Maintenance Manual

Field Master™ MS2070A/MS2080A

Handheld Spectrum Analyzer

MS2070A-703 9 kHz to 3 GHZ (Option 703)
MS2080A-704 9 kHz to 4 GHZ (Option 704)

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Chapter 1 — General Information

1-1 Introduction

This manual provides the recommended test equipment and tools, replaceable parts list, verification procedures, part replacement procedures, maintenance instructions, and test record templates for the MS20x0A Anritsu Field Master.

Familiarity with the basic operation is assumed (for example, how to change measurement modes, preset the instrument, and set up measurements).

This manual includes:

- General information including:
  - Required Test Equipment and Tools listed in Table 1-2 on page 1-2 and Table 1-3 on page 1-3.
  - Replaceable Parts listed in Table 1-4 on page 1-3.
- Performance verification procedures included in Chapter 2, "Spectrum Analyzer Verification".
- Assembly replacement and troubleshooting procedures:
  - Chapter 3, "Assembly Replacement"
  - Chapter 4, "Troubleshooting"
- Blank test records are included in Appendix A.
  - Copy the blank test records from Appendix A and use them to record measured values. Anritsu recommends making a copy of the blank test records to document measurements each time a performance verification is performed. Continuing to document this process each time provides a detailed history of the instrument performance.

Note	The MS20x0A performance verification procedures are provided in Chapter 2 and Chapter 3. Test records templates are provided in Appendix A. Copy the test records templates and use them to record the measured values obtained when verifying the performance of the MS20x0A. The measurement values taken and documented provide a record of the performance of your instrument. Anritsu recommends that you make a copy of the test records to document the measurements each time a Performance Verification is performed. Continuing to document this process each time it is performed provides a detailed history of instrument performance.

Additional Documentation

Table 1-1. Related Manuals

Document Part Number	Description
10100-00069	Important Product Information, Compliance, and Safety Notices
11410-02892	Field Master™ MS2070A Technical Data Sheet
11410-01001	Field Master MS2080A Technical Data Sheet
10580-00483	Field Master MS20x0A User Guide
10580-00484	Field Master MS2080A Programming Manual
10580-00495	Field Master MS2070A Programming Manual

Updates, if any, can be downloaded from the Library tab on the Anritsu product page:

https://www.anritsu.com/en-us/test-measurement/products/ms2080a

https://www.anritsu.com/en-us/test-measurement/products/ms2070a

1-2 Contacting Anritsu

To contact Anritsu, visit the following URL and select the services in your region:

http://www.anritsu.com/contact-us

1-3 Required Test Equipment and Tools

Table 1-2 provides a list of the test equipment used for the performance verification tests of the instrument. The test equipment is critical in making accurate measurements. In some cases, you may substitute certain test equipment having the same critical specifications as the test equipment indicated in the test equipment list.

Table 1-3 provides the list of tools that may be required to remove the screws and nuts of the instrument.

Table 1-2. Required Test Equipment

Instrument / Component	Critical Specification	Recommended Manufacturer / Model
Synthesizer	9 kHz to 20 GHz	Anritsu MG36221A, with option 15
Power Meter	18 GHz	Rohde and Schwarz, NRP18T
Termination	50 Ω, N Type	Anritsu 28N50-2
Low Pass Filter	50 MHz	Mini-Circuits, NLP-50
10 MHz Reference	10 MHz	Datum / 9390-6000
Power Splitter	N Type	Weinschel 1870A
Adapter	N Type	Anritsu 34NN50A
Adapter	SMA(m) to BNC(f)	Anritsu 2000-2054-R
Adapter	Ruggedized K(m) to N(f)	Anritsu 34RKNF50
Attenuator, Qty 2	N Type, 10 dB	Weinschel 44-10
Attenuator, Qty 1	N Type 20 dB	Weinschel 44-20
Coaxial Cable	BNC(m) to BNC(m)	Pomona
RF Coaxial Cable, Qty 1	N Type	Anritsu 15NN50-1.5C

Table 1-3. Required Tools

Tools	Specification
Wrench	5/16”
Torx Screwdriver	T10
Torx Screwdriver	T 20
Phillips Screwdriver	#1
Phillips Screwdriver	#2
Nut Driver	5.5 mm
Hex Socket Driver	6 mm (1/4”)

1-4 Replaceable Parts

The MS20x0A replacement parts and their description are listed below in Table 1-4.

Table 1-4. List of Replaceable Parts

Part Number	Description
3-ND87053-RFB	MS2080A Main
3-ND87446-RFB	MS2070A Main
3-ND87258-RFB	SPA PCB
3-ND87055	LCD Top Case Assembly
3-ND87259	Battery Door
3-85716-1-0	Bottom Case
3-ND87261	Connector Panel
3-ND87260	Fan Assembly
3-ND87341	Tilt Bail Assembly
3-806-195	Battery Cable
3-85721	Battery Shroud
3-ND87340	Wi-Fi Antenna
633-79	Li-Ion Battery
40-204-R	AC/DC Adapter
3-513-100	RF Input Port
2000-2002-R	External Power Pack
3-74842-3	Keypad Cable
3-806-415	Shielded LCD Cable
3-85093	Stand-Offs
3-85719	Left Bumper
3-85720	Right Bumper
3-85718-4	MS2080A Model Label 4 GHz
3-87338-3	MS2070A Model Label 3 GHz

Chapter 2 — Spectrum Analyzer Verification

2-1 Introduction

This chapter provides the verification procedures for the MS20x0A Field Master. Verification tests that are associated with other instrument options are described in Chapter 3, "Assembly Replacement". Record the measurement results in the test record templates provided in Appendix A, "Test Records".

This chapter includes the following performance verification procedures:

PASS/FAIL Determination for Instrument Key Parameter Performance Tests

Figure 2-1 shows the rule that is used to determine the pass/fail status of test results that are associated with warranted specifications.

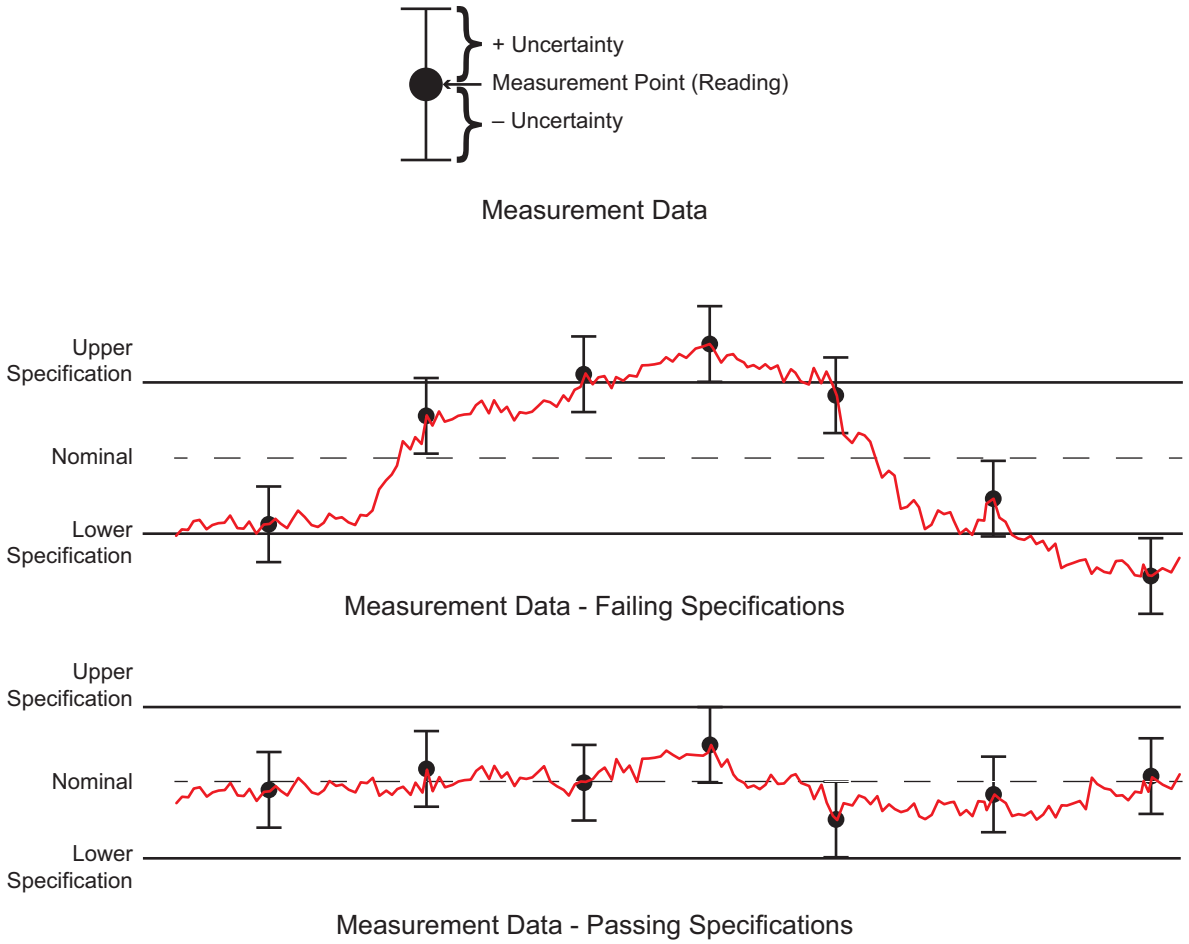

Figure 2-1. Pass/Fail Determination

The measurement uncertainty listed in each test record includes the best estimate of the errors contributed by the measurement, test equipment, standards, and other correction factors (for example, calibration factors and mismatch error) based on the suggested equipment, the equipment setup, and the prescribed test procedure. Most of the uncertainties are type-B per ISO/IEC Guide 98-3, Guide to the Expression of Uncertainty in Measurement (GUM).

