I.C.C. 3000 ELECTRONIC SPECIFICATIONS

In the I.C.C. 3000 audio control console each function for the console is separated into it's own plug-in module. The names of the modules which comprise a channel in the console are as follows:

A. PREAMP MODULE
B. INPUT SELECTOR MODULE (upper)
C. TRACK ACCESS MODULE (upper)
D. SIGNAL PROCESSOR MODULE
E. BUS ASSIGNMENT MODULE
F. INPUT SELECTOR MODULE (lower)
G. TRACK ACCESS MODULE (middle)
H. OUTPUT ASSIGNMENT MODULE
I. TRACK ACCESS MODULE (lower)
J. FADER MODULE (Fadex)
K. ARMREST MODULE

All but three of the eleven modules listed above are passive. The noise and distortion of these passive modules can be considered to be non-existent. Double gold contacts and conductive plastic potentiometers are primarily all that exists in the signal path of these passive modules. For this reason, we shall discuss only the specifications of the remaining three modules. These are:

1. PREAMP MODULE
2. SIGNAL PROCESSOR MODULE
3. FADER MODULE (Fadex)

The PREAMP MODULE is built around the respected VALLEY PEOPLE Transamp with modifications to the circuit to allow guitars and other instruments to be plugged-in without the use of line-tap boxes. Also, a Patents Pending mic-damping circuit is included which can, in nine steps, simulate high quality microphone transformer sound although this is a transformerless console. Photocopies of VALLEY PEOPLE Transamp specifications are enclosed and are representative of the I.C.C. 3000 PREAMP MODULE specifications.

The PREAMP MODULE in the I.C.C. 3000 is powered from highly regulated plus and minus 18 volts. Audio and other grounds are separated and over-built in the PREAMP MODULE. Trimmers have been eliminated and instead, precision resistors and parallel resistor positions on the circuit board are utilized

The SIGNAL PROCESSOR MODULE is used to equalize and limit the signal. The circuit design was a joint venture between I.C.C. and Advanced Audio Inc, of Provo, Utah.(Patents are pending.) The circuit utilizes five active bandpasses whose curves have been carefully designed with the aid of a computer to assure that they can combine to provide any desired frequency response with no audible phase shift. The following specifications were measured on a Sound Technology analyzer at the laboratory of Pendleton Electronic Industries, an independent firm. A Mr. Kent Pendleton oversaw the testing and his statement follows:

" I, Kent Pendleton, was present during the testing of the equalizer-limiter which is used in the I.C.C. 3000 audio control console and testify that all tests were conducted in accordance with standard industry practices and that the following conditions and results were achieved." Signed: G. Kent Pendleton,
Pendleton Electronic Industries, 254 North, 2250 West, Provo, Utah. Phone: 1-801-377-3331.

Test conditions: A typical Signal Processor Module was extracted from an I.C.C. 3000 console and placed vertically on the test bench. Plus and minus 18 volts of regulated power was applied through 6 foot cables to power the module. The module was not shielded except in the front by the modules' faceplate. The noise-carrying ground and the audio ground were connected together at the center of the two supply bypass capacitors. The limiter Vactrol was removed from the feedback path of the equalizer so as not to inhibit equalizer specifications during the maximum output readings. The VU meter power connections in the module were connected to the same plus and minus 18 volt regulated supply. The metal portion of the module faceplate was jumpered to ground. A Sound Technology distortion analyzer was used for measurements. A Hewlett-Packard oscilloscope was used to visualize distortion product waveforms. The following specifications were realized with a 0-80KHZ bandpass and a 600 ohm load:

Available boost or cut----------	20 dB	
Maximum output before clipping----------	Plus 24 dBv	
Frequency response----------	23-24 KHZ plus or minus 1dB	
Noise with controls set at unity----------	Minus 92dB referred to 1.23 volts RMS (plus 4 dBv)	
Slew rate----------	13 volts/microsecond	
I.M. distortion at unity setting with 1.23 volts output ----------	.005%	
Total harmonic distortion with controls set at unity gain and 1.23 volts output----------	20 Hertz	.0032 %
	50 "	.0030 %
	100 "	.0032 %
	1000 "	.0032 %
	10K "	.0035 %
	20K "	.0034 %
	30K "	.0035 %
	40K "	.0037 %
	50K "	.0038 %

By shorting the input in the above test, the meter reading fell to .0028 %. This demonstrates that our distortion measurement is mostly noise. This was verified on the Hewlett-Packard oscilloscope. We then decided to see what the equalizer circuit could really do, so we boosted all five controls to their maximum setting and drove the output to plus 22dBv. This would never happen in reality but the resulting specifications are as follows:

20 Hertz	.030 %
50 "	.015 %
100 "	.0097 %
1000 "	.0094 %
10K "	.0128 %
20K "	.0112 %
30K "	.0076 %
40K "	.0060 %
50K "	.0052 %

Turning any one knob up with the other four knobs all the way down yields even better specifications. This demonstrates that the circuit is very clean even when providing a high degree of equalization.
Because the noise is inaudible and yet is by far the biggest portion of the measure-

ed figures, we feel that the circuit can be considered distortionless in practical application. End of test.

