

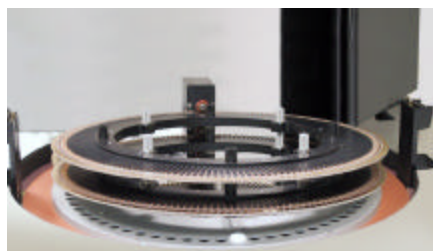


# W-2200 LOW FREQUENCY CRYSTAL DISC PALLET TEMPERATURE TEST SYSTEM

- Automated, software based quartz crystal temperature test system for low frequency crystals
- Up to 2 disc pallets can be stacked
- Standard sizes available include:

TYPE	DISC CAPACITY	TOTAL CAPACITY/ PER CHAMBER
DST-520, DST-621	160	320
DMX-26, DMX-26-S	160	320
DMX-38	100	200
SM-26F-A, SM-26F-B	160	320
SM-14-J	160	320
Leaded	100	200

- Custom sizes available
- Typical watch crystal measurement time of only 2 seconds
- Measures over 75 different parameters



- Parameter and curve fit characteristics are checked against easy to define QC limits
- Crystals of different frequencies can be tested in a single temperature run
- All data is published in a *Microsoft Access*™ data base
- Data can be exported to *Microsoft Excel*™ for custom data analysis
- Printouts are generated using *Crystal Reports*™
- Dual chamber configuration available

## SPECIFICATIONS

150K Ohm Test Head	
Frequency Range:	10 KHz to 400 KHz
Frequency Correlation:	+/- 1 ppm* at series (typical)
Crystal power:	1 nW to 1 uW into 20,000 Ohms
Temperature Stability:	±0.1 Degree C

\* Proprietary measurement and calibration algorithms provide correlation to industry standard crystal measurement equipment.

## SAUNDERS & ASSOCIATES, INC.

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# SYSTEM CONFIGURATION

- S&A 250B Network Analyzer
- S&A 2451 Switch controller (only required in dual chamber configuration)
- S&A 4220 Temperature Test Chamber (optional LCO<sub>2</sub> LN<sub>2</sub> or Mechanical Refrigeration Cooling)
- S&A 150K Ohm Test Head
- Computer Requirements: Minimum 500 MHz Pentium III, one full PCI slot with +5V & 3.3V power, and Windows 98
- Windows System Software
- Printer (Optional)

# SAMPLE REPORTS

**Crystal Plots**  
Run Name: Crystal Test Run  
Ref F: F @ 25.00°C (Set)  
Print All Operator: RMB  
Row A: Measured FL  
Row B: Measured FL  
Row C: Measured FL  
Row D: Measured FL  
Run Start: 10-Nov-2001 9:37 am  
Run Finish: 10-Nov-2001 10:15 am  
S&A W2200 Rev: 1722

**Crystal Condensed Plots**  
Run Name: Crystal Test Run  
Ref F: F @ 25.00°C (Set)  
Print All Operator: RMB  
Row A: Measured FL  
Row B: Measured FL  
Row C: Measured FL  
Row D: Measured FL  
Run Start: 10-Nov-2001 9:37 am  
Run Finish: 10-Nov-2001 10:15 am  
S&A W2200 Rev: 1722

**Crystal Tabular**  
Run Name: Example Run  
Ref F: F @ 25.00°C (Set)  
Print All Operator: RMB  
Row A: Measured FL  
Row B: Measured FL  
Row C: Measured FL  
Row D: Measured FL  
Run Start: 26-Oct-2001 4:51 pm  
Run Finish: 26-Oct-2001 6:34 pm  
S&A W2200 Rev: 1725

Setup: 12magv0	Setup: 12magv0	Setup: 12magv0	Setup: 12magv0	Setup: 12magv0
Ref F: 12,795,817 Hz	Ref F: 12,795,866 Hz	Ref F: 12,795,917 Hz	Ref F: 12,795,942 Hz	Ref F: 12,795,977 Hz
% FR ppm	% FR ppm	% FR ppm	% FR ppm	% FR ppm
25.01	0.00	4.92	25.02	0.00
8.01	0.01	5.13	9.01	0.08
5.02	0.32	4.98	5.00	0.79
8.88	0.44	5.03	10.00	5.24
15.02	0.50	5.03	15.01	10.84
20.00	0.36	5.02	20.00	15.00
25.00	0.09	5.05	25.01	20.00
30.02	-3.12	5.04	30.01	25.00
34.88	-3.39	5.03	35.00	30.00
40.02	-3.55	5.04	40.02	35.00
45.03	-3.52	5.06	45.02	40.00
49.99	-3.20	5.00	49.99	45.00
54.99	0.23	4.98	55.00	50.00
59.99	1.32	5.05	59.99	55.00

**Crystal Curvefit Summary**  
Run Name: Example Run  
Ref F: F @ 25.00°C (Set)  
Print All Operator: RMB  
Row A: Measured FL  
Row B: Measured FL  
Row C: Measured FL  
Row D: Measured FL  
Run Start: 26-Oct-2001 4:51 pm  
Run Finish: 26-Oct-2001 6:34 pm  
S&A W2200 Rev: 1725

**Crystal Curvefit Tabular**  
Run Name: Example Run  
Ref F: F @ 25.00°C (Set)  
Print All Operator: RMB  
Row A: Measured FL  
Row B: Measured FL  
Row C: Measured FL  
Row D: Measured FL  
Run Start: 26-Oct-2001 4:51 pm  
Run Finish: 26-Oct-2001 6:34 pm  
S&A W2200 Rev: 1725

**Crystal Setup File Parameters**  
Run Name: Example Run  
Ref F: F @ 25.00°C (Set)  
Print All Operator: RMB  
Row A: Measured FL  
Row B: Measured FL  
Row C: Measured FL  
Row D: Measured FL  
Run Start: 26-Oct-2001 4:51 pm  
Run Finish: 26-Oct-2001 6:34 pm  
S&A W2200 Rev: 1725

**Crystal Failures Only**  
Run Name: Example Run  
Ref F: F @ 25.00°C (Set)  
Print All Operator: RMB  
Row A: Measured FL  
Row B: Measured FL  
Row C: Measured FL  
Row D: Measured FL  
Run Start: 26-Oct-2001 4:51 pm  
Run Finish: 26-Oct-2001 6:34 pm  
S&A W2200 Rev: 1725

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