

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.

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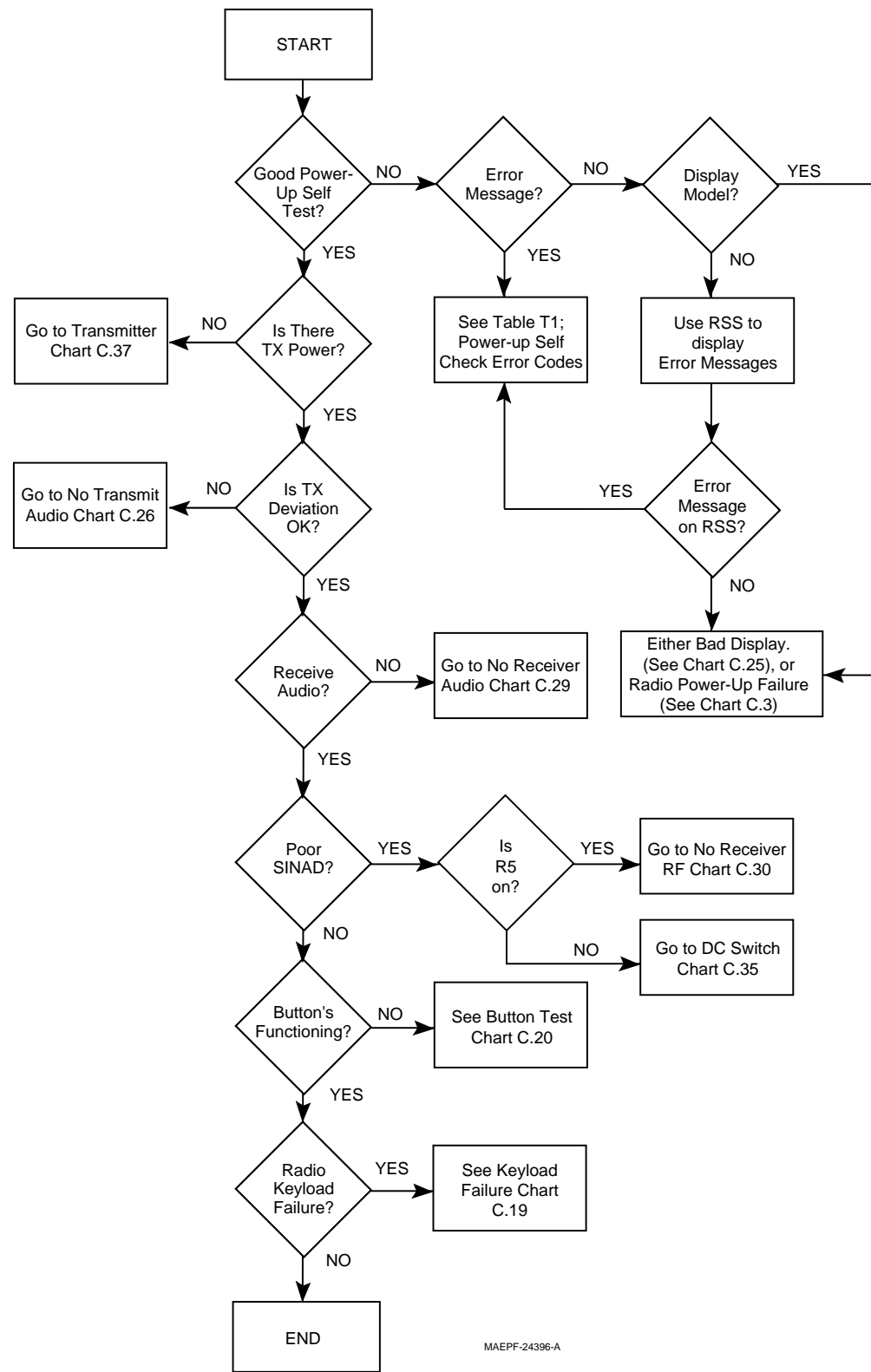


Chart 1 . 800MHz Radio Main Troubleshooting Chart

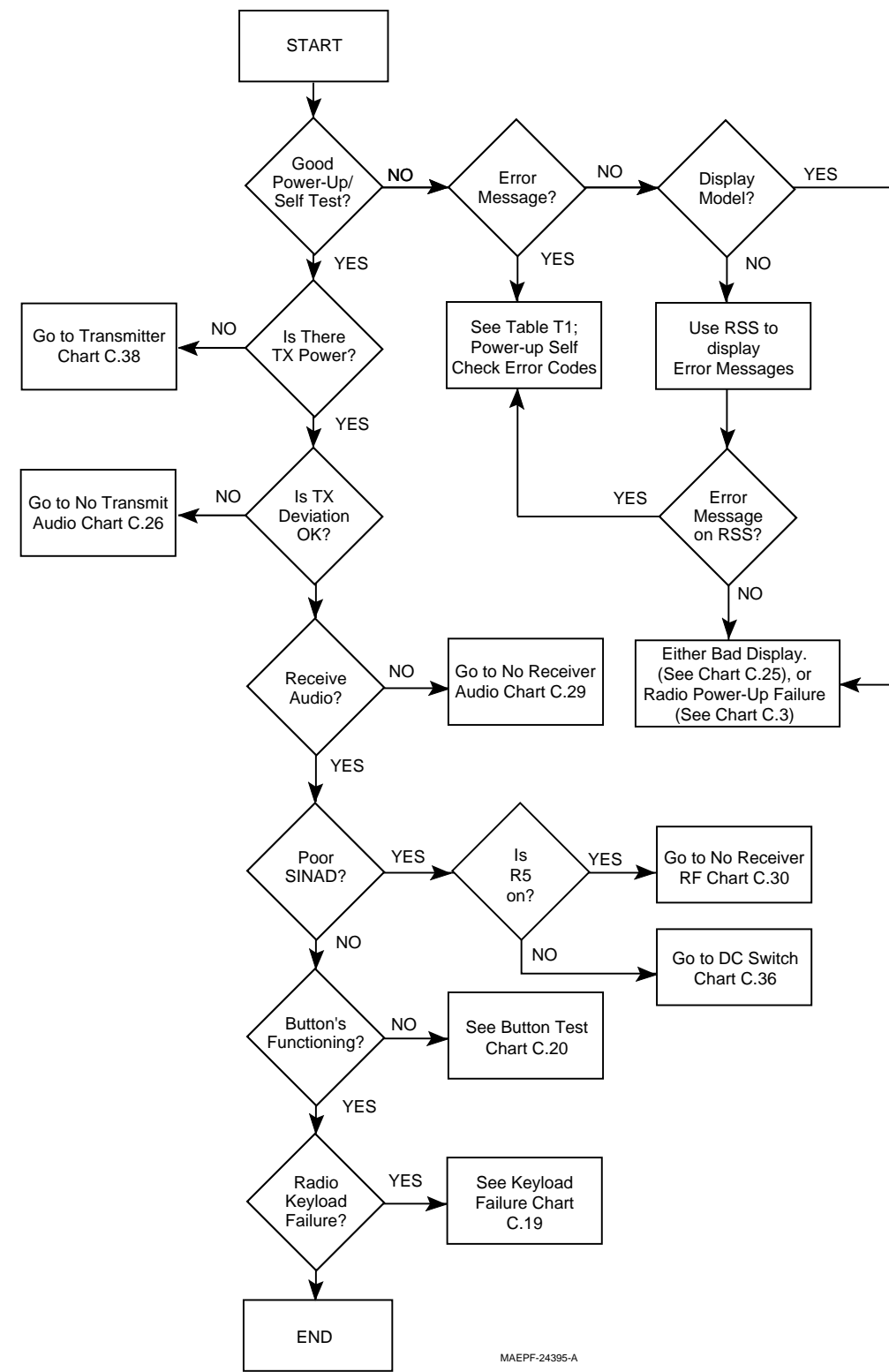


Chart 2 . VHF/UHF Radio Main Troubleshooting Chart

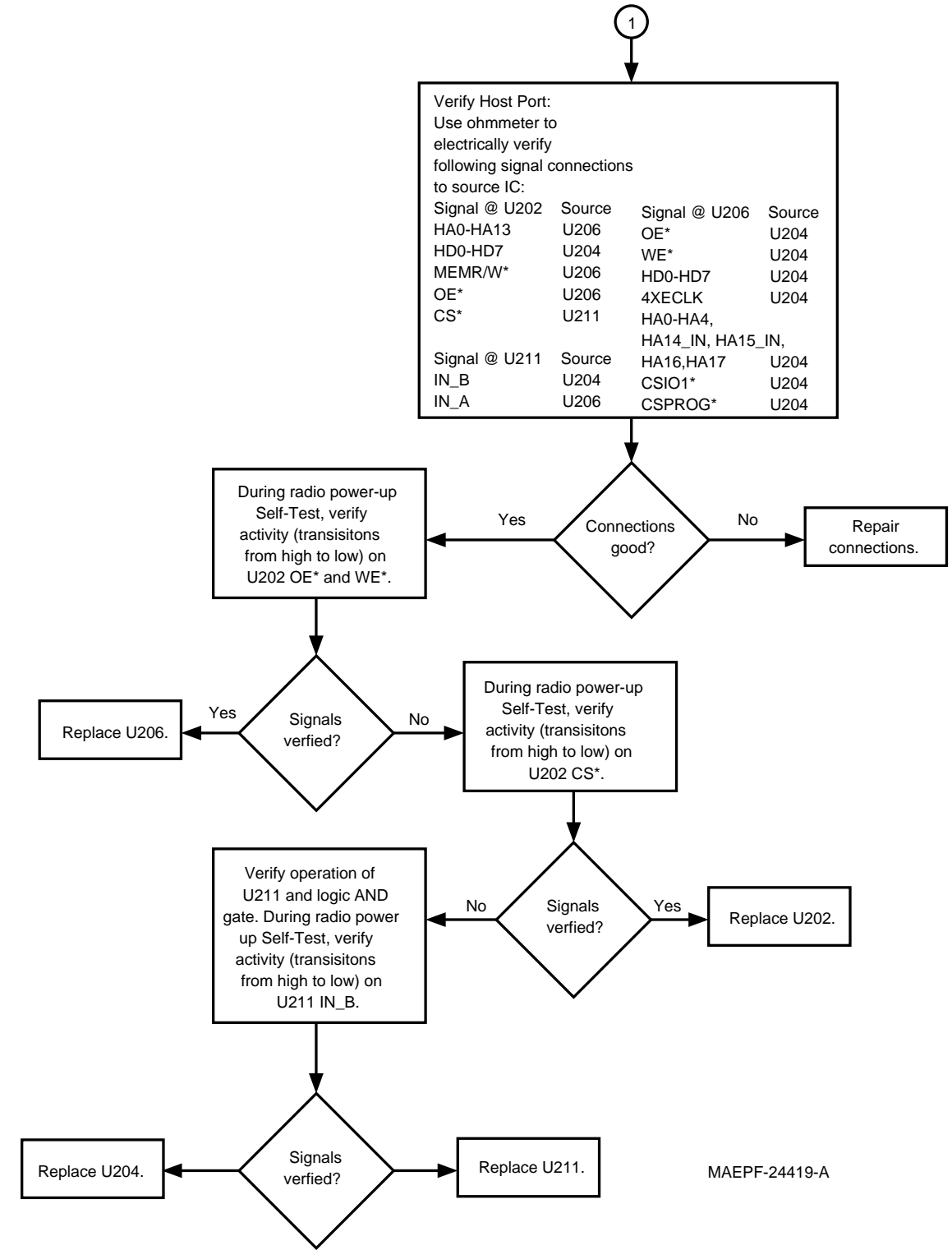
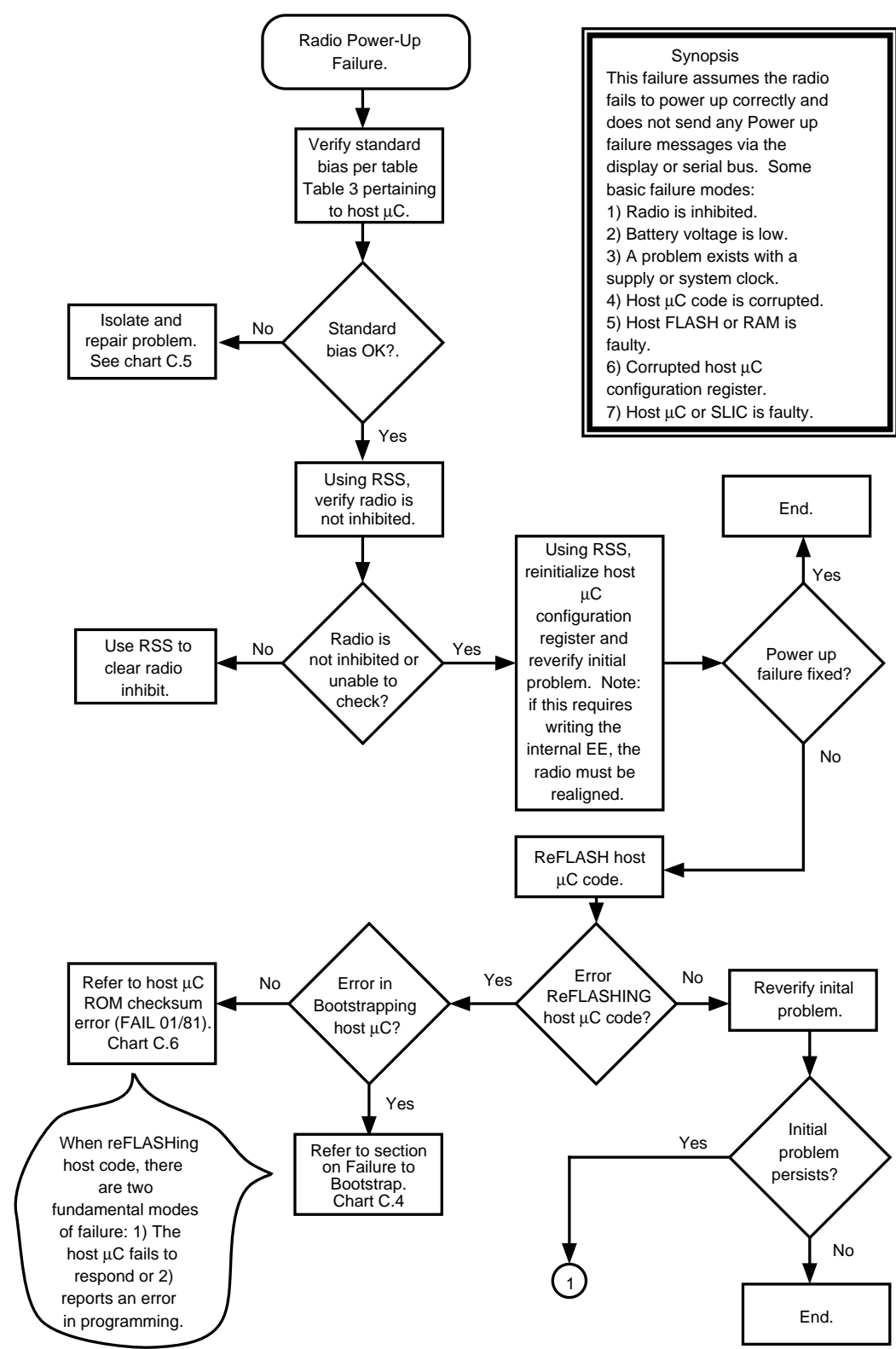
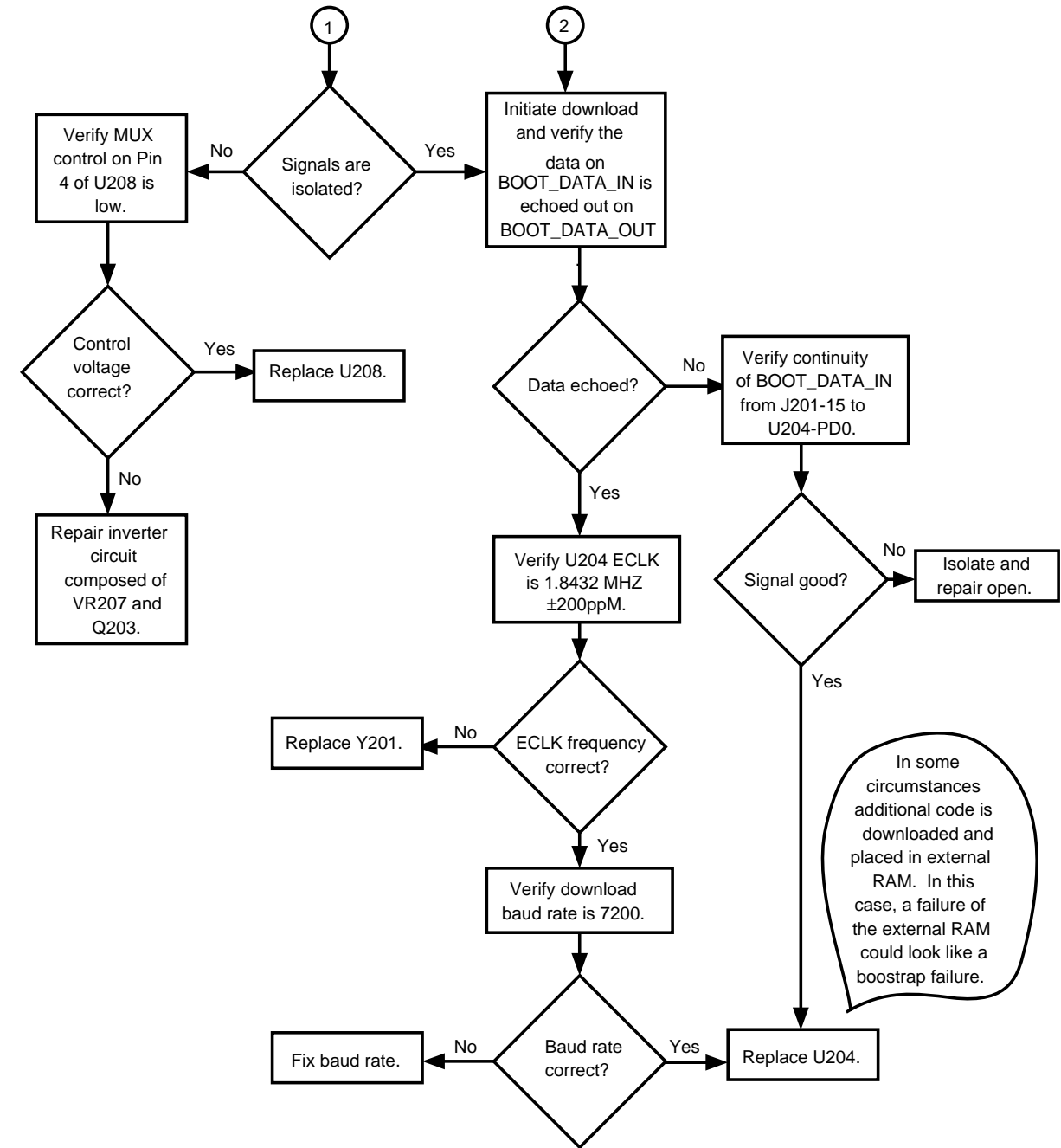
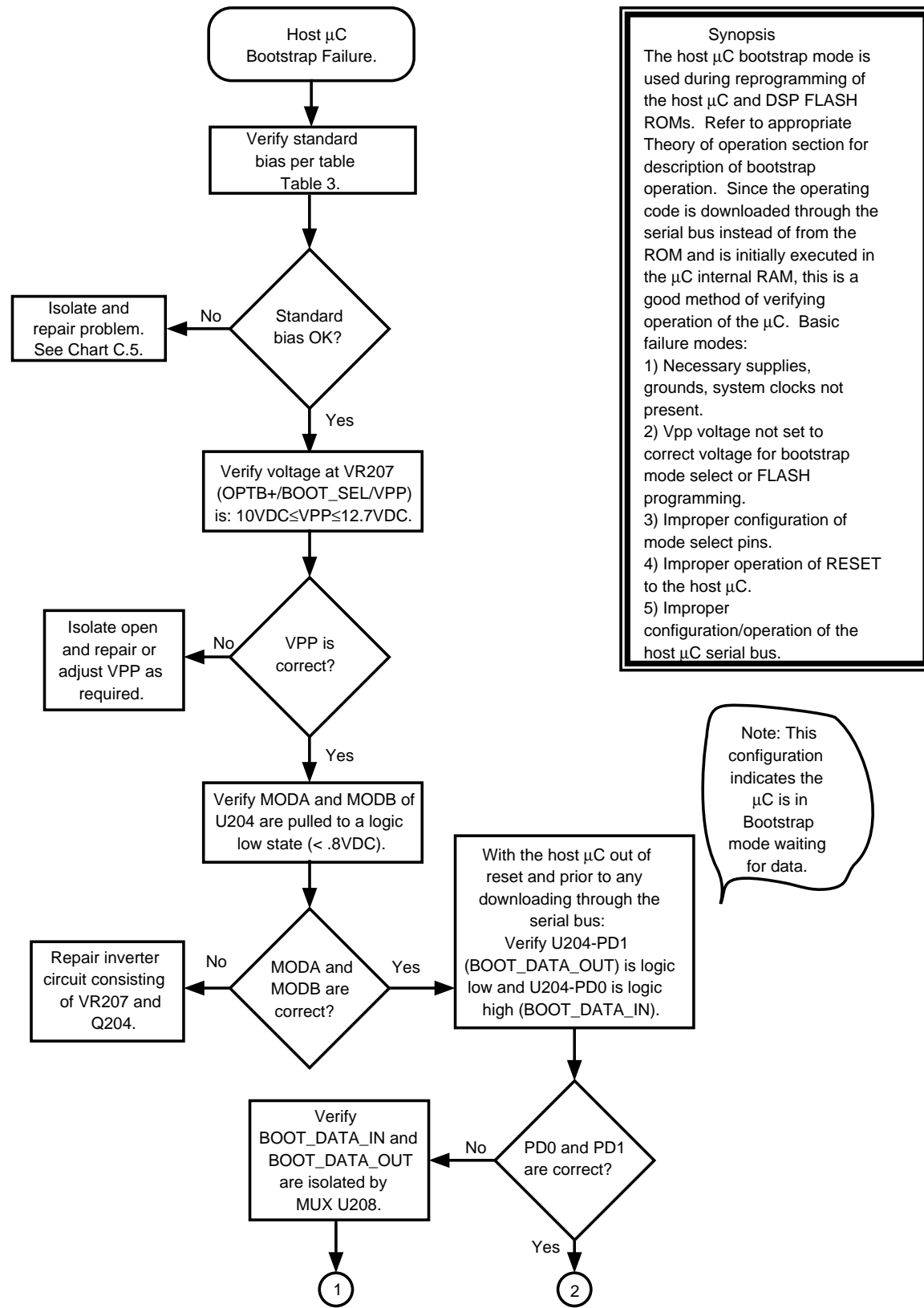


