APHEX DRIVE
This controls the amount of drive to the
Aphex side chain. It should be set so the
red/green level indicator is green, flashing
red on signal peaks. The effect is level dependent and sufficient drive is necessary for proper harmonic generation.

Sets the corner frequency of the high pass network between 700 Hz and YRLL, hithlis set— ting should be 12 o'clock. A lower setting is suggested for bandwidth limited mediums. A wast effective setting may also depend on the program material (e.g. -voice overs, a set— ing turned to maximize intelligibility on voices.

DAMPING
Adjusts the damping ratio of the side chain filter network giving somewhat of an equaliting effect. GCW produces a latter, more ever response, while CW will result in a brighter, more ever peakler sound. The overall effect will be somewhat interactive with the tuning contr.

A 12 o'clock setting is suggested for initial set up.

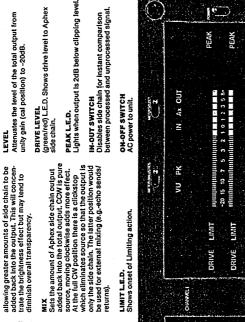
TIMBRE
The most subtle yet useful control, Timbre
veries the spectral quality of the generated
harmonics. Pure even (cxv) are warn, round
and musical. Pure add (cvv) are sharpor and
will greatly enhance the percussive edges o
the signal. Settings will depend greatly on

the harmonic structure of the particular tracks being processed and how prominent the tracks are within the mix. This control will be finally set more by "leef" than by listening.

### LIMITER

Because the generated harmonics are tevel of dependent, high signal peaks may cause a splashiness. To prevent this, the Limiter is used on the side chain only. The level at which the Limiter is east of the Limiter is the Limiter from fast CGW to Stower CW. If the Limiter from fast CGW to Stower CW. If the Limiter is assess the release time of orlock Lengthening the release will cause to Cock. Lengthening the release will cause the Limiter to act more like a compressor,

LEVEL



OTP-CT

LMITER

AUG

AL DRIVE

**APHEX II** 

A NEW

GENERATION **OF AURAL**  PEAK

APHEX II STUDIO AURAL EXCITER

CHANNEL

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FROM

EXCITEMENT

-THE ORIGINATORS OF

**AURAL EXCITEMENT** 

APHEX SYSTEMS, LTD.

EAB.

D. MCK

TMESE

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EVE

ar C

generate a brighter, cleaner, more natural high end. Tests have shown that listener presented with two signals of equal amplitude and different duration will perceive the signal with longer duration as louder.

Another important difference between 2 the Aural Exciter and other processing to equipment is, the Aural Exciter will not in-a duce listener fatigue the way large amounts of equalization or other processing will. The Fletcher-Munkon curves show that a listener with normal hearing is most sensitive to changes in the 3 to 5 KHz range. This range is critical for direction perception and intelligibility. Since the Aural Exciter is especially effective in that frequency range, the increase in detail and presence, due to the Aural Exciter, is most dramatic.

standard in the music industry and has been used for years on thousands of a labura, movies broadcast productions, commercials and concerts. The Aural Exciter is now accepted as a unique method to achieve clarity, definition and dimensionality in reproduction of sound. The

The Aphex Aural Exciter has become a

**ALL NEW DESIGN** 

COMPLETE CONTROL OF ENHANCEMENT PARAMETERS

**MENT ANY PROGRAM** 

FLEXIBILITY TO COMPLI-

MATERIAL

program material literally "opens up," possessing more detail and intelligibility, as well as greater apparent frequency and dynamic range. The sound quality is less subject to degradation through the various generations and transmissions

from production to final consumer.

FAST, ACCURATE

**ELECTRONIC METERING** EASILY INTERFACED WITH

TRONIC COMPONENTRY

**MOST ADVANCED ELEC.** 

In summary, the total effect of the Aural Exciter is directed towards a sound closer to the original acoustic event.

