12.1 Getting Meaningful Numbers

Once an audio processor exceeds the simplest single-band structure, traditional performance specifications tend to become irrelevant. The usual test tone measurements will almost never reflect the performance of the processor under normal operating conditions. Specifications for dynamic conditions, if possible to measure, would require specially built measuring instruments unavailable to the user. Therefore, the user would be incapable of verifying the specifications.

The above facts notwithstanding, there is a demand from various entities for a set of standard specifications. The following list constitutes a rational set of specifications based upon typical or normal operation of the unit. The user should be able to verify these specifications by direct measurement using measuring instruments equivalent to the following types:

- 1. Audio Precision System One
- 2. Belar Laboratories FMSA-1 Digital FM Stereo Monitor
- 3. General purpose 100MHz oscilloscope

12.2 FM Pro Setup

The specifications will be given under conditions of the following FM Pro setup. The setup parameters, as given, establish the net gain and operating level approximately equal to normal operating conditions. The leveler is locked to zero dB gain while the multiband compressor is fully released. Any operating parameter not shown may be considered inconsequential to the specifications.

Unless otherwise specified, the analog measurements are taken from the FM Pro stereo multiplex output jack and decoded through the Belar FMSA-1 stereo monitor. Measurements are taken from the FMSA-1 left and right test outputs and analyzed by the System One, or measured directly by the FMSA-1 as indicated in the specifications list.

The FM Pro Setup for Specifications			
☐ Input/Output Menu —]	Limiter —	
Input Reference: Output Level: Input : Pre-process Filters:	+4dBu +12dBp Analog All Off	Master Drive Bass Drive Warm Bass Sub Bass	: +3dB : 0dB : 0% : 0%
Leveler		Pre-emphasis Limiter	
Rate: Gain limit: Atten Limit: DVG: Sticky: Silence Gate:	2 Sec 0dB 3dB Off Off Off	Limiter Pre-emphasis Hardness	: On : 75uS & de-emphasis : 50%
Multiband Compressor		Stereo Generator —	
Xovers: 200 Drive: -200 Release: All Mix: Adj (typ Coupling: All	, 2000, 10000 dB bands = 2 Sec . for flattest response bical +.8,0,-1.2,+1 Off	Mode Pilo Pilot Leve	: Stereo : On : 9%

12.3 Test Equipment Connections

Figure 12-1 shows how equipment was arranged for development of the specifications. It is not the intention here to instruct you specifically how to measure the specifications, however. Please refer to the section on test and calibration for detailed measurement instructions.





12.4 The Specifications

12.4.1 General Analog

Internal Frequency Response 1Hz to 70KHz +/- 0.1dB

Basic Pre-emphasis Accuracy +/- 0.1dB 20Hz to 15KHz disregarding any audio processing alterations

Basic THD (for all signals below clip threshold) Demodulated MPX output, 0dB 1KHz tone input, THD <0.05%

Active Process Distortion (typical worst case) Demodulated MPX output, 0dB 1KHz tone input, CHR factory preset, THD <0.5% Note: This typifies peaks only, and not signals below clip threshold.

Stereo Output Noise (left or right channel) CHR Factory preset, 20Hz-20KHz measurement bandwidth re 100% modulation = -70dB

Mono Output Noise CHR Factory preset, 20Hz-20KHz measurement bandwidth re 100% modulation = -71dB

Processing Peak Overshoot Less than 1.5% above 100% modulation

System Stereo Separation Greater than 65dB 20Hz to 15KHz

12.4.2 Analog Input

Configuration Left and right

Input Impedance 10K Ohms

Common Mode Rejection >70dB 50Hz - 20KHz

Sensitivity -24dBu to +10dBu for nominal input level

Maximum Input Level +27dBu

Connector Type XLR 3-Pin Female EMI Suppressed. Pin 1 chassis ground, Pins 2 & 3 electronically balanced, floating and symmetrical. Pin 2 in in phase with multiplex and digital output

12.4.3 Analog Line Outputs

Configuration Left and right. Flat or pre-emphasized

Source Impedance 62 Ohms electronically servo balanced

Load Impedance 600 Ohms or greater balanced or unbalanced. Termination not required.

Maximum Output Level +24dBu onto 600 ohms balanced, +27dBu unloaded

Connector

XLR 3-Pin male, EMI Suppressed. Pin 1 chassis ground, Pins 2 & 3 electronically balanced, floating and symmetrical. Pin 2 in in phase with multiplex and digital output.

12.4.4 Digital Input

Configuration Two-channel AES/EBU standard. Pre-emphasized or non pre-emphasized.

Sampling Rate 32, 44.1, and 48KHz auto detect and lock

Connector

XLR 3-Pin male EMI Suppressed. Pin 1 chassis ground, Pins 2 & 3 transformer balanced and floating

Input Data Size 20-bits

Input Frequency Response 1 to 20KHz +/- 0.1dB

Web Version

12.4.5 Digital Output

Configuration Two-channel AES/EBU standard

Sampling Rate Input clock-slaved or independently selected at 32, 44.1, or 48KHz.

Connector XLR 3-Pin Female EMI Suppressed. Pin 1 chassis ground, Pins 2 & 3 transformer balanced and floating

Output Data Size 20-bits

Output Frequency Response 1Hz to 20KHz +/- 0.1dB

12.4.6 Composite Baseband Output

Configuration Single output with output level control

Source Impedance 10 ohms suitable to drive long or short coaxial cable

Load Impedance 50 ohms or greater

Output Level Adjustable from 0 to 13V peak-to-peak with multiturn output control

Connector BNC, EMI Suppressed.

Maximum recommended cable length 100ft RG58A/U or equivalent. Use low capacitance coax for best results.

Pilot Level Adjustable 7% to 11% mix

Frequency Stability Pilot and subcarrier +/- 10ppm -50 to +80 deg C ambient

Stereo Generator Technology Aphex patented Parallel Path Digital Modulation (PPDM)

Pilot Phase Error 0 degrees guaranteed by PPDM design

Spurious Output better than -72dB above 55KHz, typical <-85dB

Subcarrier Rejection better than -60dB

Harmonic Distortion Better than 0.003% within stereo generator

Intermodulation Distortion Better than 0.003% within stereo generator

Frequency Response 1Hz to 15KHz +/1 0.1dB, -3dB at 0.159Hz and 15.5KHz

12.4.7 Remote Control Interface

Configuration RS232 standard serial port

Connector DB-9 male

Control capability All FM Pro functions and parameters

Connectability Null modem cable to P.C. or modem cable to modem

Modem Compatibility: U.S. Robotics Sportster. For others check with factory.

12.4.8 Power

Line Voltage Input 77 to 266VAC 50-1000Hz automatic (no selection required)

Power Requirements 50 Watts

Safety Standards CE, UL, CSA, VDE

12.4.9 Physical

Front Panel Size Standard 2-RU (3.5" vertical) 19-inch panel

Chassis Depth 13.125 in. not including rear connectors

Weight 14 pounds net, 22 pounds shipping

12.4.10 Environmental

Operating Temperature Range 32-122 deg. F (0-50 deg C)

Humidity 0 to 95% RH, non-condensing

end