Chart 3 . Radio Power-Up Fail



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Chart 4 . Bootstrap Fail

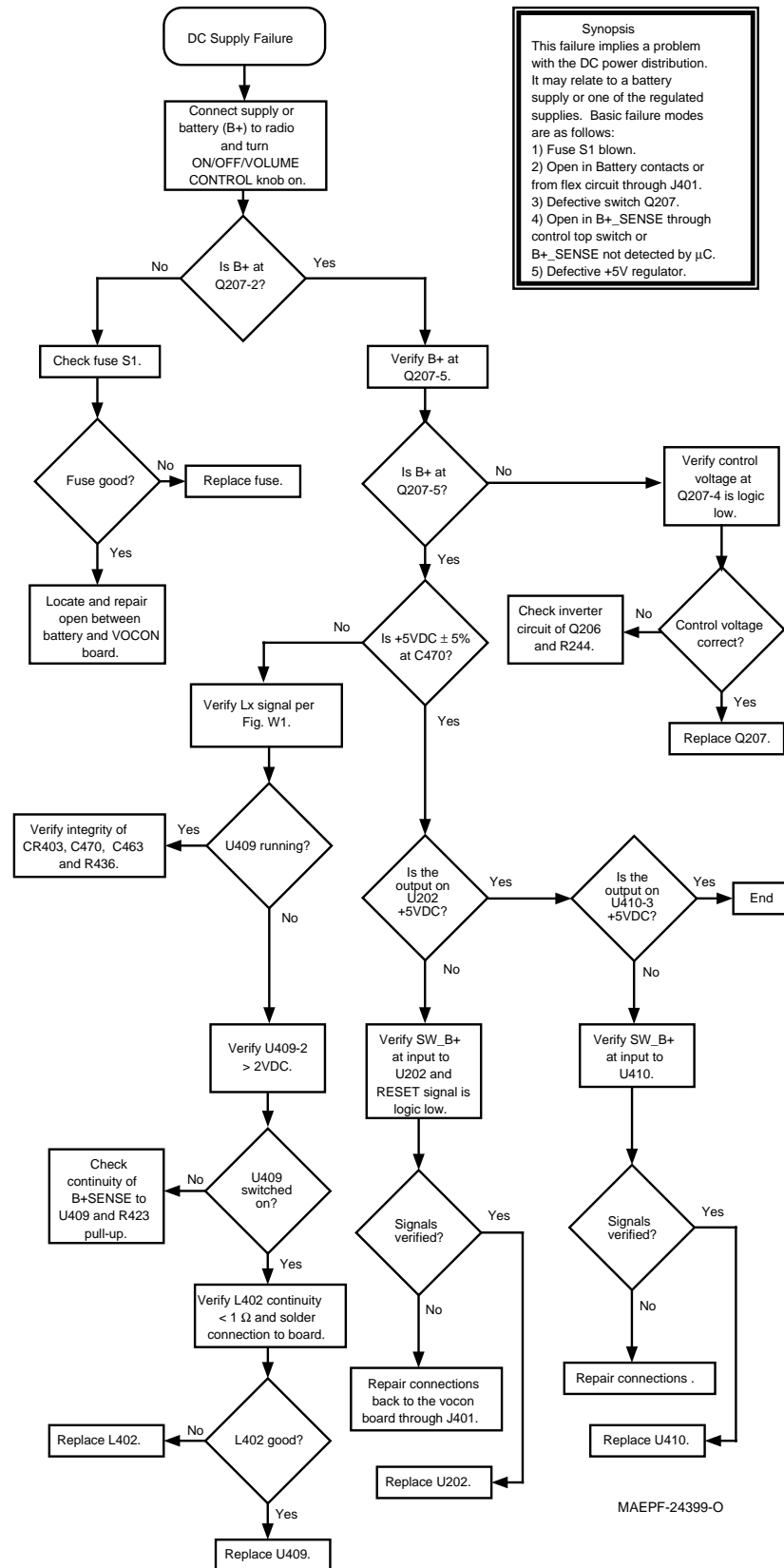


Chart 5 . DC Supply Failure

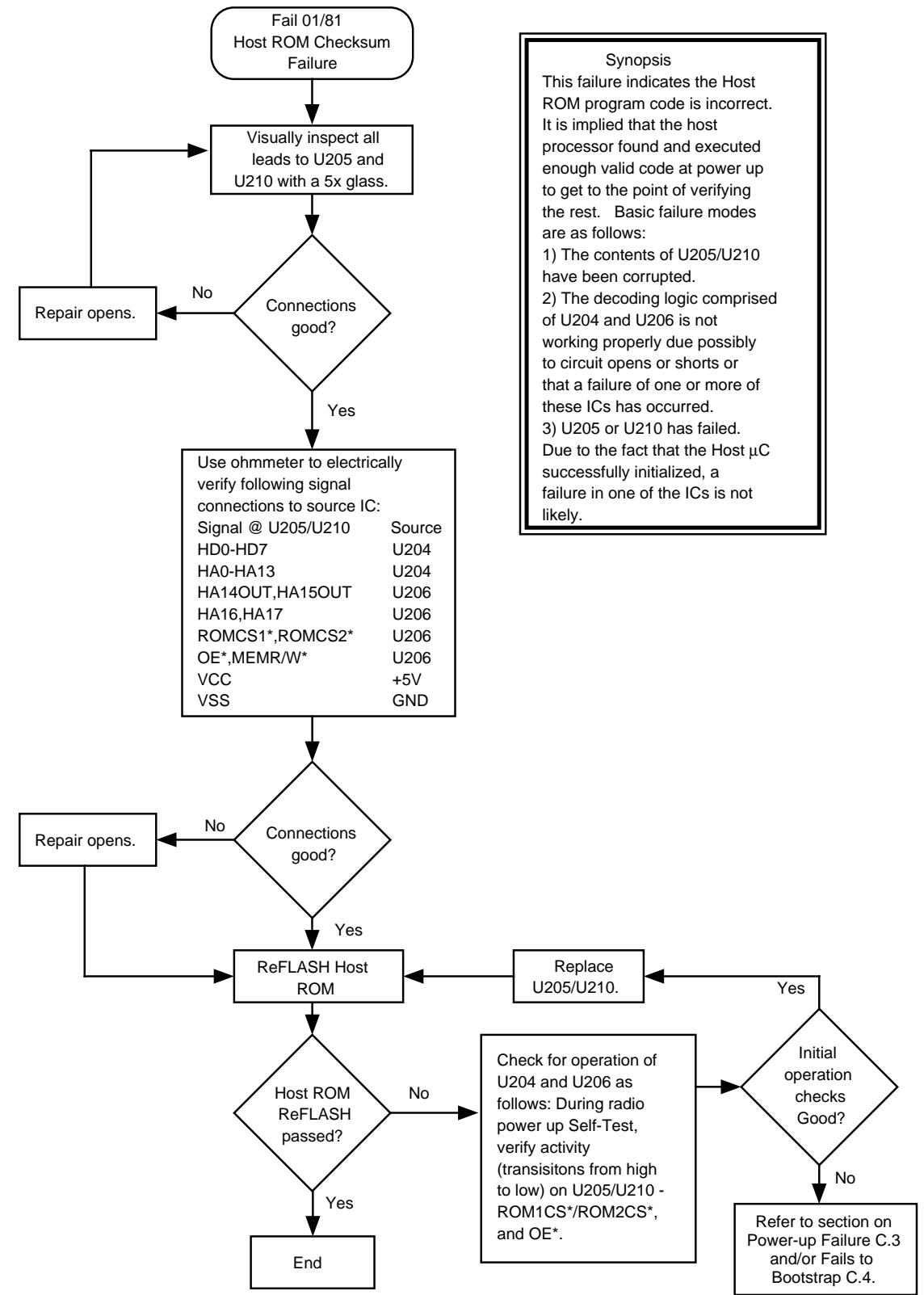


Chart 6 . 01/81 Host ROM Checksum Failure

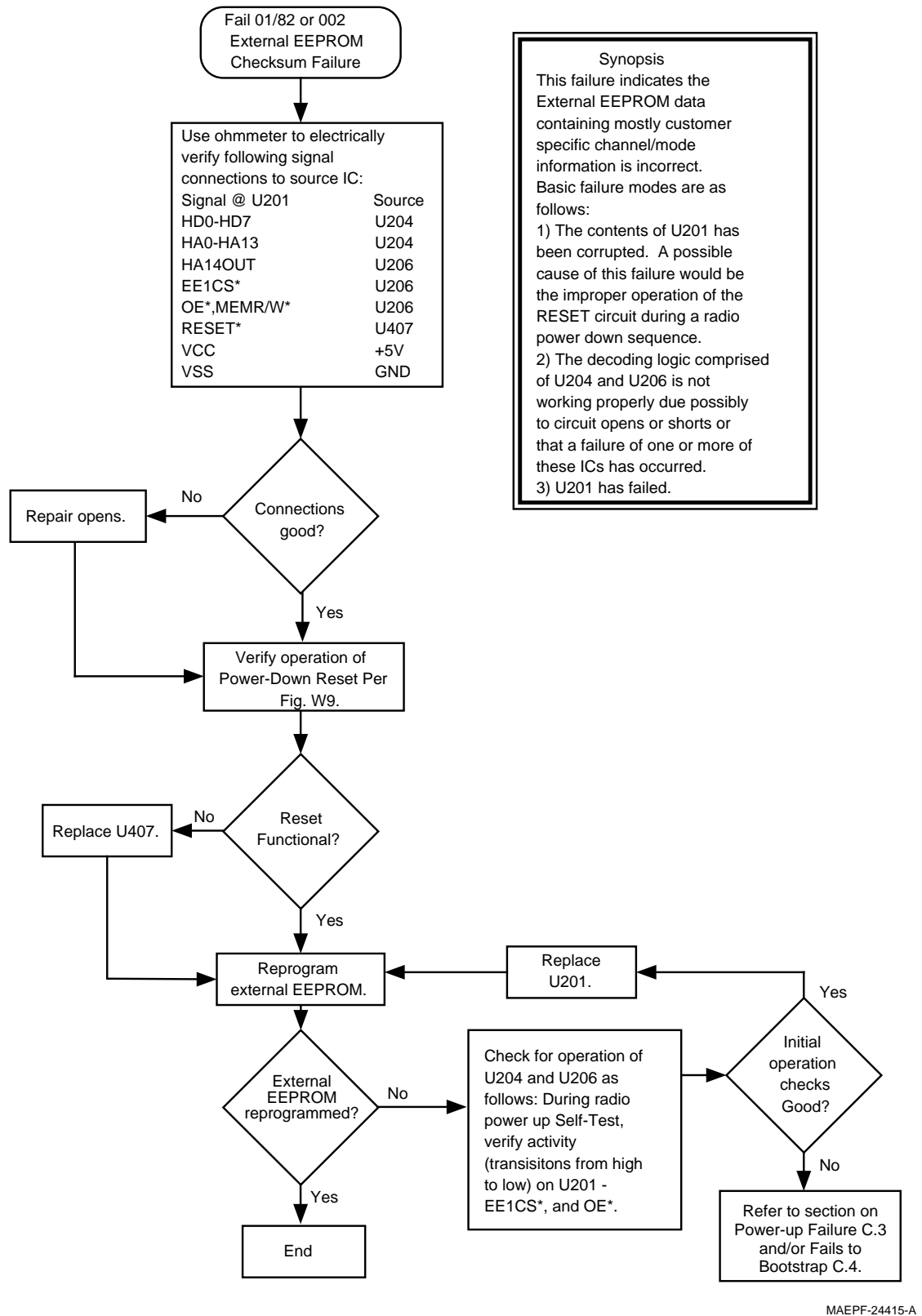


Chart 7 . 01/82 or 002, External EEPROM Checksum Failure

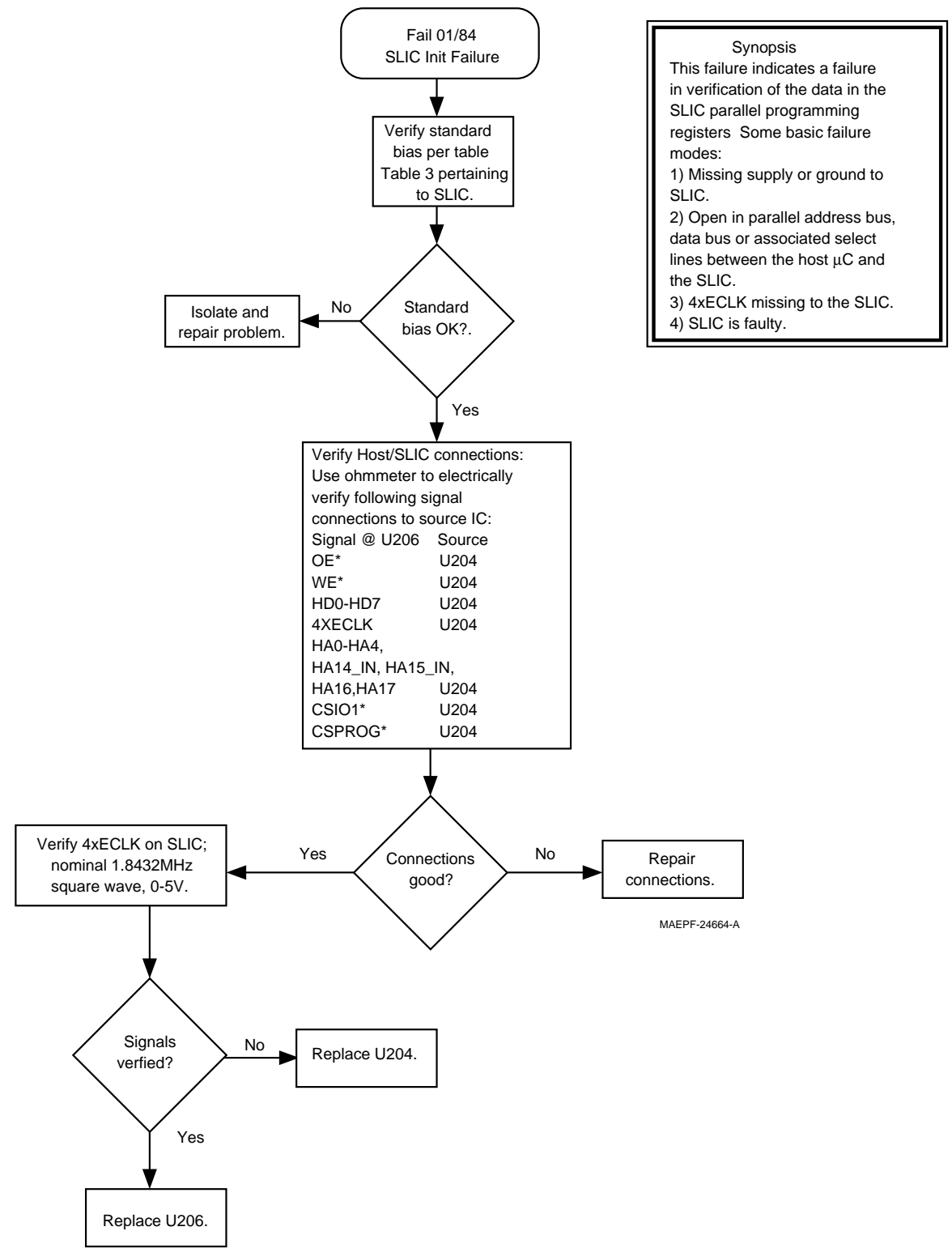


Chart 8 . 01/84 SLIC Initialization Failure

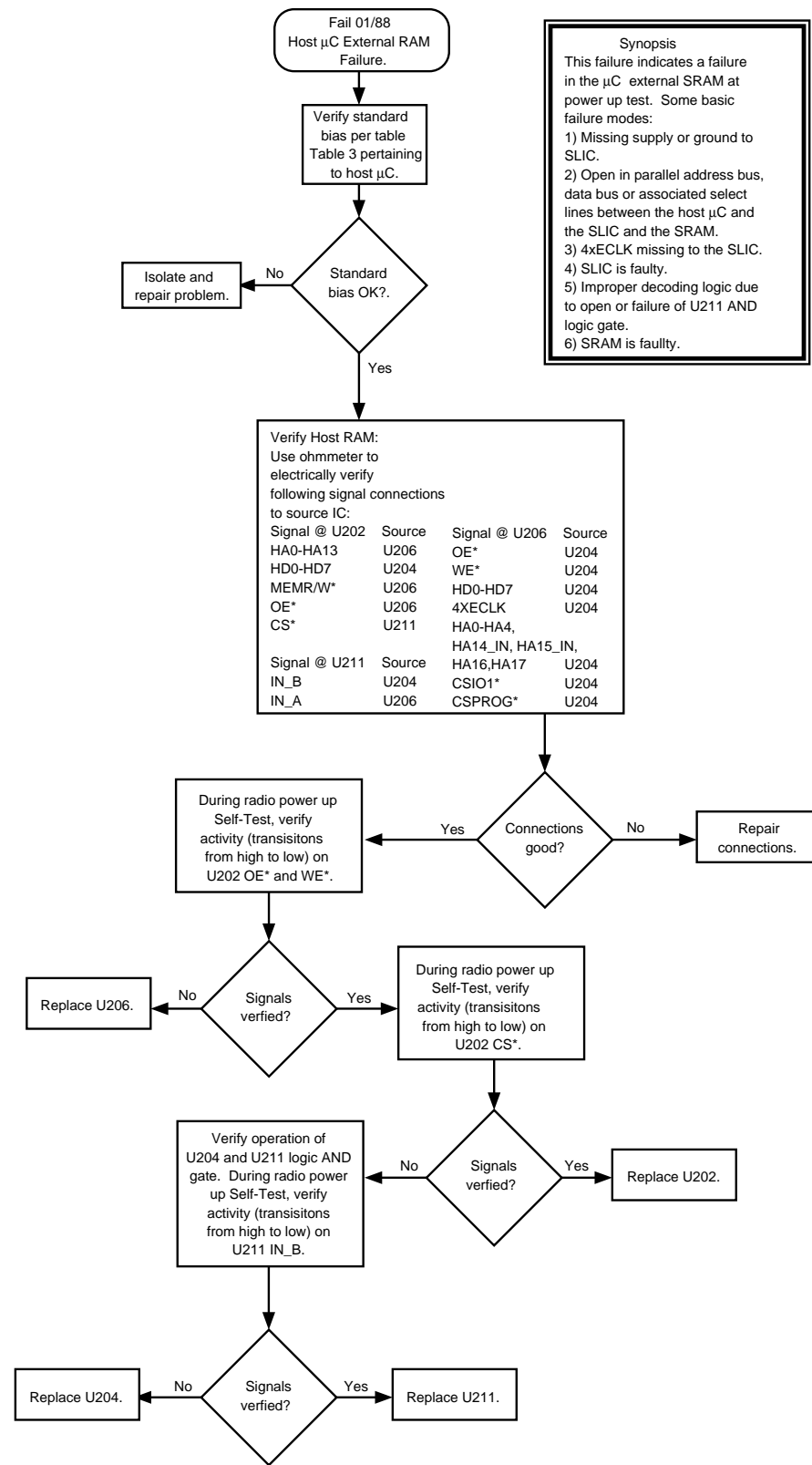


Chart 9 . 01/88 MCU (Host μ C) External SRAM Failure

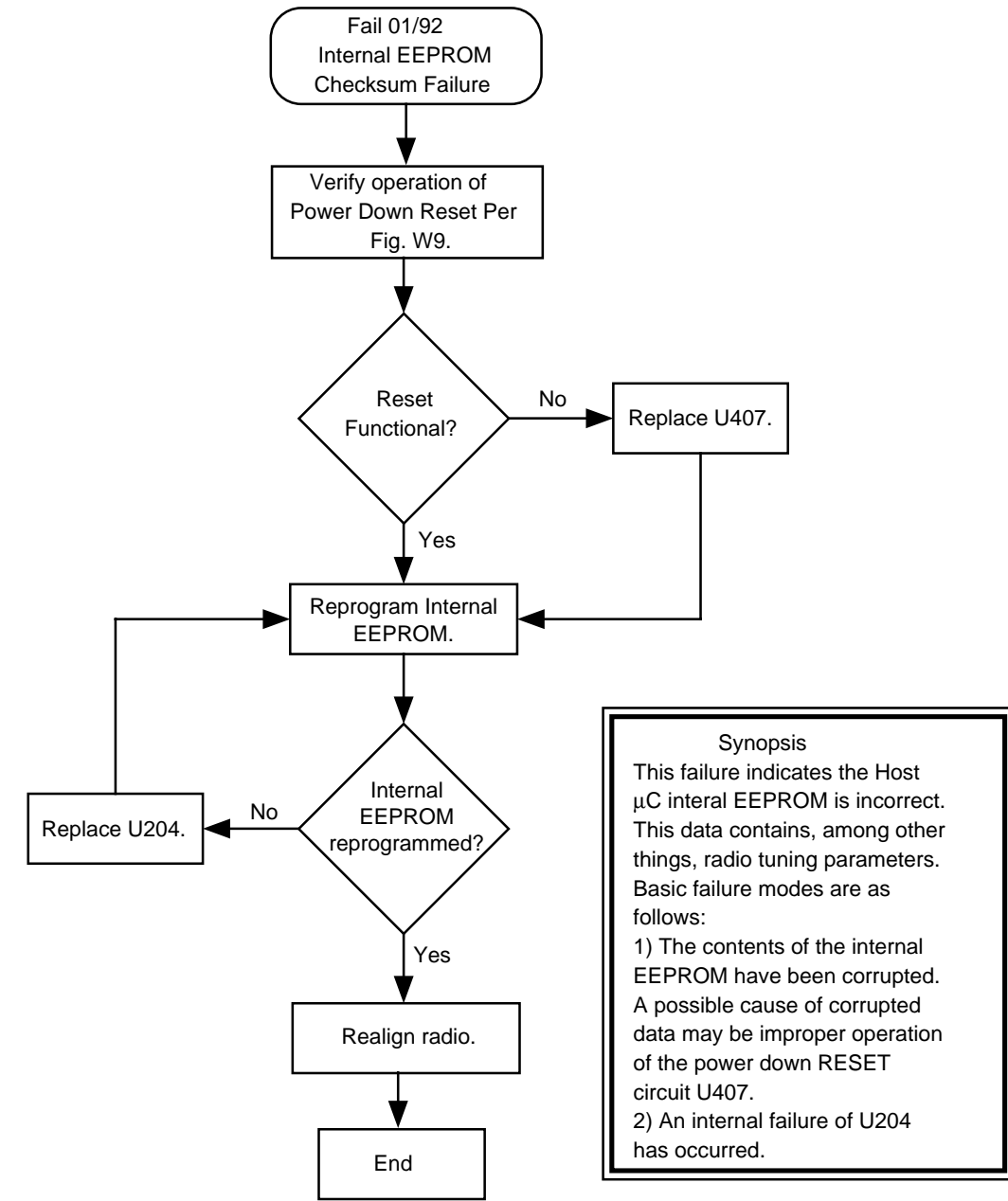


Chart 10 . 01/92, Internal EEPROM Checksum Failure

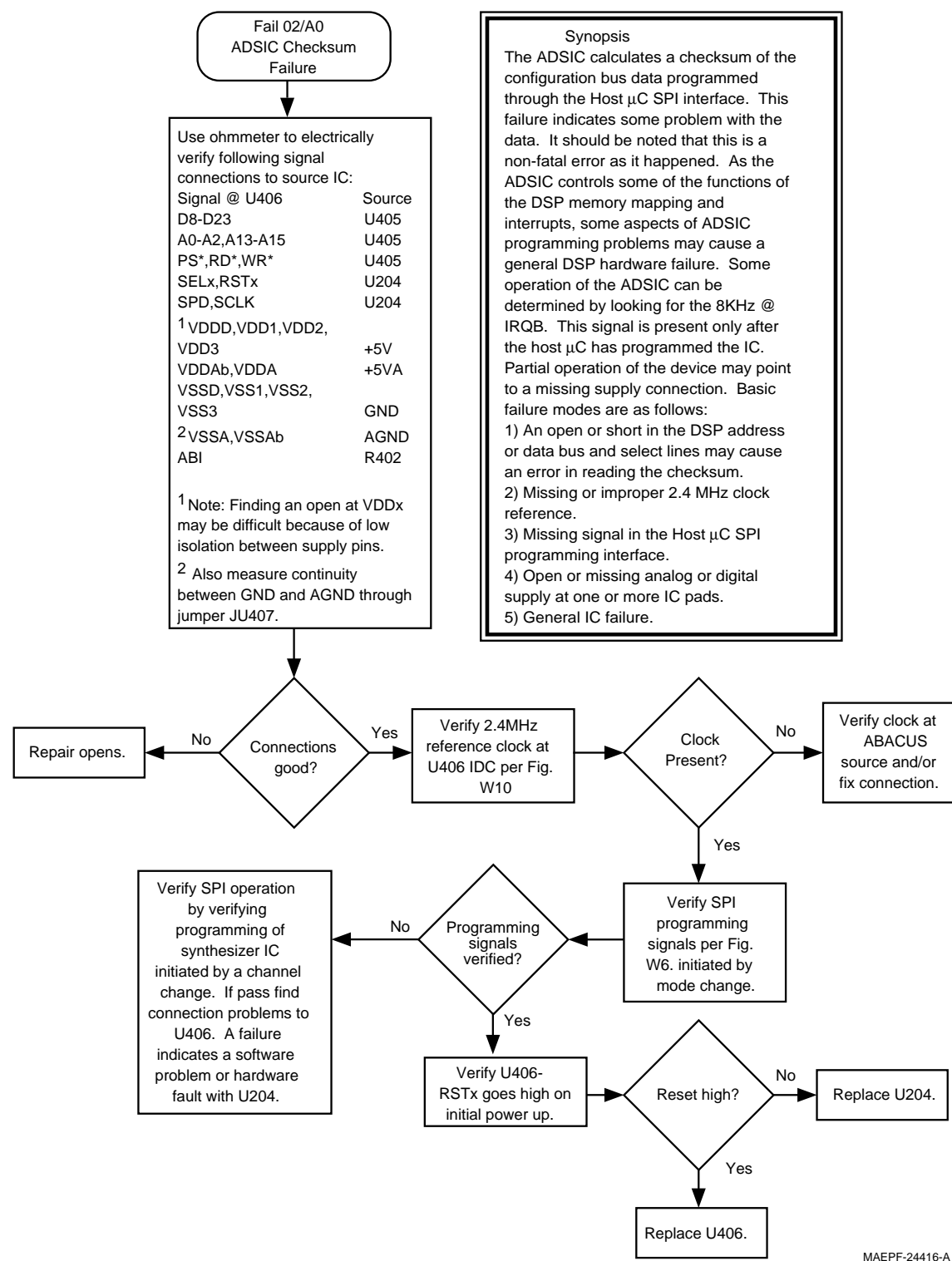


Chart 11 . 02/A0, ADSIC Checksum Failure

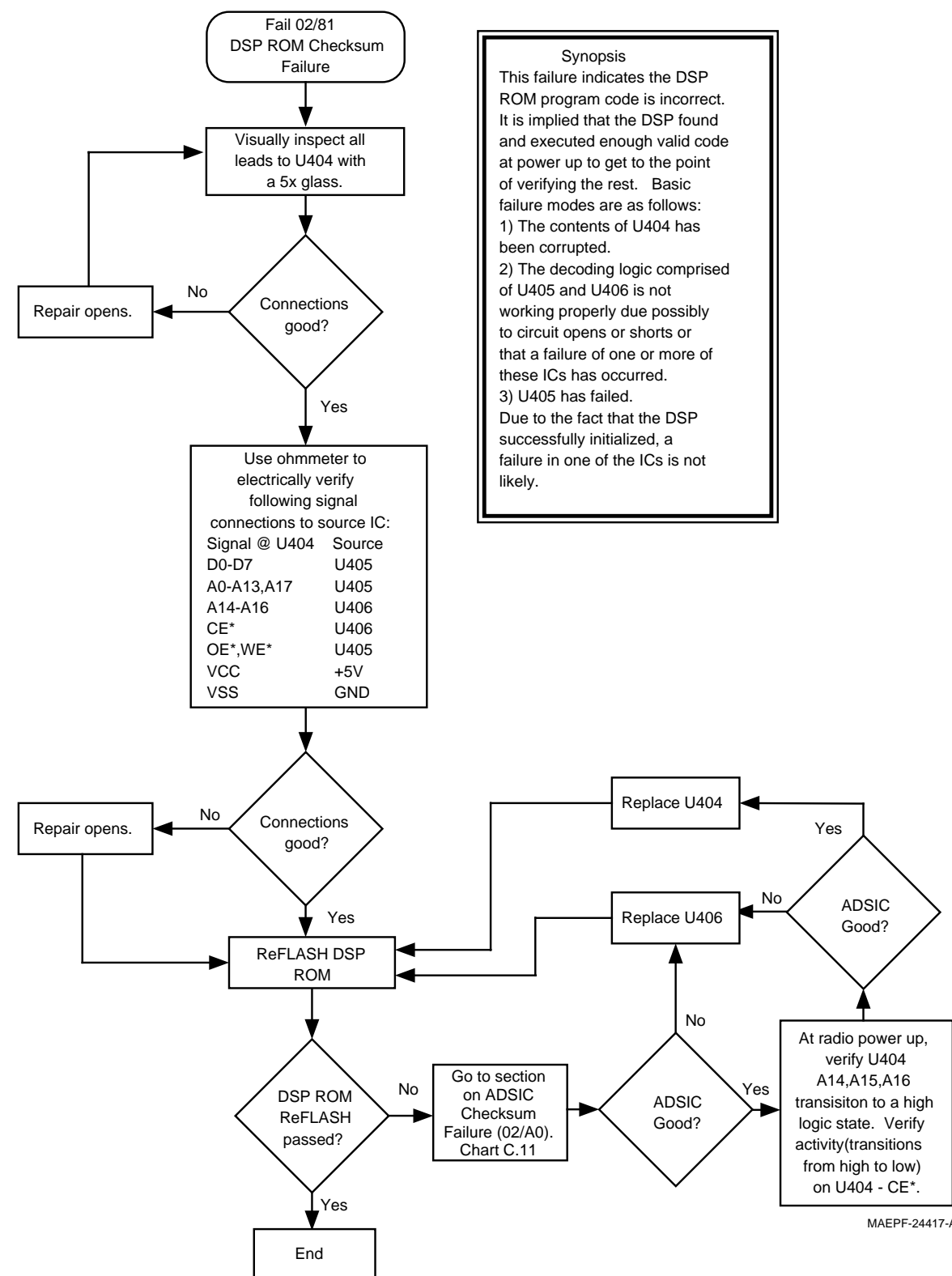