### STUDIO USE

Aphex processing gives the best results and the greatest flexibility in mixdown applications, but can also be used in tracking and mastering.

effects by creating a signal composed of frequency dependent phase shift, amplitude dependent harmonics, and mixing this signal with the original. The Aphex Aural Exciter achieves these

**ANY SYSTEM** 

able, the mix or stereo busses can be used with reduced flexibility in a "blanketing" effect. It sounds best if the Aural Exciter pan follows the original track pan. This is easiest if two post-fader sends are used to Aural Exciter channels A and B. It is best used in a foldback configura-tion similar to echo or other external effects, where channel sends can be individually mixed. It separate monitor, echo or cue sends are not avail-The only way a listener can differentiate between instruments is through overtones. The louder the fundamental the greater the amount of these overtones. The Auda Excite generates harmonics in the same manner. The harmonic structure of each instrument is thus strengthened, allowing it to stand out from the other instruments. An equalizer can only cut or boost a particular section of the audio spectrum.
Therefore, if an equalizer is used to brighten the high end, all the noise and distortion will increase also. The high end of the input to the Aural Exciter can be rolled off and the Aural Exciter can

In any natural acoustic environment a listener will hear the primary signal as well as slightly delayed, low level reflections. The phase shifted signal, when mixed back into the original signal, provides a simulation of these reflections, thus generating more natural ambient information. Because the phase shift creates time delays too short to be perceived as an echo or reverb, it is perceived as an increase in the impulse

"dead spots". It will spread the sound more evenly without adding any level to the total mix. The unit's ability to bring voices and instruments out makes it

FILM AND VIDEO USE
The Aural Exciter has been used on many videotape and motion picture productions to enhance the sound-track by recapaturing the live feeling

The send levels must be high enough for proper harmonic generation. The return faders should then be set 10 to 20 dB below the main signal according to the desired effect. The effect is addictive, and discretion is advised so that the unit is not overused.

### SOUND ENFORCEMENT

The Aural Exciter can be used with most public address systems in the same manner as studio equipment. If separate echo or monitor sends are not available, the unit can be connected in series between the mixer and power amp. In this situation, the Aural Exciter mix would be introduced into the chain in the mix pot.

Aphex processing is especially useful in reverberant halls or halls that have especially useful for monitor mixing, without increasing feedback.

It is unique in its ability to sharpen dialogue, making voices more intelligible while retaining their natural quality. The looping process often required to complete at film or video work is greatly aided by the use of the unit as the Aural Exciter allows the engineering to the the loop sound much more closely to the live sound. The effect is maintained it transfer from magnetic tape to optical and kept hitact through duplication. often lost or impaired in location takes

Video and film audio are both band-width limited and compressed. The Aphex II is especially useful in creating the perception of higher fre-quencies and greater dynamics, thus bringing more presence and clarity to the final product.

For best results, establishing correct levels is important. For that purpose, the dynamic range is internally selectable to maximize signal to noise ratio for any particular reference level.

Metering reference level is selectable for 0 VU = 0, +4, +8 dBm. or user definable position.