2-2 Frequency Accuracy

Use the following procedures to verify the frequency accuracy of the MS20x0A., without and with GPS connection. Record the results in the test records provided in Appendix A

There are two procedures involved in verifying the frequency accuracy:

- "Without GPS Connection"
- "With GPS Connection (Option 31)"

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Without GPS Connection

Use the following procedures to verify the frequency accuracy of the MS20x0A without GPS connection.

Equipment Required

- Anritsu MG36221A Synthesizer
- Anritsu 15NN50-1.5C RF Coaxial Cable
- Anritsu 34RKNF50 Ruggedized K(m) to N(f) Adapter
- 10 MHz Frequency Reference
- BNC(m) to BNC(m) Coaxial Cable
- SMA(m) to BNC(f) Adapter

Procedure

1. Connect the external 10 MHz frequency reference to the MG36221A.

Note	Do not connect the 10 MHz Reference to the MS20x0A.

2. Connect the MG36221A RF Out to the MS20x0A RF In.
3. Set the MG36221A RF output as follows:
    - Power Level: –30 dBm
    - CW Frequency: 1 GHz
4. Set the MS20x0A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
5. Set the MS20x0A parameters as follows:
    - Center Frequency: 1 GHz
    - Span: 10 kHz
    - Reference Level: –10 dBm
    - RBW: 30 Hz
    - VBW: 3 Hz
6. Enable Marker 1 and perform a Peak Search. Record the marker frequency in Table A-1, "Spectrum Analyzer Frequency Accuracy MS20x0A (without GPS)" on page A-1. Calculate the error by subtracting 1 GHz from the measured value and record the error in Table A-1 on page A-1.

With GPS Connection (Option 31)

Use this procedure to verify the frequency accuracy of the MS20x0A. Record the results in the test records provided in Appendix A.

Equipment Required

- Anritsu MG36221A Synthesizer
- 10 MHz Frequency Reference
- Anritsu 34RKNF50 Adapter
- Anritsu 15NN50-1.5C RF Coaxial Cable
- SMA(m) to BNC(f) Adapter
- BNC(m) to BNC(m) Coaxial Cable
- GPS antenna

Procedure

1. Connect the external 10 MHz Reference to the MG36221A.

Note	Do not connect the 10 MHz Reference to the MS20x0A.

2. Connect the MG36221A RF Out to the MS20x0A RF In.
3. Set the MG36221A RF output as follows:
    - Power Level: –30 dBm
    - CW Frequency: 1 GHz
4. Connect the GPS antenna to the MS20x0A, and confirm GPS coordinates are shown where the message "No GPS Fix" was shown prior to connecting the antenna.
5. Set the MS20x0A parameters as follows:
    - Center Frequency: 2 GHz for MS2070A
    - Center Frequency: 3 GHz for MS2080A
    - Span: 10 kHz
    - Reference Level: –10 dBm
    - RBW: 30 kHz
    - VBW: 3 Hz
    - Sweep Once
6. Enable Marker 1 and perform a Peak Search. Record the marker frequency in Table A-2, "Option 31, GPS Frequency Accuracy (MS2070A)" on page A-1. Calculate the error by subtracting 2 GHz from the measured value and record the error in Table A-3 on page A-1.
7. Enable Marker 1 and perform a Peak Search. Record the marker frequency in Table A-3, "Option 31, GPS Frequency Accuracy (MS2080A)" on page A-1. Calculate the error by subtracting 1 GHz from the measured value and record the error in Table A-3 on page A-1.

2-3 Amplitude Accuracy

Use the following procedures to verify the amplitude accuracy of the MS20x0A and record the results in the test records provided in Appendix A.

There are two procedures involved in verifying the amplitude accuracy:

- "Amplitude Accuracy – Preamplifier Off"
- "Amplitude Accuracy – Preamplifier On"

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Amplitude Accuracy – Preamplifier Off

Use the following procedure to verify the amplitude accuracy of the MS20x0A with preamplifier off.

Equipment Required

- Anritsu MG36221A Synthesizer
- Weinschel 1870A Power Splitter
- Weinshel 44-10 Attenuator
- Rohde and Schwarz NRP18T Power Sensor
- Anritsu 15NN50-1.5C RF Coaxial Cable
- Anritsu 34NN50A Adapter
- Anritsu 34RKNF50 Adapter
- SMA(m) to BNC(f) Adapter
- BNC(m) to BNC(m) Coaxial Cable
- 10 MHz Frequency Reference

Procedure

1. Connect the external 10 MHz Reference to both the MG36221A and MS20x0A.
2. Connect the MG36221A RF Out to the input of the splitter.
3. Connect the NRP18T directly to one output of the splitter.
4. Connect the 10 dB attenuator to the other output of the splitter.
5. Connect the RF input of the MS20x0A to the 10 dB attenuator.
6. Set the MS20x0A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
7. Set the MS20x0A parameters as follows:
    - Span: 10 kHz
    - Reference Level: 10 dBm
    - Attenuation Level: 30 dB
    - Preamplifier: Off
    - RBW:1 kHz
    - VBW: 10 Hz
    - Detector Type: Peak
8. Using the Rohde and Schwarz Power Viewer software, set the signal frequency to 50 MHz.
9. On the MG36221A, press RF OFF.

10. Zero the NRP18T sensor.

11. On the MG36221A, press RF ON.

12. On the MG36221A, set the frequency to 50 MHz.

13. Adjust the NRP18T power level to +10.0 dBm. (The power level reading of MG36221A should be approximately +16 dBm.)

14. Set the MS20x0A center frequency to 50 MHz.

15. Perform a marker peak search and record the amplitude in Table A-4, “Power Level Accuracy at 50 MHz (Preamplifier Off)” on page A-2

16. Adjust the Reference Level and Attenuation Level on the MS20x0A for the other values in Table A-4, “Power Level Accuracy at 50 MHz (Preamplifier Off)” on page A-2

17. Adjust the Power Level on the MG36221A for the other power levels in Table A-4, “Power Level Accuracy at 50 MHz (Preamplifier Off)” on page A-2, and record results for each measurement.

18. Repeat this procedure for the other frequencies using the tables listed below:

- Table A-4, “Power Level Accuracy at 50 MHz (Preamplifier Off)” for all frequency options

Amplitude Accuracy – Preamplifier On

Use the following procedure to verify the amplitude accuracy of the MS20x0A with the preamplifier on. Record the results in the test records provided in Appendix A.

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Equipment Required

- Anritsu MG36221A Synthesizer
- SMA(m) to BNC(f) Adapter
- Weinschel 1870A Power Splitter
- Weinschel 44-10 Attenuator, Qty 2
- Weinschel 44-20 Attenuator
- Rohde and Schwarz NRP18T Power Sensor
- Anritsu 15NN50-1.5C RF Coaxial Cable
- Anritsu 34NN50A Adapter, N(m) to N(m)
- Ruggedized 34RKNF50 Adapter, K(m) to N(f)
- 10 MHz Frequency Reference
- BNC(m) to BNC(m) Coaxial Cable

Procedure

1. Connect the external 10 MHz Reference to both the MG36221A and MS20x0A.
2. Connect the MG36221A RF Out to the input of the splitter.
3. Connect the NRP18T directly to one output of the splitter.
4. Connect 40 dB of attenuation to the other output of the splitter.
5. Connect the RF input of the MS20x0A to the 40 dB attenuation.
6. Set the MS20x0A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
7. Set the MS20x0A parameters as follows:
   - Span: 10 kHz
   - Reference Level: –40 dBm
   - Attenuation Level: 0 dB
   - Preamplifier: On
   - RBW: 1 kHz
   - VBW: 10 Hz
   - Detector Type: Peak
8. Using the Rohde and Schwarz Power Viewer software, set the signal frequency to 100 kHz. Ensure the MG36221A is not outputting any power, and zero the NRP18T sensor.
9. On the MG36221A, set the frequency to 100 kHz and adjust the power level so the NRP18T measures –10 dBm. (The MG36221A should be approximately –4 dBm.)
10. On the MS20x0A set the center frequency to 100 kHz and perform a peak search. Record the result in Table A-5, “Power Level Accuracy (Preamplifier On)” on page A-2.
11. Repeat Step 8 through Step 10 for the remaining frequencies that apply to the unit being tested, in Table A-5, “Power Level Accuracy (Preamplifier On)” on page A-2.

2-4 Single Side Band (SSB) Phase Noise

Use the following procedure to verify the single side-band (SSB) phase noise of the MS20x0A. Record the results in the test records provided in Appendix A.

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Equipment Required

- Anritsu MG36221A
- Ruggedized 34RKNF50 Adapter, K(m) to N(f)
- SMA(m) to BNC(f) Adapter
- Anritsu 15NN50-1.5C Coaxial Cable, N(m) to N(m)
- 10 MHz Frequency Reference
- BNC(m) to BNC(m) coaxial cable

Procedure

1. Connect the external 10 MHz Reference to both the MG36221A and MS20x0A.
2. Connect the MG36221A RF Out to the MS20x0A RF In.
3. Set the MG36221A to output frequency to 1.0 GHz.
4. Set the MG36221A to output power to –2 dBm.
5. Set the MS20x0A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
6. Set the MS20x0A parameters as follows:
    - Reference Level: 0 dBm
    - Input Attenuation: 15 dB
    - Preamplifier: Off
    - RBW: 1 kHz
    - VBW: 3 Hz
    - Detector Type: Peak
    - Averages: 3
    - Sweep Points: 601
7. 10 kHz and 100 kHz Offset Settings:
    - Center Frequency: 1000.05 MHz
    - Span: 110 kHz
8. In the Sweep menu, turn off Continuous Sweep, and choose Sweep to three and allow it to finish.
9. In the Marker menu, use the Peak Search menu to set Marker 1 to the peak at 1 GHz. Exit the Peak Search menu and set the Marker Mode to Delta. Enter a frequency value of 10 kHz, so a marker is on the peak at 1 GHz and the delta marker is 10 kHz away. Record the difference in level between the peak at 1 GHz and the noise level 10 kHz away at 1000.010 MHz in Table A-6, “Spectral Purity - SSB Phase Noise Offset from 1 GHz (MS20x0A)” on page A-3. Then subtract another 30 dB and record this as the 10 kHz Offset Measured Value reading in Table A-6 on page A-3.