Chart 12 . 02/81, DSP ROM Checksum Failure

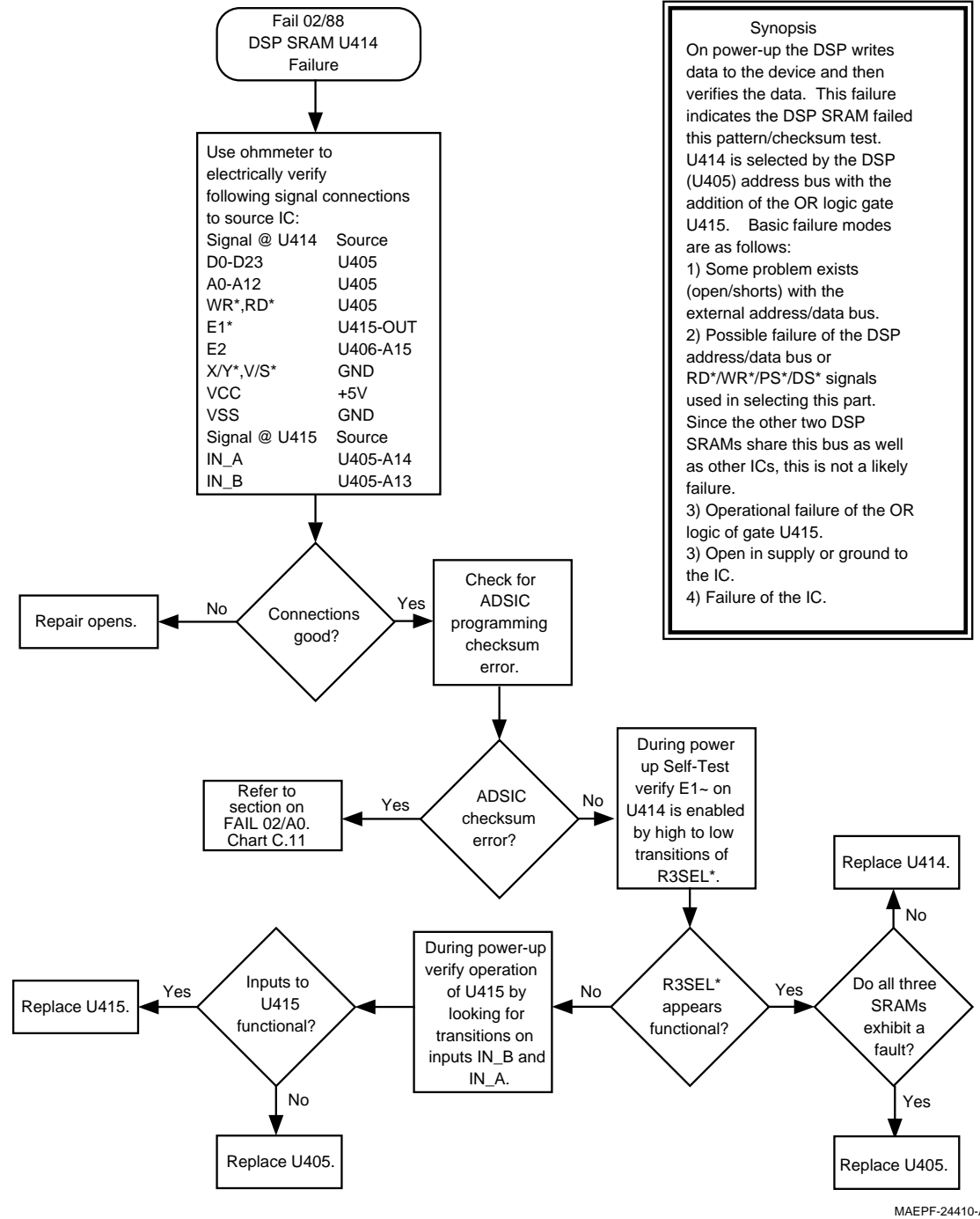


Chart 13 . 02/88, DSP External SRAM Failure U414

Synopsis
On power-up the DSP writes data to the device and then verifies the data. This failure indicates the DSP SRAM failed this pattern/checksum test. U414 is selected by the DSP (U405) address bus with the addition of the OR logic gate U415. Basic failure modes are as follows:
1) Some problem exists (open/shorts) with the external address/data bus.
2) Possible failure of the DSP address/data bus or RD*/WR*/PS*/DS* signals used in selecting this part. Since the other two DSP SRAMs share this bus as well as other ICs, this is not a likely failure.
3) Operational failure of the OR logic of gate U415.
3) Open in supply or ground to the IC.
4) Failure of the IC.