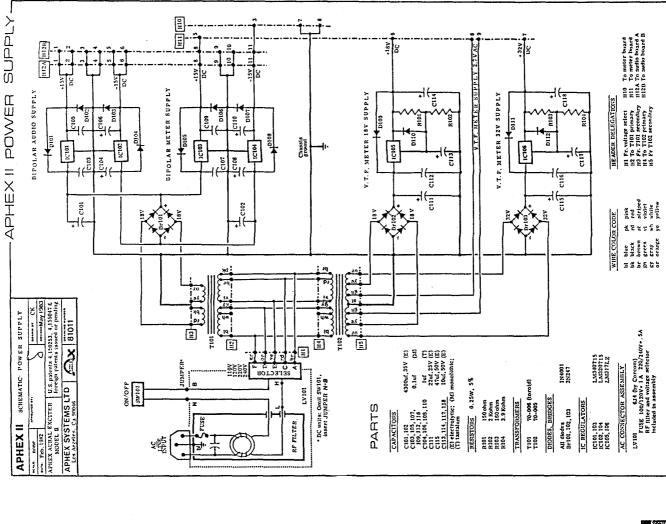
# CIRCUIT DIAGRAMS & LAYOUTS

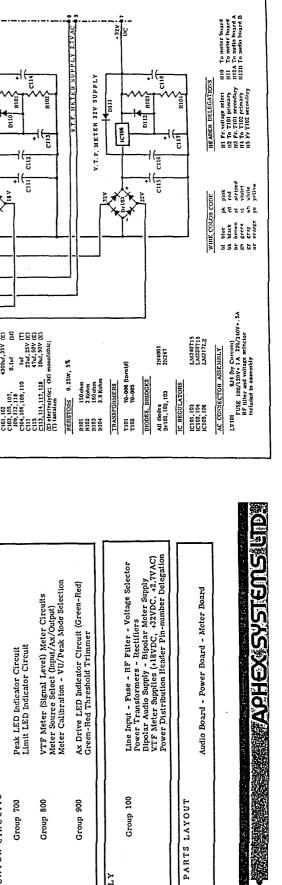
	Balanced Instrumentation type Input Amplifier Input Level Selection (+27, +24, +21dB or option) Calibration Trimmers - VTF Meter Input Level Feed	Side Chain Circuit - Hichpass Filter - Tuning Dampting - External Sidechain Access & Reference Drive Control - Drive (Green-Red) Detector Feed Timbre Control (Odd/Even Harmonics)	rimmer Circuit no Isolator	it T-Release Control i Feed	Output Circuits - Ax Solo/Mix Switching Ax Solo/Mix Switching & Ax Level Control Total Output Level Control and Calibration Trimmer Output Level Select (+27, +24, +21dB or option) Output Amplifice - Balanced Floating Transformer Peak LED Indication Feed - VTF Meter Ax Feed VTF Meter Output Level Feed	put Option
TS	Balanced Instrumen Input Level Selectio Calibration Trimme	Side Chain Circuit - Highpass Filter - Damping - External Sidechain Access & Drive Control - Drive (Green-Red) Det Timbre Control (Odd/Even Harmonics)	VCA Circuit - Bias Trimmer Proof Operate In/Out Circuit Remote Ax In/Out Opto Isolator	Limit Detector Circuit Threshold Control - T-Release Control Limit LED Indication Feed	Output Circuits - Ax Solo/Mix Switching Ax Solo/Mix Switching & Ax Level Contr Total Output Level Control and Calibratic Output Level Select (+27, +24, +218B or o Output Amplifier - Balanced Floating Tr Peak LED Indication Feed - VTF Meter VTF Meter Output Level Feed	Transformerless Output Option
A SIGNAL PATH & PROCESSING CIRCUITS	Group 200	Group 300	Group 400	Group 500	Group T-600	Group E-600
A SIGNAL PATH &	<del>)</del>		DRAWING No 81010			

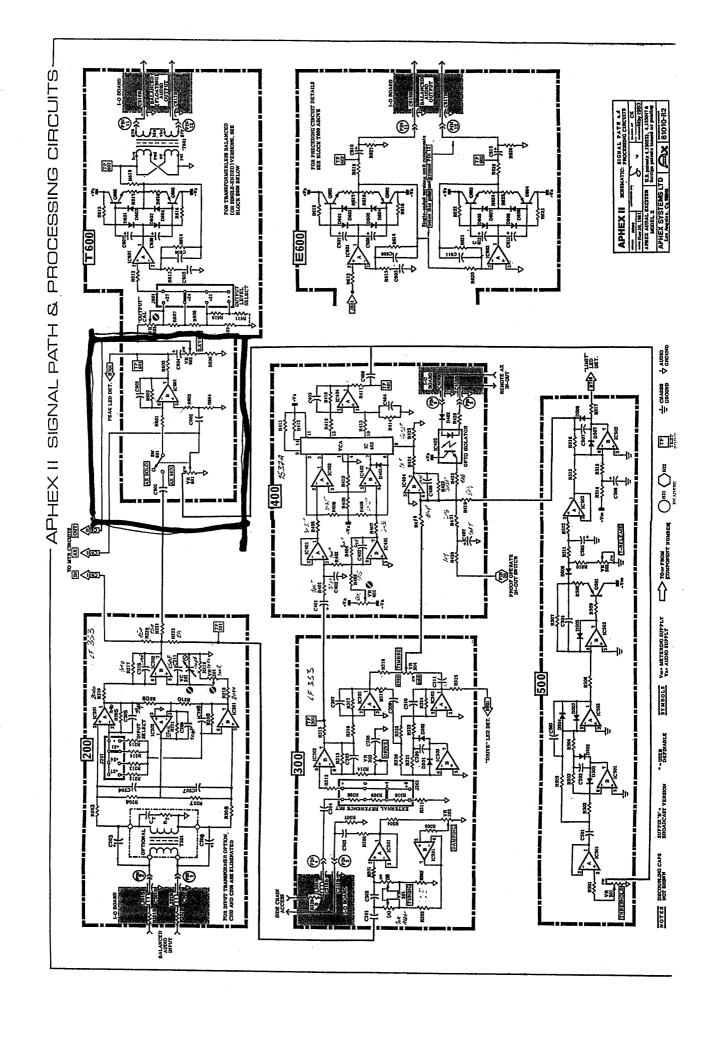
	Peak LED Indicator Circuit Limit LED Indicator Circuit	VTF Meter (Signal Level) Meter Circuits Meter Source Select (input/Ax/Output) Meter Calibration - VU/Peak Mode Selection	Ax Drive LED Indicator Circuit (Green-Red) Green-Red Threshold Trimmer
CIRCUITS	Group 700	Group 800	Group 900
METER & INDICATOR CIRCUITS	)	No 81012	