    For example: –80 dBc measured – 30 dB = –110 dBc/Hz

10. Change the Delta Frequency from 10 kHz to 100 kHz and record the difference in level between the peak at 1 GHz and the noise level 100 kHz away at 1000.100 MHz in Table A-6, “Spectral Purity - SSB Phase Noise Offset from 1 GHz (MS20x0A)” on page A-3. Then subtract another 30 dB and record this as the 100 kHz Offset Measured Value reading in Table A-6, “Spectral Purity - SSB Phase Noise Offset from 1 GHz (MS20x0A)” on page A-3.

For example: –80 dBc measured – 30 dB = –110 dBc/Hz

11. Change the Center Frequency to 1000.545 MHz and the Span to 1.1 MHz. Run the sweep of three averages and allow it to finish. Using Delta Markers, measure the difference in level between the peak at 1 GHz and the noise level 1 MHz away at 1001.0 MHz in Table A-6, "Spectral Purity - SSB Phase Noise Offset from 1 GHz (MS20x0A)" on page A-3. Then subtract another 30 dB and record this as the 1 MHz Offset Measured Value reading in Table A-6 on page A-3.

For example: –85 dBc measured – 30 dB = –115 dBc/Hz

12. Change the Center Frequency to 1005.495 MHz and the Span to 11 MHz. Run the sweep of 3 averages and allow it to finish. Using Delta Markers, measure the difference in levels between the peak at 1 GHz and the noise level 10 MHz away at 1010 MHz in Table A-6, "Spectral Purity - SSB Phase Noise Offset from 1 GHz (MS20x0A)" on page A-3. Then subtract another 30 dB and record this as the 10 MHz Offset Measured Value reading in Table A-6 on page A-3.

For example: –100 dBc measured –30 dB = –130 dBc/Hz

2-5 Second Harmonic Distortion

Use the following procedure to verify the second harmonic distortion of the MS20x0A. Record the results in the test records provided in Appendix A.

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Equipment Required

- Anritsu MG36221A Synthesizer
- Min-Circuits NLP-50 Low Pass Filter
- Anritsu 15NN50-1.5C RF Cable
- 10 MHz Frequency Reference
- BNC(m) to BNC(m) Coaxial Cable
- Ruggedized 34RKNF50 Adapter, K(m) to N(f)
- SMA(m) to BNC(f) Adapter

Procedure

1. Connect the 10 MHz reference to the MG36221A and MS20x0A.
2. Connect the output of the MG36221A to the input of the low pass filter and the output of the low pass filter to the RF In of the MS20x0A.
3. Set the MS20x0A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
4. Set the MS20x0A parameters as follows:
   - Center frequency: 50.1 MHz
   - Span: 100 kHz
   - Reference Level: –20 dBm
   - Attenuation Level: 0 dB
   - Preamplifier: Off
   - RBW: 1 kHz
   - VBW: 10 Hz
5. Set the MG36221A frequency to 50.1 MHz and adjust the level so the MS20x0A shows –30 dBm at 50.1 MHz. Record this value in Table A-7, “Second Harmonic Distortion (MS20x0A)” on page A-3
6. Set the MS20x0A Center Frequency to 100.2 MHz, perform a peak search, and record this value in Table A-7 on page A-3.
7. Subtract 50.1 MHz value from the 100.2 MHz value and record this as the Second Harmonic Distortion in Table A-7 on page A-3.

   For example, if the 50.1 MHz value is –30 dBm and the 100.2 MHz value is –90 dBm, then:

   –90 dBm – (–30 dBm) = –60 dBc

2-6 Displayed Average Noise Level (DANL)

Use the following procedures to verify the Displayed Average Noise Level (DANL) of the MS20x0A. Record the results in the test records provided in Appendix A.

There are two procedures involved in verifying the DANL of MS20x0A:

- "DANL – Preamplifier Off"
- "DANL – Preamplifier On"

DANL – Preamplifier Off

Use the following procedure to verify the Displayed Average Noise Level (DANL) of the MS20x0A with preamplifier off.

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Equipment Required

- Anritsu 28N50-2 Termination

MS2070A Procedure

1. Attach the Termination to the RF input of the MS20x0A.
2. Set the MS2070A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
3. Set the MS2070A parameters as follows:
   - Start Frequency: 10 MHz
   - Stop Frequency: 2 GHz
   - Reference Level: –20 dBm
   - Input Attenuation: 0 dB
   - Preamplifier: Off
   - RBW: 1 MHz
   - VBW: 1 kHz
   - VBW Type: Logarithmic
   - Detector Type: RMS/Avg
   - Sweep Points: 551
   - Continuous: Toggle Off
   - Press Sweep Once.
4. Using the Marker menu, choose Peak Search, subtract 60 dB from the measurement, and record the power level in Table A-8, "MS2070A Displayed Average Noise Level (Preamplifier Off)" on page A-3
5. Change the start frequency to 2 GHz and stop frequency to 3 GHz and repeat Step 3 and Step 4 to record the power level in Table A-9, "MS2080A Displayed Average Noise Level (Preamplifier Off)" on page A-3.

MS2080A Procedure

1. Attach the Termination to the RF input of the MS2080A.
2. Set the MS2080A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
3. Set the MS2080A parameters as follows:
   - Start Frequency: 10 MHz
   - Stop Frequency: 2 GHz
   - Reference Level: –20 dBm
   - Input Attenuation: 0 dB
   - Preamplifier: Off
   - RBW: 1 MHz
   - VBW: 1 kHz
   - VBW Type: Logarithmic
   - Detector Type: RMS/Avg
   - Sweep Points: 551
   - Continuous: Toggle Off
   - Press Sweep Once.
4. Using the Marker menu, choose Peak Search, subtract 60 dB from the measurement, and record the power level in Table A-10, “MS2070A Displayed Average Noise Level (Preamplifier On)” on page A-4.
5. Change the start frequency to 3 GHz and stop frequency to 4 GHz and repeat Step 3 and Step 4 to record the power level in Table A-11, “MS2080A Displayed Average Noise Level (Preamplifier On)” on page A-4.

DANL – Preamplifier On

Use the following procedure to verify the Displayed Average Noise Level (DANL) of the MS20x0A with the Preamplifier On. Record the results in the test records provided in Appendix A.

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Equipment Required

- Anritsu 28N50-2 Termination

MS2070A Procedure

1. Attach the Termination to the RF input of the MS2070A.
2. Set the MS2070A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
3. Set the MS2070A parameters as follows:
   - Start Frequency: 10 MHz
   - Stop Frequency: 2 GHz
   - Reference Level: –50 dBm
   - Attenuation Level: 0 dB
   - Preamplifier: On
   - RBW: 1 MHz
   - VBW: 1 kHz
   - VBW Type: Logarithmic
   - Detector Type: RMS/Avg
   - Sweep Points: 551
   - Continuous: Toggle Off
   - Press Sweep Once.
4. Using the Marker menu, choose Peak Search, subtract 60 dB from the measurement, and record the power level in Table A-10, “MS2070A Displayed Average Noise Level (Preamplifier On)” on page A-4.
5. Change the start frequency to 2 GHz and stop frequency to 3 GHz and repeat Step 3 and Step 4 to record the power level in Table A-10, “MS2070A Displayed Average Noise Level (Preamplifier On)” on page A-4.

MS2080A Procedure

1. Attach the Termination to the RF input of the MS2080A.
2. Set the MS2080A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
3. Set the MS2080A parameters as follows:
   - Start Frequency: 10 MHz
   - Stop Frequency: 2 GHz
   - Reference Level: –50 dBm
   - Attenuation Level: 0 dB
   - Preamplifier: On
   - RBW: 1 MHz
   - VBW: 1 kHz
   - VBW Type: Logarithmic
   - Detector Type: RMS/Avg
   - Sweep Points: 551
   - Continuous: Toggle Off
   - Press Sweep Once.
4. Using the Marker menu, choose Peak Search, subtract 60 dB from the measurement, and record the power level in Table A-11, “MS2080A Displayed Average Noise Level (Preamplifier On)” on page A-4.
5. Change the start frequency to 2 GHz and stop frequency to 4 GHz and repeat Step 3 and Step 4 to record the power level in Table A-11, “MS2080A Displayed Average Noise Level (Preamplifier On)” on page A-4.

2-7 Residual Spurs

Use the following procedures to verify the Residual Spurs of the MS20x0A with the preamplifier off and preamplifier on. Residual spurs are tested in multiple bands, record the results in the test records provided in Appendix A.

There are two procedures involved in verifying the Residual Spurs:

- "Residual Spurs – Preamplifier On"
- "Residual Spurs – Preamplifier Off"

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Residual Spurs – Preamplifier On

Use the following procedure to verify the Residual Spurs of the MS20x0A with the Preamplifier On. Record the results in the test records provided in Appendix A.

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Equipment Required

- Anritsu 28N50-2 Termination

MS2070A Procedure

1. Attach the Termination to the RF input of the MS2070A.
2. Set the MS2070A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
3. Set the MS2070A parameters as follows:
    - Start Frequency: >10 MHz
    - Stop Frequency: 500 MHz
    - Reference Level: –50 dBm
    - Attenuation Level: 0 dB
    - Preamplifier: On
    - RBW: 300 Hz
    - VBW: 100 Hz
    - Sweep Points: 601
    - Continuous: Toggle off
    - Press Sweep Once.
4. Using the Marker menu, choose Peak Search and record the power level in Table A-12, "MS2070A Residual Spurs (Preamplifier On)" on page A-4.

MS2080A Procedure

1. Attach the Termination to the RF input of the MS2080A.
2. Set the MS2080A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
3. Set the MS2080A parameters as follows:
   - Start Frequency: >10 MHz
   - Stop Frequency: 500 MHz
   - Reference Level: –50 dBm
   - Attenuation Level: 0 dB
   - Preamplifier: On
   - RBW: 300 Hz
   - VBW: 100 Hz
   - Sweep Points: 601
   - Continuous: Toggle off
   - Press Sweep Once.
4. Using the Marker menu, choose Peak Search and record the power level in Table A-13, “MS2080A Residual Spurs (Preamplifier On)” on page A-4.

