2.0 Product Description

2.1 The FM Pro Story

Aphex entered the world of broadcast audio processing with the Type II Aural Exciter in 1981. Since then Aphex has continued developing leading broadcast audio products. The Compellor became and remains the world standard automatic level controller. The Dominator became the world standard multiband peak limiter. The Digicoder, the only patented stereo generator technology, took its place as the world's best stereo generator. Together the Compellor, Dominator, Aural Exciter, and Digicoder comprise the Aphex Audiophile Air Chain which has gained worldwide recognition as the premiere FM audio processing system for transparent, lifelike transmission of sound. Worldwide, many leading broadcast institutions have adopted these Aphex products as their technical standard and continue to employ them exclusively in high grade radio and television network systems.

As proud as we are of the Audiophile Air Chain and what it achieves in its sonic purity, we realize many broadcast applications demand something else. For example, a need exists to literally design the sound of a radio station, i.e., to generate a unique and competitive air sound intentionally modified in certain ways. Also, the processor may be required to operate directly within a digital audio path. Furthermore, there is a demand for programmability, remote control, and day-part automation. We developed the FM Pro to fulfill all these needs and more. Naturally, we borrowed upon many of the proven and exclusive Aphex patented circuits to achieve a technically excellent design, but while we were at it we invented at least six additional new and innovative audio processing concepts giving the FM Pro truly advanced capabilities and performance.

2.2 Description

The FM Pro is not just a boxed-up combination of prior Aphex products. It is a totally new and advanced audio processing system tailored especially to the demands of FM broadcasting. Competition ready, the FM Pro is completely adjustable from detailed and neutral to heavy and loud. Thanks to the numerous design innovations, even at extreme settings exceptional audio quality is maintained. Unlike the competing digital or analog audio processors which afford relatively little flexibility, the FM Pro is a virtually sound designer's palette allowing you to paint a truly unique and competitive on-air sound. Don't be misled, however, the FM Pro can just as well be set up to sound as neutral and transparent as desired.

Modular design makes the FM Pro space-saving and cost efficient compared to other processors. Plug-in options are easily field installed and can be shipped to specification. Sixteen recallable user presets are provided for manual selection or day-part automation. For convenience, eight factory presets covering a variety of formats are built-in to get you up and running quickly. Day-part automation is completely self-contained and driven by an accurate internal clock/calendar timer. Front panel operation is made easy and intuitive through the logical menu tree. An RS232 port permits remote control and monitoring of the FM Pro from almost any location through the use of a standard personal computer and a serial cable or modem. A simple but effective supervised password system can be engaged to maintain security over the FM Pro's operation. Fail-safe operation is assured by a power-off internal relay bypass of both the analog and digital audio I/O circuits. Power-up fast recovery gets the FM Pro back on line with all programmable parameters set correctly and operating in just a few tenths of a second. The front panel displays are more than token indicators. They indicate the actual operation of all major process functions in real time.

2.3 Applications

The flexibility of the Aphex FM Pro makes it suitable for nearly every FM broadcasting entity from government owned to purely commercial. Whether your audio system contains analog, digital or both formats, the FM Pro can be configured to fit in perfectly. Fully adjustable parameters allow you to optimize the FM Pro for any program format: classical music, talk, even heavy metal. Automated transformation of processing parameters by the day, hour, and minute allow radio stations with varying formats to tailor the FM Pro exactly as required for each day-part. Although the FM Pro is intended mainly for FM broadcasting, it will find many interesting applications in other fields where absolute audio control and flexible sound tailoring are desired. Digital and analog mastering, recording, satellite uplinks, and amplified sound are just a few examples.

2.4 FM Pro OPTIONS

	Analog Stereo Input	Analog Stereo Output	AES/EBU I/O	Pre-Emp Limiter	PPDM MPX Output
Basic	X	X			
Option 1	X	X	X		
Option 2	X	X		X	
Option 3	X	X		X	X

2.5 FUNCTIONS AND FEATURES

1. Analog and Digital Stereo Inputs
2. Input processing functions
   a. 20Hz Highpass Filter
   b. 16.5KHz lowpass filter
   c. SPR process
   d. Selectable external processing loop patch
3. **Frequency Discriminate Leveler**
   a. Improved parametric controls
   b. **New "sticky" leveling feature**
   c. **Selectable patented "DVG"**
   d. Selectable silence gate
   e. Adjustable silence gate threshold
   f. Adjustable AGC upper and lower control limits
4. Multiband compressor
   a. 4-bands
   b. adjustable crossover frequencies
   c. **Easyrider compression**
   d. **"Peak Accelerated Compression" (PAC) algorithm**
   e. Band-by-band stereo elastic coupling
   f. Band-to-band forward elastic coupling
   g. Adjustable compression drive
   h. Separate adjustable release time per band
   i. Selectable stereo hard coupling
   j. Compression drive control
   k. Output band mixing facility
   l. **New "post crossover" multiband technique**
   m. High or Low selectable ratio
5. Bass Processor
   a. **Distortion canceled bass clipper**
   b. "Warm bass" equalizer
   c. "Sub Bass" equalizer
   d. Total "Bass Mix" control
6. Peak Limiter
   a. **Bass interactive to reduce intermod distortion**
   b. Instant processing, i.e., no pumping
   c. Zero overshoot
   d. Master drive control configures loudness factors
7. Optional pre-emphasis processor
   a. **Special 50 or 75 microsecond pre-emphasis filter**
   b. Digicoder type pre-emphasis limiter
   c. Digicoder type non-overshoot final lowpass filters
   d. Output ready for any stereo generator
8. Optional digital I/O module
   a. AES/EBU format up to 20 bits
   b. Selectable output sample rate: 32K, 44.1K, 48K
   c. Auto "lock on" for input rates of 32K, 44.1K or 48K
   d. Input and output sample rates separately selectable
9. Optional Digicoder stereo generator module
   a. **Digicoder type PPDM stereo generator**
   b. Analog multiplex output
   c. stereo/mono mode switching
   d. Pilot on/off
   e. trimmable multiplex output level
10. Digital remote control
    a. RS232 digital interface
    b. Windows 3.1 or 95 virtual control panel software
    c. Complete operating capabilities
    d. Complete visual real time meter displays
    e. Password security options
11. Front panel user interface
    a. LCD graphics panel display
    b. Password security features
    c. Rotary encoder knob
    d. Up/Down, L/R cursor buttons
    e. Menu selection system
    f. Real time LED bargraph meters for:
       1. Leveling
       2. 4-band compression
       3. Limiting
       4. Stereo input VU
    g. Real time LED indicators for:
       1. 16.5KHz Lowpass
       2. 20Hz Highpass
       3. 50/75uS Pre-emphasis
       4. SPR
       5. Analog In selected
       6. Digital in selected
       7. Digital data presence
       8. DVG
       9. Sticky on/off
       10. Silence gate
       11. L><R hard couple
       12. L><R elastic couple
       13. 1><2 couple
       14. 2><3 couple
       15. 3><4 couple
       16. Analog output presence
       17. Digital output presence
       18. Bypass on/off
    h. Headphone monitor selector
       1. Monitor input signal & volume
       2. Monitor output signal & volume