	Line Input - Fuse - RF Filter - Voltage Selector Power Transformers - Rectifiers Bipolar Audio Supply - Bipolar Meter Supply VITF Meter Supplies (+18 VDC, +22VDC, +2.TVAC) Power Distribution Header Pin-number Delegation
	Group 100
POWER SUPPLY	DRAWING No 81011









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THE SCHEMATIC IN DRAWING NO, 81010 IS ARRANGED BY PUNCTION GROUPS WITH IDENTIFYING COMPONENT NUMBERS GROUPS (700 THROUGH 800). THE SAME SYSTEM IS ALSO USED IN THIS LISTING AND ON PC BOARDS.

SUPFIXES 'B' AND 'S' RESPECTIVELY DESIGNATE SUCH COMPONENT IMPLEMENTATION AND VALUES.

FOR FUNCTION/COMPONENT GROUPS 100, 708, 800, AND 900, SEE RESPECTIVE DOCUMENTATION

600	SUMMING and OUTPUT	
200	LIMIT DETECTOR	
400	VCA	
300	SIDE CHAIN	
200	INPUT	

# RESISTORS

	2		6	L		_				۲.
		-	*1			91	•			ņ
RZ01B.Z0ZB	X	R301	2	R-101, 402	1080	1050	180 5	בייו פייז		
R203B	8x66 1	R302B	186	B403	110	2000		2001.004	OVO.	_
R203S, 204, 205	1000	B3028	5		1	N305. 303	TOWN	room	2.0	<u>_</u>
02060	35/10	2000		3	ONOI	R204	1000	1604	10010	•
0070	90.00	noon n	2	R405 - 408	3832	11505	2000	8605	95	
RZ065, 201 - 210	1000	R303S	576	R409	4482	B506	1 031	17.5	17.5	, ,
R211	330K0 S	R304	150R 5	8410	2010	2507	1 2 2 2 2	2001	:	
R212	20K0 1	R305	200	R411. 412	115.12	2050	204	2094	200	
R213	11K0	R306	1508 8	2174	1000	200		Kong	820H	•
8214	SEE 1	2102			OXOT	E002H	\$ 1001	R609	260	•
1931 con definible		200	2	H-114	2000	1 R510	150K0 5	R610, 611 user definal	ble	_
TOTAL PERMITTER		200	1000	8415	1000	11511	487 5	8612	1 140	
8718	ZOKO	H209	9X1	R416	2000	8512	180 5	BA13 /eness champal		
Ker	OXO	R310	5K6 5	R417	1508	1651	1 071	Deta de la company	200	
R218	20K0	1112	toku	8170			2	LOCAL CHARGED	123	_
R219	1000	8313			1471	1014,010	c oxi	R515,616	2K7	2
B230 221	9	-	2	H419	5K9	R516	24K3 1	R617,618	4R7	,
0110			S DXD	R420	181	RS17	1508 5	R619	100	
777	280	K314	430R S	R421	316			8620 621		, .
		R315	1508 5	R422	7 931	UPENT "TE	"Tubecuor p tow 10.	2000	2	-
VR201 trimmer	HOOR	R316	20X0	B423			The state of the total	H022,023	28.	
		R317	5	1	- Park		ILE LEADE IN III	K624, 625	4 H 7	_
		2112 310		27.5	- PX	_		R626	TOR	s
			C NOCT	8425	40R2 1			R627 828	0.7001	_
		R320, 321	20K0	R426	1 KO 1	_			200	,
		K322	4K39 1			_		****	1	-
		F R323	1000	VR401 trin	trimmer 50K			V 10 10 10 10 10 10 10 10 10 10 10 10 10	0	-
		R324	2183					אוויינים ורבאבר יונו	E 1 401	-
		R325	5 805					trimmer	_	
		R326B	IK.							
				_						-
		VR101 "TUNING" (Aual)	=							-
										-
		(B) reverse log	SOK	_						-
			_	_						_
			-	_		_				-