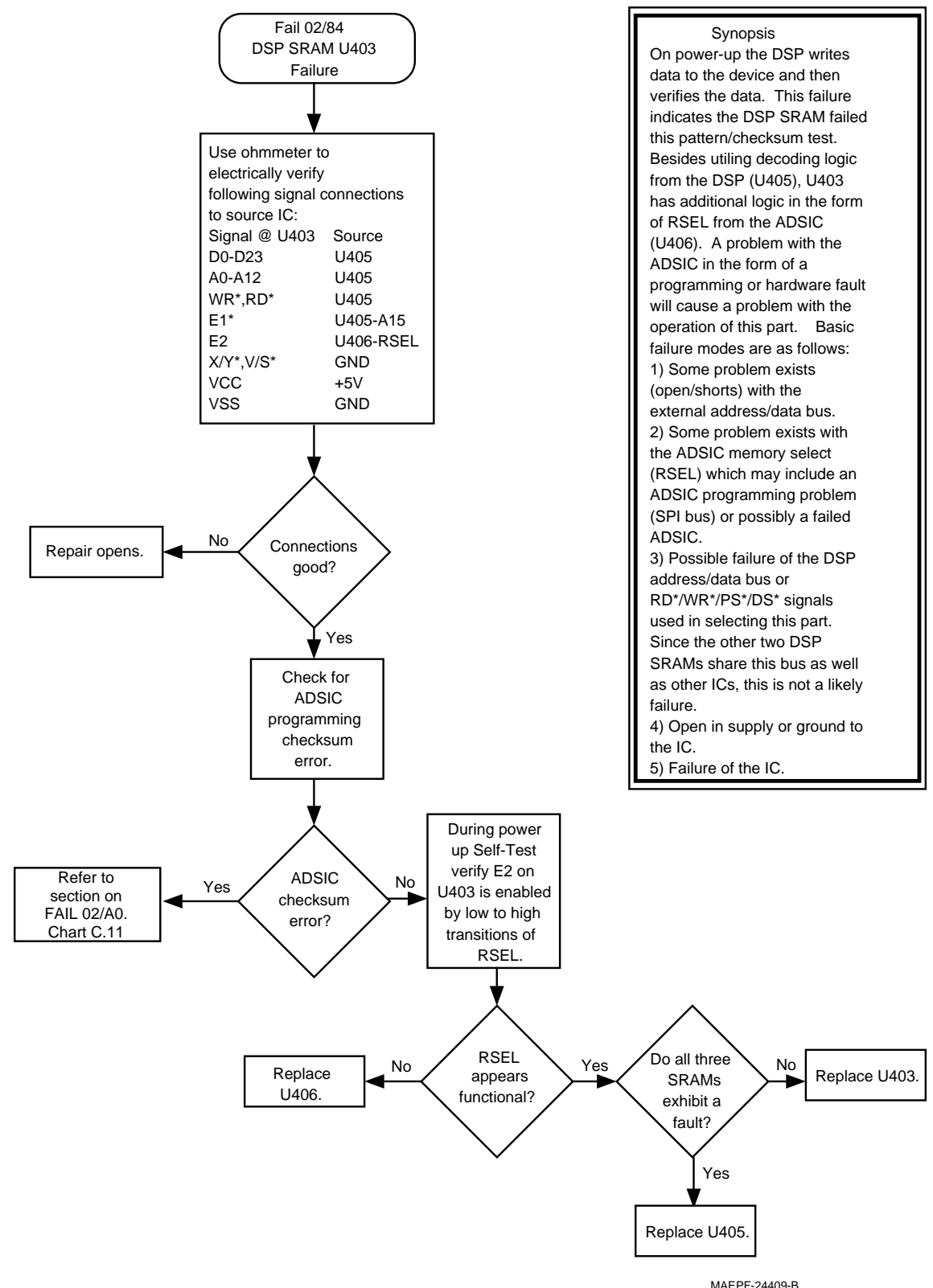


Chart 14 . 02/84, DSP External SRAM Failure U403

Synopsis
On power-up the DSP writes data to the device and then verifies the data. This failure indicates the DSP SRAM failed this pattern/checksum test. Besides utilizing decoding logic from the DSP (U405), U403 has additional logic in the form of RSEL from the ADSIC (U406). A problem with the ADSIC in the form of a programming or hardware fault will cause a problem with the operation of this part. Basic failure modes are as follows:
1) Some problem exists (open/shorts) with the external address/data bus.
2) Some problem exists with the ADSIC memory select (RSEL) which may include an ADSIC programming problem (SPI bus) or possibly a failed ADSIC.
3) Possible failure of the DSP address/data bus or RD*/WR*/PS*/DS* signals used in selecting this part. Since the other two DSP SRAMs share this bus as well as other ICs, this is not a likely failure.
4) Open in supply or ground to the IC.
5) Failure of the IC.

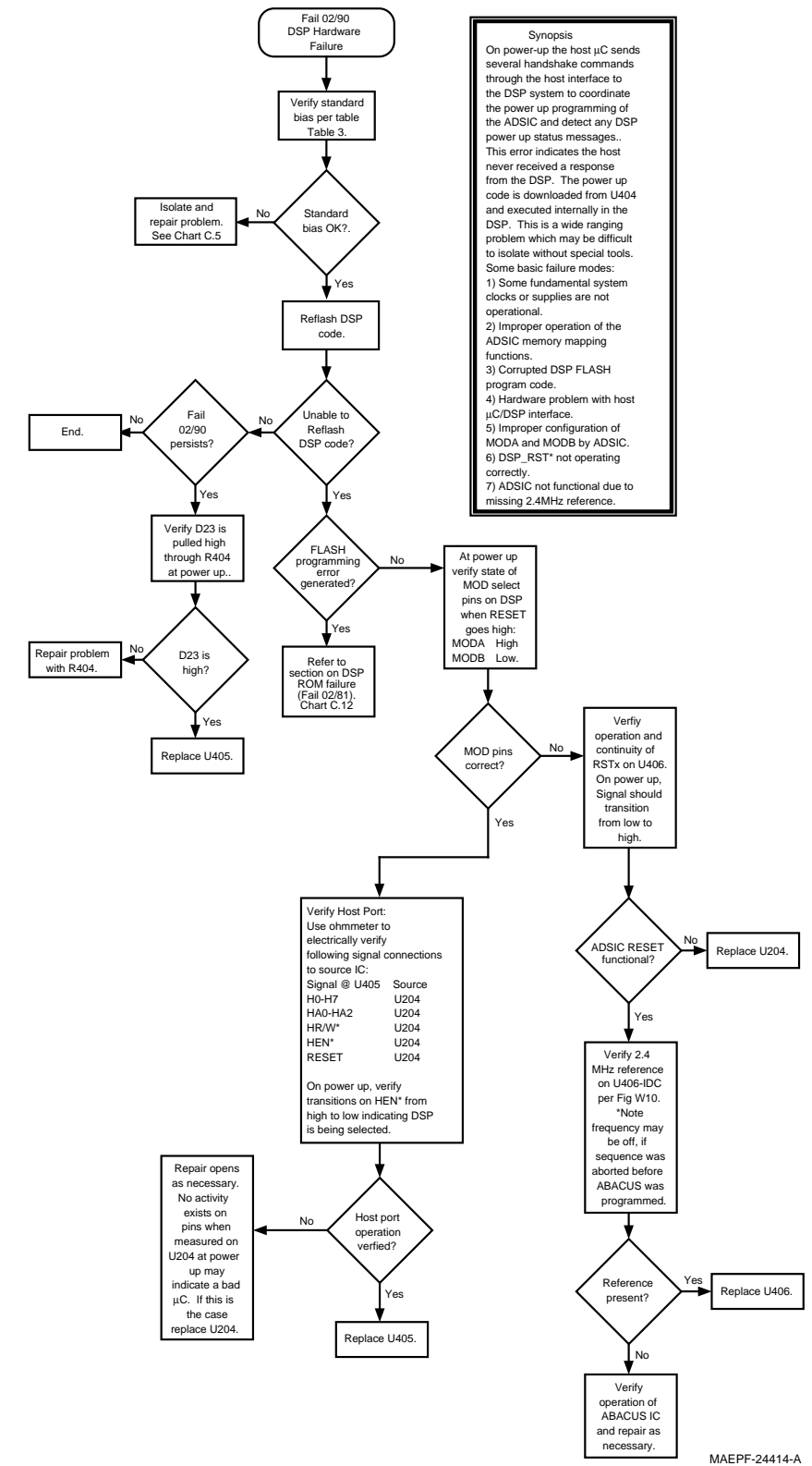
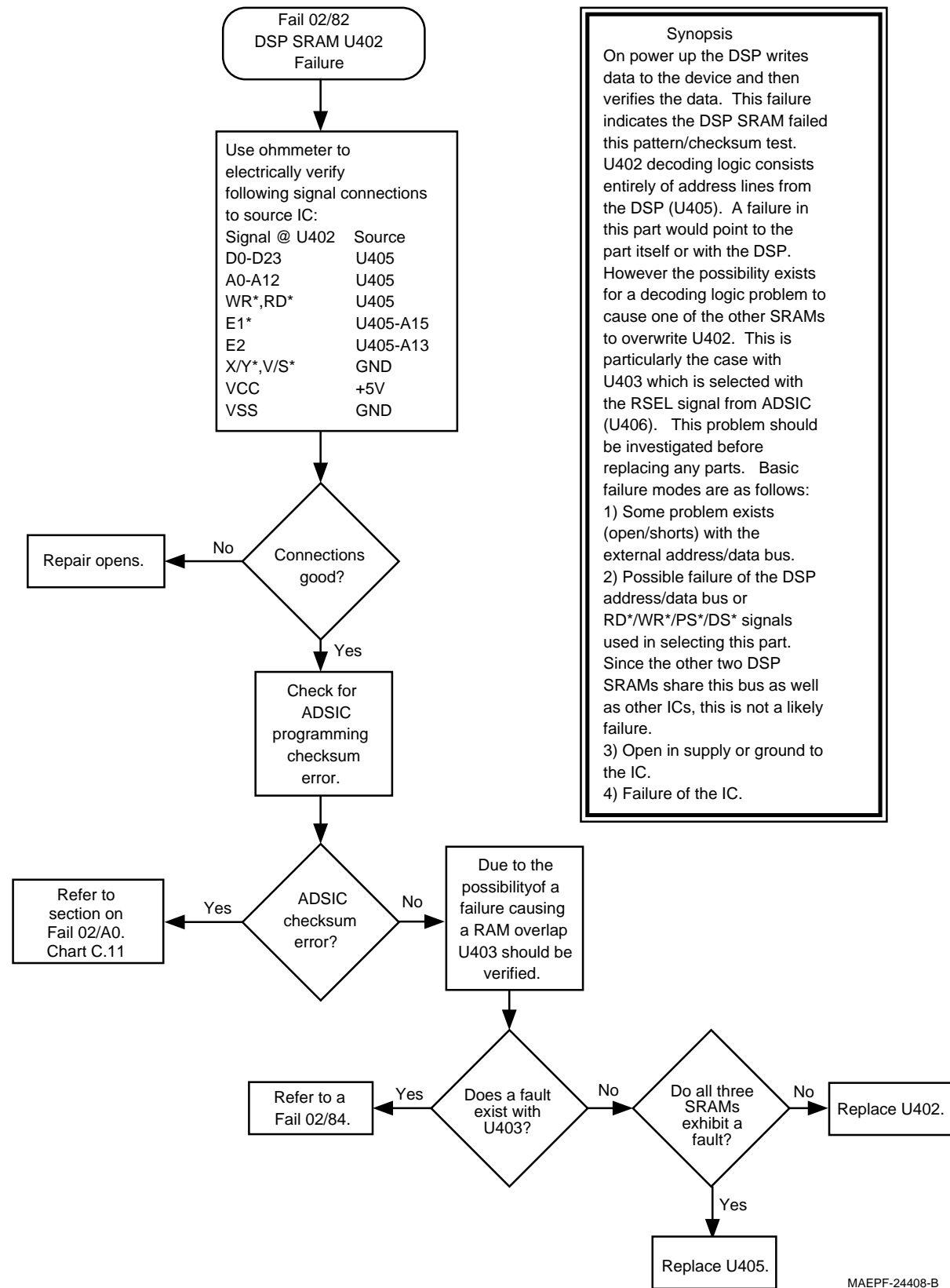


Chart 15 . 02/82, DSP External SRAM Failure U402

Chart 16 . 02/90, General DSP Hardware Failure

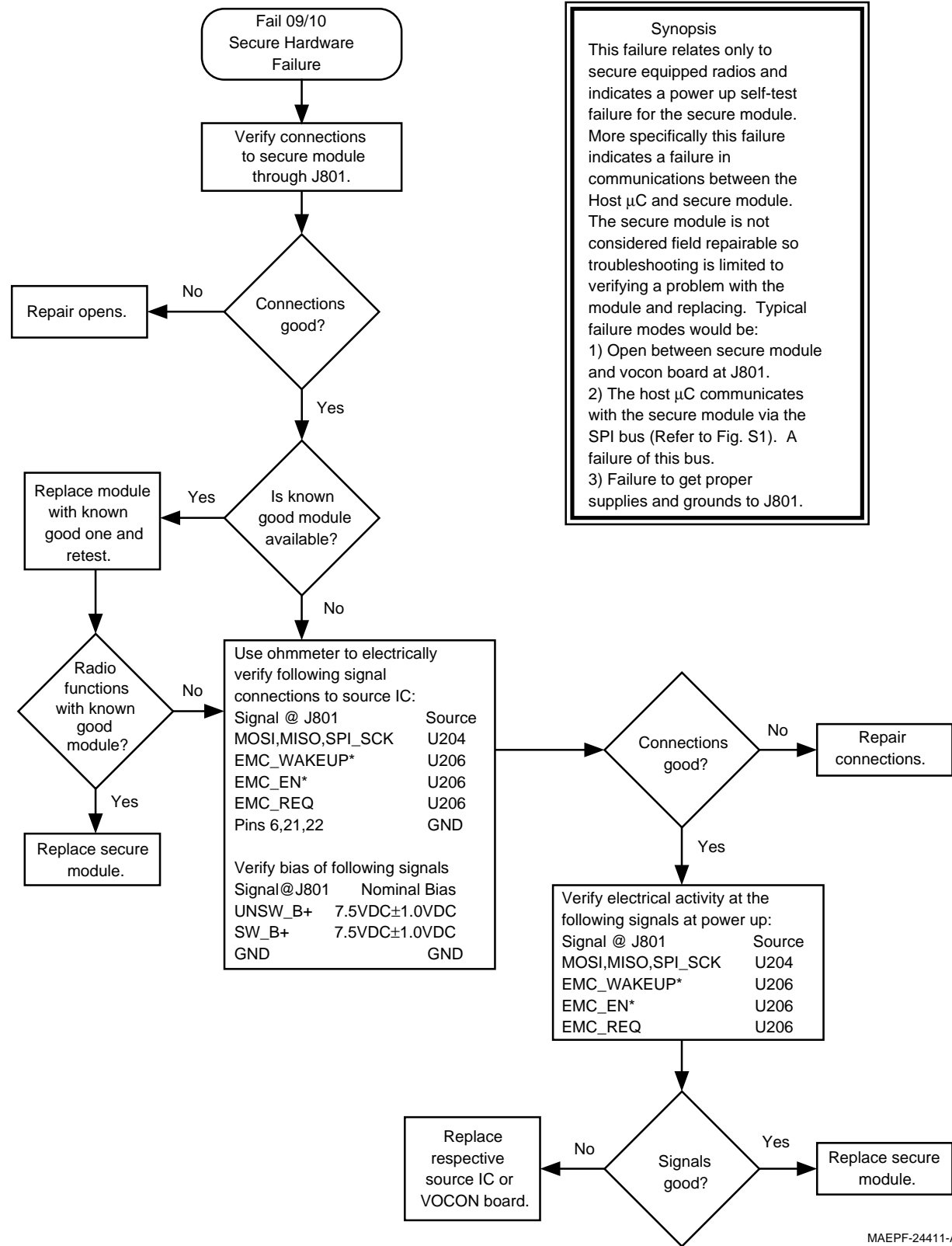


Chart 17 . 09/10, Secure Hardware Failure

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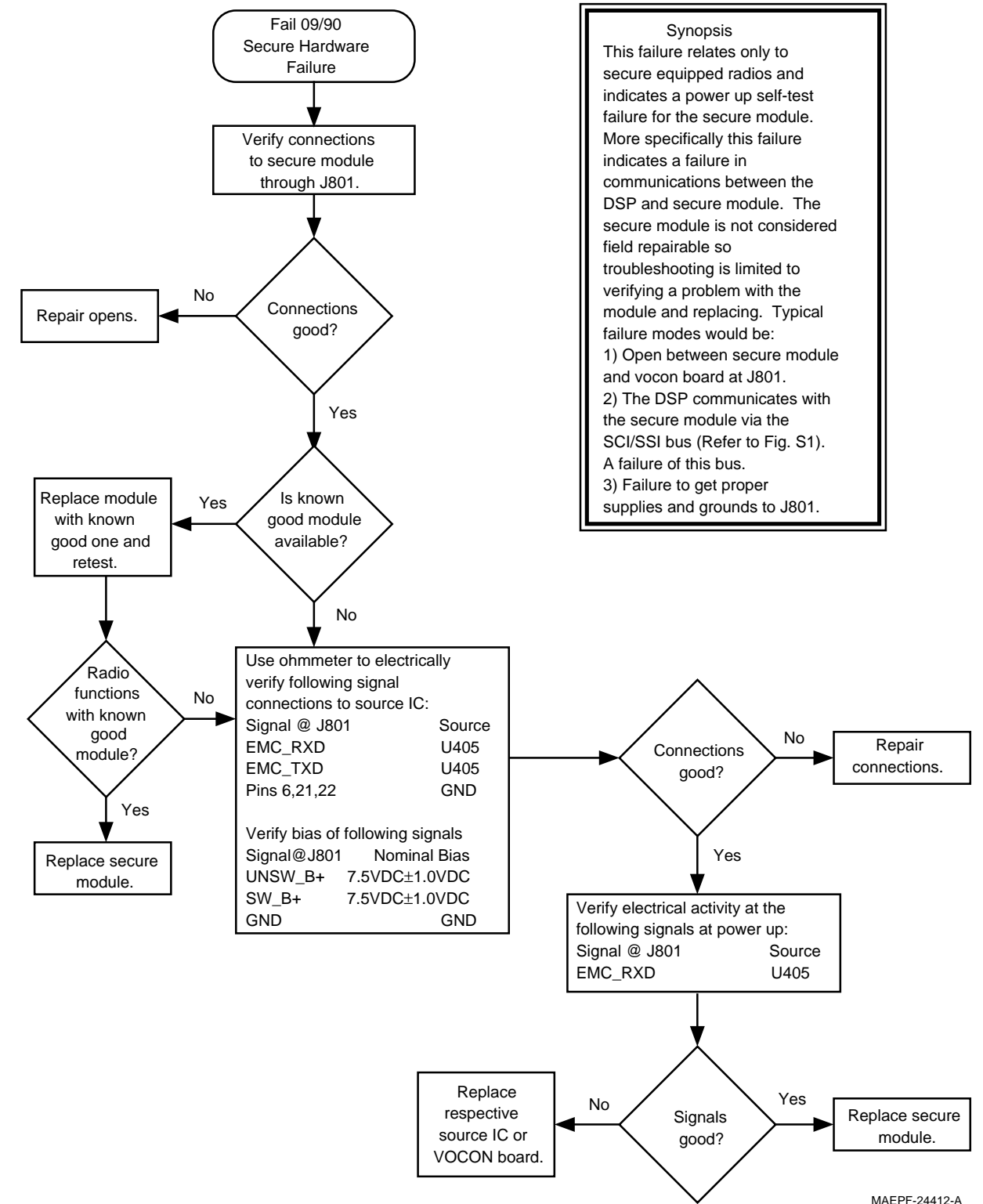