Residual Spurs – Preamplifier Off

Use the following procedure to verify the Residual Spurs of the MS20x0A with the Preamplifier Off and Record the results in the test records provided in Appendix A.

Equipment Required

- Anritsu 28N50-2 Termination

MS2070A Procedure

1. Attach the Termination to the RF input of the MS2070A.
2. Set the MS2070A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
3. Set the MS2070A parameters as follows:
    - Start Frequency: 10 MHz
    - Stop Frequency: 500 MHz
    - Reference Level: –50 dBm
    - Attenuation Level: 0 dB
    - Preamplifier: Off
    - RBW: 300 Hz
    - VBW: 100 Hz
    - Sweep Points: 601
    - Continuous: Toggle off
    - Press Sweep Once.
4. Using the Marker menu, choose Peak Search and record the power level in Table A-14, "MS2070A Residual Spurs (Preamplifier Off)" on page A-5.

MS2080A Procedure

1. Attach the Termination to the RF input of the MS2080A.
2. Set the MS2080A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
3. Set the MS2080A parameters as follows:
    - Start Frequency: 10 MHz
    - Stop Frequency: 500 MHz
    - Reference Level: –50 dBm
    - Attenuation Level: 0 dB
    - Preamplifier: Off
    - RBW: 300 Hz
    - VBW: 100 Hz
    - Sweep Points: 601
    - Continuous: Toggle off
    - Press Sweep Once.
4. Using the Marker menu, choose Peak Search and record the power level in Table A-15, "MS2080A Residual Spurs (Preamplifier Off)" on page A-5.
5. Change the Start Frequency to 3 GHz and Stop Frequency to 4 GHz.
6. Repeat Step 3 and Step 4 and record the power level in Table A-15, "MS2080A Residual Spurs (Preamplifier Off)" on page A-5.

2-8 Input Related Spurious

Use the following procedure to verify the Input Related Spurious of the MS20x0A. Record the results in the test records provided in Appendix A.

Note	Before continuing, allow a 30 minute warm-up for the internal circuitry to stabilize.

Equipment Required

- Anritsu MG36221A Synthesizer
- Anritsu 34RKNF50 Adapter
- Anritsu 15NNF50-1.5C RF Cable
- 10 MHz Frequency Reference
- BNC(m) to BNC(m) Coaxial Cable
- SMA(m) to BNC(f) Adapter

MS2070A Procedure

1. Connect the 10 MHz Reference to the MG36221A and MS2070A.
2. Connect the output of the MG36221A to the RF In of the MS20x0A.
3. Set the MS20x0A to spectrum analyzer mode and Preset the instrument (PRESET > Preset Mode).
4. Set the MS2070A parameters as follows:
    - Center Frequency: 2086 MHz
    - Span: 100 kHz
    - Reference Level: –30 dBm
    - Attenuation Level: 0 dB
    - Preamplifier: Off
    - RBW: 1 kHz
    - VBW: 10 Hz
5. Set the MG36221A frequency to 2086 MHz, and set power level so –30 dBm is read on the MS2070A at 2086 MHz. Record the measured input signal level in Table A-16, “MS2070A Input Related Spurious” on page A-5.
6. Change the center frequency of the MS2070A to 400.5 MHz and record the highest spur level in Table A-16, “MS2070A Input Related Spurious” on page A-5.

MS2080A Procedure

1. Connect the 10 MHz Reference to the MG36221A and MS2080A.
2. Connect the output of the MG36221A to the RF In of the MS2080A.
3. Set the MS2080A to spectrum analyzer mode and preset the instrument (PRESET > Preset Mode).
4. Set the MS2080A parameters as follows:
   - Center Frequency: 742 MHz
   - Span: 100 kHz
   - Reference Level: –30 dBm
   - Attenuation Level: 0 dB
   - Preamplifier: Off
   - RBW: 1 kHz
   - VBW: 10 Hz
5. Set the MG36221A frequency to 742 MHz, and set power level so –30 dBm is read on the MS2080A at 742 MHz. Record the highest spur level in Table A-17, “MS2080A Input Related Spurs” on page A-5.
6. Change the center frequency of the MS2080A to 3500.5 MHz and record the highest spur level in Table A-17, “MS2080A Input Related Spurs” on page A-5.

Chapter 3 — Assembly Replacement

3-1 Introduction

This chapter describes opening and closing the Field Master case along with basic parts replacement steps. The sections are as follows:

3-2 Replaceable Parts List

Refer to Table 1-4, "List of Replaceable Parts" on page 1-3 for the list of replacement parts.
Refer to the following sections for basic replacement instructions.

Caution	Electrostatic Discharge (ESD) can damage the highly sensitive circuits in the instrument. All work should be performed in a static-safe work area. Only qualified personnel should open the case and replace internal assemblies. Assemblies shown in Table 1-4 are typically the only items that may be replaced. The assemblies are highly fragile, items that must be soldered may not be replaced without specialized training. The Field Master contains components that can easily be damaged by electrostatic discharge (ESD). An ESD safe work area and proper ESD handling procedures that conform to ANSI/ESD S20.20-1999 or ANSI/ESD S20.20-2007 is mandatory to avoid ESD damage when handling sub-assemblies or components found in the instrument. Repair of damage that is found to be caused by electrostatic discharge is not covered under warranty.

Caution	Removing the RF shield from PC boards or adjustment of screws on or near the shields may detune sensitive RF circuits and will result in degraded performance.

Note	Many of the procedures in this section are generic and apply to many similar instruments. Photos and illustrations used are representative and may show instruments other than the Field Master.

3-3 Battery Pack Removal and Replacement

This section provides instructions for the removal and replacement of the instrument battery pack.

1. Locate the battery access door on the left side of the unit.
2. Remove the battery door tab by sliding it to the left. See Figure 3-1.

Figure 3-1. Battery Access Door Removal

3. With the battery access door removed, grab the battery lanyard and pull the battery straight out of the unit as illustrated in Figure 3-2.

Figure 3-2. Removing the Battery

3-4 Bumpers Removal

The procedure below provides instructions for removing the bumpers of the instrument:

1. Remove the left and right bumpers by pulling them outward from the bottom. See Figure 3-3.

Figure 3-3. Pulling of Side Bumpers

2. Detach the bumpers completely by lifting them upwards to remove from the unit. See Figure 3-4.

Figure 3-4. Side Bumpers Removal

3-5 Rear Case Removal

The procedure below provides instructions for removing the rear case of the instrument:

1. Remove the battery as shown in Section 3-3 “Battery Pack Removal and Replacement” on page 3-2.
2. Remove the side bumpers as shown in Section 3-4 “Bumpers Removal” on page 3-3.
3. Using a T10 Torx screwdriver, remove the nine screws from the back of the instrument as shown in Figure 3-5.

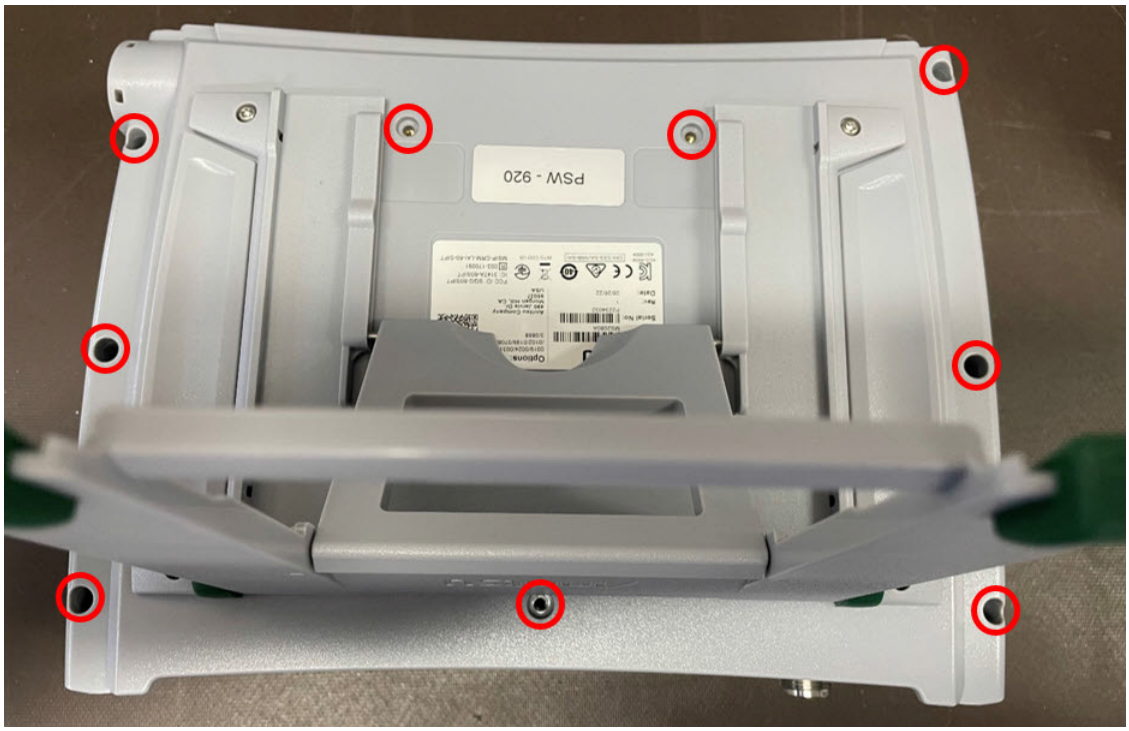

Figure 3-5. Rear Case Removal

4. With all screws removed, place the instrument face down on a stable flat work surface.
5. Gently pull the rear case apart from the front case.