# CAPACITORS

C601 224/259 C602 3714 C603 224/259 C604 224/269 C605 224/269 C607 608 224/259	
20pf C60 20pf C60 20pf C60 2.2uf C60 2.2uf C60 20pf C60	5888
01 02 03 03 12 04 04 05 05 07	
1991 CS02 1991 CS02 1991 CS03 1991 CS04 1725V CS08 2941 CS08	Jdoop
C401 C402 C403 C404 C406 C406 C406 C406 C406 C406 C407 C407	C409B, 410B feedtrough
224/25V 204 204 204 204 204 15pf 20pf	10pt 27uf 1000pt
C301B, 202B C301S, 302S C303, 304 C306 C306 C307 C308 C309	C310 C311 C312B, 313B feedth
22uf/25v 22uf/25v 39pf 22uf/25v 33pf 10pf 20pf 15pf	2 - 10pf
C201D, 202B feedbh C200 C204, 203 C206 C207, 208 C210, 2118 C211B	VC201 trimmer

# SEMICONDUCTORS

LF353 LF351 1N914B MJE181
LF153 IC601 1N914B IC602 MJE171 D601 - 608 Q601, 603
LF353 1N914B MJE171
LF153 1C501, 502, 503 1537A D501 - 508 LF153 Q501 4N37
LF353 IC401, 402 IN914B IC403 IC403 IC403 IC405 IC401 IC405
LF353 1N914B
IC301, 302, 303 D301, 302
1.5353
10201,202

# TRANSFORMERS INDUCTORS

	•	JE-123-AL
-		tont Chensen)
H70001 1000TH		
1000uH	JE-11P-9	
L201B, 202B	T201 (Jensen)	

aal values are ohise (r) and k-ohise (r): Fixed resistors are 1/4 watt unless otherwise specified: The resistors are design if ferings are metal film; 5º resistors are cardon film; Tr resistors are designituted for 50. Decoupling Capacitors are not shown in the Schematic or listed above. CAPACITORS: RESISTORS

Vo board-located rp-filter components are found only in broadcast models and carry 10's upfix above. RF FILTERS:

Switch swedi is part of "ax-agx" Level control potentiometer vredi.

J201, J301 AND J601 ARE USER-ADJUSTABLE LEVEL-SET ACCOMODATIONS.

JUMPERS: SWITCH:

 $\Theta$ 

COMPONENT IDENTIFICATION NUMBERS ARE ARRANGED IN FUNCTION GROUPS 1907, 300 NG INC. THE PROPERTY OF THE PROPERT THE SCHEMATIC IN DRAWING NO. 81012 ILLUSTRATES COMPONENT LOCATIONS AND CIRCUITRY INTERFACE ARRANGEMENTS BETWEEN RESPECTIVE PC BOARDS.