Chart 18 . 09/90, Secure Hardware Failure

MAEPF-24412-A

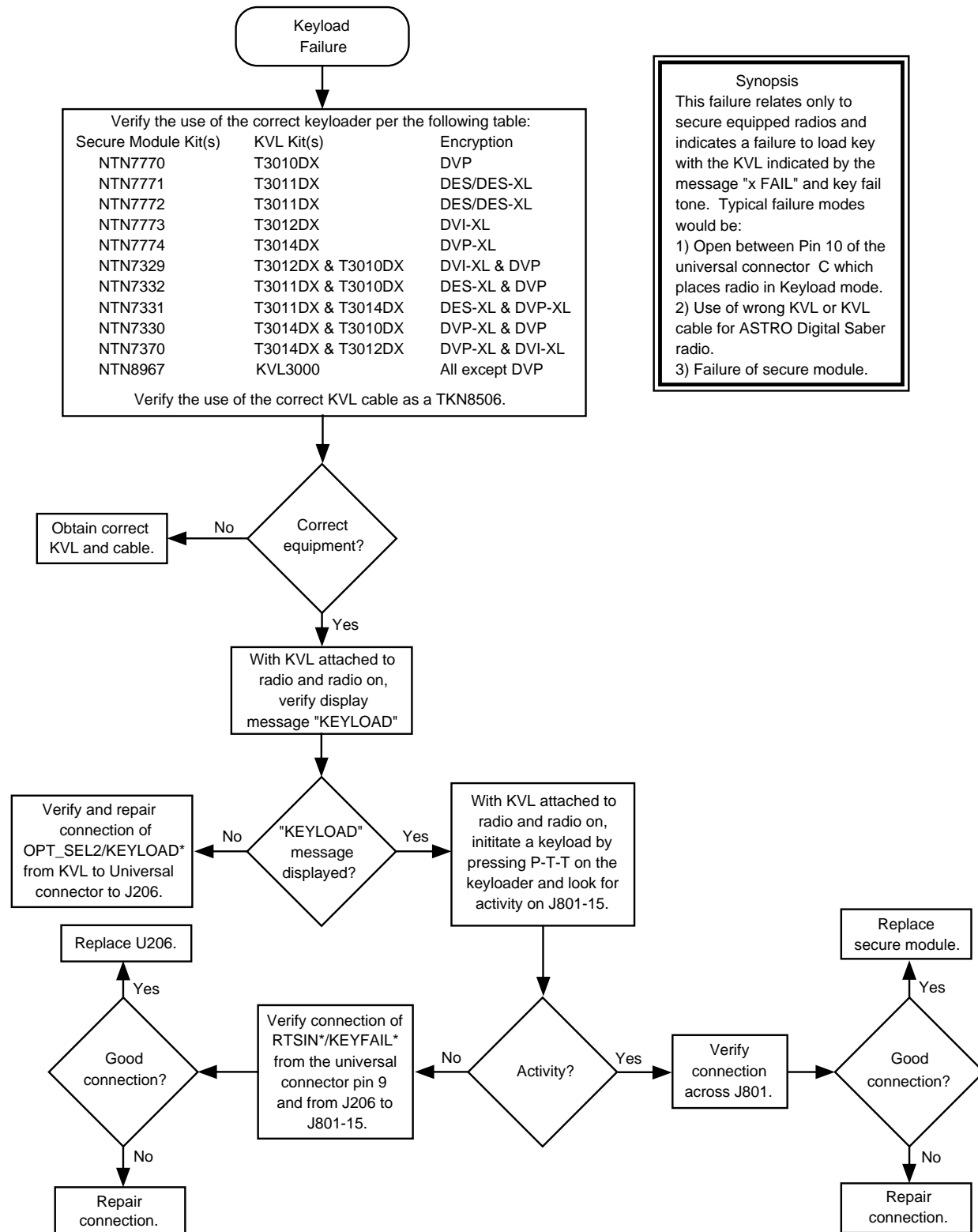


Chart 19 . Key Load Fail

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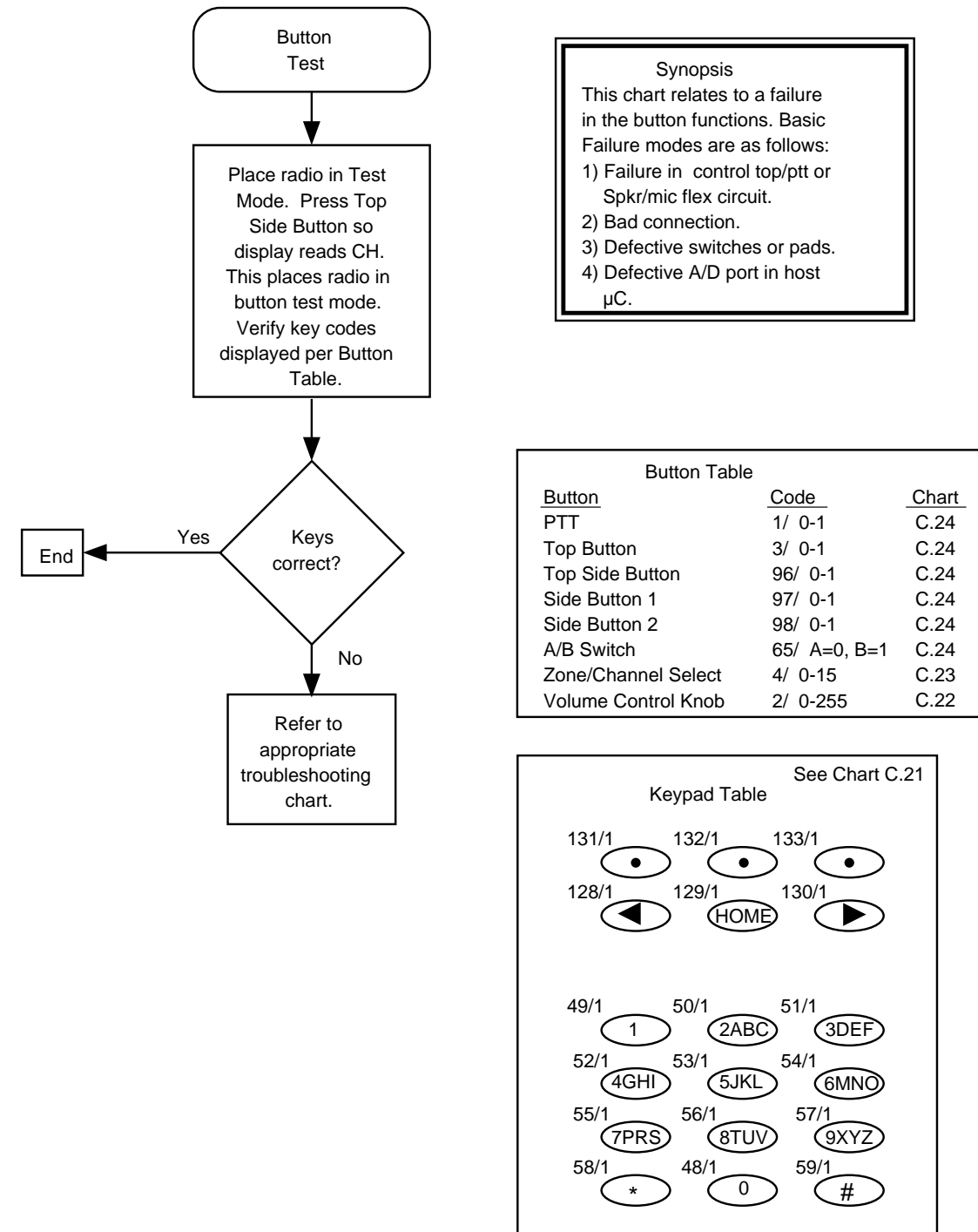
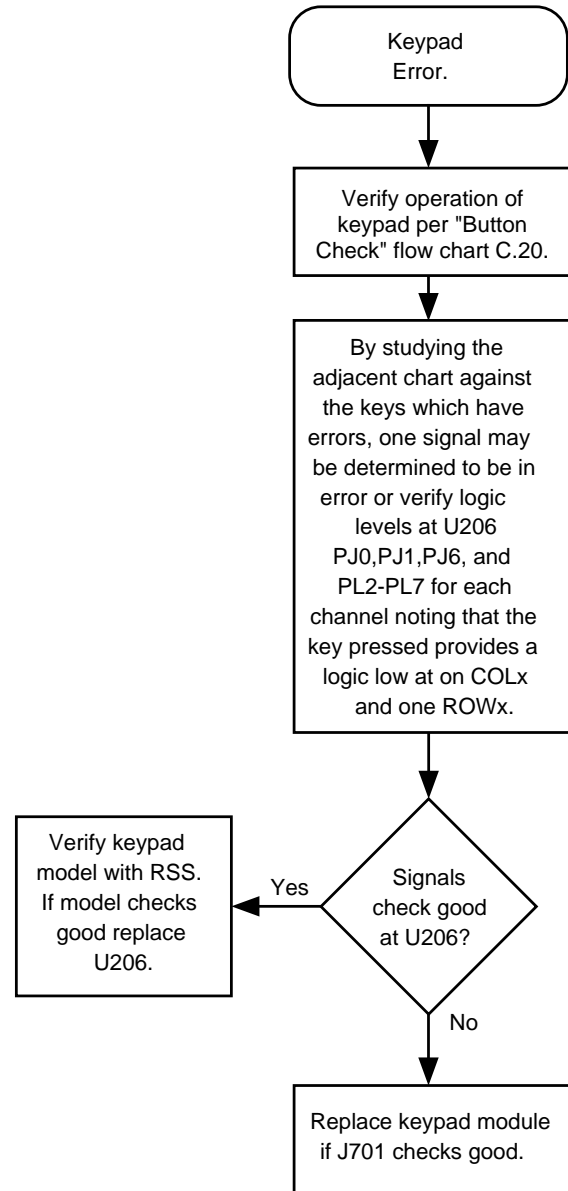
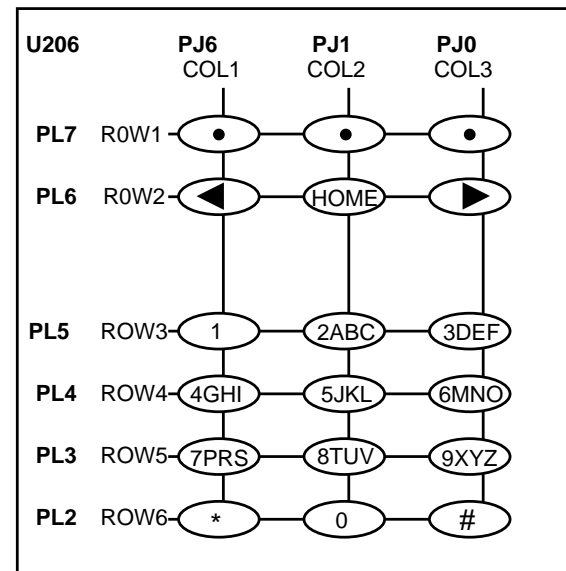


Chart 20 . Button Test

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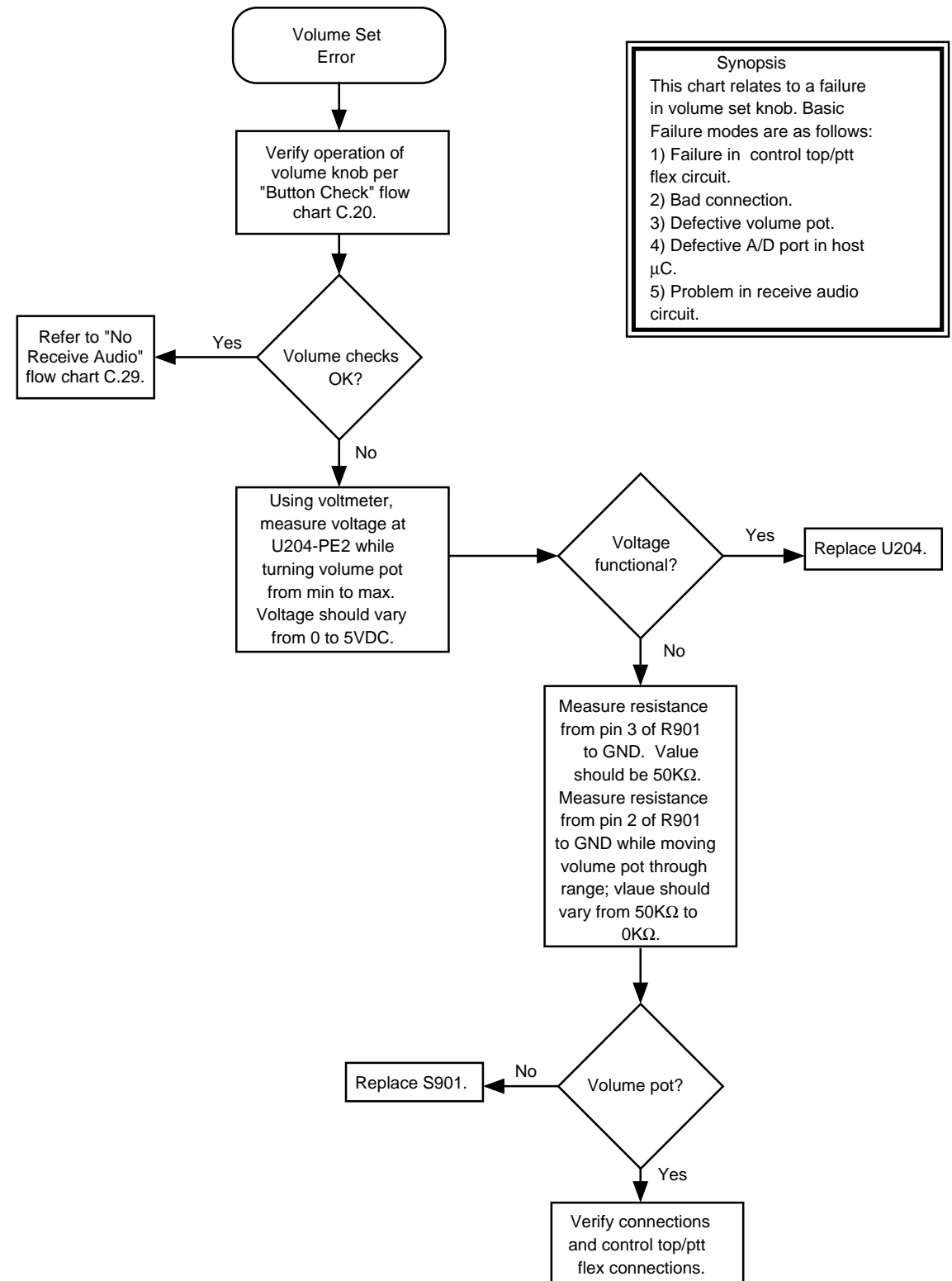


Synopsis
 This chart relates to a failure in reading the keypad. Basic Failure modes are as follows:
 1) Failure in flex circuit.
 2) Bad connection.
 3) Defective keypad.
 4) Defective port in SLIC.



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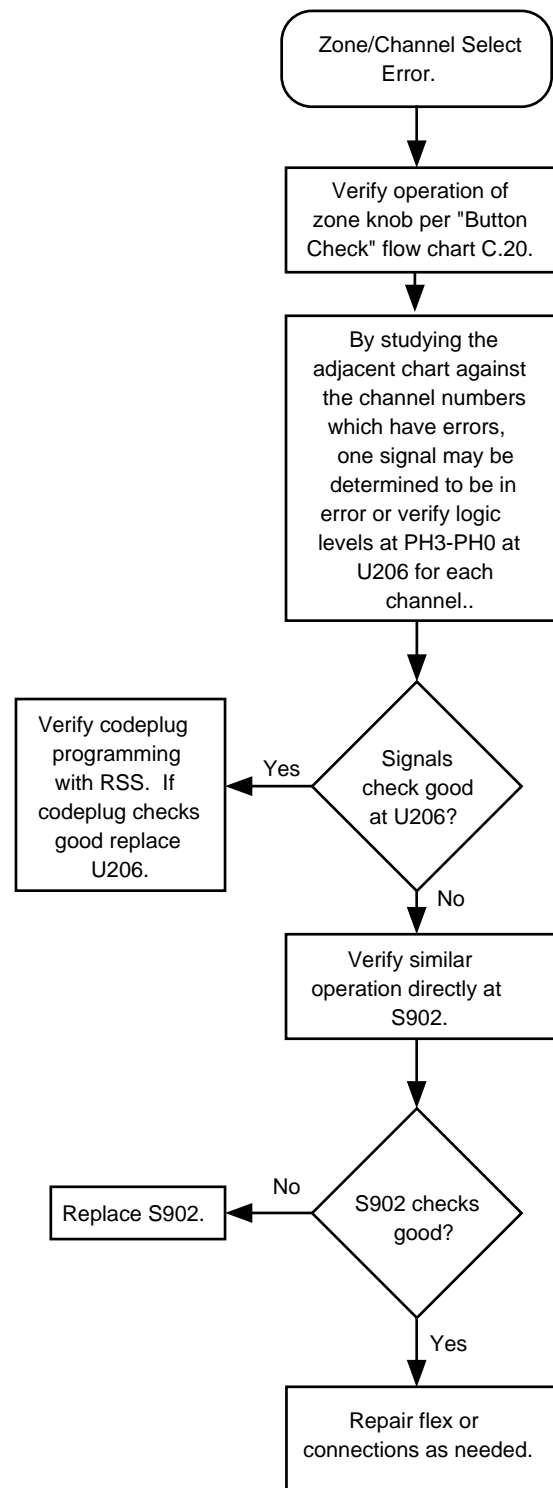
Chart 21 . Keypad Error



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

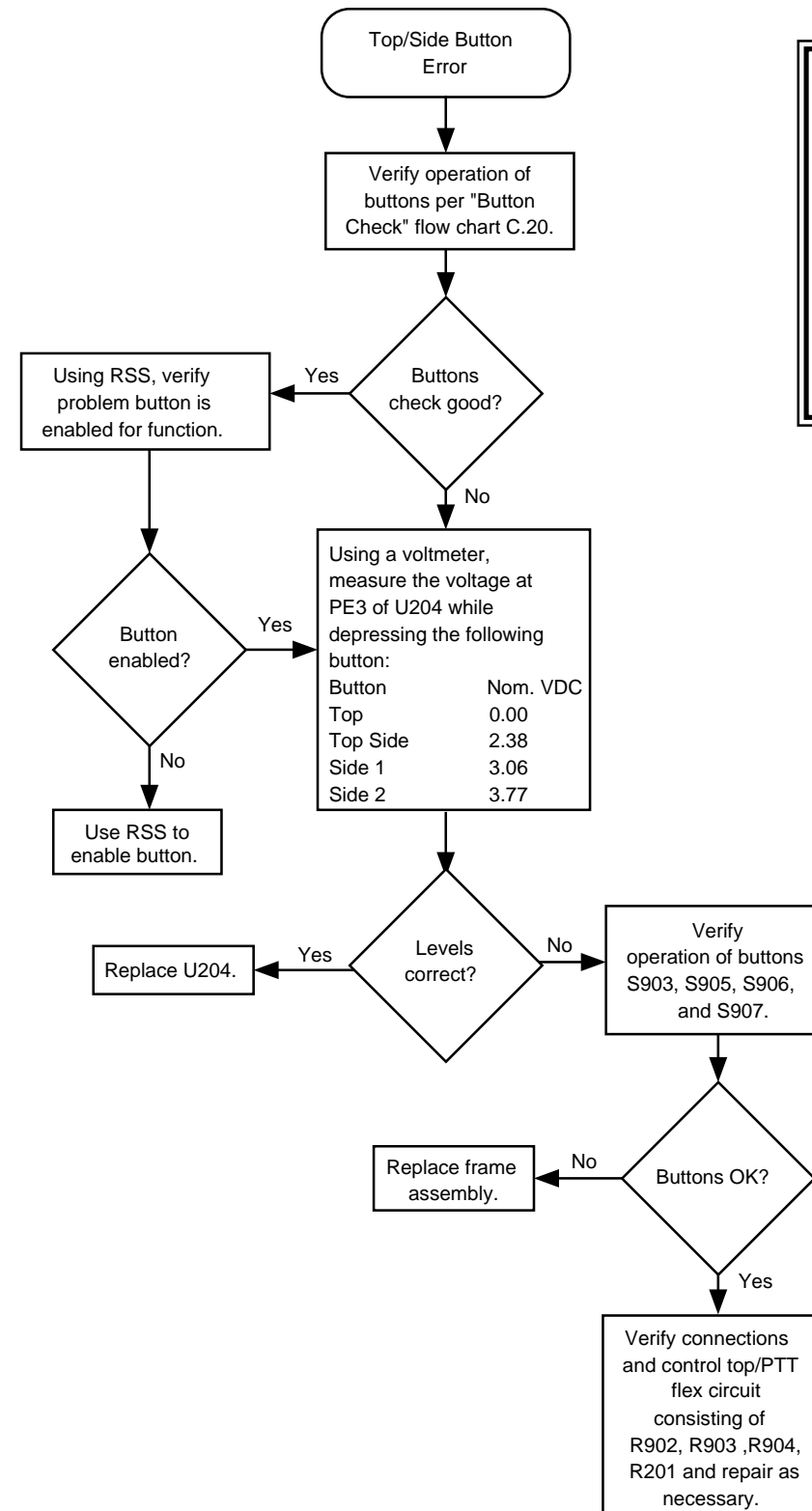


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Chart 23 . Zone/Channel Select Error

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.