The FADER MODULE(Fadex) specifications are only limited by the VCA which is utilized. In this case, an EGC-205M.

A reprint from the Valley People specifications sheet is enclosed.

This completes the discussion of channel electronic specifications with the exception of three points which we would like to make.

Point One:

In the future we will see improvements in VCA"s, Signal Processors and Preamps. With the I.C.C. 3000 you can un-plug your outdated VCA, Signal Processor, or Preamp and plug in the improved version. This gives the buyer of this system an incredible 'hedge' against obsolescence.

Point Two:

The quality of sound is not affected as it passes from a channel into and through the Master Electronics of the console because only one bus amplifier is added to the signal path. The noise and distortion of the bus amplifier is never a factor in the sound quality because the noise gates disconnect non-playing channels from the input to the bus summing amps which allows these summing amps to operate with very little gain

Point Three:

(Question)
Will Digital consoles make the I.C.C. 3000 obsolete?

(Answer)
To match the specifications of the I.C.C. 3000 with a Digital console would require technology costing probably ten times as much.

INTERNATIONAL CONSOLES CORPORATION

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EGC-205M
SPECIFICATIONS
(Typical Performance)

Audio Section

Input Configuration	-Current summing point, virtual ground
Max Input Level	- ±2mA (+27dBv w/13K input resistor)
Output Configuration	- Voltage Output, 33 ohm impedance
Max Output Level	- +22dBv into > 1K, +19dBv into 600 ohm
Gain Control Range	- +50dB to -125dB w/13K input resistor

Output Noise

@ Max Attenuation	- -110dBv (20-20KHz)
@ Unity Gain	- -87dBv (20-20KHz)
@ 20dB Gain	- -78dBv (20-20KHz)

Modulation Noise - At least 100dB below signal level

Distortion

1 KHz THD	- Less than .008% at any signal from -20dBv to +20dBv, at any gain setting from -20dB to +20dB
10 KHz THD	- Less than .015%
75 KHz THD	- Less than .25%
SMPTE I.M.D.	- Less than .015% at any signal equivalent from -20dBv to +20dBv, at any gain setting from -20dB to +20dB

Bandwidth

Frequency Response	- d.c. to 100KHz (3dB point)
Full Power Bandwidth	- >150KHz without slew induced triangulation, input or output
Slew Rate	- 13v/usec, input or output

Maximum Attenuation
(+20dBv input through 100k)

@ 100Hz	- 125dB
@ 1 KHz	- 120dB
@ 10KHz	- 105dB
@ 20KHz	- 100dB

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TELEX 558610 VAL PEOPLE NAS
a merger of Allison Research & Valley Audio

TRANS-AMP LZ TRANSFORMERLESS MIC PRE-AMP
Typical Specifications

GAIN RANGE - Adjustable from +12.5 dB to +51.5 dB
MAX. INPUT LEVEL - +10 dBv
NOISE FIGURE - @ 60 dB gain - 1 dB (EIN =-129.8 dBv RE .775V)
DISTORTION - IM = .006% at +22 dBv out into 600 ohms
THD - @10 HZ. = .006% at +22 dBv out into 600 ohms.
@1 KHZ. = .006% at +22 dBv out into 600 ohms.
@10KHZ. = .006% at +22 dBv out into 600 ohms.
@20KHZ. = .006% at +22 dBv out into 600 ohms.
FULL POWER BANDWIDTH - 1HZ to 150 KHZ at any gain setting.
SLEW RATE - 13V/µSec.
C.M.R.R. - Typically in excess of 100 dB.
OUTPUT CAPABILITY - +22.5 dBv into 600 ohms or greater
SOURCE IMPEDANCE - 50 to 600 ohms(for optimum noise performance)
INPUT IMPEDANCE - Greater than 10K ohms.
OUTPUT IMPEDANCE - 22 ohms.
POWER REQUIREMENTS - Bipolar 18 VDC Current Consumption - 25ma. full outp