FOR BOTH.	900
PARTS CHANNEL 'B' AND 'IN DESTONATIONS ARE COMMON FOR BOTH.	800
PARIS CHANNEL B. AND	700

	GREEN-RED INDICATION	
	V. T. F. METERS	The state of the s
	PEAK/LIMIT LEDS	

## RESISTORS

130	36 KO	1210	26K0	1,46	150,00	15K0	ex	150R	150K0	0X1	1508			154	7		330R		trimmer 18				
R901	R902	R903	R904	R905	B306	R907	R908.909	R910	R911	8912	R913	!	R951.961	R952, 953	R962 963	R955, 965	R956, 966		TOSUA.				
10000	82 KO	\$6K0	3980			2780	47.60	1870		150R		100K0	10000	200KO	36,00	68,00	150R	2	2 5	0000	620R	3	20K
_				user definable					user definable			53	63										trimmer
R801 th 809	R810	R811	R812	11813	R814	R815	R816	R817	R818	R819		R851,852,8	R861, 862, 863	R854,864	R855,865	R856,866	R857.867	12871	24.73	1780	R875	17061 050	VR861.862
110	39K0	150K0	1 K0	12K0	15K0	3980	150K0	1.0	39K0		620R	620R											
	104										153, 754	763, 764											
R701	R702, 703, 704	R705	R706	R707	R708	R709	R710	R711	R712		R751, 752, 753, 754	R761, 762, 763, 764											

# CAPACITORS

			-		
C701	10pt	C801,802,803	. 15ef	C901, 902	. 1uf (M)
201,101,101	(	C807, 808	20pf	C951, 961	20pt
		C851,861	.15uf		
(M) monolithic (T) tantalum		C852,853,862,863 C854,864	104 1. Sef (7)		
		C871, 872, 873	. Juf (M)		

# SEMICONDUCTORS

11914	LF353N LM1458	2N3902 npn 2N3905 pnp	AX27-005 gr-rd
D901,902 951,952,961,962	IC901 IC902, 951	0951, 961	LED951,961
11014	LF353N LM1458	2N5486 fet	HLMP2500 gr
D851,852,861,862 871,872,873	IC801 IC851,852	Q801, 802, 803 851, 852, 861, 862	LED871,872,873 874,875
11914	LF353N LM1458	2N3903 npm	HLMP2300 rd HLMP2400 ye
D701, 702, 703, 704, 705, 706	IC701	9751,752,761,762	LED751, 761 LED752, 762

all values are ohms (r) and K-ohms (k); fixed resistors are 1/4 watt, 5% RESISTORS:

VACUUM TUBE FLORESCENT DUAL CHANNEL ASSEMBLY, NIPPON-KIKI LB-100-14C10A V.T.F. METER:

JB01 AND JB02 ARE USER ADJUSTABLE LEVEL-SET ACCOMODATIONS ALCO PJ-1 JUMPERS:

SW51: SPST TOGGLE; SW871:SP 3-WAY TOGGLE; SW872: DPST TOGGLE: SWITCHES:

A. "Dyna-Set" Jumpers

The Aphex II Aural Exciter operates at an internal clipping level of +21 dBv. To accommodate systems operating at other levels, Dyna-Set allows the user to optimize the gain structure of the Aphex II for best signal-to-noise performance as well as selecting any Ovu reference point for metering ease. The calibration tag on the rear of the unit shows where it was set at the factory. Should the levels need to be changed, it can be done as follows:

1. J.201 Input Select - Set this jumper for the maximum level expected from your signal source. Fixed options are +21, +24 or +27 dBv (OdBv = 0.775v) other levels may be accomodated by choosing the appropriate value for position R215, and putting the selector in the \*position.

2. J.601 Output Level Select - This is normally set to correlate with J201 "input level", in all units with balanced outputs. For units with <u>single-ended</u> transformerless outputs the jumper must be set to read 6 dB <u>higher</u> than the actual intended output level. For example, to set +21 dBv output level, the jumper will be set at the +27 position.

In cases where the desired max output is lower than the preselected values, (i.e. +10 dBv), R609 can be removed and replaced by a pair of resistors in positions R610 and 611 to pad the output (and attendant noise) to the appropriate level.

3. "Meter Refs" J.801 and J802 correlate internal clipping and VU settings to the user's system. Set J801 to match J301. Set J802 to match user's choice of VU reference. R818 may be chosen to match a non-standard reference. Standard settable references are 0, +4, and +8 dBv = 0,VU.