3-6 Touchscreen/LCD Removal

This procedure provides instructions to replace LCD touchscreen. With the rear case removed as shown in Section 3-5 “Rear Case Removal” on page 3-4, the internal assemblies can be removed and replaced as explained below:

1. Remove the battery access door and the battery as described in Section 3-3 “Battery Pack Removal and Replacement” on page 3-2.
2. Remove the rear case as described in Section 3-5 “Rear Case Removal” on page 3-4.
3. Remove the five Torx screws securing the Main PCB and SPA PCB assemblies using a T20 Torx driver. See Figure 3-6.

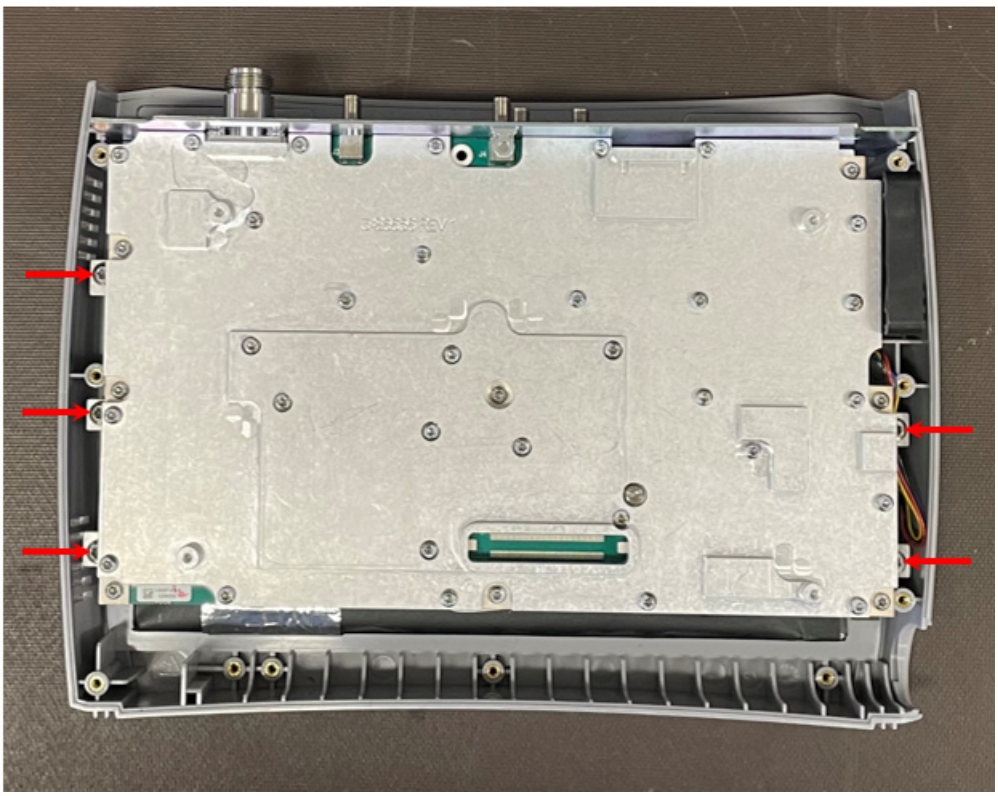

Figure 3-6. Main PCB/SPA PCB Removal

4. Remove the Torx screw on the top connector panel using a T10 screw driver. See Figure 3-7.

Figure 3-7. Top Panel Removal

5. Remove the three Torx screws securing the battery shroud using a T10 Torx screw driver. See Figure 3-8.

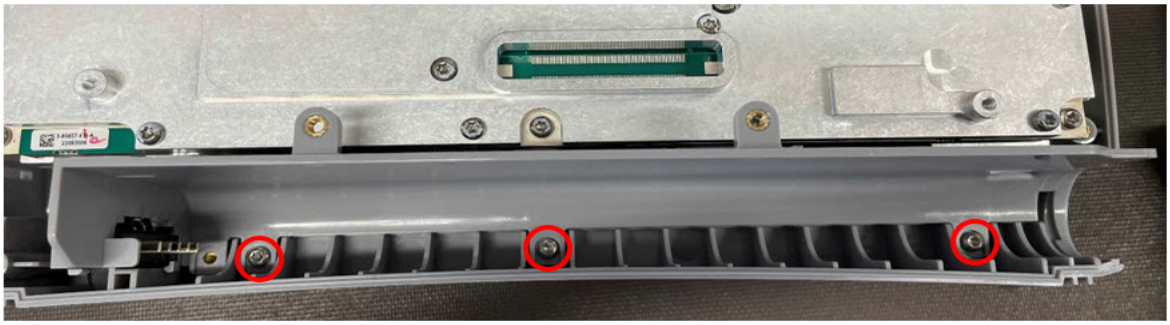

Figure 3-8. Battery Shroud Removal

6. Disconnect the battery cable and remove the battery shroud. See Figure 3-9.

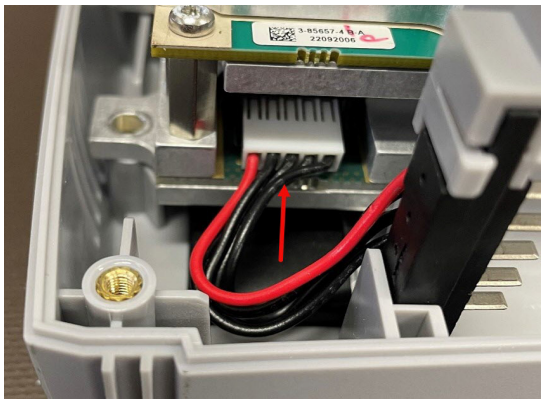

Figure 3-9. Battery Cable Removal

7. Carefully tilt the Main PCB/SPA PCB assembly to view the display cable. See Figure 3-10.

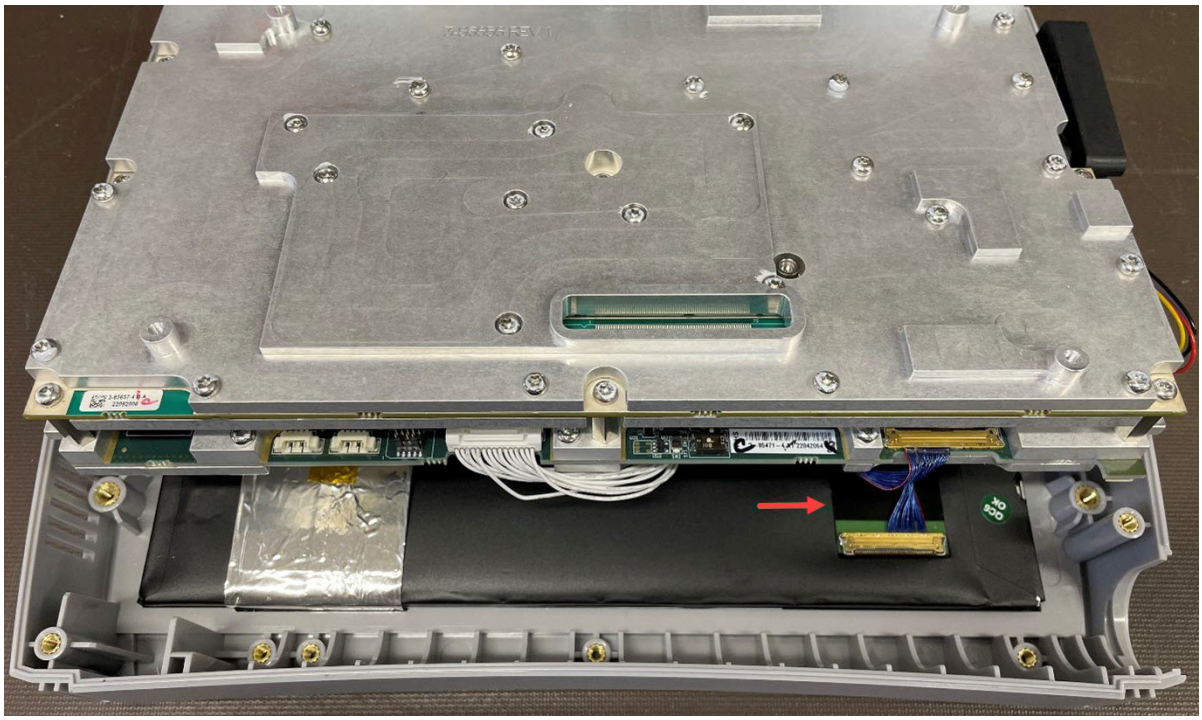

Figure 3-10. Display Cable

8. Release the locking connector by slowing lifting the metal flap upwards to disconnect the display cable. See Figure 3-11.

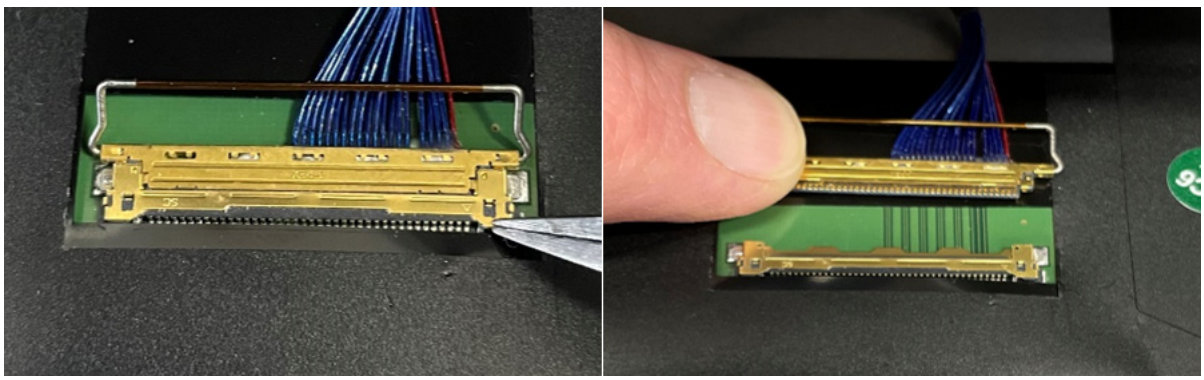

Figure 3-11. Display Cable Removal

9. Carefully tilt the Main PCB/SPA PCB assembly to remove the two Wi-Fi antennas. Release the Wi-Fi Antennas by carefully prying the end slots using a straight screw driver. See Figure 3-12.

