TRU Quick Disconnect Products
Mating Durability Test Report

Objective
Test & characterize the mating durability of TRU Quick Disconnect Products (SQS, QRM, and QDS) over an extended number of mating cycles to simulate the lifetime performance of TRU quick disconnect interface(s). The test will measure and monitor the following parameters: VSWR, insertion loss, phase, and insertion / withdrawal force to determine their impact on electrical/ mechanical performance.

Test Samples
One (1) each cable assembly described below was subjected to the test.

Sample 1:  SQS Cable Assembly: 32.5” length, TRU-500 cable, Fig(s) 1-3
Connector 1: SQS (m) Plug
Connector 2: SQS (m) Plug, Right Angle
Adapter 1:  SQS (f) to QC (m) plus QC (f) to QC (f) block adapter
            plus 7-16 (m) to QC (m)
Adapter 2:  SQS (f) to QC (m) plus QC (f) to QC (f) block adapter
            plus 7-16 (f) to QC (m)

Sample 2:  QRM Cable Assembly: 33” length, TRU-500 cable, Fig(s) 4-6
Connector 1: QRM (m) Plug
Connector 2: QRM (m) Plug, Right Angle
Adapter 1:  QRM (f) to QC (m) plus QC (f) to QC (f) block adapter
            plus 7-16 (m) to QC (m)
Adapter 2:  QRM (f) to QC (m) plus QC (f) to QC (f) block adapter
            plus 7-16 (f) to QC (m)

Sample 3:  QDS Cable Assembly: 33.5” length, RG-393 cable, Fig(s) 7-9
Connector 1: QDS (m) Plug
Connector 2: QDS (m) Plug, Right Angle
Adapter 1:  QDS (f) to QC (m) plus QC (f) to QC (f) block adapter
            plus 7-16 (m) to QC (m)
Adapter 2:  QDS (f) to QC (m) plus QC (f) to QC (f) block adapter
            plus 7-16 (f) to QC (m)
SQS Cable Assembly

Fig 1

Fig 2

Fig 3

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QRM Cable Assembly

Cable assembly

Adapters

Fig 4

Fig 5

Fig 6

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FIG 7

FIG 8

FIG 9

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**Test & Inspection Conditions:**
All individual tests and inspections performed under the following conditions unless otherwise specified in the detail procedure(s):

**Environment:**
Temperature: Room Ambient, 59 to 86 deg F (15 to 30 deg C)
Relative Humidity: 20% to 80%
Barometric Pressure: Sea Level (650 to 800mm Hg)

**Configuration:**
Tests and inspections performed on a clean flat surface (bench or equivalent) in a clean well-lighted area, free of debris and foreign objects, unless otherwise specified.

**Test & Inspection Equipment:**
The following test equipment / tools / fixtures or equivalent were used to perform the tests & inspections.

**Electrical: (Fig 10)**
Vector Network Analyzer (HP 8753E) used on all electrical measurements
Applicable test port cables / adapters for each assembly, set up as applicable per figures 1-9
7-16 Calibration Kit (p/n: Maury Microwave 2750B)
Full 2 Port Calibration:
401 data points
30 Hz BW
S11 measurement = End 1 of cable assembly
S22 measurement = End 2 of cable assembly

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Mechanical: Fig(s) 11 & 12

Force Gauge(s):
- 250 X 2.5 lbs (Chatillon DPP-10) Used on SQS and QDS samples 1 & 3 per figure 11
- 10 X .10 lbs. (Chatillon DPP-10 ) Used on QRM sample 2 per figure 12

Stereo Magnifying Scope: Vision Engineering
Digital Height Gauge: Fowler-Trimos V300+

Test Procedure:
- Baseline electrical / mechanical tests were performed on each of the sample assemblies:
  - VSWR, Insertion Loss, Phase
  - Insertion & Withdrawal Force
  - Interface Dimensions, Visual Examination of Product
- Each sample was subjected to 2500 mating cycles.
  - Note: a cycle consists of 1 complete electrical / mechanical mating onto its corresponding mating adapter and 1 complete un-mating from its corresponding adapter.
- After every 250 cycles, all electrical / mechanical tests & inspections performed at baseline were repeated on each sample. The test results were summarized and recorded per the following data:
SQS
TEST DATA

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QRM
TEST DATA

Insertion Force
QRM

Withdrawal Force
QRM

Typical Insertion Loss
QRM

Typical VSWR
QRM

Freq: .3 MHz - 1.0 GHz

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Results / Conclusions:
TRU Quick-Disconnect Products meet / exceed 500 mating cycle rating, without any degradation to electrical / mechanical performance parameters.

The Insertion / Withdrawal force of TRU Quick Disconnect Products stabilizes and remains fairly constant after approximately 1000 cycles.

TRU Quick Disconnect Products will operate a minimum of 2500 mating cycles without any significant impact on electrical performance parameters.