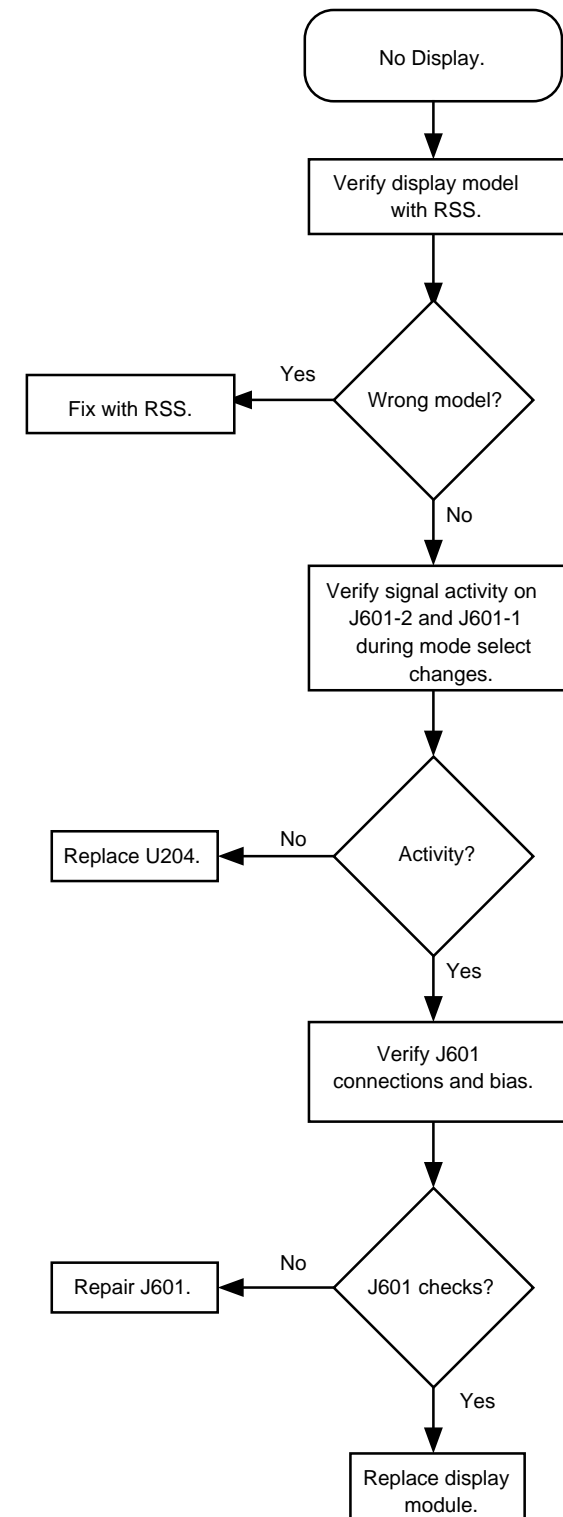
Channel	RTA3	RTA2	RTA1	RTA0
1	0	0	0	0
2	0	0	0	1
3	0	0	1	0
4	0	0	1	1
5	0	1	0	0
6	0	1	0	1
7	0	1	1	0
8	0	1	1	1
9	1	0	0	0
10	1	0	0	1
11	1	0	1	0
12	1	0	1	1
13	1	1	0	0
14	1	1	0	1
15	1	1	1	0
16	1	1	1	1



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Chart 24 . Top/Side Button Error

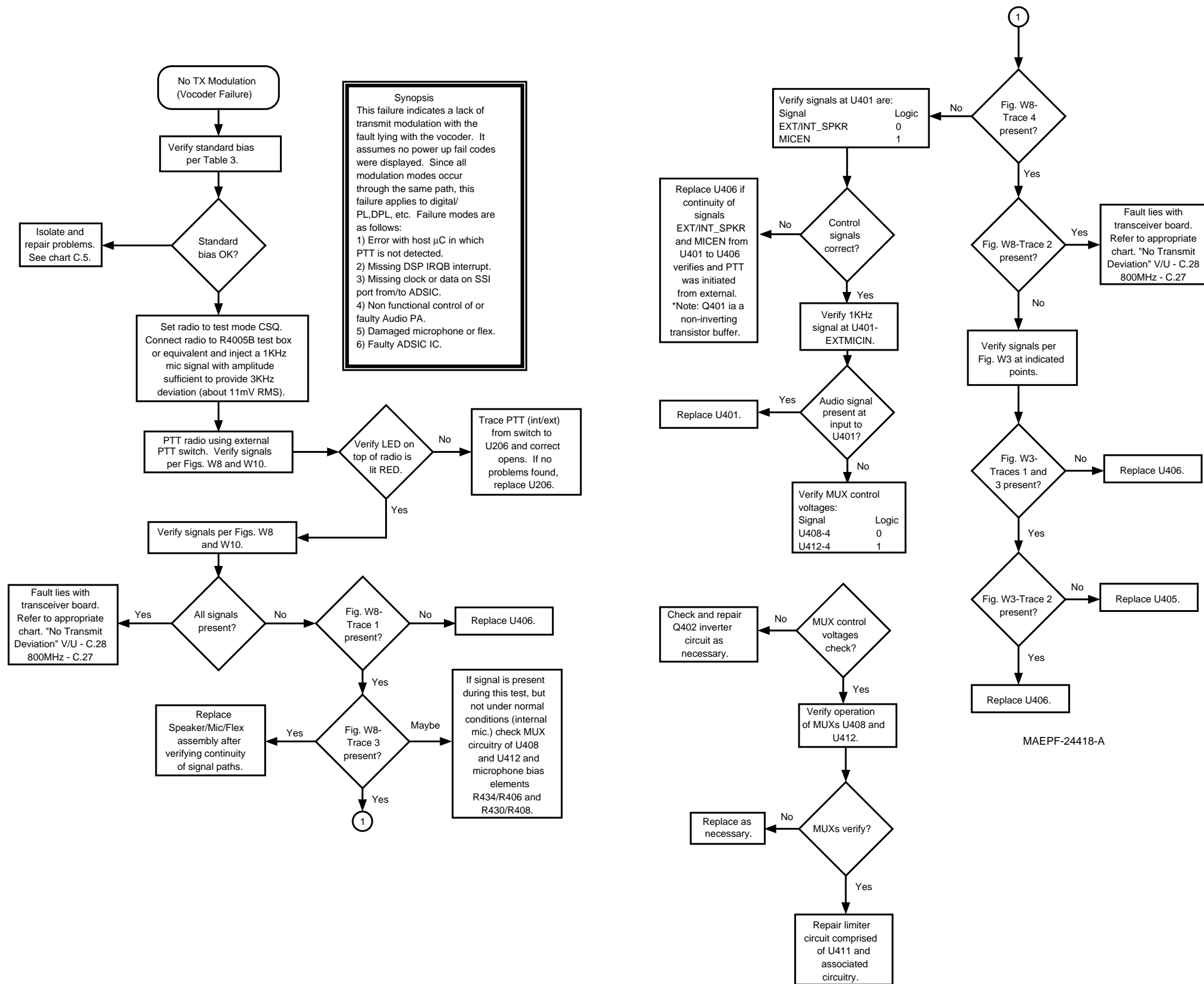
Synopsis
 This chart relates to a failure in reading the buttons: Top, Top Side, Side Button 1, or Side Button 2. Basic Failure modes are as follows:
 1) Failure in flex circuit consisting of R902, R903, R904, R201.
 2) Bad connection.
 3) Defective switch.
 4) Defective A/D port in host μ C.



MAEPF-24403-A

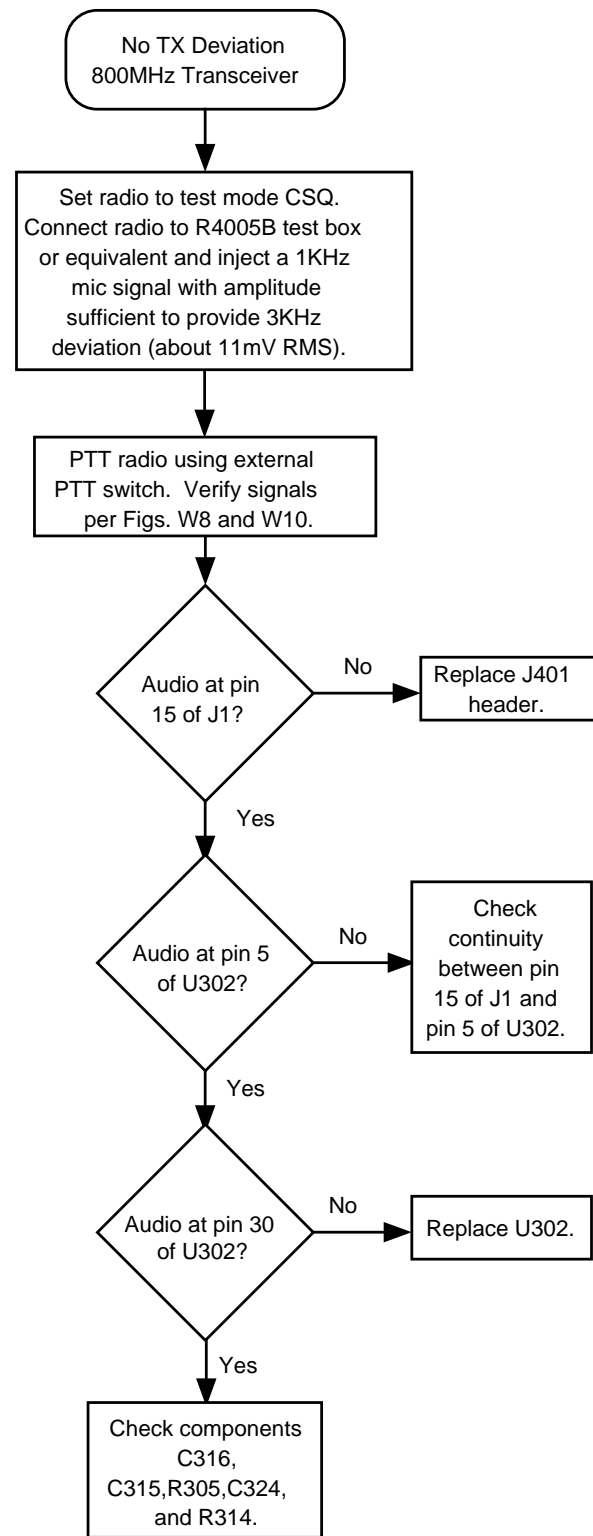
Synopsis
 This chart relates to a failure in the display. The display is considered not field repairable and must be replaced as a unit. Basic Failure modes are as follows:
 1) Non-display model radio.
 2) Bad connection.
 3) Defective μ C.

Chart 25 . No Display



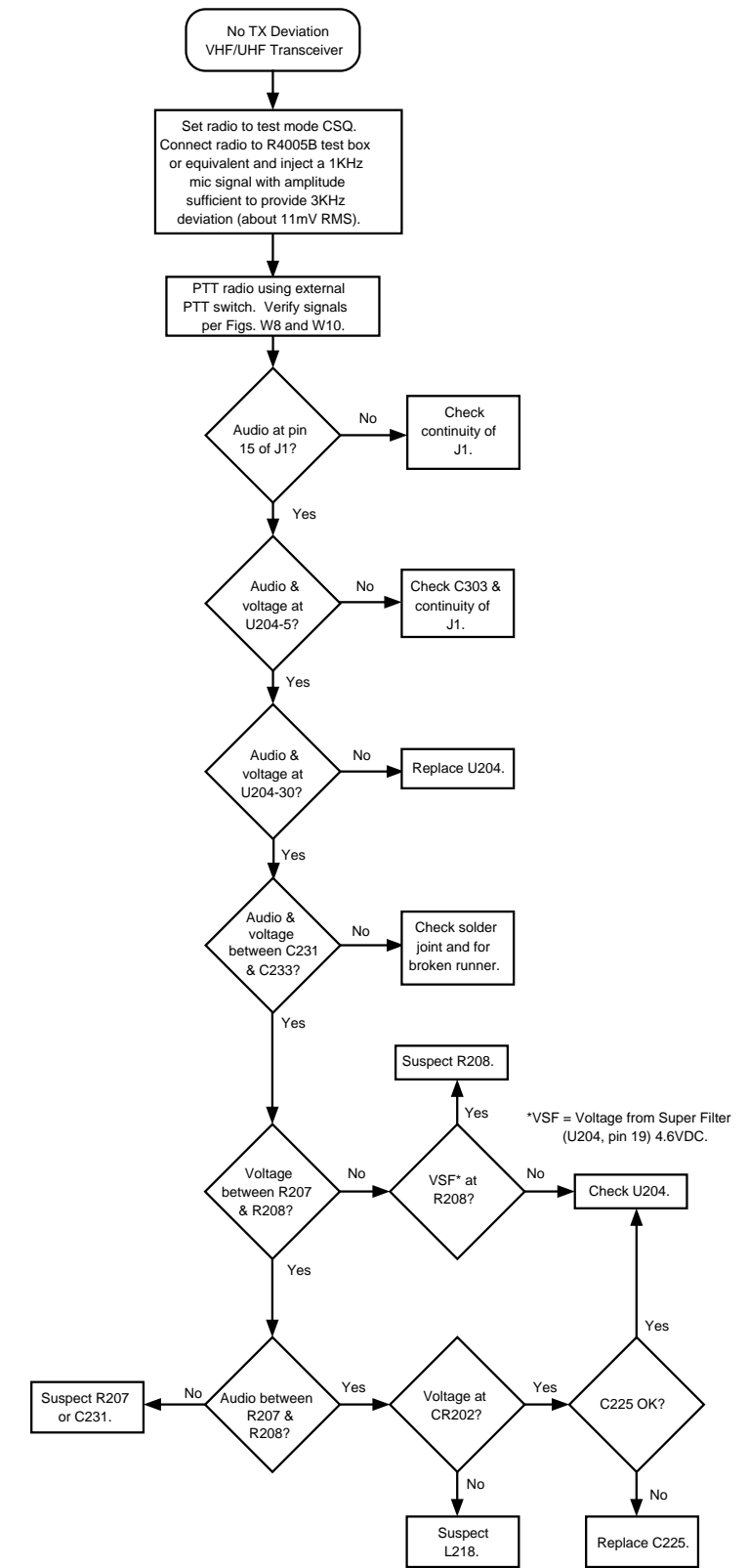
MAEPF-24418-A

Chart 26 . No TX Modulation



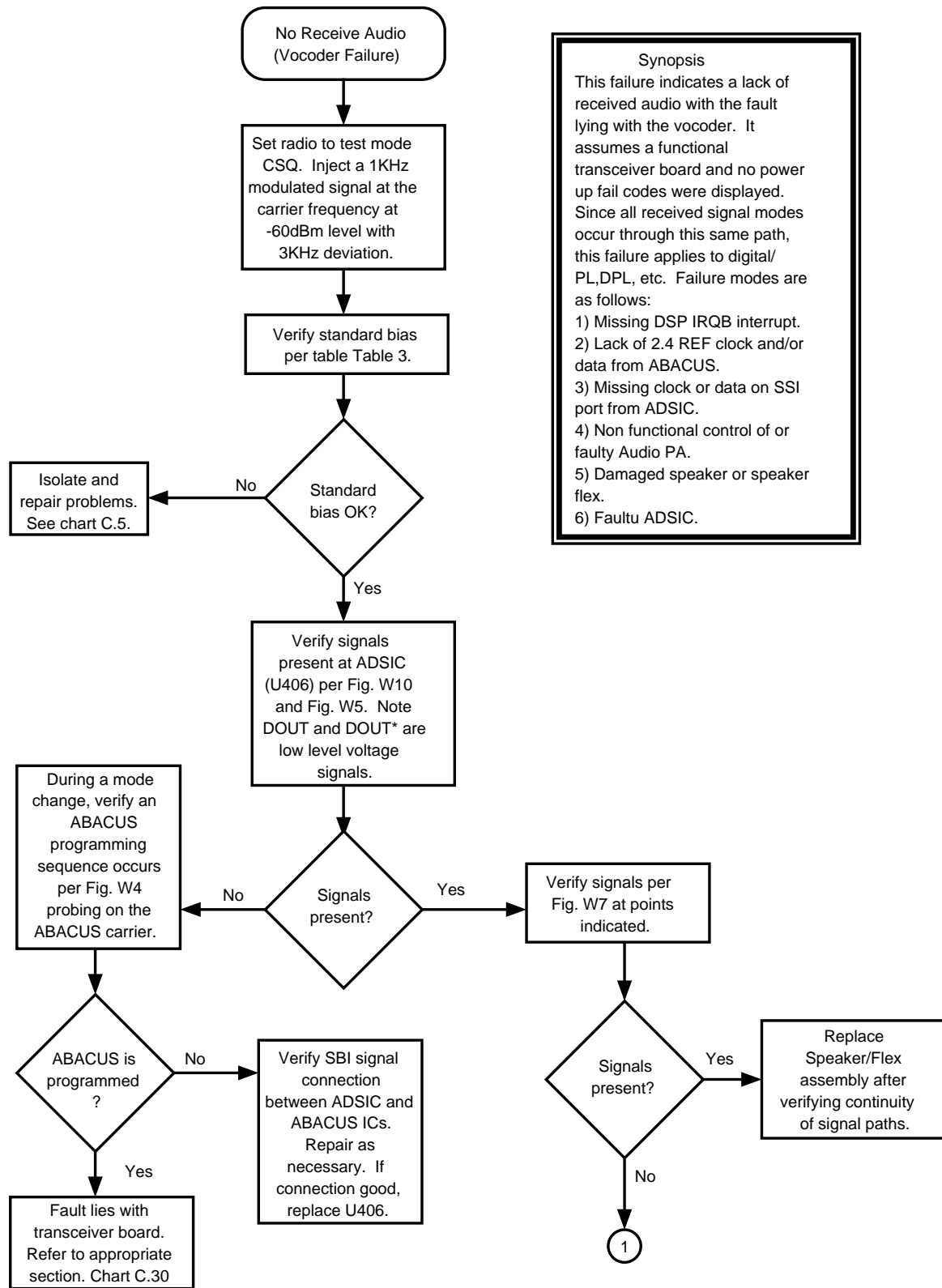
MAEPF-24405-O

Chart 27 . 800MHz No TX Deviation



MAEPF-24404-O

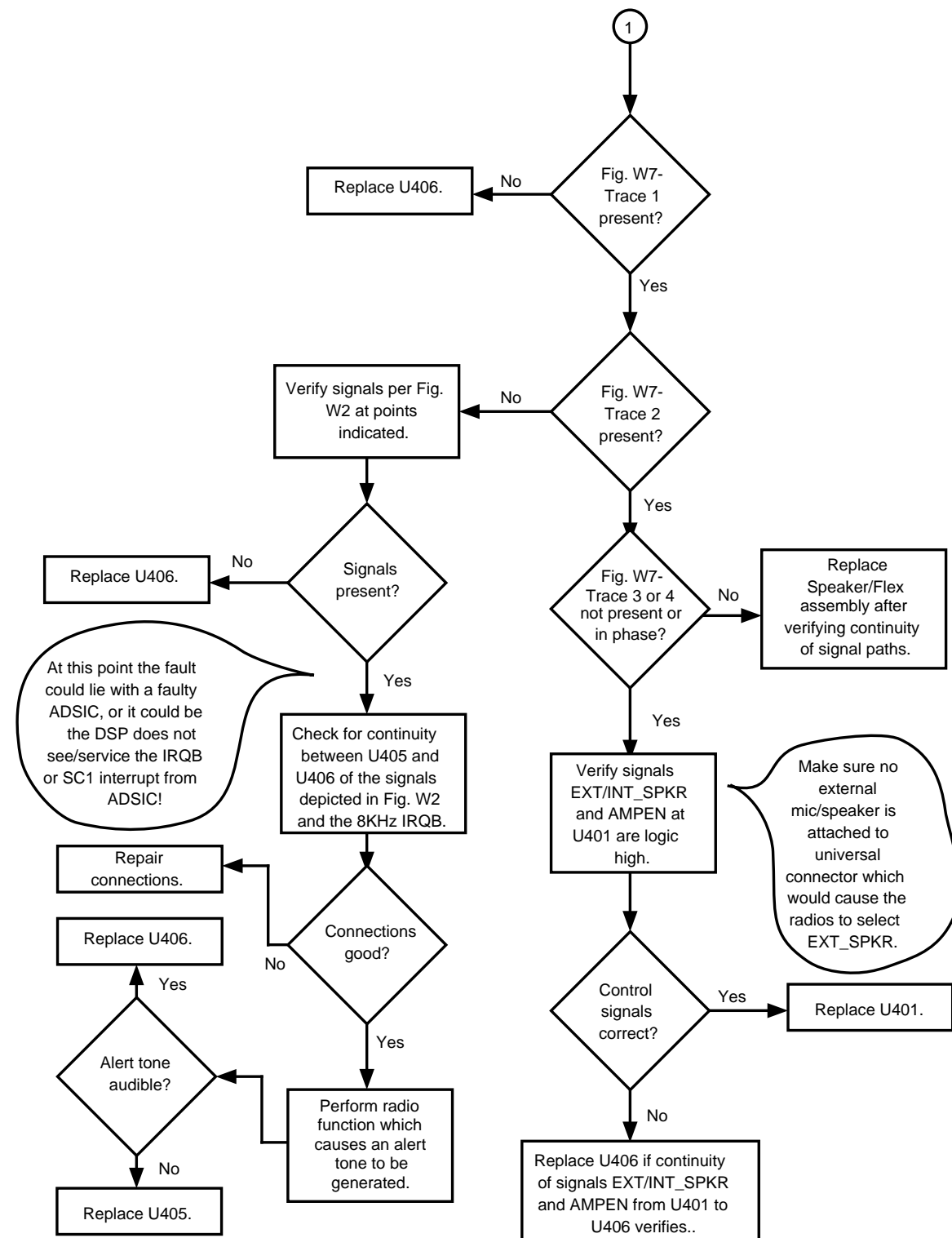
Chart 28 . VHF/UHF No TX Deviation



Synopsis

This failure indicates a lack of received audio with the fault lying with the vocoder. It assumes a functional transceiver board and no power up fail codes were displayed. Since all received signal modes occur through this same path, this failure applies to digital/ PL,DPL, etc. Failure modes are as follows:

- 1) Missing DSP IRQB interrupt.
- 2) Lack of 2.4 REF clock and/or data from ABACUS.
- 3) Missing clock or data on SSI port from ADSIC.
- 4) Non functional control of or faulty Audio PA.
- 5) Damaged speaker or speaker flex.
- 6) Faulty ADSIC.