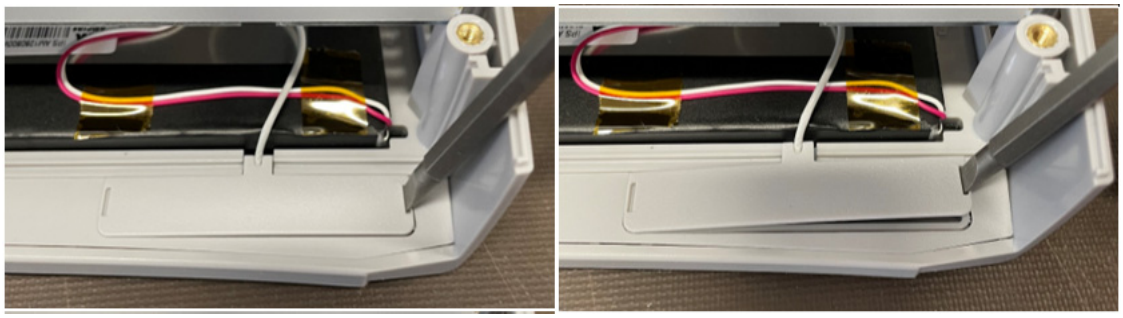

Figure 3-12. Releasing the Wi-Fi antennas

10. Carefully tilt the Main PCB/SPA PCB assembly to remove the keypad cable connector by slightly pressing it at the ends and disconnecting it from the LCD top case assembly. See Figure 3-13.

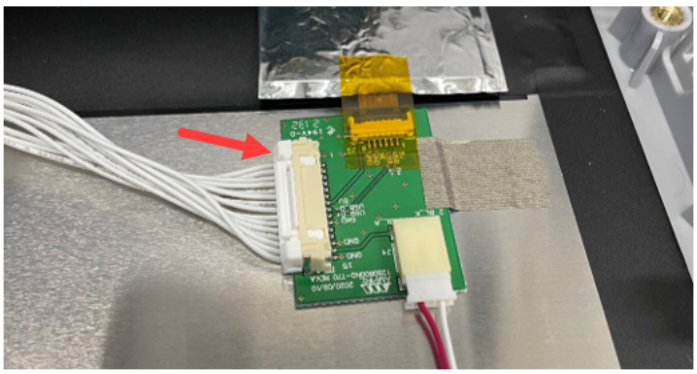

Figure 3-13. Disconnecting Keypad Cable Connector

11. The Touchscreen/LCD Display is permanently installed into the Top Case.

3-7 SPA PCB Assembly Removal

1. Remove the four nuts along with four lock washers from the SMA ports on the top connector panel using a 5/16" wrench. See Figure 3-14.

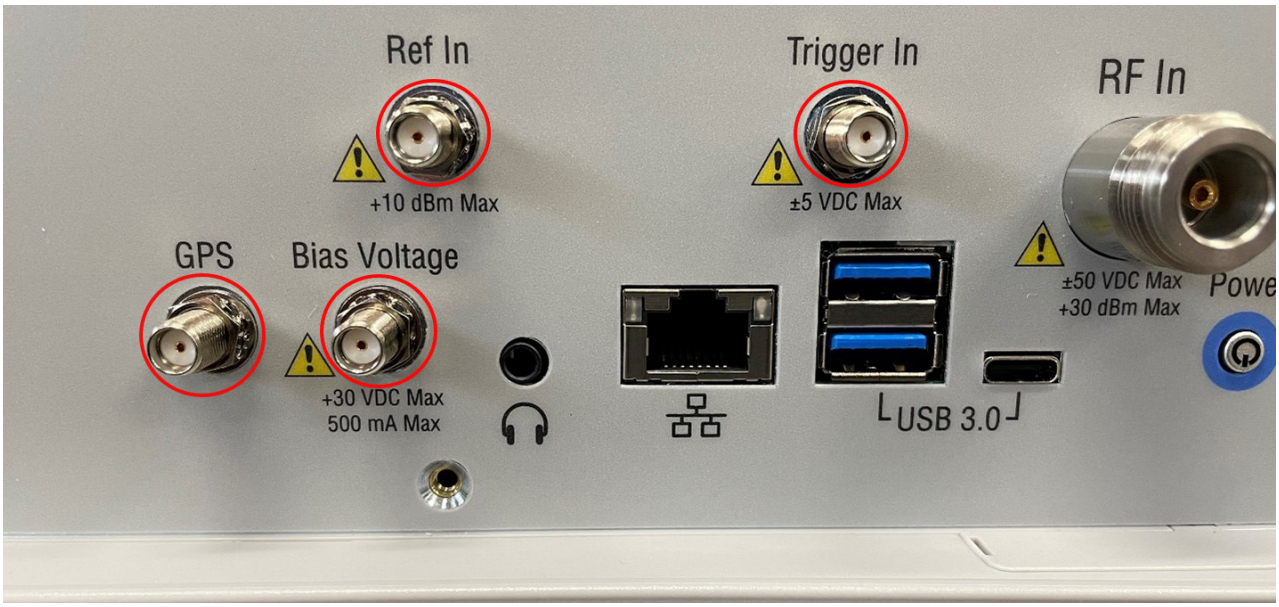

Figure 3-14. SPA PCB Removal

2. Remove the two Torx screws using T10 Torx driver from the brackets on the Main PCB. See Figure 3-15.

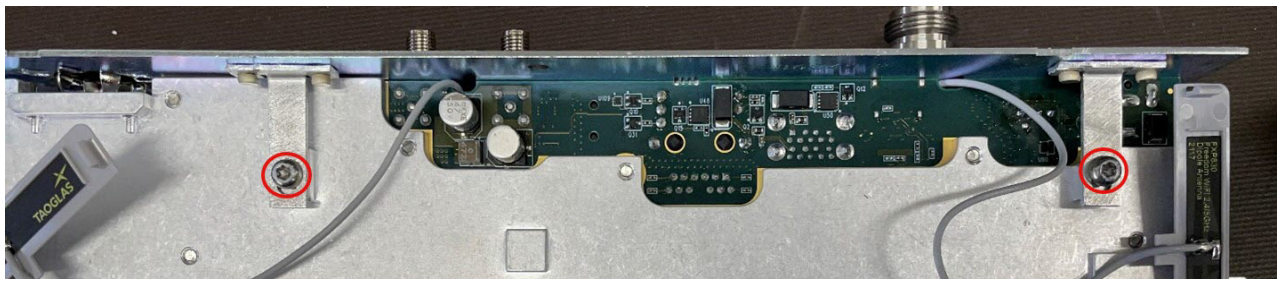

Figure 3-15. SPA PCB Removal

3. Remove the eight Torx screws securing the SPA PCB Assembly to the Main PCB using a T10 Torx driver. See Figure 3-16.

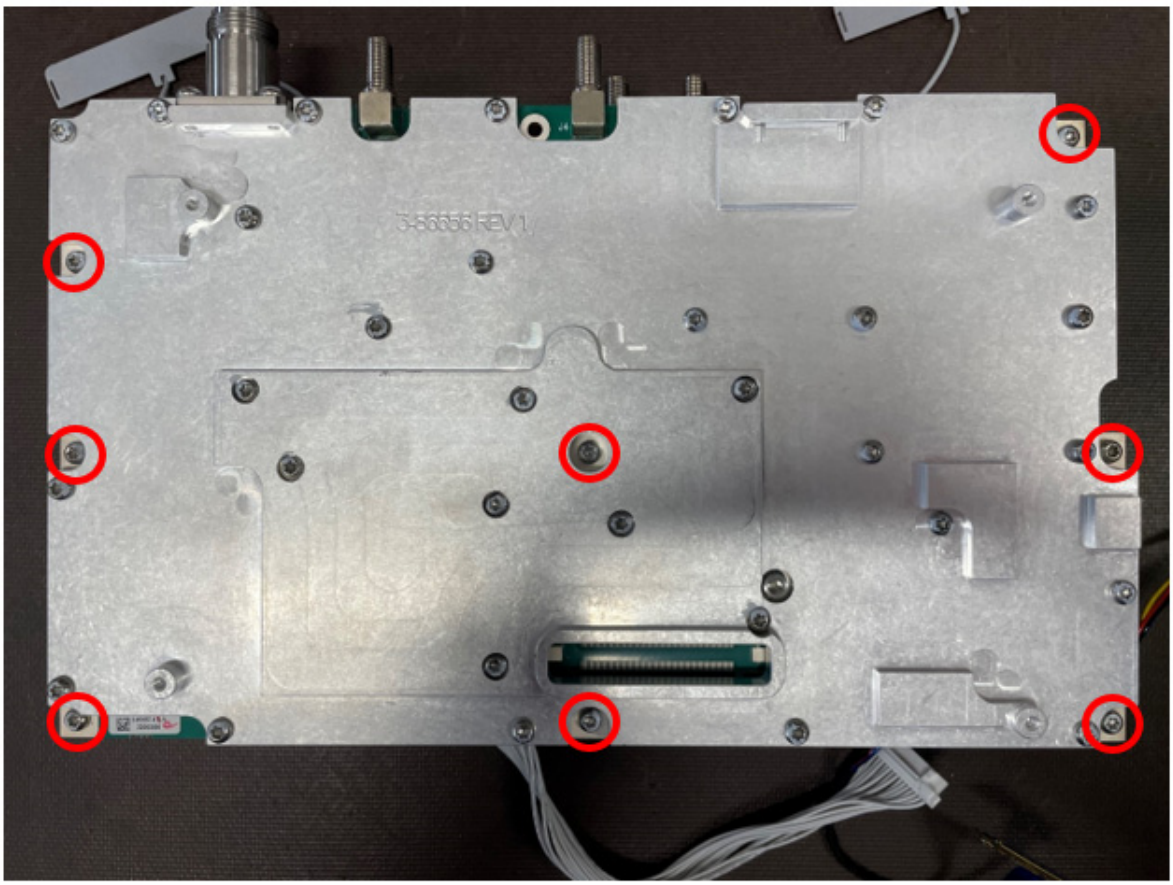

Figure 3-16. SPA PCB Removal: Torx Screws

3-8 Main PCB Removal

The semi-rigid cable connecting the RF input adapter and the step attenuator on the SPA PCB is normally a part of the SPA PCB Assembly, which may be replaced independently.

