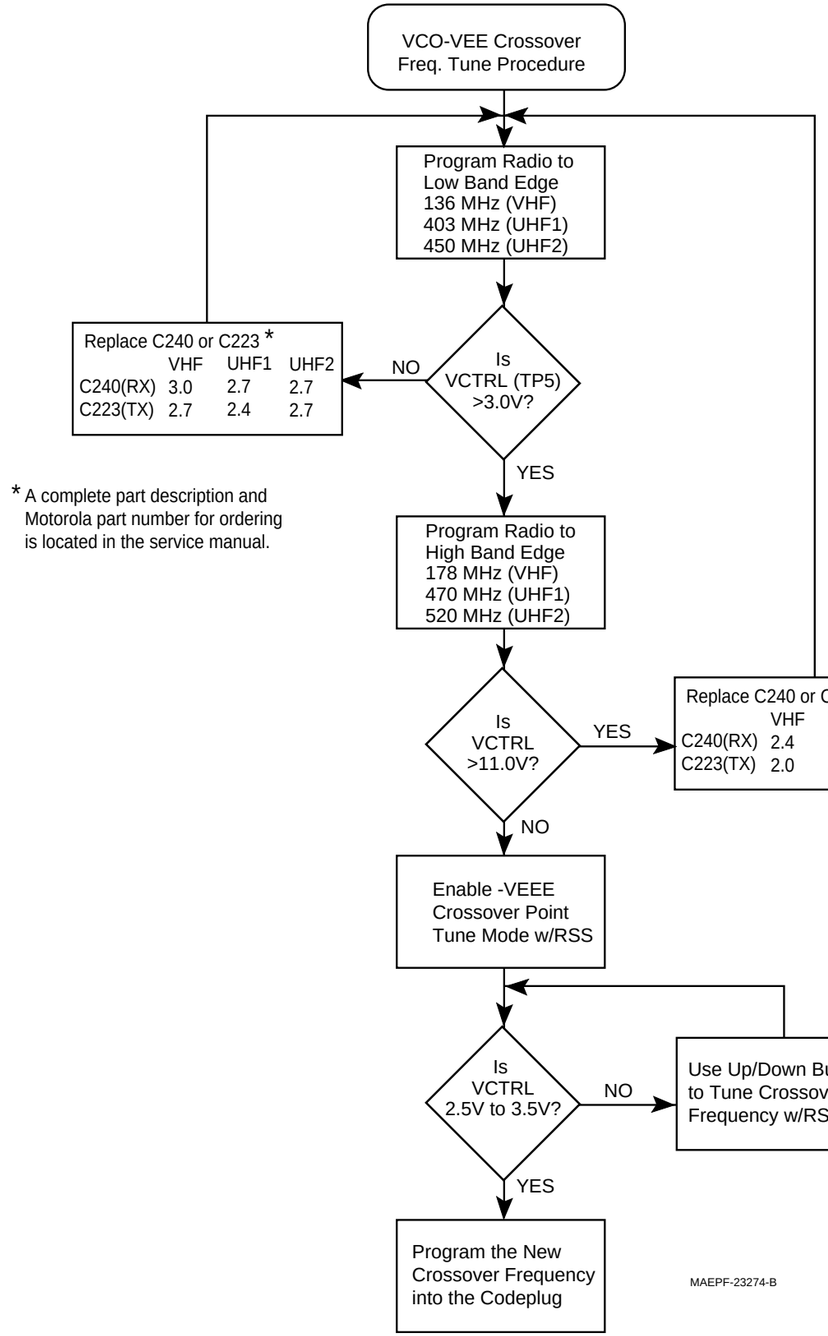


Chart 39 . VHF/UHF Only, VCO Crossover Frequency Tune