12.0 Product Specifications

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

Input Reference:	+4dBu
Output Level:	+12dBp
Input :	Analog
Pre-process Filters:	All Off

Limiter

Master Drive:	+3dB
Bass Drive:	0dB
Warm Bass:	0%
Sub Bass:	0%

Leveler

Rate:	2 Sec
Gain limit:	0dB
Atten Limit:	3dB
DVG:	Off
Sticky:	Off
Silence Gate:	Off

Pre-emphasis Limiter

Limiter:	On
Pre-emphasis:	75uS & de-emphasis
Hardness:	50%

Multiband Compressor

Xovers:	200, 2000, 10000
Drive:	-20dB
Release:	All bands = 2 Sec
Mix:	Adj. for flattest response (typical +.8,0,-1.2,+1
Coupling:	All Off

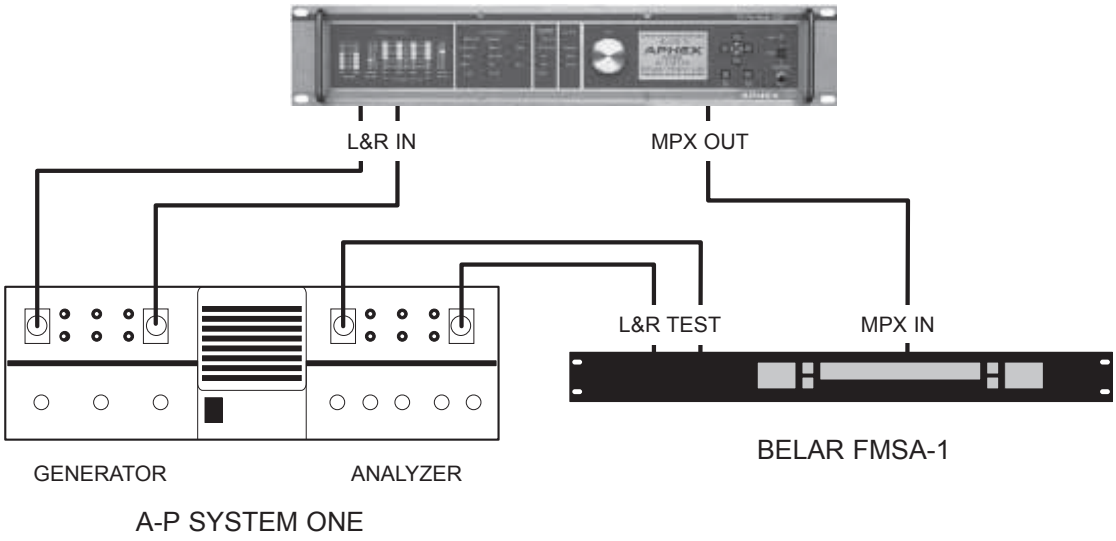
Stereo Generator

Mode:	Stereo
Pilot:	On
Pilot Level:	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.

Figure 12-1 Test setup for the specifications relating to analog I/O.



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

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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

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

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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