1. Carefully remove the two Wi-Fi cables, the keypad cable, and shielded LCD cable connected to the Main PCB.
2. Remove the eight stand-offs using 6 mm hex socket driver to remove the Main PCB. See Figure 3-17.

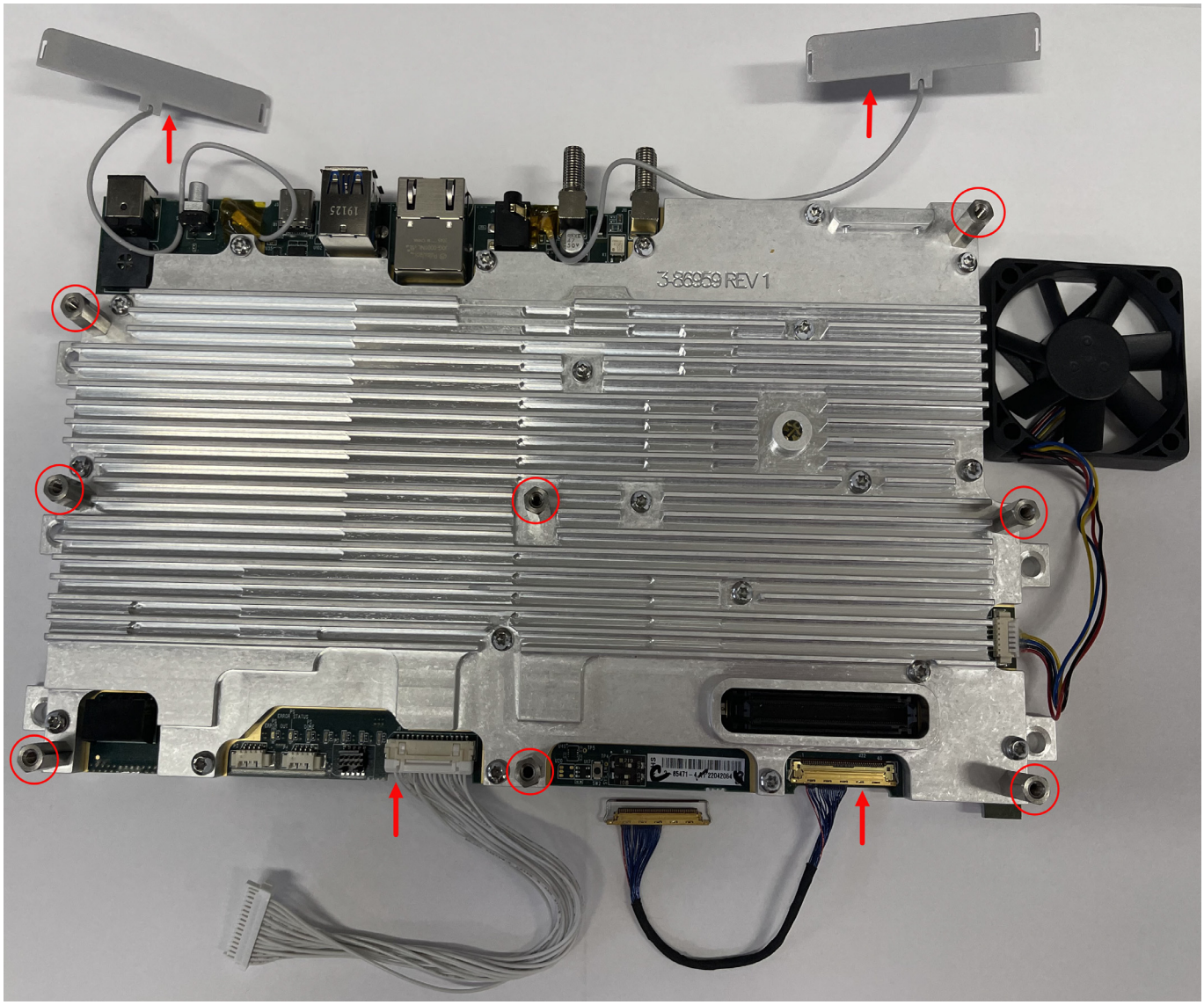

Figure 3-17. Main PCB Removal

3-9 Fan Assembly Removal

The fan assembly sits in a slot in the front case and is plugged into the Main PCB.

1. Carefully disconnect the harness and lift the fan assembly out of the case. See Figure 3-18.

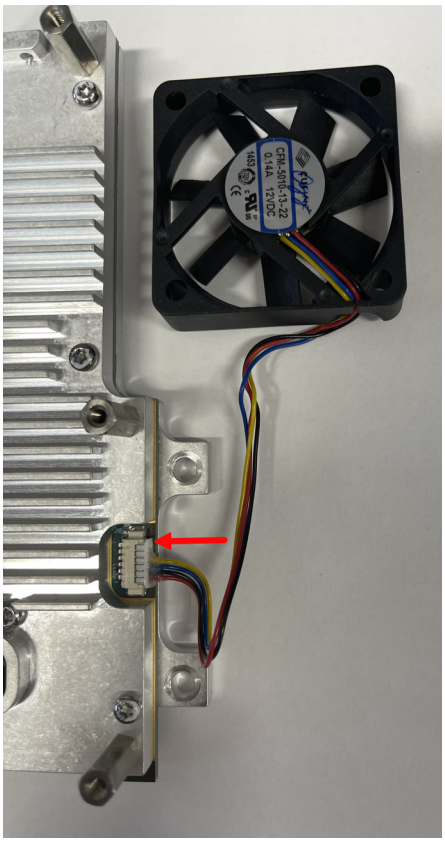

Figure 3-18. Fan Assembly Removal

3-10 RF Input Adapter Removal

The RF input adapter consists of four T10 Torx screws that are secured to the SPA PCB Assembly. Follow the steps below to remove the RF input adapter:

1. Using T10 Torx screw driver remove the four screws to carefully pull the RF input adapter straight off the SPA PCB assembly. See Figure 3-19.

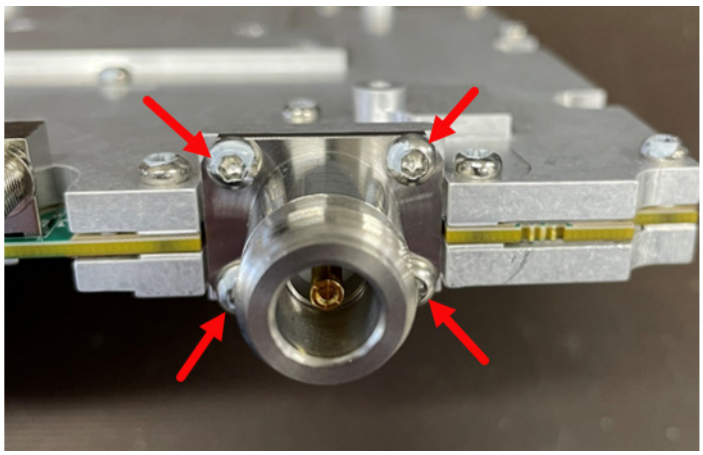

Figure 3-19. RF Input Adapter Removal

3-11 Reassembling the Unit

Reassembling the unit is simply a process done in the reverse order of the removal procedure. Use caution while reassembling all the parts together:

1. Ensure to carefully align the cables of the Wi-Fi antenna into the littles grooves of the Main PCB to prevent the Wi-Fi antenna cables from being smashed or crimped. See Figure 3-20.

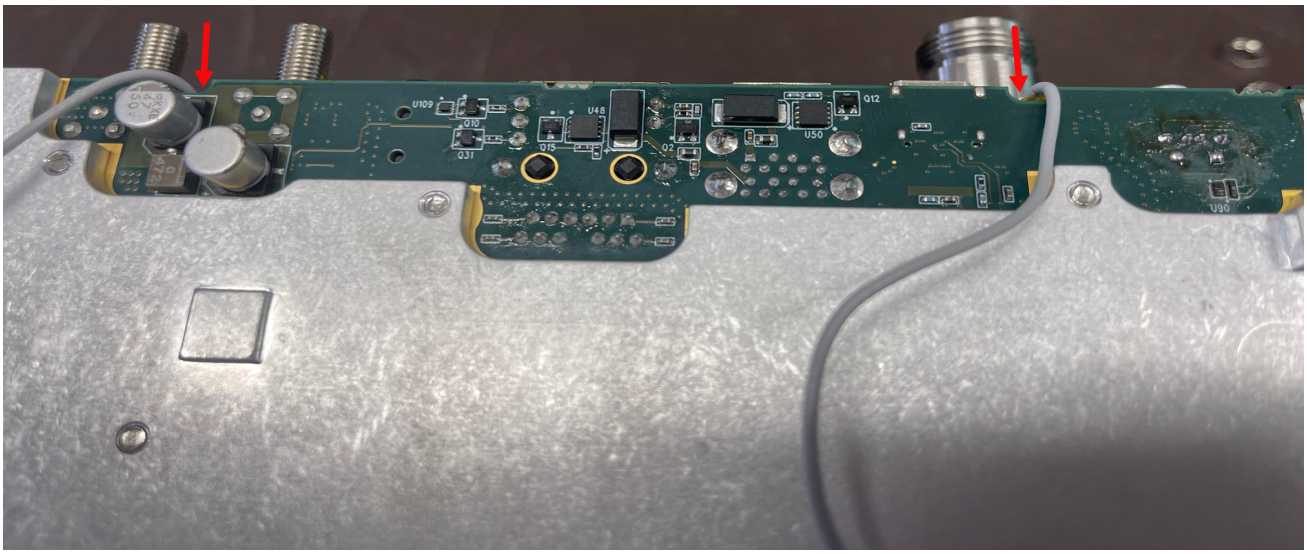

Figure 3-20. Reassembling the unit

2. Make sure that the label of the fan assembly faces outwards while fitting it into the LCD top case assembly. See Figure 3-18.
3. Use caution as not to cripple the fan assembly harness in between while securing the Main PCB/SPA assembly onto the LCD Top case assembly. See Figure 3-18.