In semi-pro or consumer applications where  $\emptyset VU = -10 \, \mathrm{d} Bv$  and clipping +  $10 \, \mathrm{d} Bv$ , use the  $\emptyset VU = \emptyset \, \mathrm{d} Bv$  position since the meter sensing point occurs before the signal level is padded and sent to the putput.

4. "External Ref" J301 sets the sidechain input headroom to minimize noisegain at a given operating level. The '0' position allows about 20 dB of headroom above your selected OVU level (see sec. 3, "meter ref").

In situations using already processed material, the headroom (and noise) can be lowered by moving the jumper to the +4 or +8 positions, giving 16 or 12 dB of headroom, respectively. Conversely, the \* position can be used for increased headroom, if necessary.

Calibrating the Aphex II

æ

Once the Dyna-Set jumpers have been set, minimal calibration adjusts will fine trim the entire unit.

Unity Gain and Meter Calibration

 a. Make sure test equipment input is loaded with the same impedance as the circuit in which unit is to be used (600 or correct bridging impedance).

Set-Up:

<u>.</u>

Meter Ballistics: "VU"
Meter Select: "Out"
In/Out (Proof/Operate): "Out" or "Proof"
Output Level: "Cal" (Max. cw)
Ax Mix: Anyplace but "solo"
All Other Controls: Does not matter

Meter Trimmer Locations: See Figure ----

VR852→ METER CAP D
851→ (REAR)
862→ (REAR)
861→ (REAR)

PROCEDURE:

 With:no signal, adjust Meter Ø Null Adj. Trimmer VR871 for no display. This is a "Ø centering" type of adjust.

2. Apply signal to CH.B at chosen Ø VU

7

Procedure, con't

Adjust Output Cal trim VR603 for exactly unity gain. (This is why the correct load is essential. There is sufficient reserve gain to bring the unit into cal load if used.) with a 600 3

Adjust CH B cal VR861 so meter barely reads "\$". 4.

Switch Meter Ballistics selector to "PK" and adjust CH B PK cal VR862 as in step 4. δ.

Repeat steps 2 - 5 for CH A, using VR851 and VR852 for VU and PK respectively. 9

Red/Green "Drive" Led Calibration

it will not usually need recalibration unless an IC in this circuit or a power supply regulator is replaced. Even then, change will be non-critical ( $\pm$  .5dB). Since this circuit is calibrated to internal levels, Note:

"Drive": Min. (Full ccw)
"Tuning": Min. "

"Damping": Min.

Procedure:

Insert signal at about OVU into input. >2kHz

Place probe at test point TP301. Adjust "Drive" (VR303) for +6dBv at this point. Note: This is a measured value ref 0 dBv = 35.

Adjust Red/Green Threshold trimmer VR901 so that 0.775 volts, not +6VU)

. 4

green to off at approximately this setting (o 12 to 13dB "window" between off and red is correct. Drive LED just goes from green to red. Reduce signal about 12dB. LED should go from 5.

(Harmonics and Limiting function, sirtion #400) 3. D.C. Offset trim on VCA:

In/Out (Proof/Operate) switch: "Out" (Proof)
all Filter Controls: Full ccw (min) SET-UP:

Shielded Probe EQUIPMENT:

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<u>س</u>

Noise (low pass) filter

Scope - 10Mv sensitivity min.

An appropriate noise filter can be made with a fixture which puts this filter in line with the probe at the scope input:

To Scope TP401 TP401 nf

PROCEDURE:

Place probe at TP401 (VCA output).

signal adjust vertical center of scope so trace With scope on 10mv/division scale D.C. with no is centered

Switch "IN/OUT" switch to "In" (OPERATE) and adjust VR401 so that trace centers at same location as previously noted. θ,

Repeat until no difference is seen between IN and OUT conditions. I IMv adjust is easily achieved. VR401 will only affect circuit output when circuit is in "IN" (OPERATE) mode. 4.

Once unit is burned in, D.C. drift is not normally a problem. Readjustment usually becomes necessary only if a power supply regulator or 10401, 402, or 403 is replaced.

\*\*\*