MAEPF-24406-A

Chart 29 . No RX Audio

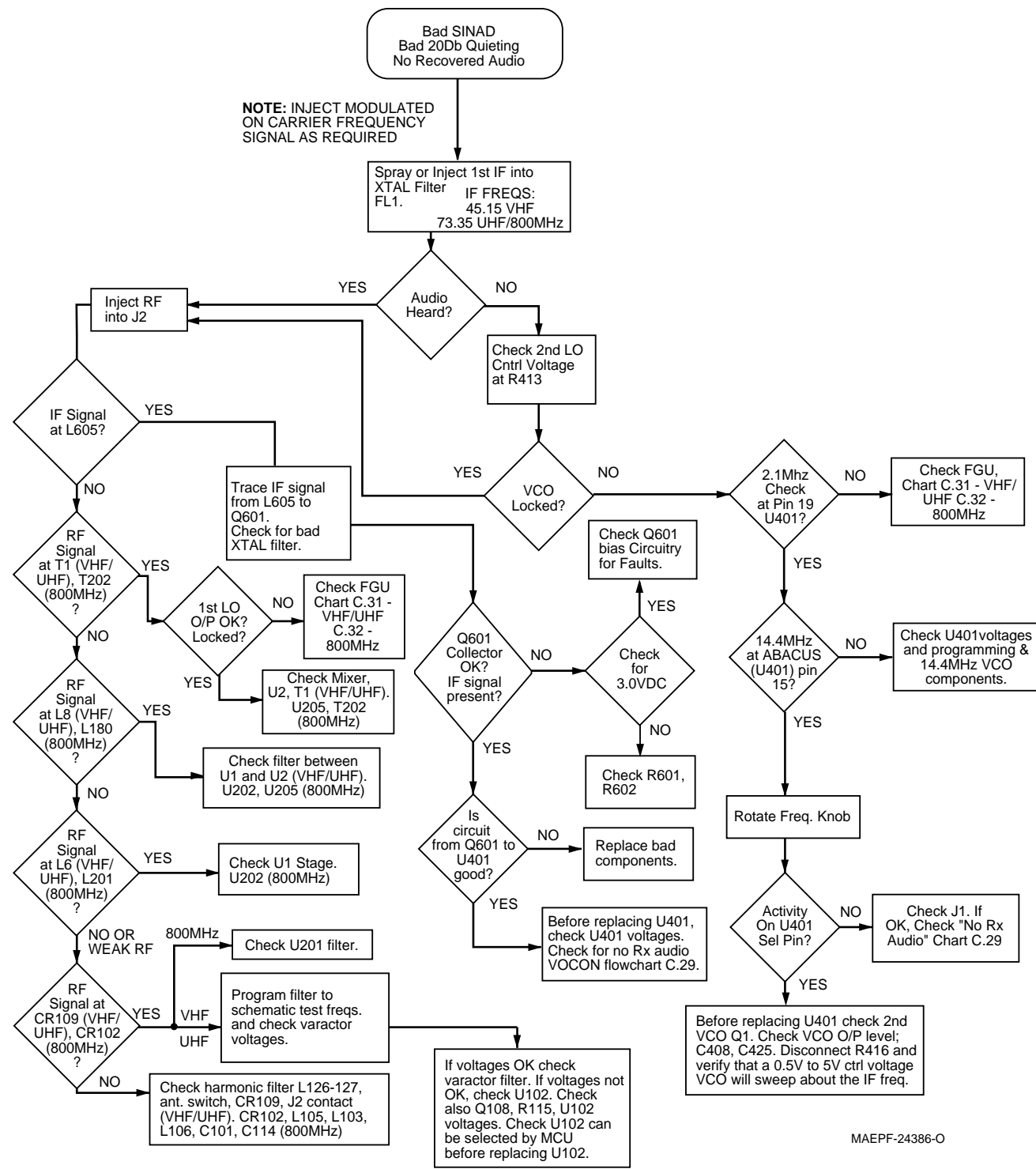


Chart 30 . VHF/UHF/800MHz Receiver RF

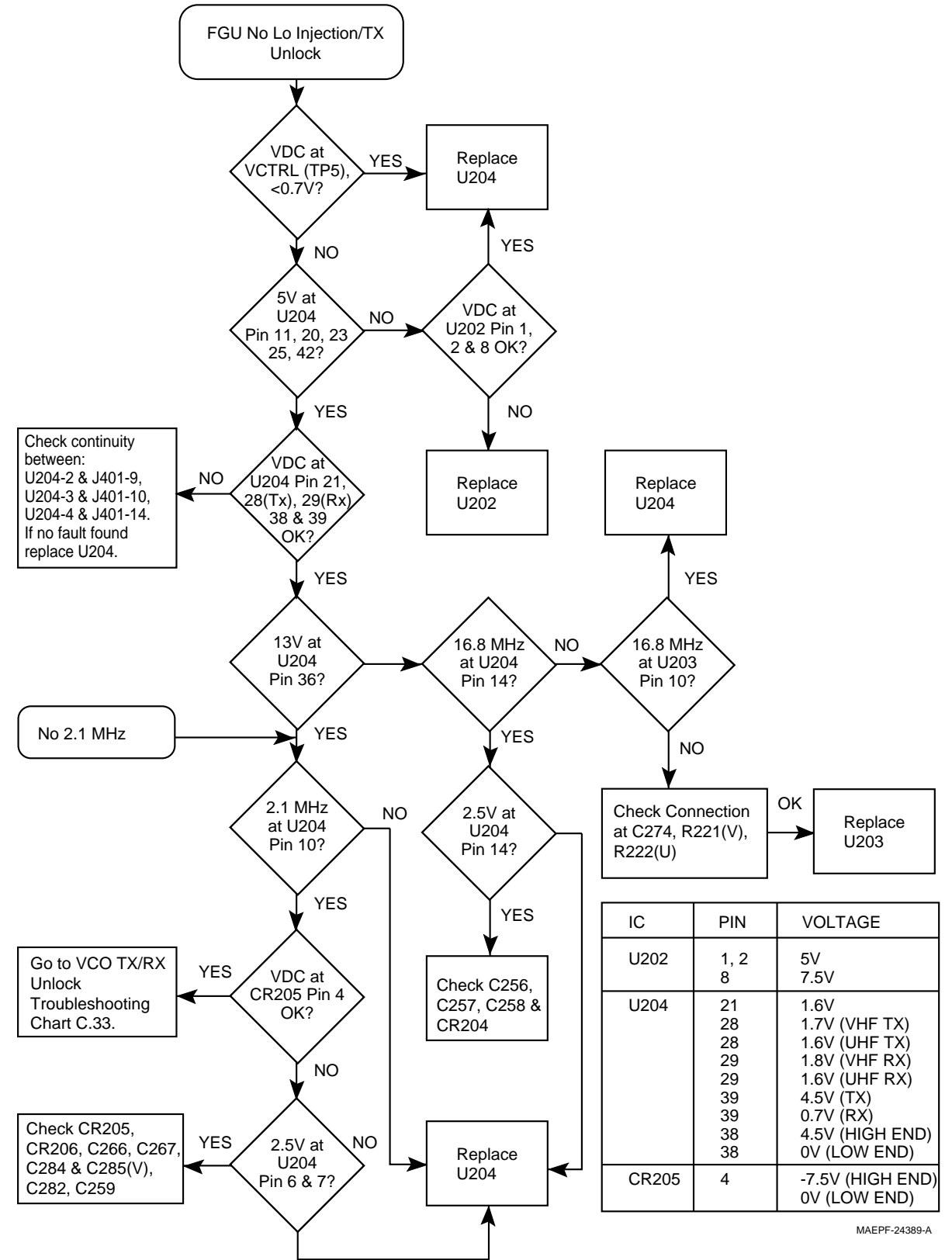
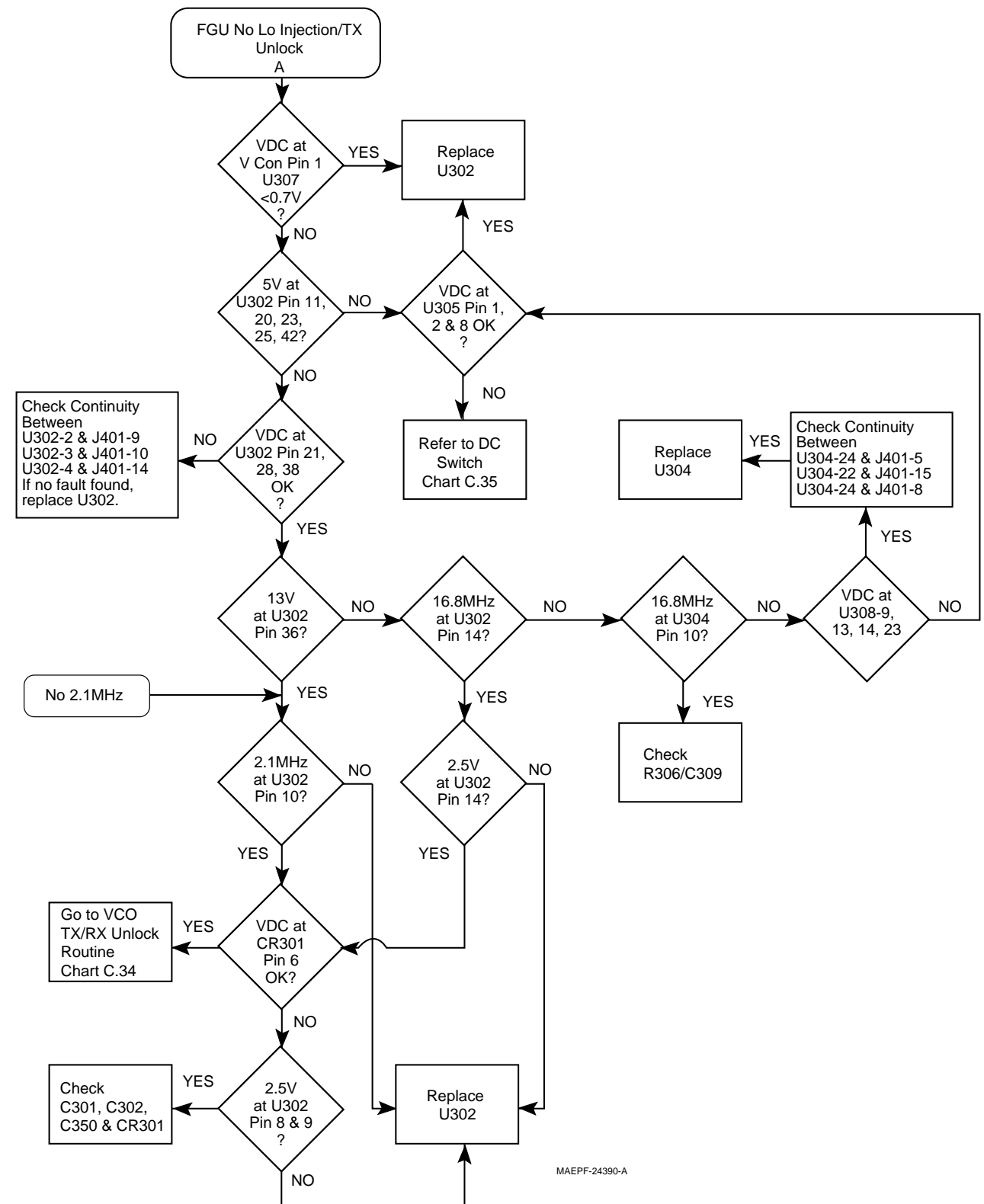
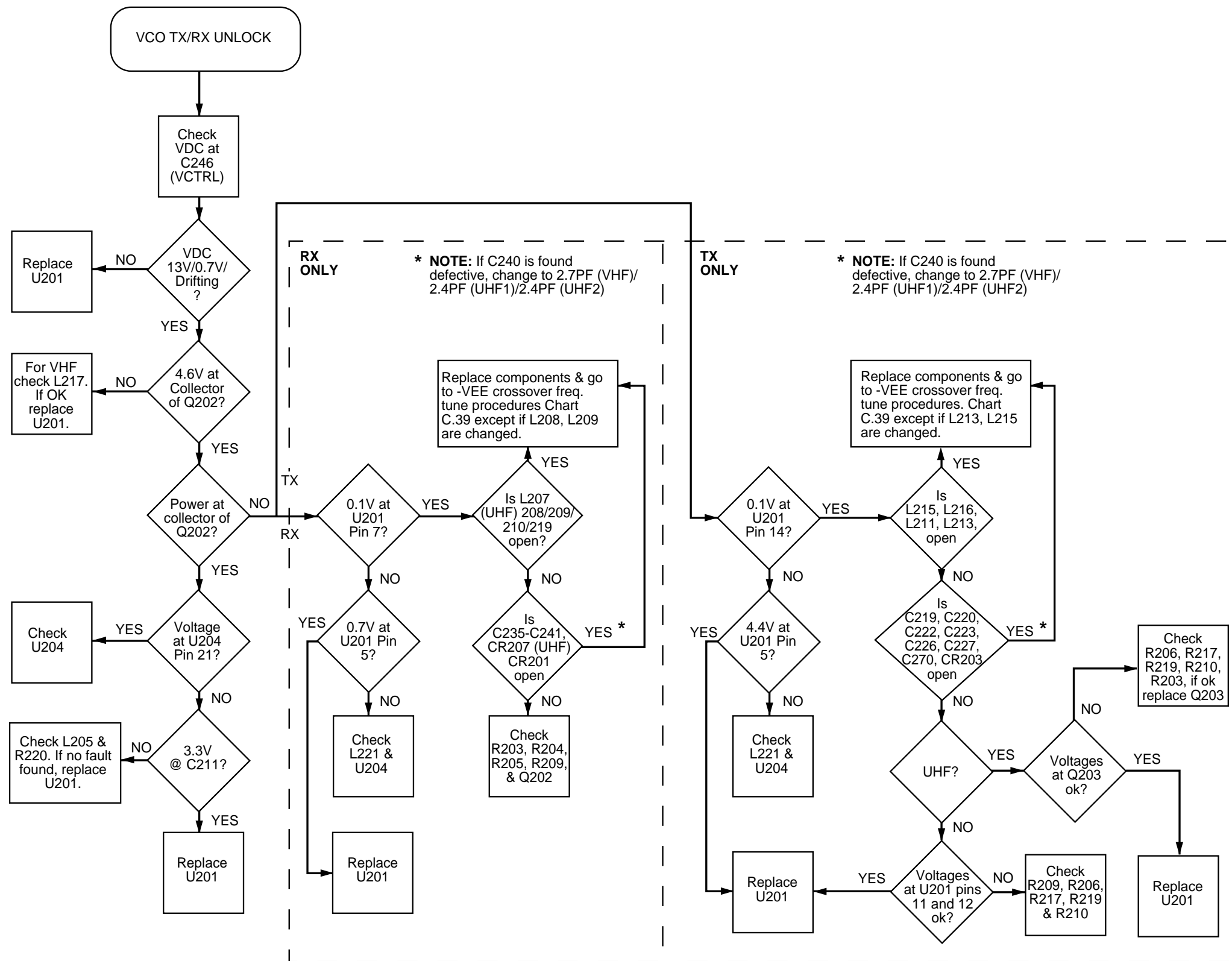


Chart 31 . VHF/UHF Frequency Generation Unit (FGU)



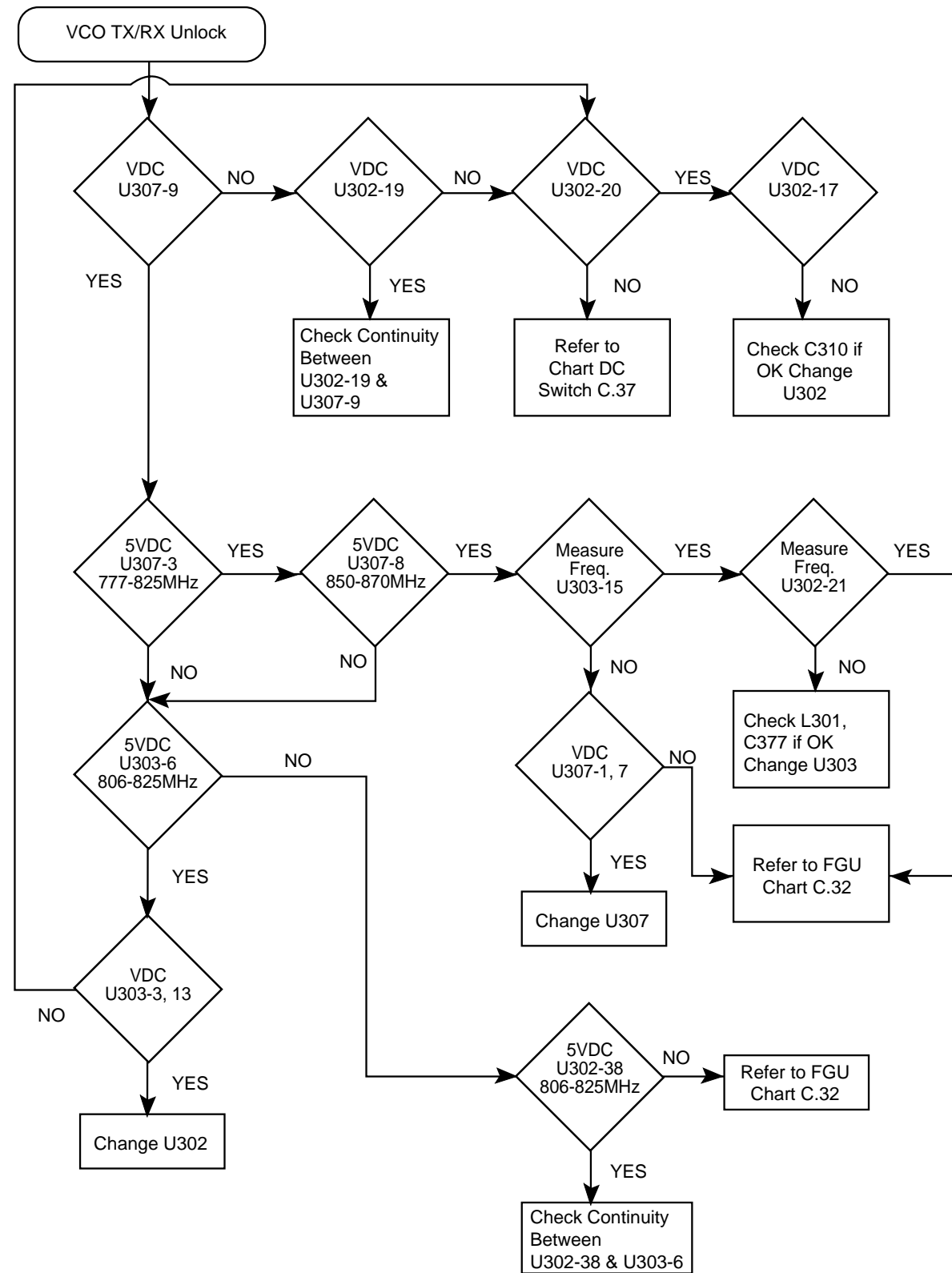
MAEPF-24390-A

Chart 32 . 800MHz Frequency Generation Unit (FGU)