Chapter 4 — Troubleshooting

4-1 Introduction

This chapter describes the primary troubleshooting operations that can be performed by all Anritsu service centers. Perform the troubleshooting suggestions in the order they are listed.

Only qualified Anritsu personnel should replace internal assemblies. Major subassemblies shown in Table 1-4 are typically the items that may be replaced. Because they are highly fragile, items that must be soldered may not be replaced without special training. Removal of RF shields from PC boards or adjustment of screws on or near the shields will detune sensitive RF circuits and will result in degraded instrument performance.

4-2 Level Accuracy Problems

Measured signal is unexpectedly too high or too low:

1. Check the N connector for damage and cleanliness.
2. Check the connections between the N connector and Main PCB.
3. If the connections are good, replace the SPA PCB.

Appendix A — Test Records

A-1 Introduction

This appendix provides the test record templates to record the performance of the MS20x0A Field Master. Anritsu recommends that you make a copy of the following test record pages and document the measurements each time a performance verification is performed. Continuing to document this process each time it is performed provides a detailed history of instrument performance.

MS20x0A **Firmware Rev:** _____ **Operator:** _____ **Date:** _____

Serial Number: _____ **Options:** _____

A-2 Test Records for Spectrum Analyzer Verification

Table A-1. MS20x0A Spectrum Analyzer Frequency Accuracy (without GPS)

Frequency	Measured Value	Error	Measurement Uncertainty	Specification
1 GHz	GHz	Hz	250 Hz (0.25 ppm)	± 280 Hz (0.28 ppm)

Table A-2. MS2070A Option 31, GPS Frequency Accuracy

Frequency	Measured Value	Error	Measurement Uncertainty	Specification
2 GHz	GHz	Hz	30 Hz (15 ppb)	± 560 Hz (0.3 ppm)

Table A-3. MS2080A Option 31, GPS Frequency Accuracy

Frequency	Measured Value	Error	Measurement Uncertainty	Specification
3 GHz	GHz	Hz	45 Hz (15 ppb)	± 840 Hz (25 ppb)

MS20x0A **Firmware Rev:** _____ **Operator:** _____ **Date:** _____

Serial Number: _____ **Options:** _____

Table A-4. MS20x0A Power Level Accuracy at 50 MHz (Preamplifier Off)

Frequency	Input Attenuation	Reference Level	NRP18T Power Level	MS20x0A Expected Power Level	MS20x0A Measured Power Level	Measurement Uncertainty	Specification
50 MHz	30 dB	10 dBm	+10 dBm	0 dBm	dBm	0.30 dB	0 dBm ±1.3 dB
50 MHz	30 dB	10 dBm	+6 dBm	–4 dBm	dBm	0.30 dB	–4 dBm ±1.3 dB
50 MHz	30 dB	10 dBm	+2 dBm	–8 dBm	dBm	0.30 dB	–8 dBm ±1.3 dB
50 MHz	20 dB	0 dBm	+0 dBm	–10 dBm	dBm	0.30 dB	–10 dBm ±1.3 dB
50 MHz	20 dB	0 dBm	–4 dBm	–14 dBm	dBm	0.30 dB	–14 dBm ±1.3 dB
50 MHz	20 dB	10 dBm	–8 dBm	–18 dBm	dBm	0.30 dB	–18 dBm ±1.3 dB
50 MHz	10 dB	–10 dBm	–10 dBm	–20 dBm	dBm	0.30 dB	–20 dBm ±1.3 dB
50 MHz	10 dB	–10 dBm	–14 dBm	–24 dBm	dBm	0.30 dB	–24 dBm ±1.3 dB
50 MHz	10 dB	–10 dBm	–18 dBm	–28 dBm	dBm	0.30 dB	–28 dBm ±1.3 dB
50 MHz	0 dB	–20 dBm	–20 dBm	–30 dBm	dBm	0.30 dB	–30 dBm ±1.3 dB

Table A-5. MS20x0A Power Level Accuracy (Preamplifier On)

Frequency	NRP18T Power Level	MS20x0A Expected Power Level	MS20x0A Measured Power Level	Measurement Uncertainty	Specification
100 kHz	–10 dBm	–50 dBm	dBm	0.30 dB	–50 dBm± 1.3 dB
10 MHz	–10 dBm	–50 dBm	dBm	0.30 dB	–50 dBm± 1.3 dB
150 MHz	–10 dBm	–50 dBm	dBm	0.30 dB	–50 dBm± 1.3 dB
1 GHz	–10 dBm	–50 dBm	dBm	0.30 dB	–50 dBm± 1.3 dB
3 GHz	–10 dBm	–50 dBm	dBm	0.30 dB	–50 dBm± 1.3 dB

MS20x0A **Firmware Rev:** _____ **Operator:** _____ **Date:** _____

Serial Number: _____ **Options:** _____

Table A-6. MS20x0A Spectral Purity - SSB Phase Noise Offset from 1 GHz

Frequency	Measured Delta with 1 kHz RBW	Calculated Value (Measured - 30 dB)	Measurement Uncertainty	Specification (For Calculated Value)
10 kHz	dBc	dBc/Hz	2.0 dB	-93 dBc/Hz max
100 kHz	dBc	dBc/Hz	2.0 dB	-95 dBc/Hz max
1 MHz	dBc	dBc/Hz	2.0 dB	-120 dBc/Hz max

Table A-7. MS20x0A Second Harmonic Distortion

Center Frequency	Measured Value	Second Harmonic Distortion (100.2 Meas Value – 50.1 Meas Value)	Measurement Uncertainty	Specification
50.1 MHz	dBm	dBc	1.0 dB	–65 dBc max
100.2 MHz	dBm	dBc	1.0 dB	–70 dBc max

Table A-8. MS2070A Displayed Average Noise Level (Preamplifier Off)

Start Frequency	Stop Frequency	RBW	VBW	Measured Value – 60 dB	Measurement Uncertainty	Specification
10 MHz	2 GHz	1 MHz	1 kHz	dBm	2.0 dB	–142 dBm max
2 GHz	3 GHz	1 MHz	1 kHz	dBm	2.0 dB	–140 dBm max

Table A-9. MS2080A Displayed Average Noise Level (Preamplifier Off)

Start Frequency	Stop Frequency	RBW	VBW	Measured Value – 60 dB	Measurement Uncertainty	Specification
10 MHz	2 GHz	1 MHz	1 kHz	dBm	2.0 dB	–142 dBm max
2 GHz	4 GHz	1 MHz	1 kHz	dBm	2.0 dB	–140 dBm max

Table A-10. MS2070A Displayed Average Noise Level (Preamplifier On)

Start Frequency	Stop Frequency	RBW	VBW	Measured Value – 60 dB	Measurement Uncertainty	Specification
10 MHz	2 GHz	1 MHz	1 kHz	dBm	2.0 dB	–161 dBm max
2 GHz	3 GHz	1 MHz	1 kHz	dBm	2.0 dB	–160 dBm max

Table A-11. MS2080A Displayed Average Noise Level (Preamplifier On)

Start Frequency	Stop Frequency	RBW	VBW	Measured Value – 60 dB	Measurement Uncertainty	Specification
10 MHz	2 GHz	1 MHz	1 kHz	dBm	2.0 dB	–161 dBm max
2 GHz	4 GHz	1 MHz	1 kHz	dBm	2.0 dB	–160 dBm max

Table A-12. MS2070A Residual Spurs (Preamplifier On)

Start Frequency	Stop Frequency	RBW	VBW	Measured Value	Measurement Uncertainty	Specification
10 MHz	500 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
500 MHz	1000 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
1000 MHz	1500 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
1500 MHz	2500 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
2500 MHz	3000 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max

Table A-13. MS2080A Residual Spurs (Preamplifier On)

Start Frequency	Stop Frequency	RBW	VBW	Measured Value	Measurement Uncertainty	Specification
10 MHz	500 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
500 MHz	1000 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
1000 MHz	1500 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
1500 MHz	2500 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
2500 MHz	3000 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max
3000 MHz	4000 MHz	300 Hz	100 Hz	dBm	1.4	<–105 dBm, max

Table A-14. MS2070A Residual Spurs (Preamplifier Off)

Start Frequency	Stop Frequency	RBW	VBW	Measured Value	Measurement Uncertainty	Specification
10 MHz	500 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
500 MHz	1000 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
1000 MHz	1500 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
1500 MHz	2500 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
2500 MHz	3000 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max

Table A-15. MS2080A Residual Spurs (Preamplifier Off)

Start Frequency	Stop Frequency	RBW	VBW	Measured Value	Measurement Uncertainty	Specification
10 MHz	500 GHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
500 MHz	1000 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
1000 MHz	1500 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
1500 MHz	2500 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
2500 MHz	3000 MHz	300 Hz	100 Hz	dBm	1.4	<–94 dBm, max
3000 MHz	4000 MHz	300 Hz	100 Hz	dBm	1.4	<-88 dBm, max

Table A-16. MS2070A Input Related Spurious

Measured Input Signal (2086 MHz)	Measured Spur (400.5 MHz)	Calculated IRS (Input Signal – Spur)	Measurement Uncertainty	Specification
dBm	dBm	dBc	4.0 dB	< –70 dBc

Table A-17. MS2080A Input Related Spurs

Measured Input Signal (742 MHz)	Measured Spur (3500.5 MHz)	Calculated IRS (Input Signal – Spur)	Measurement Uncertainty	Specification
dBm	dBm	dBc	4.0 dB	< –70 dBc

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B

Anritsu utilizes recycled paper and environmentally conscious inks and toner.

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