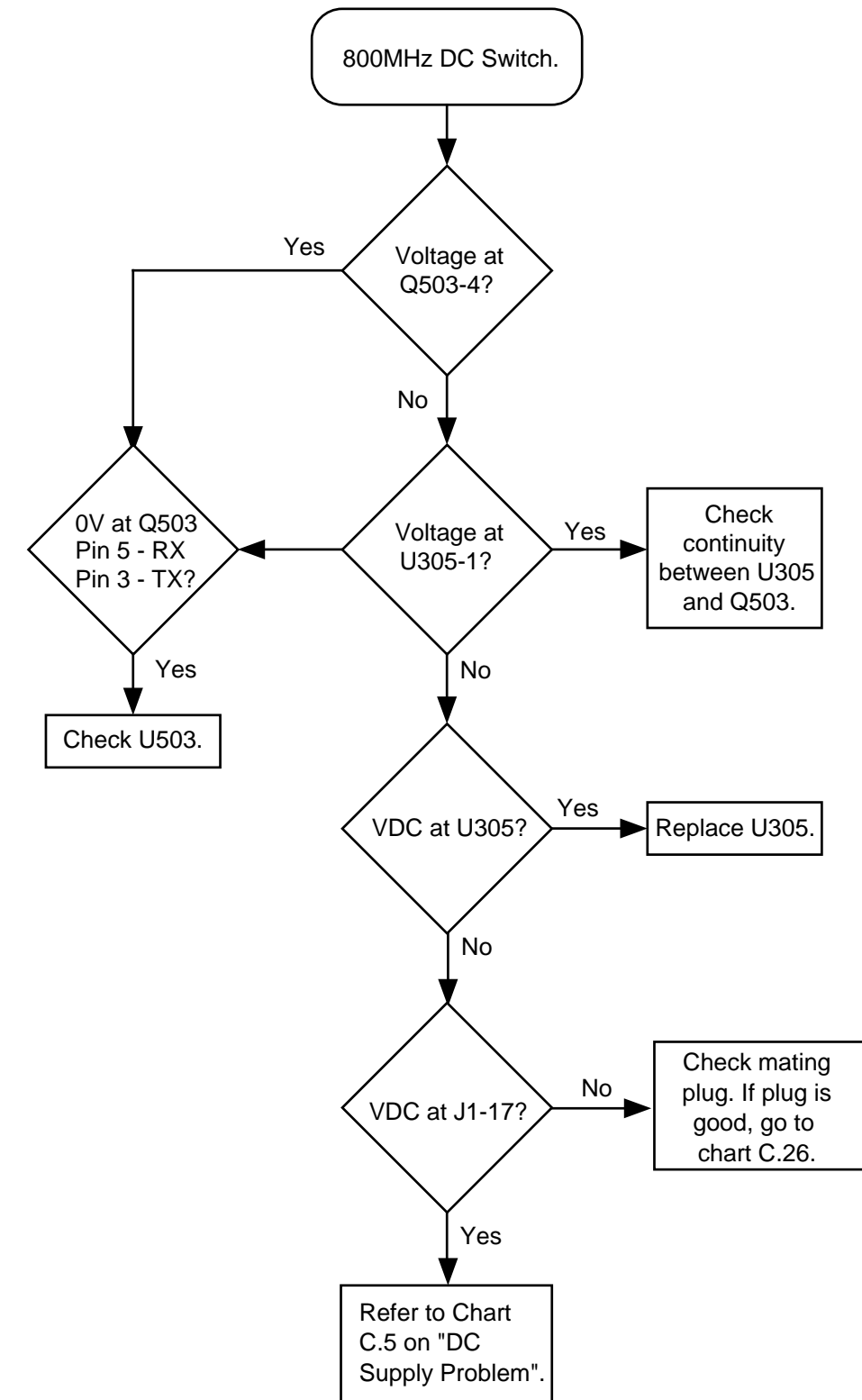
MAEPF-24387-A

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



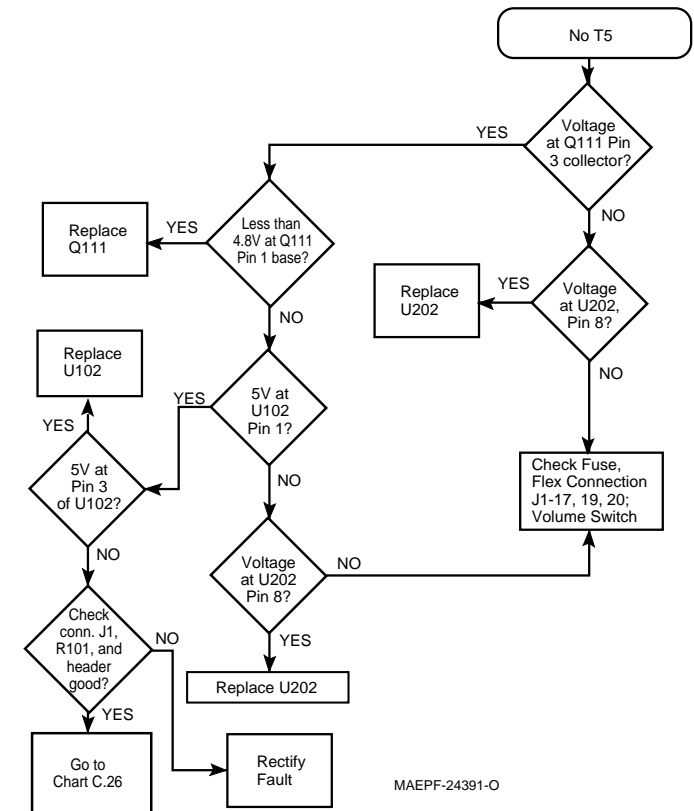
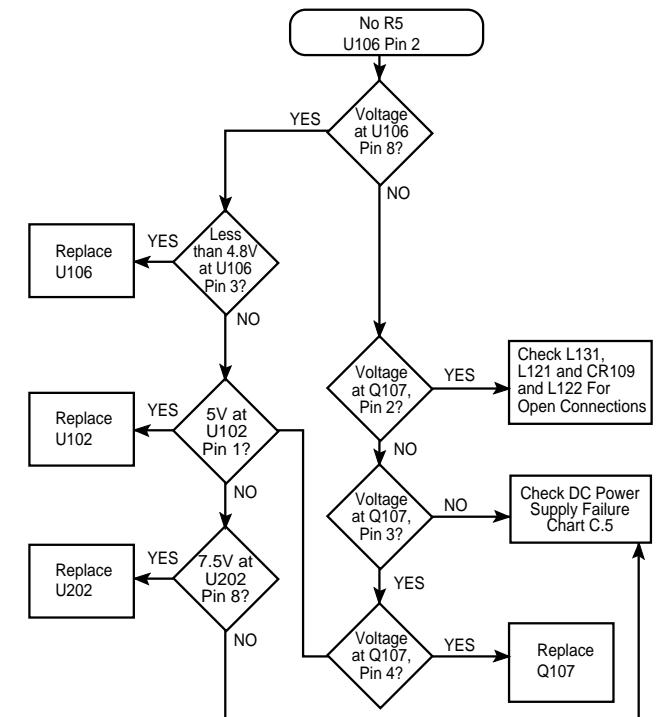
MAEPF-24388-A

Chart 34 . 800MHz Voltage Controlled Oscillator (VCO)



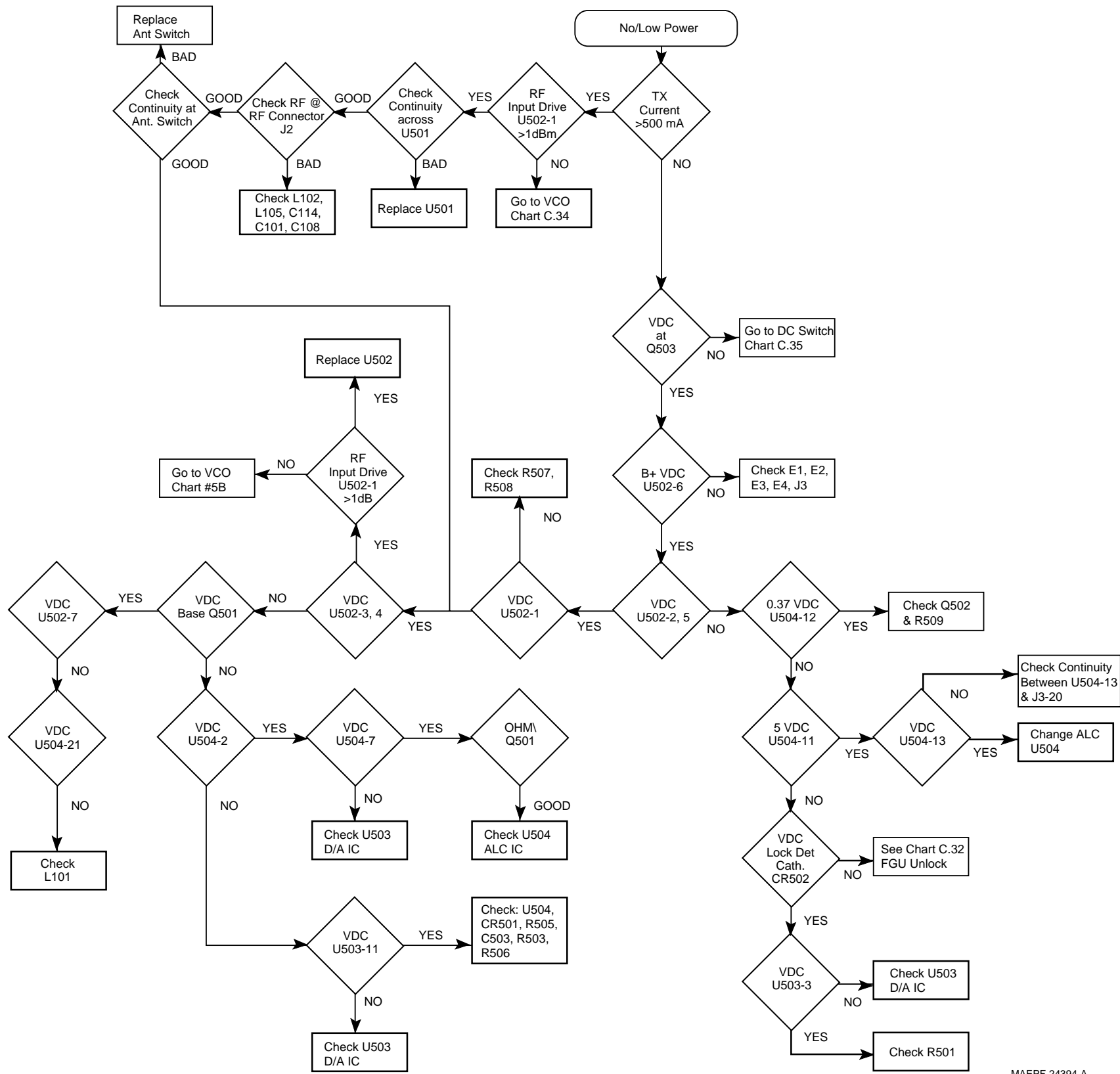
MAEPF-24392-A

Chart 35 . 800MHz DC Switch



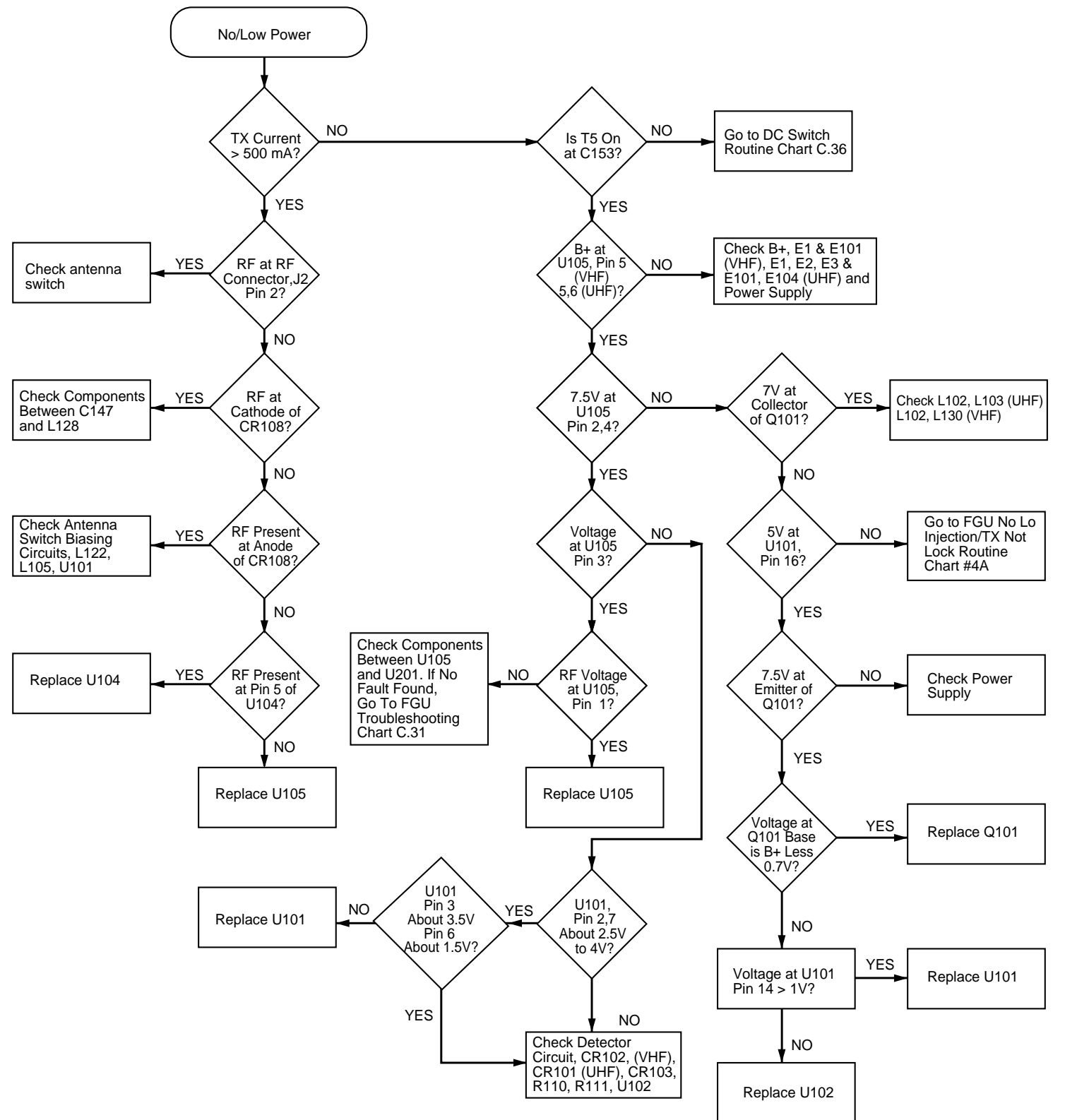
MAEPF-24391-O

Chart 36 . VHF/UHF DC Switch



MAEPF-24394-A

Chart 37 . 800MHz Transmitter RF



MAEPF-24393-O

Chart 38 . VHF/UHF Transmitter RF

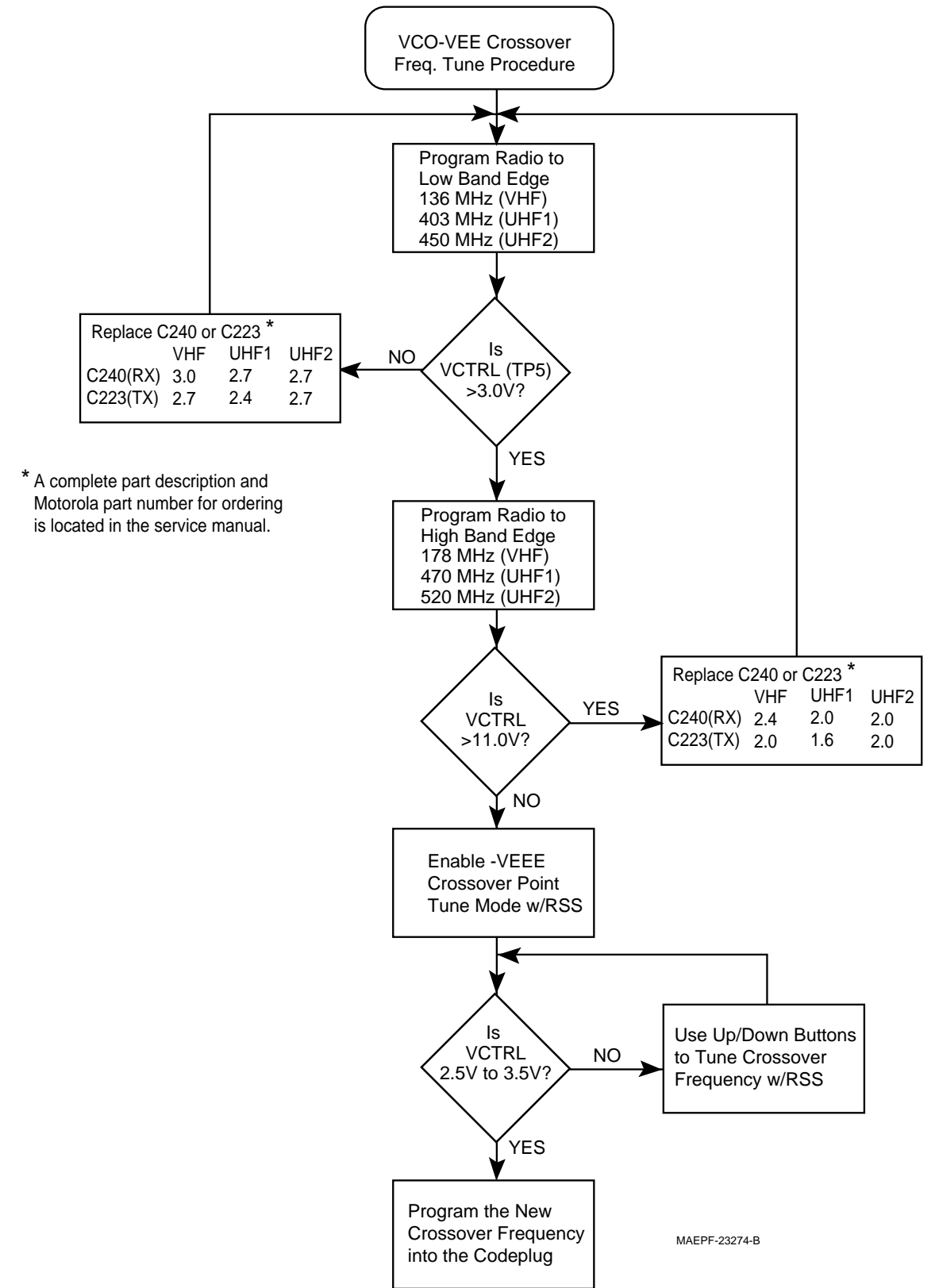


Chart 39 . VHF/UHF Only, VCO Crossover Frequency Tune